

Tiny Tim

Series T, VT, ET, and NFA Air Actuators

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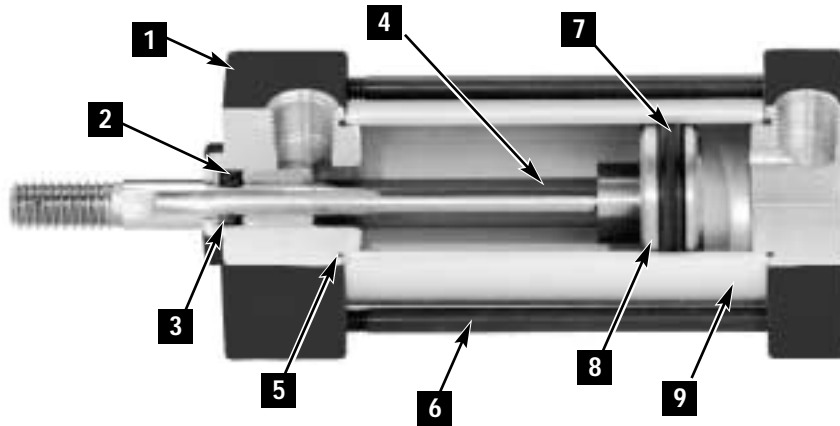




Series T & VT Tiny Tim Air Cylinders

Series T

Series T uses Quad Ring Buna-Ring piston seal.



1 Heads and Caps: Corrosion resistant alloy or black oxidized steel.

2 Rod Bushing: Oil-filled, sintered iron bushing.

3 Rod Seal: Replaceable block-vee Buna-N rod seal (Viton® optional).

4 Piston Rod: Hard chrome plated high tensile steel piston rod.

5 Seals: O-ring type seals.

6 Tie Rods: High yield strength tie rods.

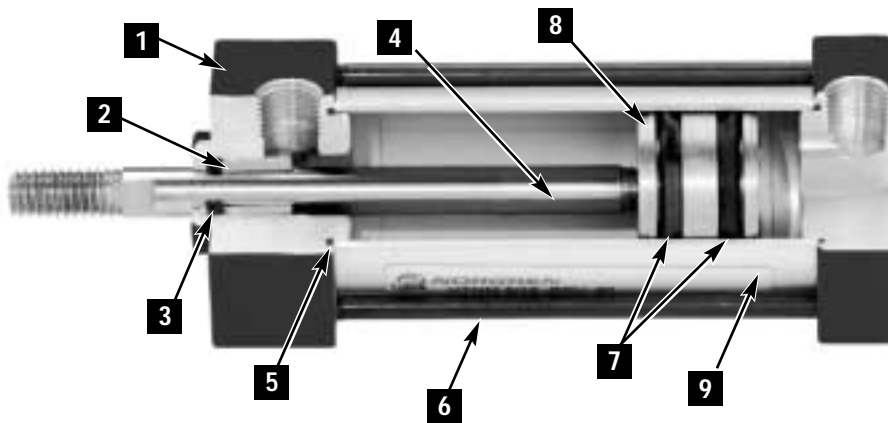
7 Piston Seal: Replaceable quad ring Buna-N (Viton® optional).

8 Piston: Machined alloy.

9 Tubing: Hard anodized I.D. aluminum tubing.

Series VT

Series VT uses Block-Vee Buna-N piston seal. This increases envelope dimension by 3/8" but provides lower breakaway pressure. (See ACT-10-4 for specifications)



1 Heads and Caps: Corrosion resistant alloy or black oxidized steel.

2 Rod Bushing: Oil-filled, sintered iron bushing.

3 Rod Seal: Replaceable block-vee Buna-N rod seal (Viton® optional).

4 Piston Rod: Hard chrome plated high tensile steel piston rod.

5 Seals: O-ring type seals.

6 Tie Rods: High yield strength tie rods.

7 Piston Seal: Replaceable Block-Vee Buna-N (Viton® optional).

8 Piston: Machined alloy.

9 Tubing: Hard anodized I.D. aluminum tubing.



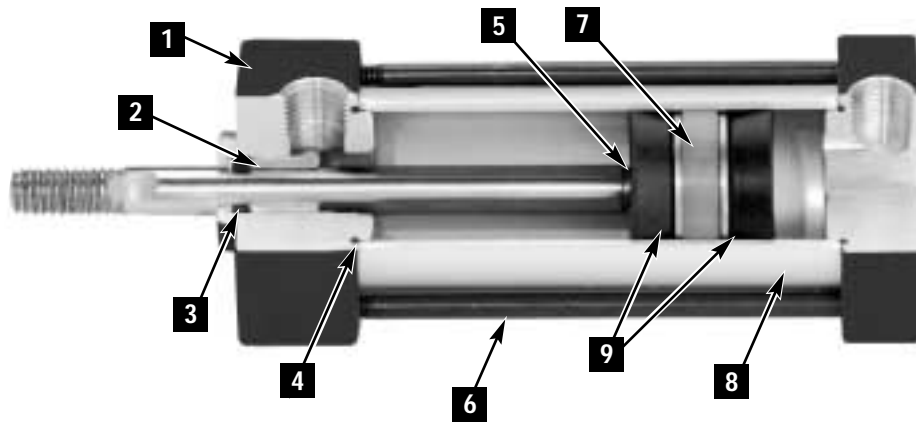
Series ET Tiny Tim Air Cylinders

Series ET

Series ET actuators achieve their cushion effect through the normal compression of the Buna-N “shock-absorber” seals at the completion of the cylinder stroke. This compressive action absorbs the cylinder’s kinetic energy and reduces the shock created by the piston striking the end caps.

The measurable cushion effect of the “shock-absorber” seals provides a predictable pounds stoppable/piston speed ratio (Chart 1, ACT-10-5), allowing you to determine the exact weight that can be stopped at a given piston speed.

Series ET actuators also help meet OSHA’s noise and clean air standards (Chart 3, ACT-10-5). They are guaranteed to operate without lubrication for one year regardless of cycles. Non-lubricated operation is achieved by the combined efforts of an oil-impregnated sintered iron piston rod bushing that lubricates the rod during normal operation, and through the use of a reinforced Teflon wear ring on the center perimeter of the piston. This ring reduces friction between the piston and the cylinder tube.



1 Heads and Caps: Corrosion resistant alloy or black oxidized steel.

2 Bushing: Oil-filled rod bushing.

3 Rod Seal: Replaceable block-vee Buna-N rod seal (Viton® optional).

4 Seals: O-ring type seals.

5 Piston: Machined alloy.

6 Tie Rods: High yield strength tie rods.

7 Wear Ring: Teflon® reinforced wear ring.

8 Tubing: Hard anodized I.D. aluminum tubing.

9 Impact Dampening Seals: Impact dampening seals specifically designed piston incorporated energy absorbing seals to dissipate the forces generated during impact without increasing envelope dimensions. Not available for cylinders with oversize rods. Not recommended for applications that require 100% repeatable stroke increments, or for applications that exceed the pounds stoppable capacities shown on ACT-10-5 at the various recommended piston speeds.

- 3/4" and 1-1/8" bore
- Single and double rod end styles
- Rated 150 psi air
- -20° to 200°F (-29° to 107°C) operating temperatures
- Viton seals optional for higher temperatures



Differences between Series T and Series VT air actuators

Series T contains a Quad Ring Buna-N piston seal. The VT Series utilizes a dual Block-Vee Buna-N piston seal design.

The Block-Vee seals increase the envelope dimensions of the Series VT cylinders by 3/8". All other features of the Series T and VT are the same.

Series VT cylinders have a slightly lower breakaway pressure (psig) than the Series T Tiny Tim air cylinders. See "Minimum Breakaway Pressures (PSIG)" chart.

Technical Information

Medium: Compressed air, filtered, lubricated or non-lubricated

Operation: Single or double acting

Operating Pressure: 150 PSI (10 bar)

Operating Temperature: -20° to 200°F (-29° to 107°C)

Cylinder Diameters: 3/4", 1-1/8"

Minimum Breakaway Pressures (PSIG) Non-cushioned cylinders, mounted horizontally with no load on the piston rod.

Cylinder Bore (inches)	Model	PSIG
3/4"	Series T	12
	Series VT-ET	8
1-1/8"	Series T	7
	Series VT-ET	5

The proper selection and application of a fluid power actuator requires consideration of the following: Operation pressure, the fluid medium, mounting style, length of stroke, type of piston rod connection to the load, thrust or mounting tension loading on the rod, mounting attitude, speed of the stroke and how the load in motion will be stopped.

Bore Size Selection

The following formulae and charts may be used in the proper selection of the actuator bore size.

- Extended force in pounds = bore area in sq. inches x pressure to cap in psig.
- Retract force in pounds = (bore area – rod area) in sq. inches x pressure to head in psig.

Bore Areas Chart A		Bore Areas Chart B	
Cylinder Bore (in.)	Area (Sq. in.)	Rod Dia. (in.)	Area (Sq. in.)
3/4"	.44	5/16"	.076
1-1/8"	.99	3/8"	.11

Note: Allow for friction and attached mechanism when selecting cylinder bore size. Also, consider the weight of the piston and rod assembly if the cylinder is not mounted with the rod in a horizontal plane.



- 3/4" and 1-1/8" bore
- Single and double rod end styles
- Rated 150 psi air
- -20° to 200°F (-29° to 107°C) operating temperatures
- Viton seals optional for higher temperatures

Chart 1
Energy Absorption of Impact Dampening "Shock-Absorber" Seals

Cylinder Bore	Inch-Pounds of Kinetic Energy Absorbable	*Pounds Stoppable at Following Speeds				
		12 in/sec	24 in/sec	36 in/sec	48 in/sec	60 in/sec
3/4"	1.5	8	2	0.8	0.41	0.23
1-1/8"	3	16	4	1.8	1	.59

* Pounds must include weight of piston and rod assembly.

