

High-Power Welding Link Clamp

Model WCG



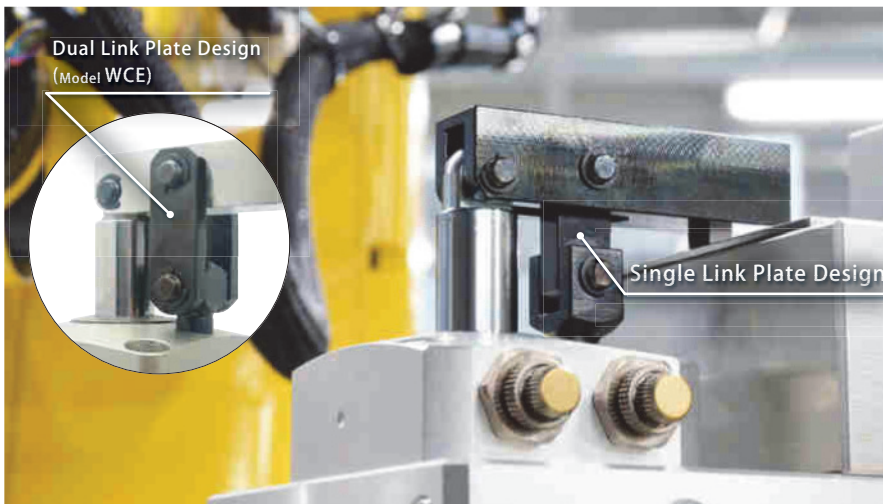
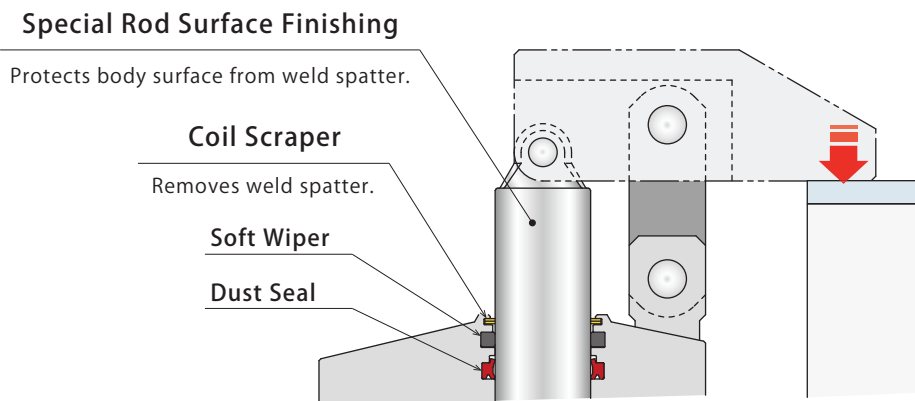
Spatter Resistant High-Power Welding Link Clamp

PAT.

Features

High Durability

Triple protective structure prevents contaminants from entering the cylinder.



Link Mechanism with Single Link Plate

Compared to dual link plate design (model WCE), the link mechanism of Welding Clamp is designed to be spatter resistant with single link plate.



Case Study

The rod operates without failure even after exposed to spatter for a long time.

The High-Power Welding Link Clamp is a hybrid system using air pressure and a mechanical lock.

Locating Pin Clamp

SWP

High-Power Welding Swing Clamp

WHG

High-Power Welding Link Clamp

WCG

Air Flow Control Valve

BZW

Manifold Block

WHZ-MD

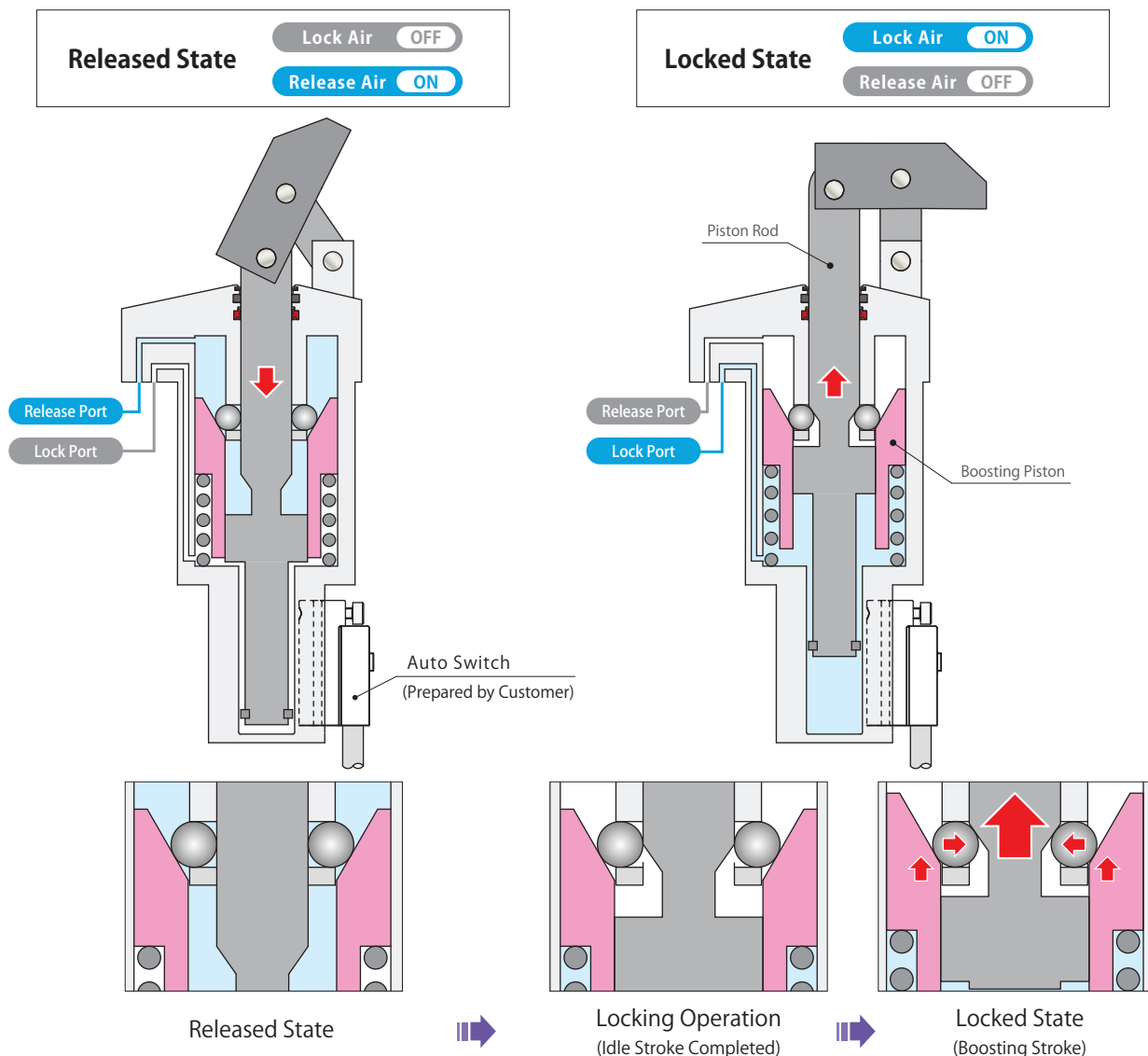
General Cautions

Welding Related Products

Quick Die Change Systems

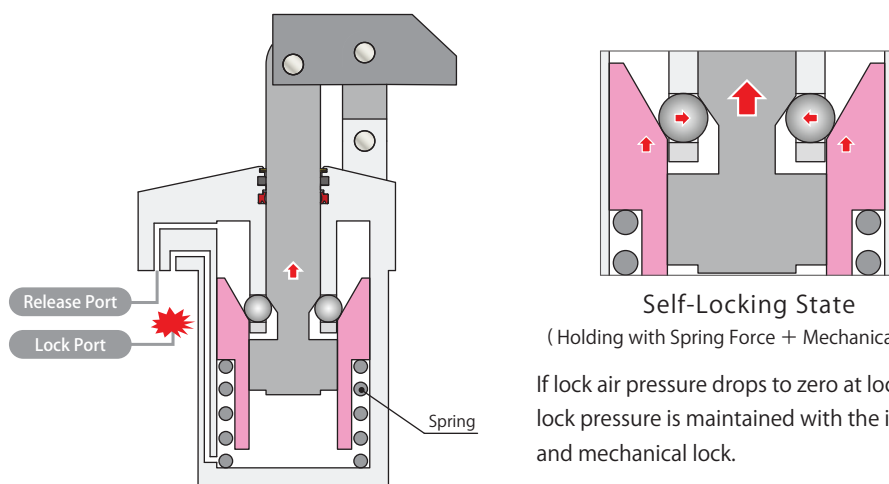
Company Profile Sales Offices

Action Description



The piston rod descends to release.

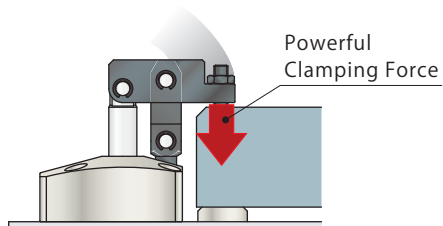
The piston rod ascends and the boosting piston activates. It exerts strong clamping force and holding force with the wedge mechanism.



