

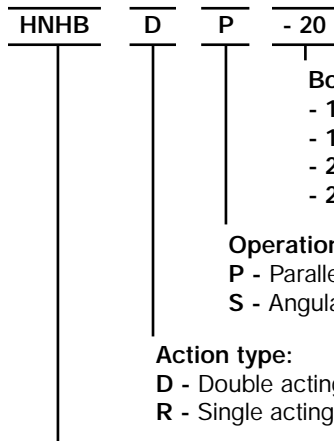
# HUMPHREY HNH SERIES GRIPPERS

## 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



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



**Size:**  
 10  
 16  
 20  
 25

**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

# 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 <sup>2</sup> )	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) <sup>NOTE 1</sup>	F = M/Lx0.85				
Lever open/close degree (angle)	-10° – + 30°				
Port connection	M3x0.5	10-32 UNF			
Weight <sup>NOTE 2</sup> 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/cm<sup>2</sup>).

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 <sup>2</sup> )	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			
Grip moment (M) lb./in. (kgf/cm)	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)
	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) <sup>NOTE 1</sup>	F = M/Lx0.85				
Lever open/close degree (angle)	-10° – + 30°				
Port connection	M3x0.5	10-32 UNF			
Weight <sup>NOTE 2</sup> 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.

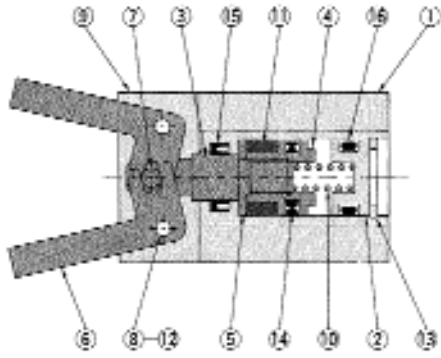
NOTE 1: Grip point force = F (actual). Grip point length = L. Grip moment = M (theoretical). Pressure = P psig (kgf/cm<sup>2</sup>).

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.

- Calculate safety factor to determine F: 0.25 x 10 = 2.5 lbs.
- Determine Moment (M) using grip point force formula:  
2.5 = M ÷ 1 x 0.85, or M = 2.97 lb./in.
- 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

