

HQS2 Series

OPERATES AT 16MPa

BY SELECTING OPERATING PRESSURE AND USE FREQUENCY

★ COMPACT DESIGN HYDRAULIC CYLINDER IN INFINITE PURSUIT OF COST PERFORMANCE

WE PRESENT "RELIABILITY"

● ALUMINUM BODY, COMPACT DESIGN HYDRAULIC CYLINDER

Conforms to JIS B8367-6. Fatigue test classification A1

● 8 TYPES OF BORE SIZE, 20mm, 25mm, 32mm, 40mm, 50mm, 63mm, 80mm and 100mm

φ20, φ25, φ32, φ40, φ50, φ63, φ80, and φ100

● ROD GLAND CONSTRUCTED OF SPECIAL COPPER ALLOY

Improves wear resistance.

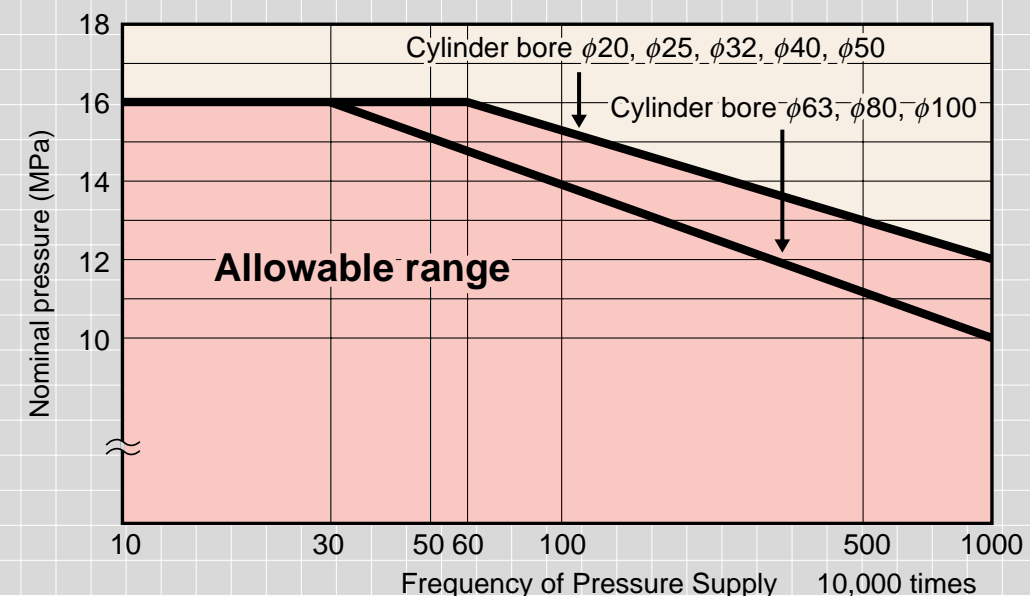
● NEW DESIGN SWITCH BRINGS MAINTAINABILITY

COMMON TO AND USABLE FOR ALL TIE ROD END TYPE SWITCH SET CYLINDERS

- Switch can be installed either on the right or left.
- Switch slides freely.
- Cord can be extended to the rear or to the top.
- Switch conforming to CE mark is available.



NOMINAL PRESSURE DIAGRAM OF HQS2



How to view the diagram

- Frequency of pressure supplied to the cylinder is taken along X-axis. (Horizontal)
- Move up vertically from the frequency, and the pressure where the line crosses the limit line of each bore size indicates the pressure (nominal pressure) at which the cylinder can be used up to the corresponding frequency of pressure supply. (Rupture probability 1%)

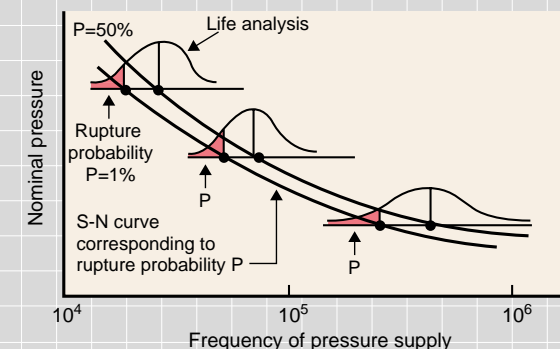
Testing procedure

In calculating the nominal pressure, fatigue test is carried out with reference to "Guideline for selecting and using hydraulic cylinder, Annex 2 Strength testing procedure of hydraulic cylinder" of JFPS1014: 2002 (Japan Fluid Power Industrial Association Standard).

In concrete, pressure is applied to several tens of supply cylinders repeatedly, the frequency of rupture is measured and processed statistically to obtain the nominal pressure.

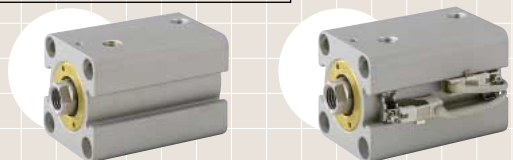
How to determine the nominal pressure

- Fatigue life is determined by material fatigue test described in testing procedure, and the value obtained by processing such data statistically.
 - Life distribution is obtained from material fatigue test data, of which the value of rupture probability 1% is used for base of nominal pressure diagram.
- [Note] No point of 0% exists in terms of statistical method.



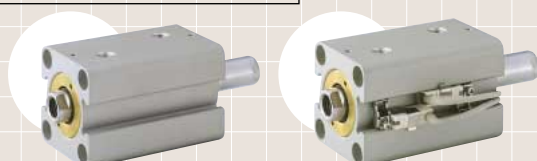
Compatible with single rod type and double rod type

Double acting single rod



HQS2 · HQSW2 HQS2R · HQSW2R

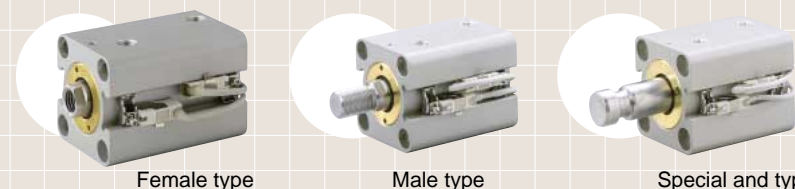
Double acting double rod



HQS2D · HQSW2D HQS2RD · HQSW2RD

- Universal type and cutting oil resistant specifications have the same dimension.
- Installation dimensions are the same for both standard type and switch set type.

For rod end specifications, male and female thread types are available as well as various special end types.



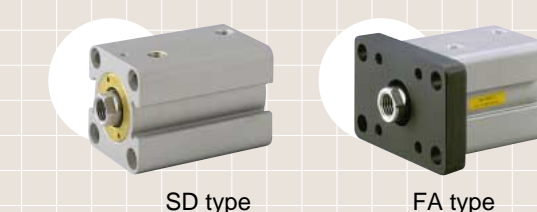
Female type Male type Special end type

Contact switch, non contact switch, and cutting oil of resistant types are also available as standard.



- Cutting fluid proof type
Packing of dust wiper dedicated to cutting oil resistant type is available for cutting oil resistant type.

Wide selection of support hardware SD, FA, FB, and LD type



SD type FA type

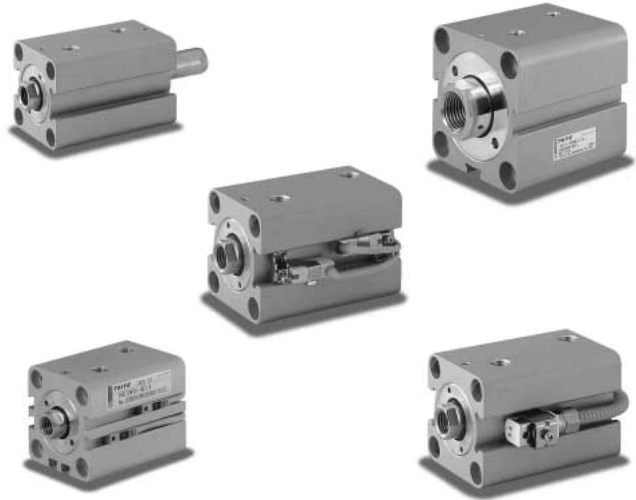


LD type

- Stroke
5 to 100 mm (depends on bore)

OPERATES AT UP TO 16MPa, DEPENDING ON FREQUENCY OF PRESSURE SUPPLY

- Wide selection of models are available of cylinder bore $\phi 20$ to $\phi 100$.
- Light-weight, compact design hydraulic cylinder with bodies constructed of special aluminum alloy.
- Cost-effective selection is available based on frequency of operation and operating pressure.
- Aluminum body, compact design hydraulic cylinder in pursuit of cost performance.
- Rod gland constructed of special copper alloy for improved wear resistance.



Standard Specifications

Types	Specifications of General Purpose	Cutting Fluid Proof Types
Nominal pressure (According to nominal pressure diagram)	$\phi 20, \phi 25, \phi 32, \phi 40, \phi 50$ 16MPa (Fatigue endurance frequency 6×10^5) 12MPa (Fatigue endurance frequency 1×10^7)	
	$\phi 63, \phi 80, \phi 100$ 16MPa (Fatigue endurance frequency 3×10^5) 10MPa (Fatigue endurance frequency 1×10^7)	
Proof test pressure	20MPa	
Minimum working pressure	0.3MPa	
Operating speed range	8 - 100mm/s	
Temperature range (Ambient temperature and oil temperature)	Standard type -10 - +70°C	
	Switch set AX · AZ types · T type -10 - +70°C WR · WS types -10 - +60°C (at non-freezing condition)	
Structure of cushioning	None	
Adaptable working oil	Petroleum-based fluid (For other working oil, refer to the table of working oil adaptability)	
Tolerance of thread	JIS 6H/6g	
Tolerance of stroke	0 - 0.8mm	
Mounting type	SD, LD, FA, FB	
Rod end thread	Female and male thread	
Suitable switche for switch set	($\phi 20, \phi 25$) T type HQS2R: ($\phi 32 - \phi 100$) AX · AZ type WR · WS type	HQSW2R: WR · WS type

Terminologies

Nominal pressure

Operating pressure which guarantees performance under specified condition. Specified condition means our fatigue test with reference to "Guideline for selecting and using hydraulic cylinder, Annex 2 Strength testing procedure of hydraulic cylinder", JFPS 1014:2002 (Japan Fluid Power Industrial Association Standard)

Proof test pressure

Static pressure used for inspection which does not cause abnormality when held for specified time, and does not deteriorate cylinder performance when returned to the atmospheric pressure.

Minimum working pressure

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

Notes) • This cylinder is not equipped with an air bleeder.

- Since lateral load (eccentric load) cannot be applied to the piston rod, carefully adjust it after rod end attachment.

Double acting single-rod



Standard type
(HQS2 · HQSW2)



Switch set
(HQS2R · HQSW2R)

- Cylinder dimensions are all the same for both general purpose type and cutting fluid proof type.

Double acting double-rod



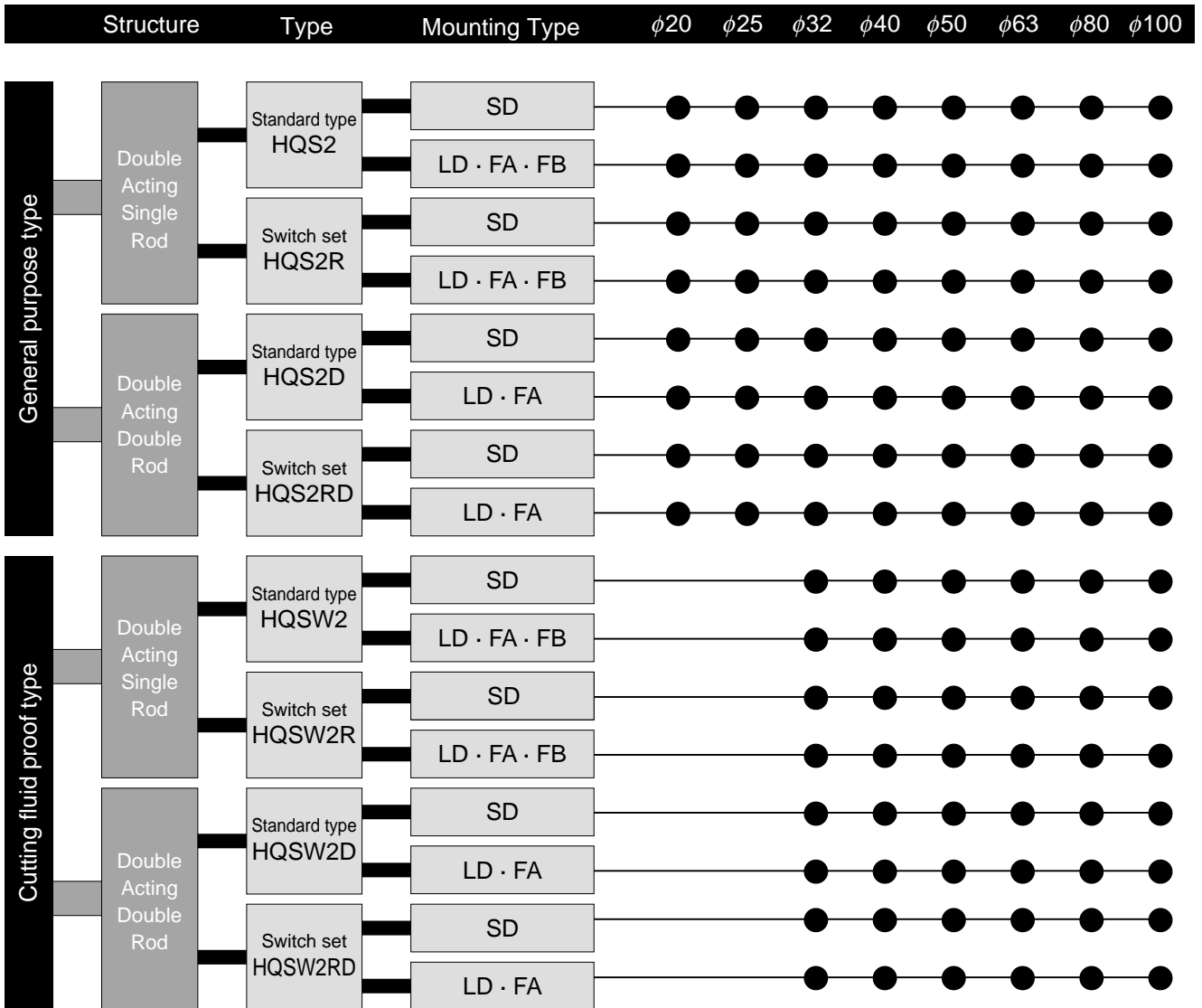
Standard type
(HQS2D · HQSW2D)



Switch set
(HQS2RD · HQSW2RD)

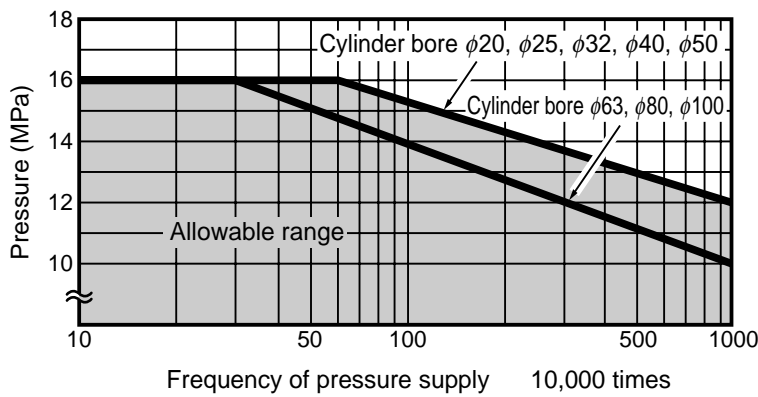
Lines

Unit: mm



Notes • Specify switch set type as above when use switch on cylinder.
Switch can not use on Standard type.

