QUICK INDEX

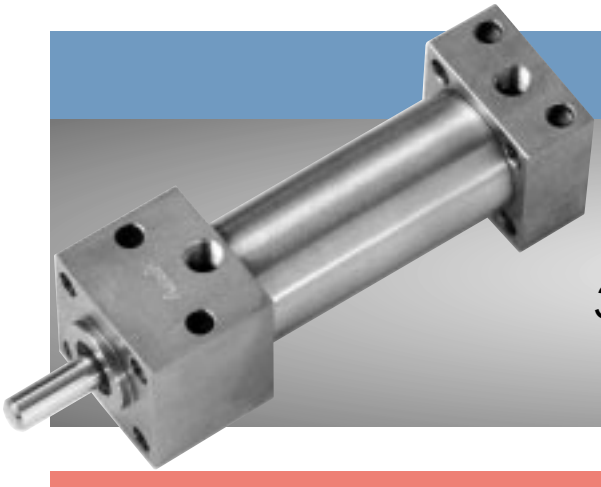
A U R O R A A I R P R O D U C T S

Series SMA Aluminum — Pages 4 thru 34

Pancake and conventional lengths 1 1/8 thru 3” bore

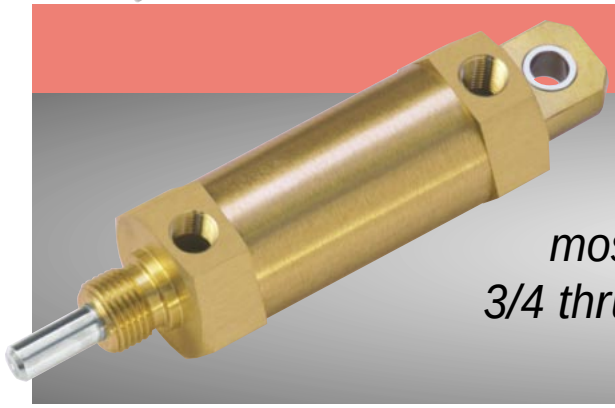
Series SMS Solid Stainless — Pages 35 thru 49

Pancake and conventional lengths for hostile environments



Series SS Solid Stainless — Pages 50 thru 61

The benchmark since ‘83 3/4 thru 2” bore



Series HB Brass — Pages 62 thru 83

For general industrial use in most environments 3/4 thru 2” bore

SMA Aluminum Cylinders

PNEUMATIC TO 200 PSI
HYDRAULIC 250 TO 400 PSI *Non shock*

1 1/8", 1 1/2", 2", 3" BORE

SPACE SAVING AND CONVENTIONAL DESIGNS

REPAIRABLE

Very high quality "Pancake" type cylinders with all of the engineering features you need to outpace the competition – generous bearing lengths, rod wipers, chromed shafts, superior seals and materials throughout.

— PLUS —

Cylinders of conventional length with longer bearings and increased distance between support points which provide exceptional service where space permits. U cup piston optional.

A GRAPH OF CYLINDER LENGTH vs QUALITY . . .

Conventional Pancake — *Too short to provide rod wipers, adequate bearing length, and quality seals. Length too short to provide end caps of sufficient strength for many applications. Piston rod wrench flats virtually unusable without special thin wrenches. Suitable for light duty pneumatic applications only.*

SMA Short Mount — *"Common sense engineered" to the shortest length possible without sacrificing areas critical to high performance. Excellent for both pneumatic and hydraulic service.*

SMA Conventional Mount — *Premium material in generous proportions yet small enough to fit.*

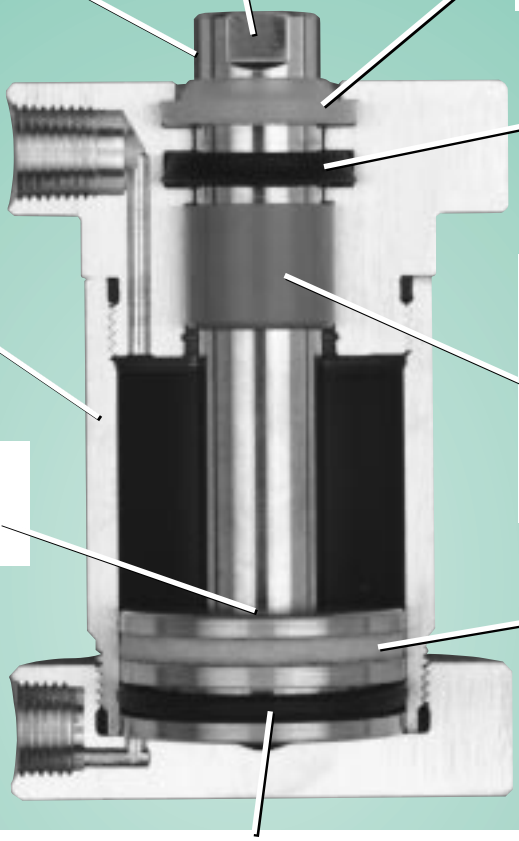
Crimped Stainless Non Repairable — *Although significantly longer, they fall short in design and materials.*

N.F.P.A. Tie Rod Cylinder — *Conventional design is too long and too costly for many applications.*

0" 1" 2" 3" 4" 5" 6"

Cylinder body length 1 1/2" Bore 0" Stroke

SMA DESIGN FEATURES



Rod extension/wrench flats are long enough to fit standard wrenches.

Piston rod is hard chrome plated type 303 stainless

Heavy duty polyurethane or viton rod wipers prevent damaging contaminants from entering the critical rod seal/rod bushing area.

Pneumatic rod seal is a "longlife" nitrile cup. Hydraulic rod seal is pressure energized and extra long wearing for improved sealability.

Heavey 1/8" wall aluminum tube is hard anodized on the interior to provide a scratch and wear resistant surface.

Composite rod bushing has high temperature capability and excellent chemical resistance. Solid lubricant fillers provide excellent wear characteristics for non-lube service. The bearing is inboard of the wiper and seal, away from the environment

Brass or aluminum piston is attached with a high strength threaded joint.

Optional wick provides teflon lube for non-lube service on O ring piston.

Reduce noise and fatigue problems such as rod breakage with urethane/nitrile shock pads. Add 1/4" to the cylinder length for each pad. Pneumatic use only to 180° F.

Standard piston seal is large cross section O ring. Compounds are carefully selected for maximum cycle life.

Optional U cup piston seals with teflon wear strip stretch the limits of service even further. Reduce friction and operate without lube in the severest applications while extending or eliminating the service interval.

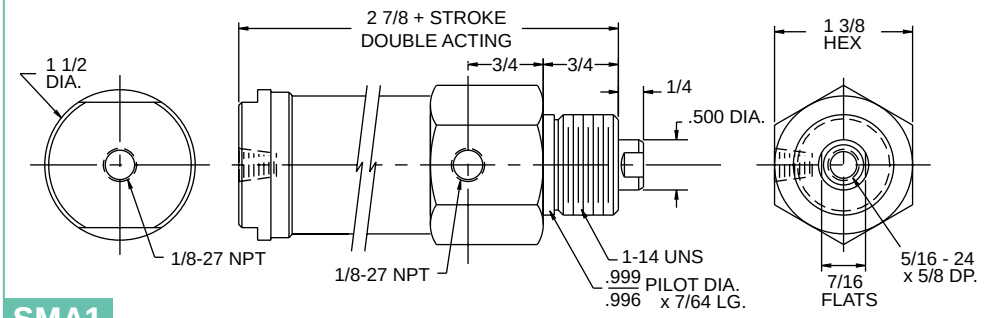
If space permits for applications involving side loads or long strokes, select SMA 1, 2, 3, 5, 7, 8, 9, 12, 13, 19, 21, 23, 25, 28 which have extra long bearings with added space between support points.

Strokes longer than the maximum listed in the ordering procedure can be produced but careful consideration must be given to how the cylinder is applied — how well is the load supported or guided, is the cylinder used in push or tension, is the cylinder vertical or horizontal, etc. Consult factory on all strokes longer than standard. Stroke increments other than standard can also be made. Special lengths are generally available in a few days and are priced as "non-standard" strokes.

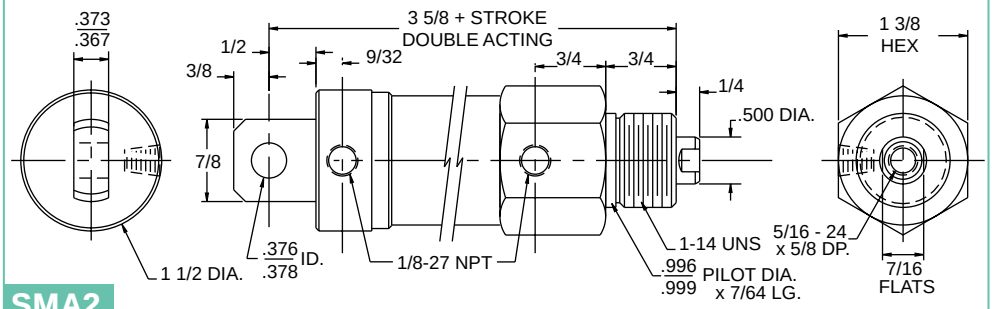
AIR PRODUCTS INC.
TM

1 1/8" BORE SMA ALUMINUM

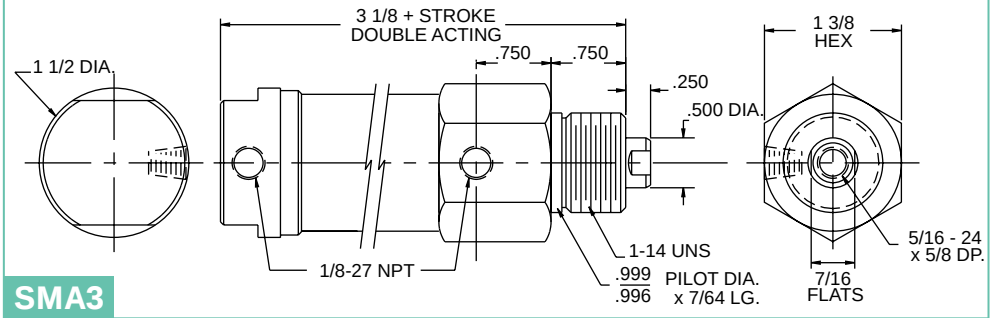
200 PSI MAX. AIR
400 PSI MAX. HYD. *Non shock*



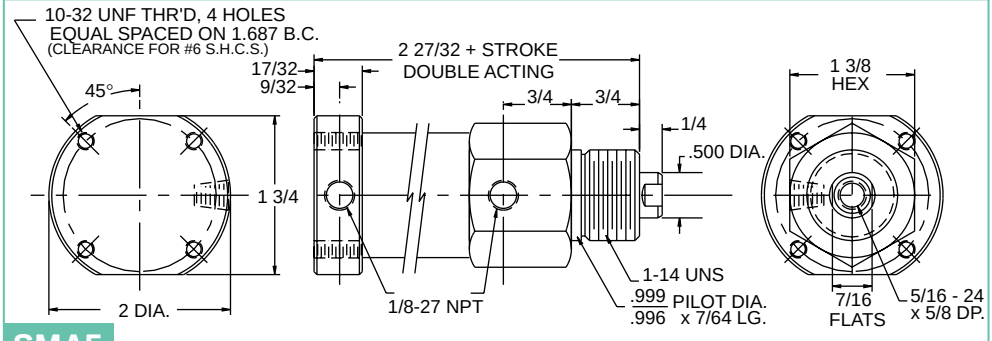
SMA1



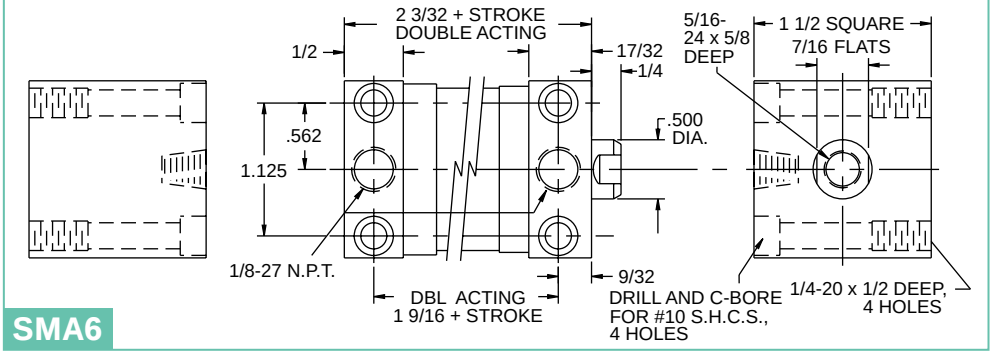
SMA2



SMA3



SMA5



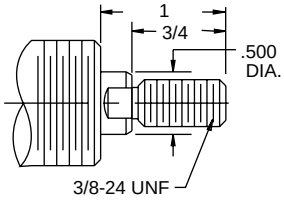
SMA6

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—8#
Fully compressed—20#
Spring material—Plated steel

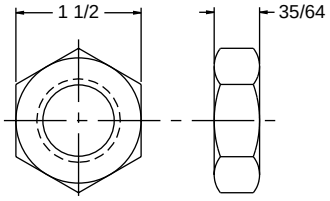
Optional Male Rod Thread



1-14 Nut

Nose Mounting Nut

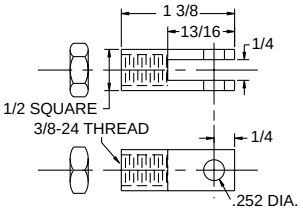
Not included with cylinder
Order Separately



HB-375

Rod Clevis & Nut

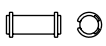
Zinc Plated Steel



HB-200

Clevis Pin Assembly

Used on HB 375
Stainless Pin/Steel Clips



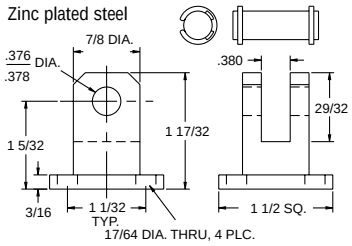
SMA Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate (SMA 7,8,9)
- 90° Rear Clevis

AURORA... BETTER BY DESIGN

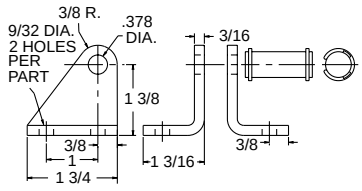
STC-40
Low Profile Clevis Brk't

Used on SMA 2
Zinc plated steel



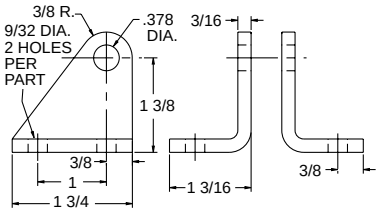
HB-90
St'd Clevis Brk't

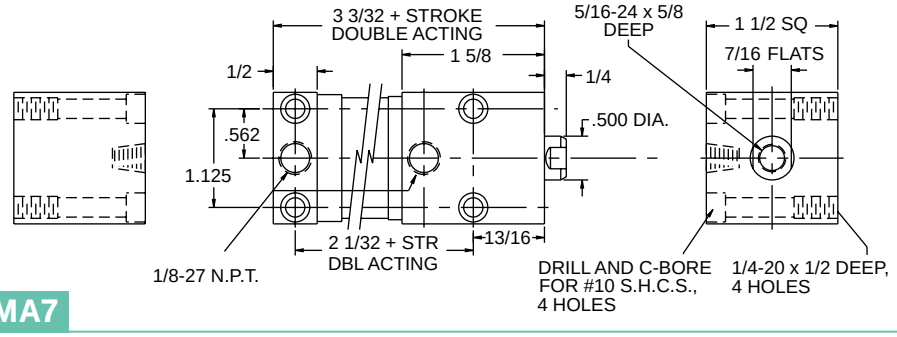
Used on SMA 2
Zinc plated steel



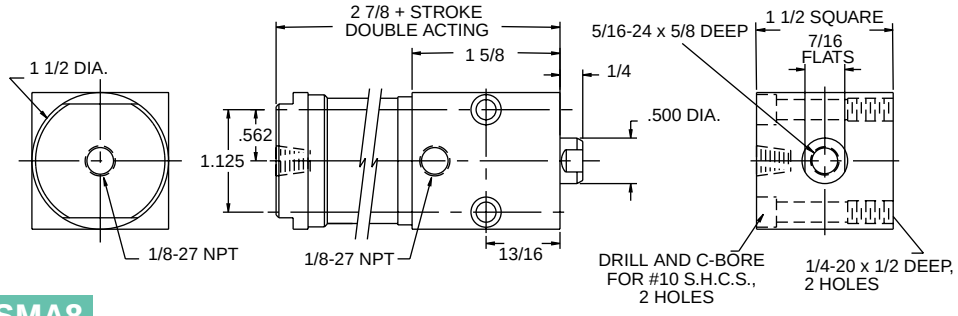
HB-90T
Trunnion Bracket

Used on SMA 10, 11
Zinc plated steel

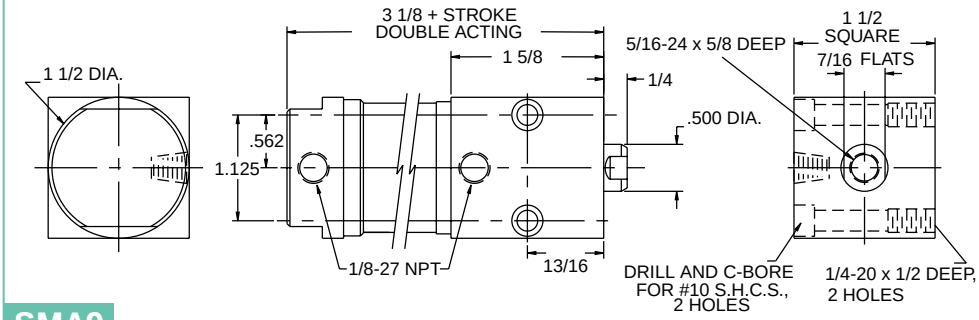




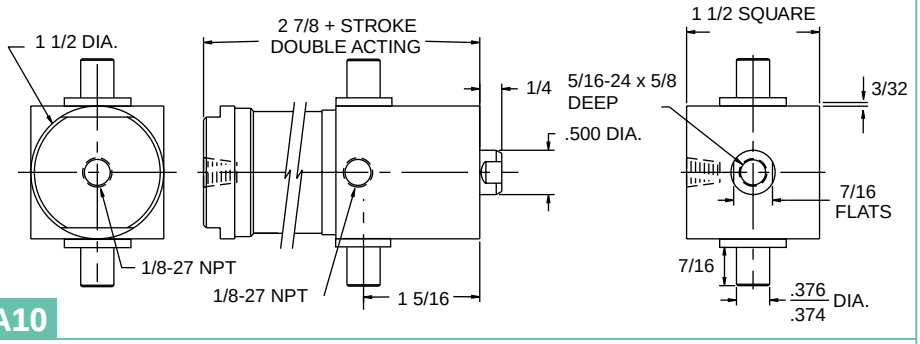
SMA7



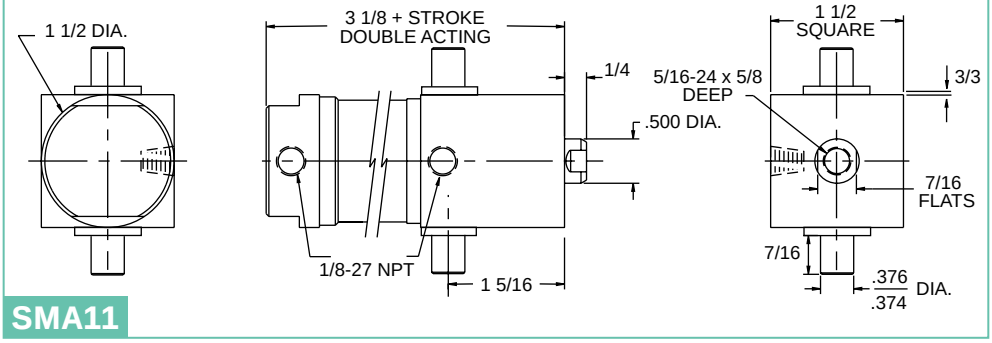
SMA8



SMA9



SMA10

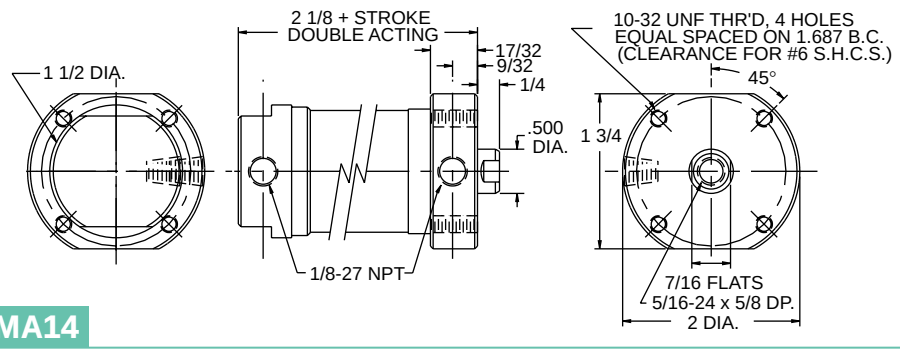


SMA11

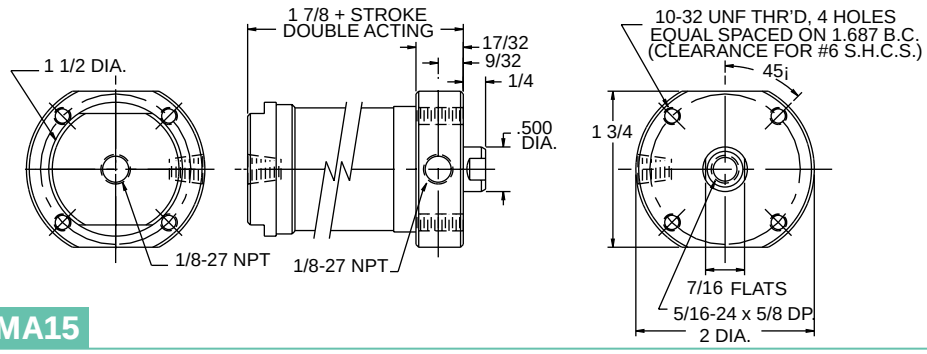
1 1/8” BORE SMA ALUMINUM

200 PSI MAX. AIR
400 PSI MAX. HYD. Non shock

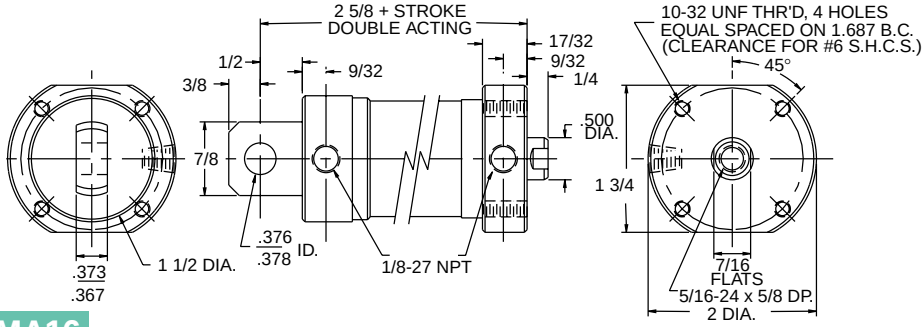
SMA14



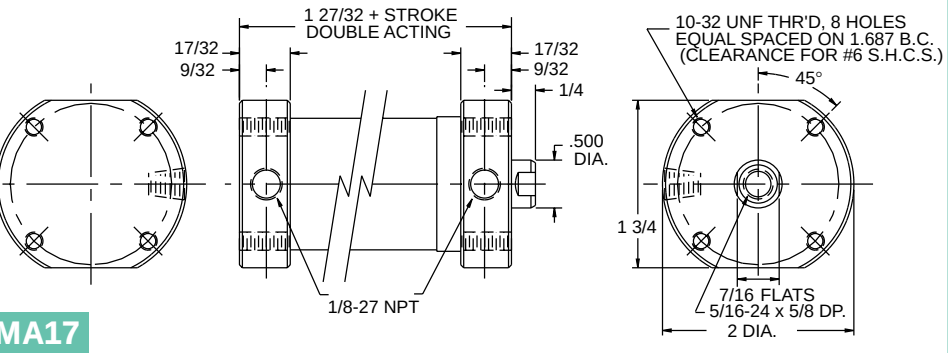
SMA15



SMA16



SMA17



For the ultimate in cycle life or where side load exists select the U cup piston with teflon wear strip

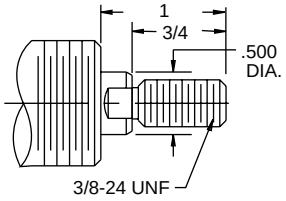
Adds 1/2” to length

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

Spring force
Fully extended—8#
Fully compressed—20#
Spring material—Plated steel

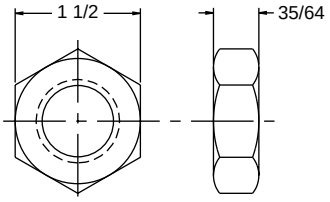
Optional Male Rod Thread



1”-14 Nut

Nose Mounting Nut

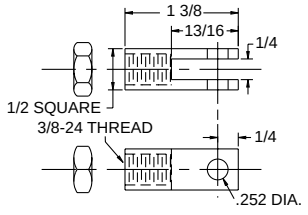
Not included with cylinder
Order Separately



HB-375

Rod Clevis & Nut

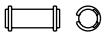
Zinc Plated Steel



HB-200

Clevis Pin Assembly

Used on HB 375
Stainless Pin/Steel Clips



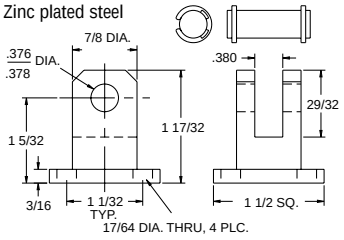
Adjustable stroke models – *Adjustment screw prevents the piston from fully retracting. Maximum adjustment is 1"*
Spherical mount models – *Eliminate side load where misalignment exists. Br'g is plated steel with teflon liner for non-lube service*

SMA Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate (SMA 12, 14, 15, 17, 20)
- 90° Rear Clevis

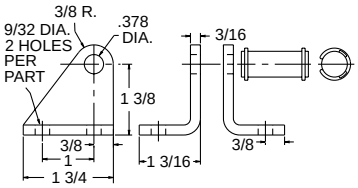
STC-40
Low Profile Clevis Brk't

Used on SMA 16
Zinc plated steel

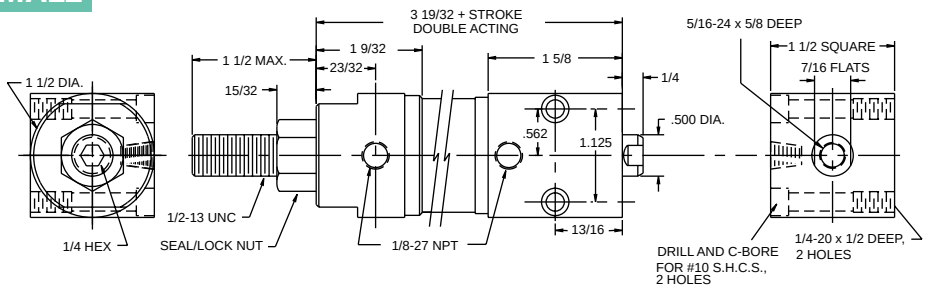


HB-90
St'd Clevis Brk't

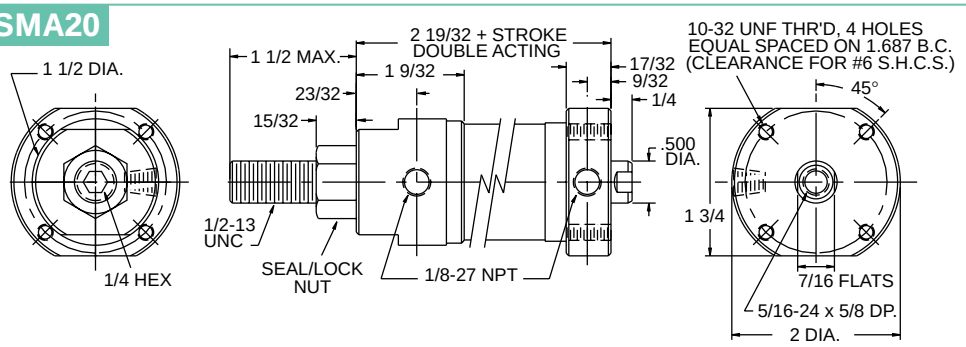
Used on SMA 16
Zinc plated steel



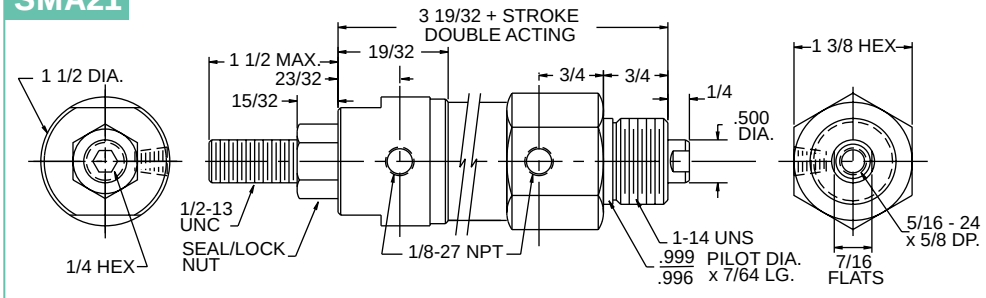
SMA12



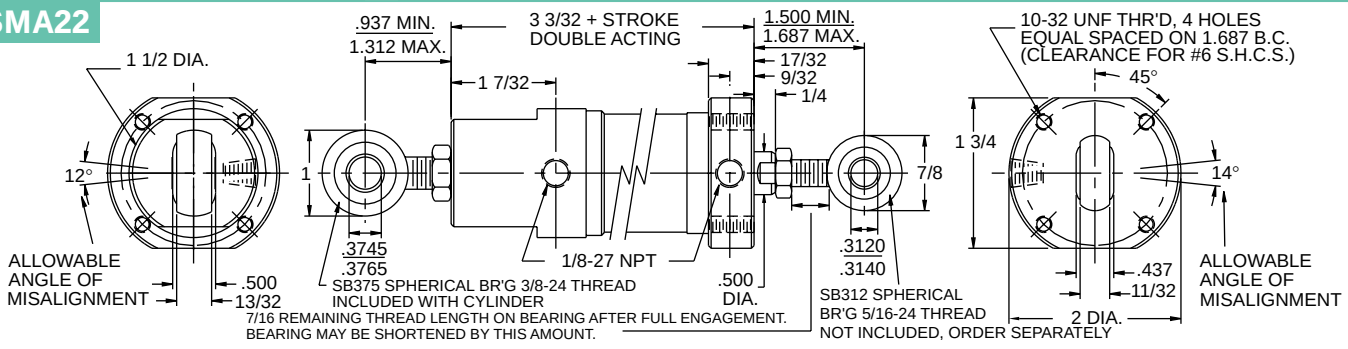
SMA20



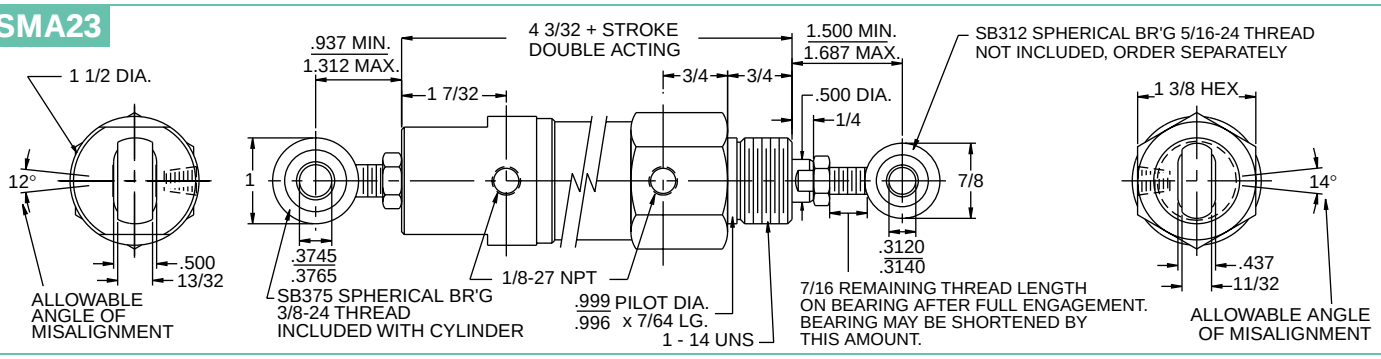
SMA21

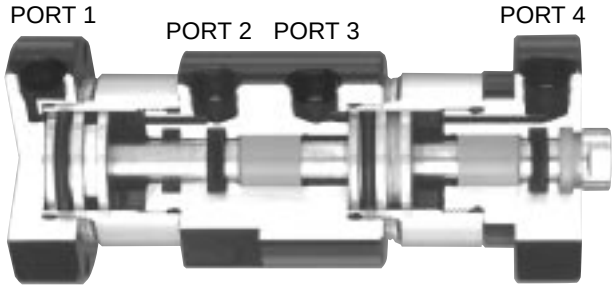


SMA22



SMA23



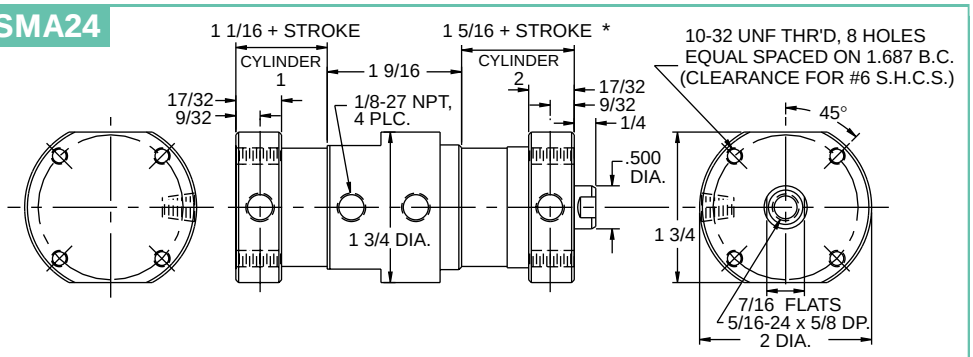


Three Position Cylinders are two in-line cylinders with a common cap but two separate and independent piston rods. By pressuring Port 1, 3, or 4, any combination of stroke 1 and total stroke may be achieved. Port 2 is a vent port only for Cylinder 1. In hydraulic applications it should be connected to a tank by a drain line.

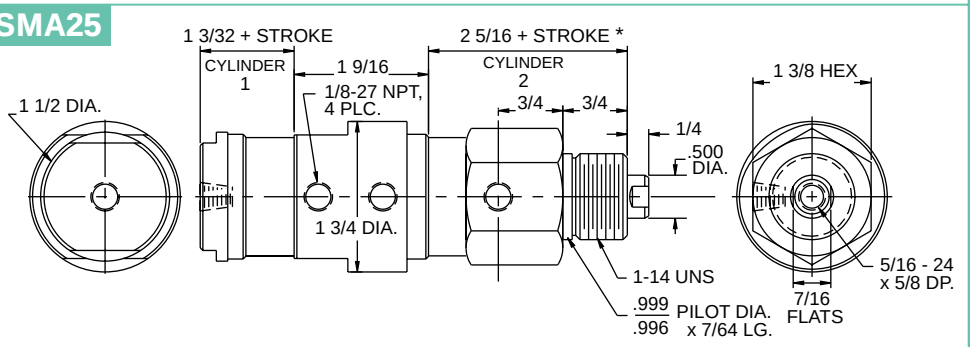
Pressurize Port 1 and Cylinder 1 will extend pushing Cylinder 2 by the same amount. Then pressurize port 3 and Cylinder 2 will extend further to its maximum length. Pressurize Port 4 and both cylinders will retract.

*Stroke of Cylinder 2 = TOTAL Stroke
EXAMPLE: If Cylinder 1 extends 2" when port 1 is pressurized, it will also push Cylinder 2 by 2". If, when Port 3 is pressurized, Cylinder 2 moves an ADDITIONAL 11/2". Then the total stroke of Cylinder 2 is 2" + 1 1/2" = 3 1/2". Always specify the stroke of Cylinder 2 as the total stroke.

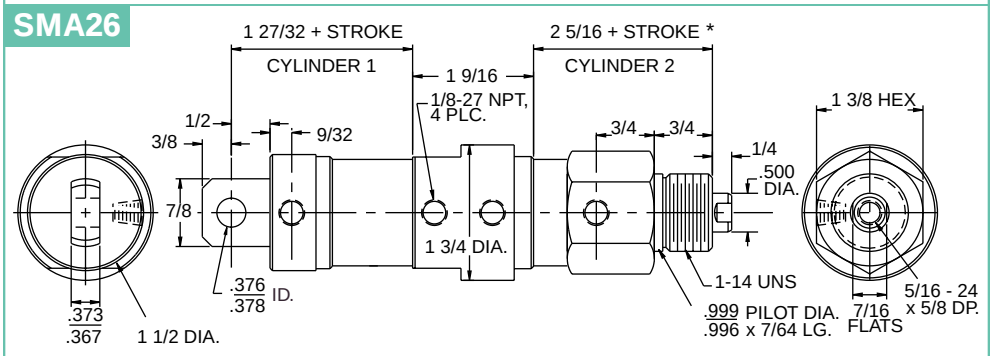
SMA24



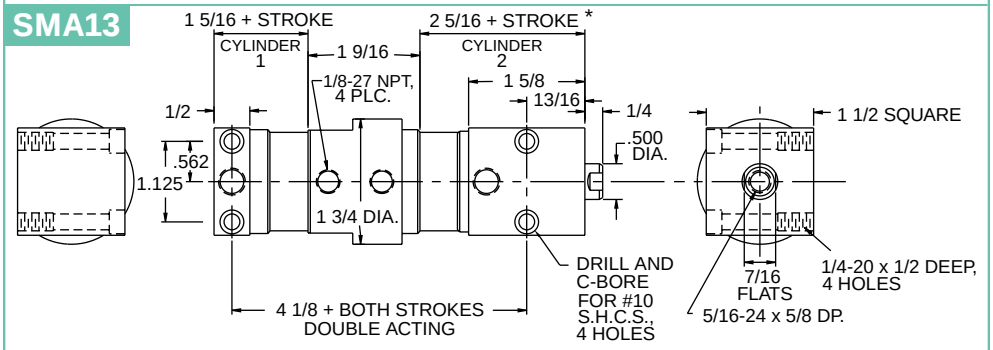
SMA25



SMA26



SMA13

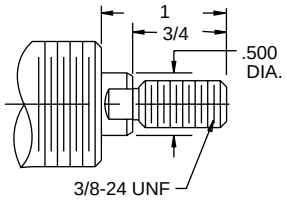


Spring Return 3 Position

Pneumatic only
Springs add to cyl. length
Cyl. #1 and/or Cyl. #2
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" not available

Spring force
Fully extended—8#
Fully compressed—20#
Spring material—Plated steel

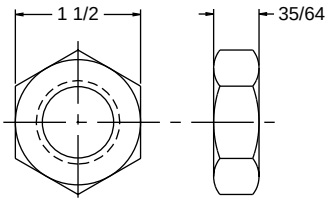
Optional Male Rod Thread



1"-14 Nut

Nose Mounting Nut

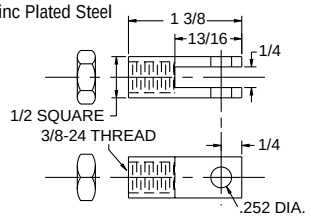
Not included with cylinder
Order Separately



HB-375

Rod Clevis & Nut

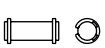
Zinc Plated Steel

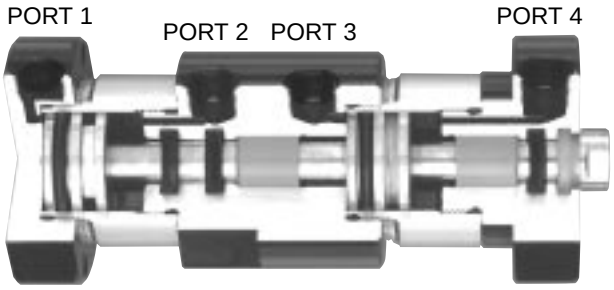


HB-200

Clevis Pin Assembly

Used on HB-375 Stainless Pin/Steel Clips





Tandem Cylinders are two in-line cylinders of the same stroke length with a common cap. Both pistons are attached to a common rod. By simultaneously pressurizing Ports 1 and 3 or 2 and 4, the force on the piston rod is nearly doubled. This can be useful when more force is required, but the diameter of the cylinder cannot be increased due to size restrictions.

Tandem cylinders can can also be used as part of an air/oil system. Fill the front cylinder (Cyl.2) with oil and pipe its ports (3 & 4) in series using one or two flow controls. Using the rear cylinder (Cyl. 1) as an air powered driver, meter the oil from end to end on Cylinder 2. This will provide smooth, precise control of piston rod motion at all speeds.

A small reservoir of oil at 10-20 psi should be connected to Cylinder 2 if oil loss or expansion/contraction due to heat are a concern.

Tandem models double acting only
Spring return not available

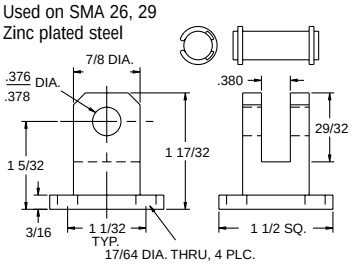
3 Position options

Viton seals
Non-lube service
Magnetic piston
U Cup piston
Non-rotate (SMA 13, 24)
90° Rear clevis
Shock pads not available

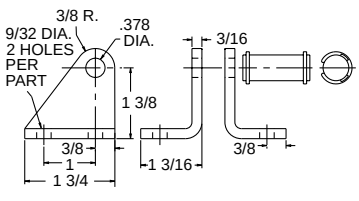
Tandem options

Viton seals
Non-lube service
90° Rear clevis
Shock pads not available
Magnetic piston not available
U cup piston not available
Non-rotate not available

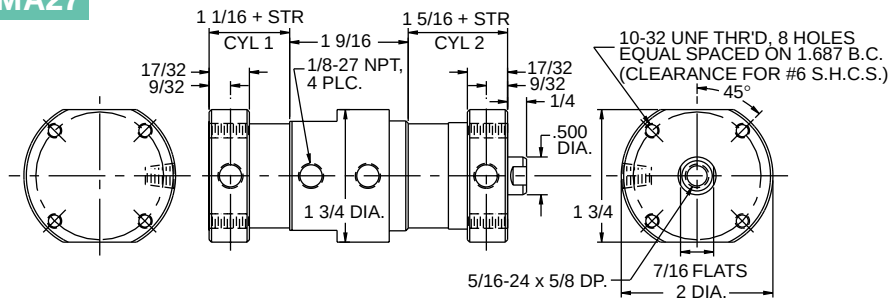
STC -40
Low Profile Clevis Brk't
Used on SMA 26, 29
Zinc plated steel



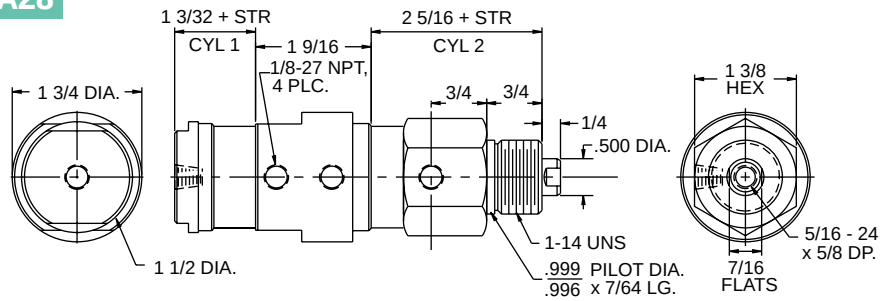
HB-90
St'd Clevis Brk't
Used on SMA 26, 29
Zinc plated steel



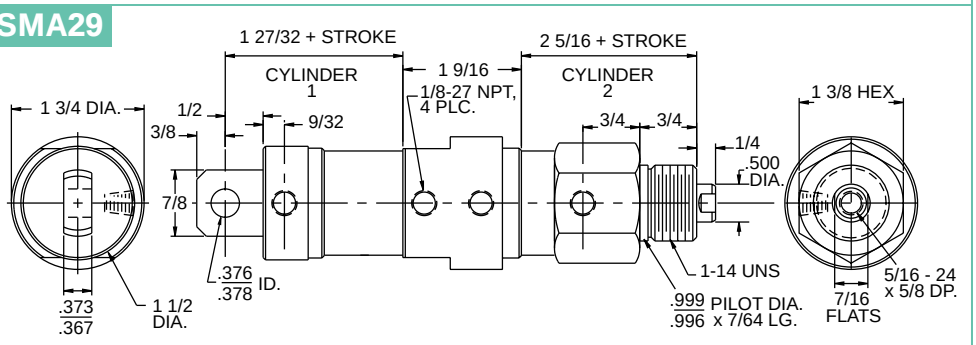
SMA27



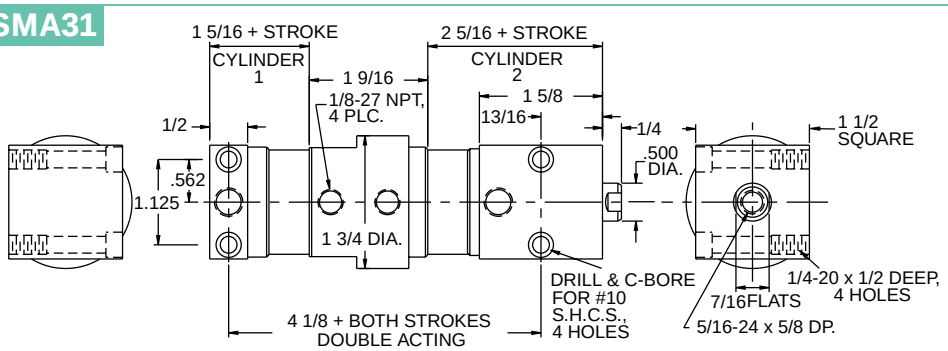
SMA28



SMA29

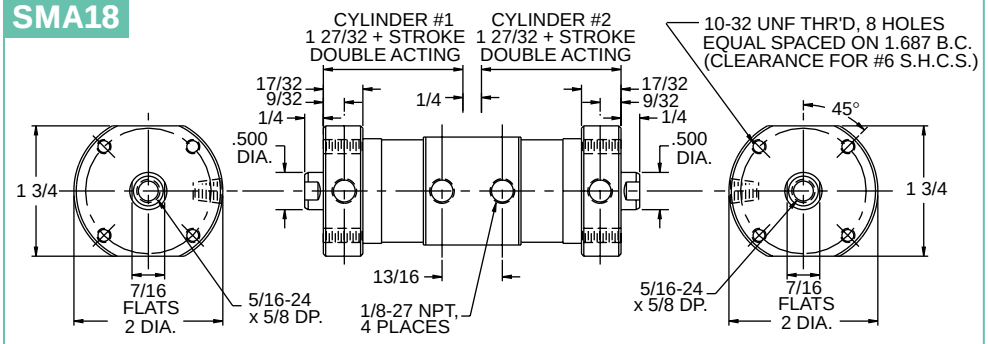


SMA31

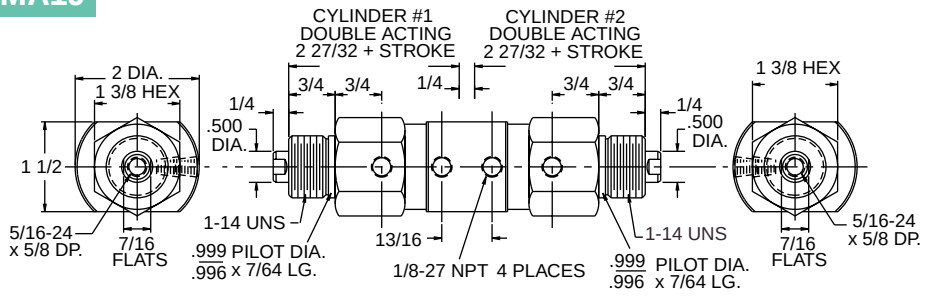


Back to back cylinders are simply two standard double acting or single acting spring return cylinders with a common cap. By proper valve sequencing, four distinct stroke lengths may be achieved.

SMA18



SMA19



BACK TO BACK OPTIONS

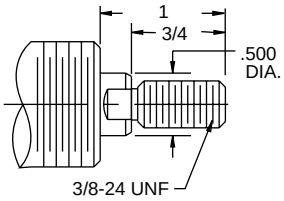
Shock pads — Non-lube service — Viton seals — U cup piston — Magnetic piston

Spring Return Cylinders

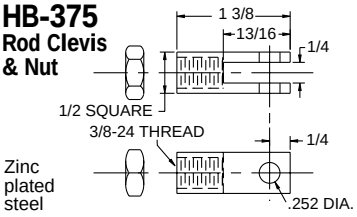
Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—8#
Fully compressed—20#
Spring material—Plated steel

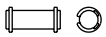
Optional Male Rod Thread



HB-375 Rod Clevis & Nut



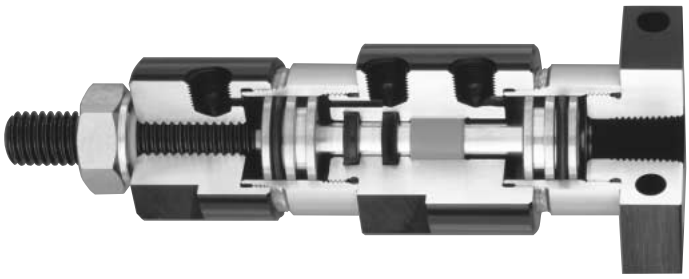
HB 200 Clevis Pin Assembly



Used on HB 375 assembly
Stainless pin/ steel clips

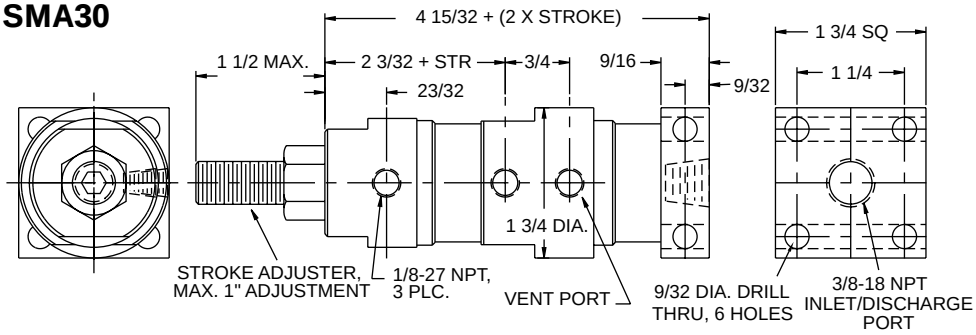
1 1/8" Bore SMA Volumetric Pump

VOLUMETRIC PUMPS measure and dispense specific volumes of fluid with compressed air. These tandem type cylinders have two pistons connected to a common rod. The air powered driver section is normally reciprocated with a four way valve. The inlet/discharge port is connected to a fluid supply line and a discharge line, both of which contain a check valve. On each stroke the pump section first draws in a specific volume of fluid from the supply line, and then forces it out the discharge line as both check valves shift. Maximum pressure of discharge fluid is approximatly equal to the air pressure on the driver section. Standard construction materials are the same as all SMA cylinders – anodized aluminum tube and end caps, stainless rod, and brass pistons. Other materials, including all stainless construction, are available. Special seal configurations are also available.



SMA 30 Volumetric Pumps are available only as double acting, pnueumatic, and in 1" increments of stroke. U cup piston and shock pads not available.