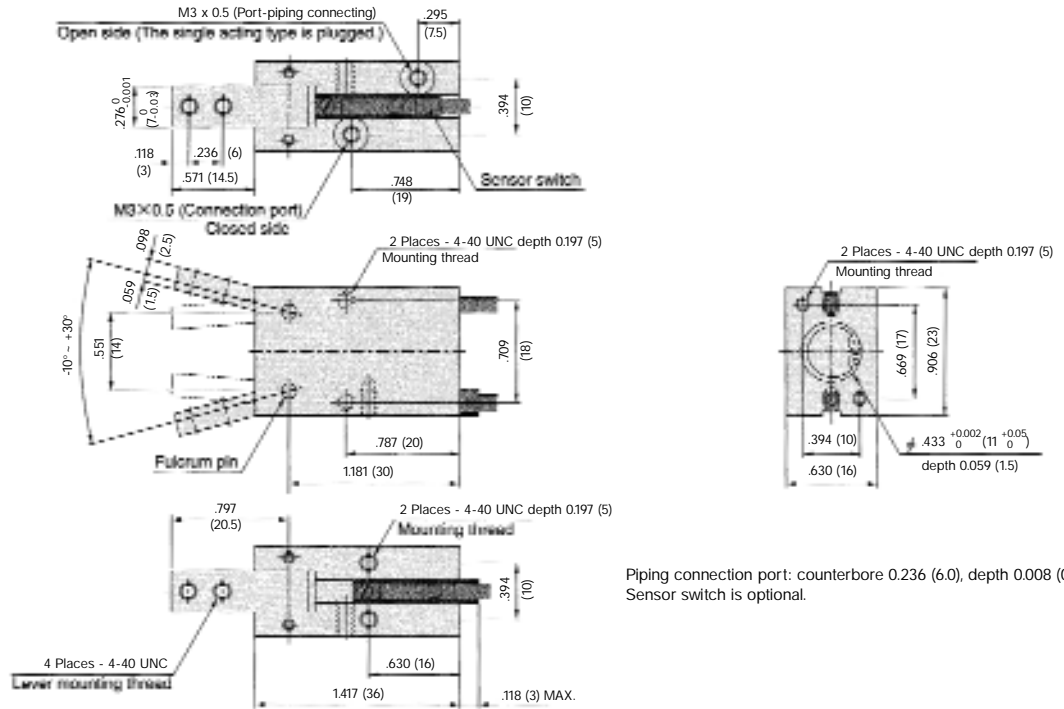


## PART NAMES AND MATERIALS

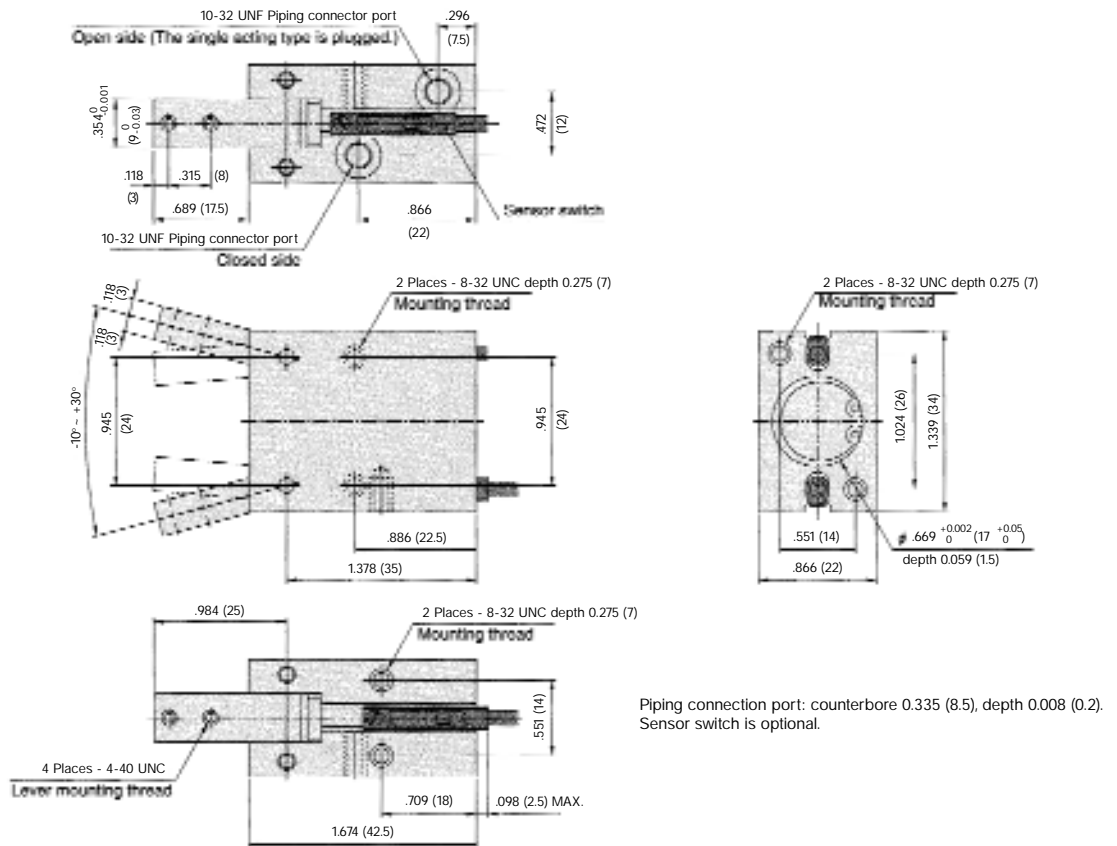
No.	Part Name	Material
1	Body	Anodized aluminum
2	Head cover	Anodized aluminum
3	Piston rod	Stainless steel
4	Piston	Anodized aluminum
5	Magnet holder	Anodized aluminum
6	Lever	Chrome - molybdenum steel
7	Rod pin	Carbon steel
8	Pin	Carbon steel
9	Slide plate	Carbon steel
10	Spring	Spring steel (single 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

