

3.5 MPa hydraulic cylinder

- Switch Set Cylinders with bores from 32 mm to 100 mm are standardized.
- For magnetic proximity sensor, the selection of small, reed sensor or solid state sensor type is available. The solid state sensor, 2-wire 2-LED type, facilitates setting at the optimum position (green lighting). WR and WS type sensors are also mountable (semi-standard).
- U-seal is used as the standard piston seal.
- For cushion structure, the metal fitting system is adopted.



Standard Specifications

Type	Standard type		Switch Set	
Nominal pressure	3.5 MPa			
Maximum allowable pressure	4.5 MPa			
Proof test pressure	5 MPa			
Minimum operating pressure	0.2 MPa or less			
Piston seal	U seal	Slipper seal	U seal	Slipper seal
Working speed range	8 to 300mm/s	0.1 to 300mm/s	8 to 300mm/s	0.1 to 300mm/s
Working temperature range (ambient/fluid temperature)	-10 to +80°C (No freezing)		-10 to +70°C (No freezing)	
Structure of cushioning	Metal fitting system			
Adaptable fluid	Petroleum-based fluid (When using another fluid, refer to the table of fluid adaptability.)			
Tolerance for thread	JIS 6g/6H			
Tolerance of stroke	0 to 250mm ^{+1.0} ₀ 251 to 1000mm ^{+1.4} ₀ 1001 to 1800mm ^{+1.8} ₀			
Mounting style	SD·LA·LB·FA·FB·CA·CB·TA·TC			
Accessories	Boots	Standard: Nylon tarpaulin Semi-standard: Chloroprene, Conex		
	Rod end attachments	Rod eye (T-end), Rod clevis (Y-end) with pin, Floating joint (F-end) (φ32 to φ100)		
	Others	CB bracket, TA/TC bracket		

Standard Stroke Range

Unit: mm

Bore Type	Standard type	
	Standard type	Switch Set
φ32·φ40	1000	1000
φ50·φ63	1200	1200
φ80	1600	1600
φ100	1600	1600
φ125·φ160	1800	—

- The above strokes indicate the maximum available strokes for the standard type.
- For the rod buckling, check with the buckling chart in the selection materials. Contact us for longer strokes.

Cushion Stroke Length

Unit: mm

Bore	Cushion stroke (Cushion ring length)
φ32 to φ63	16
φ80 to φ125	20
φ160	23

- The cushion stroke lengths in case of cylinders used up to the stroke end.
- In the case that a cylinder is not used up to the stroke end, and it is stopped 5 mm or more before the stroke end, the cushioning effect will be weakened. In such a case, consult us.

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

The 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.

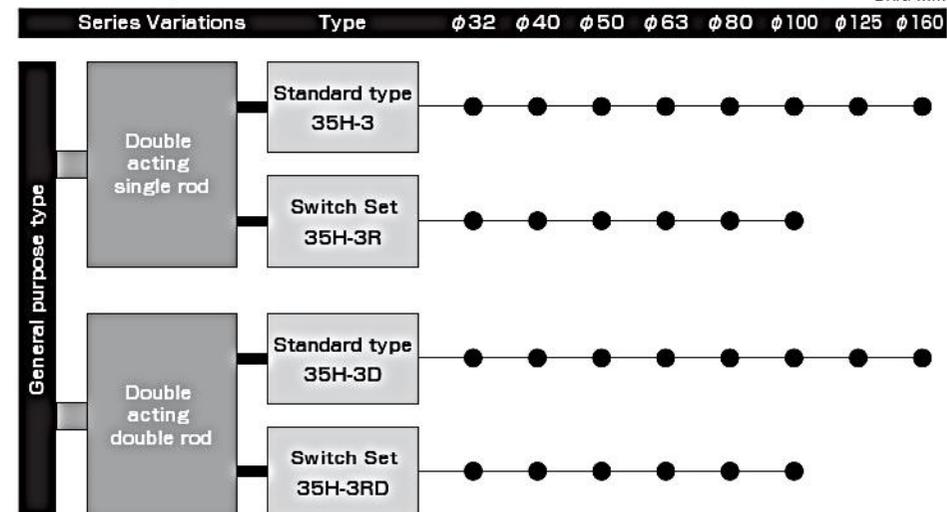
Minimum operating pressure

The minimum pressure that a cylinder placed horizontally without a load can work.

- Notes
- The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.
 - The cylinder body is not resistant to cutting oil.
 - Conex, material of the boots, is the registered trademark of Teijin Limited.
 - For the internal structure, refer to the sectional drawings at the end of this catalog.
 - Slipper seal is the registered trademark of Nippon Valqua Industries, Ltd.

Product Lineup

Unit: mm



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

Double Acting Single Rod



Standard type(35H-3)



Switch Set(35H-3R)

Double Acting Double Rod



Standard type(35H-3D)



Switch Set(35H-3RD)

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
1 Nitrile rubber	○	○	×	○	○
3 Fluorocarbon	○	×	○	○	○
6 HNBR	○	⊗	×	⊗	⊗
8 Slipper seal	○	○	×	○	○

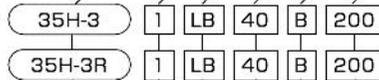
- Notes
1. ○: Applicable X: Inapplicable
 2. The ⊗-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.
 3. Slipper seal is the registered trademark of Nippon Valqua Industries, Ltd.

