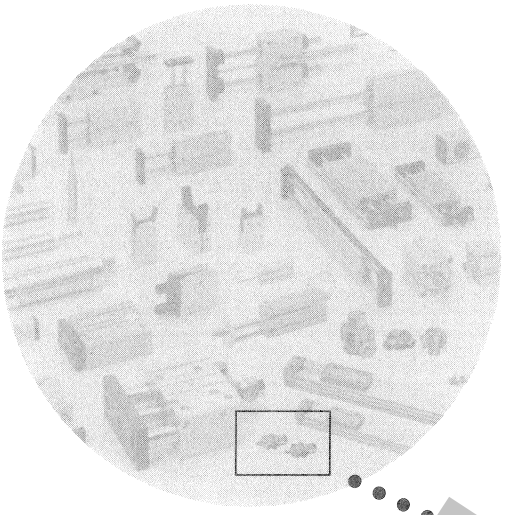
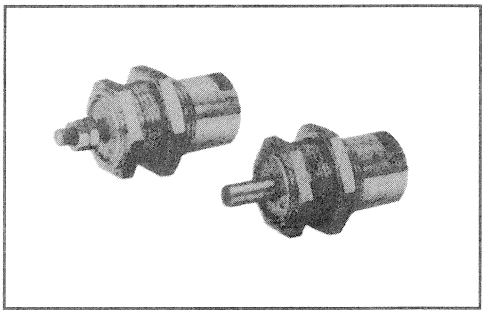
Knock Cylinders





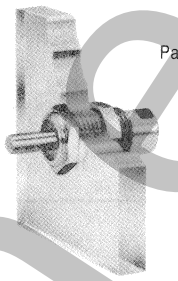
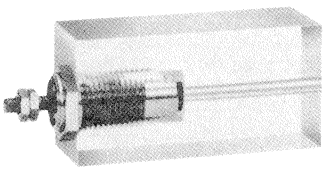
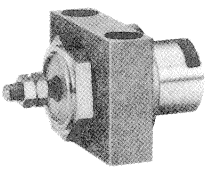
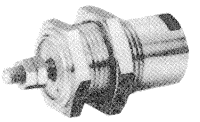
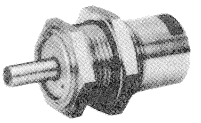
HUMPHREY KNOCK CYLINDERS

SINGLE ACTING PUSH TYPE

Features:

- Humphrey Knock Cylinders are insert-type cylinders that are designed for direct insertion *into* your finished product to become an unrecognizable, proprietary component of your equipment.
- Super short, super compact, and ultra light weight, Knock Cylinders minimize the size and weight of your finished product.
- Highly versatile mounting: The same cylinder adapts to panel, foot, and insert mounting.
- Unique threaded body design facilitates high precision mounting with centerline of piston rod.
- Hex on nose provides mounting ease and rigidness.
- Oil permeated bronze rod bushing provides long, dependable cycle life. No externally applied lubrication required.

INFORMATION

Bore size in. (nom.) (mm) (actual)	Mounting	Piston rod end options	Type of operation
1/4 (6) 3/8 (10) 5/8 (16)	 Panel mount  Insert mount  Foot mount	 Male rod thread  Plain rod	Single acting push type

SYMBOLS

SPECIFICATIONS

Item	Nominal bore size inch (mm actual)		
	1/4 (6)	3/8 (10)	5/8 (16)
Operation	Single acting push type		
Media	Air		
Pressure range psig (kgf/cm²)	28 ~ 100 (2 ~ 7)	21 ~ 100 (1.5 ~ 7)	21 ~ 100 (1.5 ~ 7)
Temperature °F (°C)	32 ~ 140 (0 ~ 60)		
Operating speeds in./sec. (mm/sec.)	2 ~ 20 (50 ~ 500) (external stopper is necessary if used over the spec. speed or work load		
Cushion	Not available		
Lubrication	Not required		
Mounting	Panel mount, foot mount, insert mount		
Port size	10 ~ 32 UNF		
Stroke differentials – in. (mm.)	+0.039 (+1) -0.000 (0)		

BORE SIZE AND STROKE

Bore size	Standard strokes	max.
1/4 (6)	1/4, 3/8, 1/2	1/2
3/8 (10)		
5/8 (16)		

WEIGHT oz. (gf)

Mounting Method	Bore size in. (mm)	Stroke – in.		
		1/4	3/8	1/2
Panel mount Insert mount	1/4 (6)	0.5 (13)	0.5 (15)	0.6 (17)
	3/8 (10)	1.0 (28)	1.1 (31)	1.2 (35)
	5/8 (16)	2.7 (77)	3.0 (85)	3.3 (94)
Foot mount	1/4 (6)	1.0 (29)	1.1 (31)	1.2 (33)
	3/8 (10)	2.0 (58)	2.1 (61)	2.3 (65)
	5/8 (16)	5.8 (166)	6.1 (174)	6.4 (183)

NOTE 1: Panel mount is with one mounting nut.
NOTE 2: Foot mount is with foot bracket and two mounting bolts.