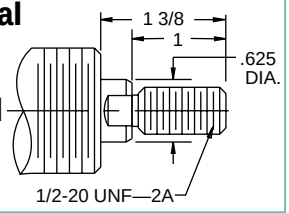
SMA30



Spring Return Cylinders

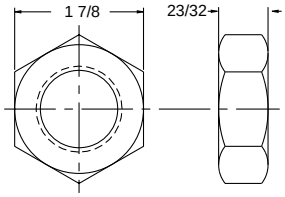
Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available
Spring force
Fully extended—15#
Fully compressed—50#
Spring material—Plated steel

Optional Male Rod Thread



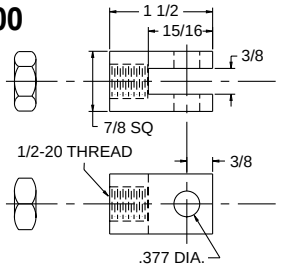
1 1/4-12 Nut
Nose Mounting Nut

Not included with cylinder Order Separately



HB-500
Rod Clevis & Nut

Zinc Plated Steel

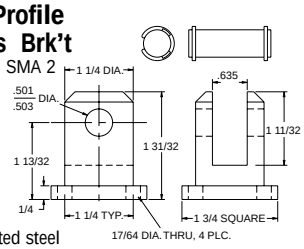


HB-501
Clevis Pin Assembly

Used on HB-500

STC-90
Low Profile Clevis Brk’t

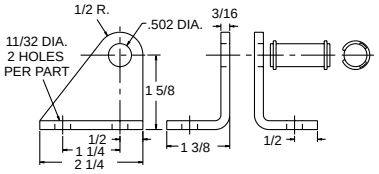
Used on SMA 2



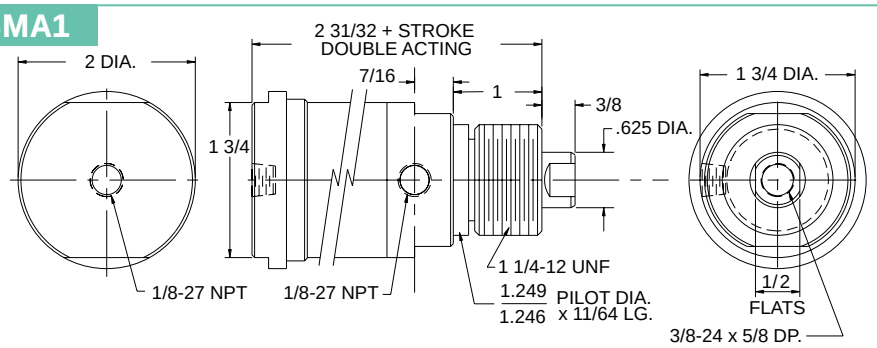
Zinc plated steel

HB-100 St’d Clevis Brk’t

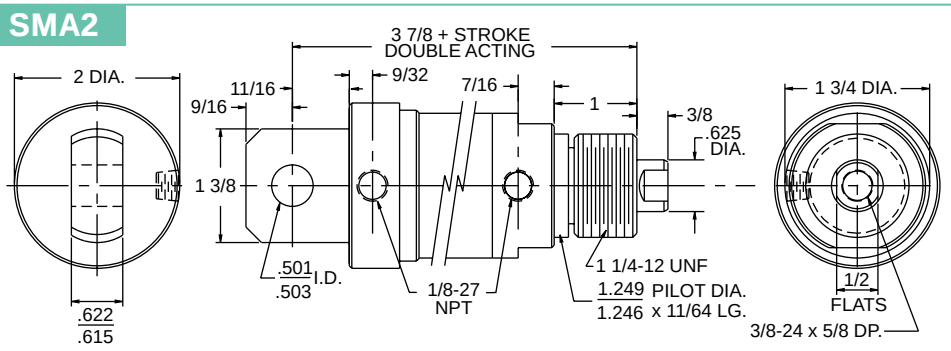
Used on SMA 2 Zinc plated steel



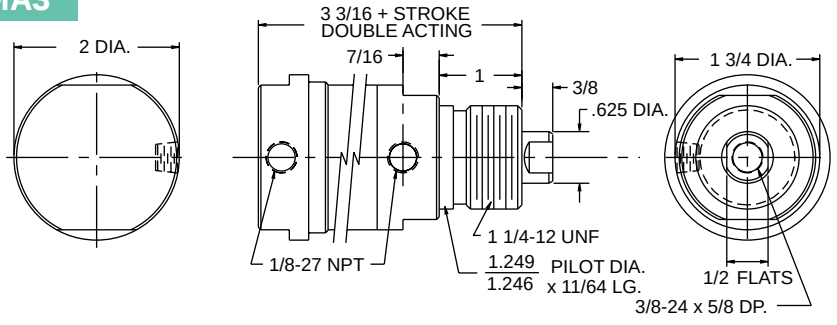
SMA1



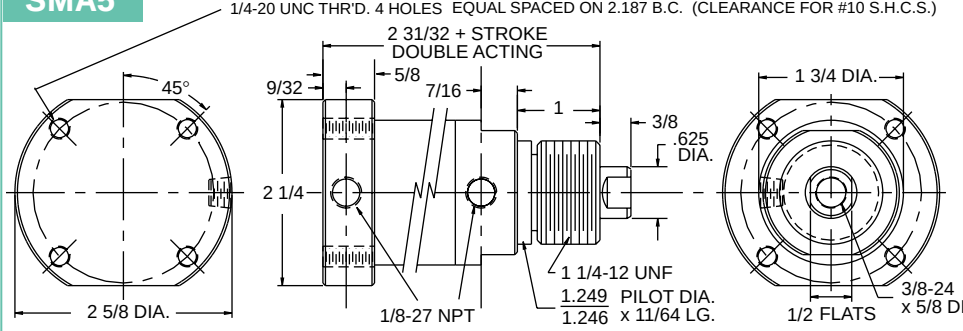
SMA2



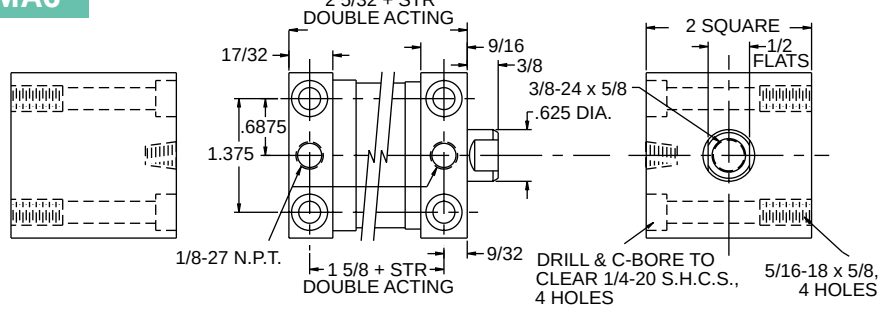
SMA3



SMA5



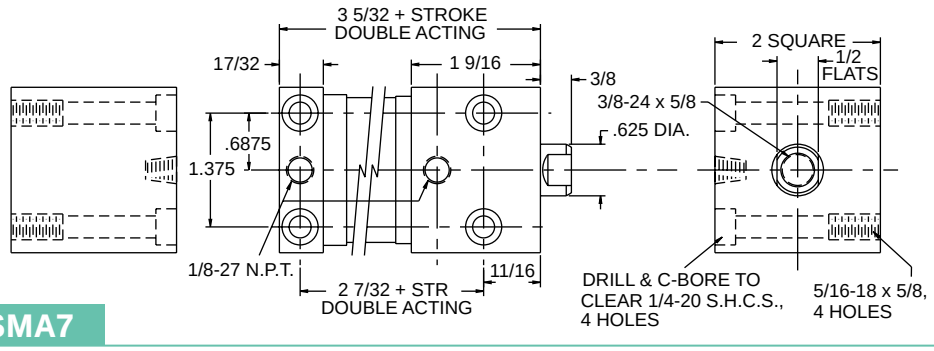
SMA6



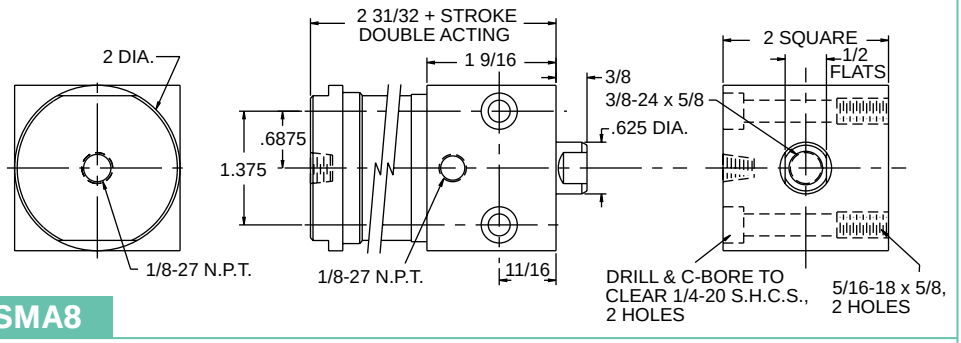
1 1/2" BORE SMA ALUMINUM

200 PSI MAX. AIR
500 PSI MAX. HYD. *Non shock*

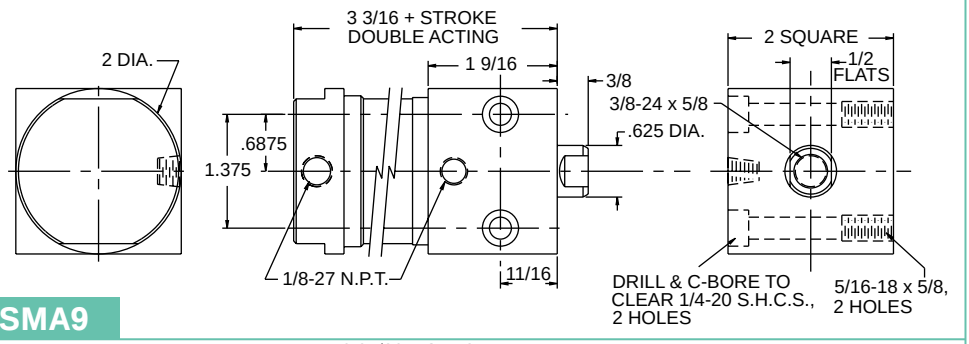
SMA7



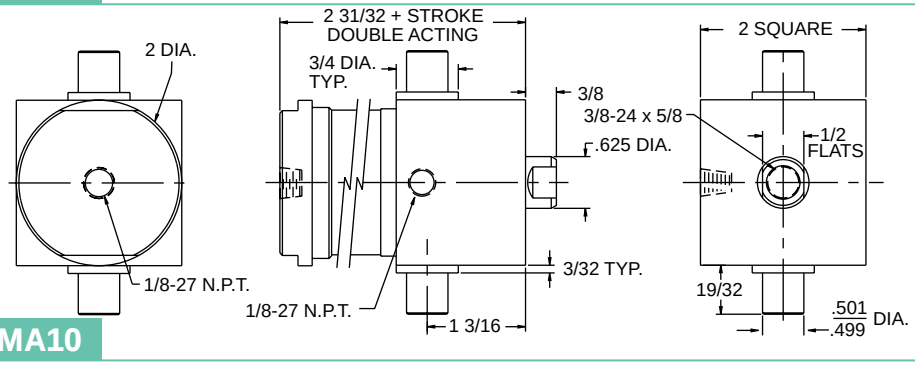
SMA8



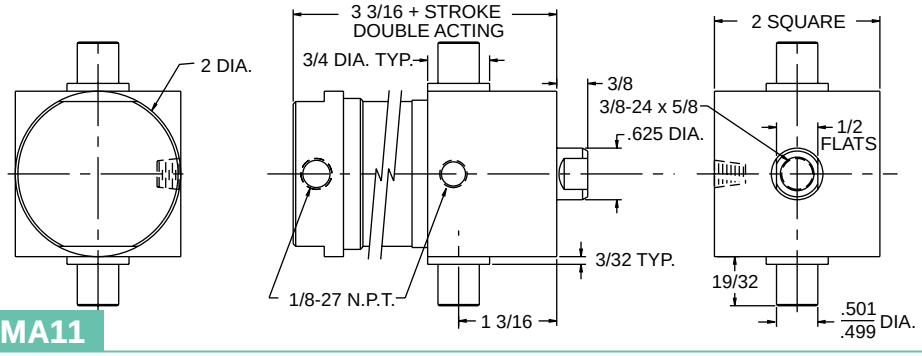
SMA9



SMA10



SMA11

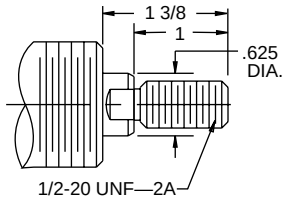


Single Acting Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—15#
Fully compressed—50#
Spring material—Plated steel

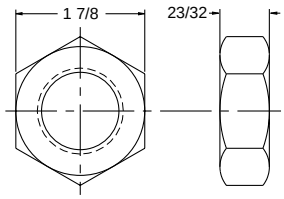
Optional Male Rod Thread



1 1/4 Nut

Nose Mounting Nut

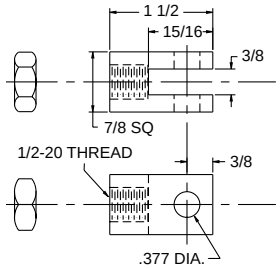
Not included with cylinder
Order Separately



HB-500

Rod Clevis & Nut

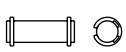
Zinc Plated Steel



HB-501

Clevis Pin Assembly

Used on HB-500
Stainless Pin/Steel Clips



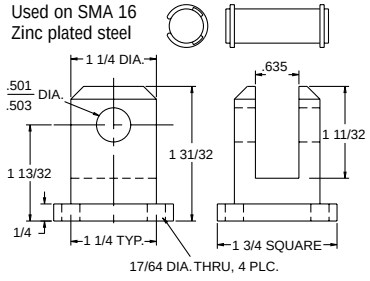
SMA Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate (SMA 7,8,9,14,15,17)
- 90° Rear Clevis

FOR MAXIMUM SUPPORT SELECT MODELS WITH LONG HEADS IF SPACE PERMITS

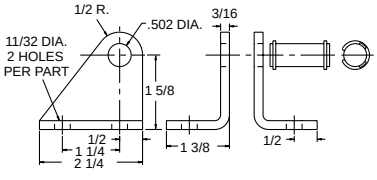
STC-90
Low Profile Clevis Brk't

Used on SMA 16
Zinc plated steel



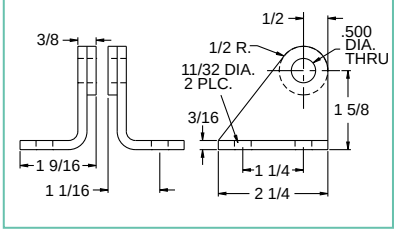
HB-100
St'd Clevis Brk't

Used on SMA 16
Zinc plated steel

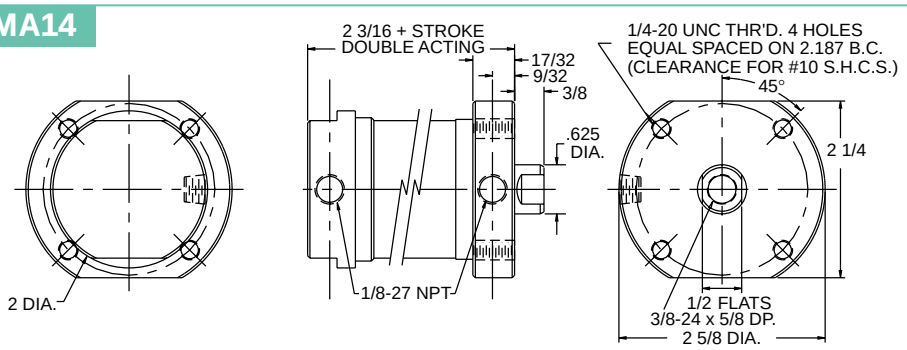


SS-100T
Trunnion Bracket

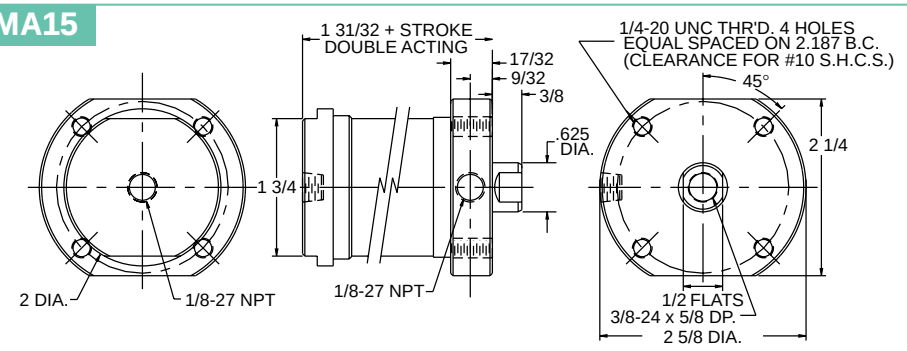
Used on SMA 10, 11



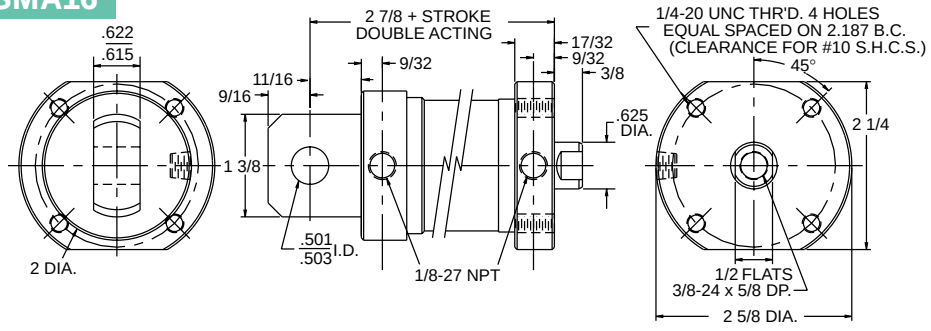
SMA14



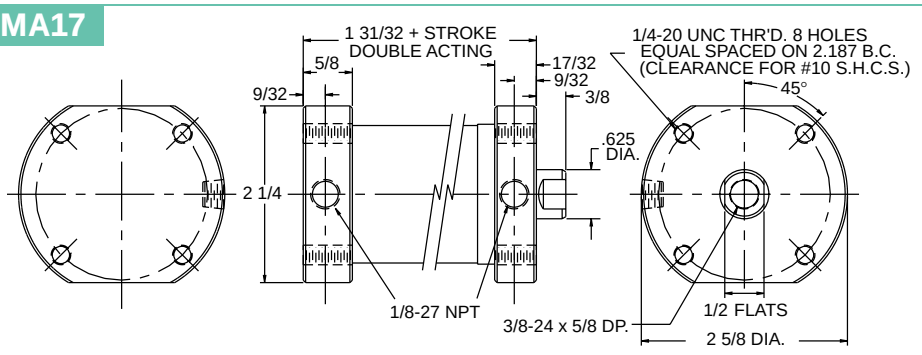
SMA15



SMA16



SMA17

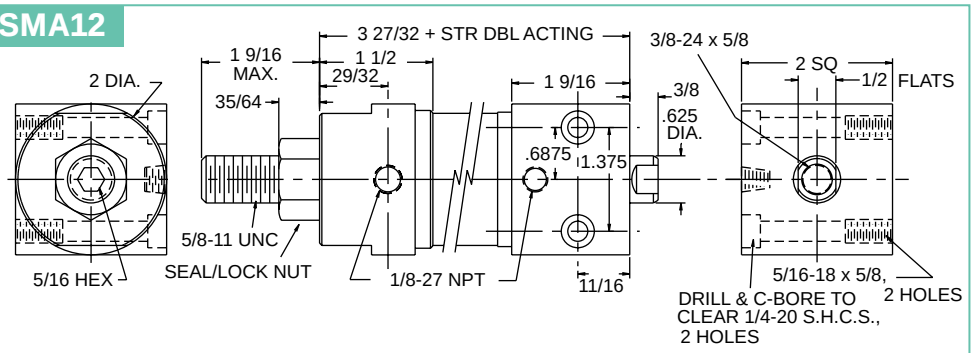


Don't Paint Yourself into a Corner

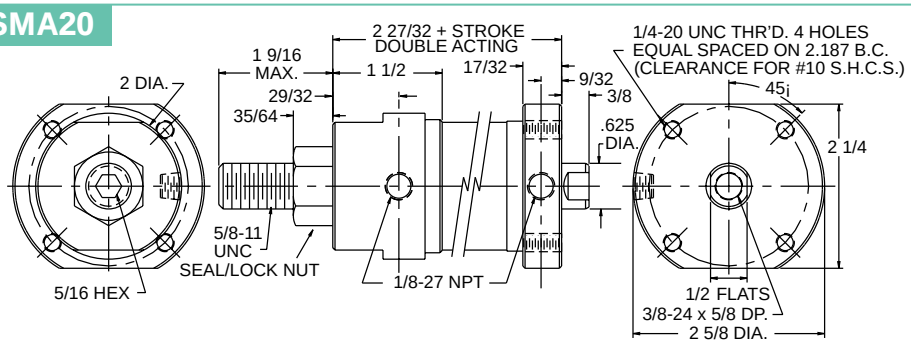
Choose the pancake that's better by design. . . SMA and SMS by Aurora

Adjustable stroke models – *Adjustment screw prevents the piston from fully retracting. Maximum adjustment is 1"*
Spherical mount models – *Eliminate side load where misalignment exists. Br'g is plated steel with teflon liner for non-lube service*

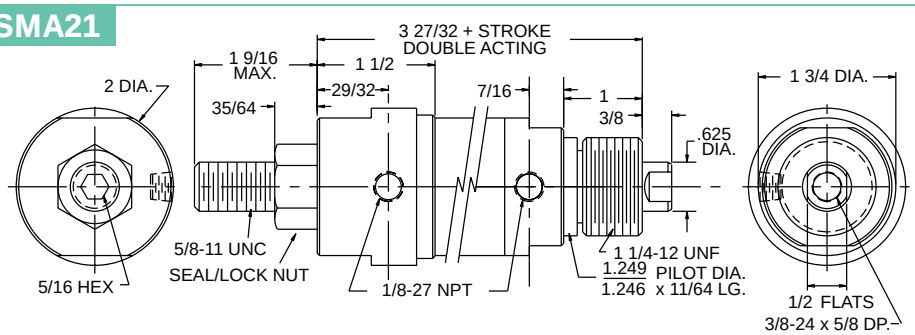
SMA12



SMA20



SMA21

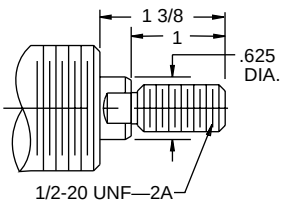


Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—15#
Fully compressed—50#
Spring material—Plated steel
Also applies to Cyl. #1 and or Cyl. #2 of 3 position models

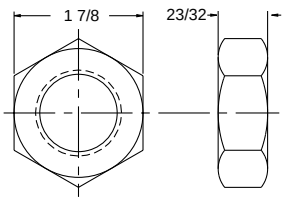
Optional Male Rod Thread



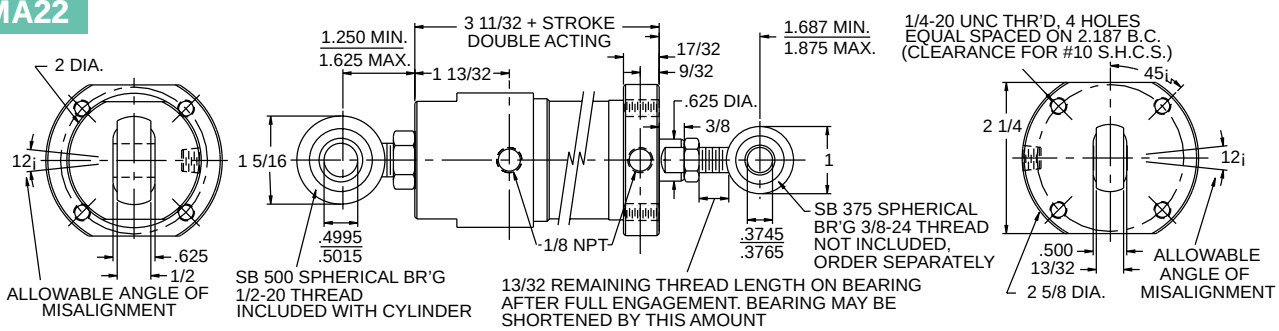
1 1/4 Nut

Nose Mounting Nut

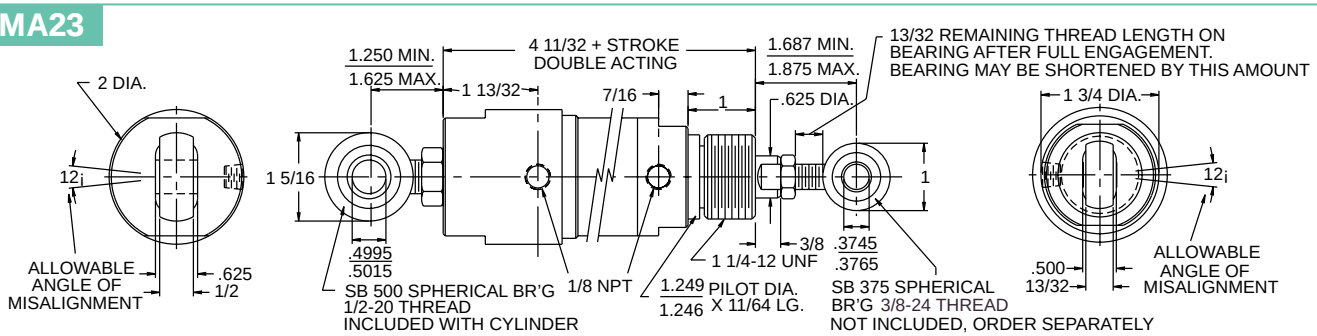
Not included with cylinder
Order separately

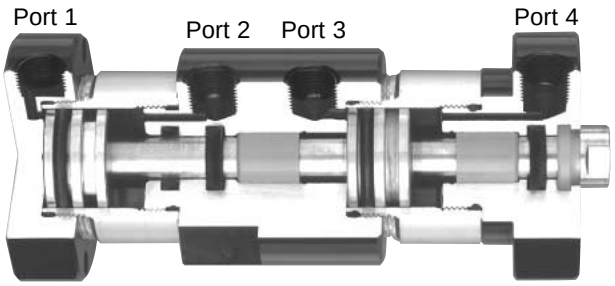


SMA22



SMA23





Three Position Cylinders are two in-line cylinders with a common cap but two separate and independent piston rods. By pressuring Port 1, 3, or 4, any combination of stroke 1 and total stroke may be achieved. Port 2 is a vent port only for Cylinder 1. In hydraulic applications it should be connected to a tank by a drain line.

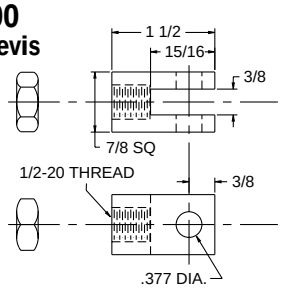
Pressurize Port 1 and Cylinder 1 will extend pushing Cylinder 2 by the same amount. Then pressurize port 3 and Cylinder 2 will extend further to its maximum length. Pressurize Port 4 and both cylinders will retract.

*Stroke of Cylinder 2 = TOTAL Stroke
EXAMPLE: If Cylinder 1 extends 2" when port 1 is pressurized, it will also push Cylinder 2 by 2". If, when Port 3 is pressurized, Cylinder 2 moves an ADDITIONAL 11/2". Then the total stroke of Cylinder 2 is 2" + 1 1/2" = 3 1/2". Always specify the stroke of Cylinder 2 as the total stroke.

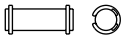
3 Position options

Viton seals
Non-lube service
Magnetic piston
U Cup piston
Non-rotate (SMA 13, 24)
90° Rear clevis
Shock pads not available

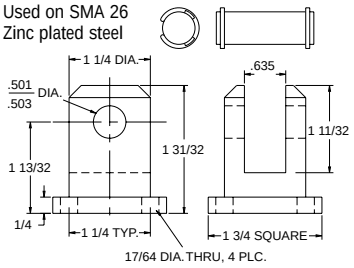
HB-500
Rod Clevis & Nut
Zinc plated steel



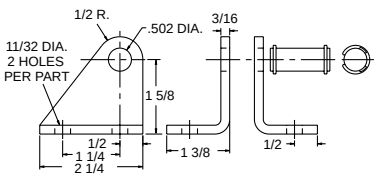
HB-501
Clevis Pin Assembly
Used on HB-500
Stainless pin/Steel clips



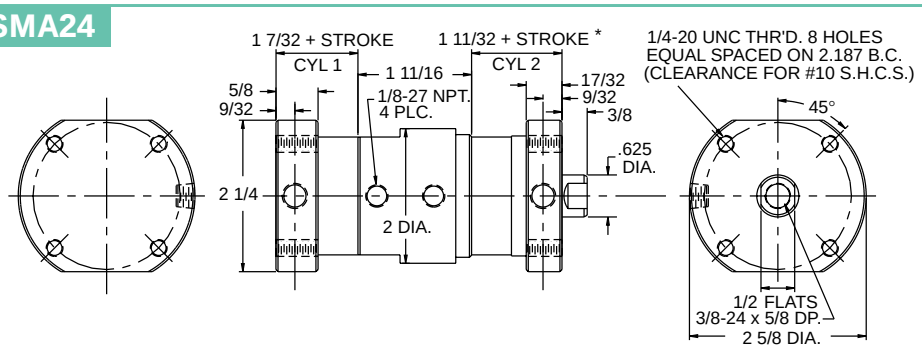
STC-90
Low Profile Clevis Brk't
Used on SMA 26
Zinc plated steel



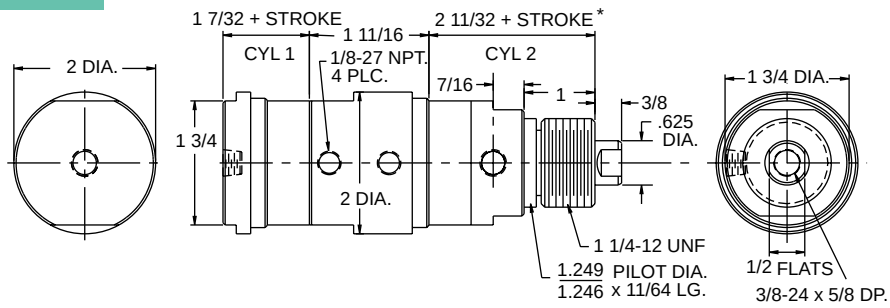
HB-100 St'd Clevis Brk't
Used on SMA 26
Zinc plated steel



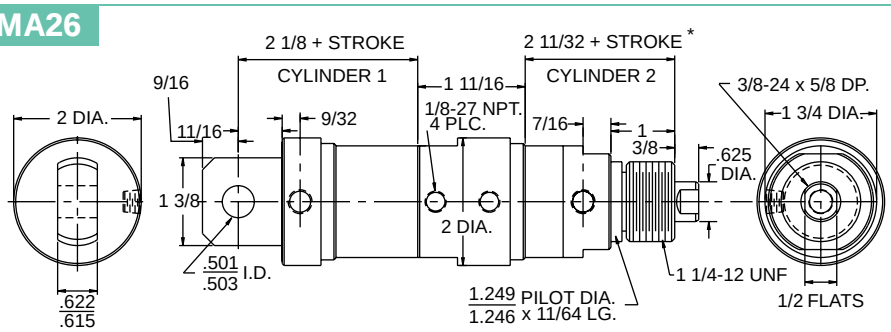
SMA24



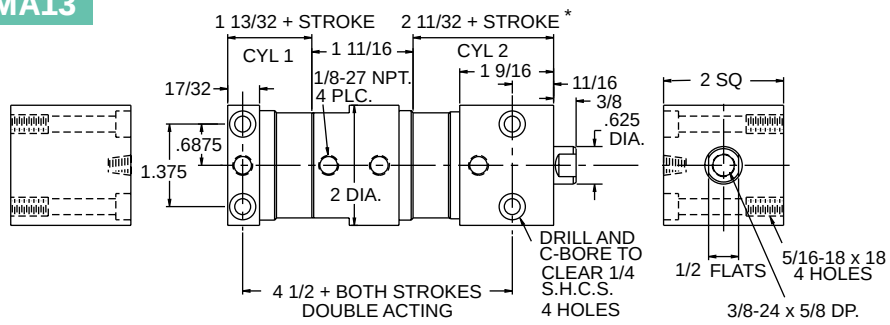
SMA25

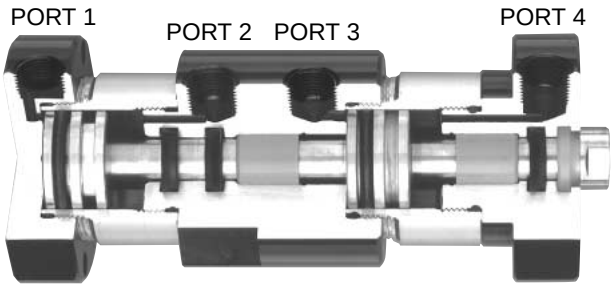


SMA26



SMA13



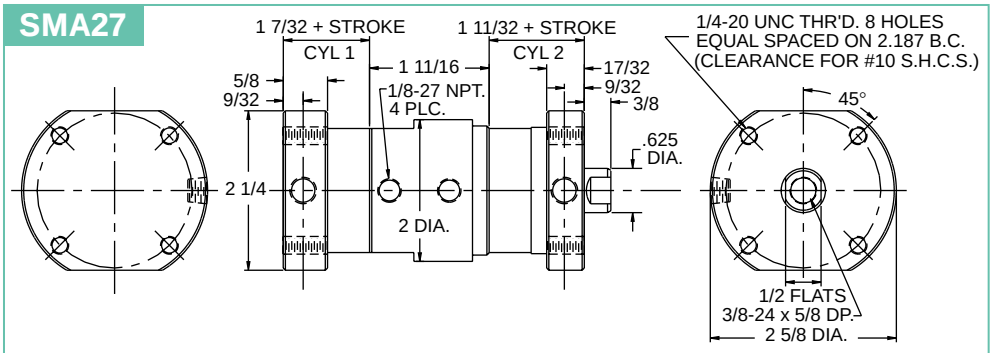


Tandem Cylinders are two in-line cylinders of the same stroke length with a common cap. Both pistons are attached to a common rod. By simultaneously pressurizing Ports 1 and 3 or 2 and 4, the force on the piston rod is nearly doubled. This can be useful when more force is required, but the diameter of the cylinder cannot be increased due to size restrictions.

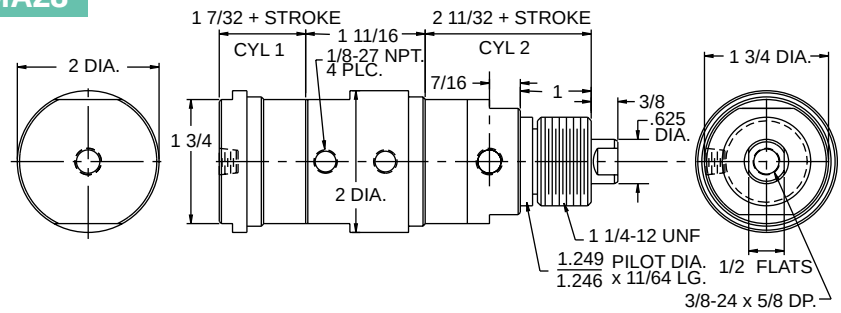
Tandem cylinders can can also be used as part of an air/oil system. Fill the front cylinder (Cyl.2) with oil and pipe its ports (3 & 4) in series using one or two flow controls. Using the rear cylinder (Cyl. 1) as an air powered driver, meter the oil from end to end on Cylinder 2. This will provide smooth, precise control of piston rod motion at all speeds.

A small reservoir of oil at 10-20 psi should be connected to Cylinder 2 if oil loss or expansion/contraction due to heat are a concern.

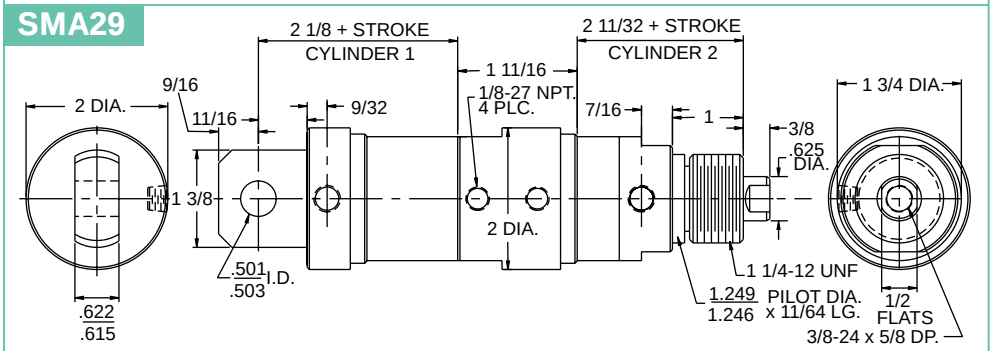
SMA27



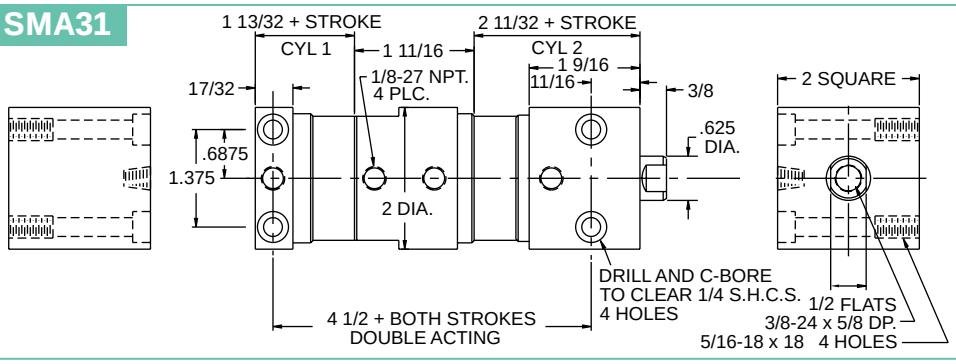
SMA28



SMA29



SMA31



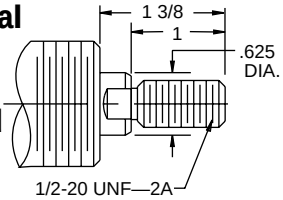
Tandem models double acting only
Spring return not available

Tandem options

Viton seals
Non-lube service
90° Rear clevis

Shock pads not available
Magnetic piston not available
U cup piston not available
Non-rotate not available

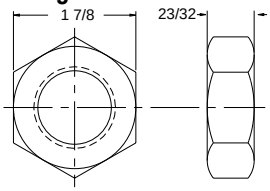
Optional Male Rod Thread



1 1/4-12 Nut
Nose Mounting Nut

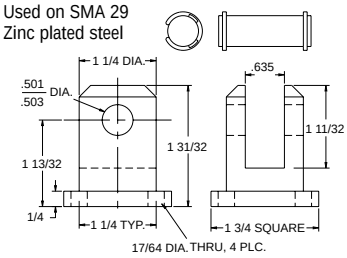
Not included with cylinder

Order Separately



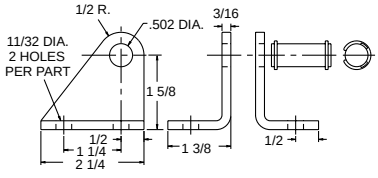
STC -90
Low Profile Clevis Brk't

Used on SMA 29
Zinc plated steel



HB-100
St'd Clevis Brk't

Used on SMA 29 Stainless steel



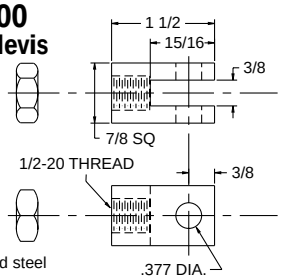
Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available
Spring force
Fully extended—15#
Fully compressed—50#
Spring material—Plated steel

BACK TO BACK OPTIONS

Shock pads
Non-lube service
Viton seals
U cup piston
Magnetic piston

HB-500 Rod Clevis & Nut



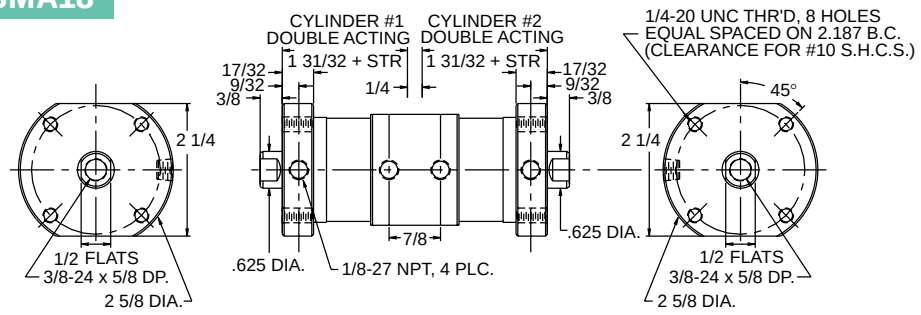
Zinc plated steel

HB 501 Clevis Pin Assembly

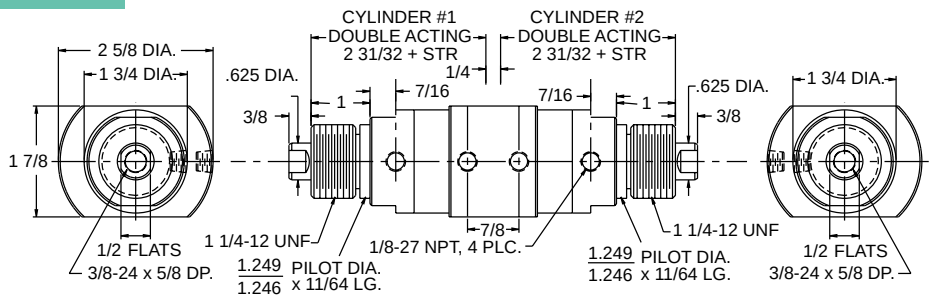
Used on HB 500
Stainless pin/
steel clips

Back to back cylinders are simply two standard double acting or single acting spring return cylinders with a common cap. By proper valve sequencing, four distinct stroke lengths may be achieved.

SMA18

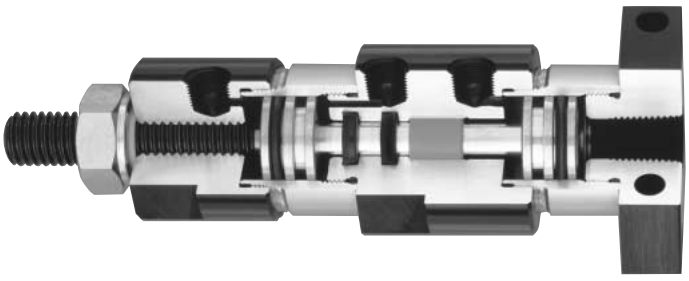


SMA19



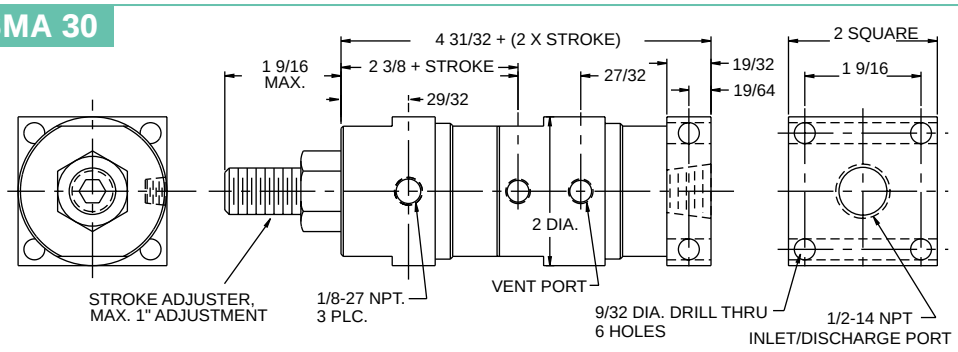
1 1/2" Bore SMA Volumetric Pump

VOLUMETRIC PUMPS measure and dispense specific volumes of fluid with compressed air. These tandem type cylinders have two pistons connected to a common rod. The air powered driver section is normally reciprocated with a four way valve. The inlet/discharge port is connected to a fluid supply line and a discharge line, both of which contain a check valve. On each stroke the pump section first draws in a specific volume of fluid from the supply line, and then forces it out the discharge line as both check valves shift. Maximum pressure of discharge fluid is approximatly equal to the air pressure on the driver section. Standard construction materials are the same as all SMA cylinders – anodized aluminum tube and end caps, stainless rod, and brass pistons. Other materials, including all stainless construction, are available. Special seal configurations are also available.



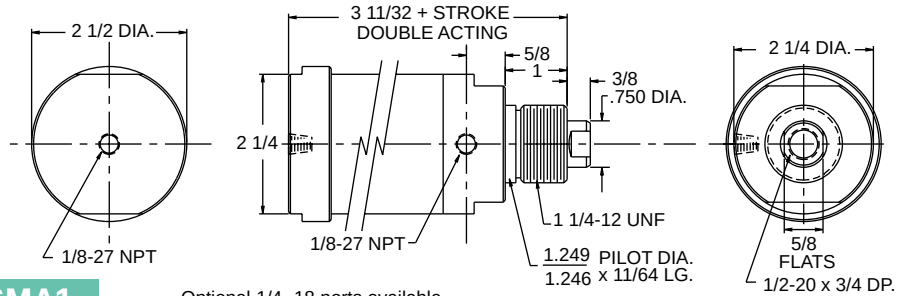
SMA 30 Volumetric Pumps are available only as double acting, pneumatic, and in 1" increments of stroke. U cup piston and shock pads not available.

SMA 30



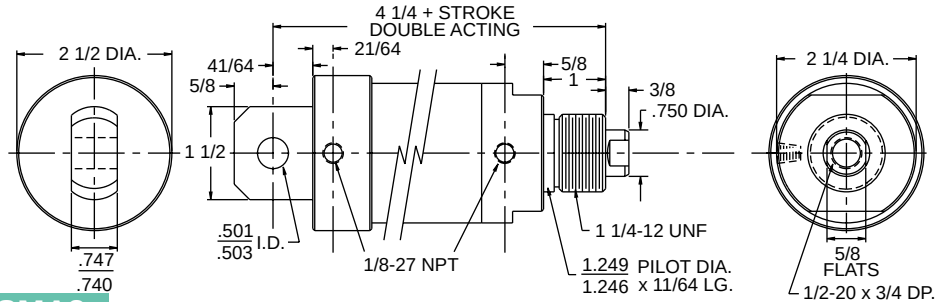
2” BORE SMA ALUMINUM

200 PSI MAX. AIR
400 PSI MAX. HYD. *Non shock*



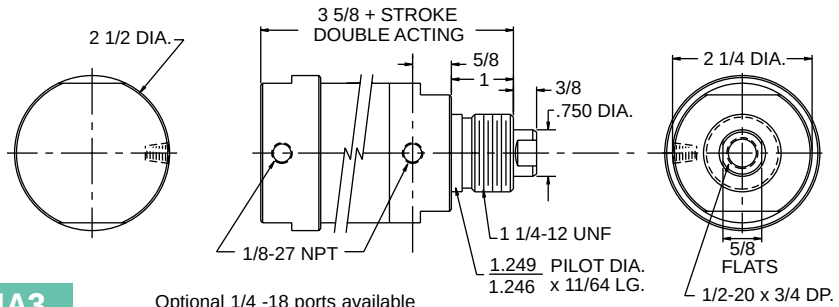
SMA1

Optional 1/4 -18 ports available



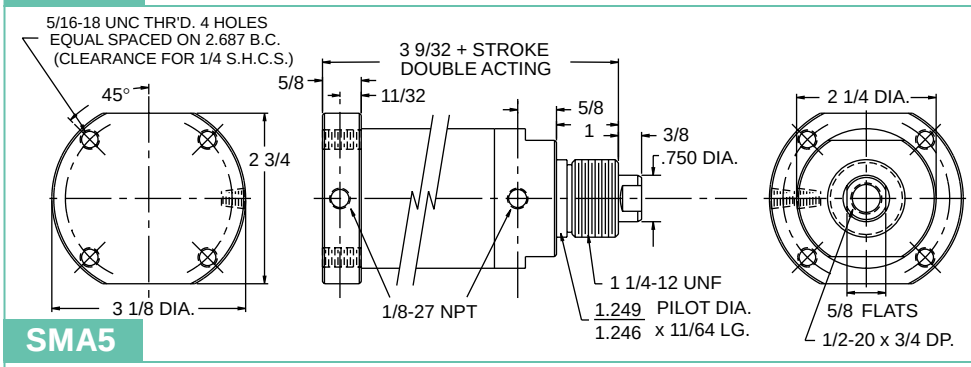
SMA2

Optional 1/4 -18 ports available

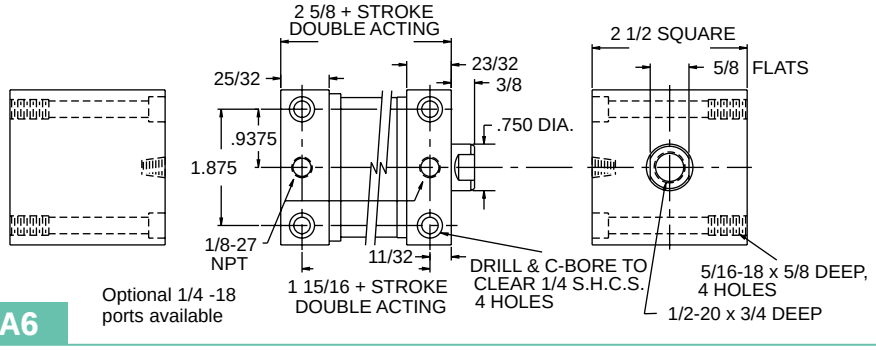


SMA3

Optional 1/4 -18 ports available



SMA5



Optional 1/4 -18 ports available

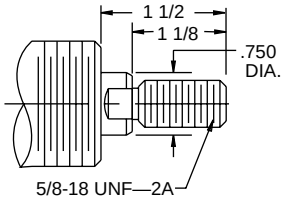
SMA6

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

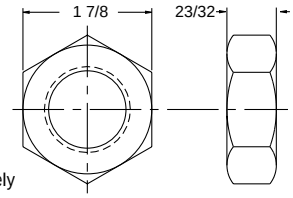
Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

Optional Male Rod Thread



1 1/4-12 Nut
Nose Mounting Nut

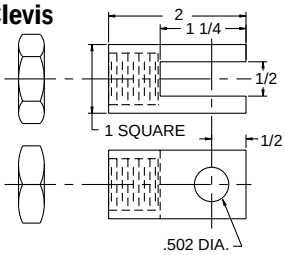
Not included with cylinder



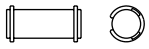
Order Separately

HB-625
Rod Clevis & Nut

Zinc plated steel



HB-601 Clevis Pin Assembly



Used on HB 625 assembly
Stainless pin/ steel clips

SEE PAGES 84–86

FOR REED AND HALL EFFECT SWITCHES AND MAGNETIC PISTONS

SMA Options

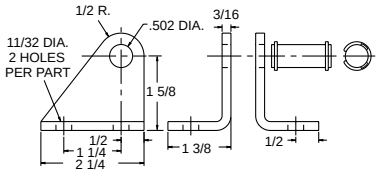
- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate (SMA 7,8,9)
- 90° Rear Clevis
- Oversize ports

UNIQUE APPLICATIONS SOMETIMES REQUIRE UNIQUE CYLINDERS

See our custom design capabilities on page 87

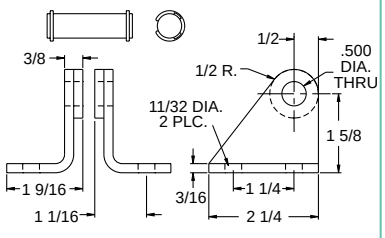
HB-100
St'd Clevis Brk't

Used on SMA 2 Stainless steel



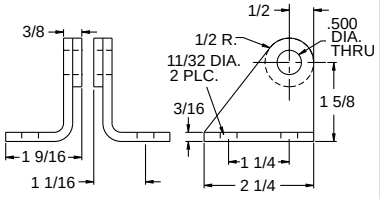
SS-100
St'd Clevis Brk't

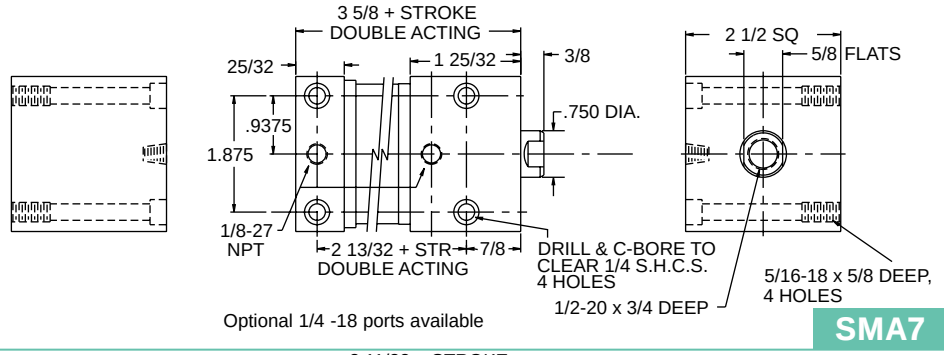
Used on SMA 2 Stainless steel



SS-100T
Trunnion Brk't

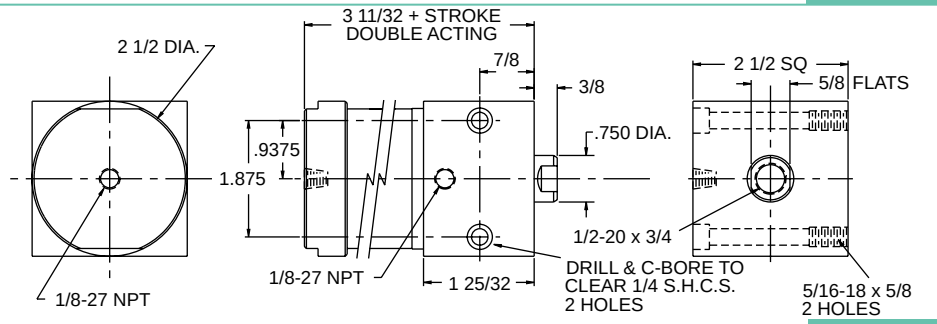
Used on SMA 10, 11 Stainless steel





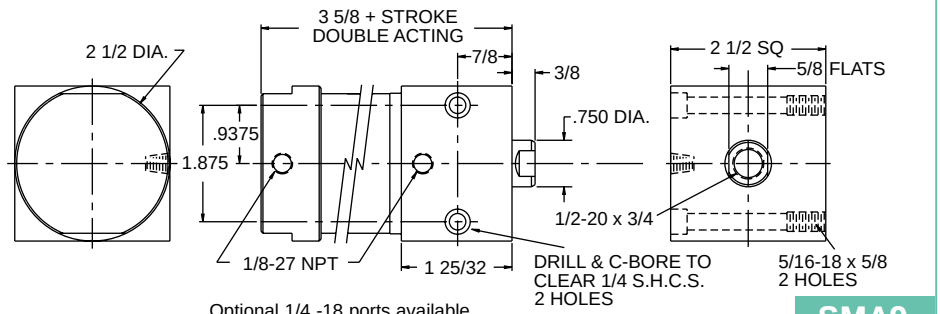
Optional 1/4 -18 ports available

SMA7



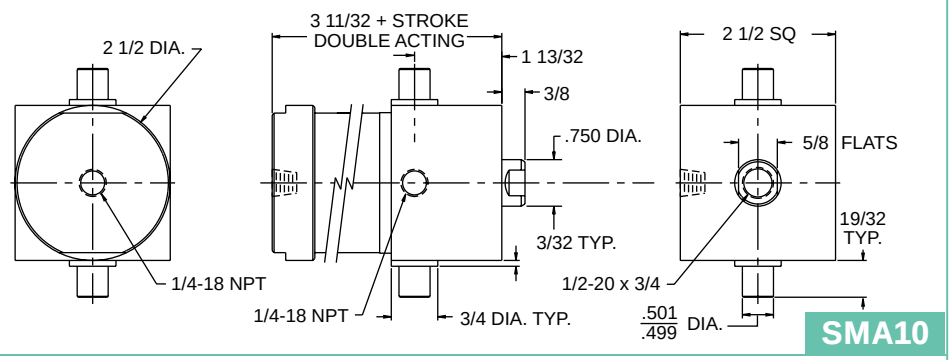
Optional 1/4 -18 ports available

SMA8

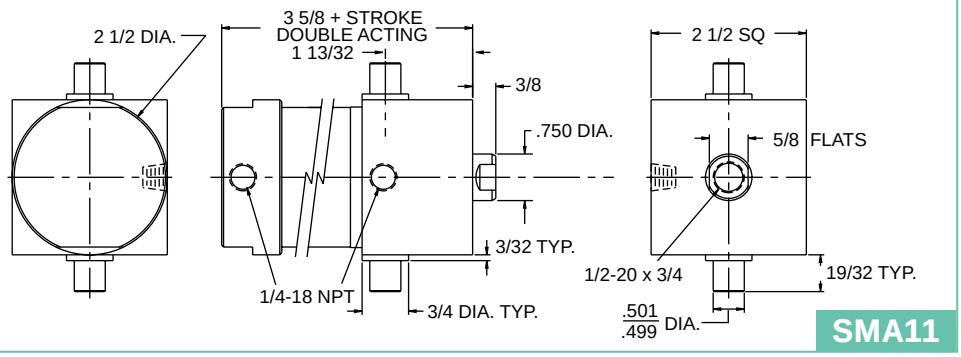


Optional 1/4 -18 ports available

SMA9



SMA10

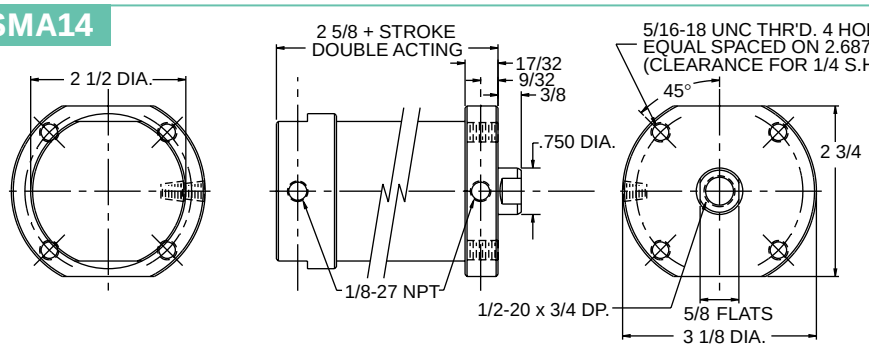


SMA11

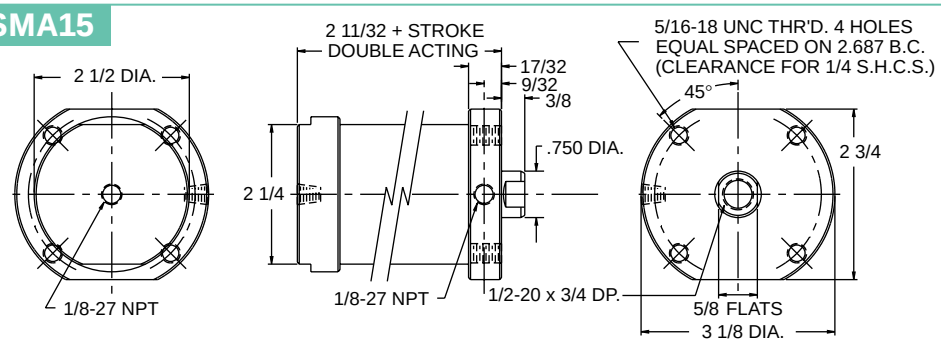
2” BORE SMA ALUMINUM

200 PSI MAX. AIR
400 PSI MAX. HYD. *Non shock*

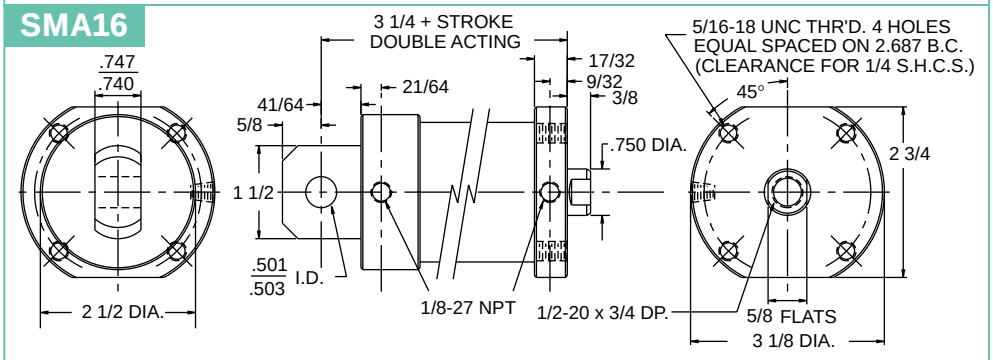
SMA14



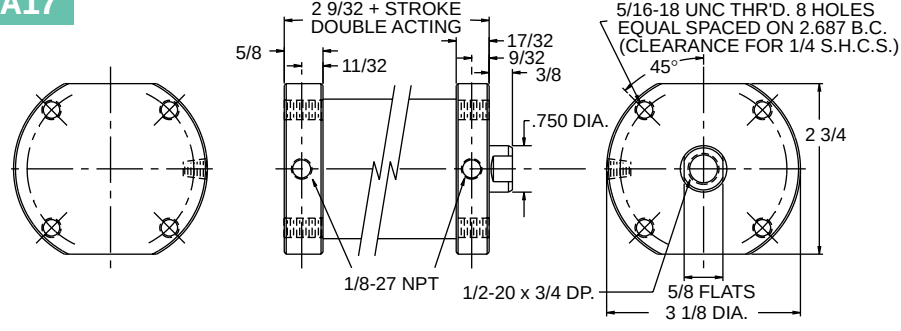
SMA15



SMA16



SMA17



For the ultimate in cycle life or where side load exists select the U cup piston with teflon wear strip

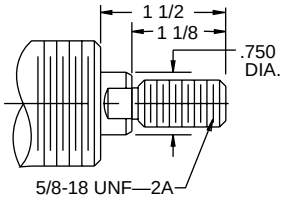
Adds 1/2” to length

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

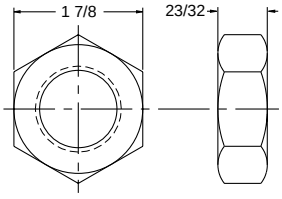
Optional Male Rod Thread



1 1/4-12 Nut

Nose Mounting Nut

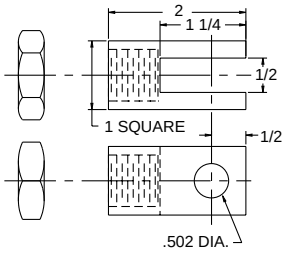
Not included with cylinder
Order Separately



HB-625

Rod Clevis & Nut

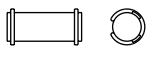
Zinc Plated Steel



HB-601

Clevis Pin Assembly

Used on HB 625
Stainless Pin/Steel Clips

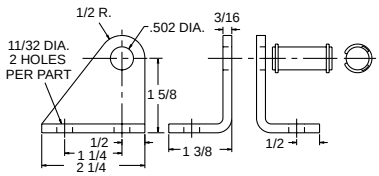


Adjustable stroke models – *Adjustment screw prevents the piston from fully retracting. Maximum adjustment is 1"*
Spherical mount models – *Eliminate side load where misalignment exists. Br'g is plated steel with teflon liner for non-lube service*

