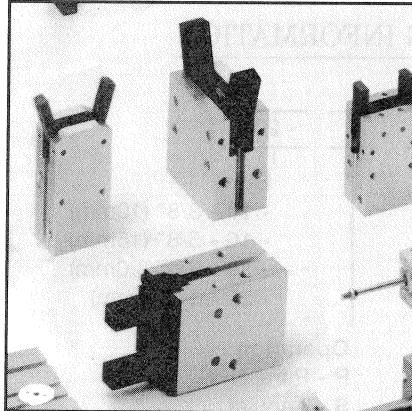
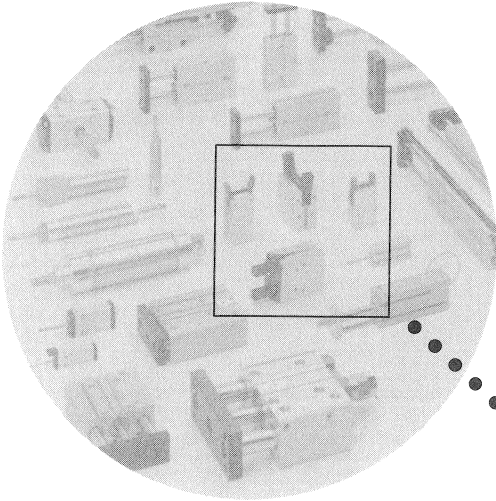


Grippers



HUMPHREY HNH SERIES GRIPPERS

HUMPHREY PNEUMATIC GRIPPERS

Humphrey pneumatic grippers are light and compact and are ideal for factory automation pick-and-place applications. They have a rugged design, and are capable of gripping items that weight up to 2.5 lbs.

- Four bore sizes—inch (mm): 3/8 (10); 5/8 (16); 3/4 (20); 1 (25).
- Double acting or single acting (normally open).
- Both angular and parallel types are available.
- Compact size reduces overall size and weight of your machine.
- Strong holding power combined with compact size provides an ideal gripping device.
- Piston magnet is standard, thus gripper is ready for use with hall effect sensor switches with LEDs.
- No lubrication is required for internal portion of gripper.
- Versatile mounting: rear axial, or two different sides provides easy installation.

ORDERING INFORMATION

HNHB **D** **P** **- 20**

Bore:

- 10 - 3/8" (10mm)
- 16 - 5/8" (16mm)
- 20 - 3/4" (20mm)
- 25 - 1" (25mm)

Operation:

- P** - Parallel
- S** - Angular

Action type:

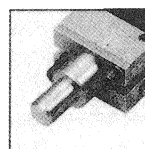
- D** - Double acting
- R** - Single acting

HNHB: Humphrey Gripper

- ZE135** ☐ - HP 2 wire, horizontal lead, solid state with LED (PNP, sourcing) DC10~28V
- ZE155** ☐ - HP 3 wire, horizontal lead, solid state with LED (NPN, sinking) DC4.5~28V
- ZE 235** ☐ - HP 2 wire, vertical lead, solid state with LED (PNP, sourcing) DC10~28V
- ZE 255** ☐ - HP 3 wire, vertical lead, solid state with LED (NPN, sinking) DC4.5~28V

- ☐ - Insert "A" for 39.37 inches, "B" for 118.11 inches

Rear Axial Mounting Bracket: **HNHB** ☐ - **M**



Size:

- 10
- 16
- 20
- 25

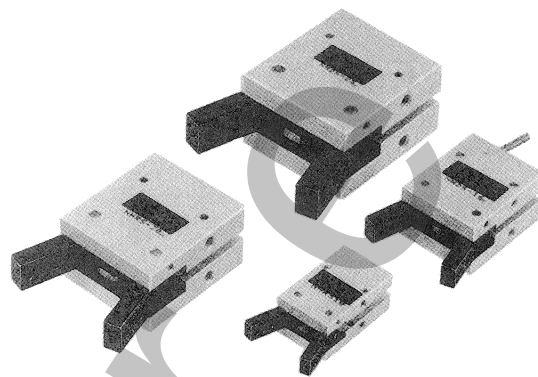
ANGULAR TYPE SPECIFICATIONS

BORE SIZES – in. nominal (mm actual)

3/8 (10), 5/8 (16), 3/4 (20), 1 (25).

SPECIFICATIONS

Double acting angular type.



Item		Basic Model			
		HNHBDS-10	HNHBDS-16	HNHBDS-20	HNHBDS-25
Cylinder dimensions - in. (mm)		3/8 (10)	5/8 (16)	3/4 (20)	1 (25)
Operating method		Double acting			
Media		Air			
Pressure range psig (kgf/cm ²)		15 ~ 100 (1.0 ~ 7.0)			
Temperature range °F (°C)		32 ~ 140 (0 ~ 60)			
Maximum repeatability cycle/min.		180			
Lubrication	Cylinder	Not required			
	Lever	Grease required at pivot points			
Grip moment (M) lb./in. (kgf/cm)	Close	0.010 (0.17) x P	0.055 (0.9) x P	0.104 (1.7) x P	0.207 (3.4) x P
	Open	0.016 (0.27) x P	0.073 (1.2) x P	0.140 (2.3) x P	0.269 (4.4) x P
Grip point length (L) - max. in. (mm)		1 1/8 (30)	1 1/2 (40)	2 1/4 (60)	2 3/4 (70)
Grip point force (F) lbs. (kgf) ^{NOTE 1}		F = M/Lx0.85			
Lever open/close degree (angle)		-10 ° ~ + 30 °			
Port connection		M3x0.5	10-32 UNF		
Weight ^{NOTE 2} oz./gf		1.4/40 (1.8/51)	3.4/96 (4.1/115)	6.4/181 (7.3/207)	11.3/321 (13.1/372)

NOTE: Refer to page 13 for additional information on gripping parts.