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

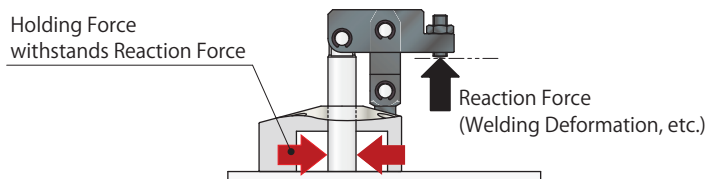
No Hydraulic Use

Welding fixture system with high-power welding clamps exerting equivalent force to hydraulic clamps needs no hydraulic pressure.



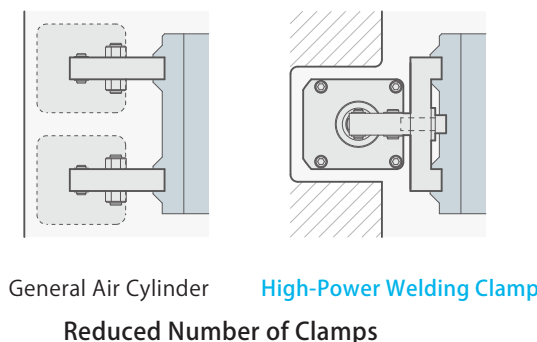
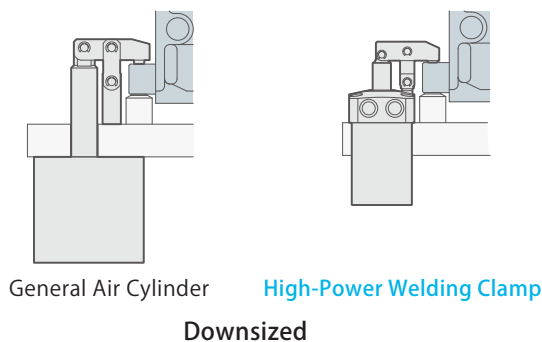
Holding Force

Minimal clamping force and powerful holding force minimize workpiece deformation. Mechanical locking allows holding force to exert 3 times the clamping force at most.



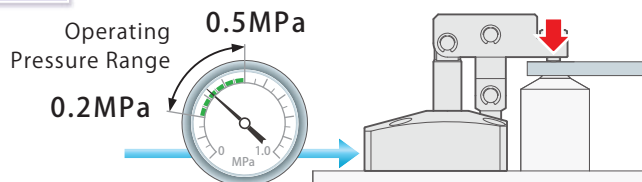
Smaller Footprint

Exerts three times clamping force compared to the same size general air cylinder. Smaller cylinder allows for more compact fixtures.



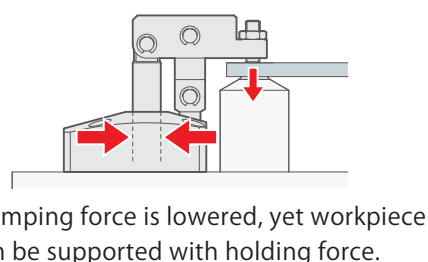
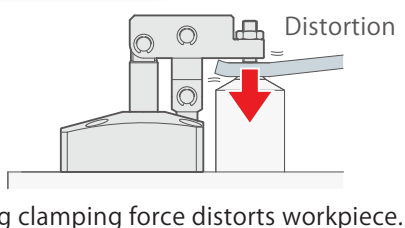
Energy Saving

Energy-saving clamp exerts high clamping force with low pressure.



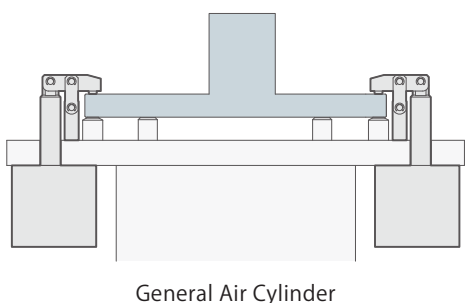
High Quality

Optimum clamping force does not distort workpiece and holding force is strong enough to withstand welding load.



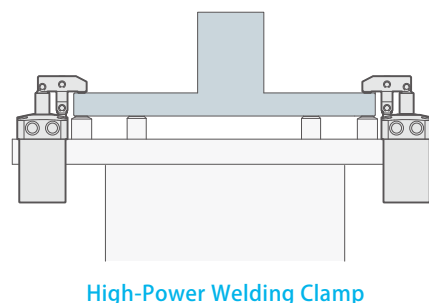
Light Weight

High-Power Welding Clamp allows for lighter fixture, minimizing load to the positioner.



Fixture 10% Lighter
Clamp 20% Lighter

※ Reference when workpiece size is 300×260.



Action Confirmation

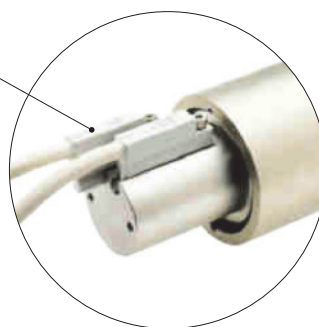
Safely used in automation systems with action confirmation of Auto Switch.

Auto Switch (Prepared by Customer)

Ability to Confirm Lock/Release Action

Recommended Auto Switch

JEP Series (KOSMEK)
Magnetic Field Resistant Model : D-P3DWA (SMC)



【Applicable Auto Switch】

Refer to FA · Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB) for detailed specifications.

Please use D-P3DWA (SMC) for an environment which generates a magnetic field disturbance.

(When using an auto switch not made by Kosmek, check specifications of each manufacture.)

Auto Switch Model No.	JEP0000-A2	JEP0000-A2L	JEP0000-B2	JEP0000-B2L
Switch Type	Reed Auto Switch		Solid State Auto Switch	
Wiring Method	2-Wire		3-Wire	
Cable Length	1m	3m	1m	3m
Specifications · Electric Circuit Diagram	Refer to FA · Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)		Refer to FA · Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)	
External Dimensions				

Auto Switch Model No.	JEP0000-A2V	JEP0000-A2VL	JEP0000-B3	JEP0000-B3L
Switch Type	Reed Auto Switch		Solid State Auto Switch	
Wiring Method	2-Wire		3-Wire	
Cable Length	1m	3m	1m	3m
Specifications · Electric Circuit Diagram	Refer to FA · Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)		Refer to FA · Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)	
External Dimensions				

Model No. Indication

WCG 160 0 - **2** A R T

1 2 3 4 5

1 Cylinder Force

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.

0 : Revision Number

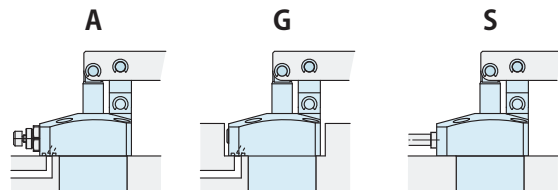
3 Piping Method

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.
Please refer to P.49.



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

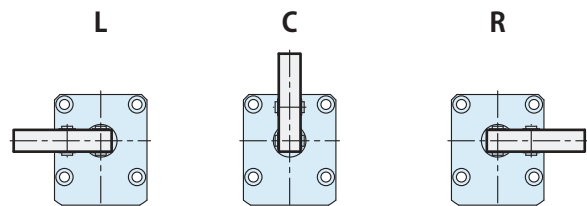
4 Lever Direction

L : Left

C : Center

R : Right

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



5 Action Confirmation Method

Blank : None (Standard)

T : With Auto Switch Installation Slot



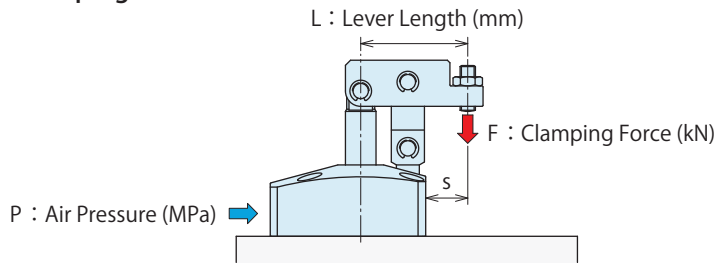
Specifications

Model No.		WCG1000-2□□□	WCG1600-2□□□	WCG2500-2□□□	WCG4000-2□□□	
Cylinder Force (at 0.5MPa)	kN	0.9	1.6	2.5	3.9	
Clamping Force		Refer to "Clamping Force Curve" on P.37				
Holding Force		Refer to "Holding Force Curve" on P.38				
Clamping Force and Holding Force at 0MPa		Refer to "Clamping Force and Holding Force Curve at 0 MPa" on P.39				
Full Stroke	mm	22	23.5	27.5	33	
(Break down):	Idle Stroke	mm	18	19.5	23.5	29
	Lock Stroke ^{※1}	mm	4	4	4	4
Cylinder Capacity	Lock	cm ³	22.4	35.8	56.1	95.6
	Release	cm ³	18.9	32.1	50.6	85.2
Spring Force	N	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	°C	0 ~ 70				
Usable Fluid		Dry Air				

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

Clamping Force Curve

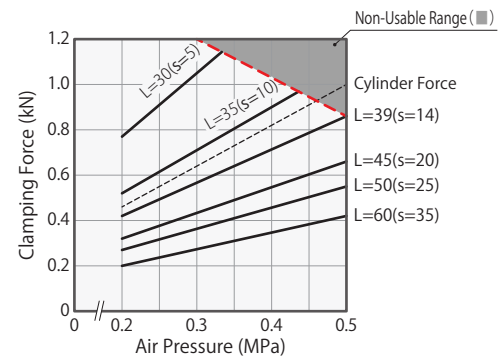


(How to read the Clamping Force Curve)
When using WCG2500
Supply Air Pressure 0.3MPa
Lever Length L=50mm
Clamping force is about 1.46kN.