Chart 2
Effect of Impact Dampening Seals on Total Stroke of Cylinder

Cylinder Bore	Reduction in inches of total stroke at following psi pressures					
	0	20	40	60	80	100
3/4"	.11	.08	.05	.03	.01	0
1-1/8"	.12	.09	.06	.04	.02	0

NOTE: The above figures are for new cylinders. The impact dampening seals will take some compression set during operation of the cylinder and the stroke loss will decrease. Also, the pressure at zero stroke loss will decrease to about 80 psi. At pressures above those of zero stroke loss, a slight clicking sound will be produced during impact.

Chart 3
Summary of Sound Levels in Decibels

Cylinder Model	With 95 psi Air Peak Sound Pressure Level +		With 50 psi Air Peak Sound Pressure Level +	
	End+ +	Side+ +	End+ +	Side+ +
	TF — 3/4" x 1-1/8"	99	107	100
ETF — 3/4" x 1-1/8"	84	86	87	87

+ Peak sound pressure is given in decibels (dB) re: 2×10^{-5} N/m².

++ End position of mike was located 3 ft. on centerline from end of cylinder; side position of mike was located 3 ft. perpendicular to centerline abeam of end of cylinder.

The total noise emitted will depend on the structure to which the cylinder is attached. If it is mounted on a thin flat plate of considerable area, the noise will be increased by a sounding board effect.

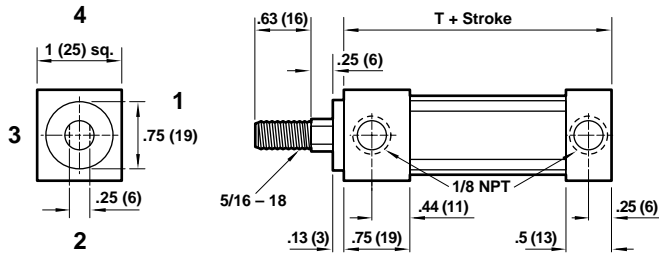


Tiny Tim Series Actuators

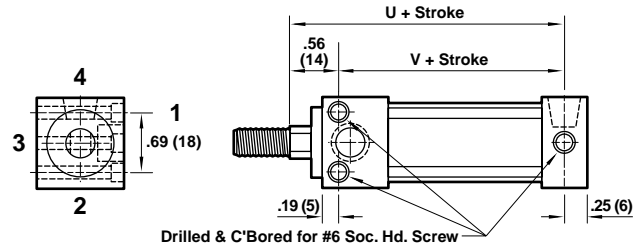
All Dimensions in Inches (mm)

Series T, ET, VT (3/4" Bore, 5/16" Rod)

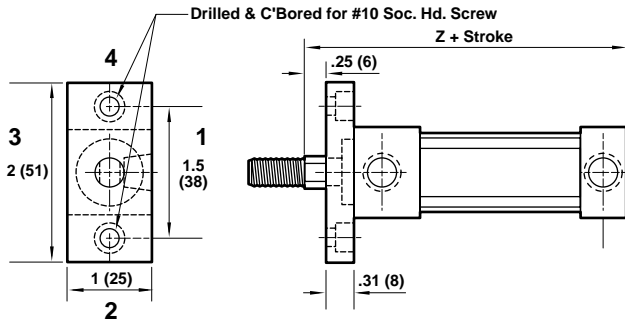
Standard Cylinder (TNM, VTNM, ETNM)



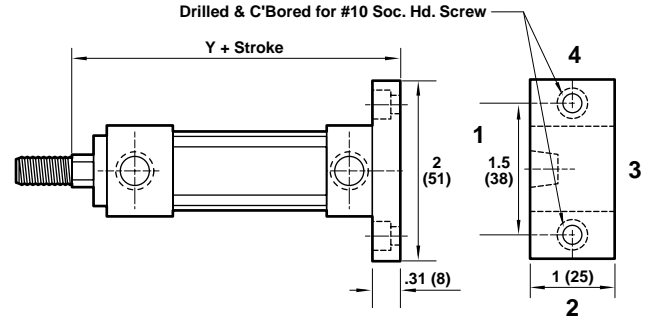
Flush Mount – TF, VTF, ETF



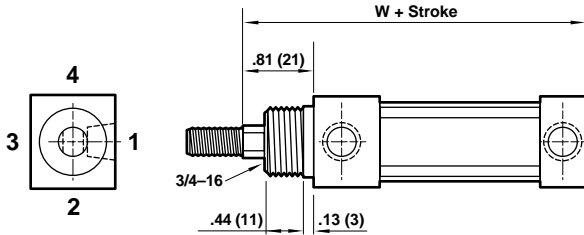
Front Flange Mount – TFR, VTFR, ETFR



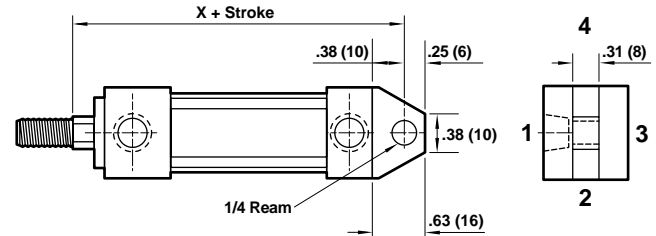
Rear Flange Mount – TFC, VTFC, ETFC



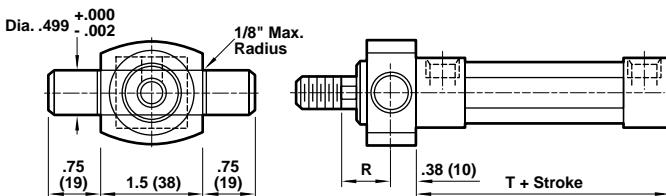
Nose Mount – TSR, VTSR, ETSR



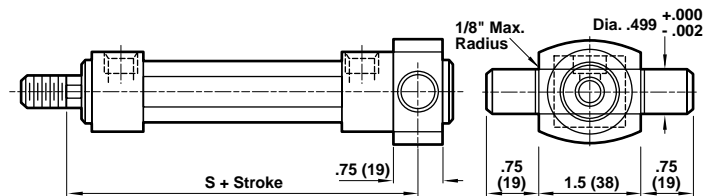
Clevis Mount – TC, VTC, ETC



Head Trunnion Mount* – THT, VTHT, ETHT



Back Trunnion Mount* – TBT, VTBT, ETBT



*Configured as special at factory

Series T: Quad Ring Seals
 Series VT: Block-Vee Seals
 Series ET: Ecology Seals

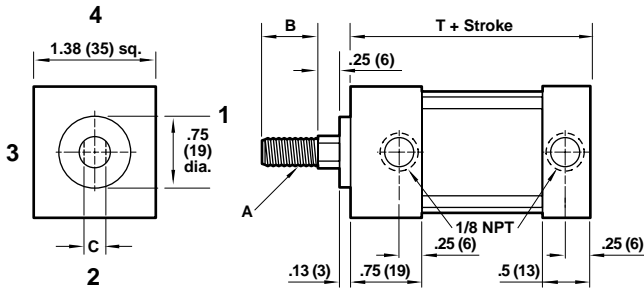
	Series T	Series ET & VT
R	.44 (11)	.44 (11)
S	2.81 (71)	3.19 (81)
T	1.81 (46)	2.19 (56)
U	1.94 (49)	2.31 (59)
V	1.38 (35)	1.75 (45)
W	2.63 (67)	3 (76)
X	2.56 (65)	2.94 (75)
Y	2.5 (64)	2.88 (73)
Z	2.38 (60)	2.75 (70)

NOTE: For spring return cylinders add an additional stroke length to dimensions.

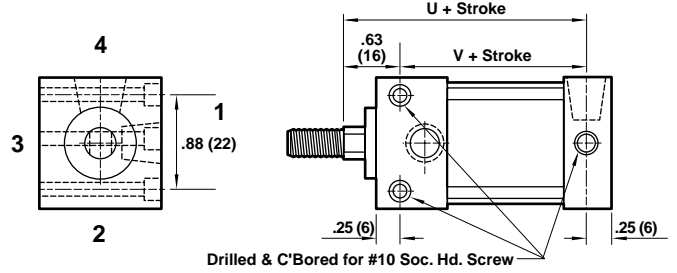


Series T, ET, VT (1-1/8" Bore, 5/16" and 3/8" Rods)

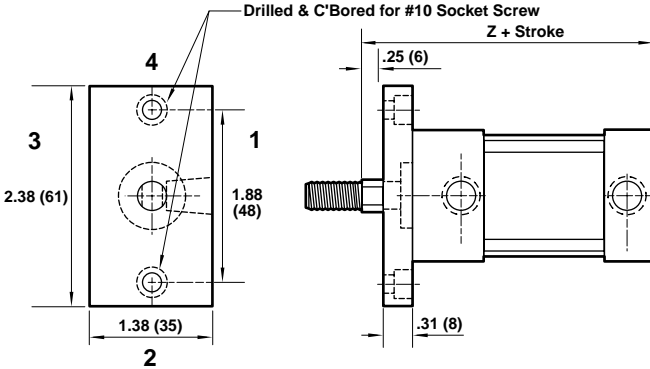
Standard Cylinder (TNM, VTNM, ETNM)



