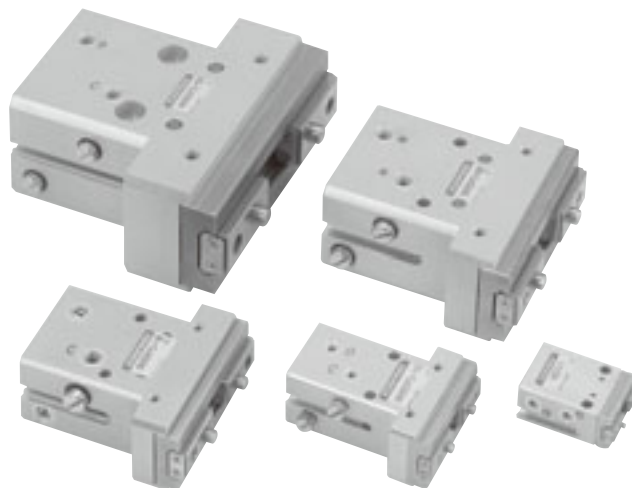
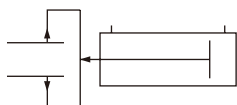


NHB SERIES PARALLEL TYPE

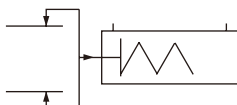
Linear Guide Specification
Double Acting Type, Single Acting Normally Open Type



Symbols



Double Acting Type



Single Acting
Normally Open Type

Specifications

● Double acting parallel type

Basic model		NHBDPG-8	NHBDPG-10	NHBDPG-16	NHBDPG-20	NHBDPG-32
Item						
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]	32 [1.260]
Operation type		Double acting type				
Media		Air				
Operating pressure range	MPa [psi.]	0.22~0.7 [32~102]	0.2~0.7 [29~102]	0.12~0.7 [17~102]	0.1~0.7 [15~102]	
Proof pressure	MPa [psi.]	1.05 [152]				
Operating temperature range	°C [°F]	0~60 [32~140]				
Maximum operating frequency	cycle/min	120				
Lubrication		Not required				
Effective gripping force (F) ^{Note 1}	Closed side	5.8 [1.30]	9.4 [2.11]	26.4 [5.93]	45.0 [10.12]	157.8 [35.47]
	Open side	9.9 [2.23]	14.7 [3.30]	39.2 [8.81]	59.8 [13.44]	176.4 [39.65]
Lever open/closed stroke	mm [in.]	4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]	22 [0.866]
Repeatability	mm [in.]	±0.01 [±0.0004]				
Port size		M3×0.5		M5×0.8		
Mass ^{Note 2}	g [oz.]	24 [0.85] (29 [1.02])	80 [2.82] (91 [3.21])	159 [5.61] (178 [6.28])	329 [11.60] (355 [12.52])	664 [23.42]

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1385](#).

2. () mean the mass with the mounting bracket: -M.

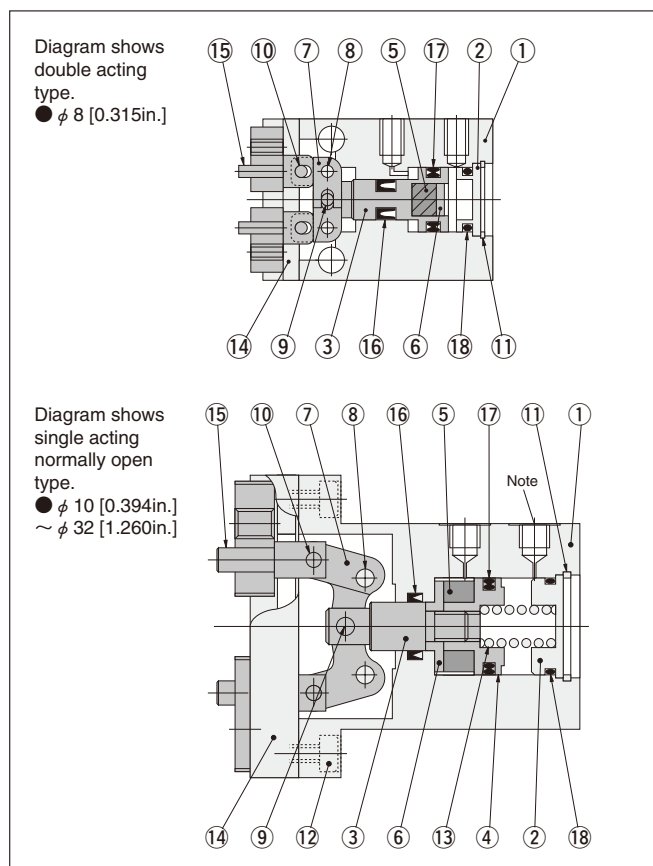
● Single acting normally open parallel type

Basic model		NHBRPG-8	NHBRPG-10	NHBRPG-16	NHBRPG-20
Item					
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Single acting normally open type			
Media		Air			
Operating pressure range	MPa [psi.]	0.4~0.7 [58~102]	0.35~0.7 [51~102]	0.25~0.7 [36~102]	
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	°C [°F]	0~60 [32~140]			
Maximum operating frequency	cycle/min	120	80		
Lubrication		Not required			
Effective gripping force (F) ^{Note 1}	Closed side	4.1 [0.92]	6.8 [1.53]	19.6 [4.41]	34.3 [7.71]
	Open side	2.7 [0.61]	2.4 [0.54]	5.4 [1.21]	7.3 [1.64]
Lever open/closed stroke	mm [in.]	4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]
Repeatability	mm [in.]	±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
Mass ^{Note 2}	g [oz.]	24 [0.85] (29 [1.02])	81 [2.86] (92 [3.25])	160 [5.64] (179 [6.31])	330 [11.64] (356 [12.56])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1385](#).

2. () mean the mass with the mounting bracket: -M.

Inner Construction



Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	Except $\phi 8$ [0.315in.].
⑤	Magnet	Plastic magnet	
⑥	Magnet holder	Aluminum alloy	
⑦	Action lever	Steel	
⑧	Fulcrum pin	Steel	
⑨	Press fit pin	Steel	
⑩	Press fit pin	Steel	
⑪	Internal snap ring	Steel	
⑫	Hexagon socket head bolt	Steel	
⑬	Spring	Steel wire	Single acting type only
⑭	Bearing	Stainless steel	
⑮	Knuckle	Stainless steel	
⑯	Seal	Synthetic rubber (NBR)	
⑰	Seal	Synthetic rubber (NBR)	
⑱	O-ring	Synthetic rubber (NBR)	

Order Codes

■ Mounting bracket No mounting bracket  Blank With mounting bracket  -M ★ Included at shipping		■ Sensor switch No sensor switch  Blank With ZE135  -ZE135 With ZE155  -ZE155 With ZE235  -ZE235 With ZE255  -ZE255 ● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Horizontal lead wire ● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Horizontal lead wire ● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire ● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire				■ Lead wire length A : 1000mm [39in.] B : 3000mm [118in.]		■ Number of sensor switches (for air hands with sensor switches) ● 1 : With 1 sensor switch ● 2 : With 2 sensor switches ★ Included at shipping	
				Additional Parts (To be ordered separately) Mounting bracket  ● For φ 8 [0.315in.] — NHB-M8 ● For φ 10 [0.394in.] — NHB-M10 ● For φ 16 [0.630in.] — NHB-M16 ● For φ 20 [0.787in.] — NHB-M20					

Additional Parts (To be ordered separately)

Mounting bracket



- For $\phi 8$ [0.315in.]
— NHB-M8
- For $\phi 10$ [0.394in.]
— NHB-M10
- For $\phi 16$ [0.630in.]
— NHB-M16
- For $\phi 20$ [0.787in.]
— NHB-M20

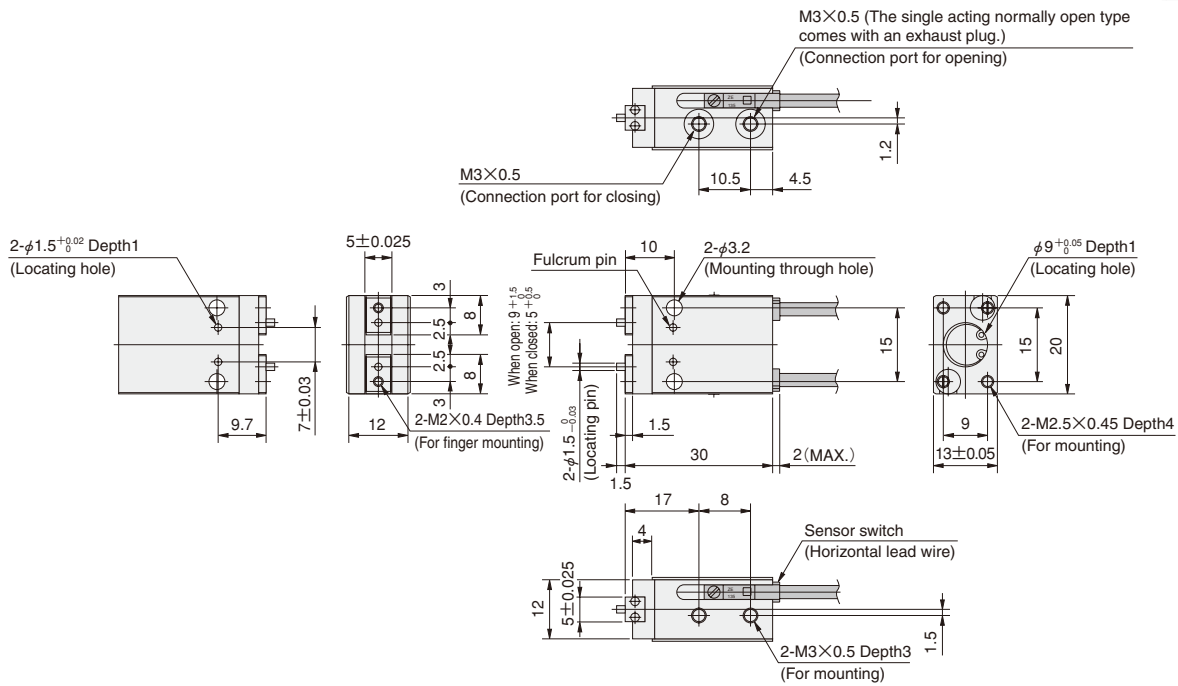
AIR HANDS SERIES

Dimensions of Liner Guide Specification Parallel Type (mm)

NHB  PG-8



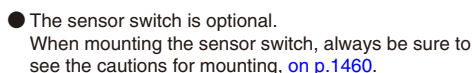
NHBDPG8



- The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.

NHB ☐ PG-16

NHBDPG-32



AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
7±0.025	9	24	16	11	20	12	M3×0.5 Depth 5	φ2.5 ^{+0.02} ₀ Depth 2.5	M4×0.7 Depth 6, Drilled hole diameter φ 3.4 thru hole	17	17	6
9±0.025	12	31	21	14	30	16	M3×0.5 Depth 5	φ3 ^{+0.02} ₀ Depth 3	M4×0.7 Depth 6, Drilled hole diameter φ 3.4 thru hole	24	20	8
12±0.025	16	37	27.3	17	40	22	M4×0.7 Depth 6	φ4 ^{+0.02} ₀ Depth 3.5	M4×0.8 Depth 8, Drilled hole diameter φ 4.2 thru hole	30	27	10
15 ⁰ _{-0.025}	20	46	31	20	50	30	M5×0.8 Depth 8	φ5 ^{+0.03} ₀ Depth 4	M6×1 Depth 9, Drilled hole diameter φ 5.2 thru hole, φ 9.5 Counterbore Depth 6 (back side)	30	32	13

● Mounting bracket: -M

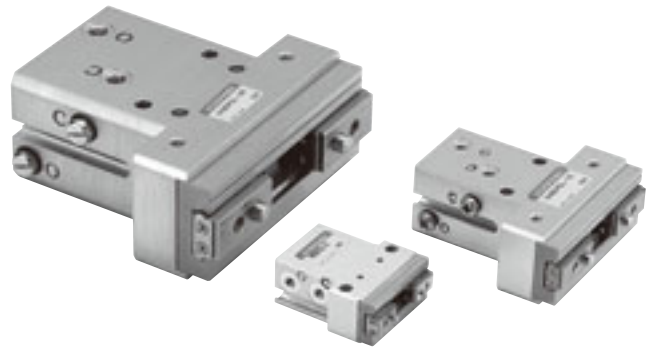


HAND

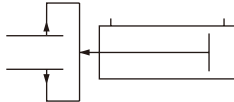


NHB SERIES PARALLEL TYPE

Linear Guide Specification Long Stroke Double Acting Type



Symbol



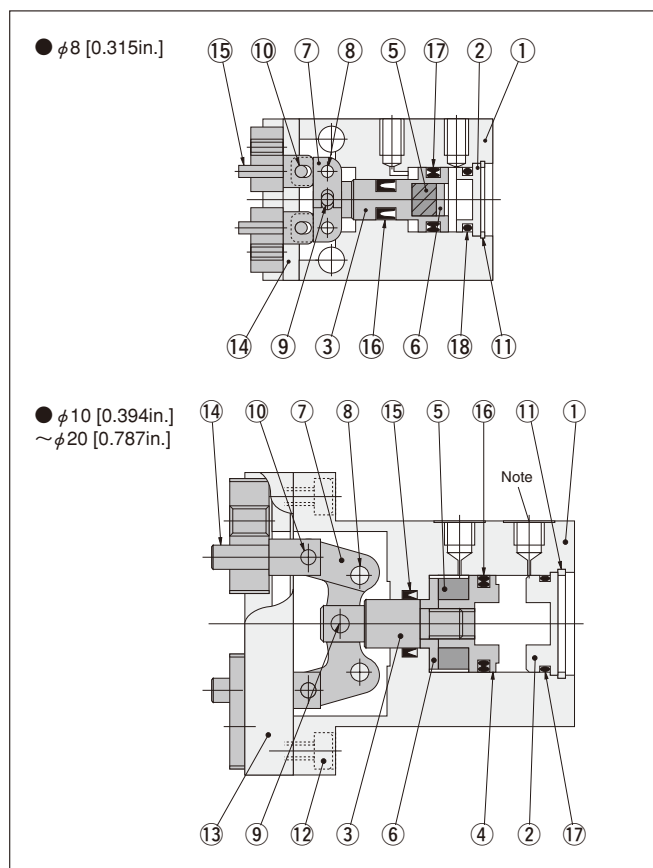
Specifications

Basic model		NHBDPGL-8	NHBDPGL-10	NHBDPGL-16	NHBDPGL-20
Item					
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Double acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.22~0.7 [32~102]	0.2~0.7 [29~102]	0.12~0.7 [17~102]	0.1~0.7 [15~102]
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	°C [°F]	0~60 [32~140]			
Maximum operating frequency	cycle/min	120			
Lubrication		Not required			
Effective gripping force (F) ^{Note 1}	Closed side	5.8 [1.30]	9.4 [2.11]	26.4 [5.93]	45.0 [10.12]
	Open side	9.9 [2.23]	14.7 [3.30]	39.2 [8.81]	59.8 [13.44]
Lever open/closed stroke	mm [in.]	8 [0.315]	12 [0.472]	16 [0.630]	22 [0.866]
Repeatability	mm [in.]	±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
Mass ^{Note 2}	g [oz.]	27 [0.95] (32 [1.13])	90 [3.17] (101 [3.56])	168 [5.93] (187 [6.60])	368 [12.98] (394 [13.90])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1385](#).

2. () mean the mass with the mounting bracket: -M.

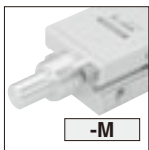
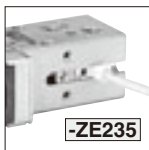
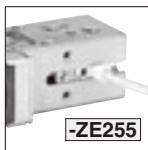
Inner Construction

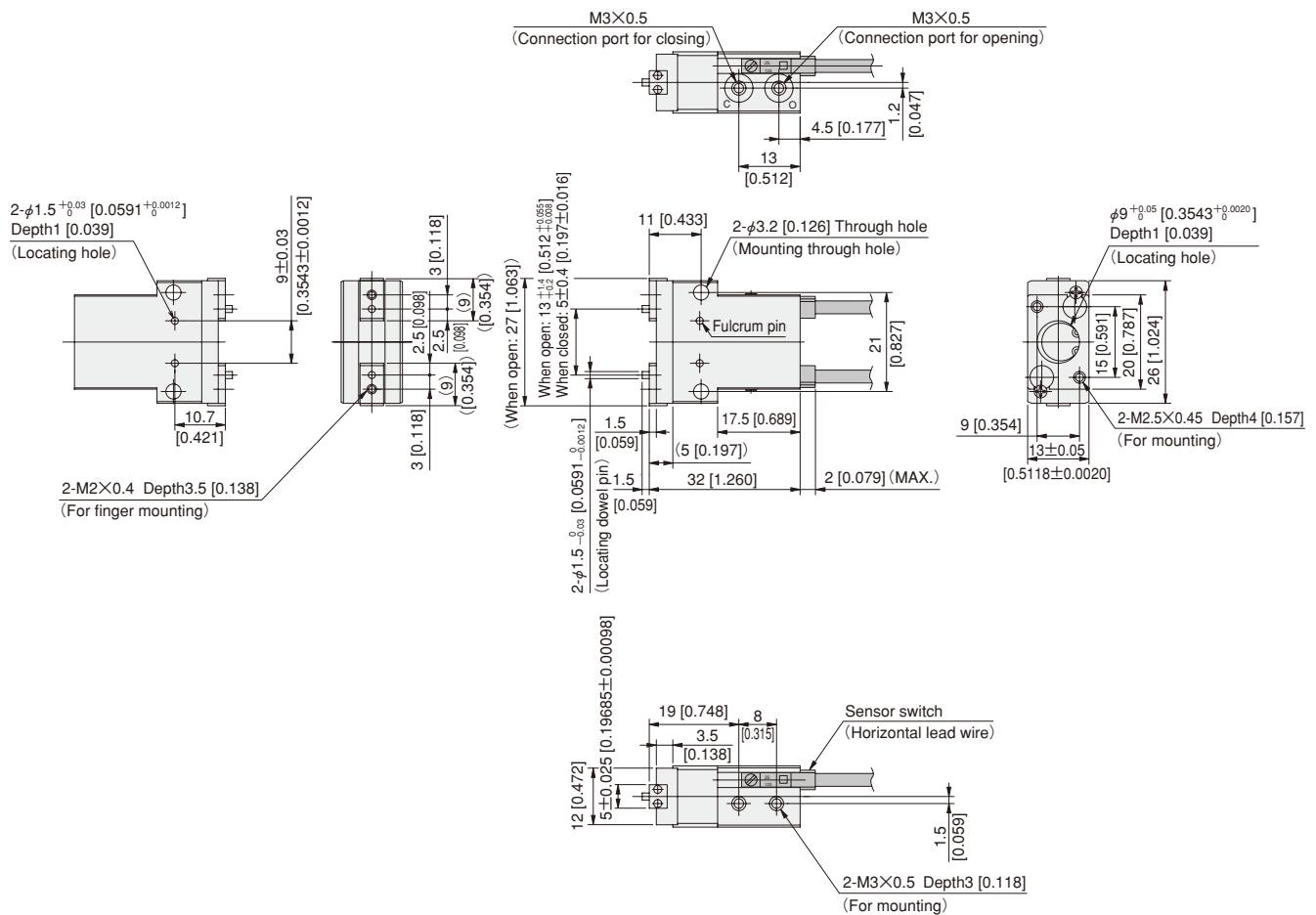


Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	Except $\phi 8$ [0.315in.].
⑤	Magnet	Plastic magnet	
⑥	Magnet holder	Aluminum alloy	
⑦	Action lever	Steel	
⑧	Fulcrum pin	Steel	
⑨	Press fit pin	Steel	
⑩	Press fit pin	Steel	
⑪	Internal snap ring	Steel	
⑫	Hexagon socket head bolt	Steel	
⑬	Bearing	Stainless steel	
⑭	Knuckle	Stainless steel	
⑮	Seal	Synthetic rubber (NBR)	
⑯	Seal	Synthetic rubber (NBR)	
⑰	O-ring	Synthetic rubber (NBR)	

Order Codes

	Mounting bracket		Sensor switch				Lead wire length		Number of sensor switches (for air hands with sensor switches)		Additional Parts (To be ordered separately)
	No mounting bracket	With mounting bracket	No sensor switch	With ZE135	With ZE155	With ZE235	With ZE255	A : 1000mm [39in.] B : 3000mm [118in.]	● 1 : With 1 sensor switch ● 2 : With 2 sensor switches	★ Included at shipping	
	 Blank	 -M ★ Included at shipping	 Blank	 -ZE135	 -ZE155	 -ZE235	 -ZE255				 ● For $\phi 8$ [0.315in.] — NHB-M8 ● For $\phi 10$ [0.394in.] — NHB-M10 ● For $\phi 16$ [0.630in.] — NHB-M16 ● For $\phi 20$ [0.787in.] — NHB-M20
				● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Horizontal lead wire	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Horizontal lead wire	● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire				
Double Acting Type	NHBDPGL			-8 -10 -16 -20	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2			

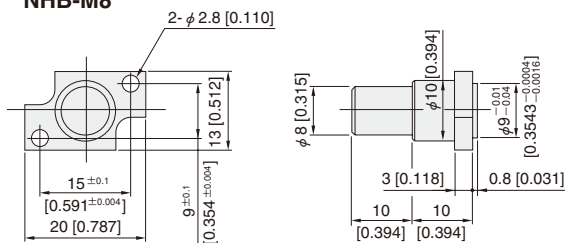


- The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting [on p.1460](#).