How to order

General Purpose Type

The item enclosed by broken line needs not to be entered, if unnecessary. ■ Semi-standard specification

Standard type



Switch Set



Double acting single rod
 35H-3 : Standard type
 35H-3R : Switch Set
 Double acting double rod
 35H-3D : Standard type
 35H-3RD : Switch Set

- 1 Nitrile rubber
- 3 Fluorocarbon
- 6 HNBR
- 8 Slipper seal

Mounting style

Standard type : $\phi 32$ to $\phi 160$
 Switch Set : $\phi 32$ to $\phi 100$

- B With cushions on both ends
- R With cushion on the rod side
- H With cushion on the cap side
- N No cushion

Cylinder stroke (mm)

- J Nylon tarpaulin
- JN Chloroprene
- JK Conex

With bracket
 Applicable mounting styles
 CB style, TA style, TC style

- T Rod eye (T-end)
- Y Rod clevis (Y-end)
- F Floating joint (F-end)

Sensor quantity (1, 2, to n)

Sensor symbol
 Note) Select applicable sensors out of the sensor list.

- Notes on ordering Switch Set
- When no sensor is required, specify 0 for the sensor symbol and the sensor quantity.
- Sensors are not mounted on cylinders at delivery.

Mounting Style

SD SD style (basic style)

FA FA style (rod flange)

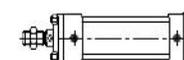
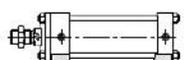
CB CB style (cap clevis)



LA LA style (side lugs)

FB FB style (cap flange)

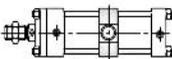
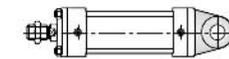
TA TA style (rod trunnion)



LB LB style (end angles)

CA CA style (cap eye)

TC TC style (intermediate trunnion)



Sensor List

■ Semi-standard

Type	Sensor symbol	Load voltage range	Load current range	Maximum 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 AC:20 mA or less	2VA	None	None	4-pin connector type, Rear wiring	0.5m	
	AK AX11ACE	AC:5 to 120V	5 to 20mA					5m	
	AL AX11BCE	DC:5 to 30V	5 to 40mA	1.5W	Provided	LED (Lights in red when sensing)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm, Rear 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	
	S SR405	AC:80 to 220V	2 to 300mA	30VA	Provided	Neon lamp (Lights when not sensing)	0.5 mm ² , 2-core, outer dia. $\phi 6$ mm, Rear wiring	5m	
	5 WR505	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	
7 WR505F	5m								
6 WR515	5m								
Solid state sensor	BE AX201CE-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	1.5m	
	BF AX205CE-1							5m	
	CE AX211CE-1							1.5m	
	CF AX215CE-1							5m	
Cutting oil proof type	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	
	RB AZ205WCE							5m	
	RE AX215WCE							5m	
	RF AZ215WCE							5m	
Solid state sensor (DC conformal)	2 WS215-1	DC:10 to 30V	5 to 20mA	—	Provided	LED (2-LED type in red/green)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	5m	
	4 WS215-1F							5m	
	3 WS225-1							5m	
Solid state sensor (DC conformal)	CT AX211CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (2-LED type in red/green)	0.3 mm ² , 2-core, outer dia. $\phi 4$ mm Rear wiring	1.5m	
	CU AX215CE-1							5m	
	CV AX21BCE-1							0.5m	
	CW AZ211CE-1							1.5m	
	CX AZ215CE-1							5m	
	CY AZ21BCE-1							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 AX135CE is a B contact. When the piston is detected, the sensor contact turns off (the lamp turns on).
 ● For handling of sensors, be sure to read the sensor specifications at the end of this catalog.
 ● 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 sensor

Cord type



Connector type



SR type sensor



Cutting oil proof type

WR/WS type sensor



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

- 5 WR505 The sensor and straight box.
- 2 WS215-1 The connector (F-SB) are combined (the flexible tube (F-0.5: 4.8 m) is required).
- 7 WR505F The flexible tube (F-0.5: 4.8 m) is attached to the sensor and straight box connector (F-SB).
- 4 WS215-1F

Standard Stroke Range

Unit: mm

Type	Bore	
	Standard type	Switch Set
φ32-φ40	1000	1000
φ50-φ63	1200	1200
φ80	1600	1600
φ100	1600	1600
φ125-φ160	1800	—

- The above strokes indicate the maximum available strokes for the standard type.
- For the rod buckling, check with the buckling chart in the selection materials. Contact us for longer strokes.

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
1] Nitrile rubber	○	○	×	○	○
3] Fluorocarbon	○	×	○	○	○
6] HNBR	○	◎	×	◎	◎
8] Slipper seal	○	○	×	○	○

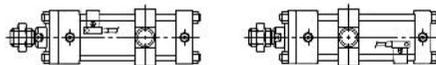
- Notes) 1. ◎○: Applicable X: Inapplicable
 2. The ◎-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.
 3. Slipper seal is the registered trade mark of Nippon Valqua Industries, Ltd.

Sensor Mountable Minimum Stroke

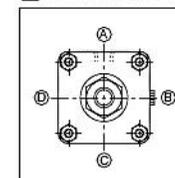
Unit: mm

Bore mm	Mounting style		Styles other than TC						TC style					
	Sensor quantity		With one sensor			With two sensors			With one sensor			With two sensors		
	Sensor type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	
φ32		25	55(40)	35	25	55(40)	35	55	85(70)	65	105	165(140)	130	
φ40		25	55(40)	35	25	55(40)	35	55	85(70)	65	105	165(140)	130	
φ50		25	55(40)	35	25	55(40)	35	55	85(70)	65	105	165(140)	130	
φ63		20	55(40)	35	20	55(40)	35	55	85(70)	65	105	165(140)	130	
φ80		20	55(40)	35	20	55(40)	35	55	85(75)	70	105	165(145)	135	
φ100		20	55(40)	35	20	55(40)	35	60	90(80)	75	110	165(150)	140	

- Notes) • For the TC style with one sensor, the cylinder strokes when the TC accessory is positioned at the place other than the center (as shown in the right figures) are shown in the table.
 • For the minimum dimension PH of TC style for mounting sensor, refer to the dimensional drawings of TC style.
 • The parenthesized values in the WR/WS type column are the minimum strokes in case of WR515 or WS225-1.