Nominal pressure diagram



How to read the diagram

- Frequency of pressure supplied to the cylinder is taken along X-axis.
- Move up vertically from the frequency, and the pressure where the line crosses the limit line of each bore indicates the pressure (nominal pressure) at which the cylinder can be used up to the corresponding frequency of pressure supply. (Rupture probability 1%)

General purpose type (Bore $\phi 20 - \phi 100$)

Dotted lines for types and symbols are not written when unnecessary.

■ Semi-standard components

• Standard type **HQS2**

• Switch set **HQS2R**

Series ①: HQS2, HQS2R

Packing material ②: 6, SD, 40

Mounting type ③: N

Cylinder bore ④: 50

Cushion type ⑤: T

Stroke ⑥: G

Thread type ⑦: AH

Port specification ⑧: 2

Switch code ⑨: -

Switch quantity ⑩: -

Lock nut ⑪: -

Air vent ⑫: -

Double acting single-rod

HQS2 : Standard type
HQS2R : Switch set

Double acting double-rod

HQS2D : Standard type
HQS2RD : Switch set

③ Fluoric rubber
⑥ Hydrogenated nitrile rubber

Note) The seal of bore size 20mm & 25mm is only Nitrile rubber for high temperature.

SD SD type, basic type
LD Foot type
FA Head flange mounting
FB End cap flange mounting

Cylinder bore (mm)
 $\phi 20 \cdot \phi 25 \cdot \phi 32 \cdot \phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100$

Without cushion

Cylinder stroke (mm)

None Rc thread
G G thread ($\phi 32 - \phi 100$)

Note) G thread is only for SD Mounting.

- Female thread (no code for the standard type)
T Male thread

Note) Double-rod and male thread means both sides are male thread as standard.

None Without air vent (Standard)
V With air vent (Made-to-order: bore 32mm to 100mm)

L with one lock nut

Note) Available only for male thread type
Additional order is required when 2 or more lock nuts are necessary.

Switch quantity (1 or 2)

Switch code
Note) Select applicable switches out of the Switch List.

⚠ Notes on order for switch set

- If a switch is unnecessary, enter the switch symbol ⑨ and the switch quantity ⑩ of 0.
- When ordering a switch set, switches are not mounted to cylinders at delivery.

Note) When the switch is retrofitted to the standard type, the switch does not work.

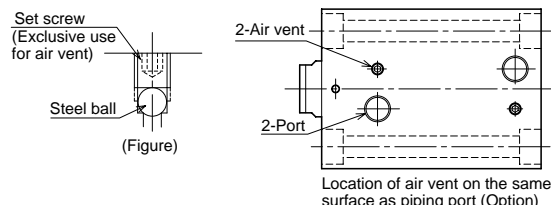
Adaptability of Working Oil to Packing Material

Packing Material	Adaptable Working Oil				
	Petroleum-based fluid	Water-glycol fluid	Phosphoric ester fluid	W/O Water in oil fluid	O/W Oil in water fluid
③ Fluoric rubber	○	×	○	○	○
⑥ Hydrogenated nitrile rubber	○	◎	×	◎	◎

Notes) 1. The ◎ and ○ - marked items are applicable, while the × - marked items are inapplicable.
2. The ◎ - marked items are the recommended packing materials in case of giving the first priority to abrasion resistance.

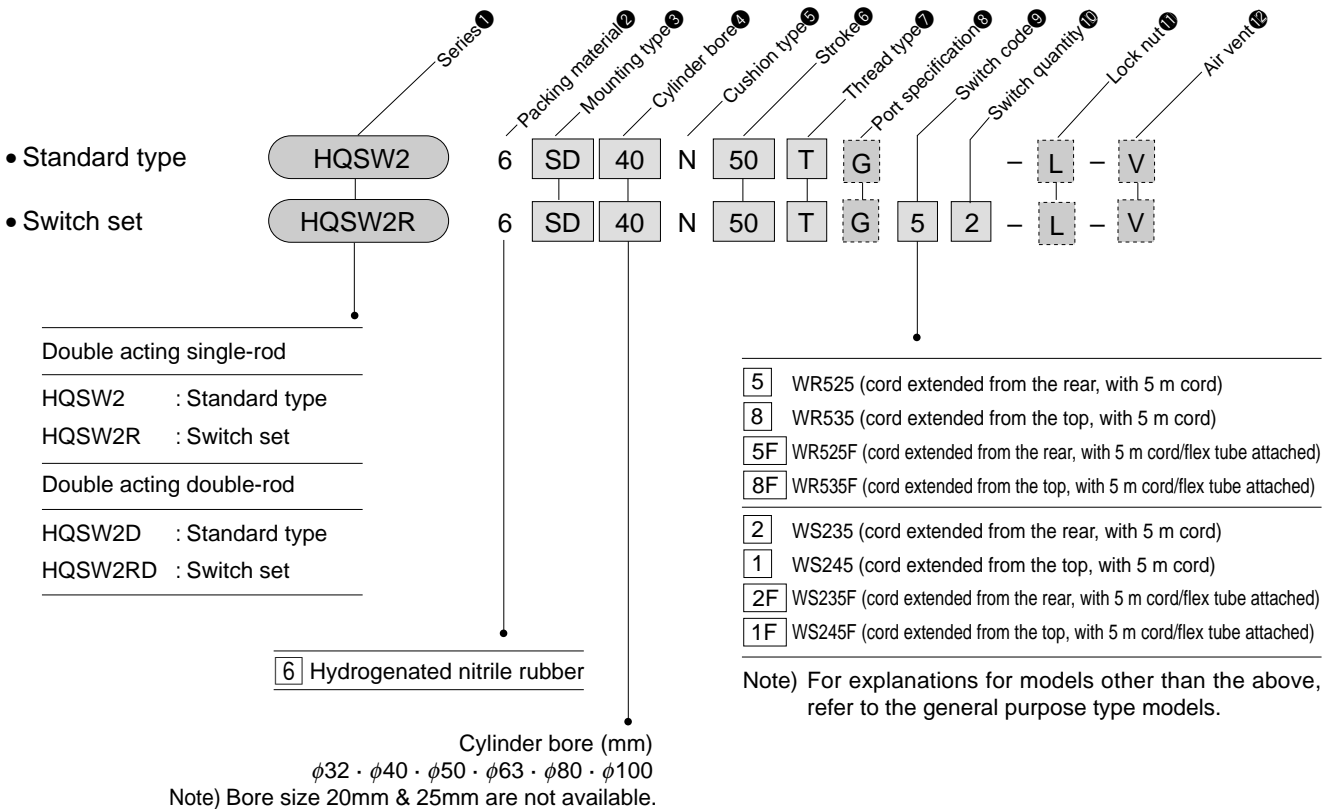
★ Specification of Air Vent (Option)

• The air vents are laid on the port surface and located symmetrical position to the port.



(Structure):
Single-rod, Double-rod
SD/LD/FA/FB type

Cutting fluid proof type (Bore $\phi 32 - \phi 100$) Dotted lines for types and symbols are not written when unnecessary. ■ Semi-standard components



Note) For explanations for models other than the above, refer to the general purpose type models.

Cutting Fluid Proof Type/Adaptability of Cutting Fluid to Packing Material

Packing Material	Non-water Soluble Cutting Oil		Water Soluble Cutting Oil
	Type 1	Type 2	
6 Hydrogenated nitrile rubber	○	×	○

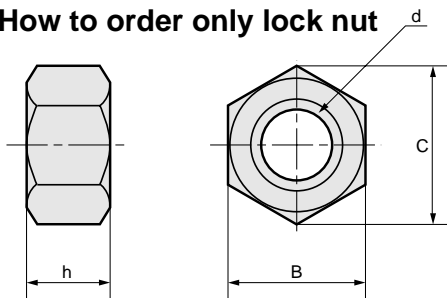
○ : applicable × : inapplicable

★ How to order G screw piping port (only for SD type)

- Please specify the model as following.
 ex. HQS2 6SD63N30 - G
G screw piping port

Note) In some bores, the apparent dimensions are changed from their standard when you specify G screw. Please refer to the detailed dimension table in following pages.

★ How to order only lock nut



Dimension Table

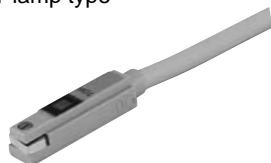
Bore	Part Model	d	B	C	h
$\phi 20$	LNH-10F-H	M10×1.25	17	19.6	6
$\phi 25$	LNH-12F-H	M12×1.25	19	21.9	7
$\phi 32$	LNH-16F-H	M16×1.5	22	25.4	10
$\phi 40$	LNH-20F-H	M20×1.5	27	31.2	12
$\phi 50$	LNH-24F-H	M24×1.5	32	37.0	14
$\phi 63$	LNH-30F-H	M30×1.5	41	47.3	17
$\phi 80$	LNH-39F-H	M39×1.5	55	68.5	20
$\phi 100$	LNH-48F-H	M48×1.5	70	80.8	26

Switch List (Bore of $\phi 20$ - $\phi 25$)

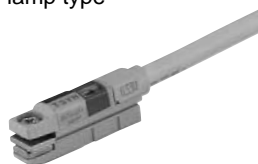
Kind	Switch Symbol	Load Voltage Range	Load Current Range	Maximum Open/Close Capacity	Protective Circuit	Indicating Lamp	Wiring Method	Cord Length	Applicable Load Device	
With Contact	UA T0H	DC12 - 24V AC100V	DC:5 - 50mA AC:7 - 20mA	DC:1.2W AC:2VA	None	LED (Red light lights up during ON)	0.2mm ² 2-core, outside diameter, $\phi 3.4$ mm Rear wiring	1 m	Small relay · Programmable Controller	
	UB T0H3							3 m		
	UC T5H	DC5 · 12 · 24V AC100V	DC:50mA or less AC:20mA or less			None	LED (Red light lights up during ON)	0.2mm ² 2-core, outside diameter, $\phi 3.4$ mm Rear wiring		1 m
	UD T5H3									3 m
	UE T0V	DC12 · 24V AC100V	DC:5 - 50mA AC:7 - 20mA			None	LED (Red light lights up during ON)	0.2mm ² 2-core, outside diameter, $\phi 3.4$ mm Upper wiring		1 m
	UF T0V3									3 m
	UG T5V	DC5 · 12 · 24V AC100V	DC:50mA or less AC:20mA or less			None	LED (Red light lights up during ON)	0.2mm ² 2-core, outside diameter, $\phi 3.4$ mm Upper wiring		1 m
	UH T5V3									3 m
With no Contact	UJ T2H	DC10 - 30V	5 - 20mA or less	-	Present	LED (Red light lights up during ON)	0.2mm ² 2-core, outside diameter, $\phi 3.4$ mm Rear wiring	1 m	Small relay · Programmable Controller	
	UK T2H3							3 m		
	UL T2YH					LED (2-lamp type in red/green)	0.3mm ² 2-core, outside diameter, $\phi 4.8$ mm Rear wiring	1 m		
	UM T2YH3							3 m		
	UN T3H	DC30V or less	100mA or less	Voltage DC10 - 30V		LED (Red light lights up during ON)	0.2mm ² 3-core, outside diameter, $\phi 3.4$ mm Rear wiring	1 m		
	UP T3H3							3 m		
	UQ T2V	DC10 - 30V	5 - 20mA or less	-		LED (Red light lights up during ON)	0.2mm ² 2-core, outside diameter, $\phi 3.4$ mm Rear wiring	1 m		
	UR T2V3							3 m		
	US T2YV					LED (2-lamp type in red/green)	0.3mm ² 2-core, outside diameter, $\phi 4.8$ mm Rear wiring	1 m		
	UT T2YV3							3 m		
	UU T3V	DC30V or less	100mA or less	Voltage DC10 - 30V		LED (Red light lights up during ON)	0.2mm ² 3-core, outside diameter, $\phi 3.4$ mm Rear wiring	1 m		
	UV T3V3							3 m		

- Notes) • For the switch without a protective circuit, be sure to provide the protective circuit (SK-100) with load devices when using induction load devices (relays).
• For 200 VAC type, contact us.

- General purpose type
1-lamp type



- 2-lamp type



Switch Mounting Minimum Possible Stroke

Bore	With A Switch				With Two Switches			
	AX and AZ types	T type	WR type	WS type	AX and AZ types	T type	WR type	WS type
$\phi 20$	-	5	-	-	-	10	-	-
$\phi 25$								
$\phi 32$	5	-	5	10	10*	-	10	20
$\phi 40$								
$\phi 50$								
$\phi 63$								
$\phi 80$								
$\phi 100$								15

Note) • When attaching two switches of the WR or WS type, they cannot be attached to the same surface.

* If you would like to mount two switches to 10mm stroke cylinder, please.

