November, 2016

Announcement of Design Number Change for High-Power Pneumatic Link Clamp (model WCE)

Dear Valued Customers,

We are sending this notice to inform our customers the design number has been changed from '1' to '2' based on improvements made for High-Power Pneumatic Link Clamp (model WCE). Please consider the revised link clamp in future designs. We thank you for your understanding.

Notes

1. Changed Points
   - Model number has been changed from 'WCE□□□1' to 'WCE□□□2'.
   - Internal structure has been modified as improving more accurate flow control and more smooth movement.

2. Compatibility
   - External Dimensions ：Compatible (Rod diameter (ϕU) is partially changed.)
   - Mounting Dimensions ：Compatible
   - Lever Mounting Part Dimensions ：Compatible
   - Clamping Force ：Nearly Equivalent
   - Holding Force ：Exact Same

3. Replacement Period
   Continuously replaced beginning from November, 2016.

Please refer to our website (http://www.kosmek.co.jp) for further information of specifications and dimensions, or please contact our salesman for further inquiries.

Yours Sincerely
KOSMEK LTD.

High-Power Pneumatic Link Clamp

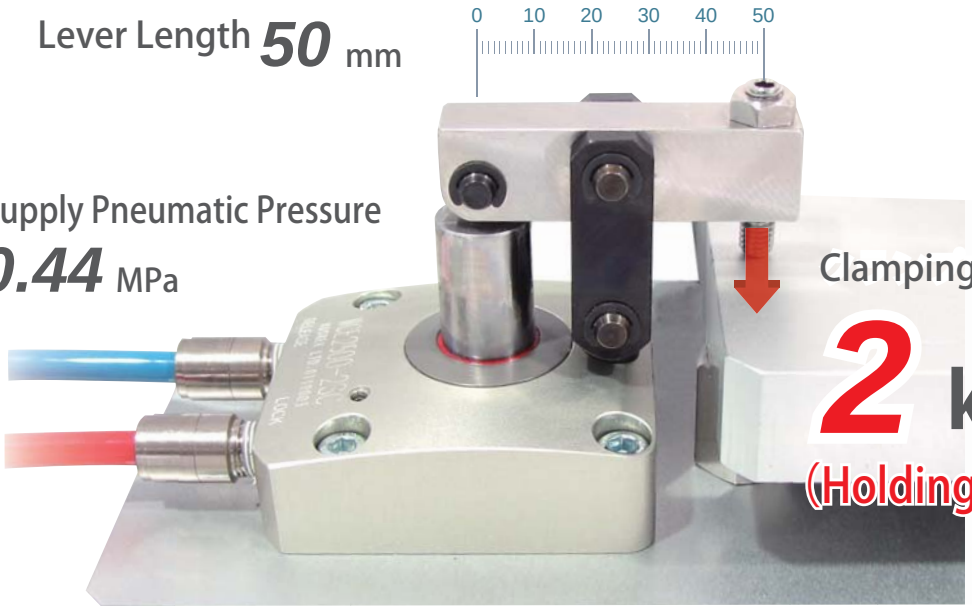
Model WCE

Clamping force which replaces hydraulic clamp
Development of high power pneumatic link clamp

PAT. P.

Lever Length ***50*** mm

Supply Pneumatic Pressure
0.44 MPa



Clamping Force
2 kN
(Holding Force is 4kN)

model WCE2502

Clamping Force
(Compared with conventional WCA model) **About 2.5 Times**

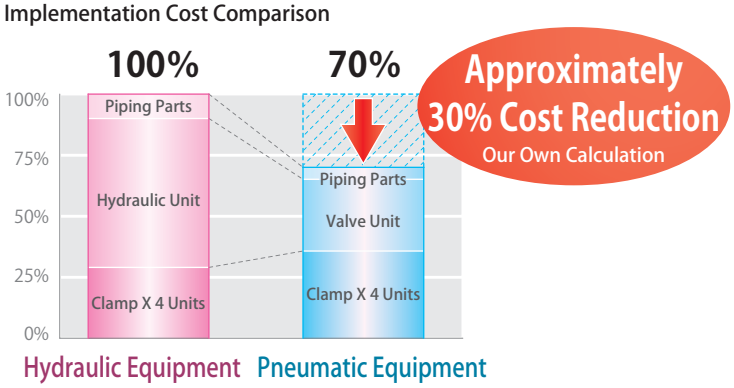
Available in five body sizes.

Cylinder force is *0.28 ~ 3.92kN*

Elimination of Hydraulics

The hydraulic power pack and clamping systems can be eliminated by using pneumatic systems.

Implementation Cost Comparison

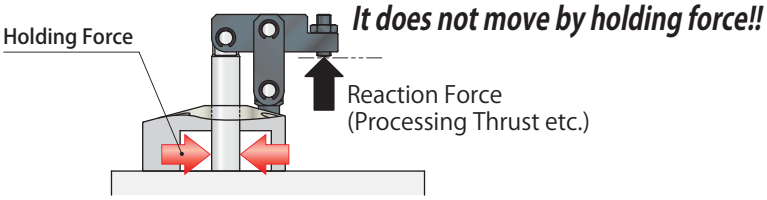


Holding Force

Clamping force is suppressed to necessary minimum by the powerful holding force beyond clamping force, and work distortion can be decreased.

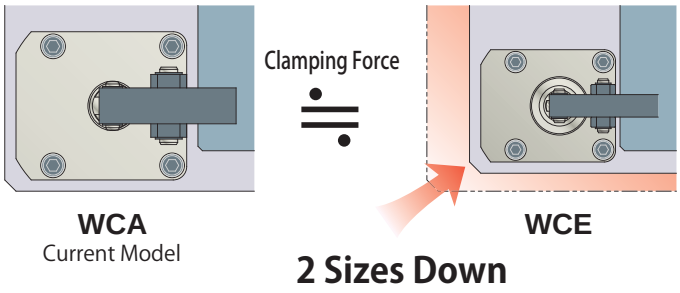
※1. It change with the working pressure and lever length.

Holding force is 3 times the clamping force by a mechanical lock. ※1



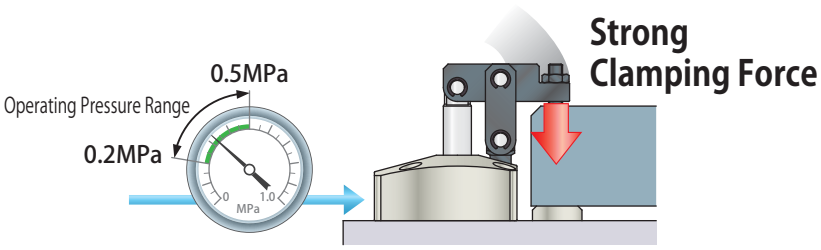
Space-Saving

Equivalent clamping force by 2 size down than current WCA.

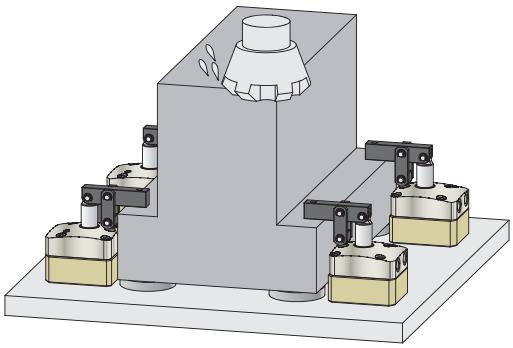


Energy Saving

Higher clamping force is achieved by low operating pressure.



Application Examples



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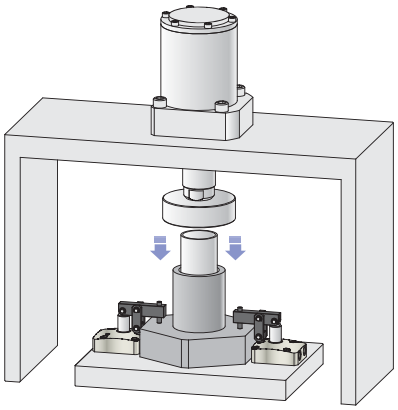

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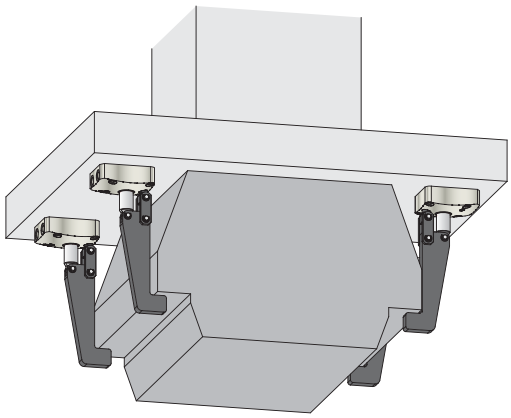
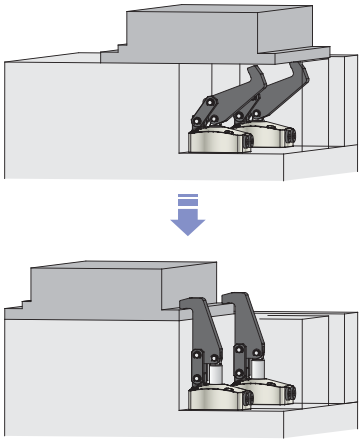


<Transportation・Gantry loader>



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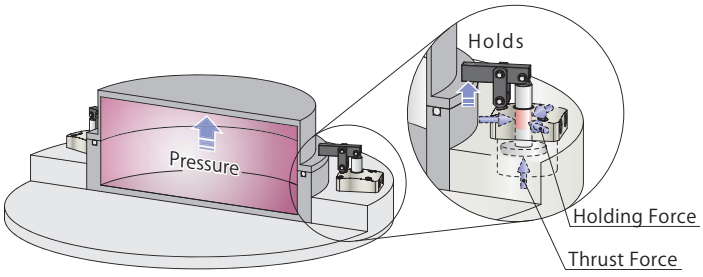
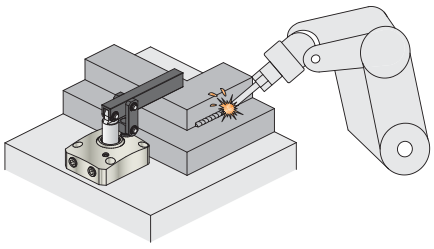


<Air Leak Tester>



<Welding Process>

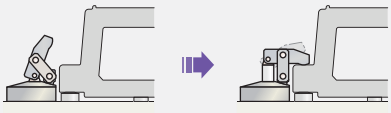
※ For details, please do not hesitate to contact us.

Variation

Standard Model

Model **WCE**

Clamping with link mechanism

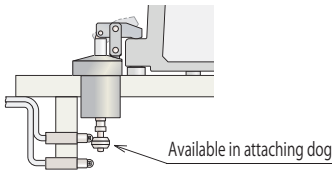


External Dimensions → P.147

Double End Rod Option for Dog

Model **WCE-D**

Clamped condition can be detected by switch etc



External Dimensions → P.149

Air Sensing Manifold Option

Model **WCE-M**

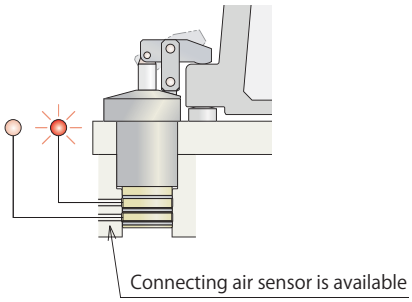
External Dimensions → P.151

Air Sensing Piping Option

Model **WCE-N**

External Dimensions → P.153

Clamping action is possible to confirm with air catch sensor



Accessories

Lever

Model **WCZ-LZ**

→ P.158

Manifold Block

Model **WHZ-MD**

→ P.1217

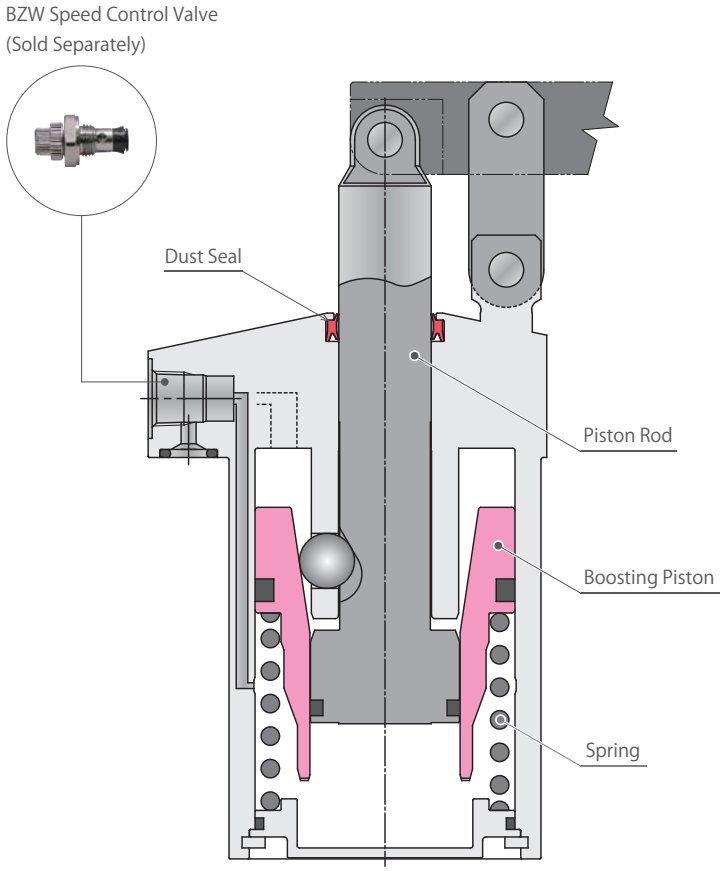
Air Flow Control Valve

Model **BZW-A**

→ P.283

Cross Section • Action Description

※ This is a simplified drawing. Actual components are different.



Strong Clamping Force with Mechanical Lock and Holding Force

The mechanical locking system and pneumatic pressure allows the WCE model to exert higher clamping force than the same size as the comparison model WCA.
The high holding force enables heavy load machining and high accurate machining.