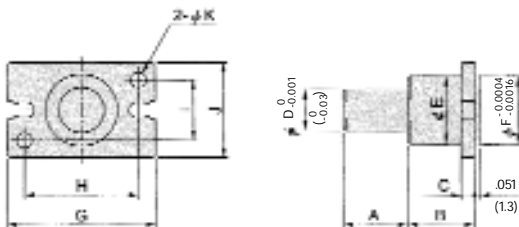


HNHBDS-16  
HNHBRS-16



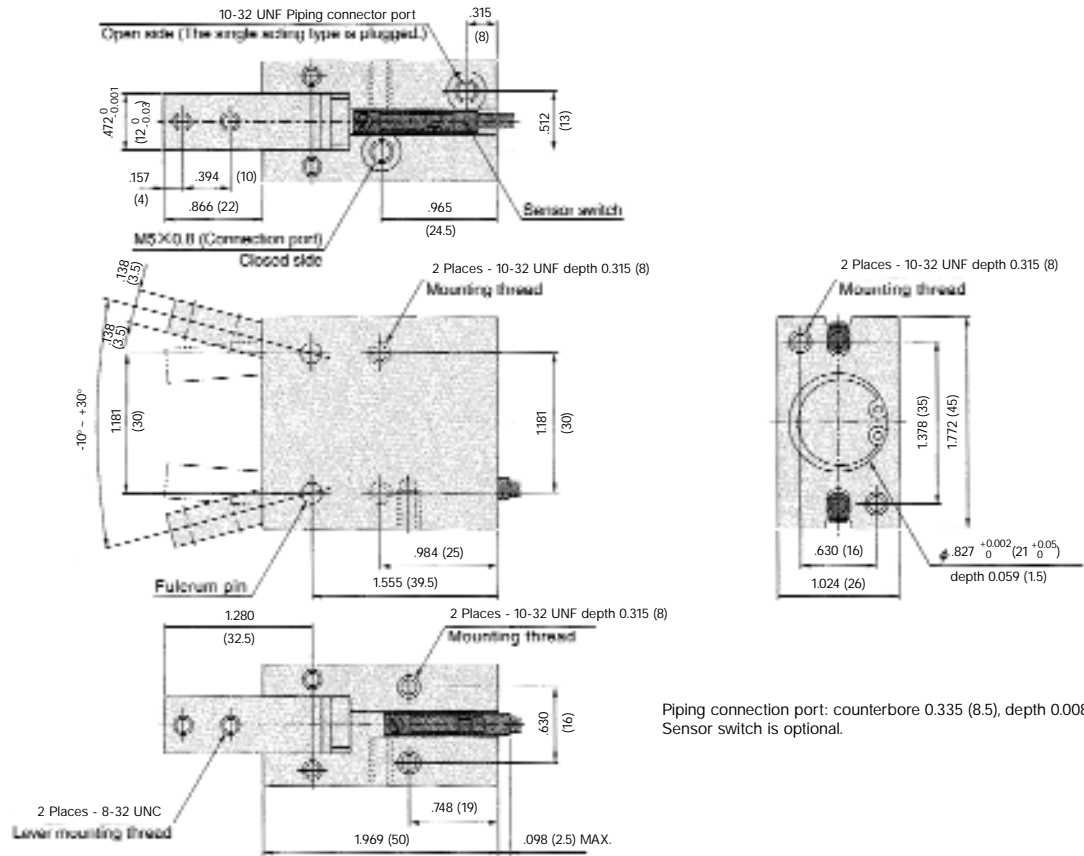
Mounting bracket option: -M

in. (mm)