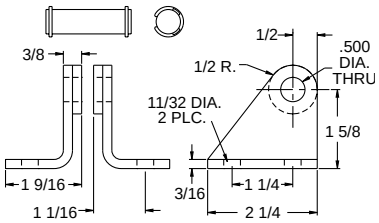
SMA Options

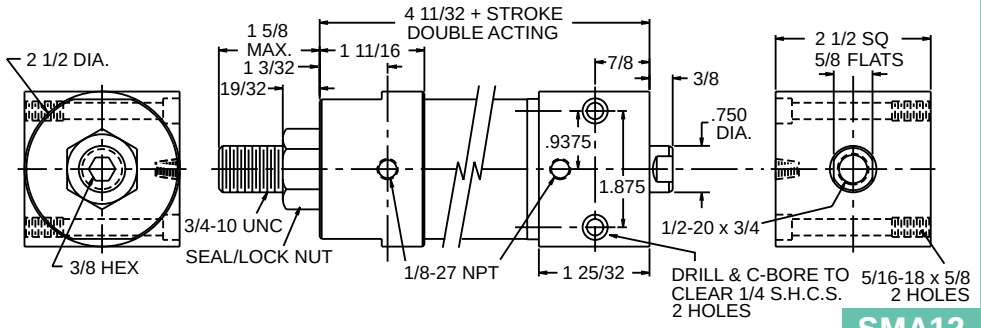
- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-Rotate (SMA12, 14, 15, 17, 20)
- 90° Rear Clevis

HB-100
St'd Clevis Brk't
Used on SMA 16 Stainless steel

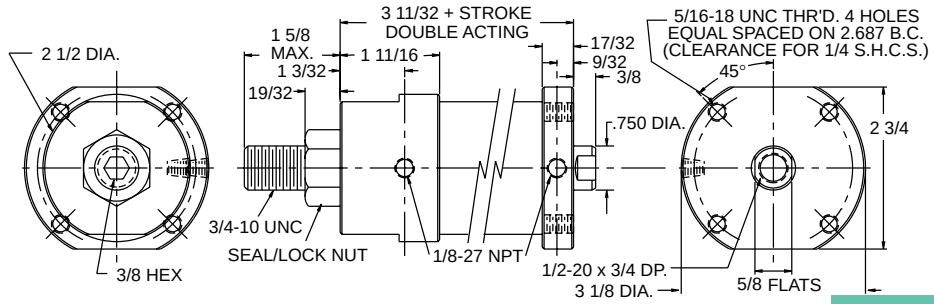


SS-100
St'd Clevis Brk't
Used on SMA 16 Stainless steel

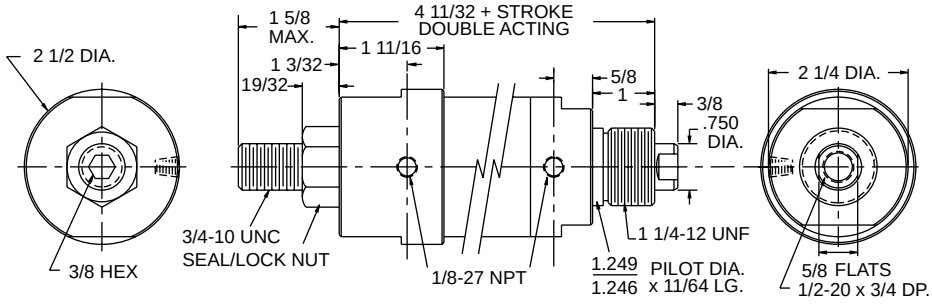




SMA12

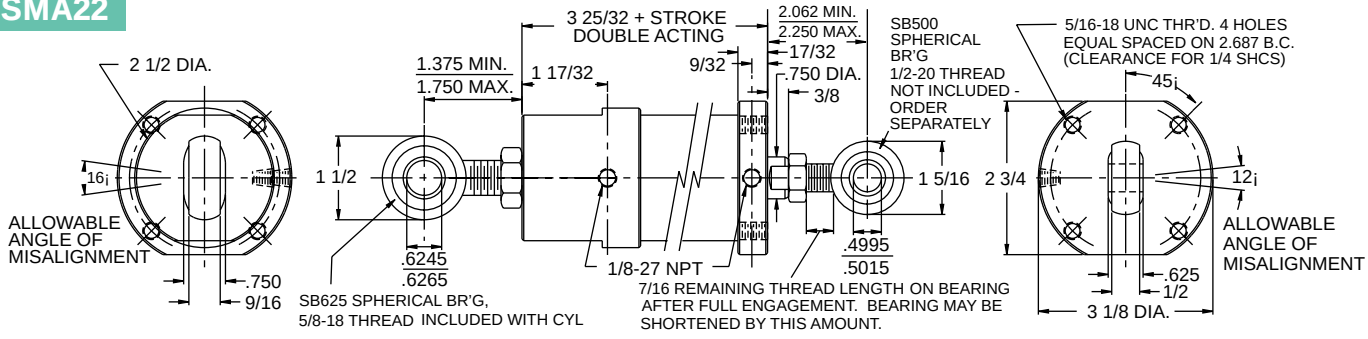


SMA20

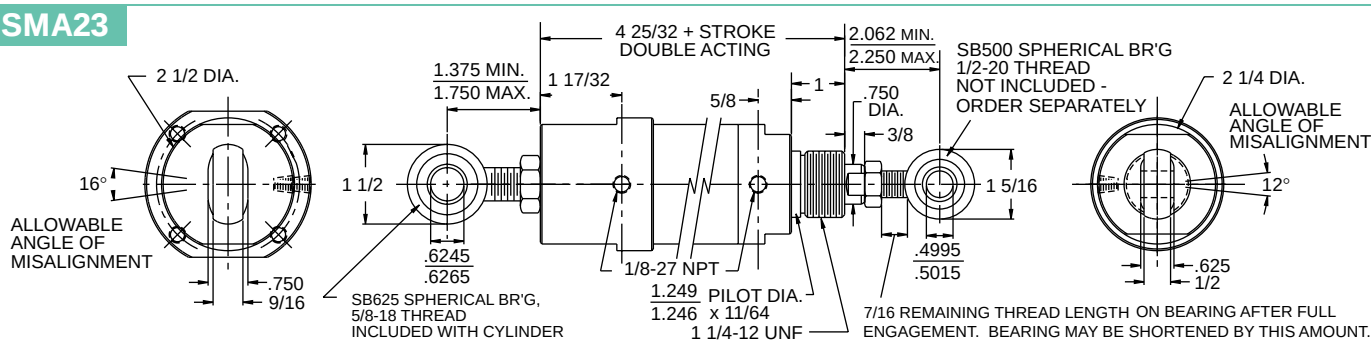


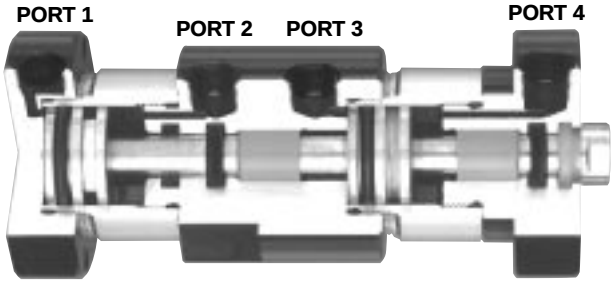
SMA21

SMA22



SMA23



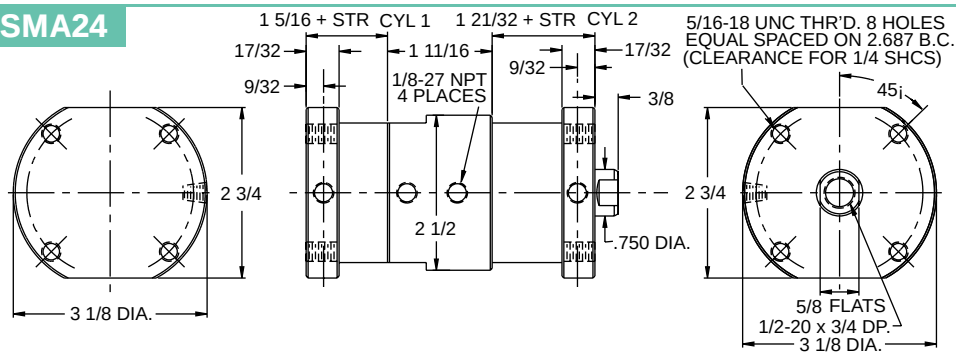


Three Position Cylinders are two in-line cylinders with a common cap but two separate and independent piston rods. By pressuring Port 1, 3, or 4, any combination of stroke 1 and total stroke may be achieved. Port 2 is a vent port only for Cylinder 1. In hydraulic applications it should be connected to a tank by a drain line.

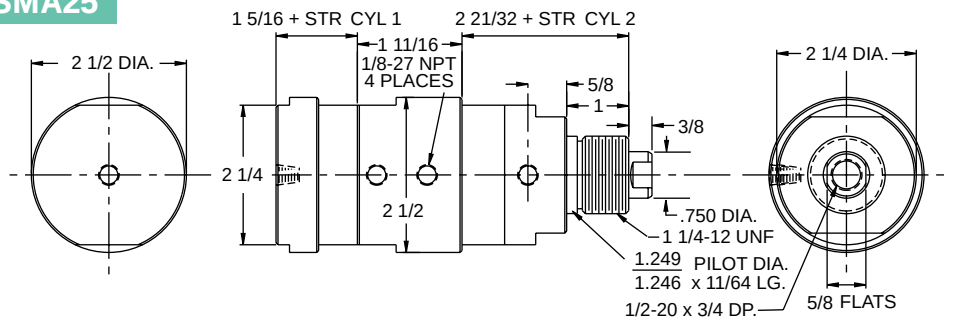
Pressurize Port 1 and Cylinder 1 will extend pushing Cylinder 2 by the same amount. Then pressurize port 3 and Cylinder 2 will extend further to its maximum length. Pressurize Port 4 and both cylinders will retract.

*Stroke of Cylinder 2 = TOTAL Stroke
EXAMPLE: If Cylinder 1 extends 2” when port 1 is pressurized, it will also push Cylinder 2 by 2”. If, when Port 3 is pressurized, Cylinder 2 moves an ADDITIONAL 11/2”. Then the total stroke of Cylinder 2 is 2” + 1 1/2” = 3 1/2”. Always specify the stroke of Cylinder 2 as the total stroke.

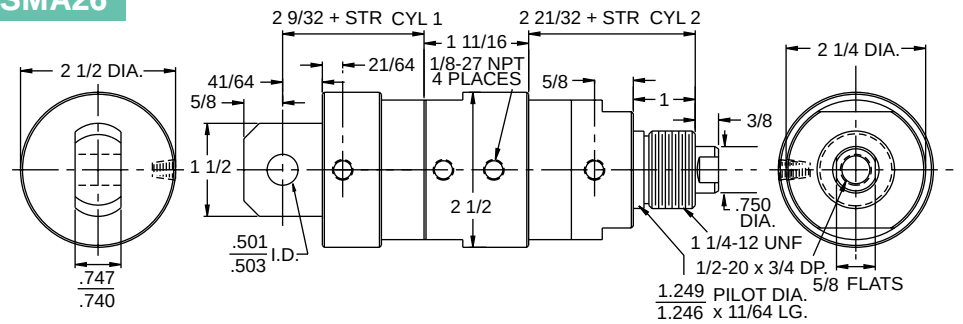
SMA24



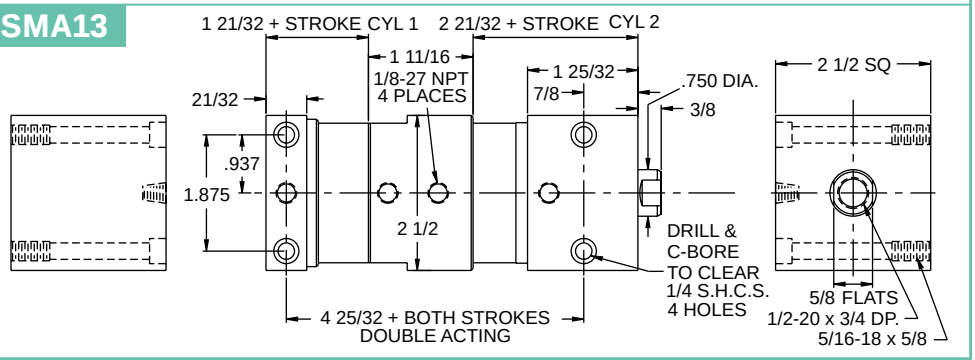
SMA25



SMA26



SMA13

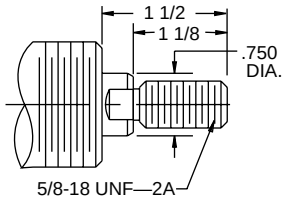


Spring Return 3 Position

Pneumatic only
Springs add to cyl. length
Cyl. #1 and/or Cyl. #2
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” not available

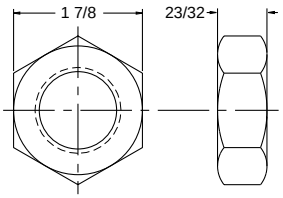
Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

Optional Male Rod Thread



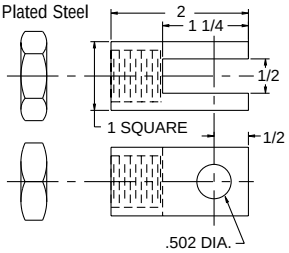
1 1/4-12 Nose Mounting Nut

Not included with cylinder
Order Separately



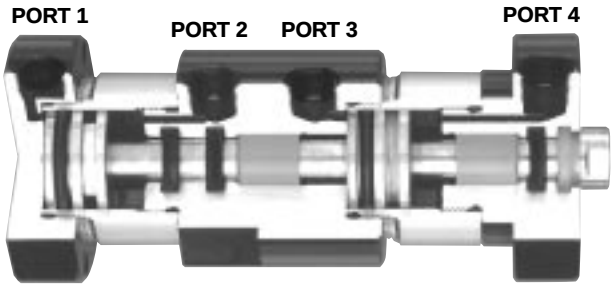
HB-625 Rod Clevis & Nut

Zinc Plated Steel



HB-601 Clevis Pin Assembly

Used on HB 625
Stainless Pin
/Steel Clips



Tandem Cylinders are two in-line cylinders of the same stroke length with a common cap. Both pistons are attached to a common rod. By simultaneously pressurizing Ports 1 and 3 or 2 and 4, the force on the piston rod is nearly doubled. This can be useful when more force is required, but the diameter of the cylinder cannot be increased due to size restrictions.

Tandem cylinders can can also be used as part of an air/oil system. Fill the front cylinder (Cyl.2) with oil and pipe its ports (3 & 4) in series using one or two flow controls. Using the rear cylinder (Cyl. 1) as an air powered driver, meter the oil from end to end on Cylinder 2. This will provide smooth, precise control of piston rod motion at all speeds.

A small reservoir of oil at 10-20 psi should be connected to Cylinder 2 if oil loss or expansion/contraction due to heat are a concern.

Tandem models double acting only
Spring return not available

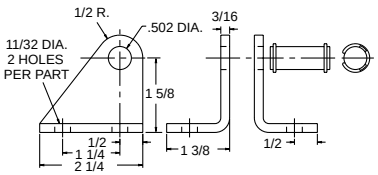
3 Position options

Viton seals
Non-lube service
Magnetic piston
U Cup piston
Non-rotate (SMA 13, 24)
90° Rear clevis
Shock pads not available

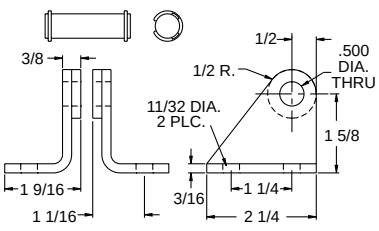
Tandem options

Viton seals
Non-lube service
90° Rear clevis
Shock pads not available
Magnetic piston not available
U cup piston not available
Non-rotate not available

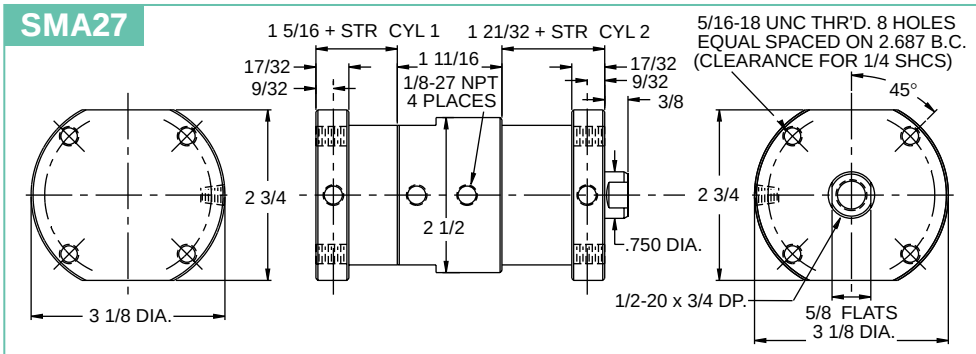
HB -100
Clevis Brk't
Used on SMA 2
Zinc plated steel



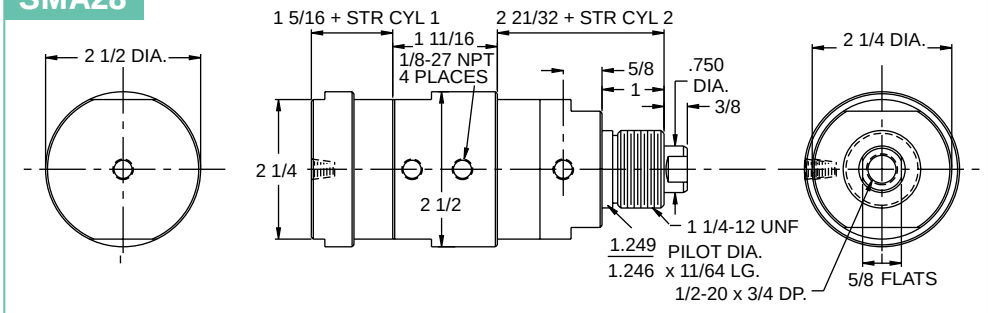
SS-100
St'd Clevis Brk't
Used on SMA 2
Zinc plated steel



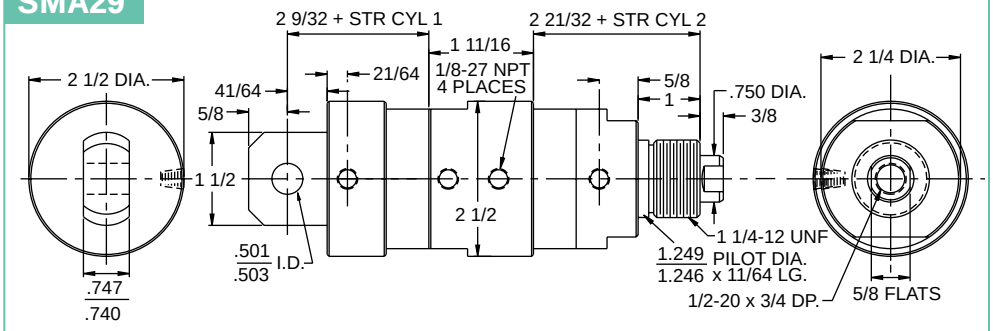
SMA27



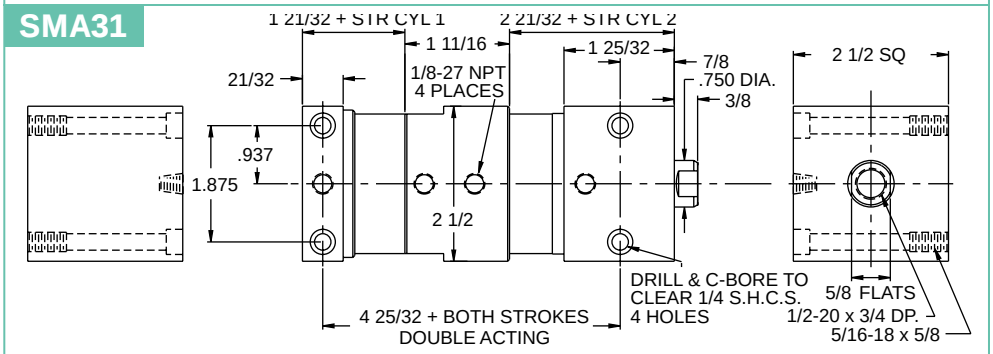
SMA28



SMA29

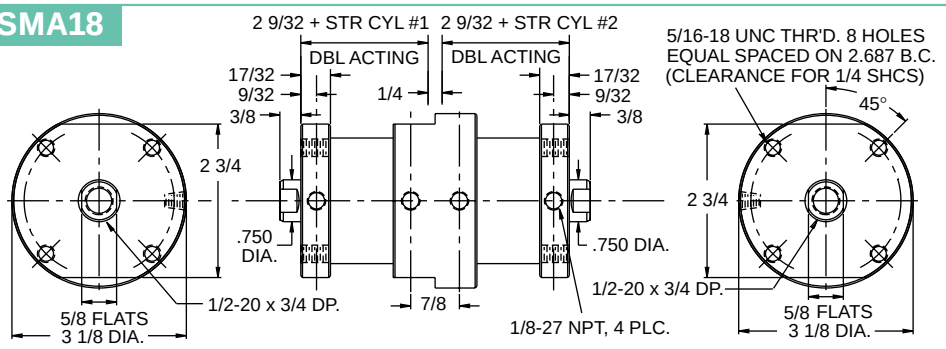


SMA31

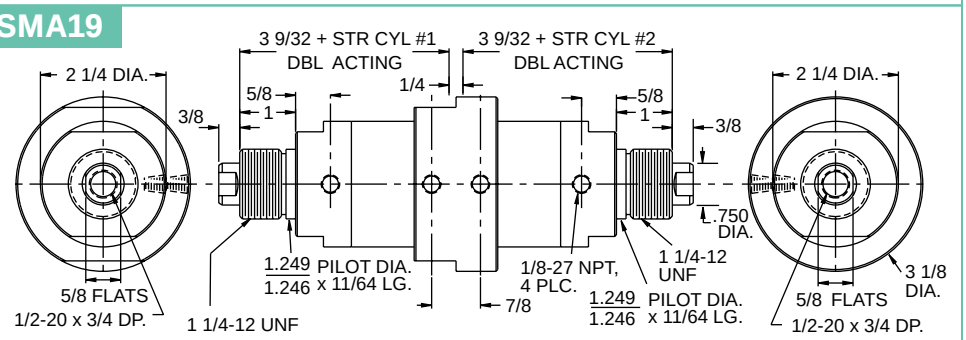


Back to back cylinders are simply two standard double acting or single acting spring return cylinders with a common cap. By proper valve sequencing, four distinct stroke lengths may be achieved.

SMA18



SMA19

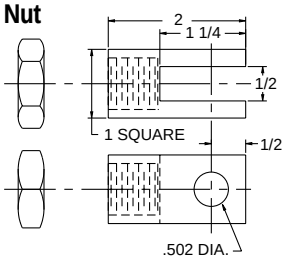


Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

HB-625 Rod Clevis & Nut



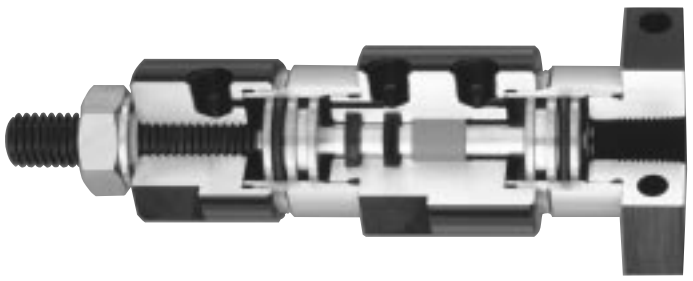
Zinc plated steel

HB-601 Clevis Pin Assembly

Used on HB 625
Stainless pin/ steel clips

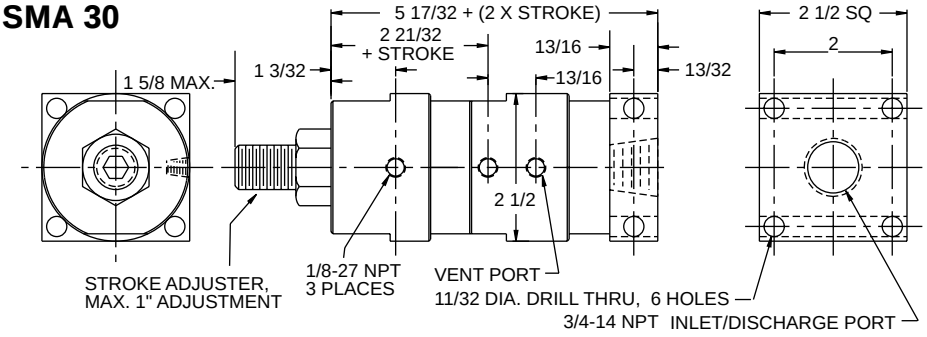
2” Bore SMA Volumetric Pump

VOLUMETRIC PUMPS measure and dispense specific volumes of fluid with compressed air. These tandem type cylinders have two pistons connected to a common rod. The air powered driver section is normally reciprocated with a four way valve. The inlet/discharge port is connected to a fluid supply line and a discharge line, both of which contain a check valve. On each stroke the pump section first draws in a specific volume of fluid from the supply line, and then forces it out the discharge line as both check valves shift. Maximum pressure of discharge fluid is approximatly equal to the air pressure on the driver section. Standard construction materials are the same as all SMA cylinders – anodized aluminum tube and end caps, stainless rod, and brass pistons. Other materials, including all stainless construction, are available. Special seal configurations are also available.



SMA 30 Volumetric Pumps are available only as double acting, pnueumatic, and in 1” increments of stroke. U cup piston and shock pads not available.

SMA 30



3" BORE SMA ALUMINUM

200 PSI MAX. AIR
250 PSI MAX. HYD. *Non shock*

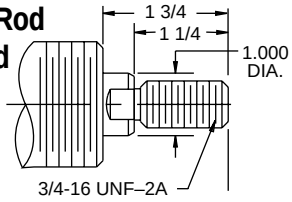
AURORA AIR PRODUCTS INC.

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

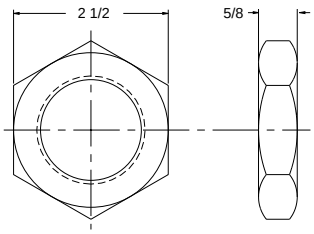
Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

Optional Male Rod Thread



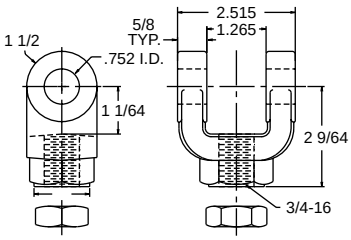
1 3/4 -12 Nut

Nose Mounting Nut
Not included with cylinder
Order Separately



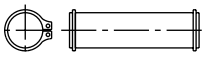
SMA-750

Rod Clevis & Nut
Plated steel



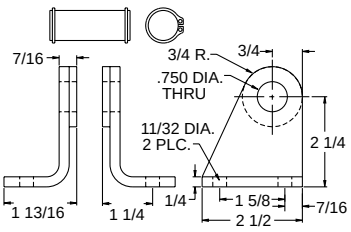
SMA-701

Clevis Pin Assembly
Used on SMA 750 Stainless pin/Steel clips



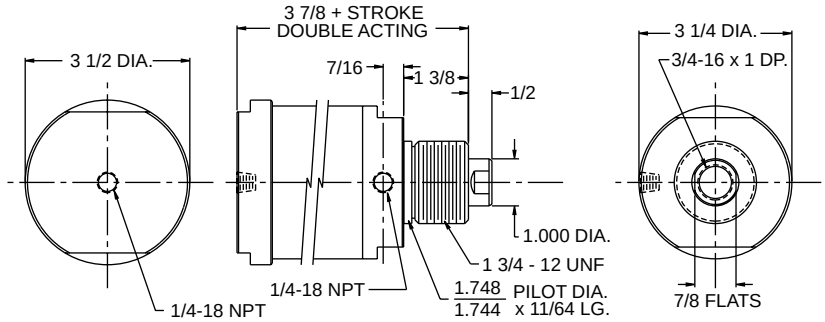
SSC-300 Clevis Brk't

Used on SMA 2 Stainless steel

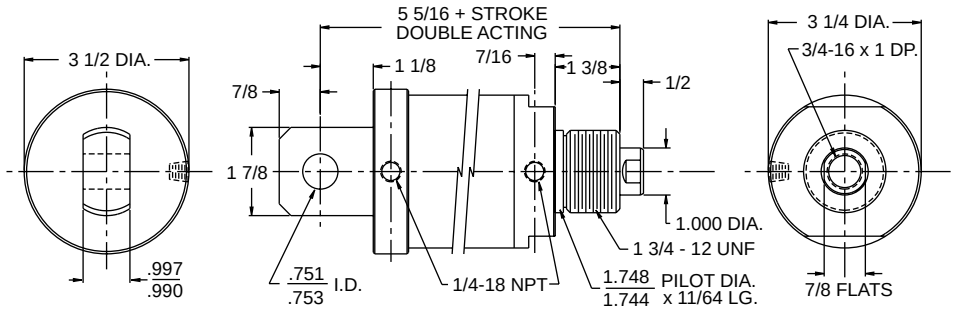


SMA Options

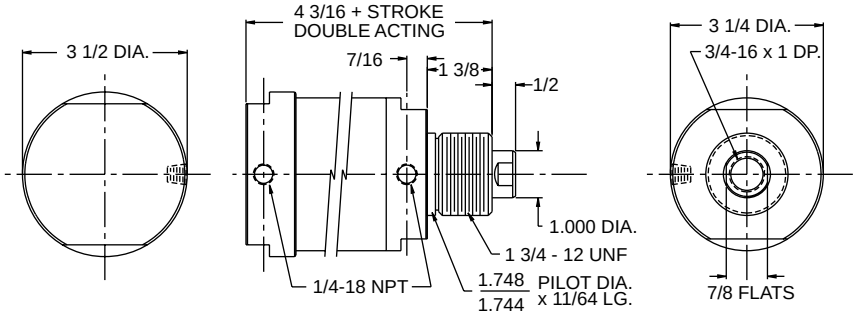
• Shock Pads • Viton Seals • Non-lube Service
• Magnetic Piston • U Cup Piston • 90° Rear Clevis



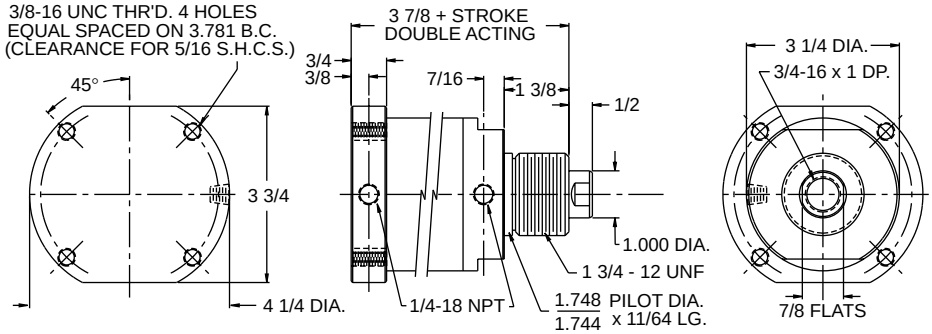
SMA1



SMA2

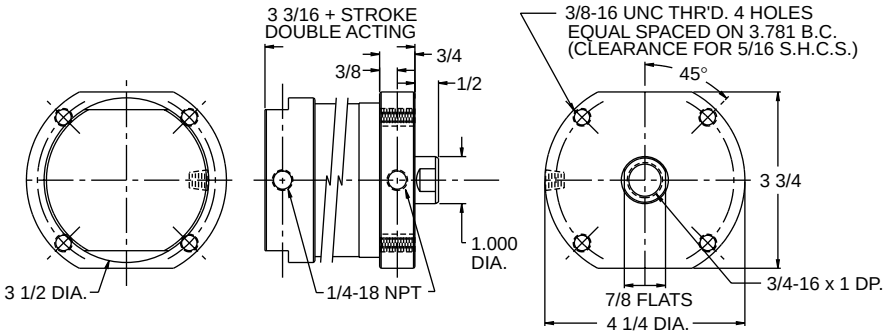


SMA3

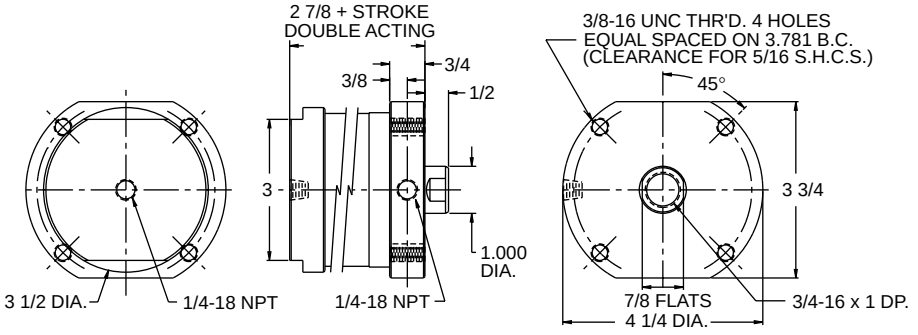


SMA5

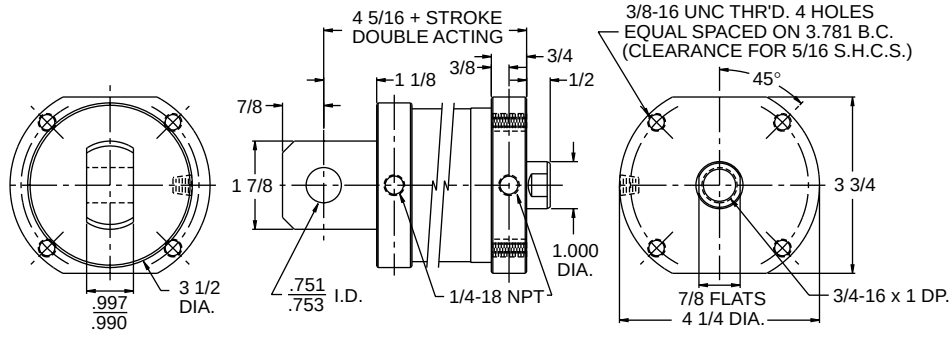
SMA14



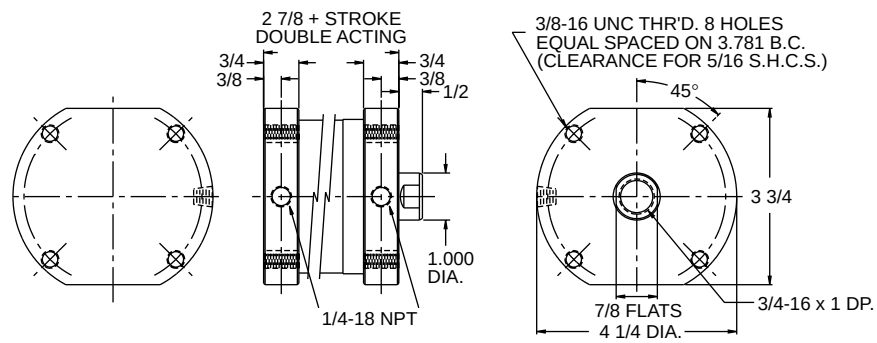
SMA15



SMA16



SMA17

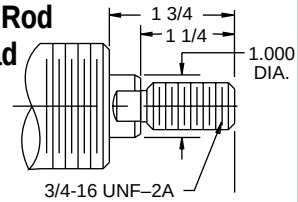


Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

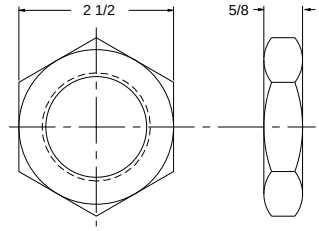
Optional Male Rod Thread



1 3/4 -12 Nut

Nose Mounting Nut

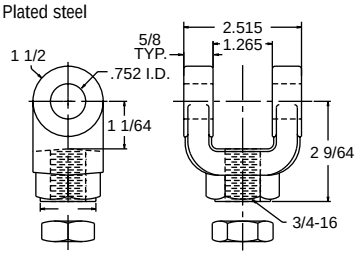
Not included with cylinder
Order Separately



SMA-750

Rod Clevis & Nut

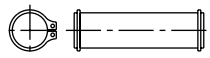
Plated steel



SMA-701

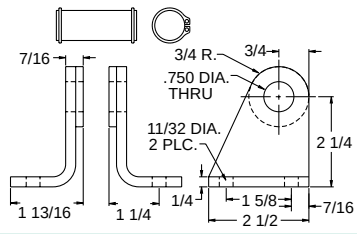
Clevis Pin Assembly

Used on SMA 750 Stainless pin/Steel clips



SSC-300 Clevis Brk’t

Used on SMA16 Stainless steel

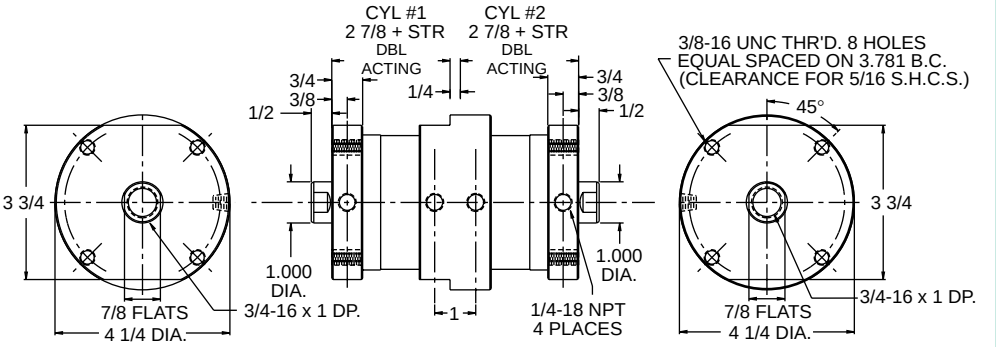


Back to Back models – *Back to Back cylinders are two standard cylinders with a common cap.*
Spherical mount models – *Eliminate side load where misalignment exists. Br'g is plated steel with teflon liner for non-lube service*

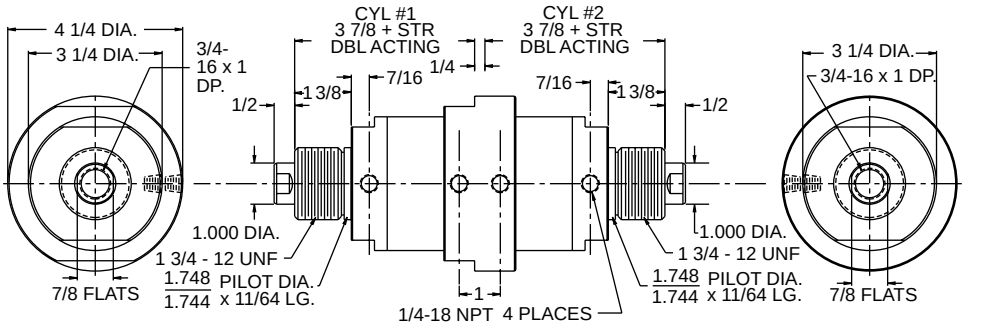
SMA Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- 90° Rear Clevis

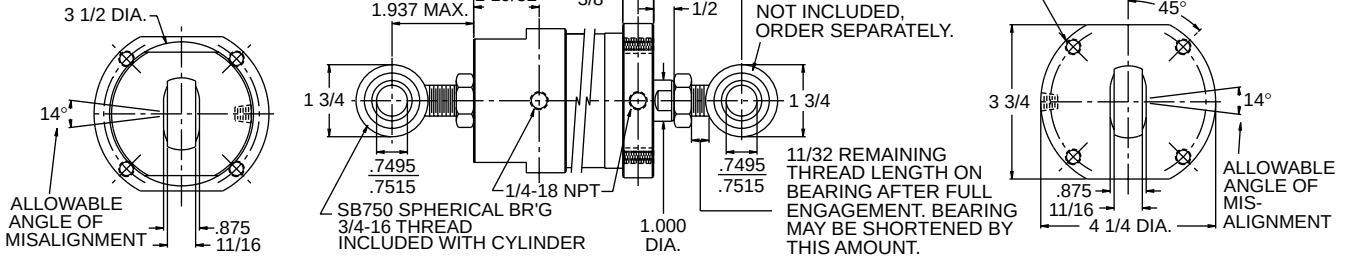
Breather Vents and Mufflers Protect Vent Ports from Dirt in Single Acting Cylinders.



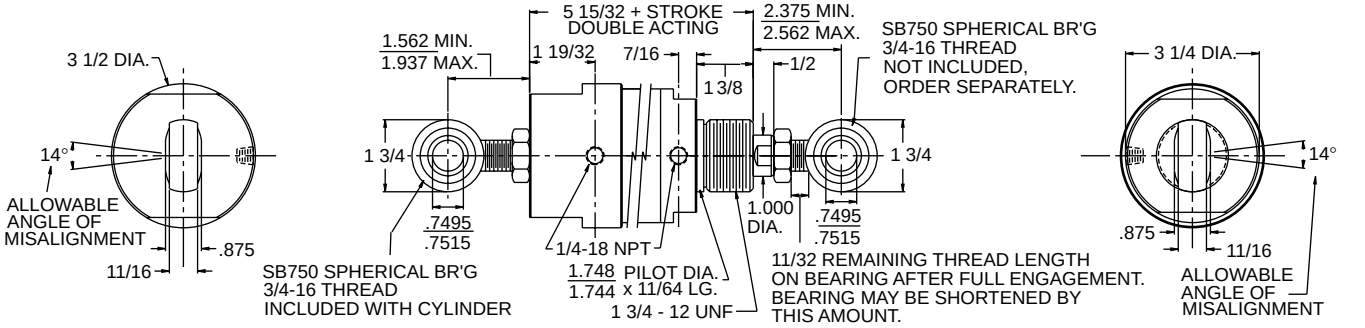
SMA18



SMA19



SMA22

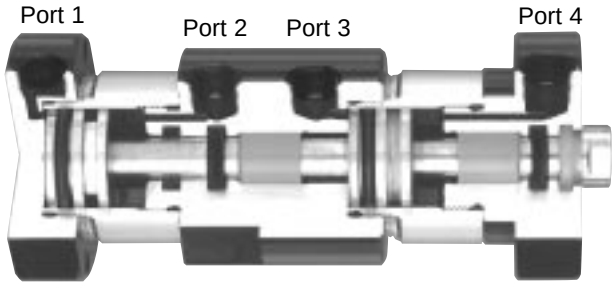


SMA23

3” BORE SMA ALUMINUM

3 Position models

200 PSI MAX. AIR
250 PSI MAX. HYD. *Non shock*

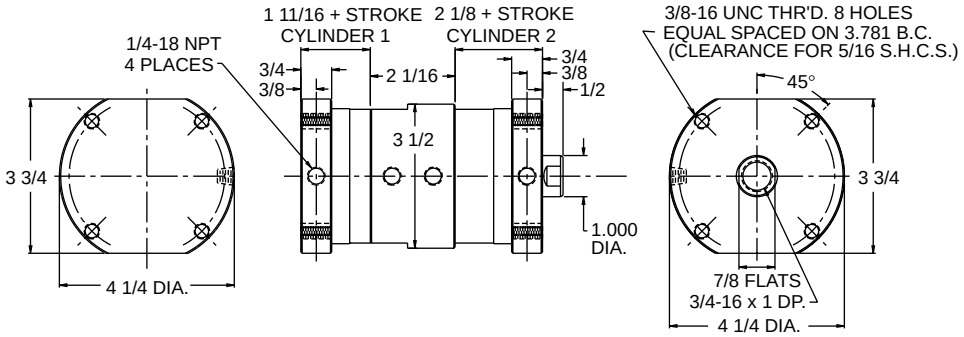


Three Position Cylinders are two in-line cylinders with a common cap but two separate and independent piston rods. By pressuring Port 1, 3, or 4, any combination of stroke 1 and total stroke may be achieved. Port 2 is a vent port only for Cylinder 1. In hydraulic applications it should be connected to a tank by a drain line.

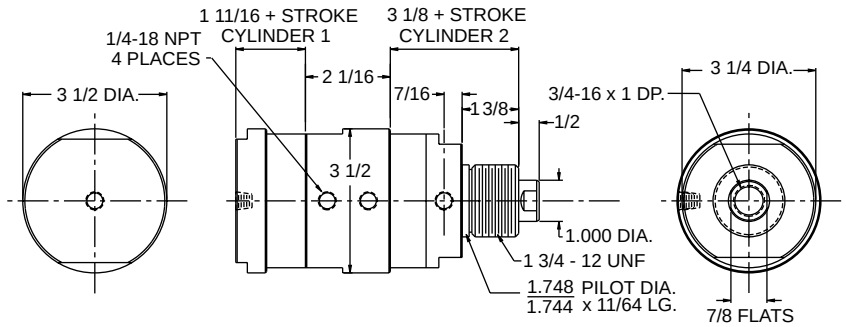
Pressurize Port 1 and Cylinder 1 will extend pushing Cylinder 2 by the same amount. Then pressurize port 3 and Cylinder 2 will extend further to its maximum length. Pressurize Port 4 and both cylinders will retract.

*Stroke of Cylinder 2 = TOTAL Stroke
EXAMPLE: If Cylinder 1 extends 2” when port 1 is pressurized, it will also push Cylinder 2 by 2”. If, when Port 3 is pressurized, Cylinder 2 moves an ADDITIONAL 11/2”. Then the total stroke of Cylinder 2 is 2” + 1 1/2” = 3 1/2”. Always specify the stroke of Cylinder 2 as the total stroke.

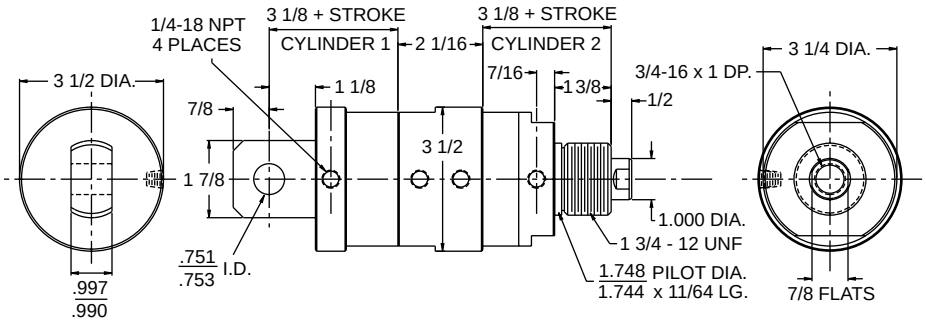
SMA24



SMA25



SMA26

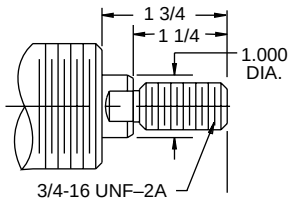


Spring Return 3 Position

Pneumatic only
Springs add to cyl. length
Cyl. #1 and/or Cyl. #2
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” not available

Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Plated steel

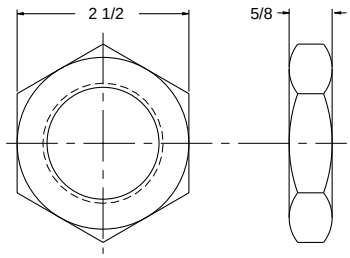
Optional Male Rod Thread



1 3/4 -12 Nut

Nose Mounting Nut

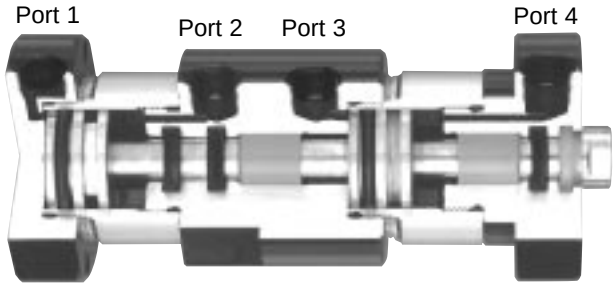
Not included with cylinder
Order Separately



3 Position options

Viton seals
Non-lube service
Magnetic piston
U Cup piston
90° Rear clevis

Shock pads not available



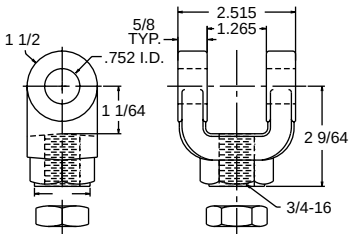
Tandem Cylinders are two in-line cylinders of the same stroke length with a common cap. Both pistons are attached to a common rod. By simultaneously pressurizing Ports 1 and 3 or 2 and 4, the force on the piston rod is nearly doubled. This can be useful when more force is required, but the diameter of the cylinder cannot be increased due to size restrictions.

Tandem cylinders can can also be used as part of an air/oil system. Fill the front cylinder (Cyl.2) with oil and pipe its ports (3 & 4) in series using one or two flow controls. Using the rear cylinder (Cyl. 1) as an air powered driver, meter the oil from end to end on Cylinder 2. This will provide smooth, precise control of piston rod motion at all speeds.

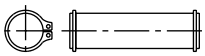
A small reservoir of oil at 10-20 psi should be connected to Cylinder 2 if oil loss or expansion/contraction due to heat are a concern.

Tandem models double acting only
Spring return not available

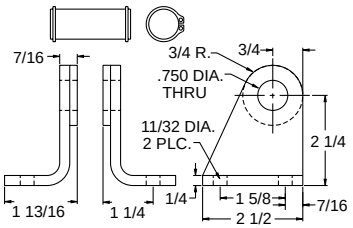
SMA-750
Rod Clevis & Nut
Plated steel



SMA-701
Clevis Pin Assembly
Used on SMA 750
Stainles pin/Steel clips



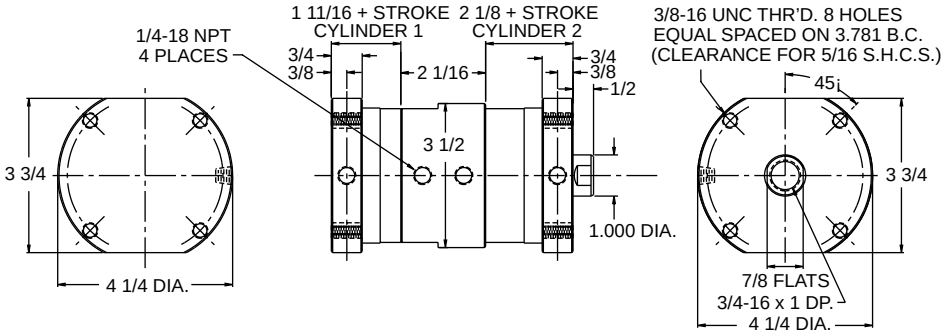
SSC-300
Clevis Bracket
Used on SMA 26, 29 Stainless steel



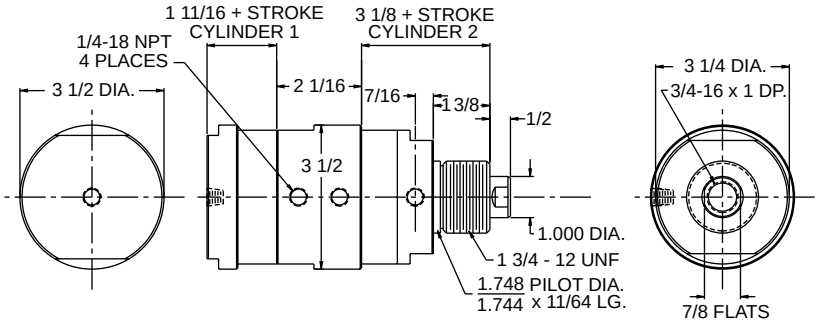
Tandem options
Viton seals
Non-lube service
90° Rear clevis

Shock pads not available
Magnetic piston not available
U cup piston not available

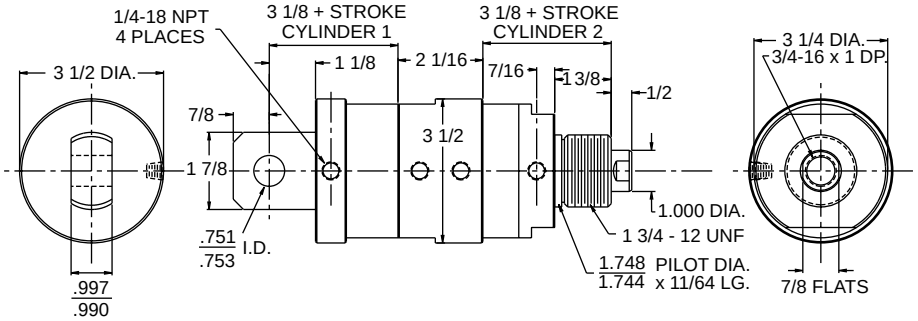
SMA27

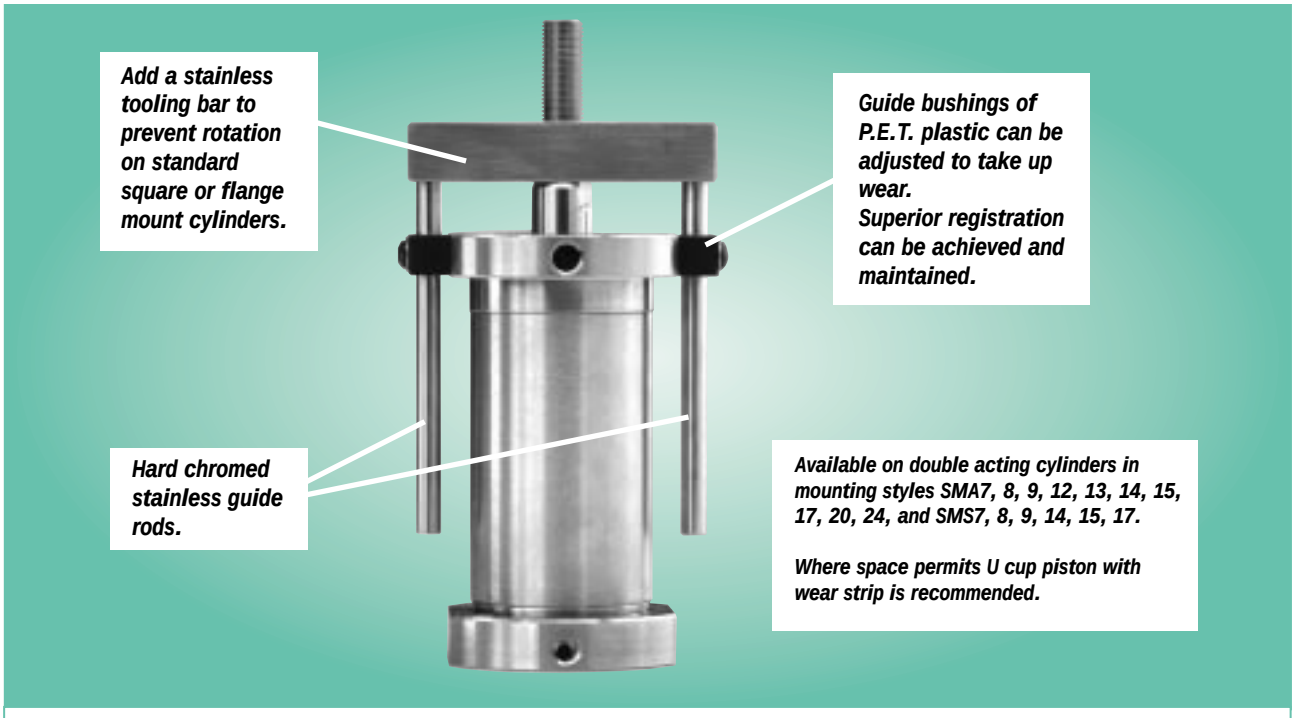


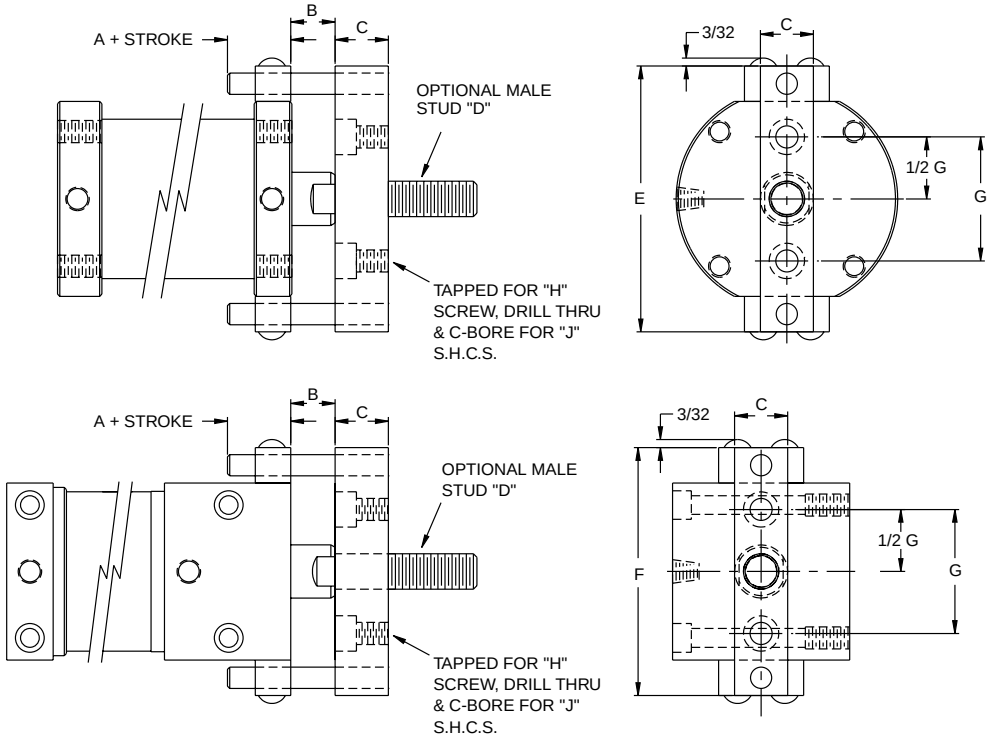
SMA28



SMA29







BORE	A	B	C	D	E	F	G	H	J
1 1/8	11/16	3/4	1/2	5/16-24 x 3/4	2 3/4	2 1/2	1.062	1/4-20	#10
1 1/2	11/16	5/8	5/8	3/8-24 x 1	3 1/4	3	1.250	5/16-18	1/4
2	9/16	5/8	3/4	1/2-20 x 1 1/4	3 3/4	3 1/2	1.750	5/16-18	1/4
3	NOT AVAILABLE								

ORDERING PROCEDURE - SMA Aluminum

Select code numbers/letters (**bold type**) from each of the six boxes below - then select options desired from the table below. List codes in the same sequence as shown.

