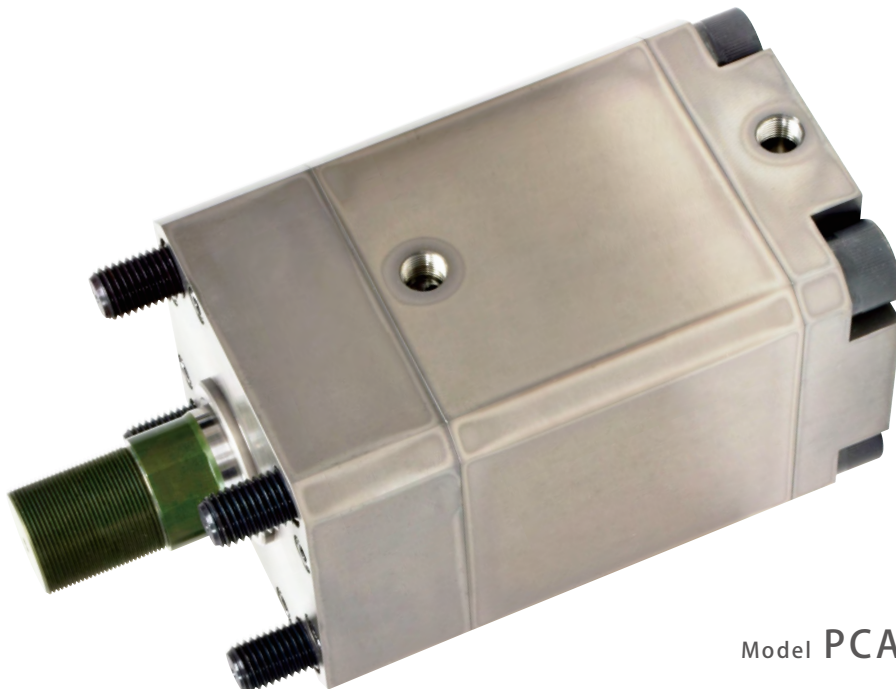


New

High-Power Core Pull Cylinder

Hydraulic Cylinder with Boosting Mechanism

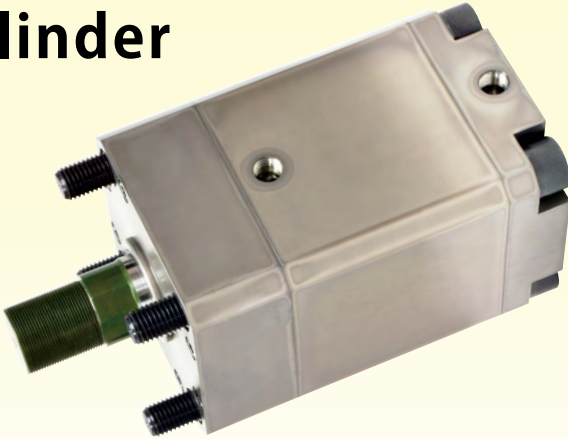
Pulls out the core with 1.8 times thrust force compared to the same size cylinder.