THRUST FORCE (PUSH)

Force (F) is determined by piston area (A) and pressure (P), F = A x P.

Select appropriate bore size by calculating the necessary force, considering loads and air pressure. Use the chart below to compute the "load rate" using the following formula:

$$\text{Load rate} = \frac{\text{Load (weight)}}{\text{Calculation value (from charts below)}}$$

We recommend the "load rate" to be no more than 70%, and no more than 50% for high speed cycle rates.

THRUST FORCE (PUSH) lbs. (kgf)

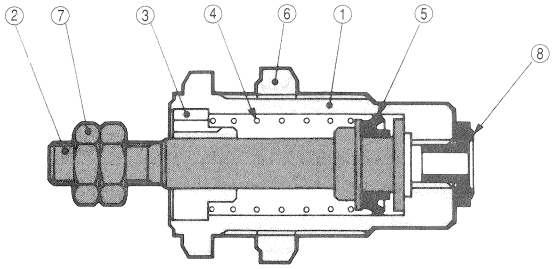
Bore size in. (nom.) (mm) (actual)	Piston area sq. in. (cm²)	Air pressure – psig (kgf)					
		28 (2)	43 (3)	57 (4)	71 (5)	85 (6)	100 (7)
1/4 (6)	0.044 (0.283)	0.42 (0.19)	1.04 (0.47)	1.68 (0.76)	2.29 (1.04)	2.91 (1.32)	3.55 (1.61)
3/8 (10)	0.122 (0.785)	1.57 (0.71)	3.28 (1.49)	5.03 (2.28)	6.75 (3.06)	8.49 (3.85)	10.23 (4.64)
5/8 (16)	0.312 (2.011)	5.12 (2.32)	9.55 (4.33)	13.98 (6.34)	18.41 (8.35)	22.84 (10.36)	27.28 (12.37)

SPRING FORCE lbs. (kgf)

Bore in. (nom.) (mm) actual	Zero stroke	End of stroke
1/4 (6)	0.33 (0.15)	0.77 (0.35)
3/8 (10)	0.55 (0.25)	1.65 (0.75)
5/8 (16)	1.21 (0.55)	3.31 (1.50)

NOTE 1: Not recommended to be used with load on return spring.
NOTE 2: Above values are consistent regardless of cylinder stroke.

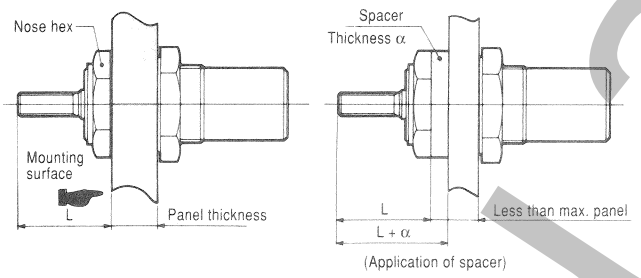
INNER CONSTRUCTION AND MAJOR PARTS



HANDLING TIPS AND POINTS TO BE CONSIDERED

MOUNTING

For panel mount, using body thread increases precision. Spacer can be used to adjust the rod end location. See chart below for maximum panel thickness.



(Application of spacer)

Cylinder bore size – in. (mm)	Max. panel thickness – in. (mm)
1/4 (6)	0.315 (8)
3/8 (10)	0.354 (9)
5/8 (16)	0.394 (10)

HOW TO ORDER INFORMATION

HNSA | **10 × 1/2** | | — | |

- **10 × 1/2** — Bore size (mm) × Stroke (in.)
- Mounting option
  - **Blank** — Panel mount
  - **1** — Foot mount (Mounting bolt)
  - **6** – Insert mount
- Rod options
  - **Blank** — Male rod thread
  - **N** — Plain rod
- **HNSA** — Knock Cylinder, Single acting, Push type

ROD NUTS

RN — **5**

- **5** — Size
  - **1** — 4 – 40 UNC
  - **3** — 8 – 32 UNC
  - **5** — 10 – 32 UNF
- **RN** — Rod nuts (Bag of 2)

MATERIALS OF MAJOR PARTS

No.	Parts	Materials
1	Cylinder body	Brass (nickel plated)
2	Piston/piston rod	Stainless steel
3	Rod bushing	Oil permeated bronze
4	Spring	Hard steel (zinc plated)
5	Piston seal	Buna
6	Mounting nut	Brass (nickel plated)
7	Male rod nut	Hard steel (nickel plated)
8	Gasket	Buna

NOTE: No. 8 only available with insert mount.

