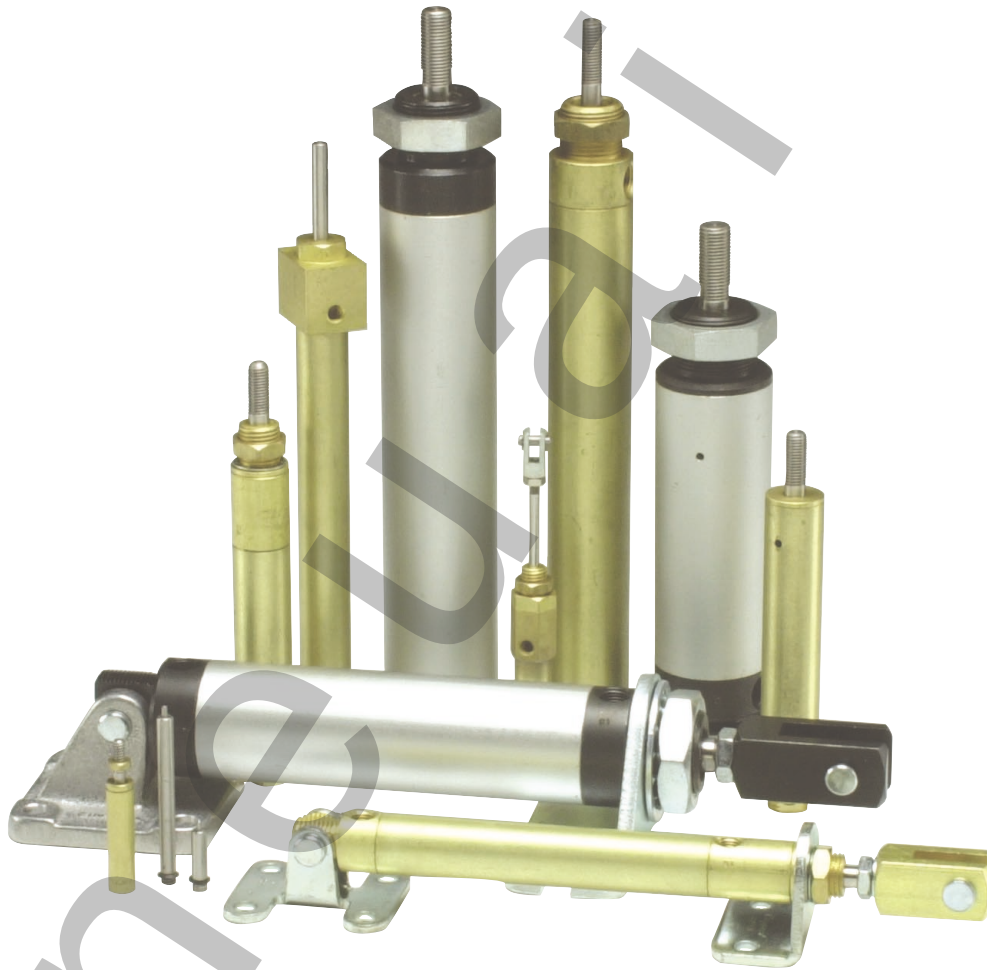




MINIMATIC® CYLINDER



Clippard offers more types of miniature pneumatic cylinders for the designer's convenience, including: spring return, spring extend, air retract, double-acting and double rod models. From sub-miniature ($5/32$ " bore) to heavy duty ($1\ 1/8$ " bore), the extensive Clippard line provides a wide selection of bore sizes to suit any application requirement. An even wider range of strokes are available in the complete Clippard line of miniature cylinders, in stroke sizes ranging from $1/4$ " to 20".

FEATURES

- Buna-N "U"-cup rod seals for smooth leakproof operation
- Buna-N "U"-cup piston seals for full power, low friction and trouble-free performance
- Rods are threaded and bonded to piston
- The original miniature pneumatic cylinder
- 100% tested
- Pneumatic & hydraulic performance
- Sturdy, compact and long life
- Temperature range: 30° F to 180° F

The Clippard line offers numerous choices in the mounting of Clippard Minimatic® cylinders. The cylinders are provided in several types of mounting styles including plain end, stud mount, block mount, and clevis mount (male and female). In addition, a complementary line of mounting hardware, including brackets, male and female clevises and Clippard's Minimatic® super structures are available for almost any application.



Clippard cylinders are of original design, pioneered by the world's most experienced manufacturer of miniature pneumatic equipment. They are of the finest OEM quality, fully tested for outstanding performance and long life. Special steps in manufacture insure the high quality of Clippard cylinders. These include: ground, polished and roller burnished rods to protect seals and provide smooth action; tube ID precision through "ballizing" with carbide precision balls; high precision screw machine parts manufacture, based on concentric design that lends itself to close tolerance machining. The reputation Clippard has earned in the field is a result of our policy to test every cylinder (100%) we manufacture.

Every Cylinder is 100% tested

Cylinder Tubes:

Machined from heavy wall, cold-drawn brass tubing; ballized internally for precise size, fine finish and low seal friction; 1 1/8" bore: hard coat aluminum

Piston Rods:

Except where otherwise specified, all rods are stainless steel, ground, polished and roller burnished for long seal life, low friction and smooth action

Pistons:

Brass in all models except aluminum in 7/8" bore single acting series

Springs:

Stainless steel for long life and resistance to corrosion

Seals:

Buna N compound, impervious to a wide range of hydraulic fluids, liquids, and gases; rod seals replaceable on models where applicable; piston seals replaceable only on threaded construction models

Bumpers:

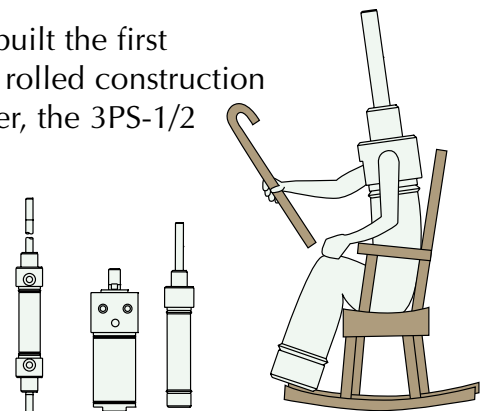
Resilient bumpers of Buna-N or polyurethane absorb shock, increase life and reduce noise level

Finish:

All external brass parts are "bright-dipped" to resist corrosion and preserve finished appearance; 1 1/8" bore: hard coated aluminum with black oxide steel heads

Did you know...

Clippard built the first miniature rolled construction air cylinder, the 3PS-1/2 in 1949.