Compact

The dimension below flange is shortened even with built-in machenical lock.

Excellent Coolant Resistance

Our exclusive dust seal is designed to protect against high pressure coolant.
It also has high durability against chlorine-based coolant by using a sealing material with excellent chemical resistance.

Able to Attach Speed Control Valve Directly

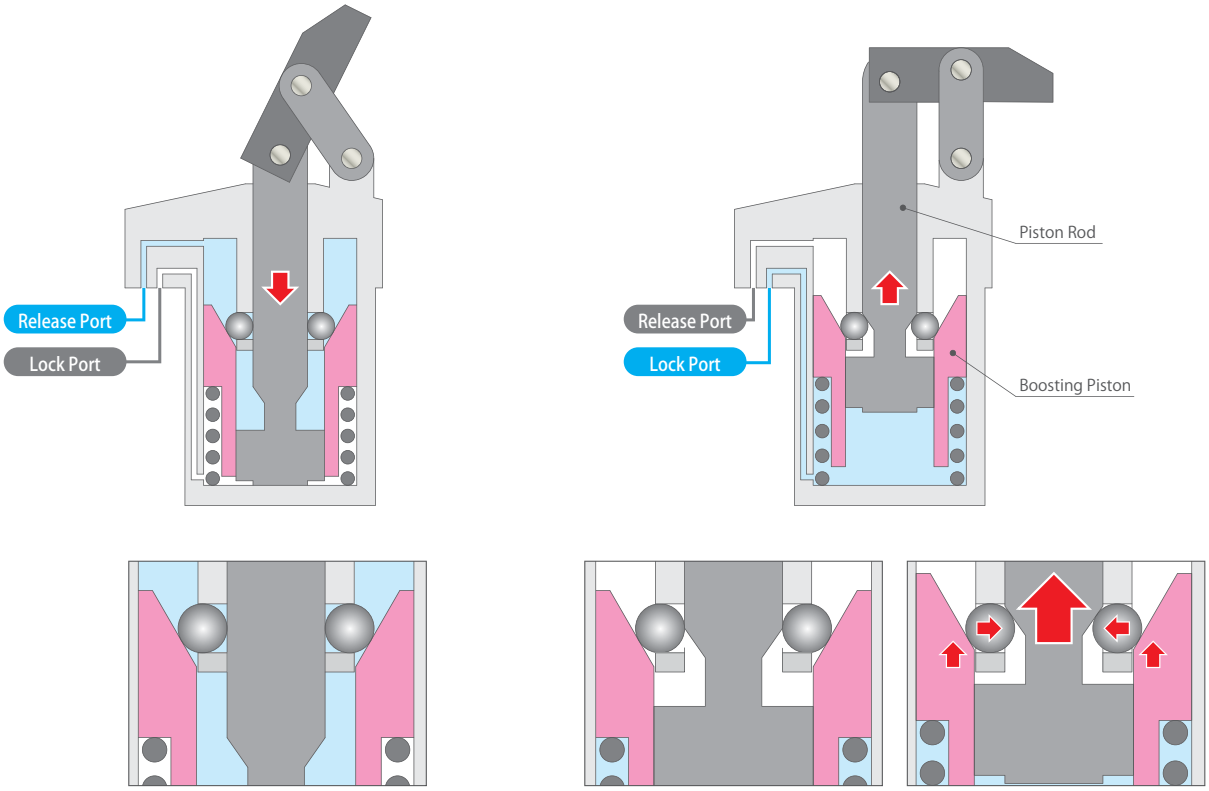
When fitting the gasket (-A option), it is able to attach the speed control valve .
(Speed control valve is sold separately.)

Action Description

※ This is a simplified drawing. Actual components are different.

Released State — Lock Air Pressure OFF / Release Air Pressure ON

Locked State — Lock Air Pressure ON / Release Air Pressure OFF

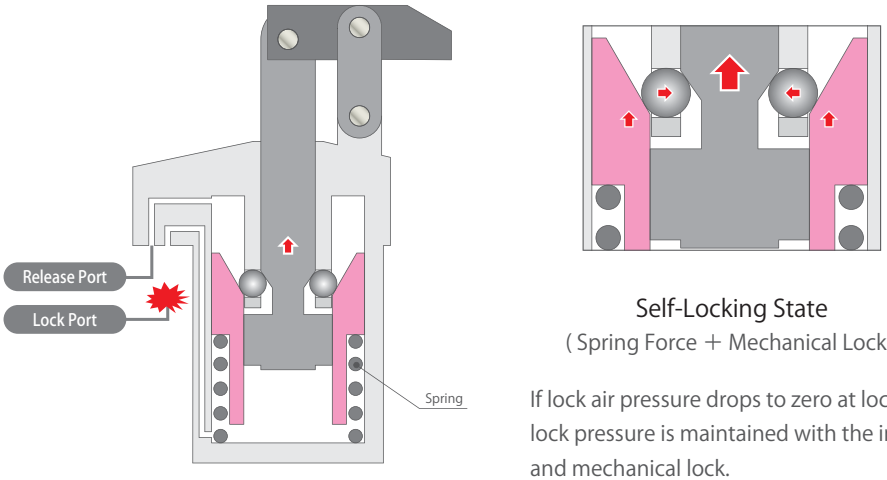


Released State ⇒ Locking Operation (Idle Stroke Completed) ⇒ Locked State (Boosting Stroke)

The piston rod descends to release.

The piston rod ascends and the boosting piston activates. Exerts strong clamping force and holding force with the wedge mechanism.

Self-Locking State — Lock Air Pressure OFF / Release Air Pressure OFF



Self-Locking State
(Spring Force + Mechanical Lock)

If lock air pressure drops to zero at locked state, lock pressure is maintained with the internal spring and mechanical lock.

Model No. Indication

WCE 160 2 - 2 A R
1 2 3 4 5

1 Cylinder Force

060 : Cylinder Force 0.6kN (Pneumatic Pressure 0.5MPa)
100 : Cylinder Force 0.9kN (Pneumatic Pressure 0.5MPa)
160 : Cylinder Force 1.6kN (Pneumatic Pressure 0.5MPa)
250 : Cylinder Force 2.5kN (Pneumatic Pressure 0.5MPa)
400 : Cylinder Force 3.9kN (Pneumatic Pressure 0.5MPa)

※ Cylinder force differs from clamping force and holding force.

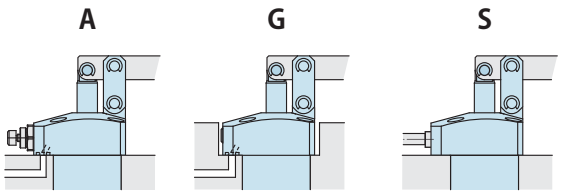
2 Design No.

2 : Revision Number

3 Piping Method

A : Gasket Option (with Ports for Speed Controller)
G : Gasket Option (with R Thread Plug)
S : Piping Option (Rc Thread)

※ Speed control valve (BZW) is sold separately.
Refer to the P.283 for detail.

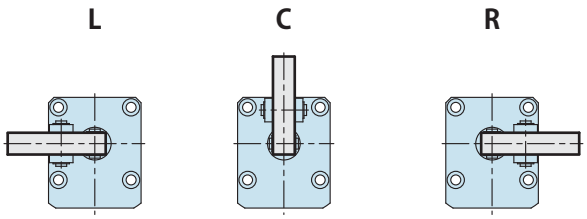


Gasket Option		Piping Option
With Ports for Speed Controller Includes R Thread Plug (order speed controller separately)	with R Thread Plug	Rc Thread No Gasket Port

4 Lever Direction

L : Left
C : Center
R : Right

※ This images show the lever direction when the piping port is placed in front of you.



5 Action Confirmation Method

Blank : Standard
D : Double End Rod Option for Dog
M : Air Sensing Manifold Option
N : Air Sensing Piping Option

Specifications

Model No.			WCE0602-2□□□	WCE1002-2□□□	WCE1602-2□□□	WCE2502-2□□□	WCE4002-2□□□
Cylinder Force (at 0.5MPa) kN			0.6	0.9	1.6	2.5	3.9
Clamping Force			Refer to “Clamping Force Curve” on P.139				
Holding Force			Refer to “Holding Force Curve” on P.141				
Clamping Force and Holding Force at 0MPa			Refer to “Clamping Force and Holding Force Curve at 0 MPa” on P.143				
Full Stroke mm			19.5	22	23.5	27.5	33
(Break down)	Idle Stroke mm		16	18	19.5	23.5	29
	Lock Stroke ※1 mm		3.5	4	4	4	4
Cylinder Capacity cm^3	Lock	5 Blank	12.0	22.4	35.8	56.1	95.6
		5 D/M/N	11.0	20.6	33.9	53.0	91.9
	Release		10.5	19.9	32.1	50.6	85.2
Spring Force N			36.8 ～ 54.4	60.8 ～ 78.4	83.5 ～ 140.9	146.5 ～ 218.8	234.1 ～ 334.6
Max. Operating Pressure MPa			0.5				
Min. Operating Pressure ※2 MPa			0.2				
Withstanding Pressure MPa			0.75				
Operating Temperature ℃			0 ～ 70				

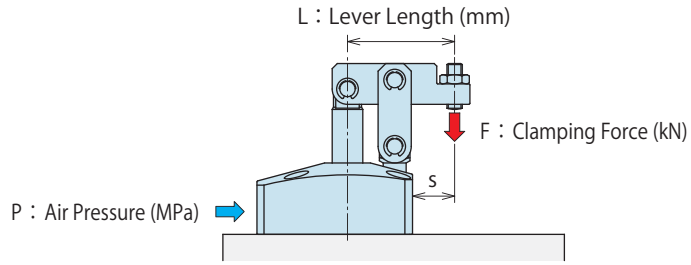
Notes:

※1. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of idle stroke.)

※2. Minimum pressure to operate the clamp without load.

1. Please see the external dimension if you need the information of mass.

Clamping Force Curve



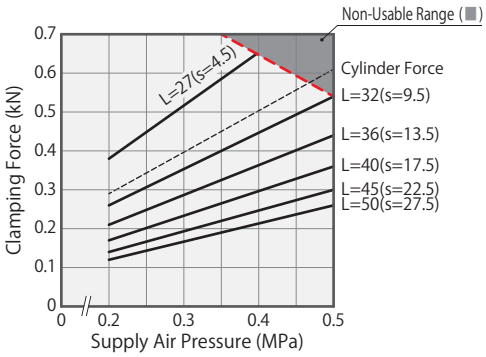
(How to read the clamping force curve)
When using WCE2502-2□□□
Supply Air Pressure 0.3MPa
Lever Length L=50mm
Clamping force is about 1.46kN.

Notes:
※1. F : Clamping Force (kN) , P : Supply Air Pressure (MPa) , L : Lever Length (mm).
1. Tables and graphs shown are the relationship between the clamping force (kN) and supply air pressure (MPa).
2. Cylinder output (When L=0) cannot be calculated from the calculation formula of clamping force.
3. Clamping force shows capability when a lever locks in a horizontal position.
4. The clamping force varies as per the lever length. Please use it with supply pneumatic pressure suitable for lever length.
5. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

WCE0602-2□□□

Clamping Force Calculation Formula※1(kN) $F = \frac{14.7 \times P + 1.1}{L - 16}$

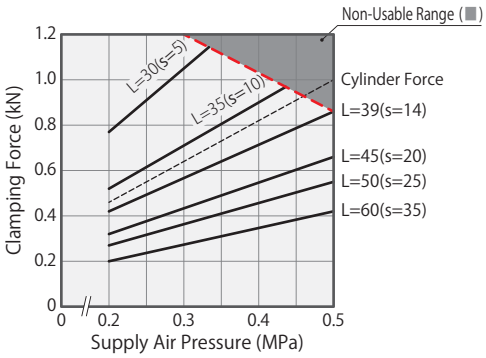
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm)						Min. Lever Length (mm)
		27	32	36	40	45	50	
0.5	0.59		0.53	0.42	0.35	0.29	0.25	32
0.4	0.49	0.63	0.44	0.35	0.29	0.24	0.21	27
0.3	0.38	0.50	0.34	0.28	0.23	0.19	0.16	24
0.2	0.28	0.37	0.25	0.20	0.17	0.14	0.12	23
Max. Operating Pressure (MPa)		0.40	0.50	0.50	0.50	0.50	0.50	



WCE1002-2□□□

Clamping Force Calculation Formula※1(kN) $F = \frac{28.6 \times P + 2.2}{L - 19.5}$

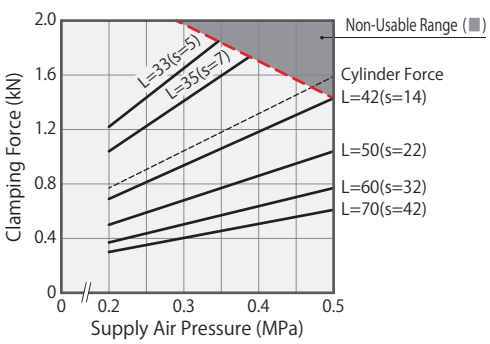
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range(■) Lever Length L (mm)						Min. Lever Length (mm)
		30	35	39	45	50	60	
0.5	0.94			0.85	0.65	0.54	0.41	39
0.4	0.78		0.88	0.70	0.54	0.45	0.34	33
0.3	0.62	1.03	0.70	0.55	0.42	0.35	0.27	29
0.2	0.45	0.76	0.51	0.41	0.31	0.26	0.20	25
Max. Operating Pressure (MPa)		0.33	0.43	0.50	0.50	0.50	0.50	



WCE1602-2□□□

Clamping Force Calculation Formula※1(kN) $F = \frac{51.6 \times P + 4.3}{L - 21}$

