TAIYO

Proven reliability in fluid power controls

ULTRA-COMPACT HYDRAULIC CYLINDERS

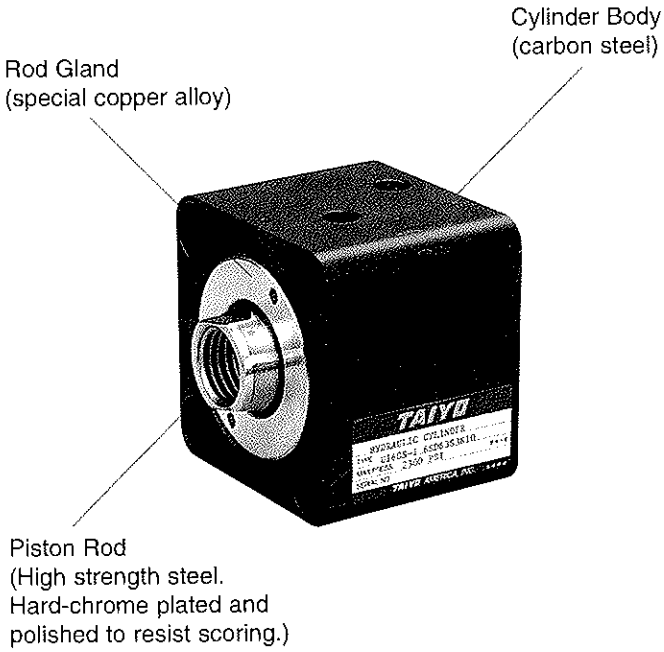
U160S-1 SERIES

- Operating at up to 3000 PSI pressure. Bore sizes from 20mm (3/4" Nom.) to 80mm (3-1/4" Nom.).
- Lightweight, durable and compact hydraulic cylinders with bodies constructed of a steel.
- Rod gland constructed of a special copper alloy for improved wear resistance.
- With no mounting accessories needed, the mounting space is smaller than the conventional cylinder.
- Mounting dimensions completely interchangable with U100S-1 Series, which has an aluminum body.

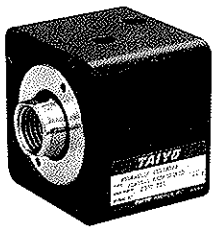
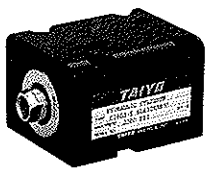
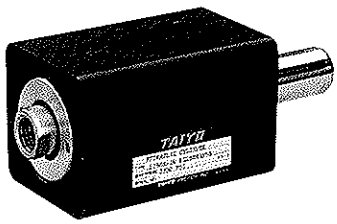
Assembled in USA

U100S-1 SERIES /
ALUMINUM BODY

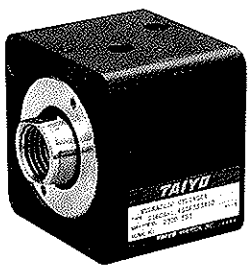
ULTRA-COMPACT HYDRAULIC CYLINDERS



- Seven bore sizes ranging from 20mm (3/4" Nom.) to 80mm (3-1/4" Nom.).
- Available in both Style 1 (Male) and Style 3 (Female) rod ends.
- Also available as the double rod type.
- High accuracy mounting is available (LA type) .
- Easy maintenance design

Double-acting, single rod type		Double-acting, double rod type	
			
SD Mounting	LA Mounting	SD Mounting	LA Mounting

Rod End - Style 3



Female Thread Type

Rod End - Style 1

Male Thread Type

How to Order

Basic type	U160S-1		6	SD	40	S	3	N	Stroke
	Series	①	②	③	④	⑤	⑥	No Cushion	⑦

①	**Cylinder type** Blank: Single rod, standard type	W: Double rod, standard type		
②	**Seal material** 6: Nitrile rubber (NHBR)			
③	**Mounting style** SD: Standard type	LA: Foot type		
④	**Bore size** 20: 20mm (3/4" Nom.) 50: 50mm (2" Nom.)	25: 25mm (1" Nom.) 63: 63mm (2-1/2" Nom.)	32: 32mm (1-1/4" Nom.) 80: 80mm (3-1/4" Nom.)	40mm: 40mm (1-1/2" Nom.)
⑤	**Rod type** S. Single rod type	W: Double rod type		
⑥	**Rod end style** 1: Style 1 - Standard male thread 4: Other — Specified by customer	3: Style 3 - Standard female thread		
⑦	**Cylinder stroke** 5: 5mm (1/5" Nom.) 25: 25mm (1" Nom.)	10: 10mm (2/5" Nom.) 30: 30mm (1-1/5" Nom.)	15: 15mm (3/5" Nom.) 40: 40mm (1-3/5" Nom.)	20: 20mm (4/5" Nom.) 50: 50mm (2" Nom.)

Seal Kit List (Complete Kit)

Parts	Material	Qty.	Part Numbers						
			Bore-20	Bore-25	Bore-32	Bore-40	Bore-50	Bore-63	Bore-80
Piston Seal	Nitrile rubber/ HNBR	1	NCHY-20	NCHY-25	NCHY-32	NCHY-40	NCHY-50	NCHY-63	NCHY-80
Rod Seal	Nitrile rubber/ HNBR	1(2)*	UHY-12	UHY-14	UHR-18	UHR-22	UHR-28A	UHR-36	UHR-45
Wiper Seal	Nitrile rubber/ HNBR	1(2)*	LPH-12	LPH-14	DHS-18	DHS-22	DHS-28	DH-36	DH-45
Rod gland O-ring	Nitrile rubber/ HNBR	1(2)*	S-18	S-22.4	G-25	G-35	G-45	G-58	G-75
Seal Kit**	U160S-1	1 set	HS1/ PKS1-20	HS1/ PKS1-25	QS1/ PKS6-032	QS1/ PKS6-040	QS1/ PKS6-050	QS1/ PKS6-063	QS1/ PKS6-080
	U160S-1D	1 set	HS1D/ PKS-20	HS1D/ PKS1-25	QS1D/ PKS6-032	QS1D/ PKS6-040	QS1D/ PKS6-050	QS1D/ PKS6-063	QS1D/ PKS6-080

* The figures in parentheses "( )" indicate the quantity for the double rod type.
** A urethane ball for protecting the threads of the rod gland is included in the seal kit. Be careful not to lose it.

ULTRA-COMPACT HYDRAULIC CYLINDERS

Medium duty (steel body), Ultra-Compact Hydraulic Cylinder for Cost-Effective Performance.

Cylinder Specifications

Type	U160S-1 Series
Operating Pressure (Max.)	2300PSI (16MPa)
Working Pressure (Min.) *1	50PSI (0.3MPa)
Speed Range	0.32"/sec. ~ 3.94"/sec. (8mm/sec. ~ 100mm/sec.)
Temperature Range	14°F ~ 212°F (-10°C ~ 100°C) at non-freezing condition
Cushion Structure	None
Recommended Fluid	Petroleum-based fluid (Refer to "Allowable Fluid" if other fluid types used.
Tolerance of Stroke	0 ~ 0.03" (0 ~ 0.8mm)

*1 Min. Operating pressure/ The minimum pressure needed to operate a horizontally place, unloaded cylinder.

Notes:
- This cylinder is not provided with an air vent valve.
- During the installation, adjustments shall be made carefully because the lateral load (eccentric load) can not be applied to the piston rod.
- If the piston comes in contact with the cylinder end at the stroke end, reduce the speed to less than the lowest speed.

Piston Pressurized Area Table

Bore	Rod Diameter	Double Acting, Single Rod Type		Double Acting, Double Rod Type	
		Extend	Retract	Extend	Retract
20mm (3/4" Nom.)	12mm (0.47")	314mm² (0.49 inch²)	201mm² (0.30 inch²)	201mm² (0.30 inch²)	
25mm (1" Nom.)	14mm (0.55")	490mm² (0.76 inch²)	336mm² (0.52 inch²)	336mm² (0.52 inch²)	
32mm (1-1/4" Nom.)	18mm (0.71")	804mm² (1.24 inch²)	550mm² (0.85 inch²)	550mm² (0.85 inch²)	
40mm (1-1/2" Nom.)	22mm (0.87")	1257mm² (1.93 inch²)	876mm² (1.34 inch²)	876mm² (1.34 inch²)	
50mm (2" Nom.)	28mm (1.10")	1963mm² (3.04 inch²)	1348mm² (2.09 inch²)	1348mm² (2.09 inch²)	
63mm (2-1/2" Nom.)	36mm (1.42")	3117mm² (4.82 inch²)	2100mm² (3.24 inch²)	2100mm² (3.24 inch²)	
80mm (3-1/4" Nom.)	45mm (1.77")	5027mm² (4.82 inch²)	3436mm² (5.62 inch²)	3436mm² (5.62 inch²)	

Formula
Force (Lbs.) = Piston pressured area (In) * Pressure (PSI) * 0.8 (Load rate)

Example: Bore Size 50mm (2" Nom.) Pressure 1000PSI
Force (Extend) = 3.04 In * 1000 * 0.8 =2432 Lbs.

