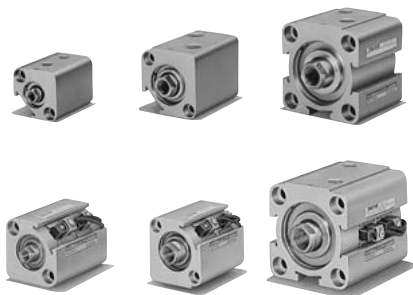


1/2 installation space, compared to 35H-3 series

- Replaceable seals
- Rod end specifications of two types: female and male threads
- Compared to the tie-rod type cylinders, the installation space is reduced to approx. 1/2.
- Cylinders with magnetic proximity sensors are standardized.
- Hydrogenated nitrile rubber (HNBR) is adopted as a seal material for sliding parts.
- Square rings are adopted for the piston seals.



Standard Specifications

Type	Standard type	Switch Set
Nominal pressure	3.5 MPa	
Maximum allowable pressure	4 MPa	
Proof test pressure	5 MPa	
Minimum operating pressure	$\phi 20 \cdot \phi 25 \cdot \phi 32 : 0.15 \text{ MPa}$ $\phi 40 \cdot \phi 50 \cdot \phi 63 : 0.1 \text{ MPa}$	
Working speed range	8 to 100mm/s	
Working temperature range (ambient temp. and oil temp.)	Standard type	-10 to +70°C
	Switch Set AX/AZ type AX·AZ type	-10 to +70°C
	WR/WS type	-10 to +60°C (No freezing)
Structure of cushioning	None	
Applicable hydraulic fluid	Petroleum-based fluid (When using another fluid, refer to the table of fluid adaptability.)	
Tolerance for thread	JIS 6H/6g	
Tolerance of stroke	0 to 1.0mm	
Mounting style	Basic style	
Rod end threads	Female thread and male thread	

Adaptability of Fluid to Seal Material

Seal material	Adaptable fluid				
	Petroleum-based fluid	Water-glycol fluid	Phosphate ester fluid	W/O Water in oil fluid	O/W Oil in water fluid
HNBR	○	○	×	○	○

Notes) ○: Applicable ×: Inapplicable
Consult us before using phosphate ester fluid.

Terminologies

Nominal pressure

Pressure given to a cylinder for convenience of naming. It is not always the same as the working pressure (rated pressure) that guarantees performance under the specified conditions.

Maximum allowable pressure

Maximum allowable pressure generated in a cylinder (surge pressure, etc.).

Proof test pressure

Test pressure against which a cylinder can withstand without unreliable performance at the return to nominal pressure.

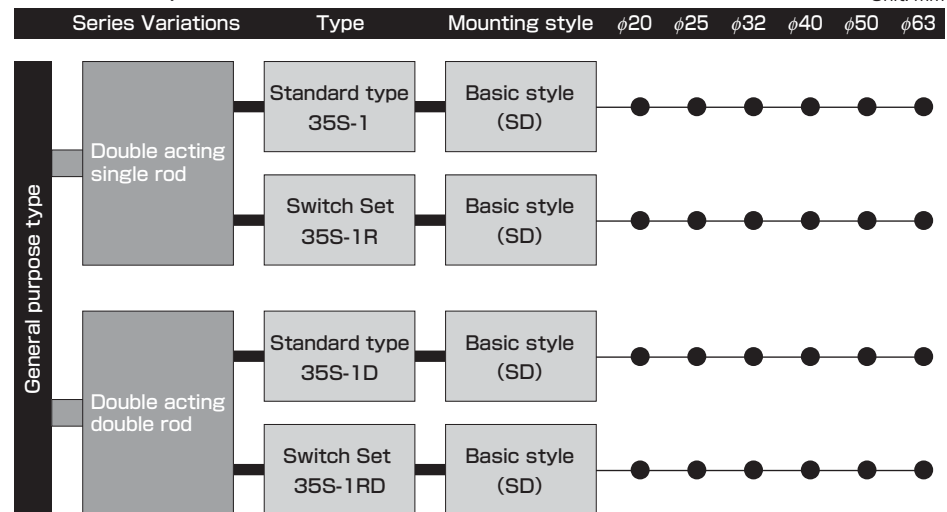
Minimum operating pressure

Minimum pressure at which cylinder installed horizontally operates under no load.

- Notes) ● The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.
- In case that the lock nut is attached to the piston rod end thread part, increase the thread length (dimension A).
 - The cylinder body is not cutting oil proof.
 - This cylinder does not have air vents.
 - For the internal structure, refer to the sectional drawings at the end of this catalog.
 - When the piston hits against the cylinder end face at the stroke end, reduce the speed to less than the minimum speed.

Product Lineup

Unit: mm



Notes) ● When using a sensor, use a Switch Set Cylinder.
● No sensor can be mounted onto the standard type cylinder.

Standard Type



Double acting single rod (35S-1)



Double acting double rod (35S-1D)



Double acting single rod (35S-1R)



Double acting double rod (35S-1RD)

How to order

General Purpose Type

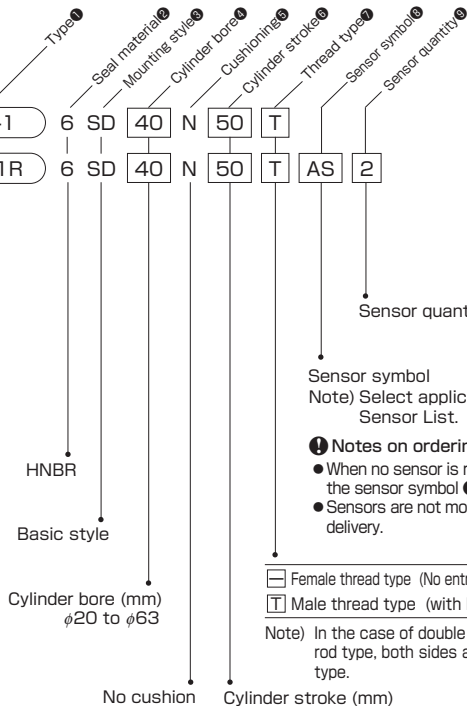
Standard type

35S-1 6 SD 40 N 50 T

Switch Set

35S-1R 6 SD 40 N 50 T AS 2

- Standard type
- 35S-1 :Double acting single rod
- 35S-1D :Double acting double rod
- Switch Set
- 35S-1R :Double acting single rod
- 35S-1RD :Double acting double rod



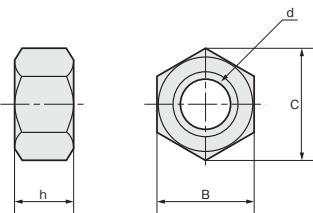
- Notes on ordering sensors**
- When no sensor is required, specify 00 for the sensor symbol ⑧ and the sensor quantity ⑨.
 - Sensors are not mounted on cylinders at delivery.

- Female thread type (No entry for standard type)
 - Male thread type (with lock nut)
- Note) In the case of double acting double rod type, both sides are male thread type.