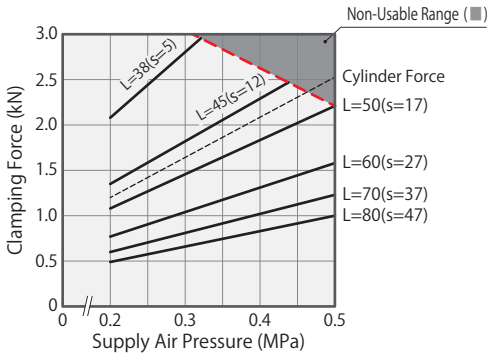
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range(■) Lever Length L (mm)						Min. Lever Length (mm)
		33	35	42	50	60	70	
0.5	1.59			1.43	1.04	0.77	0.61	42
0.4	1.32			1.19	0.86	0.64	0.51	36
0.3	1.05	1.65	1.41	0.94	0.68	0.51	0.40	31
0.2	0.77	1.22	1.04	0.70	0.50	0.37	0.30	28
Max. Operating Pressure (MPa)		0.35	0.39	0.50	0.50	0.50	0.50	



WCE2502-2□□□

Clamping Force Calculation Formula※1(kN) $F = \dfrac{93.9 \times P + 8.3}{L - 25}$

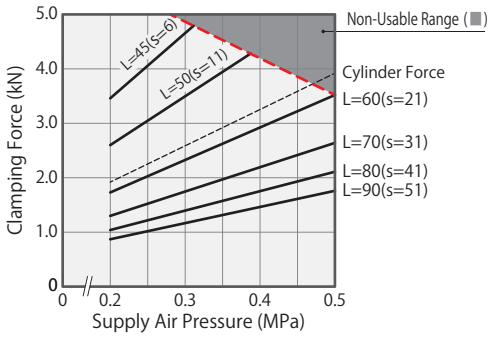
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 38	45	50	60	70	80	Min. Lever Length (mm)
0.5	2.46			2.21	1.58	1.23	1.00	50
0.4	2.04		2.29	1.83	1.31	1.02	0.83	42
0.3	1.62	2.81	1.82	1.46	1.04	0.81	0.66	37
0.2	1.20	2.08	1.35	1.08	0.77	0.60	0.49	33
Max. Operating Pressure (MPa)		0.32	0.43	0.50	0.50	0.50	0.50	



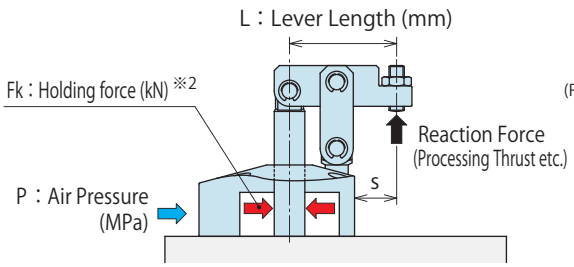
WCE4002-2□□□

Clamping Force Calculation Formula※1(kN) $F = \dfrac{179.2 \times P + 16.1}{L - 30}$

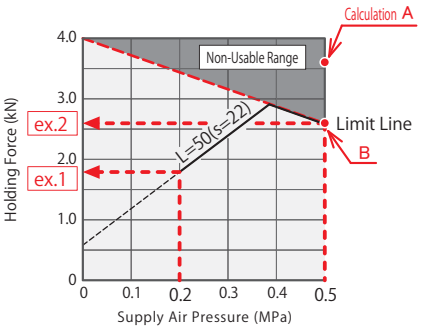
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 45	50	60	70	80	90	Min. Lever Length (mm)
0.5	3.92			3.52	2.64	2.11	1.76	60
0.4	3.25			2.93	2.19	1.76	1.46	51
0.3	2.59	4.66	3.49	2.33	1.75	1.40	1.16	44
0.2	1.92	3.46	2.60	1.73	1.30	1.04	0.87	39
Max. Operating Pressure (MPa)		0.31	0.39	0.50	0.50	0.50	0.50	



Holding Force Curve



(Reading of holding force：example1)
When WCE1602-2□□□ is used.
Supply Air Pressure 0.2MPa, Lever Length L=50mm
Holding force is about 1.79kN.
(Reading of holding force：example2)
In the case of using WCE1602-2□□□
Supply Air Pressure 0.5MPa, Lever Length L= 50 mm
A calculated value becomes the holding force.
The value of tolerance part B which met the limit line becomes holding force which can counter to reaction force, and holding force becomes about 2.58 kN(s).



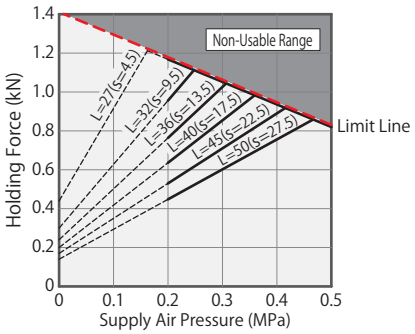
Notes:
※2. Holding force shows the force which can counter to reaction force in the clamping state, and differ from clamp force.
Moreover, keep in mind that it may produce displacement depending on lever rigidity even if it is the reaction force below holding force.
(When slight displacement is also not allowed, please keep the reaction force beyond clamp force from being added.)
※3. Fk : Holding force (kN) , P : Supply air pressure (MPa) , L : Lever length (mm).
When a holding force calculated value exceeds the value of a limit line, holding force becomes a value of a limit line.
1. This table and the graph show the relation between holding force (kN) and supply pneumatic pressure (MPa).
2. Holding force shows capability when a lever locks in a horizontal position.
3. Holding force changes with lever length. Please use it with supply pneumatic pressure suitable for lever length.
4. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

WCE0602-2□□□

Holding Force Formula ※3 (kN) (Fk ≦ Limit Line Value)

$$Fk = \frac{52.4 \times P + 4.8}{L - 16}$$

Supply Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)						Non-Usable Range Limit Line Value (kN)
	27	32	36	40	45	50	
0.5		0.82	0.82	0.82	0.82	0.82	0.82
0.4	0.94	0.94	0.94	0.94	0.89	0.76	0.94
0.3	1.05	1.05	1.03	0.86	0.71	0.60	1.05
0.2	1.17	0.96	0.76	0.64	0.53	0.45	1.17

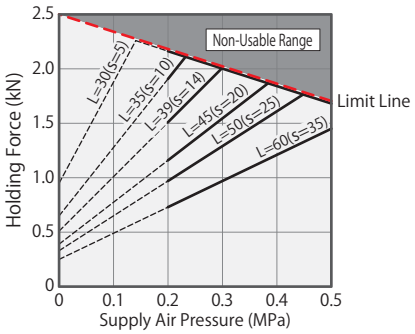


WCE1002-2□□□

Holding Force Formula ※3 (kN) (Fk ≦ Limit Line Value)

$$Fk = \frac{97.6 \times P + 10.0}{L - 19.5}$$

Supply Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)						Non-Usable Range Limit Line Value (kN)
	30	35	39	45	50	60	
0.5			1.67	1.67	1.67	1.45	1.67
0.4		1.84	1.84	1.84	1.61	1.21	1.84
0.3	2.01	2.01	2.01	1.54	1.29	0.97	2.01
0.2	2.18	1.90	1.51	1.16	0.97	0.73	2.18

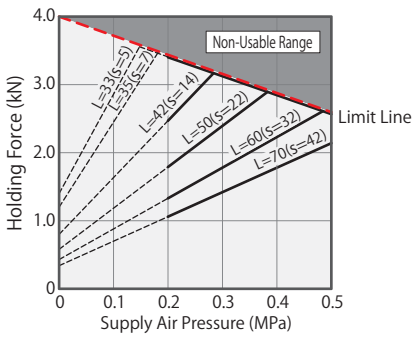


WCE1602-2□□□

Holding Force Formula ※3 (kN) (Fk ≦ Limit Line Value)

$$Fk = \frac{175.2 \times P + 16.8}{L - 21}$$

Supply Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)						Non-Usable Range Limit Line Value (kN)
	33	35	42	50	60	70	
0.5			2.58	2.58	2.58	2.13	2.58
0.4			2.86	2.86	2.23	1.77	2.86
0.3	3.14	3.14	3.14	2.39	1.78	1.42	3.14
0.2	3.42	3.42	2.47	1.79	1.33	1.06	3.42

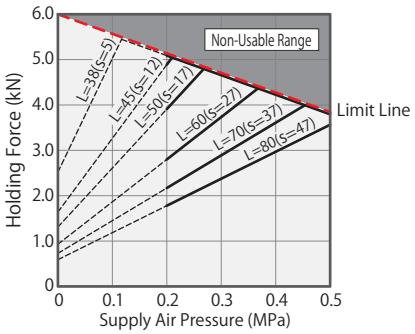


WCE2502-2□□□

Holding Force Formula ※3 (kN) (Fk ≦ Limit Line Value)

$$Fk = \frac{325.6 \times P + 32.6}{L - 25}$$

Supply Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (▬) Lever Length L (mm)						Non-Usable Range Limit Line Value (kN)
	38	45	50	60	70	80	
0.5	▬	▬	3.81	3.81	3.81	3.55	3.81
0.4	▬	4.24	4.24	4.24	3.62	2.96	4.24
0.3	4.67	4.67	4.67	3.72	2.90	2.37	4.67
0.2	5.10	4.89	3.91	2.79	2.17	1.78	5.10

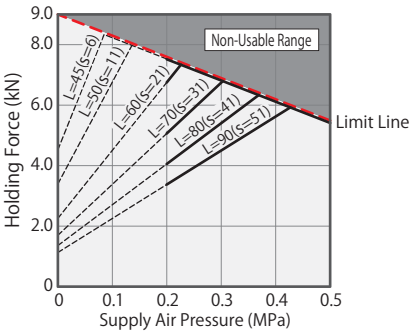


WCE4002-2□□□

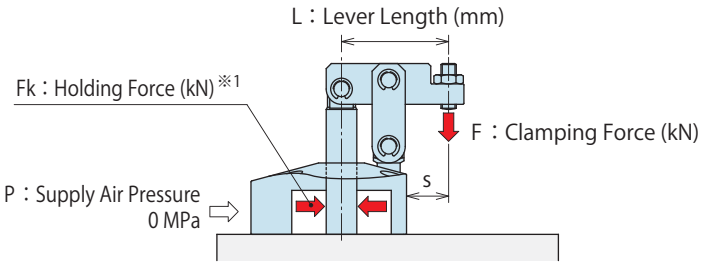
Holding Force Formula ※3 (kN) (Fk ≦ Limit Line Value)

$$Fk = \frac{673.9 \times P + 68}{L - 30}$$

Supply Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (▬) Lever Length L (mm)						Non-Usable Range Limit Line Value (kN)
	45	50	60	70	80	90	
0.5	▬	▬	5.48	5.48	5.48	5.48	5.48
0.4	▬	▬	6.16	6.16	6.16	5.63	6.16
0.3	6.85	6.85	6.85	6.75	5.40	4.50	6.85
0.2	7.53	7.53	6.76	5.07	4.06	3.38	7.53



Clamping Force and Holding Force Curve at 0MPa



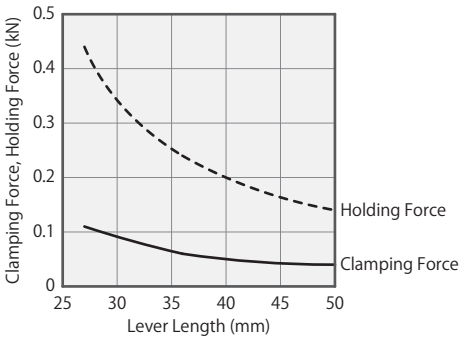
(Reading of the clamping force and holding force curve at zero pneumatic pressure)
When using WCE1602-2□□□
When pneumatic supply is severed from clamping state:
Supply Pneumatic Pressure =0MPa
Lever Length L= 50 mm
Clamping force becomes about 0.15 kN.
Holding force becomes about 0.58 kN.

Notes:
※1. Holding force shows the force which can counter to reaction force in the clamping state, and differ from clamp force.
Moreover, keep in mind that it may produce displacement depending on lever rigidity even if it is the reaction force below holding force.
(When slight displacement is also not allowed, please keep the reaction force beyond clamp force from being added.)
※2. F : Clamping force (kN) , Fk : Holding force (kN) , L : Lever length (mm).
1. This table and the graph show the relation between lever length (mm) and the clamping force (kN) and holding force (kN) at the time of 0MPa.
2. The clamping force and holding force at the time of zero pneumatic pressure show capability when a lever locks in a level position.
3. Clamping force and holding force change with lever length.