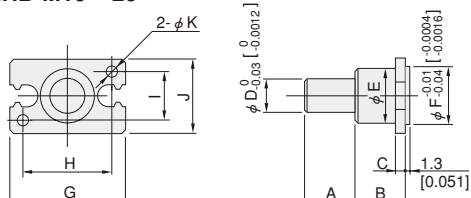
Options

● Mounting bracket: -M

NHB-M8



NHB-M10~20

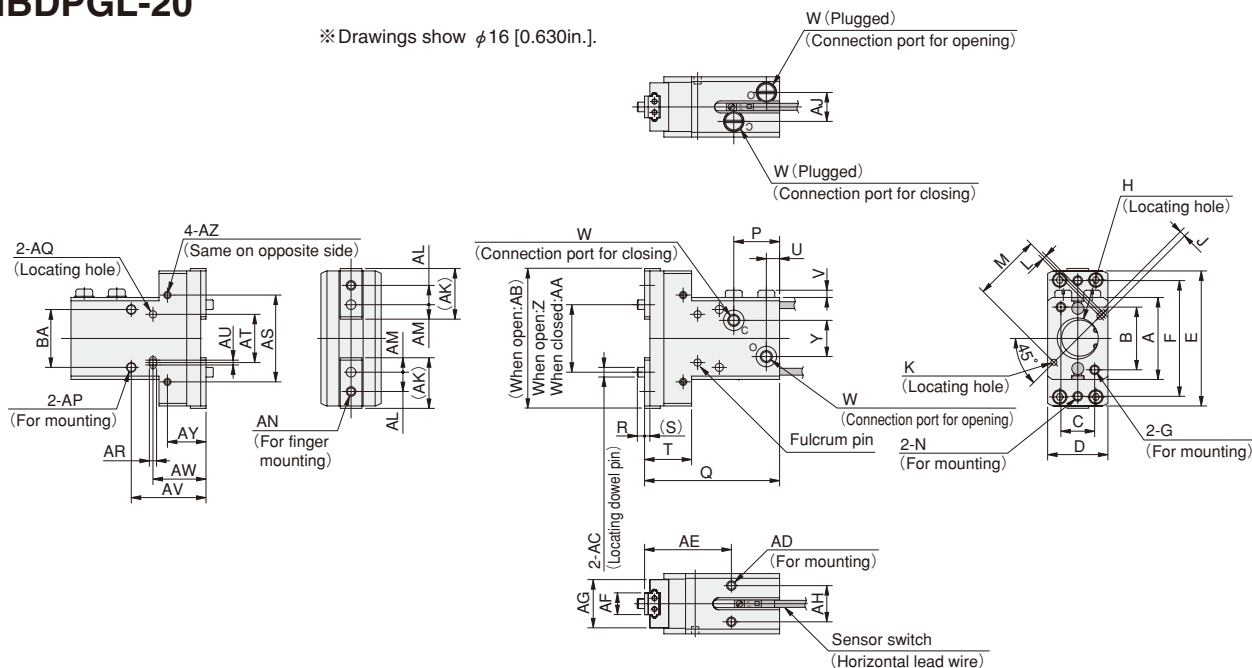


Model \ Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M10	15	15	3	10	11	11	23	17	10	16	3.4
	[0.591]	[0.591]	[0.118]	[0.3937]	[0.433]	[0.4331]	[0.906]	[0.669]	[0.394]	[0.630]	[0.134]
NHB-M16	15	15	3	10	16	17	34	26	14	22	4.5
	[0.591]	[0.591]	[0.118]	[0.3937]	[0.630]	[0.6693]	[1.339]	[1.024]	[0.551]	[0.866]	[0.177]
NHB-M20	15	15	3	10	18	21	45	35	16	26	5.5
	[0.591]	[0.591]	[0.118]	[0.3937]	[0.709]	[0.8268]	[1.772]	[1.378]	[0.630]	[1.024]	[0.217]

NHBDPGL-10
NHBDPGL-16
NHBDPGL-20



※ Drawings show $\phi 16$ [0.630in.].



● The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.

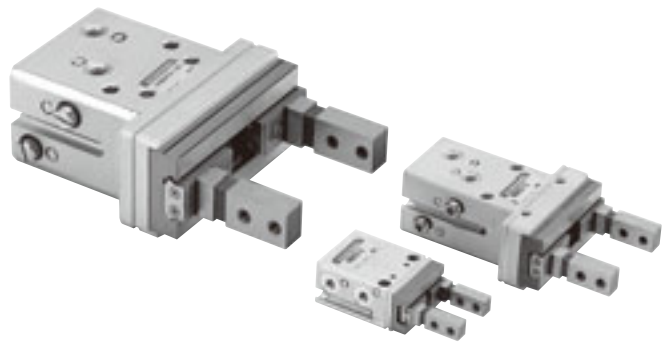
Model \ Code	A	B	C	D	E	F	G	H	J	K	L	M	N
NHBDPGL-10	23 [0.906]	17 [0.669]	10 [0.394]	20±0.05 [0.7874 ±0.0020]	45 [1.772]	39 [1.535]	M3×0.5 Depth6 [0.236]	$\phi 11^{+0.05}_0$ [0.4331 $^{+0.0020}_0$] Depth1.5 [0.059]	$2^{+0.03}_0$ [0.0787 $^{+0.0012}_0$] Depth2 [0.079]	$\phi 2^{+0.03}_0$ [0.0787 $^{+0.0012}_0$] Depth2 [0.079]	1 [0.039]	20 [0.787]	M3×0.5 Depth4.5 [0.177]
NHBDPGL-16	34 [1.339]	26 [1.024]	14 [0.551]	25±0.05 [0.9843 ±0.0020]	56 [2.205]	48 [1.890]	M4×0.7 Depth7 [0.276]	$\phi 17^{+0.05}_0$ [0.6693 $^{+0.0020}_0$] Depth1.5 [0.059]	$2.5^{+0.03}_0$ [0.0984 $^{+0.0012}_0$] Depth3 [0.118]	$\phi 2.5^{+0.03}_0$ [0.0984 $^{+0.0012}_0$] Depth3 [0.118]	2 [0.079]	28 [1.102]	M4×0.7 Depth5 [0.197]
NHBDPGL-20	45 [1.772]	35 [1.378]	16 [0.630]	32±0.05 [1.2598 ±0.0020]	73 [2.874]	65 [2.559]	M5×0.8 Depth9 [0.354]	$\phi 21^{+0.05}_0$ [0.8268 $^{+0.0020}_0$] Depth1.5 [0.059]	$3^{+0.03}_0$ [0.1181 $^{+0.0012}_0$] Depth3 [0.118]	$\phi 3^{+0.03}_0$ [0.1181 $^{+0.0012}_0$] Depth3 [0.118]	2 [0.079]	34 [1.339]	M5×0.7 Depth7 [0.276]

P	Q	R	S	T	U	V	W	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL
17 [0.669]	49 [1.929]	2 [0.079]	1.5 [0.059]	18 [0.709]	5 [0.197]	2.5 [0.098]	M3×0.5	7 [0.276]	$21^{+1.5}_0$ [0.827 $^{+0.059}_0$] Depth2.5 [0.098]	$9^{+0.5}_0$ [0.354 $^{+0.020}_0$] Depth2.5 [0.098]	46 [1.811]	$\phi 3^{+0.03}_0$ [0.1181 $^{+0.0012}_0$] Depth2.5 [0.098]	M3×0.5 Depth5 [0.197]	29 [1.142]	7 ± 0.025 [0.27559 ± 0.00098]	17 [0.669]	12 [0.472]	10 [0.394]	16.8 [0.661]	5 [0.197]
19 [0.748]	56 [2.205]	3 [0.118]	2.2 [0.087]	19.5 [0.768]	5.5 [0.217]	3 [0.118]	M5×0.8	15 [0.591]	$28^{+1.8}_0$ [1.102 $^{+0.071}_0$] Depth3 [0.118]	$12^{+1.3}_0$ [0.472 $^{+0.051}_0$] Depth3 [0.118]	59 [2.323]	$\phi 4^{+0.03}_0$ [0.1575 $^{+0.0012}_0$] Depth3 [0.118]	M4×0.7 Depth6 [0.236]	36 [1.417]	9 ± 0.025 [0.35433 ± 0.00098]	20 [0.787]	15 [0.591]	12 [0.472]	21 [0.827]	8 [0.315]
23 [0.906]	73 [2.874]	3 [0.118]	3 [0.118]	26 [1.024]	5.5 [0.217]	3 [0.118]	M5×0.8	17 [0.669]	$38^{+2.4}_0$ [1.496 $^{+0.094}_0$] Depth3.5 [0.138]	$16^{+1.4}_0$ [0.630 $^{+0.055}_0$] Depth3.5 [0.138]	75 [2.953]	$\phi 5^{+0.03}_0$ [0.1969 $^{+0.0012}_0$] Depth3.5 [0.138]	M5×0.8 Depth8 [0.315]	43 [1.693]	12 ± 0.025 [0.47244 ± 0.00098]	27 [1.063]	18 [0.709]	15 [0.591]	26 [1.024]	8 [0.315]

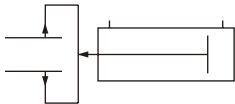
AM	AN	AP	AQ	AR	AS	AT	AU	AV	AW	AY	AZ	BA
4.5 [0.177]	M3×0.5 Depth4 [0.157]	M4×0.7 Depth6 [0.236], Drilled hole diameter $\phi 3.4$ [0.134] through hole	$\phi 2.5^{+0.02}_0$ [0.0984 $^{+0.0008}_0$] Depth2.5 [0.098]	$2.5^{+0.02}_0$ [0.0984 $^{+0.0008}_0$] Depth2.5 [0.098]	30 [1.181]	14 ± 0.03 [0.5512 ± 0.0012]	1 [0.039]	24 [0.945]	17 [0.669]	12 [0.472]	M3×0.5 Depth5 [0.197]	17 [0.669]
6 [0.236]	M4×0.7 Depth5 [0.197]	M4×0.7 Depth6 [0.236], Drilled hole diameter $\phi 3.4$ [0.134] through hole	$\phi 3^{+0.02}_0$ [0.1181 $^{+0.0008}_0$] Depth3 [0.118]	$3^{+0.02}_0$ [0.1181 $^{+0.0008}_0$] Depth3 [0.118]	36 [1.417]	20 ± 0.03 [0.7874 ± 0.0012]	2 [0.079]	31 [1.220]	22 [0.866]	16 [0.630]	M3×0.5 Depth5 [0.197]	24 [0.945]
8 [0.315]	M5×0.8 Depth7 [0.276]	M5×0.8 Depth8 [0.315], Drilled hole diameter $\phi 4.2$ [0.165] through hole	$\phi 4^{+0.02}_0$ [0.1575 $^{+0.0008}_0$] Depth3.5 [0.138]	$4^{+0.02}_0$ [0.1575 $^{+0.0008}_0$] Depth3.5 [0.138]	50 [1.969]	26 ± 0.03 [1.0236 ± 0.0012]	2 [0.079]	37 [1.457]	27.3 [1.075]	20 [0.787]	M4×0.7 Depth6 [0.236]	30 [1.181]

NHB SERIES PARALLEL TYPE

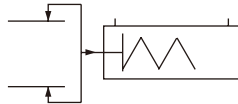
Linear Guide Specification with Fingers
Double Acting Type, Single Acting Normally Open Type



Symbols



Double Acting Type



Single Acting
Normally Open Type

Specifications

● Double acting type

Basic model		NHBDPGY-8	NHBDPGY-10	NHBDPGY-16	NHBDPGY-20
Item					
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Double acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.22~0.7 [32~102]	0.2~0.7 [29~102]	0.12~0.7 [17~102]	0.1~0.7 [15~102]
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	°C [°F]	0~60 [32~140]			
Maximum operating frequency	cycle/min	100			
Lubrication		Not required			
Effective gripping force (F) ^{Note 1}	Closed side	5.8 [1.30]	9.4 [2.11]	26.4 [5.93]	45.0 [10.12]
	Open side	9.9 [2.23]	14.7 [3.30]	39.2 [8.81]	59.8 [13.44]
Lever open/closed stroke	mm [in.]	4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]
Repeatability	mm [in.]	±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
Mass ^{Note 2}	g [oz.]	27 [0.95] (32 [1.13])	90 [3.17] (101 [3.56])	180 [6.35] (119 [4.20])	370 [13.05] (396 [13.97])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1386](#).

2. () mean the mass with the mounting bracket: -M.

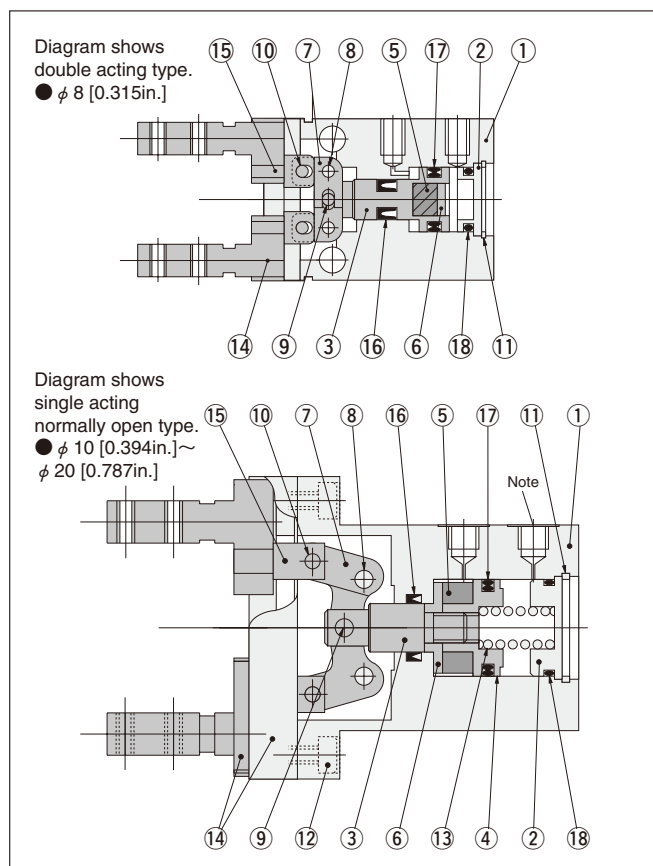
● Single acting normally open parallel type

Basic model		NHBRPGY-8	NHBRPGY-10	NHBRPGY-16	NHBRPGY-20
Item					
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Single acting normally open type			
Media		Air			
Operating pressure range	MPa [psi.]	0.4～0.7 [58～102]	0.35～0.7 [51～102]	0.25～0.7 [36～102]	
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	℃ [°F]	0～60 [32～140]			
Maximum operating frequency	cycle/min		100		
Lubrication		Not required			
Effective gripping force (F) ^{Note 1}	Closed side	4.1 [0.92]	6.8 [1.53]	20.0 [4.50]	34.0 [7.64]
	Open side	2.7 [0.61]	2.4 [0.54]	5.4 [1.21]	7.3 [1.64]
Lever open/closed stroke	mm [in.]	4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]
Repeatability	mm [in.]	±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
Mass ^{Note 2}	g [oz.]	28 [0.99] (33 [1.16])	91 [3.21] (102 [3.60])	181 [6.38] (200 [7.05])	371 [13.09] (397 [14.00])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1386](#).

2. () mean the mass with the mounting bracket: -M.

Inner Construction

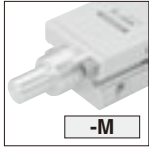
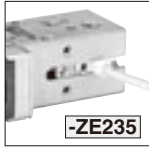
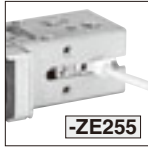


Note: An exhaust plug is attached to the exhaust connection port of the single acting normally open type. Plugs are attached to the extra connection ports on the side surface (except $\phi 8$ [0.315in.]).

Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	Except $\phi 8$ [0.315in.].
⑤	Magnet	Plastic magnet	
⑥	Magnet holder	Aluminum alloy	
⑦	Action lever	Steel	
⑧	Fulcrum pin	Steel	
⑨	Press fit pin	Steel	
⑩	Press fit pin	Steel	
⑪	Internal snap ring	Steel	
⑫	Hexagon socket head bolt	Steel	
⑬	Spring	Steel wire	Single acting type only
⑭	Bearing	Stainless steel	
⑮	Knuckle	Stainless steel	
⑯	Seal	Synthetic rubber (NBR)	
⑰	Seal	Synthetic rubber (NBR)	
⑱	O-ring	Synthetic rubber (NBR)	

Order Codes

	Mounting bracket		Sensor switch		Lead wire length		Number of sensor switches (for air hands with sensor switches)	
	No mounting bracket	With mounting bracket	No sensor switch	With ZE135	With ZE155	With ZE235	With ZE255	
	 Blank	 -M ★ Included at shipping	 Blank	 -ZE135	 -ZE155	 -ZE235	 -ZE255	
			● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Horizontal lead wire	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Horizontal lead wire	● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire	● 1 : With 1 sensor switch ● 2 : With 2 sensor switches ★ Included at shipping	
	Basic model		Cylinder bore size					
Double acting type	NHBDPGY		-8 -10 -16 -20	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2	
Single acting normally open type	NHBRPGY		-8 -10 -16 -20	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2	

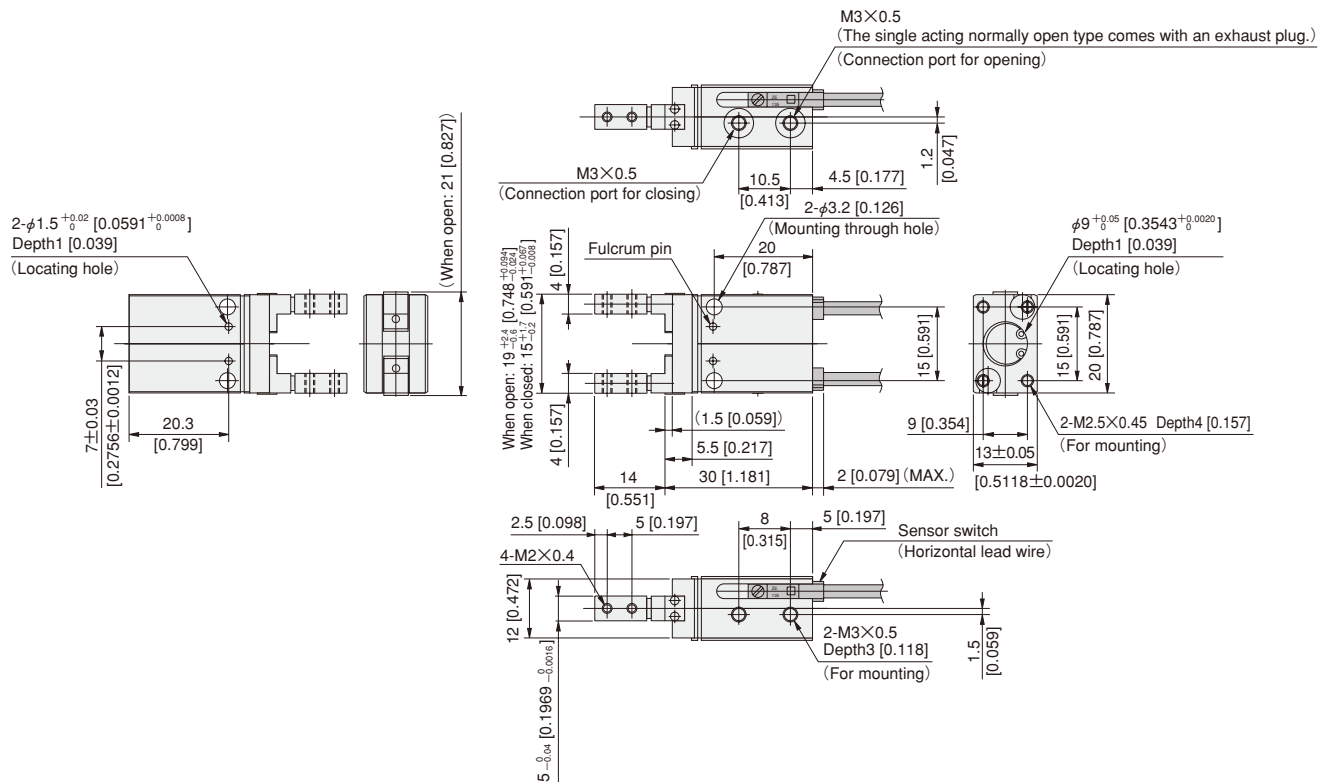
Additional Parts (To be ordered separately)

Mounting bracket



- For $\phi 8$ [0.315in.] — NHB-M8
- For $\phi 10$ [0.394in.] — NHB-M10
- For $\phi 16$ [0.630in.] — NHB-M16
- For $\phi 20$ [0.787in.] — NHB-M20

NHB PGY-8

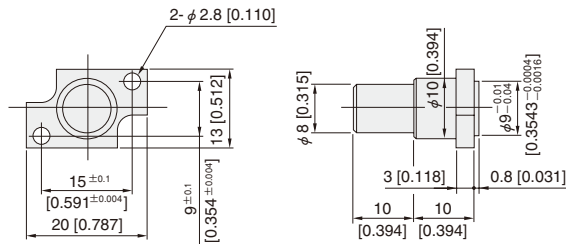


● The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.

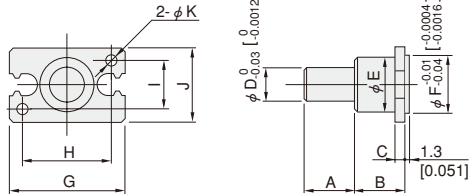
Options

● Mounting bracket: -M

NHB-M8



NHB-M10~20



Model	Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M10		15 [0.591]	15 [0.591]	3 [0.118]	10 [0.3937]	11 [0.433]	11 [0.4331]	23 [0.906]	17 [0.669]	10 [0.394]	16 [0.630]	3.4 [0.134]
NHB-M16		15 [0.591]	15 [0.591]	3 [0.118]	10 [0.3937]	16 [0.630]	17 [0.6693]	34 [1.339]	26 [1.024]	14 [0.551]	22 [0.866]	4.5 [0.177]
NHB-M20		15 [0.591]	15 [0.591]	3 [0.118]	10 [0.3937]	18 [0.709]	21 [0.8268]	45 [1.772]	35 [1.378]	16 [0.630]	26 [1.024]	5.5 [0.217]

Dimensions of Linear Guide Specification with Fingers mm [in.]