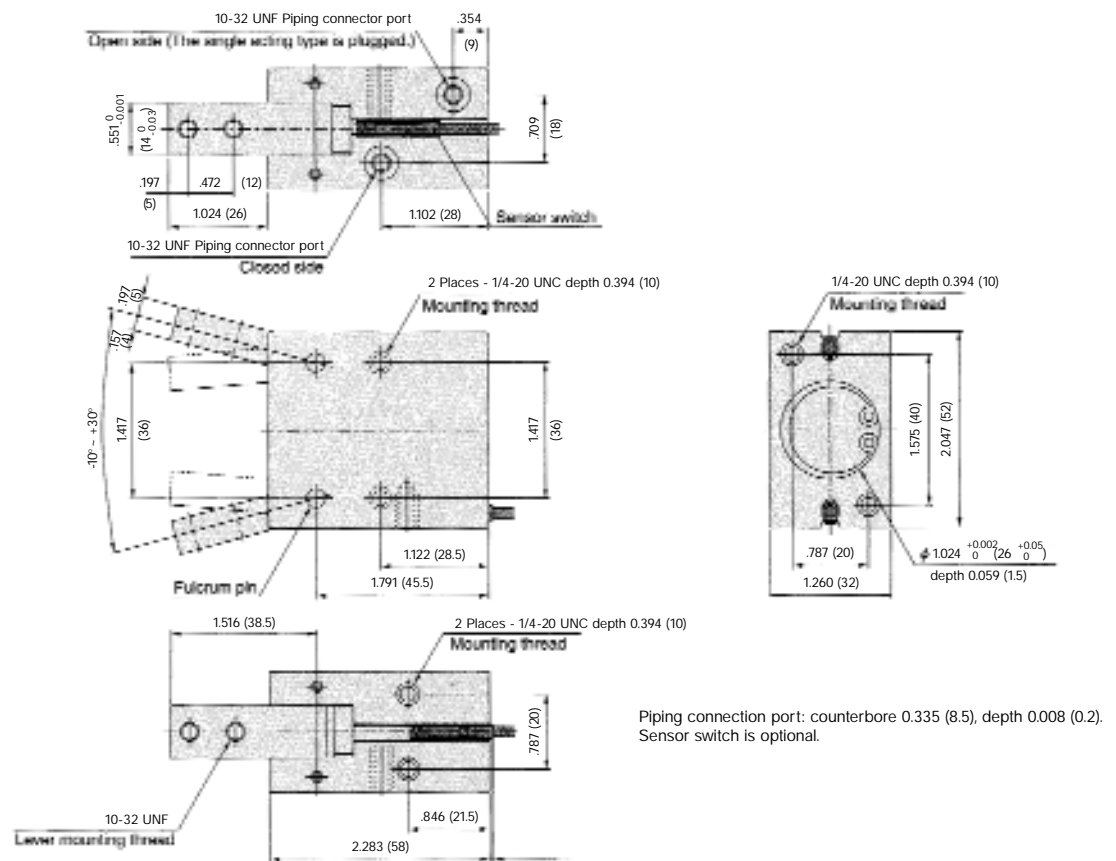


Model	Code										
	A	B	C	D	E	F	G	H	I	J	K
HNHB-10M	0.591 (15)	0.591 (15)	0.118 (3)	0.394 (10)	0.433 (11)	0.433 (11)	0.906 (23)	0.669 (17)	0.394 (10)	0.630 (16)	0.134 (3.4)
HNHB-16M	0.591 (15)	0.591 (15)	0.118 (3)	0.394 (10)	0.630 (16)	0.669 (17)	1.339 (34)	1.024 (26)	0.551 (14)	0.866 (22)	0.177 (4.5)
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 <sup>2</sup> )		15 - 100 (1.0 - 7.0)			
Temperature range °F (°C)		32 - 140 (0 - 60)			
Maximum repeatability cycle/min.		180			
Lubrication		Not required			
		Grease external moving parts			
Grip moment (M) lb./in. (kgf/cm)		Close	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)
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 <sup>NOTE2</sup> oz./gf		1.7/48 (21/59)	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/cm<sup>2</sup>).