Bore	Code
1 1/8"	**11**
1 1/2"	**15**
2"	**20**
3"	**30**

Type	Code
Double acting	**C**
Single acting spring return (Adds to cyl. length) Spring extend not available	**A**

Service	Code
Pneumatic	**E**
Hydraulic	**G**
SMA 30 always	**E**

Mounting Style/Code

SMA 1	**SMA 11**	**SMA 21**
SMA 2	**SMA 12**	**SMA 22**
SMA 3	**SMA 13***	**SMA 23**
SMA 5	**SMA 14**	**SMA 24***
SMA 6	**SMA 15**	**SMA 25***
SMA 7	**SMA 16**	**SMA 26***
SMA 8	**SMA 17**	**SMA 27***
SMA 9	**SMA 18***	**SMA 28***
SMA 10	**SMA 19***	**SMA 29***
	SMA 20	**SMA 30**
		SMA 31*

Stroke

Code is stroke in total 1/8" increments
Example: 1" stroke = **8**
2 1/4" stroke = **18**

Stocked in the following strokes:
1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2 and 1/2" increments to 10"

3" bore - Limited to 8" max. stroke

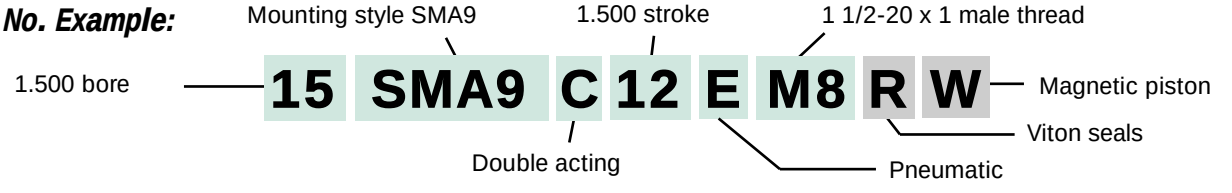
Note: SMA 27, 28, 29, 31 available only 1/2" increments

Piston Rod Codes

Bore	Thread		Code
1.125	3/8-24 x 3/4	Male	**M6**
1.125	5/16-18 x 5/8	Female	**F3**
1.125	5/16-24 x 5/8	Female	**F4**
1.500	1/2-20 x 1	Male	**M8**
1.500	3/8-16 x 5/8	Female	**F5**
1.500	3/8-24 x 5/8	Female	**F6**
2.000	5/8-18 x 1 1/8	Male	**M12**
2.000	1/2-20x 3/4	Female	**F8**
3.000	3/4-16 x 1 1/4	Male	**M10**
3.000	3/4-16 x 1	Female	**F10**
With non-rotate option enter code			**11**
For style SMA 30 enter code			**11**

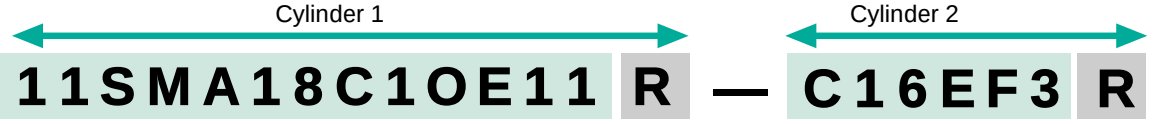
Option	Description		Code
Extra rod extension 1/4 " increments	Specify code letter **J** followed by extra length required as a two place decimal Example: **J.50** = 1/2" extra **J1.25** = 1 1/4"extra		**J**
Shock pads Pneu. only to 180° F Double acting only	Add to either or both ends in 1 1/8", 1 1/2", 2" bore up to 2" stroke. Over 2" stroke and on all 3" bore must be added to both ends Each pad adds 1/4" length — not available SMA 12, 13, 20, 21, 24, 25, 26, 27, 28, 29, 30, 31	Rod end only Cap end only Both ends	**L** **M** **N**
Non-lube service	Available on standard O ring Piston. Not available or necessary on U cup piston		**P**
Viton seals	Standard seals are nitrile and urethane +10 to +200° F For service –10 to +400° F specify viton		**R**
U cup piston	Extends cycle life and reduces friction Piston is aluminum and includes teflon wear strip — adds 1/2" to length Not available SMA 27, 28, 29, 30, 31		**S**
Clevis 90° to std	SMA 2, 16, 26, 29, only		**T**
Magnetic piston	Adds 1/2" to length — not available SMA 27, 28, 29, 31		**W**
Non rotate	Available only on double acting SMA 7, 8, 9, 12, 13, 14, 15, 17, 20, 24	with male stud without male stud	**X** **Y**
1/4" oversize ports	2" bore only — SMA 1, 2, 3, 6, 7, 8, 9, only Not available with option x,y		**Z**

Part No. Example:



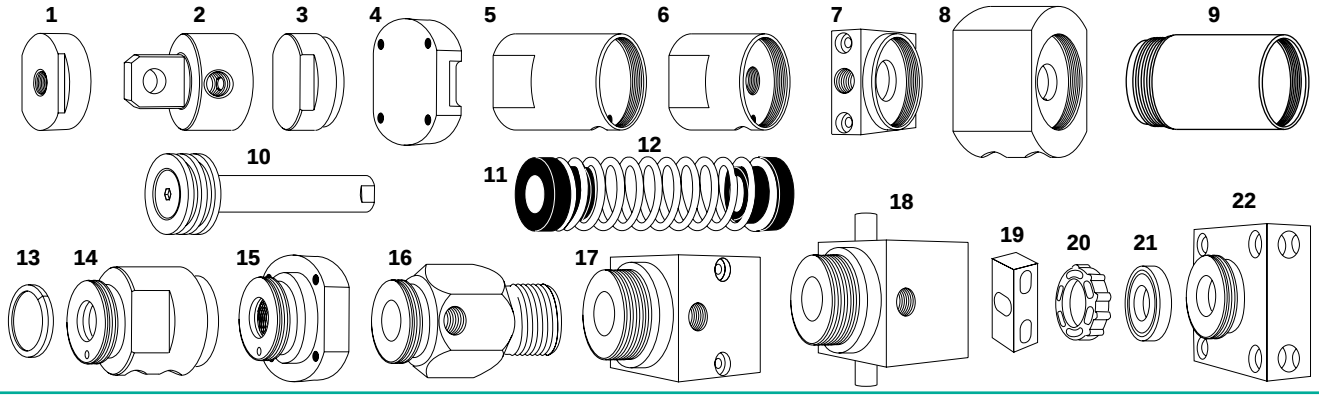
* These models are combinations of two cylinders with a common cap. The dimensional drawings illustrate them as being composed of a cylinder #1 section and a cylinder #2 section. The part number also contains 2 sections. Compose the part number for cylinder #1 as shown above. Mounting styles SMA 13, 24, 25, 26, 27, 28, 29, 31 will always have piston rod code II. Then add a dash (-) and the part number for cylinder #2 skipping the "bore" and "mounting style" codes and beginning with the "type" code.

Example:



SMA Service Parts

When ordering any repair part please provide the part number and description shown below along with the serial number and part number of the cylinder being serviced.



Key	Description		1 1/8 Bore	1 1/2 Bore	2 Bore	3 Bore
	Seal kits for standard cylinders with O ring piston — SMA 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 20, 21, 22, 23					
	Pneumatic, Nitrile	Add suffix NL for Non-Lube	SMA 3411	SMA 3415	SMA 3420	SMA 3430
	Pneumatic, Viton	Add suffix NL for Non-Lube	SMA 3411V	SMA 3415V	SMA 3420V	SMA 3430V
	Hydraulic, Nitrile		SMA 3511	SMA 3515	SMA 3520	SMA 3530
	Hydraulic, Viton		SMA 3511V	SMA 3515V	SMA 3520V	SMA 3530V
	Seal kits for standard cylinders with U cup piston — SMA 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 20, 21, 22, 23					
	Pneumatic, Nitrile		SMA 5411	SMA 5415	SMA 5420	SMA 5430
	Pneumatic, Viton		SMA 5411V	SMA 5415V	SMA 5420V	SMA 5430V
	Hydraulic, Nitrile		SMA 5511	SMA 5515	SMA 5520	SMA 5530
	Hydraulic, Viton		SMA 5511V	SMA 5515V	SMA 5520V	SMA 5530V
	Seal kits for combination cylinders with O Ring piston — SMA 13, 18, 19, 24, 25, 26, 27, 28, 29, 30, 31					
	Pneumatic, Nitrile	Add suffix NL for Non-Lube	SMA 3611	SMA 3615	SMA 3620	SMA 3630
	Pneumatic, Viton	Add suffix NL for Non-Lube	SMA 3611V	SMA 3615V	SMA 3620V	SMA 3630V
	Hydraulic, Nitrile		SMA 3711	SMA 3715	SMA 3720	SMA 3730
	Hydraulic, Viton		SMA 3711V	SMA 3715V	SMA 3720V	SMA 3730V
	Seal kits for combination cylinders with U cup piston — SMA 13, 18, 19, 24, 25, 26					
	Pneumatic, Nitrile		SMA 5611	SMA 5615	SMA 5620	SMA 5630
	Pneumatic, Viton		SMA 5611V	SMA 5615V	SMA 5620V	SMA 5630V
	Hydraulic, Nitrile		SMA 5711	SMA 5715	SMA 5720	SMA 5730
	Hydraulic, Viton		SMA 5711V	SMA 5715V	SMA 5720V	SMA 5730V
1	Rear port cap	Add suffix 250 for 2" bore 1/4 NPT	SMA 1011	SMA 1015	SMA 1020	SMA 1030
2	Rear pivot cap	Add suffix 250 for 2" bore 1/4 NPT	SMA 1111	SMA 1115	SMA 1120	SMA 1130
2	90° Rear pivot cap	Add suffix 250 for 2" bore 1/4 NPT	SMA 111190	SMA 111590	SMA 112090	SMA 113090
3	Side port cap	Add suffix 250 for 2" bore 1/4 NPT	SMA 4811	SMA 4815	SMA 4820	SMA 4830
4	Rear flange cap		SMA 1311	SMA 1315	SMA 1320	SMA 1330
5	Spherical bearing cap		SMA 2211	SMA 2215	SMA 2220	SMA 2230
6	Adjustable stroke cap		SMA 2011	SMA 2015	SMA 2020	
7	Square cap	Add suffix 250 for 2" bore 1/4 NPT	SMA 4611	SMA 4615	SMA 4620	
8	Back to back body		SMA 1811	SMA 1815	SMA 1820	SMA 1830
9	Tube		part No. is T followed by the complete cylinder part number			
10	Piston rod assembly		part No. is PR followed by the complete cylinder part number			
11	Spring guide	Pair	SMA 1211	SMA 1215	SMA 1220	SMA 1230
12	Spring		11215	15015	20015	20015
13	Magnet	SMS5911 and SS3215 supplied in pairs	SMS 5911	SS 3215	SS 3220	SS 3230
14	3 position/Tandem/Pump body		SMA 2411	SMA 2415	SMA 2420	SMA 2430
15	Flange head	Add suffix NR for non-rotate	SMA 1411	SMA 1415	SMA 1420	SMA 1430
16	Nose Mount Head	Add suffix 250 for 2" bore, 1/4 NPT	SMA 0111	SMA 0115	SMA 0120	SMA 0130
17	Short square Head	Add suffix 250 for 2" bore, 1/4 NPT	SMA 4411	SMA 4415	SMA 4420	
17	Long square Head	Add suffix 250 for 2" bore, 1/4 NPT	SMA 4511	SMA 4515	SMA 4520	
17	Square non rotate head		SMA 4511NR	SMA 4515NR	SMA 4520NR	
18	Trunnion head		SMA 4511T	SMA 4515T	SMA 4520T	
19	Non-rotate guide bushing	Pair	SMS 5111	SMS 5111	SMS 5111	
20	Cap end shock pad			Consult factory		3MSP
21	Head end shock pad		11CSP	15CSP	2CSP	3MSP
22	SMA 30 cap		SMA 6011	SMA 6015	SMA 6020	

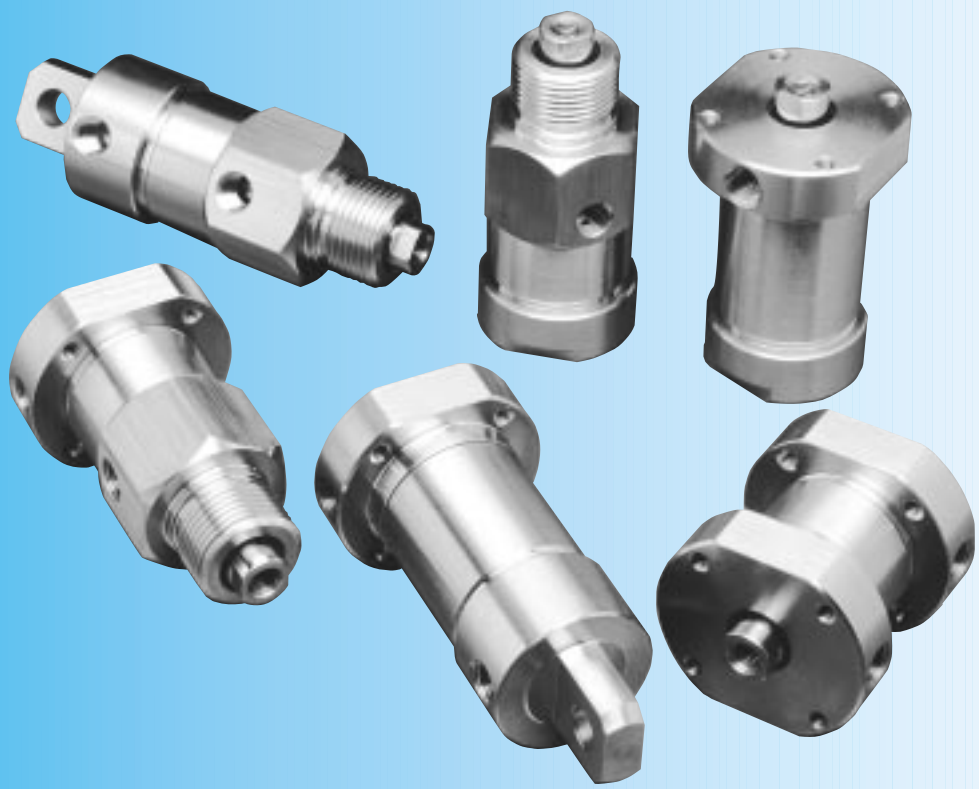
SMS Solid Stainless Cylinders

Space Saving and Conventional Lengths

Pneumatic to 200 PSI

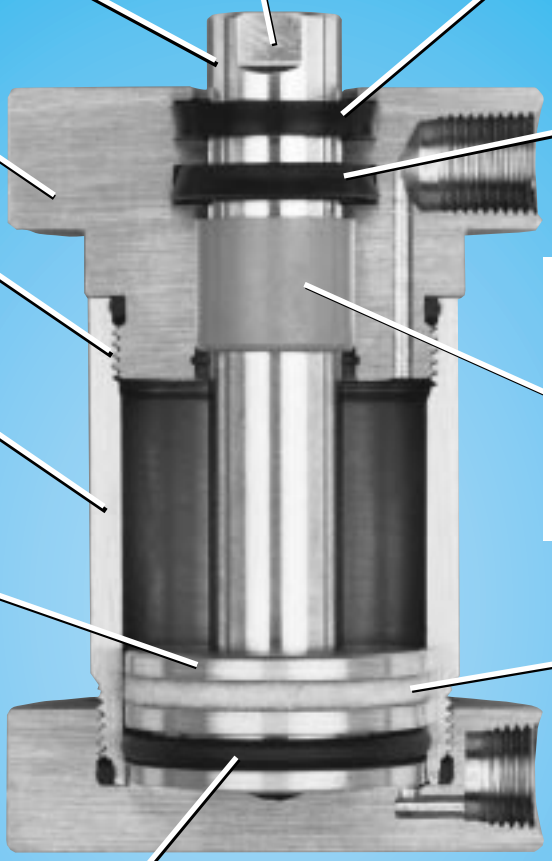
Hydraulic 400 to 500 PSI Non shock

1 1/8", 1 1/2", 2", 3" Bore



300 Series Stainless Exterior Assures Aesthetics and Function in Washdown Applications or other Harsh Environments

SMS DESIGN FEATURES



Rod extension/wrench flats are long enough to fit standard wrenches.

Special heavy duty wiper not only seals out solid contaminants but also effectively prevents liquids and gases from entering the cylinder interior.

Piston rod is hard chrome plated type 303 stainless

End caps are type 303 stainless steel

Pneumatic rod seal is a "longlife" nitrile cup. Hydraulic rod seal is pressure energized and extra long wearing for improved sealability.

Clean crevice free threaded construction assures maximum strength and allows easy wash down

Composite rod bushing has high temperature capability and excellent chemical resistance. Solid lubricant fillers provide excellent wear characteristics for non-lube service. The bearing is inboard of the wiper and seal, away from the environment

Heavy 1/8" wall type 304 stainless tube is precision honed

Brass or aluminum piston is attached with a high strength threaded joint.

Optional wick provides teflon lube for non-lube service on O ring piston.

Reduce noise and fatigue problems such as rod breakage with urethane/nitrile shock pads. Add 1/4" to the cylinder length for each pad. Pneumatic use only to 180° F.

Standard piston seal is large cross section O ring. Compounds are carefully selected for maximum cycle life. Optional U cup piston seals with teflon wear strip stretch the limits of service even futher. Reduce friction and operate without lube in the severest applications while extending or eliminating the service interval.

If space permits for applications involving side loads or long strokes, select SMS 1, 2, 3, 5, 7, 8, 9, which have extra long bearings with added space between support points.

Strokes longer than the maximum listed in the ordering procedure can be produced but careful consideration must be given to how the cylinder is applied — how well is the load supported or guided, is the cylinder used in push or tension, is the cylinder vertical or horizontal, etc. Consult factory on all strokes longer than standard.
Stroke increments other than standard can also be made.
Special lengths are generally available in a few days and are priced as "non-standard" strokes.

AURORA AIR PRODUCTS INC. TM

SMS Options

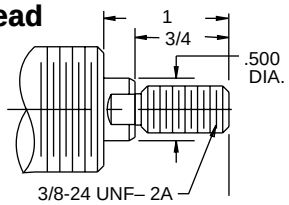
- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- 90° Rear Clevis

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

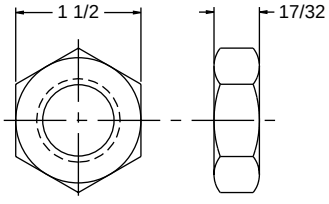
Spring force
Fully extended—8#
Fully compressed—22#
Spring material—Stainless steel

Optional Male Rod Thread



1-14SS Nut

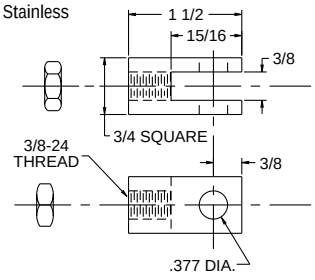
Nose Mounting Nut
Not included with cylinder Order Separately



18-8 Stainless

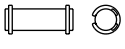
SS-375

Rod Clevis & Nut
303 Stainless

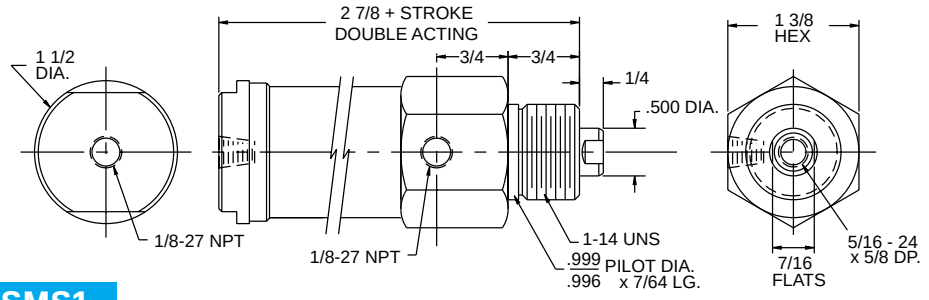


SS-301

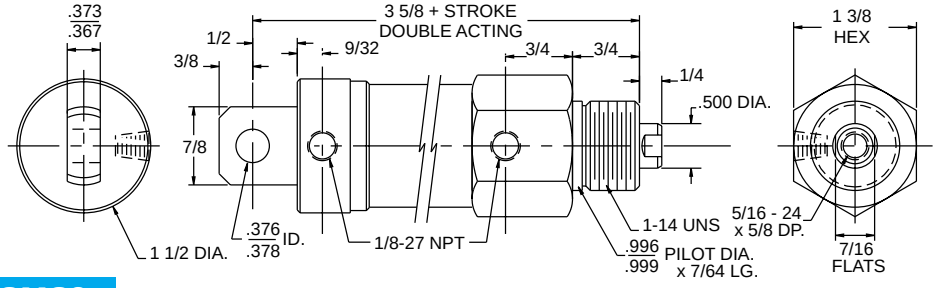
Clevis Pin assembly
Used on SS-375
303 Stainless



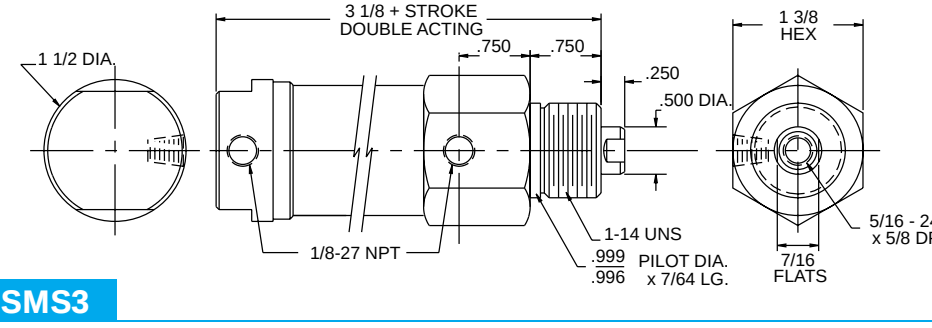
SMS1



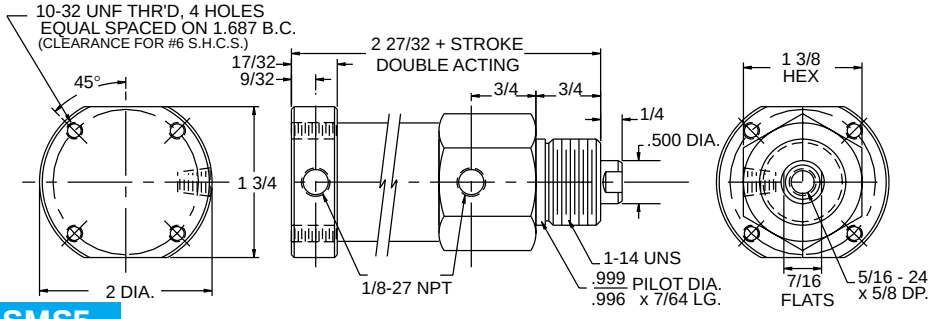
SMS2



SMS3

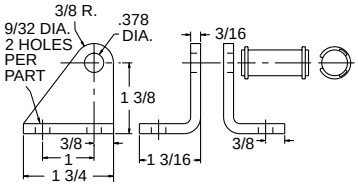


SMS5



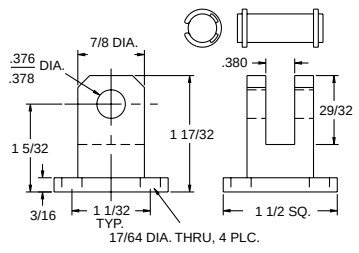
SS-90

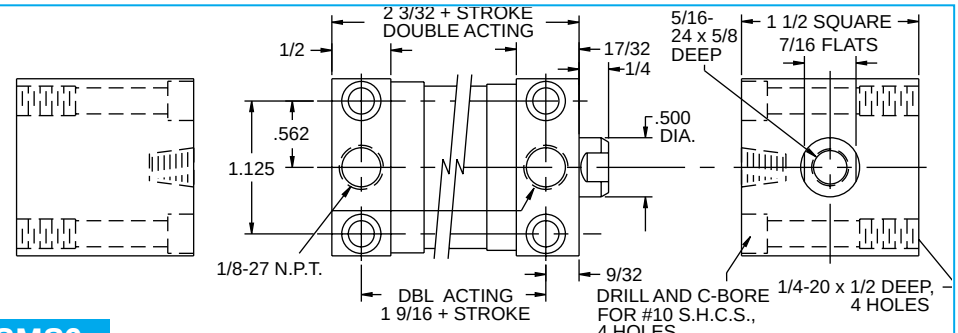
St'd Clevis Brk't
Used on SMS 2
Series 300 Stainless



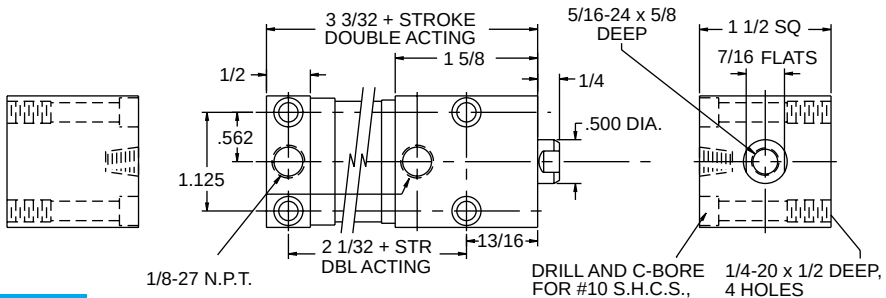
SSC-40

Low Profile Clevis Brk't
Used on SMS 2
303 Stainless

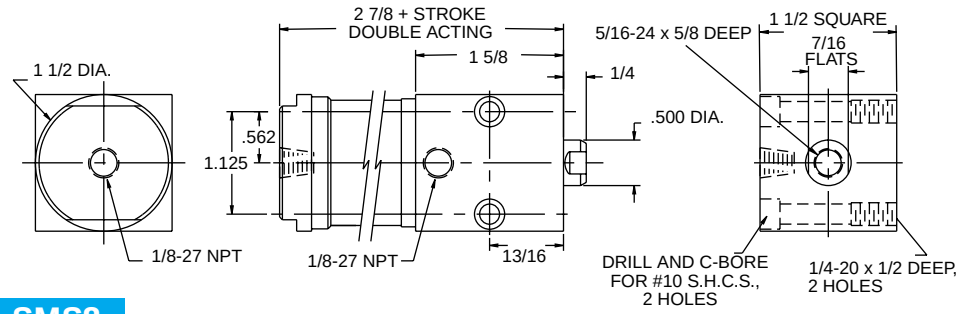




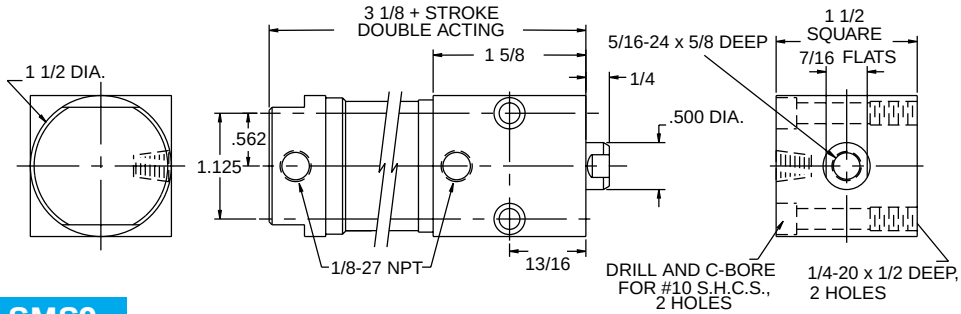
SMS6



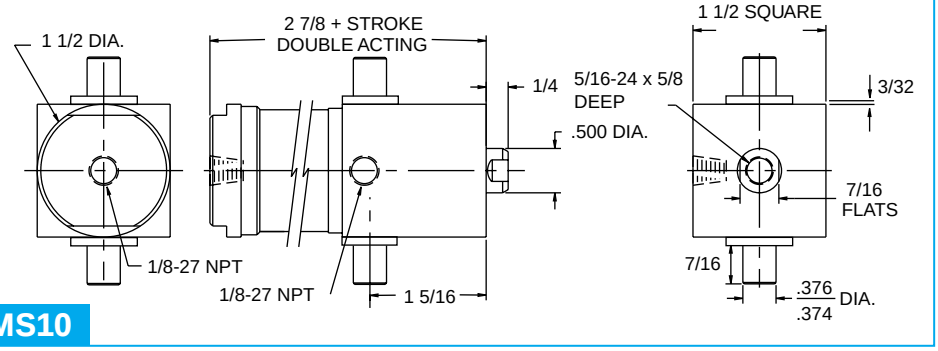
SMS7



SMS8



SMS9



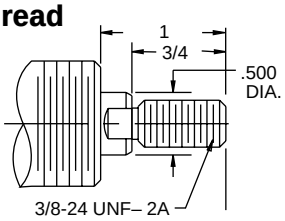
SMS10

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—8#
Fully compressed—22#
Spring material—Stainless steel

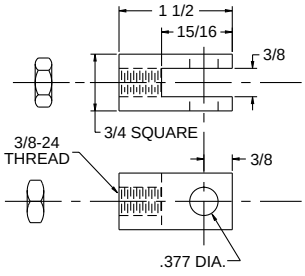
Optional Male Rod Thread



WHEN YOU'VE FINALLY HAD IT WITH PLATED CYLINDERS . . .
AURORA
AIR PRODUCTS INC.
™

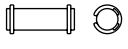
SS-375

Rod Clevis & Nut
303 Stainless



SS-301

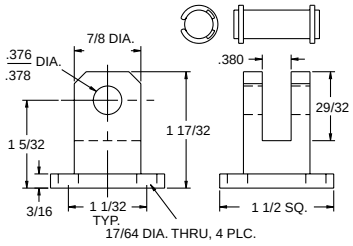
Clevis Pin assembly
Used on SS-375
303 Stainless



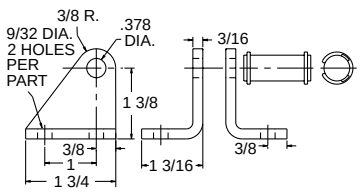
SMS Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate
  (SMA 7, 8, 9, 14, 15, 17)
- 90° Rear Clevis

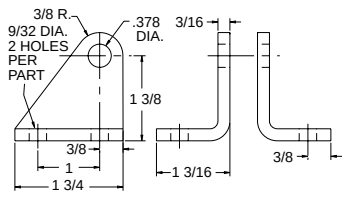
SSC-40
Low Profile Clevis Brk't
Used on SMS16 303 Stainless



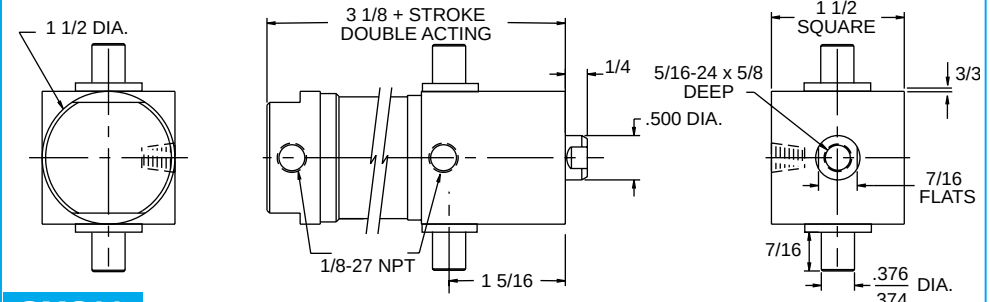
SS-90
St'd Clevis Brk't
Used on SMS 16
Series 300 Stainless steel



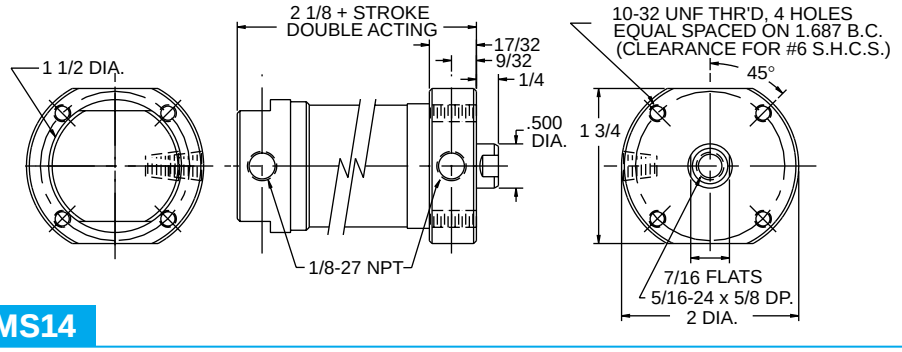
SS-90T
Trunnion Brk't
Used on SMS 10, 11 304 Stainless



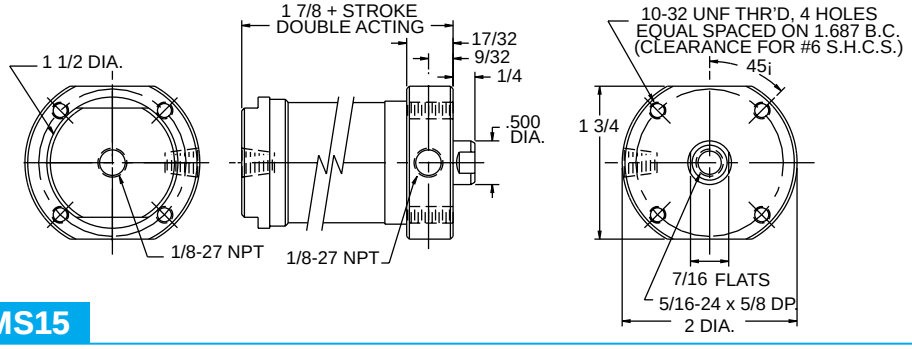
RAISE THE BAR FOR YOUR COMPETITORS BY SELECTING AURORA SOLID STAINLESS PRODUCTS



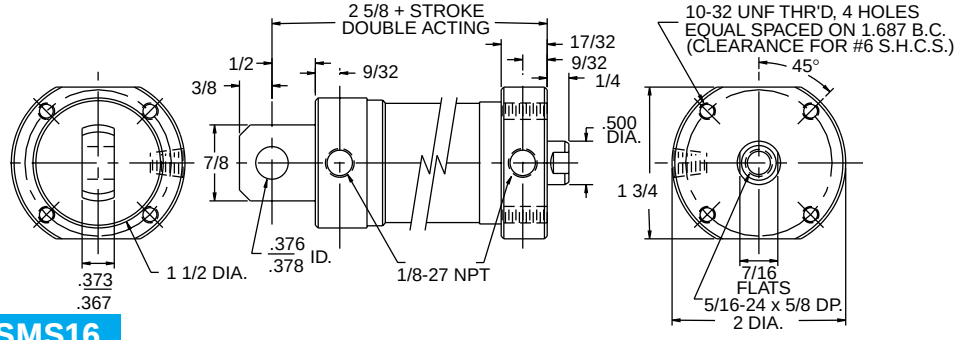
SMS11



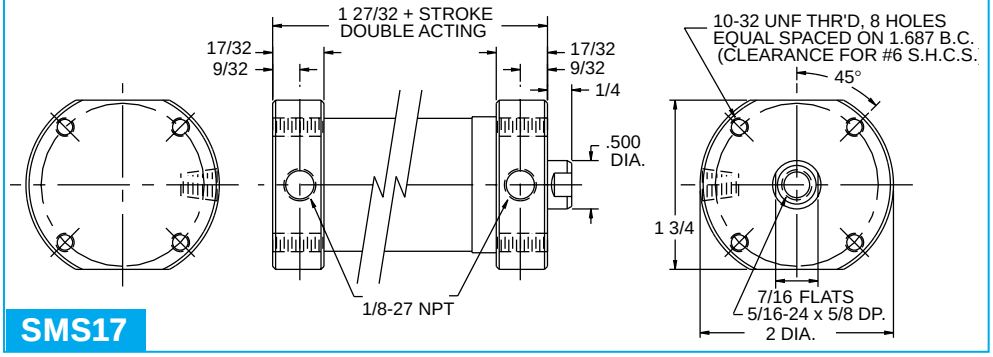
SMS14



SMS15



SMS16

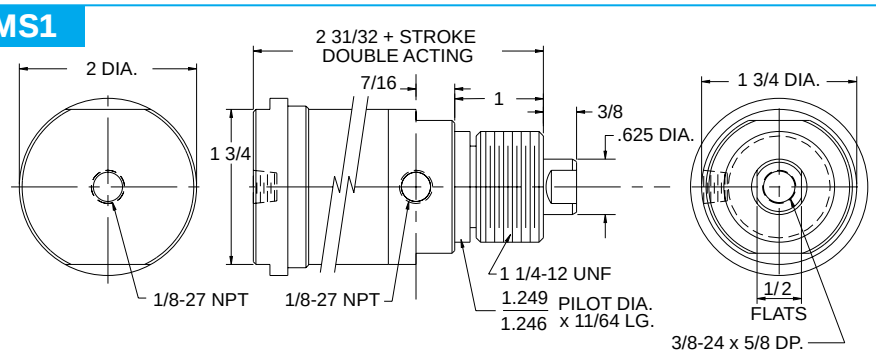


SMS17

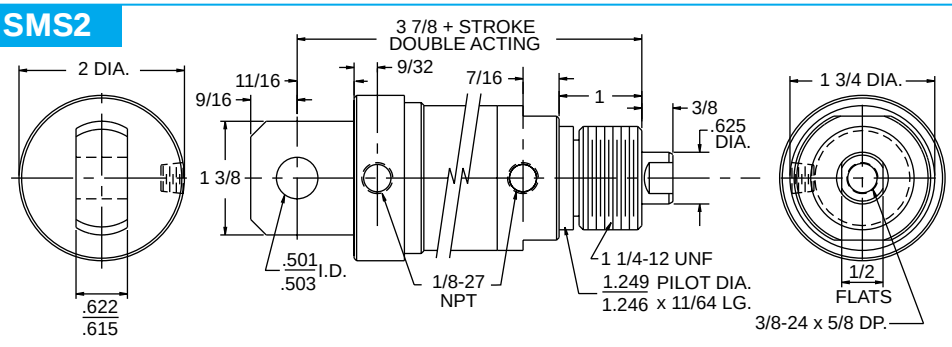
1 1/2" BORE SMS STAINLESS

200 PSI MAX. AIR
500 PSI MAX. HYD. Non shock

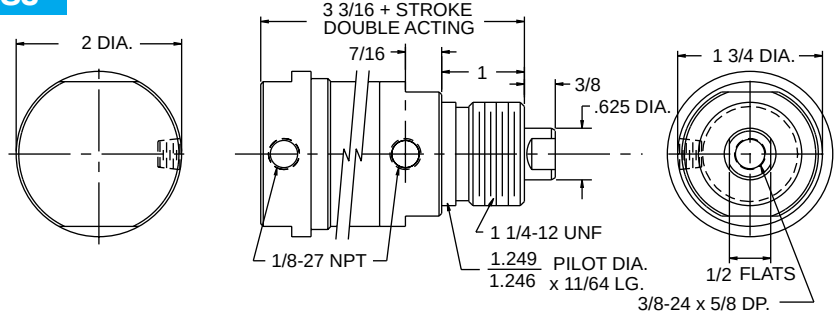
SMS1



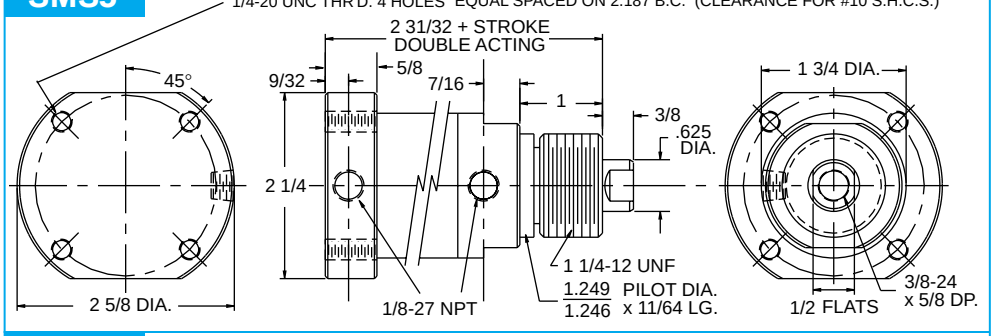
SMS2



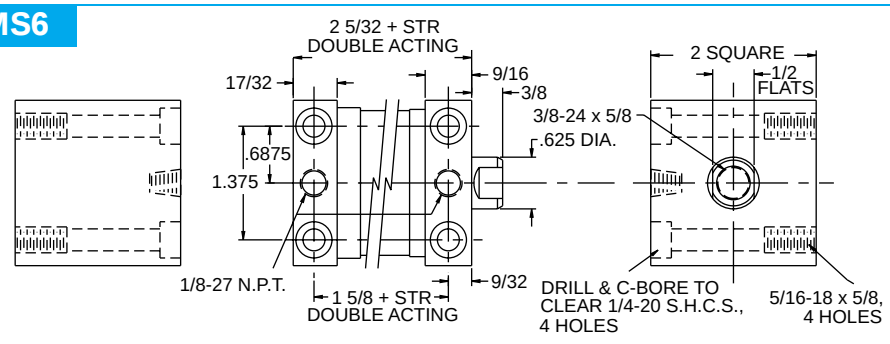
SMS3



SMS5



SMS6

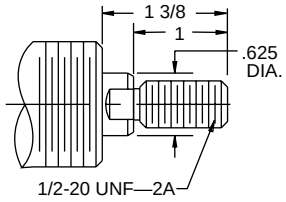


Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—15#
Fully compressed—50#
Spring material—Stainless steel

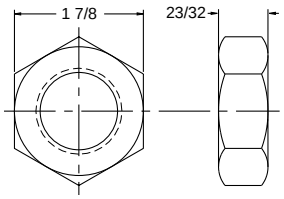
Optional Male Rod Thread



1 1/4 -12SS Nut

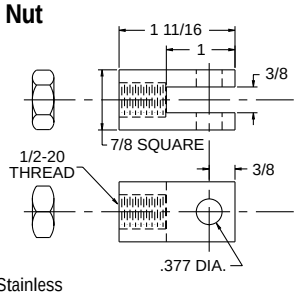
Nose Mounting Nut

Not included with cylinder
Order Separately



SS-500

Rod Clevis and Nut



303 Stainless

SS-501

Clevis Pin Assembly

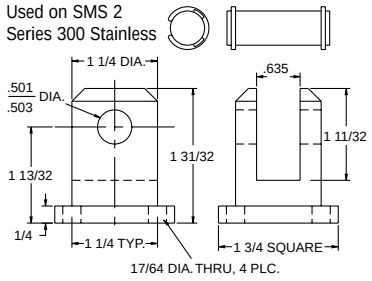
Used on SS-500 303 Stainless

SMS Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate (SMA 7,8,9)
- 90° Rear Clevis

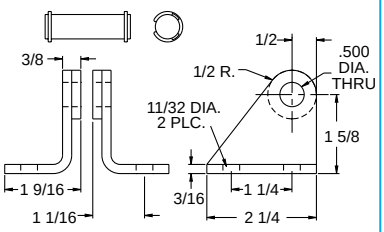
SSC-90
Low Profile Clevis Brk't

Used on SMS 2
Series 300 Stainless



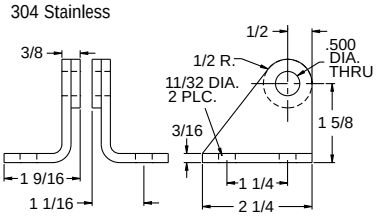
SS-100
St'd Clevis Brk't

Used on SMS 2
Series 300 Stainless



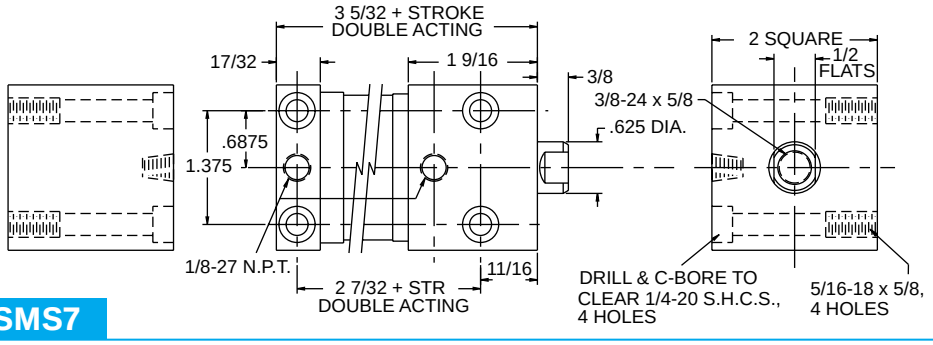
SS-100T
Trunnion Brk't

Used on SMS 10, 11
304 Stainless

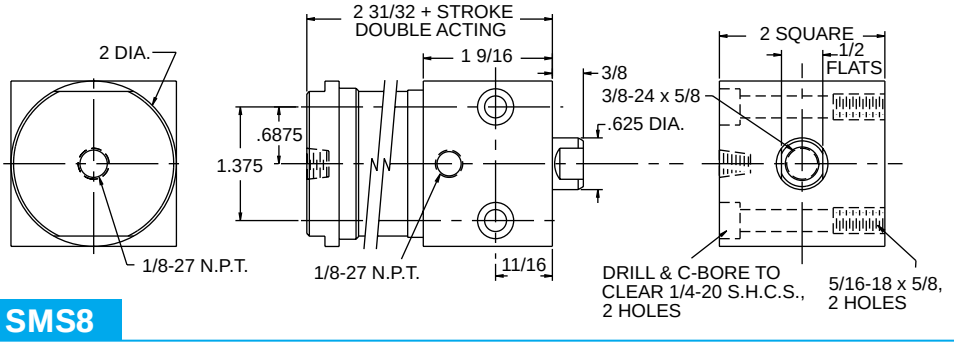


All Aurora Cylinders are 100% Factory Tested to insure Trouble Free Performance

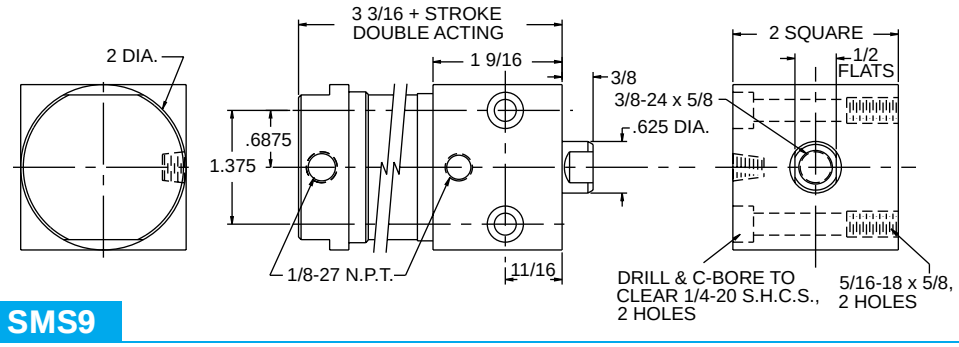
SMS7



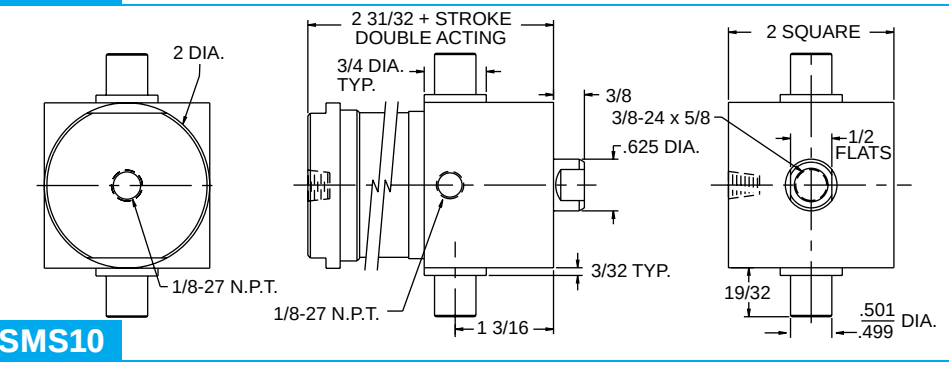
SMS8



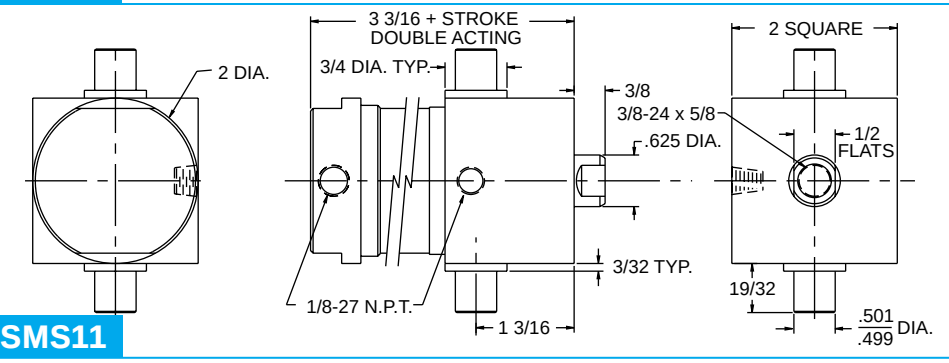
SMS9



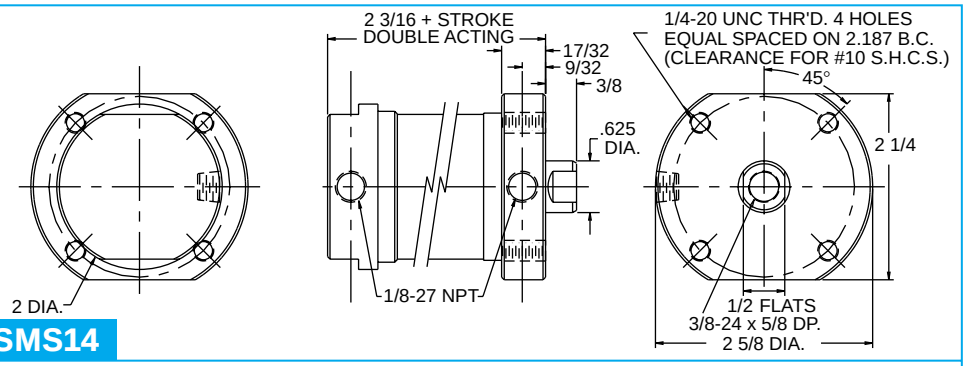
SMS10



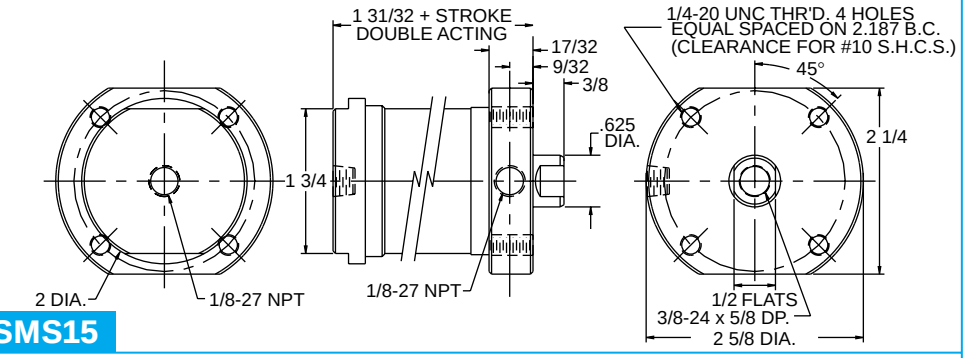
SMS11



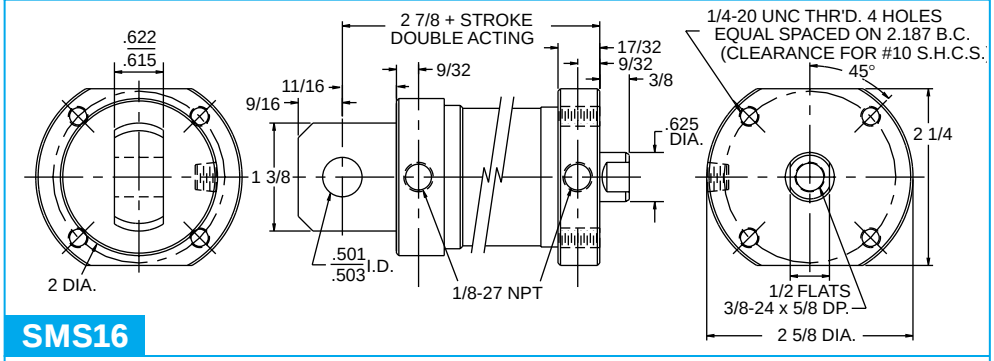
SMS14



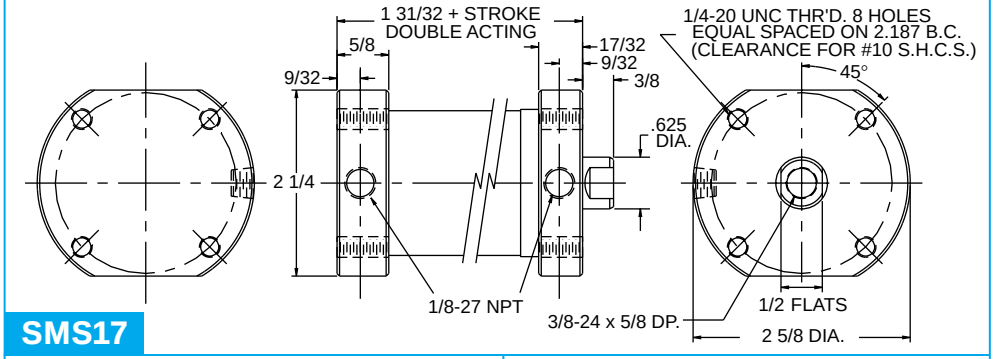
SMS15



SMS16

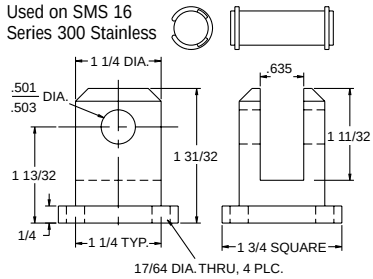


SMS17



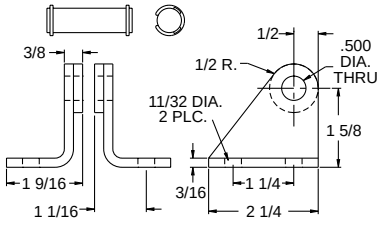
SSC-90
Low Profile Clevis Brk't

Used on SMS 16
Series 300 Stainless



SS-100
St'd Clevis Brk't

Used on SMS 16
Series 300 Stainless

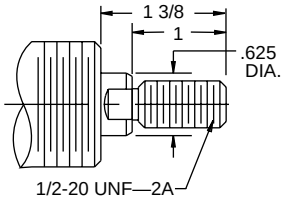


Spring Return Cylinders

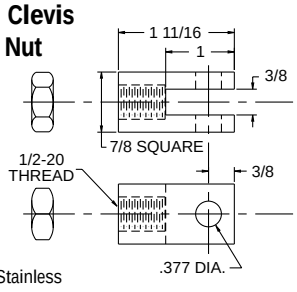
Pneumatic only
Springs add to cyl. length
0-2" stroke add 1 1/2" extra
2 1/2-4" stroke add 3" extra
over 4" stroke not available

Spring force
Fully extended—15#
Fully compressed—50#
Spring material—Stainless steel

Optional Male Rod Thread



SS-500
Rod Clevis and Nut



303 Stainless

SS-501
Clevis Pin Assembly

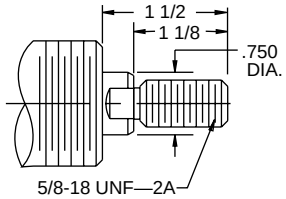
Used on SS-500 303 Stainless

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Stainless steel

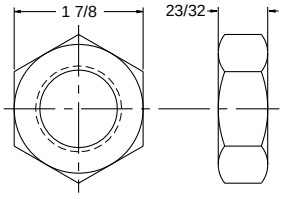
Optional Male Rod Thread



1 1/4 -12SS Nut

Nose Mounting Nut

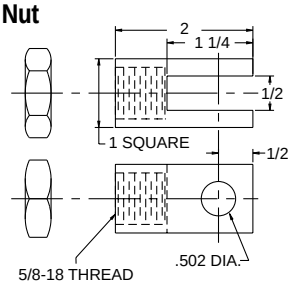
Not included with cylinder
Order Separately



