

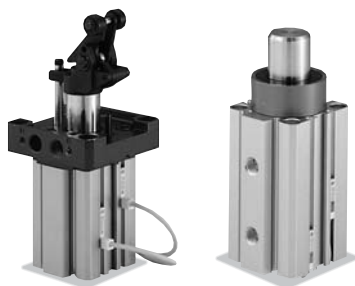
Control stop and convey of pallet on conveyer line.

(Lever Type)

- The pallet is stopped softly by built-in adjustable shock absorber.
- Saving times that measure the extend timing of cylinder by lever type stopper.
- Directly piping the solenoid valve at the rod cover for space saving. (only for $\phi 50$ mm straight type)

(Straight Type)




- Simple style of direct stop method for piston rod.
- Guaranteeing body strength by the enlargement of the rod diameter bearing area.
- The whirl-stop guide is equipped to prevent shifting of the stopper direction (Chamfer type and Roller type). It is also possible to adjust the direction in optional position.



Body Specifications

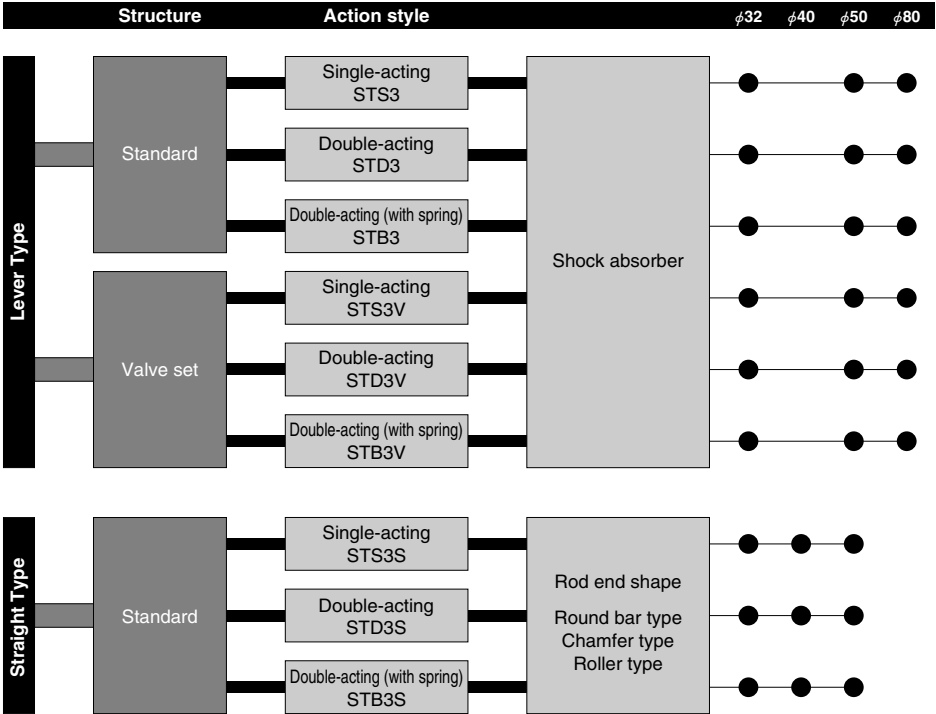
Type		Lever Type	Straight Type
Cylinder bore (mm)		$\phi 32 \cdot \phi 50 \cdot \phi 80$	$\phi 32 \cdot \phi 40 \cdot \phi 50$
Structure		Single piston	
Action style		Single-acting / Double-acting / Double-acting (with spring)	
Rod end shape		Lever type	Round bar type / Chamfer type / Roller type
Stroke (mm)		$\phi 32 : 20 \cdot \phi 50, \phi 80 : 30$	$\phi 32 : 20 \cdot \phi 40 : 25 \cdot \phi 50 : 30$
Working fluids		Air	
Lubrication		Not necessary (but possible)	
Operation pressure range	without valve	0.3 to 1MPa	
	with valve	0.3 to 0.7MPa	—
Proof test pressure		1.5MPa	
Operating temperature range		-5 to +70°C (Do not use when frozen)	
Cushion mechanism		With cushion pad on both ends	
Allowable difference of stroke length		+1.0 mm	
Lowering force (N)	Note)	$\phi 32 : 235 \cdot \phi 50 : 559 \cdot \phi 80 : 1500$	$\phi 32 : 235 \cdot \phi 40 : 375 \cdot \phi 50 : 559$
Accessories	Shock absorber	$\phi 32 : F3M10B008$	—
		$\phi 50 : AS2-10-6-PLD$	
		$\phi 80 : AS2-14-7PLD$	

Note) • Value at the supply pressure of 0.5MPa

Lever Type		Straight Type
		
Standard	Valve set	Standard

Product Lineup

Unit:mm



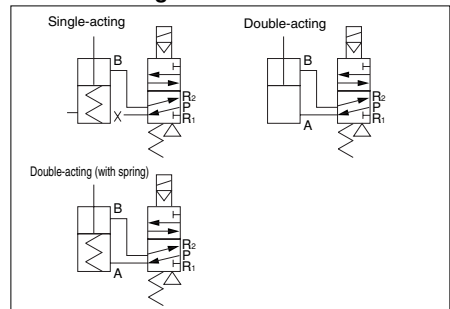
Shock Absorber Specifications

Applied cylinder bore (mm)	$\phi 32$	$\phi 50$	$\phi 80$
Code	F3M10B008	AS2-10-6-PLD	AS2-14-7-PLD
Max. energy absorption	0.98J	8J	17.7J
Stroke (mm)	5	6	7
Rod return power	5.9N	23.5N	34.3N
Structure	Fixed type	Adjustment type	

Valve specifications for Valve set

Rated voltage		DC24V	AC100V		AC200V	
Allowable voltage range (V)		21.6 ~ 26.4 ($24 \pm 10\%$)	90 ~ 132 ($100 \pm \frac{32}{10}\%$)	60	50	180 ~ 264 ($200 \pm \frac{32}{10}\%$)
Electric current (when rated voltage is applied)	Frequency (Hz)	—	50	60	50	60
	Starting mA (r.m.s.)	—	34	32	17	16
	Holding mA (r.m.s.)	75 (1.8W)	22	20	11	10
Allowable circuit leakage current mA		4	4	2		

Schematic diagram



■ for semi-standard product

● Lever Type **STD3**

● Valve set **STD3V**

STS3	Single-acting
STD3	Double-acting
STB3	Double-acting (with spring)

STD3V	Single-acting
STD3V	Double-acting
STB3V	Double-acting (with spring)

□	Square (Right angle to the line flow direction)
▭	Rectangle (Right angle to the line flow direction)
▭	Rectangle (Line flow direction)

Note) ● Rectangle is available only for φ50

Stroke
φ32=20mm, φ50, φ80=30mm

Stroke
φ32=20mm, φ50, φ80=30mm

Omit without shock absorber
▭ S with shock absorber

Note) ● φ80 is with shock absorber only

Omit without lever lock
▭ A with lever lock

Quantity of switch (1, 2 to n)

Switch code
Bracket for proximity switch
▭ B With bracket

Note: Bracket for proximity switch can be mounted on φ50 and φ80 only. Max. two switches can be mounted.
Lever location search switch can be mounted on φ50 as special order.