Semi-standard range

- Change of piston rod end

Lock nut number for ordering



Dimensional Table

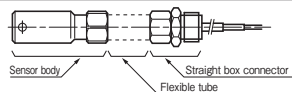
Bore	Part number	d	B	C	h
$\phi 20$	LNA-10Z-H	M10 \times 1.25	17	19.6	6
$\phi 25$	LNA-10Z-H	M10 \times 1.25	17	19.6	6
$\phi 32$	LNA-12Z-H	M12 \times 1.25	19	21.9	7
$\phi 40$	LNA-12Z-H	M12 \times 1.25	19	21.9	7
$\phi 50$	LNA-18Z-H	M18 \times 1.5	24	27.7	11
$\phi 63$	LNA-18Z-H	M18 \times 1.5	24	27.7	11

Notes on ordering WR or WS type sensors

- When ordering the cutting oil proof type sensors, WR and WS types, please be carefully the following notification.

5 WR525 The sensor and straight box connector (F-SB) are combined (the flexible tube (F-0.5: 4.8m) is required).
 8 WR535
 2 WS235-1
 1 WS245-1

7 WR525F Sensor body provided with straight box connector (F-SB) and flexible tube (F-0.5: 4.8m)
 4 WS235-1F



Adaptability of Fluid to Seal Material

Seal material	Adaptable fluid				
	Petroleum-based fluid	Water-glycol fluid	Phosphate ester fluid	Water in oil fluid	Oil in water fluid
HNBR	○	○	×	○	○

Notes) ○: Applicable ×: Inapplicable
Consult us before using phosphate ester fluid.

Sensor List

Type	Sensor symbol	Load voltage range	Load current range	Max. switching capacity	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load		
Reed sensor	AF AX101CE	DC:5 to 30V AC:5 to 120V	DC:5 to 40mA AC:5 to 20mA	DC:1.5W AC:2VA	None	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	1.5m	Small relay, programmable controller		
	AG AX105CE							5m			
	AH AX111CE							1.5m			
	AJ AX115CE	5m									
	AE AX125CE	DC: 30 V or less AC: 120 V or less	DC: 40 mA or less AD: 20 mA or less	2VA	None	None	None	5m			
	AK AX11ACE	AC:5 to 120V	5 to 20mA					0.5m			
	AL AX11BCE	DC:5 to 30V	5 to 40mA	1.5W	Provided	LED (lights in red when sensing)	4-pin connector type Rear wiring	0.5m			
	Solid state sensor	5 WR525	DC:5 to 50V AC:5 to 120V	DC:3 to 40mA AC:3 to 20mA	DC:1.5W AC:2VA	None	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring		5m	Small relay, programmable controller
		7 WR525F								5m	
		AP AZ101CE	DC:5 to 30V AC:5 to 120V	DC:5 to 40mA AC:5 to 20mA	DC:1.5W AC:2VA	None	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Upper wiring		1.5m	
		AR AZ105CE								5m	
		AS AZ111CE								1.5m	
AT AZ115CE		5m									
AN AZ125CE		DC: 30 V or less AC: 120 V or less	DC: 40 mA or less AD: 20 mA or less	2VA	None	None	None	5m			
AU AZ11ACE		AC:5 to 120V	5 to 20mA					0.5m			
AW AZ11BCE		DC:5 to 30V	5 to 40mA	1.5W	Provided	LED (lights in red when sensing)	4-pin connector type Upper wiring	0.5m			
AM AX135CE		AC/DC:90 to 240V	5 to 300mA	B contact output	Provided	LED (lights in red when not sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	5m			
AY AZ135CE								5m			
Cutting oil proof type		8 WR535	DC:5 to 50V AC:5 to 120V	DC:3 to 40mA AC:3 to 20mA	DC:1.5W AC:2VA	None	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Upper wiring	5m	Small relay, programmable controller	
	BE AX201CE-1	1.5m									
	BF AX205CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	5m			
	CE AX211CE-1							1.5m			
	CF AX215CE-1							5m			
	2 WS235-1	DC:10 to 30V	5 to 20mA	—	Provided	LED (two-LED type in red/green)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	5m			
	4 WS235-1F							5m			
	BM AZ201CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Upper wiring	1.5m			
	BN AZ205CE-1							5m			
	CM AZ211CE-1							1.5m			
	CN AZ215CE-1							5m			
	Solid state sensor	RA AX205WCE	DC:5 to 30V	5 to 40mA	—	Provided	LED (lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	5m		Small relay, programmable controller
RB AZ205WCE		5m									
1 WS245-1		DC:10 to 30V	5 to 20mA	—	Provided	LED (two-LED type in red/green)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Upper wiring	5m			
CT AX211CE-1								1.5m			
CU AX215CE-1		DC:5 to 30V	5 to 40mA	—	Provided	LED (two-LED type in red/green)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	5m			
CV AX21BCE-1								0.5m			
CW AZ211CE-1								1.5m			
CX AZ215CE-1								5m			
CY AZ21BCE-1		4-pin connector type Upper wiring	0.5m								

- Notes) ● For the sensors without a protective circuit, be sure to provide a protective circuit (SK-100) with the load when using any induction load (relay, etc.).
- The output logic of AX and AZ135CE is B contact. When the piston is detected, the sensor contact turns off (the lamp turns on).
 - For the details of sensors, be sure to read the sensor specifications at the end of this catalog.
 - WR and WS type sensors are cutting oil proof.
 - We recommend AND Unit (AU series) for multiple sensors connected in series.
- For details, refer to AND Unit at the end of this catalog.

Standard type

AX type (rear wiring)



AZ type (upper wiring)



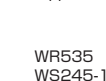
Cutting oil proof type

WR/WS type sensor

- Rear wiring



- Upper wiring



Standard Stroke Range

Series variations	Type	Mounting style	Bore	Cylinder stroke (mm)																	Male thread type			
				5	10	15	20	25	30	35	40	45	50	60	70	80	90	100						
General purpose type	Double acting single rod	Standard type 35S-1	Basic style (SD)	φ20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
				φ25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
				φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
				φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
				φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
				φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Switch Set 35S-1R	Basic style (SD)	φ20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Double acting double rod	Standard type 35S-1D	Basic style (SD)	φ20	○	○	○	○	○	○	□	□	□	□	○	○	○	○	○	○	○	○	○		
			φ25	○	○	○	○	○	○	□	□	□	□	○	○	○	○	○	○	○	○	○		
			φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	Switch Set 35S-1RD	Basic style (SD)	φ20	○	○	○	○	○	○	□	□	□	□	○	○	○	○	○	○	○	○	○		
			φ25	○	○	○	○	○	○	□	□	□	□	○	○	○	○	○	○	○	○	○		
			φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		

○: Standard range □: Semi-standard range

Sensor Mountable Minimum Stroke

Bore	With one sensor		With two sensors					
	AX/AZ type	WR/WS type	AX/AZ type		WR525	WR535	WS235	WS245
			Reed sensor	Solid state sensor				
φ20 to φ32	5	10	10	15	—	—	—	—
φ40 to φ63			10 (5) *		20	10	20	15

- (Notes) ● The parenthesized value applies in the case where one sensor is mounted in each of the two sensor mounting grooves.
 ● Cylinders with bores of 20, 25 and 32 mm can be provided with one WR or WS type sensor. Cylinders with bores of 40, 50 and 63 mm can be provided with two sensors. In this case, use the two sensor mounting grooves. One sensor can be mounted in one mounting groove.
 ● When two reed sensors are used on one surface at a stroke of 10 mm, adjust their positions because the sensors may interfere with each other.
 ● When solid state sensors are used on a cylinder with a bore of 40 mm or more at a stroke of 10 mm, use the two sensor mounting grooves.