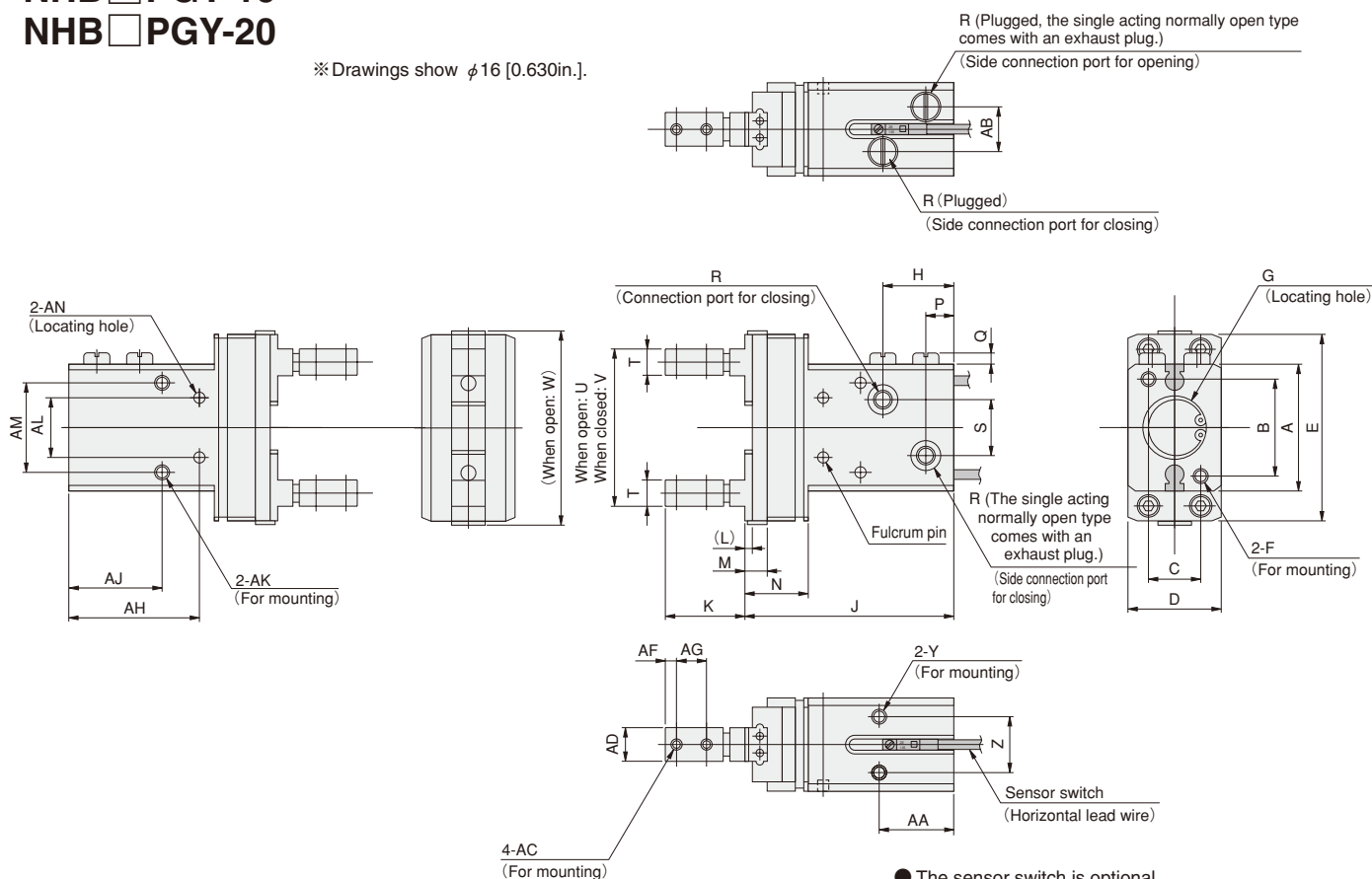


NHB ☐ PGY-10

NHB ☐ PGY-16

NHB ☐ PGY-20

※ Drawings show $\phi 16$ [0.630in.].



● The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting [on p.1460](#).

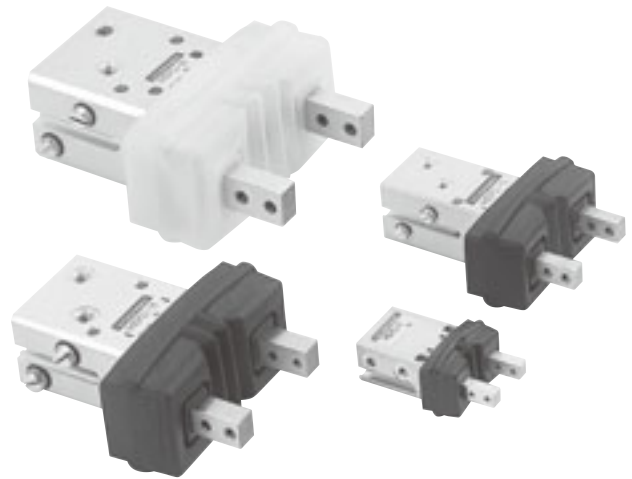
Model \ Code	A	B	C	D	E	F	G	H	J	K	L
NHB□PGY-10	23 [0.906]	17 [0.669]	10 [0.394]	20±0.05 [0.7874 ±0.0020]	36 [1.417]	M3×0.5 Depth6 [0.236]	φ 11 ^{+0.05} ₀ [0.4331 ^{+0.0020} ₀] Depth1.5 [0.059]	17 [0.669]	49 [1.929]	18.5 [0.728]	1.5 [0.059]
NHB□PGY-16	34 [1.339]	26 [1.024]	14 [0.551]	25±0.05 [0.9843 ±0.0020]	50 [1.969]	M4×0.7 Depth7 [0.276]	φ 17 ^{+0.05} ₀ [0.6693 ^{+0.0020} ₀] Depth1.5 [0.059]	19 [0.748]	56 [2.205]	21 [0.827]	2 [0.079]
NHB□PGY-20	45 [1.772]	35 [1.378]	16 [0.630]	32±0.05 [1.2598 ±0.0020]	62 [2.441]	M5×0.8 Depth9 [0.354]	φ 21 ^{+0.05} ₀ [0.8268 ^{+0.0020} ₀] Depth1.5 [0.059]	21 [0.827]	67 [2.638]	30 [1.181]	3 [1.181]

M	N	P	Q	R	S	T	U	V	W	Y	Z	AA	AB
6 [0.236]	14 [0.551]	7.5 [0.295]	2.5 [0.098]	M3×0.5	7 [0.276]	5 [0.197]	30 ^{+2.2 -0.2} [1.181 ^{+0.087 -0.088}]	23.5 ^{+1.7 -0.2} [0.925 ^{+0.087 -0.088}]	37 [1.457]	M3×0.5 Depth5 [0.197]	12 [0.472]	20 [0.787]	9 [0.354]
8 [0.315]	17 [0.669]	7.5 [0.295]	3 [0.118]	M5×0.8	15 [0.591]	7 [0.276]	41 ^{+2.9 -0.6} [1.614 ^{+0.114 -0.024}]	31 ^{+1.8 -0.5} [1.220 ^{+0.071 -0.020}]	52 [2.047]	M4×0.7 Depth6 [0.236]	15 [0.591]	20 [0.787]	12 [0.472]
10 [0.394]	23 [0.906]	7.5 [0.295]	3 [0.118]	M5×0.8	17 [0.669]	8±0.1 [0.315 ±0.004]	52 ^{+3.5 -0.5} [2.047 ^{+0.138 -0.020}]	38 ^{+2.4 -0.8} [1.496 ^{+0.094 -0.031}]	64 [2.520]	M5×0.8 Depth8 [0.315]	18 [0.709]	24 [0.945]	16 [0.630]

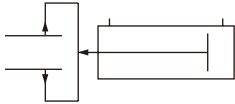
AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN
M3×0.5	$7 \begin{smallmatrix} 0 \\ -0.04 \\ [0.2756 \\ -0.0016] \end{smallmatrix}$	$17 \begin{smallmatrix} 0 \\ [0.669] \end{smallmatrix}$	$3 \begin{smallmatrix} 0 \\ [0.118] \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ [0.236] \end{smallmatrix}$	$33 \begin{smallmatrix} 0 \\ [1.299] \end{smallmatrix}$	$25 \begin{smallmatrix} 0 \\ [0.984] \end{smallmatrix}$	M4×0.7 Depth6 [0.236], Drilled hole diameter ϕ 3.4 [0.134] through hole	$12 \pm 0.03 \begin{smallmatrix} 0 \\ [0.4724 \\ \pm 0.0012] \end{smallmatrix}$	$17 \begin{smallmatrix} 0 \\ [0.669] \end{smallmatrix}$	ϕ 2.5 ^{+0.02} [0.0984 + _{0.0008}] Depth2.5 [0.098]
M3×0.5	$9 \begin{smallmatrix} 0 \\ -0.043 \\ [0.3543 \\ -0.0016] \end{smallmatrix}$	$20 \begin{smallmatrix} 0 \\ [0.787] \end{smallmatrix}$	$3 \begin{smallmatrix} 0 \\ [0.118] \end{smallmatrix}$	$8 \begin{smallmatrix} 0 \\ [0.315] \end{smallmatrix}$	$35 \begin{smallmatrix} 0 \\ [1.378] \end{smallmatrix}$	$25 \begin{smallmatrix} 0 \\ [0.984] \end{smallmatrix}$	M4×0.7 Depth6 [0.236], Drilled hole diameter ϕ 3.4 [0.134] through hole	$16 \pm 0.03 \begin{smallmatrix} 0 \\ [0.6299 \\ \pm 0.0012] \end{smallmatrix}$	$24 \begin{smallmatrix} 0 \\ [0.945] \end{smallmatrix}$	ϕ 3 ^{+0.02} [0.1181 + _{0.0008}] Depth3 [0.118]
M4×0.7	$12 \begin{smallmatrix} 0 \\ -0.05 \\ [0.4724 \\ -0.0020] \end{smallmatrix}$	$27 \begin{smallmatrix} 0 \\ [1.063] \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ [0.157] \end{smallmatrix}$	$10 \begin{smallmatrix} 0 \\ [0.394] \end{smallmatrix}$	$39.7 \begin{smallmatrix} 0 \\ [1.563] \end{smallmatrix}$	$30 \begin{smallmatrix} 0 \\ [1.181] \end{smallmatrix}$	M5×0.8 Depth8 [0.315], Drilled hole diameter ϕ 4.2 [0.165] through hole	$22 \pm 0.03 \begin{smallmatrix} 0 \\ [0.8661 \\ \pm 0.0012] \end{smallmatrix}$	$30 \begin{smallmatrix} 0 \\ [1.181] \end{smallmatrix}$	ϕ 4 ^{+0.02} [0.1575 + _{0.0008}] Depth3.5 [0.138]

NHB SERIES PARALLEL TYPE

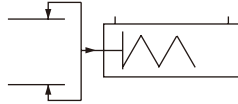
Linear Guide Specification with Rubber Cover
Double Acting Type, Single Acting Normally Open Type



Symbols



Double Acting Type



Single Acting
Normally Open Type

Specifications

● Double acting parallel type (with rubber cover)

Basic model		NHBDPGJ-8	NHBDPGJ-10	NHBDPGJ-16	NHBDPGJ-20
Item					
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Double acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.3～0.7 [44～102]	0.25～0.7 [36～102]	0.15～0.7 [22～102]	
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	℃ [°F]	0～60 [32～140]			
Maximum operating frequency	cycle/min	100			
Lubrication		Not required			
Effective gripping force (F) ^{Note 1}	Closed side	5.8 [1.30]	9.4 [2.11]	26.4 [5.93]	45.0 [10.12]
	Open side	9.9 [2.23]	14.7 [3.30]	39.2 [8.81]	59.8 [13.44]
Lever open/closed stroke	mm [in.]	4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]
Repeatability	mm [in.]	±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
Mass ^{Note 2}	g [oz.]	27 [0.95] (32 [1.13])	90 [3.17] (101 [3.56])	180 [6.35] (119 [4.20])	370 [13.05] (396 [13.97])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1385](#).

2. () mean the mass with the mounting bracket: -M.

Remark: The life of rubber cover may vary from the air hand (gripper), depending on its operating conditions.

● Single acting normally open parallel type (with rubber cover)

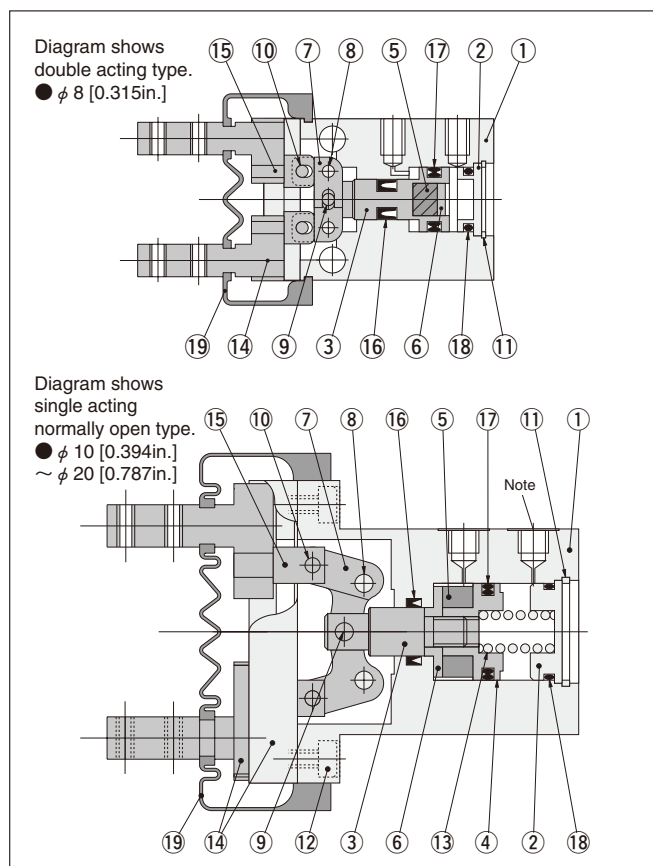
Basic model		NHBRPGJ-8	NHBRPGJ-10	NHBRPGJ-16	NHBRPGJ-20
Item					
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Normally open single acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.5～0.7 [73～102]	0.4～0.7 [58～102]	0.3～0.7 [44～102]	
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	℃ [°F]	0～60 [32～140]			
Maximum operating frequency	cycle/min	100			
Lubrication		Not required			
Effective gripping force (F) Note 1	Closed side	4.1 [0.92]	6.8 [1.53]	19.6 [4.41]	34.3 [7.71]
	Open side	2.7 [0.61]	2.4 [0.54]	5.4 [1.21]	7.3 [1.64]
Lever open/closed stroke	mm [in.]	4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]
Repeatability	mm [in.]	±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
Mass Note 2	g [oz.]	28 [0.99] (33 [1.16])	91 [3.21] (102 [3.60])	181 [6.38] (200 [7.05])	371 [13.09] (397 [14.00])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs [on p.1385](#).

2. () mean the mass with the mounting bracket: -M.

Remark: The life of rubber cover may vary from the air hand (gripper), depending on its operating conditions.

Inner Construction

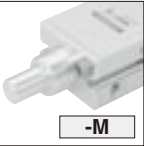


Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	Except $\phi 8$ [0.315in.].
⑤	Magnet	Plastic magnet	
⑥	Magnet holder	Aluminum alloy	
⑦	Action lever	Steel	
⑧	Fulcrum pin	Steel	
⑨	Press fit pin	Steel	
⑩	Press fit pin	Steel	
⑪	Internal snap ring	Steel	
⑫	Hexagon socket head bolt	Steel	
⑬	Spring	Steel wire	Single acting type only
⑭	Bearing	Stainless steel	
⑮	Knuckle	Stainless steel	
⑯	Seal	Synthetic rubber (NBR)	
⑰	Seal	Synthetic rubber (NBR)	
⑱	O-ring	Synthetic rubber (NBR)	
⑲	Rubber cover	Synthetic rubber ^{Note}	

Note: -JN: NBR, -JF: Fluoro rubber, -JS: Silicone rubber.

Order Codes

■ Rubber cover material  ●-JN: NBR (Black with blue mark) ●-JF: Fluoro rubber (Black with green mark) ●-JS: Silicone rubber (White)	■ Mounting bracket No mounting bracket  Blank With mounting bracket  -M ★ Included at shipping	■ Sensor switch No sensor switch  Blank With ZE135  -ZE135 ● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Horizontal lead wire With ZE155  -ZE155 ● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Horizontal lead wire With ZE235  -ZE235 ● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire With ZE255  -ZE255 ● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire	■ Lead wire length A : 1000mm [39in.] B : 3000mm [118in.]	■ Number of sensor switches (for air hands with sensor switches) ● 1 : With 1 sensor switch ● 2 : With 2 sensor switches ★ Included at shipping			
Additional Parts (To be ordered separately) Mounting bracket  ● For φ 8 [0.315in.]—NHB-M8 ● For φ 10 [0.394in.]—NHB-M10 ● For φ 16 [0.630in.]—NHB-M16 ● For φ 20 [0.787in.]—NHB-M20							
Rubber cover  □-NHBDPGJ□							
Double acting type	NHBDPGJ	-8 -10 -16 -20	-JN -JF -JS	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2
Single acting normally open type	NHBRPGJ	-8 -10 -16 -20	-JN -JF -JS	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2

■ Rubber cover material

JN: NBR
(Black with blue mark)

■ Bore size

8 : φ 8 [0.315in.]

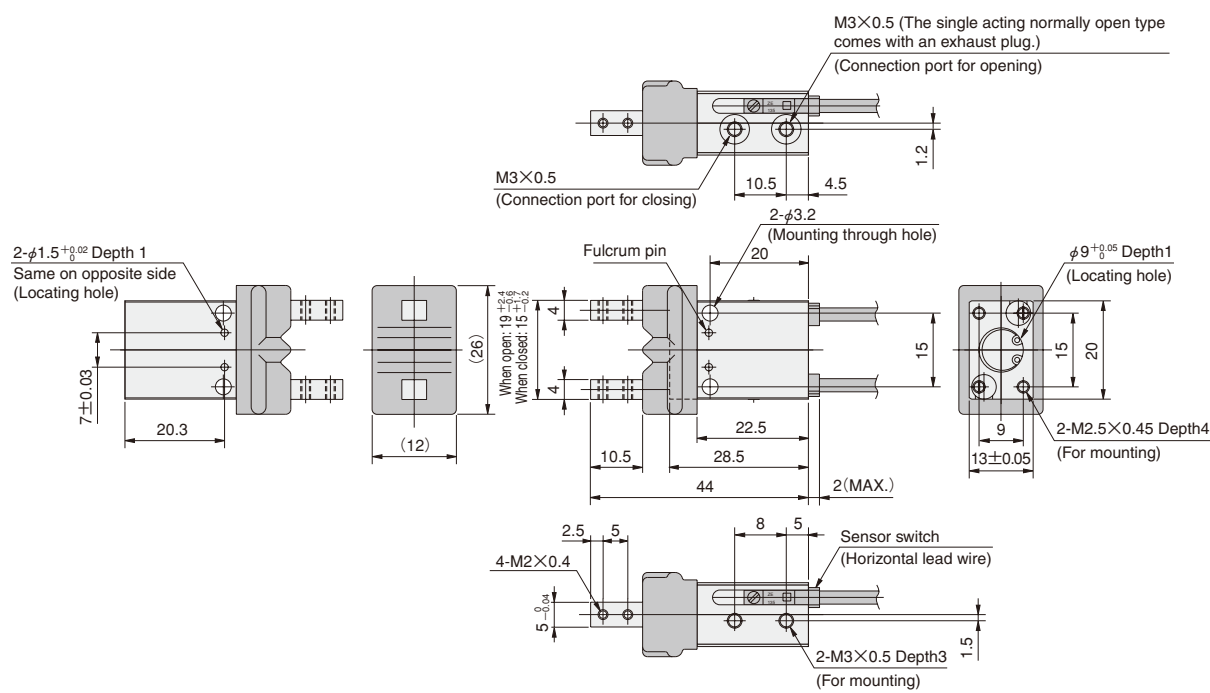
10 : φ 10 [0.394in.]

16 : φ 16 [0.630in.]

20 : φ 20 [0.787in.]

Dimensions of Linear Guide Specification Parallel Type with Rubber Cover (mm)

NHB PGJ-8

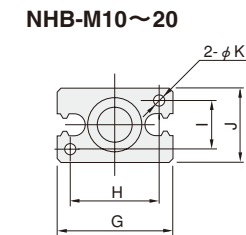
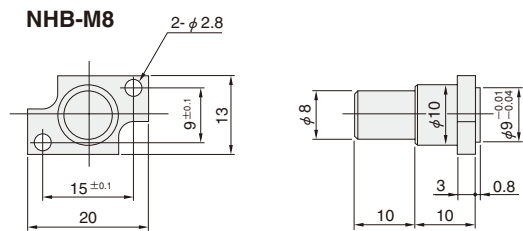


● The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.