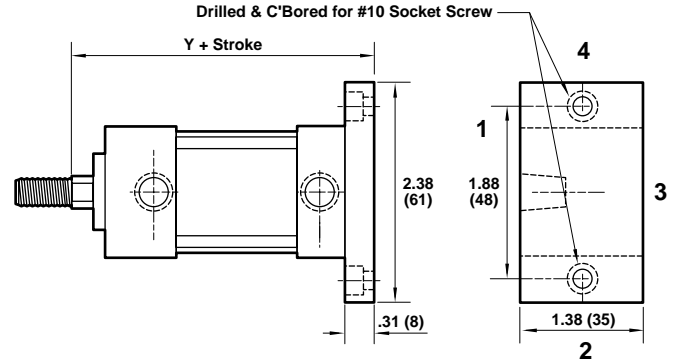
Flush Mount – TF, VTF, ETF



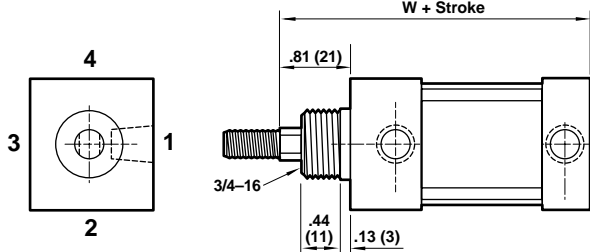
Front Flange Mount – TFR, VTFR, ETFR



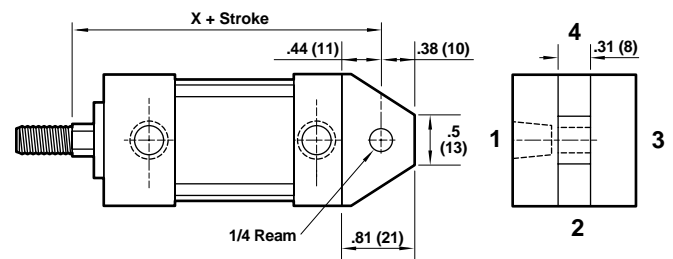
Rear Flange Mount – TFC, VTFC, ETFC



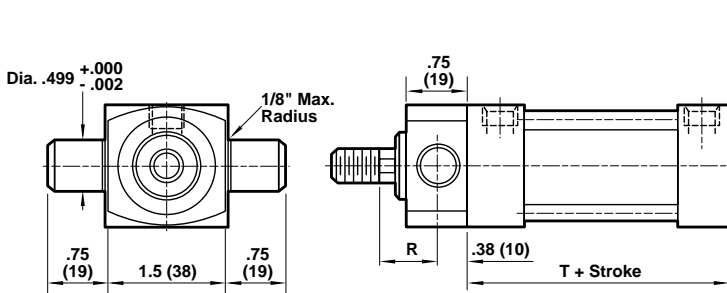
Nose Mount – TSR, VTSR, ETSR



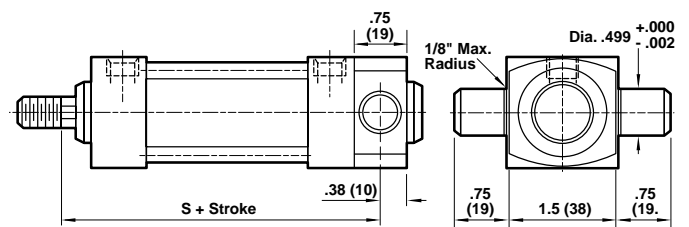
Clevis Mount – TC, VTC, ETC



Head Trunnion Mount* – THT, VTHT, ETHT



Back Trunnion Mount* – TBT, VTBT, ETBT



*Configured as special at factory

	Piston Rod	
	5/16 Diameter	3/8* Diameter
A	5/16-18	3/8-24
B	.63 (16)	.75 (19)
C	.25 (6)	.31 (8)

* 3/8" dia. piston rod will be furnished as an option only if specified.

	Series T	Series ET, VT
R	.44 (11)	.44 (11)
S	2.81 (71)	3.19 (81)
T	1.81 (46)	2.19 (56)
U	1.94 (49)	2.31 (59)
V	1.31 (33)	1.69 (43)
W	2.63 (67)	3 (76)
X	2.63 (67)	3 (76)
Y	2.5 (64)	2.88 (73)
Z	2.38 (60)	2.75 (70)

NOTE: Series T, ET & VT 1-1/8" Bore Cylinders are available with adjustable cushions. Increase dimensions T through Z by 9/16" for one cushion and by 1-1/8" for both ends cushioned. (See "Ordering Procedure" for details.) For spring return cylinders add an additional stroke length to above dimensions.

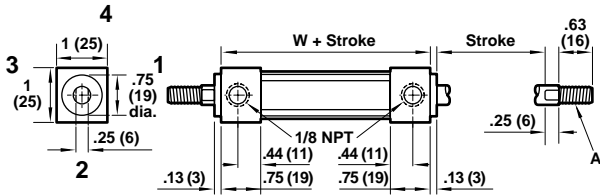


Tiny Tim Series Actuators

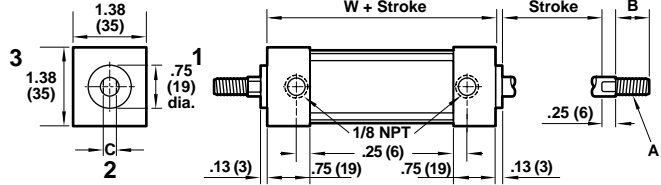
All Dimensions in Inches (mm)

Series DT, EDT, VDT (Double Rod End)

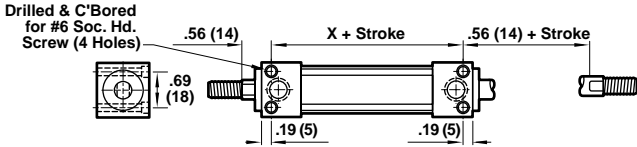
Standard Cylinder (DTNM, VDTNM, EDTNM)



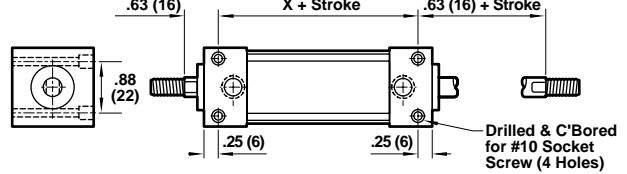
Standard Cylinder (DTNM, VDTNM, EDTNM)



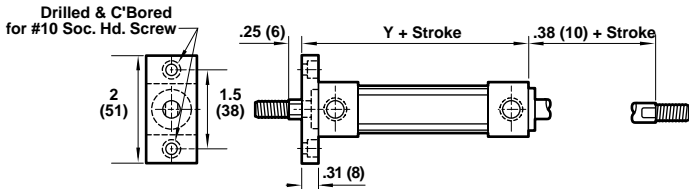
Flush Mount – DTF, VDTF, EDTF



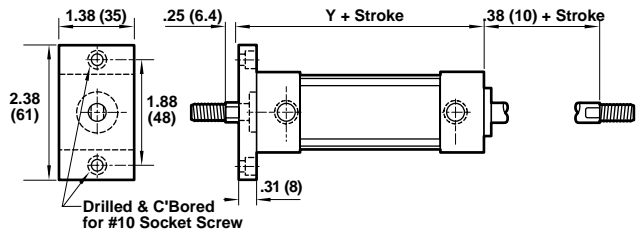
Flush Mount – DTF, VDTF, EDTF



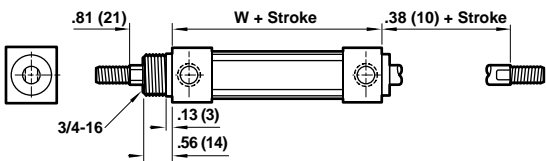
Front Flange – DTFR, VDTFR, EDTFR



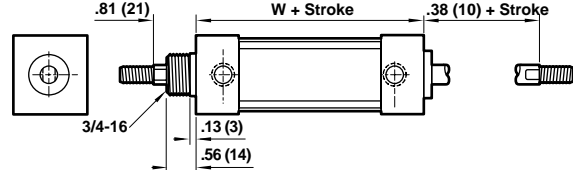
Front Flange – DTFR, VDTFR, EDTFR



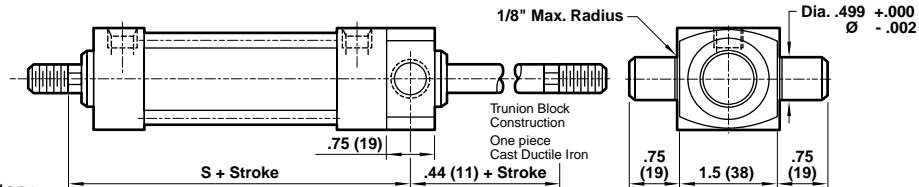
Nose Mount – DTSR, VDTSR, EDTSR



Nose Mount – DTSR, VDTSR, EDTSR



Trunnion Mount *- DTHT, VDTHT, EDTHT



*Configured as special at factory

	Piston Rod	
	5/16 Diameter	3/8* Diameter
A	5/16-18	3/8-24
B	.63 (16)	.75 (19)
C	.25 (6)	.31 (8)

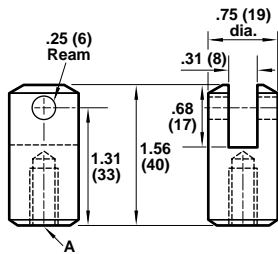
* 3/8" dia. piston rod will be furnished as an option only if specified.

	3/4" Bore		1-1/8" Bore	
	DT	VDT & EDT	DT	VDT & EDT
S	2.81 (71)	3.19 (81)	2.81 (71)	3.19 (81)
W	2.06 (52)	2.44 (62)	2.06 (52)	2.44 (62)
X	1.69 (43)	2.06 (52)	1.56 (40)	1.94 (49)
Y	2.38 (60)	2.75 (70)	2.38 (60)	2.75 (70)

NOTE: Series DT, VDT & EDT 1-1/8" bore cylinders are available with adjustable cushions. Increase dimensions S through Y by 9/16" for one cushion and by 1-1/8" for both ends cushioned.