NOTE 2: ( ) = Gripper with mounting bracket.

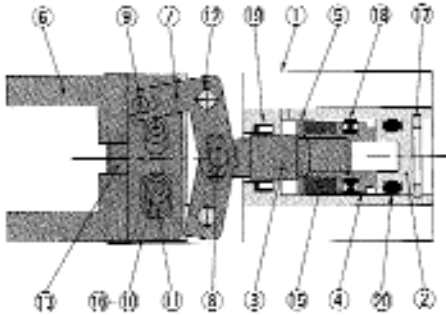
Single acting parallel type

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 <sup>2</sup> )		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		Not required			
		Grease external moving parts			
Grip moment (M) lb./in. (kgf/cm)		Close	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)
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 <sup>NOTE2</sup> oz./gf		1.7/48 (21/59)	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/cm<sup>2</sup>).

NOTE 2: ( ) = Gripper with mounting bracket.

## CONFIGURATION



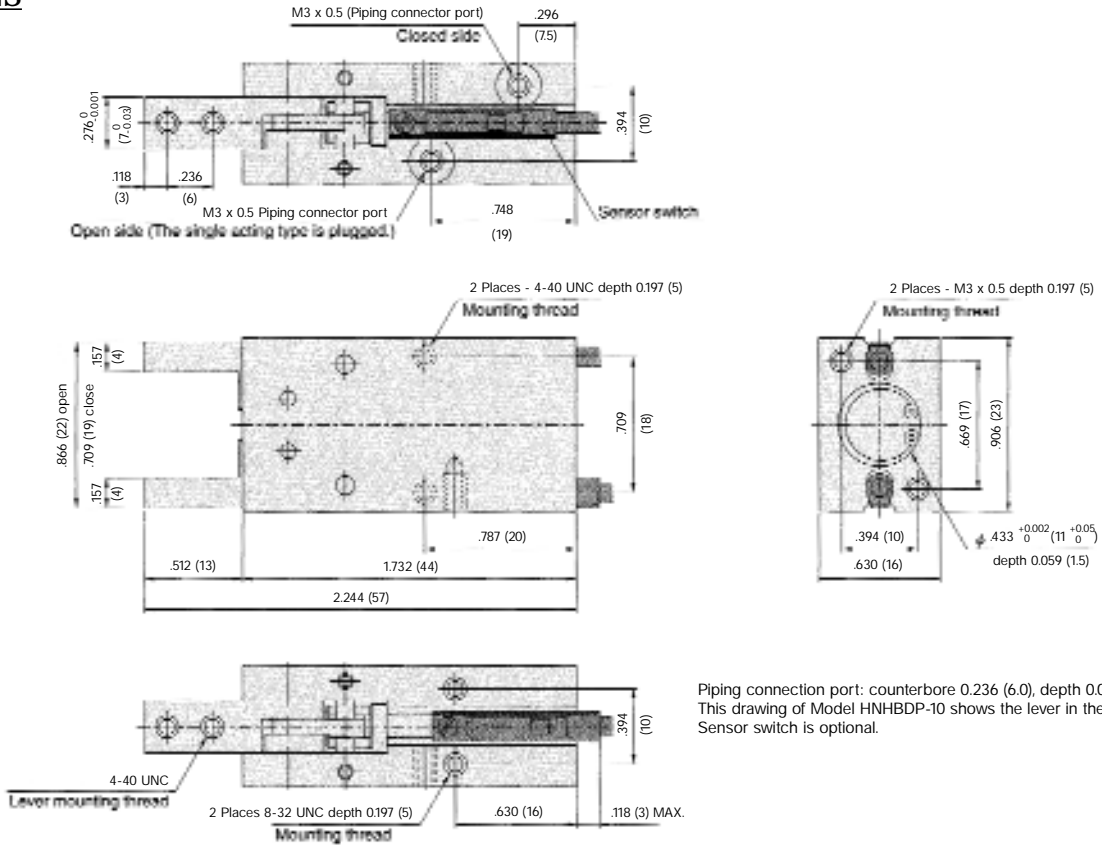
NOTE: Drawing shows lever completely open and shows the spring inserted for single-acting function.