Switch List (For bore 32 mm to 100 mm)

Kind	Switch Symbol	Load Voltage Range	Load Current Range	Maximum Open/Close Capacity	Protective Circuit	Indicating Lamp	Wiring Method	Cord Length	Applicable Load Device			
Contact	AF AX101	DC:5 - 30V AC:5 - 120V	DC:5 - 40mA AC:5 - 20mA	DC:1.5W AC:2VA	None	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm Rear wiring	1.5m	Small relay, programmable controller			
	AG AX105							5m				
	AH AX111				Present			1.5m				
	AJ AX115							5m				
	AE AX125	DC:30V or less AC:120V or less	DC:40V or less AC:20V or less	2VA	Present	LED (Red light lights up during ON)	4-pin connector, type Rear wiring	5m				
	AK AX11A	AC:5 - 120V	5 - 20mA					0.5m				
	AL AX11B	DC:5 - 30V	5 - 40mA	1.5W	None	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm Rear wiring	0.5m				
	5 WR525	DC:5 - 50V	DC:3 - 40mA	DC:1.5W AC:2VA				5m				
	5F WR525F	AC:5 - 120V	AC:3 - 20mA	DC:1.5W AC:2VA	Present	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm Upper wiring	5m				
	AP AZ101	DC:5 - 30V AC:5 - 120V	DC:5 - 40mA AC:5 - 20mA					None		LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm	1.5m
	AR AZ105											Present
	AS AZ111							None				
	AT AZ115			5m								
	AN AZ125	DC:30V or less AC:120V or less	DC:40V or less AC:20V or less	2VA	Present	LED (Red light lights up during ON)	4-pin connector, cord extended from the top	5m				
	AU AZ11A	AC:5 - 120V	5 - 20mA					0.5m				
	AW AZ11B	DC:5 - 30V	5 - 40mA	1.5W	None	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm Upper wiring	0.5m				
	8 WR535	DC:5 - 50V	DC:3 - 40mA	DC:1.5W AC:2VA				5m				
	8F WR535F	AC:5 - 120V	AC:3 - 20mA	-	Present	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm Rear wiring	5m				
BE AX201	DC:5 - 30V	5 - 40mA	-					Present	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm	1.5m	
BF AX205											5m	
CE AX211											LED (2-lamp type in red/green)	1.5m
CF AX215												5m
2 WS235	DC:10 - 30V	6 - 70mA	-					Present	LED (2-lamp type in red/green)	0.3 mm ² 2-core, outside diameter, φ4 mm	5m	
2F WS235F											5m	
BM AZ201	DC:5 - 30V	5 - 40mA	-					Present	LED (Red light lights up during ON)	0.3 mm ² 2-core, outside diameter, φ4 mm	1.5m	
BN AZ205											LED (2-lamp type in red/green)	5m
CM AZ211												Upper wiring
CN AZ215											5m	
1 WS245	DC:10 - 30V	6 - 70mA	-					Present	LED (2-lamp type in red/green)	0.3 mm ² 2-core, outside diameter, φ4 mm	5m	
1F WS245F				5m								
No Contact (CE coformed)	CT AX211CE	DC:5 - 30V	5 - 40mA	-	Present	LED (2-lamp type in red/green)	0.3 mm ² 2-core, outside diameter, φ4 mm	1.5m				
	CU AX215CE							Rear wiring	5m			
	CV AX21BCE							4-pin connector, type Rear wiring	0.5m			
	CW AZ211CE							0.3 mm ² 2-core, outside diameter, φ4 mm	1.5m			
	CX AZ215CE							Upper wiring	5m			
	CY AZ21BCE							4-pin connector, cord extended from the top	0.5m			

- (Notes) • 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.).
- For the handling of switches, be sure to refer to the switch specifications in the end of 70/140H-8 series catalogue.
 - The WR and WS type switches are cutting fluid proof type.
 - For the 200 V AC type, contact us.

- General purpose type AX type (cord rear wiring)



AZ type (cord upper wiring)



- Cutting fluid proof type WR · WS type switch

- Cord rear wiring




WR525
WS235

- Cord upper wiring

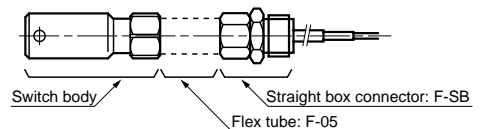


WR535
WS245

- For the switch symbol , pay attention to the points below when ordering the cutting fluid proof type switches, WR and WS types.

- 5 WR525
 - 8 WR535
 - 2 WS235
 - 1 WS245
- The switch and straight box connector (F-SB) are combined [the flex tube (F-05: 4.8 m) is required].

- 5F WR525F
 - 8F WR535F
 - 2F WS235F
 - 1F WS245F
- The flex tube (F-05: 4.8 m) is attached to the WS235F switch and straight box connector (F-SB).



Standard stroke fabrication range

	Structure	Type	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 HQS2	φ20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		φ100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		Switch set HQS2R	φ20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	φ80		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	φ100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
	Double Acting Double-rod	Standard type HQS2D	φ20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		φ100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
Switch set HQS2RD		φ20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		φ25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	φ80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
φ100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
Cutting fluid proof type	Double Acting Single-rod	Standard type HQSW2	φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			Switch set HQSW2R	φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		φ40		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		φ50		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		φ63		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		φ80		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		φ100		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Double Acting Double-rod		Standard type HQSW2D	φ32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			φ40		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	φ50		○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	φ63		○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	φ80		○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	φ100		○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	Switch set HQSW2RD		φ32		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			φ40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ63	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
			φ100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
φ100			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		

○ : Standard manufacturing range, □ : Range available for manufacturing for order (Delivery date depends on bore and stroke. Contact us for detail.)

• For the minimum stroke of the switch set, refer to the Switch Mounting Minimum Possible Stroke table. (P.7)

Note 1) Size of 5mm stroke cylinder body of bore 20mm and 25mm is same dimension as body of 10mm stroke.

Weight Table/General Purpose and Cutting Fluid Proof Types

Unit: kg

Structure	Type	Bore	Cylinder Stroke (mm)										Mounting accessories additional weight		Separate flange joint (M type joint)	Added male thread weight
			5	10	15	20	25	30	35	40	45	50	Foot type (LD)	Flange type (FA, FB)		
Double Acting Single-rod	Standard type HQS2 HQS2R	φ20	0.29	0.28	0.30	0.32	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.25	0.2	0.02
		φ25	0.41	0.40	0.43	0.45	0.48	0.51	0.54	0.56	0.59	0.62	0.58	0.30	0.3	0.03
		φ32	0.68	0.72	0.77	0.81	0.86	0.90	0.94	0.99	1.03	1.08	1.09	0.62	0.3	0.05
		φ40	0.90	0.95	1.01	1.07	1.12	1.18	1.24	1.29	1.35	1.41	1.42	1.16	0.4	0.10
		φ50	1.35	1.43	1.50	1.58	1.65	1.73	1.81	1.88	1.96	2.03	2.43	1.60	0.6	0.18
		φ63	2.10	2.21	2.31	2.42	2.52	2.63	2.74	2.84	2.95	3.05	3.30	2.02	0.8	0.40
		φ80	3.87	4.02	4.18	4.34	4.49	4.65	4.81	4.96	5.12	5.28	5.86	3.77	1.4	0.76
	φ100	7.26	7.49	7.72	7.95	8.18	8.41	8.63	8.86	9.09	9.32	9.99	7.23	3.0	1.50	
	Switch set HQS2R HQS2R2	φ20	0.30	0.29	0.31	0.33	0.36	0.38	0.40	0.42	0.44	0.46	0.46	0.25	0.2	0.02
		φ25	0.42	0.41	0.44	0.46	0.49	0.52	0.55	0.57	0.60	0.63	0.58	0.30	0.3	0.03
		φ32	0.70	0.75	0.80	0.84	0.89	0.93	0.98	1.02	1.07	1.11	1.09	0.62	0.3	0.05
		φ40	0.93	0.99	1.05	1.11	1.16	1.22	1.28	1.33	1.39	1.45	1.42	1.16	0.4	0.10
		φ50	1.14	1.49	1.57	1.64	1.72	1.79	1.87	1.94	2.02	2.09	2.43	1.60	0.6	0.18
		φ63	2.20	2.30	2.40	2.51	2.61	2.72	2.82	2.93	3.03	3.14	3.30	2.02	0.8	0.40
φ80		3.98	4.13	4.28	4.44	4.60	4.75	4.91	5.07	5.22	5.38	5.86	3.77	1.4	0.76	
φ100	7.38	7.61	7.84	8.07	8.30	8.53	8.75	8.98	9.21	9.44	9.99	7.23	3.0	1.50		
Double Acting Double-rod	Standard type HQS2D HQS2D2	φ20	0.40	0.40	0.43	0.45	0.48	0.50	0.53	0.55	0.58	0.60	0.46	0.25	0.2	0.04
		φ25	0.57	0.56	0.59	0.62	0.65	0.70	0.72	0.75	0.78	0.81	0.58	0.30	0.3	0.06
		φ32	1.06	1.11	1.17	1.22	1.28	1.33	1.39	1.44	1.50	1.55	1.09	0.62	0.3	0.10
		φ40	1.37	1.44	1.51	1.58	1.65	1.72	1.79	1.86	1.93	2.00	1.42	1.16	0.4	0.20
		φ50	2.00	2.09	2.19	2.29	2.39	2.49	2.59	2.69	2.79	2.89	2.43	1.60	0.6	0.36
		φ63	3.03	3.17	3.32	3.46	3.61	3.75	3.90	4.04	4.19	4.33	3.30	2.02	0.8	0.80
		φ80	5.58	5.79	6.01	6.23	6.44	6.66	6.88	7.09	7.31	7.53	5.86	3.77	1.4	1.52
	φ100	10.15	10.48	10.80	11.12	11.45	11.77	12.10	12.42	12.75	13.07	9.99	7.23	3.0	3.00	
	Switch set HQS2RD HQS2RD2	φ20	0.40	0.41	0.44	0.46	0.48	0.51	0.53	0.56	0.58	0.61	0.46	0.25	0.2	0.04
		φ25	0.58	0.56	0.60	0.63	0.66	0.69	0.72	0.76	0.79	0.82	0.58	0.30	0.3	0.06
		φ32	1.09	1.14	1.19	1.25	1.30	1.36	1.41	1.47	1.52	1.58	1.09	0.62	0.3	0.10
		φ40	1.39	1.46	1.53	1.60	1.67	1.74	1.81	1.88	1.95	2.02	1.42	1.16	0.4	0.20
		φ50	2.02	2.12	2.22	2.32	2.42	2.52	2.61	2.71	2.81	2.91	2.43	1.60	0.6	0.36
		φ63	3.05	3.20	3.34	3.49	3.63	3.78	3.92	4.07	4.21	4.35	3.30	2.02	0.8	0.80
φ80		5.60	5.82	6.03	6.25	6.47	6.69	6.90	7.12	7.34	7.55	5.86	3.77	1.4	1.52	
φ100	10.27	10.59	10.92	11.24	11.57	11.89	12.22	12.54	12.87	13.19	9.99	7.23	3.0	3.00		

Switch Added Weight Table

Unit: kg

AX · AZ Type			T0 · T2 · T3 · T5 Type		T2Y Type		WR · WS Type
Cord length 1.5m	Cord length 5m	Connector type	Cord length 1m	Cord length 3m	Cord length 1m	Cord length 3m	
0.05	0.13	0.04	0.02	0.05	0.03	0.09	0.51

Piston Pressurized Area Table

Unit: mm²

Bore (mm)	Rod Diameter (mm)	Double Acting Single-rod		Double Acting Double-rod	
		Push side	Pull side	Push side	Pull side
φ20	φ12	314	201	201	
φ25	φ14	491	337	337	
φ32	φ18	804	550	550	
φ40	φ22	1257	376	876	
φ50	φ28	1963	1348	1348	
φ63	φ36	3117	2100	2100	
φ80	φ45	5027	3436	3436	
φ100	φ56	7854	5391	5391	

Formula $F = A \cdot P \cdot \beta(N)$

F: Cylinder force (N)

A: Piston pressurized area (mm²)

P: Applied pressure (MPa)

β: Load rate

Calculation example

Double acting single-rod, bore of φ40, applied pressure of 10 MPa, load rate of 0.8

Push side cylinder force (N)

= 1257 × 10 × 0.8 = 10056 (N)

Pull side cylinder force (N)

= 876 × 10 × 0.8 = 7008 (N)

HQS2/THQS2 Bore

CAD/DATA
is available.



SD

Standard type

General purpose type HQS2 6 SD Bore N Stroke T ($\phi 20 - \phi 100$)

Cutting fluid proof type HQSW2 6 SD Bore N Stroke T ($\phi 32 - \phi 100$)

None : Female thread
T : Male thread

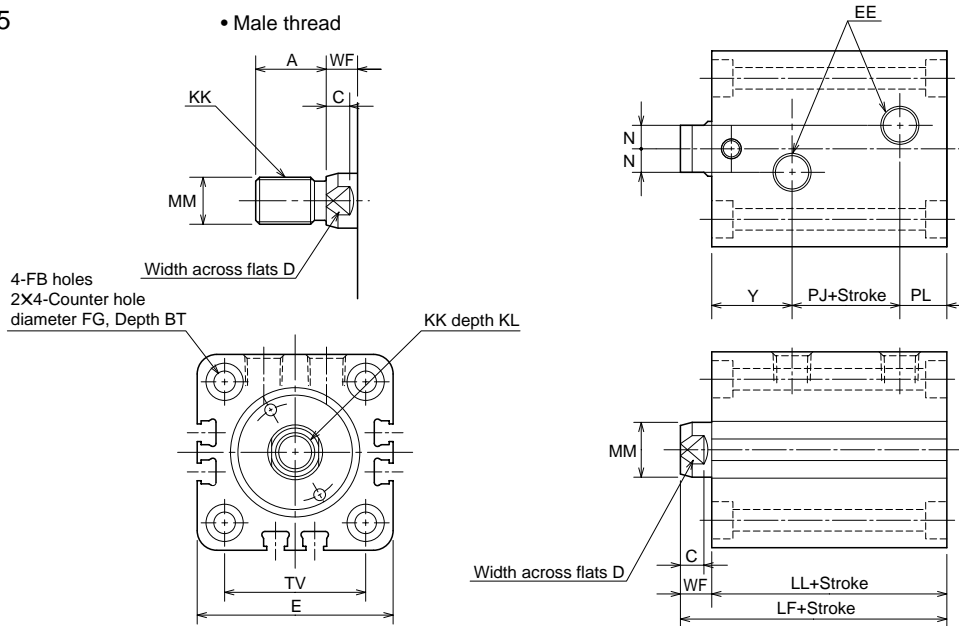
Switch set

General purpose type HQS2R 6 SD Bore N Stroke T Switch code Switch quantity ($\phi 20 - \phi 100$)

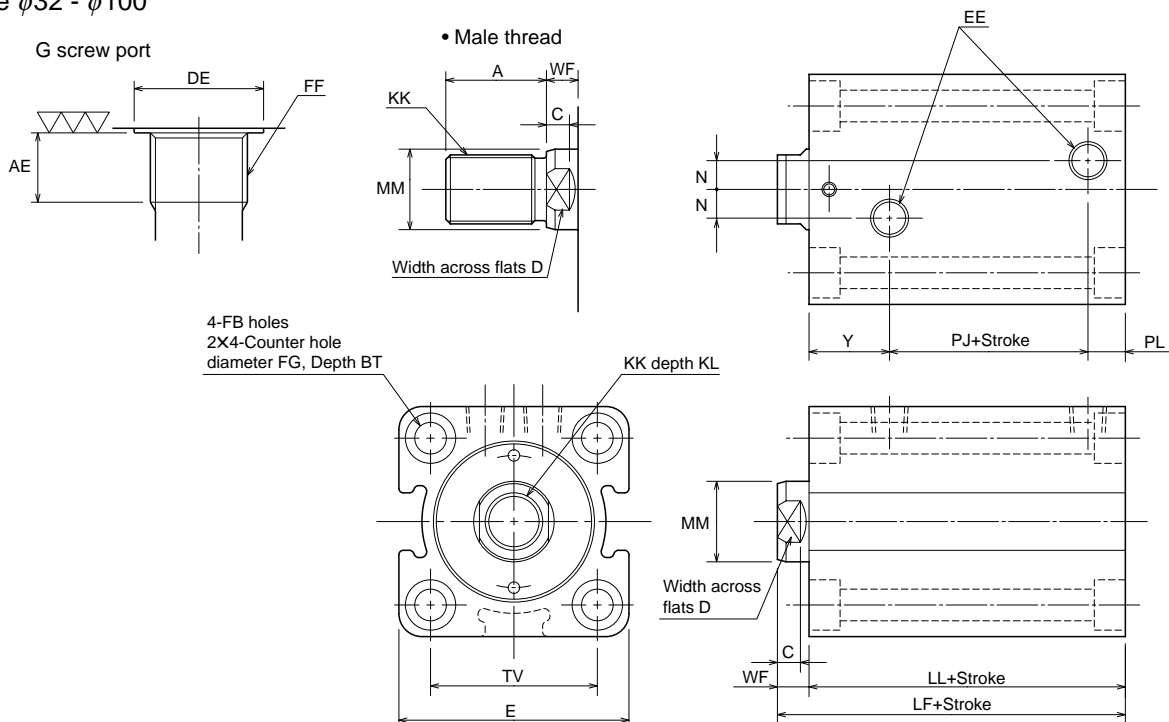
Cutting fluid proof type HQSW2R 6 SD Bore N Stroke T Switch code Switch quantity ($\phi 32 - \phi 100$)

- : Female thread
T : Male thread

• Bore $\phi 20 - \phi 25$



• Bore $\phi 32 - \phi 100$



- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- Switch installing groove is available in 3 positions for bore 100 mm.

