High-Power Pneumatic Swing Clamp

Model WHE

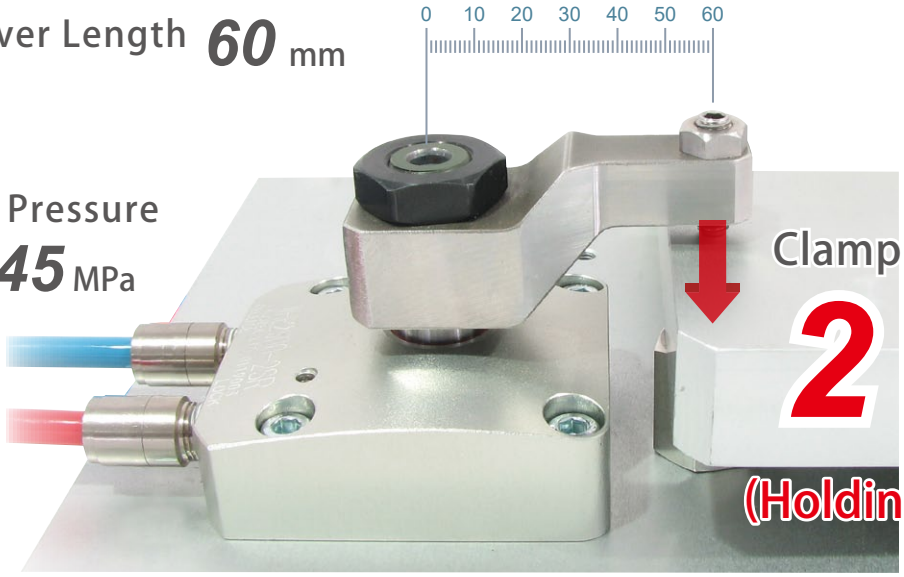
New size WHE0450 added to the lineup. (Aug, 2020)

Clamping force which replaces hydraulic clamp

Development of high power pneumatic swing clamp PAT.

Lever Length **60** mm

Supply Air Pressure **0.45** MPa



Clamping Force **2** kN

(Holding Force is 5kN)

Model WHE2500

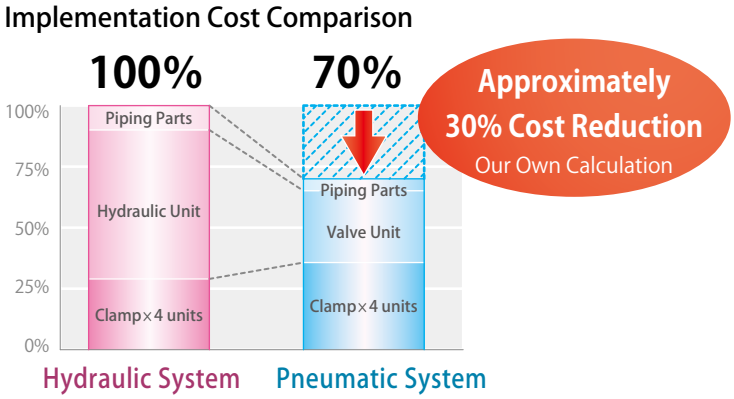
Clamping Force
(Compared with conventional WHA model) **About 3 Times**

Available in six body sizes.

Cylinder force is *0.18 ~ 3.86kN*

• Without Hydraulics

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

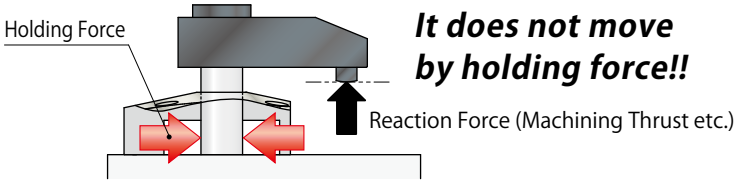


• Holding Force

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

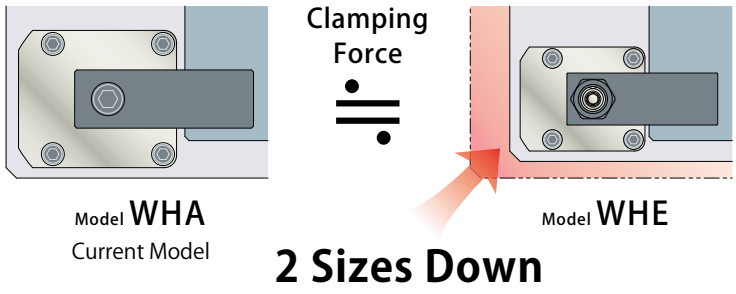
※1. It varies depending on the working pressure and lever length.

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



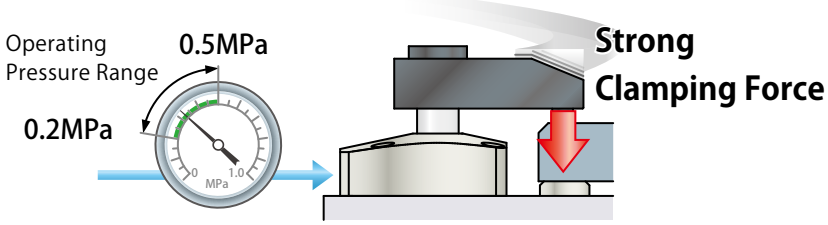
• Space-Saving

Equivalent clamping force by 2 sizes down than current WHA.

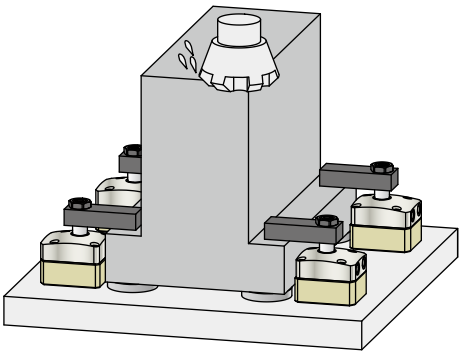


• Energy Saving

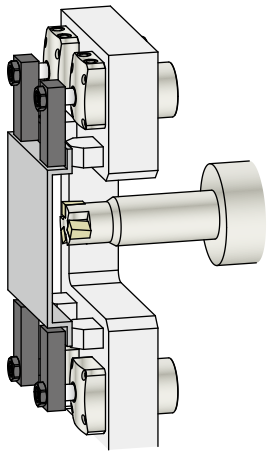
Higher clamping force is achieved by low operating pressure.



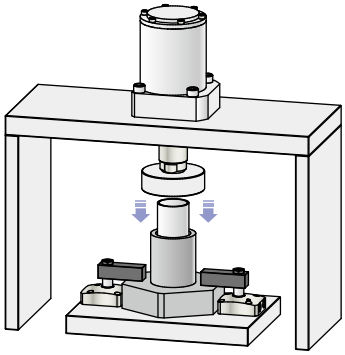
Application Examples



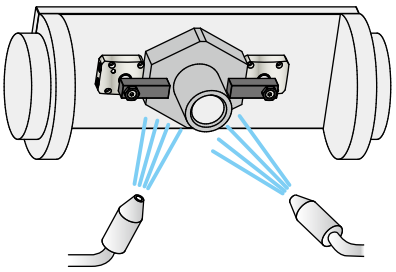
< Machining Process >



< In the Backside Machining >



< In the Press Fit Process >

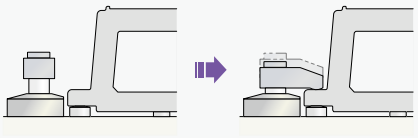


< For the Cleaning Process >

Standard Model

Model **WHE**

Clamp after 90° swing



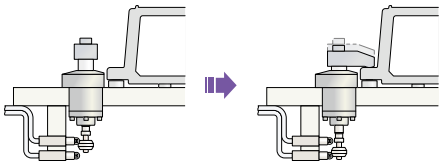
External Dimensions → P.115

Action Description

Double End Rod Option for Dog

Model **WHE-D**

Piston rod condition can be detected by a switch etc



External Dimensions → P.117

Air Sensing Manifold Option

Model **WHE-M**

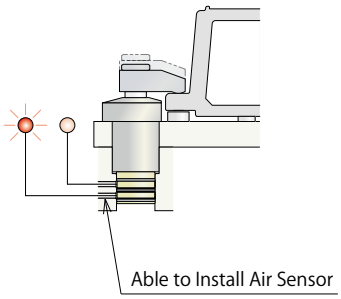
External Dimensions → P.119

Air Sensing Piping Option

Model **WHE-N**

External Dimensions → P.121

Piston rod condition can be detected by an air catch sensor etc

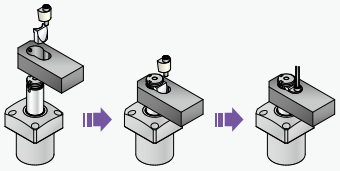


Option

Quick Change Lever Option A

Model **WHE-A**

Quick and easy to change levers with Quick Change Lever Option A

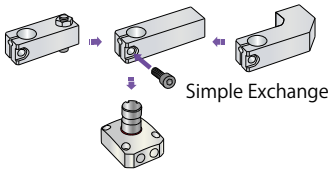


External Dimensions → P.123

Quick Change Lever Option F

Model **WHE-F**

Quick and easy to change levers with Quick Change Lever Option F



External Dimensions → P.125

Balance Lever Option

Model **WHE-P**

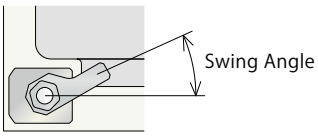
One clamp can secure two workpieces

External Dimensions → P.127

Swing Angle Selectable Option

Model **WHE-Y**

Available with 30°, 45°, 60° Swing Angle



External Dimensions → P.129

Accessories

Lever

Model **WHZ-T, WHZ-A/W WHZ-F/B**

→ P.135

Manifold Block

Model **WHZ-MD**

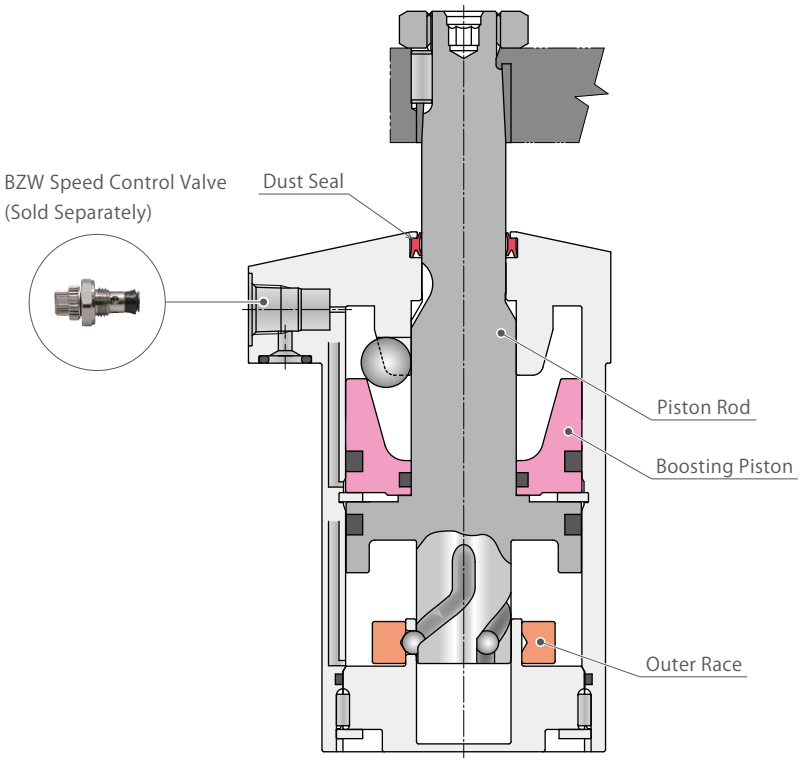
→ P.1335

Speed Control Valve

Model **BZW-B**

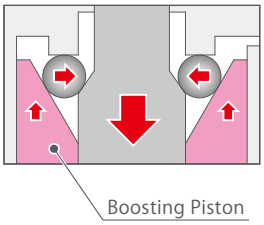
→ P.309

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



● Powerful Clamping Force and Holding Force

With mechanical lock, it exerts 3 times higher clamping force than the same size air cylinder, and powerful holding force to withstand large reaction force.

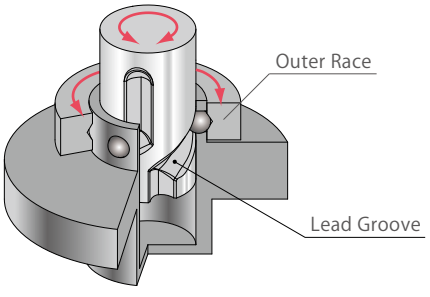


● Compact

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

● Swing Mechanism with High Speed and High Durability

Our strong hydraulic clamp mechanism is used to pneumatic clamps.
Makes it faster with 3 lines of lead groove + outer race.
(High Rigidity makes it possible to a use long lever.)



● 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

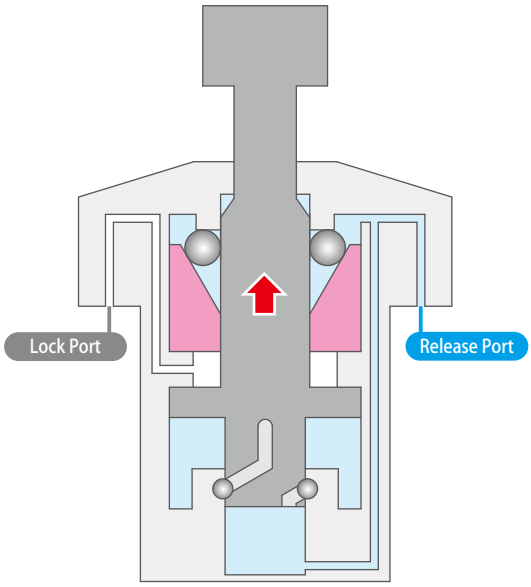
When fitting the gasket (Pioing Option A), it is able to attach the speed control valve .
(Speed control valve is sold separately.)

Action Description

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

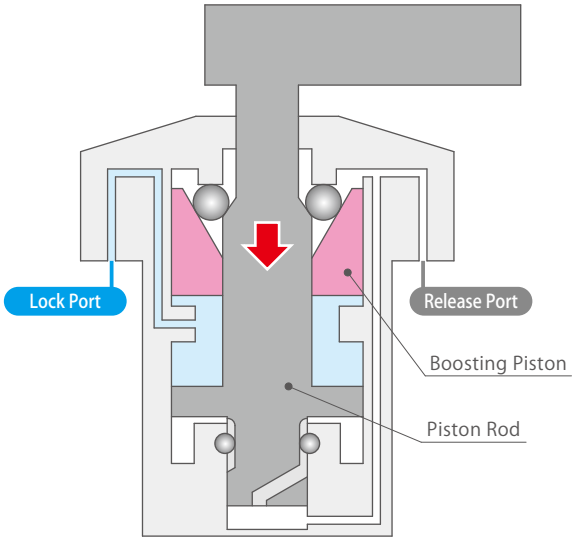
Released State

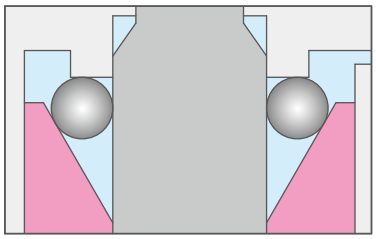
Lock Air Pressure OFF
Release Air Pressure ON



Locked State

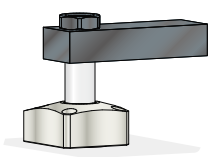
Lock Air Pressure ON
Release Air Pressure OFF

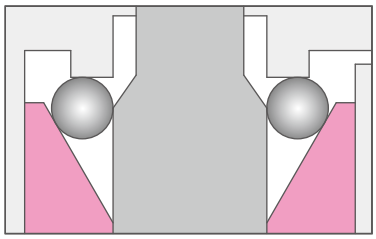




Released State

The piston rod ascends to release.



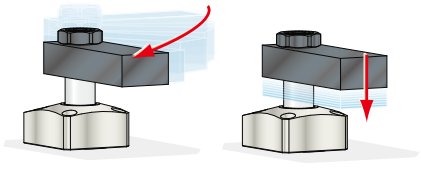


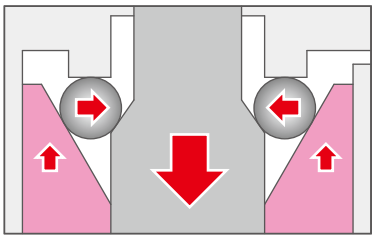
Locking Operation

(Swing Stroke+Vertical Stroke 2mm)

① The piston rod rotates while it descends along the cam.

② After swing completion, the piston descends vertically until the lever clamps the workpiece.

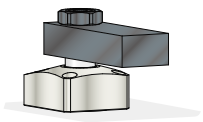




Locked State

(Boosting Stroke 4mm)

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



Model No. Indication

WHE 160 0 - 2 A R □ - □

1 2 3 4 5 6

1 Cylinder Force

045 : Cylinder Force 0.4kN (Air Pressure 0.5MPa)
060 : Cylinder Force 0.6kN (Air Pressure 0.5MPa)
100 : Cylinder Force 1.0kN (Air Pressure 0.5MPa)
160 : Cylinder Force 1.6kN (Air Pressure 0.5MPa)
250 : Cylinder Force 2.4kN (Air Pressure 0.5MPa)
400 : Cylinder Force 3.9kN (Air Pressure 0.5MPa)

※ Cylinder force differs from clamping force and holding force.

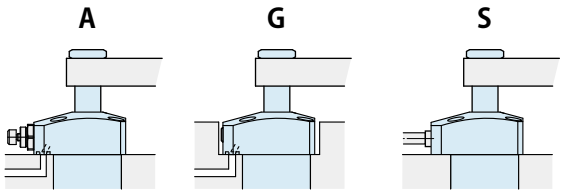
2 Design No.

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)

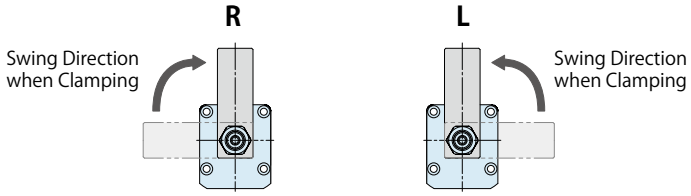
※ Speed control valve (BZW) is sold separately.
Refer to the P.309 for detail.



Gasket Option		Piping Option
With R Thread Plug (able to attach Speed Control Valve) (Order the valve separately Recommended : BZW-B)	with R Thread Plug	Rc Thread No Gasket Port

4 Swing Direction when Clamping

R : Clockwise
L : Counter-Clockwise



5 Action Confirmation Method

Blank : None (Standard)
D : Double End Rod Option for Dog
M : Air Sensing Manifold Option
N : Air Sensing Piping Option

※ Only None(Standard) : **Blank** can be selected for 1 Cylinder Force **045**.

6 Option

Blank : None (Standard : Taper Lock Lever Option)
A : Quick Change Lever Option A
F : Quick Change Lever Option F
P : Balance Lever Option
Y□ : Swing Angle Selectable Option
(**Y30** : 30° / **Y45** : 45° / **Y60** : 60°)

※ Please contact us for a combination of an action confirmation method and option.
※ Only None(Standard) : **Blank** can be selected for 1 Cylinder Force **045**.

Specifications

Model No.			WHE0450-2□□	WHE0600-2□□-□			WHE1000-2□□-□			WHE1600-2□□-□		
Cylinder Force (Air Pressure 0.5MPa)		kN	0.4	0.6			1.0			1.6		
Clamping Force (Calculation Formula)※1 kN	6 When Blank/A/F/Y□ is chosen		F=(0.8357-0.00228×L)×P	F=(1.1666-0.00287×L)×P			F=(1.8842-0.00346×L)×P			F=(3.0603-0.00505×L)×P		
	6 When P is chosen		-	$F_1=(L_2/L_3)\times1.129\times P$ $F_2=(L_1/L_3)\times1.129\times P$			$F_1=(L_2/L_3)\times1.951\times P$ $F_2=(L_1/L_3)\times1.951\times P$			$F_1=(L_2/L_3)\times3.134\times P$ $F_2=(L_1/L_3)\times3.134\times P$		
Holding Force (Calculation Formula)※1 kN	6 When Blank/A/F/Y□ is chosen		$Fk=\frac{1.842\times P}{1-0.0027\times L}$	$Fk=\frac{2.771\times P}{1-0.0025\times L}$			$Fk=\frac{4.08\times P}{1-0.0021\times L}$			$Fk=\frac{6.628\times P}{1-0.0012\times L}$		
	6 When P is chosen		-	$Fk_1=(L_2/L_3)\times2.771\times P$ $Fk_2=(L_1/L_3)\times2.771\times P$			$Fk_1=(L_2/L_3)\times4.08\times P$ $Fk_2=(L_1/L_3)\times4.08\times P$			$Fk_1=(L_2/L_3)\times6.628\times P$ $Fk_2=(L_1/L_3)\times6.628\times P$		
6 When Blank/A/F/P is chosen	Full Stroke	mm	13.5	14			14.5			15		
	Swing Stroke (90°)	mm	7.5	8			8.5			9		
	Vertical Stroke	mm	6									
	(Breakdown) Idle Stroke	mm	2									
	(Breakdown) Lock Stroke ※2	mm	4									
	Swing Angle Accuracy		90° ±3°									
	Swing Completion Position Repeatability		±0.75°									
6 When Y□ is chosen	Option Code		-	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60
	Full Stroke	mm	-	9.6	10.7	11.8	10.5	11.5	12.5	11.1	12	13
	Swing Stroke	mm	-	3.6	4.7	5.8	4.5	5.5	6.5	5.1	6	7
	Vertical Stroke	mm	-	6								
	(Breakdown) Idle Stroke	mm	-	2								
	(Breakdown) Lock Stroke ※2	mm	-	4								
	Swing Angle Accuracy		-	30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°
	Swing Completion Position Repeatability		-	±0.75°								
Max. Operating Pressure		MPa	0.5									
Min. Operating Pressure ※3		MPa	0.2									
Withstanding Pressure		MPa	0.75									
Operating Temperature		℃	0 ~ 70									
Usable Fluid			Dry Air									

Model No.			WHE2500-2□□-□			WHE4000-2□□-□		
Cylinder Force (Air Pressure 0.5MPa)		kN	2.4			3.9		
Clamping Force (Calculation Formula)※1 kN	6 When Blank/A/F/Y□ is chosen		F=(4.7875-0.00654×L)×P			F=(7.6871-0.00947×L)×P		
	6 When P is chosen		$F_1=(L_2/L_3)\times4.888\times P$ $F_2=(L_1/L_3)\times4.888\times P$			$F_1=(L_2/L_3)\times7.713\times P$ $F_2=(L_1/L_3)\times7.713\times P$		
Holding Force (Calculation Formula)※1 kN	6 When Blank/A/F/Y□ is chosen		$Fk=\frac{10.481\times P}{1-0.0008\times L}$			$Fk=\frac{16.806\times P}{1-0.0006\times L}$		
	6 When P is chosen		$Fk_1=(L_2/L_3)\times10.481\times P$ $Fk_2=(L_1/L_3)\times10.481\times P$			$Fk_1=(L_2/L_3)\times16.806\times P$ $Fk_2=(L_1/L_3)\times16.806\times P$		
6 When Blank/A/F/P is chosen	Full Stroke	mm	17.5			19.5		
	Swing Stroke (90°)	mm	11.5			13.5		
	Vertical Stroke	mm	6					
	(Breakdown) Idle Stroke	mm	2					
	(Breakdown) Lock Stroke ※2	mm	4					
	Swing Angle Accuracy		90° ±3°					
	Swing Completion Position Repeatability		±0.75°					
6 When Y□ is chosen	Option Code		Y30	Y45	Y60	Y30	Y45	Y60
	Full Stroke	mm	13	14.1	15.3	14	15.3	16.7
	Swing Stroke	mm	7	8.1	9.3	8	9.3	10.7
	Vertical Stroke	mm	6					
	(Breakdown) Idle Stroke	mm	2					
	(Breakdown) Lock Stroke ※2	mm	4					
	Swing Angle Accuracy		30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°
	Swing Completion Position Repeatability		±0.75°					
Max. Operating Pressure		MPa	0.5					
Min. Operating Pressure ※3		MPa	0.2					
Withstanding Pressure		MPa	0.75					
Operating Temperature		℃	0 ~ 70					
Usable Fluid			Dry Air					

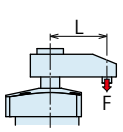
Notes:

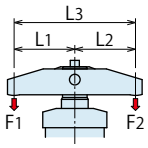
※1. F , F1 , F2 : Clamping Force (kN), Fk , Fk1 , Fk2 : Holding Force (kN), P : Supply Air Pressure (MPa), L , L1 , L2 : Distance between the piston center and the clamping point (mm), L3 : (mm).