Note: For applied switch code, please choose it from Switch list.

⚠ When switch set is ordered.
● Switch is delivered without being mounted on cylinder body.

1	AC100V 50/60Hz
2	AC200V 50/60Hz
8	DC24

1 Action style
2 Flange shape
3 Cylinder bore
4 Stroke
5 Shock absorber
6 Valve mounting direction
7 Valve voltage range
8 Switch code
9 Switch quantity
10 Lever lock code

● How to order valve only **SR532** – RMM **Voltage** RK

SR532	for φ32·φ50
SR552	for φ80

1	AC100V
2	AC200V
8	DC24V

● Straight Type

STS3S – 40 – 25 – R – GA – 2

STS3S	Single-acting
STD3S	Double-acting
STB3S	Double-acting (with spring)

Stroke
φ32=20mm, φ40=25mm, φ50=30mm

Omit Round bar type
▭ D Chamfer type
▭ R Roller type

1 Action style
2 Cylinder bore
3 Stroke
4 Rod end shape
5 Switch code
6 Switch quantity

Switch List

Type	Switch code	Load voltage range	Load current range	Protective circuit	Indicating lamp	Wiring method	Cord length	Classification	
Contact	GA PD12L1	DC24V AC110V	DC:2.5~40mA AC:2.5~20mA	None	None	0.2mm ² 2-core dimension ϕ 2.6 Rear wiring	1 m	General	
	GB PD12L3						3 m		
	GC PD11L1		DC:5~40mA AC:5~20mA		LED (Light lights up during ON)	0.2mm ² 2-core dimension ϕ 2.6 Rear wiring	1 m		
	GD PD11L3						3 m		
	GE PD32L1		DC:2.5~40mA AC:2.5~20mA		None	None	0.2mm ² 2-core dimension ϕ 2.6 Upper wiring		1 m
	GF PD32L3								3 m
	GG PD31L1		DC:5~40mA AC:5~20mA		LED (Light lights up during ON)	0.2mm ² 2-core dimension ϕ 2.6 Upper wiring	1 m		
	GH PD31L3						3 m		
Noncontact	GJ PD14L1	DC10~28V	5~20mA	Present	LED (Light lights up during ON)	0.2mm ² 2-core dimension ϕ 2.6 Rear wiring	1 m	General	
	GK PD14L3	DC28V or less	0.1~40mA				3 m		
	GL PD13L1				DC10~28V	5~20mA	LED (Light lights up during ON)		0.15mm ² 3-core dimension ϕ 2.6 Rear wiring
	GM PD13L3	3 m							
	GN PE34L1	DC28V or less	0.1~40mA		LED (Light lights up during ON)	0.2mm ² 2-core dimension ϕ 2.6 Upper wiring	1 m		
	GP PE34L3						3 m		
	GR PE33L1	DC28V or less	0.1~40mA		LED (Light lights up during ON)	0.15mm ² 3-core dimension ϕ 2.6 Upper wiring	1 m		
	GS PE33L3						3 m		

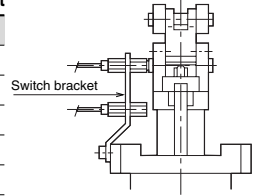
- Note) ● For the switches without a protective circuit, be sure to provide the protective circuit (SK-100) with load devices when using induction load devices (relay, etc.)
 ● When using switches by a series connection, we recommend you to use AND unit (AU series).

- General style
 PD · PE style switch



★ Recommended Iron Proximity Switch List

Cylinder bore	Switch code (name of manufacturer)
φ50	GM-8ML(SUNX)
	E2E-X4MD(OMRON)
	EV-108U(KEYENCE)
φ80	GX-12ML(SUNX)
	EV-112M(KEYENCE)
	E2E-X8MD(OMRON)



Weight List/Lever type

Unit:g

Bore (mm)	Standard weight		Flange weight		Accessories weight		Switch additional weight	
	Single-acting	Double-acting	Square	Rectangle	Shock absorber	Valve	1m Cord	3m Cord
φ 32	560	555 (551)	0	—	20	147	15	35
φ 50	1782	1772 (1738)	0	-24	180	153		
φ 80	5319	5309 (5263)	0	—	—	495		

Weight List/Straight type

Unit:g

Bore (mm)	Standard weight			Switch additional weight	
	Round bar type	Chamfer type	Roller type	1m Cord	3m Cord
φ32	428 (423)	426 (421)	446 (441)	15	35
φ40	758 (746)	752 (740)	812 (800)		
φ50	1396 (1371)	1390 (1365)	1478 (1453)		

Note ● Value in () of standard weight is for double-acting (without spring)

Calculation formula Cylinder weight(g) = Standard weight + Flange weight + Accessories weight + (Switch additional weight x Switch quantity)

Calculation example Lever type, Double-acting (with spring), bore φ32, with shock absorber, with valve, PD12L1 (cord length 1m) x 2pcs
 555+20+147+(15×2)=752g

CAD/DATA
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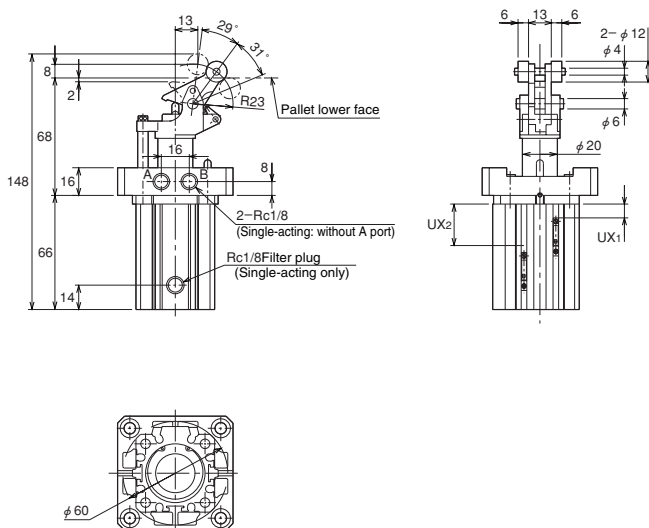
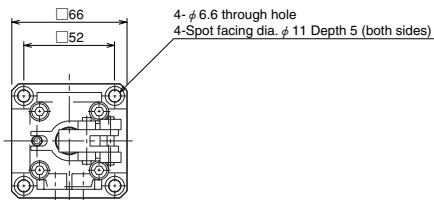
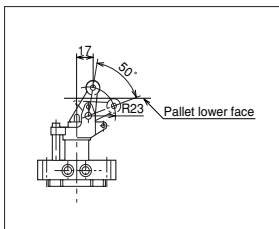