Standard Stroke Fabrication Ranges

Structure	Type/Series	Bore	Cylinder Stroke (mm) 5	10	15	20	25	30	40	50
Double Acting, Single Rod	Standard type (SD Mounting) U160S-1	20	●	●	●	●	●	●	●	●
		25	●	●	●	●	●	●	●	●
		32	●	●	●	●	●	●	●	●
		40	●	●	●	●	●	●	●	●
		50	●	●	●	●	●	●	●	●
		63	●	●	●	●	●	●	●	●
		80	●	●	●	●	●	●	●	●
	Foot Mounting (LA type) U160S-1	32	❑	❑	❑	❑	❑	❑	❑	❑
		40	❑	❑	❑	❑	❑	❑	❑	❑
		50	❑	❑	❑	❑	❑	❑	❑	❑
		63	❑	❑	❑	❑	❑	❑	❑	❑
Double Acting, Double Rod	Standard type (SD Mounting) U160S-1W	20	❑	❑	❑	❑	❑	❑	❑	❑
		25	❑	❑	❑	❑	❑	❑	❑	❑
		32	❑	❑	❑	❑	❑	❑	❑	❑
		40	❑	❑	❑	❑	❑	❑	❑	❑
		50	❑	❑	❑	❑	❑	❑	❑	❑
		63	❑	❑	❑	❑	❑	❑	❑	❑
		80	❑	❑	❑	❑	❑	❑	❑	❑
	Foot Mounting (LA type) U160S-1W	32	❑	❑	❑	❑	❑	❑	❑	❑
		40	❑	❑	❑	❑	❑	❑	❑	❑
		50	❑	❑	❑	❑	❑	❑	❑	❑
		63	❑	❑	❑	❑	❑	❑	❑	❑

● : Standard Fabrication Range ❑ : • Semi Standard (consult factory for delivery)
• Long stroke, over 50mm (consult factory for delivery)

Weight Table

Unit: lbs (kg)

Structure	Type/Series	Bore	Cylinder Stroke (mm) / Rod End Style 3 (Female Thread) 5	10	15	20	25	30	40	50	Add for Style 1 (Male Thread)
Double Acting, Single Rod	Standard type (SD Mounting) U160S-1	20	1.29(0.59)	1.43(0.65)	1.58(0.72)	1.72(0.78)	1.88(0.85)	2.01(0.91)	2.29(1.04)	X	0.04(0.017)
		25	1.78(0.81)	1.96(0.89)	2.14(0.97)	2.32(1.05)	2.49(1.13)	2.67(1.21)	3.02(1.37)	3.37(1.53)	0.06(0.026)
		32	3.33(1.51)	3.59(1.63)	3.88(1.76)	4.14(1.88)	4.43(2.01)	4.69(2.13)	5.24(2.38)	5.79(2.63)	0.11(0.05)
		40	4.12(1.87)	4.45(2.02)	4.78(2.17)	5.11(2.32)	5.44(2.47)	5.77(2.62)	6.43(2.92)	7.10(3.22)	0.22(0.10)
		50	5.77(2.62)	6.17(2.80)	6.59(2.99)	6.98(3.17)	7.40(3.36)	7.80(3.54)	8.62(3.91)	9.43(4.28)	0.40(0.18)
		63	8.75(3.97)	9.25(4.20)	9.80(4.44)	10.29(4.67)	10.82(4.91)	11.33(5.14)	12.36(5.61)	13.40(6.08)	0.88(0.40)
		80	15.18(6.89)	15.91(7.22)	16.65(7.56)	17.38(7.89)	18.13(8.23)	18.86(8.56)	20.33(9.23)	21.81(9.90)	1.67(0.76)
	Foot Mounting (LA type) U160S-1	32	3.29(1.49)	3.57(1.62)	3.88(1.76)	4.17(1.89)	4.48(2.03)	4.76(2.16)	5.36(2.43)	5.95(2.70)	0.11(0.05)
		40	4.23(1.92)	4.61(2.09)	4.98(2.26)	5.36(2.43)	5.73(2.60)	6.10(2.77)	6.85(3.11)	7.60(3.45)	0.22(0.10)
		50	6.13(2.78)	6.61(3.00)	7.10(3.22)	7.58(3.44)	8.07(3.60)	8.55(3.88)	9.52(4.32)	10.49(4.76)	0.40(0.18)
		63	9.70(4.40)	10.38(4.71)	11.06(5.02)	11.74(5.33)	12.43(5.64)	13.11(5.95)	14.48(6.57)	15.84(7.19)	0.88(0.40)
Double Acting, Double Rod	Standard type (SD Mounting) U160S-1	20	1.63(0.74)	1.79(0.81)	1.94(0.88)	2.10(0.95)	2.25(1.02)	2.40(1.09)	X	X	X
		25	2.23(1.01)	2.40(1.09)	2.60(1.18)	2.78(1.26)	2.98(1.35)	3.15(1.43)	X	X	X
		32	3.77(1.71)	4.03(1.95)	4.30(1.95)	4.56(2.07)	4.83(2.19)	5.09(2.31)	5.62(2.55)	6.15(2.79)	0.22(0.10)
		40	4.85(2.20)	5.20(2.36)	5.55(2.52)	5.91(2.68)	6.26(2.84)	6.61(3.00)	7.32(3.32)	8.02(3.64)	0.44(0.20)
		50	6.32(2.87)	6.72(3.05)	7.12(3.23)	7.51(3.41)	7.91(3.59)	8.31(3.77)	9.10(4.13)	9.89(4.49)	0.80(0.36)
		63	9.32(4.23)	9.76(4.43)	10.22(4.64)	10.66(4.84)	11.13(5.05)	11.57(5.25)	12.47(5.66)	13.37(6.07)	1.76(0.80)
		80	17.60(7.99)	18.50(8.40)	19.43(8.82)	20.33(9.23)	21.26(9.65)	22.16(10.06)	23.99(10.89)	25.82(11.72)	3.34(1.52)
	Foot Mounting (LA type) U160S-1	32	4.30(1.95)	4.61(2.09)	4.92(2.23)	5.22(2.37)	5.53(2.51)	5.84(2.65)	6.46(2.93)	7.07(3.21)	0.22(0.20)
		40	5.64(2.56)	6.04(2.74)	6.43(2.92)	6.83(3.10)	7.23(3.28)	7.62(3.46)	8.42(3.82)	9.21(4.18)	0.44(0.40)
		50	7.67(3.48)	8.20(3.72)	8.73(3.96)	9.25(4.20)	9.78(4.44)	10.31(4.68)	11.37(5.16)	12.43(5.64)	0.80(0.36)
		63	11.74(5.33)	12.49(5.67)	13.24(6.01)	13.99(6.35)	14.74(6.69)	15.49(7.03)	16.99(7.71)	18.48(8.39)	1.76(0.80)

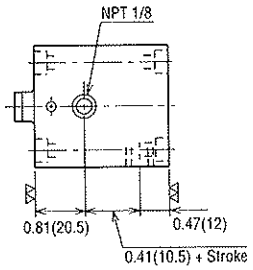
Unit : inch(mm)

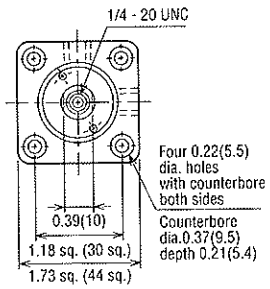
SD MOUNTING / BORE 20MM (3/4" NOM.)