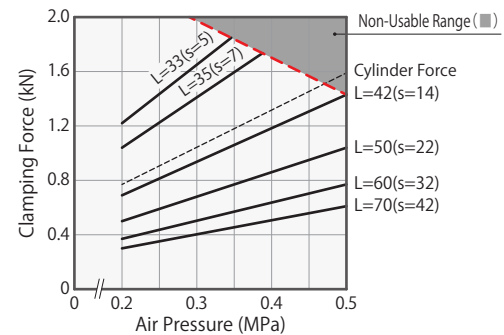
Notes:

- ※ 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 force (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.

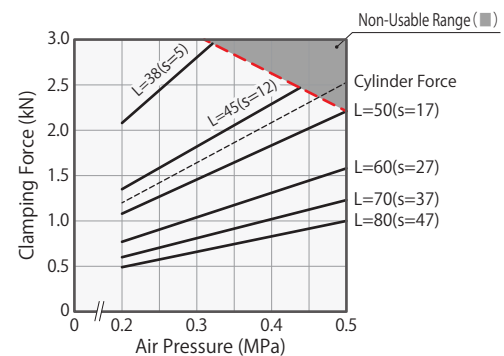
WCG1000		Clamping Force Calculation Formula ^{※1} (kN)		$F = \frac{28.6 \times P + 2.2}{L - 19.5}$				
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		30	35	39	45	50	60	
0.5	0.94	■	■	0.85	0.65	0.54	0.41	39
0.4	0.78	■	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	



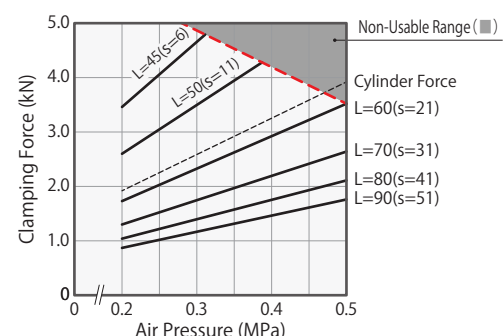
WCG1600		Clamping Force Calculation Formula ^{※1} (kN)		$F = \frac{51.6 \times P + 4.3}{L - 21}$				
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		33	35	42	50	60	70	
0.5	1.59	■	■	1.43	1.04	0.77	0.61	42
0.4	1.32	■	■	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	



WCG2500		Clamping Force Calculation Formula ^{※1} (kN)		$F = \frac{93.9 \times P + 8.3}{L - 25}$				
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		38	45	50	60	70	80	
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	

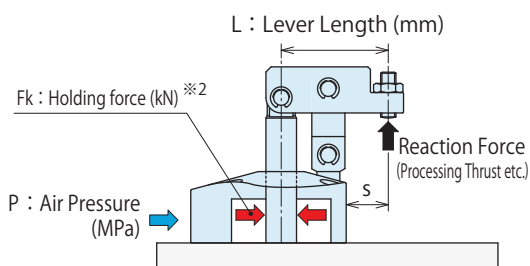


WCG4000		Clamping Force Calculation Formula ^{※1} (kN)		$F = \frac{179.2 \times P + 16.1}{L - 30}$				
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		45	50	60	70	80	90	
0.5	3.92	■	■	3.52	2.64	2.11	1.76	60
0.4	3.25	■	■	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	



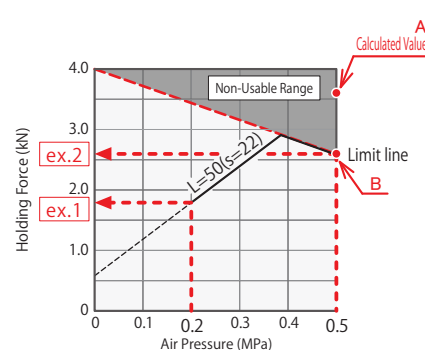
- Locating Pin Clamp
 - SWP
- High-Power Welding Swing Clamp
 - WHG
- High-Power Welding Link Clamp**
 - WCG**
- Air Flow Control Valve
 - BZW
- Manifold Block
 - WHZ-MD
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● Holding Force Curve



(How to read the Holding Force Curve: ex.1)
When using WCG1600, Supply Air Pressure 0.2MPa, Lever Length L=50mm Holding force is about 1.79kN.

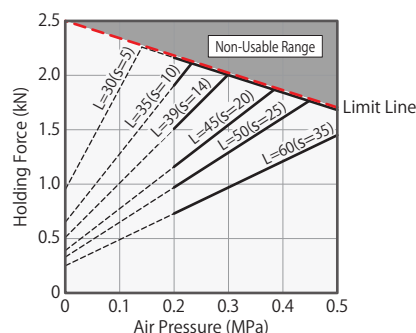
(How to read the Holding Force Curve: ex.2)
When using WCG1600, Supply Air Pressure 0.5MPa, Lever Length L=50mm The calculated value is the holding force of point A, but it is in the non-usable range. The value of intersection B is the holding force that counters the reaction force, and it is about 2.58kN.



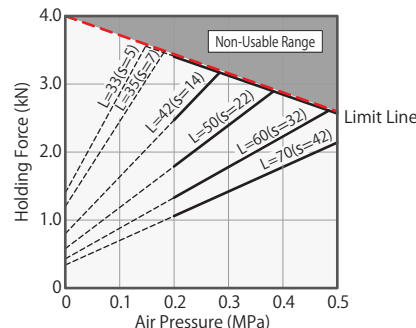
Notes :

- ※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 air 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 air pressure suitable for lever length.
 4. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

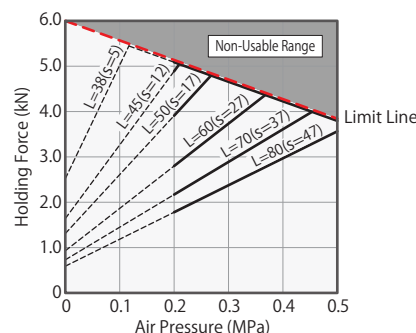
Air Pressure (MPa)	Holding Force (kN)						Non-Usable Range Limit Line Value (kN)
	Lever Length L (mm)						
	30	35	39	45	50	60	
0.5			1.67	1.67	1.67	1.45	1.67
0.4		1.84	1.84	1.84	1.61	1.21	1.84
0.3	2.01	2.01	2.01	1.54	1.29	0.97	2.01
0.2	2.18	1.90	1.51	1.16	0.97	0.73	2.18



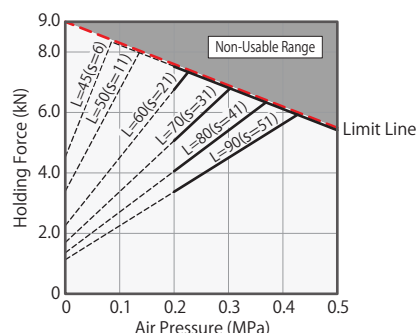
Air Pressure (MPa)	Holding Force (kN)						Non-Usable Range Limit Line Value (kN)
	Lever Length L (mm)						
	33	35	42	50	60	70	
0.5			2.58	2.58	2.58	2.13	2.58
0.4			2.86	2.86	2.23	1.77	2.86
0.3	3.14	3.14	3.14	2.39	1.78	1.42	3.14
0.2	3.42	3.42	2.47	1.79	1.33	1.06	3.42



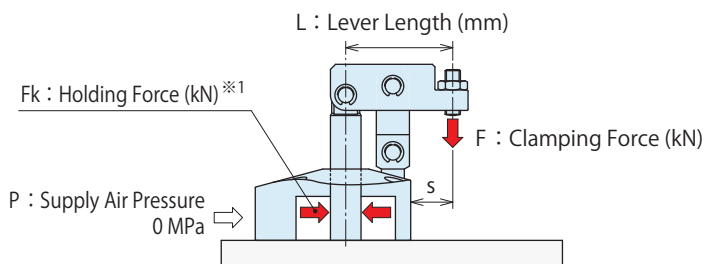
Air Pressure (MPa)	Holding Force (kN)						Non-Usable Range Limit Line Value (kN)
	Lever Length L (mm)						
	38	45	50	60	70	80	
0.5			3.81	3.81	3.81	3.55	3.81
0.4		4.24	4.24	4.24	3.62	2.96	4.24
0.3	4.67	4.67	4.67	3.72	2.90	2.37	4.67
0.2	5.10	4.89	3.91	2.79	2.17	1.78	5.10



Air Pressure (MPa)	Holding Force (kN)						Non-Usable Range Limit Line Value (kN)
	Lever Length L (mm)						
	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

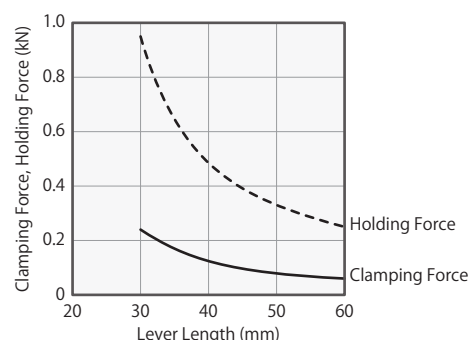


(How to read the Clamping Force and Holding Force Curve at 0MPa)
 When using WCG1600
 When air pressure is shut off at clamped state:
 Supply Pneumatic Pressure = 0MPa, Lever Length L=50 mm
 Clamping force becomes about 0.15 kN.
 Holding force becomes about 0.58 kN.