NOTE 1: Grip point force = F (actual). Grip point length = L. Grip moment = M (theoretical). Pressure = P psig (kgf/cm²).

NOTE 2: () = Gripper with mounting bracket.

Single acting angular type

Item		Basic Model			
		HNHBRS-10	HNHBRS-16	HNHBRS-20	HNHBRS-25
Cylinder dimensions - in. (mm)		3/8 (10)	5/8 (16)	3/4 (20)	1 (25)
Operating method		Single acting			
Media		Air			
Pressure range psig (kgf/cm ²)		42 ~ 100 (3.0 ~ 7.0)	28 ~ 100 (2.0 ~ 7.0)		
Temperature range °F (°C)		32 ~ 140 (0 ~ 60)			
Maximum repeatability cycle/min.		180			
Lubrication	Cylinder	Not required			
	Lever	Grease required at pivot points			
	Close	0.010xP-0.30 (0.17xP-0.35)	0.055xP-0.87 (0.9xP-1.0)	0.104xP-1.82 (1.7xP-2.1)	0.208xP-3.12 (3.4xP-3.6)
Grip moment (M) lb./in. (kgf/cm)	Open	0.30 (0.35)	0.87 (1.0)	1.82 (2.1)	3.12 (3.6)
Grip point length (L) - max. in. (mm)		1 1/8 (30)	1 1/2 (40)	2 1/4 (60)	2 3/4 (70)
Grip point force (F) lbs. (kgf) ^{NOTE 1}		F = M/Lx0.85			
Lever open/close degree (angle)		-10 ° ~ + 30 °			
Port connection		M3x0.5	10-32 UNF		
Weight ^{NOTE 2} oz./gf		1.4/40 (1.8/51)	3.4/97 (4.1/116)	6.4/182 (7.3/208)	11.4/324 (13.2/375)

NOTE: Refer to page 13 for additional information on gripping parts.

NOTE 1: Grip point force = F (actual). Grip point length = L. Grip moment = M (theoretical). Pressure = P psig (kgf/cm²).

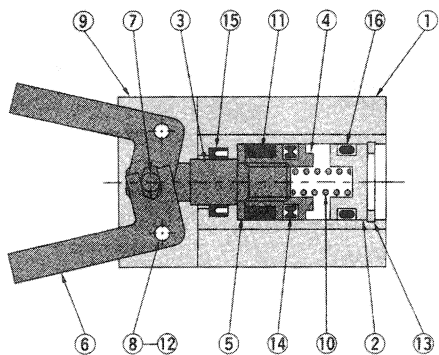
NOTE 2: () = Gripper with mounting bracket.

EXAMPLE: A double acting angular gripper must pick up a small 0.25 lb. stainless steel ball and place it in a nest.
Grip point length is 1", pressure is 70 psig, and a safety factor of 1/10 is sufficient.

1. Calculate safety factor to determine F: 0.25 x 10 = 2.5 lbs.
2. Determine Moment (M) using grip point force formula:
2.5 = M ÷ 1 x 0.85, or M = 2.97 lb./in.
3. Select gripper with moment (M) greater than 2.97 lb./in.