PIPING

Remove any foreign material such as metal chips, etc. from fittings and tubing (blow with compressed air, using appropriate safety procedures) before installing them in cylinders. Extraneous debris can potentially interfere with cylinder performance and cause leakage and/or premature failure.

ATMOSPHERE

1. When operating in ambient conditions in which excessive oil, water, dust, etc., are present, install appropriate protective devices.

2. Do not use Humphrey Knock Cylinders in environments containing organic solvents, phosphoric acids, ester-type machine oil, sulfuric acid gas, and other acids.

LUBRICATION

No lubrication is required; however, if lubrication is used it must be compatible with Buna N elastomers and it must be 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. See specifications.

MEDIA

1. Humphrey Knock Cylinders are designed for use with compressed air at the pressures indicated in the specifications. Consult factory when 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.

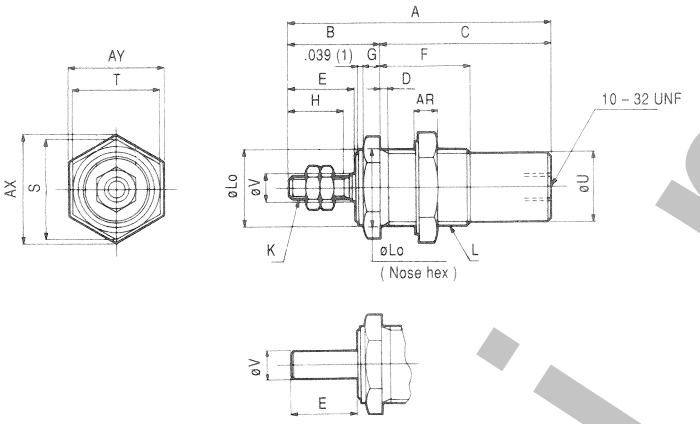
CAUTION

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 thorougly 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.

DIMENSION DIAGRAMS

in. (mm)

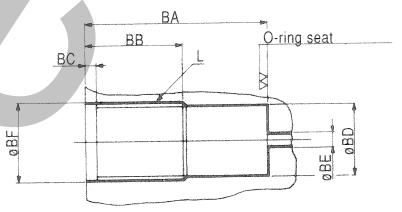
Panel mount



Bore in. (nom.) (mm actual)	Code – in. (mm)												
	A			B	C			D	E	F			G
	1/4	3/8	1/2		1/4	3/8	1/2			1/4	3/8	1/2	
1/4 (6)	1.276 (32.4)	1.402 (35.6)	1.602 (40.7)	0.512 (13)	0.764 (19.4)	0.890 (22.6)	1.091 (27.7)	0.059 (1.5)	0.354 (9)	0.453 (11.5)	0.512 (13)	0.512 (13)	0.098 (2.5)
3/8 (10)	1.472 (37.4)	1.598 (40.6)	1.799 (45.7)	0.650 (16.5)	0.823 (20.9)	0.949 (24.1)	1.150 (29.2)	0.059 (1.5)	0.472 (12)	0.531 (13.5)	0.650 (16.5)	0.650 (16.5)	0.118 (3)
5/8 (16)	1.650 (41.9)	1.776 (45.1)	1.957 (49.7)	0.768 (19.5)	0.882 (22.4)	1.008 (25.6)	1.189 (30.2)	0.079 (2)	0.551 (14)	0.610 (15.5)	0.709 (18)	0.709 (18)	0.157 (4)

Bore in. (nom.) (mm actual)	Code – in. (mm)										
	H	K	L	Lo[NOTE 1]	S	T	U	V	AR	AX	AY
1/4 (6)	0.276 (7)	4-40 UNC	M10x1	0.394 (10)	0.547 (13.9)	0.472 (12)	0.335 (8.5)	0.118 (3)	0.118 (3)	0.547 (13.9)	0.472 (12)
3/8 (10)	0.394 (10)	8-32 UNC	M14x1.25	0.551 (14)	0.728 (18.5)	0.630 (16)	0.484 (12.3)	0.197 (5)	0.157 (4)	0.772 (19.6)	0.669 (17)
5/8 (16)	0.472 (12)	10-32 UNF	M22x1.5	0.866 (22)	1.091 (27.7)	0.945 (24)	0.787 (20)	0.236 (6)	0.197 (5)	1.228 (31.2)	1.063 (27)