Unit: mm

Dimension Table

Symbol Bore	A	AE	BT	C	D	DE	E	EE	FB	FF	FG	KK		KL
												Female thread	Male thread	
φ20	15(25)	—	5.4	6	10	—	□44	Rc1/8	φ5.5	—	φ9.5	M8 × 1.25	M10 × 1.25	10
φ25	18(30)	—	5.4	6	12	—	□50	Rc1/8	φ5.5	—	φ9.5	M10 × 1.5	M12 × 1.25	12
φ32	25(40)	8	6.5	7	14	φ17.2	□62	Rc1/4	φ6.6	G1/8	φ11	M12 × 1.75	M16 × 1.5	15
φ40	30(45)	8	8.6	7	19	φ17.2	□70	Rc1/4	φ9	G1/8	φ14	M16 × 2	M20 × 1.5	20
φ50	35(50)	12	10.8	8	24	φ21.5	□80	Rc1/4	φ11	G1/4	φ17.5	M20 × 2.5	M24 × 1.5	24
φ63	45(60)	12	13	9	30	φ21.5	□94	Rc1/4	φ14	G1/4	φ20	M27 × 3	M30 × 1.5	33
φ80	60(80)	12	15.2	14	41	φ21.5	□114	Rc3/8	φ16	G1/4	φ23	M30 × 3.5	M39 × 1.5	36
φ100	75(95)	12	17.5	22	50	φ25.5	□138	Rc3/8	φ18	G3/8	φ26	M39 × 4	M48 × 1.5	45

Symbol Bore	LF	LL	MM	N		PJ		PL		TV	WF	Y	
				Rc thread	G thread	Rc thread	G thread	Rc thread	G thread			Rc thread	G thread
φ20	51	43	φ12	3	—	14.5	—	10	—	□30	8	18.5	—
φ25	53	45	φ14	6	—	12.5	—	12	—	□36	8	20.5	—
φ32	64	54	φ18	10	10	14	14	12	12	□47	10	28	28
φ40	65	55	φ22	10	10	16	16	12	12	□52	10	27	27
φ50	71	60	φ28	10	14	19	13.5	13	18.5	□58	11	28	28
φ63	80	67	φ36	10	16	24	20	13	17	□69	13	30	30
φ80	95	78	φ45	15	19	25	24	18	18	□86	17	35	36
φ100	122	96	φ56	15	18	26	26	28	28	□106	26	42	42

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

HQS2/THQS2 CAD/DATA
is available.

LD

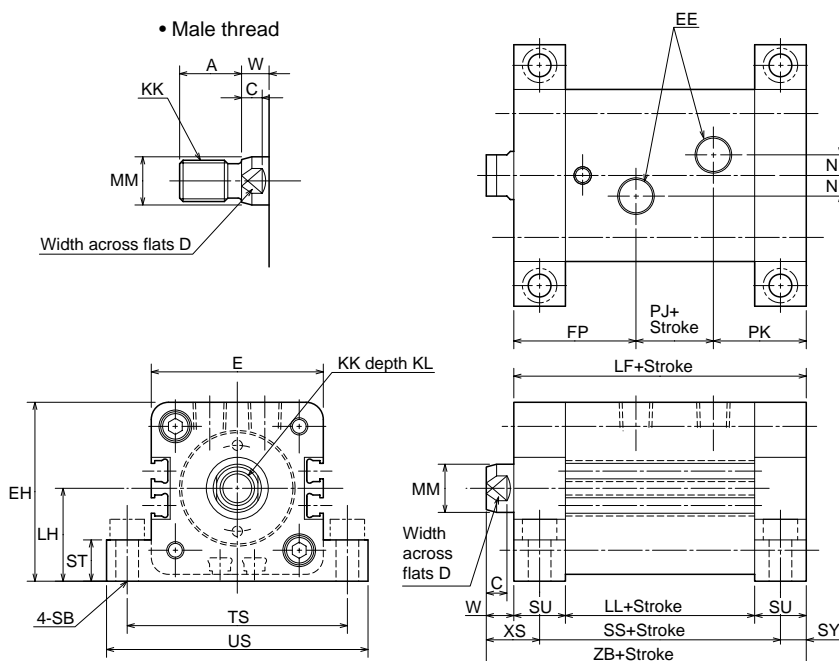
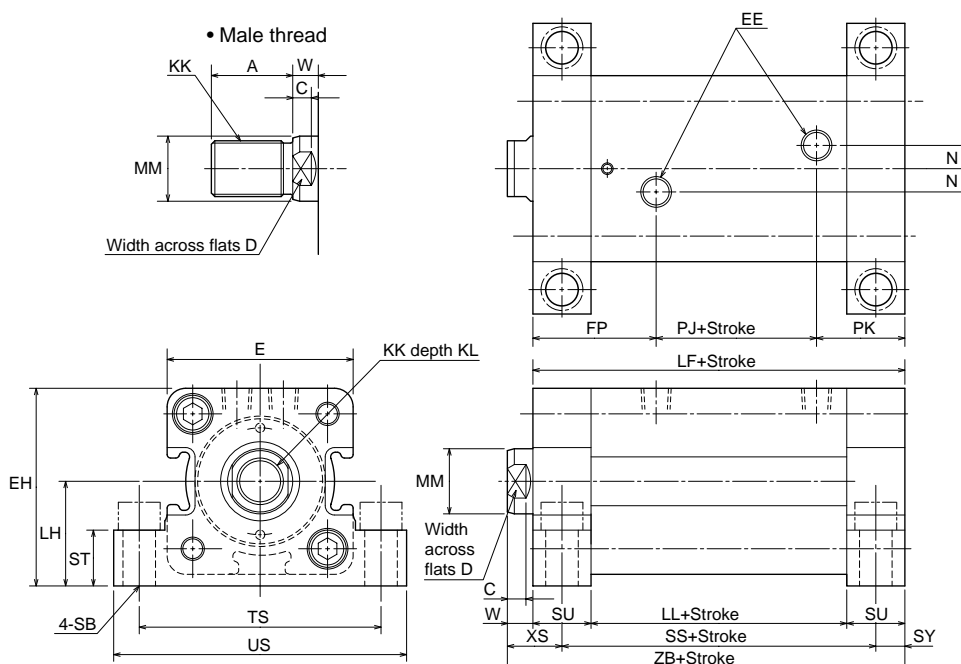
Standard type

General purpose type HQS2 LD N T ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2 LD N T ($\phi 32 - \phi 100$)

Switch set

General purpose type HQS2R LD N T ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2R LD N T ($\phi 32 - \phi 100$)

None : Female thread

 : Male thread : Female thread : Male thread• Bore $\phi 20 \cdot \phi 25$ • Bore $\phi 32 - \phi 100$ 

- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- *Please be sure to use the Socket Head Screw when install the cylinder to the contact patch.
- Switch installing groove is available in 3 positions for bore 100 mm.

Unit: mm

Dimension Table

Symbol Bore	A	C	D	E	EE	EH	FP	KK		KL	LF	LH
								Female thread	Male thread			
φ20	15(25)	6	10	□44	Rc1/8	46	33.5	M8 × 1.25	M10 × 1.25	10	73	24±0.15
φ25	18(30)	6	12	□50	Rc1/8	52	35.5	M10 × 1.5	M12 × 1.25	12	75	27±0.15
φ32	25(40)	7	14	□62	Rc1/4	66	48	M12 × 1.75	M16 × 1.5	15	94	35±0.15
φ40	30(45)	7	19	□70	Rc1/4	72.5	47	M16 × 2	M20 × 1.5	20	95	37.5±0.15
φ50	35(50)	8	24	□80	Rc1/4	85	53	M20 × 2.5	M24 × 1.5	24	110	45±0.15
φ63	45(60)	9	30	□94	Rc1/4	97	55	M27 × 3	M30 × 1.5	33	117	50±0.15
φ80	60(80)	14	41	□114	Rc3/8	117	65	M30 × 3.5	M39 × 1.5	36	138	60±0.25
φ100	75(95)	22	50	□138	Rc3/8	140	77	M39 × 4	M48 × 1.5	45	166	71±0.25

Symbol Bore	LL	MM	N	PJ	PK	SB	SS	ST	SU	SY	TS	US	W	XS	ZB
φ20	43	φ12	3	14.5	25	6.6	58	12	15	7.5	58	70	8	15.5	81
φ25	45	φ14	6	12.5	27	6.6	60	12	15	7.5	64	76	8	15.5	83
φ32	54	φ18	10	14	32	9	74	16	20	10	79	94	10	20	104
φ40	55	φ22	10	16	32	11	75	20	20	10	90	108	10	20	105
φ50	60	φ28	10	19	38	14	85	24	25	12.5	104	126	11	23.5	121
φ63	67	φ36	10	24	38	16	92	30	25	12.5	121	146	13	25.5	130
φ80	78	φ45	15	25	48	18	108	35	30	15	144	172	17	32	155
φ100	96	φ56	15	26	63	22	131	43	35	17.5	174	208	26	43.5	192

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

HQS2/THQS2 BoreCAD/DATA
is available.

FA

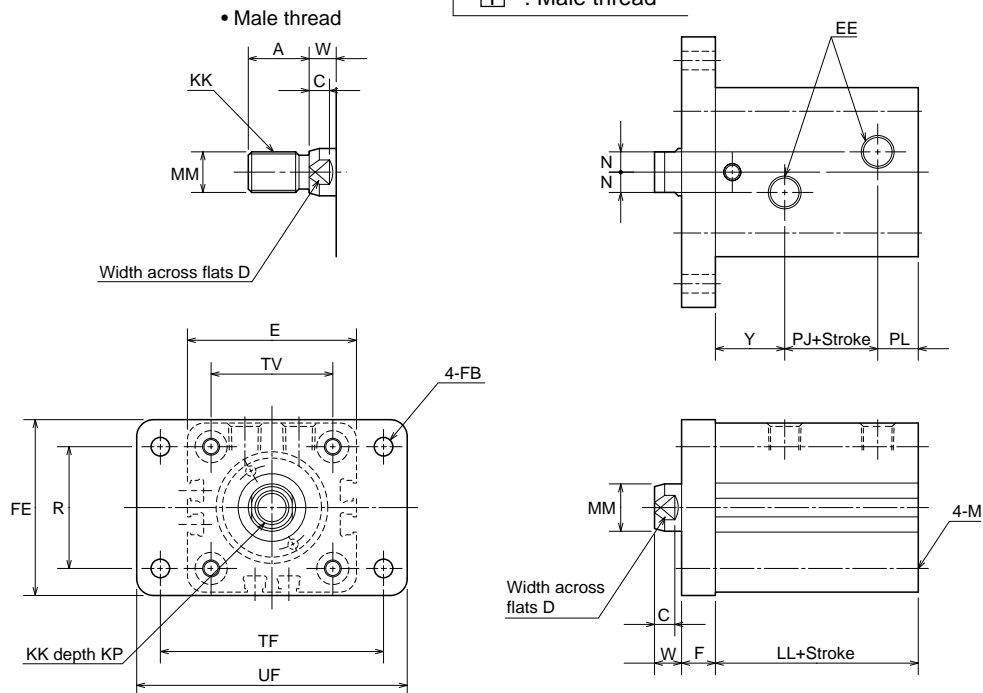
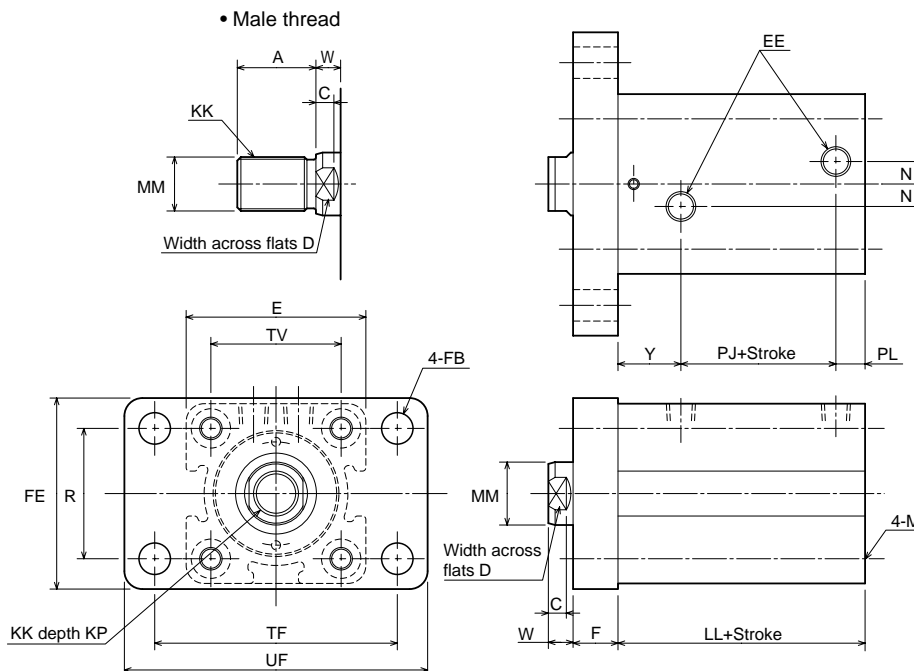
Standard type

General purpose type HQS2 6 FA Bore N Stroke T ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2 6 FA Bore N Stroke T ($\phi 32 - \phi 100$)

Switch set

General purpose type HQS2R 6 FA Bore N Stroke T Switch code Switch quantity ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2R 6 FA Bore N Stroke T Switch code Switch quantity ($\phi 32 - \phi 100$)

None : Female thread

T : Male thread- : Female threadT : Male thread• Bore $\phi 20 - \phi 25$ • Bore $\phi 32 - \phi 100$ 

- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- Switch installing groove is available in 3 positions for bore 100 mm.