Select HNHBDS-16. 0.055 x 70 psig = 3.85. 3.85 > 2.97

CONFIGURATION

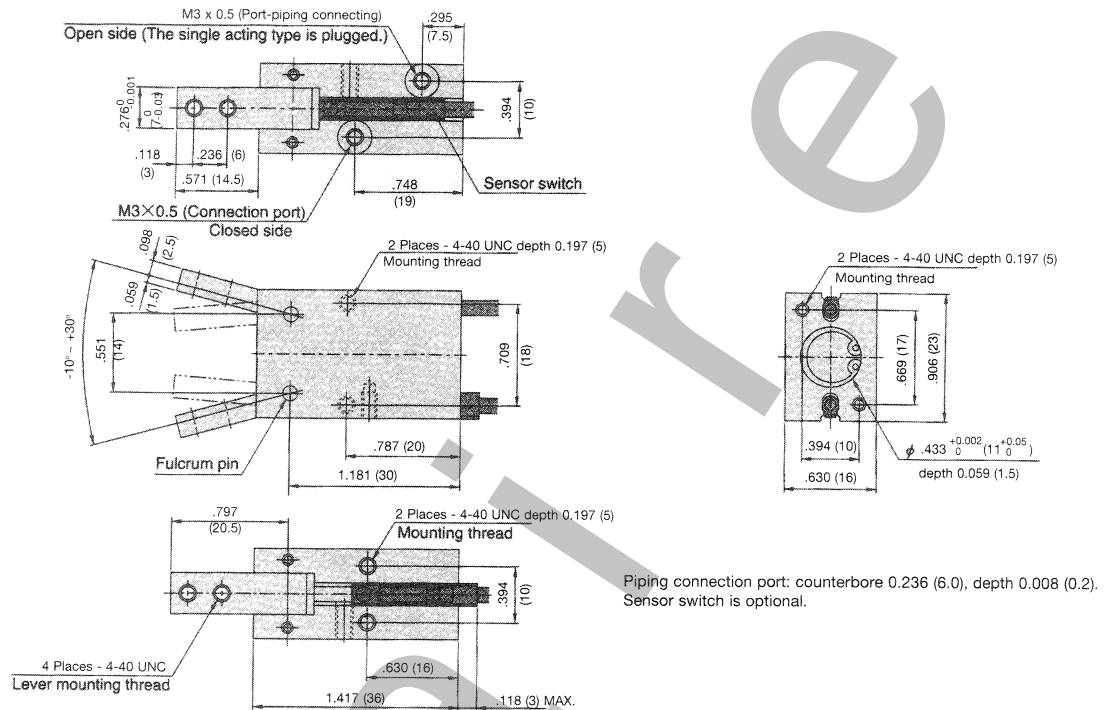


PART NAMES AND MATERIALS

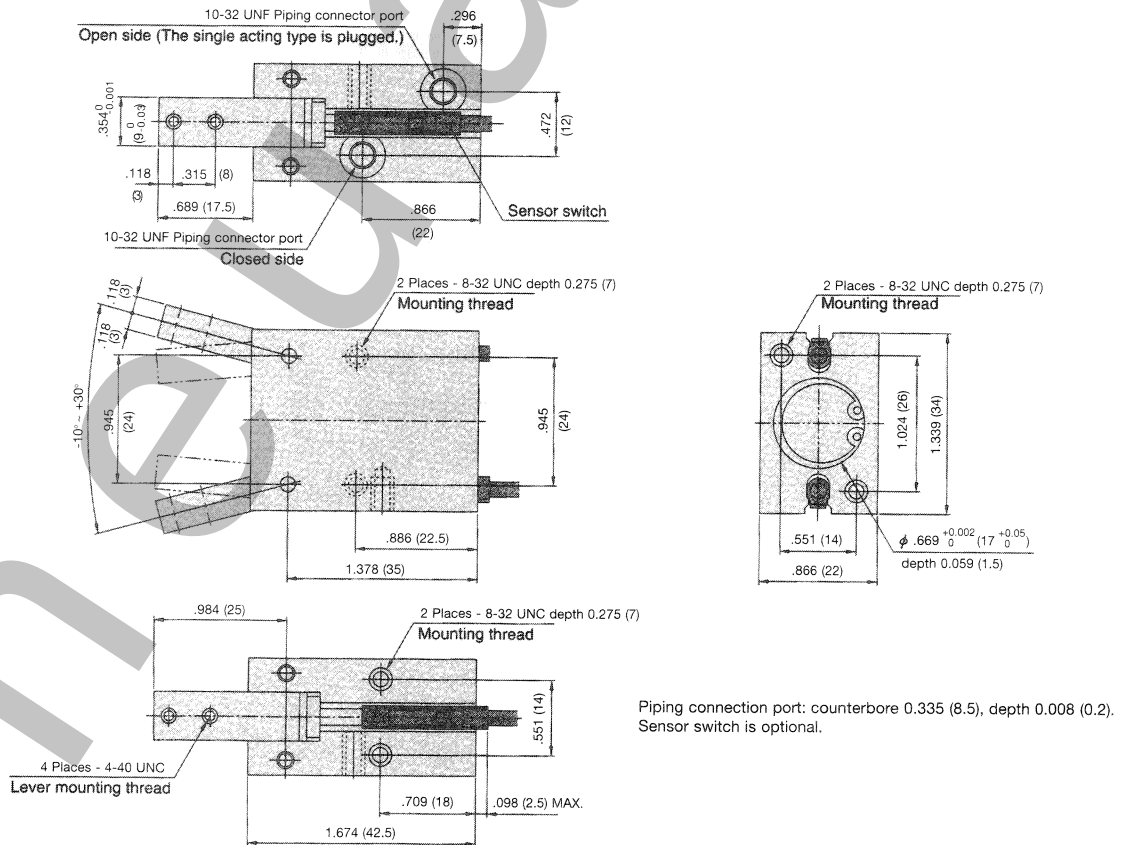
No.	Part Name	Material
1	Body	Anodized aluminum
2	Head cover	Anodized aluminum
3	Piston rod	Stainless steel
4	Piston	Anodized aluminum
5	Magnet holder	Anodized aluminum
6	Lever	Chrome - molybdenum steel
7	Rod pin	Carbon steel
8	Pin	Carbon steel
9	Slide plate	Carbon steel
10	Spring	Spring steel (single acting only)
11	Magnet	Resinous magnet
12	Hex. mounting screw	Mild steel
13	Snap ring	Hard steel
14	Piston seal	Buna
15	Rod seal	Buna
16	O-ring	Buna

ANGULAR TYPE DIMENSIONS

HNHBDS-10
HNHBRS-10

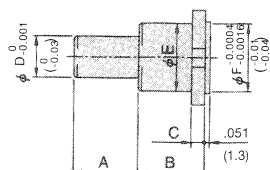
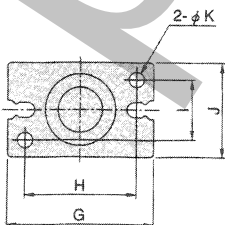