MINIMATIC® CYLINDER

Minimatic® Cylinders	Pg.	Engineering Data			Design Features						Remarks
		Medium	Force Factor	Rec. Max. Working Pres.	Piston Seals	Rod Seals	Rod Dia.	Rod End	Ports Tapped	Construction	
5/32" Bore Spring Return	85	Air	.02	150 psi	U-Cup		.062"	Plain	10-32 3-56	Rolled or Welded	45° Tapered rod end on SM-2 Spring force extend- 2 oz. Spring force compressed- 5 oz.
1/4" Bore 6.35 mm Spring Return	85	Air	.05	125 psi	U-Cup		.135"	Thd.	10-32	Rolled	Spring force extend- 6 oz. Spring force compressed-10 oz.
3/8" Bore Spring Return	86	Air	.10	125 psi	U-Cup		3/16"	Plain	10-32	RF Silver Soldered	Model 3PS-1/2 is rolled construction with non-rotating thd. brass rod, others; non-thd. stainless steel Spring force extend- 12 oz. Spring force compressed- 30 oz.
3/8" Bore Double Acting	87	Air & Hyd.	.10	125 psi -Air 500 psi -Hyd.*	U-Cup	Vee Ring	1/8"	Plain	10-32	RF Silver Soldered	
3/8" Bore Spring Extend Air Retract	86	Air	.10	125 psi	U-Cup		1/8"	Thd.	10-32	RF Silver Soldered	Min. of 14 psi to retract Spring force extend- 12 oz. Spring force compressed- 30 oz.
9/16" Bore Spring Return	88	Air	.22	125 psi	U-Cup		3/16"	Plain	10-32	RF Silver Soldered	9PS-3/4 & 9SS-3/4 have non- rotating, thd., stainless steel rods, others; non-thd., stainless steel Spring force extend- 1.6 oz. Spring force compressed- 3.7 oz.
9/16" Bore Double Acting	89	Air & Hyd.	.22	125 psi -Air 500 psi -Hyd.*	U-Cup	Vee Ring	3/16"	Plain	10-32	RF Silver Soldered	
9/16" Bore Spring Extend Air Retract	88	Air	.22	250 psi	U-Cup	Vee Ring	1/4"	Thd.	10-32	Threaded	Min. of 19 psi to retract Spring force extend- 2 lb. Spring force compressed- 4 lb.
9/16" Bore Heavy Duty Spring Return	90	Air	.20	250 psi	U-Cup		1/4"	Thd.	1/16" NPT	Threaded	Spring force extend- 2 lb. Spring force compressed- 4 lb.
9/16" Bore Heavy Duty Double Acting	91 **	Air & Hyd.	.20	250 psi -Air 1000 psi -Hyd.*	T- Ring	Vee Ring	1/4"	Thd.	1/16" NPT	Threaded	
7/8" Bore Spring Return	92	Air	.60	250 psi	U-Cup		1/4"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing Spring force extend- 7 lb. Spring force compressed- 12 lb.
7/8" Bore Double Acting	93 **	Air & Hyd.	.60	250 psi -Air 1000 psi -Hyd.*	T- Ring	Vee Ring	1/4"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing
7/8" Bore Spring Extend Air Retract	92	Air	.60	250 psi	U-Cup	Vee Ring	1/4"	Thd.	1/8" NPT	Threaded	Min. of 23 psi to retract Spring force extend- 7 lb. Spring force compressed- 12 lb.
1-1/8" Bore Double Acting	95 **	Air	1.0	250 psi	U-Cup	Vee Ring	3/8"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing Low friction - 2 psi to operate
1-1/8" Bore Spring Return	94	Air	1.0	250 psi	U-Cup		3/8"	Thd.	1/8" NPT	Threaded	Spring force extend- 8 lb. Spring force compressed- 12 lb.

Quick Cylinder Computations:

Cylinder Force = Force Factor x Pressure

Displacement = Force Factor x Stroke

(Force factor given in table above equals effective piston area)

**NOTE: Double rods also available in these models.

Temperature: 30° F to +230° F

*Consult factory for hydraulic applications

SUB-MINIATURE MINIMATIC® CYLINDER

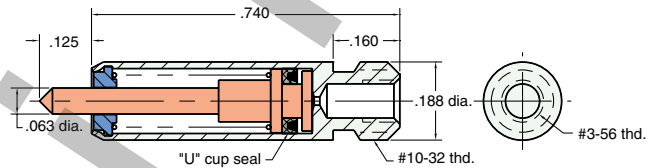


SM-2

Single Acting

Bore: 5/32"
Mount: Rear Thread
Type: Spring Return

Available Stroke Lengths: 1/4
Materials: Stainless steel body, piston & rod, Buna-N U-cup, Beryllium copper spring



SM-3-□

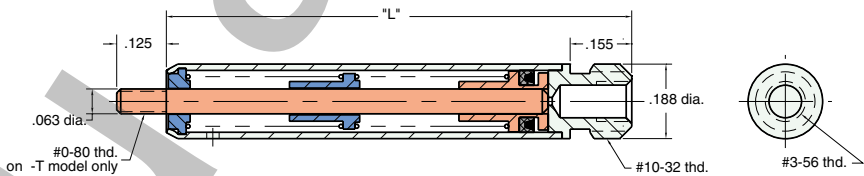
Single Acting

Bore: 5/32"
Mount: Rear Thread
Type: Spring Return

Model	SM-3-2	SM-3-3	SM-3-4
Stroke	1/2	3/4	1
Length "L"	1.171	1.593	2

Materials: Stainless steel tube and rod, brass piston, Buna-N U-cup

To order: Add stroke length to the end of the part number



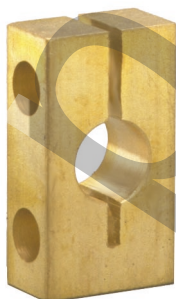
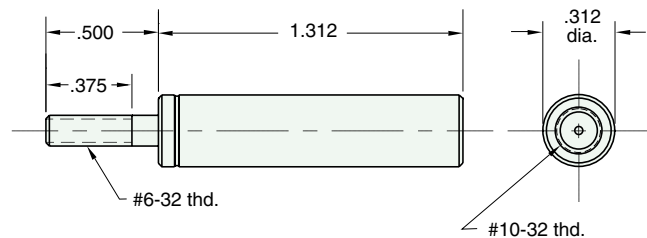
SM-6

Single Acting

Bore: 1/4"
Mount: Body*
Type: Spring Return

Available Stroke Lengths: 3/8
Materials: Brass body, Buna-N U-cup, stainless steel piston & rod

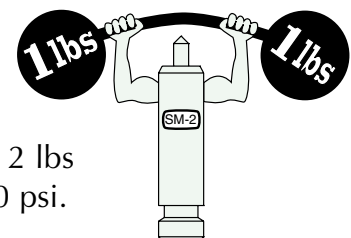
*Super structure recommended



Super structure 12327 pictured here is recommended for mounting the SM-6 cylinder. For more information see page 101.

Did you know...

The tiny SM-2 cylinder gives 2 lbs of force at 100 psi.



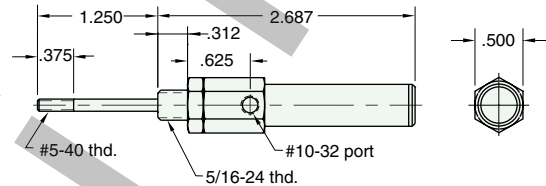


3/8" BORE BRASS MINIMATIC® CYLINDER

3SS-AR-1/2

Mount: Stud
Type: Single Acting
Spring Extended

Available Stroke Lengths: 1/2



3PS-1/2

Mount: Body*
Type: Single Acting
Spring Return

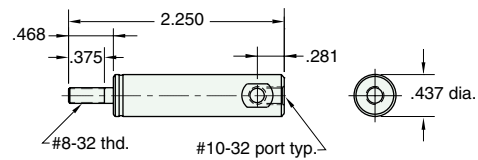
Available Stroke Lengths: 1/2

Ports: End or Side

Brass Rod - non-rotating

*Super Structure recommended

First Cylinder - 1949



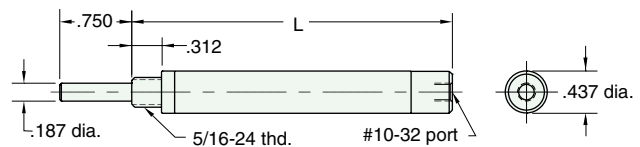
3SS-□

Mount: Stud
Type: Single Acting
Spring Return

Stroke Length "L"	1/2	1	2	3
	2.093	3.343	5.218	7.093

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



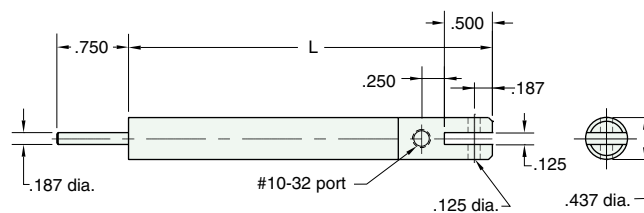
3CS-□

Mount: Clevis
Type: Single Acting
Spring Return

Stroke Length "L"	1/2	1	2	3
	2.468	3.406	5.281	7.156

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



3/8" BORE BRASS MINIMATIC® CYLINDER

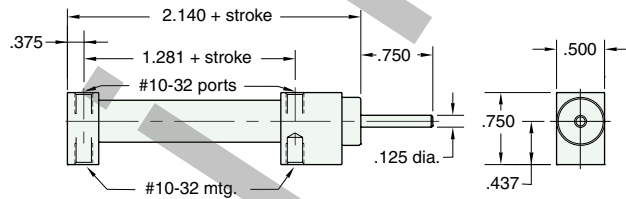


3BDS-□

Mount: Block **Available Stroke Lengths:** 1, 2, 3, 4, 5, 6
Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread

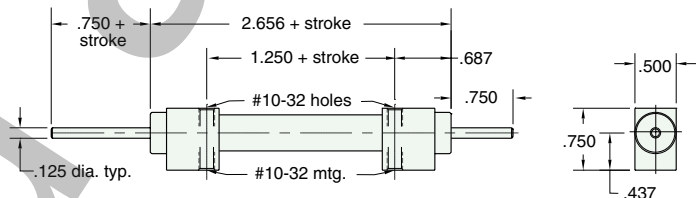


3BDD-□

Mount: Block **Available Stroke Lengths:** 1, 2, 3, 4
Type: Double Acting Double Rod

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread

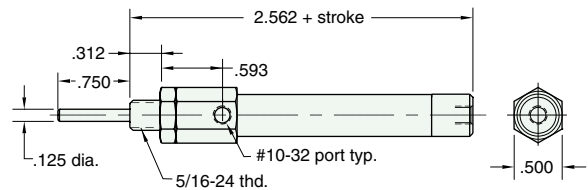


3SD-□

Mount: Stud **Available Stroke Lengths:** 1, 2, 3, 4
Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread

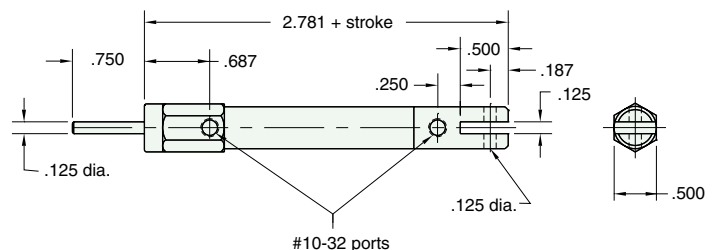


3CD-□

Mount: Clevis **Available Stroke Lengths:** 1, 2, 3, 4
Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread





9/16" BORE BRASS MINIMATIC® CYLINDER

9PS-3/4

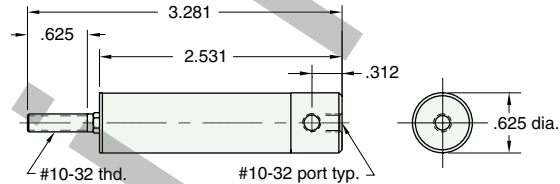
Mount: Body*

Type: Single Acting
Spring Return

Available Stroke Lengths: 3/4

Non-Rotating Shaft

*Super Structure recommended



9BS-□

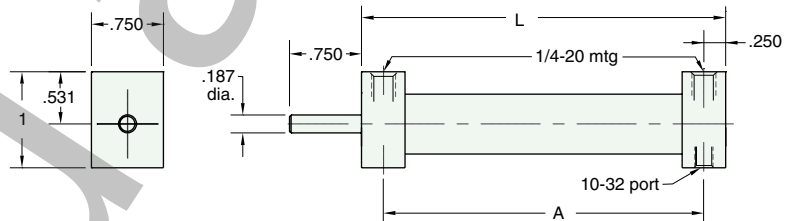
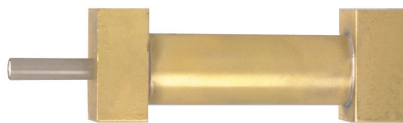
Mount: Block

Type: Single Acting
Spring Return

Stroke Length "L"	3/4	1 1/2	2 1/4	3
"A"	2.750	4.218	5.593	6.937
	2.312	3.750	5.125	6.500

To order: Add stroke
length to the end of
the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



9SS-□

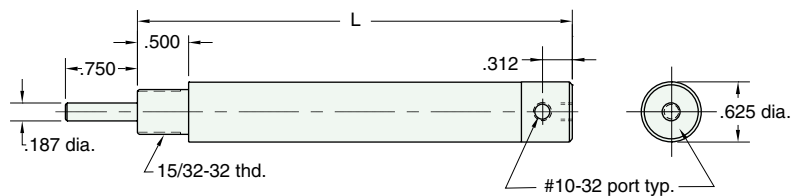
Mount: Stud

Type: Single Acting
Spring Return

Stroke Length "L"	3/4	1 1/2	2 1/4	3
	3.031	4.531	5.875	7.250

To order: Add stroke
length to the end of
the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



Note: On 3/4" stroke rod is hexagonal stainless steel (non-rotating) and threaded 10-32 x 5/8

9CS-□

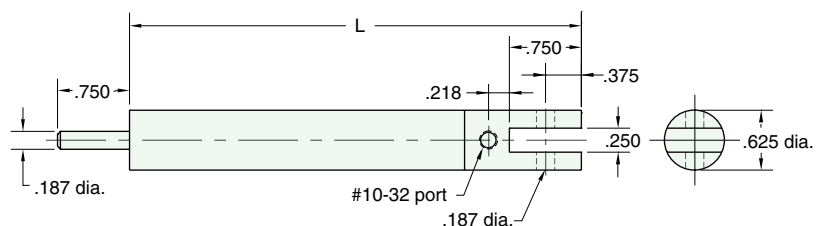
Mount: Clevis

Type: Single Acting
Spring Return

Stroke Length "L"	3/4	1 1/2	2 1/4	3
	3.343	4.687	6.062	7.406

To order: Add stroke
length to the end of
the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



9/16" BORE BRASS MINIMATIC® CYLINDER



9BDS-□

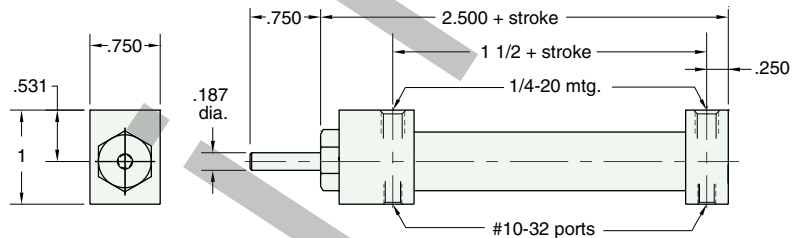
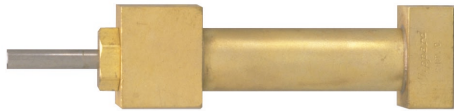
Mount: Block