Operating Range and Hysteresis

Bore	Contact				Non-contact			
	AX/AZ type		WR type		AX/AZ type		AX*W, AZ*W, WS types	
	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis
φ20	8 to 12	2 or less	7 to 12	2 or less	4 to 7	1 or less	11 to 18	2 or less
φ25			9 to 13					
φ32	5 to 11	2 or less	4 to 9	2 or less	4 to 7	1 or less	11 to 18	2 or less
φ40								
φ50								
φ63			7 to 12					

Weight Table

Unit: kg

Bore mm	Double acting single rod					Double acting double rod				
	Standard type 35S-1		Switch Set 35S-1R		Male thread additional weight	Standard type 35S-1D		Switch Set 35S-1RD		Male thread additional weight
	Basic weight	Additional weight per mm of stroke	Basic weight	Additional weight per mm of stroke		Basic weight	Additional weight per mm of stroke	Basic weight	Additional weight per mm of stroke	
φ20	0.180	0.0040	0.240	0.0040	0.025	0.260	0.0050	0.335	0.0050	0.05
φ25	0.240	0.0045	0.315	0.0045	0.025	0.350	0.0055	0.445	0.0055	0.05
φ32	0.380	0.0070	0.500	0.0070	0.048	0.570	0.0090	0.710	0.0090	0.096
φ40	0.590	0.0080	0.760	0.0080	0.048	0.905	0.0100	1.095	0.0100	0.096
φ50	1.020	0.0105	1.225	0.0105	0.135	1.500	0.0135	1.730	0.0135	0.27
φ63	1.695	0.0140	2.015	0.0140	0.135	2.490	0.0170	2.840	0.0170	0.27

Sensor Additional Weight Table

Unit: kg

AX/AZ type			WR/WS type
Cord length 1.5 m	Cord length 5 m	Connector type	0.50
0.05	0.10	0.05	

Calculation formula

Cylinder weight (kg)=
 basic weight+(cylinder stroke (mm)×additional weight per mm of stroke)+(sensor additional weight×sensor quantity)

Calculation example

35S-1R, bore φ32, cylinder stroke 20 mm, 2 pcs of AX111 (cord length 1.5 m)
 0.500+(20×0.0070)+(0.046×2)=0.732kg

Piston Pressurized Area Table

Unit: mm²

Bore mm	Rod dia. mm	Double acting single rod		Double acting double rod	
		Extension side	Retraction side	Extension side	Retraction side
φ20	φ12	314	201	201	
φ25	φ12	491	378	378	
φ32	φ18	804	550	550	
φ40	φ18	1257	1002	1002	
φ50	φ22	1963	1583	1583	
φ63	φ22	3117	2737	2737	

Calculation formula

F=A·P·β (N)
 F: Cylinder force (N)
 A: Piston pressurized area (mm²)
 P: Working pressure (MPa)
 β: Load rate

Calculation example

Double acting single rod, bore φ40, working pressure: 3.5 MPa
 Load rate: 0.8
 Cylinder force on extension side (N)
 =1257×3.5×0.8=3520 (N)
 Cylinder force on retraction side (N)
 =1002×3.5×0.8=2810 (N)

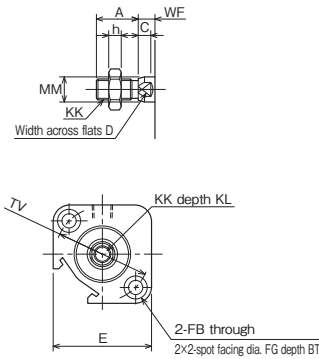
CAD/DATA is available.  35S-1/THS35 Bore

SD

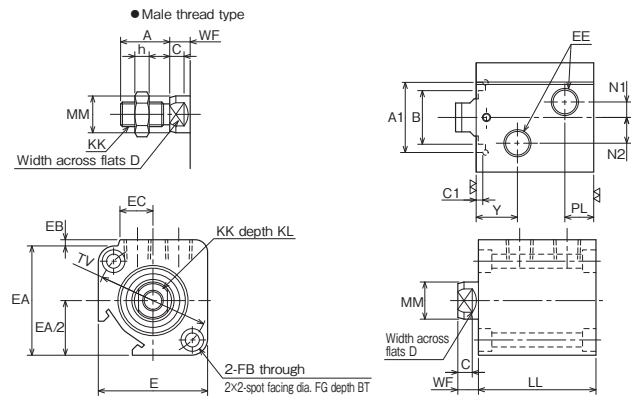
35S-1 6 SD Bore N Stroke T

None: Female thread type
T: Male thread type

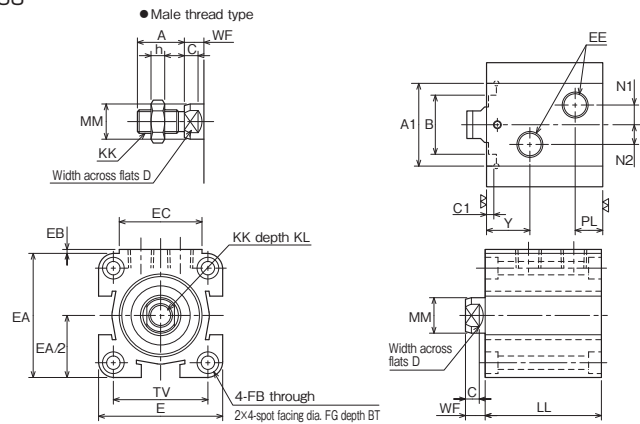
- Bore $\phi 20$ and $\phi 25$



- Bore $\phi 32$



- Bore $\phi 40$ to $\phi 63$



Space-saving Hydraulic Cylinders

35S-1

Dimensional Table

Symbol Bore	A	A1	B	BT	C	C1	D	E	EA	EB	EC	EE	FB	FG	h	KK		KL
																Female thread type	Male thread type	
$\phi 20$	20	$\phi 22H8$	-	6.5	6	2	10	$\square 43$	-	-	-	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8 \times 1.25	M10 \times 1.25	13
$\phi 25$	20	$\phi 27H8$	-	6.5	6	2	10	$\square 47$	-	-	-	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8 \times 1.25	M10 \times 1.25	13
$\phi 32$	24	$\phi 34H8$	$\phi 26$	6.5	7	3	14	53	53	3	16	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12 \times 1.75	M12 \times 1.25	18
$\phi 40$	24	$\phi 42H8$	$\phi 30$	6.5	7	3.5	14	63	63	2	42	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12 \times 1.75	M12 \times 1.25	18
$\phi 50$	36	$\phi 52H8$	$\phi 36$	8.6	7	3.5	19	74	74	2	42	Rc1/4	$\phi 9$	$\phi 14$	11	M16 \times 2	M18 \times 1.5	20
$\phi 63$	36	$\phi 65H8$	$\phi 42$	10.8	7	4.5	19	90	90	2	42	Rc1/4	$\phi 11$	$\phi 17.5$	11	M16 \times 2	M18 \times 1.5	20

Symbol Bore	LL															MM	N1	N2	PL	TV	WF	Y
	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100							
$\phi 20$	57	57	57	62	67	72	77	82	87	92	-	-	-	-	-	$\phi 12$	-	-	12	40	8	20
$\phi 25$	57	57	57	62	67	72	77	82	87	92	102	-	-	-	-	$\phi 12$	-	-	12	45	8	20
$\phi 32$	52	57	62	67	72	77	82	87	92	97	107	117	127	-	-	$\phi 18$	7.5	12.5	14	54	10	20
$\phi 40$	54	59	64	69	74	79	84	89	94	99	109	119	129	139	149	$\phi 18$	10	10	14	$\square 48$	10	22
$\phi 50$	61	66	71	76	81	86	91	96	101	106	116	126	136	146	156	$\phi 22$	10	10	15	$\square 55$	10	25
$\phi 63$	66	71	76	81	86	91	96	101	106	111	121	131	141	151	161	$\phi 22$	10	10	15	$\square 68$	10	27

Note) • The tolerance of MM is f8.