Standard specifications



- With both ends cushions
- Port position A, cushion valve position B

Change of port and cushion valve positions

The standard port position is A, and the standard cushion valve position is B. When modifying the positions, enter the symbol shown in the dimensional drawings.

Example) 35H-3R 1LB50B100—B C AH2

Port position(A, B, C, D) Cushion valve position(A, B, C, D)

- For the TA style, the standard port position and cushion valve position are A and C on the rod side and A and B on the cap side.
- In case that the cushion is not equipped, the cushion valve position is "O".

Lock Nut Part Number

Bore (mm)	Part number
φ32	LNA-12F-H
φ40	
φ50	LNA-18F-H
φ63	
φ80	LNA-24F-H
φ100	LNA-30F-H
φ125	LNA-42F-H
φ160	LNA-48F-H

★ The semi-standard ordering system

The following contents can be easily specified using the semi-standard symbols and specification symbols (position/dimension/material symbols).



Order contents	① Semi-standard symbol	Position		Dimension		Material		
		② Symbol	Description	③ Symbol	Description	④ Symbol	Description	
■ Tie rods extension Notes 1) Tolerance of dimension BB is about 2 mm due to elongation by tightening. When precise dimension BB is required, specify the value. 2) For the LB or LC style, only upper two tie rods (on the side opposite to the accessory side) can be extended. For flange or clevis style, four tie rods on the side without the accessory can be extended.	STD	TD-RS Rod side	BB-□□ □□ is a desired dimension BB of up to 70 mm.	—	—	—	—	
■ Hard chrome plated on the inside of cylinder tube (Standard style: iron tube only) Chrome plating Note) Consult us for any special thickness of chrome plating other than 0.02 mm.	STB	TD-HS Cap side		—	BG-0.02	Plating thickness 0.02 mm	—	—
	■ Stainless steel (SUS) piston rod Rod: SUS Note) Consult us for any special requirement other than material SUS304 or 0.02 mm thickness of chrome plating.	SPR		TD-BS Both sides	—	—	PR-10	Material: SUS304 Plating thickness 0.02mm
■ Additional port of bushing Bushing Specify this size. Notes 1) Specify the reduced port diameter after mounting a bushing. 2) For reduction by more than two steps by using a bushing, consult us.	PBS	—	—	RC-1.00 RC-2.00 RC-3.00 RC-4.00	Rc1/8 Rc1/4 Rc3/8 Rc1/2	—	—	
■ Change of port and cushion valve positions on the cap side Note) □□ indicates the port and cushion valve positions on the cap side.	PPC	PC-□□	—	—	—	—	—	
■ Water-glycol working fluid Notes 1) Iron tubing (standard type) is plated with hard chrome and tested with water-glycol fluid. 2) Stainless steel tubing (sensor type) is not plated in conformity with the standard and tested with water-glycol fluid.	FWF	—	—	—	—	WF-WG	WF-WG: Water-glycol fluid	
■ Intermediate trunnion location change (dimension PH) 	MTC	—	—	TCPH-□□	□□ is a new dimension.	—	—	

Weight Table

Unit: kg

Bore mm	Basic weight (SD style)		Additional weight per mm of stroke		Mounting accessory weight								Bracket weight		Rod end attachment weight		
	Standard type (single rod)	Double rod type	Standard type (single rod)	Double rod type	LA	LB	FA	FB	CA	CB	TA	TC	CB bracket	TA/TC bracket	Rod eye (T-end)	Rod clevis (Y-end) w/ pin	Floating joint (F-end)
φ32	1.17	1.53	0.0041	0.0055	0.12	0.19	0.17	0.24	0.12	0.12	0.051	0.30	0.46	0.45	0.15	0.20	0.19
φ40	1.77	2.21	0.0045	0.0059	0.19	0.23	0.25	0.32	0.18	0.15	0.193	0.48	0.66	1.06	0.16	0.34	0.19
φ50	2.56	3.27	0.0078	0.0102	0.28	0.36	0.41	0.50	0.26	0.30	0.193	0.56	0.66	1.06	0.22	0.35	0.41
φ63	3.98	5.00	0.0094	0.0118	0.29	0.46	0.56	0.64	0.40	0.38	0.193	0.70	0.66	1.06	0.22	0.35	0.41
φ80	7.55	9.31	0.0122	0.017	0.66	0.86	1.40	1.56	1.02	0.82	0.193	1.15	1.97	1.50	0.76	1.01	1.41
φ100	11.44	14.27	0.020	0.028	0.96	1.60	1.96	2.25	1.28	1.38	0.405	3.10	3.60	4.60	1.30	1.76	2.68
φ125	18.58	24.11	0.033	0.044	1.42	2.24	3.76	4.24	4.24	4.42	0.576	4.80	8.02	6.72	3.19	4.36	—
φ160	35.03	45.41	0.049	0.066	2.60	5.68	7.76	8.78	8.05	8.91	1.125	6.10	8.84	13.60	4.29	5.82	—