※2. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.137.

※3. Minimum pressure to operate the clamp without load. The swinging may stop in the middle of action due to the lever shape (Refer to P.137 for "Notes for Lever Design".)

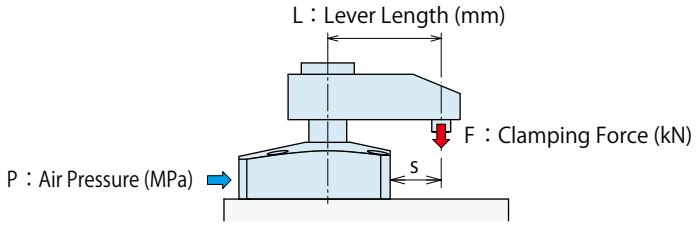
1. Please refer to the External Dimensions for the cylinder capacity and the product weight.





Clamping Force Curve

※ WHE□0-2□□□-P：For balance lever option, the clamping force curve is different from the graph. Please calculate it with the specification's formula.



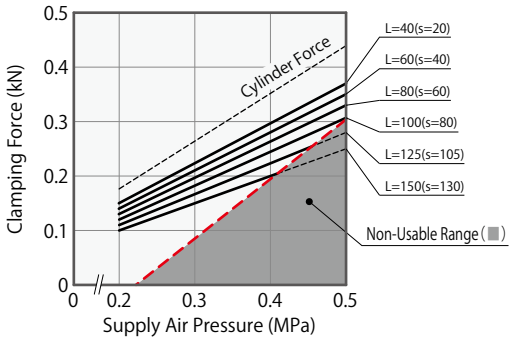
(How to read the clamping force curve)
In case of WHE1600 : When supply air pressure P is 0.4MPa and lever length L is 60mm, clamping force becomes about 1.1kN.

Notes:
※1. F : Clamping Force (kN) , P : Supply Air Pressure (MPa) , L : Lever Length (mm).
1. Tables and graphs show 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. Values in below charts indicate clamping force when clamping within the lock stroke range.
(Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.137.)
4. Values in below charts indicate clamping force when the lever locks a workpiece in horizontal position.
5. The clamping force varies depending on the lever length. Set the suitable supply air pressure based on the lever length.
6. Clamping force in the non-usable range may cause damage and fluid leakage.

WHE0450

Clamping Force Calculation Formula※1(kN) F=(0.8357-0.00228×L)×P

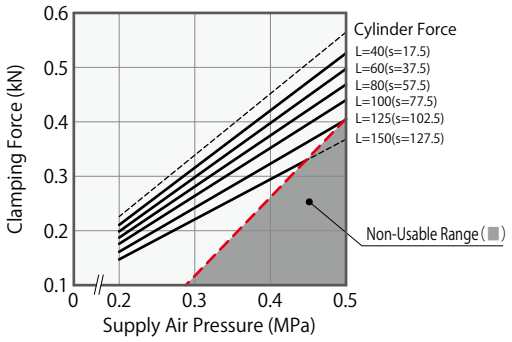
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 40	60	80	100	125	150	Max. Lever Length (mm)
0.5	0.44	0.37	0.35	0.33	0.30			100
0.4	0.35	0.30	0.28	0.26	0.24	0.22	0.20	165
0.3	0.26	0.22	0.21	0.20	0.18	0.17	0.15	165
0.2	0.18	0.15	0.14	0.13	0.12	0.11	0.10	165
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.44	0.41	



WHE0600

Clamping Force Calculation Formula※1(kN) F=(1.1666 − 0.00287 × L) ×P

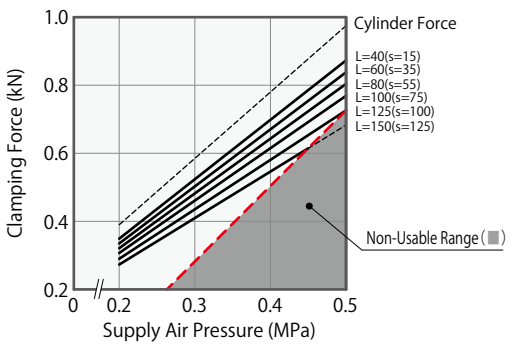
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 40	60	80	100	125	150	Max. Lever Length (mm)
0.5	0.57	0.53	0.50	0.47	0.44			120
0.4	0.45	0.42	0.40	0.37	0.35	0.32	0.29	180
0.3	0.34	0.32	0.30	0.28	0.26	0.24	0.22	180
0.2	0.23	0.21	0.20	0.19	0.18	0.16	0.15	180
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.49	0.44	



WHE1000

Clamping Force Calculation Formula※1(kN) F=(1.8842 − 0.00346 × L) ×P

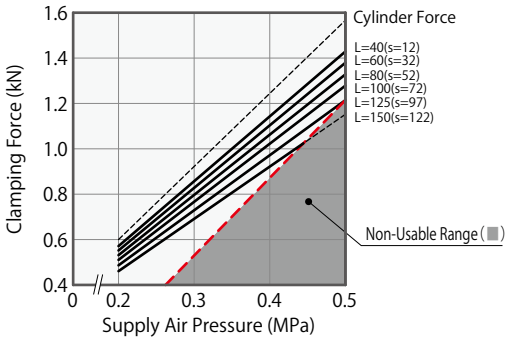
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 40	60	80	100	125	150	Max. Lever Length (mm)
0.5	0.98	0.87	0.84	0.80	0.77	0.73		125
0.4	0.78	0.70	0.67	0.64	0.62	0.58	0.55	180
0.3	0.59	0.52	0.50	0.48	0.46	0.44	0.41	190
0.2	0.39	0.35	0.34	0.32	0.31	0.29	0.27	190
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.44	



WHE1600

Clamping Force Calculation Formula※1(kN) $F = (3.0603 - 0.00505 \times L) \times P$

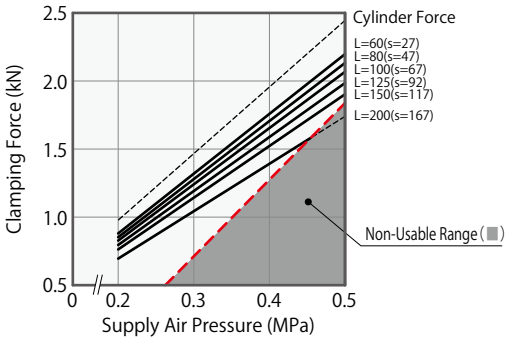
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm)						Max. Lever Length (mm)
		40	60	80	100	125	150	
0.5	1.57	1.43	1.38	1.33	1.28	1.22		125
0.4	1.25	1.14	1.10	1.06	1.02	0.97	0.92	174
0.3	0.94	0.86	0.83	0.80	0.77	0.73	0.69	200
0.2	0.63	0.57	0.55	0.53	0.51	0.49	0.46	200
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.44	



WHE2500

Clamping Force Calculation Formula※1(kN) $F = (4.7875 - 0.00654 \times L) \times P$

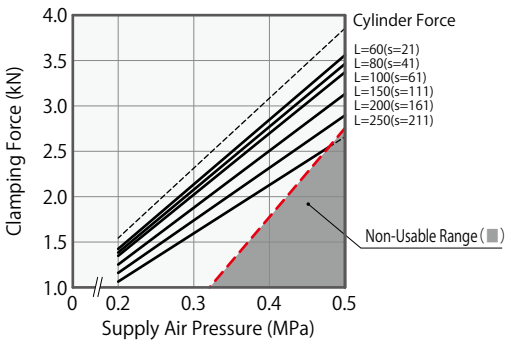
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm)						Max. Lever Length (mm)
		60	80	100	125	150	200	
0.5	2.44	2.20	2.13	2.07	1.99	1.90		170
0.4	1.96	1.76	1.71	1.65	1.59	1.52	1.39	245
0.3	1.47	1.32	1.28	1.24	1.19	1.14	1.04	270
0.2	0.98	0.88	0.85	0.83	0.79	0.76	0.70	270
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.45	



WHE4000

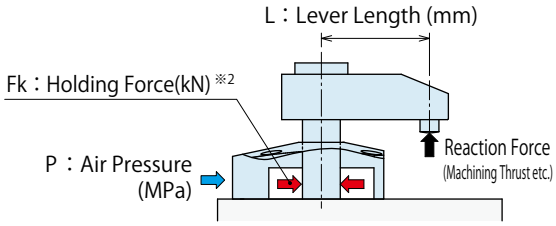
Clamping Force Calculation Formula※1(kN) $F = (7.6871 - 0.00947 \times L) \times P$

Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm)						Max. Lever Length (mm)
		60	80	100	150	200	250	
0.5	3.86	3.56	3.46	3.37	3.13	2.90		230
0.4	3.09	2.85	2.77	2.70	2.51	2.32	2.13	330
0.3	2.32	2.14	2.08	2.02	1.88	1.74	1.60	330
0.2	1.54	1.42	1.39	1.35	1.25	1.16	1.06	330
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.48	



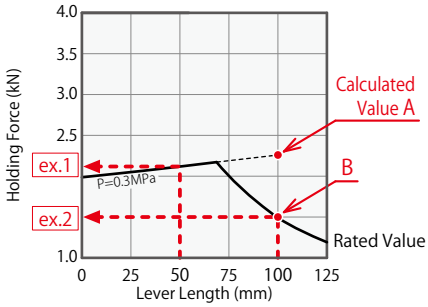
Holding Force Curve

※ WHE□0-2□□□-P：For balance lever option, the holding force curve is different from the graph. Please calculate it with the specification's formula.



(Ex.1) In case of WHE1600 : When supply air pressure P is 0.3MPa and lever length L is 50mm, holding force becomes about 2.1kN.

(Ex.2) In case of WHE1600 : When supply air pressure P is 0.3MPa and lever length L is 100mm, the calculated value is at the point A but it is above the rated value. In this case, the value of intersection B on the rated value becomes the holding force that counters the reaction force, and it becomes about 1.5kN.



Notes：

※2. Holding force is the force that counters the reaction force in the clamping state, and differs from clamping force.
Please keep in mind that it can produce displacement depending on lever rigidity even if the reaction force is lower than holding force.
(If slight displacement is also not allowed, please keep the reaction force beyond clamping force from being applied.)

※3. Fk : Holding Force (kN) , P : Supply Air Pressure (MPa) , L : Lever Length (mm).
When the calculated holding force exceeds the rated value in the graph, the holding force becomes the rated value.

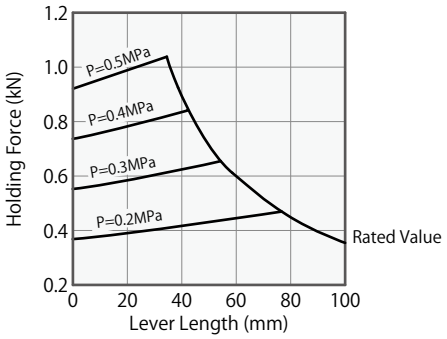
1. Tables and graphs show the relationship between the holding force (kN) and lever length (mm).
2. Values in below charts indicate holding force when clamping within the lock stroke range.
(Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.137.)
3. Values in below charts indicate holding force when the lever locks a workpiece in horizontal position.
4. The holding force varies depending on the lever length. Set the suitable supply air pressure based on the lever length.
5. The reaction force exceeding the holding force shown in the table and the graph may cause damage and fluid leakage.

WHE0450

Holding Force Formula ※3 (Fk ≦ Rated Value) (kN)

$$Fk = \frac{1.842 \times P}{1\text{-}0.0027 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)					
	40	60	80	100	125	150
0.5	0.93	0.62	0.46	0.37		
0.4	0.83	0.62	0.46	0.37	0.30	0.25
0.3	0.62	0.62	0.46	0.37	0.30	0.25
0.2	0.41	0.44	0.46	0.37	0.30	0.25

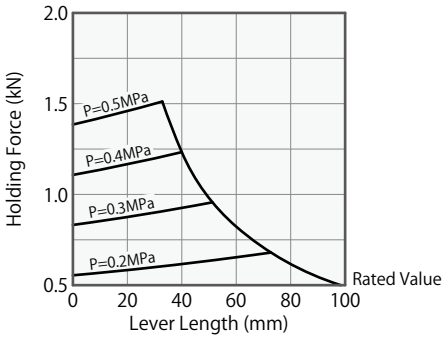


WHE0600

Holding Force Formula ※3 (Fk ≦ Rated Value) (kN)

$$Fk = \frac{2.771 \times P}{1 - 0.0025 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)					
	40	60	80	100	125	150
0.5	1.23	0.82	0.62	0.49		
0.4	1.23	0.82	0.62	0.49	0.40	0.33
0.3	0.93	0.82	0.62	0.49	0.40	0.33
0.2	0.62	0.65	0.62	0.49	0.40	0.33

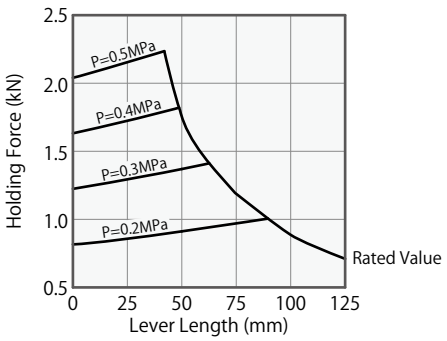


WHE1000

Holding Force Formula ※3 (Fk ≦ Rated Value) (kN)

$$Fk = \frac{4.08 \times P}{1 - 0.0021 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)					
	40	60	80	100	125	150
0.5	2.23	1.51	1.13	0.91	0.73	
0.4	1.78	1.51	1.13	0.91	0.73	0.61
0.3	1.34	1.40	1.13	0.91	0.73	0.61
0.2	0.89	0.93	0.98	0.91	0.73	0.61

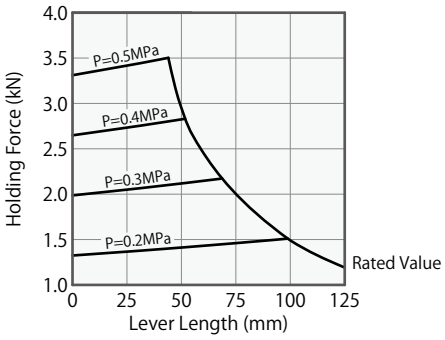


WHE1600

Holding Force Formula ※3 (Fk ≦ Rated Value) (kN)

$$Fk = \frac{6.628 \times P}{1 - 0.0012 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)					
	40	60	80	100	125	150
0.5	3.48	2.53	1.90	1.52	1.22	
0.4	2.79	2.53	1.90	1.52	1.22	1.01
0.3	2.09	2.14	1.90	1.52	1.22	1.01
0.2	1.39	1.43	1.47	1.51	1.22	1.01

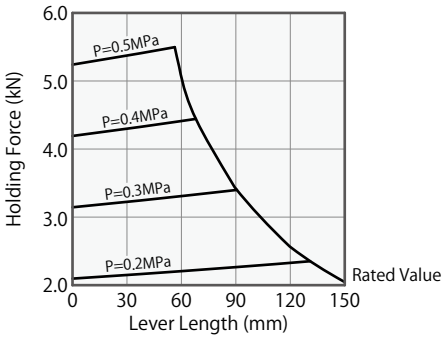


WHE2500

Holding Force Formula ※3 (Fk ≦ Rated Value) (kN)

$$Fk = \frac{10.481 \times P}{1 - 0.0008 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)					
	60	80	100	125	150	200
0.5	5.21	3.91	3.12	2.50	2.08	
0.4	4.40	3.91	3.12	2.50	2.08	1.56
0.3	3.30	3.36	3.12	2.50	2.08	1.56
0.2	2.20	2.24	2.28	2.33	2.08	1.56

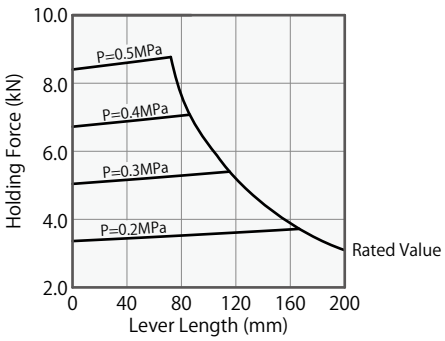


WHE4000

Holding Force Formula ※3 (Fk ≦ Rated Value) (kN)

$$Fk = \frac{16.806 \times P}{1 - 0.0006 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range ( ) Lever Length L (mm)					
	60	80	100	150	200	250
0.5	8.72	7.92	6.34	4.22	3.17	
0.4	6.97	7.06	6.34	4.22	3.17	2.53
0.3	5.23	5.30	5.36	4.22	3.17	2.53
0.2	3.49	3.53	3.58	3.69	3.17	2.53

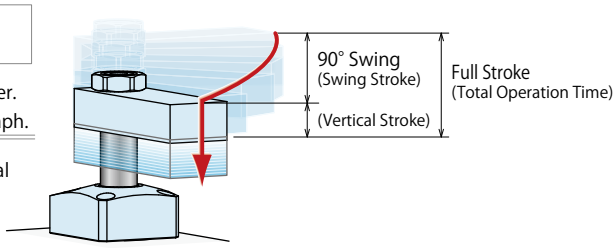


Allowable Swing Time Graph

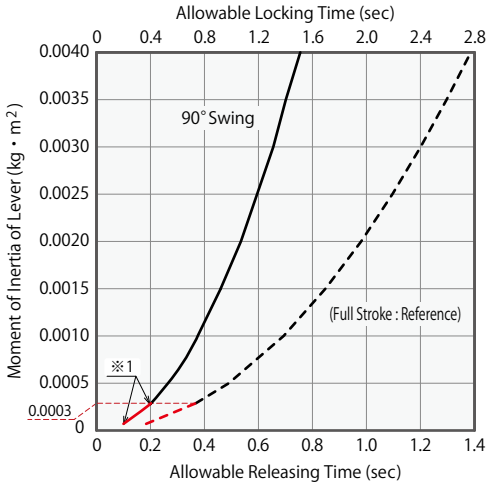
Adjustment of Swing Time

The graph shows allowable swing time against the moment of inertia of a lever.
An operation time should be longer than the operation time shown in the graph.

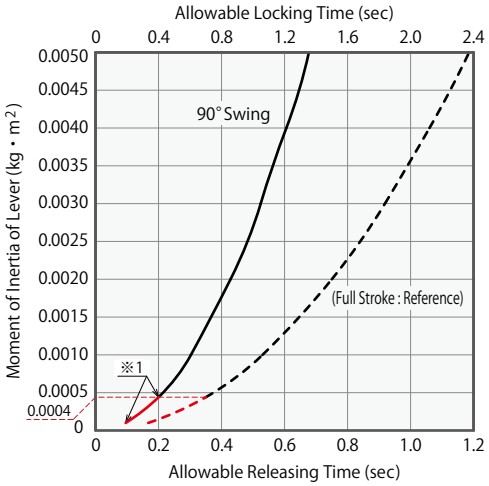
Excessive action speed can reduce stopping accuracy and damage internal components.



