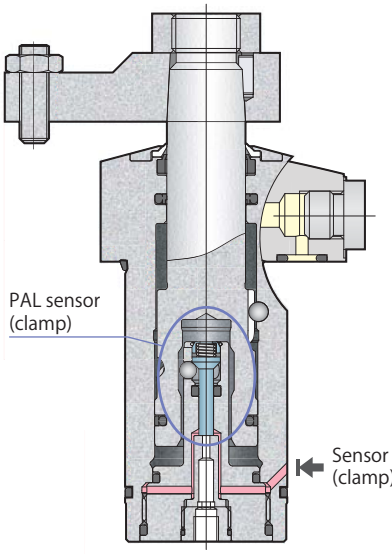
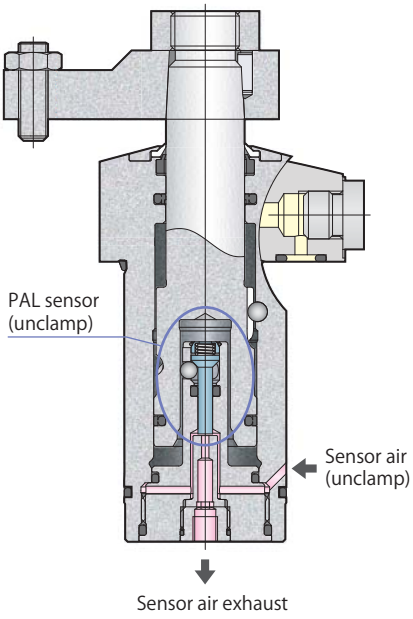
Clamp sensor model C

model **CTK□U-□C** PAT.



Unclamp sensor model B

model **CTK□U-□B** PAT.



model **CTK04U-□C**

Specifications page → 33
Sensor page → 34
Dimensions page → 38
Mounting details page → 40

Specifications

CTK [Size: 04 / 06 / 10 / 16] **U** : Upper flange —

Swing direction (when clamping)

L : Counter-clockwise

R : Clockwise

C : Clamp sensor model
Clamp, Over clamp stroke (Incomplete clamp) detection

B : Unclamp sensor model

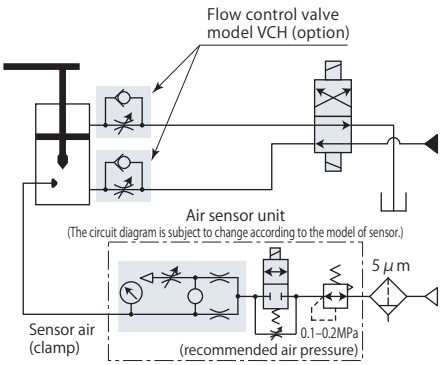
Model			CTK04U-□□	CTK06U-□□	CTK10U-□□	CTK16U-□□
Cylinder force (hydraulic pressure 35MPa)		kN	5.1	7.6	14.6	20.3
Cylinder inner diameter		mm	21	26	34	42
Rod diameter		mm	16	20	25	32
Effective area (clamp)		cm^2	1.45	2.17	4.17	5.81
Swing angle			90° ±3°			
Positioning pin groove position accuracy			±1°			
Repeated clamp positioning accuracy			±0.5°			
Full stroke	CTK□U-□C	mm	17.5	21.5	26	29
	CTK□U-□B	mm	17	21	25.5	28.5
90° swing stroke		mm	9	11	13.5	16.5
Clamp stroke		mm	8	10	12	12
Over clamp stroke (CTK□U-□C)		mm	0.5	0.5	0.5	0.5
Cylinder capacity (CTK□U-□C)	Clamp	cm^3	2.5	4.7	10.8	16.9
	Unclamp	cm^3	6.1	11.4	23.6	40.2
Cylinder capacity (CTK□U-□B)	Clamp	cm^3	2.5	4.6	10.6	16.6
	Unclamp	cm^3	5.9	11.1	23.2	39.5
Mass		kg	0.7	1.1	2.0	3.4
Recommended tightening torque of mounting screws*		N·m	7	12	29	57
Recommended tightening torque of nut		N·m	26	51	75	130

- Pressure range : 5–35 MPa
- Proof pressure : 52.5 MPa
- Operating temperature : 0–70 ℃
- Fluid used : General mineral based hydraulic oil (ISO-VG32 equivalent)
- Seals are resistant to chlorine-based cutting fluid. (not thermal resistant specification)
- There is no overload protection mechanism.
- Refer to Performance table (**page →10**), Swing speed adjustment (**page →11**).