WCE0602-2□□□

Clamping Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$F = \frac{1.1}{L - 16}$
Holding Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$Fk = \frac{4.8}{L - 16}$

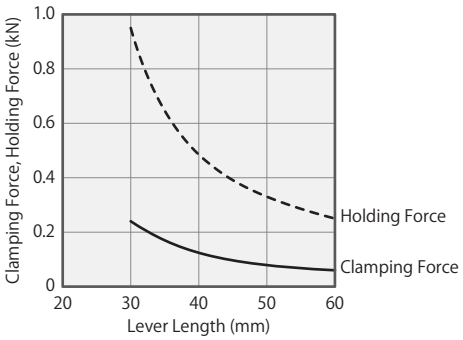
Lever Length (mm)	27	32	36	40	45	50
Clamping Force Reference Value at 0MPa (kN)	0.10	0.07	0.06	0.05	0.04	0.03
Holding Force Reference Value at 0MPa (kN)	0.44	0.30	0.24	0.20	0.17	0.14



WCE1002-2□□□

Clamping Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$F = \frac{2.2}{L - 19.5}$
Holding Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$Fk = \frac{10.0}{L - 19.5}$

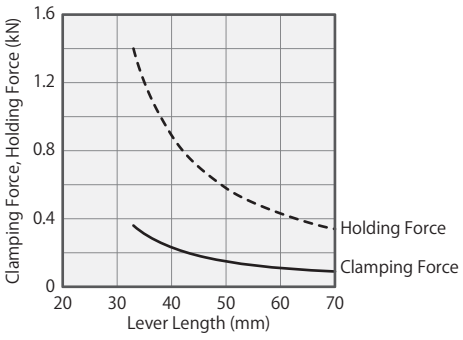
Lever Length (mm)	30	35	39	45	50	60
Clamping Force Reference Value at 0MPa (kN)	0.21	0.14	0.11	0.09	0.07	0.05
Holding Force Reference Value at 0MPa (kN)	0.95	0.65	0.51	0.39	0.33	0.25



WCE1602-2□□□

Clamping Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$F = \frac{4.3}{L - 21}$
Holding Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$Fk = \frac{16.8}{L - 21}$

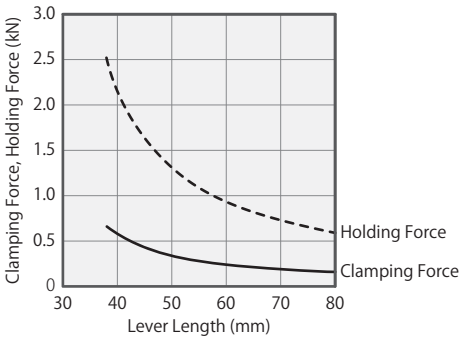
Lever Length (mm)	33	35	42	50	60	70
Clamping Force Reference Value at 0MPa (kN)	0.36	0.31	0.20	0.15	0.11	0.09
Holding Force Reference Value at 0MPa (kN)	1.40	1.20	0.80	0.58	0.43	0.34



WCE2502-2□□□

Clamping Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$F = \frac{8.3}{L - 25}$
Holding Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$Fk = \frac{32.6}{L - 25}$

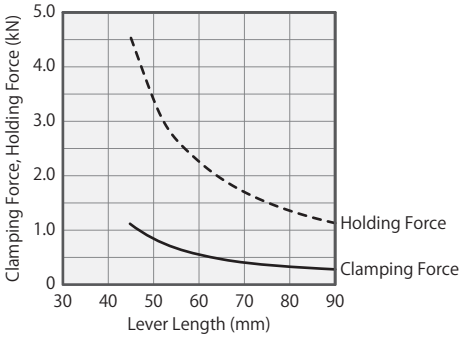
Lever Length (mm)	38	45	50	60	70	80
Clamping Force Reference Value at 0MPa (kN)	0.64	0.42	0.33	0.24	0.18	0.15
Holding Force Reference Value at 0MPa (kN)	2.51	1.63	1.30	0.93	0.72	0.59



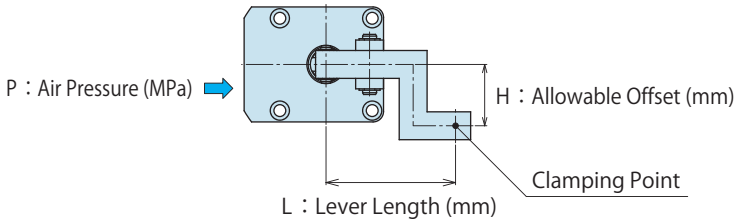
WCE4002-2□□□

Clamping Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$F = \frac{16.1}{L - 30}$
Holding Force Formula at 0MPa Pneumatic Pressure ※2 (kN)	$Fk = \frac{68.0}{L - 30}$

Lever Length (mm)	45	50	60	70	80	90
Clamping Force Reference Value at 0MPa (kN)	1.07	0.80	0.54	0.40	0.32	0.27
Holding Force Reference Value at 0MPa (kN)	4.53	3.40	2.27	1.70	1.36	1.13



Allowable Offset Graph



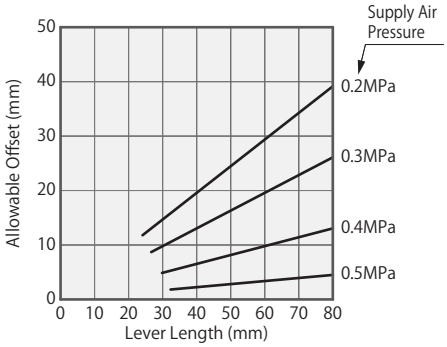
(Reading of the Allowable Offset Graph)
When using WCE2502-2□□□
Supply Air Pressure 0.3MPa,
Lever Length L=50mm,
Allowable Offset is about 18mm.

Notes:

1. Tables and graphs shown are the relationships between the lever length (mm) for supply pneumatic pressure (MPa) and the allowable offset (mm).
2. Using the lever beyond allowable offset may cause deformation, galling and fluid leakage etc.
3. The tables and graphs are only for reference. The design should be carried out with allowance fully taken into consideration.

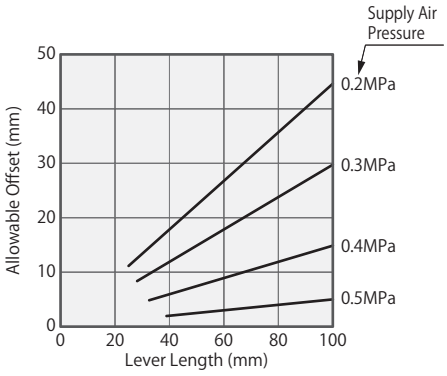
WCE0602-2□□□

Supply Air Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range ( )					
	L=27	L=32	L=36	L=40	L=45	L=50
0.5		2	2	2	3	3
0.4	4	5	6	7	7	8
0.3	9	10	12	13	15	16
0.2	13	16	18	20	22	24



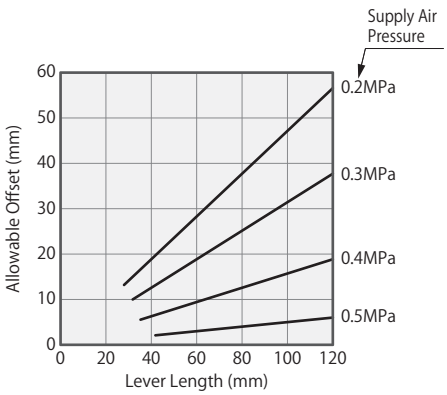
WCE1002-2□□□

Supply Air Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range ( )					
	L=30	L=35	L=39	L=45	L=50	L=60
0.5			2	2	3	3
0.4		5	6	7	7	9
0.3	9	10	12	13	15	18
0.2	13	16	17	20	22	27



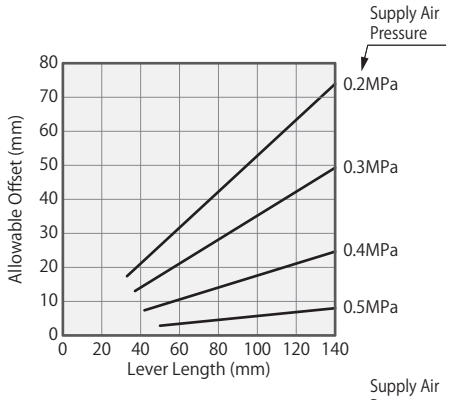
WCE1602-2□□□

Supply Air Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range ( )					
	L=33	L=35	L=42	L=50	L=60	L=70
0.5			2	3	3	4
0.4			7	8	9	11
0.3	10	11	13	16	19	22
0.2	16	17	20	24	28	33



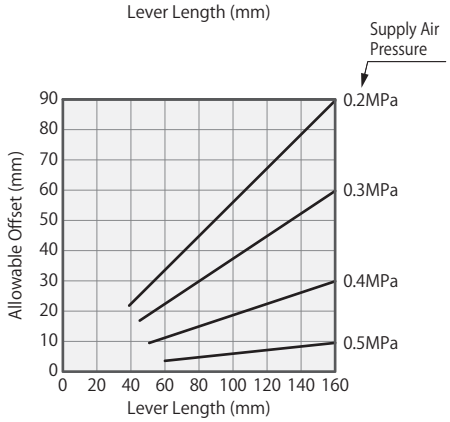
WCE2502-2□□□

Supply Air Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range ( )					
	L=38	L=45	L=50	L=60	L=70	L=80
0.5			3	3	4	5
0.4		8	9	11	12	14
0.3	13	16	18	21	25	28
0.2	20	24	26	32	37	42



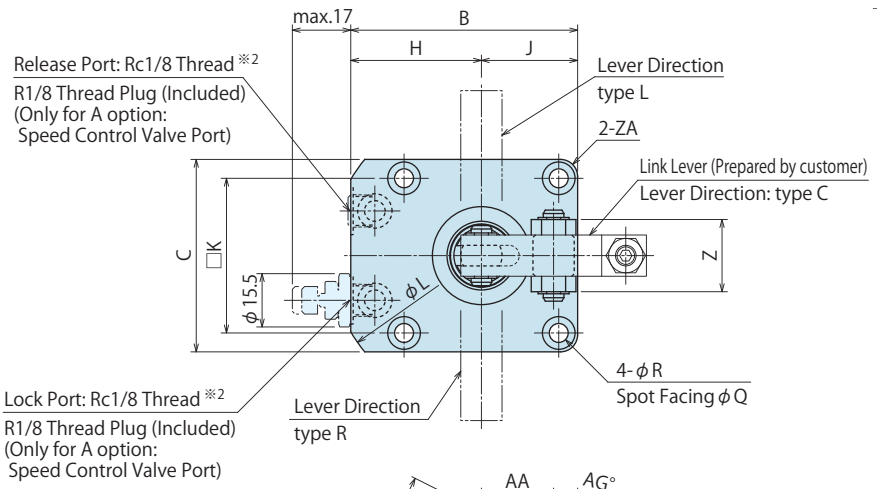
WCE4002-2□□□

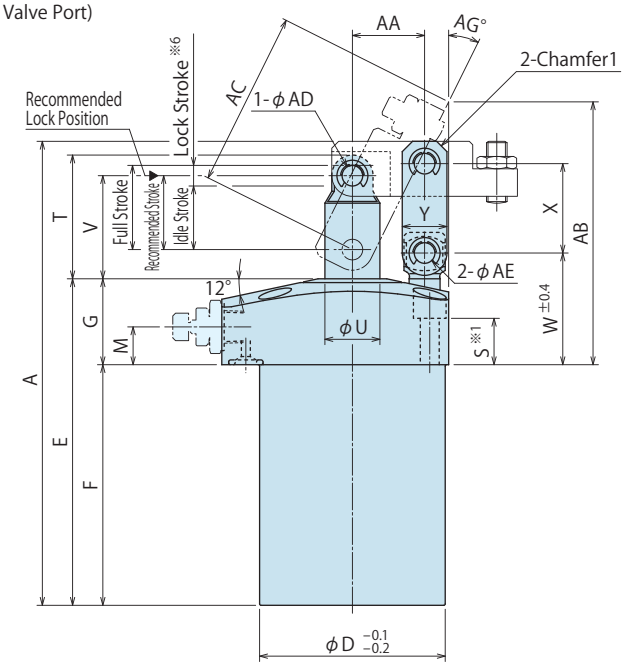
Supply Air Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range ( )					
	L=45	L=50	L=60	L=70	L=80	L=90
0.5			4	4	5	5
0.4			11	13	15	17
0.3	17	19	22	26	30	34
0.2	25	28	34	39	45	50

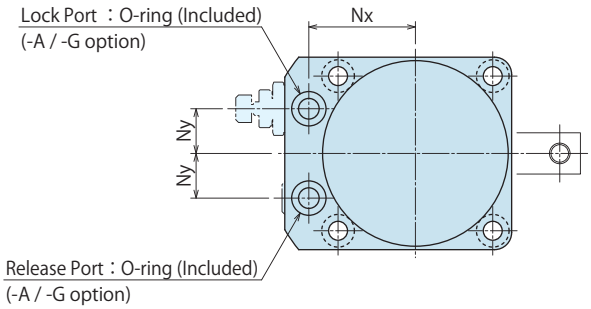


External Dimensions

A：Gasket Option
(Speed Control Valve Corresponding Option, Include R Thread Plug)
※The drawing shows the locked state of WCE-2AC.

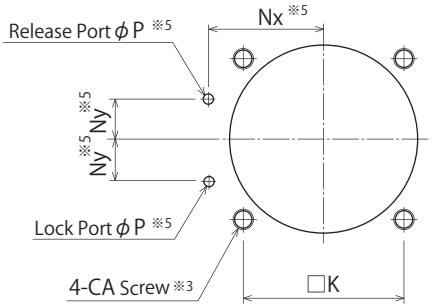


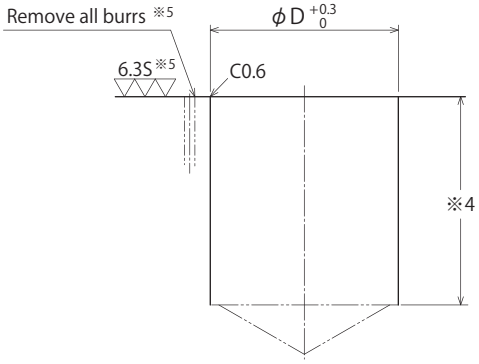




Notes:
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".
※2. Speed control valves are not provided. Please order separately (see P.283).
1. Please use the pin supplied (equivalent to ϕADf6、ϕAEf6、HRC60) for mounting pin for lever.

Machininig Dimensions of Mounting Area

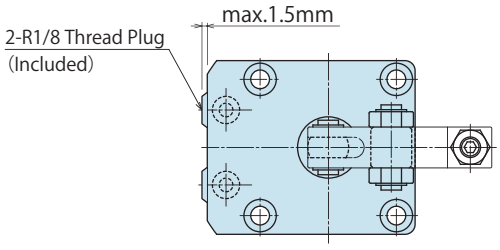




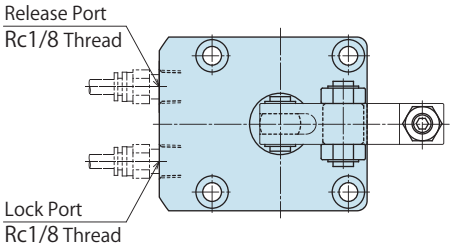
Notes:
※3. The CA thread depth of the mounting bolt should be decided based on the mounting height with reference to S size.
※4. The ϕD depth of the body mounting hole should be decided based on the mounting height with reference to F size.
※5. This process indicates -A/-G：Gasket option.

Piping Method

G：Gasket Option (with R Thread Plug)
※The drawing shows the locked state of WCE-2GC.