Options



● Mounting bracket: -M



Model	Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M10		15	15	3	10	11	11	23	17	10	16	3.4
NHB-M16		15	15	3	10	16	17	34	26	14	22	4.5
NHB-M20		15	15	3	10	18	21	45	35	16	26	5.5

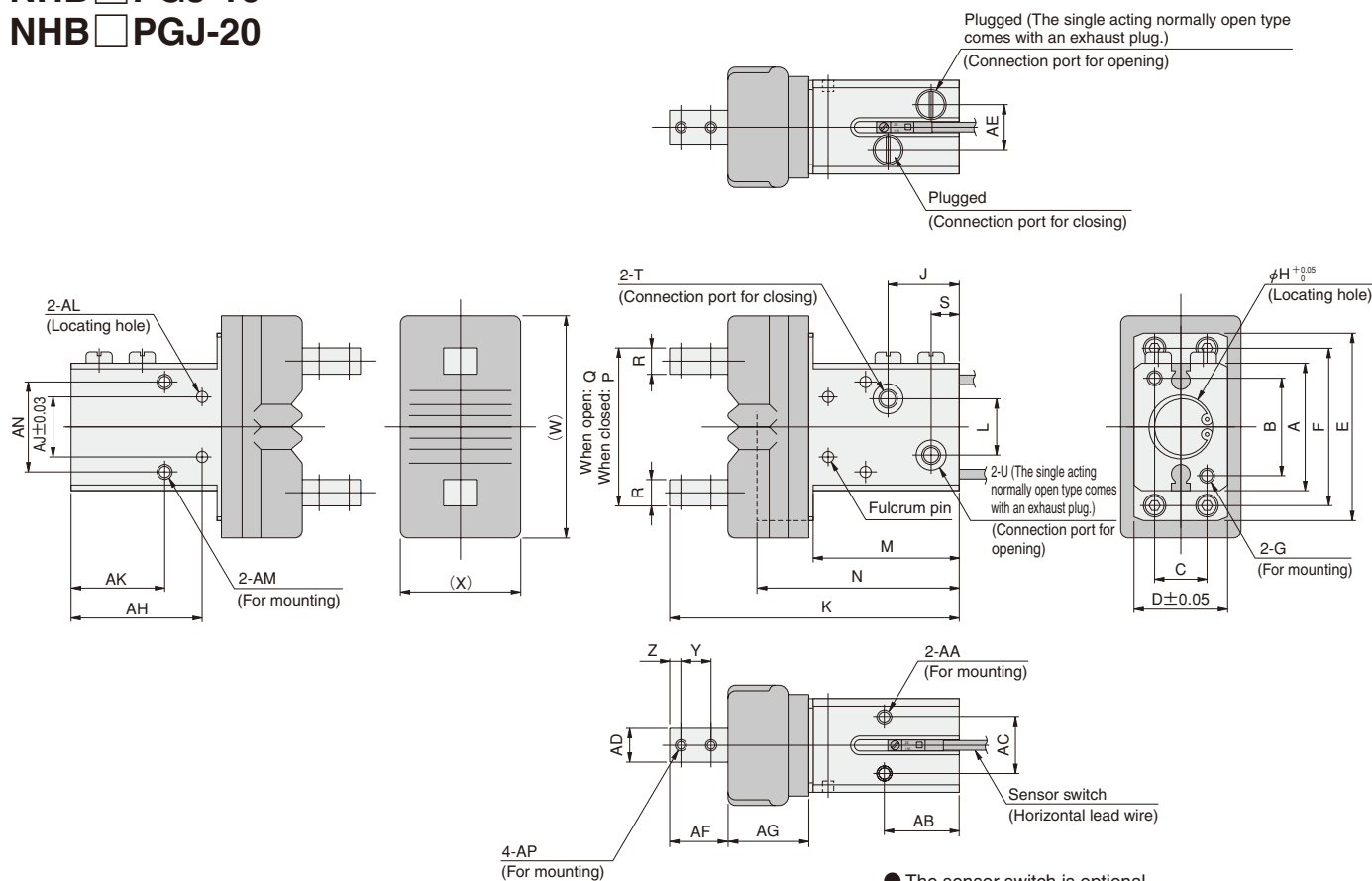
Dimensions of Linear Guide Specification Parallel Type with Rubber Cover (mm)

NHB □ PGJ-10

NHB □ PGJ-16

NHB □ PGJ-20

※ Drawings show $\phi 16$ [0.630in.].



● The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.

Model	Code	A	B	C	D	E	F	G	H	J	K	L	M
NHB □ PGJ-10		23	17	10	20	36	30	M3×0.5 Depth 6	11 Depth 1.5	17	67.5	7	35
NHB □ PGJ-16		34	26	14	25	50	42	M4×0.7 Depth 7	17 Depth 1.5	19	77	15	39
NHB □ PGJ-20		45	35	16	32	62	54	M5×0.8 Depth 9	21 Depth 1.5	21	97	17	44

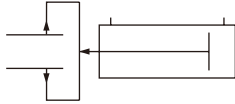
N	P	Q	R	S	T	U	W	X	Y	Z	AA	AB	AC
47.5	23.5 $^{+1.7}_{-0.2}$	30 $^{+2.2}_{-0.2}$	5	7.5	M3×0.5	M3×0.5	44	27	6	3	M3×0.5 Depth 5	20	12
54	31 $^{+1.8}_{-0.5}$	41 $^{+2.9}_{-0.5}$	7	7.5	M5×0.8	M5×0.8	59	32	8	3	M4×0.7 Depth 6	20	15
64	38 $^{+2.4}_{-0.8}$	52 $^{+3.5}_{-0.5}$	8	7.5	M5×0.8	M5×0.8	71	42	10	4	M5×0.8 Depth 8	24	18

AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN	AP
7 $^{+0.04}_{-0.04}$	9	13	18.5	33	12	25	$\phi 2.5^{+0.02}_0$ Depth 2.5	M4×0.7 Depth 6, Drilled hole diameter $\phi 3.4$ thru hole	17	M3×0.5
9 $^{+0.04}_{-0.04}$	12	15.5	21.5	35	16	25	$\phi 3^{+0.02}_0$ Depth 3	M4×0.7 Depth 6, Drilled hole diameter $\phi 3.4$ thru hole	24	M3×0.5
12 $^{+0.05}_{-0.05}$	16	20	28.5	39.7	22	30	$\phi 4^{+0.02}_0$ Depth 3.5	M4×0.8 Depth 8, Drilled hole diameter $\phi 4.2$ thru hole	30	M4×0.7

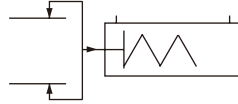
NHB SERIES PARALLEL TYPE

Cross Roller Bearing Specification
Double Acting Type, Single Acting Normally Open Type

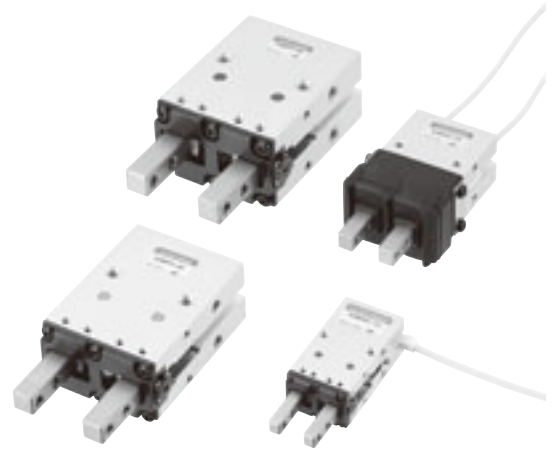
Symbols



Double Acting Type



Single Acting
Normally Open Type



Specifications

● Double acting parallel type

Basic model		NHBDPA-6	NHBDPA-10	NHBDPA-16	NHBDPA-20	NHBDPA-25	
Item							
Cylinder bore size	mm [in.]	6 [0.236]	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	
Operation type		Double acting type					
Media		Air					
Operating pressure range	MPa [psi.]	0.22~0.7 [32~102]	0.18~0.7 [26~102]	0.12~0.7 [17~102]	0.1~0.7 [15~102]		
Proof pressure	MPa [psi.]	1.05 [152]					
Operating temperature range		°C [°F]					
		0~60 [32~140]					
Maximum operating frequency		cycle/min	100	200			
Lubrication	Cylinder portion	Not required					
	Lever portion	Not required					
Maximum grip point length		mm [in.]	20 [0.79]	50 [1.97]	60 [2.36]	80 [3.15]	100 [3.94]
Effective gripping force (F) ^{Note}	Closed side		4.2 [0.94]	9.4 [2.11]	25.5 [5.73]	45.7 [10.27]	67 [15.06]
	Open side		5.6 [1.26]	14.6 [3.28]	34 [7.64]	60.9 [13.69]	87 [19.56]
Lever open/closed stroke		mm [in.]	4 [0.157]		8 [0.315]	12 [0.472]	14 [0.551]
Repeatability		mm [in.]	±0.01 [±0.0004]				
Port size		M3×0.5			M5×0.8		
Mass	g [oz.]	Body	28 [0.99]	48 [1.69]	120 [4.23]	218 [7.69]	366 [12.91]
		Mounting bracket	—	11 [0.39]	19 [0.67]	26 [0.92]	51 [1.80]
		Rubber cover	—	NBR: 6 [0.21] Silicone: 6 [0.21] Fluoro rubber: 7 [0.25]	NBR: 8 [0.28] Silicone: 8 [0.28] Fluoro rubber: 10 [0.35]	NBR: 12 [0.42] Silicone: 12 [0.42] Fluoro rubber: 16 [0.56]	NBR: 15 [0.53] Silicone: 15 [0.53] Fluoro rubber: 20 [0.71]

Note: Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs on p.1387.

Remark: The life of rubber cover may vary from the air hand (gripper), depending on its operating conditions.

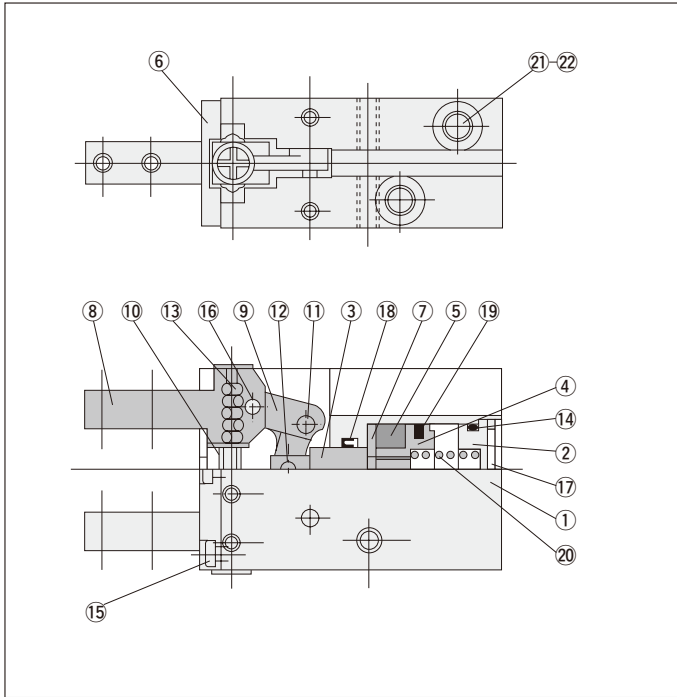
● Single acting normally open parallel type

Basic model		NHBRPA-6	NHBRPA-10	NHBRPA-16	NHBRPA-20	NHBRPA-25
Item						
Cylinder bore size	mm [in.]	6 [0.236]	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]
Operation type		Single acting normally open type				
Media		Air				
Operating pressure range	MPa [psi.]	0.4～0.7 [58～102]	0.35～0.7 [51～102]	0.25～0.7 [36～102]		
Proof pressure	MPa [psi.]	1.05 [152]				
Operating temperature range	℃ [°F]	0～60 [32～140]				
Maximum operating frequency	cycle/min	100	200			
Lubrication	Cylinder portion	Not required				
	Lever portion	Not required				
Maximum grip point length	mm [in.]	20 [0.79]	50 [1.97]	60 [2.36]	80 [3.15]	100 [3.94]
Effective gripping force (F) ^{Note}	Closed side	1.3 [0.29]	4.9 [1.10]	21 [4.72]	36.4 [8.18]	54 [12.14]
	Open side	2.7 [0.61]	2 [0.45]	3.9 [0.88]	6.9 [1.55]	13.7 [3.08]
Lever open/closed stroke	mm [in.]	4 [0.157]		8 [0.315]	12 [0.472]	14 [0.551]
Repeatability	mm [in.]	±0.01 [±0.0004]				
Port size		M3×0.5		M5×0.8		
Mass	Body	27 [0.95]	49 [1.73]	121 [4.27]	220 [7.76]	368 [12.98]
	Mounting bracket	—	11 [0.39]	19 [0.67]	26 [0.92]	51 [1.80]
	Rubber cover	—	NBR: 6 [0.21] Silicone: 6 [0.21] Fluoro rubber: 7 [0.25]	NBR: 8 [0.28] Silicone: 8 [0.28] Fluoro rubber: 10 [0.35]	NBR: 12 [0.42] Silicone: 12 [0.42] Fluoro rubber: 16 [0.56]	NBR: 15 [0.53] Silicone: 15 [0.53] Fluoro rubber: 20 [0.71]

Note: Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs on p.1387.

Remark: The life of rubber cover may vary from the air hand (gripper), depending on its operating conditions.

Inner Construction



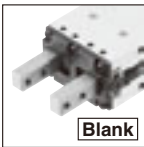
Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	
⑤	Magnet	Plastic magnet	
⑥	Cover	Steel	
⑦	Cover	Aluminum alloy	
⑧	Lever	Stainless steel	
⑨	Action lever	Steel	
⑩	Rail	Steel	
⑪	Fulcrum pin	Steel	
⑫	Press fit pin	Steel	
⑬	Cylindrical roller	Steel	
⑭	O-ring	Synthetic rubber (NBR)	
⑮	Cross recessed head screw	Mild steel	
⑯	Needle roller	Steel	
⑰	Snap ring	Steel	
⑱	Seal	Synthetic rubber (NBR)	
⑲	Seal	Synthetic rubber (NBR)	
⑳	Spring	Steel wire	Single acting type only
㉑	Plug	Brass	Single acting type only
㉒	Filter	Brass	Single acting type only

Order Codes

Rubber cover material

No rubber cover



Blank

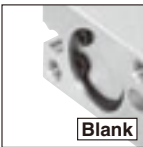
With rubber cover



●-JN: NBR (Black with blue mark)
●-JF: Fluoro rubber (Black with green mark)
●-JS: Silicone rubber (White)

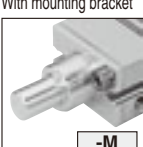
Mounting bracket

No mounting bracket



Blank

With mounting bracket



-M

★ Included at shipping

Sensor switch

No sensor switch



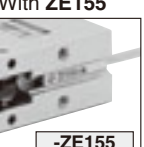
Blank

With ZE135



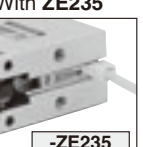
-ZE135

With ZE155



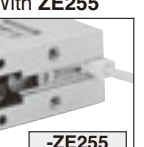
-ZE155

With ZE235



-ZE235

With ZE255



-ZE255

● Solid state type
● With indicator lamp
● DC10~28V
● 2-lead wire
● Horizontal lead wire

Note: Select vertical lead wires ZE235 or ZE255 when using a sensor switch on the lever open side of NHB□PA Air Hands.

Lead wire length

A : 1000mm [39in.]
B : 3000mm [118in.]

Number of sensor switches
(for air hands with sensor switches)

●1 : With 1 sensor switch
●2 : With 2 sensor switches
★ Included at shipping

Additional Parts
(To be ordered separately)

Mounting bracket



● For ϕ 10 [0.394in.]
—NHB-M10
● For ϕ 16 [0.630in.]
—NHB-M16
● For ϕ 20 [0.787in.]
—NHB-M20
● For ϕ 25 [0.984in.]
—NHB-M25

Rubber cover



●-NHB-DPA

Basic model		Cylinder bore size									
Double acting type	NHB-DPA	-6									
		-10									
		-16		-JN		-M	-ZE135	A	1		
		-20		-JF			-ZE155	B	2		
		-25		-JS			-ZE235				
Single acting normally open type	NHBRPA	-6									
		-10									
		-16		-JN		-M	-ZE135	A	1		
		-20		-JF			-ZE155	B	2		
		-25		-JS			-ZE235				

Rubber cover material

JN: NBR (Black with blue mark)
JF: Fluoro rubber (Black with green mark)
JS: Silicone rubber (White)

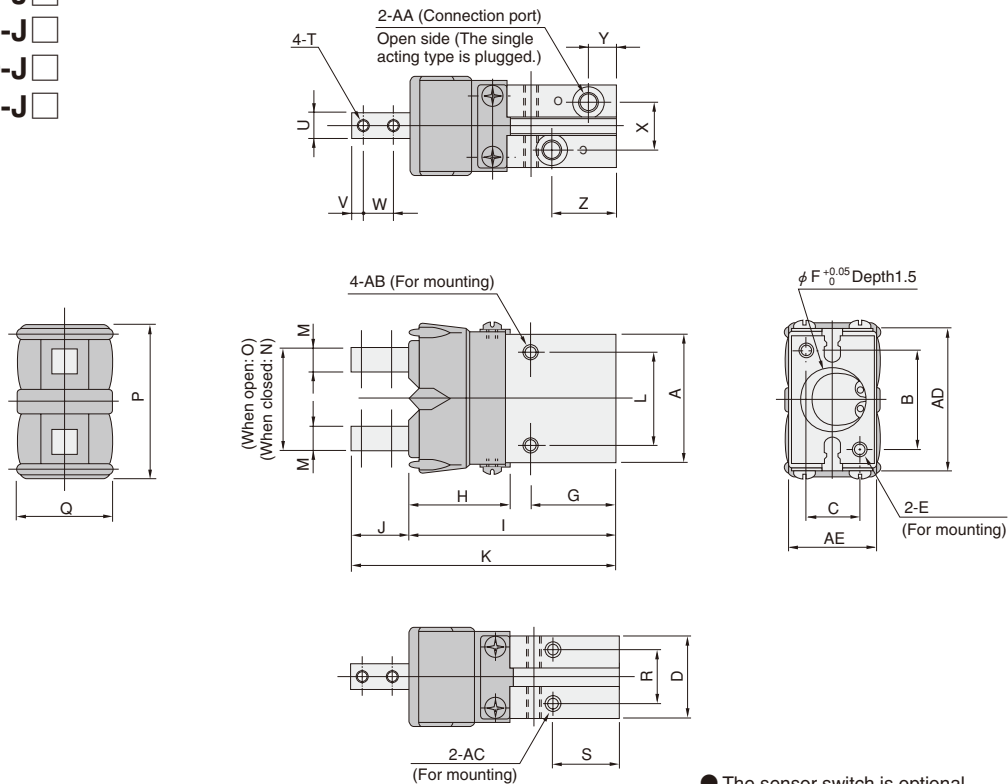
Bore size

10 : ϕ 10 [0.394in.]
16 : ϕ 16 [0.630in.]
20 : ϕ 20 [0.787in.]
25 : ϕ 25 [0.984in.]

Dimensions of Cross Roller Bearing Specification Parallel Type with Rubber Cover (mm)

NHB □ PA-10-J □
 NHB □ PA-16-J □
 NHB □ PA-20-J □
 NHB □ PA-25-J □

※ Drawings show $\phi 16$ [0.630in.].



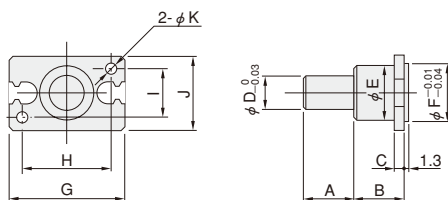
● The sensor switch is optional.
 When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.

Model	Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
NHB □ PA-10-J □		23	17	10	16	M3×0.5 Depth 5	11	20	22.5	46.5	13	59.5	18	4.5	13 ± 0.4	17 $^{+1.6}_{-0.2}$
NHB □ PA-16-J □		34	26	14	22	M4×0.7 Depth 7	17	23	27.5	56	15	71	24	6.5	18 $^{+0.6}_{-0.2}$	26 $^{+2.3}_0$
NHB □ PA-20-J □		45	35	16	26	M5×0.8 Depth 8	21	26	34	64.5	19	83.5	30	8.5	24 $^{+0.1}_{-0.9}$	36 $^{+1.5}_{-0.9}$
NHB □ PA-25-J □		52	40	20	32	M6×1 Depth 10	26	30	38	73	22	95	36	10	28 ± 0.4	42 $^{+1.0}_{-0.7}$

P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
27	20	10	16	M3×0.5	5.5 $^{+0.0}_{-0.03}$	3	6	10	7.5	15	M3×0.5	M3×0.5 Depth 5	M3×0.5 Depth 5	26.6	18
39	26	14	18	M3×0.5	7 $^{+0.0}_{-0.03}$	3	8	12	7.5	17.5	M5×0.8	M4×0.7 Depth 7	M4×0.7 Depth 7	37.6	24
51	30	16	19	M4×0.7	8 $^{+0.0}_{-0.04}$	4	10	13	8	20	M5×0.8	M5×0.8 Depth 8	M5×0.8 Depth 8	48.6	28
59	36	20	22	M5×0.8	10 $^{+0.0}_{-0.03}$	5	12	18	9	23	M5×0.8	M6×1 Depth 10	M6×1 Depth 10	55.6	34

Options

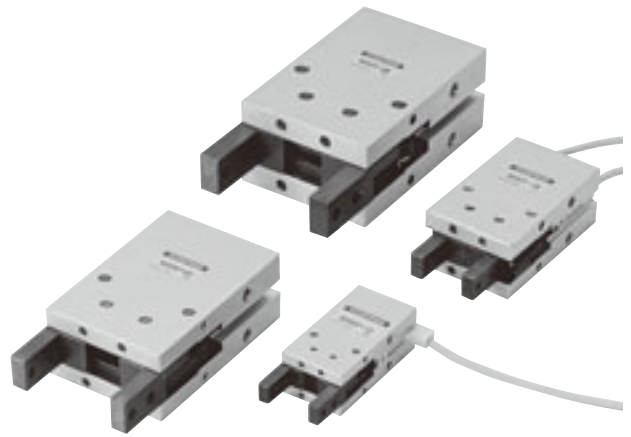
● Mounting bracket: -M



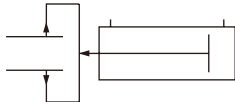
Model	Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M10		15	15	3	10	11	11	23	17	10	16	3.4
NHB-M16		15	15	3	10	16	17	34	26	14	22	4.5
NHB-M20		15	15	3	10	18	21	45	35	16	26	5.5
NHB-M25		25	17	5	14	26	26	52	40	20	32	6.6

NHB SERIES PARALLEL TYPE

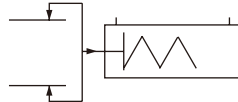
Plain Bearing Specification
Double Acting Type,
Single Acting Normally Open Type



Symbols



Double Acting Type



Single Acting
Normally Open Type

Specifications

● Double acting parallel type

Basic model		NHBDP-10	NHBDP-16	NHBDP-20	NHBDP-25
Item					
Cylinder bore size	mm [in.]	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]
Operation type		Double acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.15～0.7 [22～102]	0.1～0.7 [15～102]		
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	℃ [°F]	0～60 [32～140]			
Maximum operating frequency	cycle/min	180			
Lubrication	Cylinder portion	Not required			
	Lever portion	Required (Apply grease to the sliding portion)			
Maximum grip point length	mm [in.]	30 [1.18]	40 [1.57]	60 [2.36]	70 [2.76]
Gripping force ^{Note 1} N [lbf.]	Closed side	7.8 [1.75]	23.5 [5.28]	46.1 [10.36]	76.5 [17.20]
	Open side	4.9 [1.10]	17.7 [3.98]	34.3 [7.71]	58.8 [13.22]
Lever open/closed stroke	mm [in.]	4 [0.157]	8 [0.315]	12 [0.472]	14 [0.551]
Port size		M3×0.5	M5×0.8		
Mass ^{Note 2}	g [oz.]	47 [1.66] (58 [2.05])	120 [4.23] (139 [4.90])	230 [8.11] (256 [9.03])	388 [13.69] (439 [15.49])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs on p.1387.