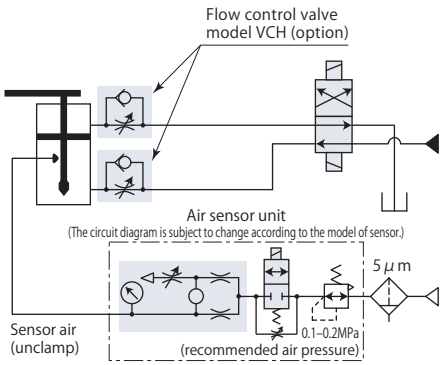
∗ : ISO R898 class 12.9

Hydraulic and pneumatic circuit diagram

model **CTK□U-□C**

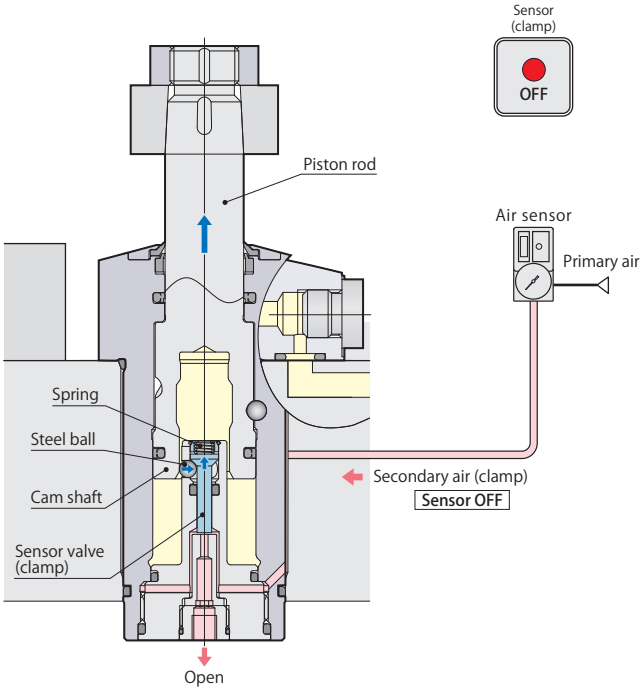


model **CTK□U-□B**



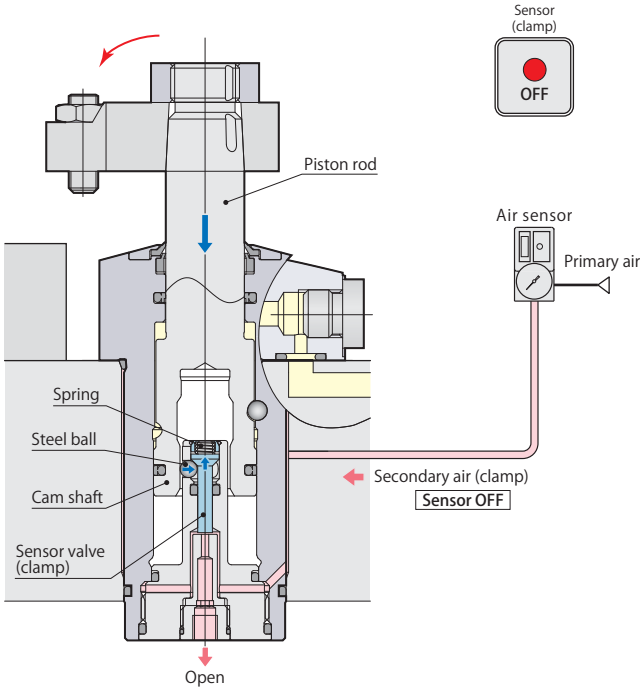
Clamp, Over clamp stroke detection signal