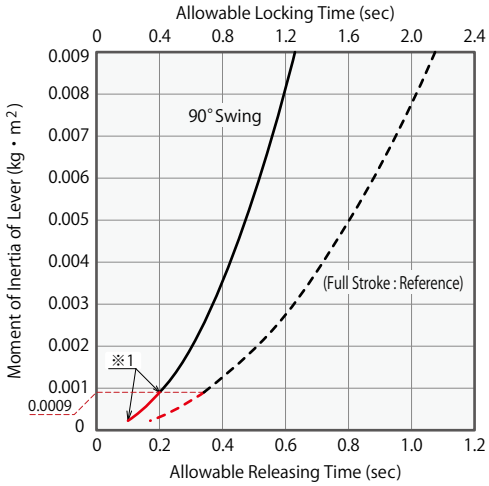
WHE0450



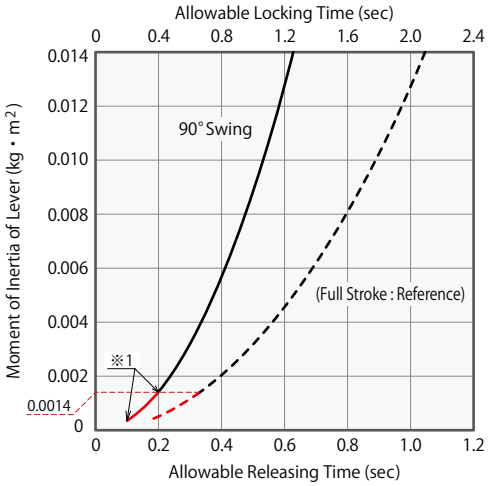
WHE0600



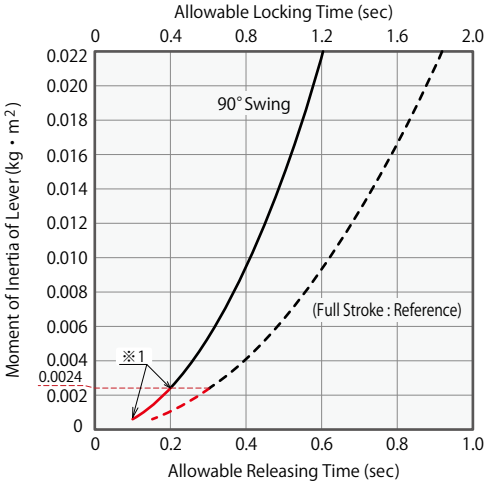
WHE1000



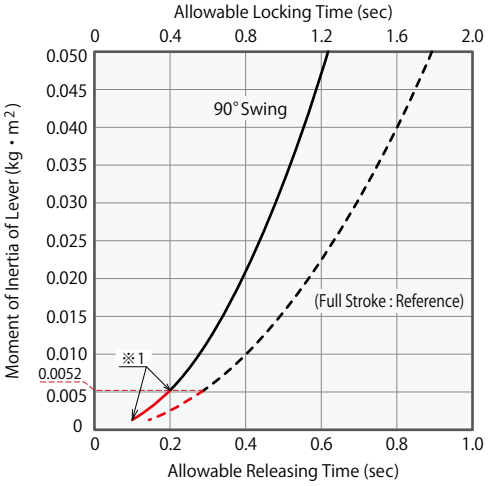
WHE1600



WHE2500



WHE4000



Notes:

※1. For any moment of inertia of a lever, the minimum 90° swing time should be 0.2 sec.

1. Lever with a large inertia sometimes does not work depending on supply air pressure, air flow rate and lever mounting position.
2. For speed adjustment of clamp lever, please use meter-out flow control valve.
   In case of meter-in control, the clamp lever may be accelerated by its own weight during swinging motion (clamp mounted horizontally) or the piston rod may be moving too fast.
   Please refer to P.137 for speed adjustment.
3. Please contact us if operational conditions differ from those shown on the graphs.

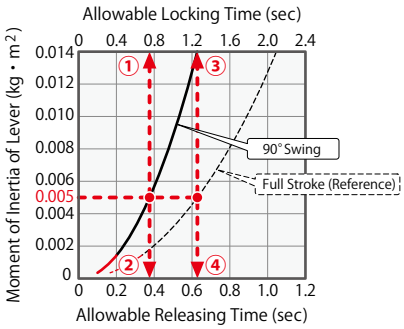
(How to read the allowable swing time graph)

In case of WHE1600

The moment of inertia of a lever : 0.005 kg・m²

① 90° Swing Time when Locking : About 0.76 sec or more
② 90° Swing Time when Releasing : About 0.38 sec or more
③ Total Lock Operation Time : About 1.27 sec or more
④ Total Release Operation Time : About 0.63 sec or more

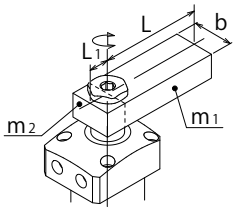
1. The total operation time on the graph represents the allowable operation time when fully stroked.



How to Calculate the Moment of Inertia (Estimated)

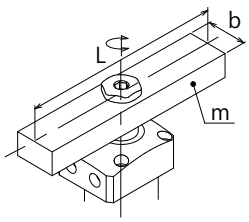
I : Moment of Inertia (kg・m²) L,L₁,L₂,K,b : Length (m) m,m₁,m₂,m₃ : Mass (kg)

① For a rectangular plate (cuboid), the rotating shaft is vertically on one side of the plate.



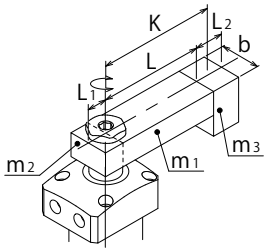
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12}$$

② For a rectangular plate (cuboid), the rotating shaft is vertically on the gravity center of the plate.



$$I = m \frac{L^2+b^2}{12}$$

③ The load is applied on the lever front end.

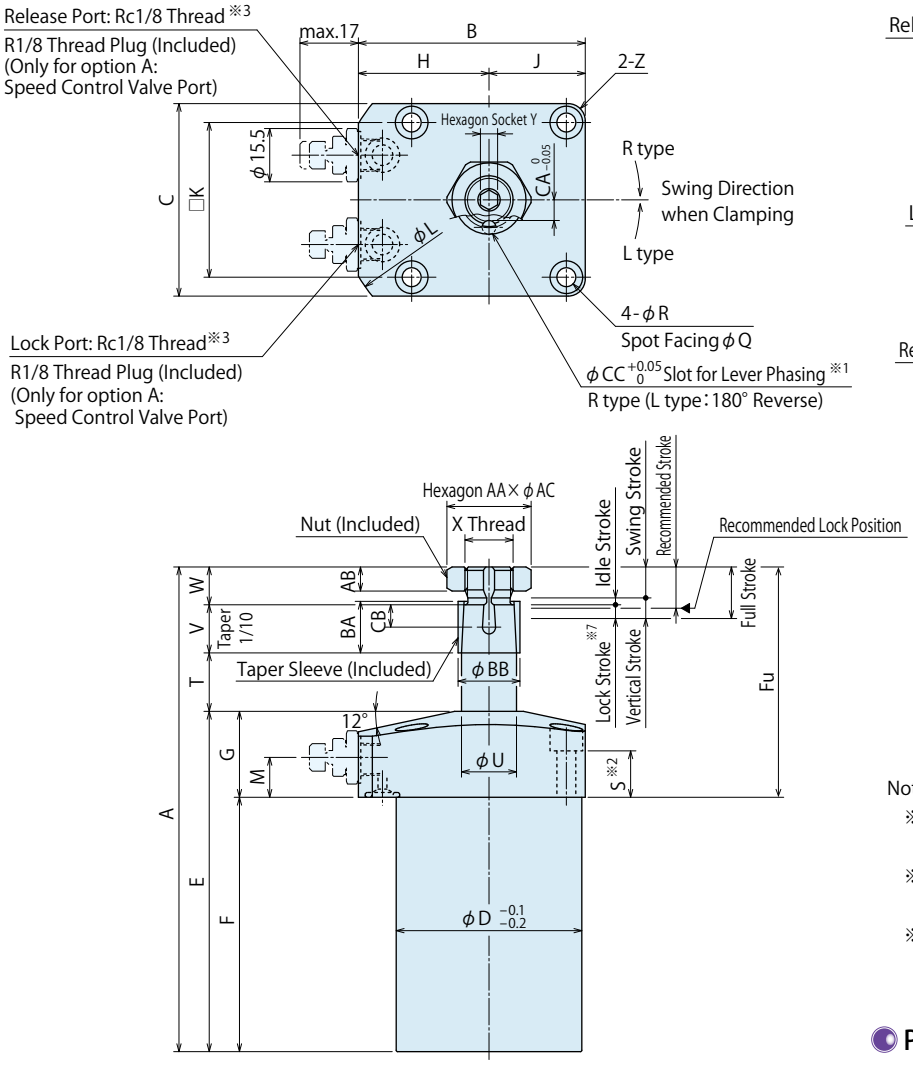


$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12} + m_3K^2 + m_3 \frac{L_2^2+b^2}{12}$$

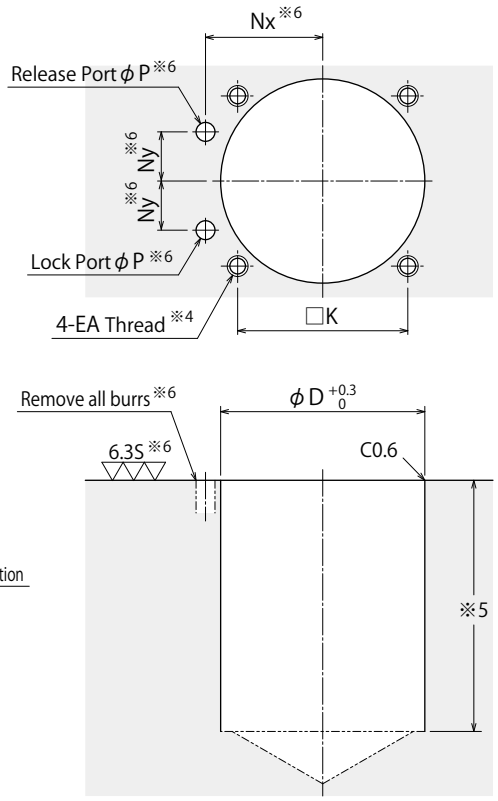
External Dimensions

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

※ The drawing shows the released state of WHE-2AR.



Machining Dimensions of Mounting Area



Notes：

※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

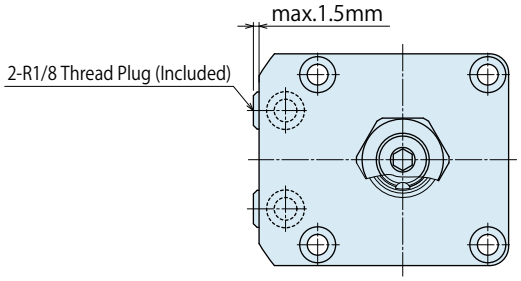
※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

※6. The machining dimension is for -A/-G：Gasket Option.

Piping Method

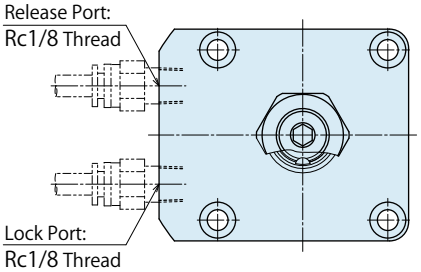
G：Gasket Option (With R Thread Plug)

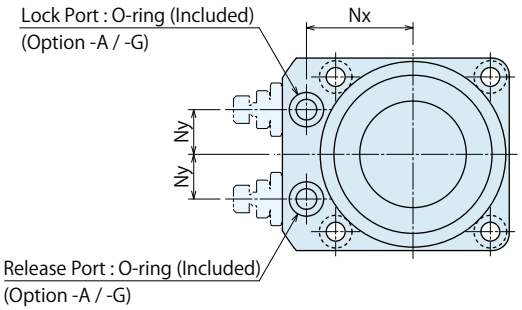
※The drawing shows the released state of WHE-2GR.



S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SR.





Notes：

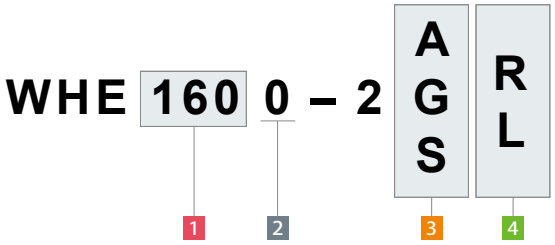
※1. The slot for lever phasing faces the port side when locked.

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.309.

Model No. Indication

(Model No.：WHE1000-2AR, WHE2500-2SL)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When Blank is chosen)
6 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0450-2□□	WHE0600-2□□	WHE1000-2□□	WHE1600-2□□	WHE2500-2□□	WHE4000-2□□
Full Stroke	13.5	14	14.5	15	17.5	19.5
Swing Stroke (90°)	7.5	8	8.5	9	11.5	13.5
Vertical Stroke	6					
(Break down) Idle Stroke	2					
(Break down) Lock Stroke ※7	4					
Recommended Stroke	10.5	11	11.5	12	14.5	16.5
A	116.5	125	134.5	141	167	185.5
B	49	54	60	66	76	87
C	40	45	50	56	66	78
D	36	40	46	54	64	77
E	83.5	89	95.5	99	117.5	128
F	58.5	64	70.5	74	87.5	98
Fu	58	61	64	67	79.5	87.5
G	25	25	25	25	30	30
H	29	31.5	35	38	43	48
J	20	22.5	25	28	33	39
K	31.4	34	39	45	53	65
L	66	72	79	88	98	113
M	11	11	11	11	13	13
Nx	23.5	26	28	31	36	41
Ny	8	9	10	13	15	20
P	max. ϕ3	max. ϕ3	max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q	7.5	9.5	9.5	9.5	11	11
R	4.5	5.5	5.5	5.5	6.8	6.8
S	17	15.5	14	13.5	16	15
T	15.5	16	16.5	17	19.5	21.5
U	10	12	14	16	20	25
V	9	10	12	14	17	21
W	8.5	10	10.5	11	13	15
X（Nominal × Pitch）	M8×1	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	3	4	5	5	6	8
Z（Chamfer）	C2	C3	R5	R5	R6	R6
AA	13	17	19	22	24	32
AB	5.5	6	6.5	7	8	10
AC	14.5	19	21.2	24.5	26.5	35.5
BA	9.5	11	13	15	18	22
BB	11.5	14	16	18	22	28
CA	3.7	4.5	5	6	8	10
CB	5.5	4.5	4.5	6.5	5.5	9.5
CC	3	3	4	4	4	6
EA (Nominal×Pitch)	M4×0.7	M5×0.8	M5×0.8	M5×0.8	M6	M6
O-ring (Piping Option A/G)	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity cm³ Lock	9	12.8	21.8	35.5	61.3	103.8
Cylinder Capacity cm³ Release	11.1	15.2	25.5	40.3	69.2	117.6
Weight ※8 kg	0.4	0.5	0.8	1.0	1.7	2.8

Notes：

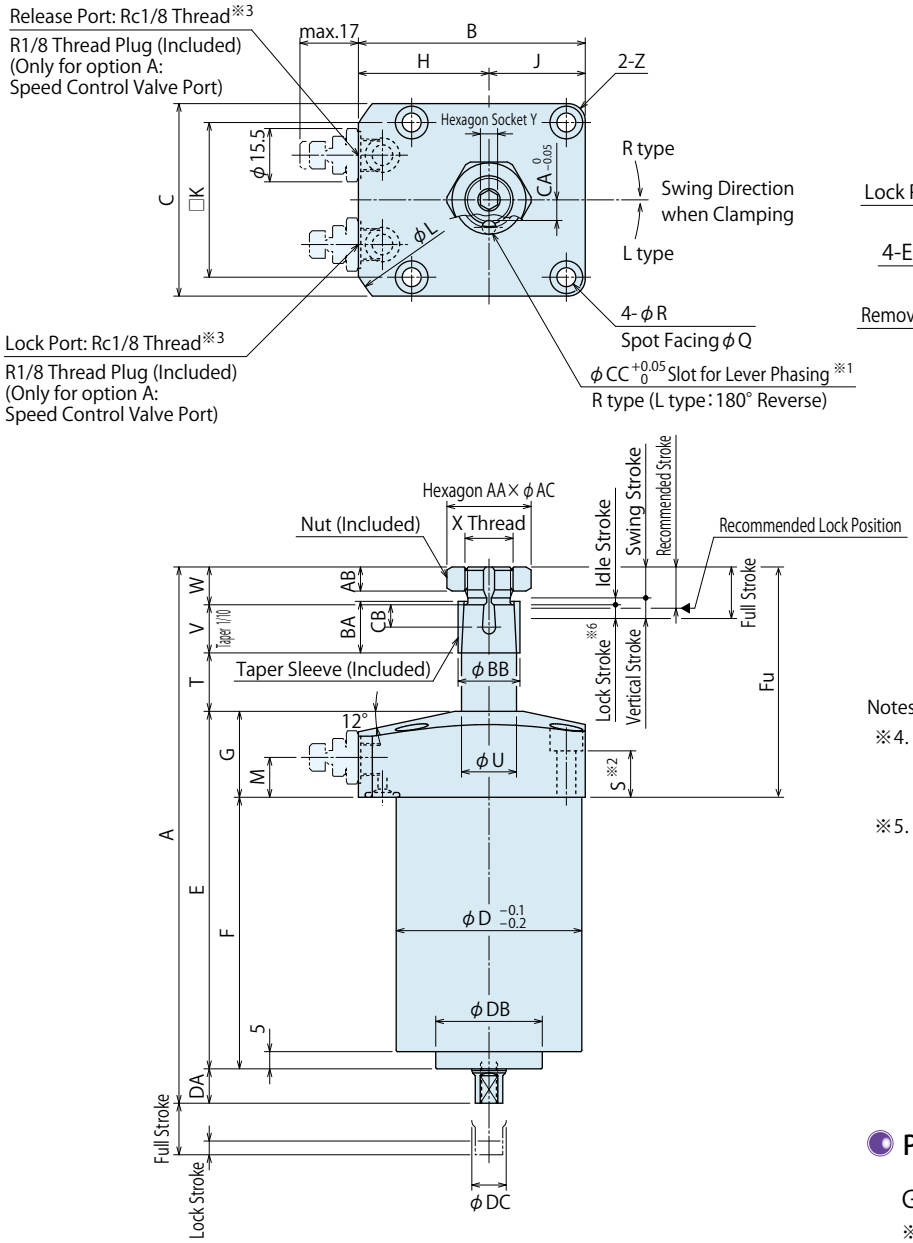
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

※8. It shows the weight of single swing clamp including taper sleeve and nut.

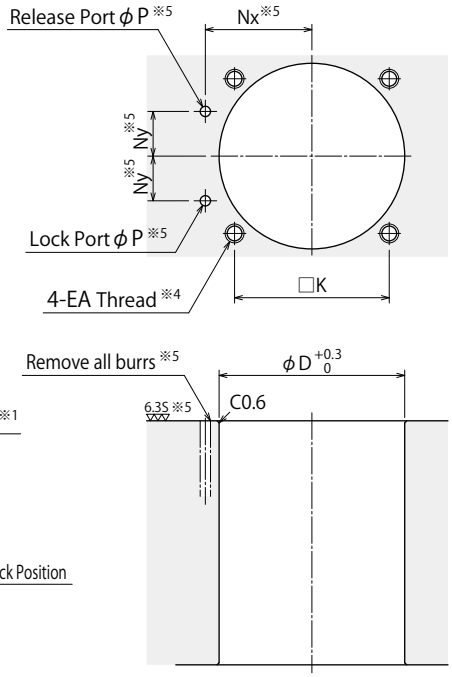
External Dimensions

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

※ The drawing shows the released state of WHE-2ARD.



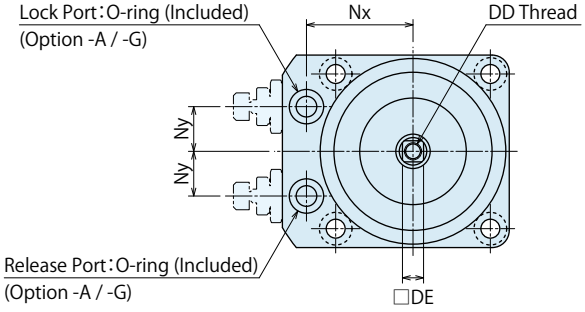
Machining Dimensions of Mounting Area



Notes：

※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

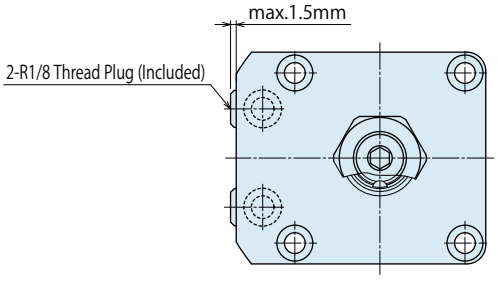
※5. The machining dimension is for -A/-G：Gasket Option.



Piping Method

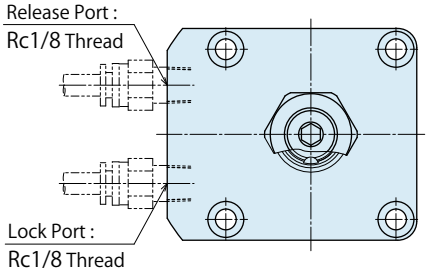
G：Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GRD.



S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SRD.



Notes：

※1. The slot for lever phasing faces the port side when locked.

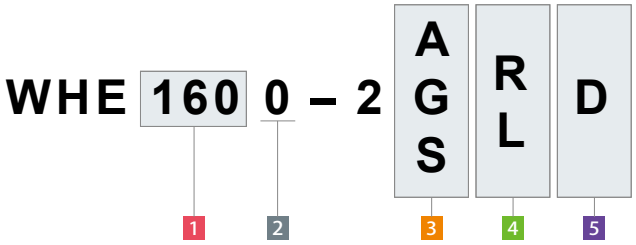
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.309.