Insert mount cavity

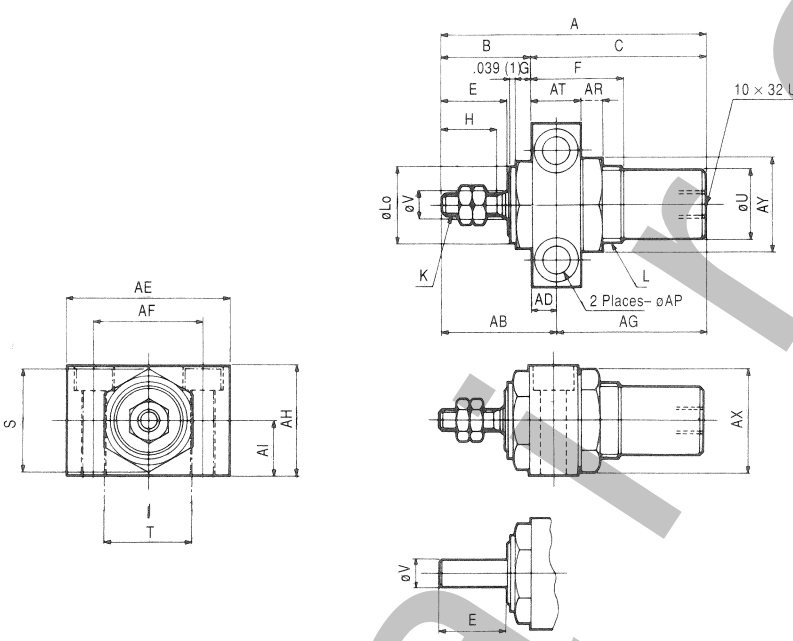


Bore in. (nom.) (mm actual)	Code – in. (mm)									
	BA			BB			BC	BD	BE	BF[NOTE 2]
	1/4	3/8	1/2	1/4	3/8	1/2				
1/4 (6)	0.819 (20.8)	0.945 (24)	1.15 (29.1)	0.512 (13)	0.591 (15)	0.591 (15)	0.079 (2)	0.354 (9)	0.157 (4)	0.394 (10)
3/8 (10)	0.878 (22.3)	1.00 (25.5)	1.20 (30.6)	0.591 (15)	0.709 (18)	0.709 (18)	0.079 (2)	0.500 (12.7)	0.157 (4)	0.551 (14)
5/8 (16)	0.937 (23.8)	1.06 (27)	1.24 (31.6)	0.669 (17)	0.787 (20)	0.787 (20)	0.098 (2.5)	0.803 (20.4)	0.157 (4)	0.866 (22)

NOTE 1: $^{0}_{-0.002}$ ($^{0}_{-0.05}$)

NOTE 2: $^{+0.006}_{+0.002}$ ($^{+0.15}_{+0.05}$)

Foot mount



Bore in. (nom.) (mm actual)	Code – in. (mm)												
	A			B	C			E	F			G	H
	1/4	3/8	1/2		1/4	3/8	1/2		5	10	15		
1/4 (6)	1.276 (32.4)	1.402 (35.6)	1.602 (40.7)	0.512 (13)	0.764 (19.4)	0.890 (22.6)	1.091 (27.7)	0.354 (9)	0.453 (11.5)	0.512 (13)	0.512 (13)	0.098 (2.5)	0.276 (7)
3/8 (10)	1.472 (37.4)	1.598 (40.6)	1.799 (45.7)	0.650 (16.5)	0.823 (20.9)	0.949 (24.1)	1.150 (29.2)	0.472 (12)	0.531 (13.5)	0.650 (16.5)	0.650 (16.5)	0.118 (3)	0.394 (10)
5/8 (16)	1.650 (41.9)	1.776 (45.1)	1.957 (49.7)	0.768 (19.5)	0.882 (22.4)	1.008 (25.6)	1.189 (30.2)	0.551 (14)	0.610 (15.5)	0.709 (18)	0.709 (18)	0.157 (4)	0.472 (12)