Unclamp



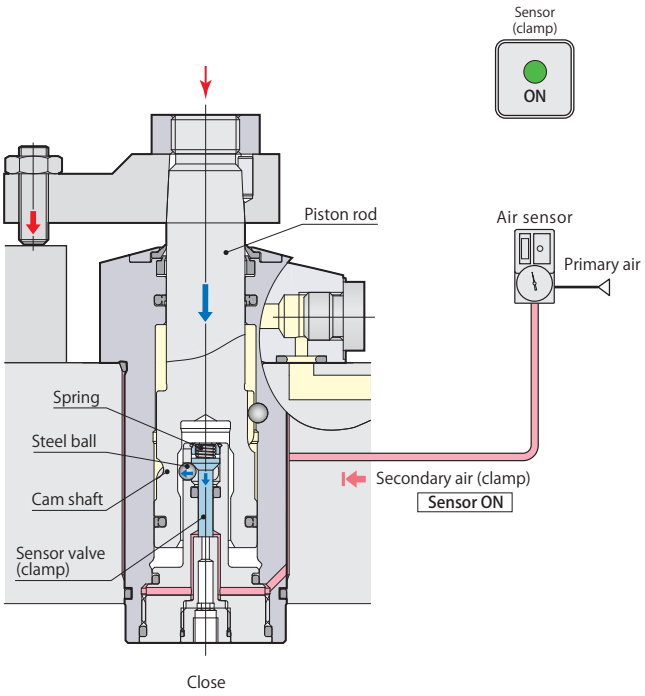
Sensor signal (clamp)	OFF	Unclamp

In the middle of swing stroke



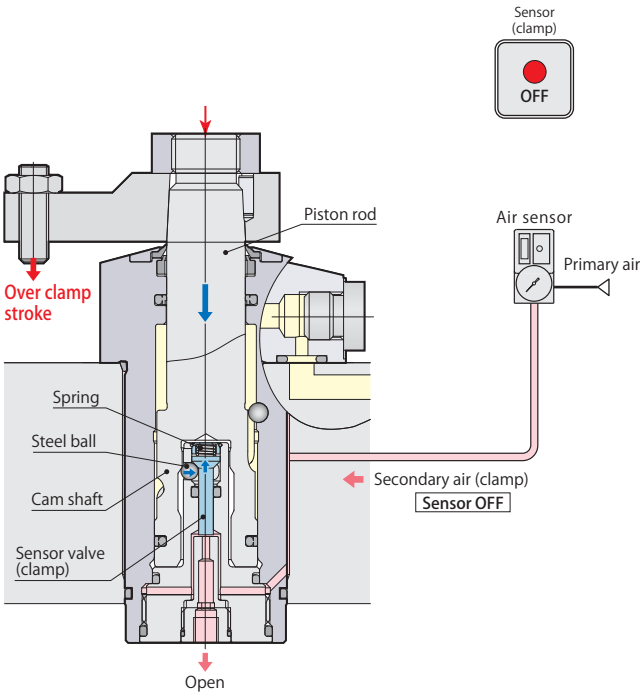
Sensor signal (clamp)	OFF	In the middle of swing stroke

Clamp detection



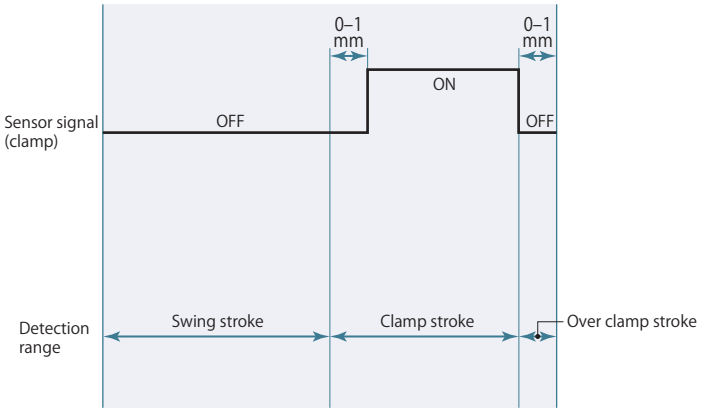
Sensor signal (clamp)	ON	Clamp

Over clamp stroke (Incomplete clamp) detection



Sensor signal (clamp)	OFF	Over clamp stroke (Incomplete clamp)

Air sensor triggering point



- Refer to the sensor supplier's instruction manual for the details of setting.
- Sensing performance such as detectable time and pressure differs depending on the supplier and model number of the sensor. Select the right model referring to sensor's application and characteristics.

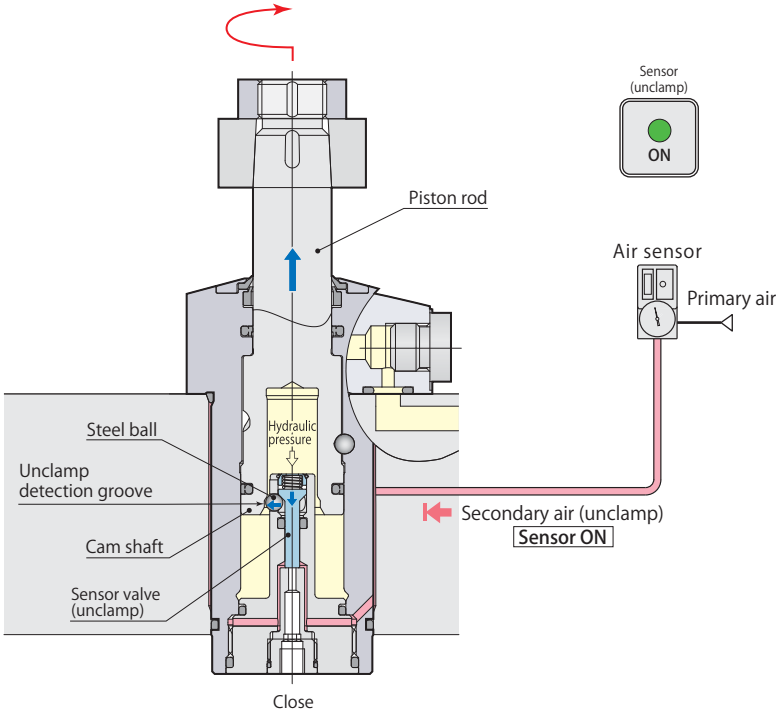
Air sensor unit recommended condition of use

Supplier and model	ISA3-F/G series manufactured by SMC
	GPS2-05, GPS3-E series manufactured by CKD
Air supply pressure	0.1–0.2 MPa
Inner diameter of piping	ø4 mm (ISA3-F：ø2.5 mm)
Overall piping length	5 m or less

- Supply the dry and filtered air. Particulate size 5 μm or less is recommended.
- Use a solenoid valve with needle for air sensor unit and control it supplying air all the time in order to eliminate intrusion of chips or coolant.
- There is a case that air sensing cannot be successfully made as designed when it is used out of the above usage. Contact Technical service center for more details.