Lever Type / Bore $\phi 32$

ST33 -32-20 Shock absorber code - Switch code Switch quantity

ST33,STD3,STB3

- without shock absorber



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of switch set, with shock absorber.
- The drawings indicate the extended piston rod in sight.

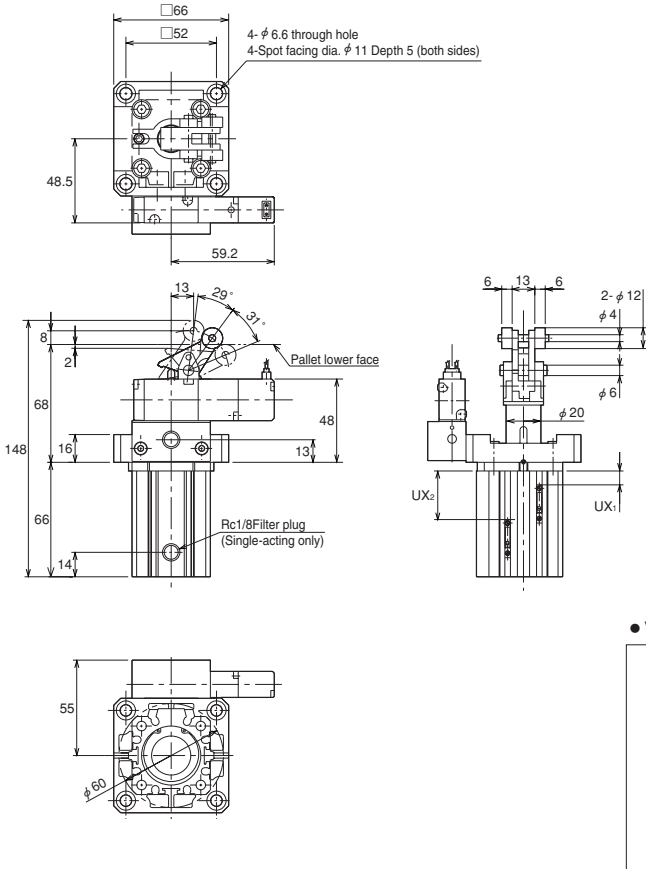
Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
1	21	7	27	6	26

Note) • UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3A is available.Lever Type / Bore $\phi 32$ / Valve set

ST33V -32-20 Shock absorber code - Valve mounting direction Valve voltage range - Switch code Switch quantity
 STS3V,STD3V,STB3V



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of with valve (upper mounting), with shock absorber, switch set.
- The drawings indicate the extended piston rod in sight.

Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
1	21	7	27	6	26

Note) ● UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3A is available.

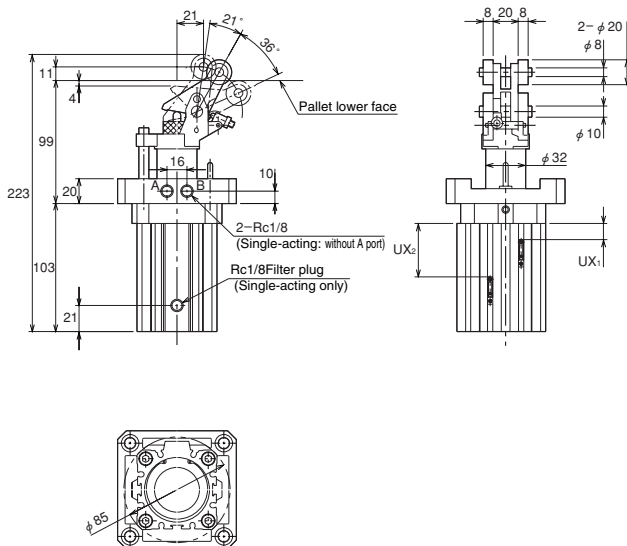
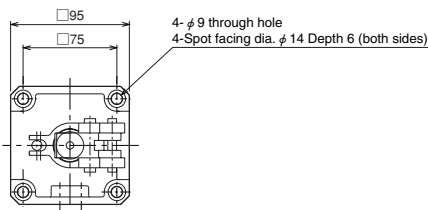
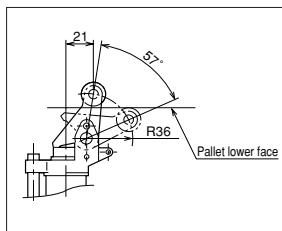


Lever Type / Bore $\phi 50$

ST33 -50-30 Shock absorber code - Switch code Switch quantity

ST33,STD3,STB3

● without shock absorber



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of switch set, with shock absorber.
- The drawings indicate the extended piston rod in sight.