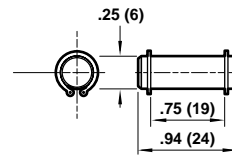


Rod Clevis (includes pin)



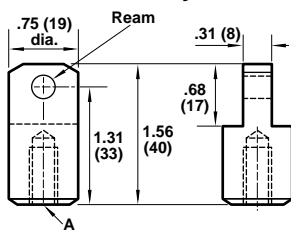
Part Number	Thread
40035	5/16-18
40036	3/8-24

Pin



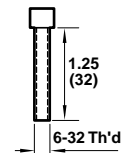
Part Number – **49085**
(includes snap rings)

Rod Eye



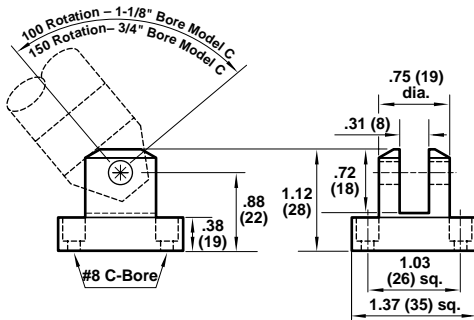
Part Number	Thread
40042	5/16-18
40043	3/8-24

Mounting Screw



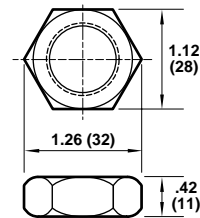
Part Number – **51043**
Used on model TF, VTF, and ETF 3/4" bore actuators

Clevis Bracket (includes pin)



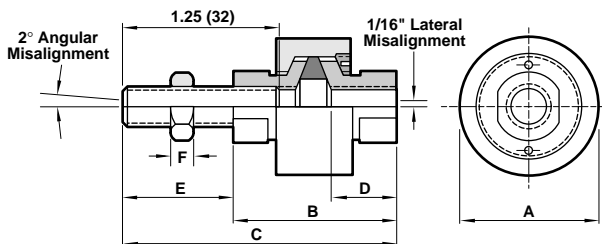
Part Number – **40038**

Mounting Nut



Part Number – **52010**
Used on model TSR, VTSR, ETSR actuators

Rod Aligners (includes jam nut)



Rod Aligners				
PN	RA-25	RA-31	RA-32	RA-38
Thread	1/4-28	5/16-18	5/16-24	3/8-24
A	1 (25)	1 (25.4)	1 (25)	1 (25)
B	1.38 (35)	1.38 (35)	1.38 (35)	1.38 (35)
C	2.13 (54)	2.13 (54)	2.13 (54)	2.13 (54)
D	.5 (13)	.5 (13)	.5 (13)	.5 (13)
E	.75 (19)	.75 (19)	.75 (19)	.75 (19)
F	.16 (4)	.19 (5)	.19 (5)	.22 (6)



Tiny Tim Series Actuators

All Dimensions in Inches (mm)

Reed Switches

PS01-B and PS04-B are compact and low profile switches when mounted on the cylinder tie rods. Each switch has a plug allowing electrical disconnection without removing or changing the adjustment of the switch on the cylinder.

Reed switches are constructed of two overlapping ferromagnetic reeds (nickel-iron) which are hermetically sealed in a glass tube with the ends aligned and a small gap between them.

When an external magnetic force is applied, the reeds assume opposite polarity and the ends of the reeds are mutually attracted and contact, completing the circuit.

Due to the light weight and small gap, very fast action is obtained. They will close in 2 ms and release in 0.1 ms. Caution should be observed when using reed switches in sensitive circuits since they can introduce noise into the circuit due to bounce and vibration occurring from the mechanical closing of the reeds.

Reed switches require a magnetic material (located in the piston) with a polarity that is axial in orientation to actuate the switch.

Note: Cylinders modified for use with a reed switch will have a magnetic strip on the piston in place of the Teflon® wear strip.

Technical Information

Working Temperature	Min. -20°F (°C) Max. 175°F (°C)
Operating Time	On 2 ms Off .1 ms
Repeatability	.015 inch
Vibration resistance	50 to 1000 Hz
Shock resistance	50g
Minimum magnetic field to actuate	85 gauss (axial)
Maximum switch current	see chart
Voltage range	see chart
Maximum switch power	30W

Note: A piston modified for a reed switch will not work with a hall effect switch.

Reed Switch Quick Reference Chart

Switch Part Number	Type	Max. VA (Watt)	Max. Switch Current Resistance	Voltage Range AC-DC	Light	Hysteresis	Varistor	Plug-In	Wire Length
PS01-B	S.P./S.T. N.O.	*50	*1 Amp	5-250	Yes	.03	Yes	Yes	114"
PS04-B	S.P./S.T. N.O.	*50	*3 Amp	0-250	No	.03	No	Yes	114"

*For inductive loads use 70% of the ratings.

PS01-B Switch & Bracket For Tiny Tim Cylinders

Part #	Fits
PS01-B7T	3/4" Bore
PS01-B11T	1-1/8" Bore

PS04-B Switch & Bracket For Tiny Tim Cylinders

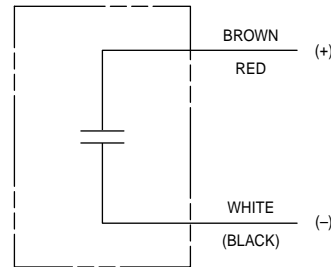
Part #	Fits
PS04-B7T	3/4" Bore
PS04-B11T	1-1/8" Bore

How to Order

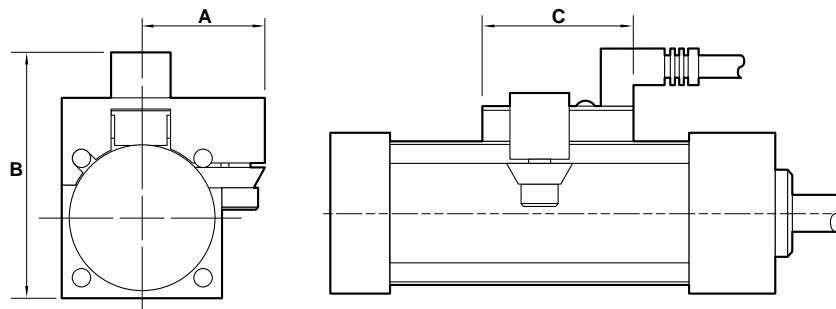
ETF-2 PS01-B 7T (22) 3/4 x 5
 — Switch Positions
 — Switch and Bracket Assy.
 — Quantity

How to Order

ETF-PS-3/4 x 5
 — Piston modification only (no switch)



PS01-B, PS04-B



Series	Bore	A	B	C
T	.75 (19)	.94 (24)	1.77 (45)	1.94 (49)
VT	1.13 (29)	1.06 (27)	2.56 (65)	
ET				

NOTE: PS Option add 1/2" to overall length of cylinder.

Series	Min. Stroke	Min. Stroke (2) Switches Same Side
T	.75 (19)	2 (51)
VT & ET	.56 (14)	1.63 (41)



Hall Effect Switches

Hall effect switches are a non-mechanical switch (no moving parts), which take the supply current and place it within a magnetic field, generating a voltage output. Hall effect switches are continually on, operating at a low voltage level (low ground), until the internal magnetic field is disturbed by the switch actuating magnetic. The built-in amplifier then boosts the output signal to a usable level. Since there are no moving parts, hall effect switches can operate in sensitive areas without sending interference or noise into the circuit. Hall effect switches require a magnetic material (located on the piston) with a polarity that is longitudinal in orientation to actuate the switch.

Note: A piston modified for a hall effect switch will not work with a reed switch.

Technical Information

Working Temperature	Min. 23°F (°C) Max. 257°F (°C)
Operating Time	On 2 ms Off .1 ms
Repeatability	.001 inch
Vibration resistance	5 to 1000 Hz
Shock resistance	30g @ 11 ms
Minimum magnetic field to actuate	85 gauss (longitudinal)

How to Order

ETF-2 HS2-7T (22) 3/4 x 5
 ——— Switch Positions
 ——— Switch and Bracket Assy.
 ——— Quantity

How to Order

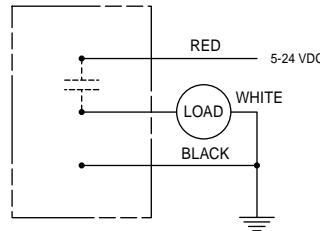
ETF-HS-3/4 x 5
 ——— Piston modification only
 (no switch)

Hall Effect Switch Quick Reference Chart

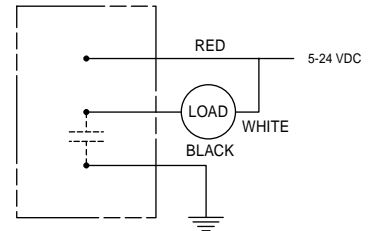
Switch Part Number	Type	Max. VA (Watt)	Max. Switch Current Resistance	Voltage Range DC	Light	Diode	Plug-In	Wire Length
HS1	N.O. Sourcing (PNP)	30	*1 Amp	5-24	No	Yes	No	108"
HS2	N.O. Sourcing (PNP)	30	*1 Amp	5-24	Yes	Yes	No	108"
HS3	Sinking (NPN)	30	*1 Amp	5-24	No	Yes	No	108"

*For inductive loads use 70% of the ratings.

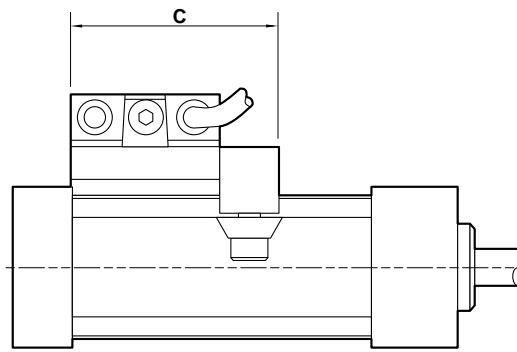
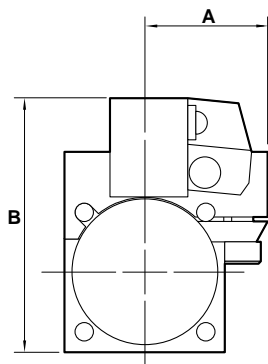
HS1 Switch & Bracket		HS2 Switch & Bracket		HS3 Switch & Bracket	
Part #	Fits	Part #	Fits	Part #	Fits
HS1-7T	3/4" Bore	HS2-7T	3/4" Bore	HS3-7T	3/4" Bore
HS1-11T	1-1/8" Bore	HS2-11T	1-1/8" Bore	HS3-11T	1-1/8" Bore



HS1, HS2-SOURCING (PNP)



HS3-SINKING (NPN)



Series	Bore	A	B	C
T	.75 (19)	.94 (24)	1.81 (46)	1.78 (45)
VT	1.13 (29)	1.06 (27)	2.19 (56)	
ET				

NOTE: PS Option add 1/2" to overall length of cylinder.