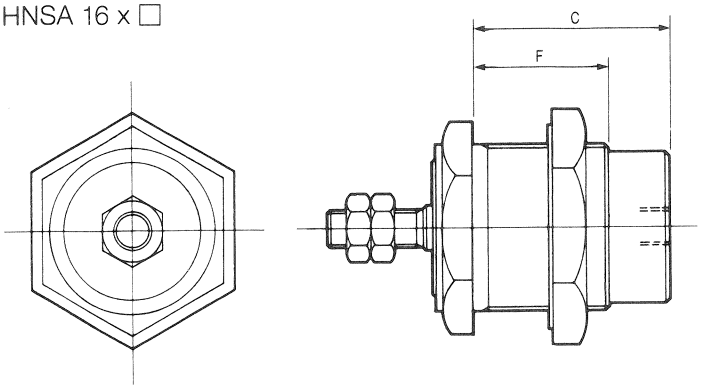
Bore in. (nom.) (mm actual)	Code – in. (mm)										
	I	J	K	L	Lo[NOTE 1]	S	T	U	V	AB	AD
1/4 (6)	0.217 (5.5)	0.071 (1.8)	4-40 UNC	M10x1	0.394 (10)	0.547 (13.9)	0.472 (12)	0.335 (8.5)	0.118 (3)	0.689 (17.5)	0.177 (4.5)
3/8 (10)	0.276 (7)	0.095 (2.4)	8-32 UNC	M14x1.25	0.551 (14)	0.728 (18.5)	0.630 (16)	0.484 (12.3)	0.197 (5)	0.827 (21)	0.177 (4.5)
5/8 (16)	0.315 (8)	0.126 (3.2)	10-32 UNF	M22x1.5	0.866 (22)	1.091 (27.7)	0.945 (24)	0.787 (20)	0.236 (6)	1.004 (25.5)	0.236 (6)

Bore in. (nom.) (mm actual)	Code – in. (mm)							
	AE	AF	AG			AH	AI	AP thru hole x c'bore x depth
			1/4	3/8	1/2			
1/4 (6)	0.866 (22)	0.551 (14)	0.453 (11.5)	0.728 (18.5)	1.004 (25.5)	0.551 (14)	0.276 (7)	0.134 (3.4) x 0.244 (6.2) x 0.130 (3.3)
3/8 (10)	1.260 (32)	0.787 (20)	0.531 (13.5)	0.787 (20)	1.063 (27)	0.787 (20)	0.394 (10)	0.177 (4.5) x 0.307 (7.8) x 0.173 (4.4)
5/8 (16)	1.654 (42)	1.181 (30)	0.551 (14)	0.787 (20)	1.043 (26.5)	1.260 (32)	0.630 (16)	0.217 (5.5) x 0.374 (9.5) x 0.213 (5.4)

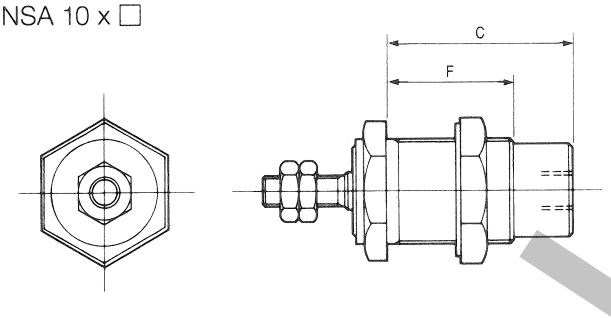
Bore in. (nom.) (mm actual)	Code – in. (mm)			
	AR	AT	AX	AY
1/4 (6)	0.118 (3)	0.354 (9)	0.547 (13.9)	0.472 (12)
3/8 (10)	0.157 (4)	0.354 (9)	0.772 (19.6)	0.669 (17)
5/8 (16)	0.197 (5)	0.472 (12)	1.228 (31.2)	1.063 (27)

NOTE 1: $^{0}_{-0.002}$ ($^{0}_{-0.05}$)

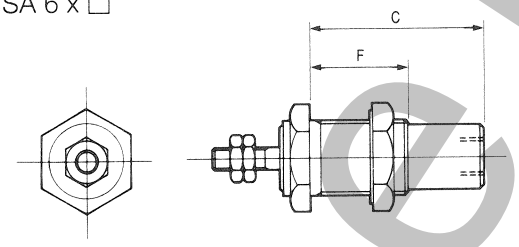
HNSA 16 x □



HNSA 10 x □



HNSA 6 x □



Bore size in. (nom.) (mm actual)	Stroke – in. (mm)					
	C			F		
	1/4	3/8	1/2	1/4	3/8	1/2
1/4 (6)	.764 (19.4)	.890 (22.6)	1.091 (27.7)	.453 (11.5)	.512 (13)	.512 (13)
3/8 (10)	.823 (20.9)	.949 (24.1)	1.150 (29.2)	.531 (13.5)	.650 (16.5)	.650 (16.5)
5/8 (16)	.882 (22.4)	1.008 (25.6)	1.189 (30.2)	.610(15.5)	.709 (18)	.709 (18)