Space-saving Hydraulic Cylinders

35S-1

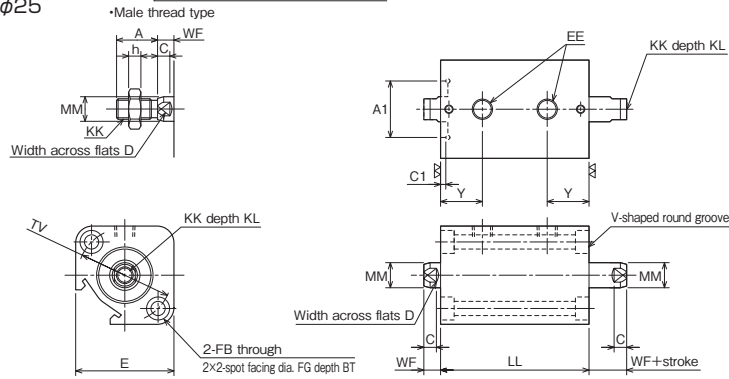
35S-1/THS35 Bore is available. CAD/DATA is available.

SD

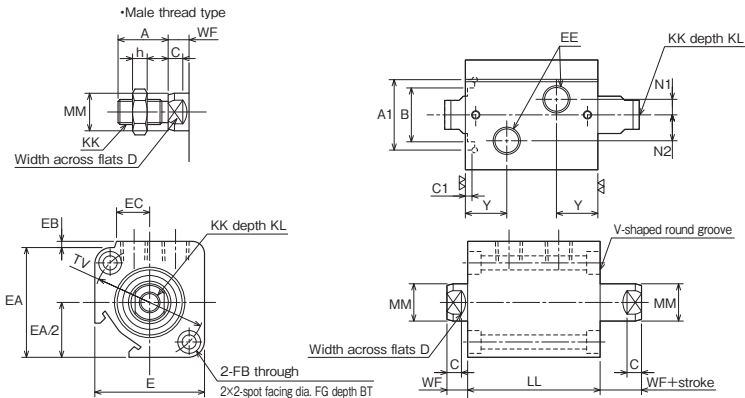
35S-1D 6 SD Bore N Stroke T

None:Female thread type
T:Male thread type

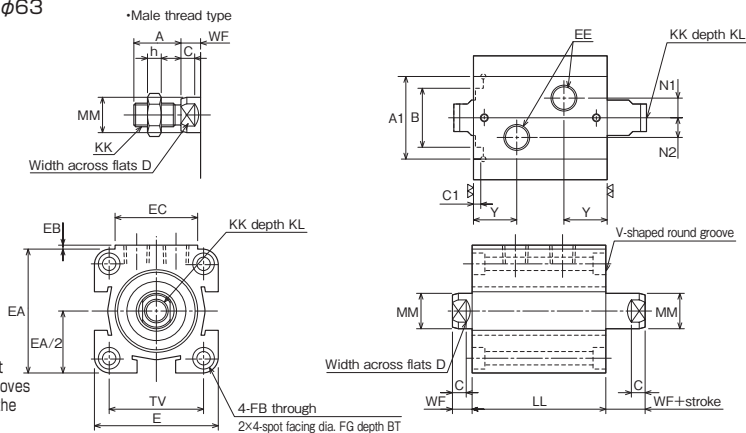
- Bore $\phi 20$ and $\phi 25$



- Bore $\phi 32$



- Bore $\phi 40$ to $\phi 63$



- The surface without V-shaped round grooves on the end face is the mounting surface.

Dimensional Table

Symbol Bore	A	A1	B	BT	C	C1	D	E	EA	EB	EC	EE	FB	FG	h	KK		KL
																Female thread type	Male thread type	
$\phi 20$	20	$\phi 22H8$	—	6.5	6	2	10	$\square 43$	—	—	—	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8×1.25	M10×1.25	13
$\phi 25$	20	$\phi 27H8$	—	6.5	6	2	10	$\square 47$	—	—	—	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8×1.25	M10×1.25	13
$\phi 32$	24	$\phi 34H8$	$\phi 26$	6.5	7	3	14	53	53	3	16	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12×1.75	M12×1.25	18
$\phi 40$	24	$\phi 42H8$	$\phi 30$	6.5	7	3.5	14	63	63	2	42	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12×1.75	M12×1.25	18
$\phi 50$	36	$\phi 52H8$	$\phi 36$	8.6	7	3.5	19	74	74	2	42	Rc1/4	$\phi 9$	$\phi 14$	11	M16×2	M18×1.5	20
$\phi 63$	36	$\phi 65H8$	$\phi 42$	10.8	7	4.5	19	90	90	2	42	Rc1/4	$\phi 11$	$\phi 17.5$	11	M16×2	M18×1.5	20

Symbol Bore	LL										MM	N1	N2	TV	WF	Y					
	5	10	15	20	25	30	35	40	45	50							60	70	80	90	100
$\phi 20$	66	66	66	71	76	81	86	91	96	101	—	—	—	—	$\phi 12$	—	—	40	8	20	
$\phi 25$	66	66	66	71	76	81	86	91	96	101	111	—	—	—	$\phi 12$	—	—	45	8	20	
$\phi 32$	59	64	69	74	79	84	89	94	99	104	114	124	134	—	$\phi 18$	7.5	12.5	54	10	20	
$\phi 40$	63	68	73	78	83	88	93	98	103	108	118	128	138	148	158	$\phi 18$	10	10	$\square 48$	10	22
$\phi 50$	72	77	82	87	92	97	102	107	112	117	127	137	147	157	167	$\phi 22$	10	10	$\square 55$	10	25
$\phi 63$	79	84	89	94	99	104	109	114	119	124	134	144	154	164	174	$\phi 22$	10	10	$\square 68$	10	27



Note) • The tolerance of MM is f8.

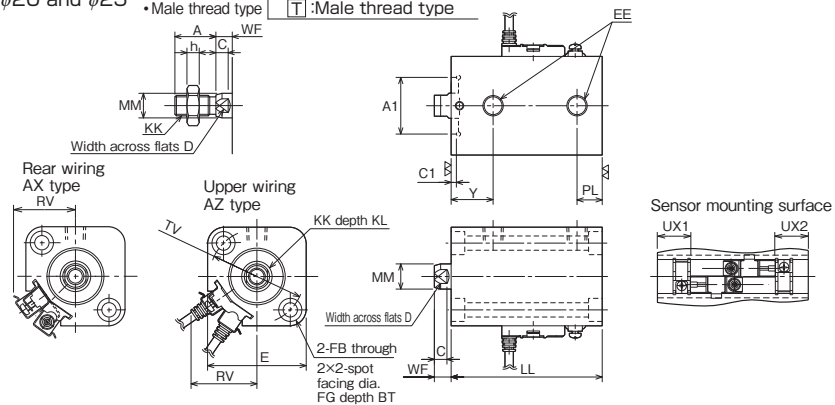
CAD/DATA is available. 