Note) Weight of one set of two TA/TC brackets

Sensor Additional Weight

Unit: kg

Bore mm	AX/AZ type			SR type	WR/WS type
	Cord length 1.5 m	Cord length 5 m	With connector	Cord length 5 m	
φ32	0.05	0.13	0.04	0.22	0.5
φ40					
φ50					
φ63					
φ80					
φ100	0.07	0.14	0.06		

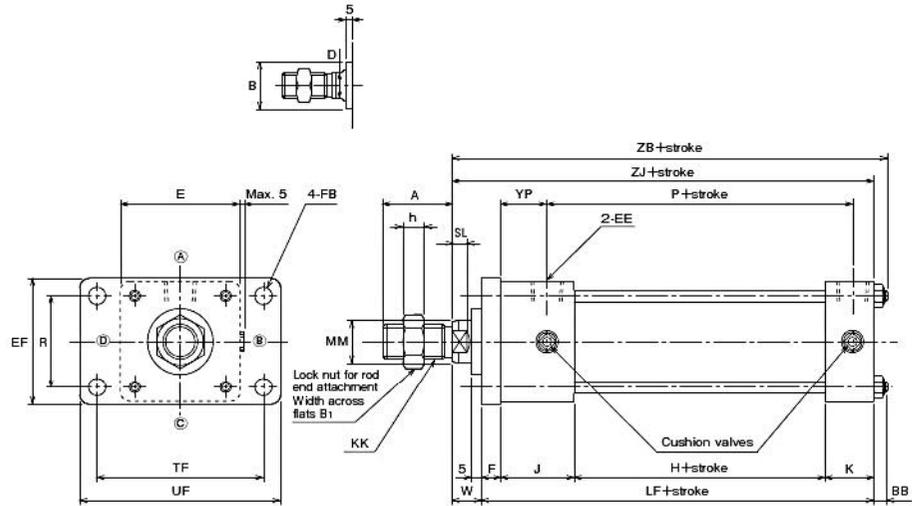
Calculation formula Cylinder weight (kg)=basic weight+(cylinder stroke (mm)× additional weight per mm of stroke)+(sensor additional weight×sensor quantity)+mounting accessory weight+ bracket weight+rod end attachment weight

Calculation example 35H-3R, bore φ80, cylinder stroke 200 mm, 2 pcs of AX215 (cord length 5 m), LA style
 $7.55+(200 \times 0.0122) + (0.13 \times 2) + 0.66 = 1.088 \text{ kg}$

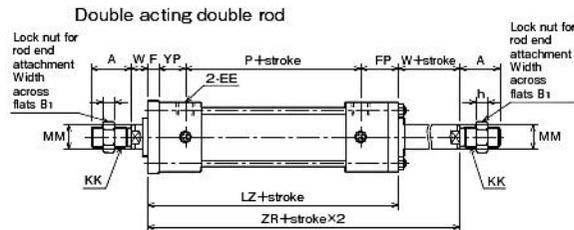
35H-3/TH35 Bore is available.

FA

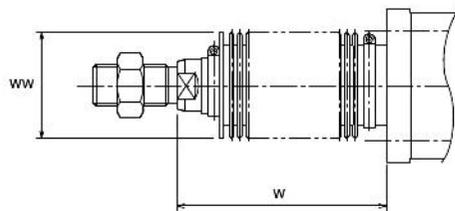
35H-3 1 FA Bore B Stroke



● When mounting a sensor, refer to the dimensional drawings of Switch Set.



35H-3/TH35 Bore



Nylon tarpaulin	φ32 to φ63	1/3 stroke+X
Chloroprene	φ80 to φ160	1/4 stroke+X
Conex	φ32 to φ63	1/2 stroke+X
	φ80 to φ160	1/3 stroke+X

● If the calculated value has a fractional part, round it up.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

Notes) ● Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
 ● The boots have been mounted at our factory prior to delivery.
 ● Conex is the registered trademark of Teijin Limited.

Dimensional Table

Symbol	A	B	B ₁	BB	D	E	EE	EF	F	FB	FP	H	h	J	K
φ 32	24	φ 30	19	7	13	□ 44	Rc1/4	47	10	φ 7	34	30	7	38	25
φ 40	24	φ 30	19	7	13	□ 50	Rc3/8	52	10	φ 7	34	30	7	38	25
φ 50	36	φ 34	24	7	19	□ 62	Rc3/8	65	10	φ 9	34	30	11	38	25
φ 63	36	φ 34	24	9	19	□ 76	Rc3/8	76	10	φ 9	34	33	11	38	25
φ 80	48	φ 42	32	10	24	□ 94	Rc1/2	95	16	φ 12	43	31	14	45	32
φ 100	60	φ 50	41	12	30	□ 114	Rc1/2	115	16	φ 14	43	31	17	45	32
φ 125	84	φ 60	60	16	41	□ 138	Rc1/2	138	20	φ 18	47	37	22	45	32
φ 160	96	φ 72	70	19	50	□ 178	Rc3/4	178	25	φ 22	54	42	26	50	38

Symbol	KK	LF	LZ	MM	P	R	SL	TF	UF	W	YP	ZB	ZJ	ZR
φ 32	M12×1.25	103	126	φ 16	58	33	7.5	58	72	15	24	125	118	141
φ 40	M12×1.25	103	126	φ 16	58	36	7.5	70	84	15	24	125	118	141
φ 50	M18×1.5	103	126	φ 22	58	47	7.5	86	104	15	24	125	118	141
φ 63	M18×1.5	106	129	φ 22	61	56	7.5	98	116	15	24	130	121	144
φ 80	M24×2	124	153	φ 28	67	70	11	119	143	19	27	153	143	172
φ 100	M30×2	124	153	φ 36	67	84	14	140	166	23	27	159	147	176
φ 125	M42×2	134	167	φ 45	73	110	17	176	212	25	27	175	159	192
φ 160	M48×2	155	192	φ 56	84	142	19	225	270	29	29	203	184	221

● The tolerance of B is f9, and that of MM is f8.