18-8 Stainless

SS-625

Rod Clevis and Nut

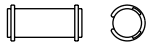


303 Stainless

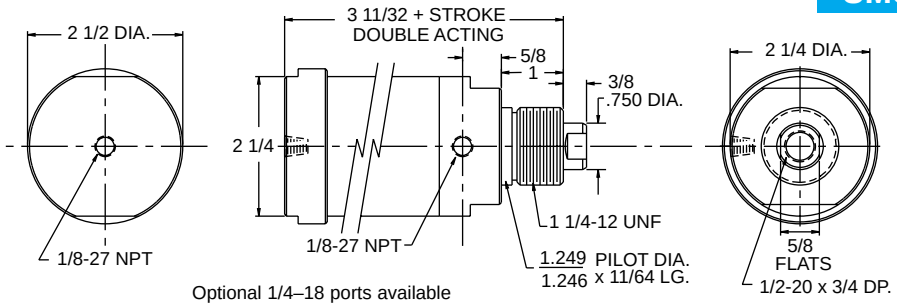
SS-601

Clevis Pin Assembly

Used on SS-625 303 Stainless

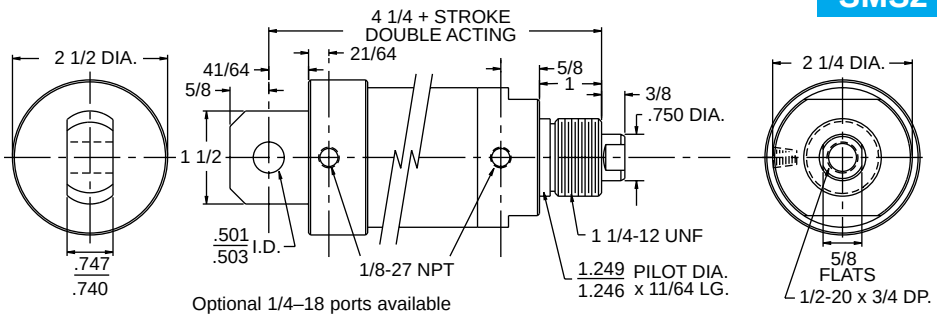


SMS1



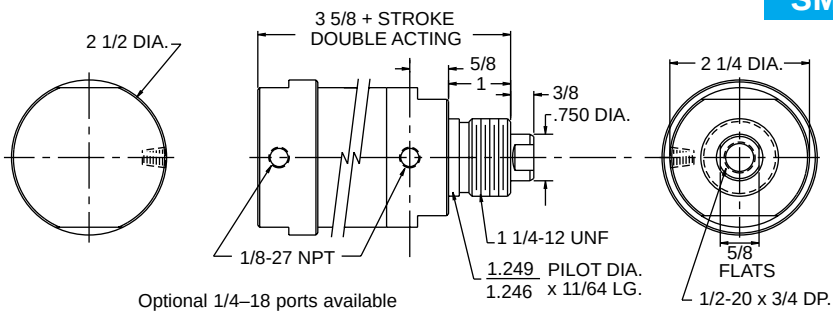
Optional 1/4–18 ports available

SMS2



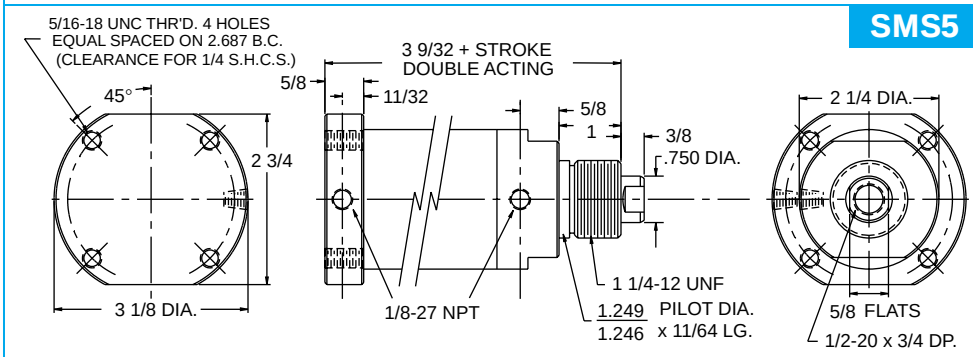
Optional 1/4–18 ports available

SMS3



Optional 1/4–18 ports available

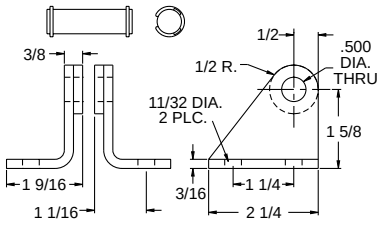
SMS5



SS-100

St'd Clevis Brk't

Used on SMS 2
Series 300 Stainless

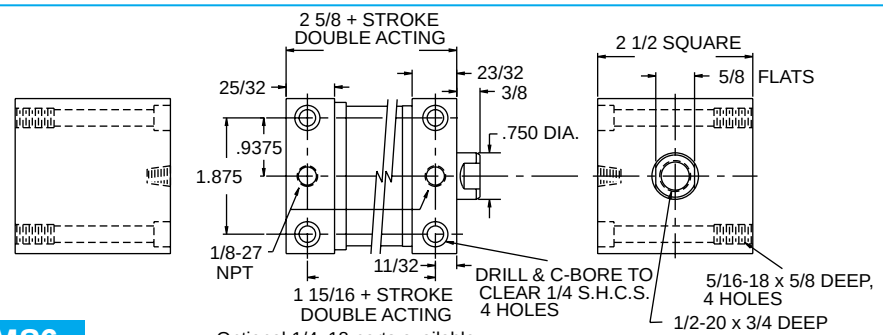


Make the Best Choice

1 630 851 4515

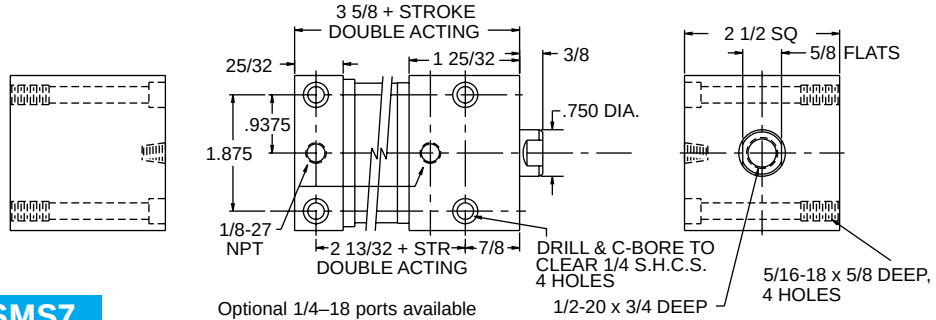
ask for Technical Support

SMS6



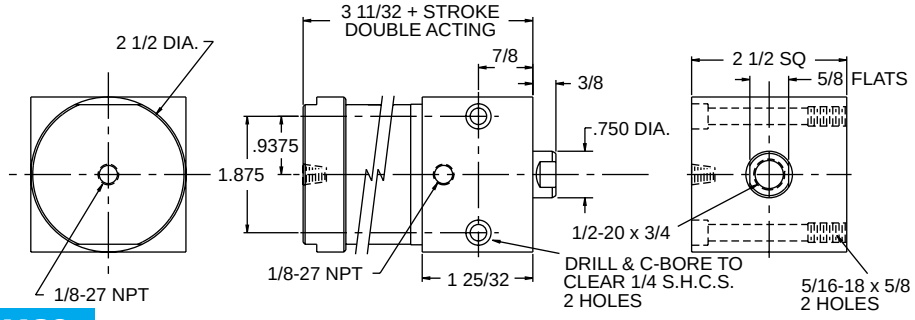
Optional 1/4–18 ports available

SMS7



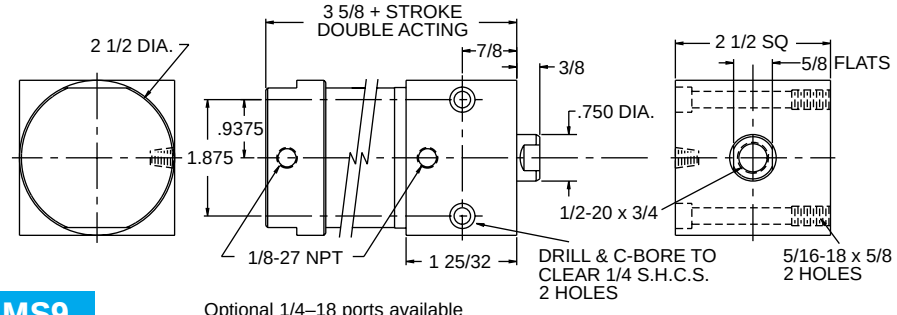
Optional 1/4–18 ports available

SMS8



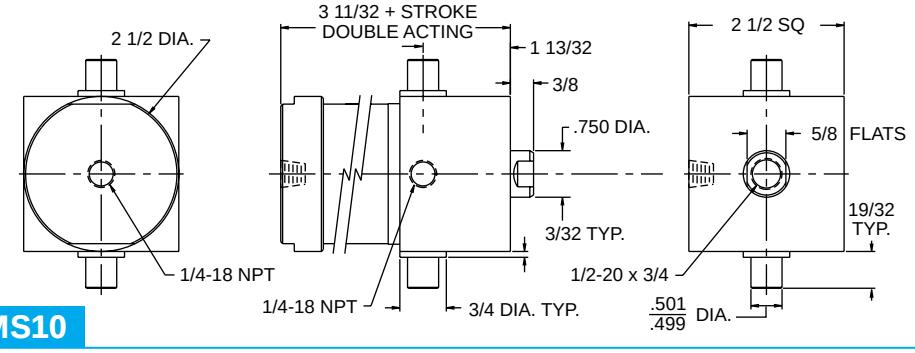
Optional 1/4–18 ports available

SMS9



Optional 1/4–18 ports available

SMS10

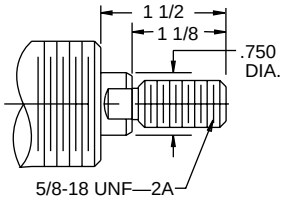


Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

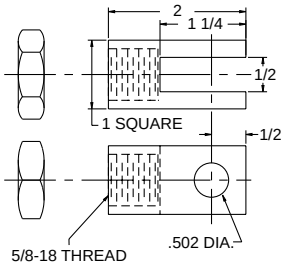
Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Stainless steel

Optional Male Rod Thread



SS-625

Rod Clevis and Nut

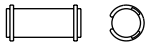


303 Stainless

SS-601

Clevis Pin Assembly

Used on SS-625 303 Stainless



You CAN Buy Peace of Mind

Aurora Stainless

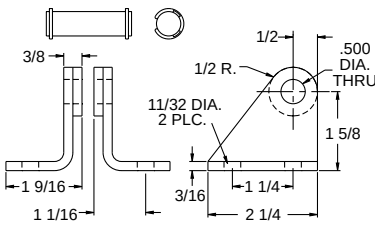
SMS Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- Non-rotate
  (SMA 7, 8, 9, 14, 15, 17)
- 90° Rear Clevis

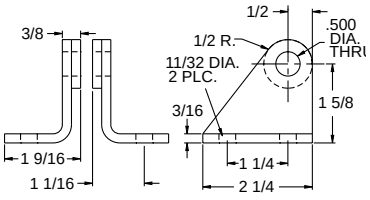
Unique Applications Sometimes Require Unique Cylinders

See our custom design capabilities on page 87

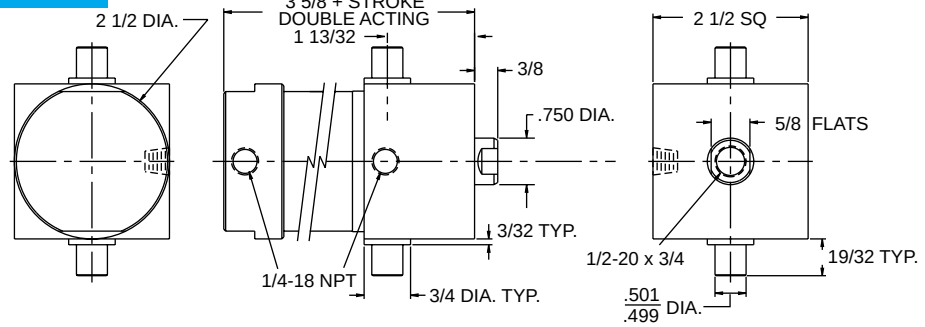
SS-100
St'd Clevis Brk't
Used on SMS 16 Series 300 Stainless



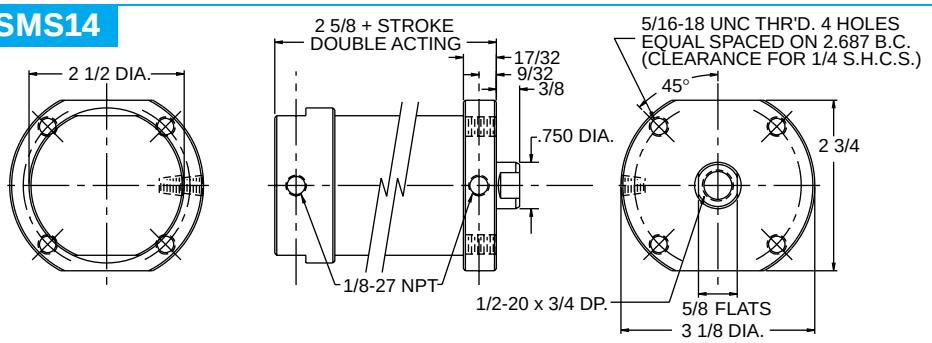
SS-100T
Trunnion Brk't
Used on SMS 10, 11 304 Stainless steel



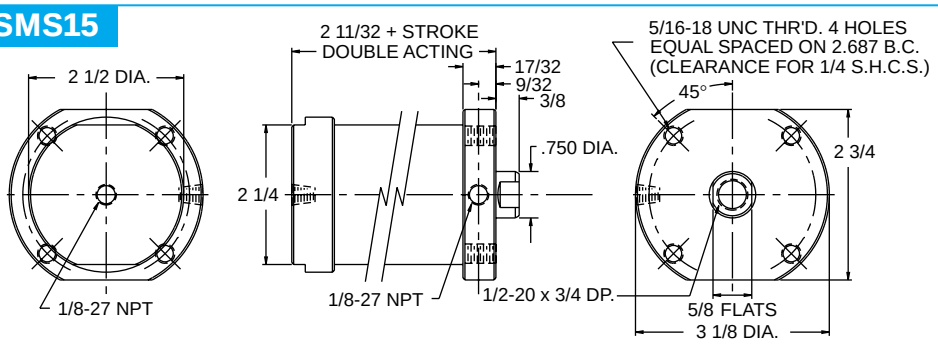
SMS11



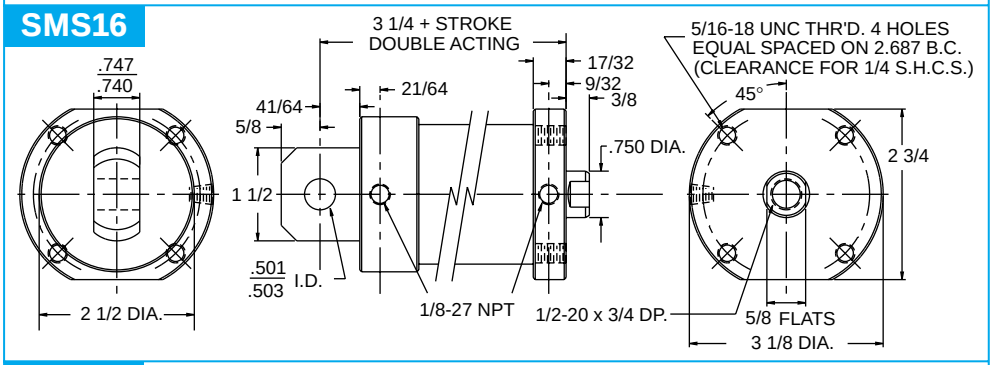
SMS14



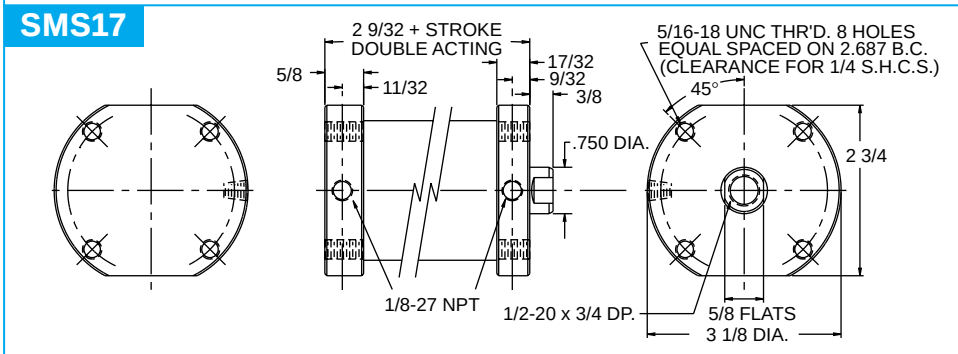
SMS15

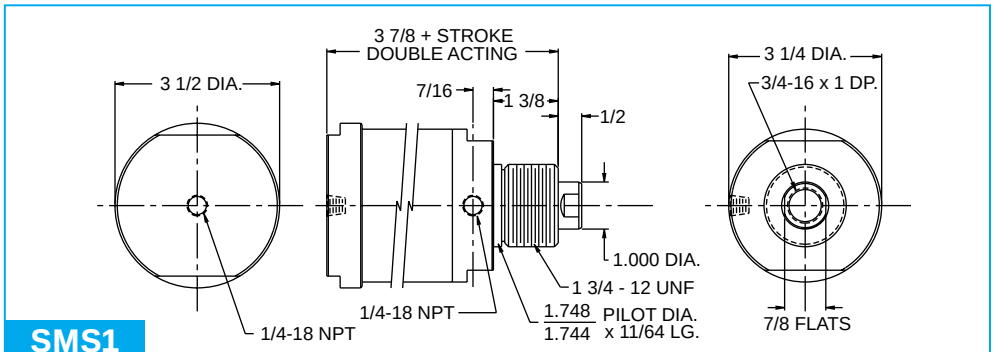


SMS16

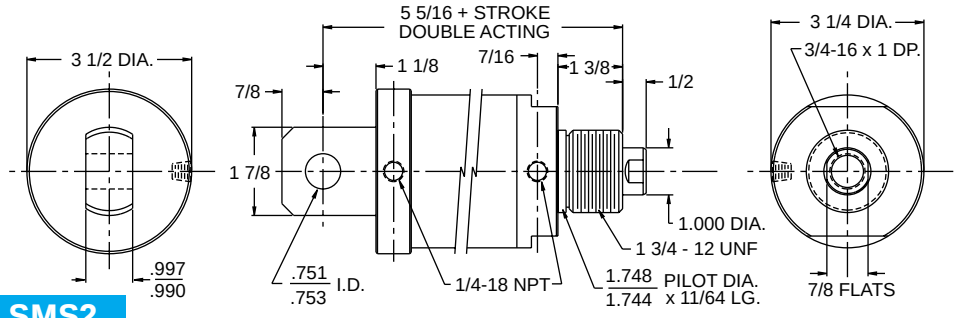


SMS17

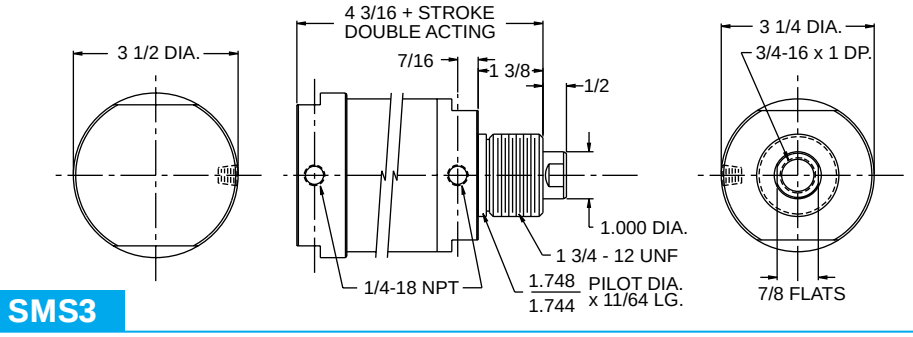




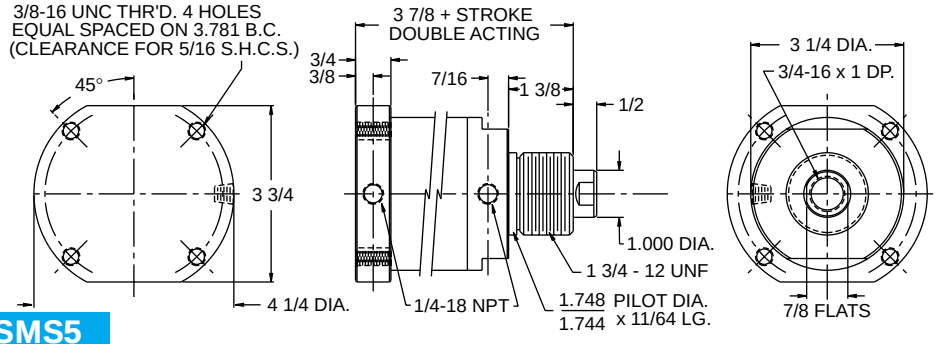
SMS1



SMS2



SMS3



SMS5

STANDARD CYLINDERS + CORROSION = LIABILITY

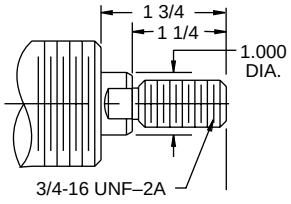
AURORA STAINLESS + CORROSION = PEACE OF MIND

Spring Return Cylinders

Pneumatic only
Springs add to cyl. length
0-2” stroke add 1 1/2” extra
2 1/2-4” stroke add 3” extra
over 4” stroke not available

Spring force
Fully extended—20#
Fully compressed—75#
Spring material—Stainless steel

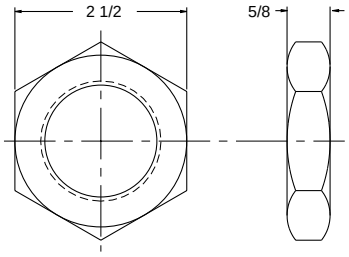
Optional Male Rod Thread



1 3/4 -12SS Nut

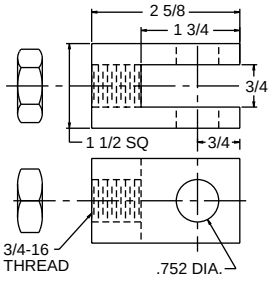
Nose Mounting Nut

Not included with cylinder Order Separately



SMS-750

Rod Clevis and Nut

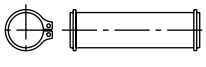


303 Stainless

SS-701

Clevis Pin Assembly

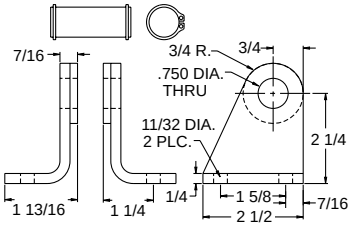
Used on SMS-750 303 Stainless



SMS Options

- Shock Pads
- Viton Seals
- Non-lube Service
- Magnetic Piston
- U Cup Piston
- 90° Rear Clevis

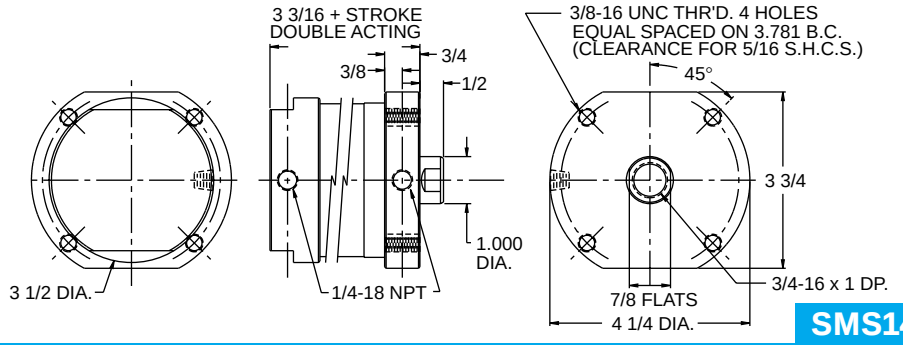
SSC-300
Clevis Brk't
Used on SMS2, 16
Series 300 Stainless steel



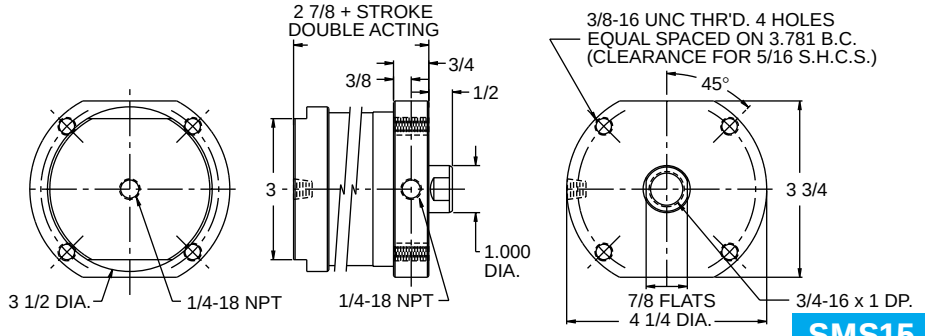
STAINLESS CYLINDERS

+

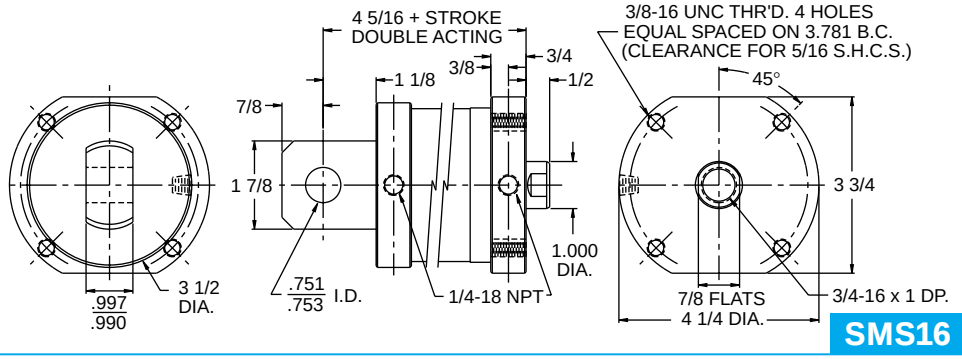
STAINLESS ACCESSORIES



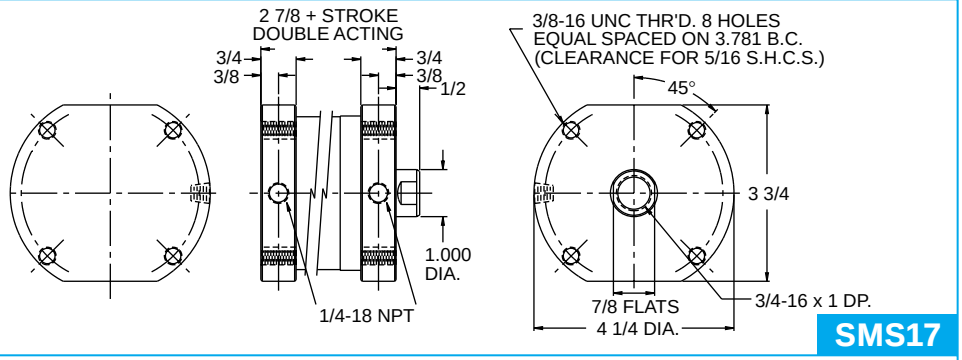
SMS14



SMS15



SMS16



SMS17

Help in Making the Best Choice

Technical Assistance @ 630 851 4515

ORDERING PROCEDURE - SMS Stainless

Select code numbers/letters (**bold type**) from each of the six boxes below - then select options desired from the table below. List codes in the same sequence as shown.

Bore	Code
1 1/8"	**11**
1 1/2"	**15**
2"	**20**
3"	**30**

Type	Code
Double acting	**C**
Single acting spring return (Adds to cyl. length) Spring extend not available	**A**

Service	Code
Pneumatic	**E**
Hydraulic	**G**

Mounting Style/Code

SMS 1	**SMS 9**
SMS 2	**SMS 10**
SMS 3	**SMS 11**
SMS 5	**SMS 14**
SMS 6	**SMS 15**
SMS 7	**SMS 16**
SMS 8	**SMS 17**

Stroke

Code is stroke in total 1/8" increments
Example: 1" stroke = **8**
2 1/4" stroke = **18**

Stocked in the following strokes:
1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2 and 1/2" increments to 10"

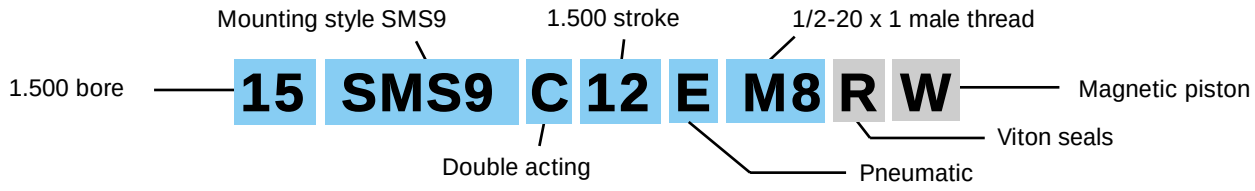
3" bore - Limited to 8" max. stroke

Piston Rod Codes

Bore	Thread		Code
1.125	3/8-24 x 3/4	Male	**M6**
1.125	5/16-18 x 5/8	Female	**F3**
1.125	5/16-24 x 5/8	Female	**F4**
1.500	1/2-20 x 1	Male	**M8**
1.500	3/8-16 x 5/8	Female	**F5**
1.500	3/8-24 x 5/8	Female	**F6**
2.000	5/8-18 x 1 1/8	Male	**M12**
2.000	1/2-20x 3/4	Female	**F8**
3.000	3/4-16 x 1 1/4	Male	**M10**
3.000	3/4-16 x 1	Female	**F10**
With non-rotate option enter code			**11**

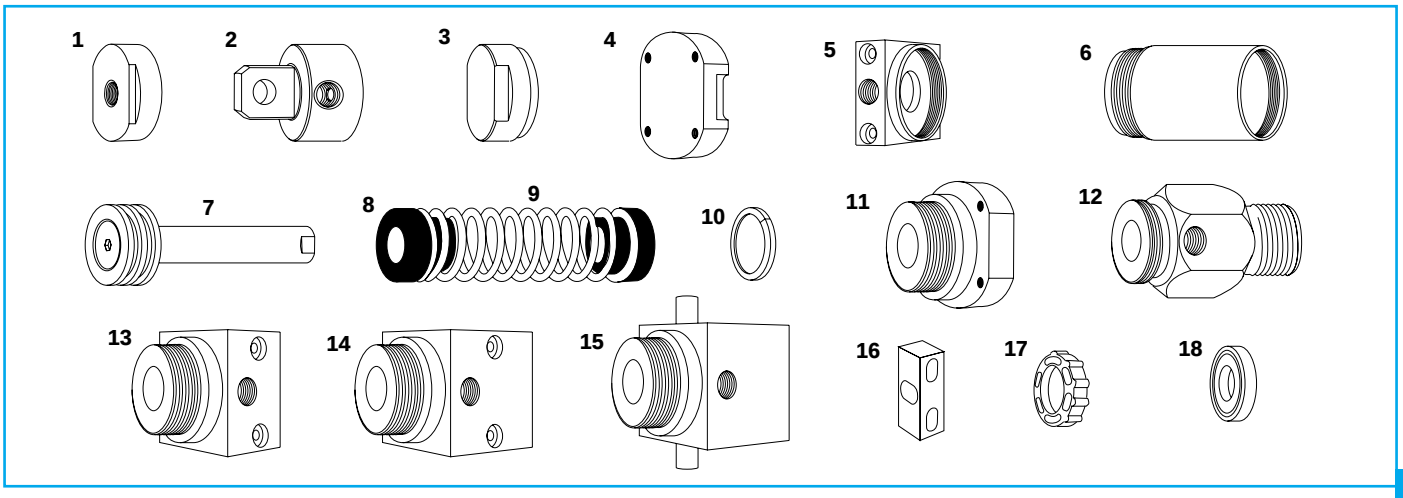
Option	Description		Code
Extra rod extension 1/4 " increments	Specify code letter **J** followed by extra length required as a two place decimal Example: **J.50** = 1/2" extra **J1.25** = 1 1/4"extra		**J**
Shock pads Pneu. only to 180° F Double acting only	Add to either or both ends in 1 1/8", 1 1/2", 2" bore up to 2" stroke. Over 2" stroke and on all 3" bore must be added to both ends Each pad adds 1/4" length	Rod end only Cap end only Both ends	**L** **M** **N**
Non-lube service	Available on standard O ring Piston. Not available or necessary on U cup piston		**P**
Viton seals	Standard seals are nitrile and urethane +10 to +200° F For service –10 to +400° F specify viton		**R**
U cup piston	Extends cycle life and reduces friction Piston is aluminum and includes teflon wear strip — adds 1/2" to length		**S**
Clevis 90° to std	SMS 2, 16, only		**T**
Magnetic piston	Adds 1/2" to length		**W**
Non rotate	Available only on double acting SMS 7, 8, 9, 14, 15, 17	with male stud without male stud	**X** **Y**
1/4" oversize ports	2" bore only — SMS 1, 2, 3, 6, 7, 8, 9, only Not available with option x,y		**Z**

Part No. Example:



SMS Service Parts

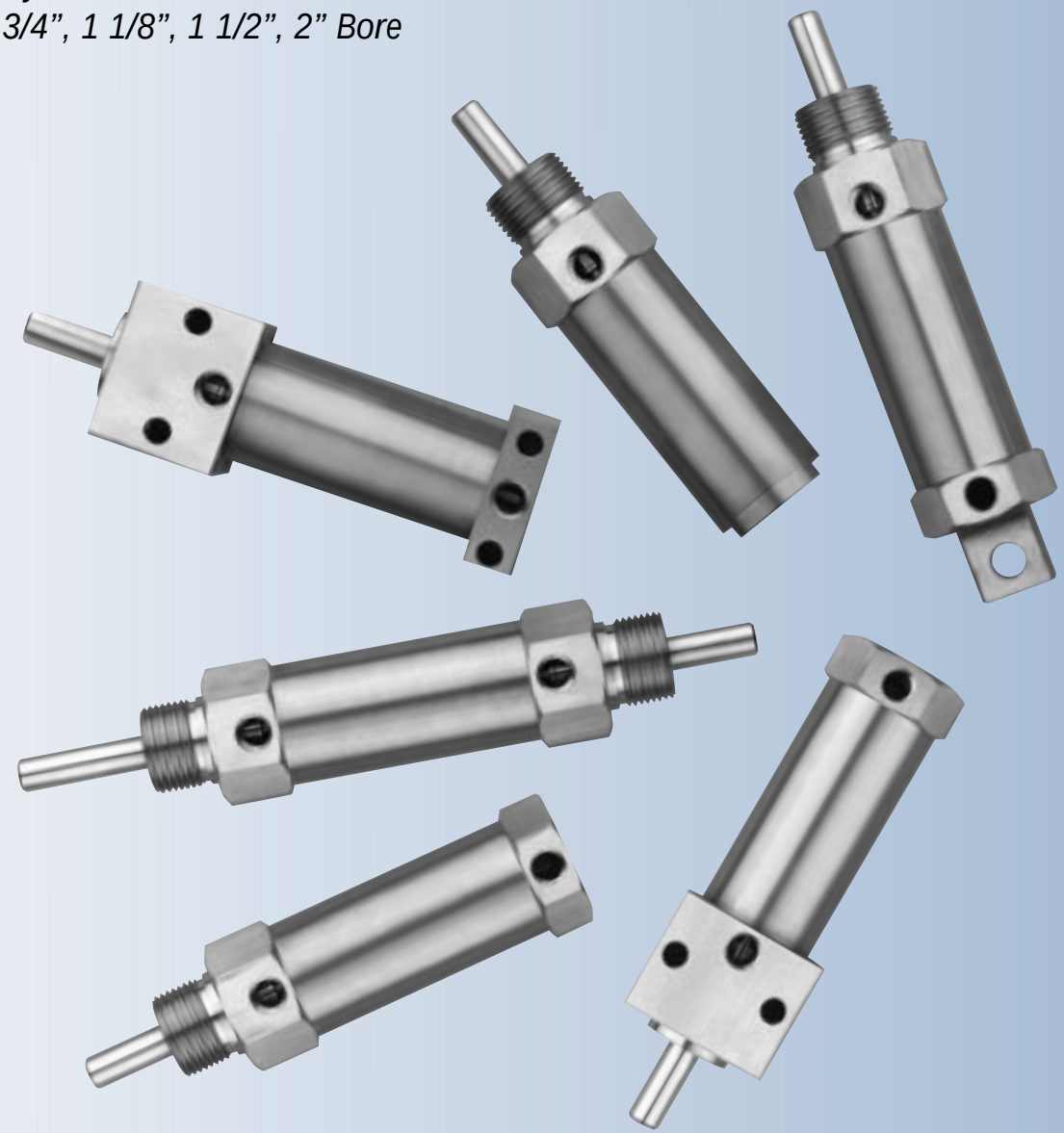
When ordering any repair part please provide the part number and description shown below along with the serial number and part number of the cylinder being serviced.



Key	Description		1 1/8 Bore	1 1/2 Bore	2 Bore	3 Bore
	Seal kits for cylinders with O ring piston					
	Pneumatic, Nitrile	Add suffix NL for Non-Lube	SMS 3411	SMS 3415	SMS 3420	SMS 3430
	Pneumatic, Viton	Add suffix NL for Non-Lube	SMS 3411V	SMS 3415V	SMS 3420V	SMS 3430V
	Hydraulic, Nitrile		SMS 3511	SMS 3515	SMS 3520	SMS 3530
	Hydraulic, Viton		SMS 3511V	SMS 3515V	SMS 3520V	SMS 3530V
	Seal kits for cylinders with U cup piston – includes Teflon wear strip					
	Pneumatic, Nitrile		SMS 5411	SMS 5415	SMS 5420	SMS 5430
	Pneumatic, Viton		SMS 5411V	SMS 5415V	SMS 5420V	SMS 5430V
	Hydraulic, Nitrile		SMS 5511	SMS 5515	SMS 5520	SMS 5530
	Hydraulic, Viton		SMS 5511V	SMS 5515V	SMS 5520V	SMS 5530V
1	Rear port cap	Add suffix 250 for 2" bore 1/4 NPT	SMS 1011	SMS 1015	SMS 1020	SMS 1030
2	Rear pivot cap	Add suffix 250 for 2" bore 1/4 NPT	SMS 1111	SMS 1115	SMS 1120	SMS 1130
2	90° Rear pivot cap	Add suffix 250 for 2" bore 1/4 NPT	SMS 111190	SMS 111590	SMS 112090	SMS 113090
3	Side port cap	Add suffix 250 for 2" bore 1/4 NPT	SMS 4811	SMS 4815	SMS 4820	SMS 4830
4	Rear flange cap		SMS 1311	SMS 1315	SMS 1320	SMS 1330
5	Square cap	Add suffix 250 for 2" bore 1/4 NPT	SMS 4611	SMS 4615	SMS 4620	
6	Tube		part No. is T followed by the complete cylinder part number			
7	Piston rod assembly		part No. is PR followed by the complete cylinder part number			
8	Spring guide	Pair	SMS 1211	SMS 1215	SMS 1220	SMS 1230
9	Spring		SS 2111	SS 2115	SS 2120	SS 2120
10	Magnet	SMS5911 and SS3215 supplied in pairs	SMS 5911	SS 3215	SS 3220	SS 3230
11	Flange head	Add suffix NR for non-rotate	SMS 1411	SMS 1415	SMS 1420	SMS 1430
12	Nose Mount Head	Add suffix 250 for 2" bore, 1/4 NPT	SMS 0111	SMS 0115	SMS 0120	SMS 0130
13	Short square Head	Add suffix 250 for 2" bore, 1/4 NPT	SMS 4411	SMS 4415	SMS 4420	
14	Long square Head	Add suffix 250 for 2" bore, 1/4 NPT	SMS 4511	SMS 4515	SMS 4520	
14	Square non rotate head		SMS 4511NR	SMS 4515NR	SMS 4520NR	
15	Trunnion head		SMS 4511T	SMS 4515T	SMS 4520T	
16	Non-rotate guide bushing	Pair	SMS 5111	SMS 5111	SMS 5111	
17	Cap end shock pad			Consult factory		3MSP
18	Head end shock pad		11CSP	15CSP	2CSP	3MSP

Series SS Solid Stainless Cylinders

Pneumatic to 200 PSI
Hydraulic to 1000 PSI *Non shock*
3/4", 1 1/8", 1 1/2", 2" Bore



To Help Brighten Your Corner of the World.

All exterior components 300 series stainless

SS STAINLESS DESIGN FEATURES

Piston rod is hard chrome plated type 303 stainless. Optional hollow piston rods available (hollow rod is not chrome plated)

End caps are machined from type 303 stainless steel.

Heavy duty urethane rod wipers seal out the environment. Other materials available.

Removable stainless retaining rings hold the seal and rod wiper in place.

Pneumatic Rod Seal is a "longlife" nitrile cup. Hydraulic Rod Seal is pressure energized and extra long wearing for improved stability

Extra long rod bearings of sintered bronze provide ample support and serve as an oil reservoir for pneumatic use. The bearing is inboard of the seal, away from the environment to ensure proper lubrication. Optional non metalic rod bearings available for chemically inert or severe applications

Tube is heavy 1/8 inch wall type 304 stainless steel and is precision honed to insure proper size, roundness, and finish for maximum cylinder life.

Brass piston silver brazed to the piston rod provides an almost indestructable joint.
Optional solid stainless steel piston with teflon wearstrip available for chemically inert or clean applications.

Reduce noise and fatigue problems such as rod breakage with urethane shock pads.
Pneumatic use only to 180° F.

Piston seals are extra long wearing pressure energized lip seals of the highest quality

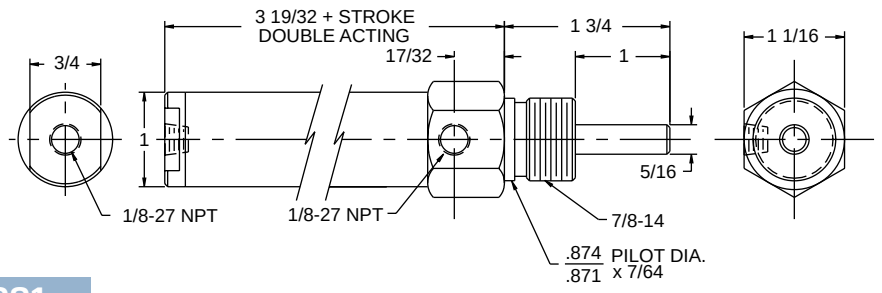
O ring static tube seal

Optional wick provides teflon lube for non-lube service

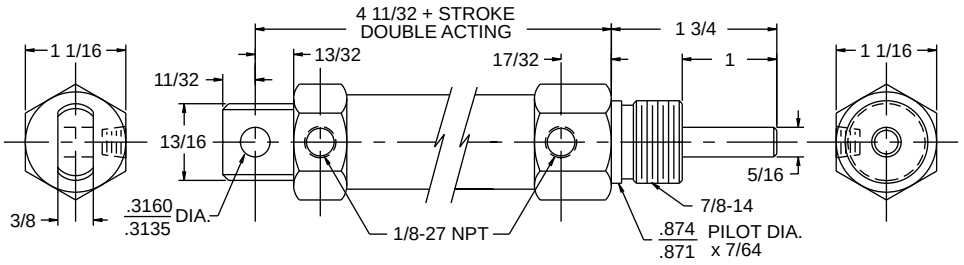
Adjustable cushions to provide deceleration at the end of the stroke are available on most models above 3/4" bore

Magnetic piston available to operate Aurora stainless proximity switches

AURORA
AIR PRODUCTS INC.
TM

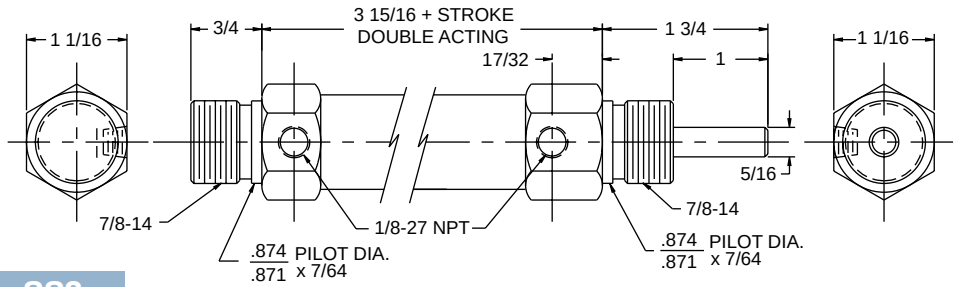


SS1

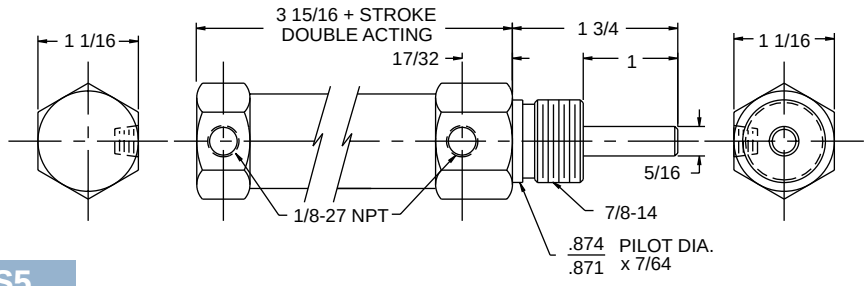


90° REAR PIVOT HOLE OPTIONAL

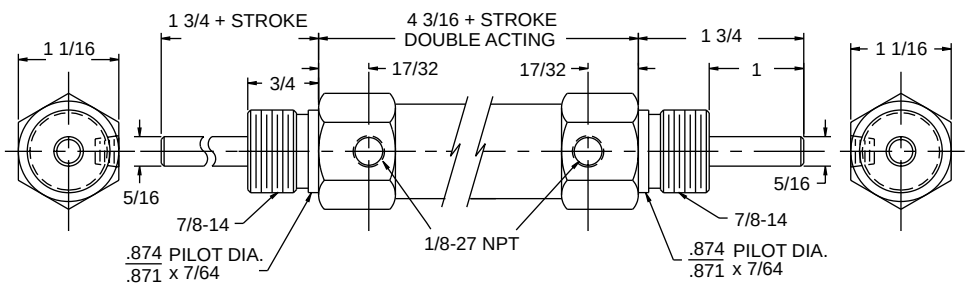
SS2



SS3



SS5



SS6

Single Acting Cylinders

Pneumatic only Adds to cylinder length

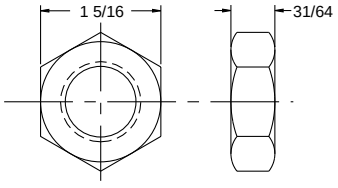
TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring extend	0-1"	1"	Not available over 2" stroke	
Spring return	0-1"	1"	1 1/8"-2"	2"

Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 12#

7/8 -14SS Nut

Nose Mounting Nut

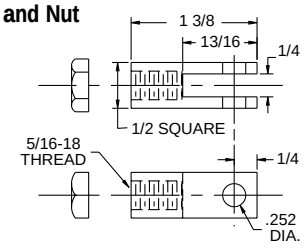
Not included with cylinder
Order Separately



18-8 Stainless

SS-312

Rod Clevis and Nut



303 Stainless

SS-200

Clevis Pin Assembly

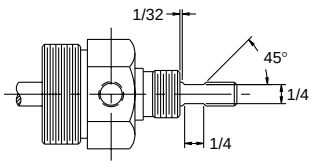
Used on SS-312 303 Stainless

Suitable for Submerged Service with Reverse Polypak Wiper

SS Options

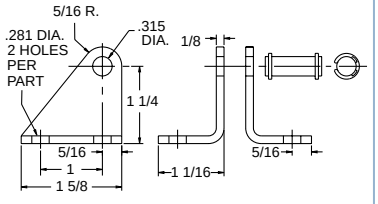
- Shock Pads
- Wrench Flats
- Viton Seals
- Non-lube Service
- Non-Metallic Rod Br'g
- Reverse Polypak Wiper
- Stainless Piston
- Magnetic Piston
- Hollow Piston Rod
- 90° Rear Clevis

Wrench Flats Optional

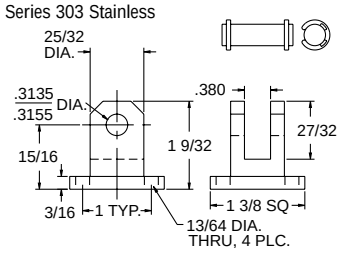


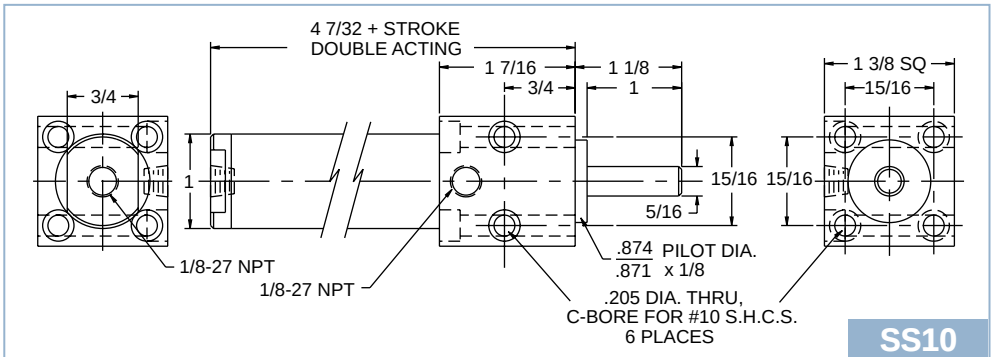
STAIN • LESS
(STAN'LIS) Adjective
1. Without blemish or stain: a stainless reputation

SS-40
St'd Clevis Brk't
Used on SS 2
Series 300 Stainless

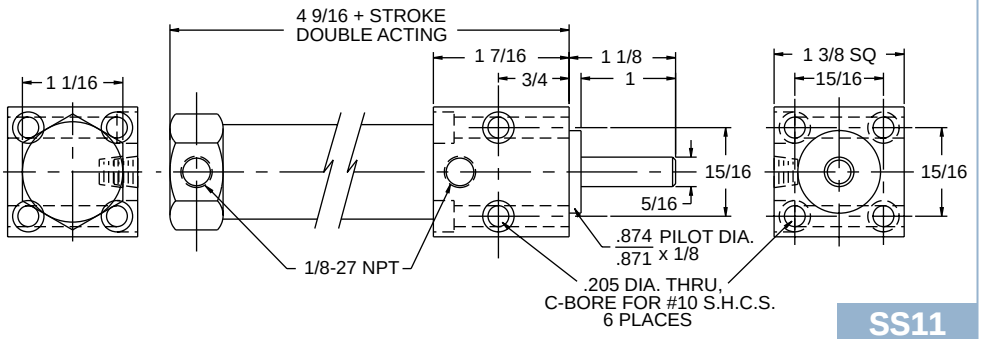


SSC-30
Low Profile Clevis Brk't
Used on SS 2
Series 303 Stainless

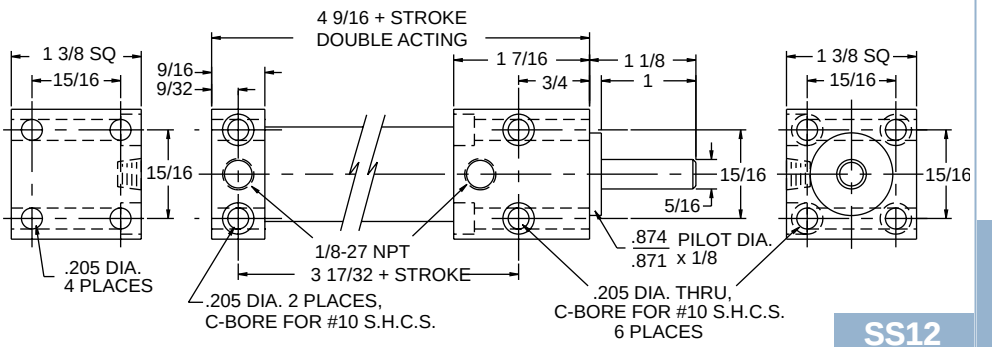




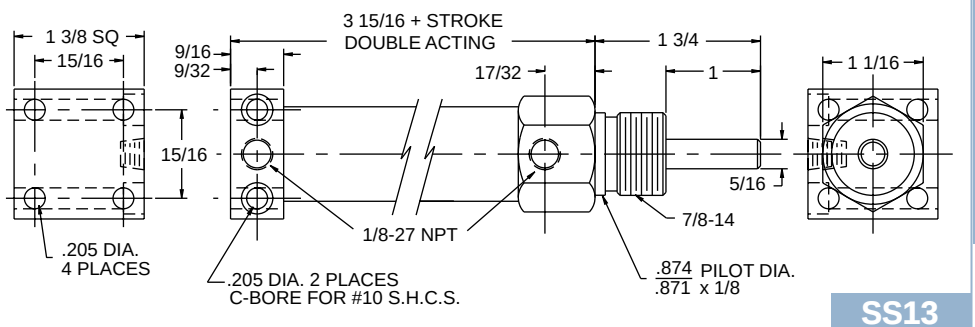
SS10



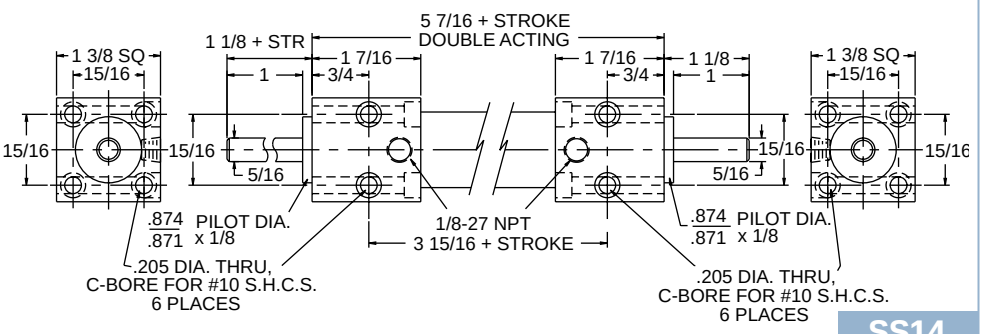
SS11



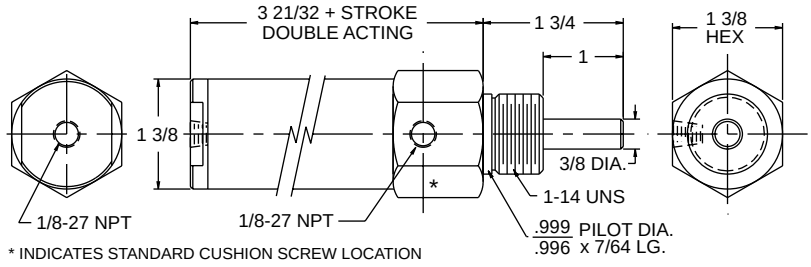
SS12



SS13

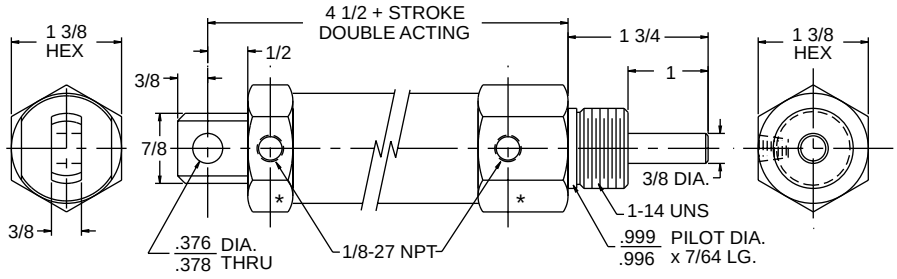


SS14



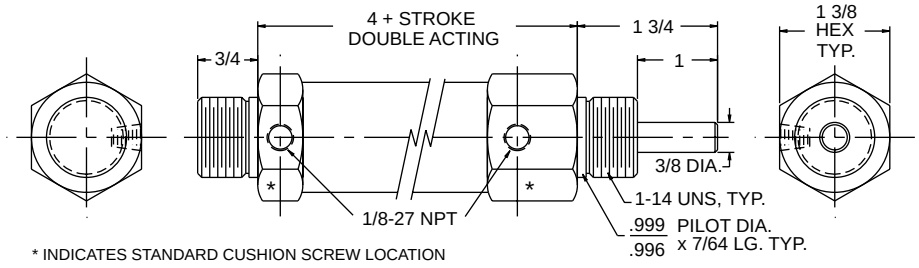
* INDICATES STANDARD CUSHION SCREW LOCATION

SS1



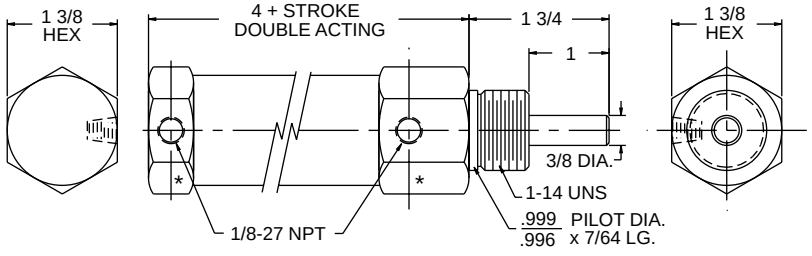
* INDICATES STANDARD CUSHION SCREW LOCATION
90° rear pivot hole optional