SD

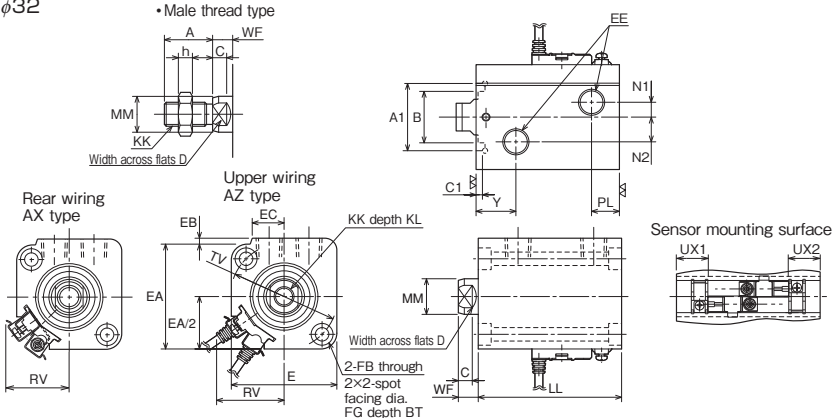
35S-1R 6 SD

- Bore $\phi 20$ and $\phi 25$
- Male thread type

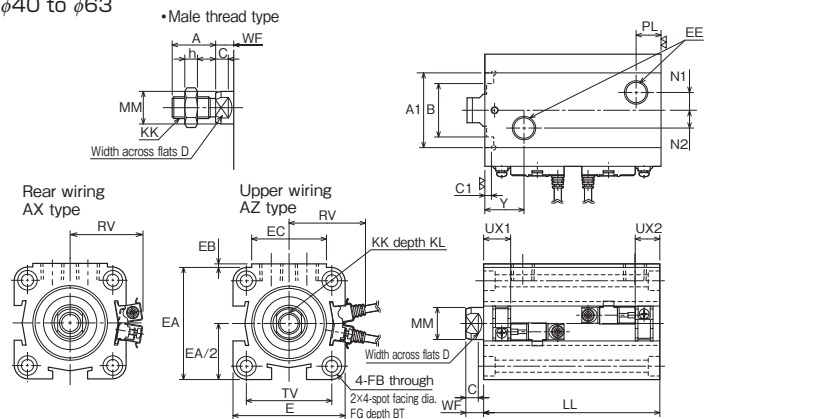
 :Female thread type
 :Male thread type



- Bore $\phi 32$
- Male thread type



- Bore $\phi 40$ to $\phi 63$
- Male thread type



Space-saving Hydraulic Cylinders

35S-1

General purpose type

Dimensional Table

Symbol	Bore	A	A1	B	BT	C	C1	D	E	EA	EB	EC	EE	FB	FG	h	KK		KL
																	Female thread type	Male thread type	
$\phi 20$	20	$\phi 22H8$	-	6.5	6	2	10	$\square 43$	-	-	-	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8×1.25	M10×1.25	13	
$\phi 25$	20	$\phi 27H8$	-	6.5	6	2	10	$\square 47$	-	-	-	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8×1.25	M10×1.25	13	
$\phi 32$	24	$\phi 34H8$	$\phi 26$	6.5	7	3	14	53	53	3	16	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12×1.75	M12×1.25	18	
$\phi 40$	24	$\phi 42H8$	$\phi 30$	6.5	7	3.5	14	63	63	2	42	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12×1.75	M12×1.25	18	
$\phi 50$	36	$\phi 52H8$	$\phi 36$	8.6	7	3.5	19	74	74	2	42	Rc1/4	$\phi 9$	$\phi 14$	11	M16×2	M18×1.5	20	
$\phi 63$	36	$\phi 65H8$	$\phi 42$	10.8	7	4.5	19	90	90	2	42	Rc1/4	$\phi 11$	$\phi 17.5$	11	M16×2	M18×1.5	20	

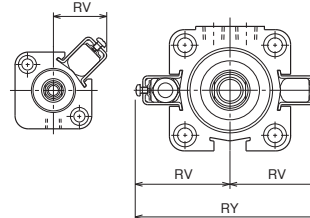
Symbol	Bore	LL										MM	N1	N2	PL	RV		TV	UX1	UX2	WF	Y				
		5	10	15	20	25	30	35	40	45	50					60	70						80	90	100	AX type
$\phi 20$	57	62	67	72	77	82	87	92	97	102	-	-	-	-	-	$\phi 12$	-	-	12	28	32	40	16	16	8	20
$\phi 25$	57	62	67	72	77	82	87	92	97	102	112	-	-	-	-	$\phi 12$	-	-	12	30	34	45	16	16	8	20
$\phi 32$	62	67	72	77	82	87	92	97	102	107	117	127	137	-	-	$\phi 18$	7.5	12.5	14	32	36	54	19	19	10	20
$\phi 40$	64	69	74	79	84	89	94	99	104	109	119	129	139	149	159	$\phi 18$	10	10	14	41	48	$\square 48$	21	19	10	22
$\phi 50$	71	76	81	86	91	96	101	106	111	116	126	136	146	156	166	$\phi 22$	10	10	15	47	53	$\square 55$	25	23	10	25
$\phi 63$	76	81	86	91	96	101	106	111	116	121	131	141	151	161	171	$\phi 22$	10	10	15	55	61	$\square 68$	27	26	10	27

Notes) • The tolerance of MM is f8.
 • Dimension UX is for reference only.
 For details, refer to the sensor mountable minimum stroke table.

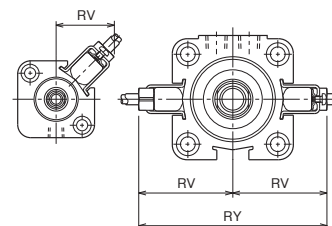
Cutting oil proof type

Dimensions when WR or WS sensors are mounted

- Rear wiring
- WR525(reed sensor)
- WS235-1(solid state sensor)



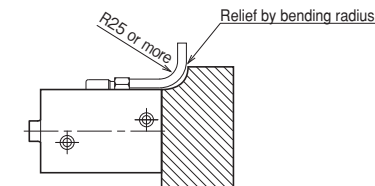
- Upper wiring
- WR535(reed sensor)
- WS245-1(solid state sensor)



Dimensional Table

Bore	RV		RY		UX1		UX2	
	Rear wiring	Upper wiring	Rear wiring	Upper wiring	Reed sensor	Solid state sensor	Reed sensor	Solid state sensor
$\phi 20$	31	35	-	-	13	16	12	15
$\phi 25$	33	37	-	-	12	16	12	15
$\phi 32$	36	40	-	-	18	20	16	18
$\phi 40$	52	54	103	107	19	20	16	18
$\phi 50$	58	60	115	119	24	25	19	22
$\phi 63$	66	68	132	135	25	28	21	25

Note) Ensure that the bending radius of the flexible tube is R25 or more. If the bending radius is smaller, the wire may be broken.



If the sensor cannot be mounted as shown above, use the upper wiring type.