HNHBDS-16
HNHBRS-16



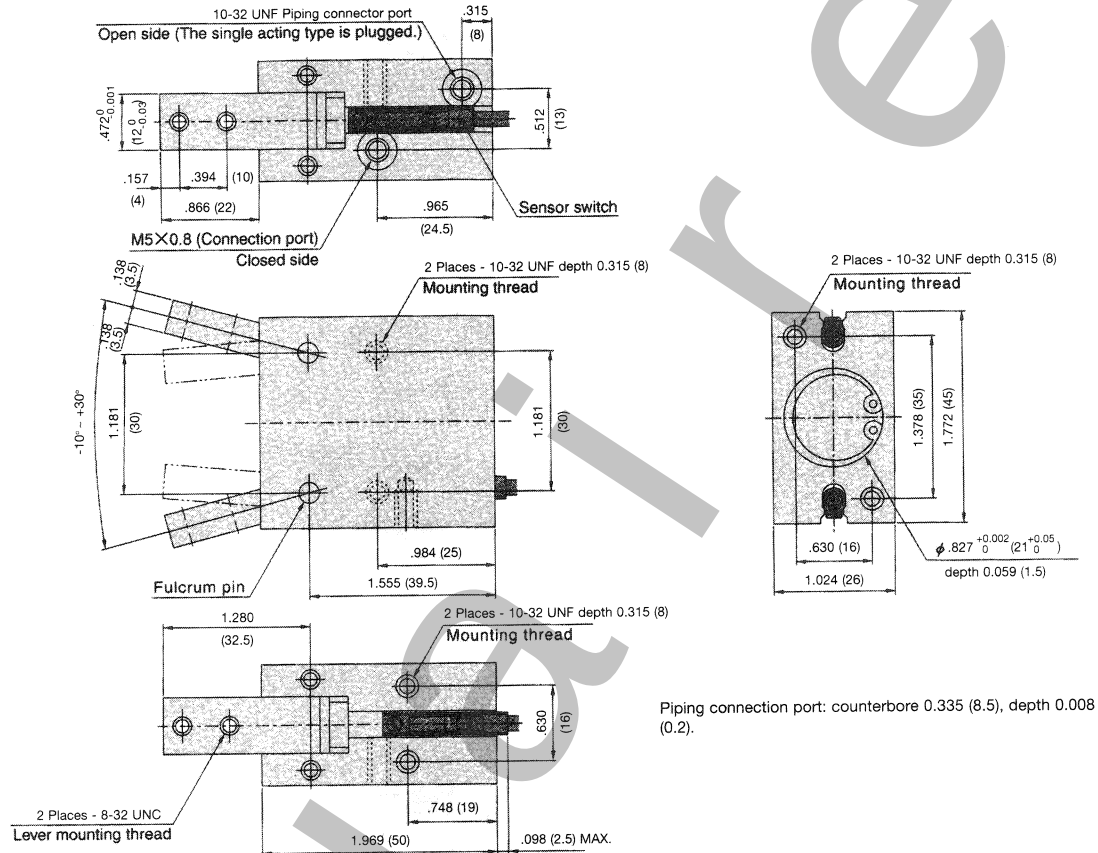
Mounting bracket option: -M

in. (mm)

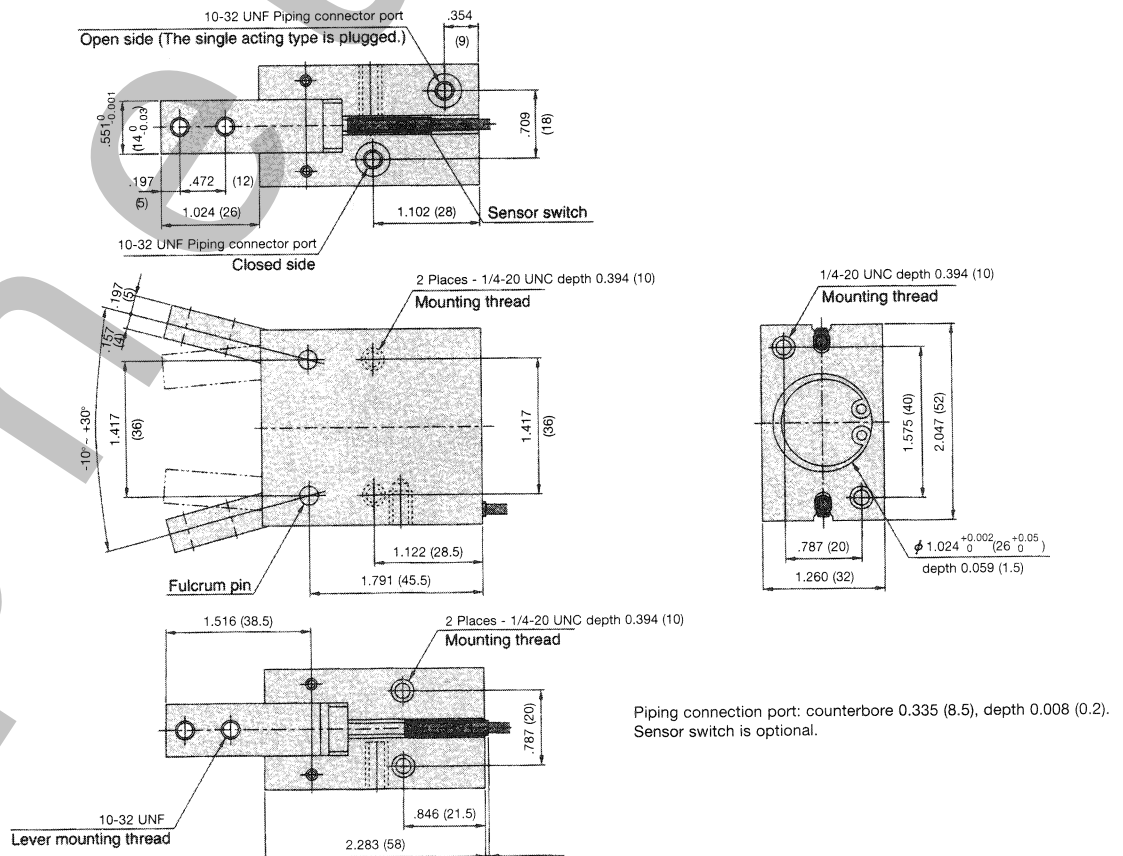


Model	Code										
	A	B	C	D	E	F	G	H	I	J	K
HNHB-10M	0.591 (15)	0.591 (15)	0.118 (3)	0.394 (10)	0.433 (11)	0.433 (11)	0.906 (23)	0.669 (17)	0.394 (10)	0.630 (16)	0.134 (3.4)
HNHB-16M	0.591 (15)	0.591 (15)	0.118 (3)	0.394 (10)	0.630 (16)	0.669 (17)	1.339 (34)	1.024 (26)	0.551 (14)	0.866 (22)	0.177 (4.5)
HNHB-20M	0.591 (15)	0.591 (15)	0.118 (3)	0.394 (10)	0.709 (18)	0.827 (21)	1.772 (45)	1.378 (35)	0.630 (16)	1.024 (26)	0.216 (5.5)
HNHB-25M	0.984 (25)	0.669 (17)	0.197 (5)	0.551 (14)	1.024 (26)	1.024 (26)	2.047 (52)	1.575 (40)	0.787 (20)	1.260 (32)	0.260 (6.6)

HNHBDS-20
HNHBRS-20



HNHBDS-25
HNHBRS-25



PARALLEL TYPE SPECIFICATIONS

BORE SIZES – in. nominal (mm actual)

3/8 (10), 5/8 (16), 3/4 (20), 1 (25).