1. Please contact us when you require options in combination.

Model No. Indication

(Model No.：WHE1000-2ARD, WHE2500-2SLD)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When D is chosen)
6 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

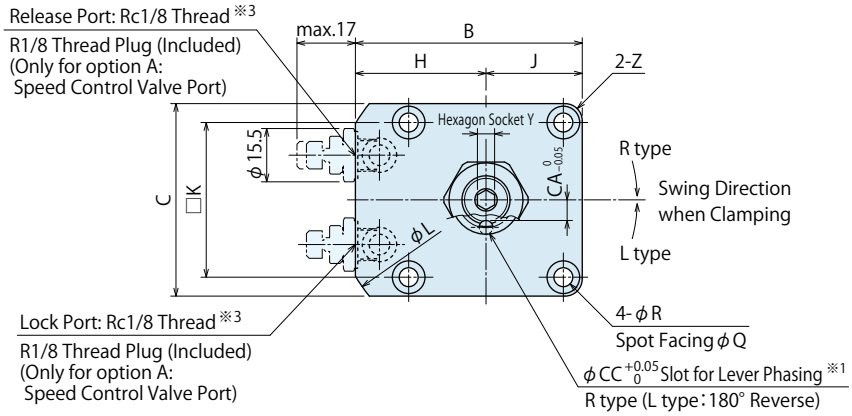
Model No.	WHE0600-2□□D	WHE1000-2□□D	WHE1600-2□□D	WHE2500-2□□D	WHE4000-2□□D
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke			6		
(Break down) Idle Stroke			2		
(Break down) Lock Stroke ※6			4		
Recommended Stroke	11	11.5	12	14.5	16.5
A	138	150	156	182	200.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	100.5	104	122.5	133
F	69	75.5	79	92.5	103
Fu	61	64	67	79.5	87.5
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	13	13
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	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
DA	8	10.5	10	10	10
DB	21.6	27	31	39	50
DC	8	10	10	12	12
DD (Nominal×Pitch×Depth)	M4×0.7×10	M5×0.8×12	M5×0.8×12	M6×1×15	M6×1×15
DE	6	8	8	10	10
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
O-ring (Piping Option A/G)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity cm³ Lock	12.8	21.8	35.5	61.3	103.8
Cylinder Capacity cm³ Release	14.5	24.4	39.1	67.2	115.4
Weight ※7 kg	0.5	0.8	1.0	1.7	2.8

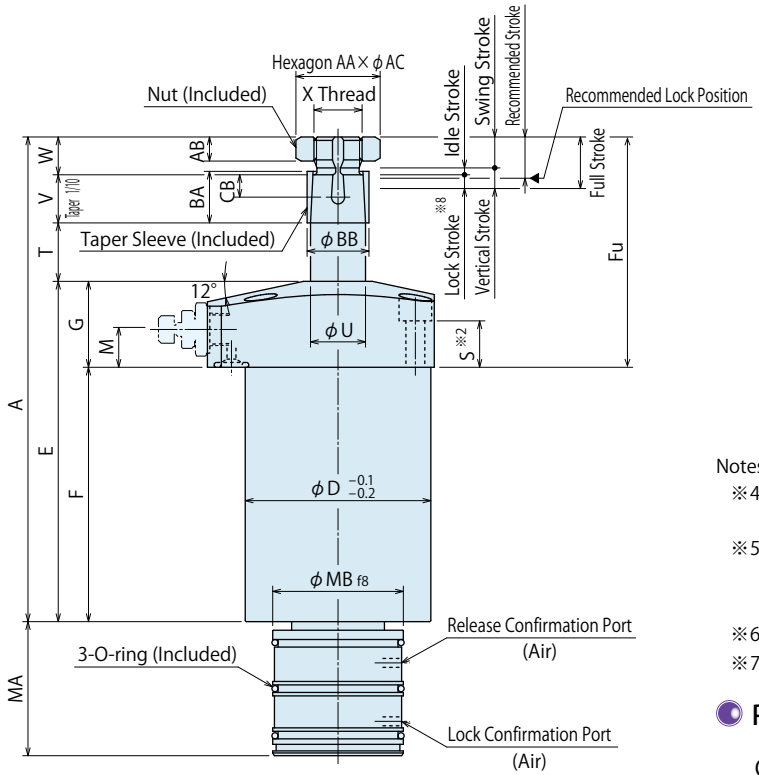
Notes: ※6. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
※7. It shows the weight of single swing clamp including taper sleeve and nut.

External Dimensions

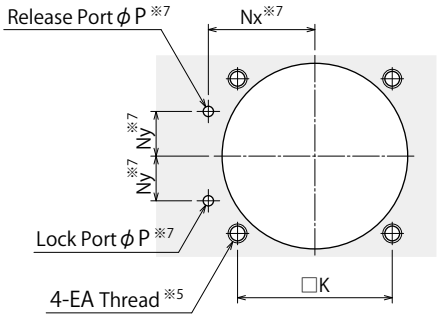
A：Gasket Option (With Ports for Speed Controller：R-Thread Plug Included)

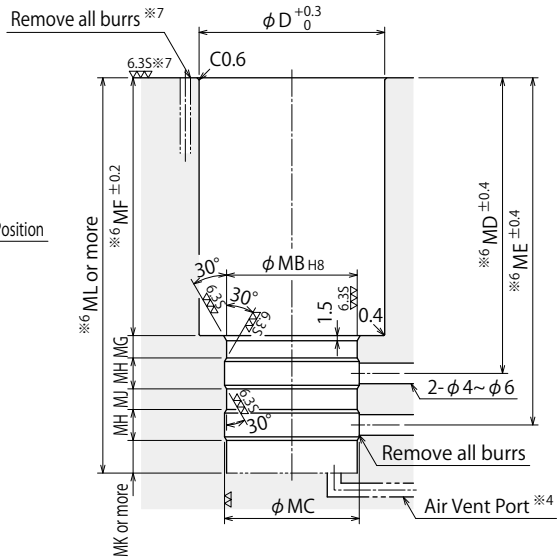
※ The drawing shows the released state of WHE-2ARM.





Machining Dimensions of Mounting Area





Notes：

※4. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.

※5. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

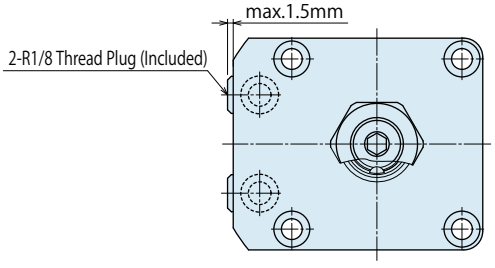
※6. The dimensions indicate those under the flange.

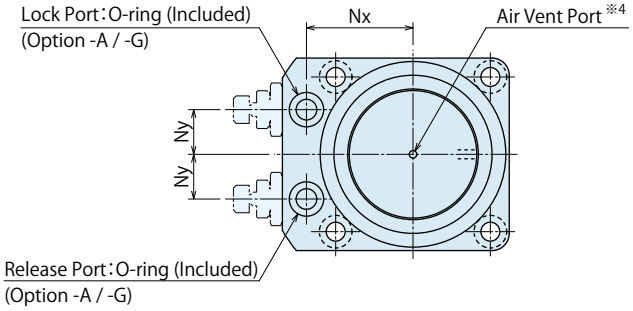
※7. The machining dimension is for -A/-G：Gasket Option.

Piping Method

G：Gasket Option (with R Thread Plug)

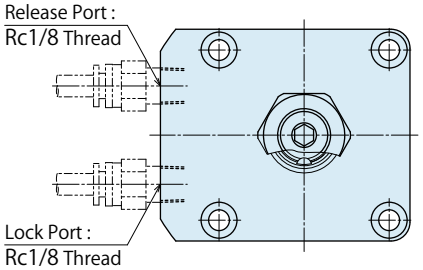
※The drawing shows the released state of WHE-2GRM.





S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SRM.



Notes：

※1. The slot for lever phasing faces the port side when locked.

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.309.

1. Please contact us when you require options in combination.
2. Please refer to P.131 ~ P.132 for Air Sensing Chart.

Model No. Indication

(Model No.：WHE1000-2ARM, WHE2500-2SLM)

WHE 160 0 – 2 A/G/S R/L M

1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When M is chosen)
6 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

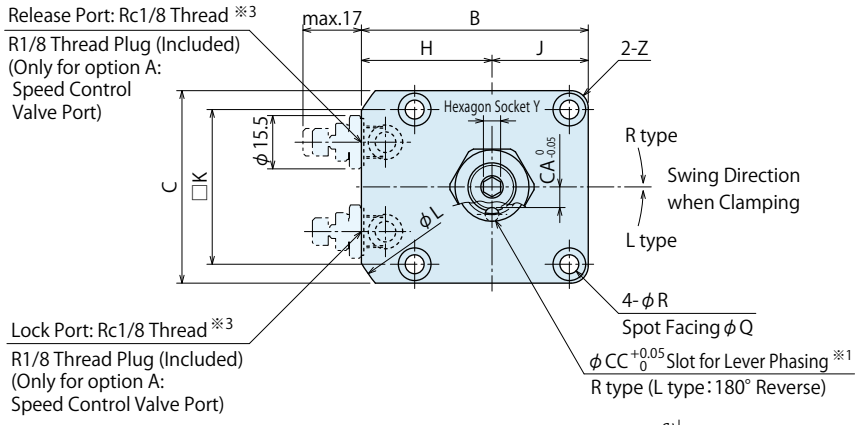
Model No.	WHE0600-2□□M	WHE1000-2□□M	WHE1600-2□□M	WHE2500-2□□M	WHE4000-2□□M
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke			6		
(Break Idle Stroke			2		
down) Lock Stroke ※7			4		
Recommended Stroke	11	11.5	12	14.5	16.5
A	125	134.5	141	167	185.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	61	64	67	79.5	87.5
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	13	13
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	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
MA	36	39	39	44	44
MB f8	$28^{-0.020}_{-0.053}$	$38^{-0.025}_{-0.064}$	$38^{-0.025}_{-0.064}$	$45^{-0.025}_{-0.064}$	$45^{-0.025}_{-0.064}$
MB H8	$28^{+0.033}_{0}$	$38^{+0.039}_{0}$	$38^{+0.039}_{0}$	$45^{+0.039}_{0}$	$45^{+0.039}_{0}$
MC	29.2	39.2	39.2	46.2	46.2
MD	75.5	82.5	86	100	110.5
ME	88.5	97.5	101	118.5	129
MF	65	71.5	75	88.5	99
MG	6	6.5	6.5	7	7
MH	9	9	9	9	9
MJ	4	6	6	9.5	9.5
MK	9	9.5	9.5	10.5	10.5
ML	102	111.5	115	133.5	144
O-ring (Piping Option A/G)	1BP5	1BP7	1BP7	1BP7	1BP7
3-O-ring	AS568-021 (70°)	AS568-028 (70°)	AS568-028 (70°)	AS568-030 (70°)	AS568-030 (70°)
Cylinder Capacity Lock	12.8	21.8	35.5	61.3	103.8
cm^3 Release	14.5	24.4	39.1	67.2	115.4
Weight ※9 kg	0.6	1.0	1.2	2.0	3.1

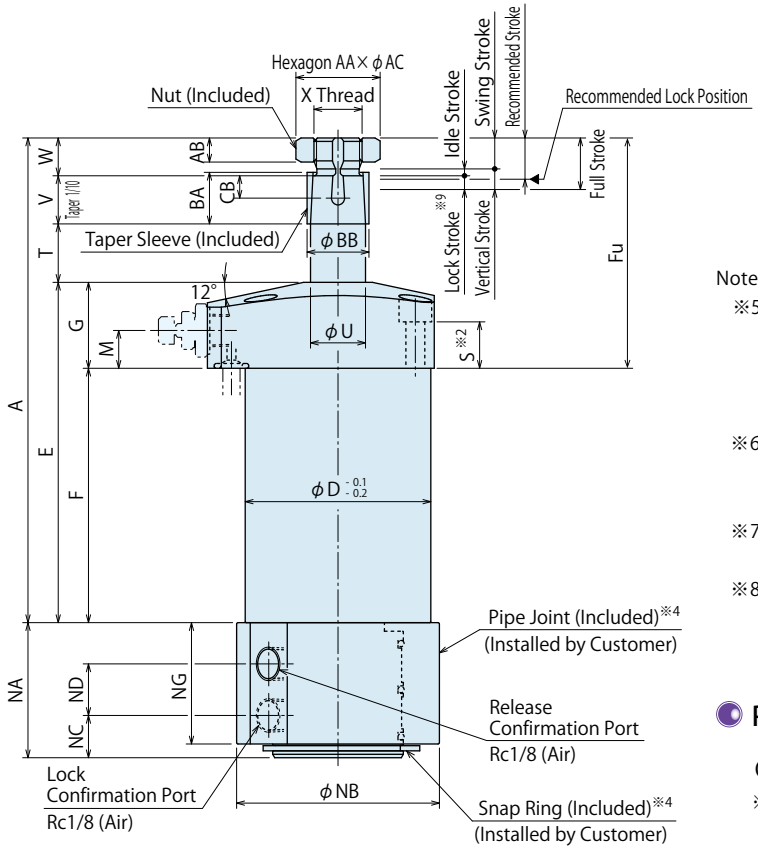
Notes: ※8. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
※9. It shows the weight of single swing clamp including taper sleeve and nut.

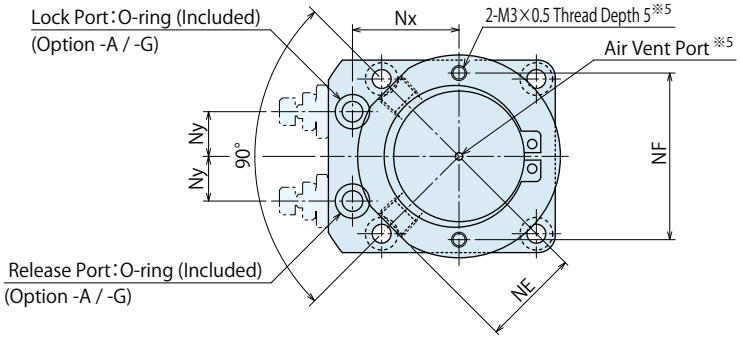
External Dimensions

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

※ The drawing shows the released state (Pipe joint mounted) of (WHE-2ARN).







Notes：

※1. The slot for lever phasing faces the port side when locked.

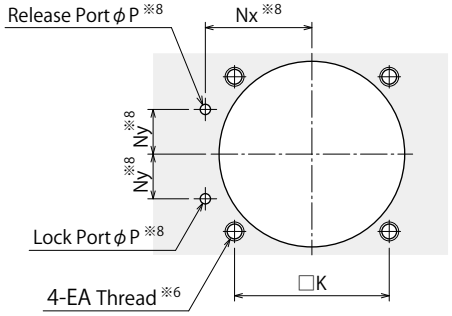
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

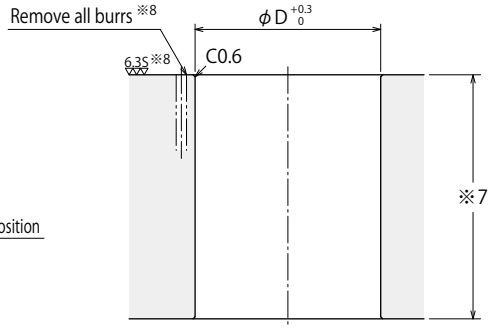
※3. Speed control valve is sold separately. Please refer to P.309.

※4. Piping joint and snap ring will be shipped as attachments. Make sure not to damage O-ring, and insert in order of ①piping joint and ②snap ring from the bottom of the cylinder. (As for piping joint, M3 screw side should face downward when mounting.)

1. Please contact us when you require options in combination.
2. Please refer to P.131 ~ P.132 for Air Sensing Chart.

Machining Dimensions of Mounting Area





Notes：

※5. Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port. If exposed to coolant and chips, use M3 thread of the bottom and install an attachment to prevent contamination, but do not block the air vent port.

※6. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

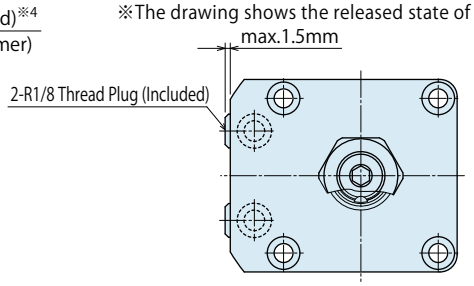
※7. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.

※8. The machining dimension is for -A/-G：Gasket Option.

Piping Method

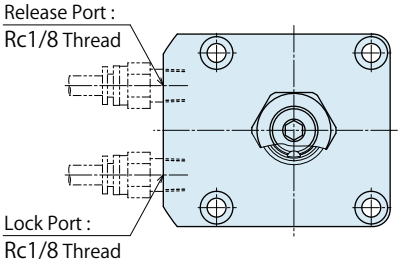
G：Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GRN.



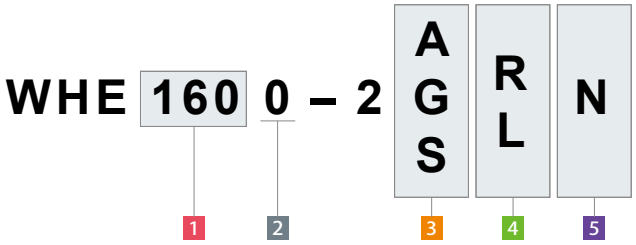
S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SRN.



Model No. Indication

(Model No.：WHE1000-2ARN, WHE2500-2SLN)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When N is chosen)
6 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□N	WHE1000-2□□N	WHE1600-2□□N	WHE2500-2□□N	WHE4000-2□□N
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke			6		
(Break Idle Stroke			2		
down) Lock Stroke ※9			4		
Recommended Stroke	11	11.5	12	14.5	16.5
A	125	134.5	141	167	185.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	61	64	67	79.5	87.5
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	13	13
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	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
NA	36	39	39	44	44
NB	49	59	59	66	66
NC	11.5	12	12	13	13
ND	13	15	15	18.5	18.5
NE	23.5	28.5	28.5	32	32
NF	38	48	48	55	55
NG	32.6	35.3	35.3	40.3	40.3
Snap Ring (Included)	STW-28	STW-38	STW-38	STW-45	STW-45
O-ring (Piping Option A/G)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity Lock	12.8	21.8	35.5	61.3	103.8
cm^3 Release	14.5	24.4	39.1	67.2	115.4
Weight ※10 kg	0.7	1.0	1.2	2.0	3.1

Notes：

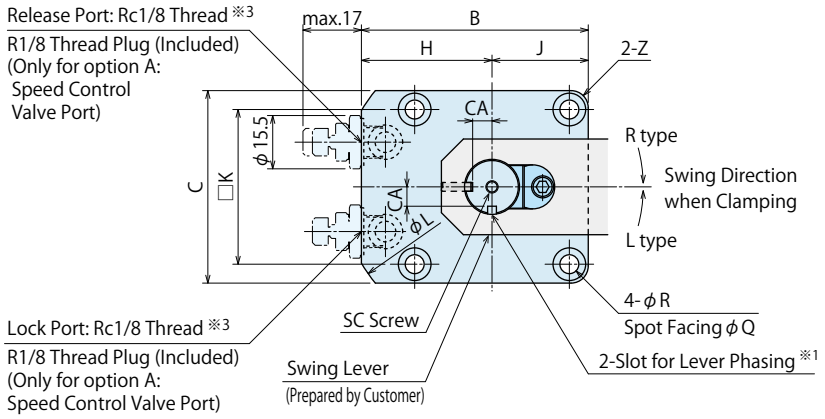
※9. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

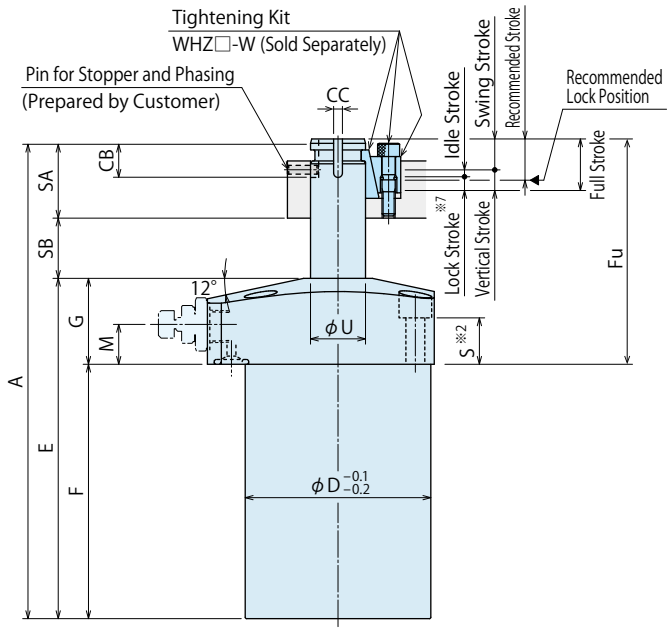
※10. It shows the weight of single swing clamp including taper sleeve and nut.

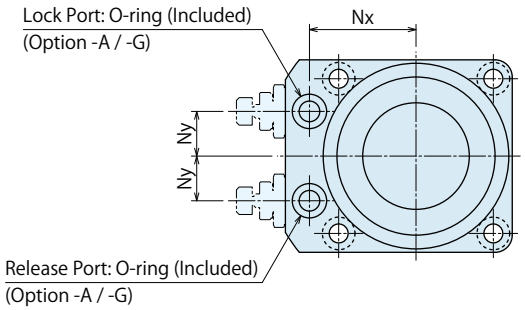
External Dimensions

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

※ The drawing shows the released state of WHE-2AR-A.







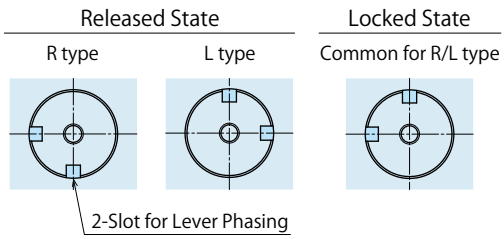
Notes：

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

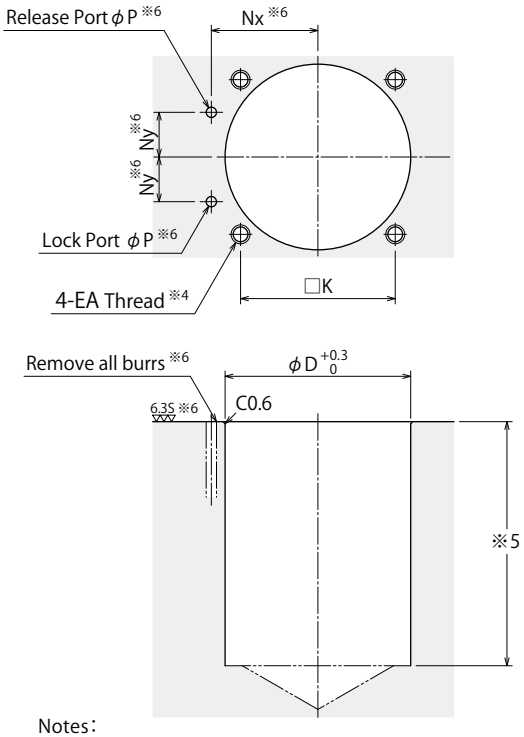
※3. Speed control valve is sold separately. Please refer to P.309.

1. Please contact us when you require another option in combination.

※1. Slot for Stopper and Lever Phasing



Machining Dimensions of Mounting Area



Notes：

※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

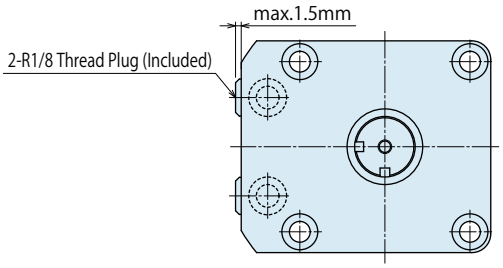
※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

※6. The machining dimension is for -A/-G：Gasket Option.