Model PCA

High-Power Core Pull Cylinder

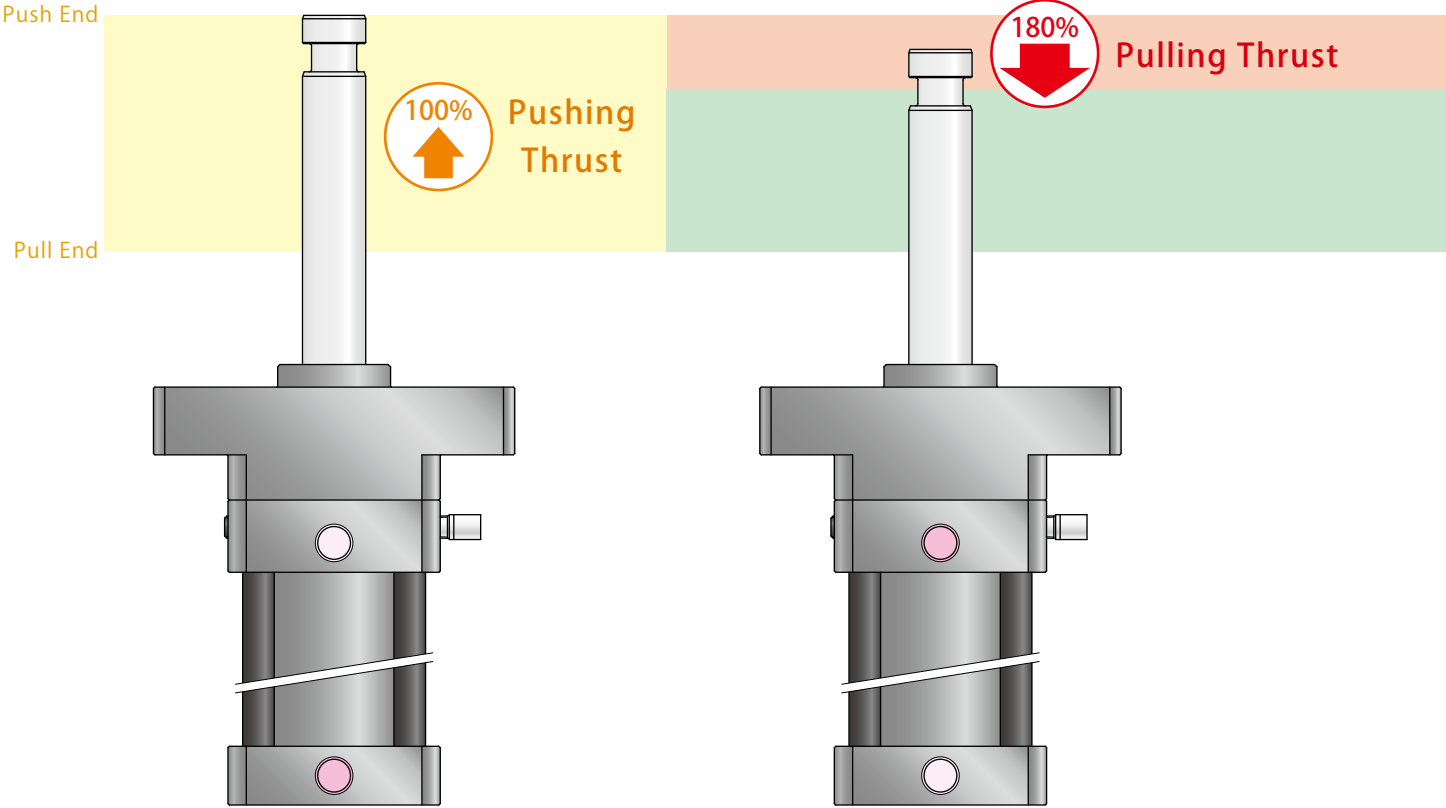
Model PCA



Hydraulic Cylinder with Boosting Mechanism

Pulls out the core with 1.8 times thrust force compared to the same size cylinder.

Action Description



Boosting Stroke Range

The cylinder with built-in boosting mechanism pulls out the core with about 1.8 times thrust force compared to a standard cylinder.