SPECIFICATIONS

Double acting parallel type.

Item		Basic Model			
		HNHBDP-10	HNHBDP-16	HNHBDP-20	HNHBDP-25
Cylinder dimensions - in. (mm)		3/8 (10)	5/8 (16)	3/4 (20)	1 (25)
Operating method		Double acting			
Media		Air			
Pressure range psig (kgf/cm ²)		15 ~ 100 (1.0 ~ 7.0)			
Temperature range °F (°C)		32 ~ 140 (0 ~ 60)			
Maximum repeatability cycle/min.		180			
Lubrication	Cylinder	Not required			
	Lever	Grease external moving parts			
Grip moment (M) lb./in. (kgf/cm)	Close	11.4 (0.8)	34.1 (2.4)	66.8 (4.7)	110.9 (7.8)
	Open	7.1 (0.5)	25.6 (1.8)	49.8 (3.5)	85.3 (6.0)
Grip point length (L) - max. in. (mm)		1 1/8 (30)	1 1/2 (40)	2 1/4 (60)	2 3/4 (70)
Lever open/close stroke in. (mm)		0.157 (4)	0.315 (8)	0.472 (12)	0.551 (14)
Port connection		M3x0.5		10-32 UNF	
Weight ^{NOTE2} oz./gf		1.7/48 (2.1/59)	4.3/123 (5.0/142)	8.4/239 (9.3/265)	14.4/400 (15.9/451)

NOTE 1: Grip point length = 1.2 in (30mm). Pressure = 72 psig (5kg/cm²).

NOTE 2: () = Gripper with mounting bracket.

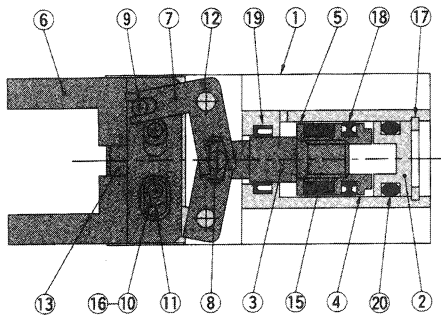
Single acting parallel type

Item		Basic Model			
		HNHBRP-10	HNHBRP-16	HNHBRP-20	HNHBRP-25
Cylinder dimensions - in. (mm)		3/8 (10)	5/8 (16)	3/4 (20)	1 (25)
Operating method		Single acting			
Media		Air			
Pressure range psig (kgf/cm ²)		50 ~ 100 (3.5 ~ 7.0)	35 ~ 100 (2.5 ~ 7.0)		
Temperature range °F (°C)		32 ~ 140 (0 ~ 60)			
Maximum repeatability cycle/min.		180			
Lubrication	Cylinder	Not required			
	Lever	Grease external moving parts			
Grip moment (M) lb./in. (kgf/cm)	Close	4.3 (0.3)	18.5 (1.3)	32.7 (2.3)	54.0 (3.8)
	Open	2.8 (0.2)	5.7 (0.4)	9.9 (0.7)	19.9 (1.4)
Grip point length (L) - max. in. (mm)		1 1/8 (30)	1 1/2 (40)	2 1/4 (60)	2 3/4 (70)
Lever open/close stroke in. (mm)		(4)	(8)	(12)	(14)
Port connection		M3x0.5	10-32 UNF		
Weight ^{NOTE2} oz./gf		1.7/48 (2.1/59)	4.3/123 (5.0/142)	8.5/240 (9.4/266)	14.2/403 (16.0/454)

NOTE 1: Grip point length = 1.2 in (30mm). Pressure = 72 psig (5kg/cm²).

NOTE 2: () = Gripper with mounting bracket.

CONFIGURATION



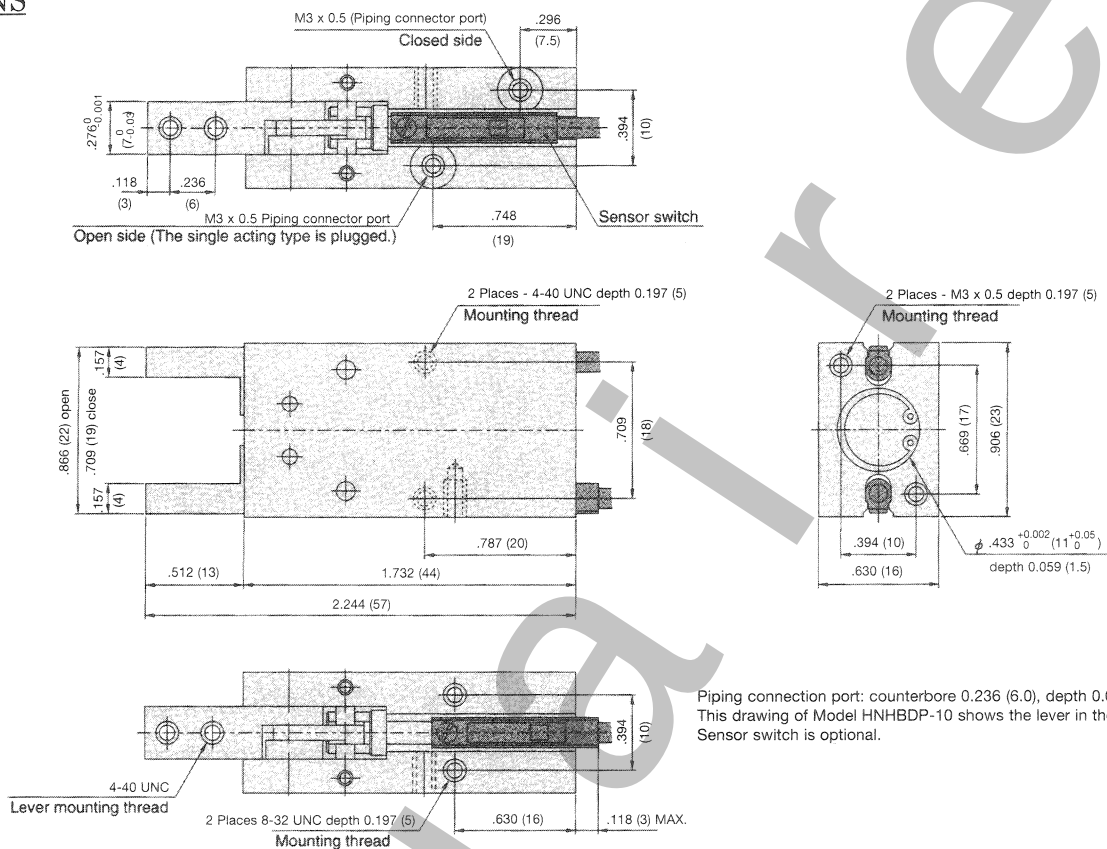
NOTE: Drawing shows lever completely open and shows the spring inserted for single-acting function.