With Boots

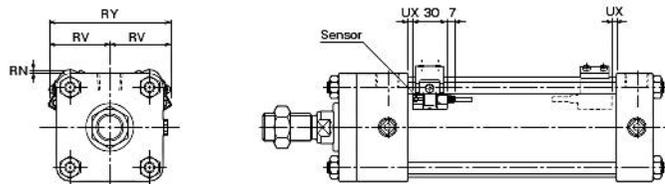
Symbol	WW	X
φ 32	φ 36	50
φ 40	φ 40	50
φ 50	φ 45	55
φ 63	φ 45	55
φ 80	φ 60	65
φ 100	φ 71	65
φ 125	φ 80	65
φ 160	φ 100	70

CAD/DATA
is available. 

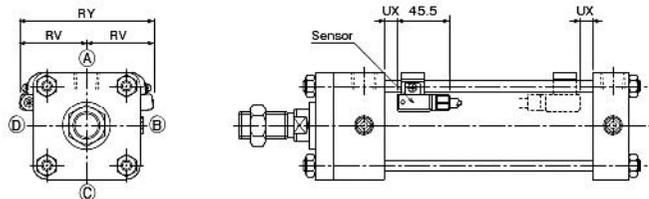
Switch Set

35H-3R 1

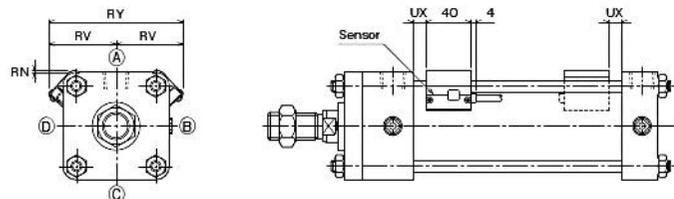
- AX1** (Reed sensor)·AX2**, AZ2** (Solid state sensor)



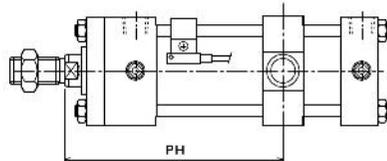
- WR type (Reed sensor), WS type (Solid state sensor/2-wire, 2-LED type) (Cutting oil proof type)



- SR type (Reed sensor)



- Minimum dimension PH of Switch Set Cylinder



- The minimum dimension PH of a Switch Set Cylinder is obtained when the sensor is mounted on the rod side and the trunnion is moved as close to the rod as possible as shown above.

When boots are provided, dimension W changes.
In such a case, specify dimension PH.

Dimensional Table

Symbol Bore	RN			RV			RY		
	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type
φ 32	7	5	5	34	37	37	68	74	74
φ 40	5	5	4	36	41	40	72	82	80
φ 50	4	3	4	41	46	45	82	92	90
φ 63	3	3	4	47	51	51	94	102	102
φ 80	3	1	3	54	59	59	108	118	118
φ 100	4	1	1	63	68	68	126	136	136

Symbol Bore	UX				
	Reed sensor			Solid state sensor	
	AX1**	SR type	WR type	AX2**·AZ2**	WS type
φ 32	5	0	2	5	5
φ 40	5	0	2	5	5
φ 50	5	0	2	5	5
φ 63	6	1	3	6	6
φ 80	4	0	2	4	4
φ 100	4	0	2	4	4

Note) Dimension UX indicates the optimum sensor mounting position for detection of stroke end.

Sensor Bore	Minimum PH		
	AX/AZ type	WR/WS type	SR type
φ 32	133	163	143
φ 40	133	163	143
φ 50	133	163	143
φ 63	136	166	146
φ 80	149	180	164
φ 100	155	191	170

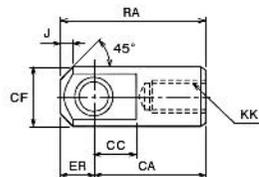
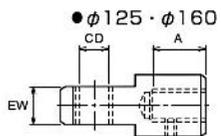
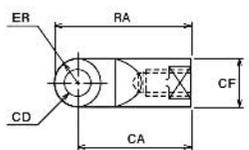
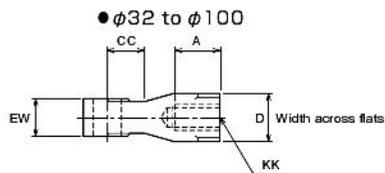
Operating Range and Hysteresis

Bore	Reed sensor						Solid state sensor			
	AX1**		WR type		SR type		AX2**·AZ2**		AX2**·W-AZ2**·W-WS type	
	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis
φ 32	5 to 10	1 or less	6 to 9	2 or less	7 to 10	3 or less	3 to 6	1 or less	8 to 13	2 or less
φ 40										
φ 50										
φ 63										
φ 80										
φ 100	7 to 11	8 to 10	9 to 12	3 to 7	10 to 14					
φ 80	8 to 12	9 to 11		4 to 7	13 to 17					

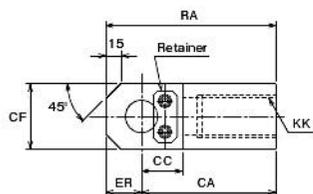
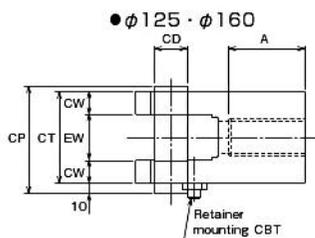
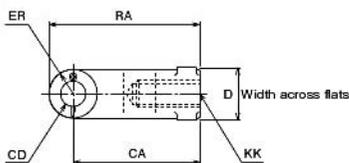
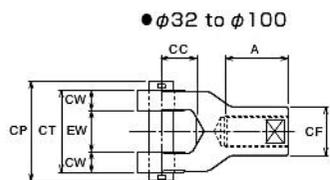
CAD/DATA
35H-3/TH35 [Bore] is available.