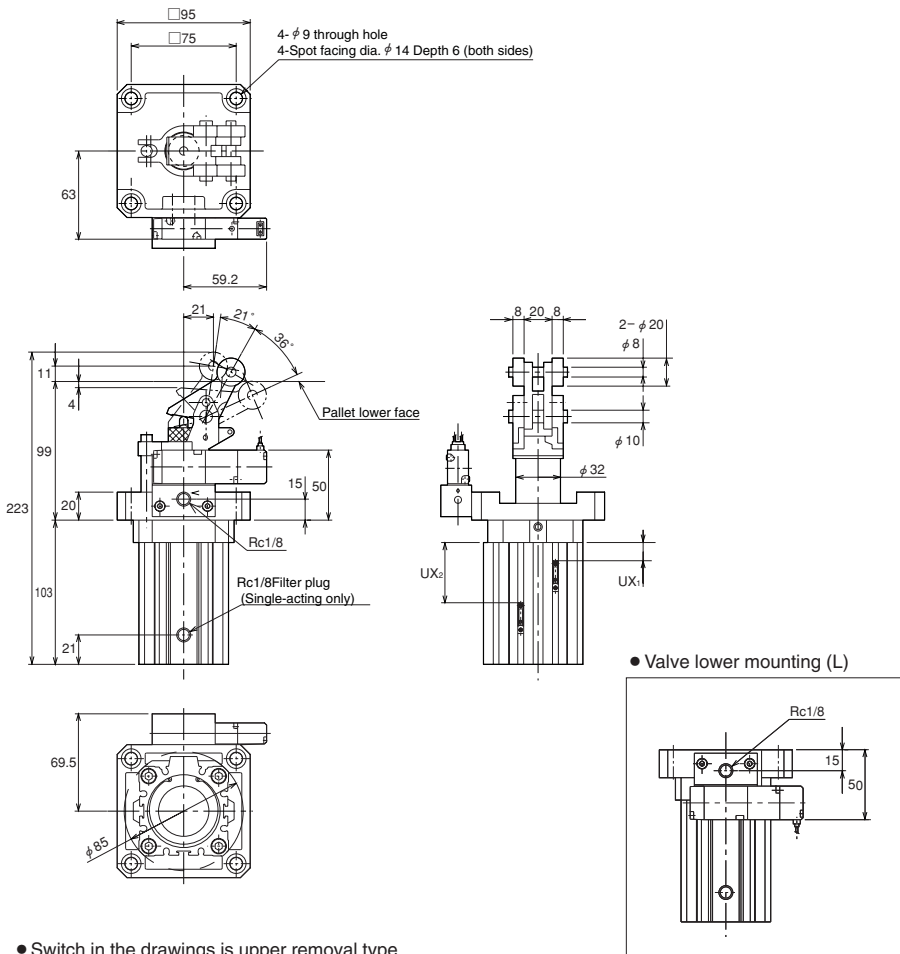
Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
6	36	12	42	11	41

Note) ● UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3A is available.Lever Type / Bore $\phi 50$ / Valve set

-50-30 - -



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of with valve (upper mounting),with shock absorber,switch set.
- The drawings indicate the extended piston rod in sight.

Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
6	36	12	42	11	41

Note) ● UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3A is available.

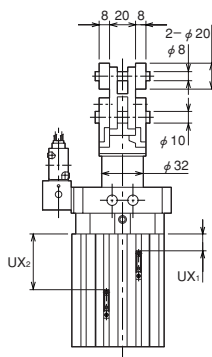
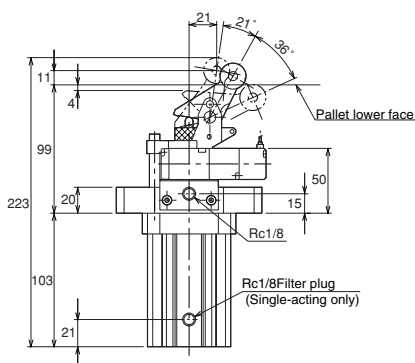
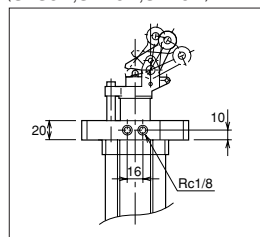
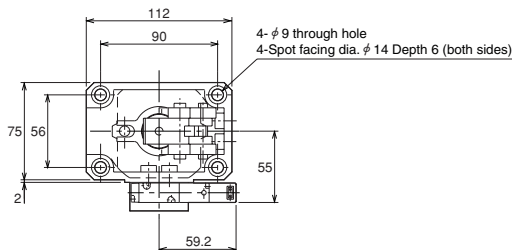


Lever Type / Bore $\phi 50$ / Rectangle (Right angle to the line flow direction) / Valve set

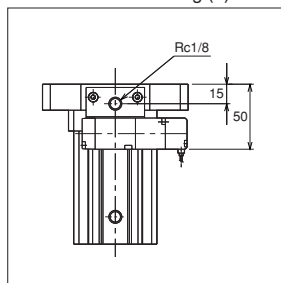
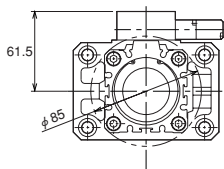
ST33VN -50-30 [Shock absorber code] - [Valve mounting direction] [Valve voltage range] - [Switch code] [Switch quantity]
ST33VN,STD33VN,STB33VN

● Standard

(ST33N,STD33N,STB33N)



● Valve lower mounting (L)



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of with valve (upper mounting), with shock absorber, switch set.
- The drawings indicate the extended piston rod in sight.

Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
6	36	12	42	11	41

Note) ● UX dimension is ideal mounting position when searching stroke end.

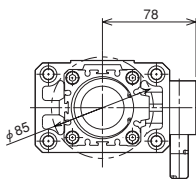
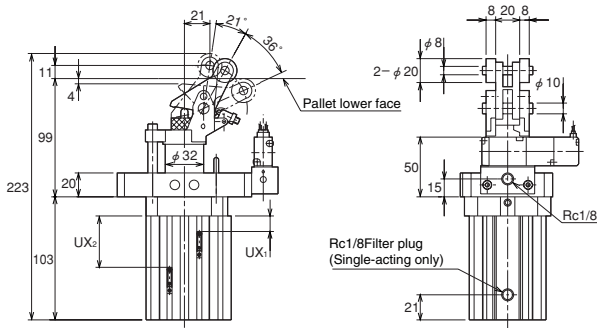
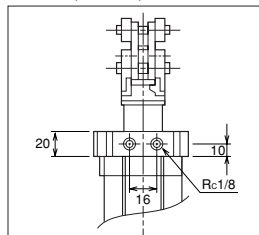
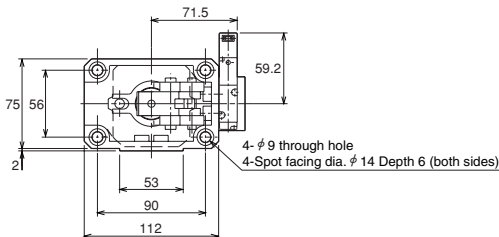
CAD/DATA
ST3/TST3A is available.



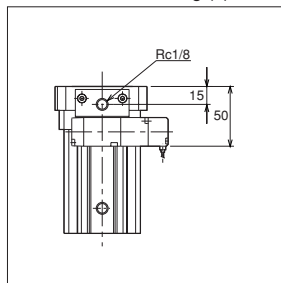
Lever Type / Bore $\phi 50$ / Rectangle (Line flow direction) / Valve set

-50-30 - -

- Standard
(STS3L,STD3L,STB3L)



- Valve lower mounting (L)



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of with valve (upper mounting), with shock absorber,switch set.
- The drawings indicate the extended piston rod in sight.
- Please refer to previous page for without shock absorber.

Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
6	36	12	42	11	41

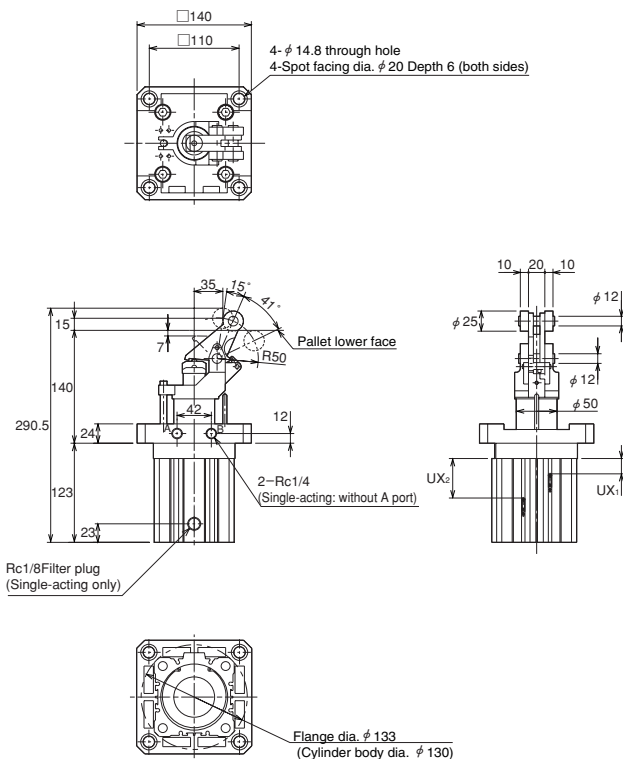
Note) • UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3A is available.



Lever Type / Bore $\phi 80$

ST3 -80-30 Shock absorber code - Switch code Switch quantity
ST3,STD3,STB3



- Switch in the drawings is upper removal type.
- The drawings are the dimensional drawings of switch set, with shock absorber.
- The drawings indicate the extended piston rod in sight.

Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
12	42	18	48	17	47

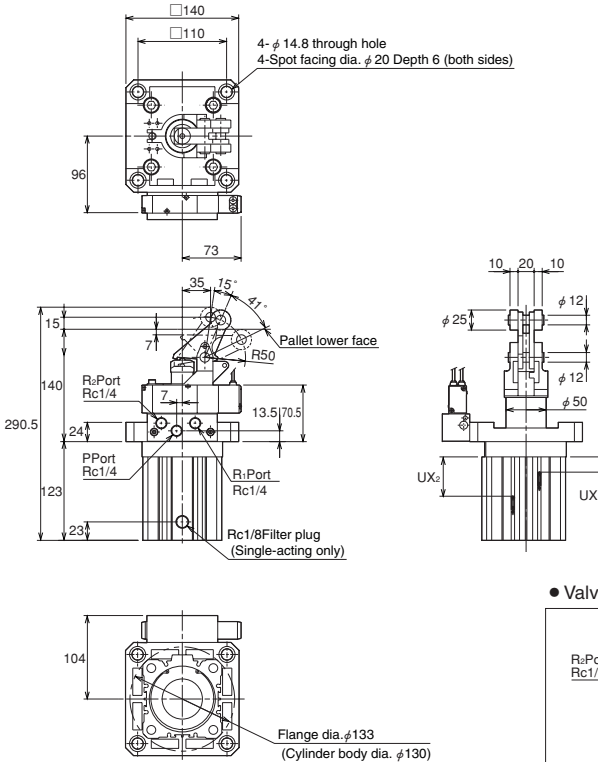
Note.) • UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3A is available.

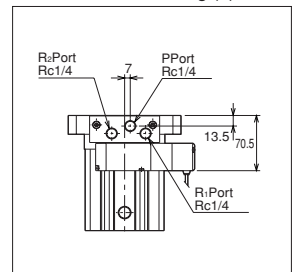


Lever Type / Bore $\phi 80$ / Valve set

ST3V -80-30 Shock absorber code - Valve mounting direction Valve voltage range - Switch code Switch quantity
ST3V,STD3V,STB3V



• Valve lower mounting (L)



- The drawings are the dimensional drawings of with valve (upper mounting),with shock absorber,switch set.
- The drawings indicate the extended piston rod in sight.

Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
12	42	18	48	17	47

Note: • UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3B is available.



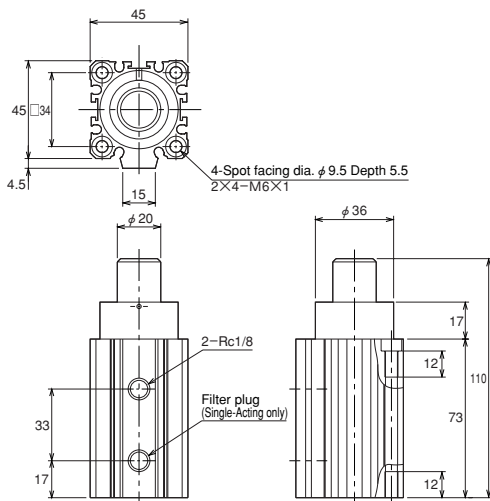
Straight Type / Bore $\phi 32$

- Round bar type

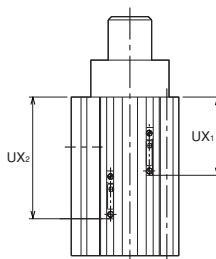
ST3S3-32-20-

ST3S3,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.



- Switch set

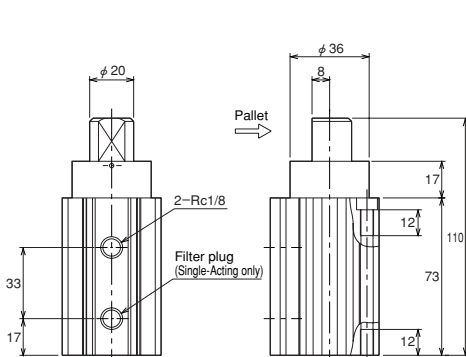


- Chamfer type

ST3S3-32-20D-

ST3S3,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.

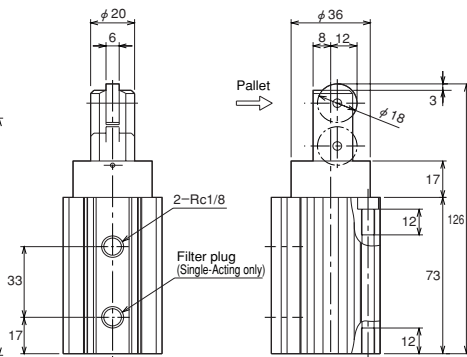


- Roller type

ST3S3-32-20R-

ST3S3,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.



Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
39	59	33	53	34	54

Note.) • UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3B is available.

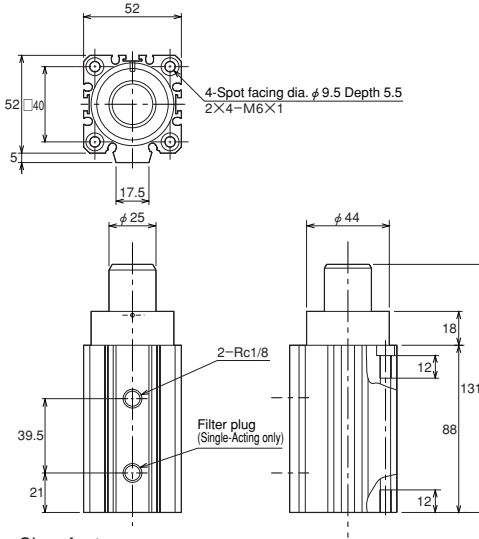


Straight Type / Bore $\phi 40$

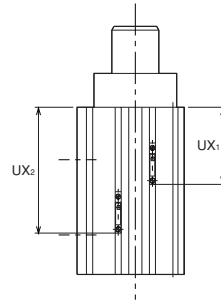
- Round bar type

ST3S-40-25- [Switch code] [Switch quantity]
ST3S,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.



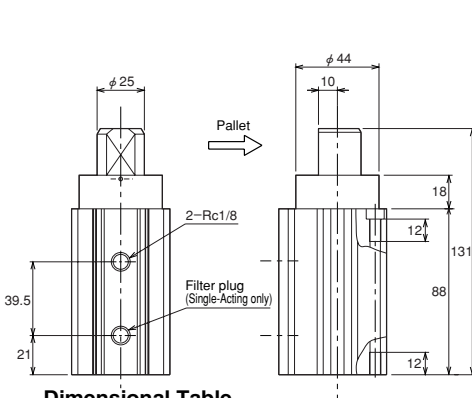
- Switch set



- Chamfer type

ST3S-40-25D- [Switch code] [Switch quantity]
ST3S,STD3S,STB3S

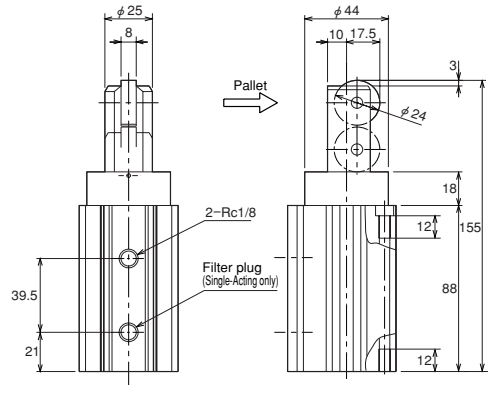
- The drawings indicate the extended piston rod in sight.



- Roller type

ST3S-40-25R- [Switch code] [Switch quantity]
ST3S,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.



Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
44	69	38	63	39	64

Note: • UX dimension is ideal mounting position when searching stroke end.

CAD/DATA
ST3/TST3B is available.



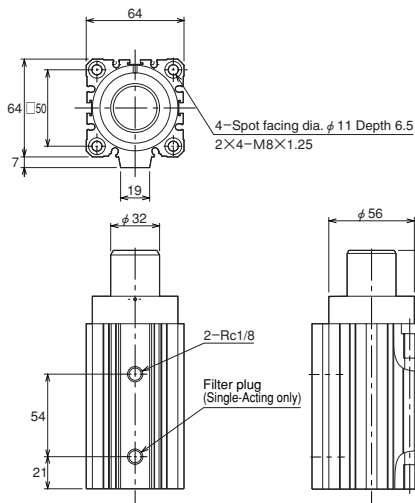
Straight Type / Bore $\phi 50$

- Round bar type

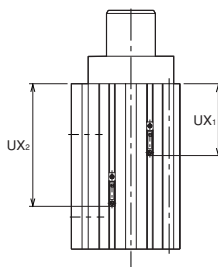
ST3S3-50-30- [Switch code] [Switch quantity]

ST3S3,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.



- Switch set

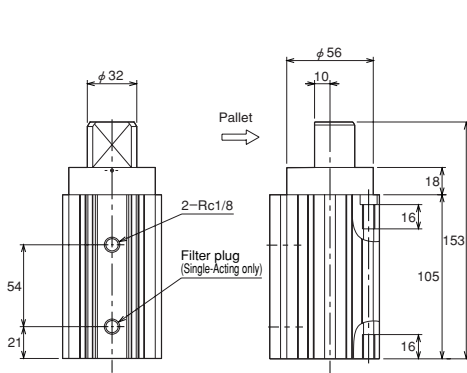


- Chamfer type

ST3S3-50-30D- [Switch code] [Switch quantity]

ST3S3,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.

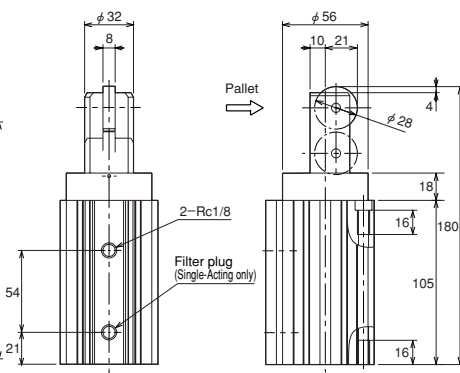


- Roller type

ST3S3-50-30R- [Switch code] [Switch quantity]

ST3S3,STD3S,STB3S

- The drawings indicate the extended piston rod in sight.



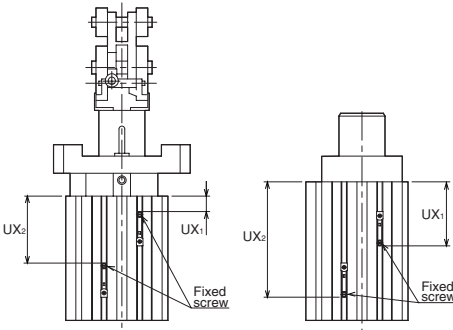
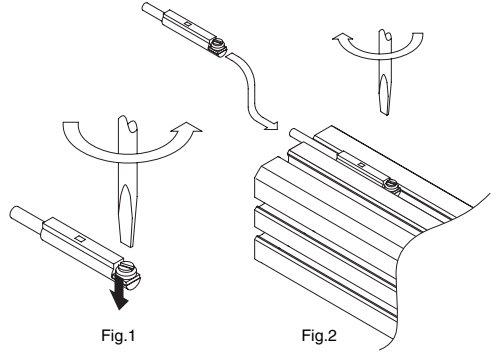
Dimensional Table

Contact		Noncontact			
PD type		PD type		PE type	
UX ₁	UX ₂	UX ₁	UX ₂	UX ₁	UX ₂
50	80	44	74	45	75

Note) • UX dimension is ideal mounting position when searching stroke end.