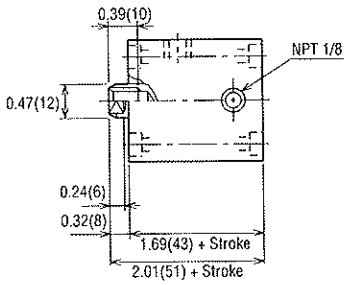
Standard Type U160S-1 6SD20S3N Stroke

LESS THAN 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

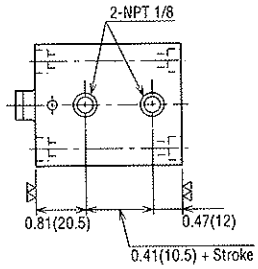


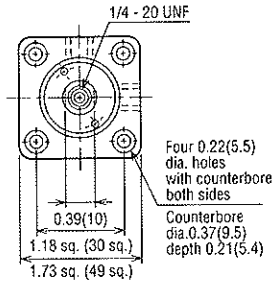


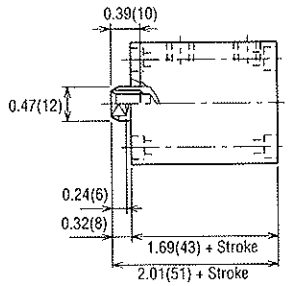


EQUAL TO OR OVER 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.





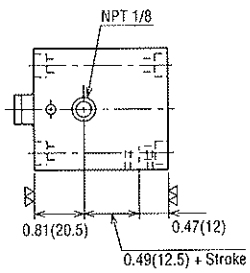


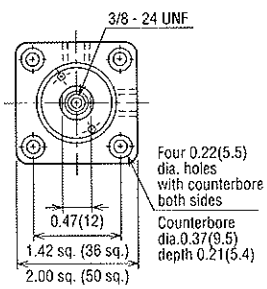
SD MOUNTING / BORE 25MM (1" NOM.)

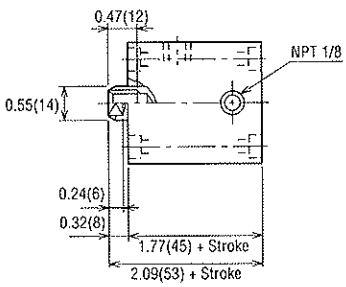
Standard Type U160S-1 6SD25S3N Stroke

LESS THAN 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

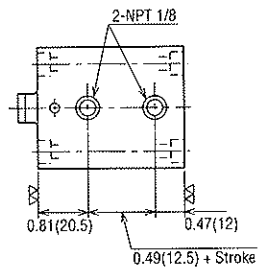


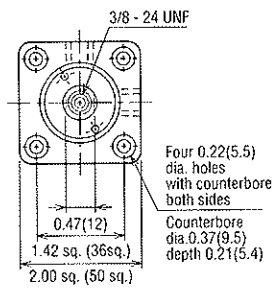


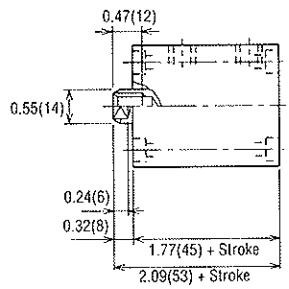


EQUAL TO OR OVER 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.





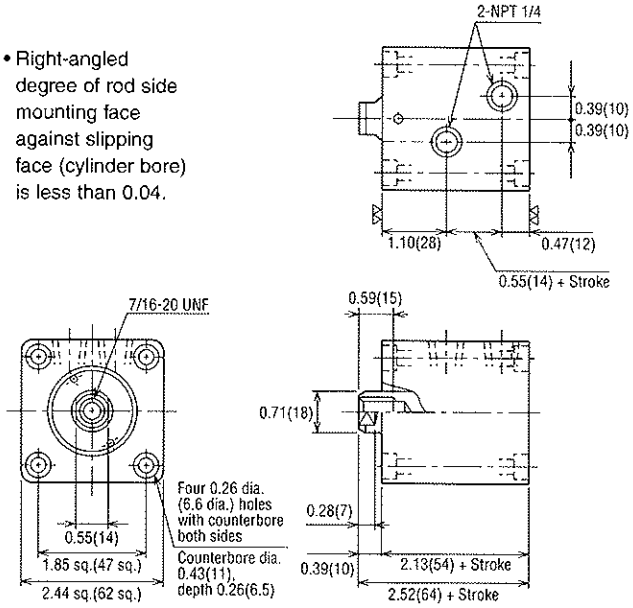


Unit : inch(mm)

SD MOUNTING / BORE 32MM (1-1/4" NOM.)

Standard Type U160S-1 6SD32S3N Stroke

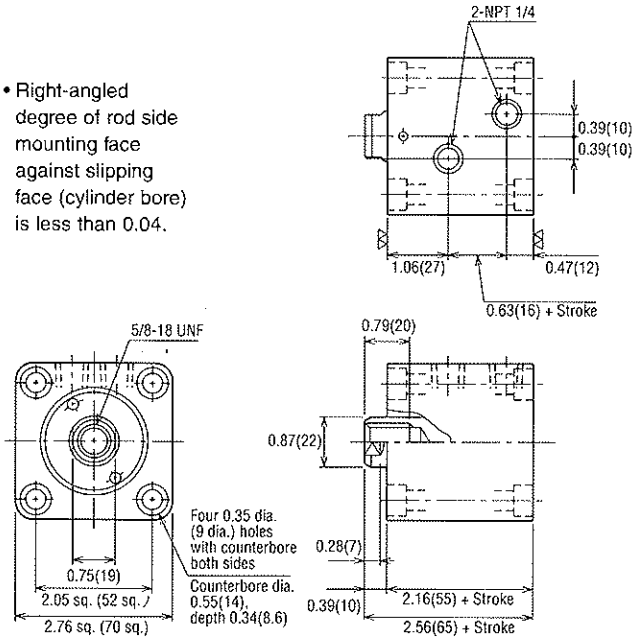
• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



SD MOUNTING / BORE 40MM (1-1/2" NOM.)

Standard Type U160S-1 6SD40S3N Stroke

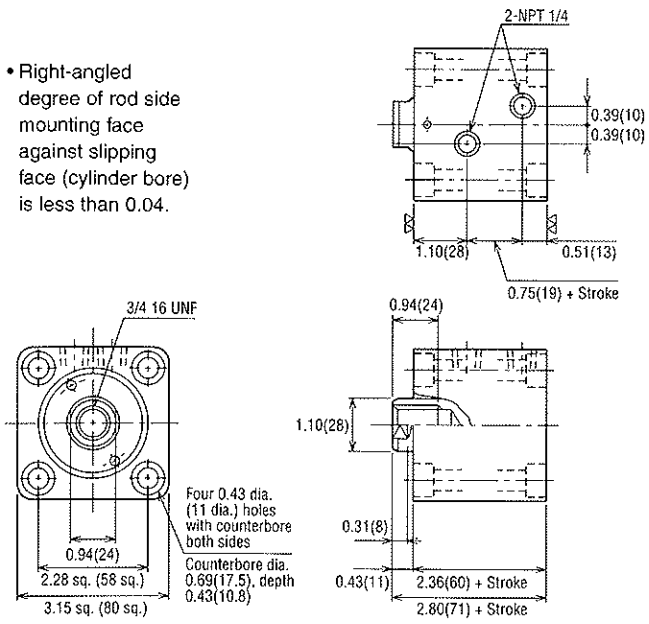
• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



SD MOUNTING / BORE 50MM (2" NOM.)

Standard Type U160S-1 6SD50S3N Stroke

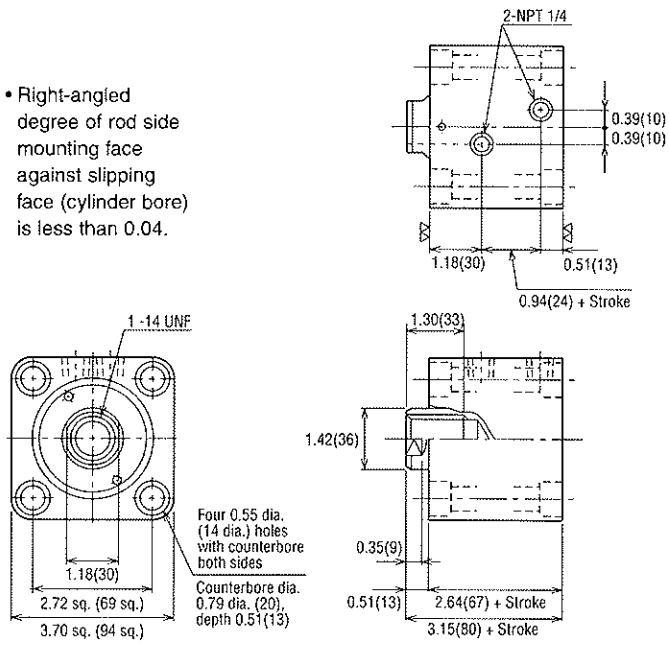
• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



SD MOUNTING / BORE 63MM (2-1/2" NOM.)