Piping Method

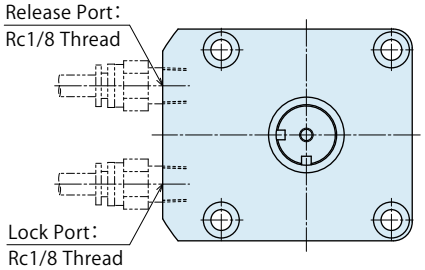
G：Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GR-A.



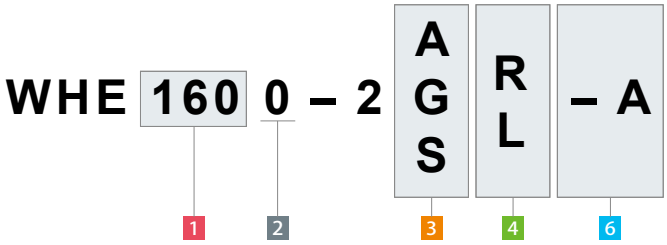
S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SR-A.



Model No. Indication

(Model No.：WHE1000-2AR-A, WHE2500-2SL-A)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When Blank is chosen)
6 Option (When A is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□-A	WHE1000-2□□-A	WHE1600-2□□-A	WHE2500-2□□-A	WHE4000-2□□-A
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke			6		
(Break down) Idle Stroke			2		
(Break down) Lock Stroke ※7			4		
Recommended Stroke	11	11.5	12	14.5	16.5
A	125	134.5	141	167	185.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	61	64	67	79.5	87.5
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	13	13
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
U	12	14	16	20	25
Z (Chamfer)	C3	R5	R5	R6	R6
CA	4.3	4.3	5.8	6.8	8.8
CB	10.25	11.5	14	15	17.5
CC	$2.5^{+0.028}_{+0.014}$	$3^{+0.028}_{+0.014}$	$4^{+0.038}_{+0.020}$	$4^{+0.038}_{+0.020}$	$4^{+0.038}_{+0.020}$
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
SA	20	22.5	25	30	36
SB	16	16.5	17	19.5	21.5
SC (Nominal × Pitch × Depth)	M4×0.7×7	M4×0.7×7	M4×0.7×7	M5×0.8×8	M6×1×11
O-ring (Piping Option A/G)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity cm³ Lock	12.8	21.8	35.5	61.3	103.8
Cylinder Capacity cm³ Release	15.2	25.5	40.3	69.2	117.6
Weight ※8 kg	0.5	0.8	1.0	1.7	2.8

Notes：

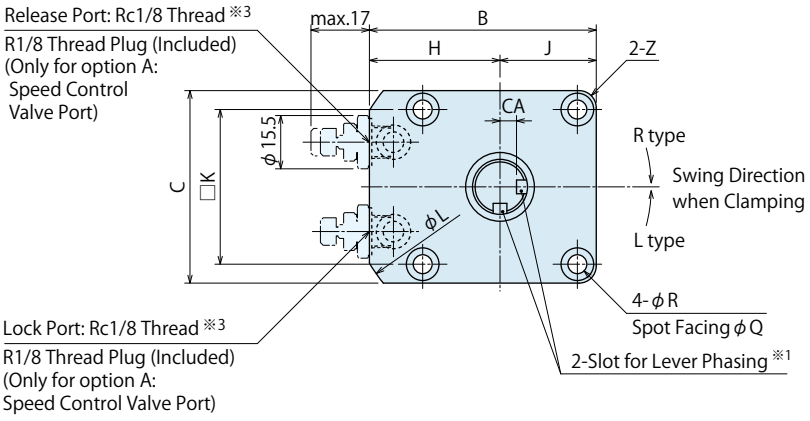
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

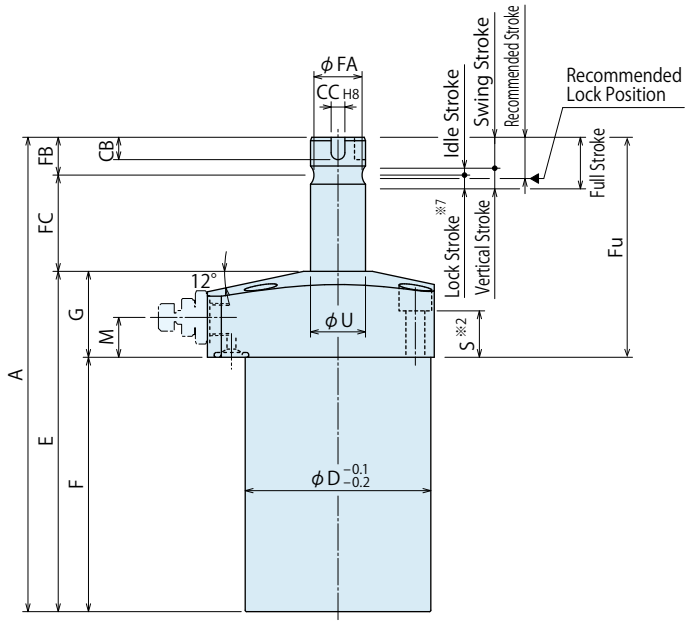
※8. It shows the weight of single swing clamp without the tightening kit and swing lever.

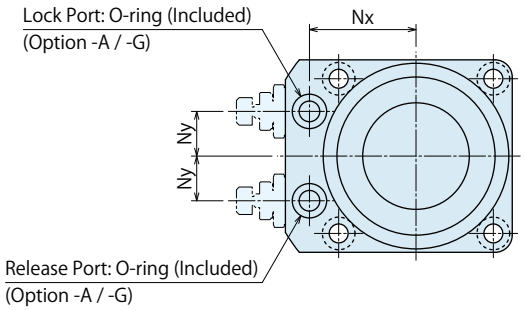
External Dimensions

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

※ The drawing shows the released state of WHE-2AL-F.







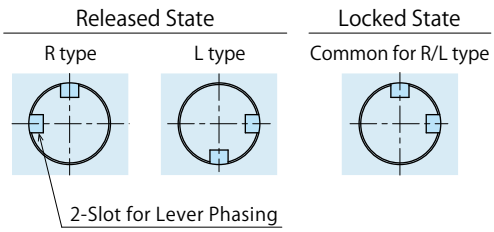
Notes：

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

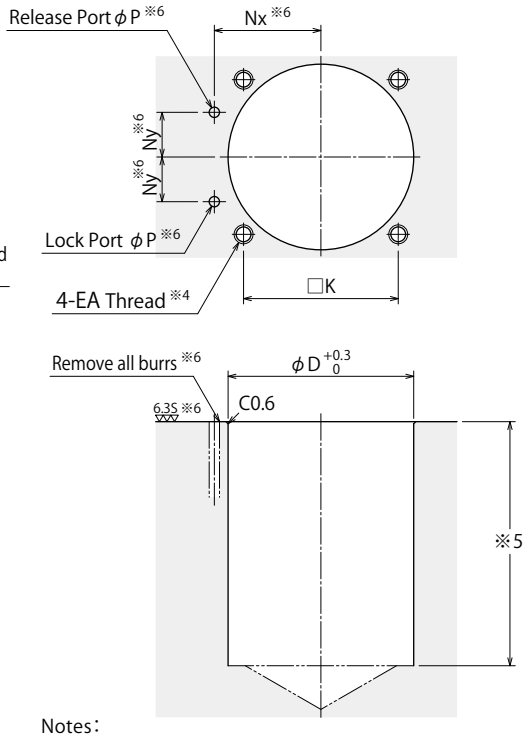
※3. Speed control valve is sold separately. Please refer to P.309.

1. Please contact us when you require another option in combination.

※1. Slot for Stopper and Lever Phasing



Machining Dimensions of Mounting Area



Notes：

※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

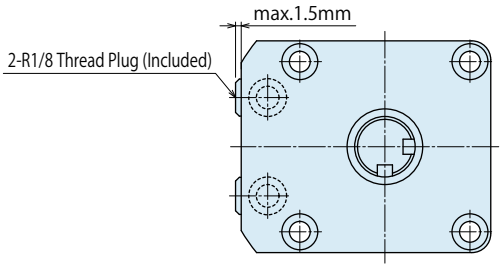
※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

※6. The machining dimension is for -A/-G：Gasket Option.

Piping Method

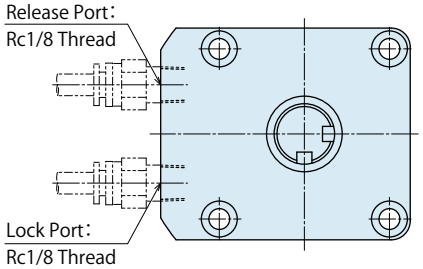
G：Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GL-F.



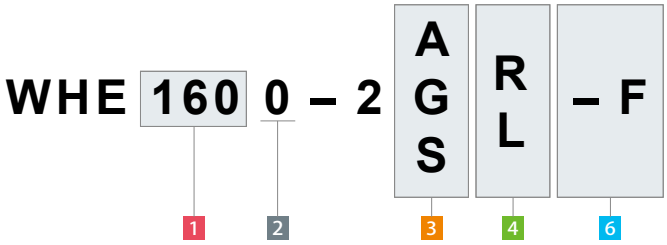
S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SL-F.



Model No. Indication

(Model No.：WHE1000-2AR-F, WHE2500-2SL-F)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When Blank is chosen)
6 Option (When F is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□-F	WHE1000-2□□-F	WHE1600-2□□-F	WHE2500-2□□-F	WHE4000-2□□-F
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke			6		
(Break down) Idle Stroke			2		
(Break down) Lock Stroke ※7			4		
Recommended Stroke	11	11.5	12	14.5	16.5
A	121	131	138	167	183.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	57	60.5	64	79.5	85.5
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	13	13
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
U	12	14	16	20	25
Z (Chamfer)	C3	R5	R5	R6	R6
CA	4	4.5	4.8	6.8	9
CB	4.25	5	6.5	6.5	7
CC	$2.5^{+0.014}_{0}$	$3^{+0.014}_{0}$	$4^{+0.018}_{0}$	$4^{+0.018}_{0}$	$4^{+0.018}_{0}$
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
FA	10.5	12.5	14	17.5	22
FB	8	9.5	11	15	17
FC	24	26	28	34.5	38.5
O-ring (Piping Option A/G)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity cm³ Lock	12.8	21.8	35.5	61.3	103.8
Cylinder Capacity cm³ Release	15.2	25.5	40.3	69.2	117.6
Weight ※8 kg	0.5	0.8	1.0	1.7	2.8

Notes：

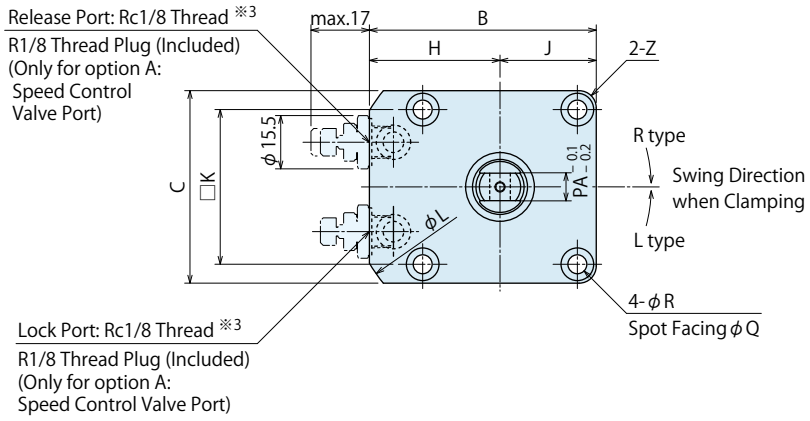
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

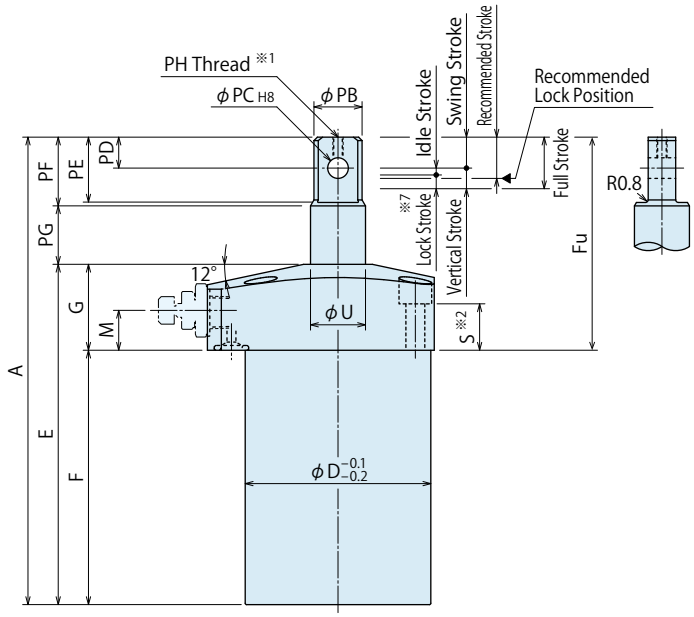
※8. It shows the weight of single swing clamp.

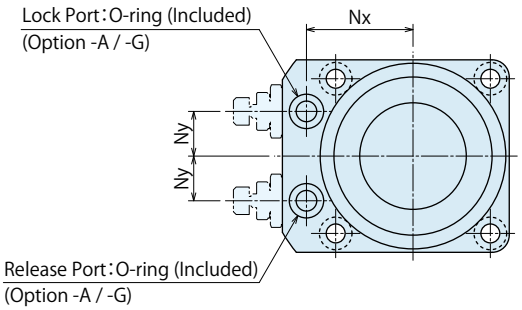
External Dimensions

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

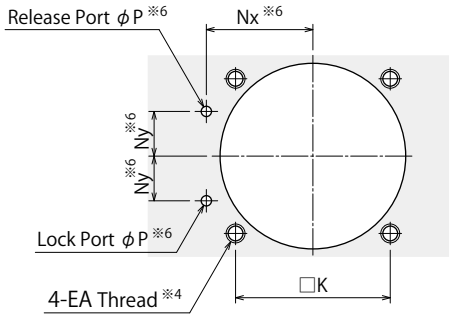
※ The drawing shows the released state of WHE-2AR-P.

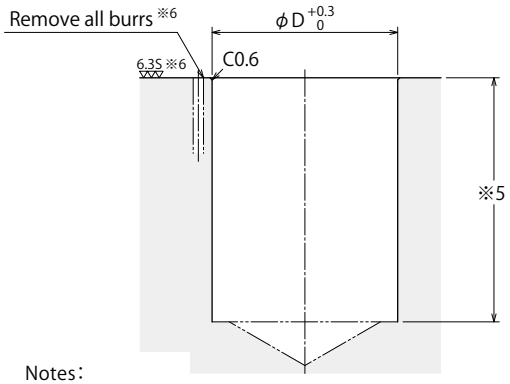






Machining Dimensions of Mounting Area





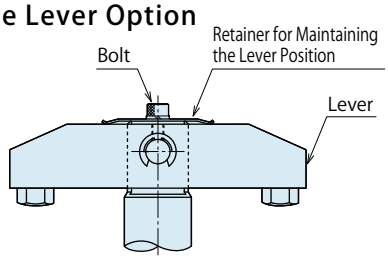
Notes：

※4. EA 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.

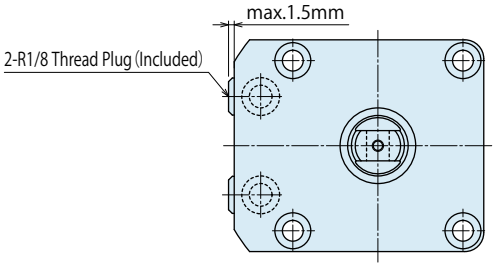
Balance Lever Option



Piping Method

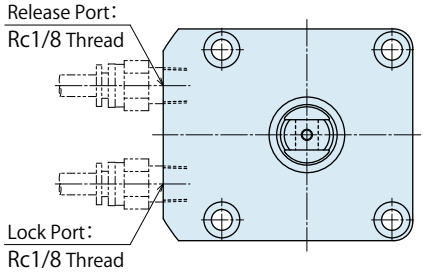
G：Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GR-P.



S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SR-P.



Notes：

※1. Use the tapped hole (PH thread) on top of rod to attach a retainer for lever.

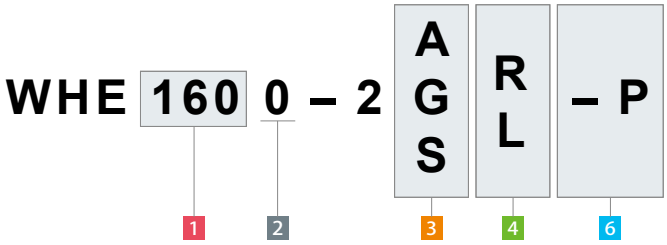
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.309.

1. Please contact us when you require options in combination.

Model No. Indication

(Model No.：WHE1000-2AR-P, WHE2500-2SL-P)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When Blank is chosen)
6 Option (When P is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□-P	WHE1000-2□□-P	WHE1600-2□□-P	WHE2500-2□□-P	WHE4000-2□□-P
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke			6		
(Break Idle Stroke			2		
down) Lock Stroke ※7			4		
Recommended Stroke	11	11.5	12	14.5	16.5
A	120	131	138	167	183.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	56	60.5	64	79.5	85.5
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	13	13
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
U	12	14	16	20	25
Z (Chamfer)	C3	R5	R5	R6	R6
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
PA	6	7	8	10	12
PB	10	12	14	18	23
PC	$4^{+0.018}_{0}$	$5^{+0.018}_{0}$	$6^{+0.018}_{0}$	$8^{+0.022}_{0}$	$10^{+0.022}_{0}$
PD	6.5	8.5	9	12	12.5
PE	14	18	21	27.5	31.5
PF	15	19	22	29	33
PG	16	16.5	17	20.5	22.5
PH (Nominal × Pitch)	M3×0.5	M3×0.5	M3×0.5	M4×0.7	M5×0.8
O-ring (Piping Option A/G)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity Lock	12.8	21.8	35.5	61.3	103.8
cm³ Release	15.2	25.5	40.3	69.2	117.6
Weight ※8 kg	0.5	0.8	1.0	1.7	2.8

Notes：

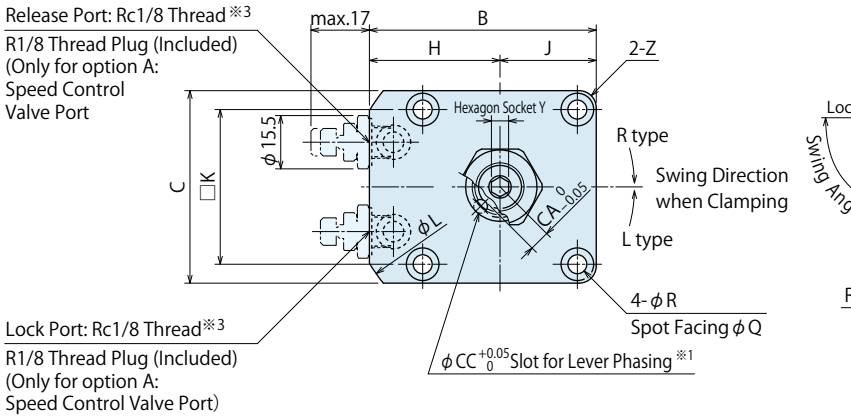
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

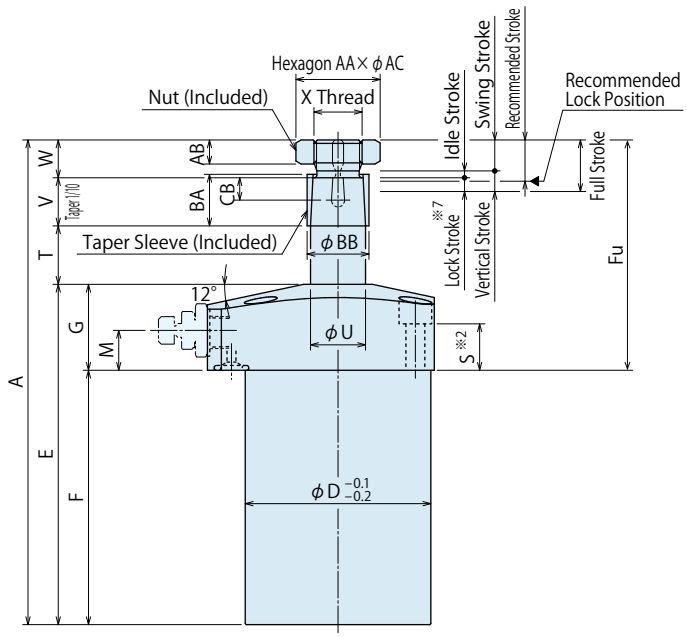
※8. It shows the weight of single swing clamp.

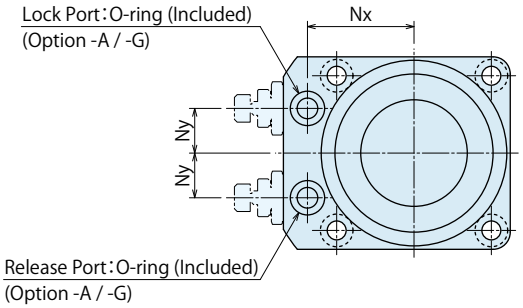
External Dimensions

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

※ The drawing shows the released state of WHE-2AR-Y45.

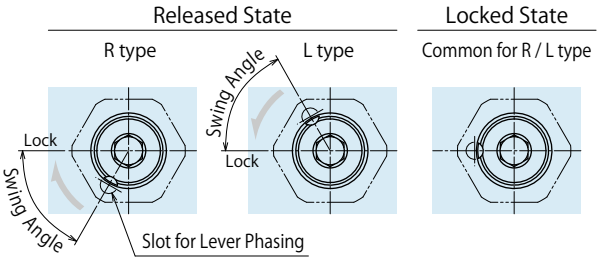




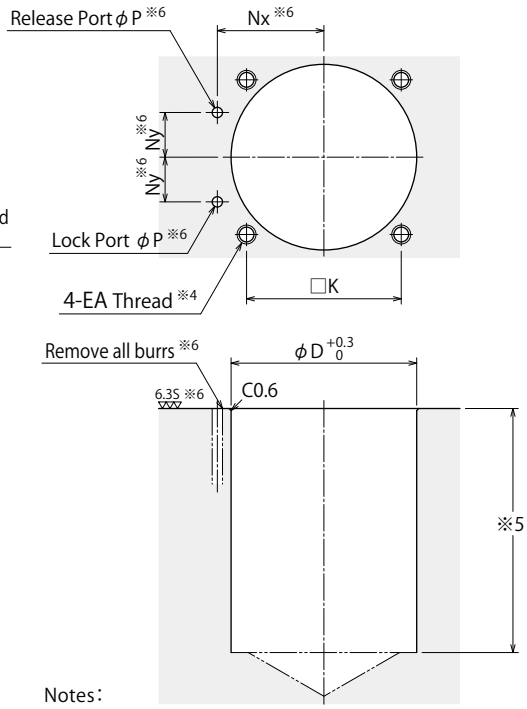


※1. Slot for Lever Phasing

The slot position varies depending on the swing direction and angle when locked. It faces the port side at locked state.