How to set switch detection position

1. Screw the switch fixed screw until it touches nut.
(Please screw it counter clockwise as shown in Fig.1 because it is left-handed screw.)
2. Insert switch into switch mounting groove of cylinder body from head side or rod side and slide it.
3. Fix it at best suited set position.
(When switch fixed screw is screwed clockwise as shown in Fig.2, it is fixed on switch mounting groove of cylinder body.)
Please set clamping torque around 0.1 to $0.2\text{N} \cdot \text{m}$.
4. In case of the type with indicating lamp, light lights up when switch is on.



Note) Please be sure that switch mounting direction is different between lever type and straight type.

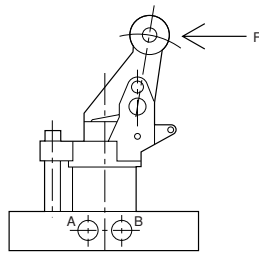
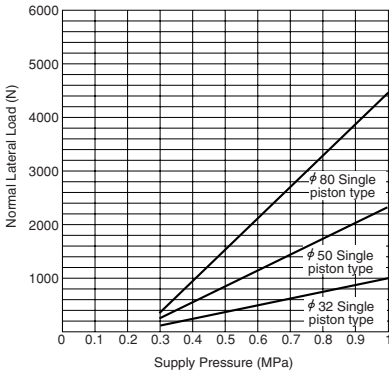
Operating range and hysteresis

Bore (mm)	Contact		Noncontact	
	PD type		PD / PE type	
	Operating range	Hysteresis	Operating range	Hysteresis
$\phi 32$	9~13	2 or less	3.5~7	1 or less
$\phi 40$	9.5~13		3.5~7	
$\phi 50$	10.5~14.5		3~8	
$\phi 80$	10~16		4.5~8.5	

Return Spring Load

Bore (mm)	$\phi 32$	$\phi 40$	$\phi 50$
Load at mounting (N)	19.6	29.4	39.2
Load at starting (N)	46.6	74.6	90.8

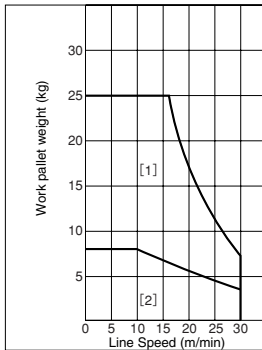
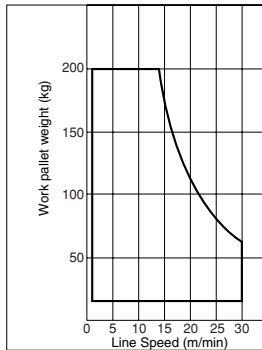
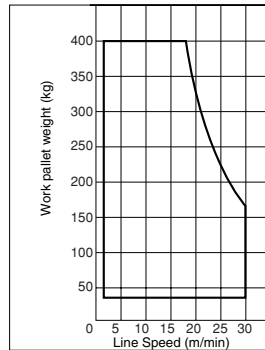
Normal Lateral Load, Supply Pressure Chart



Materials

Line Speed, Allowable Weight Of Work (Lever type)

- with shock absorber

Bore $\phi 32$ Bore $\phi 50$ Bore $\phi 80$ 

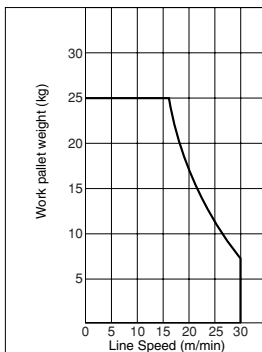
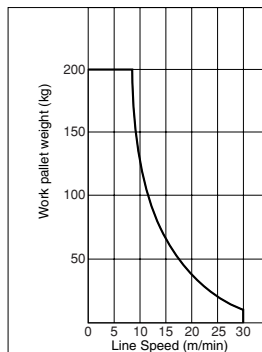
Range(1): Endurance range of cylinder.

(Pallet may remove back at target position.)

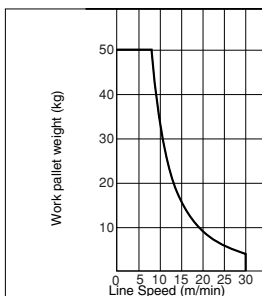
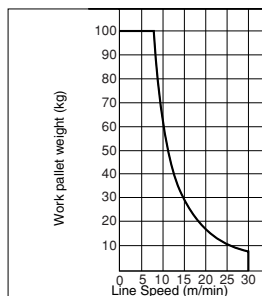
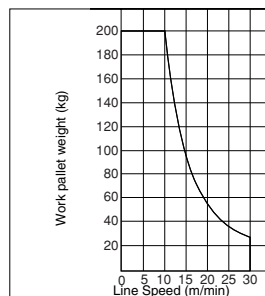
Range(2): Absorbed energy range of shock absorber.

(Pallet will have target position slowly.)

- without shock absorber

Bore $\phi 32$ Bore $\phi 50$ 

Line Speed, Allowable Weight Of Work (Straight type)

Bore $\phi 32$ Bore $\phi 40$ Bore $\phi 50$ 

Handling Instructions

Precautions For Use

Mounting Method

- For mounting pallet stopper, the mounting hole of rod cover shall be utilized.

Please refer to the table below for use of clamping bolt.

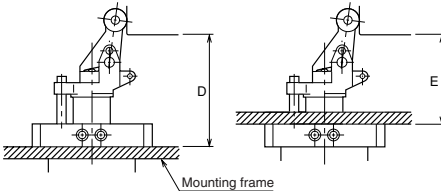
Clamping Bolt Dia. Table

Cylinder Bore	φ32	φ50	φ80
Bolt Bore	M6	M8	M12

- For the mounting method, two ways of mounting are available, from upper face of rod cover and from lower face of rod cover.