Standard Type U160S-1 6SD63S3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

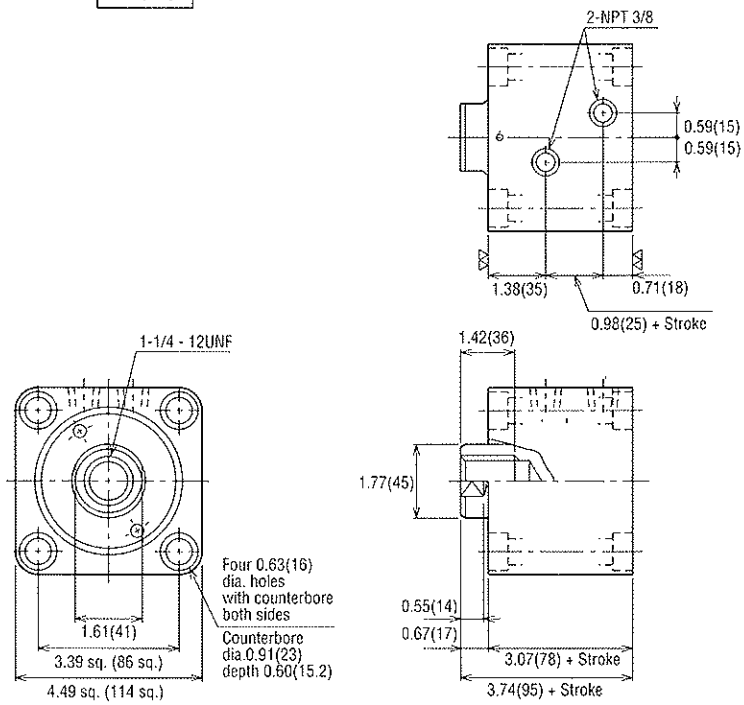


Unit : inch(mm)

SD MOUNTING / BORE 80MM (3-1/4" NOM.)

Standard Type U160S-1 6SD80S3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

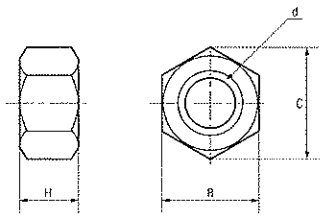


ROD END STYLE 1 (Male Thread Type)

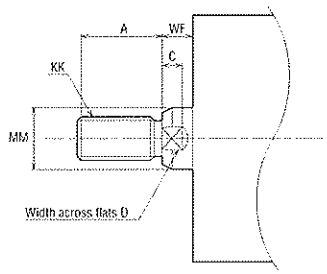
U160S-1

6SD Bore S1N Stroke

Lock Nut



Rod End Style 1 (Male Thread)



Lock Nut

Parts Number	B	C	H	d
LNH-20	11/16	0.794	3/8	7/16-20 UNF
LNH-25	3/4	0.866	7/16	1/2-20 UNF
LNH-1	7/8	1.010	31/64	9/16-18 UNF
LNH-2	1-1/8	1.299	41/64	3/4-16 UNF
LNH-3	1-5/16	1.516	3/4	7/8-14 UNF
LNH-4	1-11/16	1.949	31/32	1-1/8-12 UNF
LNH-5	2-1/16	2.382	1-11/64	1-3/8-12 UNF

Dimensional Table
Rod end style 1 (Male thread)

Bore	A	A'	C	D	KK	MM	WF
20 (3/4" Nom.)	0.59(15)	1.18(30)	0.24(6)	0.39(10)	7/16-20 UNF	0.47(12)	0.32(8)
25 (1" Nom.)	0.71(18)	1.38(35)	0.24(6)	0.47(12)	1/2-20 UNF	0.55(14)	0.32(8)
32 (1-1/4" Nom.)	0.98(25)	1.57(40)	0.28(7)	0.55(14)	9/16-18 UNF	0.71(18)	0.39(10)
40 (1-1/2" Nom.)	1.18(30)	1.89(48)	0.28(7)	0.75(19)	3/4-16 UNF	0.87(22)	0.39(10)
50 (2" Nom.)	1.38(35)	2.17(55)	0.31(8)	0.94(24)	7/8-14 UNF	1.10(28)	0.43(11)
63 (2-1/2" Nom.)	1.77(45)	2.56(65)	0.35(9)	1.18(30)	1-1/8-12 UNF	1.42(36)	0.51(13)
80 (3-1/4" Nom.)	2.36(60)	3.15(80)	0.55(14)	1.61(41)	1-3/8-12 UNF	1.77(45)	0.67(17)

Note: When using a lock nut, the figures in column A' are recommended. (Special orders accepted.)

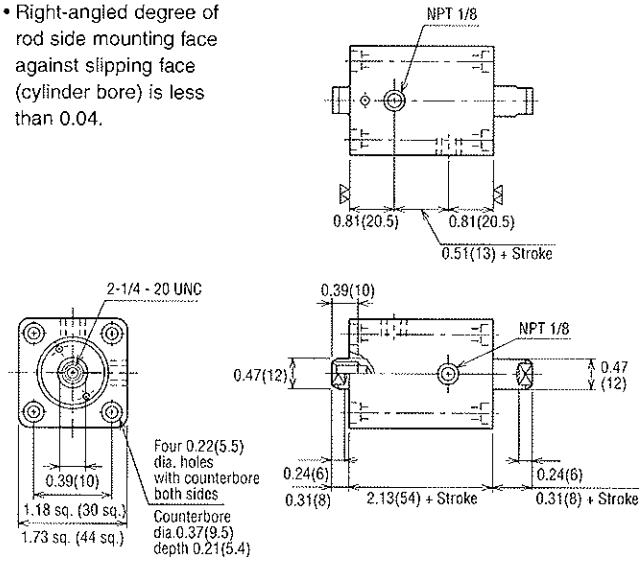
Unit : inch(mm)

SD MOUNTING / BORE 20MM (3/4" NOM.)

Standard Type U160S-1W 6SD20W3N Stroke

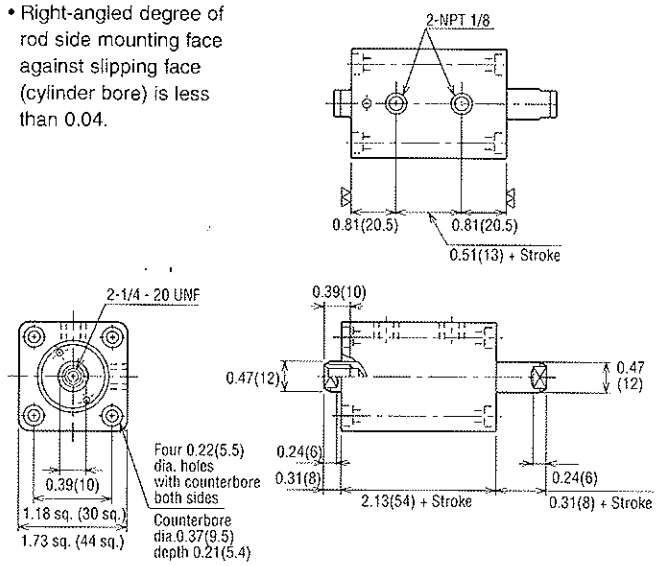
LESS THAN 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



EQUAL TO OR OVER 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

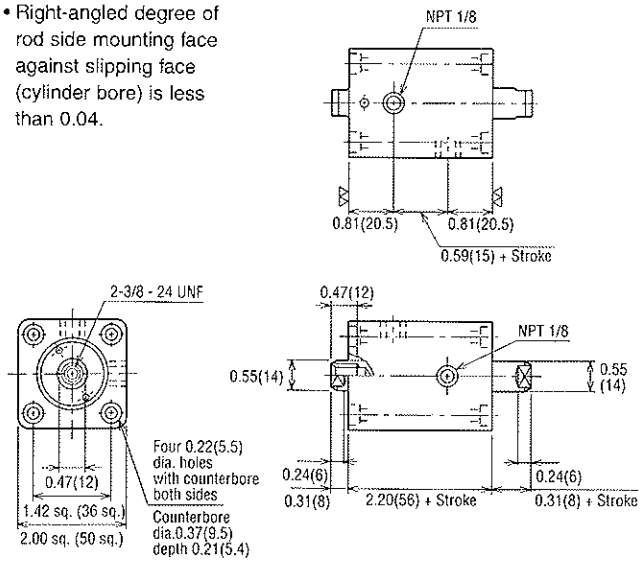


SD MOUNTING / BORE 25MM (1" NOM.)