Machining Dimensions of Mounting Area



Notes：

※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

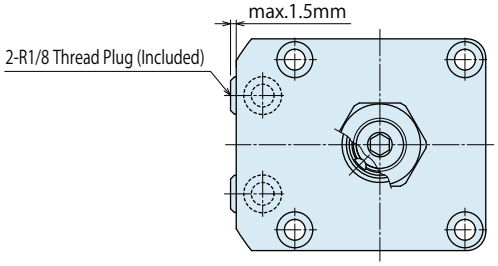
※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

※6. The machining dimension is for -A/-G：Gasket Option.

Piping Method

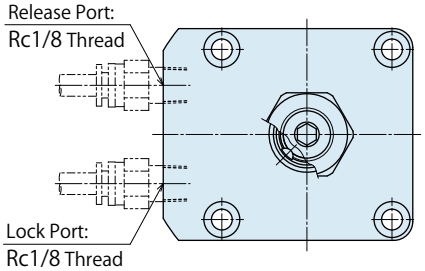
G：Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GR-Y45.



S：Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SR-Y45.



Notes：

※1. The slot for lever phasing faces the port side when locked.

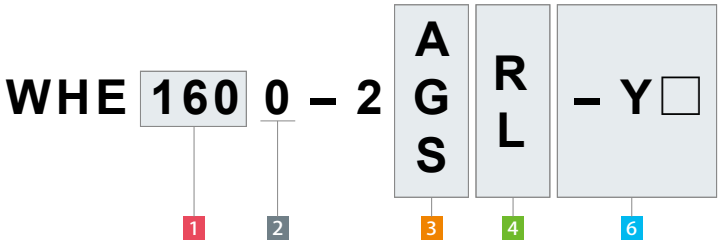
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.309.

1. Please contact us when you require options in combination.

Model No. Indication

(Model No.：WHE1000-2AR-Y45, WHE2500-2SL-Y45)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When Blank is chosen)
6 Option (When Y is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□-Y□			WHE1000-2□□-Y□			WHE1600-2□□-Y□			WHE2500-2□□-Y□			WHE4000-2□□-Y□		
Option Code	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60
Swing Angle	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°
Full Stroke	9.6	10.7	11.8	10.5	11.5	12.5	11.1	12	13	13	14.1	15.3	14	15.3	16.7
Swing Stroke	3.6	4.7	5.8	4.5	5.5	6.5	5.1	6	7	7	8.1	9.3	8	9.3	10.7
Vertical Stroke	6														
(Break Idle Stroke	2														
down) Lock Stroke ※7	4														
Recommended Stroke	6.6	7.7	8.8	7.5	8.5	9.5	8.1	9	10	10	11.1	12.3	11	12.3	13.7
A	120.6	121.7	122.8	130.5	131.5	132.5	137.1	138	139	162.5	163.6	164.8	180	181.3	182.7
B	54			60			66			76			87		
C	45			50			56			66			78		
D	40			46			54			64			77		
E	89			95.5			99			117.5			128		
F	64			70.5			74			87.5			98		
Fu	56.6	57.7	58.8	60	61	62	63.1	64	65	75	76.1	77.3	82	83.3	84.7
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			13			13		
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	11.6	12.7	13.8	12.5	13.5	14.5	13.1	14	15	15	16.1	17.3	16	17.3	18.7
U	12			14			16			20			25		
V	10			12			14			17			21		
W	10			10.5			11			13			15		
X (Nominal × Pitch)	M10×1			M12×1.5			M14×1.5			M16×1.5			M22×1.5		
Y	4			5			5			6			8		
Z (Chamfer)	C3			R5			R5			R6			R6		
AA	17			19			22			24			32		
AB	6			6.5			7			8			10		
AC	19			21.2			24.5			26.5			35.5		
BA	11			13			15			18			22		
BB	14			16			18			22			28		
CA	4.5			5			6			8			10		
CB	4.5			4.5			6.5			5.5			9.5		
CC	3			4			4			4			6		
EA (Nominal × Pitch)	M5×0.8			M5×0.8			M5×0.8			M6×1			M6×1		
O-ring (Piping Option A/G)	1BP5			1BP7			1BP7			1BP7			1BP7		
Cylinder Capacity Lock	10.4	11.0	11.6	18.1	19.0	20.0	30.1	31.3	32.7	52.0	54.3	56.8	86.5	90.6	95.0
cm^3 Release	12.1	12.9	13.7	21.2	22.2	23.3	34.1	35.5	37.1	58.5	61.1	64.0	97.6	102.3	107.4
Weight ※8 kg	0.5			0.8			1.0			1.7			2.8		

Notes：

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

※8. It shows the weight of single swing clamp including taper sleeve and nut.

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

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

Applicable Model

WHE 160 0 - 2 [A G S] [L R] [M N]

5 Action Confirmation Method：When M/N is chosen

About Air Catch Sensor

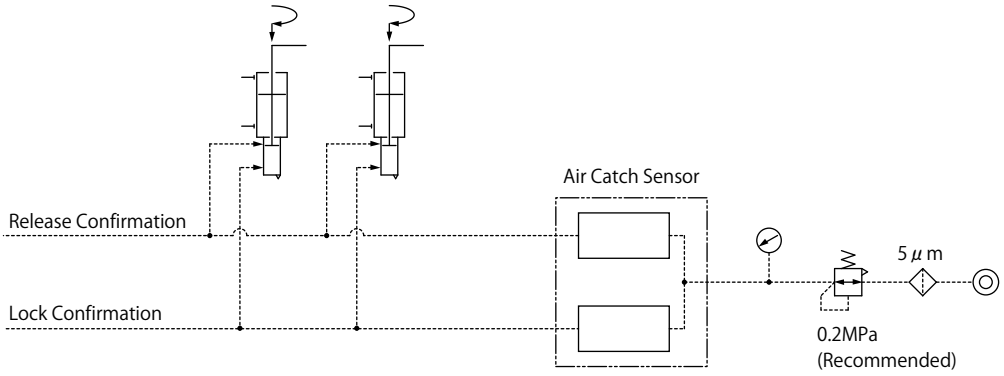
Requires an air catch sensor to confirm piston rod actions.

Recommended Operating Air Pressure : 0.2 MPa

Recommended Air Catch Sensor

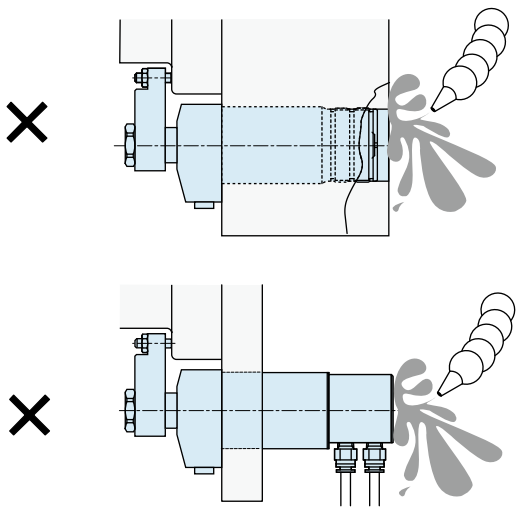
Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA3-G	GPS3-E

In order to carry out stabilized detection, the number of clamps connected per 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 air circuit structure.



Notes for Use and Installation

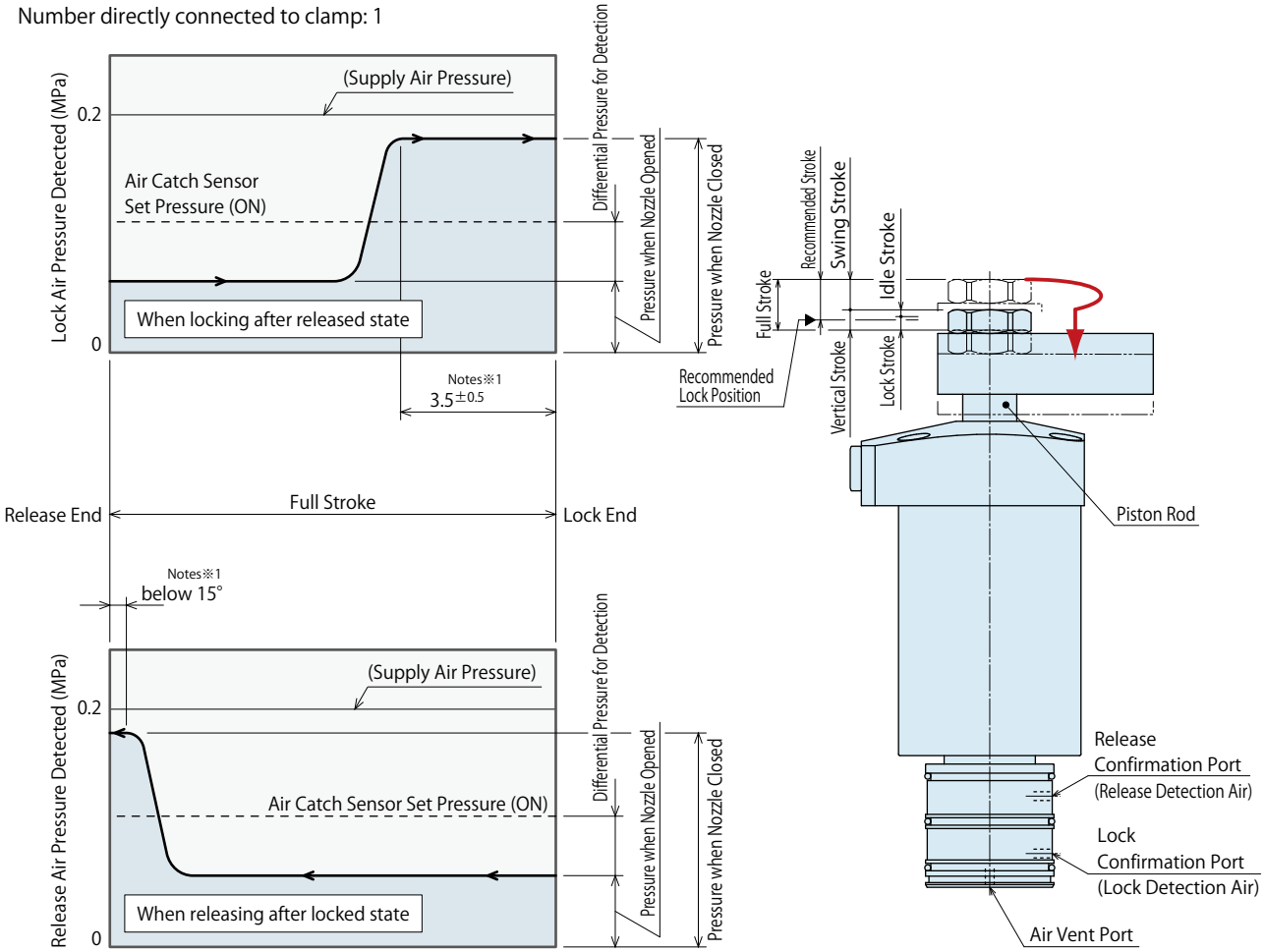
- Please keep clear condition at the air vent port, and prevent coolant and chips from entering the port.
  The air catch sensor can malfunction if the air vent port is blocked.



- 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



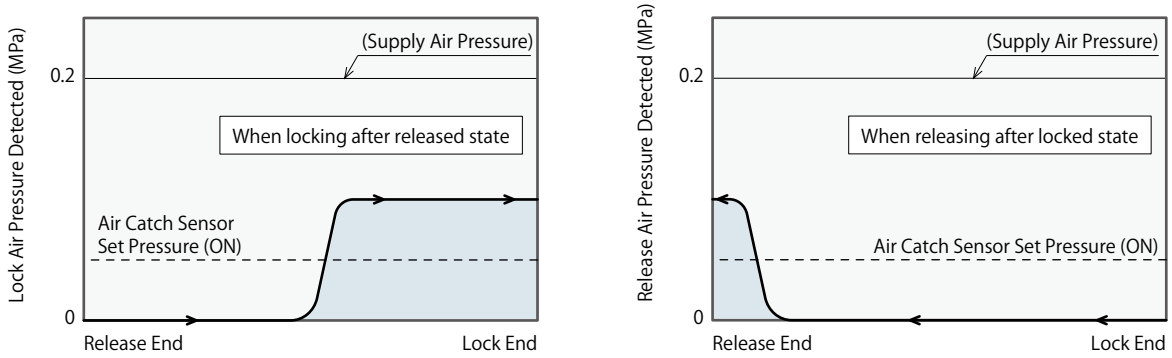
Notes：

1. The sensing chart shows the relationship between the stroke and detection circuit air pressure.
2. The location of a signal from air sensor output varies depending on the sensor setting.
3. The detection pressure varies depending on the number of clamps connected per circuit. (Maximum number of clamps connected: 4)
4. The features may vary depending on the air circuit structure. Please contact us for further information.

※1. There is a 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.)

Model No.		WHE0600-2□□M/N	WHE1000-2□□M/N	WHE1600-2□□M/N	WHE2500-2□□M/N	WHE4000-2□□M/N
Full Stroke	mm	14	14.5	15	17.5	19.5

Number directly connected to clamp：4 (for reference)



Taper Lock Lever Design Dimensions

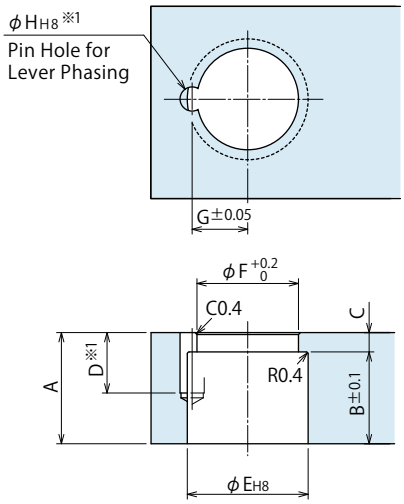
※ Reference for designing a taper lock swing lever.

Corresponding Model No.

WHE □ 0 - 2 [A/G/S] [L/R] [Blank/D/M/N] - [Blank/Y□]

1 Cylinder Force

6 Option: when selecting Blank / Y□



(mm)

Corresponding Model No.	WHE0450-2□□	WHE0600-2□□□ WHE0600-2□□□-Y□	WHE1000-2□□□ WHE1000-2□□□-Y□	WHE1600-2□□□ WHE1600-2□□□-Y□	WHE2500-2□□□ WHE2500-2□□□-Y□	WHE4000-2□□□ WHE4000-2□□□-Y□
A	12	14	16	18	22	26
B	9.5	11	13	15	18	22
C	2.5	3	3	3	4	4
D	8.5	8.5	8.5	10.5	10.5	14.5
E	11.5 +0.027 0	14 +0.027 0	16 +0.027 0	18 +0.027 0	22 +0.033 0	28 +0.033 0
F	9	11	13	15	17	23.5
G	5.2	6	7.1	8.1	10.1	13.1
H	3 +0.014 0	3 +0.014 0	4 +0.018 0	4 +0.018 0	4 +0.018 0	6 +0.018 0
Phasing Pin (Reference) ※2	φ3(h8)×8	φ3(h8)×8	φ4(h8)×8	φ4(h8)×10	φ4(h8)×10	φ6(h8)×14

Notes :

1. Swing lever should be designed with its length according to performance curve.
2. If the swing lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.

※1. The pin hole (φH) for determining the lever phase should be added, if necessary.
※2. Phasing pin is not included. Prepare it separately.
※3. Refer to Design Dimensions of Quick Change Lever Option A for -A (Quick Change Lever Option A).
Refer to Design Dimensions of Quick Change Lever Option F for -F (Quick Change Lever Option F).
For -P (Balance Lever Option), it should be designed by customer.

Quick Change Lever Option A Design Dimensions

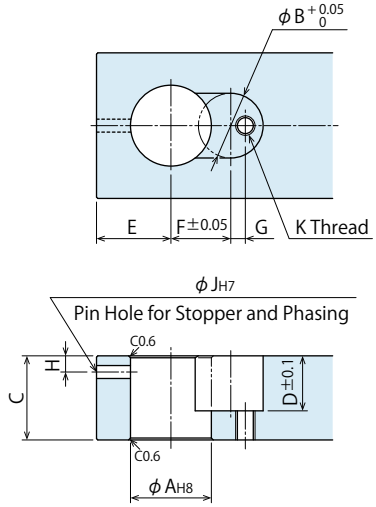
※ Reference for designing Quick Change Swing Lever Option A.

Corresponding Model No.

WHE □ 0 - 2 [A/G/S] [L/R] [Blank/D/M/N] - A

1 Cylinder Force

6 Option A



(mm)

Corresponding Model No.	WHE0600-2□□□-A	WHE1000-2□□□-A	WHE1600-2□□□-A	WHE2500-2□□□-A	WHE4000-2□□□-A
A	12 +0.027 0	14 +0.027 0	16 +0.027 0	20 +0.033 0	25 +0.033 0
B	10.5	12	12	15	20
C	14	16	18	22	26
D	9.5	11	11	13	17
E	10.5	12.5	14	17	23
F	10.75	12	13	16	18.5
G	1.25	2	2	2.5	4.5
H	2.5	3	4	4	4
J	2.5 +0.010 0	3 +0.010 0	4 +0.012 0	4 +0.012 0	4 +0.012 0
K	M4×0.7	M4×0.7	M4×0.7	M5×0.8	M6×1
Pin for Stopper and Phasing	φ2.5 (m6) ×6	φ3 (m6) ×8	φ4 (m6) ×8	φ4 (m6) ×10	φ4 (m6) ×14

Notes :

1. Swing lever should be designed with its length according to performance curve.
2. If the swing lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
3. The pin hole for stopper and phasing (φJ) should be appropriately machined according to the slot for lever phasing on the clamp body. Pin for stopper and phasing (prepared by customer) is used as phasing when mounting the lever and as stopper when removing the lever. If you are not using a pin for stopper and phasing, a stopper is required to remove the lever.
4. Tightening Kit (WHZ□-W) for Quick Change Lever Option A is sold separately.

Quick Change Lever Option F Design Dimensions

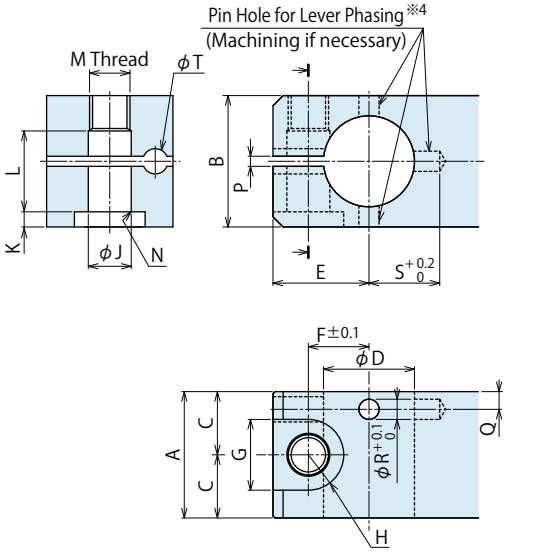
※ Reference for designing Quick Change Swing Lever Option F.

Corresponding Model No.

WHE [ ] 0 - 2 [A G S / L R / Blank D M N] - F

1 Cylinder Force

6 Option F



(mm)

Corresponding Model No.	WHE0600-2□□□-F	WHE1000-2□□□-F	WHE1600-2□□□-F	WHE2500-2□□□-F	WHE4000-2□□□-F
A	16	19	22	30	34
B	19	22	25	30	36
C	8	9.5	11	15	17
D	12 $^{0}_{-0.016}$	14 $^{0}_{-0.016}$	16 $^{0}_{-0.016}$	20 $^{0}_{-0.016}$	25 $^{0}_{-0.020}$
E	13	15	18	22	26.5
F	7.75	9.25	11	13.75	17
G	10	11	14	17.5	20
H	R5	R5.5	R7	R8.75	R10
J	5.5	6.5	8.5	10.5	12.5
K	1.5	2	3	2	4
L	11.5	13.5	15.5	18	22
M	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
N	C0.4	C0.4	C0.6	C0.6	C1
P	2	2	2	2	2
Q	2.25	2.5	3.5	3.5	4
R	2.5	3	4	4	4
S	10.5	13	13	17	19.5
T	2.9	3.4	4.5	4.5	4.5
Phasing Pin (Ref.) ※5	φ2.5×6	φ3×8	φ4×8	φ4×10	φ4×10

Notes :

1. Swing lever should be designed with its length according to performance curve.
2. If the swing lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
3. Tightening Bolt (WHZ□-B) for Quick Change Lever is sold separately.

※4. The pin hole (φR) for determining the lever phase should be added, if necessary.

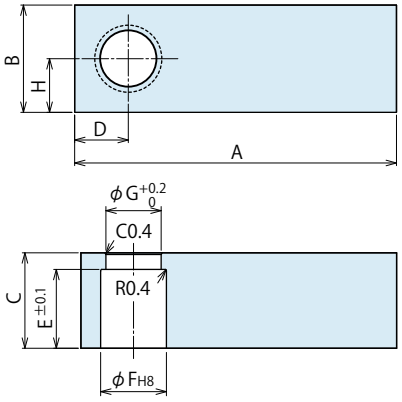
※5. Phasing pin is not included. Prepare it separately.