Unit: mm

Dimension Table

Symbol Bore	A	C	D	E	EE	F	FB	FE	KK		KL	LL
									Female thread	Male thread		
φ20	15(25)	6	10	□44	Rc1/8	10	φ5.5	46	M8 × 1.25	M10 × 1.25	10	43
φ25	18(30)	6	12	□50	Rc1/8	10	φ5.5	52	M10 × 1.5	M12 × 1.25	12	45
φ32	25(40)	7	14	□62	Rc1/4	15	φ6.6	62	M12 × 1.75	M16 × 1.5	15	54
φ40	30(45)	7	19	□70	Rc1/4	20	φ11	70	M16 × 2	M20 × 1.5	20	55
φ50	35(50)	8	24	□80	Rc1/4	20	φ14	85	M20 × 2.5	M24 × 1.5	24	60
φ63	45(60)	9	30	□94	Rc1/4	20	φ14	98	M27 × 3	M30 × 1.5	33	67
φ80	60(80)	14	41	□114	Rc3/8	25	φ18	118	M30 × 3.5	M39 × 1.5	36	78
φ100	75(95)	22	50	□138	Rc3/8	30	φ22	150	M39 × 4	M48 × 1.5	45	96

Symbol Bore	M	MM	N	PJ	PL	R	TF	TV	UF	W	Y
φ20	M5 × 0.8	φ12	3	14.5	10	30	60	□30	75	8	18.5
φ25	M5 × 0.8	φ14	6	12.5	12	36	66	□36	80	8	20.5
φ32	M6 × 1	φ18	10	14	12	40	80	□47	95	10	28
φ40	M8 × 1.25	φ22	10	16	12	46	96	□52	118	10	27
φ50	M10 × 1.5	φ28	10	19	13	58	108	□58	135	11	28
φ63	M12 × 1.75	φ36	10	24	13	65	124	□69	150	13	30
φ80	M14 × 2	φ45	15	25	18	87	154	□86	185	17	35
φ100	M16 × 2	φ56	15	26	28	109	190	□106	230	26	42

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

HQS2/THQS2 CAD/DATA
is available.

FB

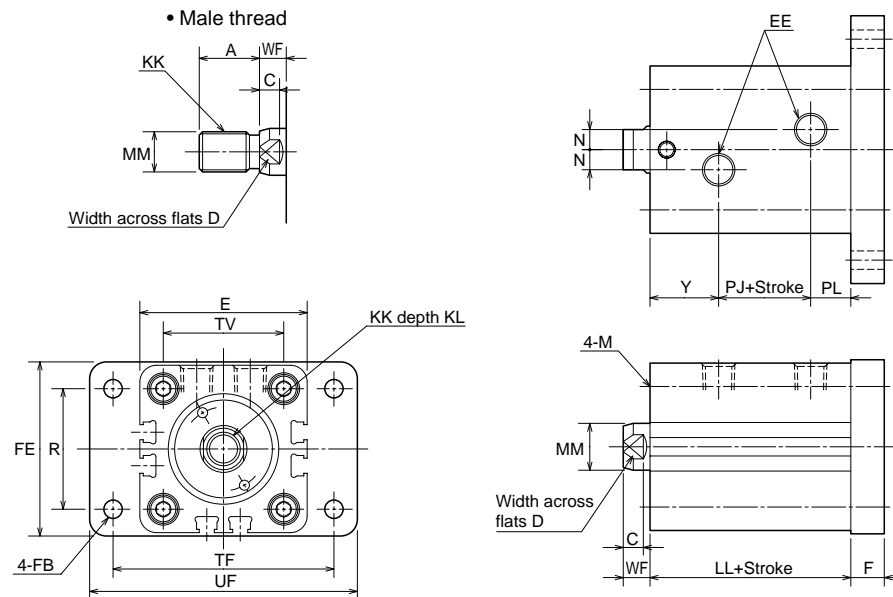
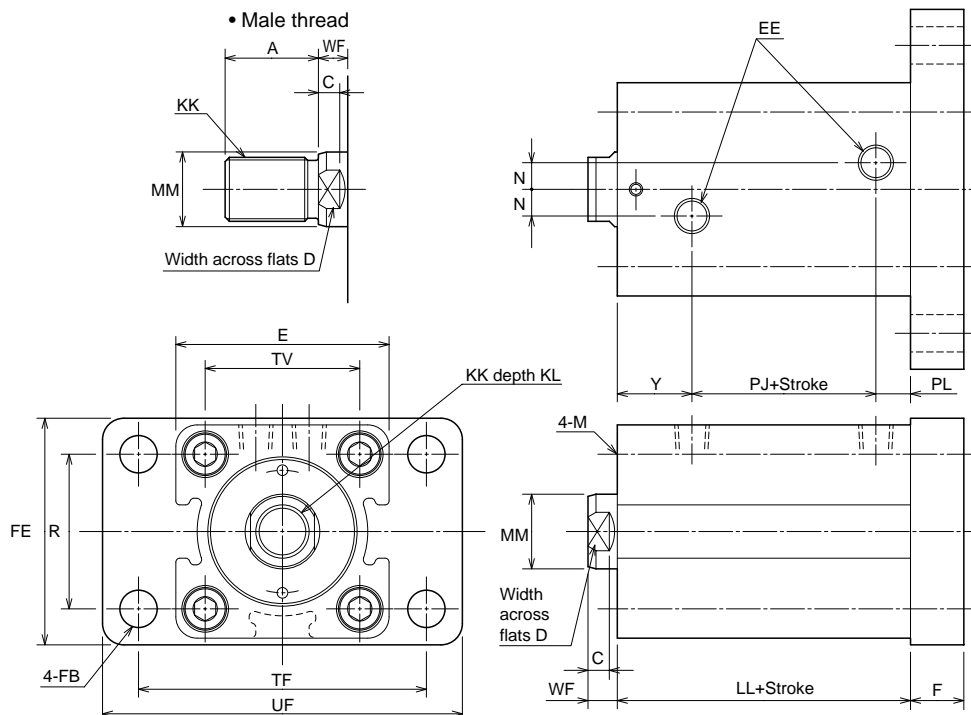
Standard type

General purpose type HQS2 FB N ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2 FB N ($\phi 32 - \phi 100$)

Switch set

General purpose type HQS2R FB N ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2R FB N ($\phi 32 - \phi 100$)

None : Female thread

 : Male thread : Female thread : Male thread• Bore $\phi 20 - \phi 25$ • Bore $\phi 32 - \phi 100$ 

- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- Switch installing groove is available in 3 positions for bore 100 mm.

Unit: mm

Dimension Table

Symbol Bore	A	C	D	E	EE	F	FB	FE	KK		KL	LL
									Female thread	Male thread		
φ20	15(25)	6	10	□44	Rc1/8	10	φ5.5	46	M8 × 1.25	M10 × 1.25	10	43
φ25	18(30)	6	12	□50	Rc1/8	10	φ5.5	52	M10 × 1.5	M12 × 1.25	12	45
φ32	25(40)	7	14	□62	Rc1/4	15	φ6.6	62	M12 × 1.75	M16 × 1.5	15	54
φ40	30(45)	7	19	□70	Rc1/4	20	φ11	70	M16 × 2	M20 × 1.5	20	55
φ50	35(50)	8	24	□80	Rc1/4	20	φ14	85	M20 × 2.5	M24 × 1.5	24	60
φ63	45(60)	9	30	□94	Rc1/4	20	φ14	98	M27 × 3	M30 × 1.5	33	67
φ80	60(80)	14	41	□114	Rc3/8	25	φ18	118	M30 × 3.5	M39 × 1.5	36	78
φ100	75(95)	22	50	□138	Rc3/8	30	φ22	150	M39 × 4	M48 × 1.5	45	96

Symbol Bore	M	MM	N	PJ	PL	R	TF	TV	UF	WF	Y
φ20	M5 × 0.8	φ12	3	14.5	10	30	60	□30	75	8	18.5
φ25	M5 × 0.8	φ14	6	12.5	12	36	66	□36	80	8	20.5
φ32	M6 × 1	φ18	10	14	12	40	80	□47	95	10	28
φ40	M8 × 1.25	φ22	10	16	12	46	96	□52	118	10	27
φ50	M10 × 1.5	φ28	10	19	13	58	108	□58	135	11	28
φ63	M12 × 1.75	φ36	10	24	13	65	124	□69	150	13	30
φ80	M14 × 2	φ45	15	25	18	87	154	□86	185	17	35
φ100	M16 × 2	φ56	15	26	28	109	190	□106	230	26	42

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

HQS2/THQS2 Bore

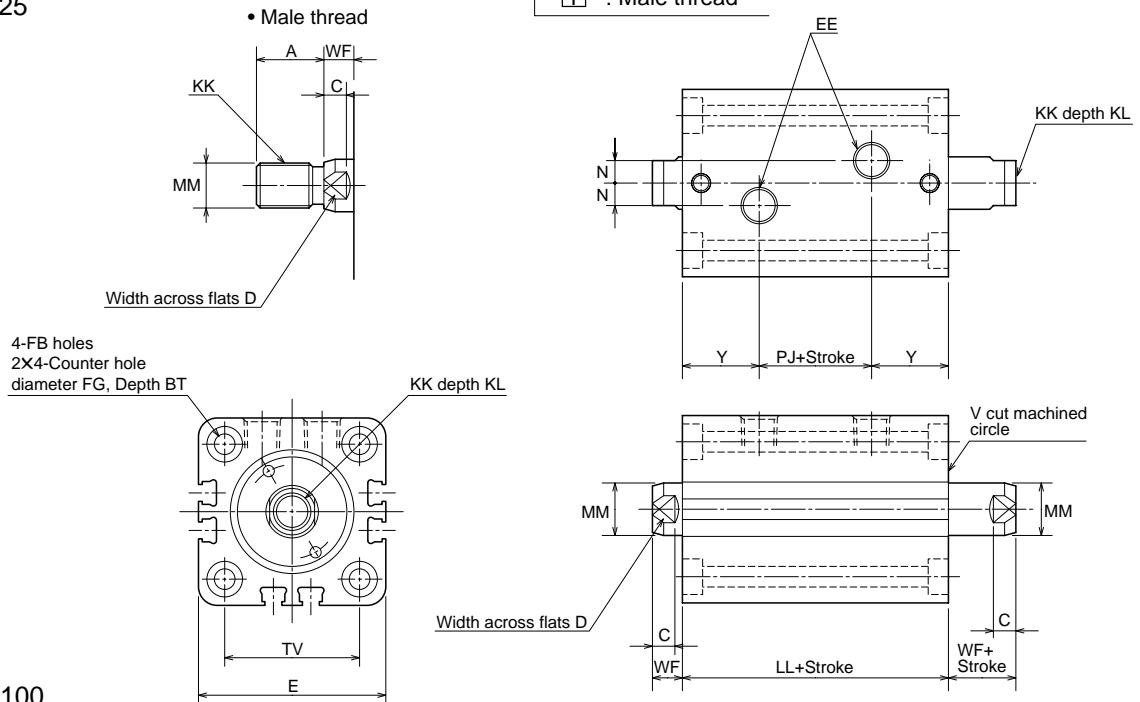
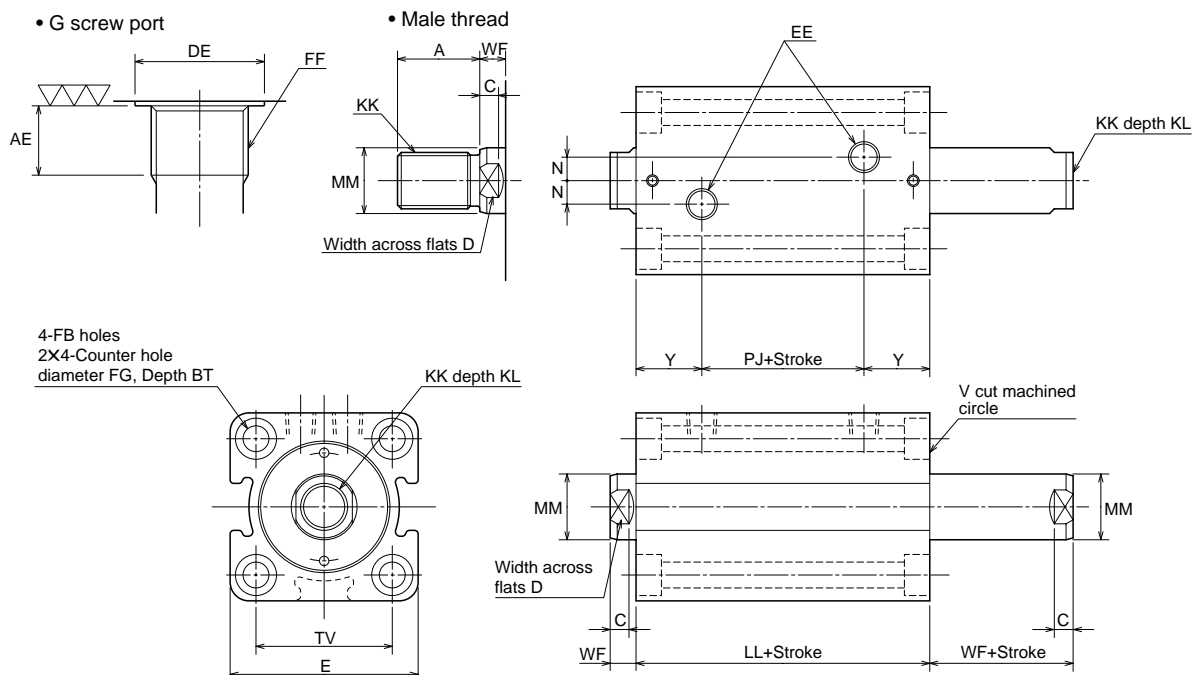
CAD/DATA
is available.

SD

Standard type

General purpose type HQS2D 6 SD Bore N Stroke T ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2D 6 SD Bore N Stroke T ($\phi 32 - \phi 100$)None : Female thread
T : Male thread

Switch set

General purpose type HQS2RD 6 SD Bore N Stroke T Switch code Switch quantity ($\phi 20 - \phi 100$)Cutting fluid proof type HQSW2RD 6 SD Bore N Stroke T Switch code Switch quantity ($\phi 32 - \phi 100$)None : Female thread
T : Male thread• Bore $\phi 20 - \phi 25$ • Bore $\phi 32 - \phi 100$ 

- Face with no V cut machined circle is for mounting.
- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- Switch installing groove is available in 3 positions for bore 100 mm.

Dimension Table

Symbol Bore	A	AE	BT	C	D	DE	E	EE	FB	FF	FG	KK		KL
												Female thread	Male thread	
φ20	15(25)	–	5.4	6	10	–	□44	Rc1/8	φ5.5	–	φ9.5	M8 × 1.25	M10 × 1.25	10
φ25	18(30)	–	5.4	6	12	–	□50	Rc1/8	φ5.5	–	φ9.5	M10 × 1.5	M12 × 1.25	12
φ32	25(40)	8	6.5	7	14	φ17.2	□62	Rc1/4	φ6.6	G1/8	φ11	M12 × 1.75	M16 × 1.5	15
φ40	30(45)	8	8.6	7	19	φ17.2	□70	Rc1/4	φ9	G1/8	φ14	M16 × 2	M20 × 1.5	20
φ50	35(50)	12	10.8	8	24	φ21.5	□80	Rc1/4	φ11	G1/4	φ17.5	M20 × 2.5	M24 × 1.5	24
φ63	45(60)	12	13	9	30	φ21.5	□94	Rc1/4	φ14	G1/4	φ20	M27 × 3	M30 × 1.5	33
φ80	60(80)	12	15.2	14	41	φ21.5	□114	Rc3/8	φ16	G1/4	φ23	M30 × 3.5	M39 × 1.5	36
φ100	75(95)	12	17.5	22	50	φ25.5	□138	Rc3/8	φ18	G3/8	φ26	M39 × 4	M48 × 1.5	45

Symbol Bore	LL	MM	N		PJ		TV	WF	Y	
			Rc thread	G thread	Rc thread	G thread			Rc thread	G thread
φ20	54	φ12	3	–	17	–	□30	8	18.5	–
φ25	56	φ14	6	–	15	–	□36	8	20.5	–
φ32	72	φ18	10	10	16	16	□47	10	28	28
φ40	72	φ22	10	10	18	18	□52	10	27	27
φ50	75	φ28	10	14	19	19	□58	11	28	28
φ63	82	φ36	10	16	22	22	□69	13	30	30
φ80	95	φ45	15	19	25	23	□86	17	35	36
φ100	108	φ56	15	18	24	24	□106	26	42	42

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

HQS2/THQS2 Bore

CAD/DATA
is available.