Standard Type U160S-1W 6SD20W3N Stroke

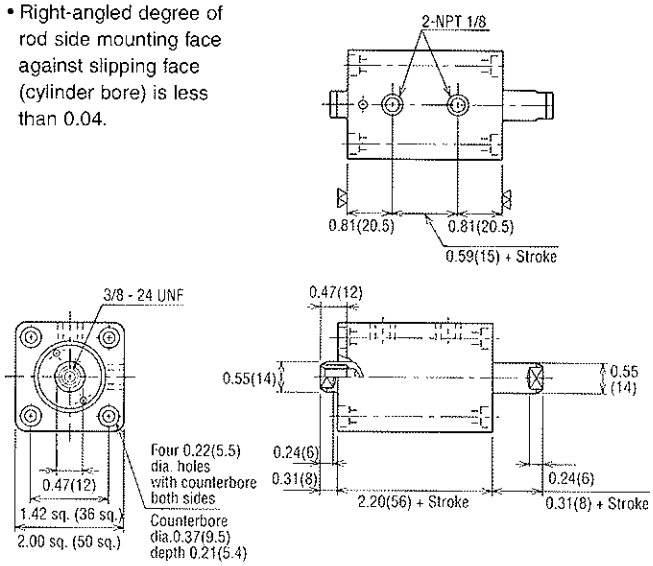
LESS THAN 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



EQUAL TO OR OVER 15 STROKE

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

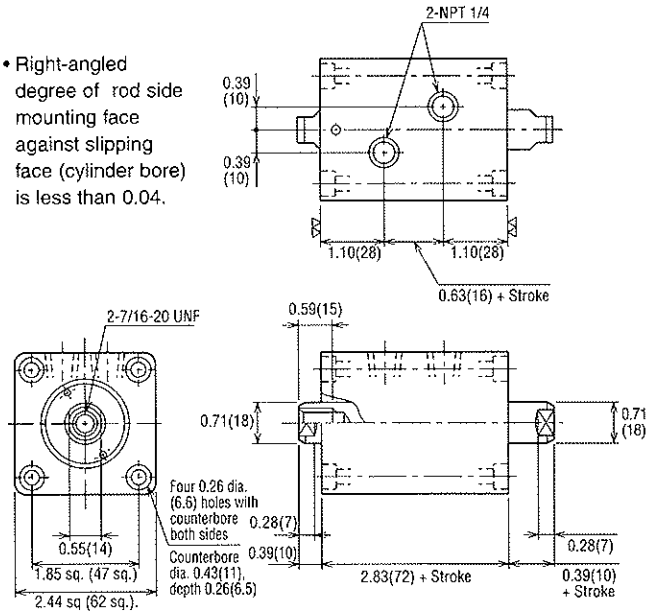


Unit : inch(mm)

SD MOUNTING / BORE 32MM (1-1/4" NOM.)

Standard Type U160S-1W 6SD32W3N Stroke

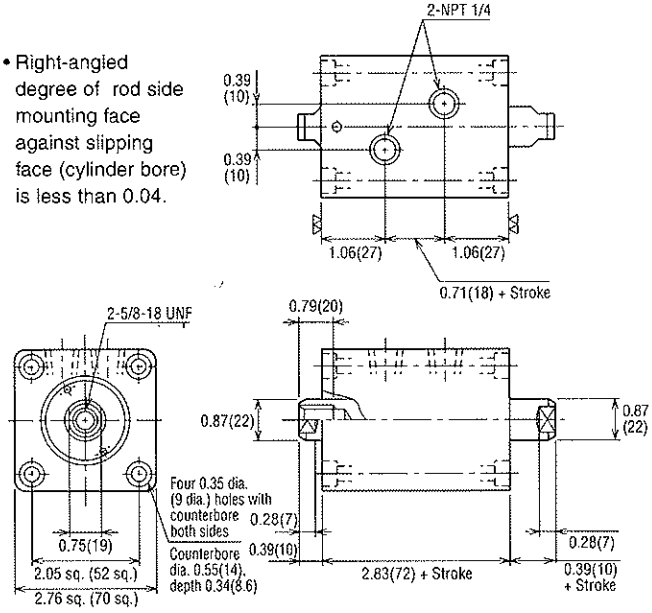
• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



SD MOUNTING / BORE 40MM (1-1/2" NOM.)

Standard Type U160S-1W 6SD40W3N Stroke

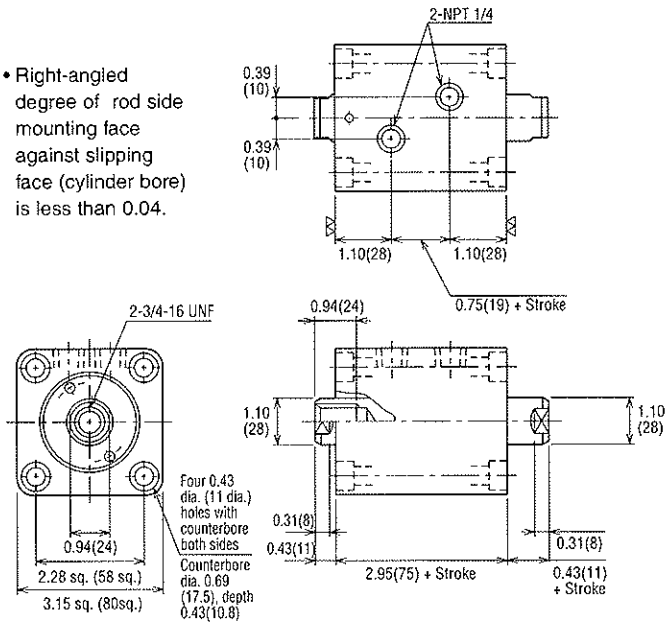
• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



SD MOUNTING / BORE 50MM (2" NOM.)

Standard Type U160S-1W 6SD50W3N Stroke

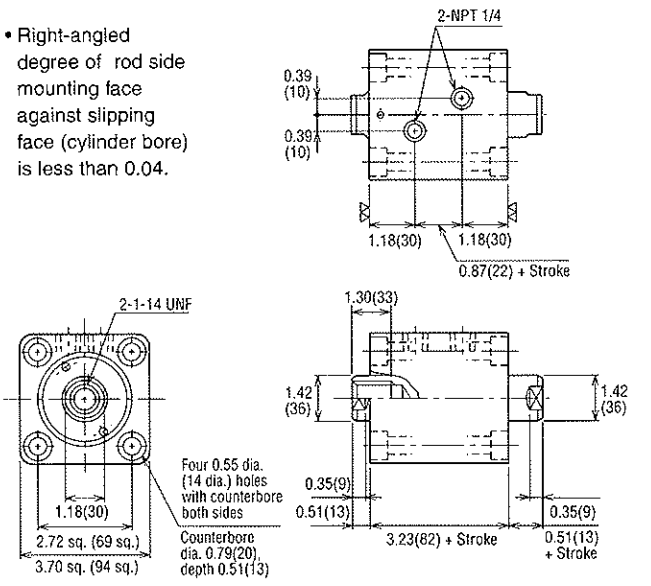
• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



SD MOUNTING / BORE 63MM (2-1/2" NOM.)

Standard Type U160S-1W 6SD63W3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

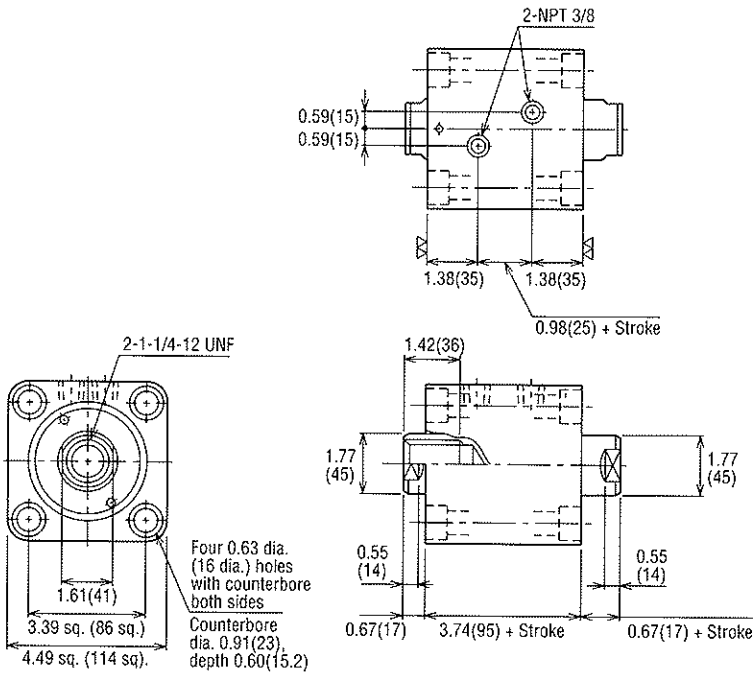


Unit : inch(mm)

SD MOUNTING / BORE 80MM (3-1/4" NOM.)