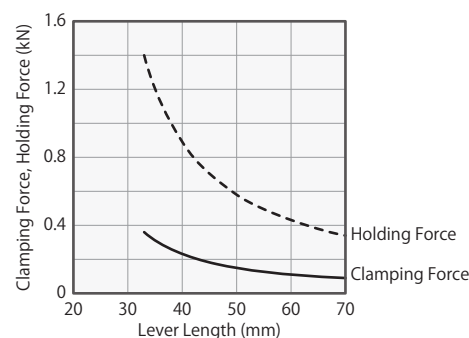
Notes:

- ※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.

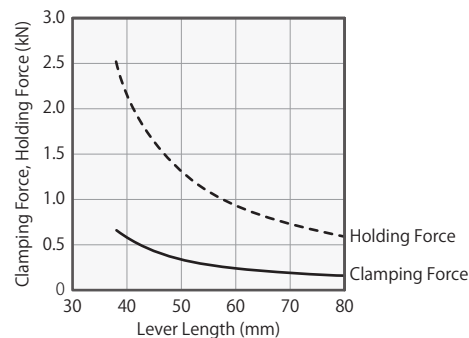
WCG1000							
Clamping Force Formula at 0MPa ※2 (kN)		$F = \frac{2.2}{L - 19.5}$					
Holding Force Formula at 0MPa ※2 (kN)		$Fk = \frac{10.0}{L - 19.5}$					
Lever Length (mm)		30	35	39	45	50	60
Clamping Force Reference Value at 0MPa (kN)		0.21	0.14	0.11	0.09	0.07	0.05
Holding Force Reference Value at 0MPa (kN)		0.95	0.65	0.51	0.39	0.33	0.25



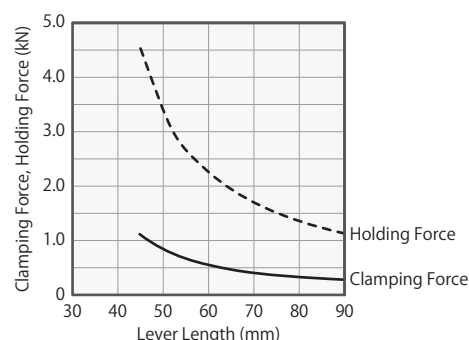
WCG1600							
Clamping Force Formula at 0MPa ※2 (kN)		$F = \frac{4.3}{L - 21}$					
Holding Force Formula at 0MPa ※2 (kN)		$Fk = \frac{16.8}{L - 21}$					
Lever Length (mm)		33	35	42	50	60	70
Clamping Force Reference Value at 0MPa (kN)		0.36	0.31	0.20	0.15	0.11	0.09
Holding Force Reference Value at 0MPa (kN)		1.40	1.20	0.80	0.58	0.43	0.34



WCG2500							
Clamping Force Formula at 0MPa ※2 (kN)		$F = \frac{8.3}{L - 25}$					
Holding Force Formula at 0MPa ※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



WCG4000							
Clamping Force Formula at 0MPa ※2 (kN)		$F = \frac{16.1}{L - 30}$					
Holding Force Formula at 0MPa ※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



Action Description	Features	Model No. Indication Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Accessories	Cautions
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Locating
Pin Clamp

SWP

High-Power
Welding
Swing Clamp

WHG

High-Power
Welding
Link Clamp

WCG

Air Flow
Control Valve

BZW

Manifold
Block

WHZ-MD

General Cautions

Welding
Related Products

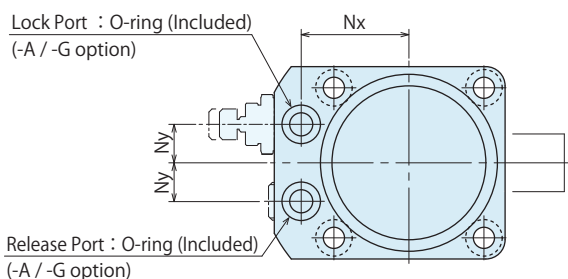
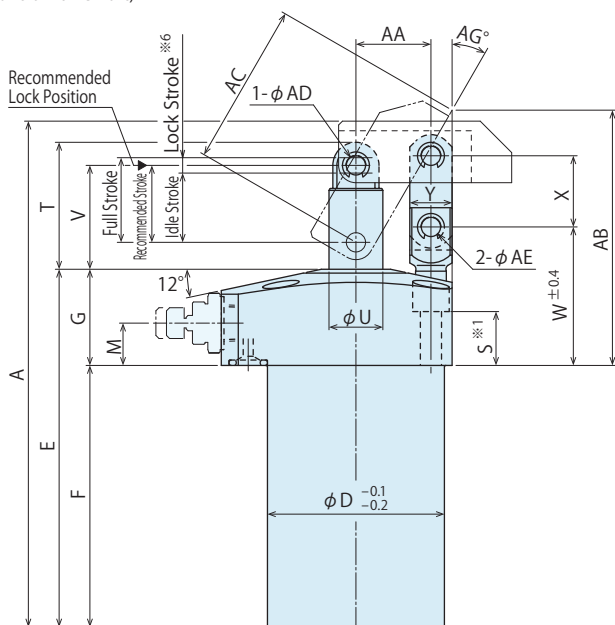
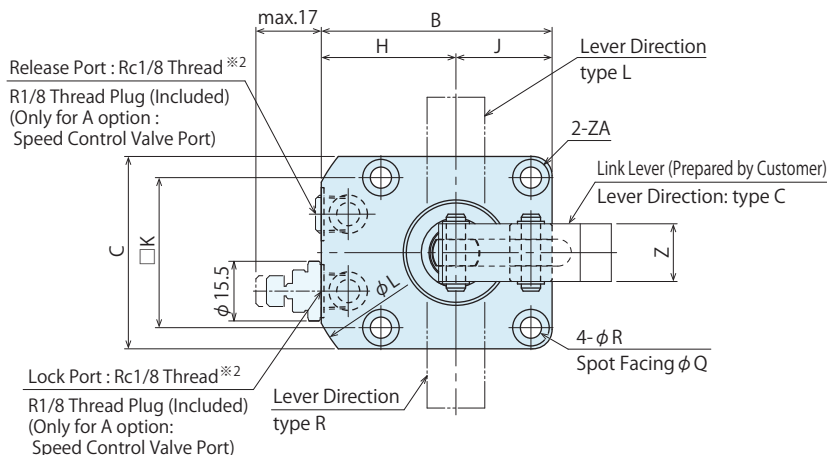
Quick Die
Change Systems

Company Profile
Sales Offices

External Dimensions

A : Gasket Option (With Ports for Speed Controller : R-Thread Plug Included)

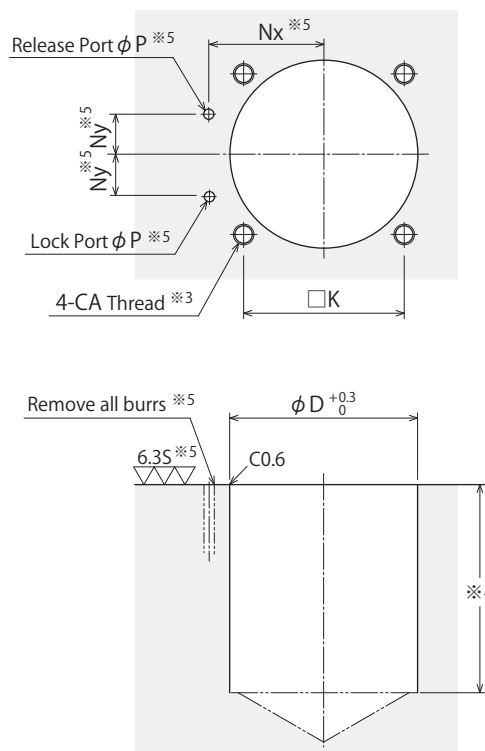
※The drawing shows the locked state of WCG-2AC.



Notes :

- ※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※2. Speed control valve is sold separately. Please refer to P.49.
 1. Please use the attached pin (equivalent to $\phi ADf6$, $\phi AEf6$, HRC60) as the mounting pin for lever.

Machining Dimensions of Mounting Area



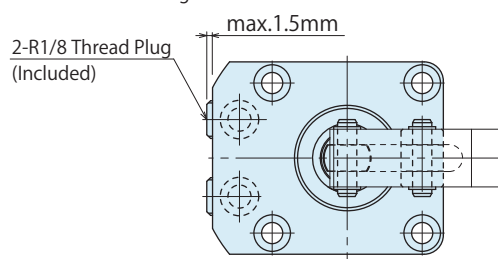
Notes:

- ※3. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※4. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.
- ※5. The machining dimension is for -A/-G : Gasket Option.