Available Stroke Lengths: 1, 2, 3, 4, 5, 6

Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



9BDD-□

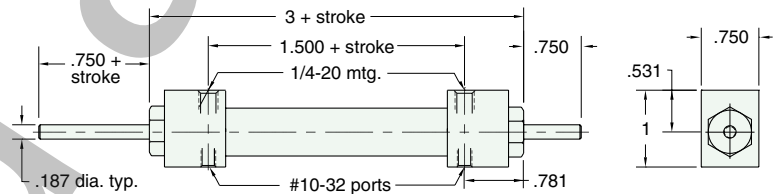
Mount: Block

Available Stroke Lengths: 1, 2, 3, 4, 5, 6

Type: Double Acting
Double Rod

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



9SD-□

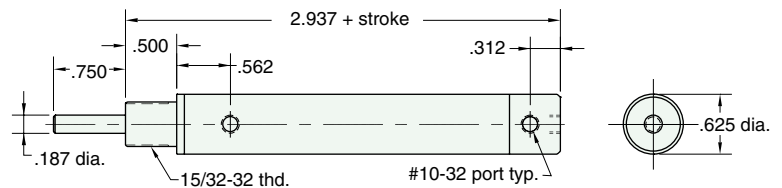
Mount: Stud

Available Stroke Lengths: 1, 2, 3, 4, 5, 6

Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



9CD-□

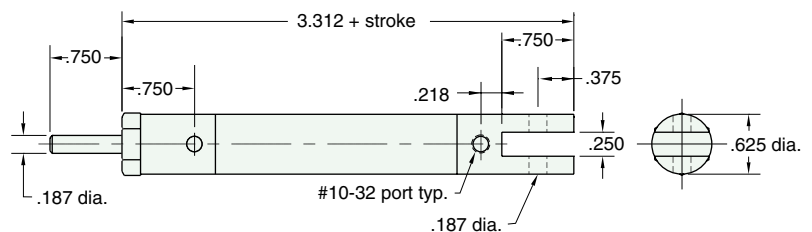
Mount: Clevis

Available Stroke Lengths: 1, 2, 3, 4, 5, 6

Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



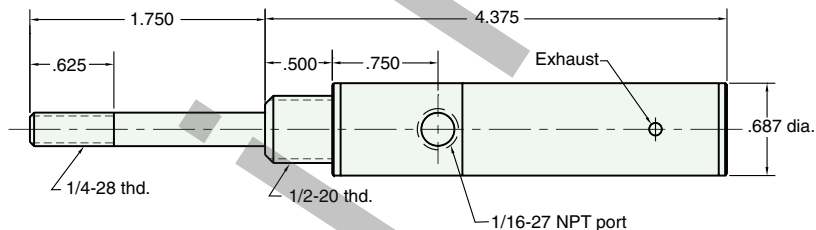


9/16" BORE BRASS HEAVY DUTY CYLINDER

9SS-AR-1

Mount: Stud
Type: Single Acting
Spring Extended

Available Stroke Lengths: 1

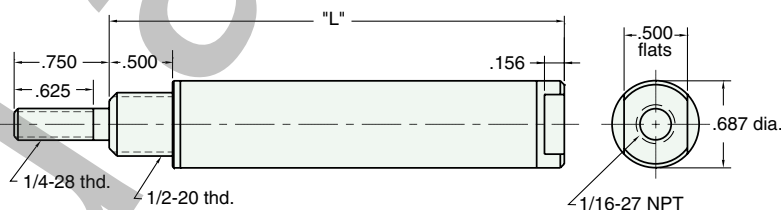


H9S-□S

Mount: Stud
Type: Single Acting
Spring Return

Stroke	1	2	3
Length "L"	3.593	5.250	6.906

To order: Indicate stroke in box □

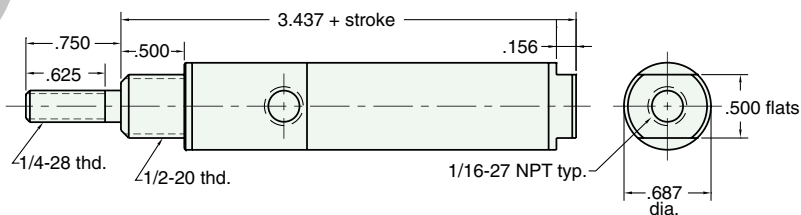


H9S-□D

Mount: Stud
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 4, 5, 6

To order: Indicate stroke in box □

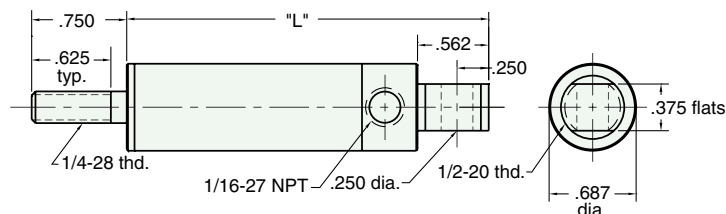


H9C-□S

Mount: Clevis
Type: Single Acting
Spring Return

Stroke	1	2	3
Length "L"	3.875	5.531	7.187

To order: Indicate stroke in box □



9/16" BORE BRASS HEAVY DUTY CYLINDER

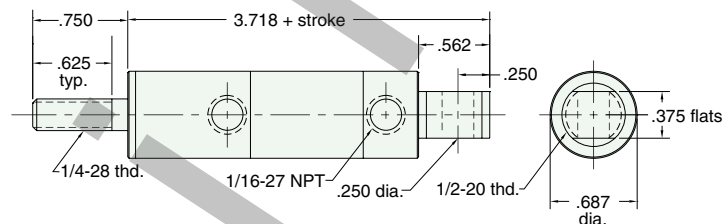


Consult factory for hydraulic applications

Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

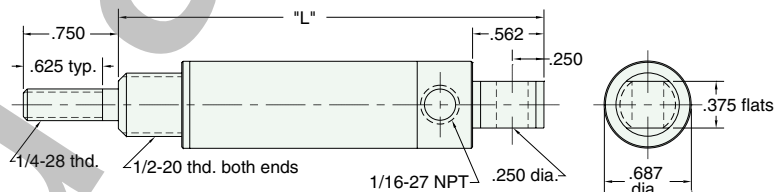
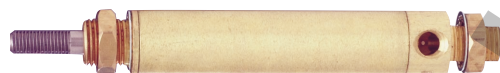
H9C-□D

Mount: Clevis
Type: Double Acting

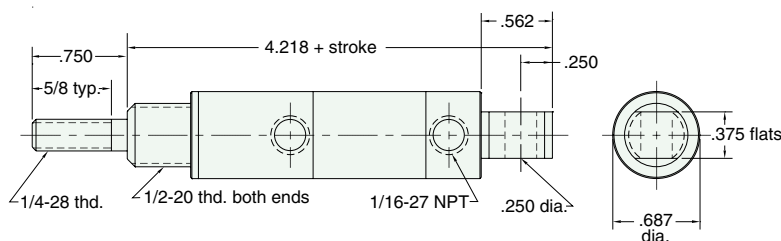
Available Stroke Lengths: 1, 2, 3, 4, 5, 6**To order:** Indicate stroke in box □**H9U-□S**

Mount: Universal
Type: Single Acting Spring Return

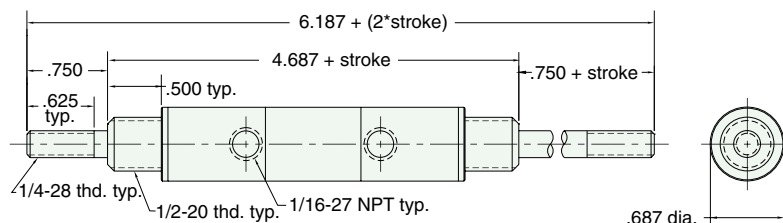
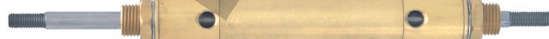
Stroke Length "L"	1	2	3
	4.375	6.031	7.687

To order: Indicate stroke in box □**H9U-□D**

Mount: Universal
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 4, 5, 6**To order:** Indicate stroke in box □**H9D-□D**