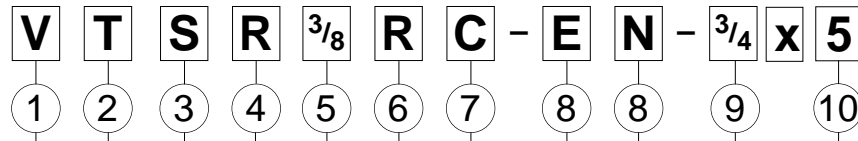
Series	Min. Stroke	Min. Stroke (2) Switches Same Side
T	.75 (19)	2.5 (64)
VT & ET	.56 (14)	2.44 (62)



Tiny Tim Series Actuators

All Dimensions in Inches (mm)

T, VT, and ET Product Ordering Information



Single Rod End Models

- T = Quad ring piston seal, block – vee rod seal
- VT = Block-vee piston and rod seals
- ET = Impact dampening piston seals and block-vee rod seal

Double Rod End Models

- DT = Quad ring piston, block – vee rod seal
- VDT = Block-vee piston and rod seals
- EDT = Impact dampening piston seals and block-vee rod seal

Mounting Styles

- F = Flush mount
- C = CLevis mount
- SR = Nose mount
- FC = Rear flange mount
- FR = Front flange mount
- HT = Head trunnion mount
- BT = Back trunnion mount

Rod Diameter

Specify 5/16" or 3/8"

Single Acting Cylinders (3/4" and 1-1/8" bore cylinders)

- SR = Spring on rod end (spring retracts rod).
- SC = Spring on cap end (spring extends rod).
- Notes: Cylinder requires a stop tube equivalent to the stroke length.
- Cushions not available on spring end of cylinder.
- Standard spring forces for SR and SC = 3.5 lbs relaxed, 11.5 lbs compressed

Cushions

- R = Rod end cushion
- C = Cap end cushion
- RC = Both ends cushioned
- Notes: Available on 1-1/8" bore cylinders only.
- 1/4" effective cushion length.
- Add 9/16" to overall length of cylinder for each cushion.
- Cushion not available on spring end of a single acting cylinder.

Options

- A = T and VT stroke adjustment. (Specify length of adjustment)
- AA = ET stroke adjustment (specify length of adjustment) Note: This option adds 1/2" to overall cylinder length.
- EN = Electroless nickel plating (includes option S).
- *†EV = Pneumatic valve (specify position 1, 2, 3, or 4)
- *L = Port location other than standard. (Specify location)
- PR = Plain rod, no thread
- RX = Rod extension over standard. (Specify length)
- S = Stainless steel tie rods and nuts.
- SS = Chrome-plated stainless steel piston rod.
- *†SV = Stroke signal valve. (specify position 1, 2, 3, or 4)
- TX = Rod thread extension over standard (specify length)
- V = Viton® seals. -20° to 350°F temperature range.

Bore (Specify 3/4" or 1-1/8")

Stroke (inches)

* Designate head position first, and cap position last

† Not available on 3/4" and 1-1/8" bore Series T



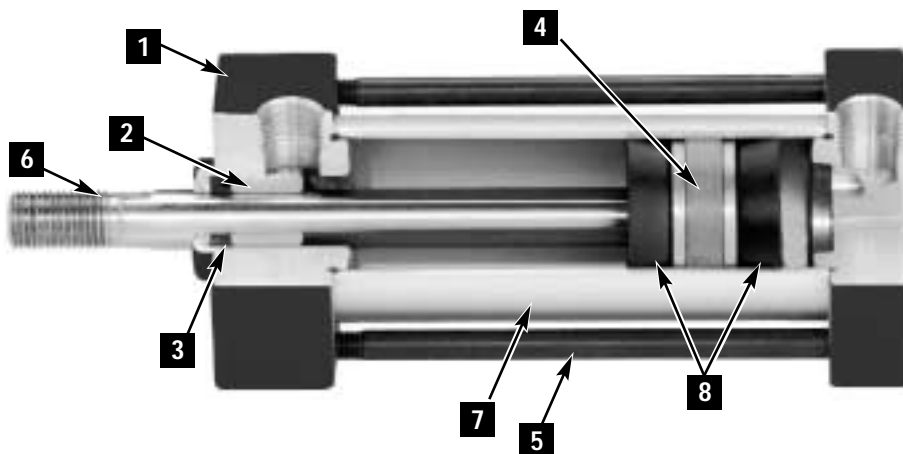
NFPA interchangeable Tiny Tim Air Actuators

Series TA, TAV, TAE

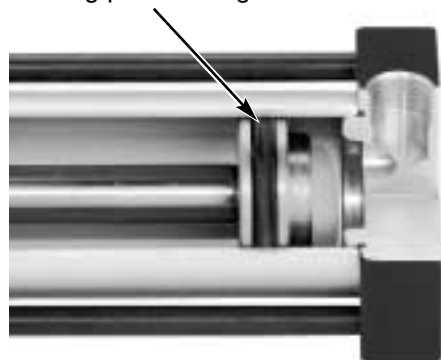
- 1** Heads and Caps: Corrosion resistant alloy
- 2** Rod Bushing: Oil-filled, sintered iron bushing.
- 3** Rod Seal: Carboxylated Nitrile Block-vee for maximum life and efficiency.
- 4** Piston and Rod Assembly: Full diameter thread into the piston, secured with red Loctite® to resist shock and vibration.
- 5** Tie Rods: Pre-stressed to maintain rigidity. Tie rod nuts are recessed into the head or caps for compactness and clean appearance.
- 6** Piston Rod: Hard chrome plated steel. Milled wrench flats and full diameter thread for maximum rod strength. 303 hard chrome plated stainless steel available at extra cost.
- 7** Tube: Hard anodized aluminum tube with micro-inch finish for low breakaway and long seal life.
- 8** Impact Dampening Seals: Impact dampening seals specifically designed piston incorporated energy absorbing seals to dissipate the forces generated during impact without increasing envelope dimensions. Not available for cylinders with oversize rods. Not recommended for applications that require 100% repeatable stroke increments, or for applications that exceed the pounds stoppable capacities shown on ACT-10-14 at the various recommended piston speeds.

Series TAE

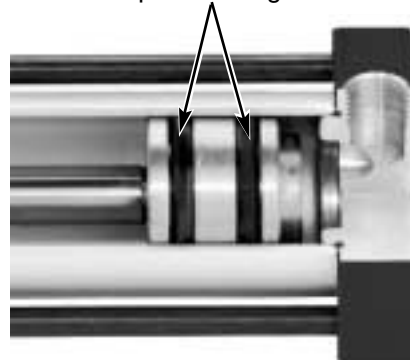
Series TAE features impact dampening piston design.



Series TA
Quad Ring piston design



Series TAV
Block-V piston design



- 3/4", 1", and 1-1/8" bore
- Single and double rod end styles
- Rated 150 psi air
- -20° to 200°F (-29° to 107°C) operating temperatures
- Viton seals optional for higher temperatures
- Designed to conform with NFPA (T3.6.11) 1972, and interchange with Tom Thumb's Series A and AV mounting dimensions.



Minimum Breakaway Pressures (PSIG)
Non-cushioned cylinders, mounted horizontally with no load on the piston rod.

Cylinder Bore (inches)	Model	PSIG
3/4"	Series TA	12 (DTA-15)
	Series TAE-TAV	8 (DTAE, DTAV-11)
1", 1-1/8"	Series TA	7 (DTA-11)
	Series TAE-TAV	5 (DTAE, DTAV-9)

Temperatures

Buna N Seals: -20° to 200°F (-29° to 107°C)
Viton Seals: -40° to 350°F (-40° to 175°C)

Technical Information

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Double acting

Operating Pressure:

150 PSI (10 bar)

Operating Temperature:

-20° to 200°F (-29° to 107°C)

Cylinder Diameters:

Nominal Inch:

3/4", 1-1/8"

Effective Piston Areas

To determine approximate force/lb multiply area by applicable pressure

Bore	Head End*	Cap End
3/4"	.393 sq. in.	.442 sq. in.
1"	.917 sq. in.	.994 sq. in.
1-1/8"	.884 sq. in.	.994 sq. in.

* With standard rods

Energy Absorption Capacity of Impact Dampening Seals

Size	In./Lbs of Kinetic Energy Absorbable	Pounds* Stoppable at Following Speeds					
		6 in/sec	12 in/sec	24 in/sec	36 in/sec	48 in/sec	60 in/sec
3/4"	1.5	32.4	8.0	2.0	.8	.41	.23
1"	3	79.2	16	4	1.8	1	.59
1-1/8"							

*Pounds must include piston and rod assembly weight

Series TA NFPA Interchangeable Tiny Tim Actuators

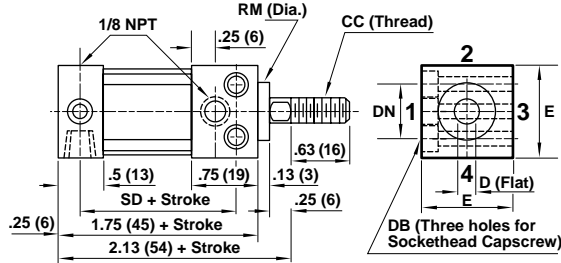


All Dimensions in Inches (mm)

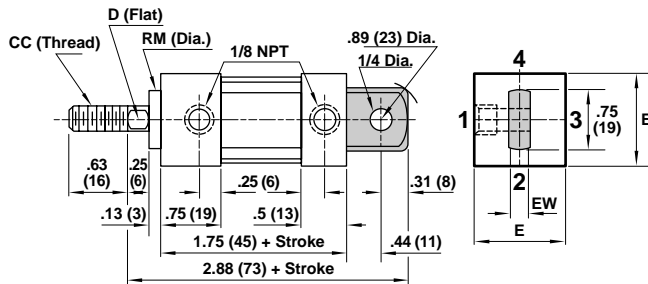
Bore	3/4	1*	1-1/8
BC	1.06 (27)	1.41 (36)	1.59 (40)
CC	1/4-28	5/16-24	3/8-24
D	.22 (6)	.25 (6)	.31 (8)
DB	8-32	10-32	10-32
DN	.63 (16)	.88 (22)	1 (25)
E	1 (25)	1.38 (35)	1.5 (38)
EW	.25 (6)	.38 (10)	.38 (10)
KM	5/8-18	3/4-16	3/4-16
N	.75 (19)	1 (25)	1.13 (29)
NT	8-32 x 3/16 DP	10-32 x 1/4 DP	10-32 x 1/4 DP
R	.5 (13)	.88 (22)	1 (25)
RM	.63 (16)	.75 (19)	.75 (19)
RM ₁	.69 (18)	.81 (21)	.81 (21)
RT	8-32 x 1/4 DP	8-32 x 1/4 DP	10-32 x 1/4 DP
SD	1.31 (33)	1.25 (32)	1.25 (32)
SN	1.31 (33)	1.25 (32)	1.25 (32)
TF	1.5 (38)	1.88 (48)	2 (51)
TN	.63 (16)	.88 (22)	1 (25)
UF	2 (51)	2.38 (60)	2.5 (64)

* Piston Dia. of 1" cylinders is 1-1/8" diameter.