Piping Method

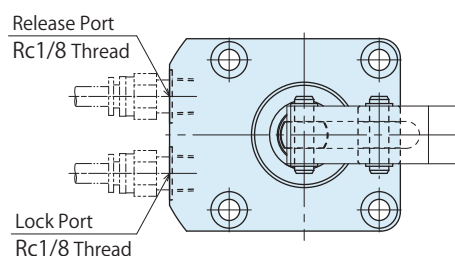
G : Gasket Option (with R Thread Plug)

※The drawing shows the locked state of WCG-2GC.

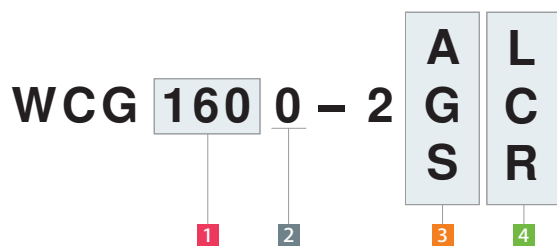


S : Piping Option (Rc Thread)

※The drawing shows the locked state of WCG-2SC.



Model No. Indication



(Format Example : WCG1000-2AR, WCG2500-2SL)

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

Locating Pin Clamp

SWP

High-Power Welding Swing Clamp

WHG

High-Power Welding Link Clamp

WCG

Air Flow Control Valve

BZW

Manifold Block

WHZ-MD

General Cautions

Welding Related Products

Quick Die Change Systems

Company Profile Sales Offices

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WCG1000-2□□	WCG1600-2□□	WCG2500-2□□	WCG4000-2□□
Full Stroke	22	23.5	27.5	33
(Break down) Idle Stroke	18	19.5	23.5	29
Lock Stroke ※6	4	4	4	4
Recommended Stroke	20	21.5	25.5	31
A	131.5	143.5	169	197.5
B	60	66	76	87
C	50	56	66	78
D	46	54	64	77
E	93	99.5	117	133
F	68	74.5	87	103
G	25	25	30	30
H	35	38	43	48
J	25	28	33	39
K	39	45	53	65
L	79	88	98	113
M	11	11	11	11
Nx	28	31	36	41
Ny	10	13	15	20
P	max. φ 5	max. φ 5	max. φ 5	max. φ 5
Q	9.5	9.5	11	11
R	5.5	5.5	6.8	6.8
S	14	13.5	16	15
T	33	36	40	50.5
U	14	14	16	20
V	27	30	34	42.5
W	36	37.5	43.5	49
X	18.5	21	26.5	31
Y	11	13	16	18
Z	15	16	19	25
AA	19.5	21	25	30
AB	66.4	70.5	84	93.4
AC	42.3	46	55.8	64.4
AD	5	6	6	8
AE	5	6	8	10
AG	30°	29.7°	29.8°	29.8°
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M6×1
ZA (Chamfer)	R5	R5	R6	R6
O-ring (-A/-G option)	1BP7	1BP7	1BP7	1BP7
Mass ※7 kg	0.6	0.9	1.5	2.4

Notes : ※6. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.

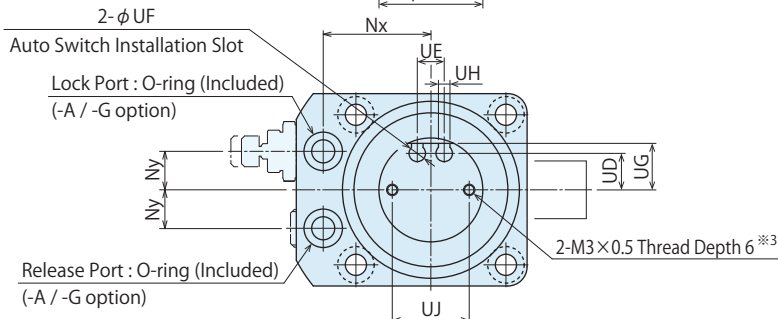
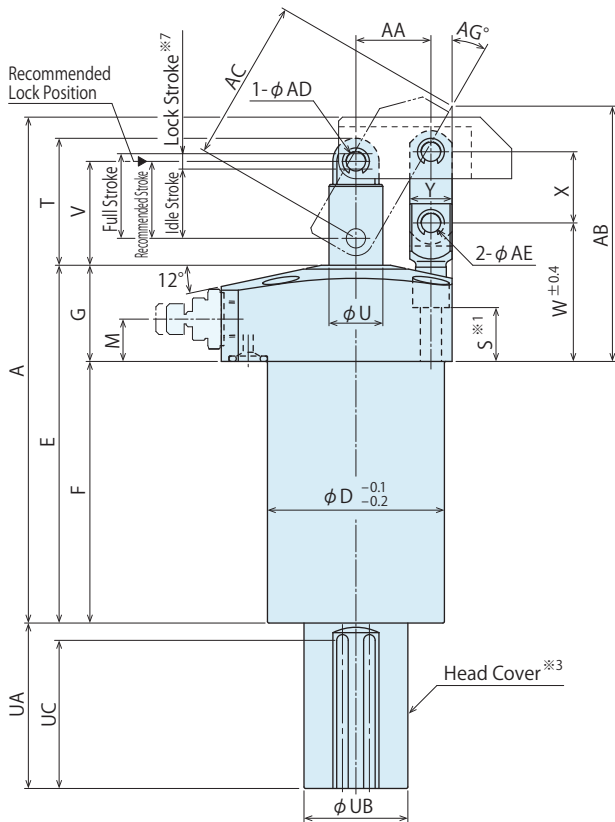
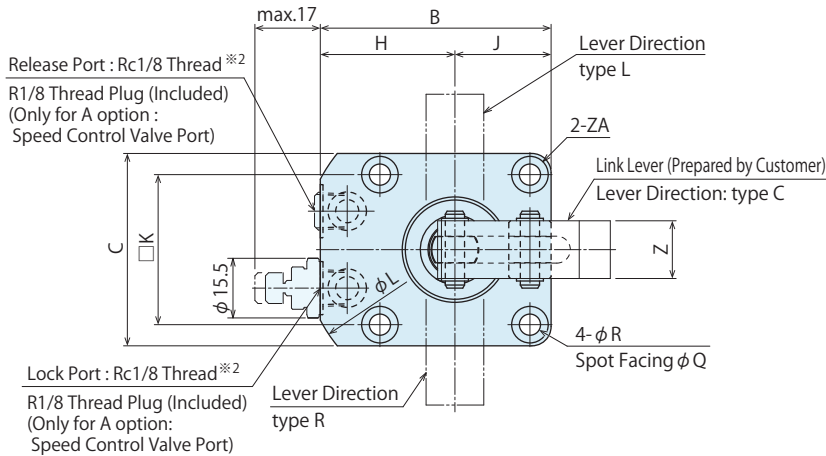
(The specification value is not fulfilled when clamping within the range of idle stroke.)

※7. Mass of single clamp without the link lever.

External Dimensions

A : Gasket Option (With Ports for Speed Controller : R-Thread Plug Included)

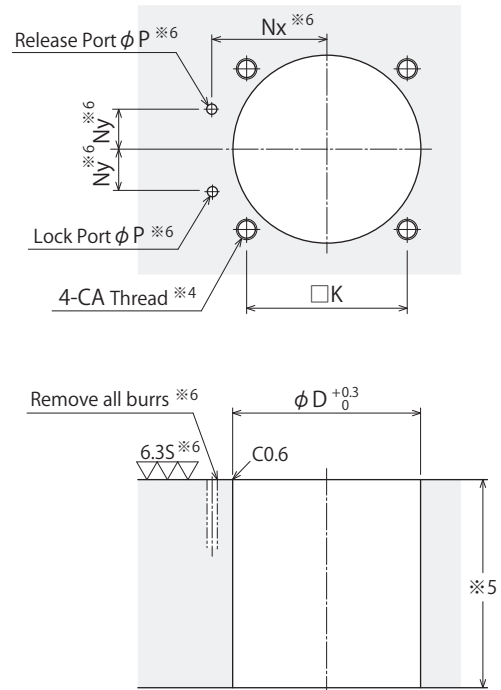
※The drawing shows the locked state of WCG-2ACT.



Notes :

- ※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※2. Speed control valve is sold separately. Please refer to P.49.
- ※3. The direction of the Head Cover is not as indicated in the drawing. Adjust the direction as you need. Use M3 tapped holes on the bottom to fix the head cover with bracket.
 1. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60) as the mounting pin for lever.

Machining Dimensions of Mounting Area



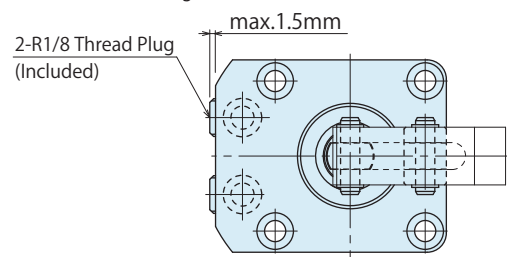
Notes:

- ※4. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.
- ※6. The machining dimension is for -A/-G : Gasket Option.

Piping Method

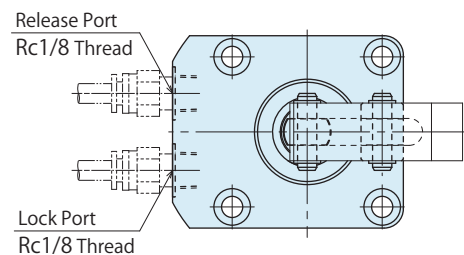
G : Gasket Option (with R Thread Plug)

※The drawing shows the locked state of WCG-2GCT.