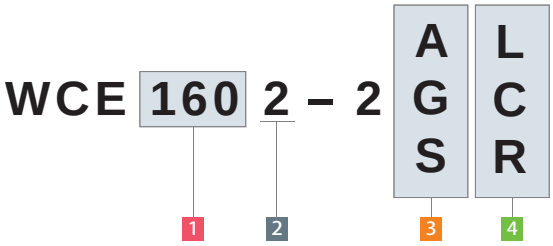


S：Piping Option (Rc Thread)
※The drawing shows the locked state of WCE-2SC.



Model No. Indication

(Format Example：WCE1002-2AR、WCE2502-2SL)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Lever Direction
5 Action Confirmation (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

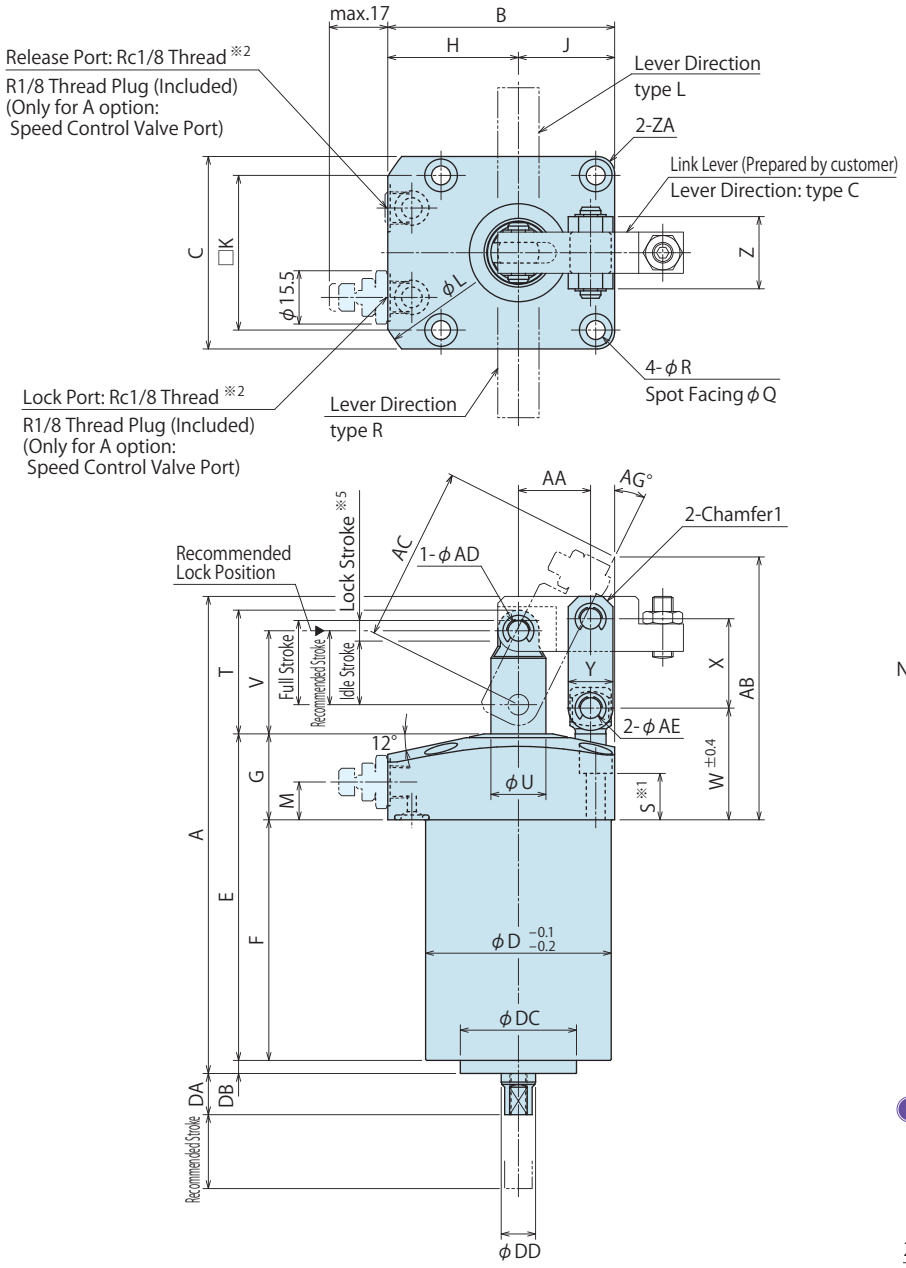
(mm)

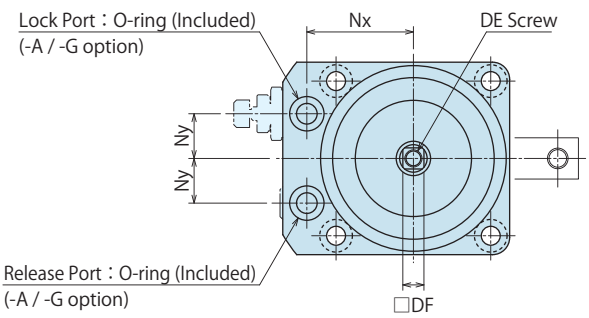
Model No.	WCE0602-2□□	WCE1002-2□□	WCE1602-2□□	WCE2502-2□□	WCE4002-2□□
Full Stroke	19.5	22	23.5	27.5	33
(Break down) Idle Stroke	16	18	19.5	23.5	29
(Break down) Lock Stroke ※6	3.5	4	4	4	4
Recommended Stroke	17.5	20	21.5	25.5	31
A	111.5	123	134.5	157.5	184
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	79.5	88	94.5	109.5	124.5
F	54.5	63	69.5	79.5	94.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	11	11
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. ϕ3	max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
T	28.5	31.5	36	40	50.5
U	10	12	14	16	20
V	24	27	30	34	42.5
W	31	31	32.5	37.5	40.5
X	20.5	23.5	26	32.5	39.5
Y	11	11	13	16	18
Z	19	19	21	28	37
Chamfer 1	C2.5	C2.5	C3	C3	C5
AA	16	19.5	21	25	30
AB	76.1	72	76.5	92.2	105.7
AC	49.8	46.9	50.9	62.7	74.7
AD	5	5	6	6	8
AE	5	5	6	8	10
AG	21.6°	26.5°	26.4°	26.1°	25.2°
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
ZA (Chamfer)	C3	R5	R5	R6	R6
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
Mass ※7 kg	0.5	0.6	0.9	1.4	2.3

Notes: ※6. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of idle stroke.)
※7. Mass of single clamp without the link lever.

External Dimensions

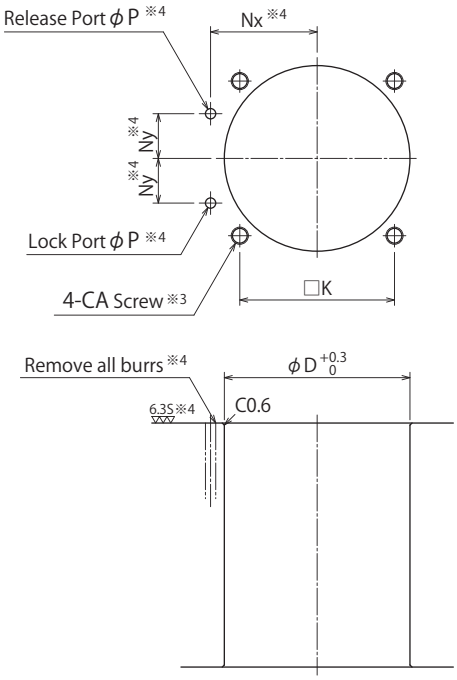
A : Gasket Option
(Speed Control Valve Corresponding Option, Include R Thread Plug)
※The drawing shows the locked state of WCE-2ACD.





Notes:
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".
※2. Speed control valves are not provided. Please order separately (see P.283).
1. Please use the pin supplied (equivalent to φADf6、φAEf6、HRC60) for mounting pin for lever.

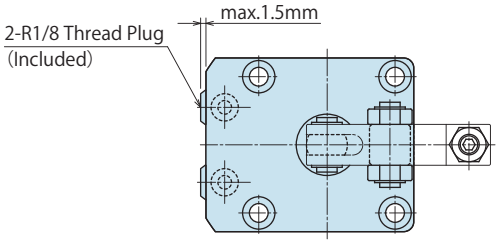
Machining Dimensions of Mounting Area



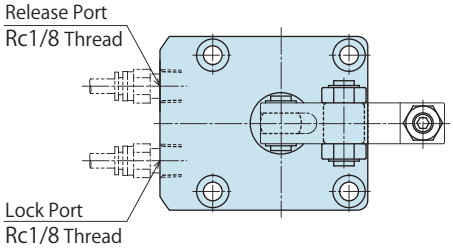
Notes:
※3. The CA thread depth of the mounting bolt should be decided based on the mounting height with reference to S size.
※4. This process indicates -C/-G：Gasket option.

Piping Method

G：Gasket Option (with R Thread Plug)
※The drawing shows the locked state of WCE-2GCD.

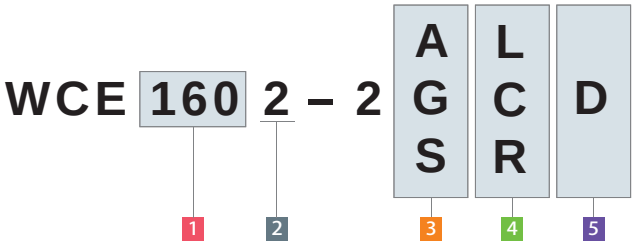


S：Piping Option (Rc Thread)
※The drawing shows the locked state of WCE-2SCD.



Model No. Indication

(Format Example：WCE1002-2ARD、WCE2502-2SLD)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Lever Direction
5 Action Confirmation (When D is chosen)

External Dimensions and Machining Dimensions for Mounting

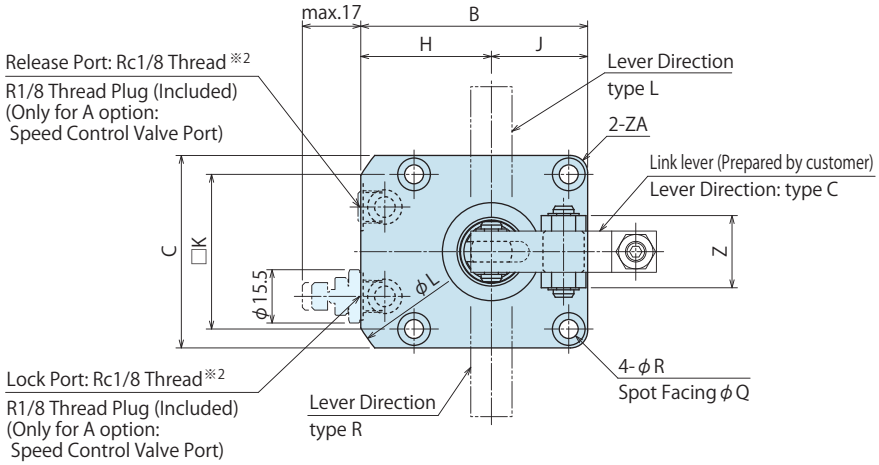
(mm)

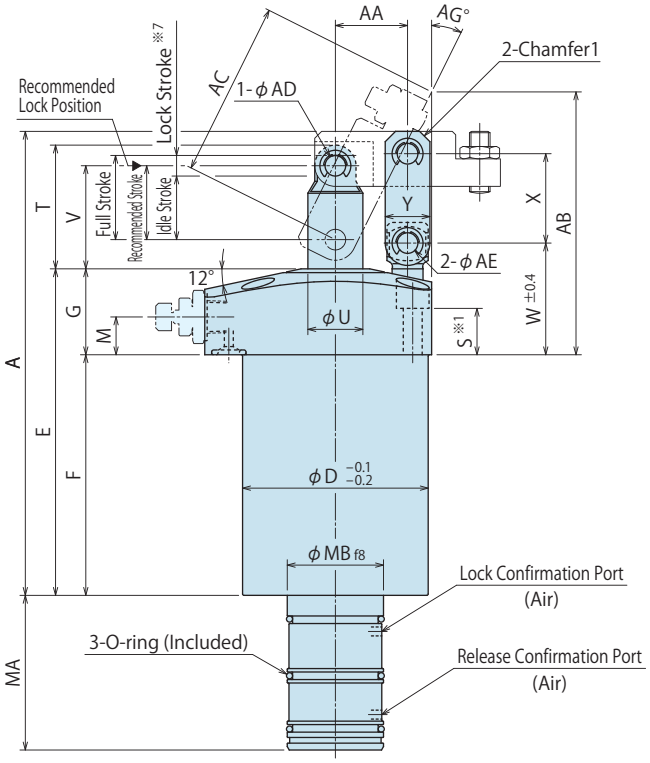
Model No.		WCE0602-2□□D	WCE1002-2□□D	WCE1602-2□□D	WCE2502-2□□D	WCE4002-2□□D
	Full Stroke	19.5	22	23.5	27.5	33
(Break down)	Idle Stroke	16	18	19.5	23.5	29
	Lock Stroke ※5	3.5	4	4	4	4
Recommended Stroke		17.5	20	21.5	25.5	31
A		115.5	127	138.5	162.5	188.5
B		54	60	66	76	87
C		45	50	56	66	78
D		40	46	54	64	77
E		79.5	88	94.5	109.5	124.5
F		54.5	63	69.5	79.5	94.5
G		25	25	25	30	30
H		31.5	35	38	43	48
J		22.5	25	28	33	39
K		34	39	45	53	65
L		72	79	88	98	113
M		11	11	11	11	11
Nx		26	28	31	36	41
Ny		9	10	13	15	20
P		max. ϕ3	max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q		9.5	9.5	9.5	11	11
R		5.5	5.5	5.5	6.8	6.8
S		15.5	14	13.5	16	15
T		28.5	31.5	36	40	50.5
U		10	12	14	16	20
V		24	27	30	34	42.5
W		31	31	32.5	37.5	40.5
X		20.5	23.5	26	32.5	39.5
Y		11	11	13	16	18
Z		19	19	21	28	37
Chamfer 1		C2.5	C2.5	C3	C3	C5
AA		16	19.5	21	25	30
AB		76.1	72	76.5	92.2	105.7
AC		49.8	46.9	50.9	62.7	74.7
AD		5	5	6	6	8
AE		5	5	6	8	10
AG		21.6°	26.5°	26.4°	26.1°	25.2°
CA (Nominal × Pitch)		M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
DA		11.5	12	12	12	12
DB		4	4	4	5	4.5
DC		22.5	28	33.8	41.6	54
DD		8	10	10	12	12
DE (Nominal×Pitch×Depth)		M4×0.7×10	M5×0.8×12	M5×0.8×12	M6×1×15	M6×1×15
DF		6	8	8	10	10
ZA (Chamfer)		C3	R5	R5	R6	R6
O-ring (-A/-G option)		1BP5	1BP7	1BP7	1BP7	1BP7
Mass ※6	kg	0.5	0.6	0.9	1.4	2.3

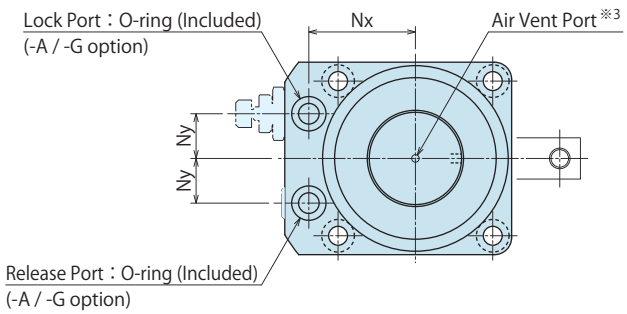
Notes: ※5. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of idle stroke.)
※6. Mass of single clamp without the link lever.