Space-saving Hydraulic Cylinders

35S-1

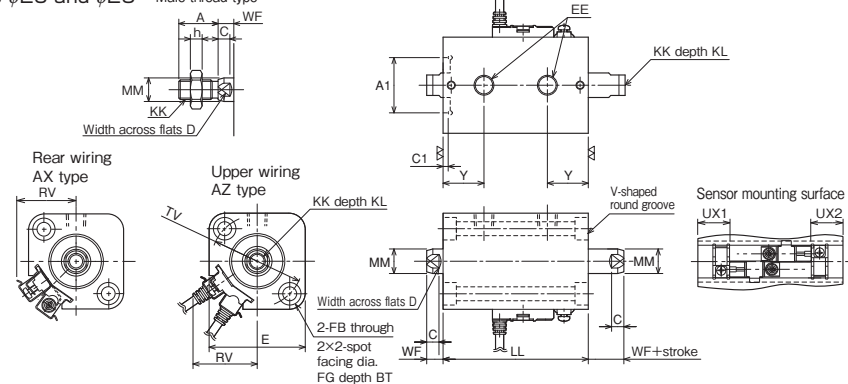
CAD/DATA
35S-1/THS35[Bore] is available.

SD

35S-1RD 6 SD Bore N Stroke Sensor symbol Sensor quantity

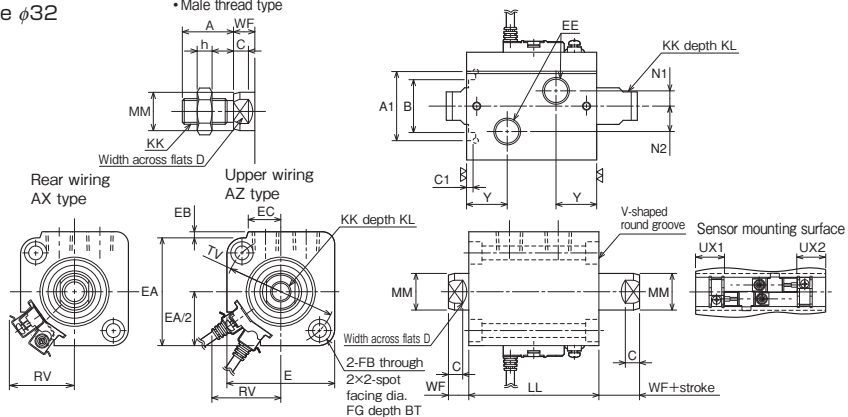
- Bore $\phi 20$ and $\phi 25$ • Male thread type

:Female thread type
 :Male thread type



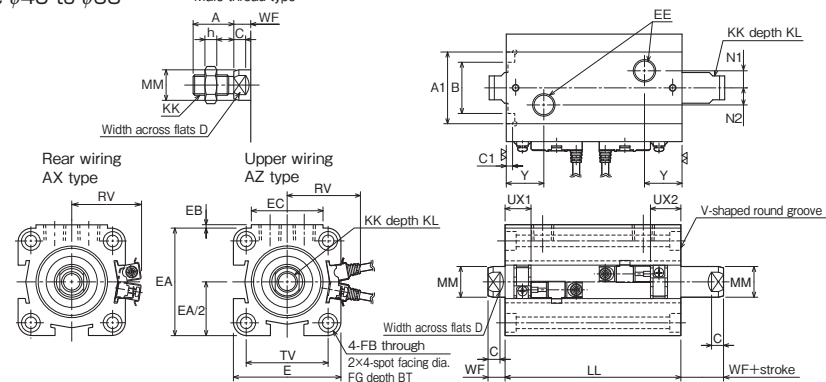
- Bore $\phi 32$

• Male thread type



- Bore $\phi 40$ to $\phi 63$

• Male thread type



- The surface without V-shaped round grooves on the end face is the mounting surface.
The side without V-shaped round grooves on the end face corresponds to UX1.

General purpose type

Dimensional Table

Symbol	Bore	A	A1	B	BT	C	C1	D	E	EA	EB	EC	EE	FB	FG	h	KK		KL
																	Female thread type	Male thread type	
$\phi 20$	20	$\phi 22H8$	-	6.5	6	2	10	$\square 43$	-	-	-	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8×1.25	M10×1.25	13	
$\phi 25$	20	$\phi 27H8$	-	6.5	6	2	10	$\square 47$	-	-	-	Rc1/8	$\phi 6.8$	$\phi 11$	6	M8×1.25	M10×1.25	13	
$\phi 32$	24	$\phi 34H8$	$\phi 26$	6.5	7	3	14	53	53	3	16	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12×1.75	M12×1.25	18	
$\phi 40$	24	$\phi 42H8$	$\phi 30$	6.5	7	3.5	14	63	63	2	42	Rc1/4	$\phi 6.8$	$\phi 11$	7	M12×1.75	M12×1.25	18	
$\phi 50$	36	$\phi 52H8$	$\phi 36$	8.6	7	3.5	19	74	74	2	42	Rc1/4	$\phi 9$	$\phi 14$	11	M16×2	M18×1.5	20	
$\phi 63$	36	$\phi 65H8$	$\phi 42$	10.8	7	4.5	19	90	90	2	42	Rc1/4	$\phi 11$	$\phi 17.5$	11	M16×2	M18×1.5	20	

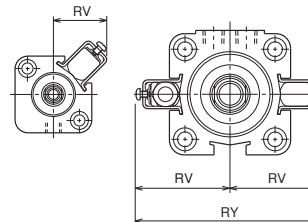
Symbol	Bore	LL										MM	N1	N2	RV		TV	UX1	UX2	WF	Y				
		5	10	15	20	25	30	35	40	45	50				60	70						80	90	100	AX type
$\phi 20$	66	71	76	81	86	91	96	101	106	111	-	-	-	-	-	$\phi 12$	-	-	28	32	40	16	26	8	20
$\phi 25$	66	71	76	81	86	91	96	101	106	111	121	-	-	-	-	$\phi 12$	-	-	30	34	45	16	26	8	20
$\phi 32$	69	74	79	84	89	94	99	104	109	114	124	134	144	-	-	$\phi 18$	7.5	12.5	32	36	54	19	26	10	20
$\phi 40$	73	78	83	88	93	98	103	108	113	118	128	138	148	158	168	$\phi 18$	10	10	41	48	$\square 48$	21	28	10	22
$\phi 50$	82	87	92	97	102	107	112	117	122	127	137	147	157	167	177	$\phi 22$	10	10	47	53	$\square 55$	25	34	10	25
$\phi 63$	89	94	99	104	109	114	119	124	129	134	144	154	164	174	184	$\phi 22$	10	10	55	61	$\square 68$	27	39	10	27

- Notes) • The tolerance of MM is f8.
 • Dimension UX is for reference only.
 For details, refer to the sensor mountable minimum stroke table.

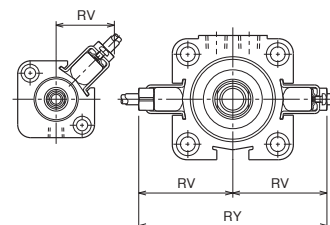
Cutting oil proof type

Dimensions when WR or WS sensors are mounted

- Rear wiring
WR525(reed sensor)
WS235-1 (solid state sensor)



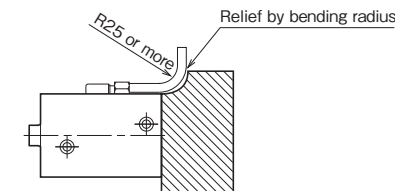
- Upper wiring
WR535(reed sensor)
WS245-1 (solid state sensor)



Dimensional Table

Bore	RV		RY		UX1		UX2	
	Rear wiring	Upper wiring	Rear wiring	Upper wiring	Reed sensor	Solid state sensor	Reed sensor	Solid state sensor
$\phi 20$	31	35	-	-	13	16	21	24
$\phi 25$	33	37	-	-	12	16	21	24
$\phi 32$	36	40	-	-	18	20	23	25
$\phi 40$	52	54	103	107	19	20	25	27
$\phi 50$	58	60	115	119	24	25	30	33
$\phi 63$	66	68	132	135	25	28	34	38

- Note) Ensure that the bending radius of the flexible tube is R25 or more. If the bending radius is smaller, the wire may be broken.