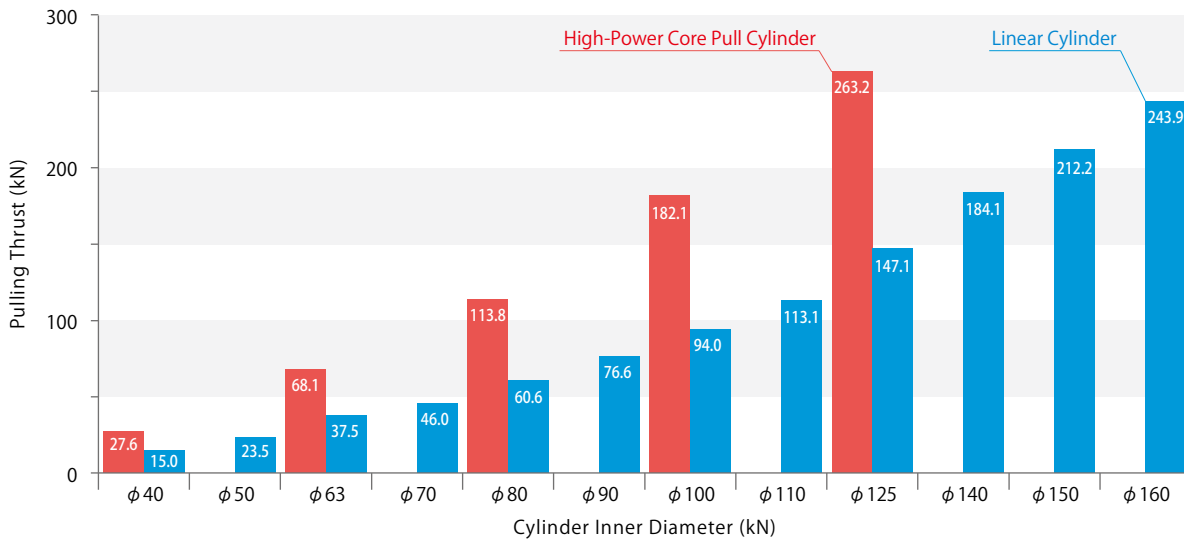
Push Side

● **Advantages**

When comparing cylinders with the same inner diameter,

High-Power Core Pull Cylinder exerts **about 1.8 times thrust force**

to **General Linear Cylinder**



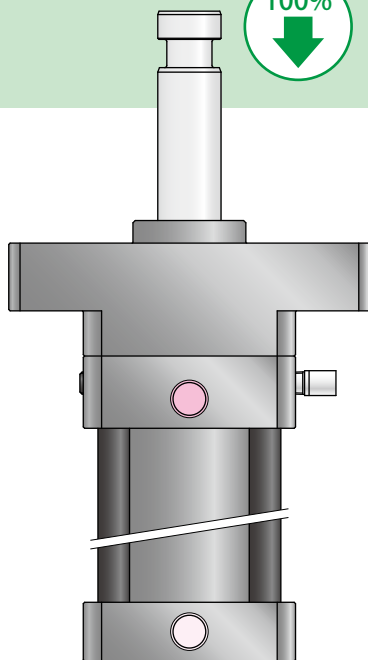
Pulling Thrust Comparison (Supply Hydraulic Pressure at 15MPa)

Boosting Stroke 10 mm

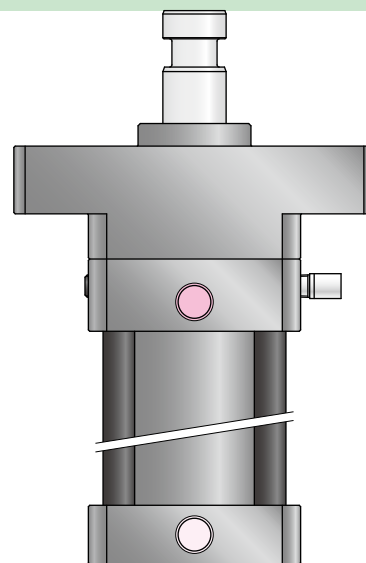


Stroke Thrust

Idle Stroke Range



Idle Stroke Range



Pulling Action Completed

After boosting stroke the cylinder operates by the piston with standard diameter.

Pull Side

When comparing cylinders with the same pulling thrust,

High-Power Core Pull Cylinder is **3 size smaller**

than **General Linear Cylinder**

For Example

General Linear Cylinder

Cylinder Inner Diameter ϕ 140 mm
 Pulling Thrust **184.1 kN**
 Weight About **80 kg**

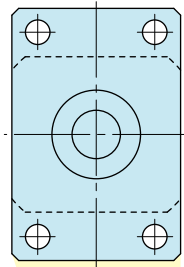
Cylinder Weight [※]

58%
Down!

High-Power Core Pull Cylinder

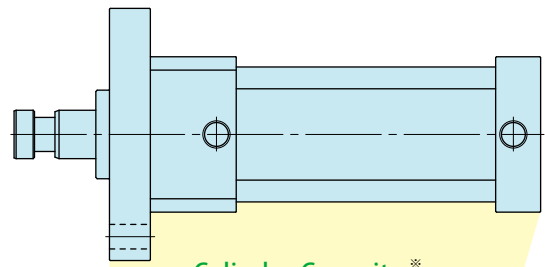
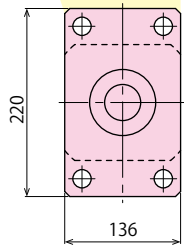
Cylinder Inner Diameter ϕ 100 mm
 Pulling Thrust **182.1 kN**
 Weight About **33.4 kg**

※ At 200mm Stroke



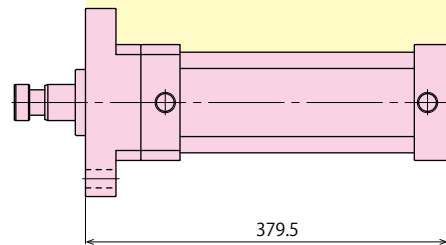
Projected Area

48%
Down!