External Dimensions

A : Gasket Option
(Speed Control Valve Corresponding Option, Include R Thread Plug)
※The drawing shows the locked state of WCE-2ACM.

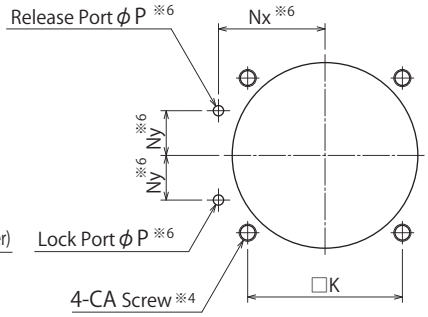


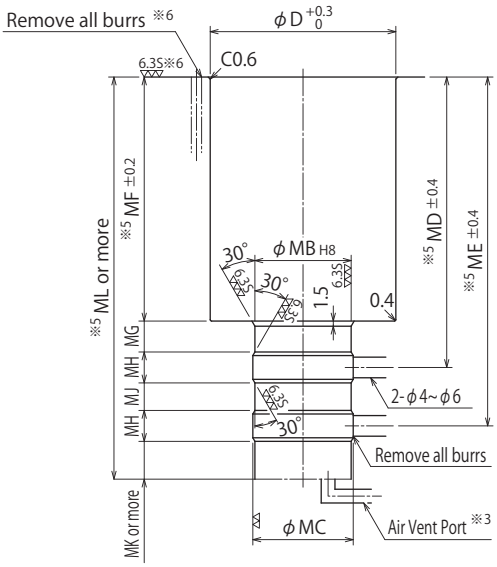




Notes:
※1. Mounting bolts are not provided. Customer should prepare based on dimension "S".
※2. Speed control valves are not provided. Please order separately (see P.283).
1. Please use the pin supplied (equivalent to ϕADf6、ϕAEf6、HRC60) for mounting pin for lever.
2. Please refer to P.155～156 about air sensing chart.

Machining Dimensions of Mounting Area

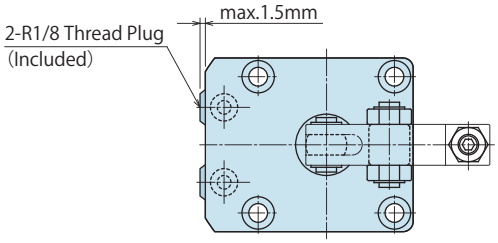




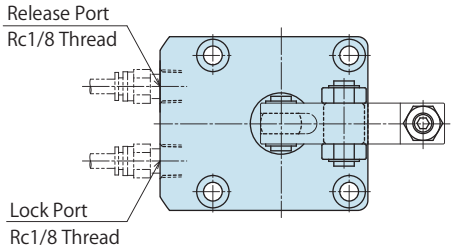
Notes:
※3. Air venting port must be open to the atmosphere and kept free of coolant, chips or other debris.
※4. The CA thread depth of the mounting bolt should be decided based on the mounting height with reference to S size.
※5. The dimensions indicate those under the flange.
※6. This process indicates -A/-G：Gasket option.

Piping Method

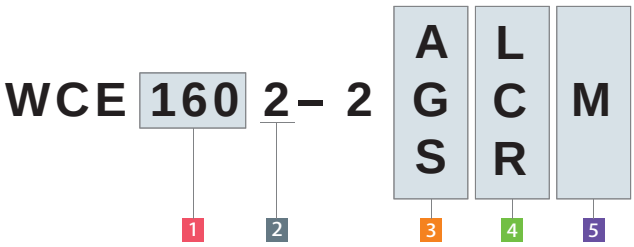
G：Gasket Option (with R Thread Plug)
※The drawing shows the locked state of WCE-2GCM.



S：Piping Option (Rc Thread)
※The drawing shows the locked state of WCE-2SCM.



Model No. Indication



(Format Example：WCE1002-2ARM、WCE2502-2SLM)

1 Cylinder Force
2 Design No.
3 Piping Method
4 Lever Direction
5 Action Confirmation (When M is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

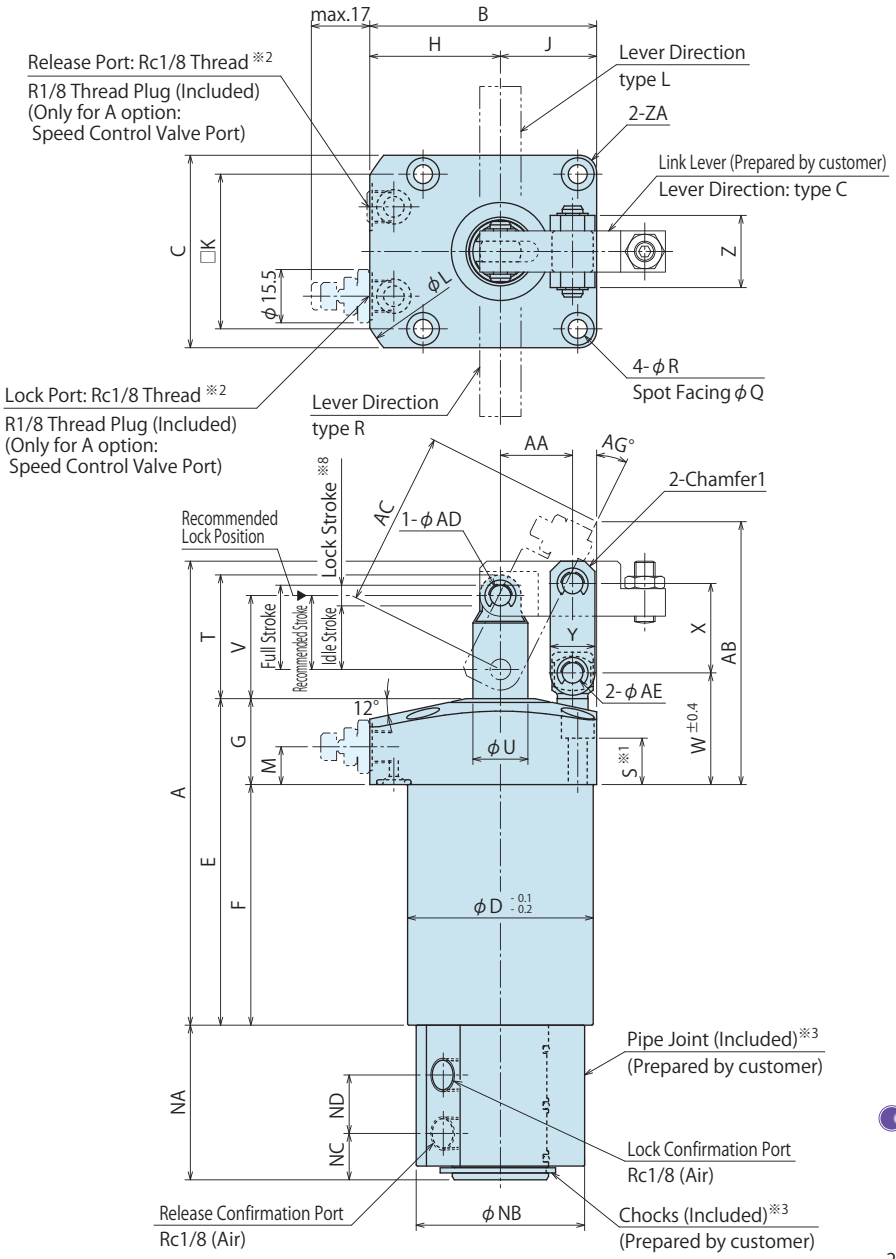
Model No.	WCE0602-2□□M	WCE1002-2□□M	WCE1602-2□□M	WCE2502-2□□M	WCE4002-2□□M
Full Stroke	19.5	22	23.5	27.5	33
(Break down) Idle Stroke	16	18	19.5	23.5	29
(Break down) Lock Stroke ※7	3.5	4	4	4	4
Recommended Stroke	17.5	20	21.5	25.5	31
A	111.5	123	134.5	157.5	184
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	79.5	88	94.5	109.5	124.5
F	54.5	63	69.5	79.5	94.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	11	11
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. ϕ3	max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
T	28.5	31.5	36	40	50.5
U	10	12	14	16	20
V	24	27	30	34	42.5
W	31	31	32.5	37.5	40.5
X	20.5	23.5	26	32.5	39.5
Y	11	11	13	16	18
Z	19	19	21	28	37
Chamfer1	C2.5	C2.5	C3	C3	C5
AA	16	19.5	21	25	30
AB	76.1	72	76.5	92.2	105.7
AC	49.8	46.9	50.9	62.7	74.7
AD	5	5	6	6	8
AE	5	5	6	8	10
AG	21.6°	26.5°	26.4°	26.1°	25.2°
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
MA	40	43.5	45	50	55
MB f8	$20^{-0.020}_{-0.053}$	$28^{-0.020}_{-0.053}$	$28^{-0.020}_{-0.053}$	$38^{-0.025}_{-0.064}$	$38^{-0.025}_{-0.064}$
MB H8	$20^{+0.033}_{0}$	$28^{+0.033}_{0}$	$28^{+0.033}_{0}$	$38^{+0.039}_{0}$	$38^{+0.039}_{0}$
MC	21.2	29.2	29.2	39.2	39.2
MD	68	77.5	84	95	112
ME	82	92.5	101	115	134
MF	55.5	64	70.5	80.5	95.5
MG	8	9	9	10	12
MH	9	9	9	9	9
MJ	5	6	8	11	13
MK	10	11.5	11	12	13
ML	96.5	108.5	116.5	131.5	151.5
ZA (Chamfer)	C3	R5	R5	R6	R6
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
3-O-ring	AS568-016 (70°)	AS568-021 (70°)	AS568-021 (70°)	AS568-028 (70°)	AS568-028 (70°)
Mass ※8 kg	0.6	0.7	1.0	1.6	2.5

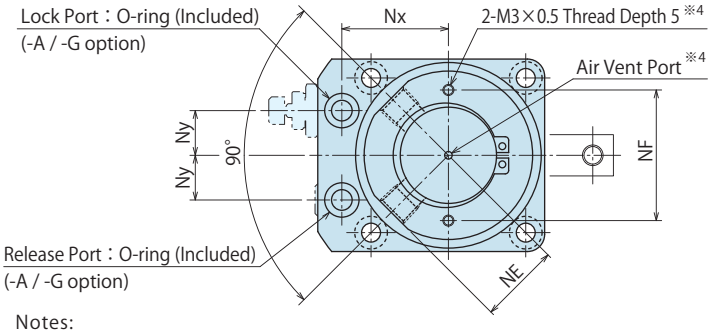
Notes: ※7. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of idle stroke.)
※8. Mass of single clamp without the link lever.

External Dimensions

A : Gasket Option
(Speed Control Valve Corresponding Option, Include R Thread Plug)

※The drawing shows the locked state of WCE-2ACN (mounting state of pipe joint).





Notes:

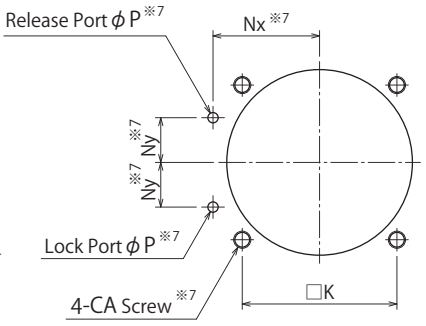
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".

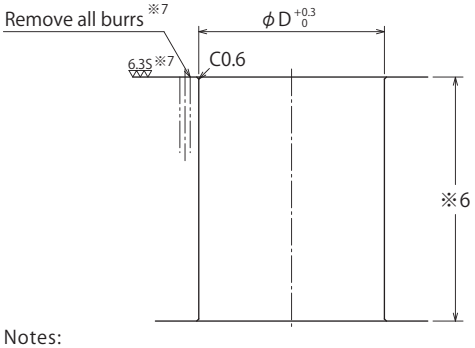
※2. Speed control valves are not provided. Please order separately (see P.283).

※3. We bundle it and ship plumbing joint and chocks without attaching it.
Please attach plumbing joint and chocks with caution in order of, ① plumbing joint ,② chocks not to damage an O-ring from a cylinder bottom.
(The plumbing joint does the M3 screw side downward, and, please attach it.)After only WCE 0601 and WCE1002 got the main body, please attach plumbing joint and chocks.

1. Please use the pin supplied (equivalent to φADf6、φAEf6、HRC60) for mounting pin for lever.
2. Please refer to P.155～ 156 about air sensing chart.