SS2



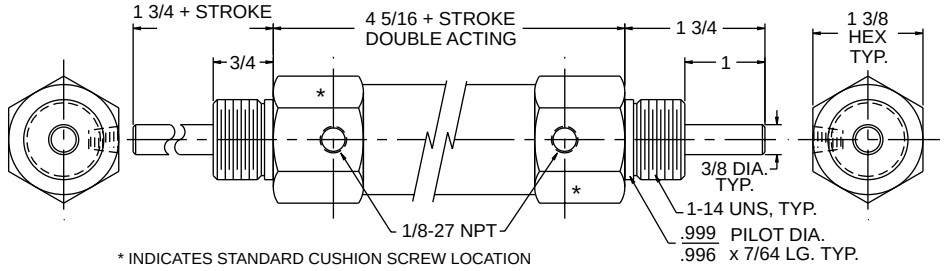
* INDICATES STANDARD CUSHION SCREW LOCATION

SS3



* INDICATES STANDARD CUSHION SCREW LOCATION

SS5



* INDICATES STANDARD CUSHION SCREW LOCATION

SS6

Single Acting Cylinders

Pneumatic only Adds to cylinder length

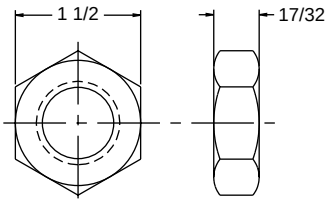
TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring extend	0-2"	1 1/2"	Not available over 2" stroke	
Spring return	0-2"	1 1/2"	2 1/8"-4"	3"

Spring Force: Spring fully extended approx. 7#
Spring fully compressed approx. 22#

1 -14SS Nut

Nose Mounting Nut

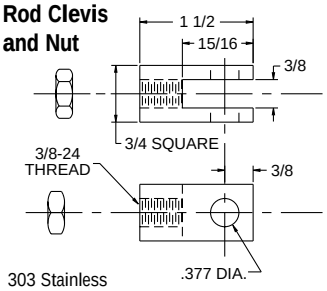
Not included with cylinder
Order Separately



18-8 STAINLESS

SS-375

Rod Clevis and Nut



303 Stainless

SS-301

Clevis Pin Assembly

Used on SS-375

303 Stainless

Conventional Cylinder Cost

+ Warranty Repairs

+ Downtime

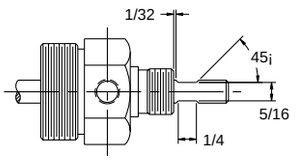
+ Liability

> Aurora Stainless

SS Options

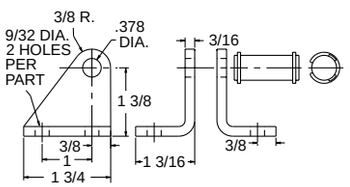
- Shock Pads
- Wrench Flats
- Viton Seals
- Non-lube Service
- Non-Metallic Rod Br'g
- Reverse Polypak Wiper
- Stainless Piston
- Magnetic Piston
- Hollow Piston Rod
- 90° Rear Clevis
- Adjustable Cushions

Wrench Flats Optional

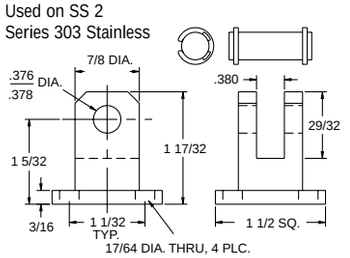


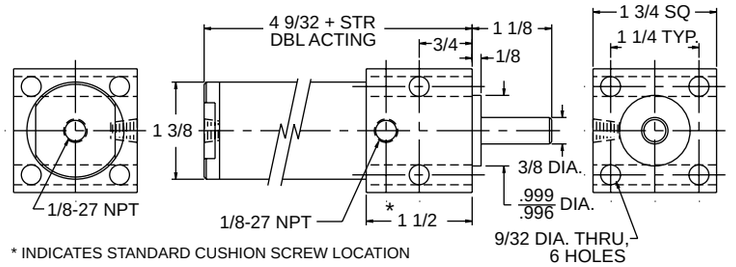
Series SS Stainless have been field proven since 1983

SS-90
St'd Clevis Brk't
Used on SS 2
Series 300 Stainless



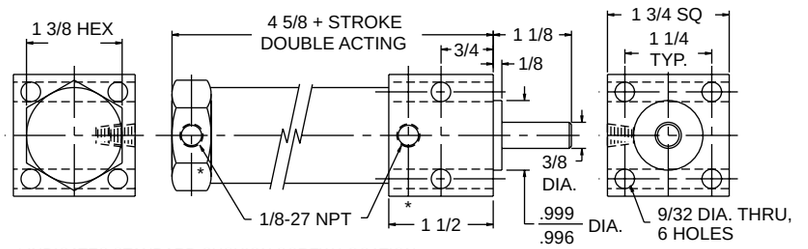
SSC-40
St'd Clevis Brk't
Used on SS 2
Series 303 Stainless





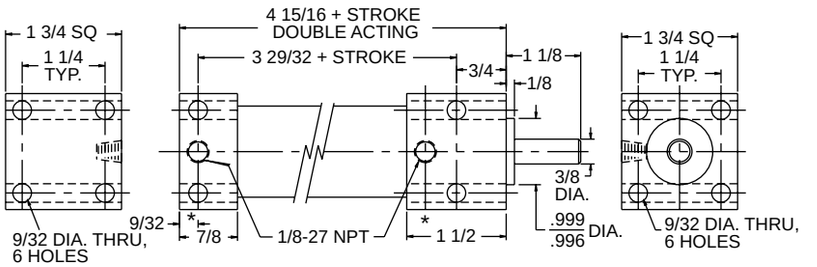
* INDICATES STANDARD CUSHION SCREW LOCATION

SS10



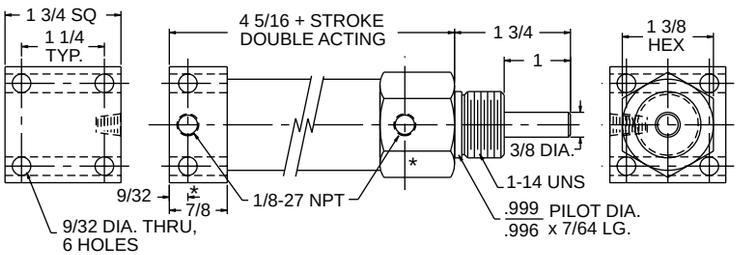
* INDICATES STANDARD CUSHION SCREW LOCATION

SS11



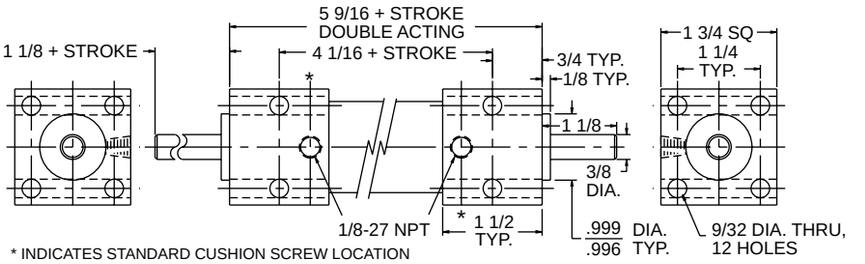
* INDICATES STANDARD CUSHION SCREW LOCATION

SS12



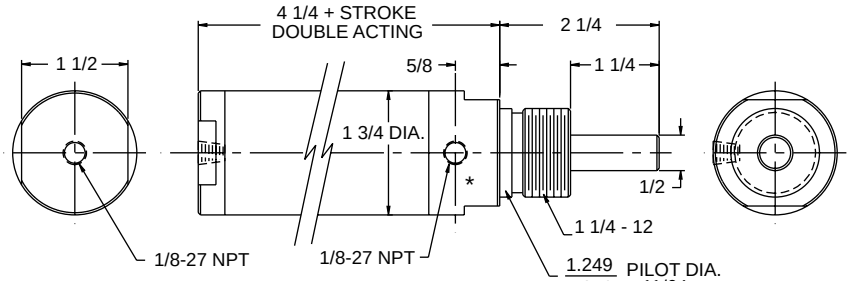
* INDICATES STANDARD CUSHION SCREW LOCATION

SS13



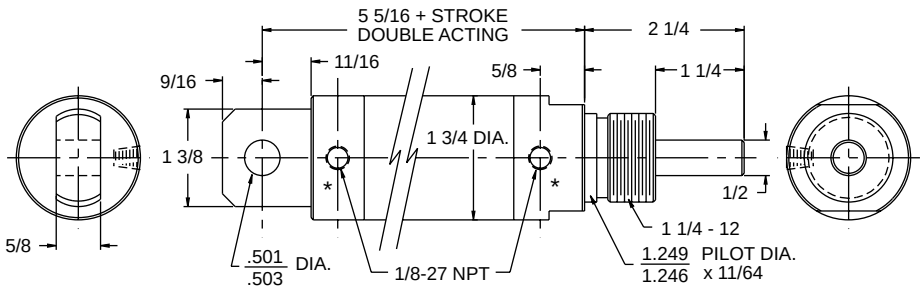
* INDICATES STANDARD CUSHION SCREW LOCATION

SS14



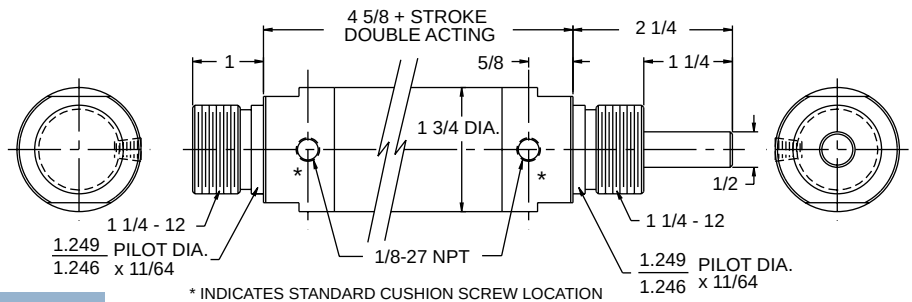
* INDICATES STANDARD CUSHION SCREW LOCATION

SS1



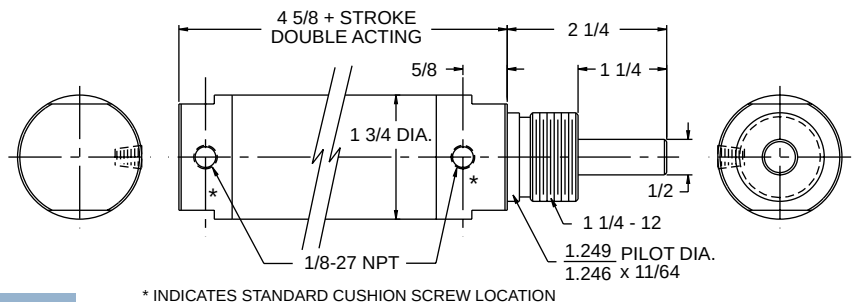
* INDICATES STANDARD CUSHION SCREW LOCATION

SS2



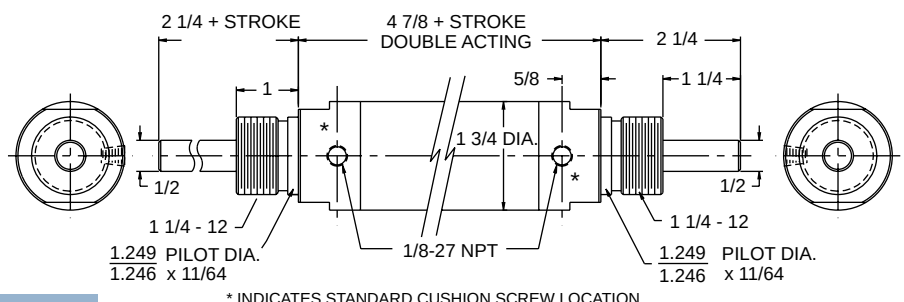
* INDICATES STANDARD CUSHION SCREW LOCATION

SS3



* INDICATES STANDARD CUSHION SCREW LOCATION

SS5



* INDICATES STANDARD CUSHION SCREW LOCATION

SS6

Single Acting Cylinders

Pneumatic only Adds to cylinder length

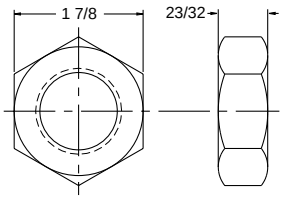
TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring extend	0-2"	1 1/2"	2 1/8"-4"	3"
Spring return	0-2"	1 1/2"	2 1/8"-4"	3"

Spring Force: Spring fully extended approx. 15#
Spring fully compressed approx. 50#

1 1/4 -12SS Nut

Nose Mounting Nut

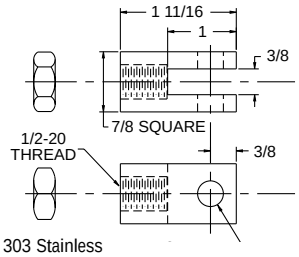
Not included with cylinder
Order Separately



18-8 Stainless

SS-500

Rod Clevis and Nut



303 Stainless

SS-501

Clevis Pin Assembly

Used on SS-500

303 Stainless

We'll Bill You for the Cylinders. . .

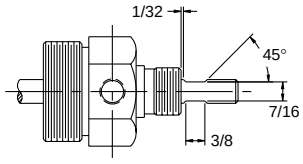
but Our Experience is Free

630 851 4515

SS Options

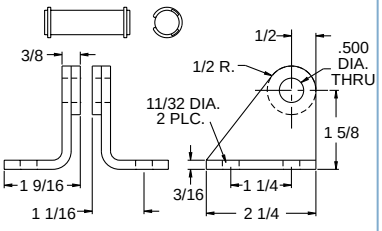
- Shock Pads
- Wrench Flats
- Viton Seals
- Non-lube Service
- Non-Metallic Rod Br'g
- Reverse Polypak Wiper
- Stainless Piston
- Magnetic Piston
- Hollow Piston Rod
- 90° Rear Clevis
- Adjustable Cushions

Wrench Flats Optional

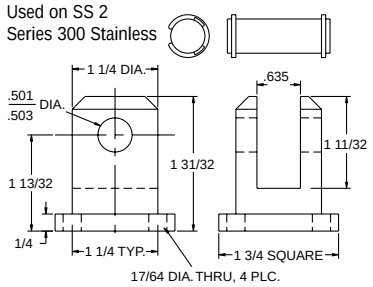


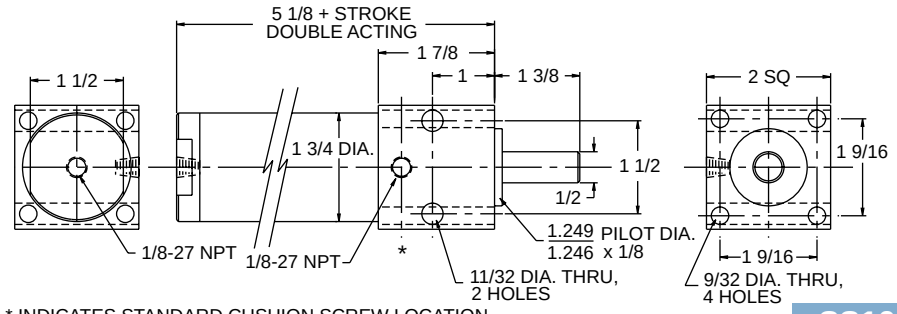
See SMS Stainless for More Compact Size and Lower Cost

SS-100
St'd Clevis Brk't
Used on SS 2
Series 300 Stainless



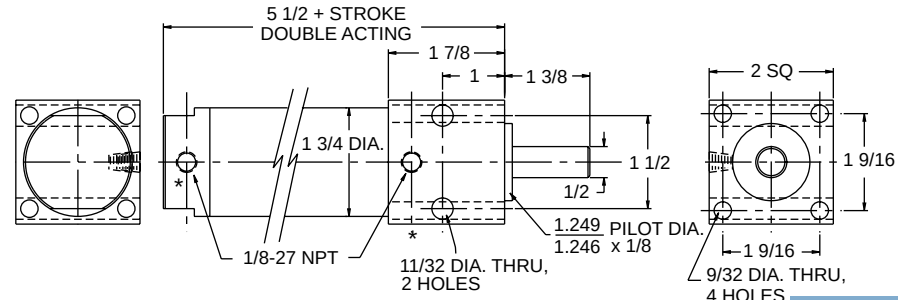
SSC-90
Low Profile Clevis Brk't
Used on SS 2
Series 300 Stainless





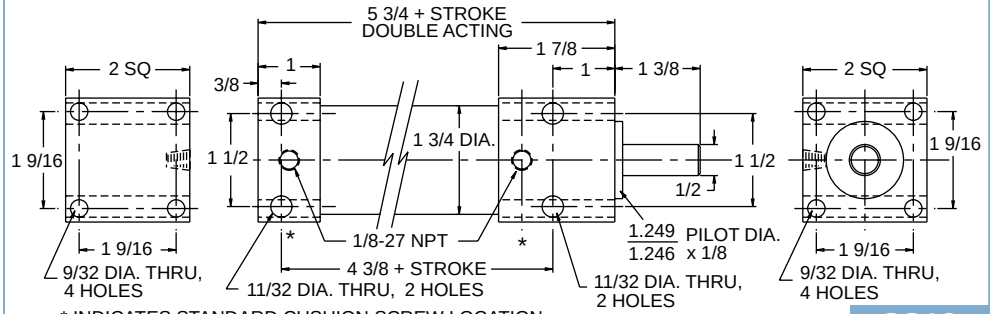
* INDICATES STANDARD CUSHION SCREW LOCATION

SS10



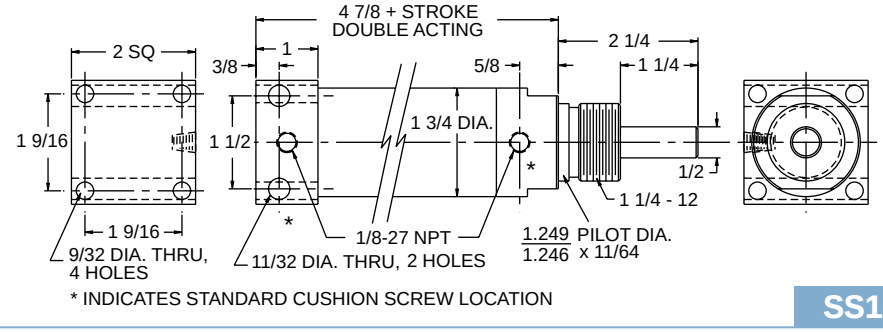
* INDICATES STANDARD CUSHION SCREW LOCATION

SS11



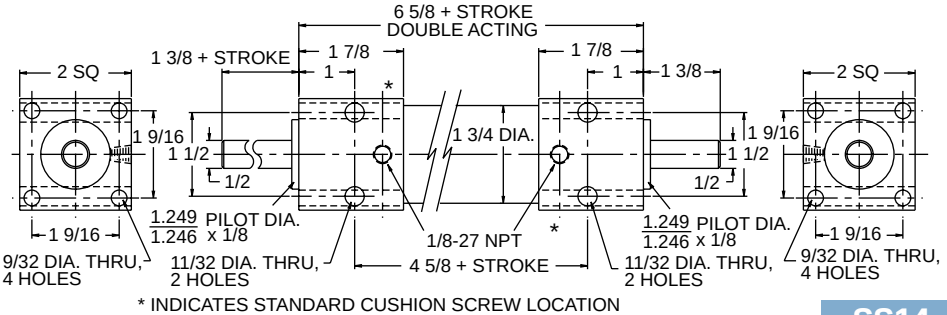
* INDICATES STANDARD CUSHION SCREW LOCATION

SS12



* INDICATES STANDARD CUSHION SCREW LOCATION

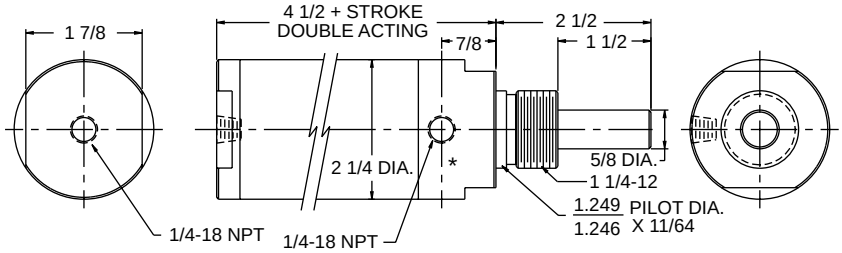
SS13



* INDICATES STANDARD CUSHION SCREW LOCATION

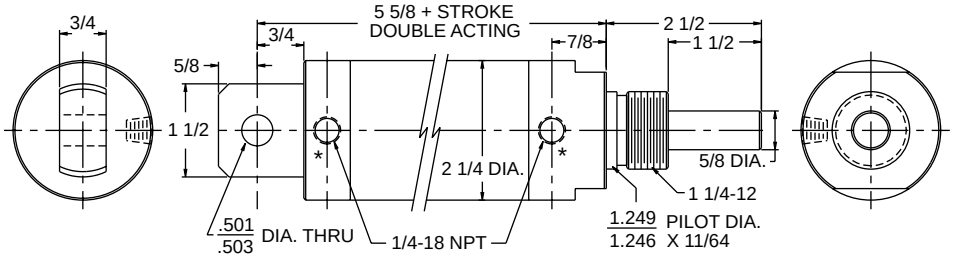
SS14

Series SS Solid Stainless



* INDICATES STANDARD CUSHION SCREW LOCATION

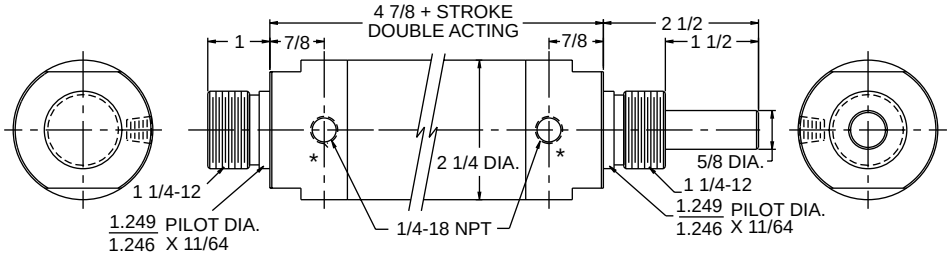
SS1



90° REAR PIVOT HOLE OPTIONAL

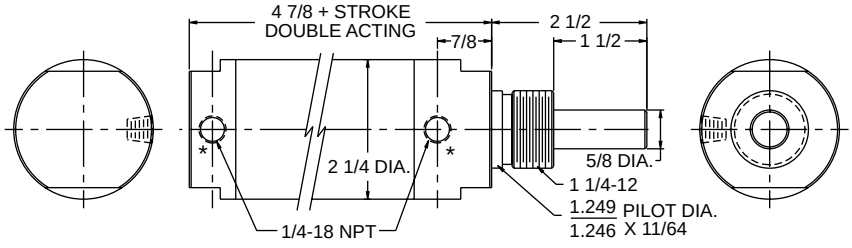
SS2

* INDICATES STANDARD CUSHION SCREW LOCATION



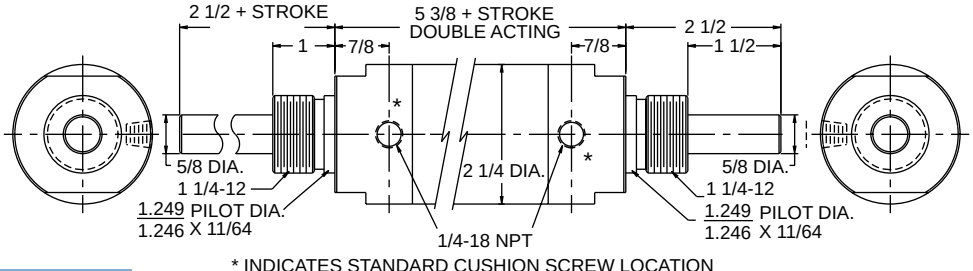
* INDICATES STANDARD CUSHION SCREW LOCATION

SS3



* INDICATES STANDARD CUSHION SCREW LOCATION

SS5



* INDICATES STANDARD CUSHION SCREW LOCATION

SS6

Single Acting Cylinders

Pneumatic only Adds to cylinder length

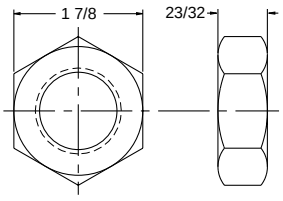
TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring extend	0-2”	1 1/2”	2 1/8”-4”	3”
Spring return	0-2”	1 1/2”	2 1/8”-4”	3”

Spring Force: Spring fully extended approx. 20#
Spring fully compressed approx. 75#

1 1/4 -12SS Nut

Nose Mounting Nut

Not included with cylinder
Order Separately

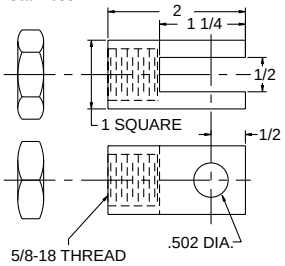


18-8 Stainless

SS-625

Rod Clevis and Nut

303 Stainless



SS-601

Clevis Pin Assembly

Used on SS-625 303 Stainless

Make the Best Choice

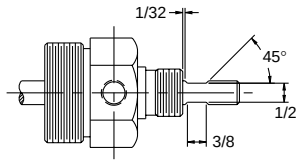
1 630 851 4515

ask for Technical Support

SS Options

- Shock Pads
- Wrench Flats
- Viton Seals
- Non-lube Service
- Non-Metallic Rod Br'g
- Reverse Polypak Wiper
- Stainless Piston
- Magnetic Piston
- 90° Rear Clevis
- Adjustable Cushions

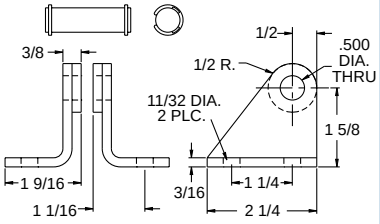
Wrench Flats **Optional**

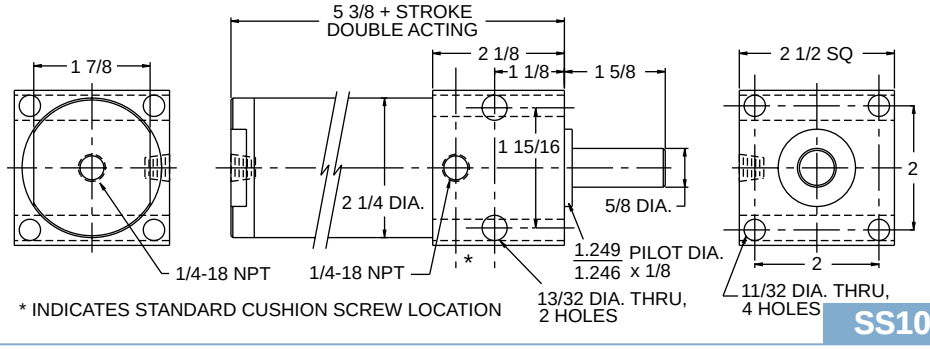


UNIQUE APPLICATIONS SOMETIMES REQUIRE UNIQUE CYLINDERS

See our custom design capabilities on page 87

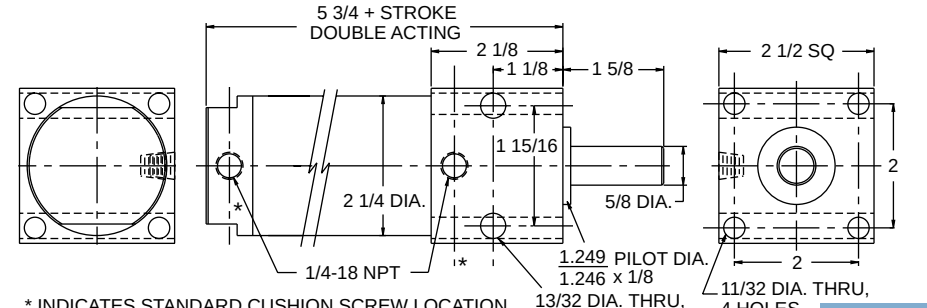
SS-100
St'd Clevis Brk't
Used on SS 2
Series 300 Stainless





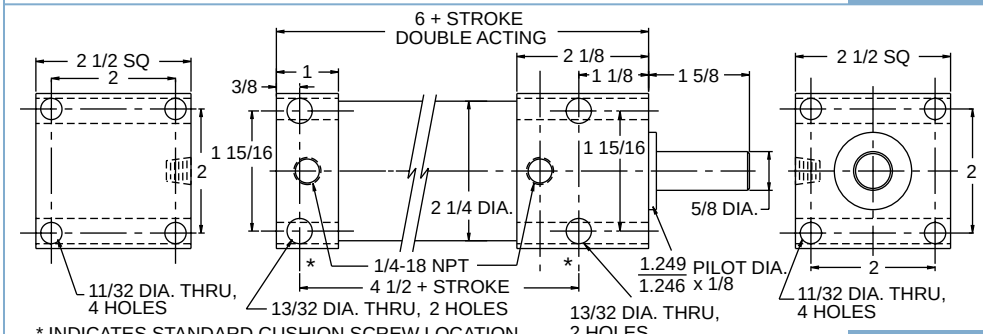
* INDICATES STANDARD CUSHION SCREW LOCATION

SS10



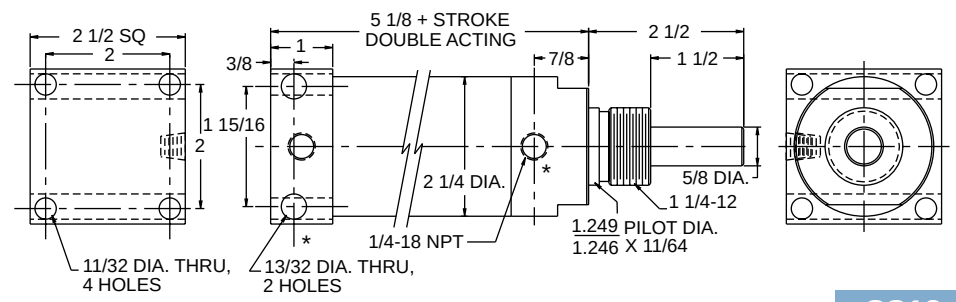
* INDICATES STANDARD CUSHION SCREW LOCATION

SS11



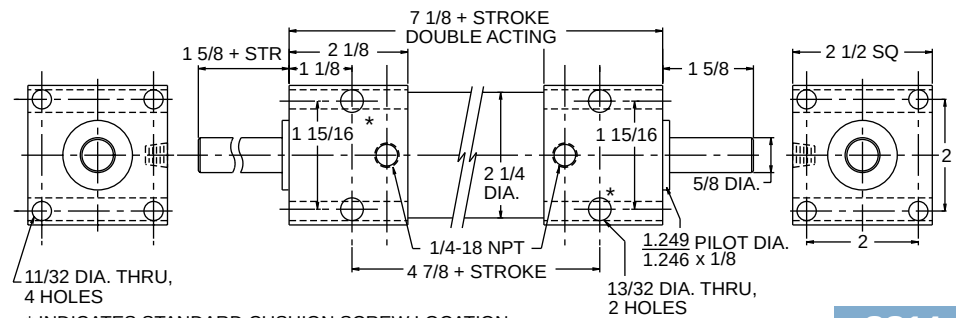
* INDICATES STANDARD CUSHION SCREW LOCATION

SS12



* INDICATES STANDARD CUSHION SCREW LOCATION

SS13



* INDICATES STANDARD CUSHION SCREW LOCATION

SS14

Series SS Solid Stainless

ORDERING PROCEDURE - Series SS Stainless

Select code numbers/letters (**bold type**) from each of the six boxes below - then select options desired from the table below. List codes in the same sequence as shown.

Bore	Code
3/4"	**07**
1 1/8"	**11**
1 1/2"	**15**
2"	**20**

Type	Code
Single Acting Spring return*	**A**
Single Acting Spring extend*	**B**
Double acting	**C**

*Adds to cyl. length
If double rod end model is to be single acting, select **A**

Service	Code
Pneumatic	**E**
Hydraulic	**G**

Mounting Style/Code

SS 1	**SS 10**
SS 2	**SS 11**
SS 3	**SS 12**
SS 5	**SS 13**
SS 6	**SS 14**

Stroke

Code is stroke in total 1/8" increments

Example: 1" stroke = **8**
2 1/4" stroke = **18**

Stocked in 1/2" increments as follows:

3/4" bore to 6" 1 1/8" bore to 8"
1 1/2" bore to 10" 2" bore to 12"

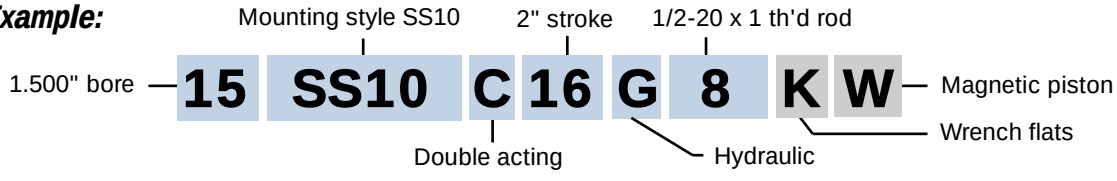
Piston Rod Codes

Bore	Thread	Code
All	Plain rod No thread	**0**
.750	5/16-18 x 3/4	**3**
.750	5/16-24 x 3/4	**4**
1.125	3/8-16 x 3/4	**5**
1.125	3/8-24 x 3/4	**6**
1.500	1/2-13 x 1	**7**
1.500	1/2-20 x 1	**8**
2.000	5/8-11x 1 1/4	**11**
2.000	5/8-18 x 1 1/4	**12**

SS 6, 14 Double rod models will have same rod thread both ends

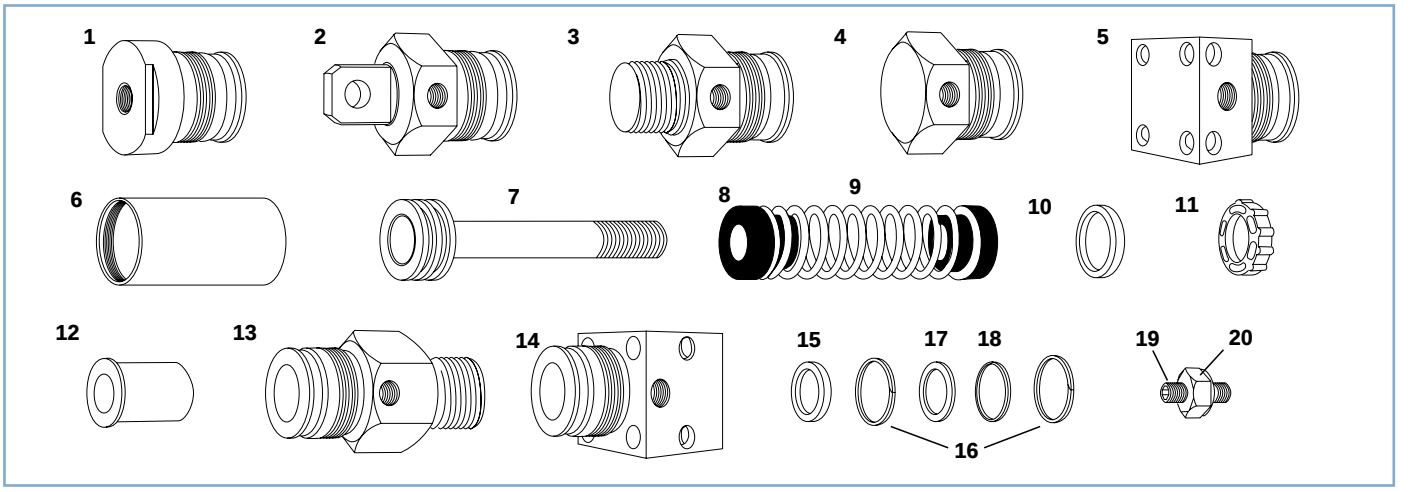
Option	Description	Code
Extra rod extension	Specify code letter **J** followed by the extra length as a two place decimal. Example: **J.50** = 1/2" extra **J1.25** = 1 1/4"extra SS6, 14 double rod cylinders with extra extension cannot be ordered by a standard part number - consult factory for a special part number.	**J**
Wrench flats	Specify if required If specified will be added to both ends of SS6, 14 double rod cylinders	**K**
Shock pads	Double acting cylinders only — must be added to both ends Adds 1/2" to length — pneumatic use only to 180°F	**N**
Non-lube service	Pneumatic only — Not available with magnetic piston or solid stainless piston	**P**
Viton seals	Standard seals are nitrile and urethane +10 to +180°F For service –10 to +400°F specify viton	**R**
Reverse polypak rod wiper	More effective at keeping liquids and gases out of the cylinder	**S**
Clevis 90° to st'd	SS 2 only	**T**
Stainless piston	303 Stainless with teflon wear strip Not available with magnet, non lube, or cushion options	**V**
Magnetic piston	Adds 1/2" to length on 3/4" bore only Not available with Non-lube or stainless piston options	**W**
Hollow piston rod	Available in 5/16 dia.rod – thru hole .135" Available in 3/8 dia.rod – thru hole .248" Available in 1/2 dia.rod – thru hole .313" Rod is plain 304 stainless - no chrome plating	**X**
Non - metalic rod bushings	Fiberglass backed teflon	**Y**
Adjustable Cushions	Not Available on: 3/4" bore cylinders Rear port caps (SS1, 10) Solid stainless piston Cylinders with shock pads Cushion head end only Cushion cap end only Cushion both ends	**AA** **BB** **CC**

Part No. Example:



Series SS Service Parts

When ordering any repair part please provide the part number and description shown below along with the serial number and part number of the cylinder being serviced.



Key	Description		3/4 Bore	1 1/8 Bore	1 1/2 Bore	2 Bore
	Seal kit – Pneumatic, Nitrile	Add suffix NL for Non-lube Add suffix REV for Reverse Polypak Wiper Add suffix W with Stainless Piston	SS 2207 PB	SS 2211 PB	SS 2215 PB	SS 2220 PB
	Seal kit – Pneumatic, Viton	Add suffix NL for Non-lube Add suffix REV for Reverse Polypak Wiper Add suffix W with Stainless Piston	SS 2207 PV	SS 2211 PV	SS 2215 PV	SS 2220 PV
	Seal kit – Hydraulic, Urethane	Add suffix REV for Reverse Polypak Wiper Add suffix W with Stainless Piston	SS 2207 HU	SS 2211 HU	SS 2215 HU	SS 2220 HU
	Seal kit – Hydraulic, Viton	Add suffix REV for Reverse Polypak Wiper Add suffix W with Stainless Piston	SS 2207 HV	SS 2211 HV	SS 2215 HV	SS 2220 HV
1	Rear port cap		SS 1007	SS 1011	SS 1015	SS 1020
2	Rear pivot cap	Add suffix C for adjustable cushion	SS 1107	SS 1111	SS 1115	SS 1120
2	90ϒRear pivot cap	Add suffix C for adjustable cushion	SS 110790	SS 111190	SS 111590	SS 112090
3	Rear stud cap	Add suffix C for adjustable cushion	SS 1207	SS 1211	SS 1215	SS 1220
4	Side port cap	Add suffix C for adjustable cushion	SS 1307	SS 1311	SS 1315	SS 1320
5	Square cap	Add suffix C for adjustable cushion	SS 1507	SS 1511	SS 1515	SS 15 20
6	Tube		part No. is T followed by the complete cylinder part number			
7	Piston rod assembly		part No. is PR followed by the complete cylinder part number			
8	Spring guide Pair		SS 2007	SS 2011	SS 2015	SS 2020
9	Spring		SS 2107	SS 2111	SS 2115	SS 2120
10	Magnet	1 or 2 as necessary	SS 3207	SS 3211	SS 3215	SS 3220
11	Shock pad		75MSP	11MSP	15MSP	2MSP
12	Rod bearing	Add suffix DU for non-metalic		SS 0211	SS 0215	SS 0220
13	Head w/ Bronze br'g	Add suffix C for adjustable cushion	SS 0107	SS 0111	SS 0115	SS 0120
13	Head w/ Non-metalic br'g	Add suffix C for adjustable cushion	SS 0107 DU	SS 0111 DU	SS 0115 DU	SS 0120 DU
14	Head w/ Bronze br'g	Add suffix C for adjustable cushion	SS 1407	SS 1411	SS 1415	SS 1420
14	Head w/ Non-metalic br'g	Add suffix C for adjustable cushion	SS 1407 DU	SS 1411 DU	SS 1415 DU	SS 1420 DU
15	Rod seal retaining washer		SS 0507	SS 0511	SS 0515	SS 0520
16	Rod seal/Rod wiper snap ring		SS 0607	SS 0611	SS 0615	SS 0620
17	Rod wiper inside retaining washer	Add suffix REV for Reverse Polypak Wiper	SS 0307	SS 0311	SS 0315	SS 0320
18	Rod wiper outside retaining washer	Add suffix REV for Reverse Polypak Wiper	SS 0407	SS 0411	SS 0415	SS 0420
19	Cushion screw 3/4" long			SS 2611	SS 2615	
19	Cushion screw 7/8" long			SS 2611L	SS 2615L	SS 2620L
20	Cushion screw locknut			SS 2711	SS 2715	SS 2720

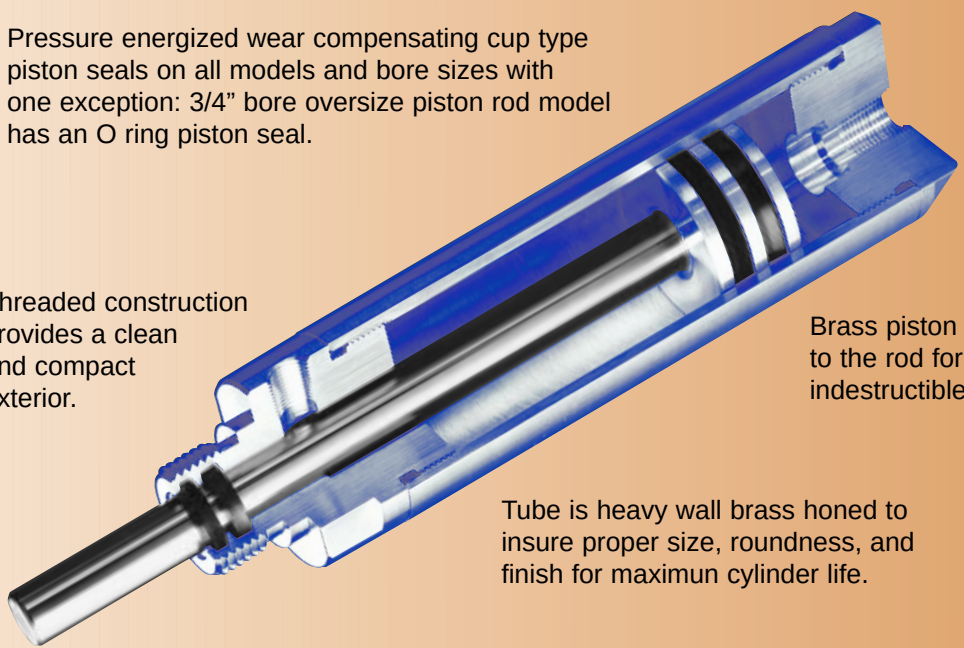
Series HB Solid Brass Cylinders

For General Industrial Use in most Environments

200 PSI Pneumatic
500 PSI Hydraulic Non shock
3/4", 1", 1 1/8", 1 1/2", 2" Bores

Magnetic piston available to operate Aurora stainless proximity switches.

Pressure energized wear compensating cup type piston seals on all models and bore sizes with one exception: 3/4" bore oversize piston rod model has an O ring piston seal.



Solid brass heads and caps are precision machined.

Threaded construction provides a clean and compact exterior.

Brass piston is silver brazed to the rod for an almost indestructible joint.

Tube is heavy wall brass honed to insure proper size, roundness, and finish for maximun cylinder life.

3/4, 1, 1 1/8 Bore Cylinders have four lobed rod seal.
1 1/2, 2 Bore Cylinders have cup type rod seal.

A natural choice where moisture is a problem .

ADDITIONAL DESIGN FEATURES

SHOCK PADS

Reduce noise and fatigue problems such as rod breakage with energy absorbing shock pads. Add 1/4" to the cylinder length for each pad. For pneumatic use only to 180°F.

ROD WIPERS

Prolong the life of cylinders operating in dirty environments by adding rod wipers. Polyurethane or Viton wipers are wear compensating and effectively prevent damaging contaminants from entering the critical rod seal/rod bushing area. Limited availability.

SEAL COMPOUNDS

Standard cylinders contain buna n (nitrile) seals and polyurethane wipers which are compatible with most lubricants and fluids, and can withstand temperatures from –40° to +200°F.

Viton seals and wipers may be ordered for temperatures ranging from –10° to +400°F and for added chemical resistance.

"Long Life" seals will provide significantly increased service life due to their excellent abrasion resistance. Fluid compatibility is identical to buna n seals and their effective temperature range is +20° - +200°F. Long life rod seals are standard on all 3/4, 1, 1 1/8" bore cylinders.

HYDRAULIC SEALS

Rod seal weepage can be substantially reduced by specifying polypak* rod seals. They are available on all 1 1/2 and 2" bore cylinders. For availability on other bore sizes consult factory.

HARD CHROMED PISTON ROD

The standard rod in all HB cylinders is ground and polished type 303 stainless steel. Hard chrome plated steel rods are available. The plating gives the rod a very hard scratch resistant surface which increases the wear life of the rod, rod bushing, and rod seal. The result is increased cycle life on all cylinders and improved sealability on hydraulic cylinders.

PISTON ROD THREADS

Rods are stocked with both fine and coarse male threads as listed in the ordering procedure. Almost any special thread – female, metric, etc. – can be produced to customer requirements in just a day or so for a modest extra charge.

- Female thread depth: #10, 1/4, 5/16, 3/8 threads are 5/8 deep.
  1/2, 5/8, 3/4 threads are 1 1/4 deep.
- Threads smaller than the nominal rod diameter will be per the photo unless otherwise noted.

PIVOT BUSHING

All HB2 caps have a stainless steel pivot bushing.

STOP TUBE

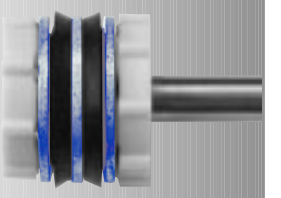
Stop tubes are spacers between the piston and the cylinder head which prevent the piston from fully extending. This will reduce the bearing loads by increasing the distance between bearing points. Stop tubes should be used on long stroke cylinders and on cylinders where side load is a concern. See ordering procedure for available lengths. Also consider SMA aluminum cylinders for long strokes and side load conditions.

ADJUSTABLE CUSHIONS

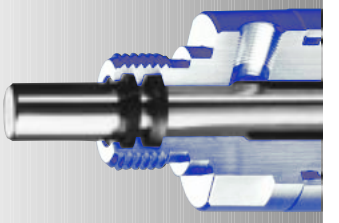
Reduce noise and decelerate the piston at the end of stroke. Aurora's cup type cushion seal provides positive cushioning yet allows a high flow rate when reversing for minimum cycle time. A stainless steel metering screw offers simple adjustment of the cushion rate. The adjusting screw is fully recessed and self locking on 1 1/2 and 2" bore cylinders. The adjusting screw on 1 1/8" bore cylinders is locked in place by a low profile nut.

* Polypak is a registered trademark of Parker Hannifin

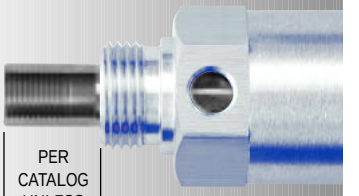
SHOCK PADS



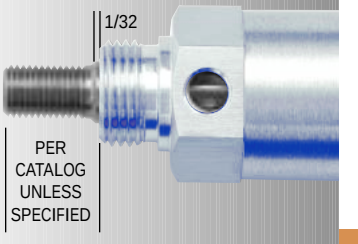
ROD WIPERS



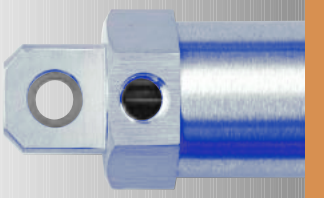
FEMALE ROD THREADS



SPECIAL DIAMETER MALE THREADS

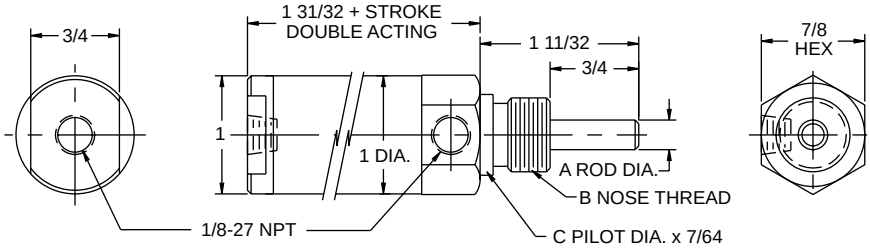


PIVOT BUSHING

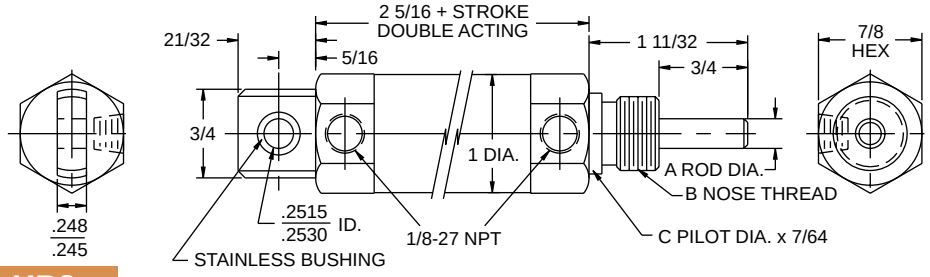


3/4” BORE HB BRASS

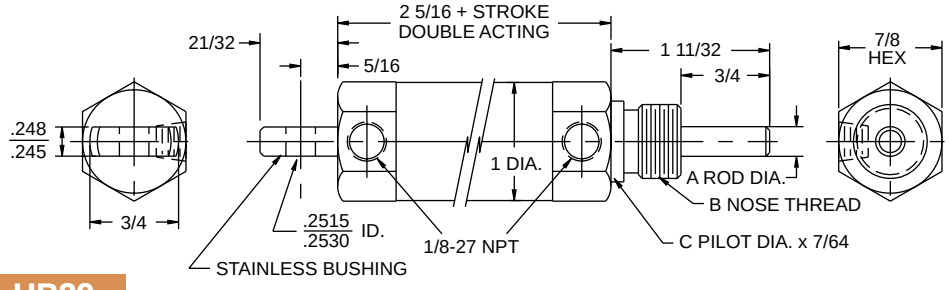
200 PSI MAX. AIR
500 PSI MAX. HYD. *Non shock*



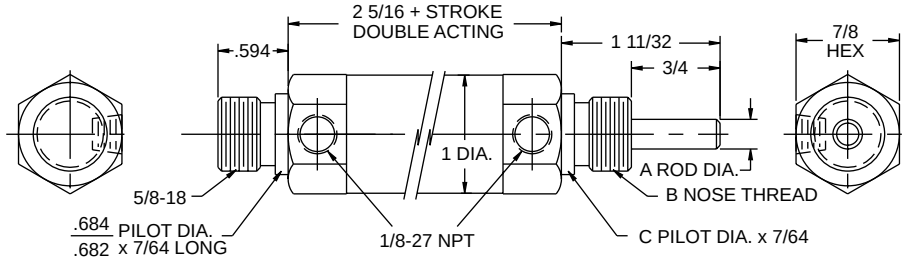
HB1



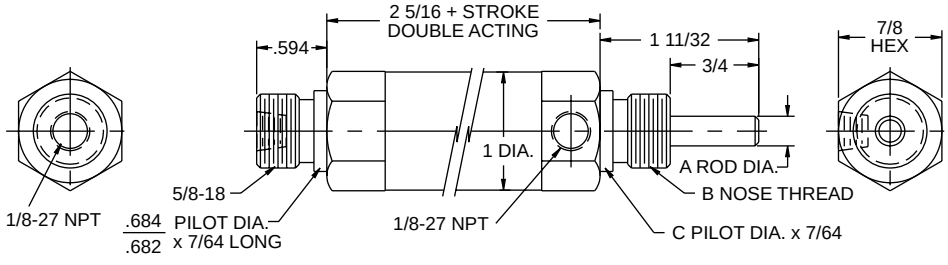
HB2



HB29



HB3



HB4

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
1/4	5/8 –18	.684/.682	**D**
5/16	5/8 –18	.684/.682	**E**

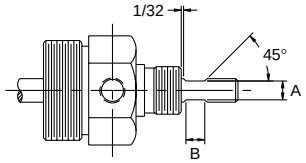
Single Acting Cylinders

Pneumatic only Adds to cylinder length

TYPE	STROKE	cyl. O.A.L.	STROKE	cyl. O.A.L.
Spring return	0-1 3/4”	1”	1 7/8”-3 1/2”	2”
Spring extend	0-1 3/4”	1”	Not available over 1 3/4” stroke	

Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 9#

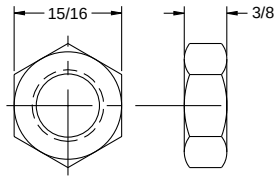
Wrench Flats Optional



ROD DIA.	A	B
1/4	.187	1/4
5/16	.250	1/4

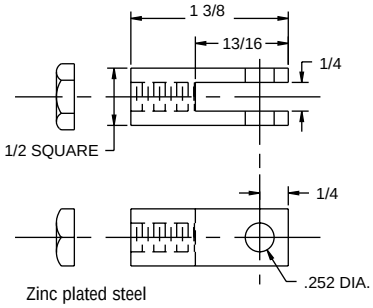
Nose Mounting Nut

Included with Cylinder Zinc plated steel



Thread 5/8 –18

HB-250 1/4-28 Thread
HB-312 5/16-18 Thread
Rod Clevis and Nut



Zinc plated steel

HB-200
Clevis Pin Assembly

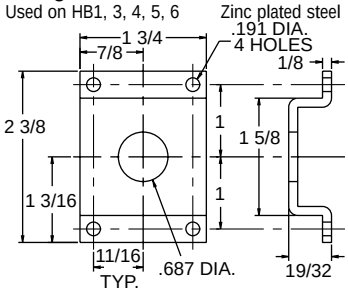
Used on HB-250, 312

HB Options

- Shock Pads
- Wrench Flats
- Viton or Long Life Seals
- Chrome Rod
- Magnetic Piston
- Hollow Rod 5/16 ONLY