Standard Type U160S-1 6SD80S3N [Stroke]

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

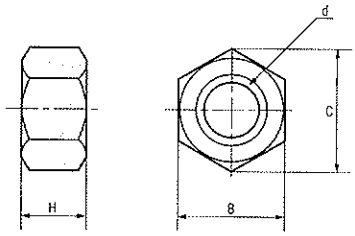


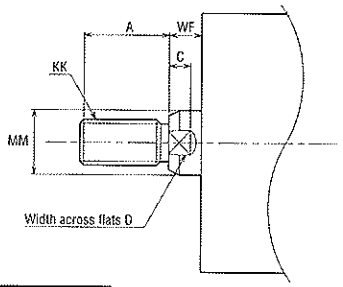
ROD END STYLE 1 (Male Thread Type)

U160S-1W

6SD [Bore] W1N [Stroke]

Lock Nut	Rod End Style 1 (Male Thread)





Lock Nut

Part Numbers	B	C	H	d
LNH-20	11/16	0.794	3/8	7/16-20 UNF
LNH-25	3/4	0.866	7/16	1/2-20 UNF
LNH-1	7/8	1.010	31/64	9/16-18 UNF
LNH-2	1-1/8	1.299	41/64	3/4-16 UNF
LNH-3	1-5/16	1.516	3/4	7/8-14 UNF
LNH-4	1-11/16	1.949	31/32	1-1/8-12 UNF
LNH-5	2-1/16	2.382	1-11/64	1-3/8-12 UNF

Dimensional Table
Rod end style 1 (Male thread)

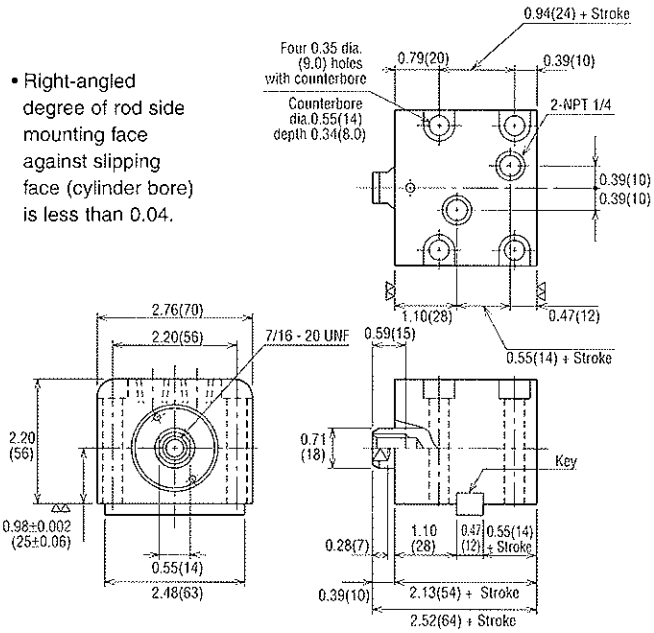
Bore	A	A'	C	D	KK	MM	WF
20 (3/4" Nom.)	0.59(15)	1.18(30)	0.24(6)	0.39(10)	7/16-20 UNF	0.47(12)	0.32(8)
25 (1" Nom.)	0.71(18)	1.38(35)	0.24(6)	0.47(12)	1/2-20 UNF	0.55(14)	0.32(8)
32 (1-1/4" Nom.)	0.98(25)	1.57(40)	0.28(7)	0.55(14)	9/16-18 UNF	0.71(18)	0.39(10)
40 (1-1/2" Nom.)	1.18(30)	1.89(48)	0.28(7)	0.75(19)	3/4-16 UNF	0.87(22)	0.39(10)
50 (2" Nom.)	1.38(35)	2.17(55)	0.31(8)	0.94(24)	7/8-14 UNF	1.10(28)	0.43(11)
63 (2-1/2" Nom.)	1.77(45)	2.56(65)	0.35(9)	1.18(30)	1-1/8-12 UNF	1.42(36)	0.51(13)
80 (3-1/4" Nom.)	2.36(60)	3.15(80)	0.55(14)	1.61(41)	1-3/8-12 UNF	1.77(45)	0.67(17)

Note: When using a lock nut, the figures in column A' are recommended. (Special orders accepted.)

LA MOUNTING / BORE 32MM (1-1/4" NOM.)

Standard Type U160S-1 6LA32S3N Stroke

- Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

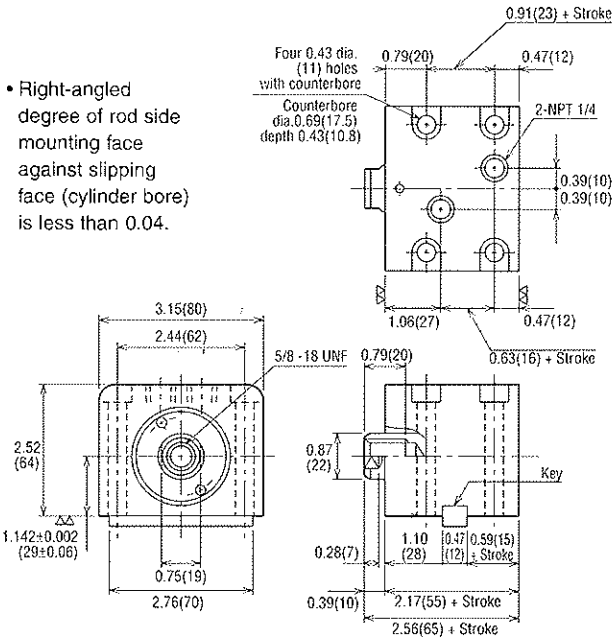


* Key included with cylinder

LA MOUNTING / BORE 40MM (1-1/2" NOM.)

Standard Type U160S-1 6LA40S3N Stroke

- Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

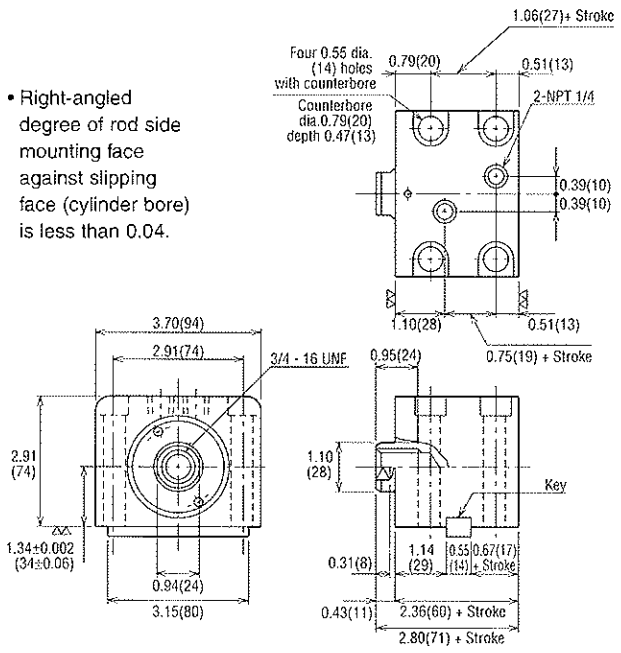


* Key included with cylinder

LA MOUNTING / BORE 50MM (2" NOM.)