2. () mean the mass with the mounting bracket: -M.

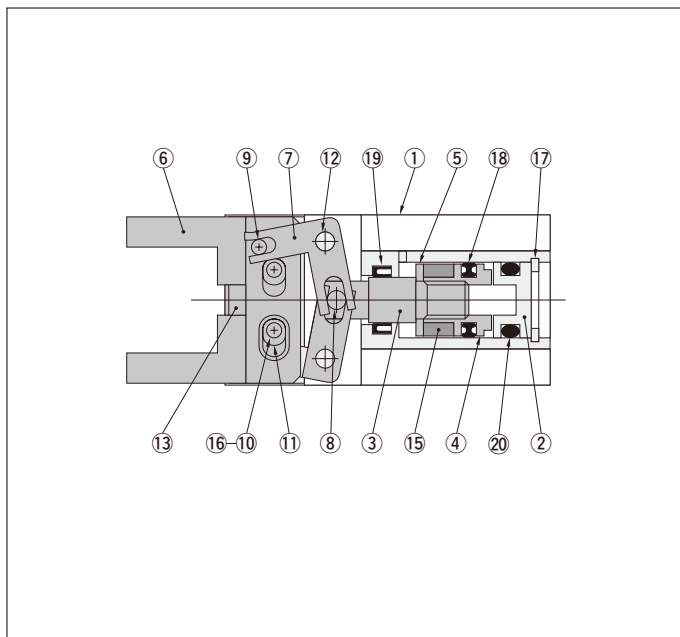
● Single acting normally open parallel type

Basic model		NHBRP-10	NHBRP-16	NHBRP-20	NHBRP-25
Item					
Cylinder bore size	mm [in.]	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]
Operation type		Single acting normally open type			
Media		Air			
Operating pressure range	MPa [psi.]	0.35~0.7 [51~102]	0.25~0.7 [36~102]		
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	°C [°F]	0~60 [32~140]			
Maximum operating frequency	cycle/min	180			
Lubrication	Cylinder portion	Not required			
	Lever portion	Required (Apply grease to the sliding portion)			
Maximum grip point length	mm [in.]	30 [1.18]	40 [1.57]	60 [2.36]	70 [2.76]
Gripping force ^{Note 1} N [lbf.]	Closed side	2.9 [0.65]	12.7 [2.85]	22.6 [5.08]	37.3 [8.39]
	Open side	2.0 [0.45]	3.9 [0.88]	6.9 [1.55]	13.7 [3.08]
Lever open/closed stroke	mm [in.]	4 [0.157]	8 [0.315]	12 [0.472]	14 [0.551]
Port size		M3×0.5	M5×0.8		
Mass ^{Note 2}	g [oz.]	48 [1.69] (59 [2.08])	121 [4.27] (140 [4.94])	232 [8.18] (258 [9.10])	392 [13.83] (443 [15.63])

Notes: 1. Values are obtained when grip point length is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs on p.1387.

2. () mean the mass with the mounting bracket: -M.

Inner Construction

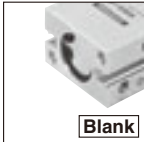
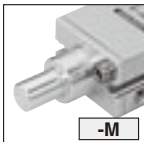
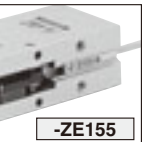
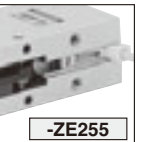
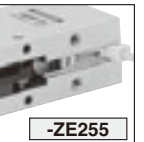
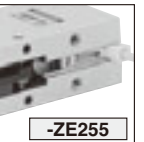


Note: Diagram shows the double acting type with the levers completely opened.

Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	
⑤	Magnet holder	Aluminum alloy	
⑥	Slide lever	Carbon steel	
⑦	Action lever	Carbon steel	
⑧	Rod pin	Carbon steel	
⑨	Slide pin	Carbon steel	
⑩	Slide guide pin	Carbon steel	
⑪	Ring	Carbon steel	
⑫	Fulcrum pin	Carbon steel	
⑬	Slide plate	Carbon steel	
⑭	Spring	Spring steel	Single acting type only
⑮	Magnet	Magnet material	
⑯	Hexagon socket setscrew	Mild steel	
⑰	C-shaped snap ring	Steel	
⑱	Piston seal	Synthetic rubber (NBR)	
⑲	Rod seal	Synthetic rubber (NBR)	
⑳	O-ring	Synthetic rubber (NBR)	

Order Codes

	Mounting bracket	Sensor switch	Lead wire length	Number of sensor switches (for air hands with sensor switches)		
	No mounting bracket  Blank	No sensor switch  Blank	A : 1000mm [39in.] B : 3000mm [118in.]	● 1 : With 1 sensor switch ● 2 : With 2 sensor switches ★ Included at shipping		
	With mounting bracket  -M	With ZE135  -ZE135	With ZE155  -ZE155	With ZE235  -ZE235		
	With ZE255  -ZE255	With ZE235  -ZE235	With ZE255  -ZE255	With ZE255  -ZE255		
	★ Included at shipping	● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Horizontal lead wire	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Horizontal lead wire	● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire		
	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire	● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire	● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire	● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire		
	Basic model	Cylinder bore size				
Double acting type	NHBDP	-10 -16 -20 -25	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2
Single acting normally open type	NHBRP	-10 -16 -20 -25	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2

Additional Parts (To be ordered separately)

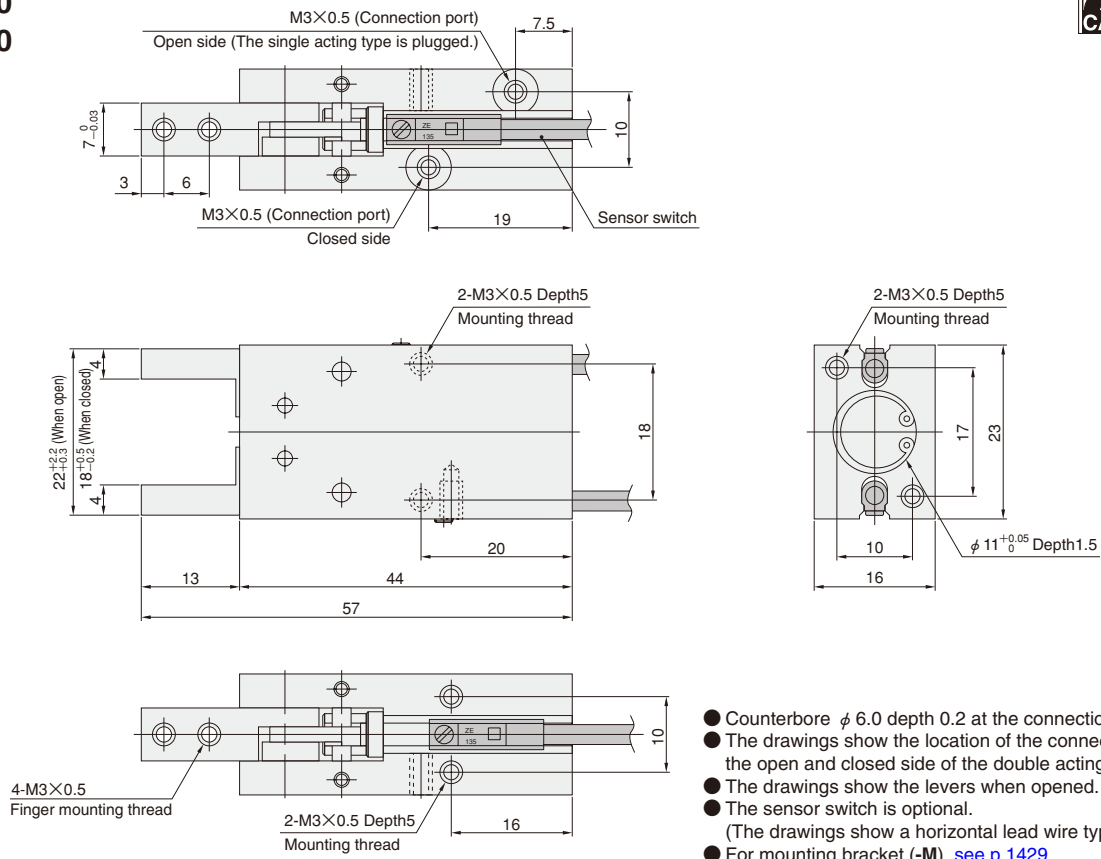
Mounting bracket



- For ϕ 10 [0.394in.] — NHB-M10
- For ϕ 16 [0.630in.] — NHB-M16
- For ϕ 20 [0.787in.] — NHB-M20
- For ϕ 25 [0.984in.] — NHB-M25

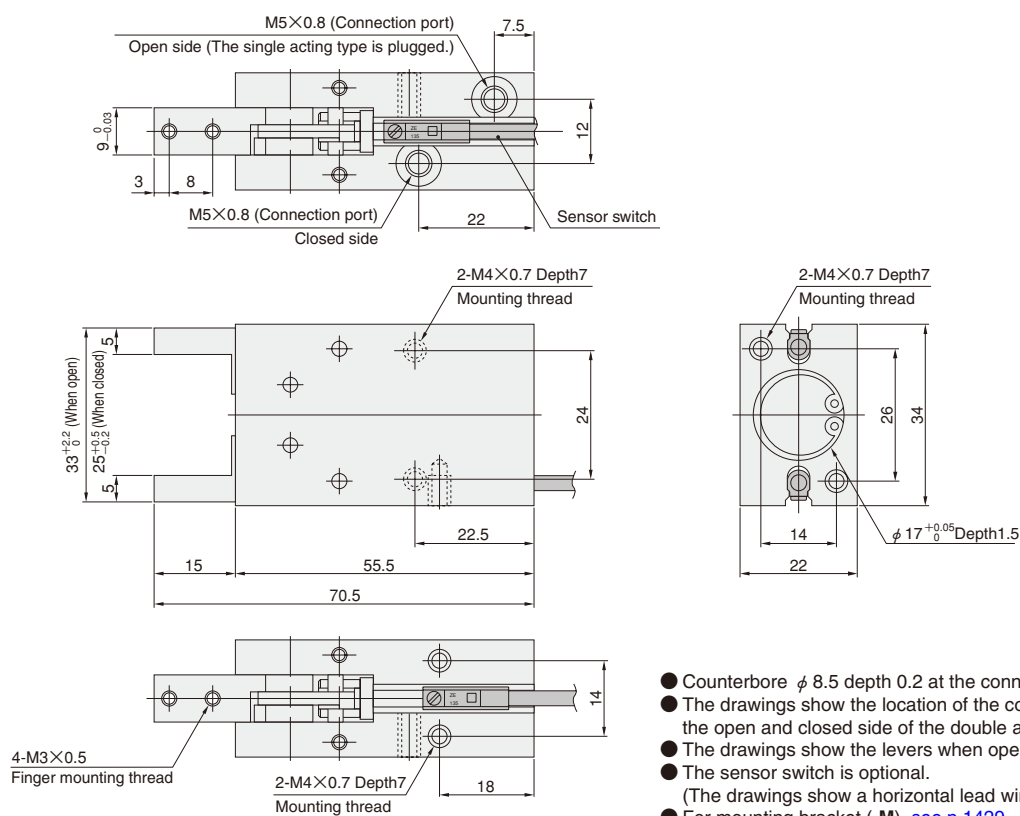
Dimensions of Parallel Type Plain Bearing Specification (mm)

NHBDP-10 NHBRP-10

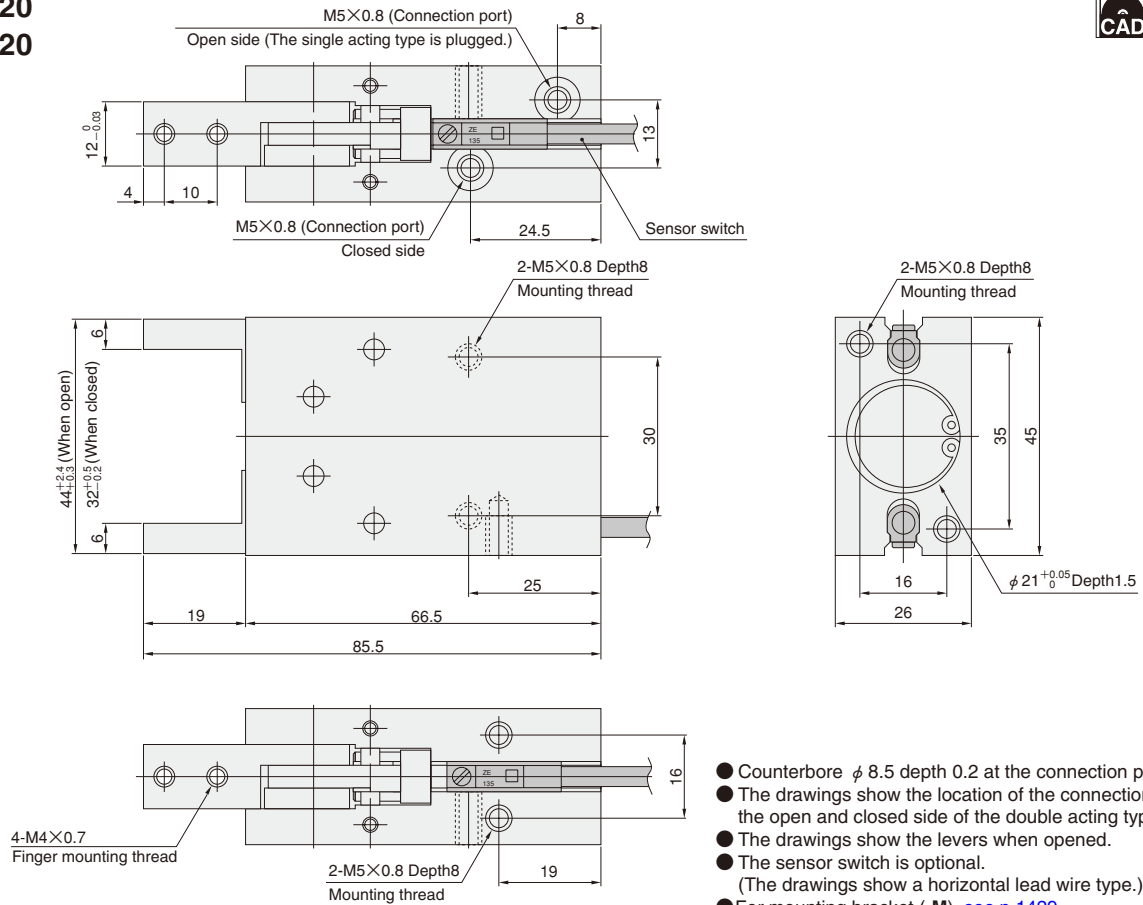


- Counterbore $\phi 6.0$ depth 0.2 at the connection port.
- The drawings show the location of the connection ports for the open and closed side of the double acting type.
- The drawings show the levers when opened.
- The sensor switch is optional.
(The drawings show a horizontal lead wire type.)
- For mounting bracket (-M), see p.1429.

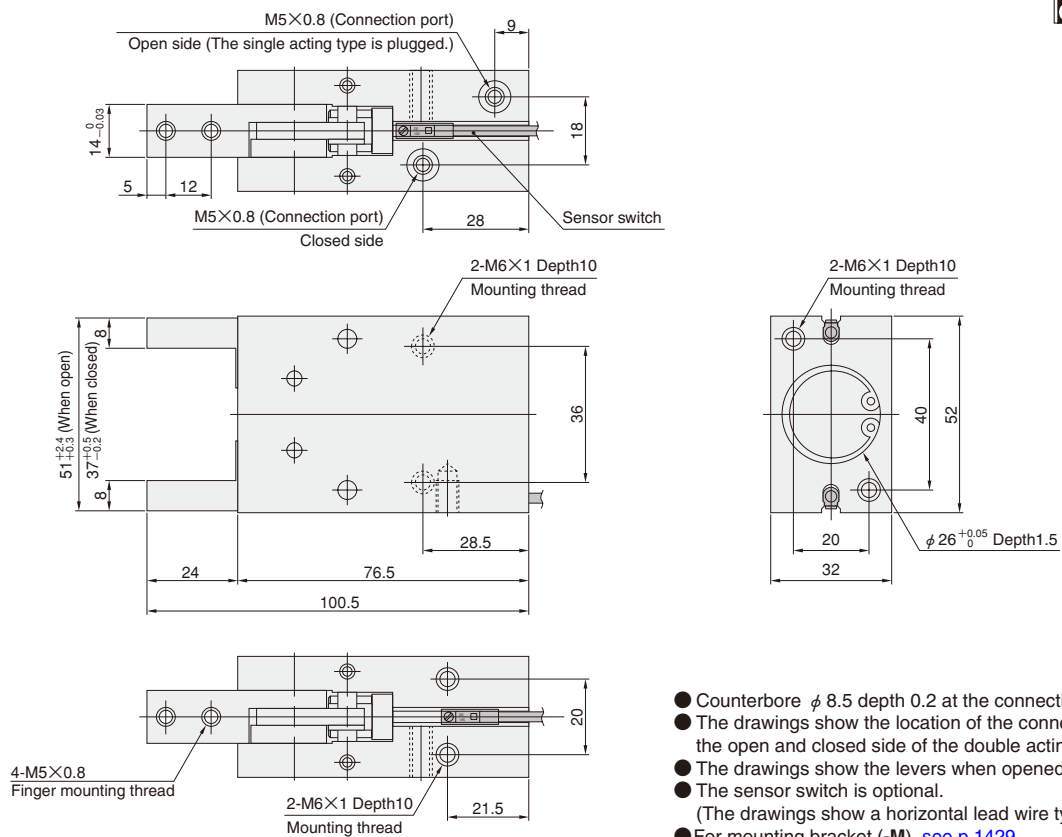
NHBDP-16 NHBRP-16



- Counterbore $\phi 8.5$ depth 0.2 at the connection port.
- The drawings show the location of the connection ports for the open and closed side of the double acting type.
- The drawings show the levers when opened.
- The sensor switch is optional.
(The drawings show a horizontal lead wire type.)
- For mounting bracket (-M), see p.1429.



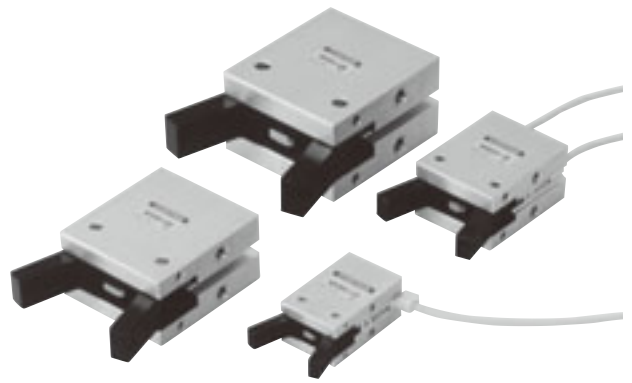
- Counterbore ϕ 8.5 depth 0.2 at the connection port.
- The drawings show the location of the connection ports for the open and closed side of the double acting type.
- The drawings show the levers when opened.
- The sensor switch is optional.
- (The drawings show a horizontal lead wire type.)
- For mounting bracket (-M), [see p.1429](#).



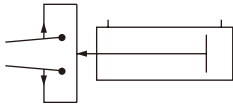
- Counterbore ϕ 8.5 depth 0.2 at the connection port.
- The drawings show the location of the connection ports for the open and closed side of the double actuated type.
- The drawings show the levers when opened.
- The sensor switch is optional.
(The drawings show a horizontal lead wire type.)
- For mounting bracket (-M), [see p.1429](#).

NHB SERIES SWING TYPE

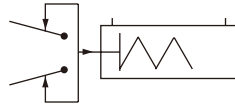
Double Acting Type,
Single Acting Normally Open Type



Symbols



Double Acting Type



Single Acting
Normally Open Type

Specifications

● Double acting swing type

Basic model		NHBDS-8	NHBDS-10	NHBDS-16	NHBDS-20	NHBDS-25
Item						
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]
Operation type		Double acting type				
Media		Air				
Operating pressure range	MPa [psi.]	0.22~0.7 [32~102]	0.1~0.7 [15~102]			
Proof pressure	MPa [psi.]	1.05 [152]				
Operating temperature range	°C [°F]	0~60 [32~140]				
Maximum operating frequency	cycle/min	100	180			
Lubrication	Cylinder portion	Not required				
	Lever portion	Required (Apply grease to the sliding portion)				
Theoretical gripping moment (M) ^{Note1} N·cm [in·lbf]	Closed side	9×P [0.0055×P]	17×P [0.0104×P]	90×P [0.0549×P]	170×P [0.104×P]	340×P [0.208×P]
	Open side	15×P [0.0092×P]	27×P [0.0165×P]	120×P [0.0732×P]	230×P [0.140×P]	440×P [0.269×P]
Maximum grip point length ^{Note2}	mm [in.]	30 [1.18]		40 [1.57]	60 [2.36]	70 [2.76]
Effective gripping force (F) ^{Note1}	N [lbf.]	F=M/L×8.5 [F=M/L×0.85]				
Lever open/closed angles		-10°~+30°				
Port size		M3×0.5		M5×0.8		
Mass ^{Note3}	g [oz.]	23 [0.81] (28 [0.99])	40 [1.41] (51 [1.80])	96 [3.39] (115 [4.06])	180 [6.35] (206 [7.27])	313 [11.04] (364 [12.84])

Notes: 1. F: Effective gripping force, M: Theoretical gripping moment, P: Operating pressure MPa [psi.], L: Grip point length mm [in.]. Values of P and L should vary from SI unit to imperial units. For details of the effective gripping force, see the graphs on p.1388.