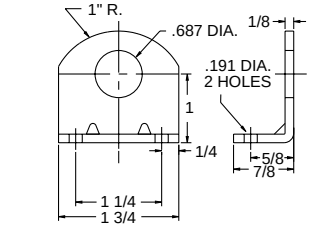
HB-10
Flange Bracket

Used on HB1, 3, 4, 5, 6 — Zinc plated steel



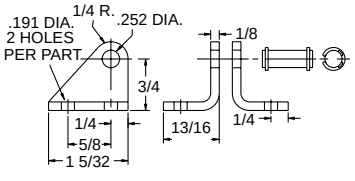
HB-20
Foot Bracket

Used on HB1, 3, 4, 5, 6 — Zinc plated steel



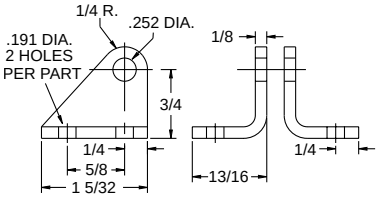
HB-30
Clevis Bracket

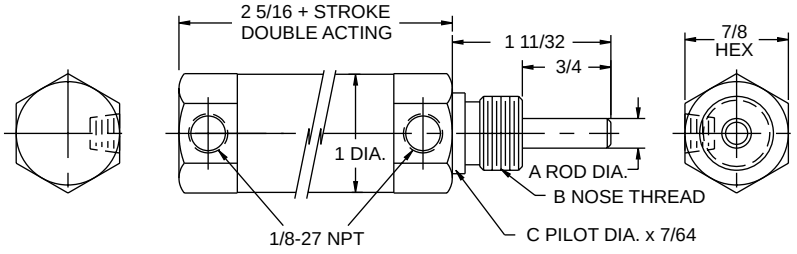
Used on HB2, 29 — Zinc plated steel



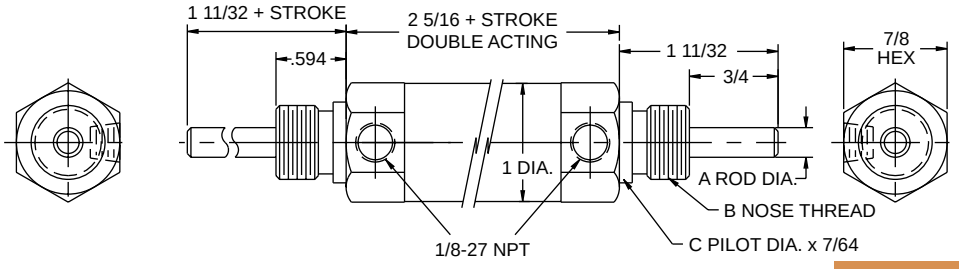
HB-30T
Trunnion Bracket

Used on HB7, 8, 9 — Zinc plated steel

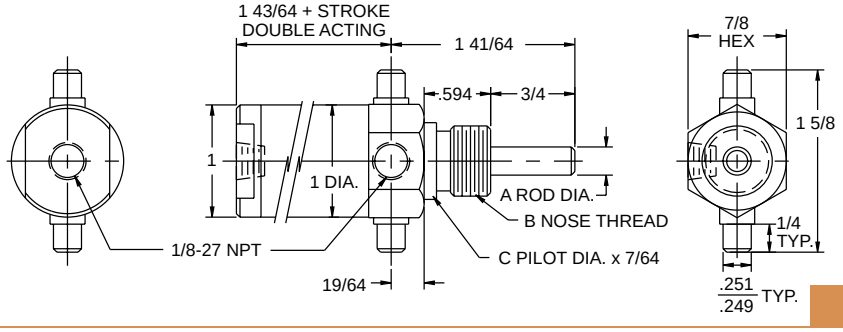




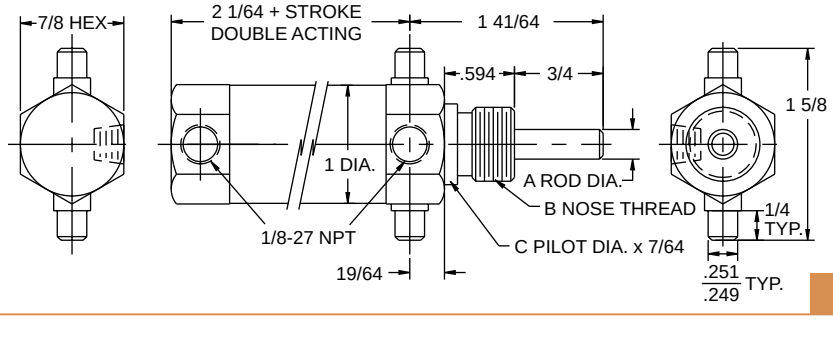
HB5



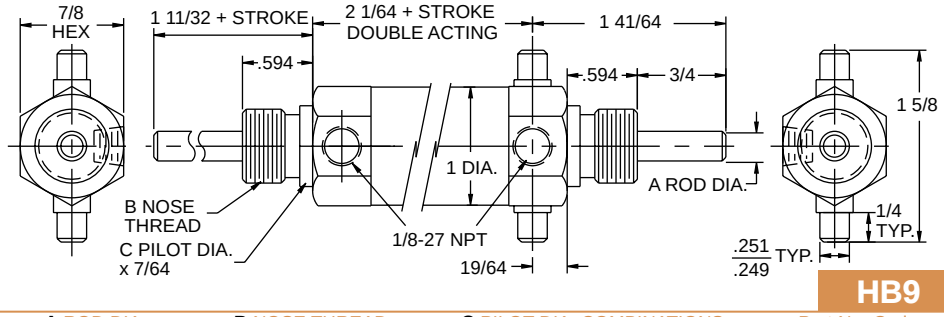
HB6



HB7



HB8



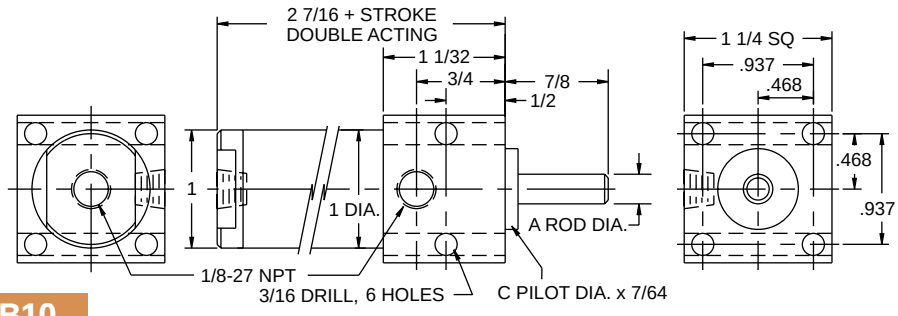
HB9

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
1/4	5/8 –18	.684/.682	**D**
5/16	5/8 –18	.684/.682	**E**

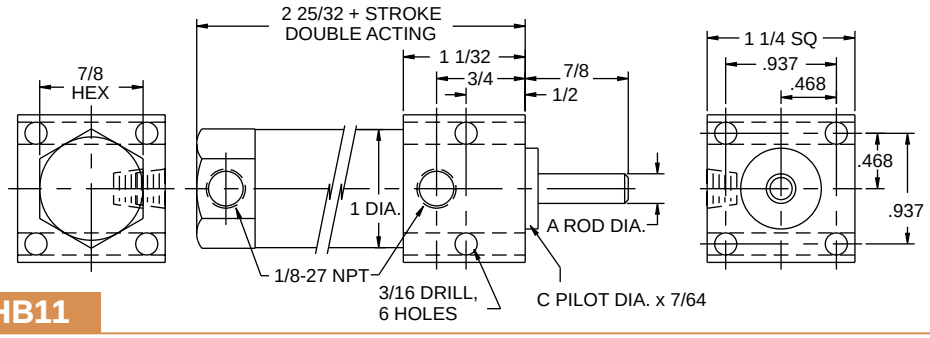
Series HB BRASS

3/4" BORE HB BRASS

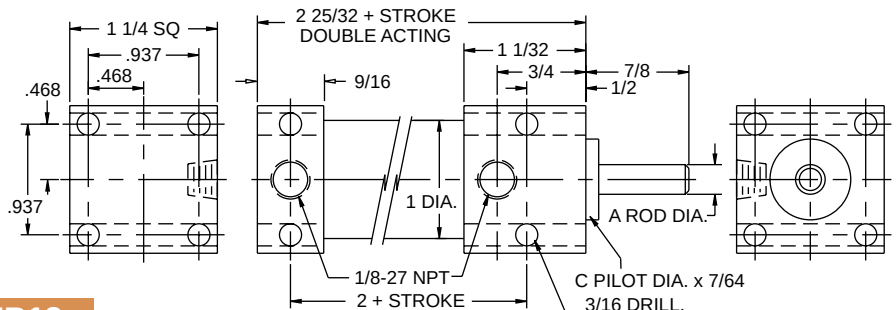
200 PSI MAX. AIR
500 PSI MAX. HYD. *Non shock*



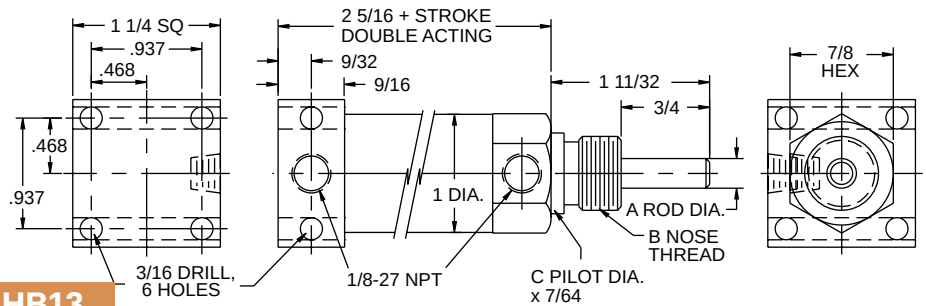
HB10



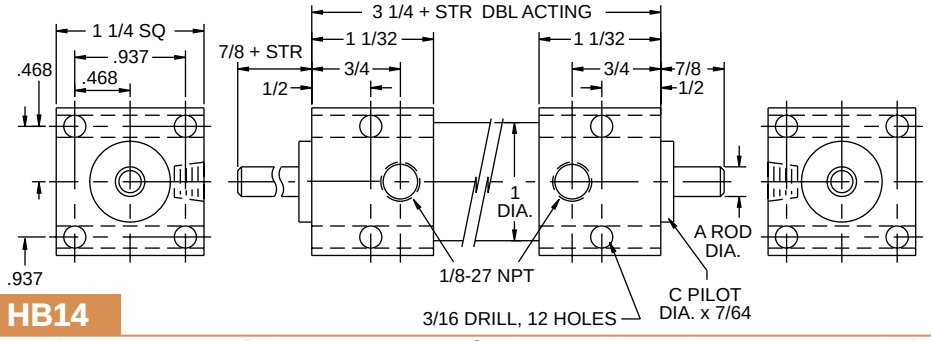
HB11



HB12



HB13



HB14

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
1/4	5/8 –18	.684/.682	**D**
5/16	5/8 –18	.684/.682	**E**

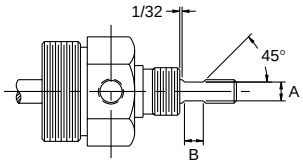
Single Acting Cylinders

Pneumatic only **Adds to cylinder length**

TYPE	STROKE	cyl. O.A.L.	STROKE	cyl. O.A.L.
Spring return	0-1 3/4"	1"	1 7/8"-3 1/2"	2"
Spring extend	0-1 3/4"	1"	Not available over 1 3/4" stroke	

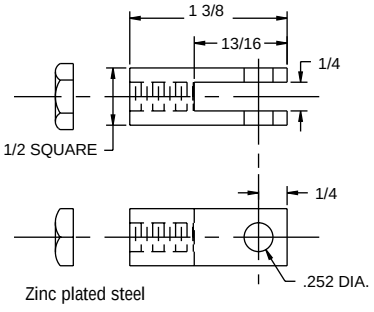
Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 9#

Wrench Flats **Optional**



ROD DIA.	A	B
1/4	.187	1/4
5/16	.250	1/4

HB-250 1/4-28 Thread
HB-312 5/16-18 Thread
Rod Clevis and Nut



Zinc plated steel

HB-200
Clevis Pin Assembly

Used on HB-250, 312

For Higher Cycle Life Add Chrome Rod & Long Life Seal Options. . . or Switch to Series SMA

Single Acting Cylinders

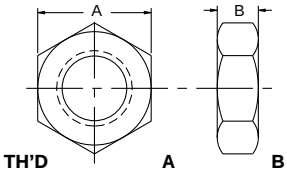
Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2”	1”	2 1/8”-4”	2”
Spring extend	0-2”	1”	Not available over 2” stroke	

Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 13#

Wrench Flat Chart - Pg 68

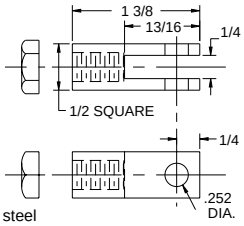
Nose Mounting Nut



TH’D	A	B
5/8 –18	15/16	3/8
3/4 –16	1 1/8	27/64

HB-312 5/16 –18 Thread
HB-375 3/8 –24 Thread

Rod Clevis & Nut

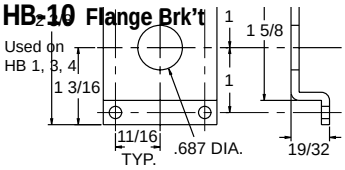


Zinc plated steel

HB-200 Clevis Pin

Used on HB 312, 375

HB-10 Flange Brk’t

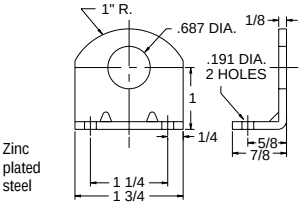


Used on HB 1, 3, 4

Zinc plated steel

HB-20 Foot Brk’t

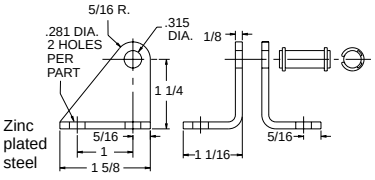
Used on HB 1, 3, 4



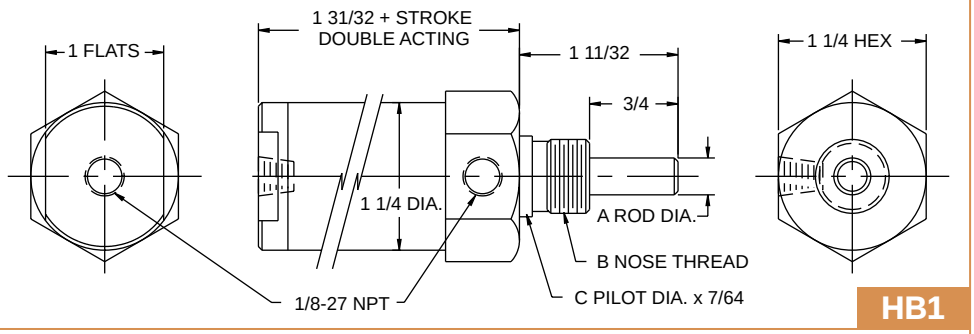
Zinc plated steel

HB-40 Clevis Brk’t

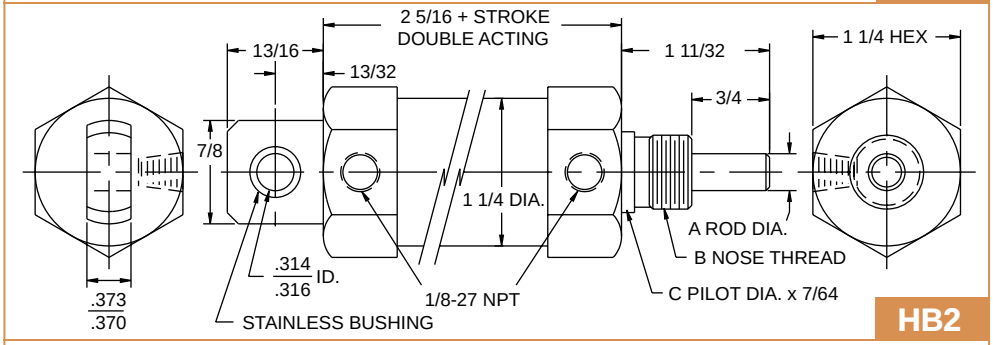
Used on HB 2, 29



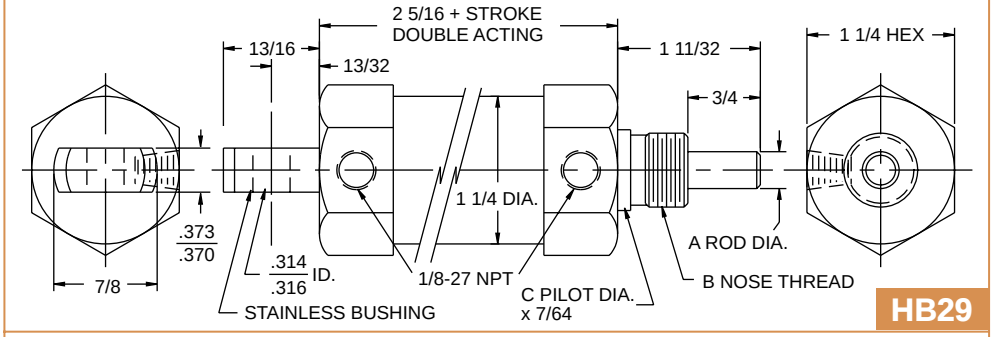
Zinc plated steel



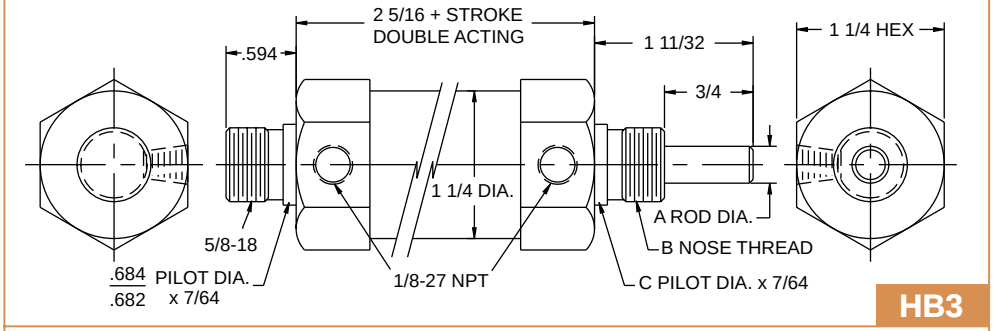
HB1



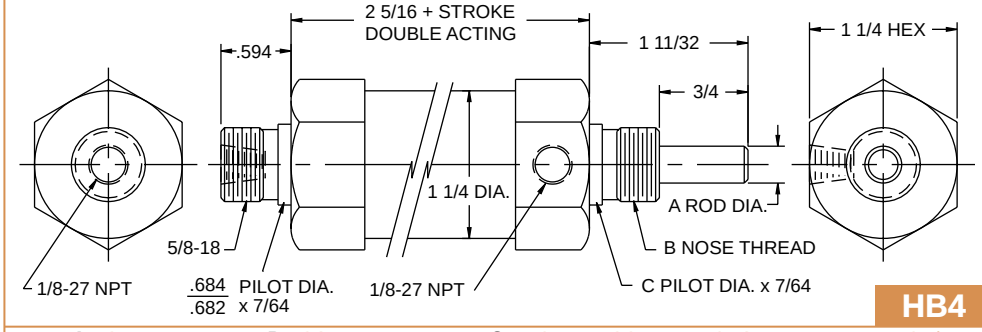
HB2



HB29



HB3

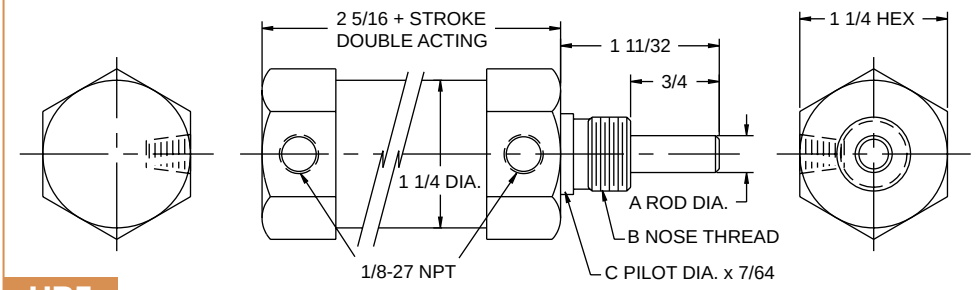


HB4

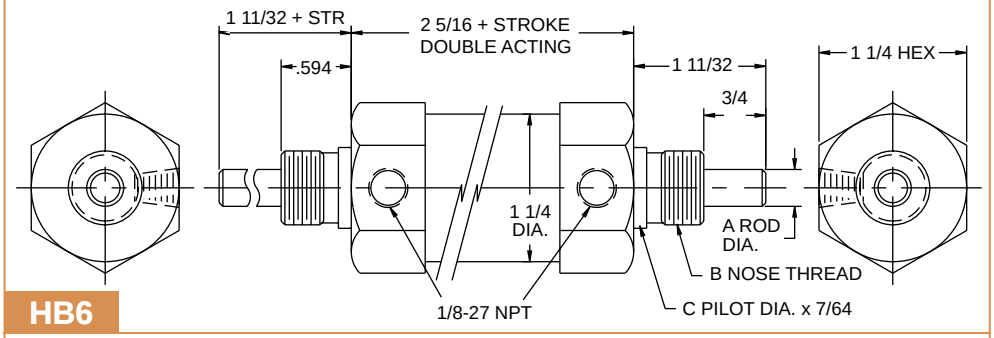
A ROD DIA.	B NOSE THREAD	C PILOT DIA. COMBINATIONS	Part No. Code
5/16 Standard	5/8 –18	.684/.682	D
3/8 Oversize	5/8 –18	.684/.682	E
3/8 Oversize	3/4 –16	.747/.745	F

1" BORE HB BRASS

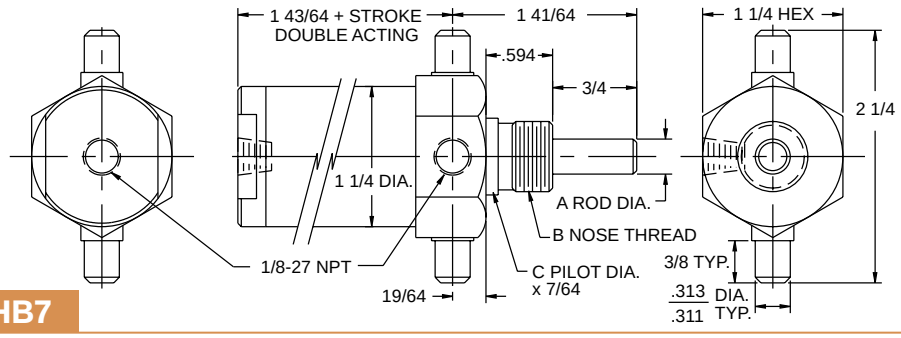
200 PSI MAX. AIR
500 PSI MAX. HYD. *Non shock*



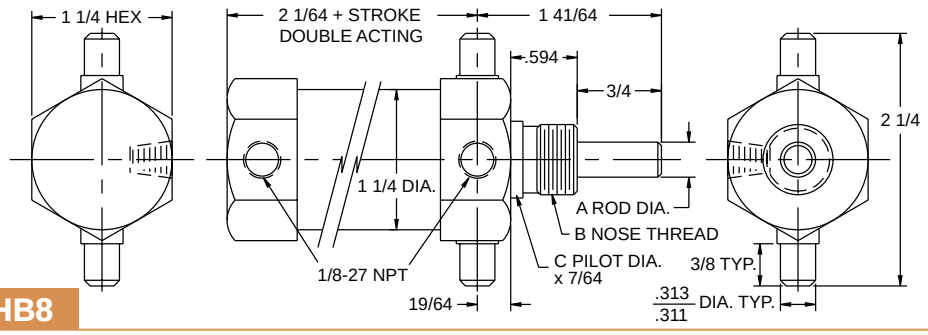
HB5



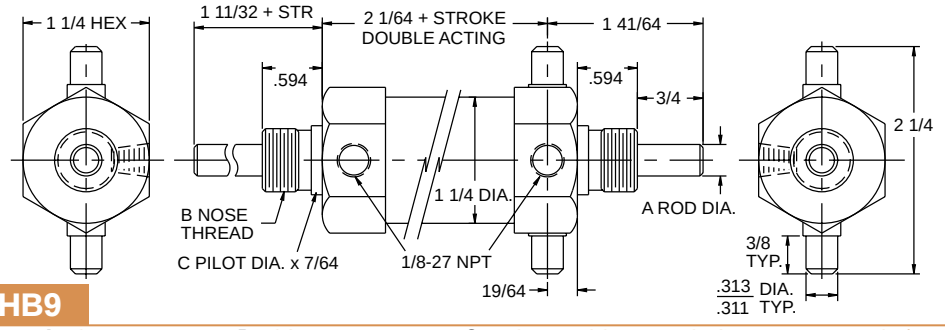
HB6



HB7



HB8



HB9

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/16 Standard	5/8 –18	.684/682	**D**
3/8 Oversize	5/8 –18	.684/.682	**E**
3/8 Oversize	3/4 –16	.747/.745 HB5, 6 ONLY	**F**

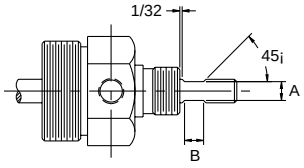
Single Acting Cylinders

Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2"	1"	2 1/8"-4"	2"
Spring extend	0-2"	1"	Not available over 2" stroke	

Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 13#

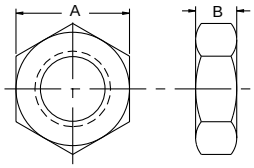
Wrench Flats Optional



ROD DIA.	A	B
5/16	.250	1/4
3/8	.312	1/4

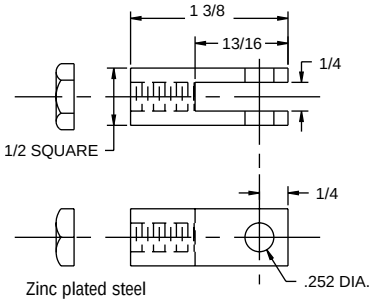
Nose Mounting Nut

Included with Cylinder Zinc plated steel



TH'D	A	B
5/8 –18	15/16	3/8
3/4 –16	1 1/8	27/64

HB-250 1/4-28 Thread
HB-312 5/16-18 Thread
Rod Clevis and Nut



HB-200
Clevis Pin

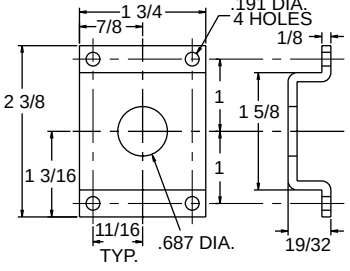
Used on HB 312, 375

For Improved Hydraulic Service Upgrade to Series SMA with U Cup Piston

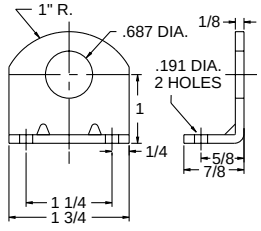
HB Options

- Shock Pads
- Wrench Flats
- Viton or Long Life Seals
- Chrome Rod
- Hollow Rod

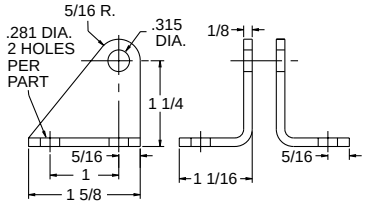
HB-10
Flange Bracket
Used on HB1, 3, 4, 5, 6
Zinc plated steel



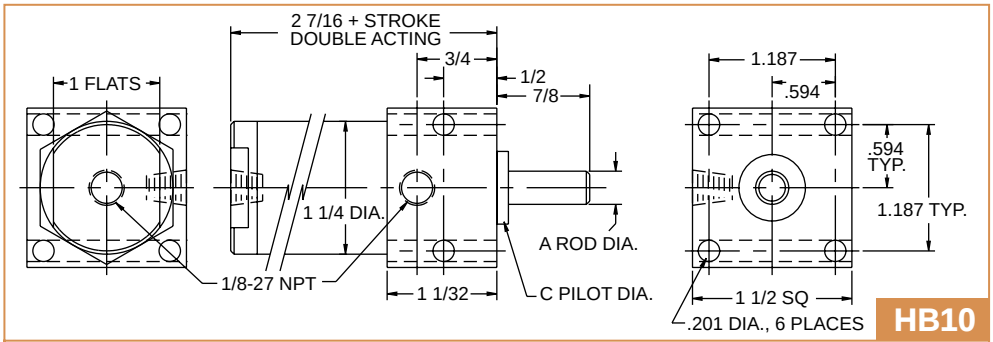
HB-20
Foot Bracket
Used on HB1, 3, 4, 5, 6
Zinc plated steel



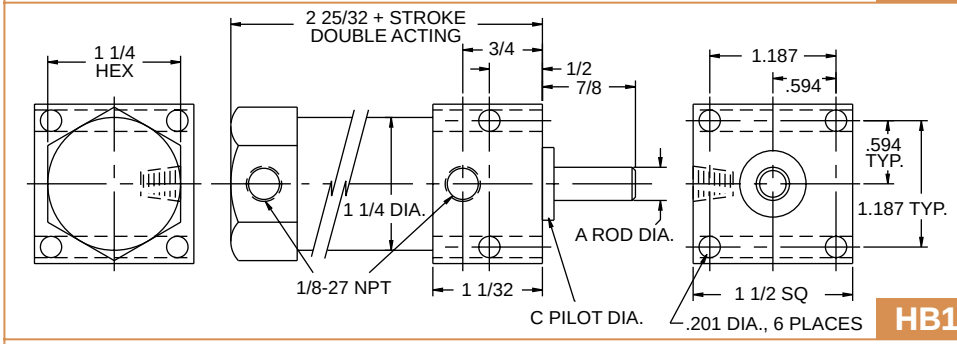
HB-40T
Trunnion Bracket
Used on HB7, 8, 9
Zinc plated steel



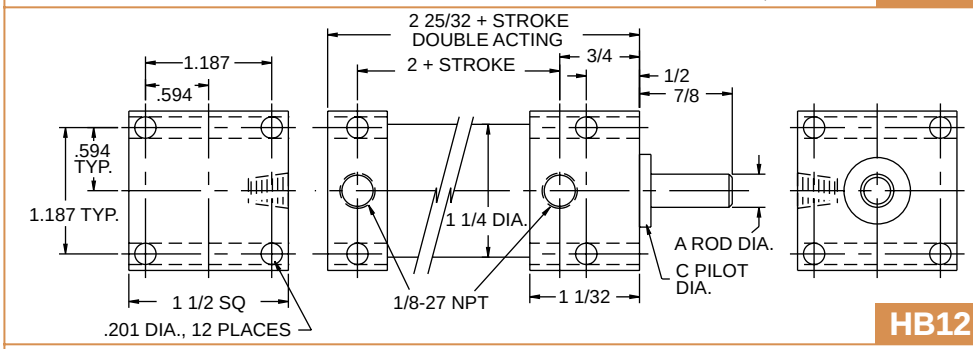
Don't Guess-
Call Us to Review Your Application
630 851 4515



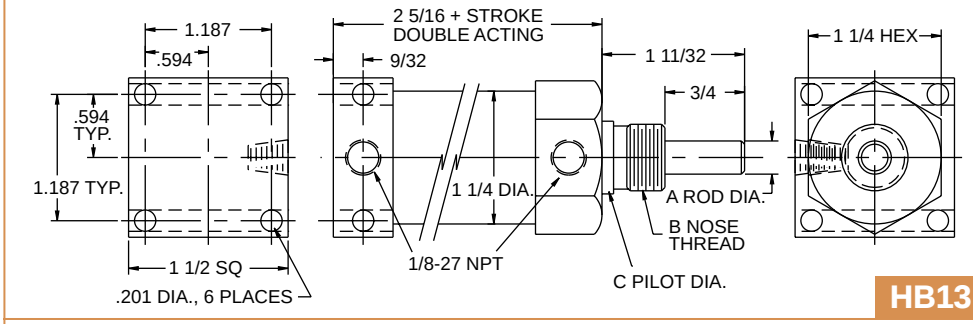
HB10



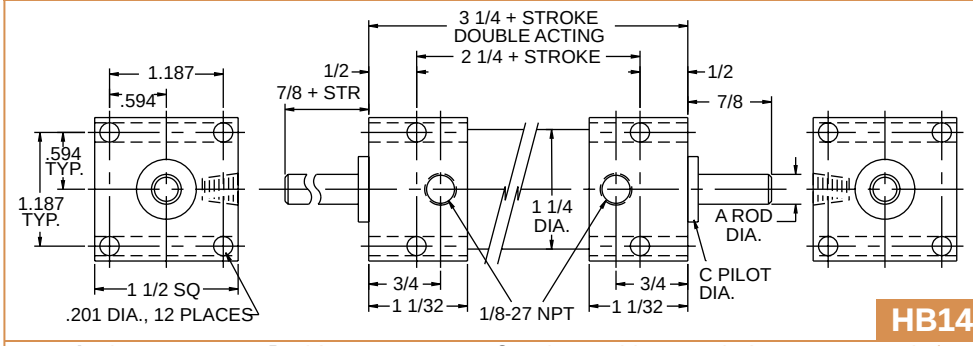
HB11



HB12



HB13

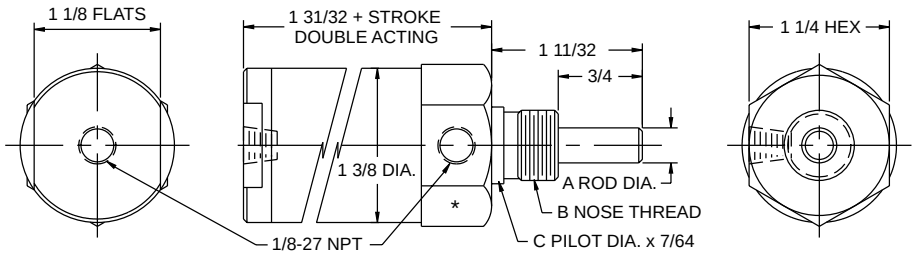


HB14

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/16 Standard	5/8 –18	.684/682	**D**
3/8 Oversize	5/8 –18	.684/.682 HB13 ONLY	**E**
3/8 Oversize	3/4 –16	.747/.745	**F**

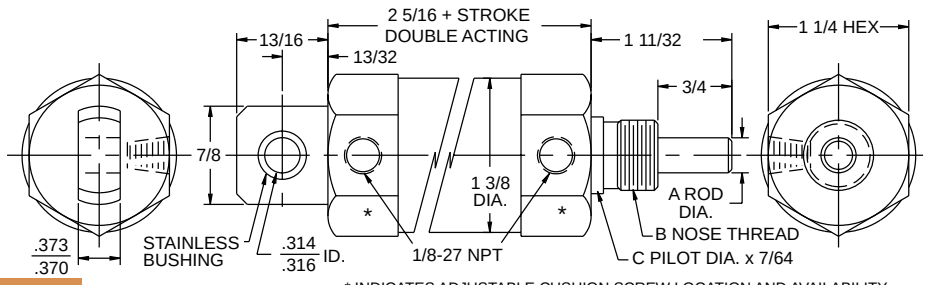
1 1/8" BORE HB BRASS

200 PSI MAX. AIR
500 PSI MAX. HYD. *Non shock*



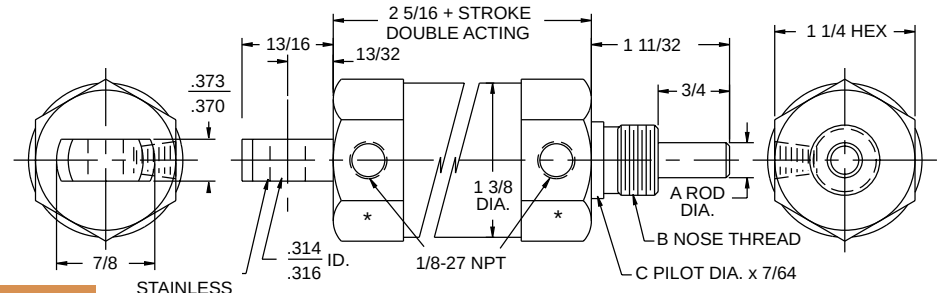
HB1

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



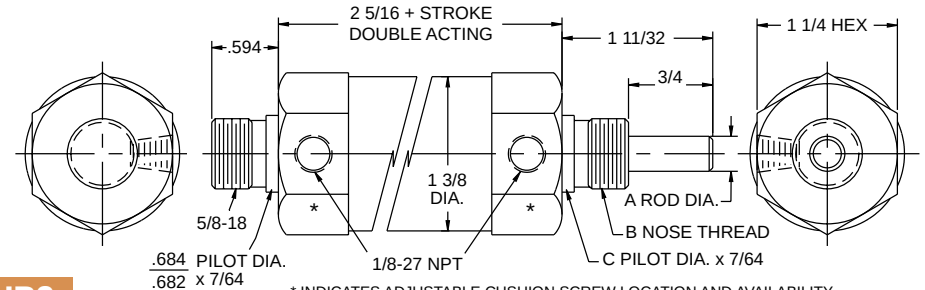
HB2

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



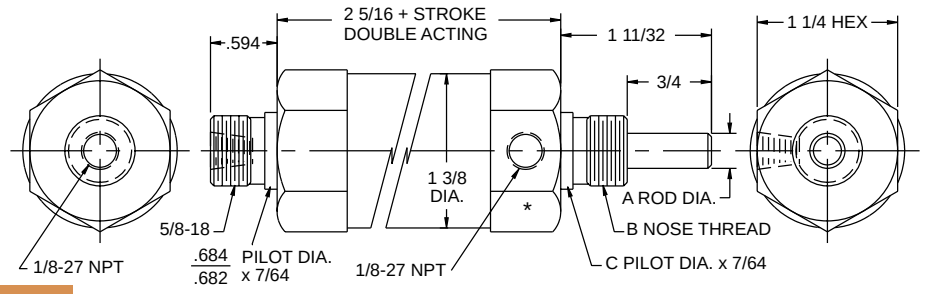
HB29

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



HB3

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



HB4

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/16 Standard	5/8 –18	.684/682	**D**
3/8 Oversize	5/8 –18	.684/.682	**E**
3/8 Oversize	3/4 –16	.747/.745	**F**
3/8 Oversize	7/8 –14	.934/.932	**G**
1/2 Oversize	7/8 –14	.934/.932	**H**

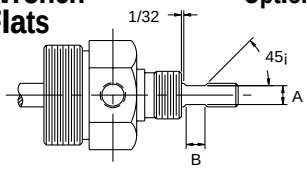
Single Acting Cylinders

Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2"	1"	2 5/8"-4"	2"†
Spring extend	0-2 1/2"	1"	Not available over 2 1/2" stroke	

Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 20#
† Spring fully compressed approx. 13#

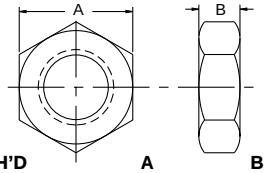
Wrench Flats — Optional



ROD DIA.	A	B
5/16	.250	1/4
3/8	.312	1/4
1/2	.437	1/4

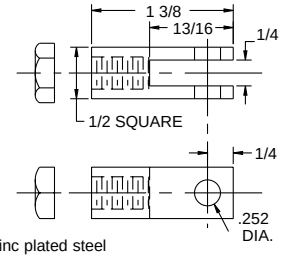
Nose Mounting Nut

Included with Cylinder Zinc plated steel



TH'D	A	B
5/8 –18	15/16	3/8
3/4 –16	1 1/8	27/64
7/8 –14	1 5/16	31/64

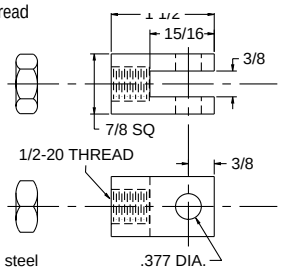
HB-312 5/16 –18 Thread / HB-375 3/8 –24 Thread — Rod Clevis & Nut



Zinc plated steel

HB-500 Rod Clevis & Nut

1/2 –20 Thread



Zinc plated steel

HB-200 Clevis Pin Used on HB-312, 375

HB-501 Clevis Pin Used on HB-500

303 Stainless

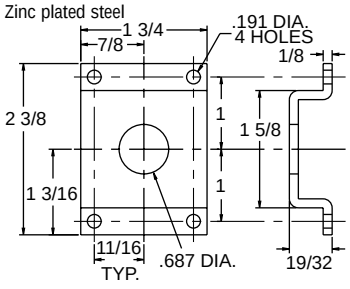
Cushions not available on cylinders with 1/2" diameter rod.

HB Options

- Shock Pads
- Wrench Flats
- Viton or Long Life Seals
- Chrome Rod
- Magnetic Piston
- Hollow Rod
- Adjustable Cushions

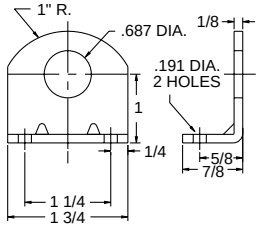
HB-10
Flange Bracket

Used on HB1, 3, 4, 5, 6
Zinc plated steel



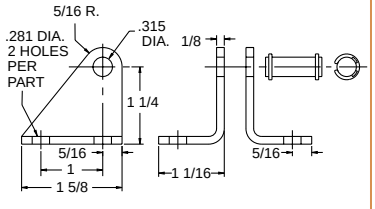
HB-20
Foot Bracket

Used on HB1, 3, 4, 5, 6
Zinc plated steel



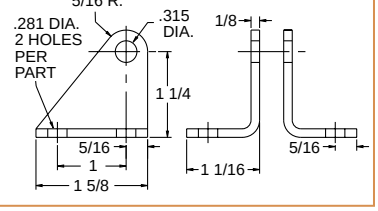
HB-40
Clevis Bracket

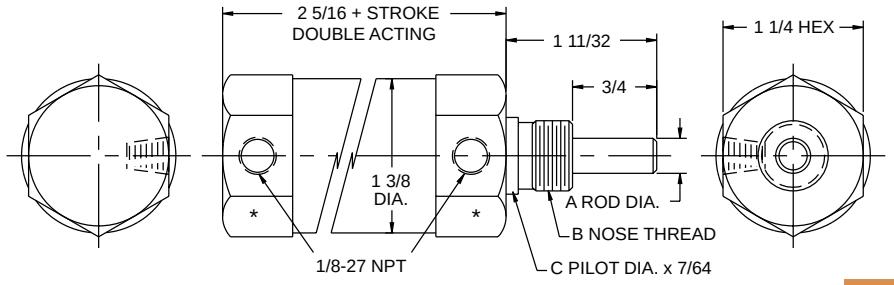
Used on HB2, 29 — Zinc plated steel



HB-40T
Trunnion Bracket

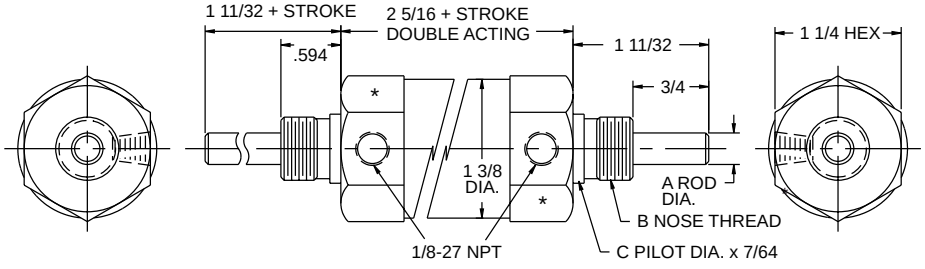
Used on HB7, 8, 9 — Zinc plated steel





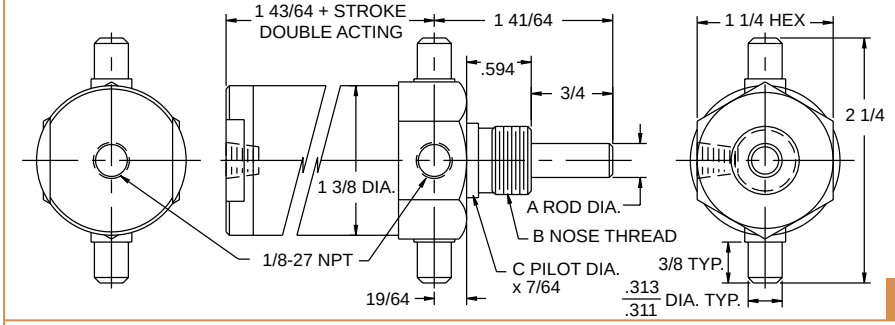
* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY

HB5

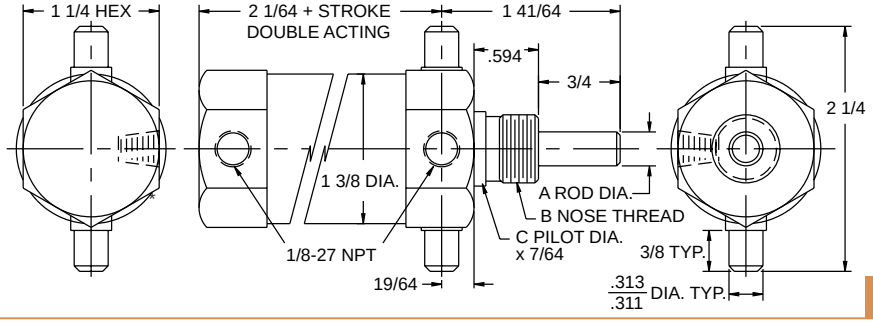


* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY

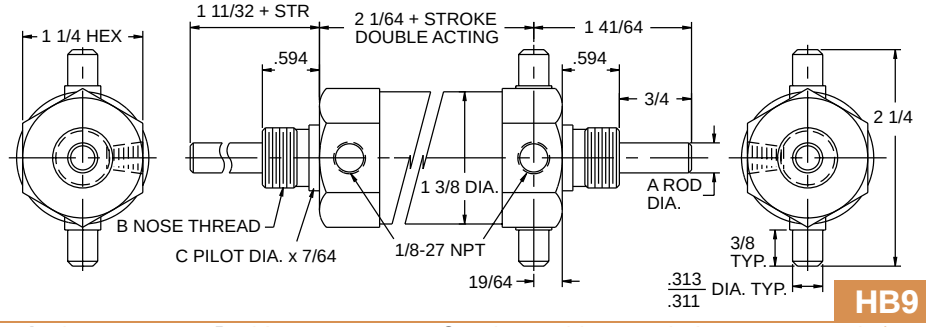
HB6



HB7

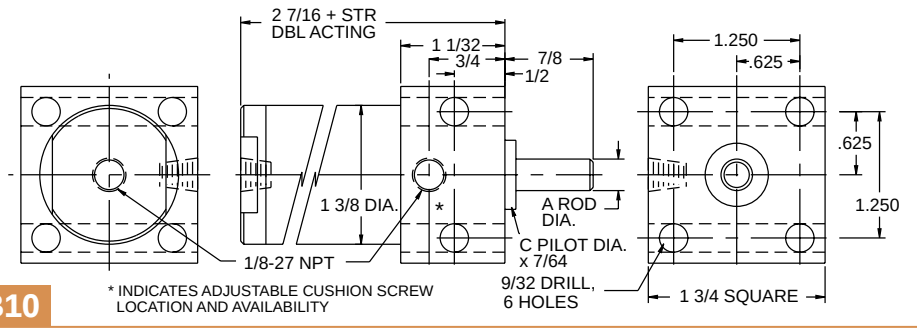


HB8



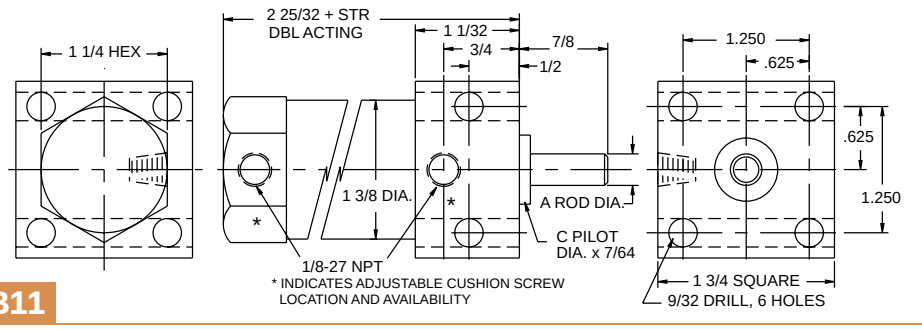
HB9

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/16 Standard	5/8 –18	.684/682	**D**
3/8 Oversize	5/8 –18	.684/.682	**E**
3/8 Oversize	3/4 –16	.747/.745 HB5, 6 Only	**F**
3/8 Oversize	7/8 –14	.934/.932 HB5, 6 Only	**G**
1/2 Oversize	7/8 –14	.934/.932	**H**



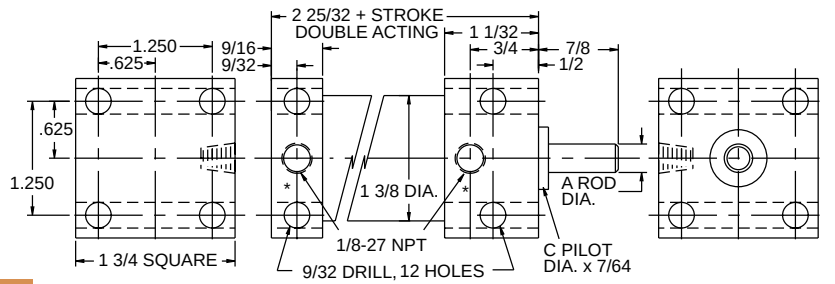
HB10

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



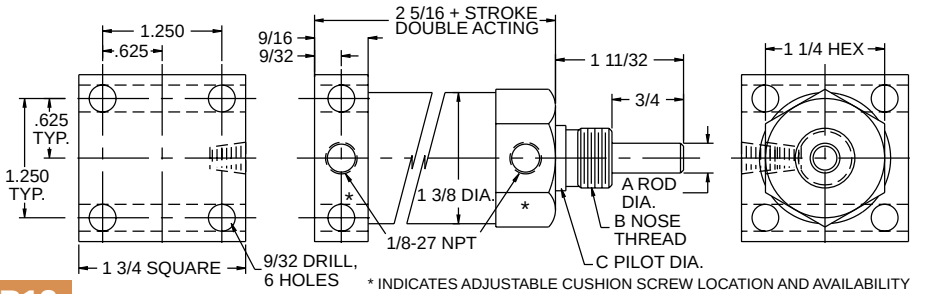
HB11

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



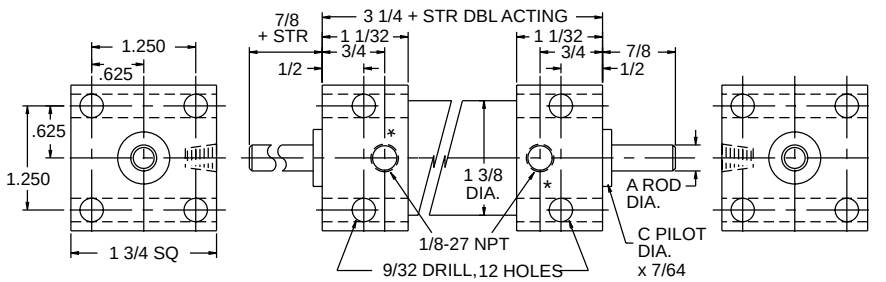
HB12

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



HB13

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY



HB14

* INDICATES ADJUSTABLE CUSHION SCREW LOCATION AND AVAILABILITY

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/16 Standard	5/8 –18	.684/682	**D**
3/8 Oversize	5/8 –18	.684/.682 HB13 Only	**E**
3/8 Oversize	3/4 –16	.747/.745	**F**
3/8 Oversize	7/8 –14	.934/.932 HB13 Only	**G**
1/2 Oversize	7/8 –14	.934/.932	**H**

Single Acting Cylinders

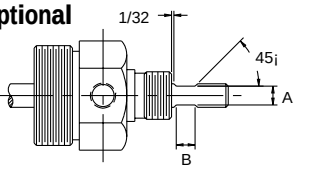
Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2 1/2"	1"	2 5/8"-4"	2"†
Spring extend	0-2 1/2"	1"	Not available over 2 1/2" stroke	

Spring Force: Spring fully extended approx. 4#
Spring fully compressed approx. 20#
† Spring fully compressed approx. 13#

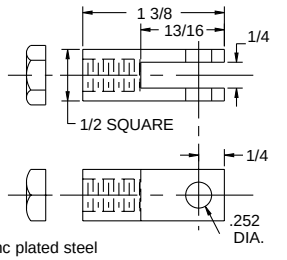
Wrench Flats

Optional



ROD DIA.	A	B
5/16	.250	1/4
3/8	.312	1/4
1/2	.437	1/4

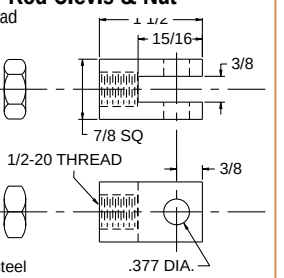
HB-312 5/16 –18 Thread HB-375 3/8 –24 Thread Rod Clevis & Nut



Zinc plated steel

HB-500 Rod Clevis & Nut

1/2 –20 Thread



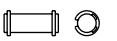
Zinc plated steel

HB-200 Clevis Pin Assembly

Used on HB-312, HB-375

HB-501 Clevis Pin Assembly

Used on HB-500



Cushions not available on cylinders with 1/2" diameter rod.