Standard Type U160S-1 6LA50S3N Stroke

- Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

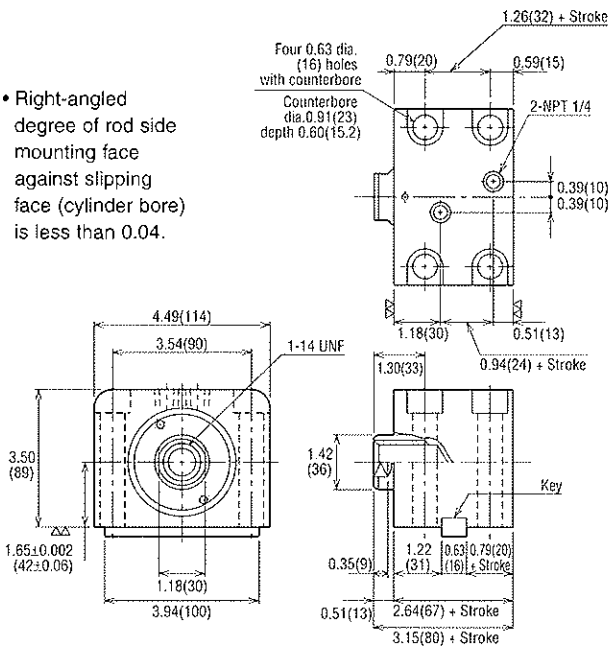


* Key included with cylinder

LA MOUNTING / BORE 63MM (2-1/2" NOM.)

Standard Type U160S-1 6LA63S3N Stroke

- Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



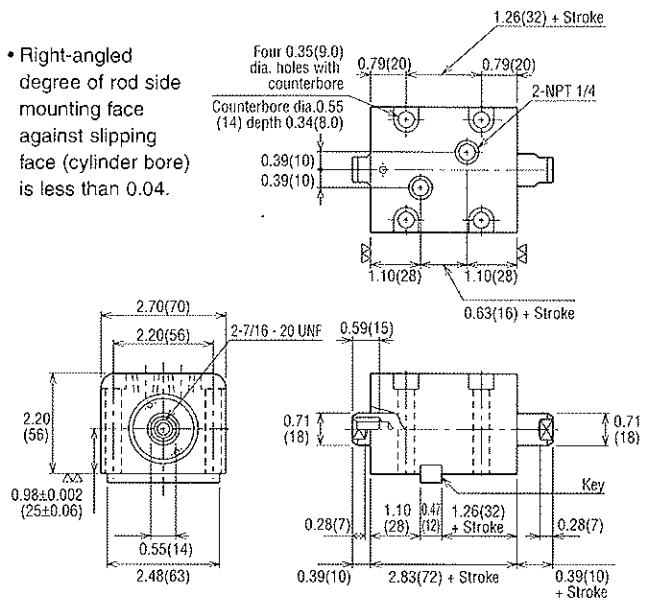
* Key included with cylinder

Unit : inch(mm)

LA MOUNTING / BORE 32MM (1-1/4" NOM.)

Standard Type U160S-1W 6LA32W3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

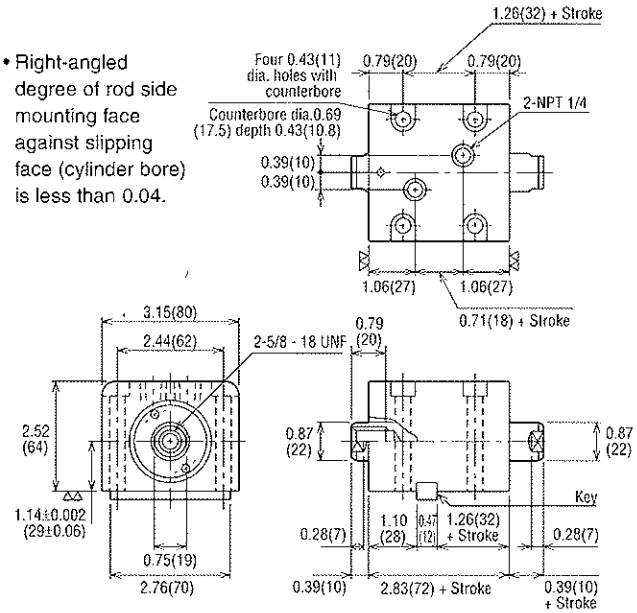


* Key included with cylinder

LA MOUNTING / BORE 40MM (1-1/2" NOM.)

Standard Type U160S-1W 6LA40W3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

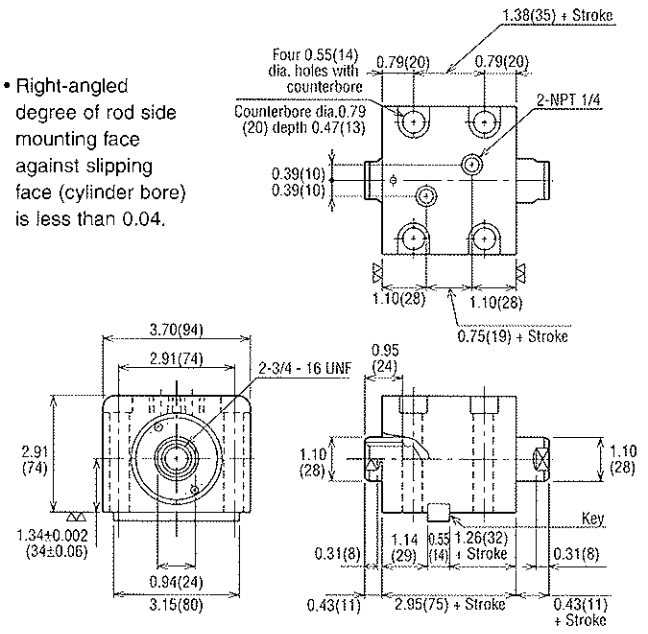


* Key included with cylinder

LA MOUNTING / BORE 50MM (2" NOM.)

Standard Type U160S-1W 6LA50W3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.

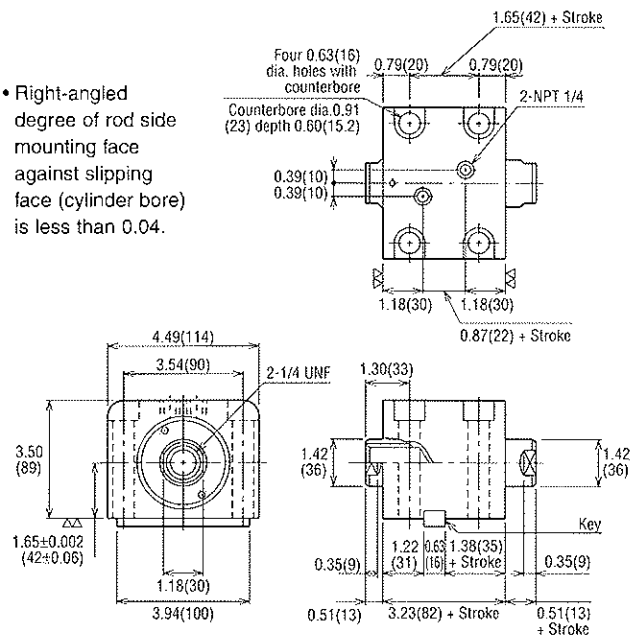


* Key included with cylinder

LA MOUNTING / BORE 63MM (2-1/2" NOM.)

Standard Type U160S-1W 6LA63W3N Stroke

• Right-angled degree of rod side mounting face against slipping face (cylinder bore) is less than 0.04.



* Key included with cylinder

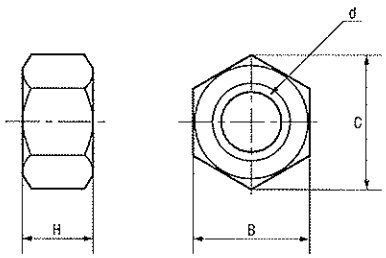
Unit : inch(mm)

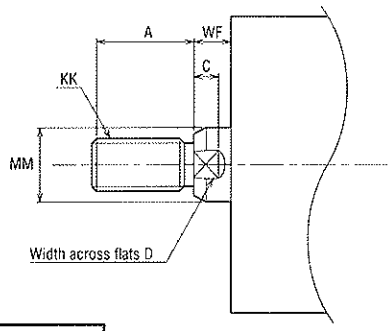
ROD END STYLE 1 (Male Thread Type)

U160S-1

6LA [Bore] S1N [Stroke]

Lock Nut	Rod End Style 1 (Male Thread)





Lock Nut

Part Numbers	B	C	H	d
LNH-1	7/8	1.010	31/64	9/16-18 UNF
LNH-2	1-1/8	1.299	41/64	3/4-16 UNF
LNH-3	1-5/16	1.516	3/4	7/8-14 UNF
LNH-4	1-11/16	1.949	31/32	1-1/8-12 UNF

Dimensional Table
Rod end style 1 (Male thread)

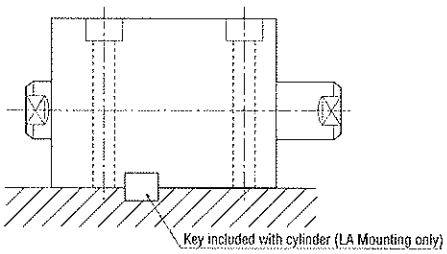
Unit: inch(mm)

Bore	A	A'	C	D	KK	MM	WF
32 (1-1/4" Nom.)	0.98(25)	1.57(40)	0.28(7)	0.55(14)	9/16-18 UNF	0.71(18)	0.39(10)
40 (1-1/2" Nom.)	1.18(30)	1.89(48)	0.28(7)	0.75(19)	3/4-16 UNF	0.87(22)	0.39(10)
50 (2" Nom.)	1.38(35)	2.17(55)	0.31(8)	0.94(24)	7/8-14 UNF	1.10(28)	0.43(11)
63 (2-1/2" Nom.)	1.77(45)	2.56(65)	0.35(9)	1.18(30)	1-1/8-12 UNF	1.42(36)	0.51(13)

Note: When using a lock nut, the figures in column A' are recommended. (Special orders accepted.)