PART NAMES AND MATERIALS

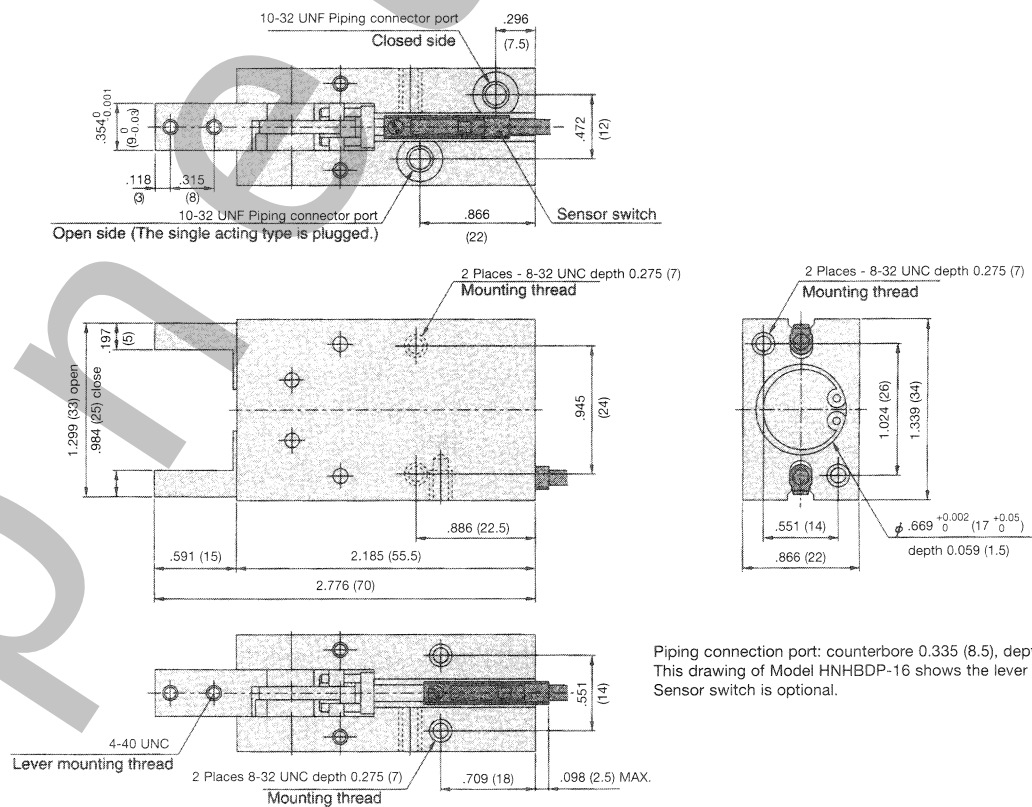
No.	Part Name	Material
1	Body	Anodized aluminum
2	Head cover	Anodized aluminum
3	Piston rod	Stainless steel
4	Piston	Anodized aluminum
5	Magnet holder	Anodized aluminum
6	Slide lever	Carbon steel
7	Action lever	Carbon steel
8	Rod pin	Carbon steel
9	Slide pin	Carbon steel
10	Slide guide pin	Carbon steel
11	Ring	Carbon steel
12	Pin	Carbon steel
13	Slide plate	Carbon steel
14	Spring	Spring steel (single acting only)
15	Magnet	Resinous magnet
16	Hex. mounting screw	Mild steel
17	Snap ring	Hard steel
18	Piston seal	Buna
19	Rod seal	Buna
20	O-ring	Buna