Accessories：Material Swing Lever for Taper Lock Option

Model No. Indication

WHZ 160 0 – T

- 160: Size (Refer to the table.)
- 0: Design No. (Revision Number)
- T: Taper Lock Option



(mm)

Model No.	WHZ0450-T	WHZ0600-T	WHZ1000-T	WHZ1600-T	WHZ2500-T	WHZ4000-T
Corresponding Model No. ※1	WHE0450-2□□	WHE0600-2□□□ WHE0600-2□□□-Y□	WHE1000-2□□□ WHE1000-2□□□-Y□	WHE1600-2□□□ WHE1600-2□□□-Y□	WHE2500-2□□□ WHE2500-2□□□-Y□	WHE4000-2□□□ WHE4000-2□□□-Y□
A	85	90	90	125	150	170
B	17	21	25	28	34	45
C	12	14	16	18	22	26
D	8.5	10.5	12.5	14	17	23
E	9.5	11	13	15	18	22
F	11.5 $^{+0.027}_{0}$	14 $^{+0.027}_{0}$	16 $^{+0.027}_{0}$	18 $^{+0.027}_{0}$	22 $^{+0.033}_{0}$	28 $^{+0.033}_{0}$
G	9	11	13	15	17	23.5
H	8.5	10.5	12.5	14	17	22.5

Notes :

1. Material：S50C　Surface Finishing：Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. When determining the phase, refer to taper lock lever design dimensions for each model for the additional machining.

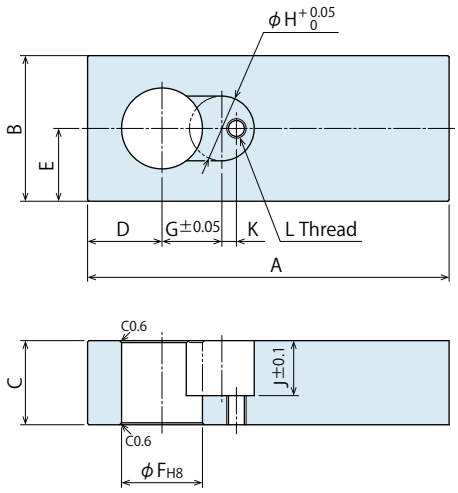
※1. Refer to Accessory of Quick Change Lever Option A for -A (Quick Change Lever Option A). Refer to Accessory of Quick Change Lever Option F for -F (Quick Change Lever Option F). For -P (Balance Lever Option), it should be designed by customer.

Accessories：Material Swing Lever for Quick Change Lever Option A

Model No. Indication

WHZ 160 0 – A

- 160: Size (Refer to the table.)
- 0: Design No. (Revision Number)
- A: Quick Change Lever Option A



(mm)

Model No.	WHZ0600-A	WHZ1000-A	WHZ1600-A	WHZ2500-A	WHZ4000-A
Corresponding Model No.	WHE0600-2□□□-A	WHE1000-2□□□-A	WHE1600-2□□□-A	WHE2500-2□□□-A	WHE4000-2□□□-A
A	90	90	125	150	170
B	21	25	28	34	45
C	14	16	18	22	26
D	10.5	12.5	14	17	23
E	10.5	12.5	14	17	22.5
F	12 $^{+0.027}_{0}$	14 $^{+0.027}_{0}$	16 $^{+0.027}_{0}$	20 $^{+0.033}_{0}$	25 $^{+0.033}_{0}$
G	10.75	12	13	16	18.5
H	10.5	12	12	15	20
J	9.5	11	11	13	17
K	1.25	2	2	2.5	4.5
L	M4×0.7	M4×0.7	M4×0.7	M5×0.8	M6×1

Notes :

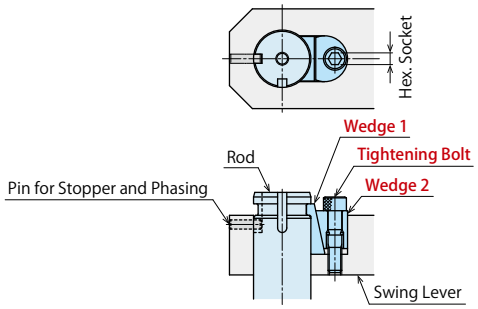
1. Material：S50CH　Surface Finishing：Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. The pin hole for stopper and lever phasing should be additionally machined by referring to Quick Change Lever Option A Design Dimensions.
4. Tightening Kit (WHZ□-W) for Quick Change Lever Option A is sold separately.

Accessories：Tightening Kit for Quick Change Lever Option A

Model No. Indication

WHZ 160 1 – W

- 160: Size (Refer to the table.)
- 1: Design No. (Revision Number)
- W: Tightening Kit for Quick Change Lever Option A



Tightening Kit for mounting Quick Change Lever Option A.
Sold separately from clamp body.

【Contents of Tightening Kit】
・Wedge 1　・Wedge 2　・Tightening Bolt

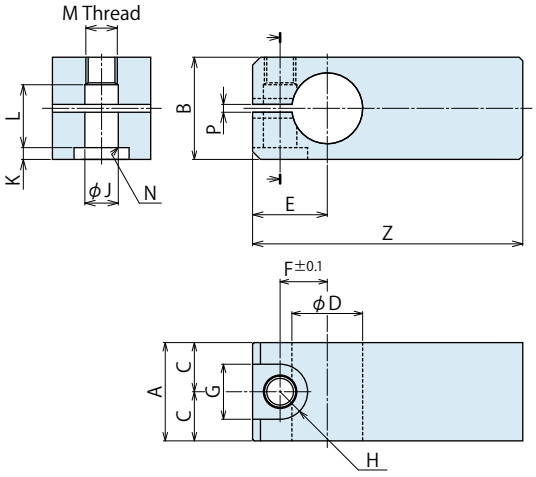
Model No.	WHZ0601-W	WHZ1001-W	WHZ1601-W	WHZ2501-W	WHZ4001-W
Corresponding Model No.	WHE0600 -2□□□-A	WHE1000 -2□□□-A	WHE1600 -2□□□-A	WHE2500 -2□□□-A	WHE4000 -2□□□-A
Nominal×Pitch of Tightening Bolt	M4×0.7	M4×0.7	M4×0.7	M5×0.8	M6×1
Hex. Socket mm	2.5	2.5	2.5	3	4
Tightening Torque N·m	2.5	2.5	2.5	5.0	8.0

Accessories：Material Swing Lever for Quick Change Lever Option F

Model No. Indication

WHZ 160 0 – F

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



(mm)

Model No.	WHZ0600-F	WHZ1000-F	WHZ1600-F	WHZ2500-F	WHZ4000-F
Corresponding Model No.	WHE0600-2□□□-F	WHE1000-2□□□-F	WHE1600-2□□□-F	WHE2500-2□□□-F	WHE4000-2□□□-F
A	16	19	22	30	34
B	19	22	25	30	36
C	8	9.5	11	15	17
D	12 $^{0}_{-0.016}$	14 $^{0}_{-0.016}$	16 $^{0}_{-0.016}$	20 $^{0}_{-0.016}$	25 $^{0}_{-0.020}$
E	13	15	18	22	26.5
F	7.75	9.25	11	13.75	17
G	10	11	14	17.5	20
H	R5	R5.5	R7	R8.75	R10
J	5.5	6.5	8.5	10.5	12.5
K	1.5	2	3	2	4
L	11.5	13.5	15.5	18	22
M	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
N	C0.4	C0.4	C0.6	C0.6	C1
P	2	2	2	2	2
Z	95	105	120	150	170

Notes :

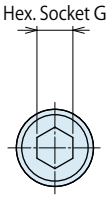
1. Material：S50C　Surface Finishing：Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. When determining the phase, refer to Quick Change Lever Option F Design Dimensions for the additional machining.
4. Tightening Kit (WHZ□-B) for Quick Change Lever Option F is sold separately.

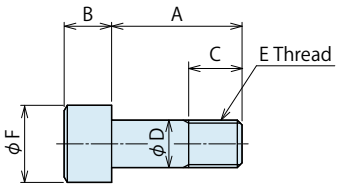
Accessories：Tightening Bolts for Quick Change Lever Option F

Model No. Indication

WHZ 160 0 – B

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





(mm)

Model No.	WHZ0600-B	WHZ1000-B	WHZ1600-B	WHZ2500-B	WHZ4000-B
Corresponding Model No.	WHE0600-2□□□-F	WHE1000-2□□□-F	WHE1600-2□□□-F	WHE2500-2□□□-F	WHE4000-2□□□-F
A	17.5	20	22	28	32
B	5	6	8	10	12
C	6.5	7	9	11	13
D	5	6	8	10	12
E	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
F	8.5	10	13	16	18
G	4	5	6	8	10

Cautions

Notes for Design

1) Check Specifications

- Please use each product according to the specifications.

2) Notes for Circuit Design

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

3) Swing lever should be designed to make the moment of inertia small.

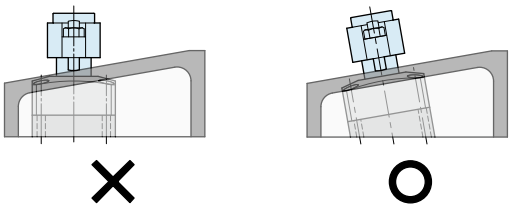
- Large inertia moment will degrade the lever's stopping accuracy and cause undue wear to the clamp.
  Additionally, the clamp may not function, depending on supplied air pressure and lever mounting position.
- Please set the operating time after the moment of inertia is calculated. Please make sure that the clamps work within allowable operating time referring to the allowable operating time graph.
- If supplying a large amount of air right after installation, action time will be extremely fast leading to severe damage on a clamp. Install the speed controller (meter-in) near the air source and gradually supply air pressure.

4) Protect the exposed area of the piston rod when using on a welding fixture.

- If spatter attaches to the sliding surface it could lead to malfunction and air leakage.

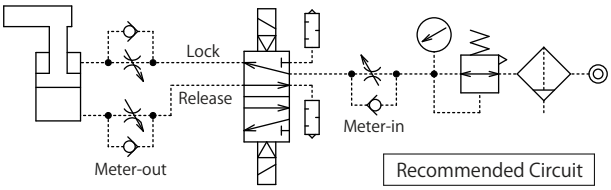
5) When clamping on a sloped surface of the workpiece

- Make sure the clamping surface and the mounting surface of the clamp are parallel.



6) Swing Speed Adjustment

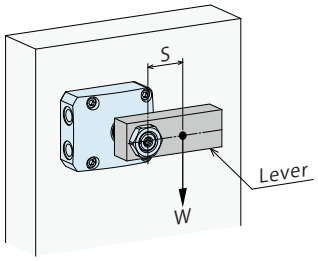
- If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure. Adjust the speed following "Allowable Swing Time Graph".
- Install a speed control valve (meter-out) and gradually control the flow rate from the low-speed side (small flow) to the designated speed. Controlling from the high-speed side (large flow) causes excessive surge pressure or overload to the clamp leading to damage of a machine or device.



- When operating multiple clamps simultaneously, please install the speed controller (meter-out) to each clamp.

7) Notes for Lever Design

- Please design the lever as light as possible, and it should be no larger than necessary.
  The clamp may not function depending on supplying air pressure, mounting position and shape of the lever. If using a large lever in the mounting position as shown below, it may stop in the middle of swing action. Please use a lever with (Lever Weight W) × (Gravity Center S) lighter than shown in the following table.

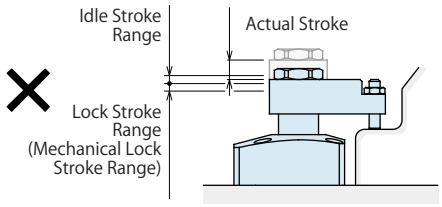


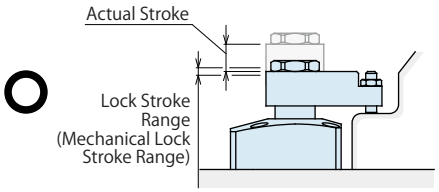
Model	(Lever Weight W) × (Center of Gravity S) (N·m)
WHE0450	0.06
WHE0600	0.08
WHE1000	0.10
WHE1600	0.20
WHE2500	0.45
WHE4000	0.90

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

- The mechanical lock function will not work when clamping within the range of swing stroke and idle stroke, and the specification value of cylinder force, clamping force, holding force and swing completion position repeatability will not be fulfilled.

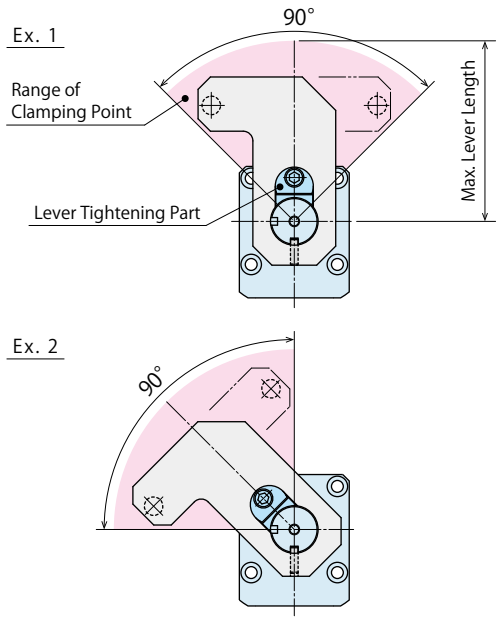
The actual stroke of the piston that descends from the release-end to lock-end should be designed to have the same value as the recommended stroke listed in the external dimensions.





9) When using an offset lever for (WHE-A) Quick Change Lever Option A.

● Clamping point should be within the range of 90° towards the lever tightening part.



※ Please refer to P.1357 for common cautions. ・Notes on Handling ・Maintenance/Inspection ・Warranty

Cautions

Installation Notes

1) Check the fluid to use.

- Please supply filtered clean dry air. (Install a 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.
  Dust and cutting chips in the circuit can lead to air 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 air leakage and malfunction.
- Pieces of the sealing tape can lead to air leakage and malfunction.
- When piping, be careful that contaminants such as sealing tape do not enter in products.

4) Installation of the Product

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

Model No.	Mounting Bolt Size	Tightening Torque (N·m)
WHE0450	M4×0.7	3.2
WHE0600	M5×0.8	6.3
WHE1000	M5×0.8	6.3
WHE1600	M5×0.8	6.3
WHE2500	M6×1	10
WHE4000	M6×1	10

5) Installation of the Flow Control Valve

- Tightening torque for installing flow control valve is 5 to 7 N・m.

6) Installation / Removal of the Swing Lever

- Oil or debris on the tightened part of the lever, taper sleeve or piston rod may cause the lever to loosen. Please clean them thoroughly before installation.
- Tighten the tightening bolt of swing lever with the torque shown below. Tightening with greater torque than recommended can damage the bolt and lever tightening function.

Standard：Taper Lock Lever Option

Model	Thread Size	Tightening Torque (N·m)
WHE0450	M8×1	8~10
WHE0600	M10×1	10 ~ 13
WHE1000	M12×1.5	17 ~ 20
WHE1600	M14×1.5	21 ~ 25
WHE2500	M16×1.5	33 ~ 40
WHE4000	M22×1.5	84 ~ 100

–F：Quick Change Lever Option F

Model	Tightening Bolt Size	Tightening Torque (N·m)
WHE0600–2□□□–F	M5×0.8	7.5
WHE1000–2□□□–F	M6×1	13
WHE1600–2□□□–F	M8×1	32
WHE2500–2□□□–F	M10×1.25	65
WHE4000–2□□□–F	M12×1.5	100 ~ 114

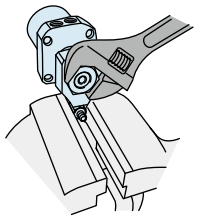
–A：Quick Change Lever Option A

Model	Tightening Bolt Size	Tightening Torque (N·m)
WHE0600–2□□□–A	M4×0.7	2.5
WHE1000–2□□□–A	M4×0.7	2.5
WHE1600–2□□□–A	M4×0.7	2.5
WHE2500–2□□□–A	M5×0.8	5.0
WHE4000–2□□□–A	M6×1	8.0

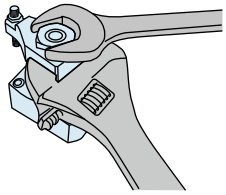
- In case of WHE Standard (Taper Lock Lever)
  If the piston rod is subjected to excessive torque or shock, the rod or the internal mechanism may be damaged. Observe the following points to prevent such shock.

Installation Procedure

① With a clamp positioned to a jig, determine the lever position, and tighten the nut for fixing the lever (temporal tightening).



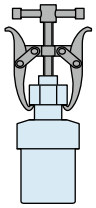
② Remove the clamp from the jig, fix the lever with a machine vise etc., and tighten the nut.



③ If tightening the nut with the clamp positioned to the jig, use a wrench to the hexagon part of piston rod, or fix the lever with a spanner.
It is best to bring the lever to the middle of the swing stroke before tightening the nut.

Removal Procedure

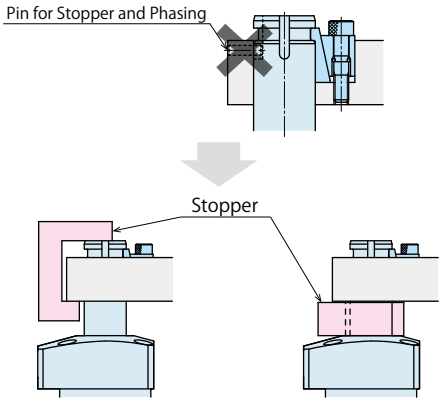
① While the clamp is on the jig or vise, use a hex wrench to bring the lever to the middle of the swing stroke and then loosen the nut.



② Loosen the nut after securing the lever two or three turns then remove the lever with a puller without any rotational torque applied on the piston rod.

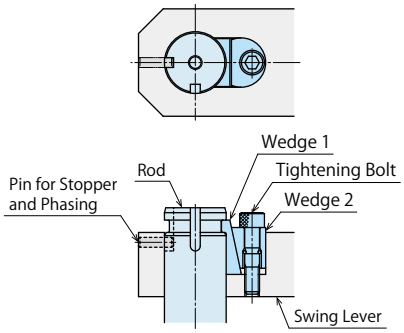
● In case of WHE-A (Quick Change Lever Option A)
A pin for stopper and phasing (prepared by customer) is used for phasing when mounting the lever and as a stopper when removing the lever. If you are not using the pin for stopper and phasing, a stopper is required to remove the lever.

Stopper example for lever removal when not using the pin for stopper and phasing.



Installation Procedure
① Install in order of swing lever, wedge 1, wedge 2 to the rod.
② Pull the lever towards the wedge side and tighten the tightening bolt with the specified torque.

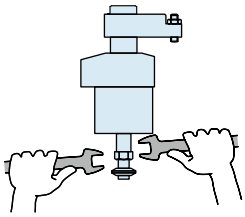
Removal Procedure
① By loosening the tightening bolt, the wedges are released and the lever can be removed.



7) Swing Speed Adjustment
● Adjust the speed following "Allowable Swing Time Graph". If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
● 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 the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

9) Notes on double end rod option (-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. Tightening torque of mounting screw is shown in the table below.



Model	Thread Size	Tightening Torque (N·m)
WHE0600–2□□D	M4×0.7	3.2
WHE1000–2□□D	M5×0.8	6.3
WHE1600–2□□D	M5×0.8	6.3
WHE2500–2□□D	M6×1	10
WHE4000–2□□D	M6×1	10

※ Please refer to P.1357 for common cautions. • Notes on Handling • Maintenance/Inspection • Warranty

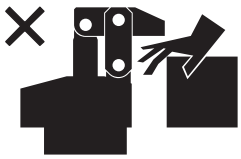
Cautions

Notes on Handling

1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.

2) Do not operate 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 safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured due to clinching.

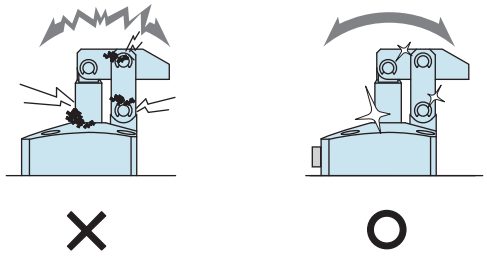


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

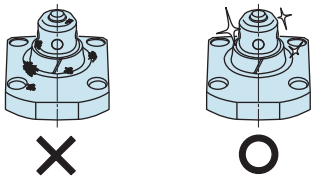
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning and fluid leakage.



3) Please clean out the reference surfaces on a regular basis (taper reference surface and seating surface) of the locating products. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXE/VXF)
- The locating products, except VX/VXE/VXF model, can remove contaminants with cleaning functions. However, hardened cutting chips, adhesive coolant and others may not be removed. Make sure there are no contaminants before installing a workpiece/pallet.
- Continuous use with contaminant on components will lead to locating accuracy failure, malfunction and fluid leakage.



4) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.

5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

8) The products should be stored in the cool and dark place without direct sunshine or moisture.

9) 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 operated in an 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.

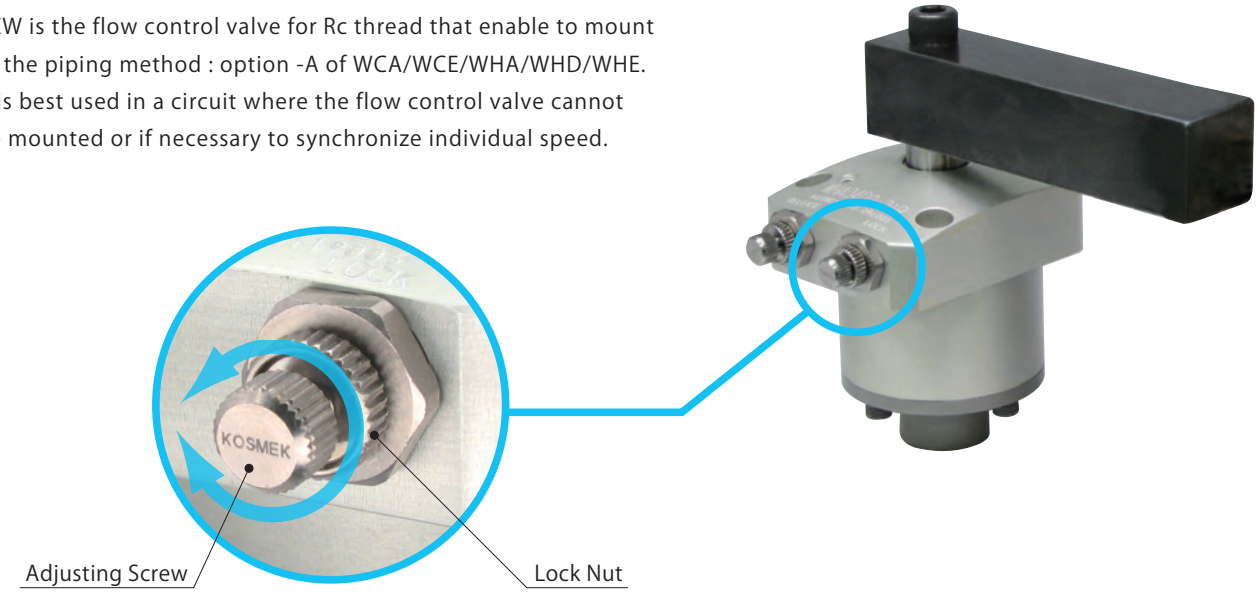
Air Flow Control Valve

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 : option -A of WCA/WCE/WHA/WHD/WHE. 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

Clamps	BZW Model No.	Clamp Model No.
High-Power Pneumatic Link Clamp	BZW0100-**A**	**WCE**□2-2**A**□
High-Power Pneumatic Swing Clamp	BZW0100-**B**	WHE□0-2**A**□
Pneumatic Swing Clamp		WHA□0-2**A**□
Double Piston Pneumatic Swing Clamp		WHD□0-2**A**□
Pneumatic Link Clamp		WCA□1-2**A**□

Corresponding to piping method -A option.