- If the sensor cannot be mounted as shown above, use the upper wiring type.

Change of Rod End Shape

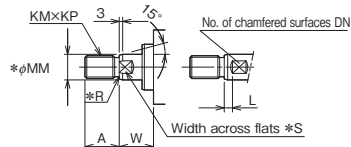
■ You can specify the shape and dimension of the rod end as shown below using the semi-standard symbols and dimension symbols.
(No need to specify the dimension symbol if you order a cylinder with the basic dimensions. Specify only the semi-standard symbol)

How to order **Series** **Model number** - X **Semi-standard symbol** **Dimension symbol** (Specify only when the dimension differs from the basic dimension.)

↳ KM and KP need to be specified as a pair.

Example 1)

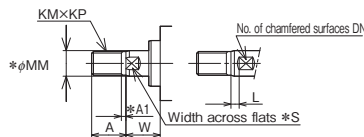
A53



● Bore $\phi 32$, male thread type, rod end shape: A53, A=50, W=40, screw: M10 \times 1.25, 2 surfaces chamfered, position of width across flats L=10
35S-1 6SD32N50T-X A53
A-50, KM-10, KP-1.25, L-10, WF-40

Example 2)

A54



● Bore $\phi 63$, male thread type, rod end shape: A54, with the basic dimensions
35S-1 6SD63N30T-X A54
Note) In the case of A54, if KM and KP are changed, dimension A1 is changed as shown below.

KP (pitch)	Dimension A1
1.25 or less	3
1.5	4
2	5
2.5 or more	KP (pitch) \times 2

Special Rod End Shapes

A00(T)

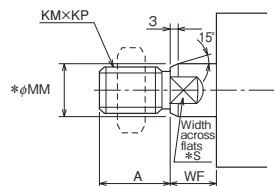


Table of Basic Dimensions (Standard dimensions)

Symbol	A	KM	KP	* MM	* S	WF
$\phi 20$	20	10	1.25	$\phi 12$	10	8
$\phi 25$	20	10	1.25	$\phi 12$	10	8
$\phi 32$	24	12	1.25	$\phi 18$	14	10
$\phi 40$	24	12	1.25	$\phi 18$	14	10
$\phi 50$	36	18	1.5	$\phi 22$	19	10
$\phi 63$	36	18	1.5	$\phi 22$	19	10

A51

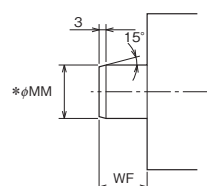
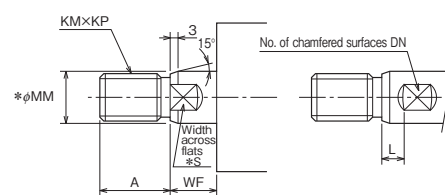


Table of Basic Dimensions

Symbol	* MM	WF
$\phi 20$	$\phi 12$	8
$\phi 25$	$\phi 12$	8
$\phi 32$	$\phi 18$	10
$\phi 40$	$\phi 18$	10
$\phi 50$	$\phi 22$	10
$\phi 63$	$\phi 22$	10

- The *-marked dimension is fixed.
- If it is necessary to change the fixed dimension, consult us.
- When screw diameter (KM) and pitch (KP) are changed, the lock nut is not supplied.

A53



Note) Increase dimension WF by dimension L.

Table of Basic Dimensions

Symbol	A	DN	KM	KP	L	* MM	* S	WF
$\phi 20$	20	2	10	1.25	0	$\phi 12$	10	8
$\phi 25$	20	2	10	1.25	0	$\phi 12$	10	8
$\phi 32$	24	2	12	1.25	0	$\phi 18$	14	10
$\phi 40$	24	2	12	1.25	0	$\phi 18$	14	10
$\phi 50$	36	2	18	1.5	0	$\phi 22$	19	10
$\phi 63$	36	2	18	1.5	0	$\phi 22$	19	10

Use this shape to move the width across flats S of 'A00(T)'.

A54

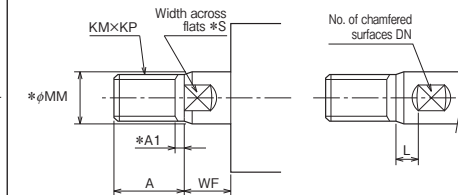


Table of Basic Dimensions

Symbol	A	* A1	DN	KM	KP	L	* MM	* S	WF
$\phi 20$	20	2.5	2	10	1.25	0	$\phi 12$	10	8
$\phi 25$	20	2.5	2	10	1.25	0	$\phi 12$	10	8
$\phi 32$	24	2.5	2	12	1.25	0	$\phi 18$	14	10
$\phi 40$	24	2.5	2	12	1.25	0	$\phi 18$	14	10
$\phi 50$	36	3	2	18	1.5	0	$\phi 22$	19	10
$\phi 63$	36	3	2	18	1.5	0	$\phi 22$	19	10

A81

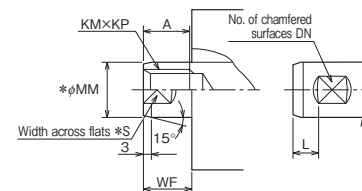


Table of Basic Dimensions

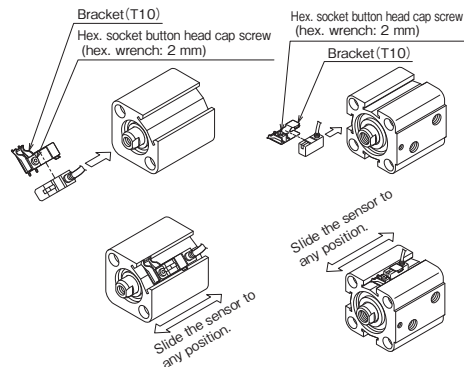
Symbol	A	DN	KM	KP	L	* MM	* S	WF
$\phi 20$	13	2	8	1.25	0	$\phi 12$	10	8
$\phi 25$	13	2	8	1.25	0	$\phi 12$	10	8
$\phi 32$	18	2	12	1.75	0	$\phi 18$	14	10
$\phi 40$	18	2	12	1.75	0	$\phi 18$	14	10
$\phi 50$	20	2	16	2	0	$\phi 22$	19	10
$\phi 63$	20	2	16	2	0	$\phi 22$	19	10

- The *-marked dimension is fixed.
- The number of chamfered surfaces DN is 2 (standard) or 4 only.
- If it is necessary to change the fixed dimension, consult us.