PARALLEL TYPE DIMENSIONS

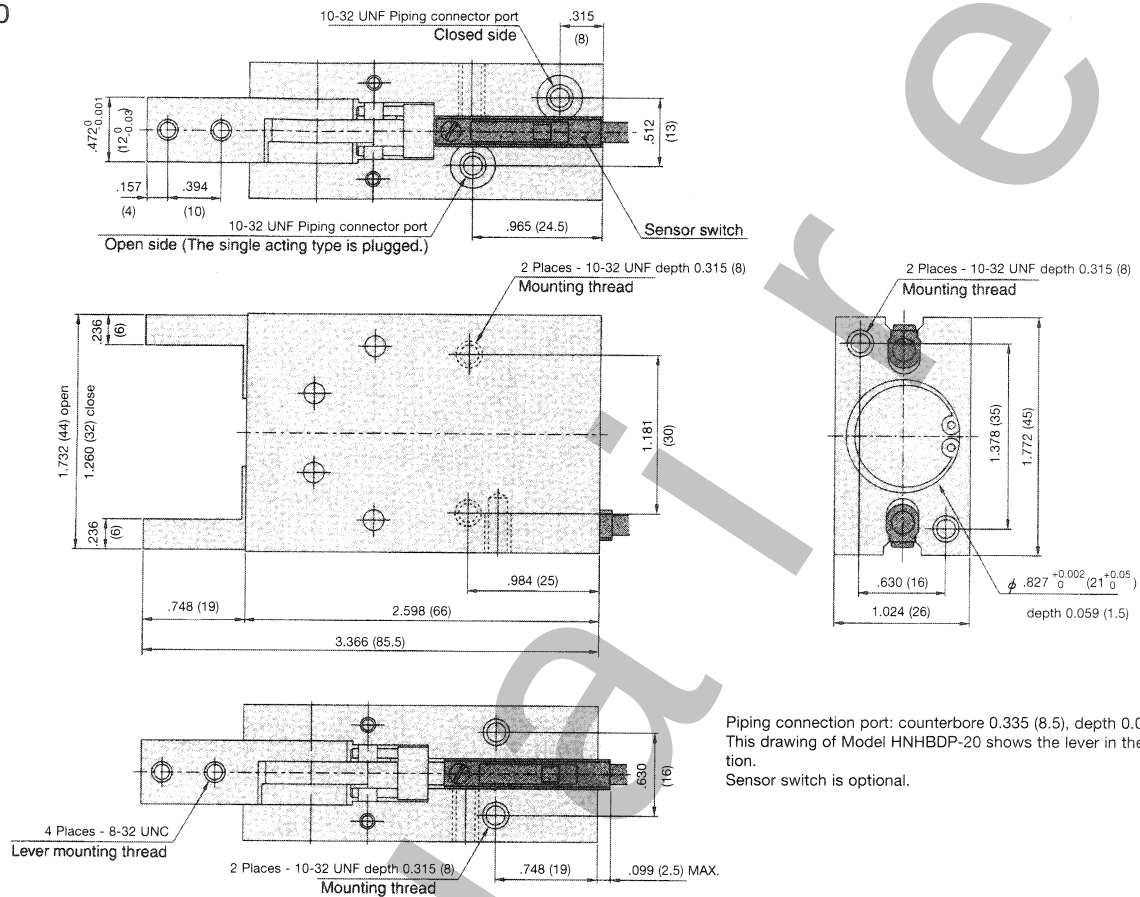
HNHBDP-10
HNHBRP-10



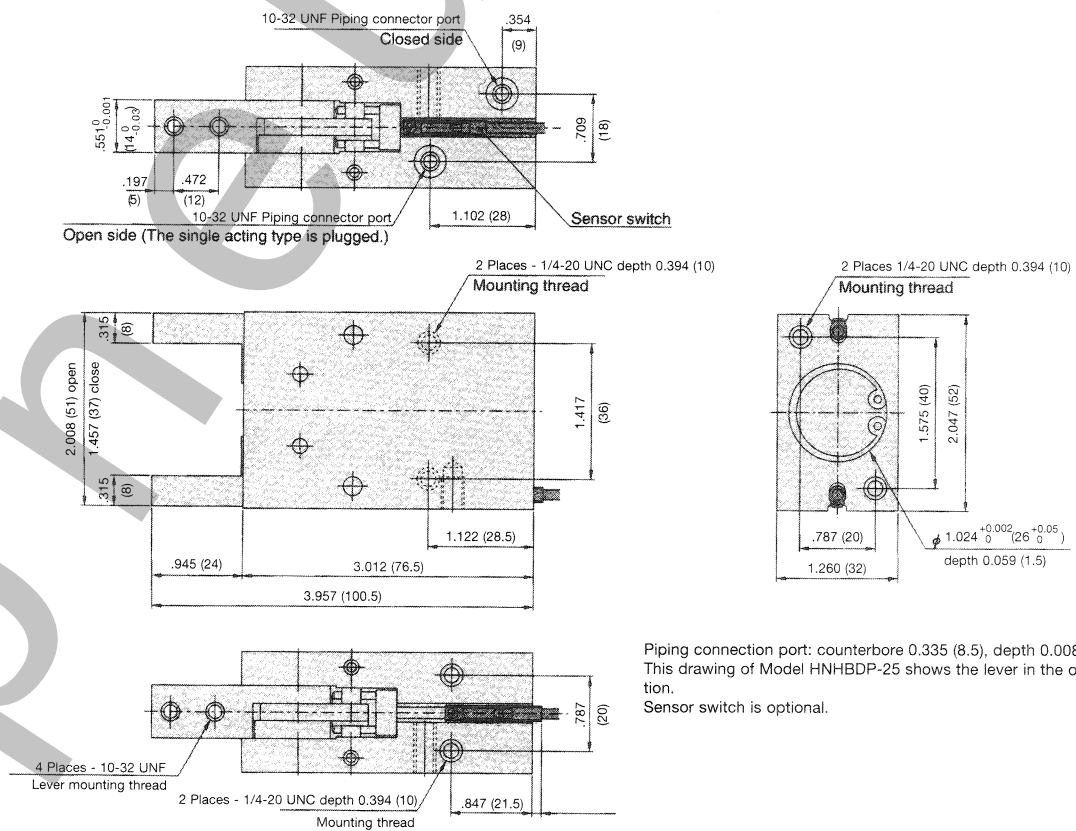
HNHBDP-16
HNHBRP-16



HNHBDP-20
HNHBRP-20



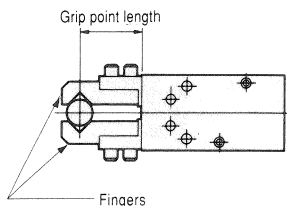
HNHBDP-25
HNHBRP-25



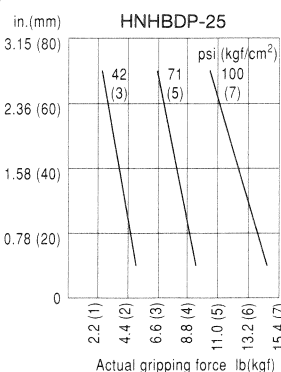
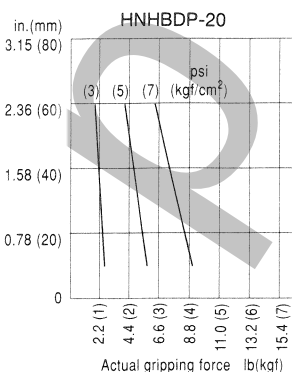
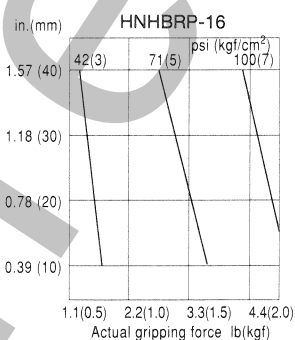
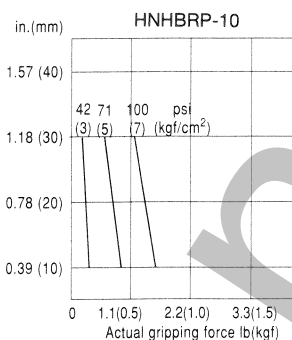
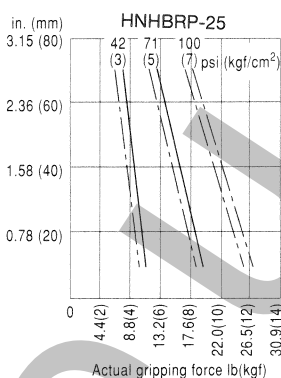
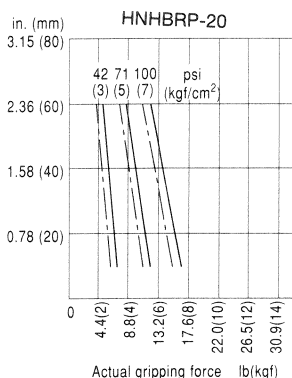
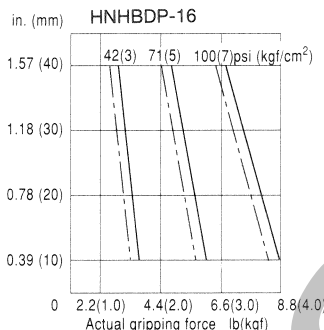
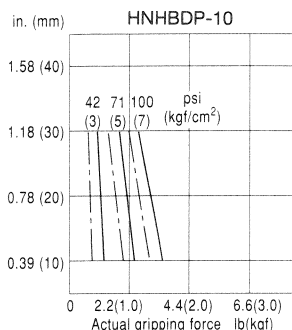
HANDLING CAUTIONS AND GENERAL INFORMATION

SELECTION

PARALLEL TYPE ACTUAL GRIPPING FORCE



— : Closed
- - - : Open



CAUTIONS

GRIPPING

1. When attaching fingers to unit, use the shortest and lightest weight fingers possible. Longer, heavier fingers will cause greater shock when opening and closing resulting in lower gripping accuracy and increased gripper wear.
2. Excessive opening and closing speed causes greater shock and greatly reduces gripping accuracy and increases wear. Consider using speed controllers.
3. Use a shock absorber for smooth stops during straightforward or rotating actions. Sudden stops may cause parts to jump or fall from the gripper.
4. When using an angular-type gripper, grip the part when the levers are in the parallel position.

NOTES:

1. Avoid pick-up positions that put lateral load on the unit and gripper mounting joints.
2. When using normally open single acting angular type grippers, do not use spring force to grip parts.

GRIPPING PARTS

1. The weight of parts will be influenced by the shape and materials of the fingers, gripping surface, and production speed. The information on the accompanying charts should be used for reference only.