LD

Standard type

General purpose type HQS2D 6 LD Bore N Stroke T ($\phi 20 - \phi 100$)

Cutting fluid proof type HQSW2D 6 LD Bore N Stroke T ($\phi 32 - \phi 100$)

None : Female thread
T : Male thread

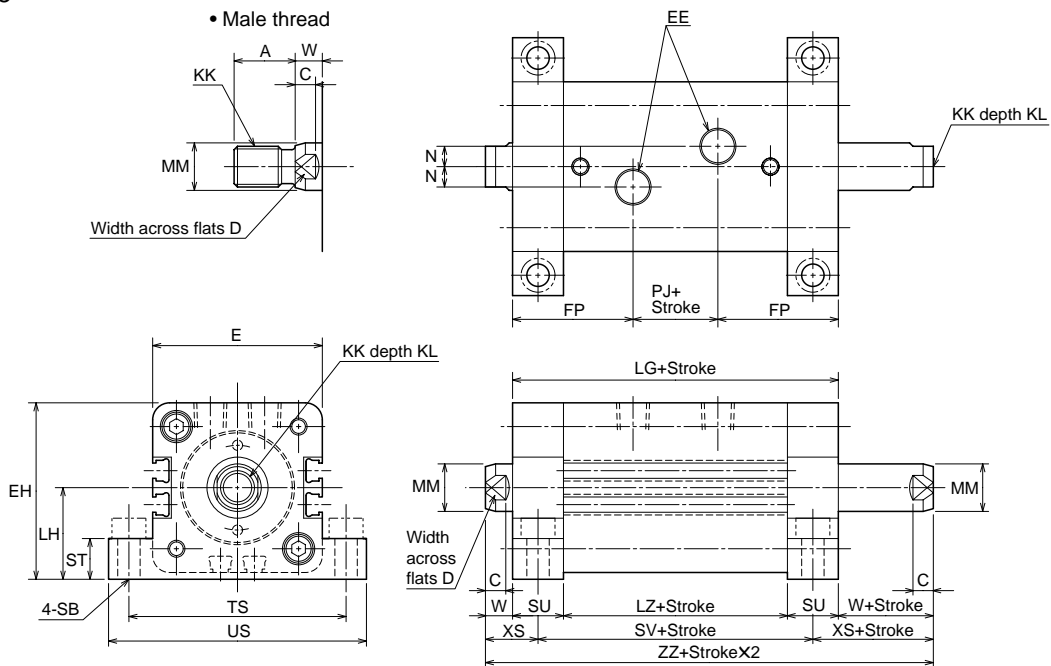
Switch set

General purpose type HQS2RD 6 LD Bore N Stroke T Switch code Switch quantity ($\phi 20 - \phi 100$)

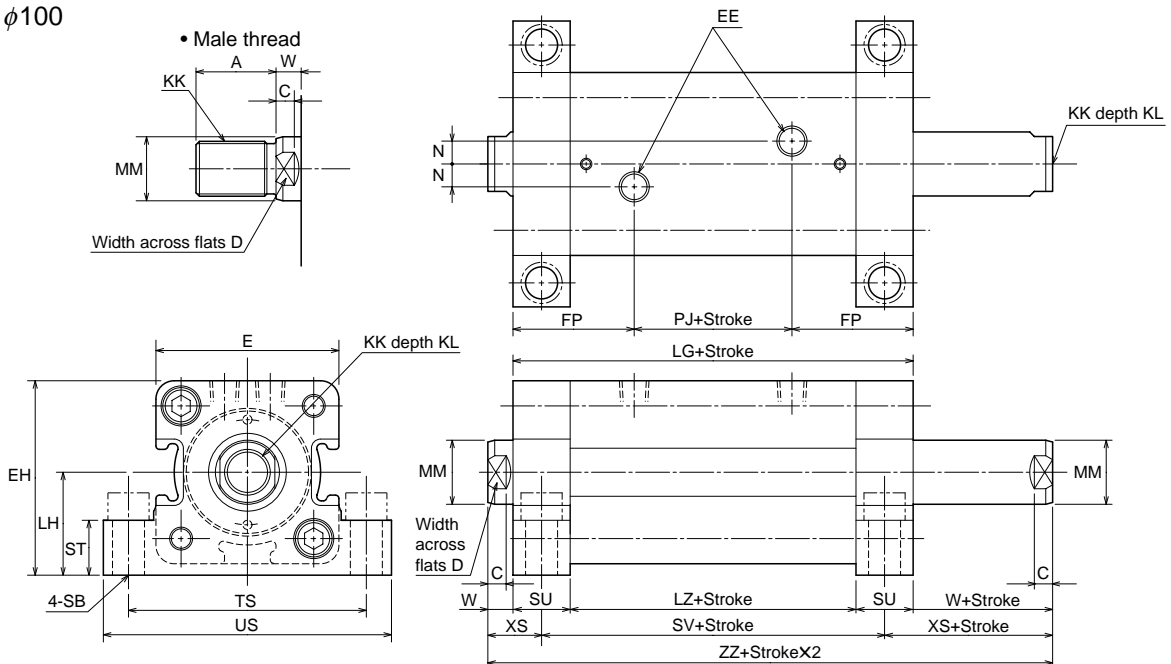
Cutting fluid proof type HQSW2RD 6 LD Bore N Stroke T Switch code Switch quantity ($\phi 32 - \phi 100$)

- : Female thread
T : Male thread

- Bore $\phi 20 - \phi 25$



- Bore $\phi 32 - \phi 100$



- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- *Please be sure to use the Socket Head Screw when install the cylinder to the contact patch.
- Switch installing groove is available in 3 positions for bore 100 mm.

Unit: mm

Dimension Table

Symbol Bore	A	C	D	E	EE	EH	FP	KK		KL	LG	LH
								Female thread	Male thread			
φ20	15(25)	6	10	□44	Rc1/8	46	33.5	M8 × 1.25	M10 × 1.25	10	84	24±0.15
φ25	18(30)	6	12	□50	Rc1/8	52	35.5	M10 × 1.5	M12 × 1.25	12	86	27±0.15
φ32	25(40)	7	14	□62	Rc1/4	66	48	M12 × 1.75	M16 × 1.5	15	112	35±0.15
φ40	30(45)	7	19	□70	Rc1/4	72.5	47	M16 × 2	M20 × 1.5	20	112	37.5±0.15
φ50	35(50)	8	24	□80	Rc1/4	85	53	M20 × 2.5	M24 × 1.5	24	125	45±0.15
φ63	45(60)	9	30	□94	Rc1/4	97	55	M27 × 3	M30 × 1.5	33	132	50±0.15
φ80	60(80)	14	41	□114	Rc3/8	117	65	M30 × 3.5	M39 × 1.5	36	155	60±0.25
φ100	75(95)	22	50	□138	Rc3/8	140	77	M39 × 4	M48 × 1.5	45	178	71±0.25

Symbol Bore	LZ	MM	N	PJ	SB	ST	SU	SV	TS	US	W	XS	ZZ
φ20	54	φ12	3	17	6.6	12	15	69	58	70	8	15.5	100
φ25	56	φ14	6	15	6.6	12	15	71	64	76	8	15.5	102
φ32	72	φ18	10	16	9	16	20	92	79	94	10	20	132
φ40	72	φ22	10	18	11	20	20	92	90	108	10	20	132
φ50	75	φ28	10	19	14	24	25	100	104	126	11	23.5	147
φ63	82	φ36	10	22	16	30	25	107	121	146	13	25.5	158
φ80	95	φ45	15	25	18	35	30	125	144	172	17	32	189
φ100	108	φ56	15	24	22	43	35	143	174	208	26	43.5	230

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

HQS2/THQS2 Bore

CAD/DATA
is available.



FA

Standard type

General purpose type HQS2D 6 FA Bore N Stroke T ($\phi 20 - \phi 100$)

Cutting fluid proof type HQSW2D 6 FA Bore N Stroke T ($\phi 32 - \phi 100$)

None : Female thread
T : Male thread

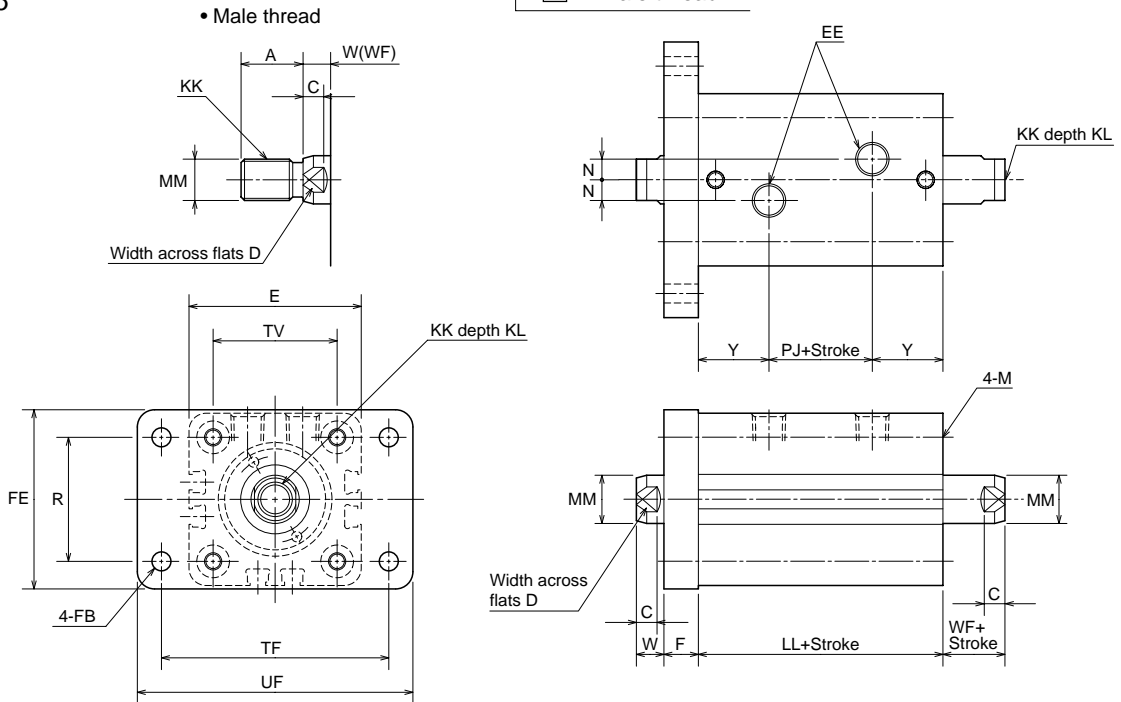
Switch set

General purpose type HQS2RD 6 FA Bore N Stroke T Switch code Switch quantity ($\phi 20 - \phi 100$)

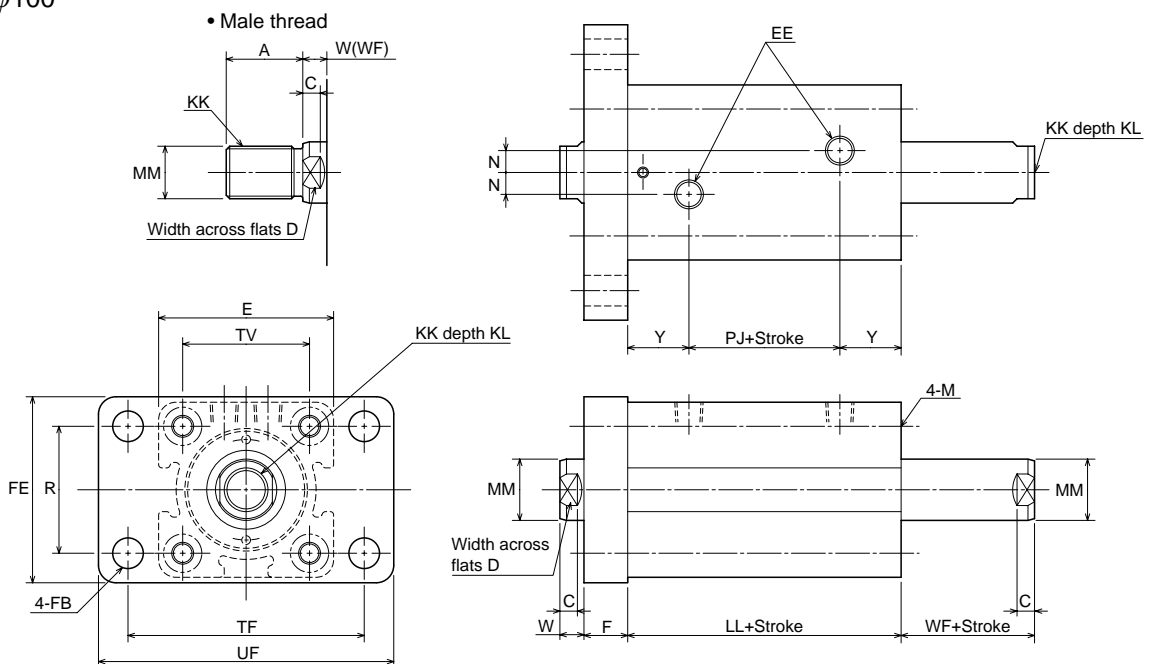
Cutting fluid proof type HQSW2RD 6 FA Bore N Stroke T Switch code Switch quantity ($\phi 32 - \phi 100$)

- : Female thread
T : Male thread

• Bore $\phi 20 - \phi 25$



• Bore $\phi 32 - \phi 100$



- See "Switch set dimension diagram" for installing the switch. It is the same except for switch installing dimension.
- Switch installing groove is available in 3 positions for bore 100 mm.