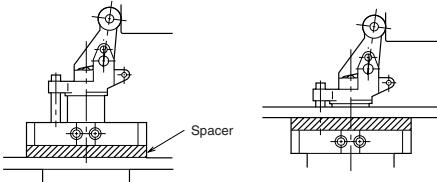
However the dimension from pallet sole face to mounting frame must be D mension and E mension each as shown below.

Cautions shall be fully taken that the stop of pallet and bad effect on conveyance control may be caused if the dimension is not fitted.



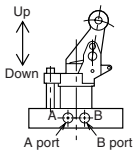
Bore	φ32	φ50	φ80
D	68	99	140

Bore	φ32	φ50	φ80
E	52	79	116



Piping

- When piping, dust and foreign matter shall not be mixed in pipes. Pipe and fitting shall be fully flushed with fresh air before connected.
- Make sure to provide air filter on way of piping so that dust, moisture and foreign matter shall not be entered in pallet stopper.
- When piping, please be sure of piping port position and cylinder operating direction.



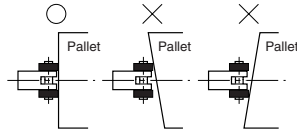
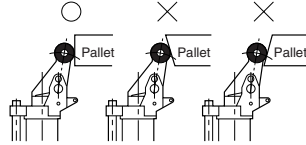
A port	Up
B port	Down

Lubrication

- Although it is usable with non-lubrication, lubricant JIS K2213-1 (additive-free turbine oil ISO VG32) or equivalent shall be applied in case of lubrication. Do not use machine oil and spindle oil.

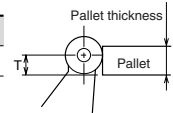
Pallet Shape

- Contact surface of pallet and body roller shall be flat and contacted vertically. Also be sure that two rollers are touched at the same time, not one roller only. (In case that only one roller is touched, it may cause the damage of roller and set ring for roller, and may damage guide bar as piston rod is torqued.)



- Pallet shall be thicker than T dimension. (more than 3 to 5mm as a guide) Should pallet be not thick enough, it may cause stop of pallet and bad effect on conveyance control.

Cylinder Bore	φ32	φ50	φ80
T (mm)	8	11	15

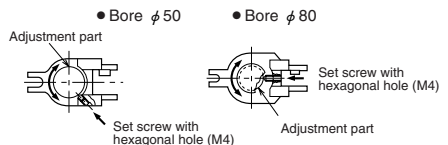


Shock Absorber Resisting Force Adjustment Method

- In case of use, it shall be adjusted so that the shock become soft according to the pallet weight and speed because the shock absorber contained in pallet is adjustment type. In case that plural pallets are stopped, the shock of first pallet is absorbed, but the shock of second pallet and others may not be absorbed.

Adjustment Method

- Loosen set screw with hexagonal hole (M4) at the side of lever bracket.
- By turning the adjustment part with hand, it shall be adjusted to that there is no shock of pallet.
 - As temporary adjustment, it shall be collided at the hardest adjustment position. In case that shock at the initial collision is large (work bounds), the adjustment part shall be turned to the slower direction.
 - In case that shock at the stop position is large (work bounds), the adjustment part shall be turned to the hard direction.
- After the completion of adjustment, set screw shall be tightened completely.



Note) Shock absorber for cylinder bore φ32 cannot be adjusted because only fixed type is applied.

Procedure For Replacement of Shock Absorber

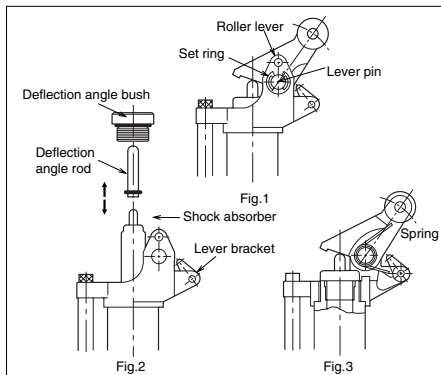
ST□3-32 Series

Removal Procedure

- Remove set ring of lever pin and remove roller lever. (See Fig.1)
- Remove deflection angle bush and remove shock absorber. (See Fig.2)

Mounting Procedure

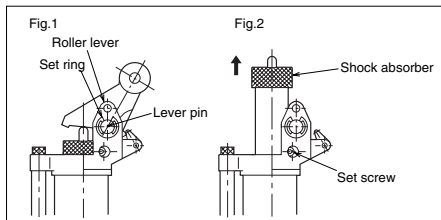
- Piston rod shall be inserted to shock absorber first, and then deflection angle rod.
- Deflection angle bush shall be surely screwed into piston rod.
- Spring shall be equipped as indicated on Fig.3. Shorter arm shall be fixed on lever bracket side.



ST□3-50 Series

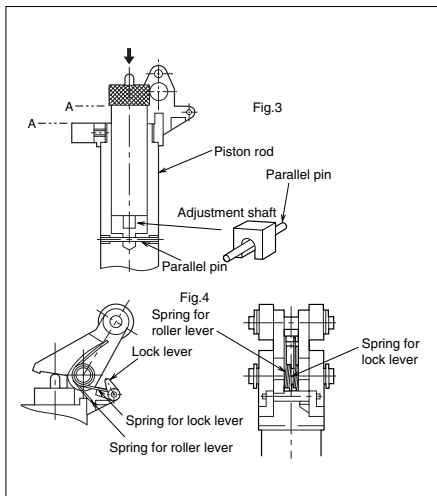
Removal Procedure

- Remove set ring of roller pin and remove roller lever. (See Fig.1)
- Set screw for adjustment lock shall be loosened to remove shock absorber. (see Fig.2)



Mounting Procedure

- In case of inserting piston rod, slotting part of shock absorber adjustment shaft shall be inserted into parallel pin. (See Fig.3)
- Shock absorber shall be inserted until A face is located at the same position. (If inserted insufficiently, it is unable to equip roller lever.)
- Both types of spring, for roller lever and lock lever shall be equipped. Spring for lock lever has smaller wire diameter and volume. Please refer to Fig.4 for mounting position and be sure it is right position.
- After adjustment of shock absorber is completed, set screw shall be tightened to lock.



ST□3-80 Series

Removal Procedure

- Remove set ring of lever pin and remove roller lever. (See Fig.1)
- Set screw at two positions shall be loosened to remove shock absorber. (See Fig.2 and Fig.3)

Mounting Procedure

- Shock absorber shall be inserted until X face and Y face are at the same position and fix set screw A. (See Fig.2 and Fig.3)
- Springs shall be equipped as indicated in Fig.3. Short arm shall be fixed on lever bracket side.
- After adjustment of shock absorber is completed, set screw B shall be tightened to lock.