2. The weight of the part at the point where it is gripped should be $\frac{1}{10}$ - $\frac{1}{20}$ of the actual gripping force.
3. The total weight of the part to be moved while gripped should be $\frac{1}{30}$ - $\frac{1}{50}$ of the actual gripping force.

PIPING

Before connecting fittings and tubing, blow all foreign materials from these components. Foreign objects may cause air leakage and improper operation.

ATMOSPHERE

1. Protect grippers when used in contaminated conditions such as excessive dust or where exposed to water or oil particles.
2. Grippers cannot be used in applications where they are exposed to organic solvents, phosphate type machine oil, sulfurous acid gas, chlorine gas, and other acids.

LUBRICATION

1. Cylinder parts do not require lubrication. However, if lubrication is used, ensure that the lubricating oils are of sufficient viscosity to assure adequate lubrication. Thin or low viscosity oils (spindle oil, machine oil, etc.) do not provide a good residual film of lubrication.
2. Apply grease regularly (about every one million cycles) to mounting joint, pin, and ring.

MEDIA/FILTRATION

1. Humphrey HNH Series Grippers are designed for use with compressed air or inert gases. Consult factory if using any other media.
2. Compressed air should be clean and uncontaminated. When in doubt, install an air filter with filtering capacity of 40 microns. Periodically, remove and clean or replace filter element.

CAUTION

Compressed air is powerful and may be dangerous. Before attempting to remove a component from an air line or system, *always* disconnect the supply air and thoroughly exhaust the line or system. *Never* attempt to construct, operate, or service anything using compressed air unless you have been properly trained to do so. Failure to heed this warning could result in SERIOUS, EVEN FATAL, PERSONAL INJURY.