Rod End Attachment

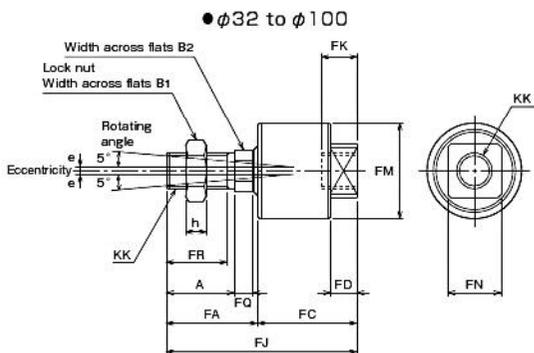
● Rod eye (T-end)



● Rod clevis (Y-end) with pin



● Floating joint (F-end)



Notes ● The insertion of the floating joint into the socket shall not equal or exceed the dimension of screw diameter. (Return the joint one or two turns after it gets into contact with the socket bottom, and fix it with a lock nut.) Excessive insertion can cause operation failure.
● DO NOT use together with CA, CS, CB, TA, and TC accessories.
● The lock nut is indispensable in using the floating joint. Please don't miss to order the lock nut with the floating joint.

Dimensional Table/Rod eye (T-end)

Symbol	Part number	A	CA	CC	CD	CF	D	ER	EW	J	KK	RA
φ 32	RTA-12-1-H	25	55	20	φ12H9	φ24	24	R12	16 ⁰ _{-0.07}	—	M12×1.25	67
φ 40	RTA-12-H	25	60	20	φ14H9	φ24	24	R12	20 ⁰ _{-0.1}	—	M12×1.25	72
φ 50	RTA-18-H	37	64	18	φ14H9	φ28	30	R14	20 ⁰ _{-0.1}	—	M18×1.5	78
φ 63												
φ 80	RTA-24-H	49	100	30	φ20H9	φ38	41	R19	32 ⁰ _{-0.1}	—	M24×2	119
φ 100	RTA-30-H	61	110	37	φ25H9	φ48	50	R24	40 ⁰ _{-0.1}	—	M30×2	134
φ 125	RTA-42-2-H	67	132	40	φ32H9	φ70	—	32	45 ⁰ _{-0.1}	15	M42×2	164
φ 160	RTA-48-1-H	78	150	45	φ36H9	φ79	—	36	50 ⁰ _{-0.1}	19	M48×2	186

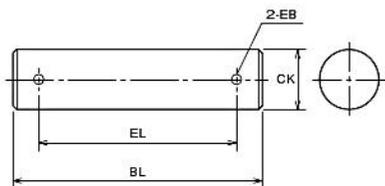
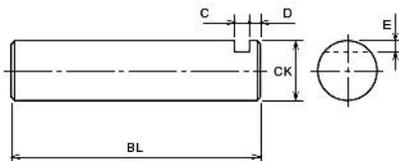
Dimensional Table/Rod clevis (Y-end) with pin

Symbol	Part number	A	CA	CC	CD	CF	CP	CT	CW	D	ER	EW	KK	RA
φ 32	RYA-12-2-H	25	55	20	φ12 ^{H9} _{B8}	φ24	46	32	8	24	R12	16 ^{+1.5} _{+0.5}	M12×1.25	67
φ 40	RYA-12-1-H	25	60	20	φ14 ^{H9} _{B8}	φ24	58	44	12	24	R12	20 ^{+1.5} _{+0.5}	M12×1.25	72
φ 50	RYA-18-H	37	64	18	φ14 ^{H9} _{B8}	φ28	58	44	12	30	R14	20 ^{+1.5} _{+0.5}	M18×1.5	78
φ 63														
φ 80	RYA-24-H	49	100	28	φ20 ^{H9} _{B8}	φ38	78	64	16	41	R19	32 ^{+1.5} _{+0.5}	M24×2	119
φ 100	RYA-30-H	61	110	35	φ25 ^{H9} _{B8}	φ48	94	80	20	50	R24	40 ^{+1.5} _{+0.5}	M30×2	134
φ 125	RYA-42-2-H	75	132	40	φ32 ^{H9} _{B8}	65	105	90	22.5	—	35	45 ^{+1.5} _{+0.5}	M42×2	167
φ 160	RYA-48-H	86	150	45	φ36 ^{H9} _{B8}	70	115	100	25	—	40	50 ^{+1.5} _{+0.5}	M48×2	190

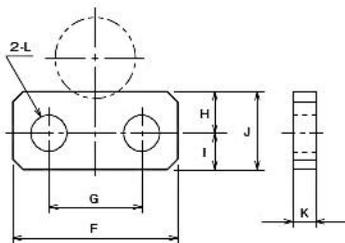
Dimensional Table/Floating joint (F-end)