## 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

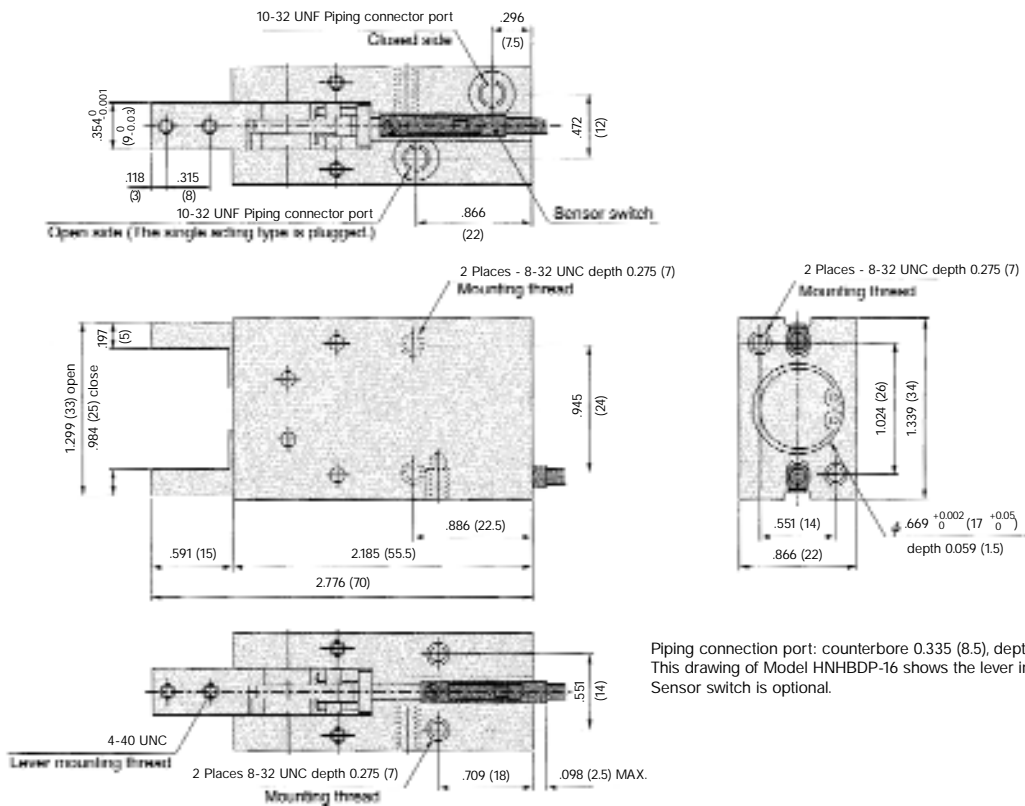
# PARALLEL TYPE DIMENSIONS

HNHBDP-10  
HNHBRP-10



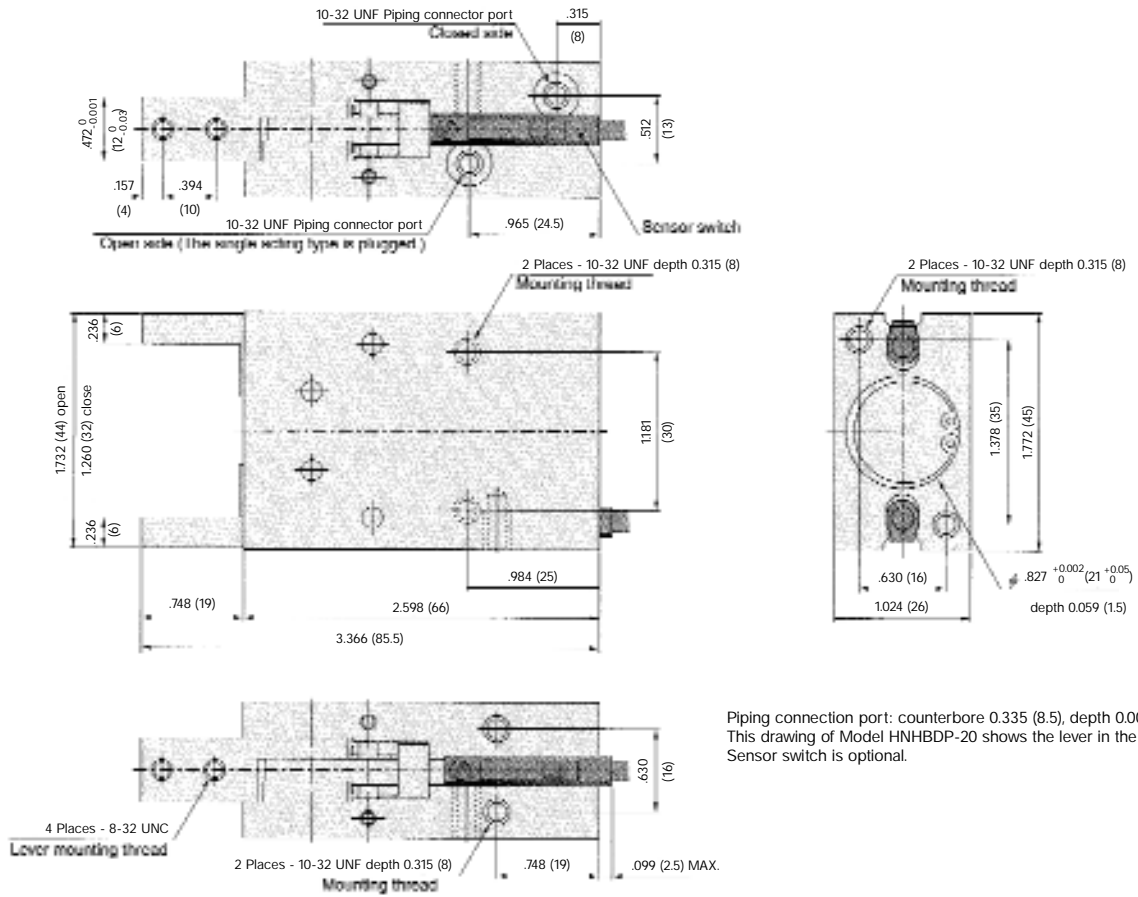
Piping connection port: counterbore 0.236 (6.0), depth 0.008 (0.2).  
This drawing of Model HNHBDP-10 shows the lever in the open position.  
Sensor switch is optional.