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

Model No. Indication

BZW 010 0 – B

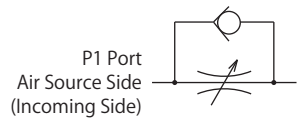
- Control Method
  B : Meter-out
  A : Meter-in
  ※ Select **A** : Meter-in when using BZW for WCE.
- Design No.
  0 : Revision Number
- R Thread Size
  010 : Rc1/8

Specifications

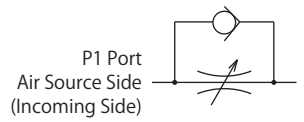
Model No.	BZW0100-B	BZW0100-A
Control Method	Meter-out	Meter-in
Operating Pressure MPa	0.1 ~ 1.0	
Withstanding Pressure MPa	1.5	
Adjusting Screw Number of Rotations	10	
Tightening Torque N•m	5 ~ 7	
Weight g	13	13
Corresponding Model No.	WHE□0-2A□ WHA□0-2A□ WHD□0-2A□ WCA□1-2A□	WCE□2-2A□

Circuit Symbol

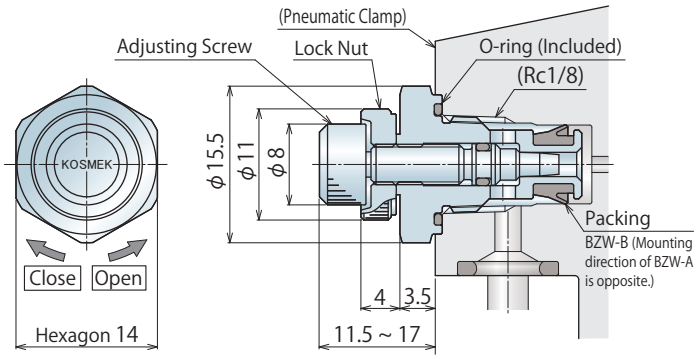
BZW0100-B : Meter-out



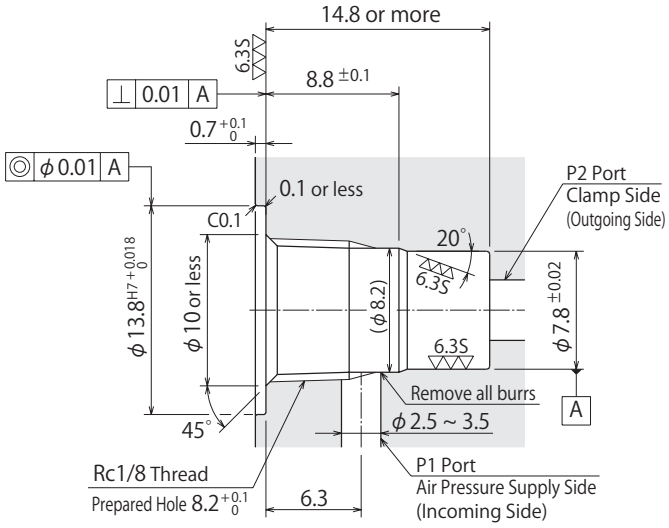
BZW0100-A : Meter-in



External Dimensions



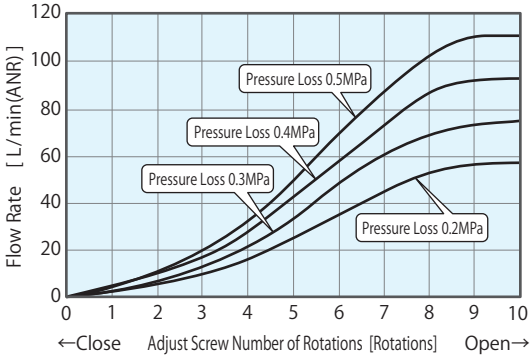
Machining Dimensions of Mounting Area



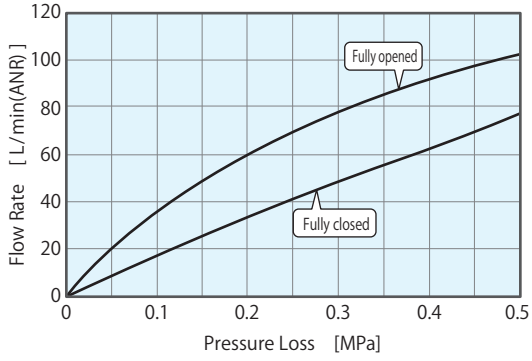
Flow Rate Graph

BZW0100-B/BZW0100-A common

Controlled Flow Direction



Free Flowing Direction



Notes :

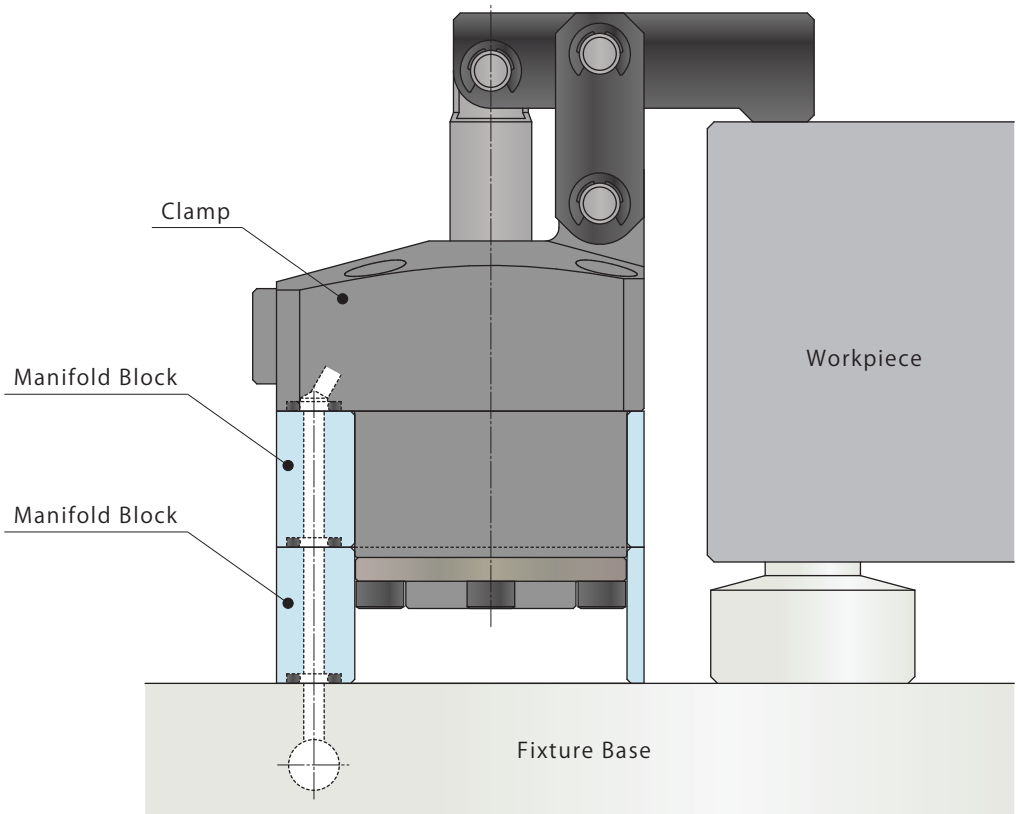
1. Since the ▽▽▽ area is sealing part, be careful not to damage it.
2. No cutting chips or burr shoud be at the tolerance part of machining hole.
3. As shown in the drawing, P1 port is used as the air supply side and P2 port as the clamp side.

Manifold Block

Model WHZ-MD
Model LZY-MD
Model LZ-MS
Model LZ-MP
Model TMZ-1MB
Model TMZ-2MB
Model DZ-MG□
Model DZ-MS□

Manifold Block

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

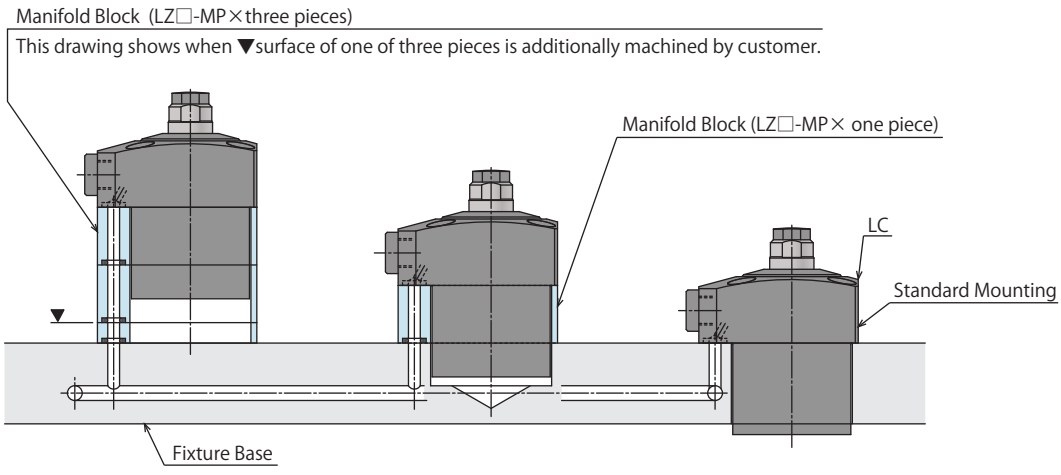


Applicable Model

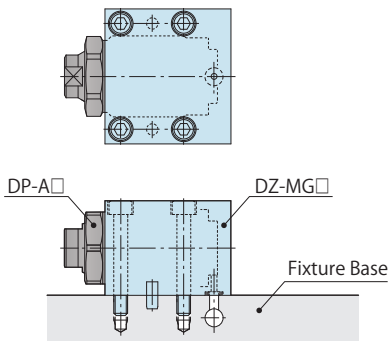
Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCA, Model WHA, Model WCE, Model WHE
Model LZY-MD	Model LKA, Model LKE, Model LHC, Model LHS, Model LKC, Model LHA, Model LHE, Model LL
Model LZ-MS	Model LJ, Model LG, Model LM, Model LT
Model LZ-MP	Model LC, Model TC
Model TMZ-1MB	Model TMA-1
Model TMZ-2MB	Model TMA-2
Model DZ-MG□/MS□	Model DP

Application Examples

Work Support (LC) Application Example



Push Cylinder (DP) Application Example

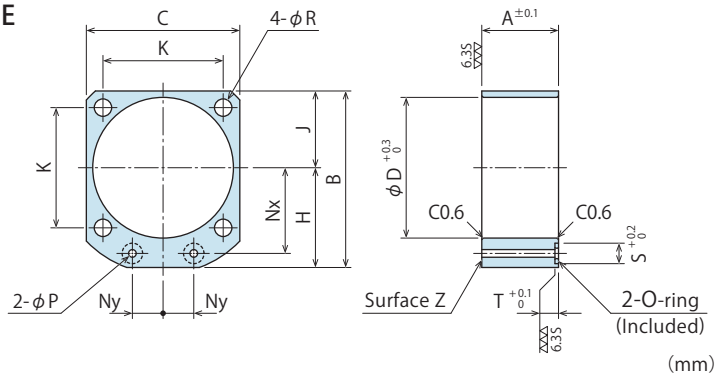


Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

WHZ 048 0 – MD

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



(mm)

Model No.	WHZ0450-MD	WHZ0600-MD	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Model No.	WCE0452 WHE0450	WCE0602 WHE0600	WCA0321 WCE1002 WHA0320 WHE1000	WCA0401 WCE1602 WHA0400 WHE1600	WCA0501 WCE2502 WHA0500 WHE2500	WCA0631 WCE4002 WHA0630 WHE4000
A	20	23	25	27	31	35
B	49	54	60	67	77	88.5
C	40	45	50	58	68	81
D	36	40	46	54	64	77
H	29	31.5	35	38	43	48
J	20	22.5	25	29	34	40.5
K	31.4	34	39	45	53	65
Nx	23.5	26	28	31	36	41
Ny	8	9	10	13	15	20
P	3	3	5	5	5	5
R	4.5	5.5	5.5	5.5	6.5	6.5
S	8	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.1	0.1	0.2	0.2

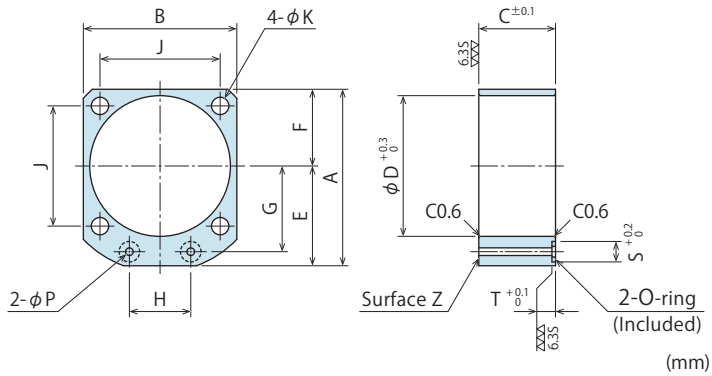
Notes : 1. Material : A2017BE-T4 Surface Finishing : Zircon Finishing (Zirconium Chemical Conversion Treatment)
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for LKA/LKC/LKE/LHA/LHC/LHE/LHS/LL

Model No. Indication

LZY 048 0 – MD

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



(mm)

Model No.	LZY0360-MD	LZY0400-MD	LZY0480-MD	LZY0550-MD	LZY0650-MD	LZY0750-MD	LZY0900-MD	LZY1050-MD
Corresponding Model No.	LKA0360 / LKE0360 LHA0360 / LHC0360 LHE0360 / LHS0360 LL0360	LKA0400 / LKC0400 LKE0400 / LHA0400 LHC0400 / LHE0400 LHS0400 / LL0400	LKA0480 / LKC0480 LKE0480 / LHA0480 LHC0480 / LHE0480 LHS0480 / LL0480	LKA0550 / LKC0550 LKE0550 / LHA0550 LHC0550 / LHE0550 LHS0550 / LL0550	LKA0650 / LKC0650 LHA0650 / LHC0650 LHS0650 LL0650	LKA0750 LHA0750 LHS0750 LL0750	LKA0900 LHA0900 LHS0900 LL0900	LKA1050 LHA1050 LHS1050 LL1050
A	49	54	61	69	81	92	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	29	31.5	35.5	39	46	52	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
G	23.5	26	30	33.5	39.5	45	52.5	60
H	16	18	22	24	30	32	37	45
J	31.4	34	40	47	55	63	75	88
K	4.5	5.5	5.5	6.8	6.8	9	11	14
P	3	3	3	3	5	5	5	5
S	8	8	8	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

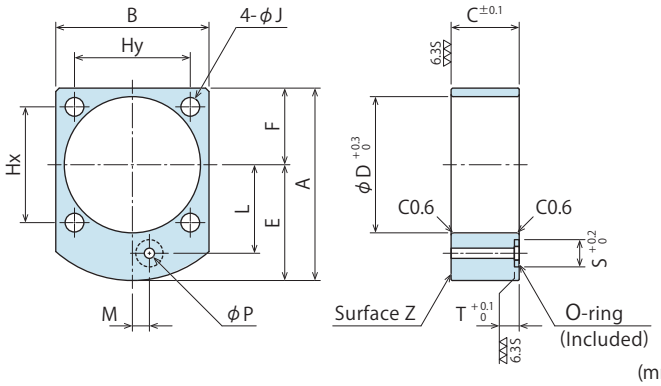
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for LJ/LM/LG/LT

Model No. Indication

LZ 048 0 – MS

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



(mm)

Model No.	LZ0300-MS	LZ0360-MS	LZ0400-MS	LZ0480-MS	LZ0550-MS	LZ0650-MS	LZ0750-MS	LZ0900-MS	LZ1050-MS
Corresponding Model No.	LG0301 / LT0301 LJ0302 / LM0300	LG036□ / LT036□ LJ0362 / LM0360	LG040□ / LT040□ LJ0402 / LM0400	LG048□ / LT048□ LJ0482 / LM0480	LG055□ / LT055□ LJ0552 / LM0550	LG065□ / LT065□ LJ0652 / LM0650	LG075□ / LT075□ LJ0752 / LM0750	LG090□ LJ0902	LG105□ LJ1052
A	48	51.5	56.5	62	70	82	93	107	122
B	34	40	45	51	60	70	80	95	110
C	18	20	20	27	30	32	37	45	50
D	30	36	40	48	55	65	75	90	105
E	28.5	31.5	34	36.5	40	47	53	59.5	67
F	19.5	20	22.5	25.5	30	35	40	47.5	55
Hx	30	31.4	34	40	47	55	63	75	88
Hy	23	31.4	34	40	47	55	63	75	88
J	4.5	4.5	5.5	5.5	6.8	6.8	9	11	14
L	20.5	23.5	26	30	33.5	39.5	45	52.5	60
M	3	5	5	0	0	0	0	0	0
P	3	3	3	3	3	5	5	5	5
S	8	8	8	8	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

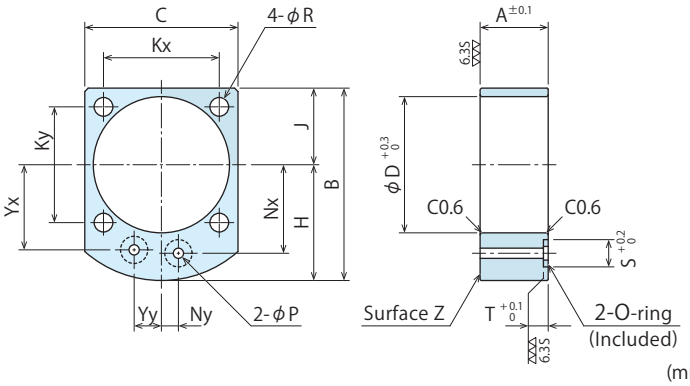
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for LC/TC

Model No. Indication

LZ 048 0 – MP

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



(mm)

Model No.	LZ0260-MP	LZ0300-MP	LZ0360-MP	LZ0400-MP	LZ0480-MP	LZ0550-MP	LZ0650-MP	LZ0750-MP	LZ0900-MP
Corresponding Model No.	LC0262	LC0302	LC0362	LC0402 / TC0402	LC0482 / TC0482	LC0552 / TC0552	LC0652 / TC0652	LC0752 / TC0752	LC0902
A	18	18	20	20	27	30	32	37	45
B	43	48	51.5	56.5	62	70	82	93	107
C	29	34	40	45	51	60	70	80	95
D	26	30	36	40	48	55	65	75	90
H	26.5	28.5	31.5	34	36.5	40	47	53	59.5
J	16.5	19.5	20	22.5	25.5	30	35	40	47.5
Kx	25	30	31.4	34	40	47	55	63	75
Ky	21	23	31.4	34	40	47	55	63	75
Nx	18.5	20.5	23.5	26	30	33.5	39.5	45	52.5
Ny	3	3	5	5	0	0	0	0	0
R	3.4	4.5	4.5	5.5	5.5	6.8	6.8	9	11
Yx	18.5	20.5	23.5	25	28	31	37	42.5	50
Yy	7	7	8	8	11	13	14	15	15
P	3	3	3	3	3	3	5	5	5
S	8	8	8	8	8	8	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.8	1.2

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

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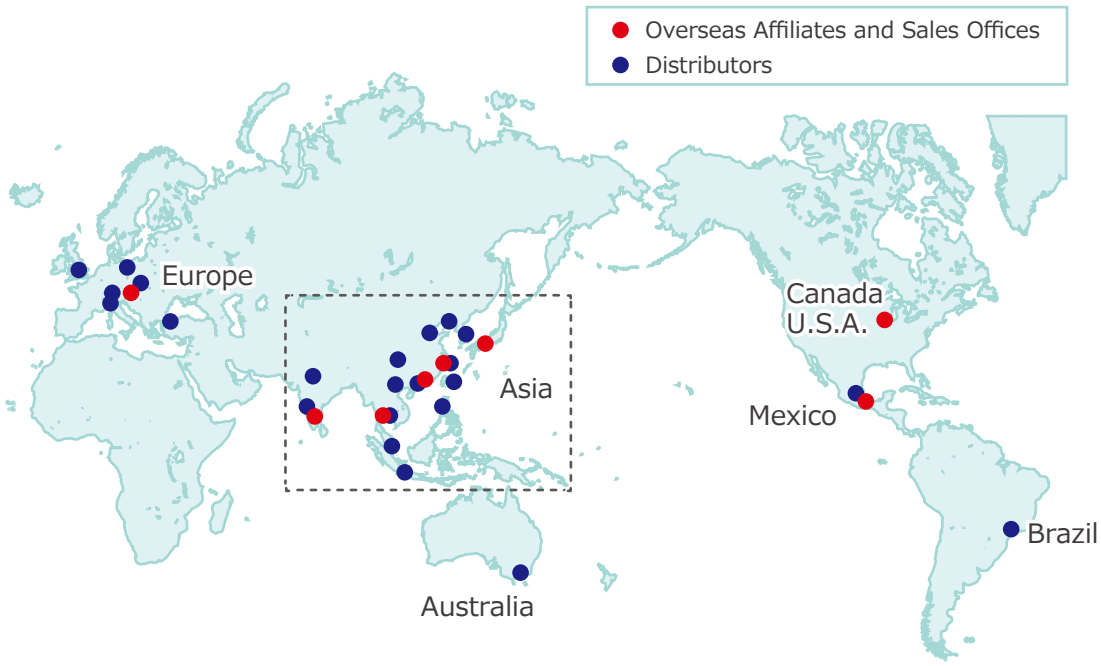

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