Unit : mm

INSTALLATION WITH A KEY

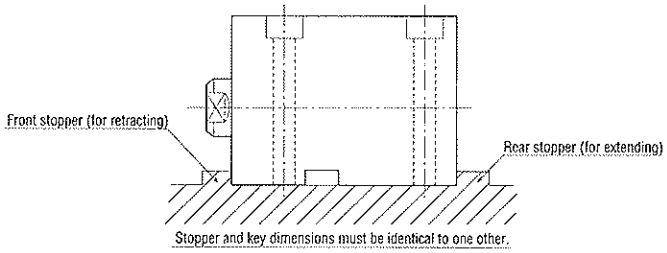


When installing a Foot Mounting (LA Mounting) type cylinder, refer to the dimensional table for the correct key and machined groove dimensions.

DIMENSIONAL TABLE

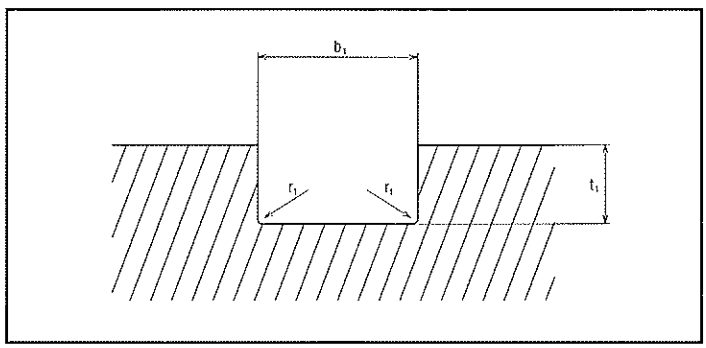
Bore	Key nominal dimension b x h x ℓ	Key groove dimension b_1	t_1	r_2
ø32	12 X 8 X 63 (Double)	$12_{-0.043}^{0}$	$5^{+0.2}_{0}$	0.25 ~0.40
ø40	12 X 8 X 70 (Double)	$12_{-0.043}^{0}$	$5^{+0.2}_{0}$	
ø50	14 X 9 X 80 (Double)	$14_{-0.043}^{0}$	$5.5^{+0.2}_{0}$	
ø63	16 X 10 X 100 (Double)	$16_{-0.043}^{0}$	$6^{+0.2}_{0}$	

INSTALLATION WITHOUT A KEY



When installing a cylinder without a key, be sure to place stoppers at each end. Bolts alone may not support the cylinder's force, which could result in damage to the bolts.

RECOMMENDED KEY GROOVE DIMENSION



HANDLING PRECAUTIONS

- When using with the rod push output, make sure that the rod is screwed in all the way to its end face so that no force is applied to the threaded portion of piston rod.
- During installation, make adjustments carefully because a lateral load (eccentric load) can not be applied to the piston rod.
- When operating the cylinder for the first time, be sure to bleed the air from the piping. After bleeding the air, operate the cylinder at the low pressure, and gradually increase the pressure to reach the operating pressure.

Note: The U160S-1 series cylinders are not provided with the air vent. Therefore, exhaust the air from the piping.

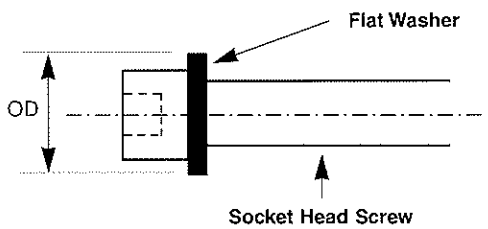
- To install the cylinder, 4 hexagon socket bolts (JIS B1176, strength classification of 10.9 or more) shall be used.
- When using the mounting bolts, screw 80% or more of the threaded portion of bolts into the material to be mounted. The material to be mounted must have the strength that is equivalent to the SS400 material quality.
- To tighten the mounting bolts with nuts, use steel nuts with the strength classification of 6 or more. (However, do not use type 3.)
- When screwing mounting bolts into the cylinders, be sure to tighten them using the torque values indicated in the table below.

Cylinder mounting bolt tightening torque table

	Bore	Mounting bolt size		Tightening torque ft-lbs (N•m)
		Inch	Metric	
SD Mounting	20	10-24	M5 X 0.8	107.52 (4.8)
	25	10-24	M5 X 0.8	107.52 (4.8)
	32	1/4-20	M6 X 1	181.44 (18.1)
	40	5/16-18	M8 X 1.25	448.00 (20.00)
	50	3/8-16	M10 X 1.5	896.00 (40.00)
	63	1/2-13	M12 X 1.75	1500.80 (67.00)
	80	1/2-13*	M14 X 2	2464.00 (110.00)
LA Mounting	32	5/16-18	M8 X 1.25	448.00 (20.00)
	40	3/8-16	M10 X 1.5	896.00 (40.00)
	50	1/2-13	M12 X 1.75	1500.80 (67.0)
	63	1/2-13	M14 X 2	2464.00 (110.00)

* When using Socket head screws, Flat washers are required.
Flat washer dimensions:

1 N•m = 22.4 ft•lbs



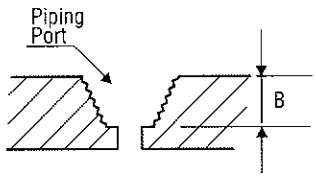
OD must be 0.846" (21.5mm) ~ 0.886" (22.5mm)

- To tighten the piston rod end threads of the double acting, double rod type, make sure to use the width across flats of the rod to be tightened. Because the double rod type piston rod is joined by the threads, cautions shall be taken that the rotational force at both ends of the piston rod is not applied to the rod.

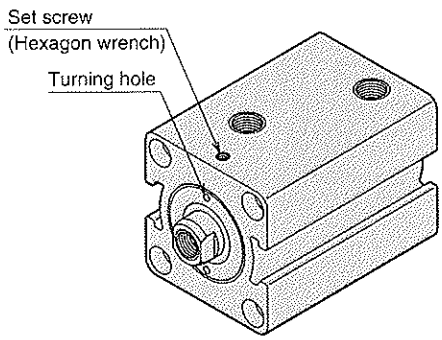
- The compact design of the piping port allows for fittings (B) with threads in the sizes listed below. An improper fit may damage the cylinder, resulting in poor performance.

Unit: Inch (mm)

Cylinder Bore Size	Port Size	B
20	NPT 1/8	0.25 (6.3)
25	NPT 1/8	0.25 (6.3)
32	NPT 1/4	0.374 (9.5)
40	NPT 1/4	0.374 (9.5)
50	NPT 1/4	0.374 (9.5)
63	NPT 1/4	0.374 (9.5)
80	NPT 3/8	0.413 (10.5)



DISASSEMBLY AND REASSEMBLY PRECAUTIONS



- After removing the set screw, utilize the turning hole of the rod gland to remove the rod gland from the cylinder body. When removing a jig from the rod end threads, burrs may be created on the width across flats of the rod. In that case, use a file to remove the burrs; then, remove the rod gland.
- The piston rod and piston cannot be disassembled.
- If the cylinder has been disassembled, make sure to replace all sealing materials (seals and gaskets).
- During the reassembly of the cylinder, make sure that no dust or debris such as metal particles enter the cylinder.
- A urethane ball for protecting the threads of the rod gland is located below the set screw. This ball must be removed before tightening the rod gland.
- After tightening the rod gland, install the urethane ball that is included in the seal set and tighten the set screw.

REPLACING THE SEALS

- The general-purpose type (U160S-1), piston seal, rod seal, dust wiper, and rod gland O-ring can be replaced.