Machining Dimensions of Mounting Area





Notes:

※4. Air venting port must be open to the atmosphere and kept free of coolant, chips or other debris.
If the port might be exposed to coolant or debris a filter mechanism should be attached using tapped holes M3 screw. Be sure not to block the air vent port.

※5. The CA thread depth of the mounting bolt should be decided based on the mounting height with reference to S size.

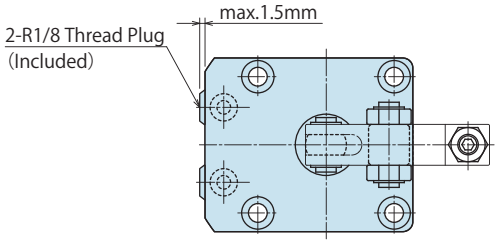
※6. The φD depth of the body mounting hole of WCE0602 and WCE1002 should be set less than the value of dimension "F".

※7. This process indicates -A/-G：Gasket option.

Piping Method

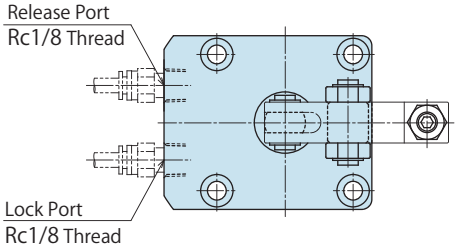
G：Gasket Option (with R Thread Plug)

※The drawing shows the locked state of WCE-2GCN.



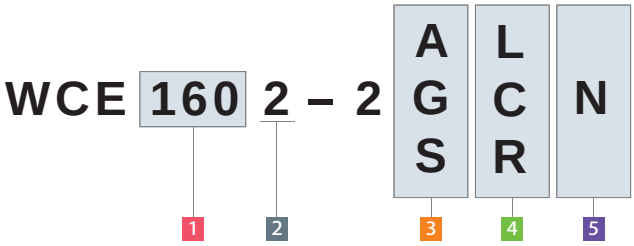
S：Piping Option (Rc Thread)

※The drawing shows the locked state of WCE-2SCN.



Model No. Indication

(Format Example：WCE1002-2ARN、WCE2502-2SLN)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Lever Direction
5 Action Confirmation (When N is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		WCE0602-2□□N	WCE1002-2□□N	WCE1602-2□□N	WCE2502-2□□N	WCE4002-2□□N
Full Stroke		19.5	22	23.5	27.5	33
(Break down)	Idle Stroke	16	18	19.5	23.5	29
	Lock Stroke ※8	3.5	4	4	4	4
Recommended Stroke		17.5	20	21.5	25.5	31
A		111.5	123	134.5	157.5	184
B		54	60	66	76	87
C		45	50	56	66	78
D		40	46	54	64	77
E		79.5	88	94.5	109.5	124.5
F		54.5	63	69.5	79.5	94.5
G		25	25	25	30	30
H		31.5	35	38	43	48
J		22.5	25	28	33	39
K		34	39	45	53	65
L		72	79	88	98	113
M		11	11	11	11	11
Nx		26	28	31	36	41
Ny		9	10	13	15	20
P		max. ϕ3	max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q		9.5	9.5	9.5	11	11
R		5.5	5.5	5.5	6.8	6.8
S		15.5	14	13.5	16	15
T		28.5	31.5	36	40	50.5
U		10	12	14	16	20
V		24	27	30	34	42.5
W		31	31	32.5	37.5	40.5
X		20.5	23.5	26	32.5	39.5
Y		11	11	13	16	18
Z		19	19	21	28	37
Chamfer1		C2.5	C2.5	C3	C3	C5
AA		16	19.5	21	25	30
AB		76.1	72	76.5	92.2	105.7
AC		49.8	46.9	50.9	62.7	74.7
AD		5	5	6	6	8
AE		5	5	6	8	10
AG		21.6°	26.5°	26.4°	26.1°	25.2°
CA (Nominal × Pitch)		M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
NA		40	43.5	45	50	55
NB		42	49	49	59	59
NC		12.5	14	13.5	14.5	15.5
ND		16	15	17	20	22
NE		19.5	23.5	23.5	28.5	28.5
NF		30	38	38	48	48
Chocks (Included)		STW-20	STW-28	STW-28	STW-38	STW-38
ZA (Chamfer)		C3	R5	R5	R6	R6
O-ring (-A/-G option)		1BP5	1BP7	1BP7	1BP7	1BP7
Mass ※9	kg	0.7	0.8	1.1	1.8	2.7

Notes: ※8. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of idle stroke.)
※9. Mass of single clamp without the link lever.

Air Sensing Option (Action Confirmation Method･･･M：Air Sensing Manifold Option / N：Air Sensing Piping Option)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor connected to lock check port and release check port.

Applicable Model

WCE 160 2 - 2 [A/G/S] [L/C/R] [M/N]

5 Action Confirmation Method
：When M/N is chosen

About Air Catch Sensor

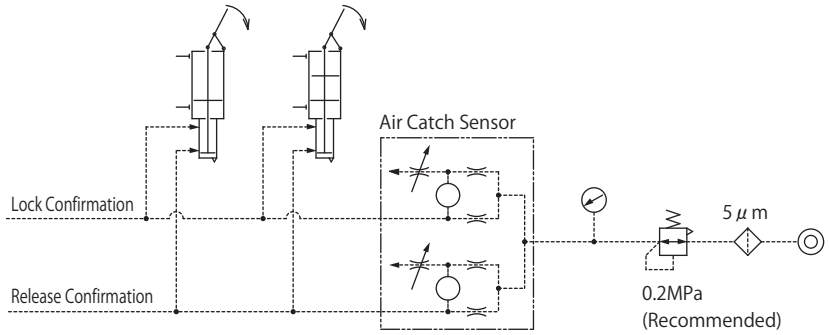
The essential condition: Air catch sensor that have a consumption rate more than 22～25L/min (at 0.2 MPa) is needed.

Recommended Operating Air Pressure : 0.2 MPa

Recommended Air Catch Sensor

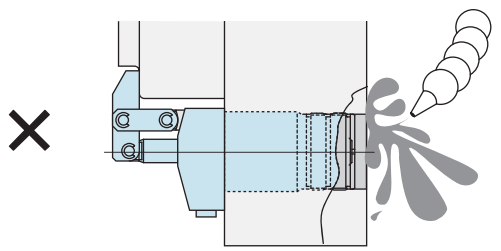
Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA1、ISA2-H	GPS2-07-15

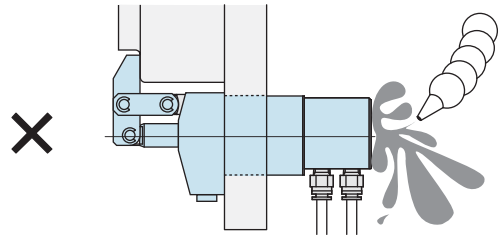
In order to carry out stabilized detection, the number of clamps connected per one air catch sensor should be no more than 4.
The air pressure to the air catch sensor should be 0.2MPa.
Refer to the drawing below for the pneumatic circuit composition.



Notes for Use and Installation

- Air venting port must be open to the atmosphere and kept free of coolant, chips or other debris.
  The air catch sensor can malfunction if the air vent port is blocked.

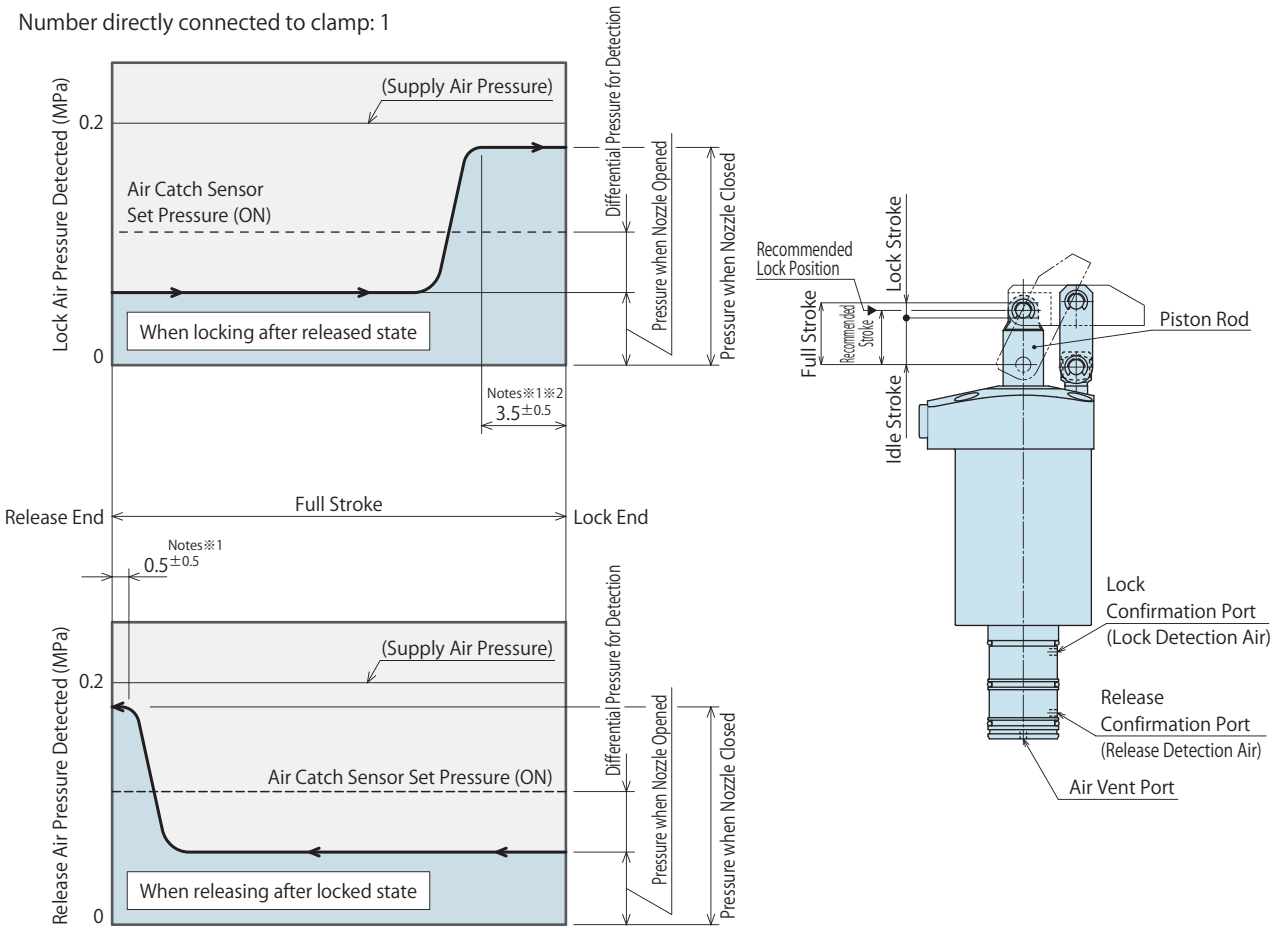




- Grease the O-ring before assembly to fixture.
  If it is mounted under dry state, the O-ring may have twisting or be defective.
  If excessive grease is applied, the grease may overflow to block the detection port, resulting in malfunctioning of the air catch sensor.

Air Sensing Chart

Number directly connected to clamp: 1



Notes:

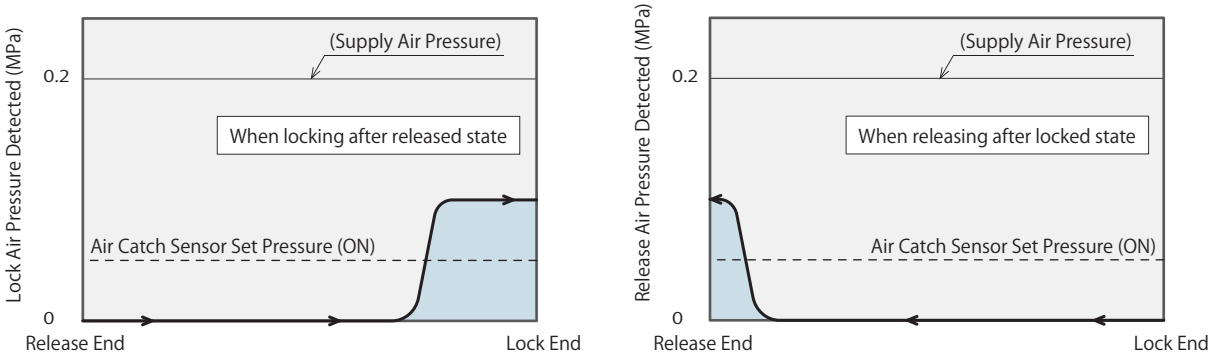
1. Sensing chart shown is the relationship between the cylinder stroke and detection circuit air pressure.
2. The position where the air catch sensor has ON signal output varies as per the sensor setting.
3. The detection pressure varies as per the number of clamps connected per circuit. (Maximum number of clamps connected: 4)
4. The features may vary as per the air circuit structure. Please refer for the details separately.

※1. There is certain tolerance with regard to the position where the pressure for fully closing the detection nozzle is reached as per the clamp structure. (Refer to the sensing chart.)

※2. WCE0602-2□□M/N: the position where the pressure for fully closing the detection nozzle is 3.0±0.5 mm.