Cylinder Capacity [※]

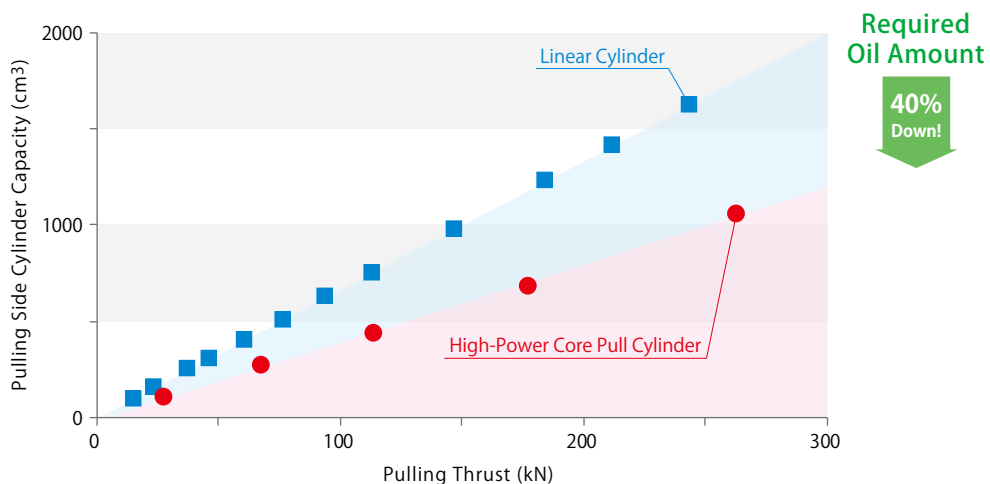
Push Side **49%**
Down!
 Pull Side **47%**
Down!



Advantages of Downsizing

Energy Saving

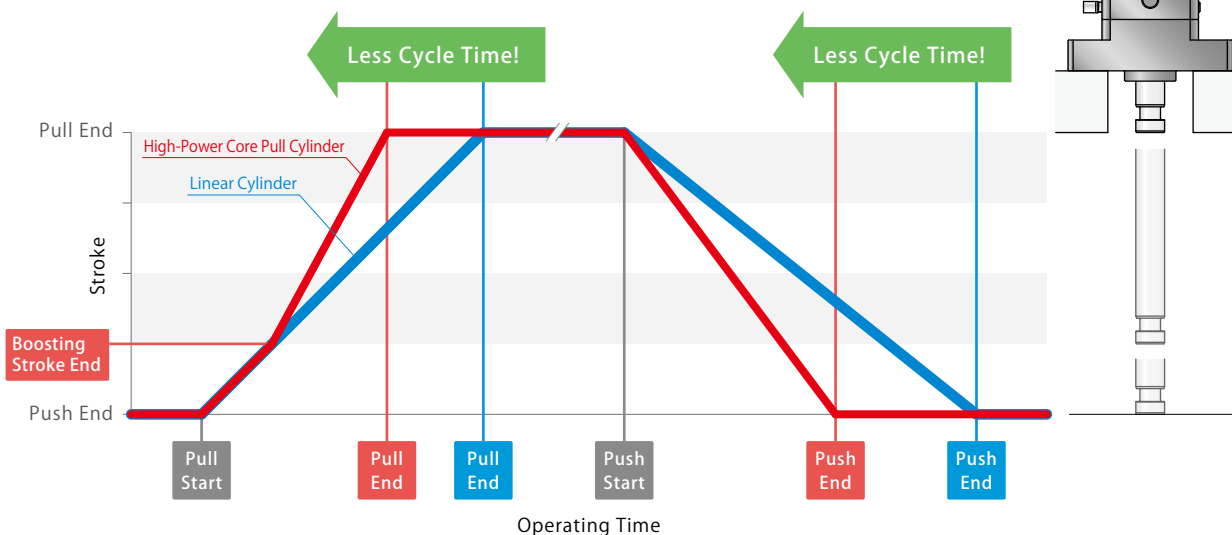
High-Power Core Pull Cylinder reduces approximately 40% of required oil amount compared to a linear cylinder with the same pulling thrust.



Pulling Side Cylinder Capacity Comparison (At 100 mm Stroke)

Cycle Time Reduction

High-power core pull cylinder with smaller cylinder capacity is high speed and cycle time can be reduced.