2. The grip point length is measured from the fulcrum pin.

3. () mean the mass with the mounting bracket: -M.

● Single acting normally open swing type

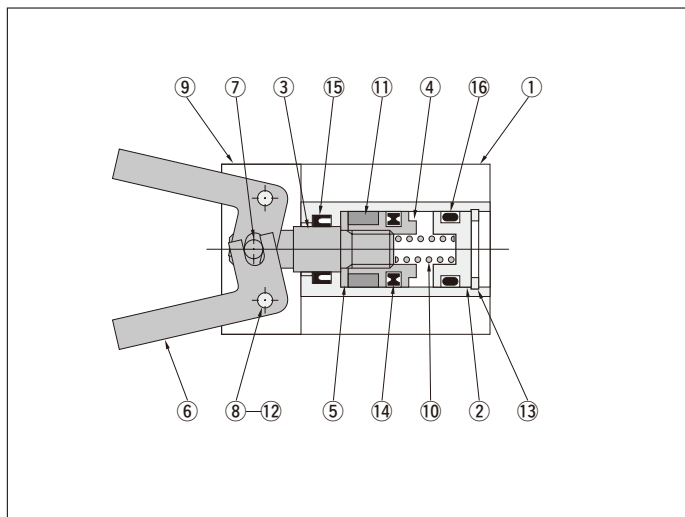
Basic model		NHBRS-8	NHBRS-10	NHBRS-16	NHBRS-20	NHBRS-25
Item						
Cylinder bore size	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]
Operation type		Single acting normally open type				
Media		Air				
Operating pressure range	MPa [psi.]	0.36~0.7 [52~102]	0.3~0.7 [44~102]	0.2~0.7 [29~102]		
Proof pressure	MPa [psi.]	1.05 [152]				
Operating temperature range	°C [°F]	0~60 [32~140]				
Maximum operating frequency	cycle/min	100	180			
Lubrication	Cylinder portion	Not required				
	Lever portion	Required (Apply grease to the sliding portion)				
Theoretical gripping moment (M) ^{Note1} N・cm [in・lbf]	Closed side	9×P-2.5 [0.0055×P-0.22]	17×P-3.4 [0.0104×P-0.30]	90×P-9.8 [0.0549×P-0.87]	170×P-20.5 [0.104×P-1.81]	340×P-35.3 [0.208×P-3.12]
	Open side	2.5 [0.22]	3.4 [0.30]	9.8 [0.87]	20.5 [1.81]	35.3 [3.12]
Maximum grip point length ^{Note2}	mm [in.]	30 [1.18]		40 [1.57]	60 [2.36]	70 [2.76]
Effective gripping force (F) ^{Note1}	N [lbf.]	F=M/L×8.5 [F=M/L×0.85]				
Lever open/closed angles		-10°~+30°				
Port size		M3×0.5		M5×0.8		
Mass ^{Note3}	g [oz.]	23 [0.81] (28 [0.99])	40 [1.41] (51 [1.80])	96 [3.39] (115 [4.06])	182 [6.42] (208 [7.34])	317 [11.18] (368 [12.98])

Notes: 1. F: Effective gripping force, M: Theoretical gripping moment, P: Operating pressure MPa [psi.], L: Grip point length mm [in.]. Values of P and L should vary from SI unit to imperial units. For details of the effective gripping force, see the graphs on p.1388.

2. The grip point length is measured from the fulcrum pin.

3. () mean the mass with the mounting bracket: -M.

Inner Construction



Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	
⑤	Magnet holder	Aluminum alloy	
⑥	Lever	Chrome molybdenum steel	
⑦	Rod pin	Carbon steel	
⑧	Fulcrum pin	Carbon steel	
⑨	Slide plate	Carbon steel	
⑩	Spring	Spring steel	Single acting type only
⑪	Magnet	Magnet material	
⑫	Hexagon socket setscrew	Mild steel	
⑬	C-shaped snap ring	Steel	
⑭	Piston seal	Synthetic rubber (NBR)	
⑮	Rod seal	Synthetic rubber (NBR)	
⑯	O-ring	Synthetic rubber (NBR)	

Order Codes

		■ Mounting bracket		■ Sensor switch		■ Lead wire length		■ Number of sensor switches (for air hands with sensor switches)	
		No mounting bracket  Blank		No sensor switch  Blank		A : 1000mm [39in.] B : 3000mm [118in.]		● 1 : With 1 sensor switch ● 2 : With 2 sensor switches ★ Included at shipping	
		With mounting bracket  -M ★ Included at shipping		With ZE135  -ZE135 ● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Horizontal lead wire		With ZE155  -ZE155 ● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Horizontal lead wire			
				With ZE235  -ZE235 ● Solid state type ● With indicator lamp ● DC10~28V ● 2-lead wire ● Vertical lead wire		With ZE255  -ZE255 ● Solid state type ● With indicator lamp ● DC4.5~28V ● 3-lead wire ● Vertical lead wire			
		Basic model		Cylinder bore size					
Double acting type	NHBDS	-8	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2			
		-10							
		-16							
		-20							
		-25							
Single acting normally open type	NHBR	-8	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B	1 2			
		-10							
		-16							
		-20							
		-25							

Additional Parts
(To be ordered separately)

Mounting bracket



● For ϕ 8 [0.315in.]
— NHB-M8

● For ϕ 10 [0.394in.]
— NHB-M10

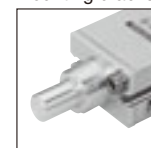
● For ϕ 16 [0.630in.]
— NHB-M16

● For ϕ 20 [0.787in.]
— NHB-M20

● For ϕ 25 [0.984in.]
— NHB-M25

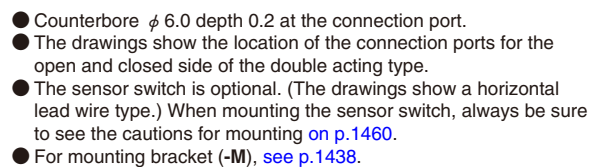
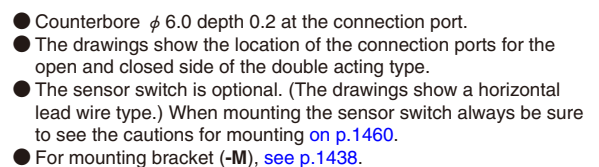
Additional Parts (To be ordered separately)

Mounting bracket



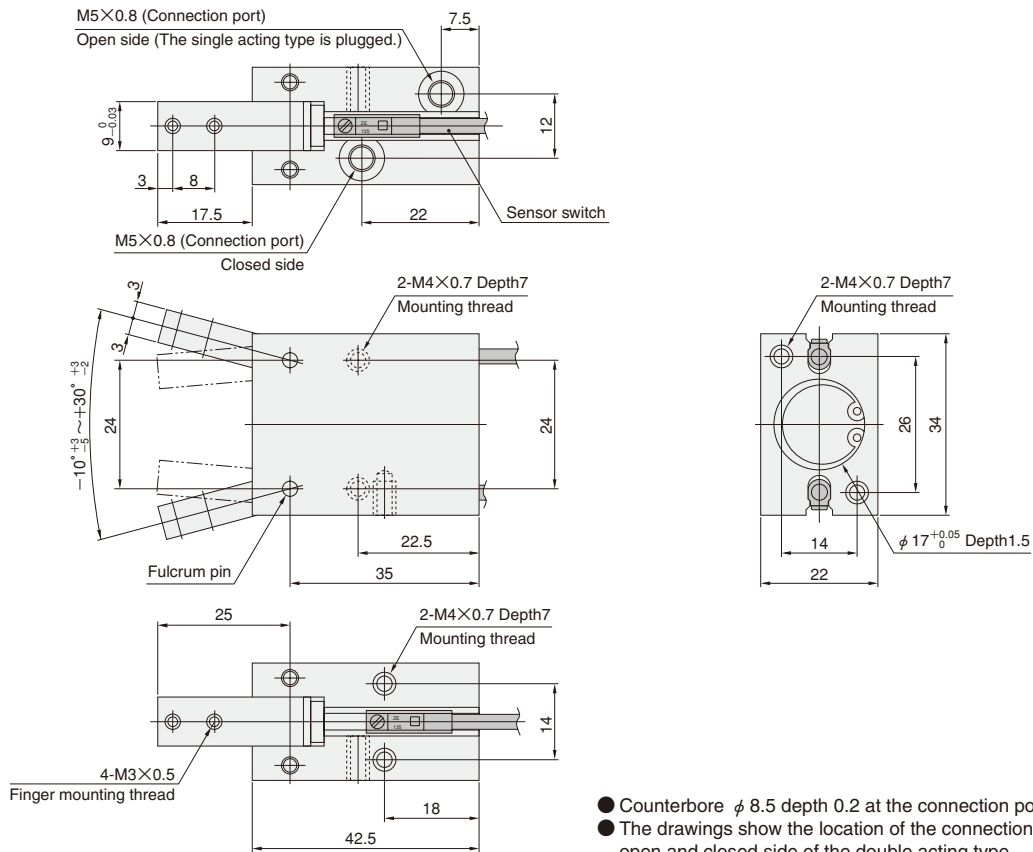
- For ϕ 8 [0.315in.] — NHB-M8
- For ϕ 10 [0.394in.] — NHB-M10
- For ϕ 16 [0.630in.] — NHB-M16
- For ϕ 20 [0.787in.] — NHB-M20
- For ϕ 25 [0.984in.] — NHB-M25

NHBDS-8
NHBRS-8

 NHBDS10

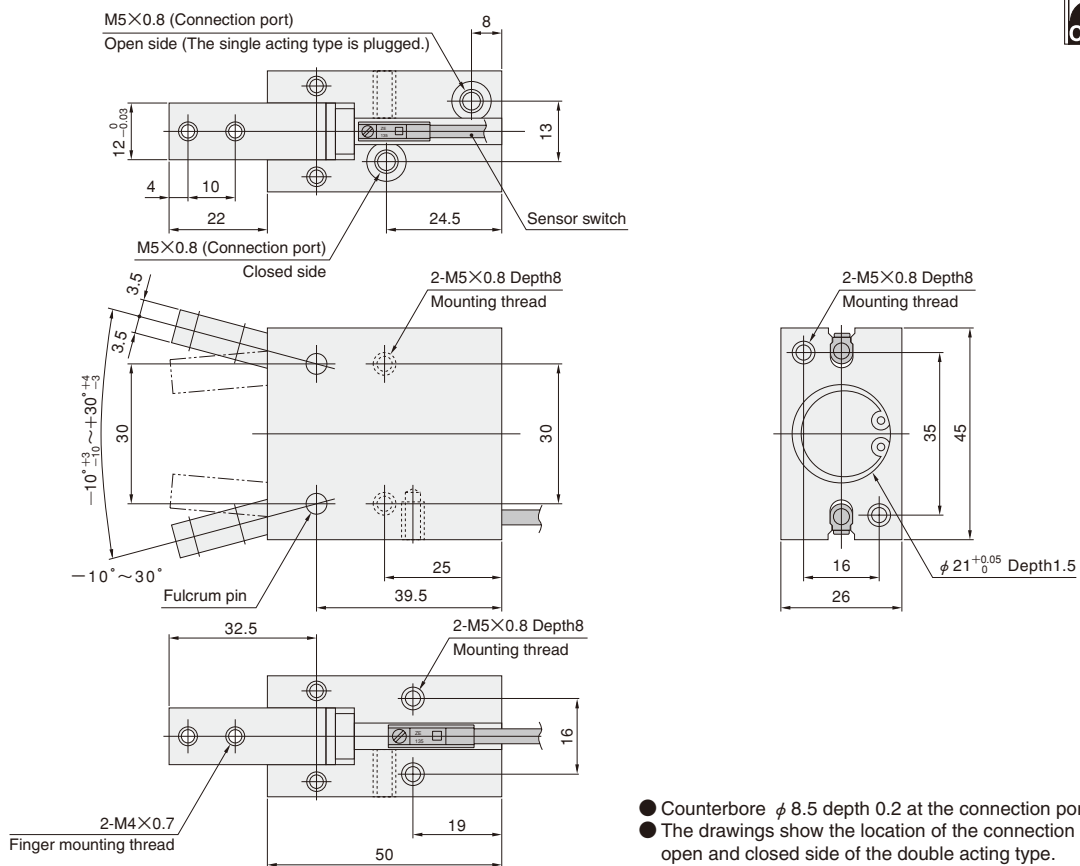
Dimensions of Swing Type (mm)

NHBDS-16 NHBR-16



- Counterbore $\phi 8.5$ depth 0.2 at the connection port.
- The drawings show the location of the connection ports for the open and closed side of the double acting type.
- The sensor switch is optional. (The drawings show a horizontal lead wire type.) When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.
- For mounting bracket (-M), see p.1438.

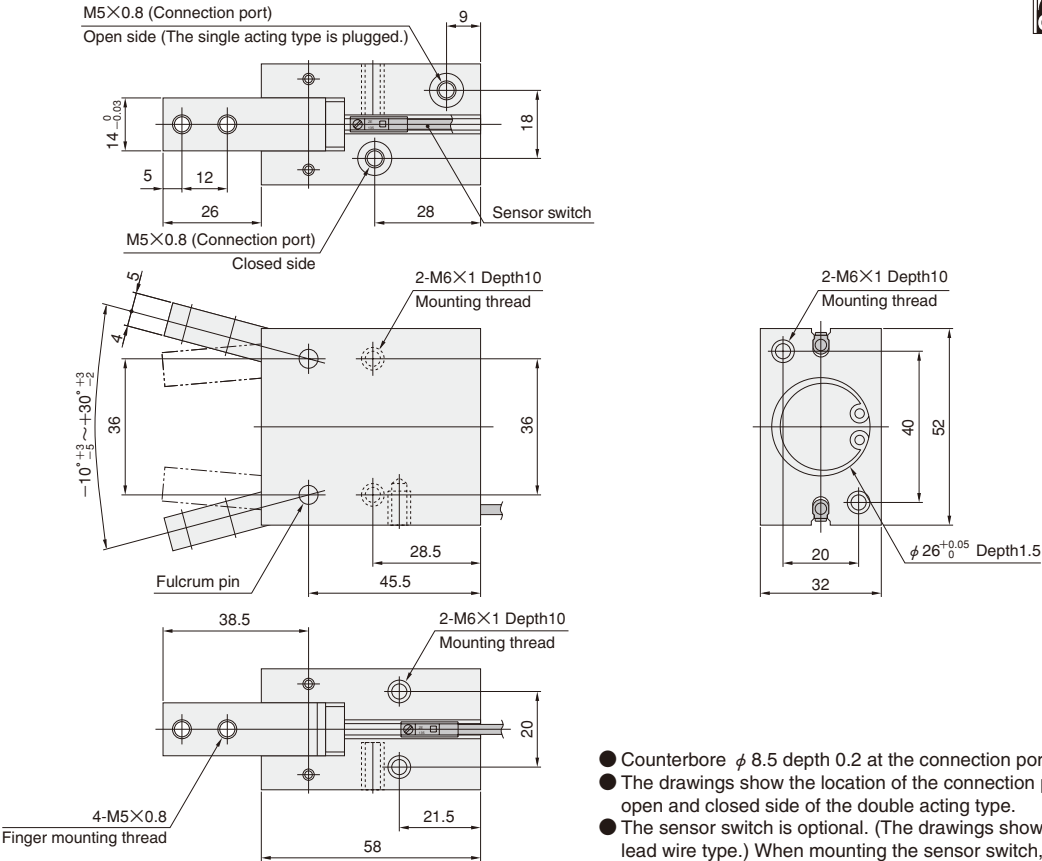
NHBDS-20 NHBR-20



- Counterbore $\phi 8.5$ depth 0.2 at the connection port.
- The drawings show the location of the connection ports for the open and closed side of the double acting type.
- The sensor switch is optional. (The drawings show a horizontal lead wire type.) When mounting the sensor switch, always be sure to see the cautions for mounting on p.1460.
- For mounting bracket (-M), see p.1438.

Dimensions of Swing Type (mm)

NHBDS-25 NHBR-25

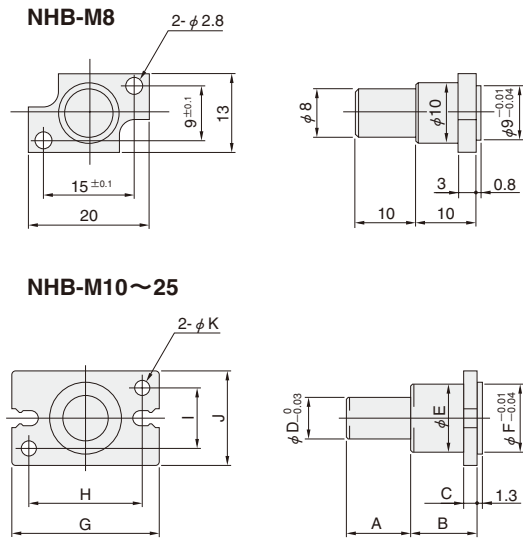


Options

● Mounting bracket: -M



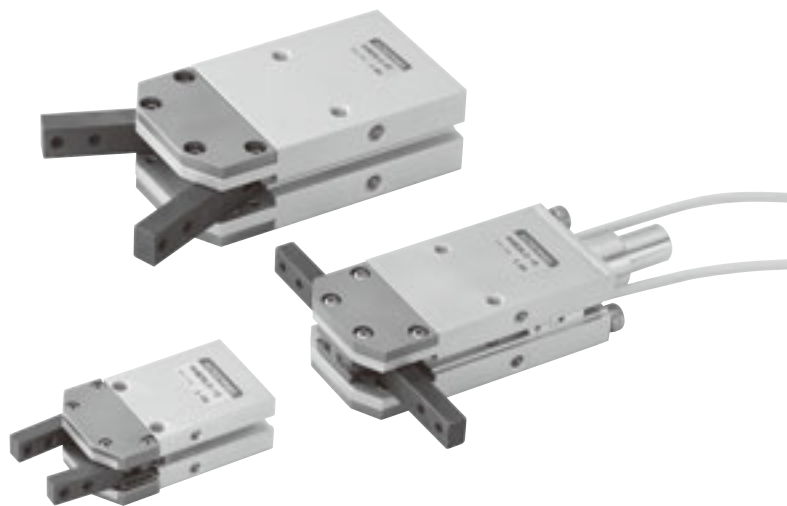
Note: Except NHB-M8 and NHB-M12.