HNHBDP-16  
HNHBRP-16

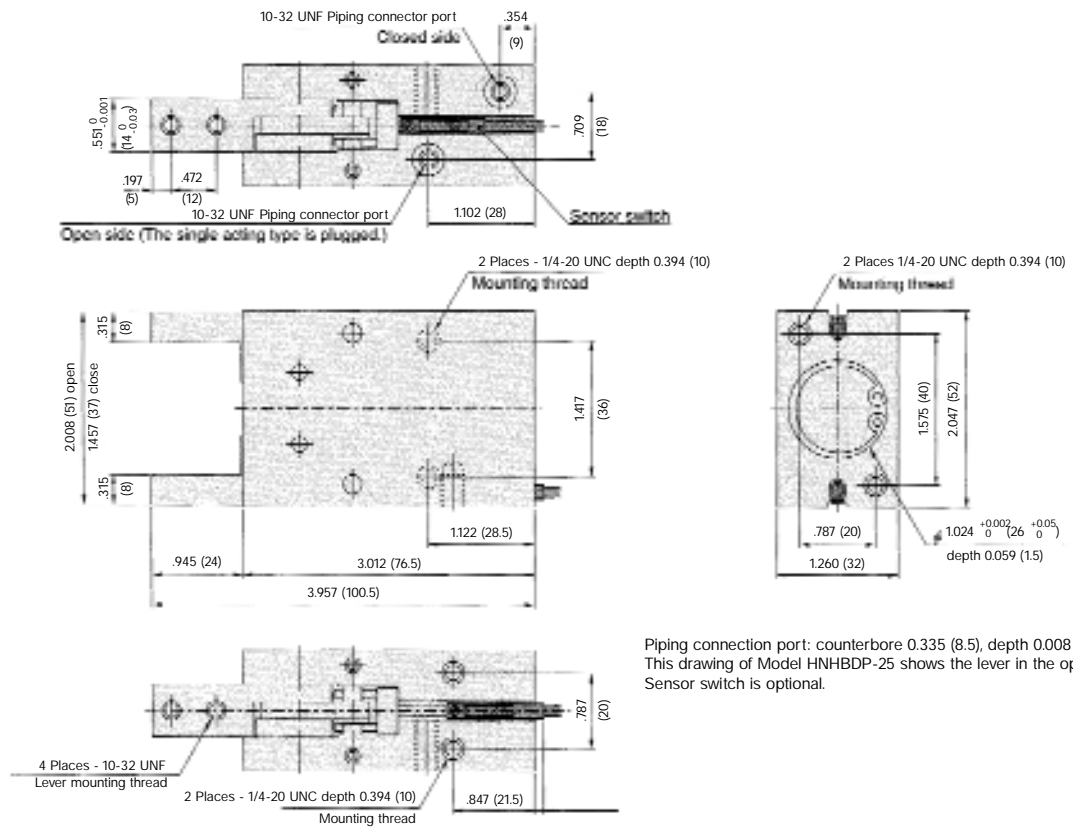


Piping connection port: counterbore 0.335 (8.5), depth 0.008 (0.2).  
This drawing of Model HNHBDP-16 shows the lever in the open position.  
Sensor switch is optional.

HNHBDP-20  
HNHBRP-20



HNHBDP-25  
HNHBRP-25



## Actuator

Model	Type	Operation	Bore
<b>HNHB</b>			
<b>HNHB</b> Gripper	<b>D</b> Double acting	<b>P</b> Parallel	<b>10</b> 10 mm (.394 inch) (3/8 inch nominal diameter)
	<b>R</b> Single acting (spring return)	<b>S</b> Angular	<b>16</b> 16 mm (.630 inch) (5/8 inch nominal diameter)
			<b>20</b> 20 mm (.787 inch) (3/4 inch nominal diameter)
			<b>25</b> 25 mm (.984 inch) (1 inch nominal diameter)

Example: HNHBDP-16

## Accessories

Mounting bracket

Model	Bore	Type
<b>HNHB</b>		
<b>HNHB</b> Gripper	<b>10</b> 10 mm (.394 inch) (3/8 inch nominal diameter)	<b>M</b> Mounting bracket (rear axial only)
	<b>16</b> 16 mm (.630 inch) (5/8 inch nominal diameter)	
	<b>20</b> 20 mm (.787 inch) (3/4 inch nominal diameter)	
	<b>25</b> 25 mm (.984 inch) (1 inch nominal diameter)	

Example: HNH16-M

## Sensors

See Sensor section at back of catalog for order information.