Setting method of sensor detecting position

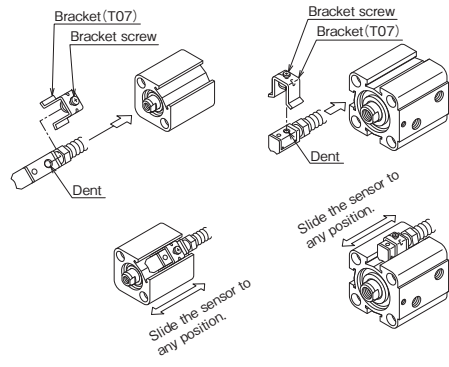
AX/AZ type bracket screw tightening torque: Approx. 0.4 N·m

- Bore $\phi 20, \phi 25, \phi 32$
- Bore $\phi 40, \phi 50, \phi 63$



WR/WS type bracket screw tightening torque: Approx. 0.6 N·m

- Bore $\phi 20, \phi 25, \phi 32$
- Bore $\phi 40, \phi 50, \phi 63$



- Place the bracket in the bracket mounting groove of the sensor. (When using T07 bracket for WR or WS type sensor, loosen the bracket screw in advance.)
- Insert the sensor combined with the bracket into the sensor mounting part of the cylinder body. Cylinders with bores of 40 to 63 mm have three sensor mounting parts to select the most suitable one for cylinder installation space, wiring condition, etc. To detect the cylinder stroke end, the sensor cord shall be set to face the center of the cylinder.
- Slide the sensor to any detecting position (where the sensor detects the piston 2 to 4 mm ahead of the ON start point). When the WS type sensor is used, mount the sensor so that the indicating lamp lights in green. To detect the cylinder stroke end, mount the sensor at the optimum setting position (dimension UX).
- After sliding the sensor to the detecting position, tighten the bracket screw to the proper tightening torque shown in the figures.

Note) If the tightening torque is improper, the sensor may be dislocated, or the sensor body may be damaged.

Notes on handling (in case of rear wiring)

When the rear wiring sensor WR525 (reed sensor) or WS235-1 (solid state sensor) is secured on the cylinder, the minimum bending radius of the flexible tube must be 25 mm or more. If the minimum bending radius cannot be ensured because the sensor is close to the cylinder fixing part, follow the procedures described on the right.

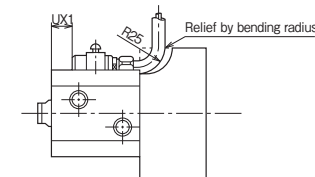
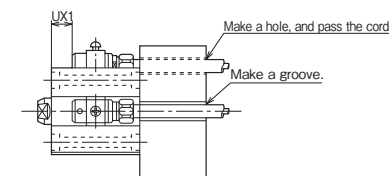


Table of Applicability of Sensors: Rear wiring WR525(reed sensor)/WS235-1 (solid state sensor)

Sensor type	Cylinder type	Cylinder bore	Stroke															
			5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	
WR525 (reed sensor)	Single rod type	$\phi 20$	x	△	△	△	△	△	○	○	○	○	—	—	—	—	—	
		$\phi 25$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	
		$\phi 32$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 40$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 50$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
	Double rod type	$\phi 63$	x	△	△	△	△	○	○	○	○	○	○	○	○	○	○	
		$\phi 20$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	
		$\phi 25$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	
		$\phi 32$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 40$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
WS235-1 (solid state sensor)	Single rod type	$\phi 50$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 63$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 20$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	
		$\phi 25$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	
		$\phi 32$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
	Double rod type	$\phi 40$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 50$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 63$	x	△	△	△	△	△	○	○	○	○	○	○	○	○	○	
		$\phi 20$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	
		$\phi 25$	x	△	△	△	△	△	○	○	○	○	○	—	—	—	—	

△ in the table indicates that the work shown above is required. × indicates that the sensor cannot be mounted. In the case of △, use the upper wiring type WR535 (reed sensor) or WS245 (solid state sensor) sensor.

Precautions for use

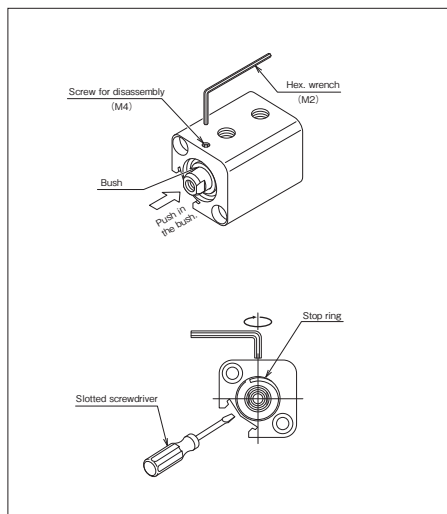
- To install the cylinder, use hex. socket head cap screws (JIS B1176, strength class 10.9 or more). Mount a bolt to every mounting hole ($\phi 20$ to $\phi 32$: 2 pcs, $\phi 40$ to $\phi 63$: 4 pcs)
- When the cylinder is used for output on the rod extension side, fabricate jigs to ensure that the rod can be screwed to the end face to prevent application of force to the threaded portion of the piston rod.
- Since side load (eccentric load) must not be applied to the piston rod, take care when fabricating mounting jigs.
- When operating the cylinder for the first time, take air bleeding without fail. After air bleeding, run the cylinder at a reduced pressure, and gradually increase the pressure to the working pressure.
- Since 35S-1 Series has no air vent plugs, take air bleeding through a part other than the cylinder (piping, etc.).
- When the cylinder body is tightened with mounting bolts, take care not to apply excessive tightening torque to the bolts because the cylinder body is made of an aluminum alloy. Tighten the bolts according to the specified torque shown in the following table.

Cylinder Mounting Bolt Tightening Torque

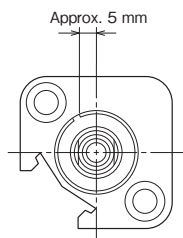
Bore	Mounting bolt		Tightening torque N · m
	Size	Number of bolts	
$\phi 20$	M6×1	2	5.9
$\phi 25$	M6×1	2	5.9
$\phi 32$	M6×1	2	5.9
$\phi 40$	M6×1	4	5.9
$\phi 50$	M8×1.25	4	14.0
$\phi 63$	M10×1.5	4	28.0

- When using mounting bolts, screw the bolts into mounting materials by 80% or more of the screw diameter. The material of the mounting materials must have strength equal to SS400.
- When using nuts to tighten mounting bolts, use steel nuts with a strength class of 6 or more. (However, DO NOT use the type-3 nuts.)
- When tightening the piston rod end screw of 35S-1D or 35S-1RD (double acting double rod), use the width across flats on the side on which the screw is tightened. Since the piston rod of a double rod type cylinder is fastened with screws, take care that rotating force at both ends of the piston rod is not applied to the rod.
- Screw the rod end thread (both female and male threads) into the mounting member by 80% or more of the screw diameter.

Notes on disassembly and reassembly



- Push in the bush.
- Screw the screw for disassembly (M4) using a hex. wrench (M2) until the stop ring end comes off the body groove.
- Remove the stop ring with a slotted screwdriver taking care not to damage the body and bush.
- Return the screw for disassembly, and remove the bush and piston rod.



Notes) When reassembling, mount the stop ring referring to the above figure.

- When disassembling and reassembling, take care not to damage the cylinder parts and seals.
- When disassembling, be sure to renew the seals.

General precautions

- Avoid applying impact load to the cylinder during use.
- Check the correlation between speed and allowable inertia force shown in "Selection materials" at the beginning of this catalog.
- If the cylinder is used in a place where vibration is generated, the hex. socket set screw for disassembly may come off the cylinder body and damage peripheral devices. To prevent this, remove the screw in advance, or apply a seal or the like to the screw port.
- When a 35S-1(R) cylinder with bores of 40 to 63 mm (single rod type) is used, take care not to bring any tool into contact with the bottom plate when installing the cylinder. Doing so may dislocate the bottom plate.
- Do not use the cylinder as a shock absorber.