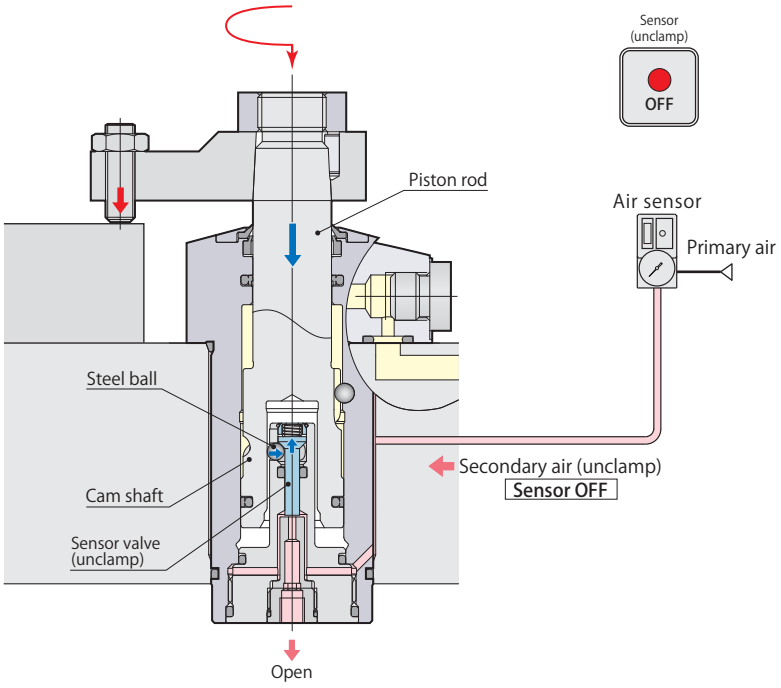
Unclamp detection signal

Unclamp detection



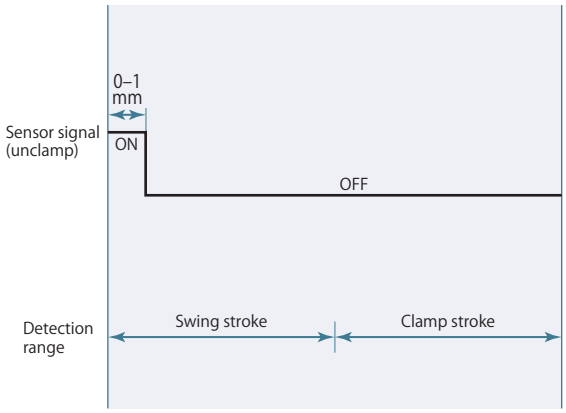
Sensor signal (unclamp)	ON	Unclamp

In the middle of stroke



Sensor signal (unclamp)	OFF	Clamp, In the middle of stroke

Air sensor triggering point



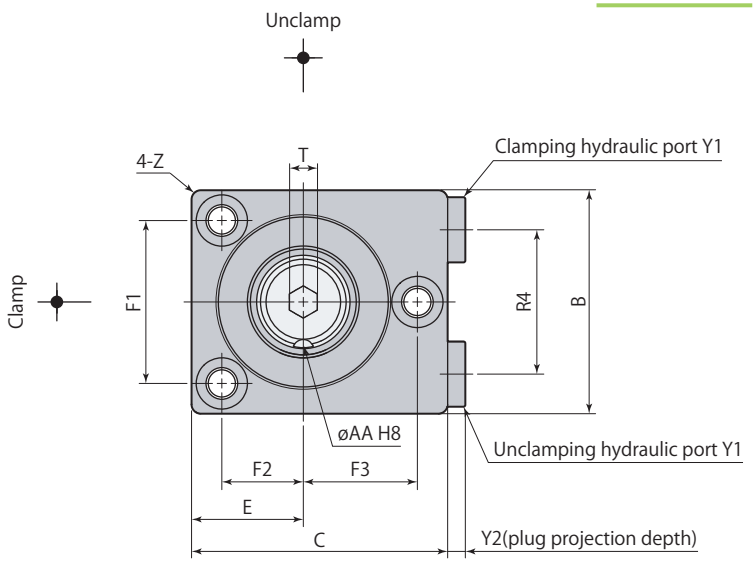
- Refer to the sensor supplier's instruction manual for the details of setting.
- Sensing performance such as detectable time and pressure differs depending on the supplier and model number of the sensor. Select the right model referring to sensor's application and characteristics.