Mount: Stud
Type: Double Acting Double Rod

Available Stroke Lengths: 1, 2, 3, 4, 5, 6**To order:** Indicate stroke in box □



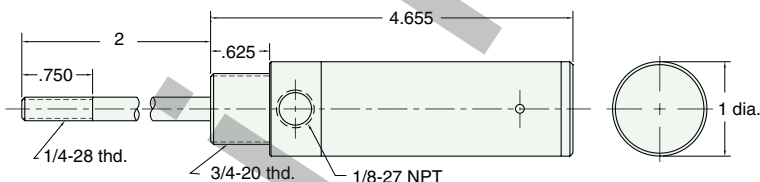
7/8" BORE BRASS HEAVY DUTY CYLINDER

Consult factory for hydraulic applications

7SS-AR-1

Mount: Stud
Type: Single Acting
Spring Extended

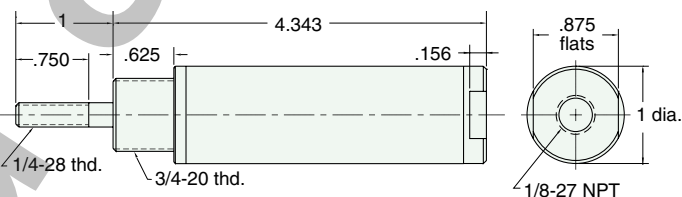
Available Stroke Lengths: 1



7SS-1

Mount: Stud
Type: Single Acting
Spring Return

Available Stroke Lengths: 1

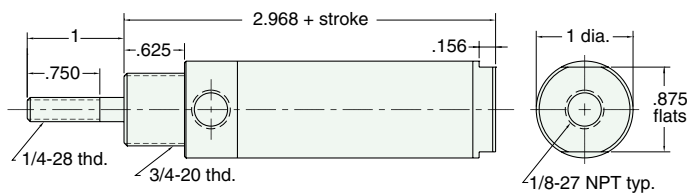


7SD-□

Mount: Stud
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 5, 7, 9

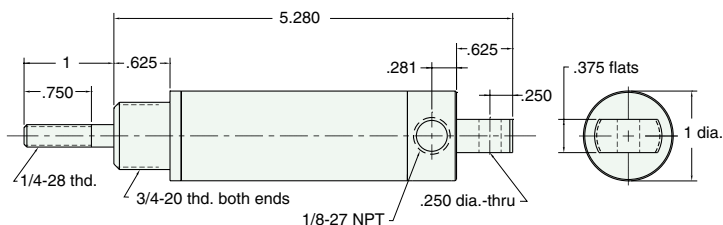
To order: Add stroke length to the end of the part number



7S-1

Mount: Universal
Type: Single Acting
Spring Return

Available Stroke Lengths: 1



7/8" BORE BRASS HEAVY DUTY CYLINDER



Consult factory for hydraulic applications

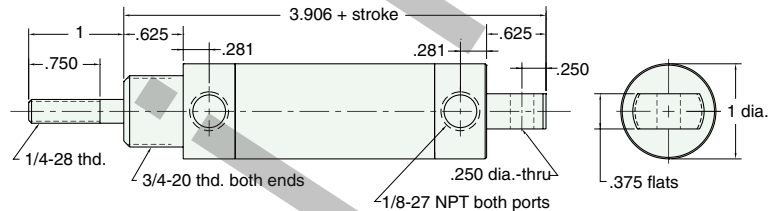
Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

7D-□

Mount: Universal
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 5, 7, 9

To order: Add stroke length to the end of the part number

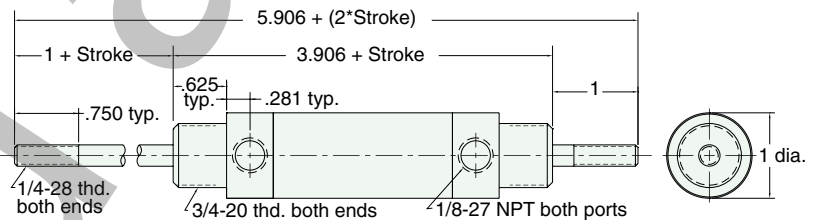


7DD-□

Mount: Universal
Type: Double Acting
Double Rod

Available Stroke Lengths: 1, 2, 3, 5, 7, 9

To order: Add stroke length to the end of the part number



Did you know...

Leonard Clippard made the prototype cylinder piston seals by punching leather disks from his kids old shoe tongues.

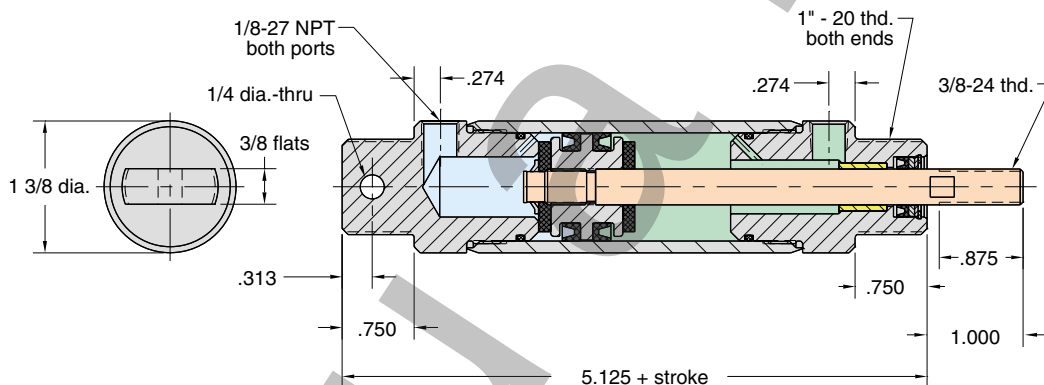




1 1/8" BORE HEAVY DUTY ALUMINUM CYLINDER

Features

- Very low breakaway force - allows for a consistent stroke speed (no sudden jumps)
- Hard-anodized aluminum body - attractive, yet durable
- Force factor of 1 - 100 psig input provides 100 lbs. output force
- Available in many stroke lengths (even up to 8 ft. in special quantities!)
- Brass piston, stainless steel rod

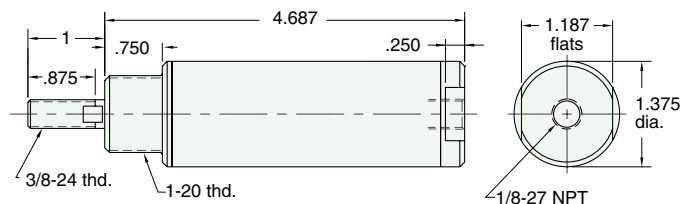


18SS-1

Mount: Stud

Available Stroke Lengths: 1

Type: Single Acting
Spring Return

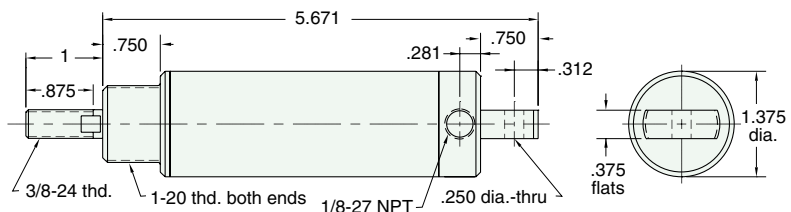


18S-1

Mount: Universal

Available Stroke Lengths: 1

Type: Single Acting
Spring Return



1 1/8" BORE HEAVY DUTY ALUMINUM CYLINDER

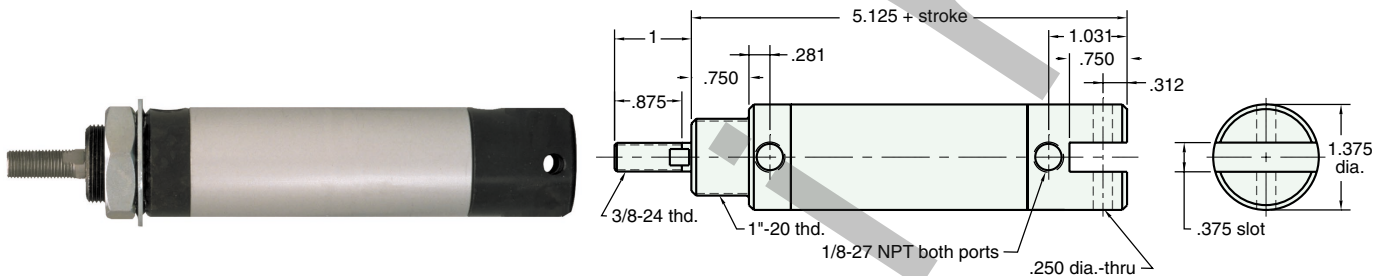


18CSD-□

Mount: Clevis
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 4, 5, 6,
7, 8, 9, 10, 12, 14, 16, 18, 20