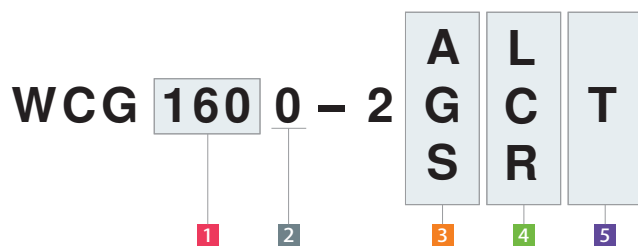
S : Piping Option (Rc Thread)

※The drawing shows the locked state of WCG-2SCT.



Model No. Indication

(Format Example : WCG1000-2ART, WCG2500-2SLT)



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

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WCG1000-2□□T	WCG1600-2□□T	WCG2500-2□□T	WCG4000-2□□T
Full Stroke	22	23.5	27.5	33
(Break down) Idle Stroke	18	19.5	23.5	29
Lock Stroke ※7	4	4	4	4
Recommended Stroke	20	21.5	25.5	31
A	131.5	143.5	169	197.5
B	60	66	76	87
C	50	56	66	78
D	46	54	64	77
E	93	99.5	117	133
F	68	74.5	87	103
G	25	25	30	30
H	35	38	43	48
J	25	28	33	39
K	39	45	53	65
L	79	88	98	113
M	11	11	11	11
Nx	28	31	36	41
Ny	10	13	15	20
P	max. φ 5	max. φ 5	max. φ 5	max. φ 5
Q	9.5	9.5	11	11
R	5.5	5.5	6.8	6.8
S	14	13.5	16	15
T	33	36	40	50.5
U	14	14	16	20
V	27	30	34	42.5
W	36	37.5	43.5	49
X	18.5	21	26.5	31
Y	11	13	16	18
Z	15	16	19	25
AA	19.5	21	25	30
AB	66.4	70.5	84	93.4
AC	42.3	46	55.8	64.4
AD	5	6	6	8
AE	5	6	8	10
AG	30°	29.7°	29.8°	29.8°
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M6×1
ZA (Chamfer)	R5	R5	R6	R6
UA	43	45.5	50.5	55.5
UB	27	27	30	30
UC	38.5	40	44	49.5
UD	9.5	9.5	11	11
UE	7	7	7	7
UF	4.3	4.3	4.3	4.3
UG	12.1	12.1	13.6	13.6
UH	3	3	3	3
UJ	20	20	22	22
O-ring (-A/-G option)	1BP7	1BP7	1BP7	1BP7
Mass ※8 kg	0.7	1.0	1.6	2.6

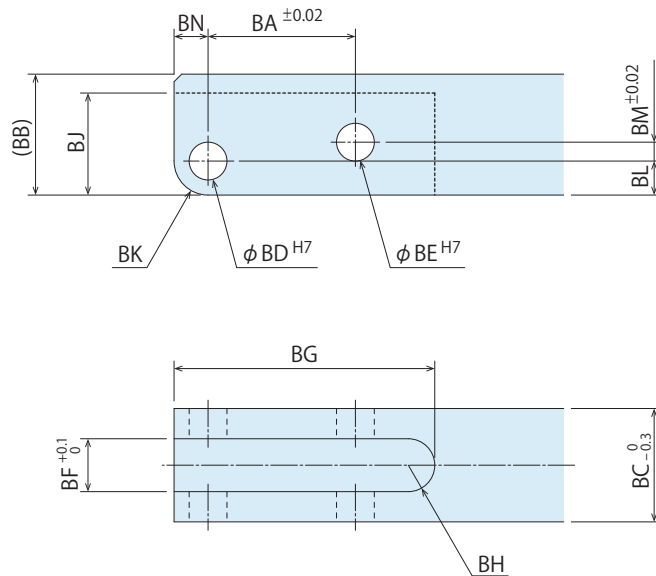
Notes : ※7. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.

(The specification value is not fulfilled when clamping within the range of idle stroke.)

※8. Mass of single clamp without the link lever.

● Link Lever Design Dimension

※ Reference for designing link lever.



● Calculation List of Link Lever Design Dimension

(mm)

Corresponding Model No.	WCG1000	WCG1600	WCG2500	WCG4000
BA	19.5	21	25	30
BB	16	20	24	30
BC	15	16	19	25
BD	5 ^{+0.012} ₀	6 ^{+0.012} ₀	6 ^{+0.012} ₀	8 ^{+0.015} ₀
BE	5 ^{+0.012} ₀	6 ^{+0.012} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀
BF	7	7	8	12
BG	35.5	39.5	46	56
BH	R3.5	R3.5	R4	R6
BJ	13.5	17	21	26.5
BK	R4.5	R6	R6	R8
BL	4.5	6	6	8
BM	2.5	3.5	6	7.5
BN	4.5	6	6	8

Notes:

1. Design the link lever length according to the performance curve.
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 WCG for the dimensions φAD and φAE.)

● Accessories : Material Link Lever

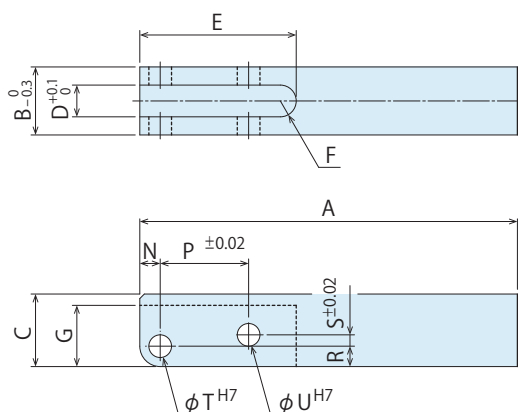
Model No. Indication

WCZ 160 0 - L3

Size
(Refer to following table)

Design No.
(Revision Number)

(mm)



Model No.	WCZ1000-L3	WCZ1600-L3	WCZ2500-L3	WCZ4000-L3
Corresponding Model No.	WCG1000	WCG1600	WCG2500	WCG4000
A	90	100	115	140
B	15	16	19	25
C	16	20	24	30
D	7	7	8	12
E	35.5	39.5	46	56
F	R3.5	R3.5	R4	R6
G	13.5	17	21	26.5
N	4.5	6	6	8
P	19.5	21	25	30
R	4.5	6	6	8
S	2.5	3.5	6	7.5
T	5 ^{+0.012} ₀	6 ^{+0.012} ₀	6 ^{+0.012} ₀	8 ^{+0.015} ₀
U	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 ϕ ADf6, ϕ AEf6, HRC60) as the mounting pin for lever.
(Refer to the external dimensions for ϕ AD, ϕ AE)

Cautions

Notes for Design

1) Check Specifications

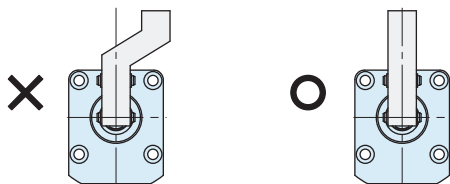
- Please use each product according to the specifications.
- The mechanical lock mechanism of this clamp maintains clamping force and holding force even when air pressure falls to zero. (Refer to "Clamping Force and Holding Force Curve at OMPa" .)

2) Notes for Circuit Design

- Ensure there is no possibility of supplying air pressure to the lock and release ports simultaneously. Improper circuit design may lead to malfunctions and damages.

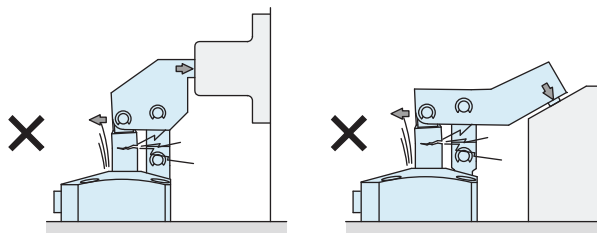
3) Do not apply offset load.

- Do not apply offset load on the link part. The point of load (clamping point) should be within the width of the link lever.



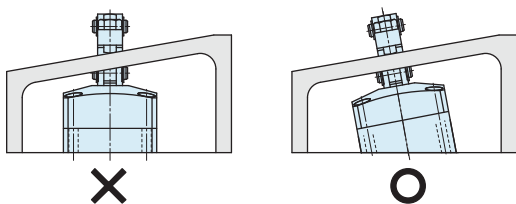
4) Notes for Link Lever Design

- Make sure no force except the axial direction is applied to the piston rod. The usage like the one shown in the drawing below will apply a large bending stress to the piston rod and must be avoided.



5) When clamping on a sloped surface of the workpiece

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

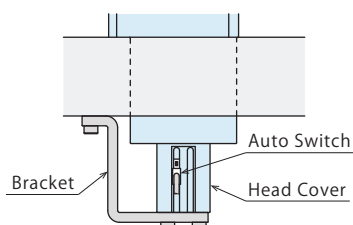


6) When using in a dry environment

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

7) Adjust the direction of the head cover as you need.

Use M3 tapped holes on the bottom to fix the head cover with bracket.