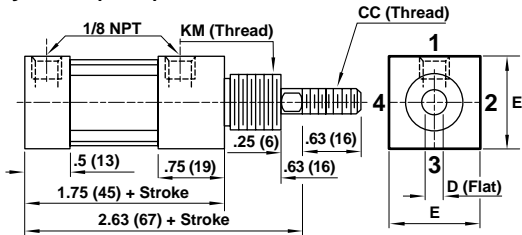
Style 2 – (MS8) Side Through Holes



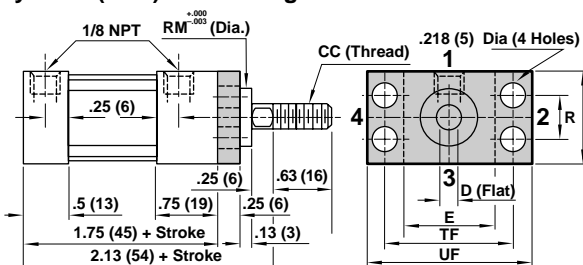
Style 4 – (MP3) Cap Eye



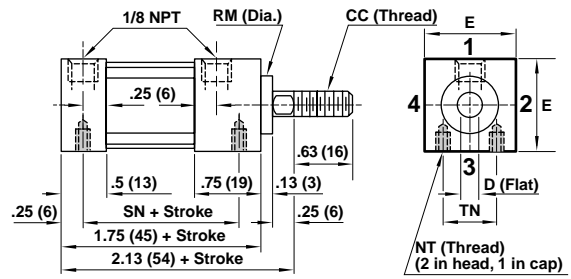
Style 6 – (MN1) Threaded Nose



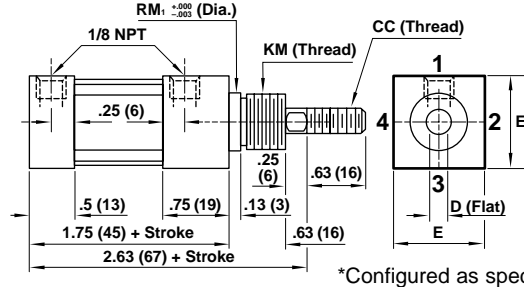
Style 8 – (MF1) Head Flange



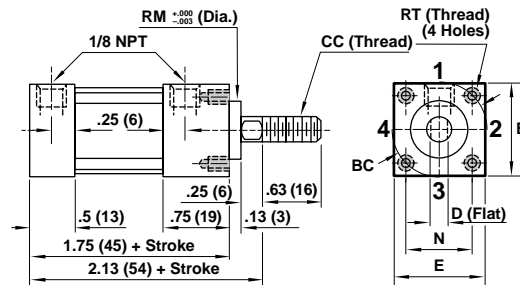
Style 1 – (MS9) Side Tapped



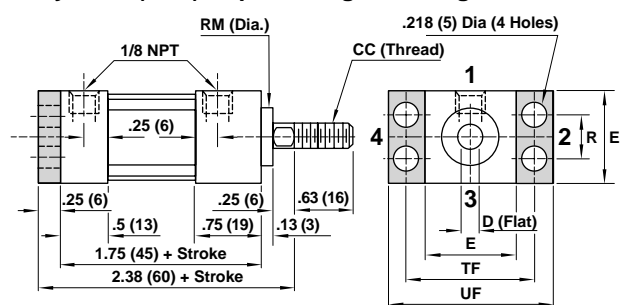
Style 3 – (MNR1) Threaded Male Rabbet*



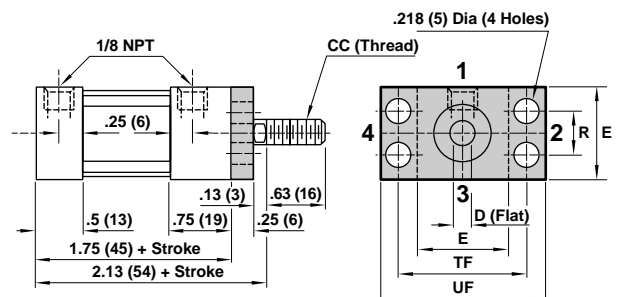
Style 5 – (MR1) Head Male Rabbet



Style 7 – (MF2) Cap Rectangular Flange



Style 9 – (MF7) Head Flange (No pilot)





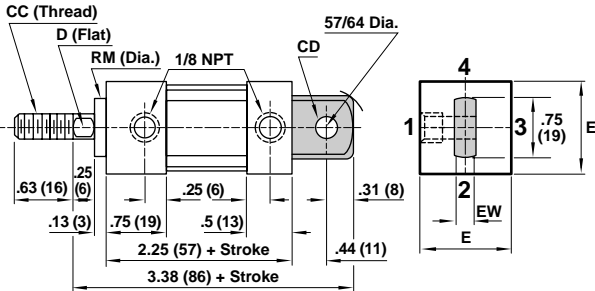
Series TAE & TAV NFPA Interchangeable Tiny Tim Actuators

All Dimensions in Inches (mm)

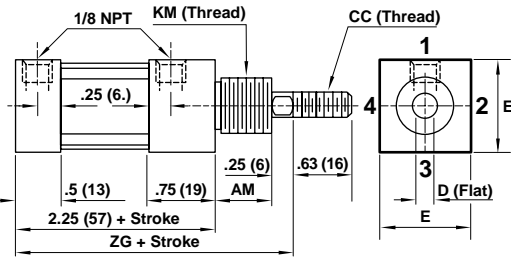
Bore	3/4	1*	1-1/8
AM	.63 (16)	.63 (16)	.88 (22)
BC	1.06 (27)	1.41 (36)	1.59 (40)
CC	1/4-28	5/16-24	3/8-24
CD	.25 (6)	.38 (10)	.38 (10)
D	.22 (6)	.25 (6)	.31 (8)
DB	8-32	10-32	10-32
DN	.63 (16)	.88 (22)	1 (25)
E	1 (25)	1.38 (35)	1.5 (38)
EW	.25 (6)	.38 (10)	.38 (10)
KM	5/8-18	3/4-16	1-14
N	.75 (19)	1 (25)	1.13 (29)
NT	8-32 x 3/16 DP	10-32 x 1/4 DP	10-32 x 1/4 DP
R	.5 (13)	.88 (22)	1 (25)
RM	.63 (16)	.75 (19)	.75 (19)
RM ₁	.69 (18)	.81 (21)	1.06 (27)
RT	8-32 x 1/4 DP	8-32 x 1/4 DP	10-32 x 1/4 DP
SD	1.81 (46)	1.75 (45)	1.75 (45)
SN	1.81 (46)	1.75 (45)	1.75 (45)
TF	1.5 (38)	1.88 (48)	2 (51)
TN	.63 (16)	.88 (22)	1 (25)
UF	2 (51)	2.38 (60)	2.5 (64)
ZG	3.13 (79)	3.13 (79)	3.38 (86)

* Piston Dia. of 1" cylinders is 1-1/8" diameter.