To order: Add stroke length
to the end of the part number

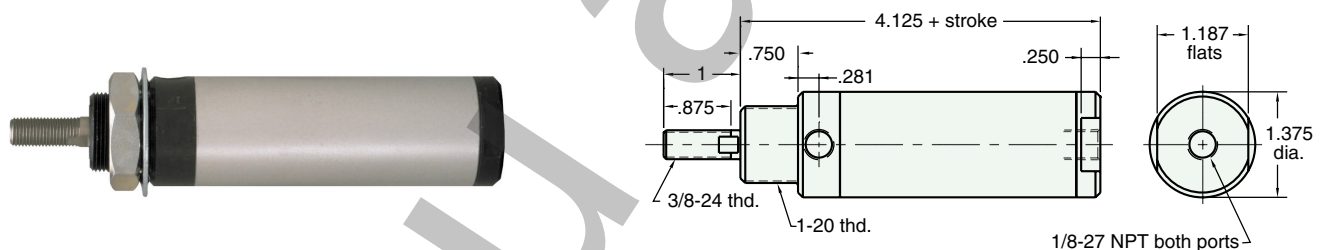


18SD-□

Mount: Stud
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 4, 5, 6, 7,
8, 9, 10, 12, 14, 16, 18, 20

To order: Add stroke length
to the end of the part number

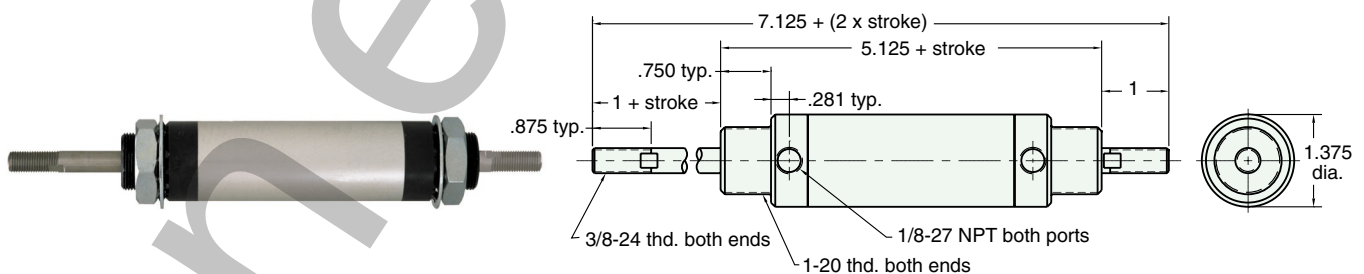


18DD-□

Mount: Stud
Type: Double Acting
Double Rod

Available Stroke Lengths: 1, 2, 3, 6

To order: Add stroke length
to the end of the part number

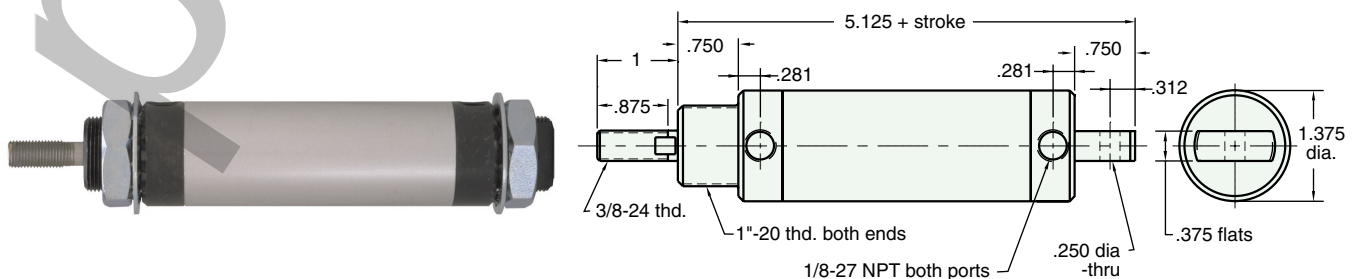


18D-□

Mount: Universal
Type: Double Acting

Available Stroke Lengths: 1, 2, 3, 4, 5, 6, 7, 8, 9,
10, 12, 14, 16, 18, 20

To order: Add stroke length
to the end of the part number

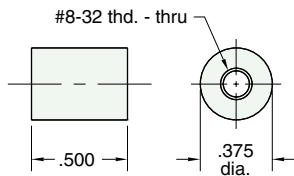




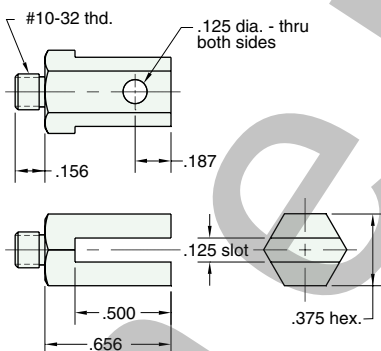
3/8" BORE MOUNTING BRACKETS

11767

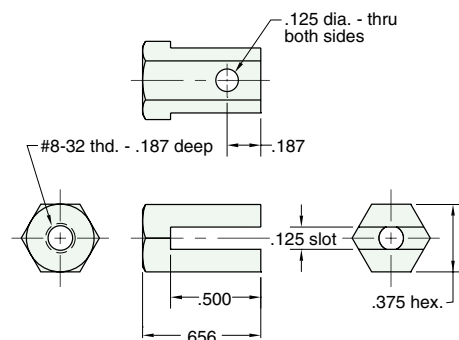
Ceramic Insulator
Use with cylinder having 8-32 threaded shaft to insulate cylinder from heat or electricity


11996

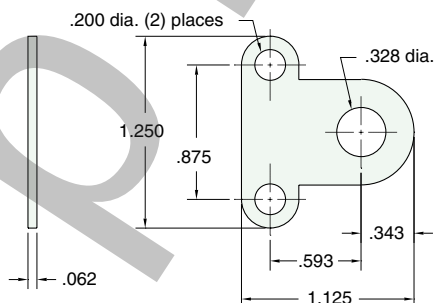
Male Clevis
Mounts in rear of cylinder tapped 10-32


11997

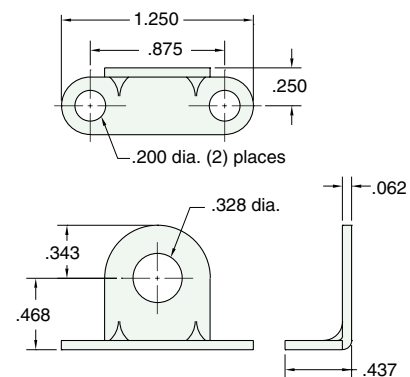
Female Clevis
Use with cylinder having 8-32 threaded shaft


11917-2

Mounting Bracket (flat)


11918-2

Mounting Bracket (angled)