8) Speed Adjustment

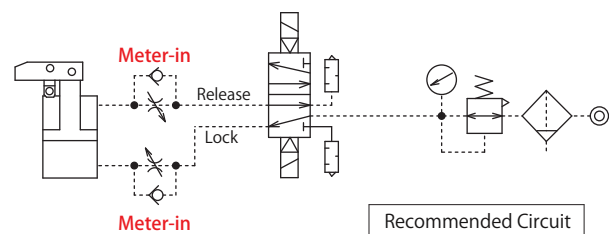
- If the clamp operates too fast the parts will wear out and become damaged more quickly leading to equipment failure. Do not adjust the Meter-out valve outside the cylinder because there is an orifice of meter-out connected internally. (The operating time of mechanical locking system will be very long if there is back pressure in the circuit.)

Adjust speed control of locking operation speed within 0.5 seconds by installing Meter-in speed control valve into the lock port.

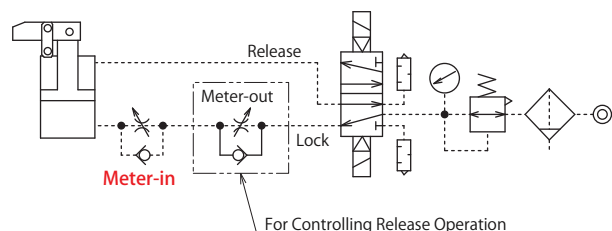
If the adjustment time is longer than 0.5 seconds, pressure rising will be slow and eventually takes more time to achieve the clamping force corresponding to the catalogue data.

Even if there is stiff or sudden movement under low pressure and small volume of air, it is not malfunction.

(Please set under above condition when you have to adjust action movement time over 1.0 second.)

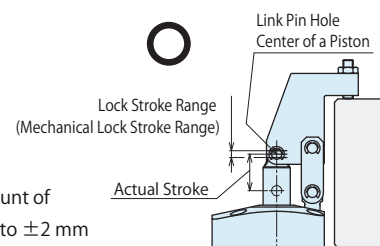


For multiple clamps operating simultaneously, please install the speed controller (meter-in) to each clamp. Also, when load is applied to the release action direction during release action, adjust the speed by installing the speed controller (meter-out) on the lock port side.



9) 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 air 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.)

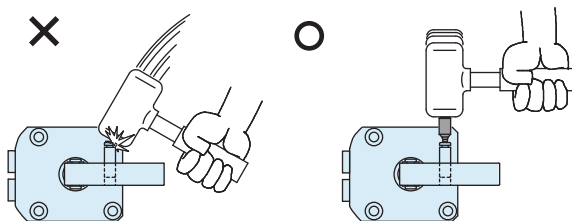
- Locating Pin Clamp
 - SWP
- High-Power Welding Swing Clamp
 - WHG
- High-Power Welding Link Clamp**
 - WCG**
- Air Flow Control Valve
 - BZW
- Manifold Block
 - WHZ-MD
- General Cautions
- Welding Related Products
- Quick Die Change Systems
- Company Profile Sales Offices

● 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 screw direction. Wrapping in the wrong direction will cause leakage and malfunction.
 - Pieces of the sealing tape can lead to air leakage and malfunction.
 - When piping, be careful that contaminant such as sealing tape does not enter in products.
- 4) Installation of the Product
 - When mounting the product use four hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the table below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

Model No.	Thread Size	Tightening Torque (N·m)
WCG1000	M5×0.8	6.3
WCG1600	M5×0.8	6.3
WCG2500	M6×1	10
WCG4000	M6×1	10

- 5) Installing Flow Control Valve
 - Tightening torque for installing flow control valve is 5 to 7 N·m.
- 6) Installation / Removal of 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
 - Adjust the locking action to be about 0.5 seconds. Excessively fast operating speed of the clamp may lead to wear-out or damage the internal components.
 - Turn the speed 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 installation, bolts may be tightened lightly. Check torque 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.

※ Please refer to P.53 for common cautions. • Notes on Handling • Maintenance/Inspection • Warranty

Air Flow Control Valve

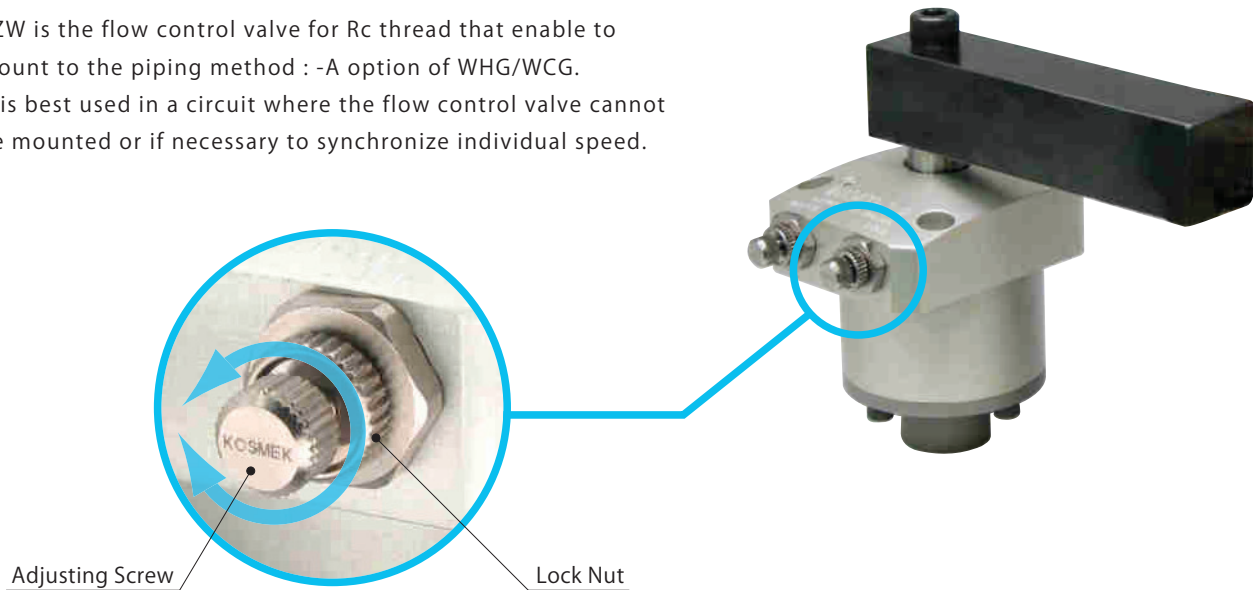
Model BZW



Directly mounted to clamps, easy adjusting

- **Directly Mounted to Clamps**

BZW is the flow control valve for Rc thread that enable to mount to the piping method : -A option of WHG/WCG. It is best used in a circuit where the flow control valve cannot be mounted or if necessary to synchronize individual speed.



Corresponding Product Model

Clamp	BZW Model No.	Clamp Model No.
High-Power Welding Link Clamp	BZW0100- A	WCG □ 2-2 A □
High-Power Welding Swing Clamp	BZW0100- B	WHG □ 0-2 A □

Corresponding to piping method -A option.

※ When mounting BZW to piping method G, take off R thread plug and remove the seal tape not to get inside cylinder.

Model No. Indication

BZW 010 0 - B

Control Method
B : Meter-out
A : Meter-in

Design No.
0 : Revision Number

R Thread Size
010 : Rc1/8

Locating
Pin Clamp

SWP

High-Power
Welding
Swing Clamp

WHG

High-Power
Welding
Link Clamp

WCG

**Air Flow
Control Valve**

BZW

Manifold
Block

WHZ-MD

General Cautions

Welding
Related Products

Quick Die
Change Systems

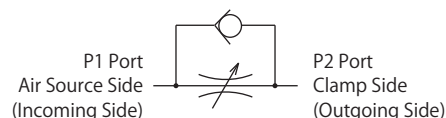
Company Profile
Sales Offices

Specifications

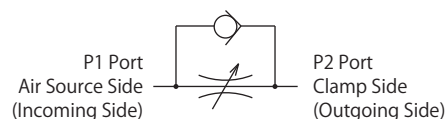
Model No.	BZW0100-B	BZW0100-A
Control Method	Meter-out	Meter-in
Operating Pressure MPa	0.1 ~ 1.0	
Withstanding Pressure MPa	1.5	
Adjust Screw Number of Rotations	10 Rotations	
Tightening Torque N·m	5 ~ 7	
Corresponding Model No.	WHG□-2A□	WCG□-2A□