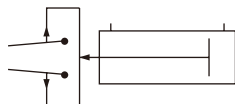
Model	Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M10		15	15	3	10	11	11	23	17	10	16	3.4
NHB-M12		15	15	3	10	12	13	27	20	10	16	3.4
NHB-M16		15	15	3	10	16	17	34	26	14	22	4.5
NHB-M20		15	15	3	10	18	21	45	35	16	26	5.5
NHB-M25		25	17	5	14	26	26	52	40	20	32	6.6

NHB SERIES SWING TYPE

High Precision, 180° Open Specification



Symbol



Double Acting Type

Specifications

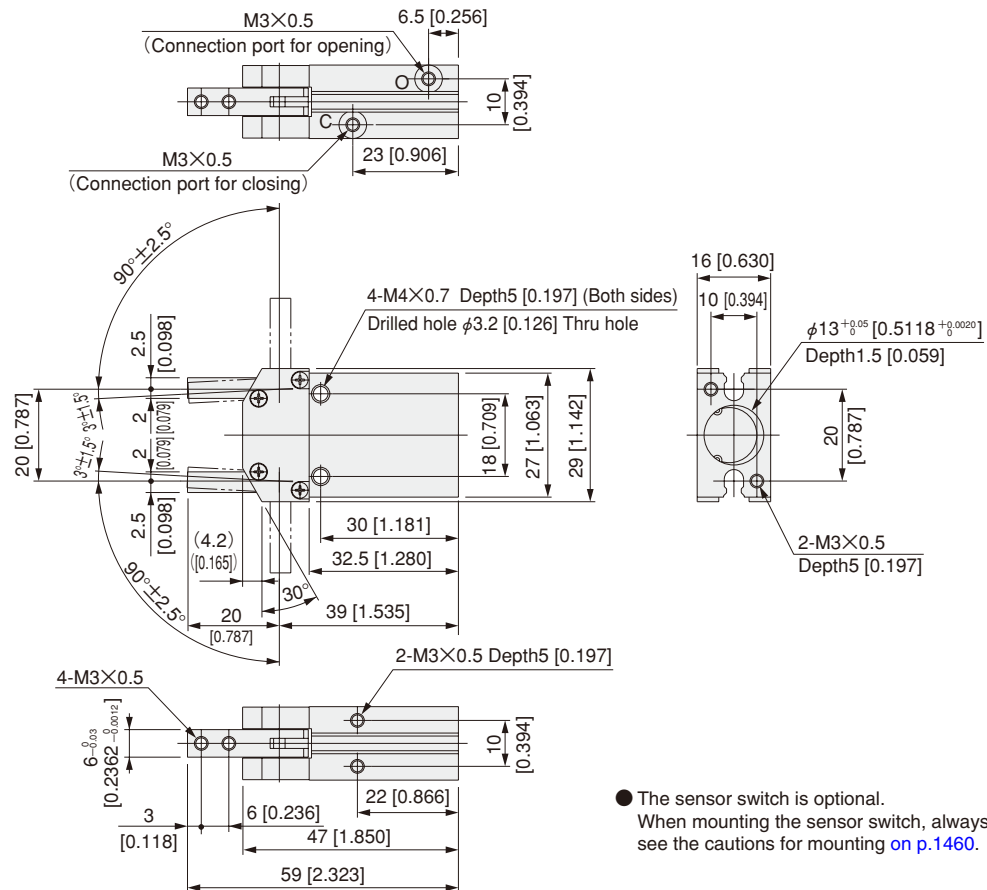
● Double acting swing type

Basic model		NHBDSLGL-12	NHBDSLGL-16	NHBDSLGL-20
Item				
Cylinder bore size	mm [in.]	12 [0.472]	16 [0.630]	20 [0.984]
Operation type		Double acting type		
Media		Air		
Operating pressure range	MPa [psi.]	0.2~0.7 [29~102]		
Proof pressure	MPa [psi.]	1.05 [152]		
Operating temperature range	°C [°F]	0~60 [32~140]		
Maximum operating frequency	cycle/min	100		
Lubrication	Cylinder portion	Not required		
	Lever portion	Required (Apply grease to the sliding portion)		
Effective gripping force ^{Note}	Open	20/L [0.177/L]	55/L [0.487/L]	113/L [1.000/L]
	Closed	24/L [0.212/L]	64/L [0.566/L]	134/L [1.19/L]
Lever open/closed angles		-6° ± 3° ~ 180° ± 5°		
Port size		M3 × 0.5	M5 × 0.8	
Mass	g [oz.]	63 [2.22] (73 [2.57])	168 [5.93] (187 [6.60])	312 [11.01] (338 [11.92])

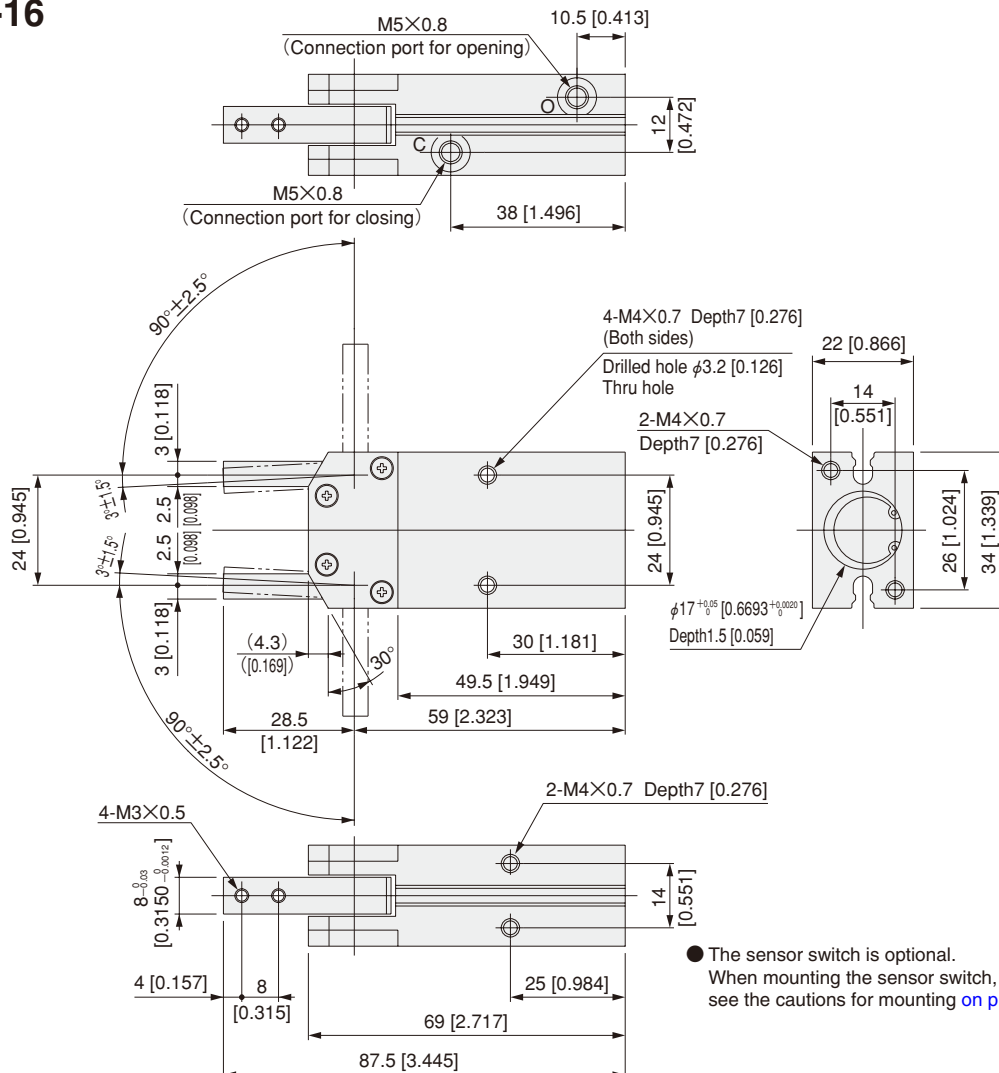
Notes: 1. L expresses the length (mm [in.]) from the fulcrum pin to grip point. (Gripping at lever in parallel state) For details of the effective gripping force, see the graphs [on p. 1388](#).

2. () means the mass with the mounting bracket: -M.

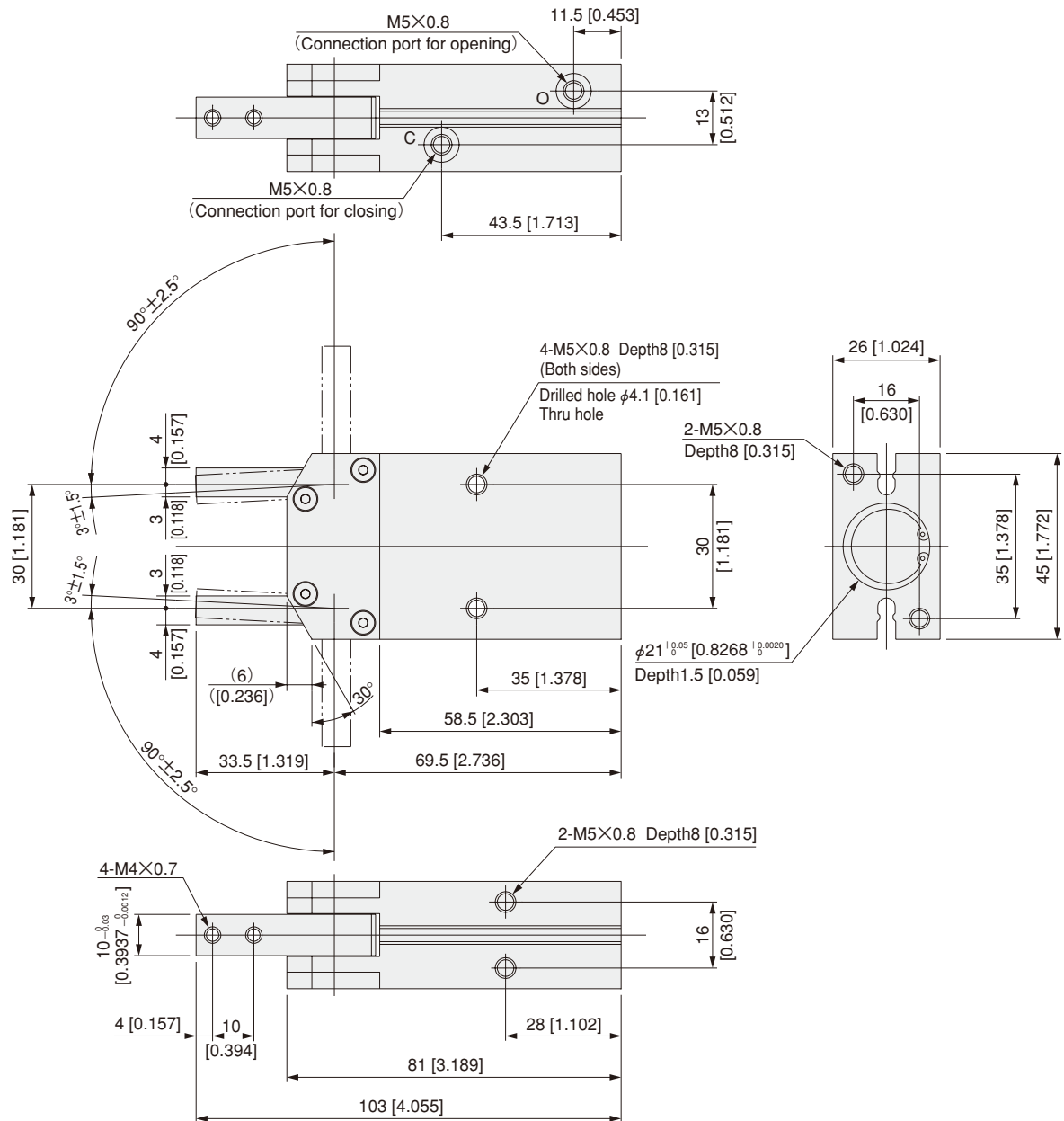
NHBDSLGL-12



NHBDSLGL-16



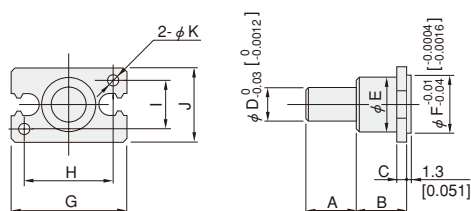
NHBDSL G-20



- The sensor switch is optional.
When mounting the sensor switch, always be sure to see the cautions for mounting [on p.1460](#).

Options

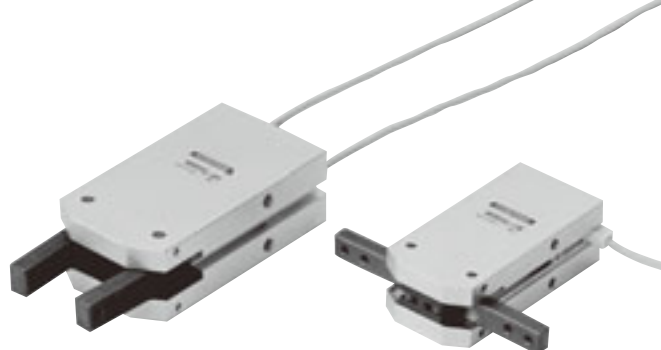
- Mounting bracket: -M



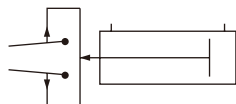
Model \ Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M12	15	15	3	10	12	13	27	20	10	16	3.4
	[0.591]	[0.591]	[0.118]	[0.3937]	[0.472]	[0.5118]	[1.063]	[0.787]	[0.394]	[0.630]	[0.134]
NHB-M16	15	15	3	10	16	17	34	26	14	22	4.5
	[0.591]	[0.591]	[0.118]	[0.3937]	[0.630]	[0.6693]	[1.339]	[1.024]	[0.551]	[0.866]	[0.177]
NHB-M20	15	15	3	10	18	21	45	35	16	26	5.5
	[0.591]	[0.591]	[0.118]	[0.3937]	[0.709]	[0.8268]	[1.772]	[1.378]	[0.630]	[1.024]	[0.217]

NHB SERIES SWING TYPE

180° Open Specification



Symbol



Double Acting Type

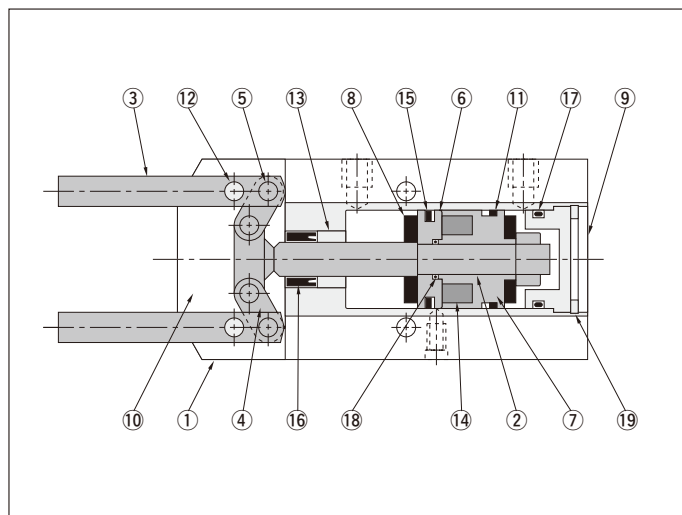
Specifications

● Double acting swing type

Basic model		NHBDL-12	NHBDL-16	NHBDL-20	NHBDL-25
Item					
Cylinder bore size	mm [in.]	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]
Operation type		Double acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.2~0.7 [29~102]			
Proof pressure	MPa [psi.]	1.0 [145]			
Operating temperature range	°C [°F]	0~60 [32~140]			
Maximum operating frequency	cycle/min	100			
Lubrication	Cylinder portion	Not required			
	Lever portion	Required (Apply grease to the sliding portion)			
Theoretical gripping moment (M) ^{Note}	N · cm [in · lbf]	47P [0.0287P]	128P [0.0781P]	231P [0.1410P]	525P [0.3204P]
Maximum grip point length	mm [in.]	40 [1.57]	80 [3.15]	100 [3.94]	60 [2.36]
Effective gripping force (F) ^{Note}	N [lbf]	$F = M/L \times 9.0$ [$F = M/L \times 0.9$]			
Lever open/closed angles		-10°~+180°	-6°~+180°		-10°~+180°
Port size		M3×0.5	M5×0.8		
Mass	g [oz.]	55 [1.94] (65 [2.29])	146 [5.15] (165 [5.82])	277 [9.77] (303 [10.69])	427 [15.06] (478 [16.86])

Note: F: Effective gripping force (value when levers are parallel), L: Grip point length mm [in.], M: Theoretical gripping moment, P: Operating pressure MPa [psi.]. Values of P and L should vary from SI unit to imperial units.
For details of the effective gripping force, see the graphs on p. 1389.

Inner Construction



Major Parts and Materials

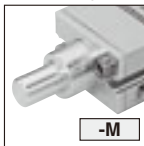
No.	Parts	Materials
①	Body	Aluminum alloy
②	Piston rod	Carbon steel
③	Lever	Carbon steel
④	Link	Carbon steel
⑤	Press fitting link pin	Carbon tool steel
⑥	Piston	Brass
⑦	Piston holder	Brass
⑧	Cushion rubber	Urethane
⑨	Head cover	Aluminum alloy
⑩	Slide plate	Phosphor bronze
⑪	Wear ring	Plastic
⑫	Fulcrum pin	Carbon tool steel
⑬	Oil impregnated bushing	Oil impregnated copper alloy
⑭	Magnet	Magnet material
⑮	Piston seal	Synthetic rubber (NBR)
⑯	Rod seal	Synthetic rubber (NBR)
⑰	Head seal	Synthetic rubber (NBR)
⑱	O-ring	Synthetic rubber (NBR)
⑲	C-shaped snap ring	Steel

Order Codes

■ Mounting bracket

No mounting bracket

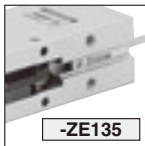
Blank

With mounting bracket

-M
★ Included at shipping

■ Sensor switch

No sensor switch

Blank

With ZE135

-ZE135

- Solid state type
- With indicator lamp
- DC10~28V
- 2-lead wire
- Horizontal lead wire

With ZE155

-ZE155

- Solid state type
- With indicator lamp
- DC4.5~28V
- 3-lead wire
- Horizontal lead wire

With ZE235

-ZE235

- Solid state type
- With indicator lamp
- DC10~28V
- 2-lead wire
- Vertical lead wire

With ZE255

-ZE255

- Solid state type
- With indicator lamp
- DC4.5~28V
- 3-lead wire
- Vertical lead wire

■ Lead wire length

A : 1000mm [39in.]
B : 3000mm [118in.]

■ Number of sensor switches
(for air hands with sensor switches)

● **1** : With 1 sensor switch
● **2** : With 2 sensor switches
★ Included at shipping

**Additional Parts
(To be ordered separately)**

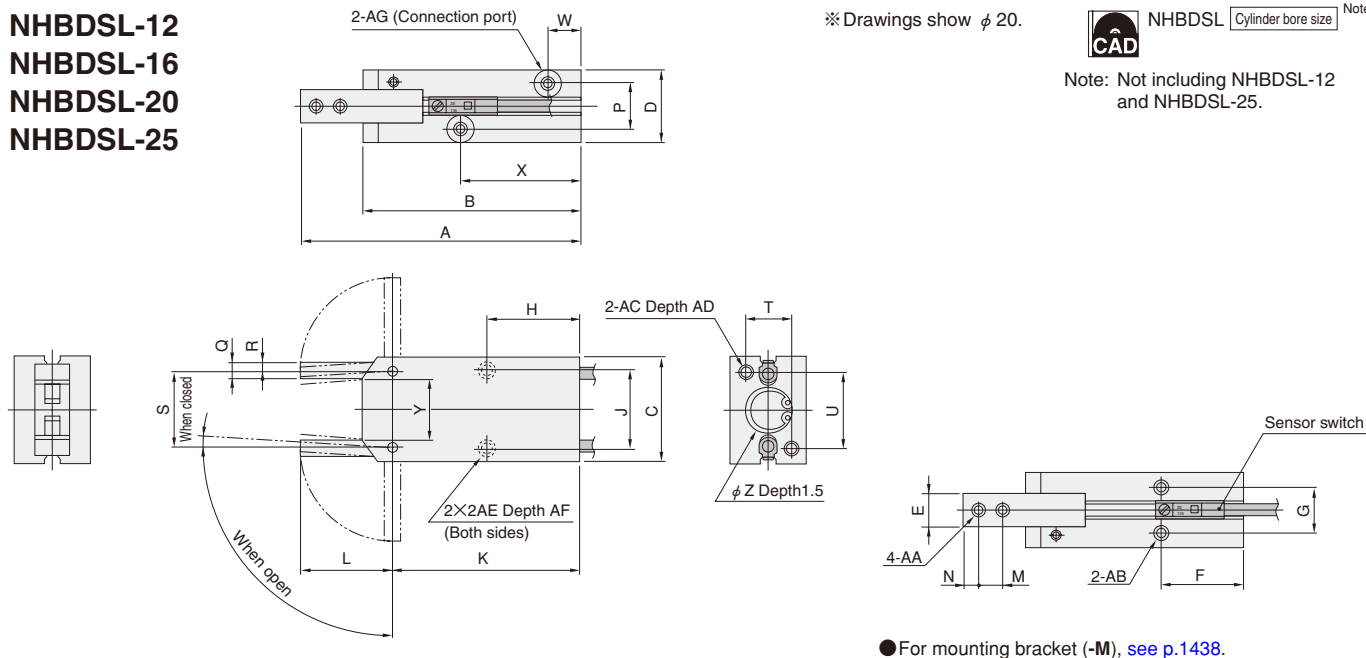
Mounting bracket


- For ϕ 12 [0.472in.] — **NHB-M12**
- For ϕ 16 [0.630in.] — **NHB-M16**
- For ϕ 20 [0.787in.] — **NHB-M20**
- For ϕ 25 [0.984in.] — **NHB-M25**

Basic model	Cylinder bore size				
Double acting type	NHBDL	-12 -16 -20 -25	-M	-ZE135 -ZE155 -ZE235 -ZE255	A B
					1 2

Dimensions of Swing Type 180° Open Specification (mm)

NHBDL-12
NHBDL-16
NHBDL-20
NHBDL-25

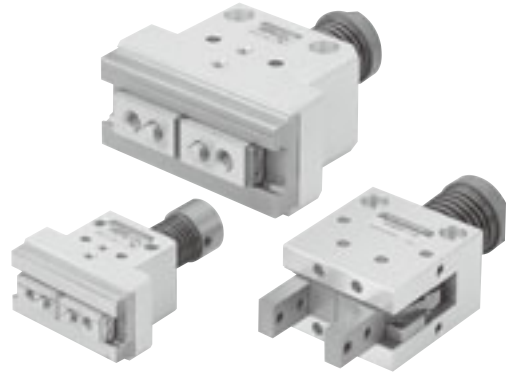


Model	Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
NHBDL-12		59	47	27	16	6.0 ⁰ _{-0.03}	22	10	30	18	39	20	6	3	10	4.5
NHBDL-16		87.5	69	34	22	8.0 ⁰ _{-0.03}	25	14	30	24	59	28.5	8	4	12	5.5
NHBDL-20		103	81	45	26	10.0 ⁰ _{-0.03}	28	16	35	30	69.5	33.5	10	4	13	7
NHBDL-25		114.5	88	52	32	12.0 ⁰ _{-0.03}	45	18	43	36	73.5	41	12	5	18 ^{+0.1}	10

R	S	T	U	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	When open	When closed
2.5	20	10	20	6.5	23	16	$\phi 13^{+0.05}_0$	M3×0.5	M3×0.5	M3×0.5	5	M4×0.7	5 ($\phi 3.2$ Thru.)	M3×0.5	90°±2.5	-3°±1.5
3	24	14	26	10.5	38	19	$\phi 17^{+0.05}_0$	M3×0.5	M4×0.7	M4×0.7	7	M4×0.7	7 ($\phi 3.2$ Thru.)	M5×0.8		
4	30	16	35	11.5	43.5	24	$\phi 21^{+0.05}_0$	M4×0.7	M5×0.8	M5×0.8	8	M5×0.8	8 ($\phi 4.2$ Thru.)	M5×0.8		
6	37	20	40	14	43	29	$\phi 26^{+0.05}_0$	M5×0.8	M6×1	M6×1	—	M6×1	10 ($\phi 5.2$ Thru.)	M5×0.8		

NHB SERIES PARALLEL TYPE

Mechanical Hands Linear Guide Specification Mechanical Hands



Specifications

● Parallel type mechanical hands

Basic model		NHBMRP-10	NHBMP-10	NHBMRP-16	NHBMP-16	NHBMRP-20	NHBMP-20
Item		10 [0.394]		16 [0.630]		20 [0.787]	
Nominal diameter (NHBDPG equivalent) mm [in.]		10 [0.394]		16 [0.630]		20 [0.787]	
Operation type		Single acting normally open type	Single acting normally closed type	Single acting normally open type	Single acting normally closed type	Single acting normally open type	Single acting normally closed type
Operation method		Operating by external force type when closed	Operating by external force type when open	Operating by external force type when closed	Operating by external force type when open	Operating by external force type when closed	Operating by external force type when open
Returning method		Compression spring					
Operating temperature range °C [°F]		0~60 [32~140]					
Maximum operating frequency cycle/min		100					
Lubrication		Required (Apply grease to the sliding portion)					
Repeatability mm [in.]		±0.01 [±0.0004]					
Gripping force N [lbf.]	-L	3.4 [0.76]		4.4 [0.99]		6.5 [1.46]	
	-M	4.5 [1.01]		6.4 [1.44]		8.3 [1.87]	
Pushing force ^{Note1} N [lbf.]	-L	23.5 [5.28]		32.3 [7.26]		47.0 [10.57]	
	-M	32.3 [7.26]		47.0 [10.57]		58.8 [13.22]	
Allowable pushing force N [lbf.]		50 [11.2]		130 [29.2]		210 [47.2]	
Lever ratio ^{Note2}		1 : 2.1					
Mass g [oz.]		60 [2.12]		135 [4.76]		245 [8.64]	

Notes: 1. Pushing force refers to the external force required to completely open the lever against the spring force constantly exerted in the closed direction.