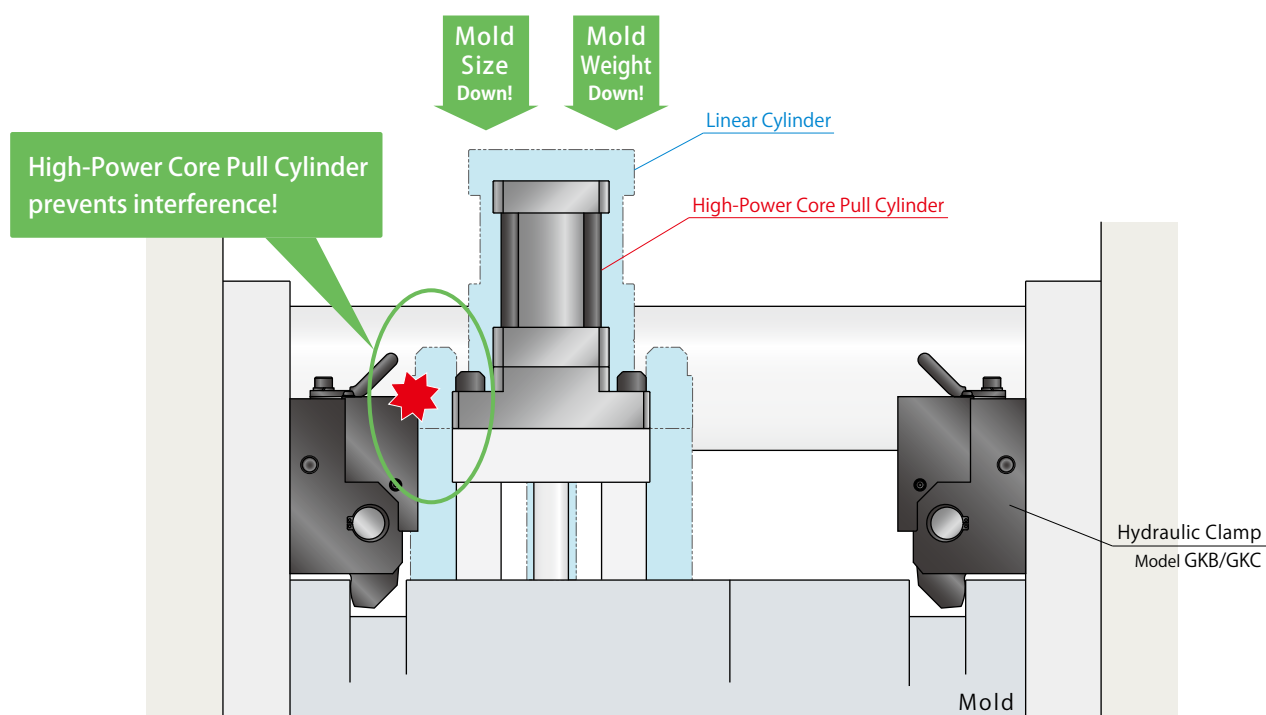
Operating Time Image (Compared to cylinder with the same pulling thrust.)

Space Saving • Light Weight

Downsizing of the core pull cylinder allows for smaller mold and light mold weight.

No Interference • Flexible Design

No interference with hydraulic clamp, coupler and connector allows for flexibility in mold designing.



Model No. Indication

PCA 100 0 - A C F - 150 - V - 0

1
2
3
4
5
6
7
8

1 Cylinder Inner Diameter

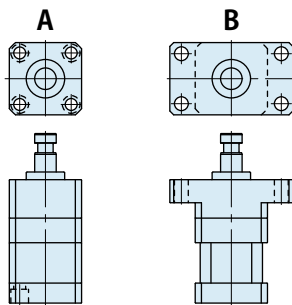
- 040** : φ 40 mm
- 063** : φ 63 mm
- 080** : φ 80 mm
- 100** : φ 100 mm
- 125** : φ 125 mm

2 Design No.

- 0** : Revision Number

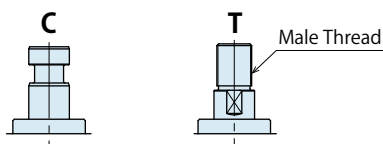
3 Mounting Shape

- A** : Compact Model (Flangeless)
- B** : Flange Model



4 Rod Shape

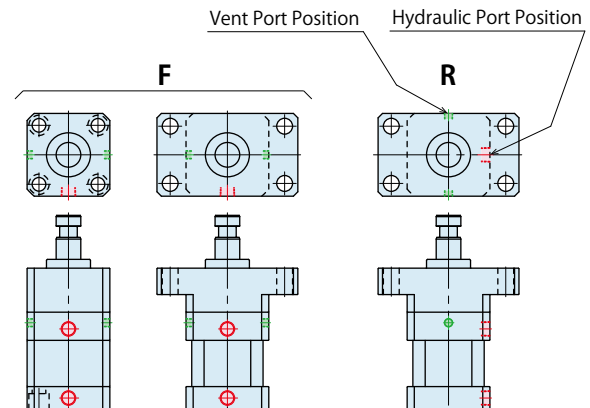
- C** : Coupling
- T** : Male Thread



※. Only **4 C** can be selected for **1 125**.

5 Port Position

- F** : Front
- R** : Side



※. Only **5 F** can be selected for **3 A**.

6 Stroke

- When selecting **1 040**、**3 A**
15 ~ 150 : Select from Full Stroke 15~150mm
- When selecting **1 040**、**3 B**
15 ~ 200 : Select from Full Stroke 15~200 mm
- When selecting **1 063/080/100/125**、**3 A**
15 ~ 200 : Select from Full Stroke 15~200 mm
- When selecting **1 063/080/100/125**、**3 B**
15 ~ 250 : Select from Full Stroke 15~250 mm

※. Select **6** Stroke in 5mm increments.