Air sensor unit recommended condition of use

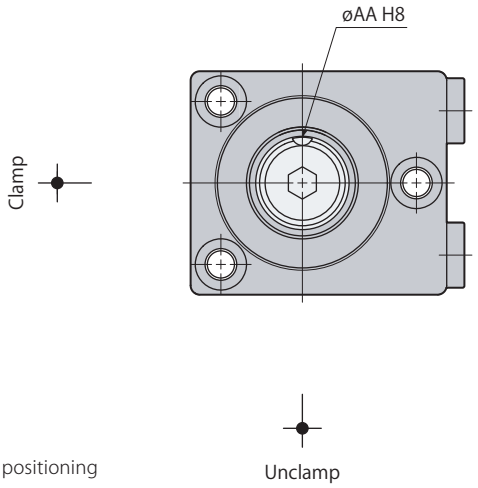
Supplier and model	ISA3-F/G series manufactured by SMC
	GPS2-05, GPS3-E series manufactured by CKD
Air supply pressure	0.1–0.2 MPa
Inner diameter of piping	ø4 mm (ISA3-F：ø2.5 mm)
Overall piping length	5 m or less

- Supply the dry and filtered air. Particulate size 5 μm or less is recommended.
- Use a solenoid valve with needle for air sensor unit and control it supplying air all the time in order to eliminate intrusion of chips or coolant.
- There is a case that air sensing cannot be successfully made as designed when it is used out of the above usage. Contact Technical service center for more details.

Dimensions

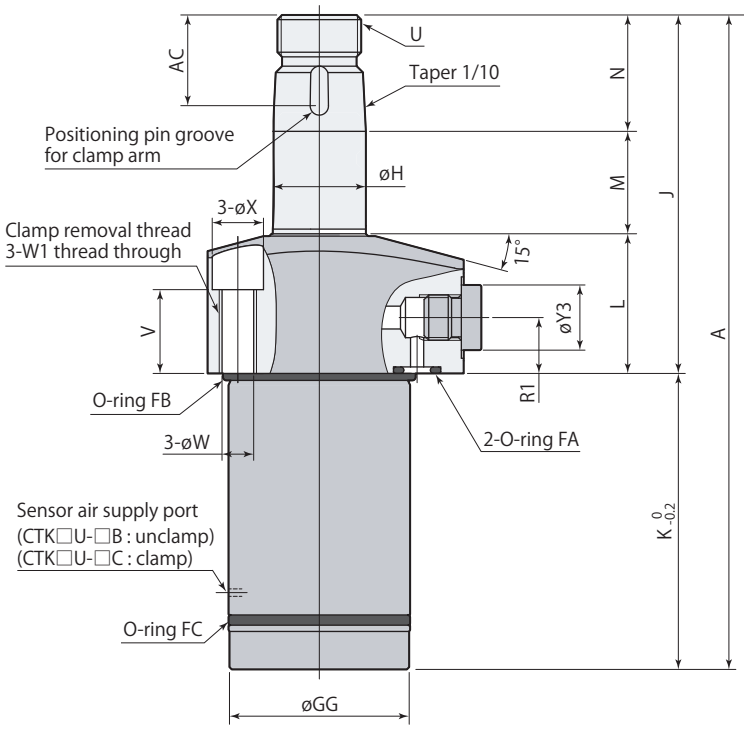


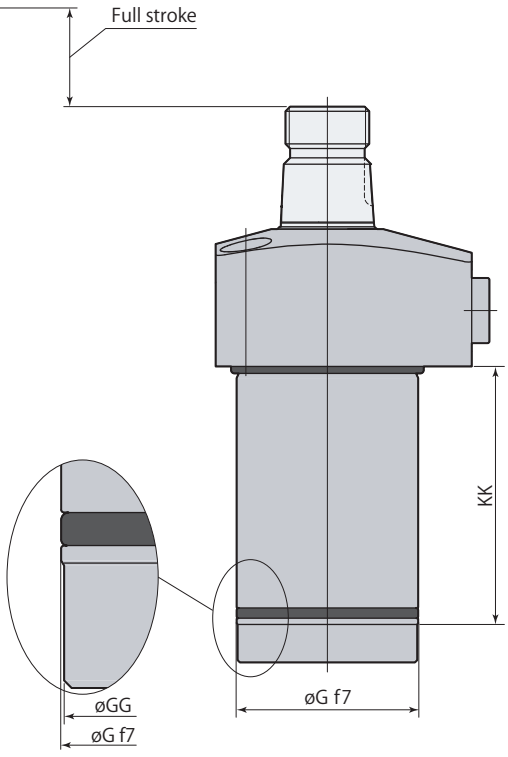
This diagram indicates the arm positioning pin groove at unclamped condition.