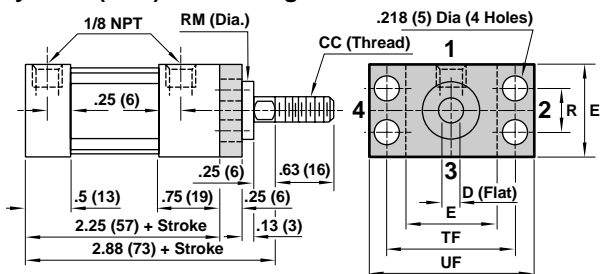
Style 4 – (MP3) Cap Eye



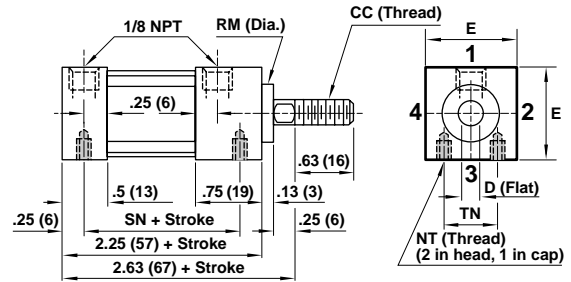
Style 6 – (MN1) Threaded Nose



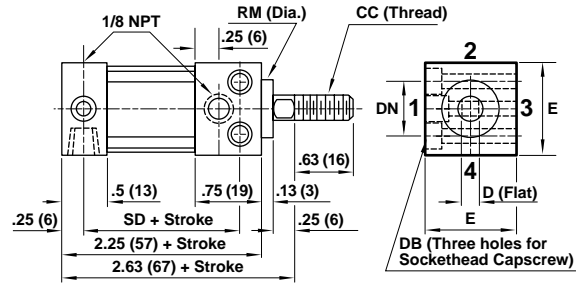
Style 8 – (MF1) Head Flange



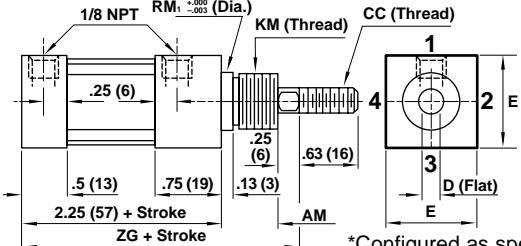
Style 1 – (MS9) Side Tapped



Style 2 – (MS8) Side Through Holes

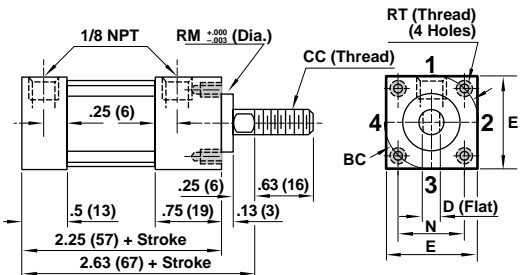


Style 3 – (MNR1) Threaded Male Rabbit*

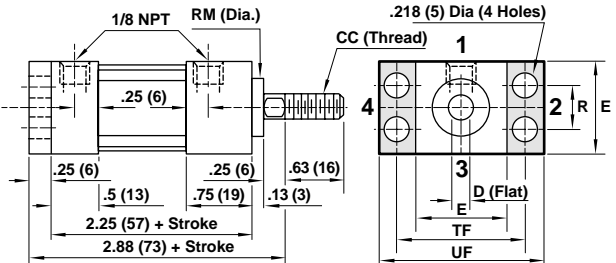


*Configured as special at factory

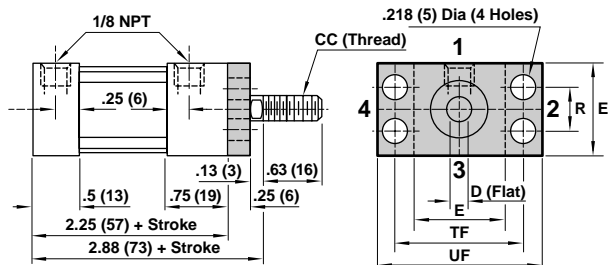
Style 5 – (MR1) Head Male Rabbit



Style 7 – (MF2) Cap Rectangular Flange



Style 9 – (MF7) Head Flange (No pilot)



Tiny Tim Series NFPA Interchangeable Actuators

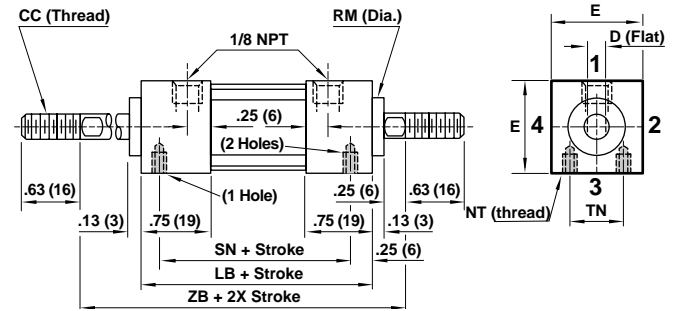
All Dimensions in Inches (mm)



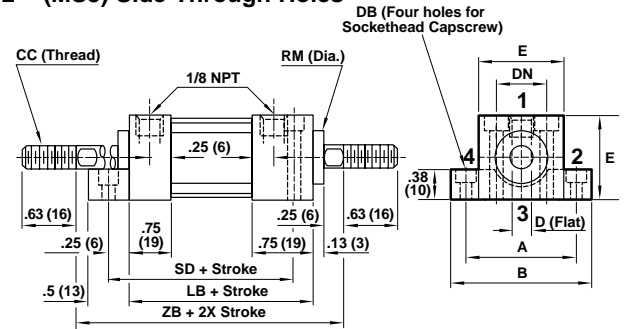
Bore Series	3/4		1*		1-1/8	
	DTA	DTAE-DTAV	DTA	DTAE-DTAV	DTA	DTAE-DTAV
A	1.38 (35)		1.75 (45)		1.88 (48)	
AM	.63 (16)		.63 (16)		.63 (16)	
B	1.75 (45)		2.13 (54)		2.25 (57)	
BC	1.06 (27)		1.41 (36)		1.59 (40)	
CC	1/4-28		5/16-24		3/8-24	
D	.22 (6)		.25 (6)		.31 (8)	
DB	8-32		10-32		10-32	
DN	.63 (16)		.88 (22)		1 (25)	
E	1 (25)		1.38 (35)		1.5 (38)	
KM	5/8-18		3/4-16		3/4-16	1-14
LB	2 (51)	2.5 (64)	2 (51)	2.5 (64)	2 (51)	2.5 (64)
N	.75 (19)		1 (25)		1.13 (29)	
NT	8-32 x 3/16 DP		10-32 x 1/4 DP		10-32 x 1/4 DP	
R	.5 (13)		.88 (22)		1 (25)	
RM	.63 (16)		.75 (19)		.75 (19)	
RM1	.69 (18)		.81 (21)		.81 (21)	1.06 (27)
RT	8-32 x 1/4 DP		8-32 x 1/4 DP		10-32 x 1/4 DP	
SD	2.06 (52)	2.56 (65)	2 (51)	2.5 (64)	2 (51)	2.5 (64)
SN	1.56 (40)	2.06 (52)	1.5 (38)	2 (51)	1.5 (38)	2 (51)
TF	1.5 (38)		1.88 (48)		2 (51)	
TN	.63 (16)		.88 (22)		1 (25)	
UF	2 (51)		2.38 (60)		2.5 (64)	
ZB	2.75 (70)	3.25 (83)	2.75 (70)	3.25 (83)	2.75 (70)	3.25 (83)
ZR	3.25 (83)	3.75 (95)	3.25 (83)	3.75 (95)	3.25 (83)	3.75 (95)
ZT	3 (76)	3.5 (89)	3 (76)	3.5 (89)	3 (76)	3.5 (89)

* Piston Dia. of 1" cylinders is 1-1/8" diameter.

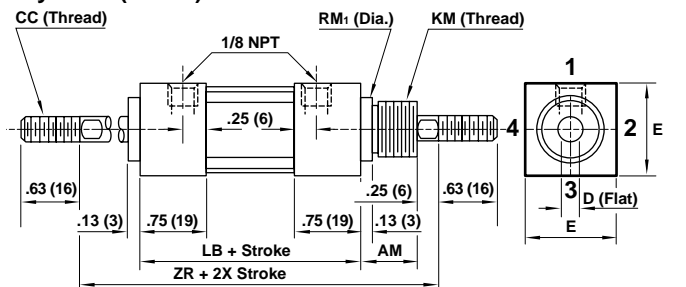
Style 1 – (MS9) Side Tapped



Style 2 – (MS8) Side Through Holes

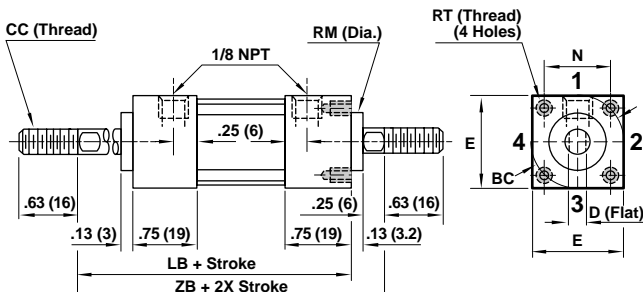


Style 3 – (MNR1) Threaded Male Rabbet*

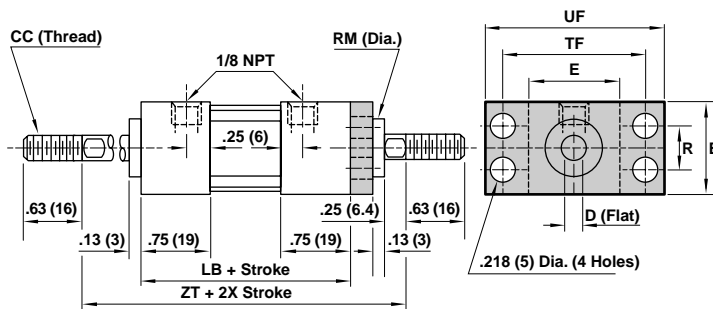


*Configured as special at factory

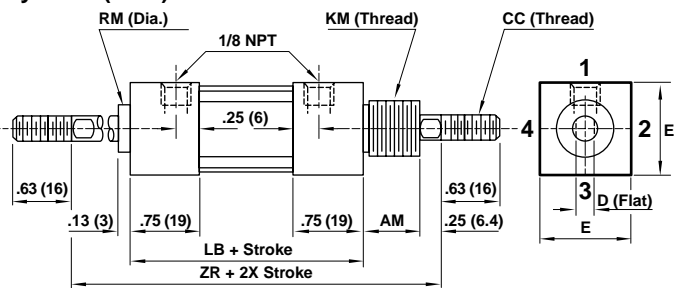
Style 5 – (MR1) Head Male Rabbet



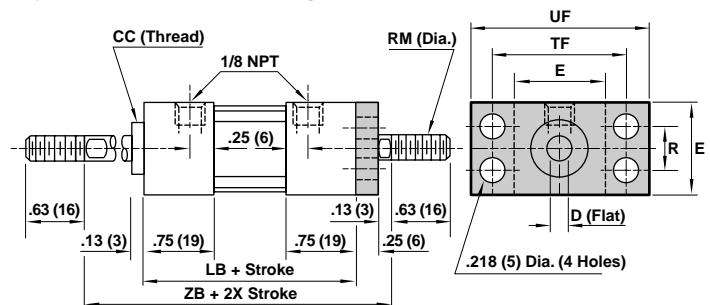
Style 8 – (MF1) Head Flange



Style 6 – (MN1) Threaded Nose



Style 9 – (MF7) Head Flange (No pilot)