7 Operating Temperature

- N** : Standard 0 ~ 70 °C
- V** : High Temperature 0 ~ 120 °C

8 Usable Fluid

- 0** : General Hydraulic Oil (Equivalent to ISO-VG-32)
- G** : Water•Glycol
- S** : Silicon Oil
- F** : Fatty Acid Ester

※. Please refer to "Appropriate Fluid According to Packing Material".

Specifications

Model No.		PCA0400	PCA0630	PCA0800	PCA1000	PCA1250
Cylinder Inner Diameter	mm	φ40	φ63	φ80	φ100	φ125
Stroke (Every 5mm)	mm	15 ~ 200				
		15 ~ 250				
Cylinder ^{※1}	Push Side	1.26×Stroke	3.12×Stroke	5.03×Stroke	7.85×Stroke	12.27×Stroke
	Pull Side	1.00×Stroke+8.4	2.50×Stroke+20.4	4.04×Stroke+35.5	6.26×Stroke+58.7	9.81×Stroke+77.4
Capacity	cm ³					
Operating Pressure	MPa	15.0				
Max. Operating Pressure	MPa	16.0				
Min. Operating Pressure ^{※2}	MPa	1.0				
Withstanding Pressure	MPa	24.0				
Operating Temperature	°C	7 N: Standard 0 ~ 70 V: High Temperature 0 ~ 120				
Weight ^{※1}	kg	0.025×Stroke+4.5	0.050×Stroke+10.1	0.070×Stroke+17.2	0.096×Stroke+26.2	0.137×Stroke+44.3
		0.006×Stroke+4.5	0.013×Stroke+10.2	0.022×Stroke+17.0	0.034×Stroke+26.6	0.053×Stroke+45.5

Notes:

- ※1. The stroke in calculation of cylinder capacity and weight should be calculated in mm.
- ※2. Minimum pressure to operate the cylinder with no load.

Appropriate Fluid According to Packing Material

7 Operating Temperature	Packing Material	Appropriate Fluid			
		0: General Hydraulic Oil	G: Water·Glycol	S: Silicon Oil	F: Fatty Acid Ester
N: Standard 0 ~ 70 °C	Nitrile Rubber (NBR)	○	○	○	○
V: High Temperature 0 ~ 120 °C	Fluor Rubber (FKM)	○	△ ^{※3}	○	○

Notes :

- ※3. Please contact us when using 8 G : Water · Glycol with 7 V : High Temperature.
- 1. Please contact us for other conditions.

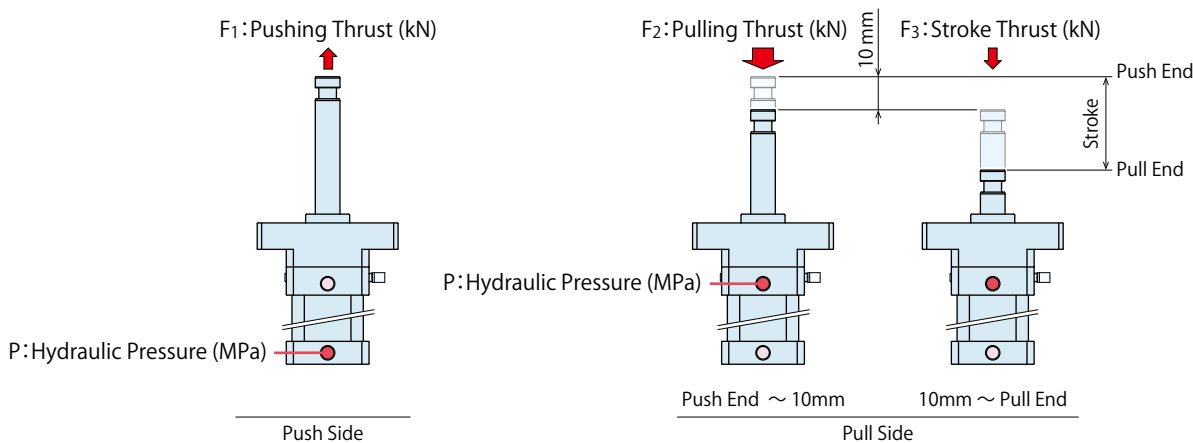
Ability

(kN)