- ***Back to Back***
- ***Three Position***
- ***Tandems***
- ***Adjustable Stroke***
- ***Spherical Mount***
- ***Non-Rotate***

All from Stock in the SMA Section

Single Acting Cylinders

Pneumatic only Adds to cylinder length

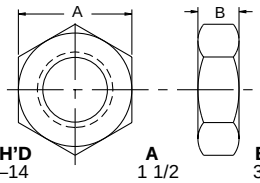
TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2"	1 1/2"	2 1/8"-4"	3"
Spring extend	0-2"	1 1/2"	2 1/8"-4"	3"

Spring Force: Spring fully extended approx. 15#
Spring fully compressed approx. 50#

Wrench Flat chart pg 74

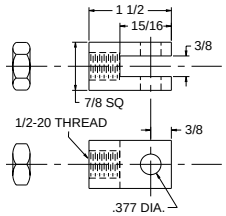
1-14 Nut & 1 1/4-12 Nut

Not included with Cylinder Order separately



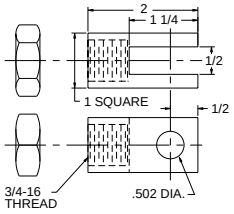
TH'D	A	B
1 –14	1 1/2	35/64
1 1/4 –12	1 7/8	23/32

HB-500 Rod Clevis and Nut



Zinc plated steel

HB-750 Rod Clevis and Nut

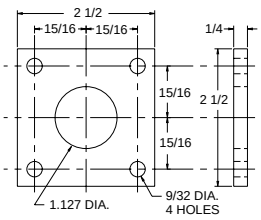


Zinc plated steel

HB-50 Flange Brk't

Order 1"-14 nut separately

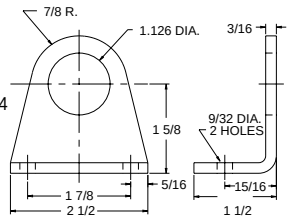
Zinc plated steel



HB-70 Foot Brk't

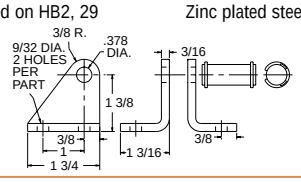
Order 1"-14 nut separately

Zinc plated steel

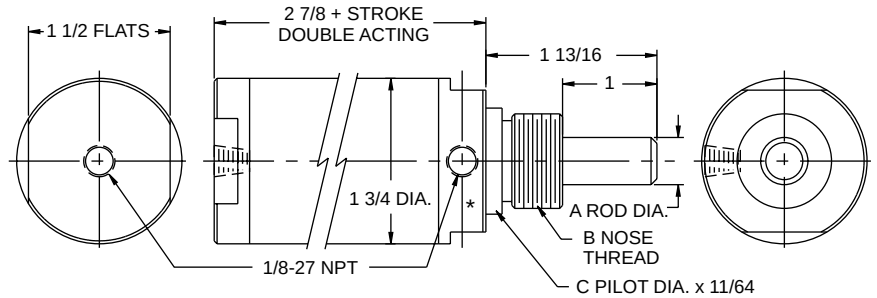


HB-90 St'd Clevis Brk't

Used on HB2, 29 Zinc plated steel

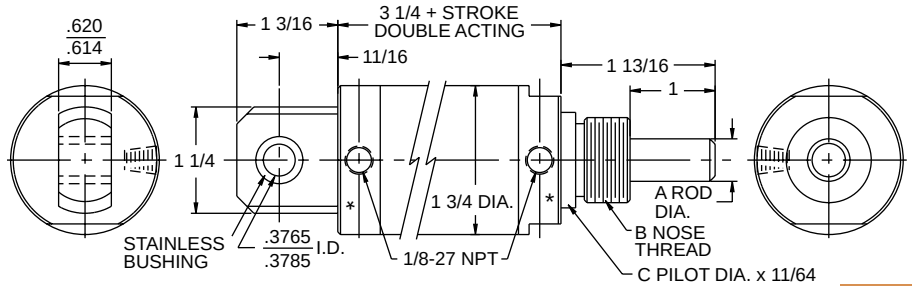


Cushions not available on cylinders with 3/4" diameter rod or oversize 1/4" ports



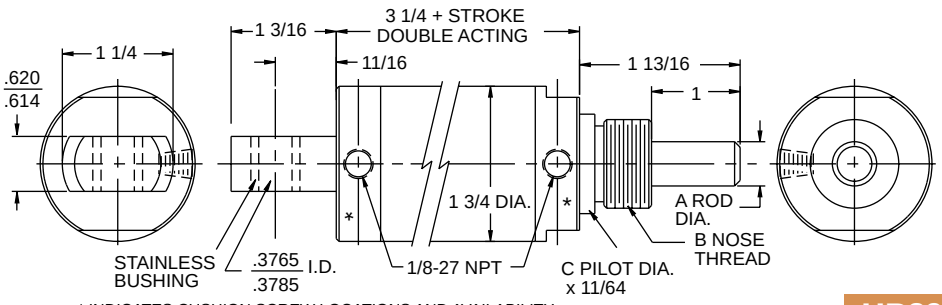
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB1



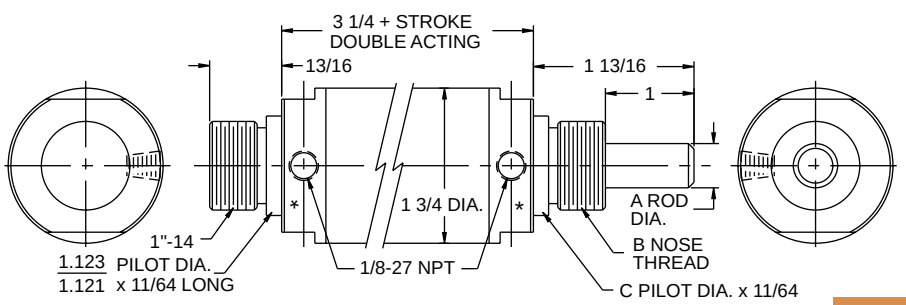
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB2



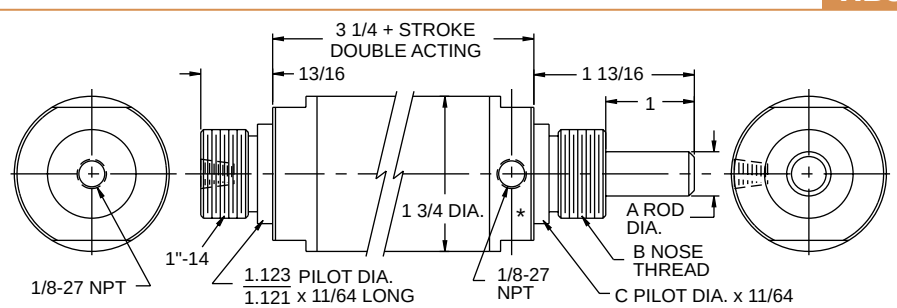
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB29



* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

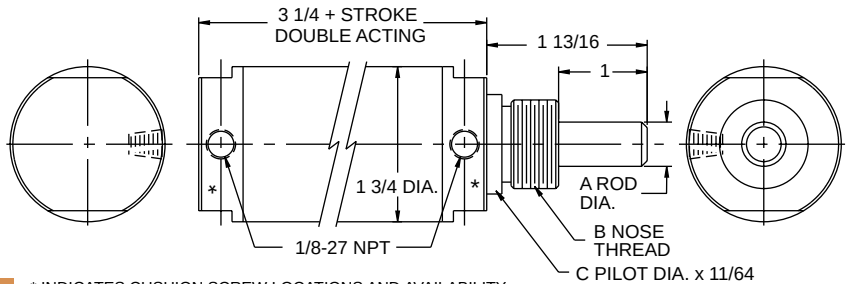
HB3



* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

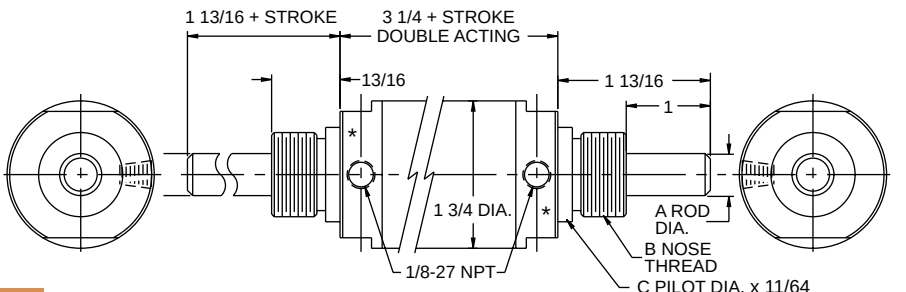
HB4

A ROD DIA.	B NOSE THREAD	C PILOT DIA. COMBINATIONS	Part No. Code
1/2 Standard	1 –14	1.123/1.121	D
3/4 Oversize	1 1/4 –12	1.373/1.371	E



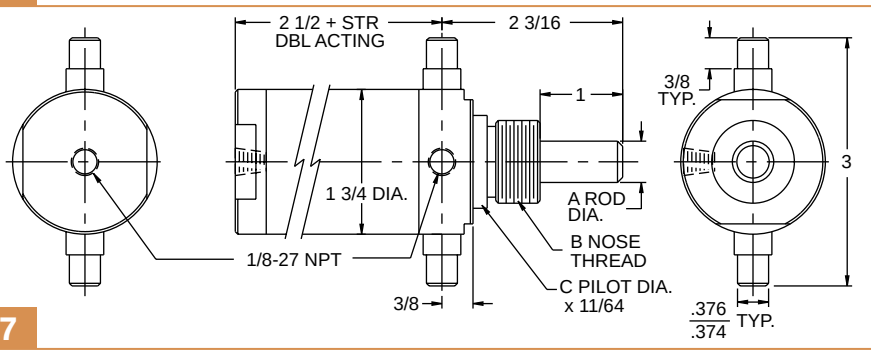
HB5

* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

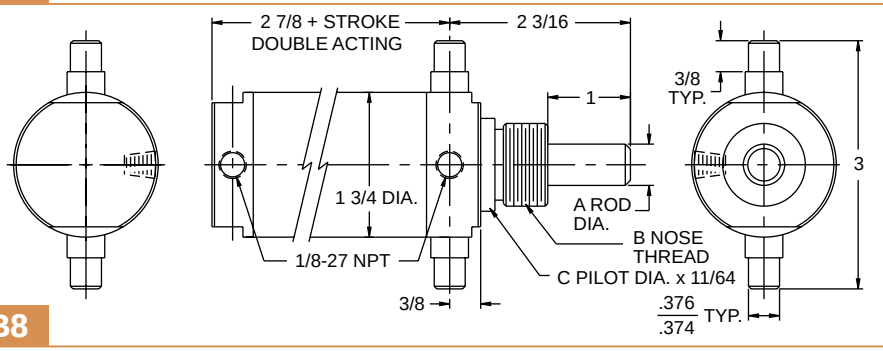


HB6

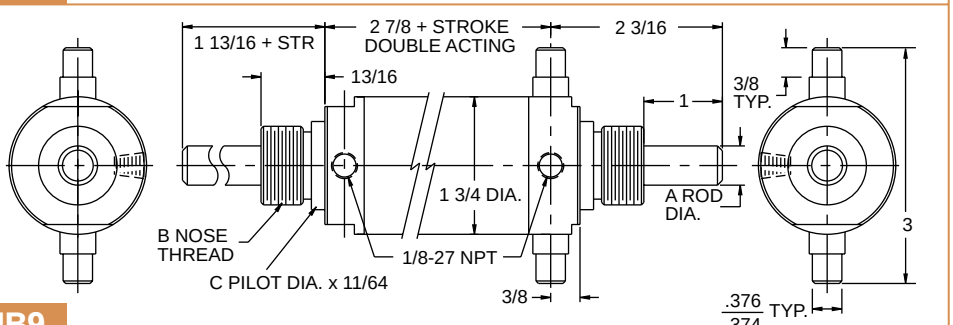
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY



HB7



HB8



HB9

A ROD DIA.	B NOSE THREAD	C PILOT DIA. COMBINATIONS	Part No. Code
1/2 Standard	1 –14	1.123/1.121	D
3/4 Oversize	1 1/4 –12	1.373/1.371	E

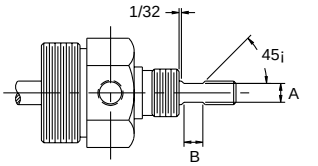
Single Acting Cylinders

Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2"	1 1/2"	2 1/8"-4"	3"
Spring extend	0-2"	1 1/2"	2 1/8"-4"	3"

Spring Force: Spring fully extended approx. 15#
Spring fully compressed approx. 50#

Wrench Flats Optional

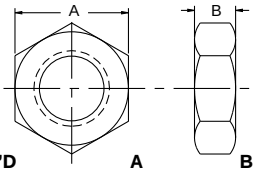


ROD DIA.	A	B
1/2	.437	3/8
3/4	.625	3/8

1-14 Nut & 1 1/4-12 Nut

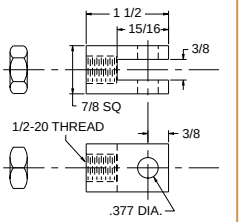
Nose Mounting Nut

Included with Cylinder Zinc plated steel



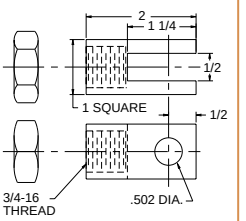
TH'D	A	B
1 –14	1 1/2	35/64
1 1/4 –12	1 7/8	23/32

HB-500 Rod Clevis and Nut



Zinc plated steel

HB-750 Rod Clevis and Nut



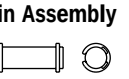
Zinc plated steel

HB-501 Clevis Pin Assembly

Used on HB-500

HB-601 Clevis Pin Assembly

Used on HB-750

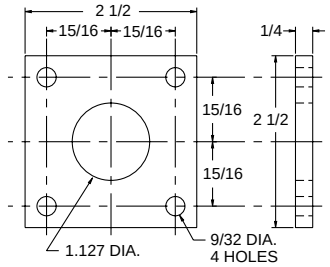


1/4" Oversize Ports Available on 1 1/2 Bore Series HB

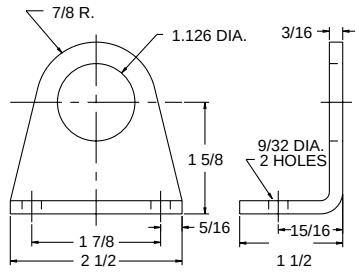
HB Options

- Shock Pads
- Wrench Flats
- Rod Wiper
- Viton or Long Life Seals
- Polypak Rod Seal
- Chrome Rod
- Magnetic Piston
- Hollow Rod (1/2" only)
- Stop Tube
- Oversized Ports
- Adjustable Cushions

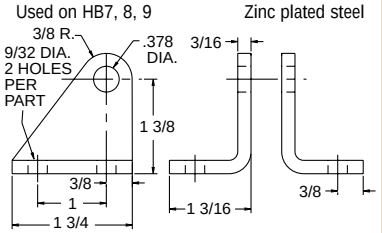
HB-50
Flange Bracket
Order 1"–14 Nut separately
Zinc plated steel



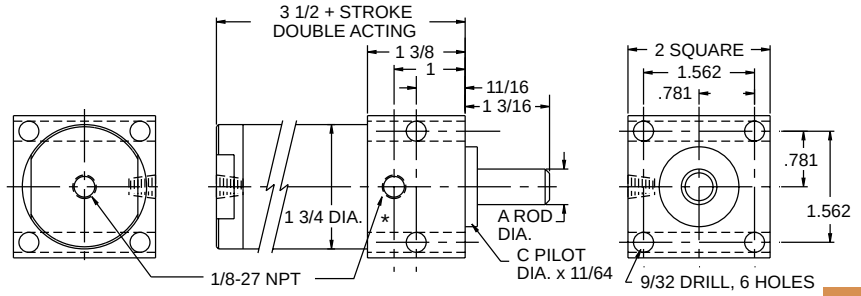
HB-70
Foot Bracket
Order 1"–14 Nut separately
Zinc plated steel



HB-90T
Trunnion Bracket
Used on HB7, 8, 9
Zinc plated steel

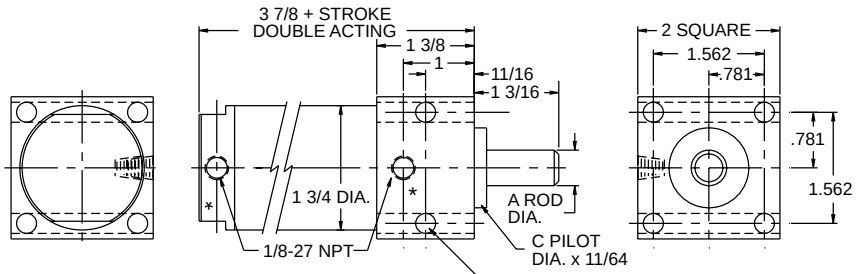


Cushions not available on cylinders with 3/4" diameter rod or oversize 1/4" ports.



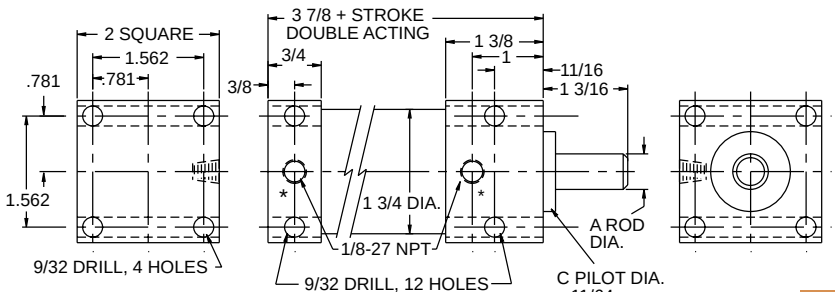
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB10



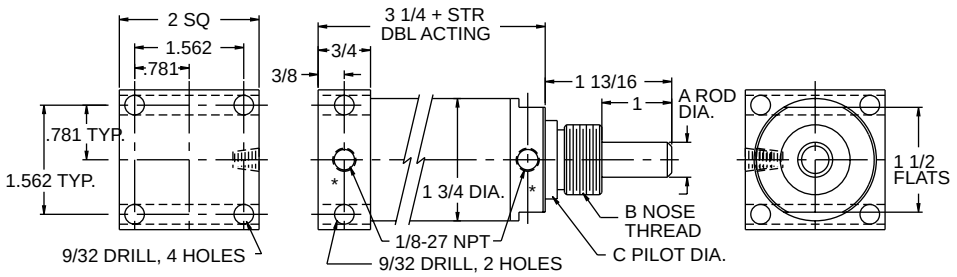
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB11



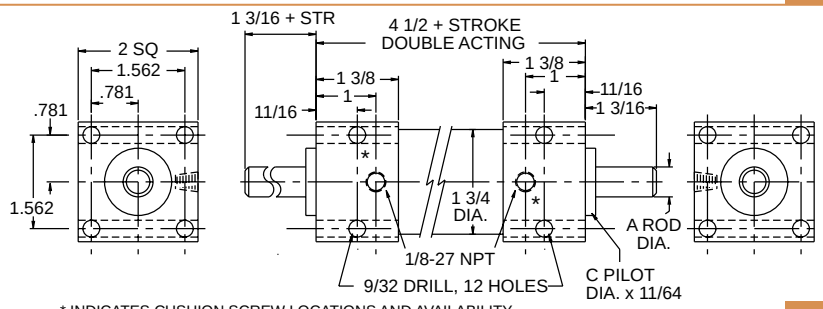
* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB12



* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB13

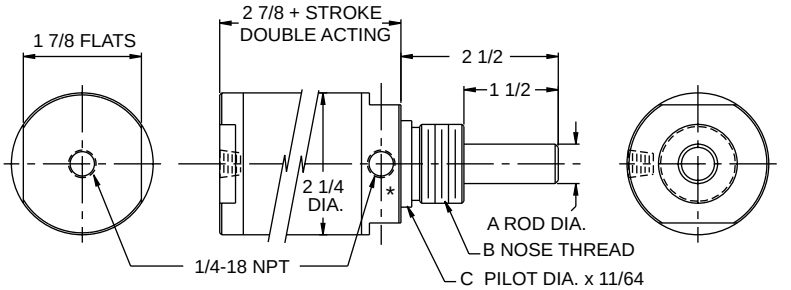


* INDICATES CUSHION SCREW LOCATIONS AND AVAILABILITY

HB14

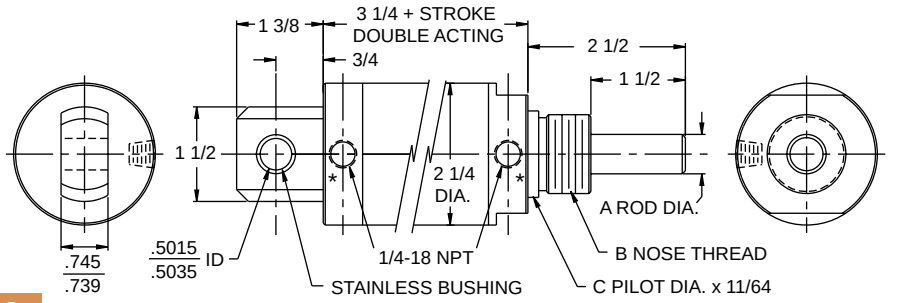
A ROD DIA.	B NOSE THREAD	C PILOT DIA. COMBINATIONS	Part No. Code
1/2 Standard	1 –14	1.123/1.121	D
3/4 Oversize	—	1.123/1.121	E
3/4 Oversize	1 1/4 –12	1.373/1.371 HB13 Only	E

Series HB BRASS



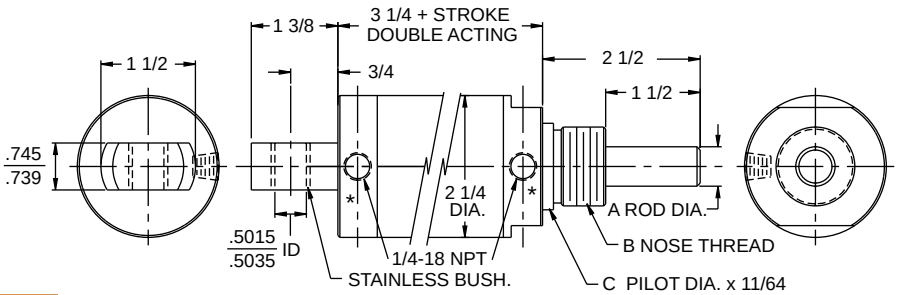
HB1

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



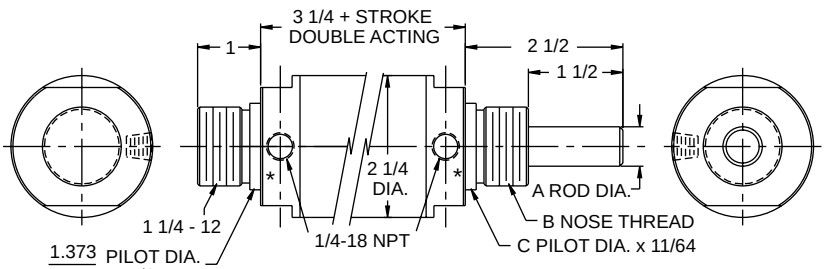
HB2

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



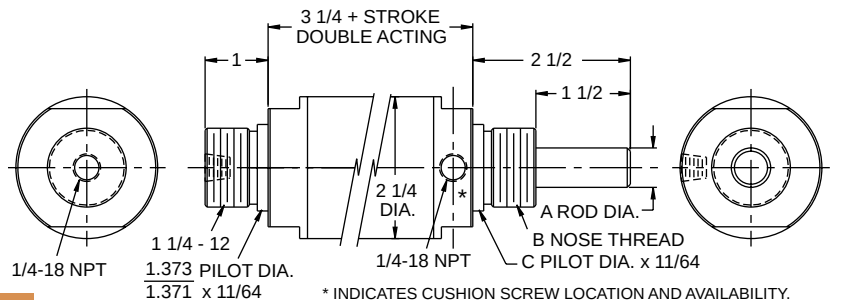
HB29

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.

HB3



* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.

HB4

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/8 Standard	1 1/4 –12	1.373/1.371	**D**
3/4 Oversize	1 1/4 –12	1.373/1.371	**E**

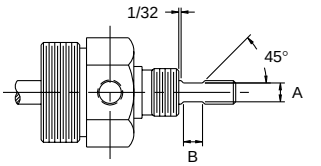
Single Acting Cylinders

Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2”	1 1/2”	2 1/8”-4”	3”
Spring extend	0-2”	1 1/2”	2 1/8”-4”	3”

Spring Force: Spring fully extended approx. 20#
Spring fully compressed approx. 75#

Wrench Flats Optional

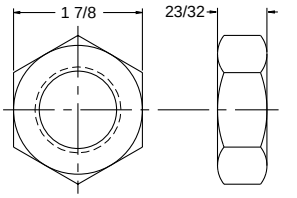


ROD DIA.	A	B
5/8	.500	3/8
3/4	.625	3/8

1 1/4-12 Nut

Nose Mounting Nut

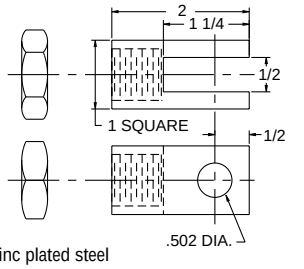
Not included with Cylinder Order separately



Thread 1 1/4 –12 Zinc plated steel

HB-625 5/8-18 Thread
HB-750 3/4-16 Thread

Rod Clevis and Nut

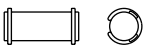


Zinc plated steel

HB-601

Clevis Pin Assembly

Used on HB-625, 750

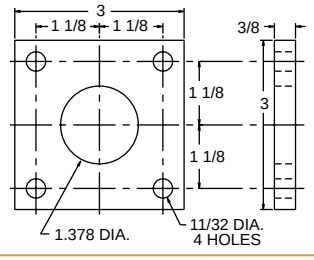


Cushions not available on cylinders with 3/4” diameter rod.

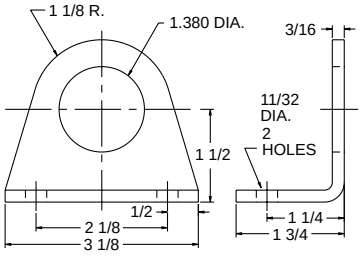
HB Options

- Shock Pads
- Wrench Flats
- Rod Wiper
- Viton or Long Life Seals
- Polypak Rod Seal
- Chrome Rod
- Magnetic Piston
- Stop Tube
- Adjustable Cushions

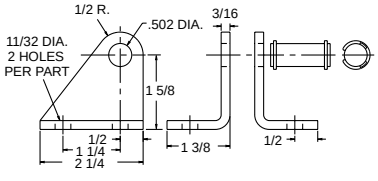
HB-60
Flange Bracket
Order 1 1/4-12 nut separately
Zinc plated steel



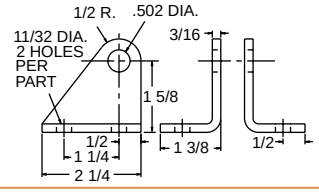
HB-80
Foot Bracket
Order 1 1/4-12 nut separately
Zinc plated steel

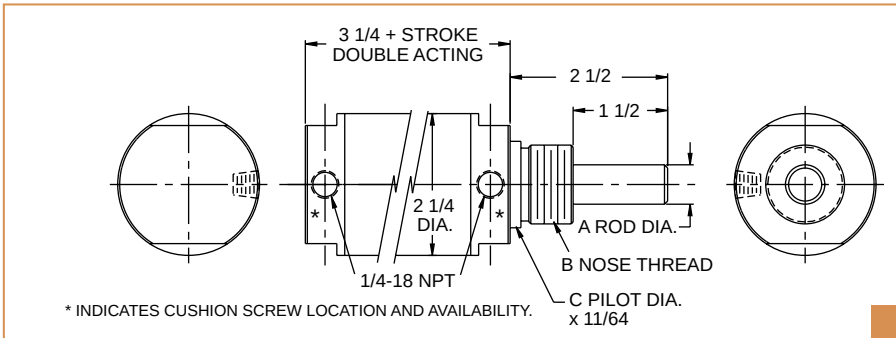


HB-100
Clevis Bracket
Used on HB2, 29
Zinc plated steel



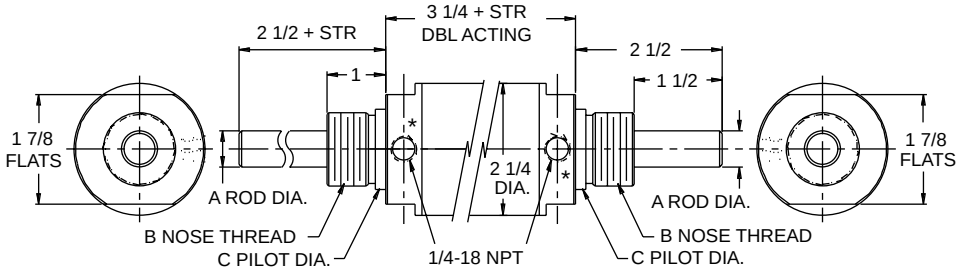
HB-100T
Trunnion Bracket
Used on HB7, 8, 9
Zinc plated steel





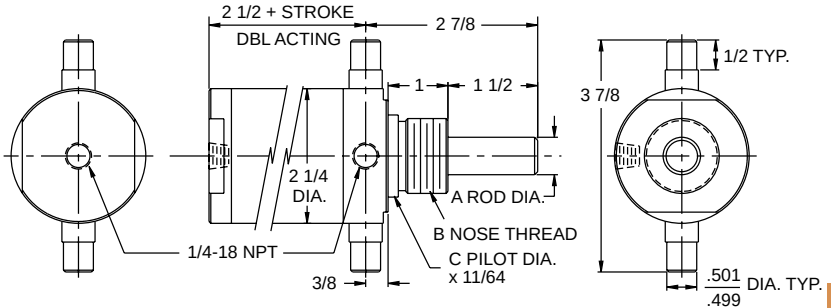
* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.

HB5

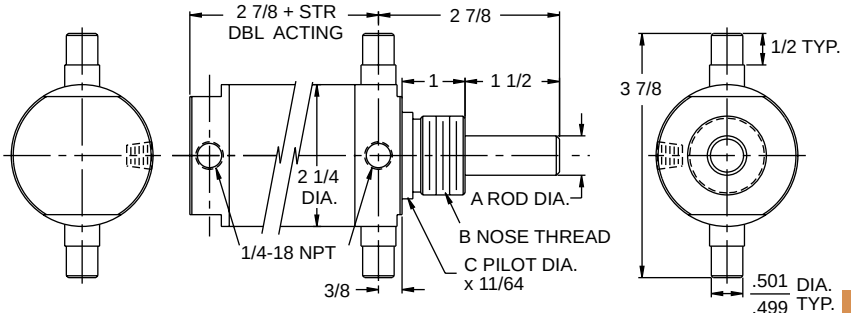


* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.

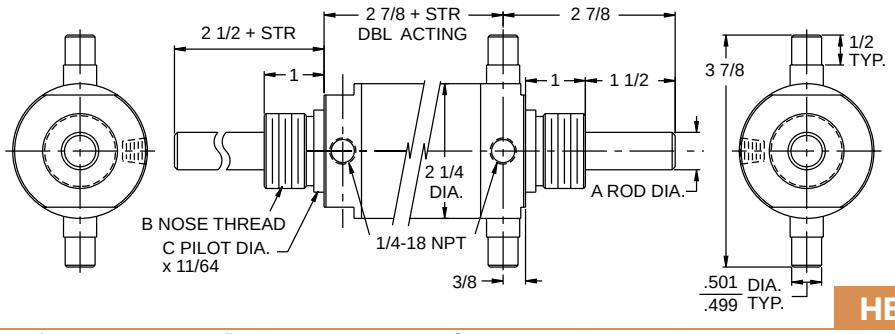
HB6



HB7



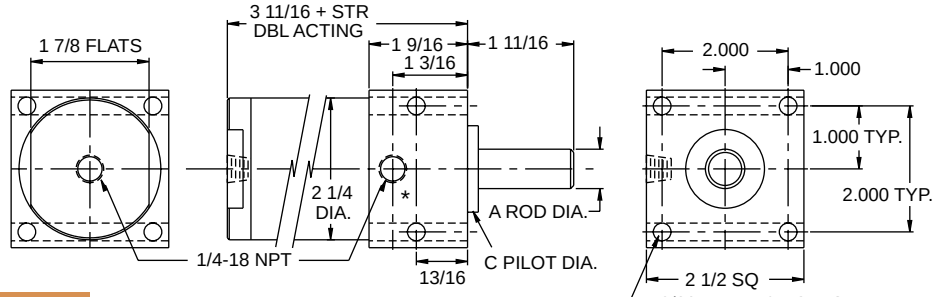
HB8



HB9

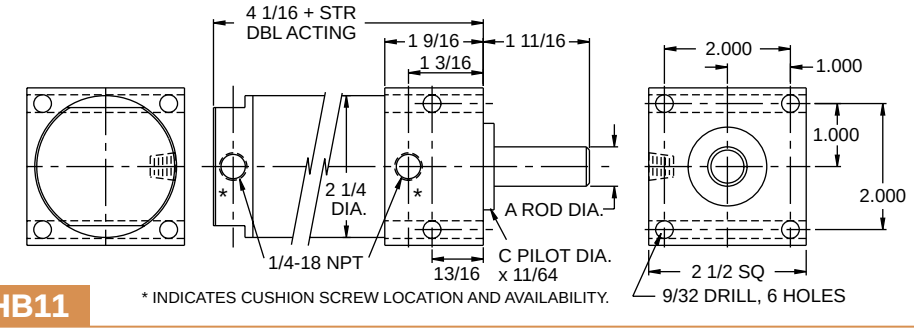
A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/8 Standard	1 1/4 –12	1.373/1.371	**D**
3/4 Oversize	1 1/4 –12	1.373/1.371	**E**

Series HB BRASS



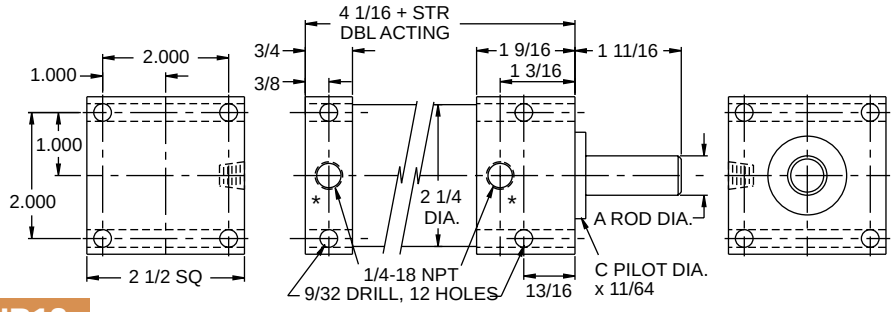
HB10

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



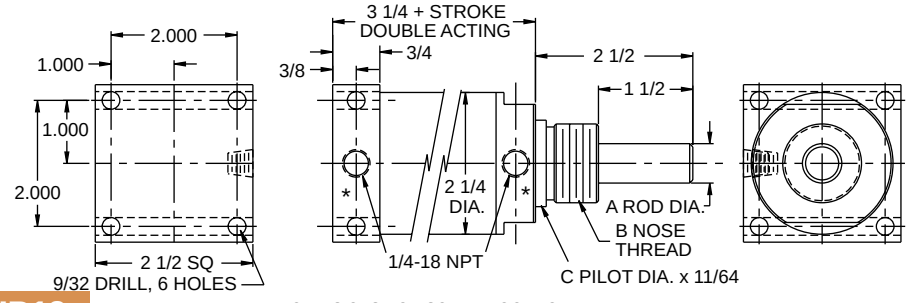
HB11

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



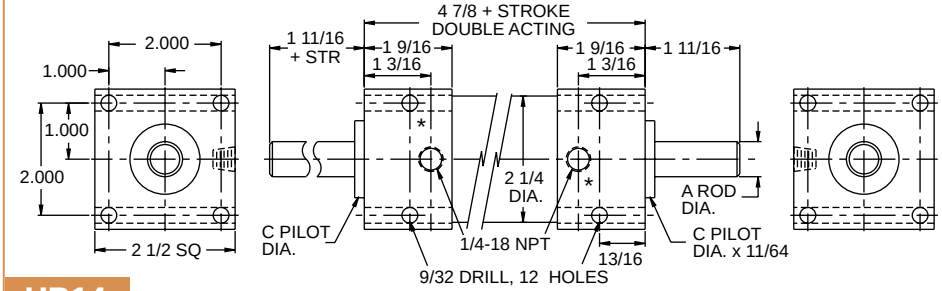
HB12

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



HB13

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.



HB14

* INDICATES CUSHION SCREW LOCATION AND AVAILABILITY.

A ROD DIA.	**B** NOSE THREAD	**C** PILOT DIA. COMBINATIONS	Part No. Code
5/8 Standard	1 1/4 –12	1.373/1.371	**D**
3/4 Oversize	1 1/4 –12	1.373/1.371	**E**

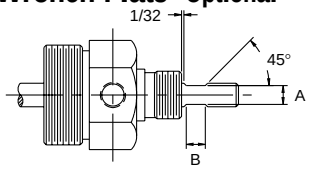
Single Acting Cylinders

Pneumatic only Adds to cylinder length

TYPE	STROKE	Add to cyl. O.A.L.	STROKE	Add to cyl. O.A.L.
Spring return	0-2"	1 1/2"	2 1/8"-4"	3"
Spring extend	0-2"	1 1/2"	2 1/8"-4"	3"

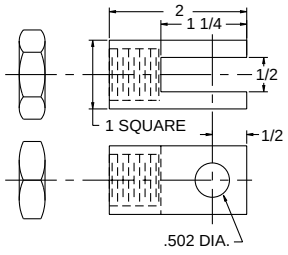
Spring Force: Spring fully extended approx. 20#
Spring fully compressed approx. 75#

Wrench Flats Optional



ROD DIA.	A	B
5/8	.500	3/8
3/4	.625	3/8

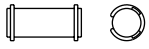
HB-625 5/8-18 Thread
HB-750 3/4-16 Thread
Rod Clevis and Nut



Zinc plated steel

HB-601
Clevis Pin Assembly

Used on HB-625, 750



Problem:
Side Load

Solution:
Series SMA with Wear Strip Piston and Teflon Rod Bushing

Select code numbers/letters (**bold type**) from each of the six boxes below - then select any options desired from the opposite page. List codes in the same sequence as shown.

The cylinder part number is an alpha numeric code.

Type	Code
Single Acting Spring return*	**A**
Single Acting Spring extend*	**B**
Double acting	**C**

*Adds to cyl. length

If double rod end model (HB6, 9,14) is to be single acting, select **A**

Bore	Code
3/4"	**07**
1"	**10**
1 1/8"	**11**
1 1/2"	**15**
2"	**20**

Mounting Style/Code

HB 1
HB 2
HB 29
HB 3
HB 4
HB 5
HB 6
HB 7
HB 8
HB 9
HB 10
HB 11
HB 12
HB 13
HB 14

Stroke

Code is stroke in total 1/8" increments

Example:
1" stroke = **8**
2 1/2" stroke = **20**

Piston Rod Diameter / Nose Mount Combinations

Bore size	Rod dia.	Mounting Style of Cylinder Head	Pilot dia.	Code
3/4	1/4	5/8-18 Nose Mount / Sq. Head Mount / Sq. Cap Mount	.682/.684	**D**
	5/16	5/8-18 Nose Mount / Sq. Head Mount / Sq. Cap Mount	.682/.684	**E**
1	5/16	5/8-18 Nose Mount / Sq. Head Mount / Sq. Cap Mount	.682/.684	**D**
	3/8	5/8-18 Nose Mount / Sq. Cap Mount	.682/.684	**E**
	3/8	3/4-16 Nose Mount / Sq. Head Mount	.745/.747	**F**
1 1/8	5/16	5/8-18 Nose Mount / Sq. Head Mount / Sq. Cap Mount	.682/.684	**D**
	3/8	5/8-18 Nose Mount / Sq. Cap Mount	.682/.684	**E**
	3/8	3/4-16 Nose Mount / Sq. Head Mount	.745/.747	**F**
	3/8	7/8-14 Nose Mount	.932/.934	**G**
	1/2	7/8-14 Nose Mount / Sq. Head Mount / Sq. Cap Mount	.932/.934	**H**
1 1/2	1/2	1-14 Nose Mount / Sq. Head Mount / Sq. Cap Mount	1.121/1.123	**D**
	3/4	1 1/4-12 Nose Mount / Sq. Cap Mount	1.371/1.373	**E**
	3/4	Sq. Head Mount	1.121/1.123	**E**
2	5/8	1 1/4-12 Nose Mount / Sq. Head Mount / Sq. Cap Mount	1.371/1.373	**D**
	3/4	1 1/4-12 Nose Mount / Sq. Head Mount / Sq. Cap Mount	1.371/1.373	**E**

Piston Rod Threads
HB6, HB9, HB14 Double rod models have same rod thread both ends

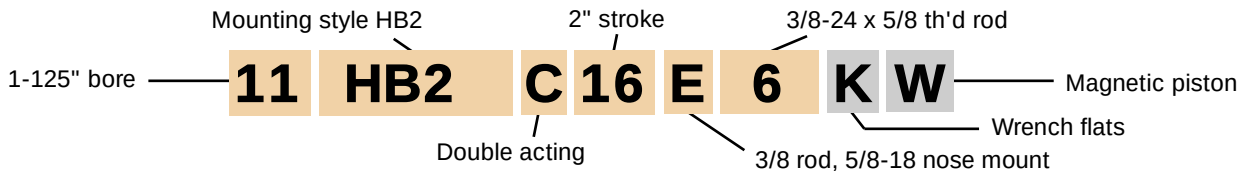
Cyl. bore	Rod dia.	Rod th'd	Code
All	All	Plain Rod	**0**
3/4	.250	1/4-20 x 5/8	**1**
	.250	1/4-28 x 5/8	**2**
	.312	5/16-18 x 5/8	**3**
	.312	5/16-24 x 5/8	**4**
1	.312	5/16-18 x 5/8	**3**
	.312	5/16-24 x 5/8	**4**
	.375	3/8-16 x 5/8	**5**
	.375	3/8-24 x 5/8	**6**
1 1/8	.312	5/16-18 x 5/8	**3**
	.312	5/16-24 x 5/8	**4**
	.375	3/8-16 x 5/8	**5**
	.375	3/8-24 x 5/8	**6**
	.500	1/2-13 x 5/8	**7**
	.500	1/2-20 x 5/8	**8**
1 1/2	.500	1/2-13 x 3/4	**7**
	.500	1/2-20 x 3/4	**8**
	.750	3/4-10 x 7/8	**9**
	.750	3/4-16 x 7/8	**10**
2	.625	5/8-11 x 1 1/4	**11**
	.625	5/8-18 x 1 1/4	**12**
	.750	3/4-10 x 1 1/4	**9**
	.750	3/4-16 x 1 1/4	**10**

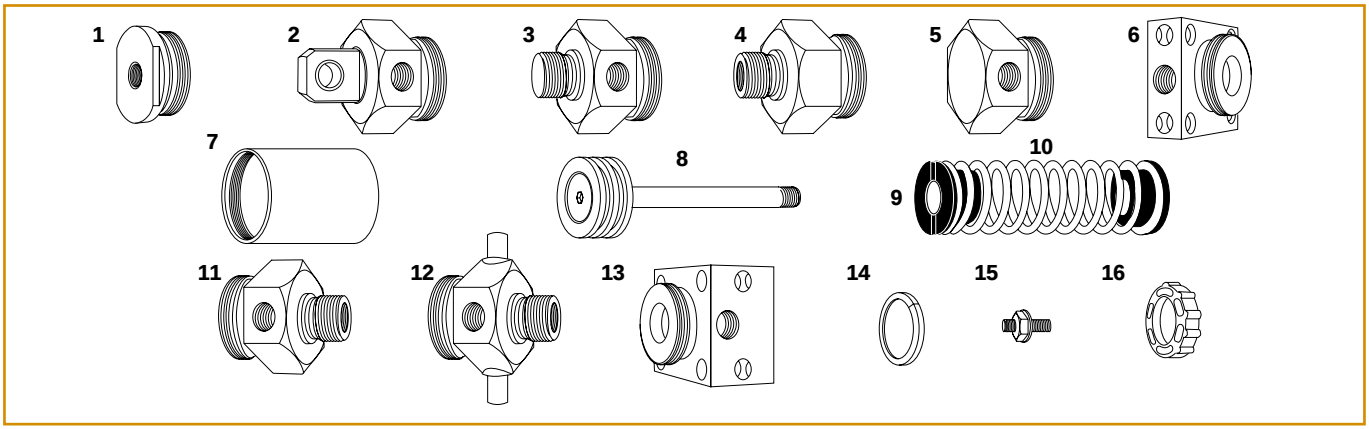
Series HB cylinder options

List codes in the same sequence as they appear below

Option	Description		Code
Extra rod extension	Specify code letter **J** followed by the extra length as a two place decimal. Example: **J.50** = 1/2" extra **J1.25** = 1 1/4"extra HB6, 9, 14 double rod cylinders with extra extension cannot be ordered by a standard part number - consult factory for a special part number.		**J**
Wrench flats	Specify if required If specified will be added to both ends of HB6, HB9, HB14 double rod cylinders		**K**
Shock pads	Available on both ends of double acting cylinders and the end opposite the spring on single acting cylinders. Each pad adds 1/4" to cylinder length. Pneumatic use only to 180° F	Pad on rod end only Pad on cap end only Pads on both ends	**L** **M** **N**
Rod wiper	3/4", 1" bore - Not available 1 1/8" bore - Available only with 3/8" rod, 7/8 - 14 nose mount 1 1/2, 2" bore - Available all models - standard with trunnion & adj. cushion heads		**P**
Optional seal compounds	St'd seals are buna (nitrile) and require no code –40 to +200° F Long life available for extended cycle life +10 to +200° F Viton available for temps –10 to +400°F		**Q** **R**
Polypak rod seal	For optimum sealing on hydraulic cylinders Available only in 1 1/2 and 2" bore sizes		**S**
Hard chromed rod	Hard chrome plated steel - 100,000 min. yield		**T**
Magnetic piston	Not available in 1" bore Adds 1/2" to cylinder length		**W**
Hollow piston rod	Available in 5/16 dia. rod – thru hole .135" Available in 3/8 dia. rod – thru hole .248" Available in 1/2 dia. rod – thru hole .313"	Not available on hard chrome rods	**X**
Stop tube	Available on 1 1/2 & 2" bore only in 2" increments Specify code **Y** followed by length in inches Example: **Y4** = 4" stop tube Adds to cylinder length. An 8" stroke cyl. with 2" stop tube will be as long as a 10" stoke cylinder. Order actual stroke req. (8" above)	Not avail. HB6, 9, 14 or with adj. cushions	**Y**
Oversize ports	1/4 NPT ports on 1 1/2 bore cylinder (both ends)		**Z**
Adjustable Cushions	Available on 1 1/8, 1 1/2, 2" bore except as follows: Mounting styles HB7, 8, 9 Rear port cap on mt'g styles HB1, 4, 10 Cyl. with 1/2" or 3/4" oversize rods or oversize ports Cylinders with shock pads	Cushion head end only Cushion cap end only Cushion both ends	**AA** **BB** **CC**

Part No. Example:





3/4" Bore Service Parts

Key	Description	Part Number
	Seal Kit, Buna	07522-B
	Seal Kit, Long life	07522-LL
	Seal Kit, Viton	07522-V
1	Rear port cap	07503
2	Rear pivot cap	07506
2	90° Rear pivot cap	0750690
3	Rear stud cap	07507
4	Cap	07508
5	Cap	07509
6	Cap	07525
7	Tube - P.N. is T followed by the complete cyl. part no.	
8	Rod - P.N. is PR followed by the complete cyl. part no.	

Key	Description	Part Number
9	Spring stop 1/4" rod pair	07512-250
9	Spring stop 5/16" rod pair	07512-312
10	Spring - Must supply cyl. stroke	07515
11	Head 1/4 rod	07510-250
11	Head 5/16 rod	07510-312
12	Head 1/4 rod	07510-250 TRN
12	Head 5/16 rod	07510-312 TRN
13	Head 1/4 rod	07524-250
13	Head 5/16 rod	07524-312
14	Magnet pair	SS3207
16	Shock pad	75MSP

1" Bore Service Parts

Key	Description	Part Number
	Seal Kit, Buna	10022-B
	Seal Kit, Long life	10022-LL
	Seal Kit, Viton	10022-V
1	Cap	10003
2	Cap	10006
2	90° Cap	1000690
3	Cap	10007
4	Cap	10008
5	Cap	10009
6	Cap	10025
7	Tube - P.N. is T followed by the complete cyl. part no.	
8	Rod - P.N. is PR followed by the complete cyl. part no.	

Key	Description	Part Number
9	Spring stop 5/16" rod pair	10012-312
9	Spring stop 3/8" rod pair	10012-375
10	Spring	10015
11	Head 5/16 rod, 5/8 - 18 nose	10010-312-625
11	Head 3/8 rod, 5/8 - 18 nose	10010-375-625
11	Head 3/8 rod, 3/4 - 16 nose	10010-375-750
12	Head 5/16 rod, 5/8 - 18 nose	10010-312TRN
12	Head 3/8 rod, 5/8 - 18 nose	10010-375TRN
13	Head 5/16 rod	10024-312
13	Head 3/8 rod	10024-375

1 1/8" Bore Service Parts

Key	Description	Part Number
	Seal Kit, Buna, 5/16 rod	11222-312B
	Seal Kit, Buna, 3/8 rod	11222-375B
	Seal Kit, Buna, 1/2 rod	11222-500B
	Seal Kit, Long life, 5/16 rod	11222-312LL
	Seal Kit, Long life, 3/8 rod	11222-375LL
	Seal Kit, Long life, 1/2 rod	11222-500LL
	Seal Kit, Viton, 5/16 rod	11222-312V
	Seal Kit, Viton, 3/8 rod	11222-375V
	Seal Kit, Viton, 1/2 rod	11222-500V
1	Cap	11203
2	Cap Add suffix C for cushion	11206
2	90° Cap Add suffix C for cushion	1120690

Key	Description	Part Number
10	Spring 0 - 2 1/2" Stroke	11215
10	Spring 0ver - 2 1/2" Stroke	10015
11	Head, 5/16 Rod, 5/8 - 18 Nose	11253-312-625
11	Head, 5/16 Rod, 5/8 - 18 Nose, Cushion	11253-312-625C
11	Head, 3/8 Rod, 5/8 - 18 Nose	11253-375-625
11	Head, 3/8 Rod, 5/8 - 18 Nose, Cushion	11253-375-625C
11	Head, 3/8 Rod, 3/4 - 16 Nose	11253-375-750
11	Head, 3/8 Rod 3/4 - 16 Nose, Cushion	11253-375-750C
11	Head, 3/8 Rod 7/8 - 14 Nose	11253-375-875
11	Head, 3/8 rod, 7/8 - 14 nose, cushion	11253-375-875C
11	Head, 3/8 rod, 7/8 - 14 nose, wiper	11253-375-875W
11	Head, 1/2 rod, 7/8 - 14 nose	11253-500-875

1 1/8" Bore Service Parts (Cont.)

Key	Description	Part Number
3	Cap Add suffix C for cushion	11207
4	Cap	11208
5	Cap Add suffix C for cushion	11209
6	Cap Add suffix C for cushion	11225
7	Tube – P.N. is T followed by the complete cyl. P.N.	
8	Rod – P.N. is PR followed by the complete cyl. P.N.	
9	Stop 5/16 rod, 0 – 2 1/2" stroke	11212-312
9	Stop 5/16 rod, over 2 1/2" stroke (pair)	10012-312
9	Stop 3/8 rod, 0 – 2 1/2" stroke	11212-375
9	Stop 3/8 rod, over 2 1/2" stroke (pair)	10012-375
9	Stop 1/2 rod, 0 – 2 1/2" stroke	11212-500
9	Stop 1/2 rod, over 2 1/2" stroke (pair)	10012-500

Key	Description	Part Number
12	Head, 5/16 rod, 5/8 - 18 nose	11253-312TRN
12	Head, 3/8 rod, 5/8 - 18 nose	11253-375TRN
12	Head, 1/2 rod, 7/8 - 14 nose	11253-500 TRN
13	Head, 5/16 rod	11224-312
13	Head, 5/16 rod, cushion	11224-312C
13	Head, 3/8 rod	11224-375
13	Head, 3/8 rod, cushion	11224-375C
13	Head, 1/2 rod	11224-500
14	Magnet pair	SMS5911
15	Screw ass'y Add suffix V for Viton	11227
16	Shock pad	11 MSP

1 1/2" Bore Service Parts

Add suffix HYD to seal kit part no. if polypak hyd. rod seal is required		
	Seal Kit, Buna, 1/2 rod	15022-500B
	Seal Kit, Buna, 3/4 rod	15022-750B
	Seal Kit, Longlife, 1/2 rod	15022-500LL
	Seal Kit, Longlife, 3/4 rod	15022-750LL
	Seal Kit, Viton, 1/2 rod	15022-500V
	Seal Kit, Viton, 3/4 rod	15022-750V
1	Cap	15003
1	Cap 1/4" port	15003250
2	Cap add suffix C for cushion	15006
2	Cap 1/4" port	15006250
2	90¡ Cap add suffix C for cushion	1500690
2	90¡ Cap 1/4" port	1500690250
3	Cap add suffix C for cushion	15007
3	Cap 1/4" port	15007250
4	Cap	15008
4	Cap 1/4" port	15008250
5	Cap add suffix C for cushion	15009
5	Cap 1/4" port	15009250
6	Cap add suffix C for cushion	15025
6	Cap 1/4" port	15025250
7	Tube - P.N. is T followed by the complete cyl. part no.	
8	Rod - P.N. is PR followed by the complete cyl. part no.	
9	Stop, 1/2 rod, st'd pair	15012-500
9	Stop, 1/2 rod, spring extend over 2" str.	15012-500L
9	Stop 3/4 rod, st'd pair	15012-750
9	Stop 3/4 rod, spring extend over 2" str.	15012-750L

10	St'd spring	15015
10	Spring, over 2" spring extend only	15015L
11	Head, 1/2 rod	15010-500
11	Head, 1/2 rod, 1/4 port	15010-500250
11	Head, 1/2 rod, wiper	15010-500W
11	Head, 1/2 rod, 1/4 port, wiper	15010-500250W
11	Head, 1/2 rod, cushion	15010-500C
11	Head, 3/4 rod	15010-750
11	Head, 3/4 rod, 1/4 port	15010-750250
11	Head, 3/4 rod, wiper	15010-750W
11	Head, 3/4 rod, 1/4 port, wiper	15010-750250W
12	Head, 1/2 rod	15010-500TRN
12	Head, 3/4 rod	15010-750TRN
12	Head, 1/2 rod, 1/4 port	15010-500250TRN
12	Head, 3/4 rod, 1/4 port	15010-750250TRN
13	Head, 1/2 rod	15024-500
13	Head, 1/2 rod, 1/4 port	15024-500250
13	Head, 1/2 rod, wiper	15024-500W
13	Head, 1/2 rod, 1/4 port, wiper	15024-500250W
13	Head, 1/2 rod, cushion	15024-500C
13	Head, 3/4 rod	15024-750
13	Head, 3/4 rod, 1/4 port	15024-750250
13	Head, 3/4 rod, wiper	15024-750W
13	Head, 3/4 rod, 1/4 port, wiper	15024-750250W
14	Magnet pair	SS3215
16	Shock pad	15MSP

2" Bore Service Parts

Add suffix HYD to seal kit part no. if polypak hyd. rod seal is required		
	Seal Kit, Buna, 5/8 rod	20022-625B
	Seal Kit, Buna, 3/4 rod	20022-750B
	Seal Kit, Long life, 5/8 rod	20022-625LL
	Seal Kit, Long life, 3/4 rod	20022-750LL
	Seal Kit, Viton, 5/8 rod	20022-625V
	Seal Kit, Viton, 3/4 rod	20022-750V
1	Cap	20003
2	Cap add suffix C for cushion	20006
2	90¡ Cap add suffix C for cushion	2000690
3	Cap add suffix C for cushion	20007
4	Cap	20008
5	Cap add suffix C for cushion	20009
6	Cap add suffix C for cushion	20025
7	Tube - P.N. is T followed by the complete cyl. part no.	
8	Rod - P.N. is PR followed by the complete cyl. part no.	
9	Stop, 5/8 rod, st'd pair	20012-625
9	Stop, 5/8 rod, spring extend over 2" str.	20012-625L

9	Stop, 3/4 rod, st'd pair	20012-750
9	Stop, 3/4 rod, spring extend over 2" str.	20012-750L
10	St'd spring	20015
10	Spring 0ver - 2" spring extend only	20015L
11	Head, 5/8 Rod	20010-625
11	Head, 5/8 Rod, wiper	20010-625W
11	Head, 5/8 Rod, Cushion	20010-625C
11	Head, 3/4	20010-750
11	Head, 3/4 Rod, wiper	20010-750W
12	Head, 5/8 Rod	20010-625TRN
12	Head, 3/4 Rod	20010-750TRN
13	Head, 5/8 Rod, wiper	20024-625
13	Head, 5/8 Rod , wiper	20024-625W
13	Head, 5/8 Rod , cushion	20024-625C
13	Head, 3/4 Rod	20024-750
13	Head, 3/4 Rod , wiper	20024-750W
14	Magnet pair	SS3220
16	Shock pad	2MSP

1 FILL IN 4 BLANK SPACES TO SELECT A SWITCH AND TO CREATE ITS PART NUMBER

A ☐ S ☐ ☐☐

R	REED SWITCH
H	HALL SWITCH
O	SWITCH with permanent 9 foot cable
3	SWITCH ONLY with 8mm male quick connect

TYPE CODE	DESCRIPTION	FUNCTION	SWITCHING VOLTAGE	SWITCHING CURRENT	SWITCHING POWER	SWITCHING SPEED	VOLTAGE DROP
02	Reed Switch for PLC's w/ LED	SPST Normally Open	5 - 120 VDC/VAC 50/60 Hz	0.03 Amp Max. 0.001 Amp Min.	4 Watts Max.	0.5 ms operate 0.1 ms release	3.5 Volts
31	Electronic Hall Sensor, LED, Sourcing	Normally Open PNP output	6 - 24 VDC	0.5 Amp Max.	12 Watts Max.	1.5 µs operate 0.5 µs release	1.0 Volts
32	Electronic Hall Sensor, LED, Sinking	Normally Open NPN output	6 - 24 VDC	0.5 Amp Max.	12 Watts Max.	1.5 µs operate 0.5 µs release	1.0 Volts

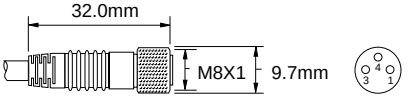
2 SELECT A SWITCH MOUNTING CLAMP To securely fasten any switch to the cylinder tube choose the proper size stainless steel band clamp from the table below

CYLINDER BORE SIZE	CLAMP PART NUMBER
3/4"	750CLAMP
1 1/8"	112CLAMP
1 1/2"	150CLAMP
2"	200CLAMP
3"	300CLAMP

ORDER SEPARATELY - NOT INCLUDED WITH SWITCH

3 SELECT A QUICK CONNECT CABLE IF REQUIRED Cable part No. ARC130 fits any Aurora switch with 8mm male quick connect and is 16 feet long

120VAC/DC 4Amp max.



Brown = Pin 1
Blue = Pin 3
Black = Pin4

Poles -	3 pole	Nominal Volt. Rating -	60 VAC / 75 VDC
Materials -		Environmental Resistance -	IP67
Cable -	Black PUR or PVC	Current Rating -	4 Amps
Housing -	Nylon	Insulation Resistance -	$\geqq 10^{10}\,\Omega$
Contact Finish -	Au	Contact Resistance -	$\leqq 5m\Omega$
Male Contact -	Cu Zn	Temperature Rating -	–25° to 85°C
Female Contact -	Cu Sn	Wire Gauge -	.25mm² wire / 24 AWG

4 SELECT MAGNETIC PISTON When ordering a cylinder along with a switch be sure to include a magnetic piston on the cylinder – see next page.

MAGNETIC PISTON

Add this option to your cylinder to operate Aurora reed or hall switches

Flexible Nitrile based permanent magnets are suitable for pneumatic and hydraulic service –20°F to +180°F.

Aurora piston magnets are made from high energy material and sufficient mass to create a strong stable magnetic field parallel to the cylinder axis.

All magnets are impact resistant and will retain maximum strength indefinitely.

Magnetic pistons are available in all series Aurora cylinders. They are compatible with most options and usually add 1/2" to cylinder length. Consult ordering procedure options for your choice.

BREATHER VENTS, MUFFLERS, SPEED CONTROLS

Breather Vent

PART	NPT	HEX	LENGTH
ABV-1	1/8	7/16	7/16
ABV-2	1/4	9/16	5/8

Aurora breather vents can be used to vent single acting cylinders gear boxes, etc. where contamination from foreign particles is a problem. The vent is made of sintered bronze fitted to a brass body, and is rated at 40 microns. Threaded construction allows easy removal for cleaning.

Exhaust Muffler

PART	NPT	HEX	LENGTH
AM-1	1/8	7/16	1 1/8
AM-2	1/4	9/16	1 3/8

These muffler-filters utilize porous sintered bronze bonded to copper plated steel bodies, and are used to silence exhaust air from the port of cylinders, valves, air tools, etc. The standard filter is rated at 40 microns, and may be removed for cleaning.

Speed Control Muffler

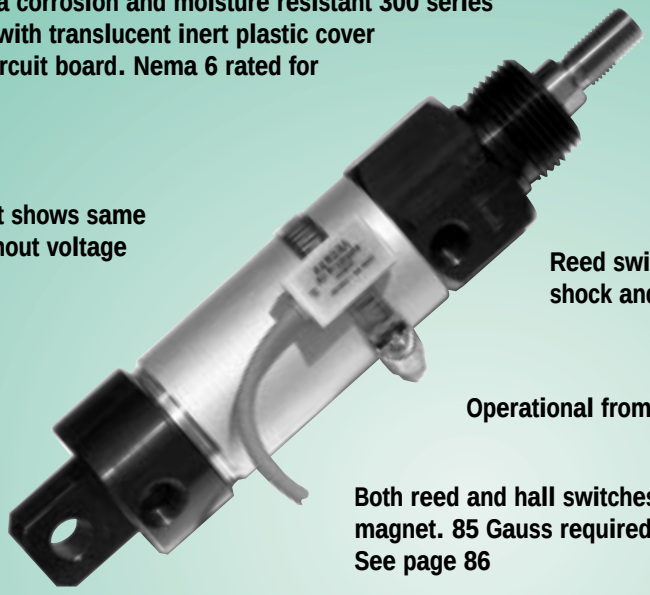
PART	NPT	HEX	LENGTH CLOSED	LENGTH OPEN
ASC-1	1/8	9/16	1 3/8	2
ASC-2	1/4	5/8	1 9/16	2 3/16

These units provide an infinite variation of metered air flow at an acceptable sound level on exhaust ports of air valves, cylinders, etc. The operating speed of cylinders or air tools may be varied with the adjusting screw, which is locked in place with a locknut. The standard unit contains a 40 micron bronze element on a brass body.

Aurora quality American made switches with broad spectrum application and durability

One Series of switches fits all Aurora cylinders

All switches have a corrosion and moisture resistant 300 series stainless housing with translucent inert plastic cover and epoxy filled circuit board. Nema 6 rated for wet environments



Hall switches are completely solid state with no moving parts making them shock and vibration resistant

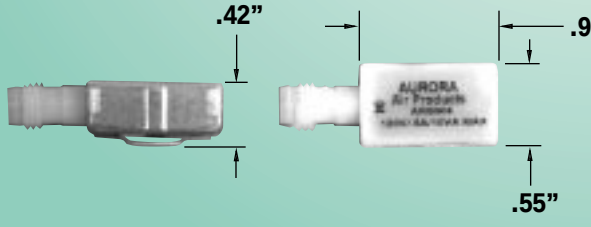
LED indicator light shows same brightness throughout voltage range

Reed switches operational to 30g (11msec) shock and 20g (10–55hz) vibration

Operational from 0° to 170° F

Both reed and hall switches work with the same magnet. 85 Gauss required at cylinder O.D.
See page 86

Stainless band clamp fastens the switch to any cylinder.
Not included with switch - order separately



All housings have the same slim profile 8mm male quick connect model shown

Cable

Part number ARC130 quick connect cable connects to any switch that has the 8mm male quick connect thread

Not included with switch - order separately

Extra long 16 foot length

Unique Applications Sometimes Require Unique Cylinders

AURORA AIR PRODUCTS INC.

In special design our only bounds are the limits of imagination. . .

We turn ideas into reality.