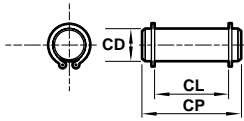




Tiny Tim Series NFPA Interchangeable Actuators

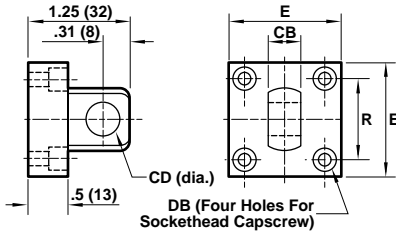
All Dimensions in Inches (mm)

Pivot Pin



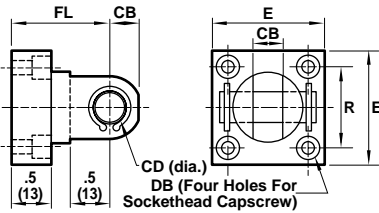
Cyl. Bore	Cyl. Series	Part No.	CD	CL	CP
3/4	All	49085	.25 (6)	.75 (19)	.94 (24)
1, 1-1/8	TA	49086	.25 (6)	.88 (22)	1.06 (27)
1, 1-1/8	TAV-TAE	49087	.38 (10)	.88 (22)	1.06 (27)

Eye Bracket



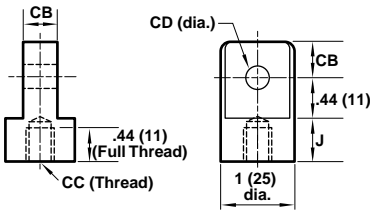
Cyl. Bore	Cyl. Series	Part No.	CD	CB	DB	E	R
3/4	TA, TAV-TAE	49069	.25 (6)	.25 (6)	6-32	1 (25)	.75 (19)
1 &	TA	49070	.25 (6)	.38 (10)	10-32	1.38 (35)	1 (25)
1-1/8	TAV-TAE	49071	.38 (10)	.38 (10)	10-32	1.38 (35)	1 (25)

Clevis Bracket (includes pin)



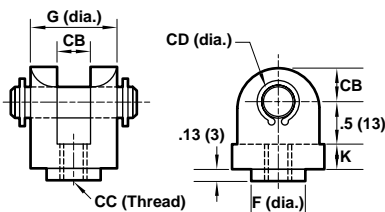
Cyl. Bore	Cyl. Series	Part No.	E	R	FL	CB	CD	DB
3/4	TA, TAV-TAE	49072	1 (25)	.75 (19)	1.19 (30)	.25 (6)	.25 (6)	6-32
1 &	TA	49073	1.38 (35)	1 (25)	1.25 (32)	.38 (10)	.25 (6)	10-32
1-1/8	TAV-TAE	49074	1.38 (35)	1 (25)	1.25 (32)	.38 (10)	.38 (10)	10-32

Rod Eye



Cyl. Bore	Cyl. Series	Part No.	CC	CD	CB	I	J
3/4	TA, TAV-TAE	49075	1/4-28	.25 (6)	.25 (6)	.5 (13)	.31 (8)
1	TA	49076	5/16-24	.25 (6)	.38 (10)	.75 (19)	.44 (11)
	TAV-TAE	49077	5/16-24	.38 (10)	.38 (10)	.75 (19)	.44 (11)
1-1/8	TA	49078	3/8-24	.25 (6)	.38 (10)	.75 (19)	.44 (11)
	TAV-TAE	49079	3/8-24	.38 (10)	.38 (10)	.75 (19)	.44 (11)

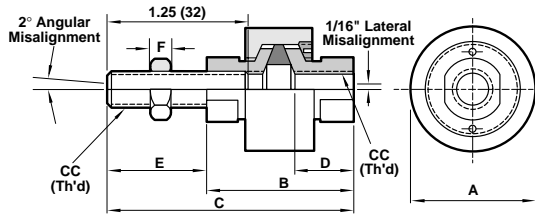
Rod Clevis (includes pin)



Cyl. Bore	Cyl. Series	Part No.	CB	CD	F	G	K	CC
3/4	TA, TAV-TAE	49080	.25 (6)	.25 (6)	.44 (11)	.75 (19)	.19 (5)	1/4-28
1	TA	49081	.38 (10)	.25 (6)	.56 (14)	.88 (22)	.25 (6)	5/16-24
	TAV-TAE	49082	.38 (10)	.38 (10)	.56 (14)	.88 (22)	.25 (6)	5/16-24
1-1/8	TA	49083	.38 (10)	.25 (6)	.56 (14)	.88 (22)	.25 (6)	3/8-24
	TAV-TAE	49084	.38 (10)	.38 (10)	.56 (14)	.88 (22)	.25 (6)	3/8-24

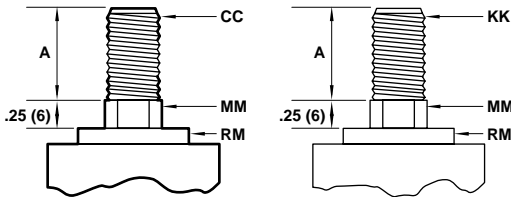


Rod Aligners (includes jam nut)



Model	A	B	C	D	E	F	CC
RA-25	1 (25)	1.38 (35)	2.13 (54)	.5 (13)	.75 (19)	.16 (4)	1/4-28
RA-32	1 (25)	1.38 (35)	2.13 (54)	.5 (13)	.75 (19)	.19 (5)	5/16-24
RA-38	1 (25)	1.38 (35)	2.13 (54)	.5 (13)	.75 (19)	.19 (5)	3/8-24
RA-44	1.5 (38)	1.78 (45)	3 (76)	.69 (18)	1.22 (31)	.22 (6)	7/16-20
RA-50	1.5 (38)	1.78 (45)	3 (76)	.69 (18)	1.22 (31)	.25 (6)	1/2-20

Oversize Rods – Optional Rod End Styles



Note: Oversize rods are not available in Style 2, sizes 3/4" and 1" due to interference with the rod gland. See ACT-10-20 for cylinders equipped with modified rods or other optional equipment.

Bore	Rod Size	MM	CC (Style A)	A	KK (Style B)	D	RM
3/4"	1	.25 (6)	1/4-28	.63 (16)	10-32	.22 (6)	.63 (16)
	2	.31 (8)	5/16-24	.63 (16)	1/4-28	.25 (6)	.63 (16)
1"	2	.31 (8)	5/16-24	.63 (16)	1/4-28	.25 (6)	.75 (19)
	3	.38 (10)	3/8-24	.63 (16)	5/16-24	.31 (8)	.75 (19)*
1-1/8"	4	.5 (13)	1/2-20	.75 (19)	7/16-20	.44 (11)	.75 (19)*
	3	.38 (10)	3/8-24	.63 (16)	5/16-24	.31 (8)	.75 (19)*
1-1/8"	4	.5 (13)	1/2-20	.75 (19)	7/16-20	.44 (11)	.75 (19)*

Optional rod sizes indicated on shaded areas. Not available on Series TAE and DTAE.
 * RM (Dia.) on Series TAV and DTAV 1" & 1-1/8" Sizes in Mounting Styles 5 and 8 is 1".

Optional Equipment

High temperature seals

Available for all seals and bore sizes when normal service requires the cylinder to operate at ambient temperatures ranging above 200° to 350°F (93° to 177°C). Specify Viton.

Single Acting, Spring Return Actuators

Available for all Series and bore sizes. Add two times working stroke to envelope dimensions shown on ACT-10-16/17

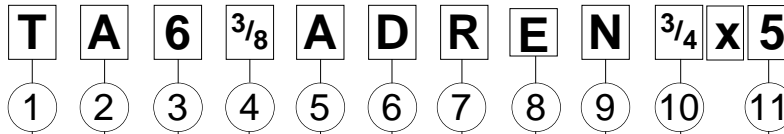
Adjustable Cushions

Insert type adjustable cushions are available when required. Add 1/2" to cylinder length per cushioned end.

Note: Not available with 1/2" diameter rods.



NFPA Product Ordering Information



Series

Standard Single Rod End Models
 TA = Quad ring piston seal, Block-V rod seal
 TAV - Block-V piston and rod seals
 TAE = Impact dampening piston seals, Block-V rod seal
 Standard Double Rod End Models
 DTA = Quad ring piston seal, Block-V rod seals
 DTAV - Block-V piston and rod seals
 DTAE = Impact dampening piston seals, Block-V rod seal

Mounting Styles

- 1 = Side Tapped
- 2 = Side through holes
- 4 = Cap eye
- 5 = Head male rabbet
- 6 = Threaded nose
- 7 = Cap rectangular flange
- 8 = Head flange
- 9 = Head flange (no pilot)

Rod Diameter (Specify on all models)

- 1/4"
- 5/16"
- 3/8"
- 1/2"

Note: 1/2" diameter rods are not available on Series TAE

Rod End Thread Style

(Specify "A" or "B" on all models)

Rod Size	Thd A	Thd B
1/4 ø	1/4-28	10-32
5/16 ø	5/16-24	1/4-28
3/8 ø	3/8-24	5/16-24
1/2 ø	1/2-20	7/16-20

Adjustable Cushions*

- DR = Rod end only
- DC = Cap end only
- D = Both ends

* Add 1/2" per cushioned end.

Stroke

Bore

- 3/4"
- 1"
- 1-1/8"

Options

- RX = Rod extension (specify length)
- TX = Rod thread extension (specify length)
- T = Special Rod thread (specify length)
- PR = Plain rod end
- PS = Magnetic piston**
- L = Port location other than standard (specify location)
- ST = Stop tube. (specify length and location)
- A = Stroke adjust (specify length of adjustment)
- AA = Stroke adjustment (double piston design)
- V = Viton seals
- SS = Piston Rod (chrome plated stainless steel)
- EN = Electroless nickel plating (includes option S)
- S = Stainless steel tie rods & nuts

Single Acting Actuators

- SR = Spring on Rod End
- SC = Spring on Cap End

** PS option adds 1/2" to overall length.