Model No.		PCA0400	PCA0630	PCA0800	PCA1000	PCA1250	
Pushing Thrust	At P: 15MPa	18.8	46.8	75.4	117.8	184.1	
	Calculation Formula ^{※4}	F ₁ =1.25×P	F ₁ =3.12×P	F ₁ =5.03×P	F ₁ =7.85×P	F ₁ =12.27×P	
Pull Side	Pulling Thrust (Push End ~ 10mm)	At P: 15MPa	27.6	68.1	113.8	182.1	263.2
		Calculation Formula ^{※4}	F ₂ =1.84×P	F ₂ =4.54×P	F ₂ =7.59×P	F ₂ =12.14×P	F ₂ =17.55×P
	Stroke Thrust (10mm ~ Pull End)	At P: 15MPa	15.0	37.5	60.6	94.0	147.1
		Calculation Formula ^{※4}	F ₃ =1.00×P	F ₃ =2.50×P	F ₃ =4.04×P	F ₃ =6.27×P	F ₃ =9.81×P

Notes :

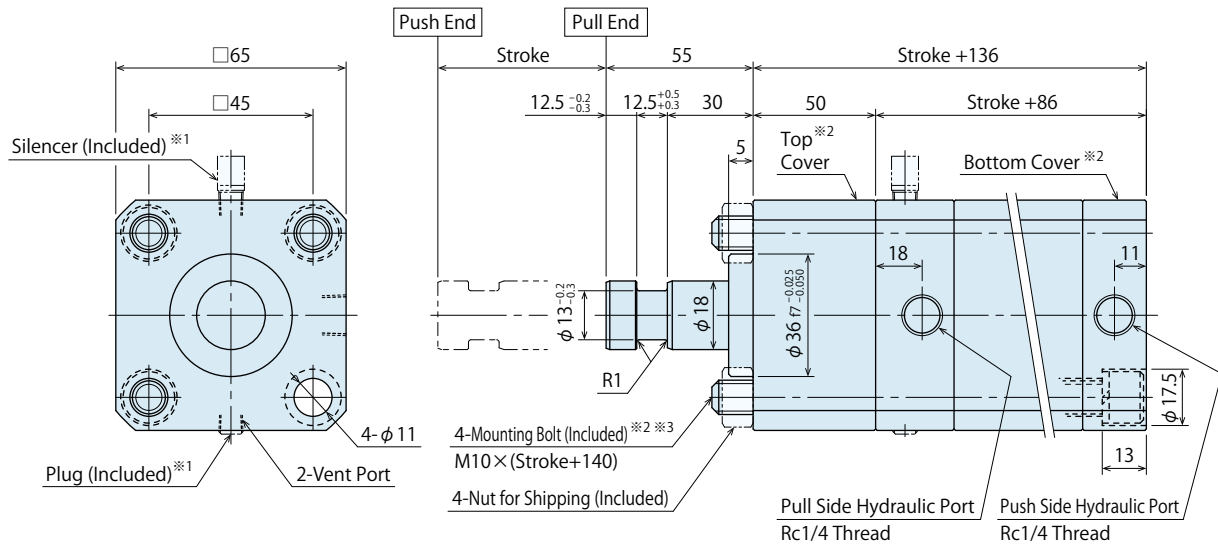
- ※4. F₁ : Pushing Thrust (kN)、F₂ : Pulling Thrust (kN)、F₃ : Stroke Thrust (kN)、P : Hydraulic Pressure (MPa)



External Dimensions : PCA0400

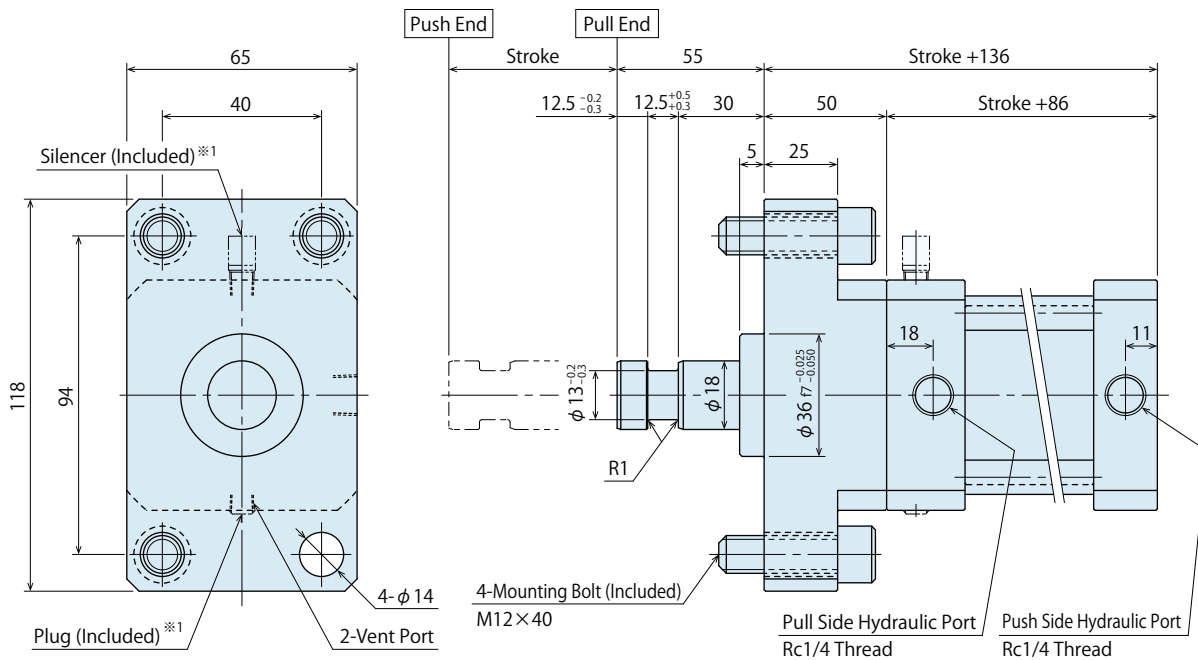
Mounting Shape **A**: Compact Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA0400-ACF.