Symbol	Part number	A	B ₁	B ₂	e	FA	FC	FD	FJ	FK	FM	FN	FQ	FR	h	KK
φ 32	RFH-12	24	19	13	1	33	36.5	11	69.5	13.5	φ32	19	7	20.5	7	M12×1.25
φ 40																
φ 50	RFH-18	35	24	19	1.5	46	46	13	92	16	φ40	24	8	31	11	M18×1.5
φ 63																
φ 80	RFH-24-2	46	32	24	2.5	62	67	18	129	24	φ64	36	12	41	14	M24×2
φ 100	RFH-30-2	58	41	32	2.5	78	83	21	161	30	φ76	46	14	52	17	M30×2

Parallel Pin

● $\phi 32$ to $\phi 100$ ● $\phi 125 \cdot \phi 160$ 

Retainer



Dimensional Table/Parallel pin

Symbol Bore	BL		C	CK	D	E	EB	EL		Nominal of split pin
	For Y-end	For CB						For Y-end	For CB	
$\phi 32$	46	46	—	$\phi 12$	—	—	$\phi 3$	37	37	3
$\phi 40$	58	58	—	$\phi 14$	—	—	$\phi 3$	49	49	3
$\phi 50$	58	66	—	$\phi 14$	—	—	$\phi 3$	49	57	3
$\phi 63$	58	66	—	$\phi 14$	—	—	$\phi 3$	49	57	3
$\phi 80$	78	78	—	$\phi 20$	—	—	$\phi 3$	71	71	3
$\phi 100$	94	94	—	$\phi 25$	—	—	$\phi 3$	87	87	3
$\phi 125$	105	105	6	$\phi 32$	4	5	—	—	—	—
$\phi 160$	115	115	6	$\phi 36$	4	7	—	—	—	—

● The tolerance of CK is f8.

Dimensional Table/Retainer

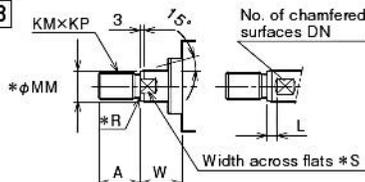
Symbol Bore	F	G	H	I	J	K	L	Retainer mounting bolt size
$\phi 125$	50	30	12	12	24	6	$\phi 10$	M8×1.25×16L
$\phi 160$	50	30	12	12	24	6	$\phi 10$	M8×1.25×16L

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 dimension. Specify only the semi-standard symbol.)

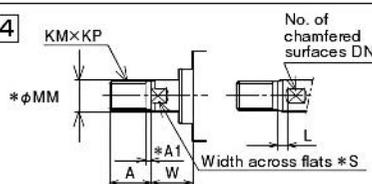
How to order **Series** **Model number** — × **Semi-standard symbol** **Dimension symbol** (Specify only when the dimension differs from the basic dimension.)
 └─ KM and KP need to be specified as a pair.

Example 1) **A53**



● Bore: 40 mm, rod end shape: A53, A=50, W=60, screw: M10X1.25, 2 surfaces chamfered, position of width across flats L=15
(Port and cushion positions: Standard AB)
35H+3R 1FA40B200-X A53
A=50, KM=10, KP=1.25, L=15, W=60

Example 2) **A54**



● Bore: 63 mm, rod end shape: A54, with basic dimensions
35H+3 2LB63B500-BD-X A54

Note) In 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)×2

Special Rod End Shapes

A00

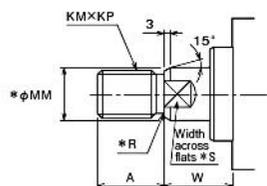


Table of Basic Dimensions

*Bore	A	KM	KP	*MM	*R	*S	W
φ 32	24	12	1.25	φ 16	1	13	15
φ 40	24	12	1.25	φ 16	1	13	15
φ 50	36	18	1.5	φ 22	1	19	15
φ 63	36	18	1.5	φ 22	1	19	15
φ 80	48	24	2	φ 28	1	24	19
φ 100	60	30	2	φ 36	1.6	30	23
φ 125	84	42	2	φ 45	1.6	41	25
φ 160	96	48	2	φ 56	1.6	50	29

A51

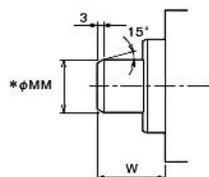


Table of Basic Dimensions

*Bore	*MM	W
φ 32	φ 16	15
φ 40	φ 16	15
φ 50	φ 22	15
φ 63	φ 22	15
φ 80	φ 28	19
φ 100	φ 36	23
φ 125	φ 45	25
φ 160	φ 56	29

- The *-marked dimensions are fixed.
- If it is necessary to change the fixed dimensions, consult us.

Special Rod End Shapes

A53

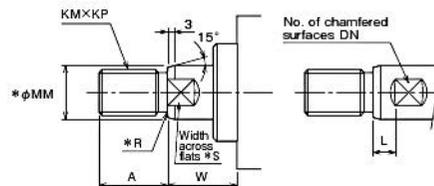


Table of Basic Dimensions

*Bore	A	DN	KM	KP	L	*MM	*R	*S	W
φ 32	24	2	12	1.25	0	φ 16	1	13	15
φ 40	24	2	12	1.25	0	φ 16	1	13	15
φ 50	36	2	18	1.5	0	φ 22	1	19	15
φ 63	36	2	18	1.5	0	φ 22	1	19	15
φ 80	48	2	24	2	0	φ 28	1	24	19
φ 100	60	2	30	2	0	φ 36	1.6	30	23
φ 125	84	2	42	2	0	φ 45	1.6	41	25
φ 160	96	2	48	2	0	φ 56	1.6	50	29