Circuit Symbol

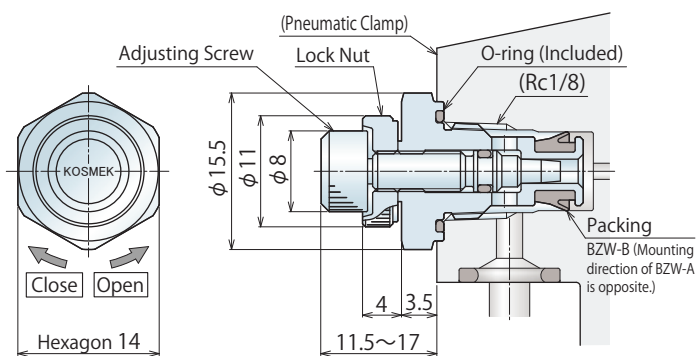
BZW0100-B : Meter-out



BZW0100-A : Meter-in

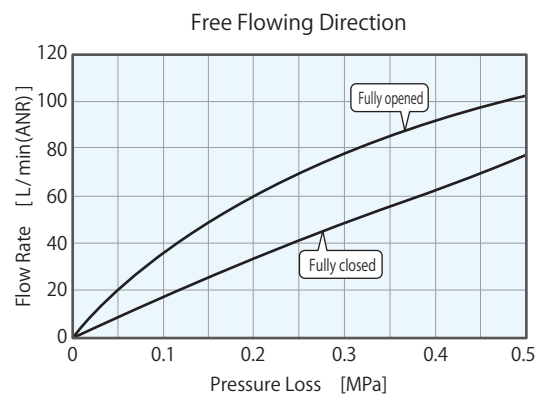
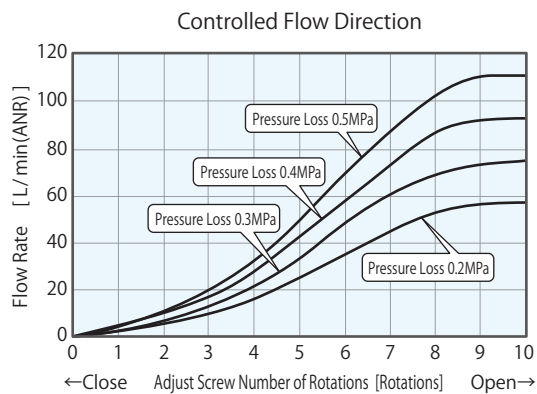


External Dimensions

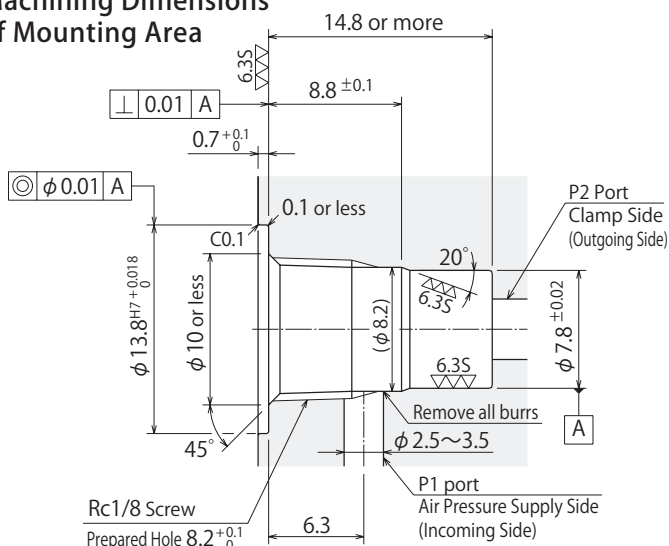


Flow Rate Graph

BZW0100-B/BZW0100-A common



Machining Dimensions of Mounting Area



Notes :

1. Since the $\nabla\nabla\nabla$ area is sealing part, be careful not to damage it.
2. No cutting chips or burr should be at the tolerance part of machining hole.
3. As shown in the drawing, P1 port is used as the air supply side and P2 port as the clamp side.

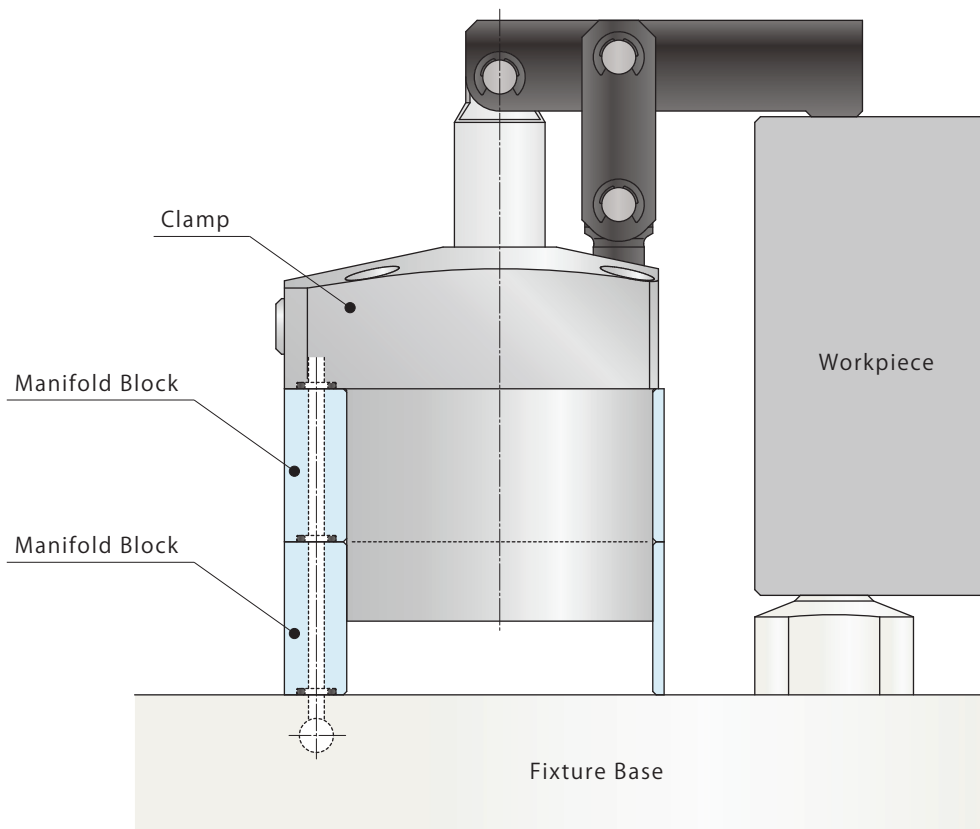
Manifold Block

Model WHZ-MD



- **Manifold Block**

The mounting height of clamp is adjustable with the manifold block.



Locating
Pin Clamp

SWP

High-Power
Welding
Swing Clamp

WHG

High-Power
Welding
Link Clamp

WCG

Air Flow
Control Valve

BZW

Manifold
Block

WHZ-MD

General Cautions

Welding
Related Products

Quick Die
Change Systems

Company Profile
Sales Offices

Applicable Model

Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCG Model WHG

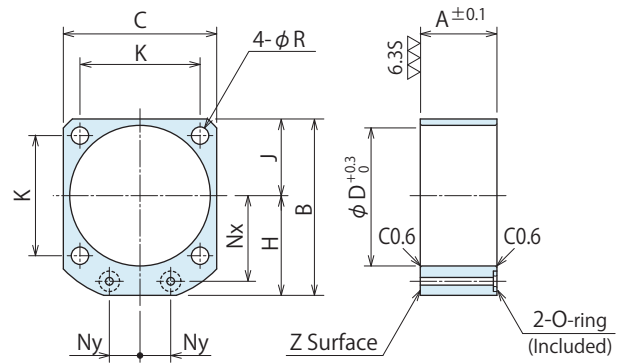
Manifold Block for WCG/WHG

Model No. Indication

WHZ 048 0 - MD

Size
(Refer to
following table)

Design No.
(Revision Number)



(mm)

Model No.	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Item Model Number	WCG1000 WHG1000	WCG1600 WHG1600	WCG2500 WHG2500	WCG4000 WHG4000
A	25	27	31	35
B	60	67	77	88.5
C	50	58	68	81
D	46	54	64	77
H	35	38	43	48
J	25	29	34	40.5
K	39	45	53	65
Nx	28	31	36	41
Ny	10	13	15	20
R	5.5	5.5	6.5	6.5
O-ring	1BP7	1BP7	1BP7	1BP7
Mass kg	0.1	0.1	0.2	0.2

- Notes :
1. Material: A2017BE-T4
 2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the A dimensions as a reference.
 3. If thickness other than A is required, perform additional machining on surface Z. Please refer to the drawing.

ⓘ Cautions

● Notes on Handling

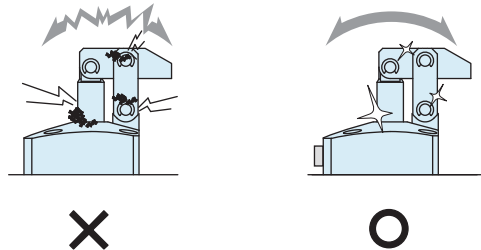
- 1) It should be handled by qualified personnel.
- The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the product unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
 - ② Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - ③ After stopping the machine, do not remove until the temperature cools down.
 - ④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.
- 3) Do not touch clamp (cylinder) while clamp (cylinder) is working. Otherwise, your hands may be injured due to clinching.



- 4) Do not disassemble or modify.
 - If the product is taken apart or modified, the warranty will be voided even within the warranty period.

● Maintenance and Inspection

- 1) Removal of the Product and Shut-off of Pressure Source
 - Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - Make sure there is no abnormality in the bolts and respective parts before restarting.
- 2) Regularly clean the area around the piston rod.
 - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.



- 3) Regularly tighten pipings, mounting bolts, nuts, snap rings and cylinders to ensure proper use.
- 4) Make sure there is smooth action and no abnormal noise.
 - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 5) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 6) Please contact us for overhaul and repair.

● Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense. Defects or failures caused by the following are not covered.
 - ① If the stipulated maintenance and inspection are not carried out.
 - ② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
 - ③ If it is used or handled in inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
 - ④ If the defect is caused by reasons other than our responsibility.
 - ⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
 - ⑥ Other caused by natural disasters or calamities not attributable to our company.
 - ⑦ Parts or replacement expenses due to parts consumption and deterioration. (Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

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