Dimension Table

Symbol Bore	A	C	D	E	EE	F	FB	FE	KK		KL	LL
									Female thread	Male thread		
φ20	15(25)	6	10	□44	Rc1/8	10	φ5.5	46	M8 × 1.25	M10 × 1.25	10	54
φ25	18(30)	6	12	□50	Rc1/8	10	φ5.5	52	M10 × 1.5	M12 × 1.25	12	56
φ32	25(40)	7	14	□62	Rc1/4	15	φ6.6	62	M12 × 1.75	M16 × 1.5	15	72
φ40	30(45)	7	19	□70	Rc1/4	20	φ11	70	M16 × 2	M20 × 1.5	20	72
φ50	35(50)	8	24	□80	Rc1/4	20	φ14	85	M20 × 2.5	M24 × 1.5	24	75
φ63	45(60)	9	30	□94	Rc1/4	20	φ14	98	M27 × 3	M30 × 1.5	33	82
φ80	60(80)	14	41	□114	Rc3/8	25	φ18	118	M30 × 3.5	M39 × 1.5	36	95
φ100	75(95)	22	50	□138	Rc3/8	30	φ22	150	M39 × 4	M48 × 1.5	45	108

Symbol Bore	M	MM	N	PJ	R	TF	TV	UF	W	WF	Y
φ20	M5 × 0.8	φ12	3	17	30	60	□30	75	8	8	18.5
φ25	M5 × 0.8	φ14	6	15	36	66	□36	80	8	8	20.5
φ32	M6 × 1	φ18	10	16	40	80	□47	95	10	10	28
φ40	M8 × 1.25	φ22	10	18	46	96	□52	118	10	10	27
φ50	M10 × 1.5	φ28	10	19	58	108	□58	135	11	11	28
φ63	M12 × 1.75	φ36	10	22	65	124	□69	150	13	13	30
φ80	M14 × 2	φ45	15	25	87	154	□86	185	17	17	35
φ100	M16 × 2	φ56	15	24	109	190	□106	230	26	26	42

- Notes)
- When you use the cylinder with lock nut, we recommend you change A dimension for parenthesis one. (made-to-order.)
 - The lock nut needs to be ordered separately. (Refer to page of how to order.)
 - For 5 stroke type of bore 20 mm and 25 mm, dimension is the same as for 10 stroke type.
 - 20mm and 25mm bore size of Cutting Fluid Proof Type are not available.
 - Allowance of MM is f8.

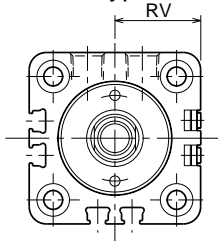
Switch set

General purpose type	HQS2R(D)	6	Mounting type	Bore	N	Stroke	T	Switch code	Switch quantity
Cutting fluid proof type	HQSW2R(D)	6	Mounting type	Bore	N	Stroke	T	Switch code	Switch quantity

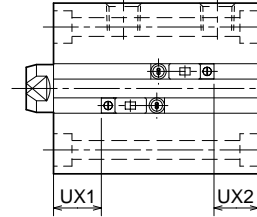
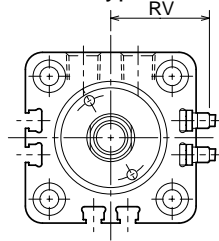
- Bore $\phi 20 \cdot \phi 25$
Single-rod

 : Female thread
 : Male thread

Cord extended to rear
T type

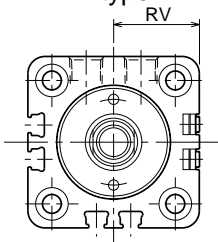


Cord extended to top
T type

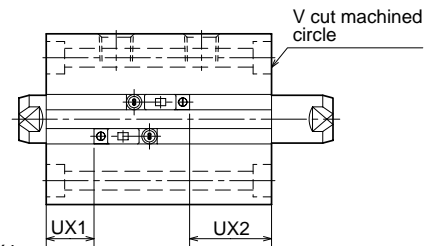
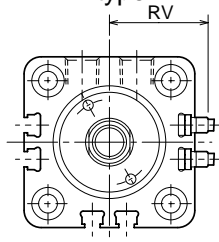


Double-rod

Cord extended to rear
T type



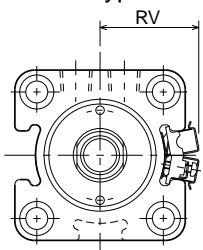
Cord extended to top
T type



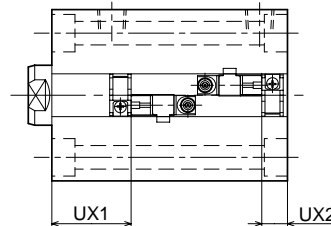
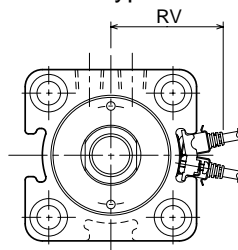
- The side which has no V circular groove on the end surface corresponds to UX1.

- Bore $\phi 32 - \phi 100$
Single-rod

Cord extended to rear
AX type



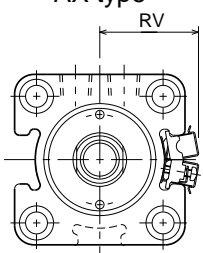
Cord extended to top
AZ type



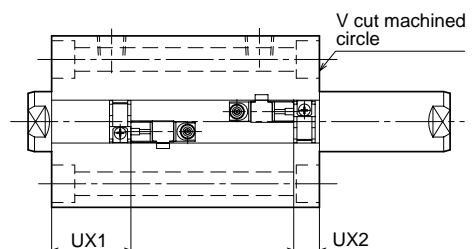
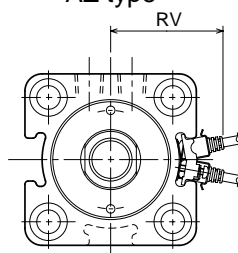
- Type of bore 100 mm has switch groove in three positions.

Double-rod

Cord extended to rear
AX type



Cord extended to top
AZ type



- Type of bore 100 mm has switch groove in three positions.
- The side which has no V circular groove on the end surface corresponds to UX1.

Unit: mm

General purpose type

Dimension Table (T · AX · AZ Type)

Bore	RV						UX1						UX2							
	T0H-T5H		T0V-T5V		T2YH	T2YV	AX	AZ	Single-rod			Double-rod			Single-rod			Double-rod		
	T2H-T3H	T2V-T3V	T	AX					AZ	T	AX	AZ	T	AX	AZ	T	AX	AZ		
φ20	22	26	24	31	-	-	13	-	-	13	-	-	12	-	-	23	-	-		
φ25	25	29	27	34	-	-	14	-	-	14	-	-	13	-	-	24	-	-		
φ32	-	-	-	-	37	44	-	19	19	-	19	19	-	17	17	-	35	35		
φ40	-	-	-	-	41	48	-	20	20	-	20	20	-	17	17	-	34	34		
φ50	-	-	-	-	46	53	-	22	22	-	22	22	-	20	20	-	35	35		
φ63	-	-	-	-	54	61	-	24	24	-	24	24	-	25	25	-	40	40		
φ80	-	-	-	-	63	70	-	30	30	-	30	30	-	30	30	-	47	47		
φ100	-	-	-	-	75	82	-	36	36	-	36	36	-	42	40	-	53	53		

Note) UX dimension is for a guide. See the Switch Monitoring Minimum Possible Stroke list for detail.

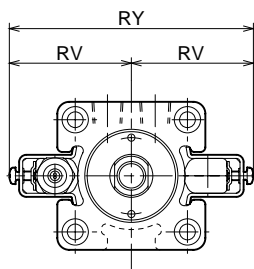
Operating Ranges and Differences

Bore	Contact						No Contact							
	AX1** · AZ1**		T type		WR type		AX2** · AZ2**		T2 · T3 type		T2Y type		WS type	
	Operating range	Difference	Operating range	Difference	Operating range	Difference	Operating range	Difference	Operating range	Difference	Operating range	Difference	Operating range	Difference
φ20	-	-	3 - 10	2 or less	-	-	-	-	3 - 8	1 or less	5 - 10	1 or less	-	-
φ25	-	-	-	-	-	-	-	-	-	-	-	-	-	-
φ32	-	-	-	-	-	-	-	-	-	-	-	-	-	-
φ40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
φ50	10 - 17	2 or less	-	-	10 - 17	2 or less	4 - 8	1 or less	-	-	-	-	15 - 24	1 or less
φ63	-	-	-	-	-	-	-	-	-	-	-	-	-	-
φ80	-	-	-	-	-	-	-	-	-	-	-	-	-	-
φ100	6 - 14	2 or less	-	-	7 - 15	2.5 or less	6 - 9	1 or less	-	-	-	-	20 - 28	1 or less

Cutting fluid proof type

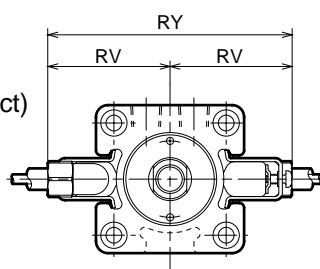
WR · WS type switch attachment dimensions

- Cord rear wiring
WR525 (contact)
WS235 (no contact)



* Type of bore 100 mm has mounting groove on three sides.

- Cord upper wiring
WR535 (contact)
WS245 (no contact)

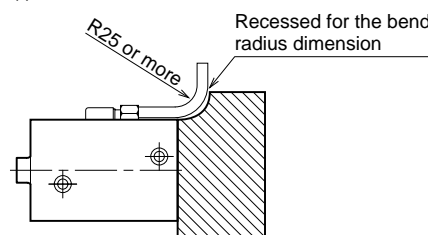


* Type of bore 100 mm has mounting groove on three sides.

Dimension Table

Bore	RV		RY		UX1		UX2	
	Cord rear wiring	Cord upper wiring	Cord rear wiring	Cord upper wiring	WR	WS	WR	WS
φ32	53	53	106	106	11(11)	15(15)	12(28)	16(32)
φ40	57	57	114	114	17(17)	20(20)	14(33)	16(36)
φ50	62	62	124	124	19(19)	21(21)	16(35)	20(37)
φ63	69	69	138	138	20(20)	24(24)	21(36)	23(40)
φ80	79	79	158	158	25(25)	29(29)	25(43)	29(47)
φ100	90	90	180	180	33(33)	35(35)	40(50)	41(52)

- Note) • Set the flex tube so that its bend radius becomes R25 or more.
 If the bend radius becomes smaller than this value, the cord may be disconnected
 • Numeric within () indicates the dimension of double-rod type.



When the switch cannot be attached as shown above, use the other type (cord upper wiring).

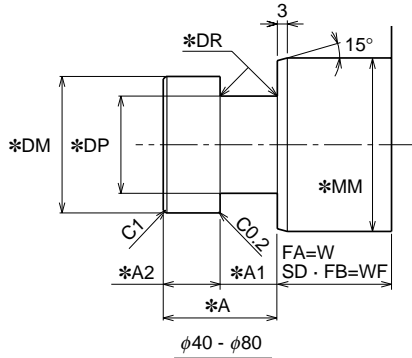
Special specification at the rod end

■ You can easily order following categorized items using the Semi-standard symbols and dimensional parameters.
(No need to specify dimensional parameters if you would apply the basic dimensions.)

How to order Series Model number – X Semi-standard symbols Dimensional parameters

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

ex. A83

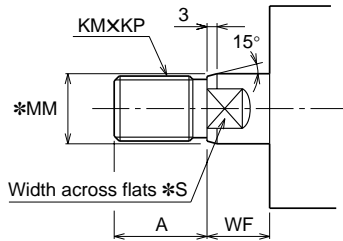


- A83, bore:40mm, WF:60mm
- HQS2 6SD40N50T-X A83
- WF-60

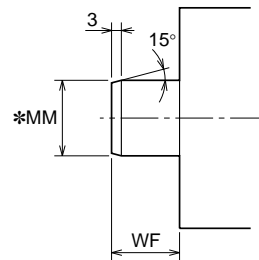
Note) Only WF dimension can be changed at A82 and A83 special rod end shape.
If you would like to change other.

Special rod end shape

A00(T)



A51



Basic Dimension Table (Standard Dimensions)

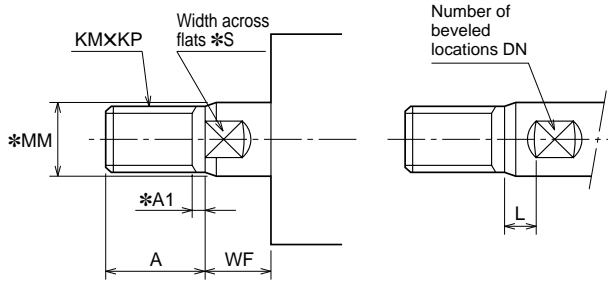
Bore	A	KM	KP	*MM	*S	WF
φ20	15	10	1.25	φ12	10	8
φ25	18	12	1.25	φ14	12	8
φ32	25	16	1.5	φ18	14	10
φ40	30	20	1.5	φ22	19	10
φ50	35	24	1.5	φ28	24	11
φ63	45	30	1.5	φ36	30	13
φ80	60	39	1.5	φ45	41	17
φ100	75	48	1.5	φ56	50	26

Basic Dimension Table

Bore	*MM	WF
φ20	φ12	8
φ25	φ14	8
φ32	φ18	10
φ40	φ22	10
φ50	φ28	11
φ63	φ36	13
φ80	φ45	17
φ100	φ56	26

- Dimensions indicated by *Mark are fixed as our semi-standard.
- You are requested to consult us if you would like to change fixed dimensions.