A54

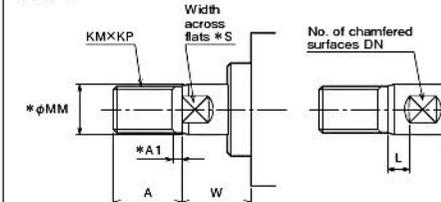


Table of Basic Dimensions

*Bore	A	A1	DN	KM	KP	L	*MM	*S	W
φ 32	24	3	2	12	1.25	0	φ 16	13	15
φ 40	24	3	2	12	1.25	0	φ 16	13	15
φ 50	36	4	2	18	1.5	0	φ 22	19	15
φ 63	36	4	2	18	1.5	0	φ 22	19	15
φ 80	48	5	2	24	2	0	φ 28	24	19
φ 100	60	5	2	30	2	0	φ 36	30	23
φ 125	84	5	2	42	2	0	φ 45	41	25
φ 160	96	5	2	48	2	0	φ 56	50	29

A55

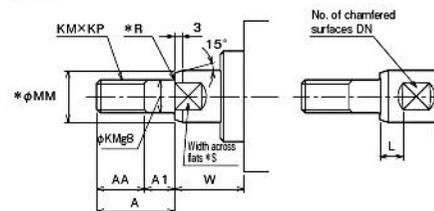


Table of Basic Dimensions

*Bore	A	AA	A1	DN	KM	KP	L	*MM	*R	*S	W
φ 32	22	12	10	2	8	1	0	φ 16	1.6	13	15
φ 40	22	12	10	2	8	1	0	φ 16	1.6	13	15
φ 50	34	20	14	2	14	1.5	0	φ 22	1.6	19	15
φ 63	34	20	14	2	14	1.5	0	φ 22	1.6	19	15
φ 80	44	30	14	2	20	1.5	0	φ 28	1.6	24	19
φ 100	55	35	20	2	24	2	0	φ 36	2	30	23
φ 125	65	45	20	2	30	2	0	φ 45	2	41	25
φ 160	83	63	20	2	42	2	0	φ 56	2	50	29

When changing dimension A1, change it to 10 or more.

A81

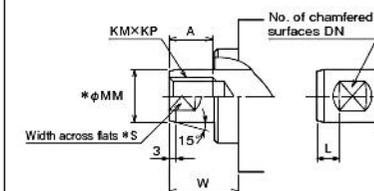


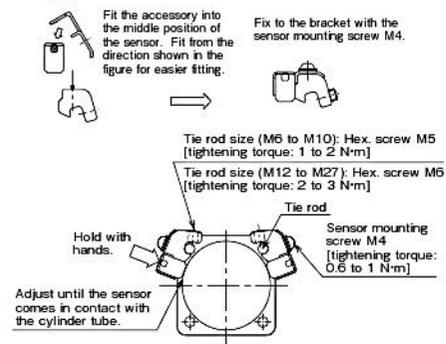
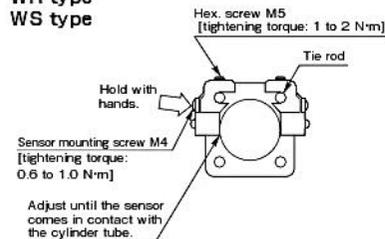
Table of Basic Dimensions

*Bore	A	DN	KM	KP	L	*MM	*S	W
φ 32	12	2	10	1.5	0	φ 16	13	15
φ 40	12	2	10	1.5	0	φ 16	13	15
φ 50	20	2	16	2	0	φ 22	19	15
φ 63	20	2	16	2	0	φ 22	19	15
φ 80	24	2	20	2.5	0	φ 28	24	19
φ 100	33	2	27	3	0	φ 36	30	23
φ 125	36	2	30	3.5	0	φ 45	41	25
φ 160	45	2	39	4	0	φ 56	50	29

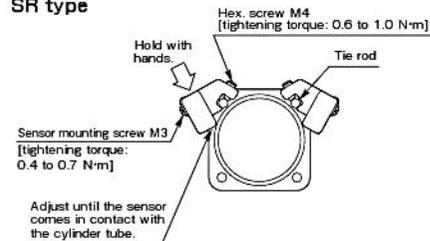
- The *-marked dimensions are fixed.
- The number of chamfered surfaces DN is 2 (standard) or 4.
- If it is necessary to change the fixed dimensions, consult us.

Setting method of sensor detecting position

AX type

WR type
WS type

SR type



1. Loosen the two hex. screws with a hex. wrench, and move them along the tie rod.
2. Adjust the detecting position (for the 2-LED type, the position where the green lamp lights up) 2 to 5 mm (about half of the operating range is appropriate) before the required position where the sensor indicator lamp starts to light up (ON). Then, gently hold the top of the sensor so that the cylinder tube contacts the detecting face of the sensor, and clamp the hex. screw to an appropriate tightening torque.

Note) Inappropriate tightening torque may cause the off-center of the sensor position.

3. The indicating lamp lights up when the sensor is set to the ON position.
4. Sensors can be mounted to any of four tie rods and on the most suitable position depending on the mounting space of the cylinder and wiring method.
5. Mount a sensor to the most suitable position to detect the stroke end with the "sensor mounting dimension" (dimension UX).

Notes on assembly

Tightening of tie rods

- DO NOT tighten only one tie rod at a time, but tighten them gradually in the order shown in the right diagram. Uneven tightening of the tie rods can cause operation failure or stick-slip.

Specified Tie Rod Tightening Torque Table

Bore mm	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ160
Tie rod thread	M6×1	M6×1	M6×1	M8×1.25	M10×1.25	M12×1.5	M16×1.5	M20×1.5
Tightening torque (N·m)	4.1	4.1	4.1	10	21	35	87	180