2. Lever ratio expresses the "pushing distance : lever open distance (stroke)" where the pushing distance on the rear rod is assumed to be 1.

● Parallel type linear guide specification mechanical hands

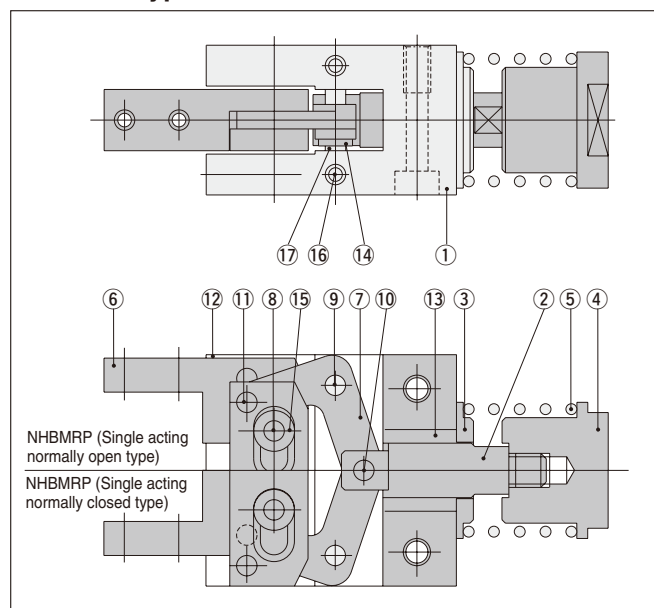
Basic model		NHBMPG-8	NHBMPG-10	NHBMPG-16	NHBMPG-20
Item		8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Nominal diameter (NHBDPG equivalent)	mm [in.]	8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operation type		Single acting normally closed type			
Operation method		Operating by external force type when open			
Returning method		Compression spring			
Operating temperature range	°C [°F]	0~60 [32~140]			
Maximum operating frequency	cycle/min	100			
Lubrication		Required (Apply grease to the sliding portion)			
Repeatability	mm [in.]	±0.01 [±0.0004]			
Gripping force	-L	1.6 [0.36]	3.4 [0.76]	4.4 [0.99]	6.5 [1.46]
	-M	2.6 [0.58]	4.5 [1.01]	6.4 [1.44]	8.3 [1.87]
Pushing force ^{Note1}	-L	12.2 [2.74]	19.6 [4.41]	27.4 [6.16]	28.2 [6.34]
	-M	17.2 [3.87]	27.4 [6.16]	39.2 [8.81]	40.7 [9.15]
Allowable pushing force	N [lbf.]	30 [6.7]	50 [11.2]	130 [29.2]	210 [47.2]
Open/closed stroke	mm [in.]	4.8 [0.189]	6.8 [0.268]	11.2 [0.441]	14.9 [0.587]
Lever ratio ^{Note2}		1 : 2		1 : 2.2	
Mass	g [oz.]	31 [1.09]	78 [2.75]	156 [5.50]	312 [11.0]

Notes: 1. Pushing force refers to the external force required to completely open the lever against the spring force constantly exerted in the closed direction.

2. Lever ratio expresses the "pushing distance : lever open distance (stroke)" where the pushing distance on the rear rod is assumed to be 1.

Inner Construction

● Parallel type mechanical hands

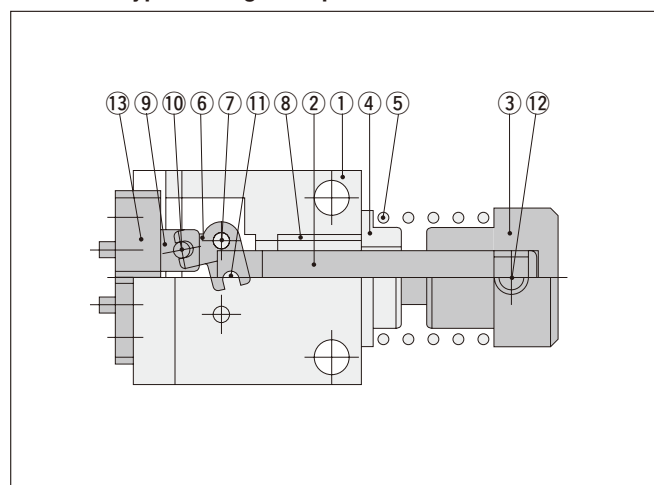


Major Parts and Materials

● Parallel type mechanical hands

No.	Parts	Materials
①	Body	Aluminum alloy
②	Piston rod	Stainless steel
③	Holder	Aluminum alloy
④	Holder	Aluminum alloy
⑤	Spring	Steel wire
⑥	Lever	Steel
⑦	Action lever	Steel
⑧	Fulcrum pin	Steel
⑨	Fulcrum pin	Steel
⑩	Press fit pin	Steel
⑪	Press fit pin	Steel
⑫	Slide plate	Steel
⑬	Metal	—
⑭	Ring	Steel
⑮	Ring	Brass
⑯	Hexagon socket setscrew	Steel
⑰	Snap ring	Steel

● Parallel type linear guide specification mechanical hands

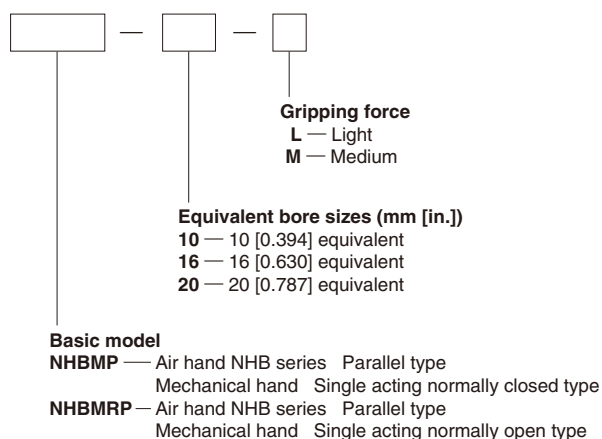


● Parallel type linear guide specification mechanical hands

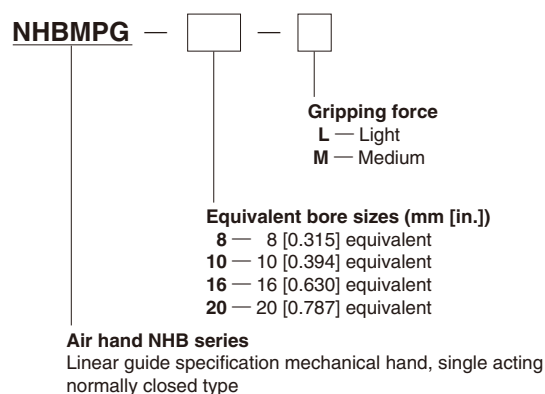
No.	Parts	Materials
①	Body	Aluminum alloy
②	Piston rod	Stainless steel
③	Holder	Steel
④	Holder	Aluminum alloy
⑤	Spring	Steel wire
⑥	Action lever	Steel
⑦	Fulcrum pin	Steel
⑧	Metal	—
⑨	Knuckle	Stainless steel
⑩	Roller	Steel
⑪	Roller	Steel
⑫	Hexagon socket setscrew	Steel
⑬	Bearing	—

Order Codes

● Parallel type mechanical hands

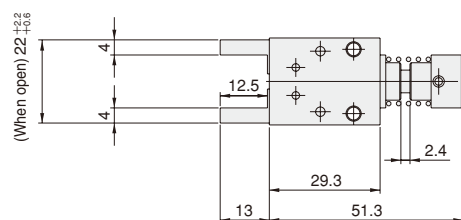


● Parallel type linear guide specification mechanical hands

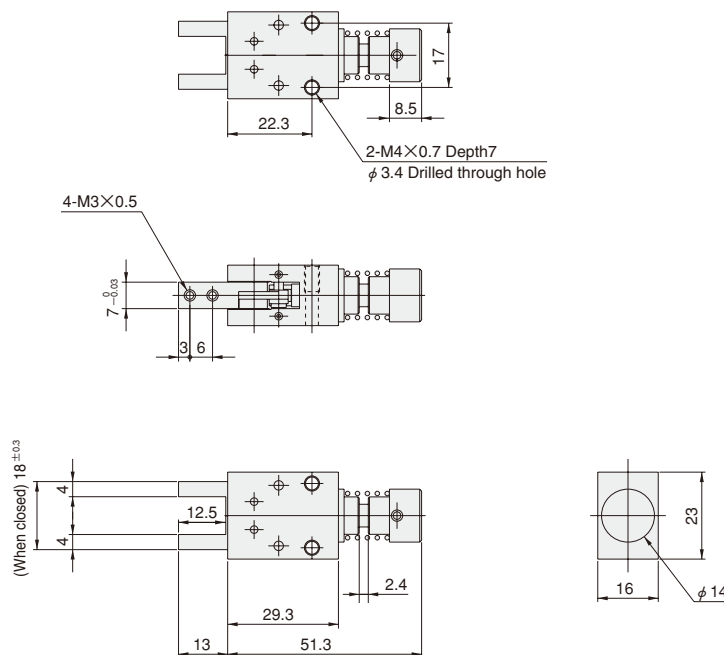


Caution: The sensor switch cannot be used with the mechanical hand.

NHBMP-10 NHBMRP-10

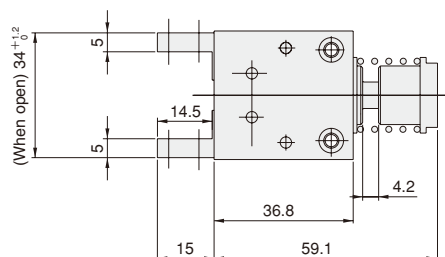


NHBMRP-10 (Single acting normally open type)

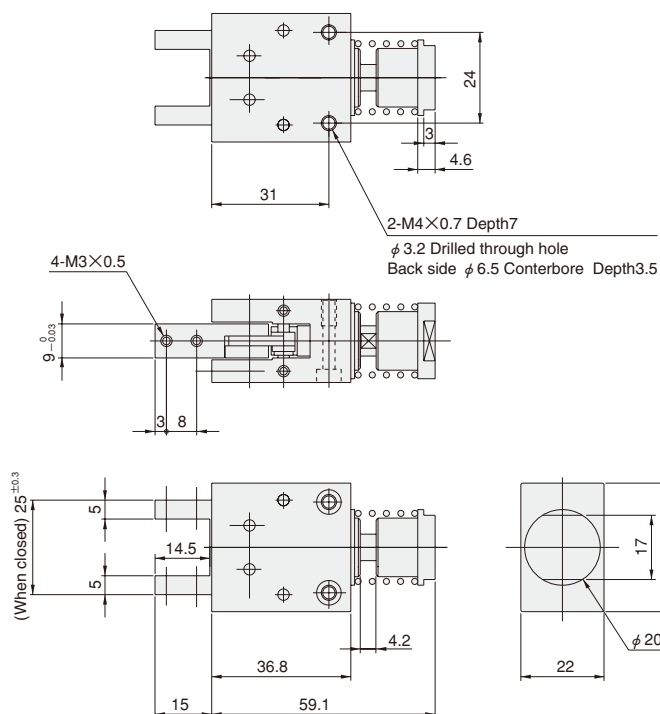


NHBMP-10 (Single acting normally closed type)

NHBMP-16 NHBMRP-16

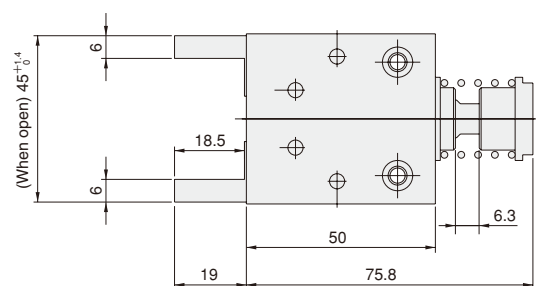


NHBMRP-16 (Single acting normally open type)

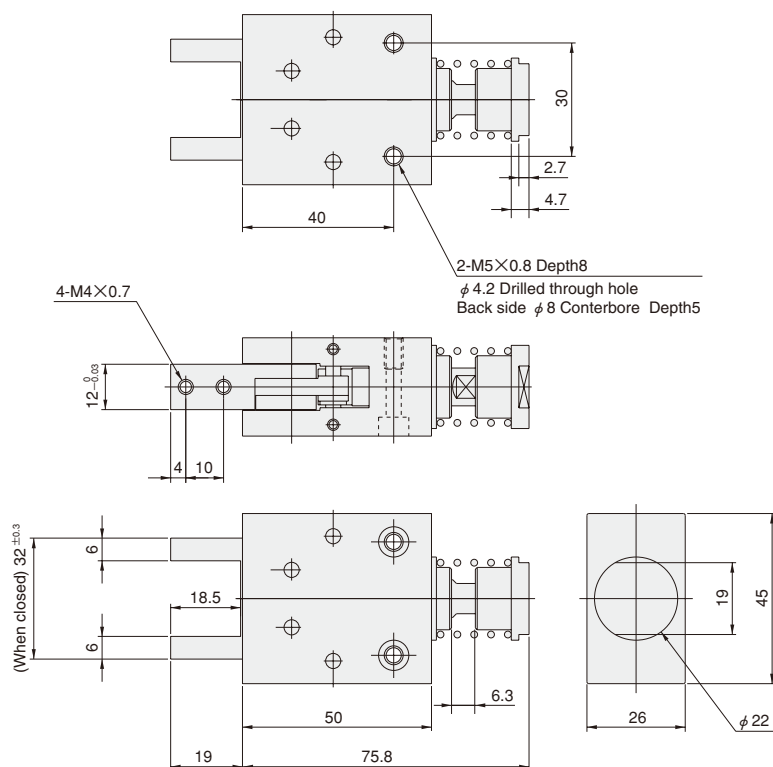


NHBMP-16 (Single acting normally closed type)

NHBMP-20 NHBMRP-20

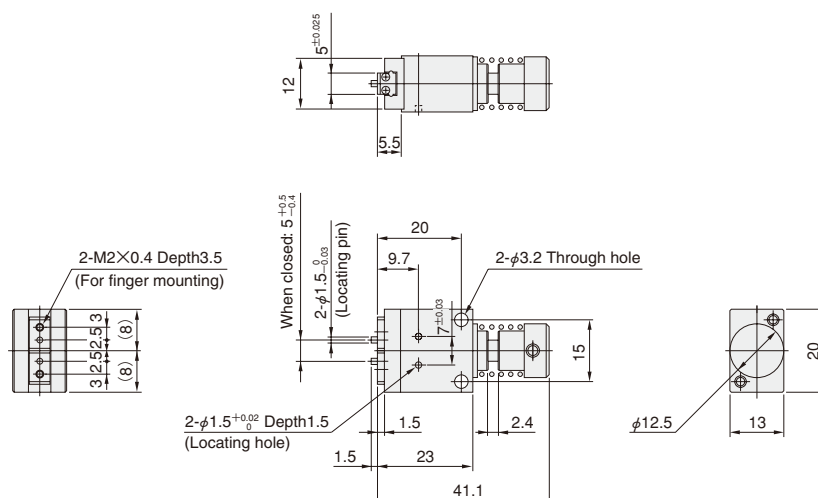


NHBMRP-20 (Single acting normally open type)

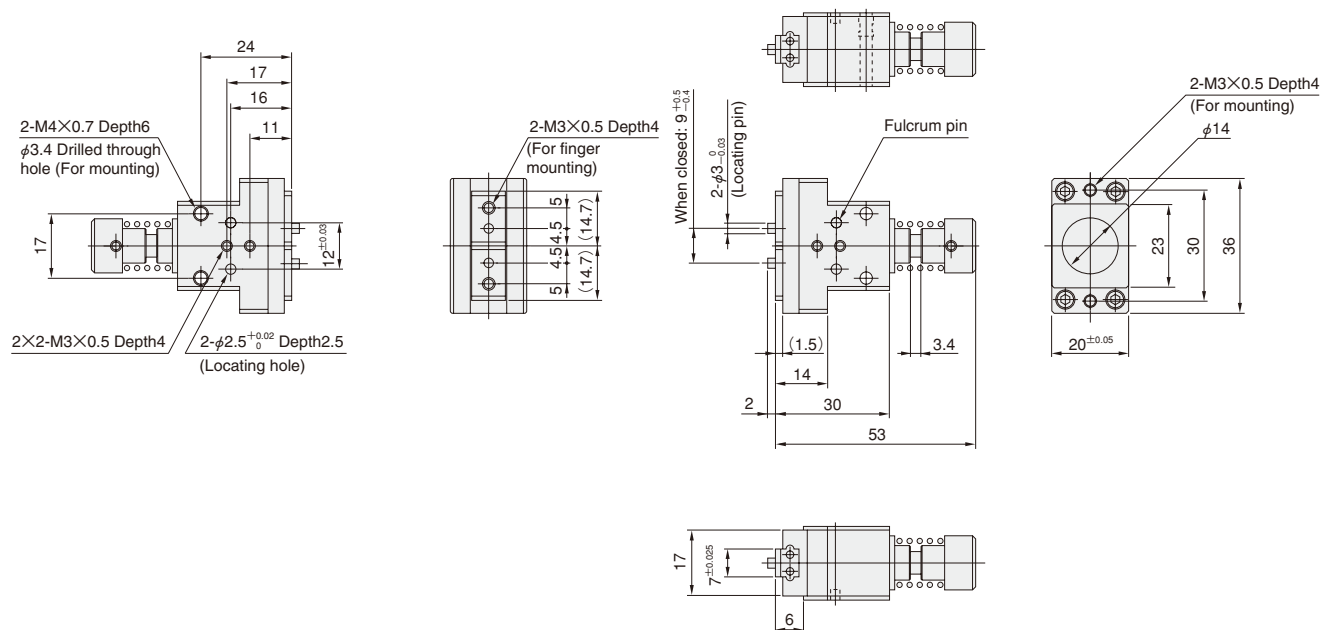


NHBMP-20 (Single acting normally closed type)

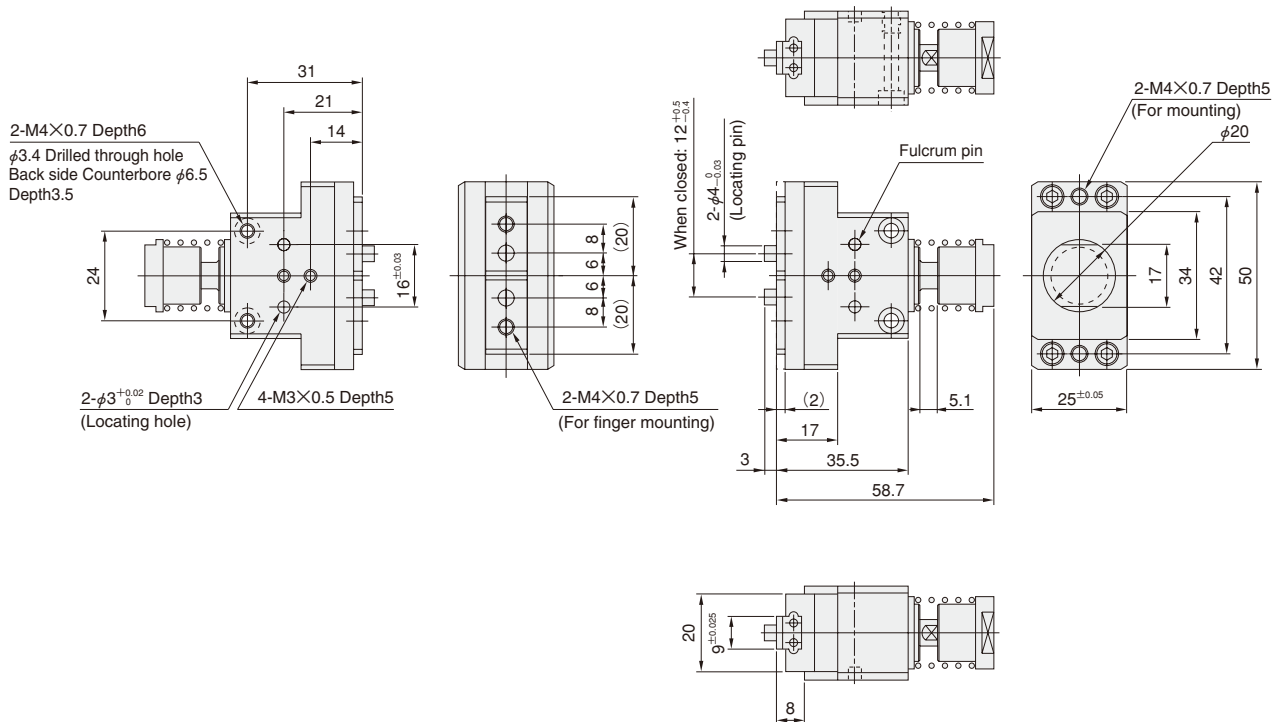
NHBMPG-8



NHBMPG-10



NHBMPG-16



NHBMPG-20