Swing direction L (counter-clockwise)

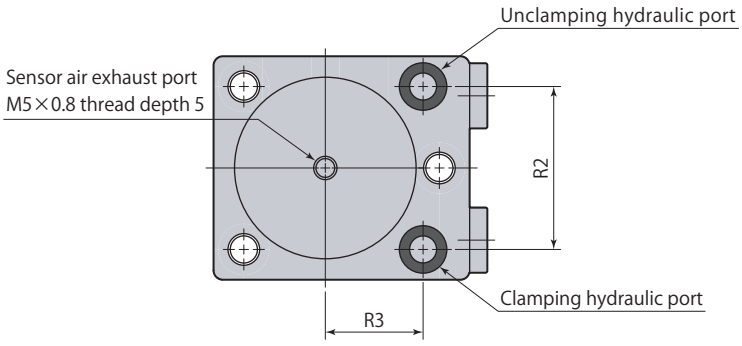
Swing direction R (clockwise)

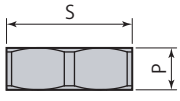




Unclamp

Stroke end





Hex nut for arm mount

- Hex nut for arm mount is included.
- Clamp arm, positioning pin and mounting screws are not included.
- Remove plugs when choosing G port piping. O-ring must be used.

mm

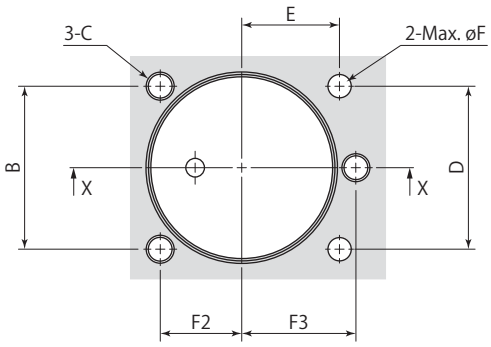
Model	CTK04U-□□	CTK06U-□□	CTK10U-□□	CTK16U-□□
A	121	140.5	168	194.5
B	43	48	60	74
C	50	55	70	85
E	21.5	24	30	37
F1	32	35	44	54
F2	16	17.5	22	27
F3	22.5	24.5	32	38
øG	$33^{-0.025}_{-0.050}$	$39^{-0.025}_{-0.050}$	$48^{-0.025}_{-0.050}$	$58^{-0.030}_{-0.060}$
øGG	32.6	38.6	47.6	57.6
øH	16	20	25	32
J	64	77	89.5	103
K	57	63.5	78.5	91.5
KK	49	55	69	78
L	24	30	34	37.5
M	18	22	26.5	29.5
N	22	25	29	36
P	8	9	10	11
R1	9.5	12	12.5	14
R2	30	35	44	56
R3	18.5	21	30	33
R4	26	31	40	50
S (nut width across flats)	22	27	30	36
T (hex socket)	5	6	10	12
U	M14×1.5	M18×1.5	M22×1.5	M28×1.5
V	12	18	18	18
øW	5.5	6.8	9	11
W1	M6×1	M8×1.25	M10×1.5	M12×1.75
øX	9.5	11	14	17.5
Y1	G1/8	G1/8	G1/8	G1/4
Y2	3.8	3.8	3.8	4.8
øY3	14	14	14	19
Z	R2	R2	R3	R3
øAA (pin groove diameter)	$3^{+0.014}_{0}$	$4^{+0.018}_{0}$	$5^{+0.018}_{0}$	$6^{+0.018}_{0}$
AC	16.5	19.5	22.5	23.5
Positioning pin (dowel pin)	ø3(h8)×8	ø4(h8)×10	ø5(h8)×12	ø6(h8)×12
O-ring FA (fluorocarbon hardness Hs90)	P7	P7	P7	P8
O-ring FB (fluorocarbon hardness Hs70)	AS568-026	AS568-029	AS568-031	AS568-035
O-ring FC (fluorocarbon hardness Hs70)	AS568-025	AS568-028	AS568-031	AS568-034
Taper sleeve	CTH04-KS	CTH06-KS	CTH10-KS	CTH16-KS
Flow control valve (meter-in)*	VCH01	VCH01	VCH01	VCH02
Air bleeding valve*	VCE01	VCE01	VCE01	VCE02

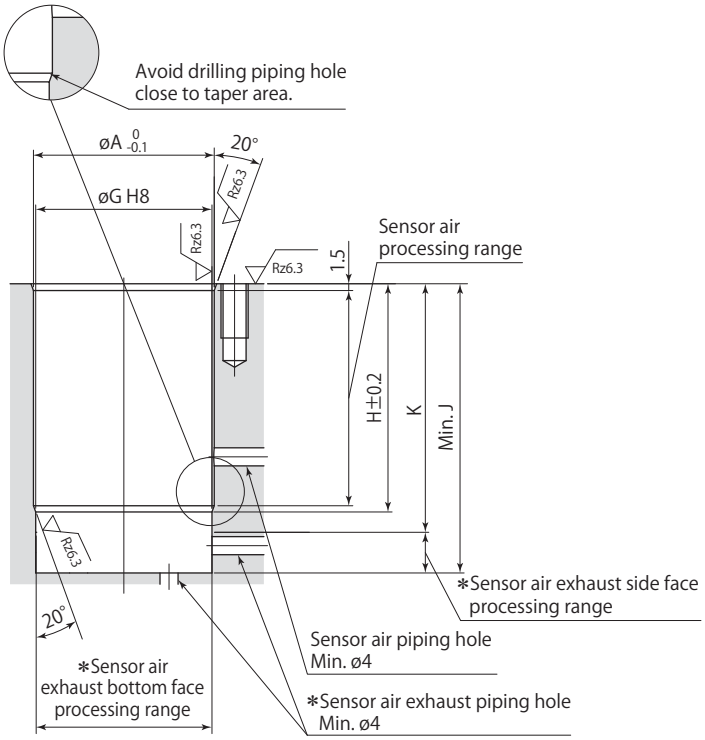
∗: Select the right model of VCH and VCE according to the size of the clamp.