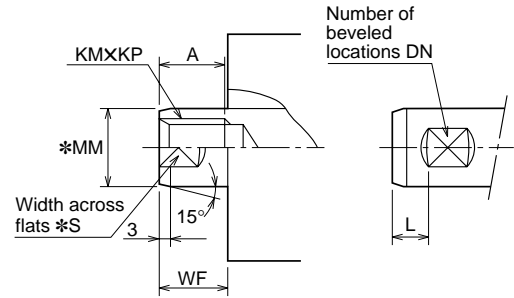
A54



Basic Dimension Table

Bore	A	*A1	DN	KM	KP	L	*MM	*S	WF
φ20	15	4	2	10	1.25	0	φ12	10	8
φ25	18	4	2	12	1.25	0	φ14	12	8
φ32	25	4	2	16	1.5	0	φ18	14	10
φ40	30	4	2	20	1.5	0	φ22	19	10
φ50	35	4	2	24	1.5	0	φ28	24	11
φ63	45	4	2	30	1.5	0	φ36	30	13
φ80	60	4	2	39	1.5	0	φ45	41	17
φ100	75	4	2	48	1.5	0	φ56	50	26

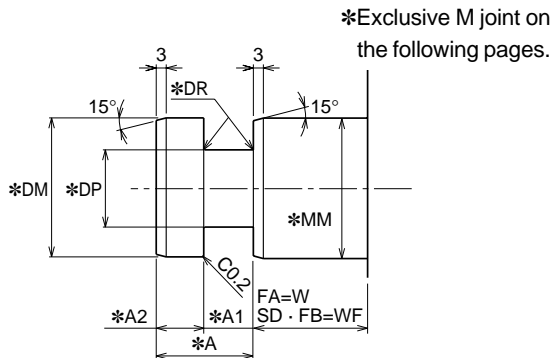
A81



Basic Dimension Table

Bore	A	DN	KM	KP	L	*MM	*S	WF
φ20	10	2	8	1.25	0	φ12	10	8
φ25	12	2	10	1.5	0	φ14	12	8
φ32	15	2	12	1.75	0	φ18	14	10
φ40	20	2	16	2	0	φ22	19	10
φ50	24	2	20	2.5	0	φ28	24	11
φ63	33	2	27	3	0	φ36	30	13
φ80	36	2	30	3.5	0	φ45	41	17
φ100	45	2	39	4	0	φ56	50	26

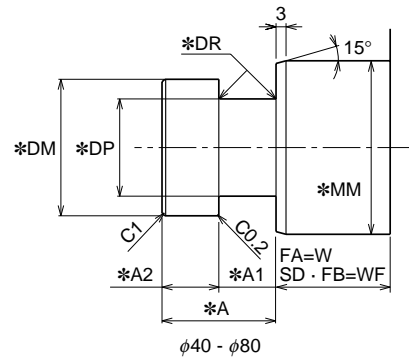
A82



Basic Dimension Table (Standard Dimension)

Bore	*A	*A1 ^{+0.5} / _{+0.3}	*A2 ^{-0.2} / _{-0.3}	*DM	*DP ^{-0.2} / _{-0.3}	*DR	*MM	W	
								FA type	SD · FB type
φ20	25	12.5	12.5	φ12	φ8	0.5	φ12	20	20
φ25	25	12.5	12.5	φ14	φ10	0.5	φ14	20	20
φ32	25	12.5	12.5	φ18	φ13	1.0	φ18	30	30
φ40	25	12.5	12.5	φ22	φ16	1.5	φ22	35	35
φ50	25	12.5	12.5	φ28	φ21	1.5	φ28	35	35
φ63	30	15	15	φ36	φ26	2.0	φ36	40	40
φ80	30	15	15	φ45	φ31	2.0	φ45	45	45
φ100	40	20	20	φ56	φ38	3.0	φ56	55	55

A83

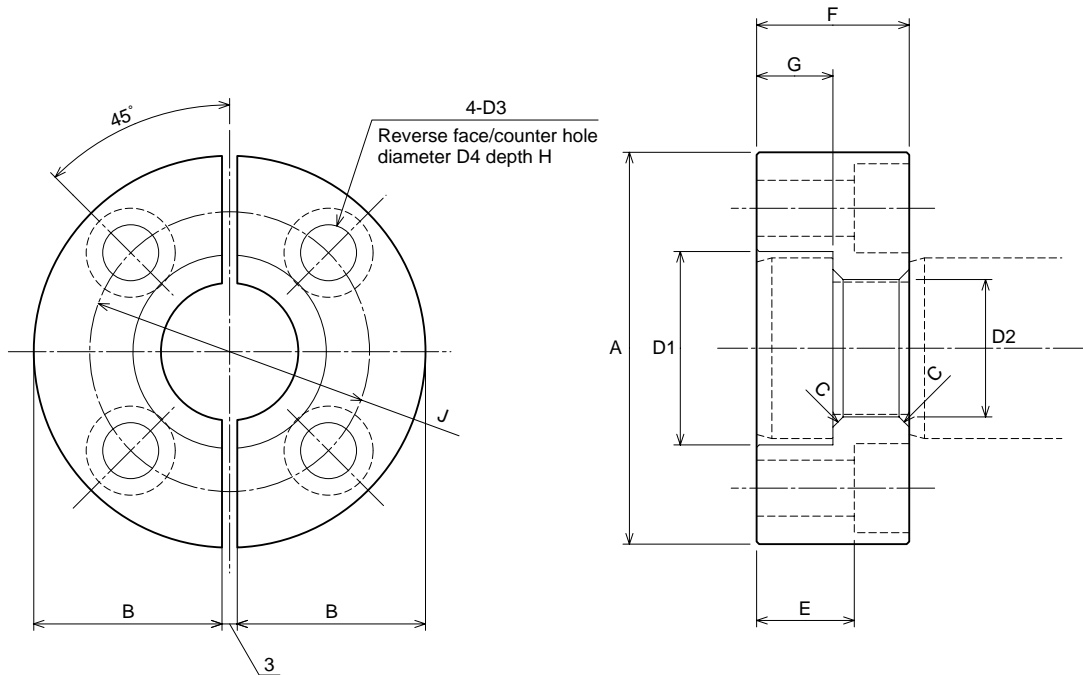


Basic Dimension Table (Standard Dimension)

Bore	*A	*A1 ^{+0.5} / _{+0.3}	*A2 ^{-0.2} / _{-0.3}	*DM ^{-0.1} / _{-0.4}	*DP ^{-0.2} / _{-0.3}	*DR	*MM	W	
								FA type	SD · FB type
φ40	25	12.5	12.5	φ18	φ13	1.0	φ22	35	35
φ50	25	12.5	12.5	φ22	φ16	1.5	φ28	35	35
φ63	25	12.5	12.5	φ28	φ21	1.5	φ36	40	40
φ80	30	15	15	φ36	φ26	2.0	φ45	45	45

- Dimensions indicated by *Mark are fixed as our semi-standard.
- You are requested to consult us if you would like to change fixed dimensions.

Separate flange joint : Only for A82 rod end style



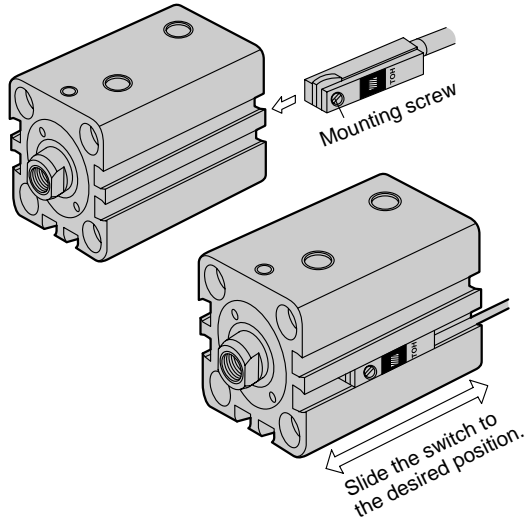
- Need additional order for this item. Part No.: RMH-Rod Dia. mm.

Dimension Table

Symbol Bore	Parts code	A	B	C	D1	D2	D3	D4	E	F	G	H	J
φ20	RMH-12	φ44	20.5	0.5	φ13	φ8.5	φ5.5	φ9.5	19.6	25	12.5	5.4	φ29
φ25	RMH-14	φ46	21.5	0.5	φ15	φ10.5	φ5.5	φ9.5	19.6	25	12.5	5.4	φ31
φ32	RMH-18	φ49	23	1	φ19	φ13.5	φ6.6	φ11	18.5	25	12.5	6.5	φ34
φ40	RMH-22	φ57	27	1.5	φ23	φ16.5	φ9	φ14	16.4	25	12.5	8.6	φ40
φ50	RMH-28	φ71	34	1.5	φ29	φ21.5	φ11	φ17.5	14.2	25	12.5	10.8	φ50
φ63	RMH-36	φ77	37	2	φ38	φ27	φ11	φ17.5	19.2	30	15	10.8	φ55
φ80	RMH-45	φ100	48.5	2	φ48	φ33	φ14	φ20	17	30	15	13	φ76
φ100	RMH-56	φ124	60.5	3	φ60	φ41	φ18	φ26	22.5	40	20	17.5	φ92

Switch Detection Position Adjustment Method

T type switch ($\phi 20 - \phi 25$)



1. Place the switch into the gutter as shown on the left.
2. Slide the switch to any desired position. Installing in the center of operating range provides the most stable detection.
3. If the cylinder stroke end is detected, install the switch at the dimension UX (optimum sensing position).
4. Slide the unit to the detection position and tighten the mounting screw.

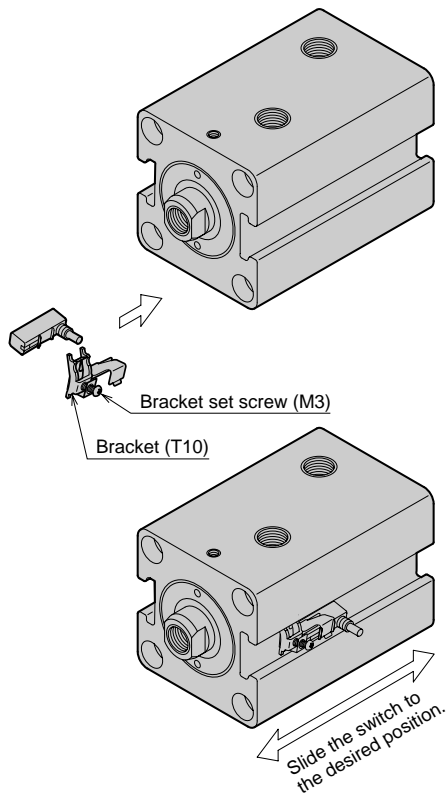
TORQUE OF MOUNTING SCREW

Switch type	T0 · T5 · T2 · T3	T2Y
Nominal diameter of mounting screw	M2.5	M3
Mounting screw tightening tool	Flat-blade precision screwdriver	Phillips type small screwdriver
Tightening torque	Approx 0.1 to 0.2 Nm	Approx 0.4 Nm

Note) If the tightening torque to tighten the bracket set screw is inappropriate, switch dislocation or damage to the switch body may be caused.

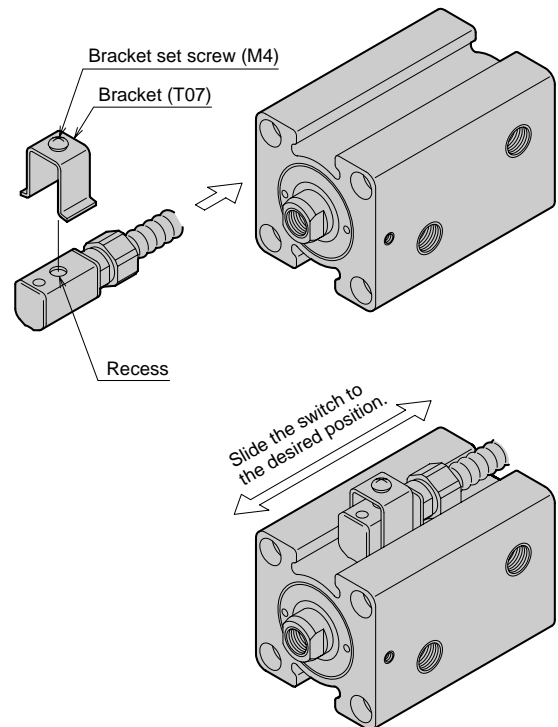
AX · AZ type switch ($\phi 32 - \phi 100$)

AX · AZ type bracket set screw's tightening torque:
Approximately 0.4 N·m



WR · WS type switch ($\phi 32 - \phi 100$)

WR · WS type bracket set screw's tightening torque:
Approximately 0.6 N·m



1. Loosen the bracket set screw and attach the bracket to the switch center part.
2. Attach the switch and bracket assembly to the cylinder body's switch attachment section.
3. Slide the switch to the desired position. When the switch is attached to the center of the operating range, switch detection is performed most stably.
4. To detect the cylinder stroke end, attach the switch to the UX dimension (optimal sensing position).
5. After sliding the switch to the detection position, tighten the bracket set screw.

Note) If the tightening torque to tighten the bracket set screw is inappropriate, switch dislocation or damage to the switch body may be caused.

Precautions for Use

- When using the cylinder with the rod push output, tighten the screw(s) to the rod end completely so that no load is applied to the piston rod screw section.
- Since lateral load (eccentric load) cannot be applied to the piston rod, carefully adjust it after rod end attachment.
- When tightening the double-acting double rod type's piston rod end thread(s), be sure to use the width across flats of the rod to be tightened. Since the double rod type's piston rod is tightened by screws, be careful not to apply rotational force to the piston rod's both ends.

Note) Since the HQS2 series is not equipped with the air bleeder, perform air-bleeding via the piping section.

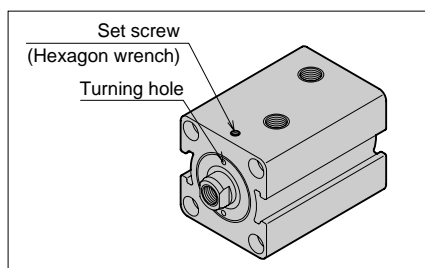
- Use four hexagon socket bolts (JIS B1176, strength classification of 10.9 or more) to install the cylinder.
- When using mounting bolts, screw the bolt's threads 80% or more into the installation members. The material for the installation members must have strength equal to SS400.
- When using nuts to tighten the mounting bolts, use steel nuts with a strength classification of 6 or more. (However, DO NOT use type 3 nuts.)
- When using the mounting bolts to secure the cylinder unit, be sure to use the following standard tightening torque.

Cylinder Mounting Bolt Tightening Torque

Cylinder Bore	Mounting Bolt	Tightening Torque N • m
φ20	M5 × 0.8	4.8
φ25	M5 × 0.8	4.8
φ32	M6 × 1	5.9
φ40	M8 × 1.25	14.0
φ50	M10 × 1.5	28.0
φ63	M12 × 1.75	49.0
φ80	M14 × 2	77.0
φ100	M16 × 2	120.0

- When installing the foot type, use the accompanying key. If this key cannot be used, attach a stopper in front and rear of the cylinder unit. Otherwise, the mounting bolts may be damaged.

Overhaul and Reassembly Requirements



- After removing the set screw, use the rod gland's turning hole to remove the rod gland from the cylinder

Note) The body contains a copper piece under the set screw.

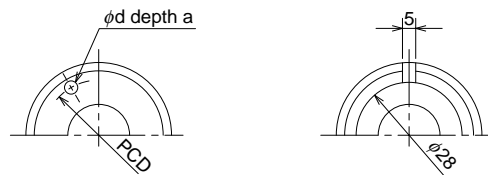
body. Since, when removing the rod end thread's jig, burrs may occur on the rod's width across flats, use a file or other appropriate tools to remove the burrs and then remove the rod gland.

- The piston rod and piston cannot be disassembled.
- When reassembling the cylinder, be careful that foreign matters such as dust, filings, and debris do not enter the inside of the cylinder.
- Under the set screw, a rod gland thread protective copper piece is equipped. First, remove this ball and then tighten the rod gland.
- After tightening the rod gland, return the seal set's copper piece in place and tighten the set screw.

Seal Replacement

- When overhauling the cylinder, replace all the sealing materials (seals and gaskets) with new ones.
- General purpose type (HQS2, HQS2D, HQS2R, HQS2RD)'s piston seal, rod seal, dust wiper, and rod gland O-ring can be replaced.
- Cutting fluid proof type (HQSW2, HQSW2D, HQSW2R, HQSW2RD)'s piston seal, rod seal, rod gland O-ring can be replaced. Wiper-seal of Cutting Fluid Proof Type is pressed into the rod gland, so rod gland including the Wiper-seal is available as a spare part. Please be careful for not being included wiper-seal in the seal kit.
- Since the piston and rod have been locked, the piston rod O-ring cannot be replaced.

Dimension of turning hole



*General purpose type:bore φ20~φ100 *Cutting fluid proof type:bore φ32
Cutting fluid proof type:bore φ40~φ100

Bore	a	d	PCD
φ20	4	4	23
φ25	4	4	25
φ32	5	4	32
φ40	7	4	38
φ50	8	5	46
φ63	8	5	58
φ80	10	8	70
φ100	12	10	85