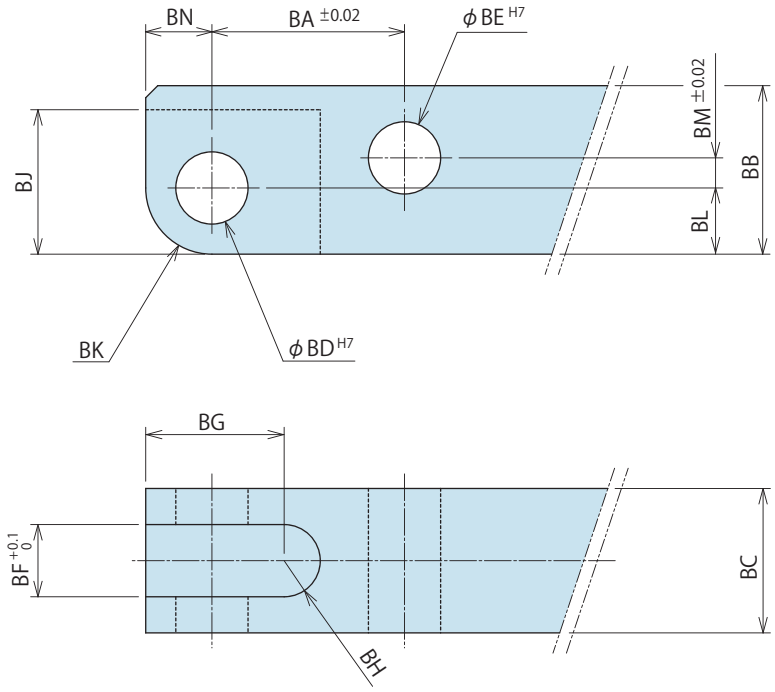
Model No.		WCE0602-2□□M/N	WCE1002-2□□M/N	WCE1602-2□□M/N	WCE2502-2□□M/N	WCE4002-2□□M/N
Full Stroke	mm	19.5	22	23.5	27.5	33

Number directly connected to clamp: 4 (for reference)



Link Lever Design Dimension

※ Reference for designing link lever.



Calculation List of Link Lever Design Dimension

(mm)

Corresponding Model No.	WCE0602	WCE1002	WCE1602	WCE2502	WCE4002
BA	16	19.5	21	25	30
BB	12.5	12.5	16	20	25
BC	$10\,^{0}_{-0.2}$	$10\,^{0}_{-0.2}$	$12\,^{0}_{-0.3}$	$16\,^{0}_{-0.3}$	$19\,^{0}_{-0.3}$
BD	$5\,^{+0.012}_{0}$	$5\,^{+0.012}_{0}$	$6\,^{+0.012}_{0}$	$6\,^{+0.012}_{0}$	$8\,^{+0.015}_{0}$
BE	$5\,^{+0.012}_{0}$	$5\,^{+0.012}_{0}$	$6\,^{+0.012}_{0}$	$8\,^{+0.015}_{0}$	$10\,^{+0.015}_{0}$
BF	5	5	6	8	10
BG	10	10	13	13	17
BH	R2.5	R2.5	R3	R4	R5
BJ	10	10	13	13	17.5
BK	R4.5	R4.5	R6	R6	R8
BL	4.5	4.5	6	6	8
BM	2.5	2.5	3.5	6	7.5
BN	4.5	4.5	6	6	8

Notes:

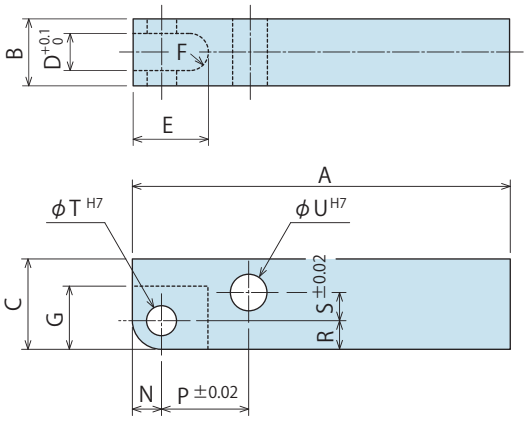
1. Design the link lever length according to the performance graph.
2. If the link lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
3. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60) as the mounting pin for lever.
   (Please refer to each external dimension of WCE for the dimensions φAD and φAE.)

Accessories：Material Link Lever

Model No. Indication

WCZ 160 0 – L2

- 160: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	WCZ0600-L2	WCZ1000-L2	WCZ1600-L2	WCZ2500-L2	WCZ4000-L2
Corresponding Model No.	WCE0602	WCE1002	WCE1602	WCE2502	WCE4002
A	80	90	100	115	140
B	$10^{\ 0}_{-0.2}$	$10^{\ 0}_{-0.2}$	$12^{\ 0}_{-0.3}$	$16^{\ 0}_{-0.3}$	$19^{\ 0}_{-0.3}$
C	12.5	12.5	16	20	25
D	5	5	6	8	10
E	12.5	12.5	16	17	22
F	R2.5	R2.5	R3	R4	R5
G	10	10	13	13	17.5
N	4.5	4.5	6	6	8
P	16	19.5	21	25	30
R	4.5	4.5	6	6	8
S	2.5	2.5	3.5	6	7.5
T	$5^{\ +0.012}_{\ 0}$	$5^{\ +0.012}_{\ 0}$	$6^{\ +0.012}_{\ 0}$	$6^{\ +0.012}_{\ 0}$	$8^{\ +0.015}_{\ 0}$
U	$5^{\ +0.012}_{\ 0}$	$5^{\ +0.012}_{\ 0}$	$6^{\ +0.012}_{\ 0}$	$8^{\ +0.015}_{\ 0}$	$10^{\ +0.015}_{\ 0}$

Notes:

1. Material S45C
2. If necessary, the front end should be additionally machined.
3. Please use the attached pin (equivalent to φADf6、φAEf6、HRC60) as the mounting pin for lever.
   (Refer to the external dimensions for φAD, φAE)

Accessories：Others

● We offer other accessories shown below.

Air Flow Control Valve

Model **BZW-A**

※Please use BZW□-A for WCE.

Refer to P.283 for detail.

Manifold Block

Model **WHZ-MD**

Refer to P.1217 for detail.

Cautions

Note for Design

1) Check Specifications

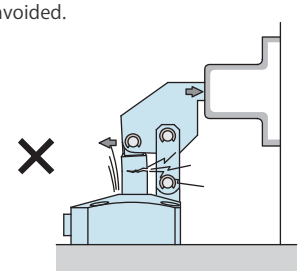
- Please use each product according to the specifications.
- The mechanical lock mechanism of this clamp has the clamping force and holding force even when pneumatic pressure falls to zero. (Refer to clamping force and holding force diagram.)

2) Notes for Circuit Design

- Never supply pressure simultaneously to lock and release ports. If there is something wrong with the circuit design, it leads to get the applications damaged and work wrongly.

3) Notes for Link Lever Design

- Make sure no force is applied to the piston rod except the axial direction. (Make sure the clamp surface and the mounting surface on the workpiece are parallel.) The usage like the one shown in the drawing below will apply a large bending stress to the piston rod and must be avoided.

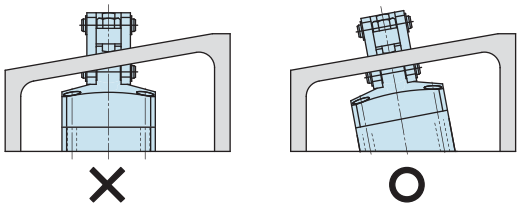


4) When using on a welding fixture, the exposed area of piston rod and link plate should be protected.

- If spatter gets onto the sliding surface it may lead to malfunction and fluid leakage.

5) When clamping on a sloped surface of the workpiece

- Make sure the clamp surface and the mounting surface on the workpiece are parallel.

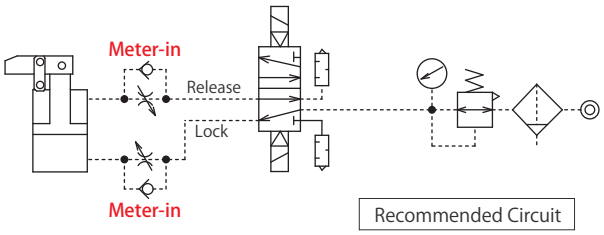


6) When using in a dry environment

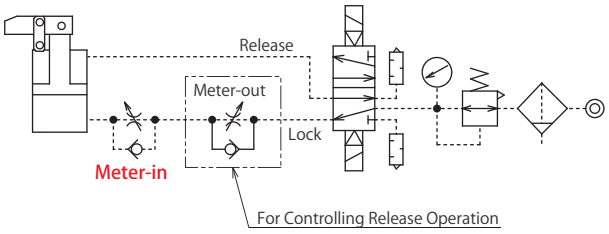
- The link pin may dry out. Grease it periodically or use a special pin. Contact us for the specifications of special pins.

7) Speed Adjustment

- If the clamp operates too fast the parts will wear out and become damaged more quickly leading to equipment failure. Don't adjust the Meter-out valve outside the cylinder because there is an orifice of meter-out connected internally. (The operating time of mechanical locking system will be very long if there is back pressure in the circuit.) Adjust speed control of locking operation speed within 0.5 to 1.0 second by installing Meter-in speed control valve into the lock port. If the adjustment time is longer than 1.0 second, pressure rising will be slow and eventually takes more time to achieve the clamping force corresponding to the catalogue data. Even if there is stiff or sudden movement under low pressure and small volume of air, it isn't malfunction. (Please set under above condition when you have to adjust action movement time over 1 second.)

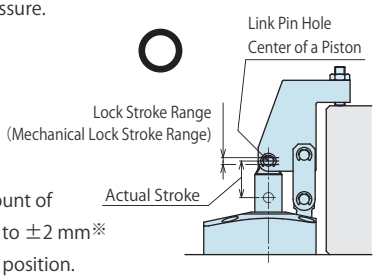


Please set one speed controller for each clamp (meter-in) if multiple clamps are synchronized for action.
When big thrust force occur towards the release direction in release action, please adjust lever speed with Meter-In speed control in Lock port side.



8) The specification value is not fulfilled when clamping out of the lock stroke (mechanical lock stroke) range.

- When the center of link pin hole of piston rod clamps out of the lock stroke range, the mechanical lock function does not work. As a result, The specification value of clamping force and holding force will not be fulfilled. Moreover, there will be no clamping or holding force at zero pneumatic pressure.



Please design the amount of actual stroke to be set to ±2 mm※ of recommended lock position.
(The specification value is fulfilled since the center of link pin hole of piston rod is within the lock stroke (mechanical lock stroke) range.
※ For WCE0602, please design the amount of actual stroke to be set to -1.5mm ~ +2mm of recommended lock position.

Installation Notes

1) Check the fluid to use.
- Please supply filtered clean dry air. (Install the drain removing device.)
- Oil supply with a lubricator etc. is unnecessary. Oil supply with a lubricator may cause loss of the initial lubricant. The operation under low pressure and low speed may be unstable. (When using secondary lubricant, please supply lubricant continuously. Otherwise, the initial grease applied from KOSMEK will be removed from the secondary lubricant.)

2) Procedure before Piping
- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly.
  The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with this product for prevention of contaminants in the air circuit.

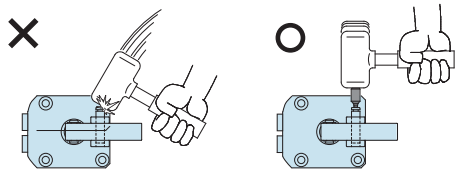
3) Applying Sealing Tape
- Wrap with tape 1 to 2 times following the screwing direction. Wrapping in the wrong direction will cause leaks and malfunction.
- Pieces of the sealing tape can lead to air leaks and malfunction.
- When piping, be careful that contaminant such as sealing tape does not enter in products.

4) Mounting the Unit
- When mounting the product use four hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

Model No.	Thread Size	Tightening Torque (N·m)
WCE0602	M5×0.8	6.3
WCE1002	M5×0.8	6.3
WCE1602	M5×0.8	6.3
WCE2502	M6×1	10
WCE4002	M6×1	10

5) Installing Flow Control Valve.
- Torque to 5 – 7Nm.

6) Mounting and removing the link lever.
- When inserting the link pin, do not hit the pin directly with a hammer. When using a hammer to insert the pin, always use a cover plate with a smaller diameter than the snap ring groove on the pin.



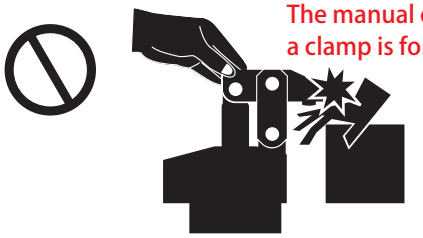
7) Speed Adjustment
- Please perform speed adjustment by the standard of lock operation within 0.5 to 1.0 second.
  If the clamp operates too fast the parts will wear out and become damaged more quickly leading to equipment failure.
- Turn the flow control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

8) Checking looseness and retightening
- At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

9) Please do not carry out manual operation of a clamp.
- When a piston or a lever raises a piston by manual operation at the time of not supplying pneumatic, if it goes into the range of lock stroke, the mechanical lock mechanism will operate and the piston will operate till a rise to a rise end or locking action completion.
  Since a hand is pinched and it becomes a cause of an injury, please do not carry out manual operation of a clamp.

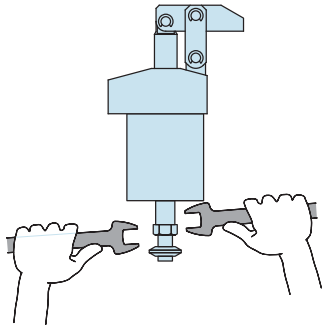
During shipment, clamps are in locked state (with mechanical lock function) to prevent accidents. Even when shipping them to users after installing clamps to fixtures or systems, make sure clamps are in locked state (with mechanical lock function) to prevent accidents.

During locked state, clamps cannot be operated manually because of the mechanical lock. Supply release air pressure to conduct release action.



10) The cautions at the time of a test run.
- If large flow air is supplied right after installation, the action time may become extremely fast, resulting in major clamp damage. Install the speed controller (meter-in) beside the air source and gradually supply air.

11) Notes on dual rod type (-D) for dog application.
- When attaching dog, set up the piston so that it will not turn around. Please secure the dog or cam and prevent any rotation or torque on the piston rod.
  Torque values for the mounting screw are shown in the table below.



Model No.	Thread Size	Tightening Torque (N·m)
WCE0602–2□□D	M4×0.7	3.2
WCE1002–2□□D	M5×0.8	6.3
WCE1602–2□□D	M5×0.8	6.3
WCE2502–2□□D	M6×1	10
WCE4002–2□□D	M6×1	10

※ Please refer to P.1237 for common cautions. • Notes on Handling • Maintenance/Inspection • Warranty