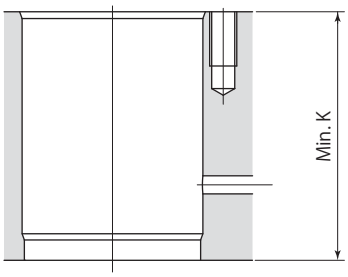
Refer to each page for the details of options.

● Taper sleeve **page →42** ● Flow control valve **page →48** ● Air bleeding valve **page →50**

Mounting details







In through hole X-X

In blind hole X-X

Rz: ISO4287(1997)

*: Sensor air exhaust piping hole must be made on either side or bottom face.

- Apply an appropriate amount of grease to the chamfer and the bore when mounting.
  Excessive grease may be a blockage in the air passage, causing malfunction of the sensor.
- The 20° taper machining must be provided to avoid the damage of the O-ring.
  Ensure that there are no interference on taper area when drilling the hole for sensor air.

Mounting details

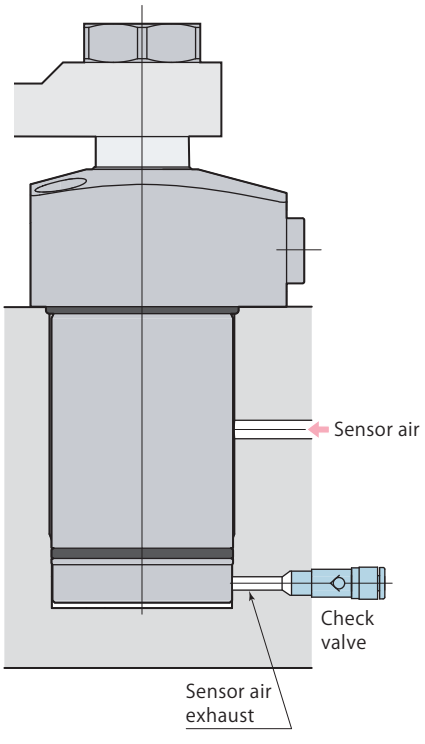
mm

Model	CTK04U-□□	CTK06U-□□	CTK10U-□□	CTK16U-□□
øA	34	40	49	59
B	32	35	44	54
C	M5	M6	M8	M10
D	30	35	44	56
E	18.5	21	30	33
øF	5	5	5	6
F2	16	17.5	22	27
F3	22.5	24.5	32	38
øG	$33^{+0.039}_{0}$	$39^{+0.039}_{0}$	$48^{+0.039}_{0}$	$58^{+0.046}_{0}$
H	44.5	50.5	64.5	73.5
J	57.5	64	79	92
K	49	55	69	78

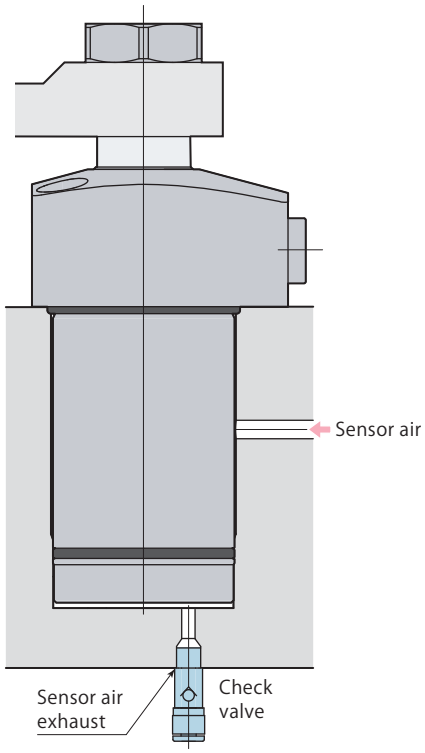
Caution for piping

Refer to the diagram shown below for the sensor air exhaust port.