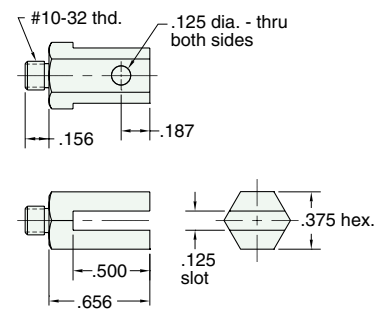
9/16" BORE MOUNTING BRACKETS



11996

Male Clevis

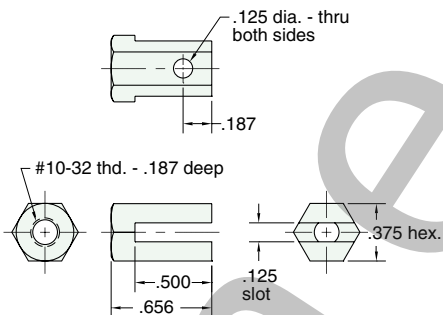
Mounts in rear of cylinder tapped 10-32



15009

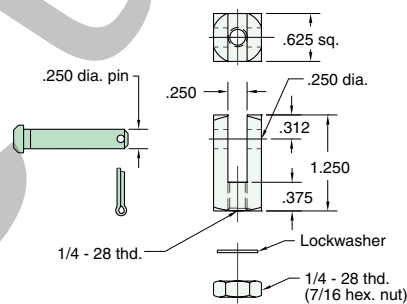
Female Clevis

For use with cylinders having 10-32 threaded shaft



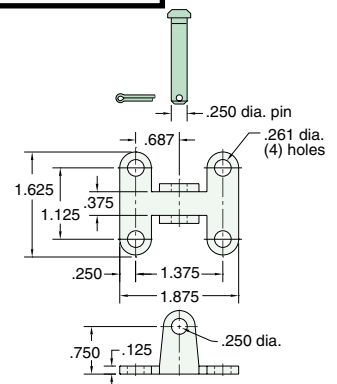
15015

Rod Clevis Assembly



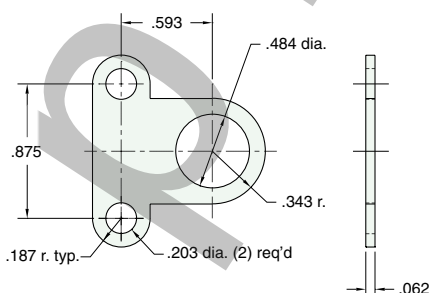
15019

Clevis Mounting Bracket



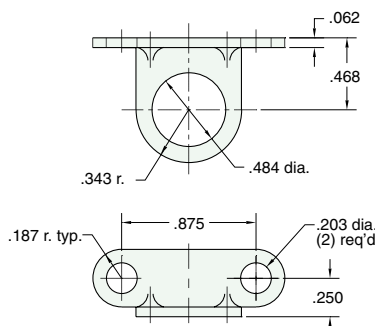
11917-1

Mounting Bracket (flat)



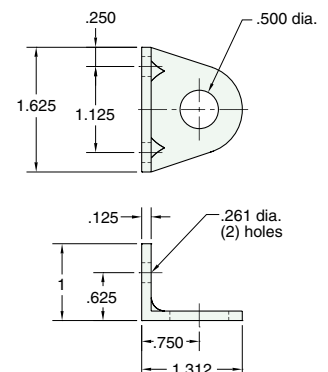
11918-1

Mounting Bracket (angled)



15018-2

Mounting Bracket (angled)