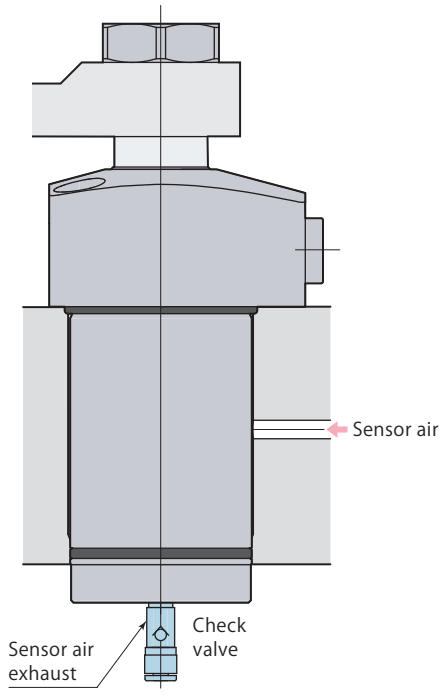
Mounting in blind hole
(Sensor air exhaust：side face)



Mounting in blind hole
(Sensor air exhaust：bottom face)



Mounting in through hole



● Use a check valve with cracking pressure of 0.005 MPa or less if there is a risk of metal chips or coolant intrusion.
Recommended check valve：AKH or AKB series manufactured by SMC.

Specifications

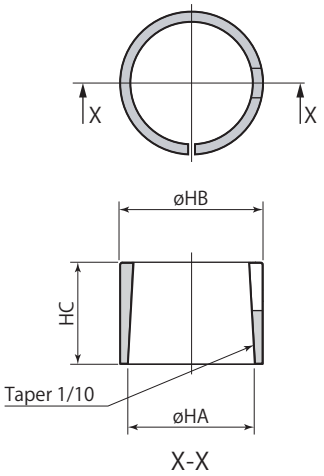
Size / Option code

CTH – 02 / 04 / 06 / 10 / 16

- KS : Taper sleeve
- KN : Perfect nut
- KNR : Perfect release nut

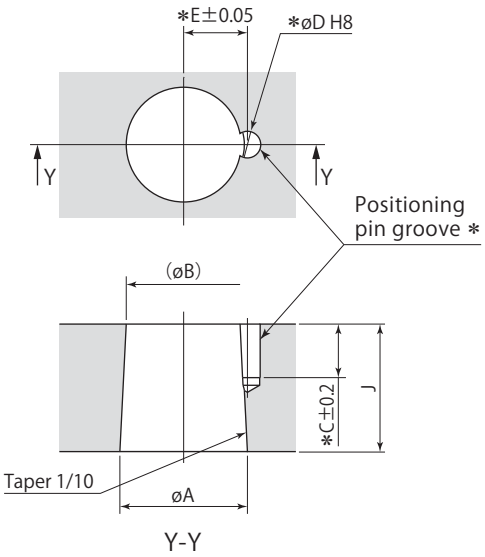
Taper sleeve and perfect release nut can not be combined.
■ indicates made to order.

Taper sleeve

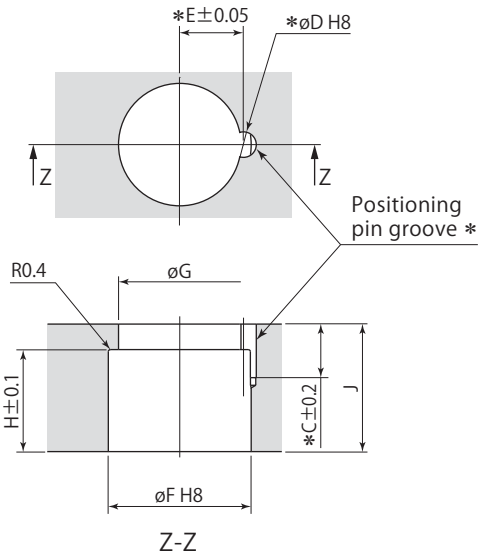


Clamp arm mounting details

Not using taper sleeve



Using taper sleeve



∗ : No need to machine the pin groove (C, øD, E) unless positioning pin is used for the arm.
The positioning pin enables a clamp arm to locate on the clamp firmly and easily.

mm

Taper sleeve	CTH02-KS	CTH04-KS	CTH06-KS	CTH10-KS	CTH16-KS
Applicable swing clamp	CTK02	CTK04	CTK06	CTK10	CTK16
øHA	12	16	20	25	32
øHB	14	18	22	28	36
HC	9.5	11	13	16	22
øA	$12^{-0.016}_{-0.034}$	$16^{-0.016}_{-0.034}$	$20^{-0.020}_{-0.041}$	$25^{-0.020}_{-0.041}$	$32^{-0.025}_{-0.050}$
øB	10.8	14.6	18.4	23.1	29.5
C	6.5	8.5	10.5	12.5	12.5
øD (pin groove diameter)	$2.5^{+0.014}_{0}$	$3^{+0.014}_{0}$	$4^{+0.018}_{0}$	$5^{+0.018}_{0}$	$6^{+0.018}_{0}$
E	6.05	8.1	10.1	12.6	16.1
øF	$14^{+0.027}_{0}$	$18^{+0.027}_{0}$	$22^{+0.033}_{0}$	$28^{+0.033}_{0}$	$36^{+0.039}_{0}$
øG	11.5	15	19	23.5	30
H	9.5	11	13	16	22
J	12	14	16	19	25