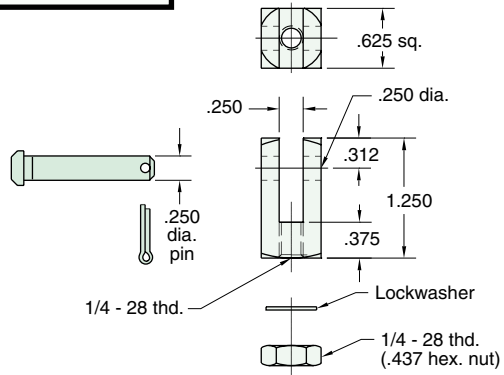




7/8" BORE MOUNTING BRACKETS

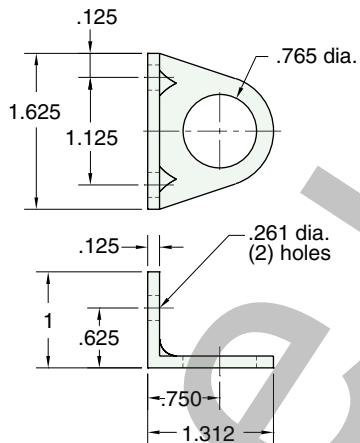
15015

Rod Clevis Assembly



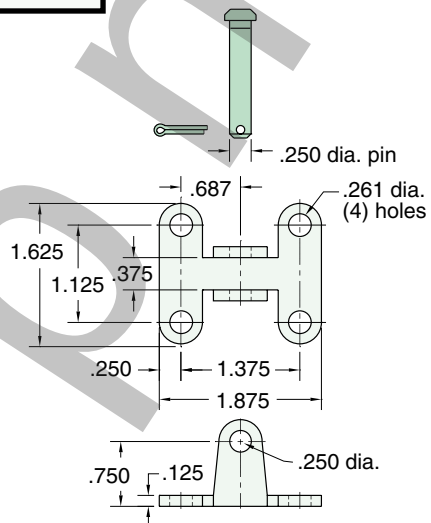
15018-1

Foot Mounting Bracket

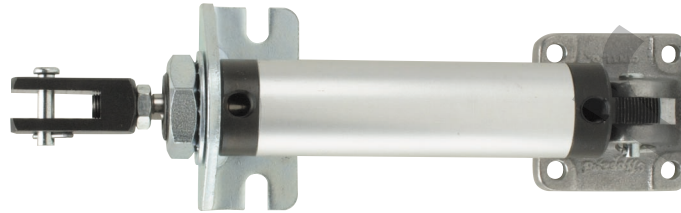


15019

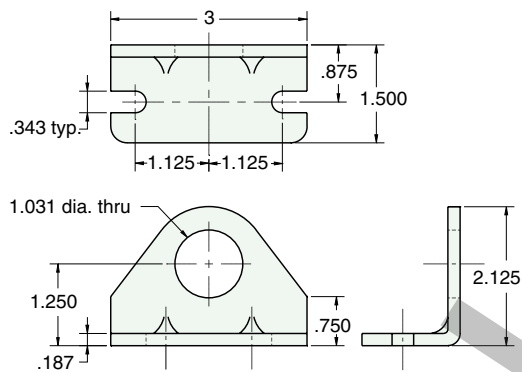
Clevis Mounting Bracket



1 1/8" BORE MOUNTING BRACKETS

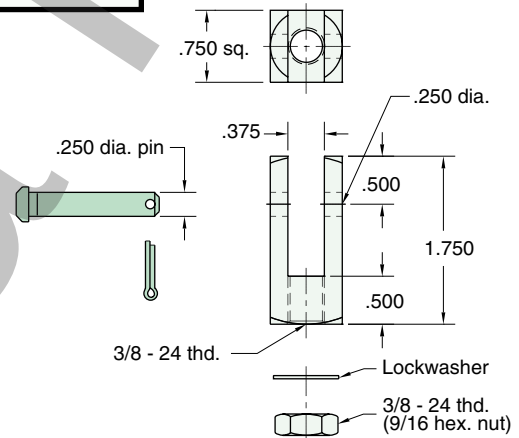


FB-2891



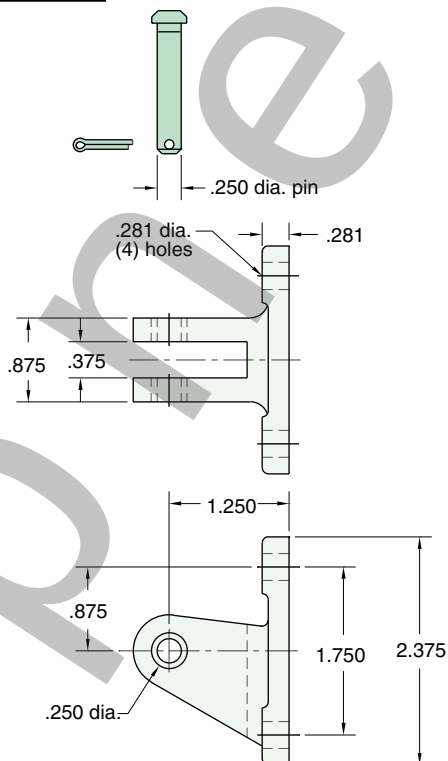
12346

Rod Clevis Assembly



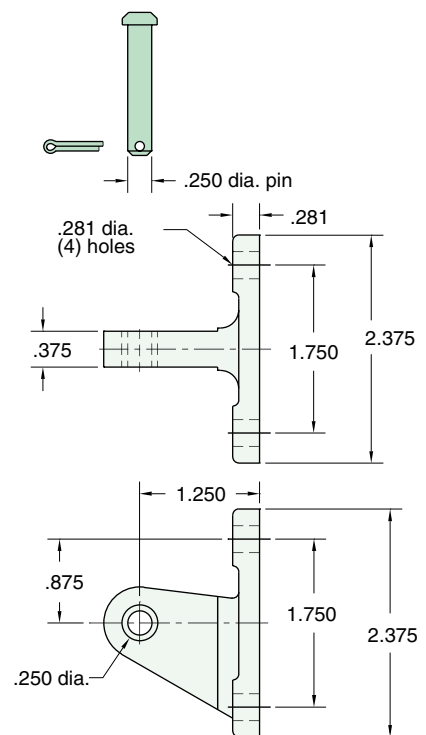
12456

Female Clevis Mounting Bracket



12458

Male Clevis Mounting Bracket



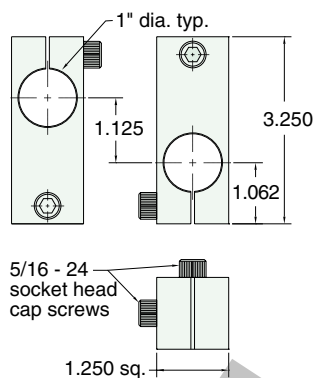


SUPER STRUCTURE

Here's a building block concept to speed construction of small equipment, fixtures, jigs and tooling. Machined steel blocks adapt to any position on the column and base. Offset extensions are provided through use of fixture and block mounting shafts of various lengths. Use of proper size brass slotted adapter permits mounting small bore cylinders or other parts. Column base is drilled for mounting. The Super Structure is extremely solid and secure, yet fully adjustable.

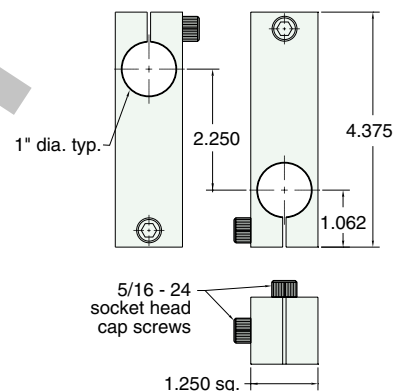
12361

Perpendicular mounting block
(black oxide finished steel)



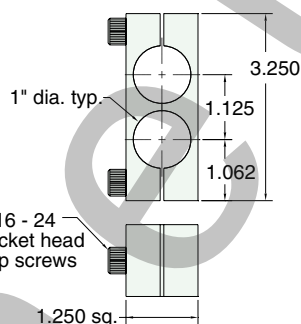
12362

Perpendicular mounting block
(black oxide finished steel)



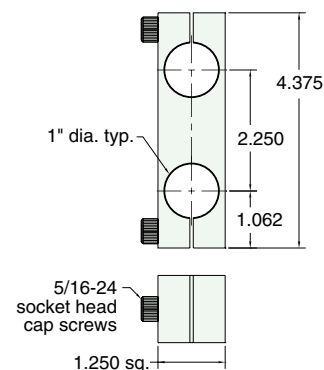
12363

Inline mounting block
(black oxide finished steel)



12364

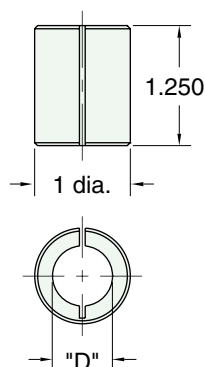
Inline mounting block
(black oxide finished steel)



12365-□

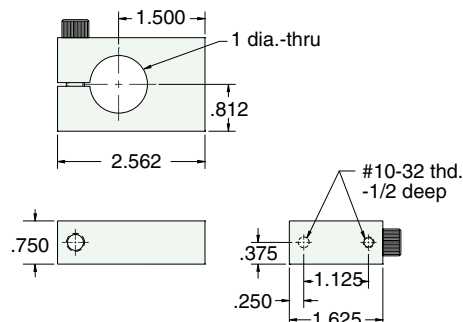
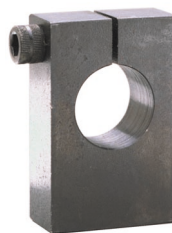
Part #	12365-1	12365-2	12365-3
"D" dia.	.437	.625	.687

Slotted adapters (brass)



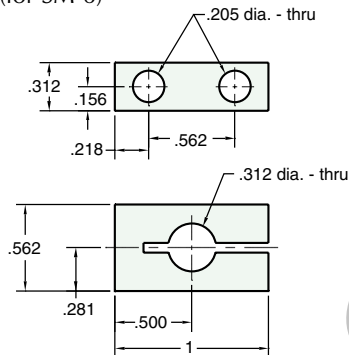
12369

Bracket mounting adapter block



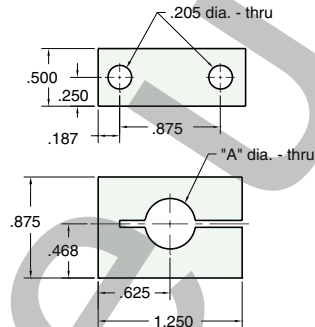
12327

Cylinder mounting squeeze block
(for SM-6)



12326-□

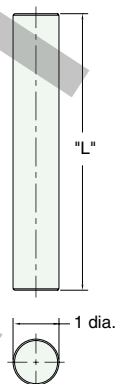
Cylinder mounting squeeze blocks
(for 3/8" & 9/16" standard bore)



Part #	"A"	
12326-1	5/8	(for 9/16 stand. bore cylinder)
12326-2	7/16	(for 3/8 stand. bore cylinder)

12366-□

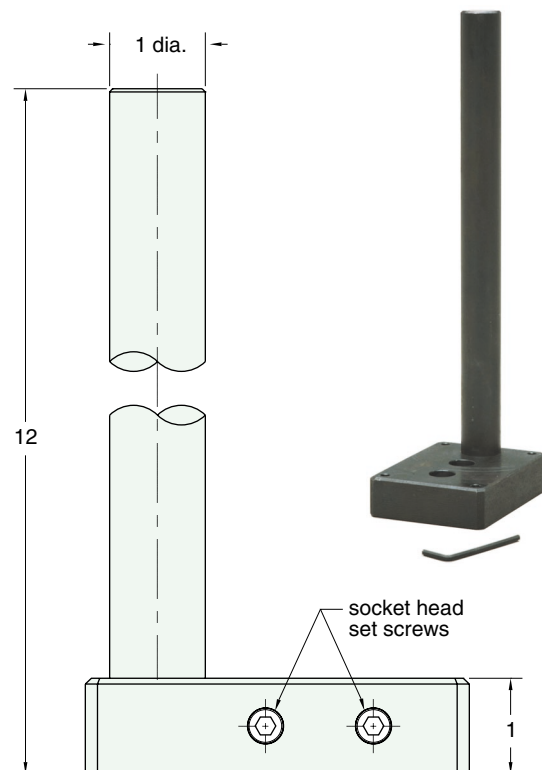
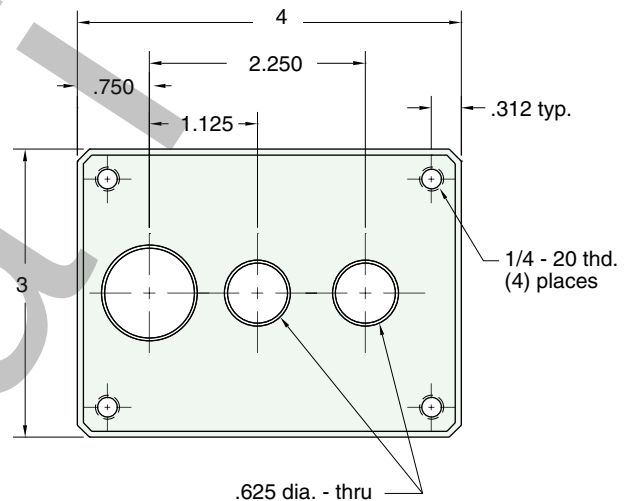
Fixture and bracket mounting shafts
(black oxide finished steel)



Part #	"L"
12366-4	4"
12366-6	6"
12366-8	8"
12366-10	10"
12366-12	12"
12366-14	14"
12366-16	16"
12366-18	18"
12366-20	20"

CMB

Column and mounting base
(black oxide finished steel)





Miniature Swing-In Automated Arbor Press