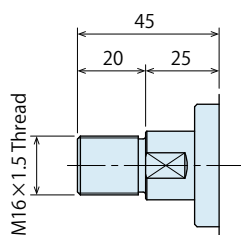


Mounting Shape **B**: Flange Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA0400-BCF.

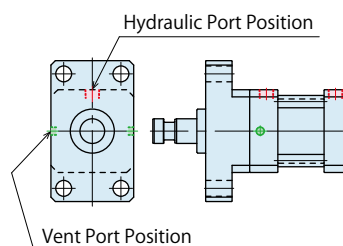


Rod Shape **T**: Male Thread



Port Position **R**: Side

(Only when selecting Mounting Shape **B**)



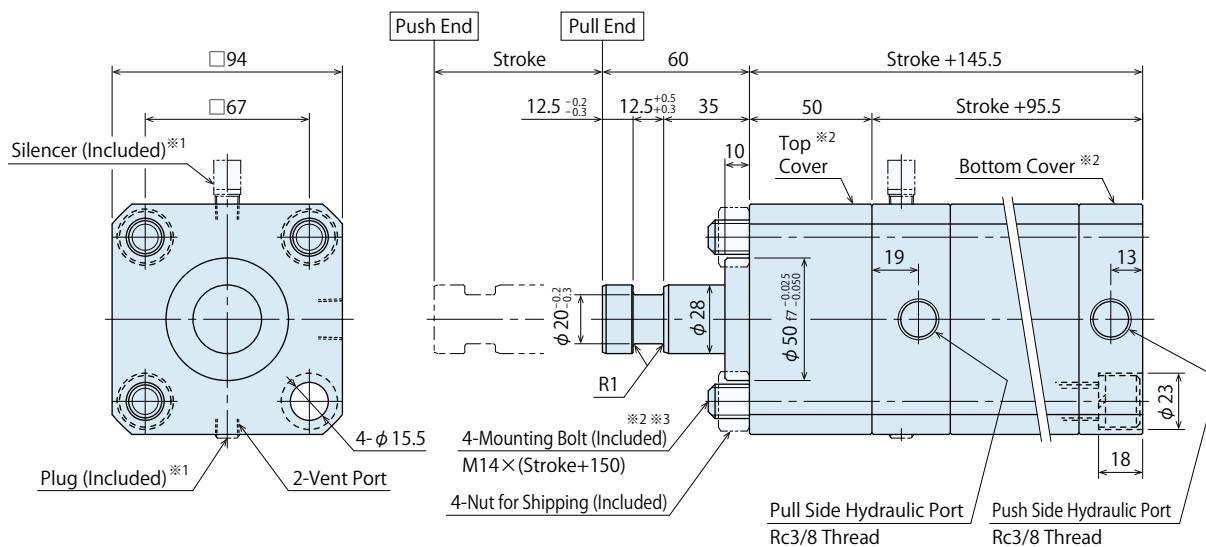
Notes :

- ※1. Mount the attached silencer and plug to the applicable vent port.
- ※2. The top cover and bottom cover of Mounting Shape **A** Compact Model are temporarily tightened. Pressure supply to the product without mounted on the mold leads to damages. Make sure to mount the product on the mold and tighten the attached bolts before pressure supply.
- ※3. Mounting bolt length of Mounting Shape **A** Compact Model is in 10mm increments with the number of units counted as one.

External Dimensions : PCA0630

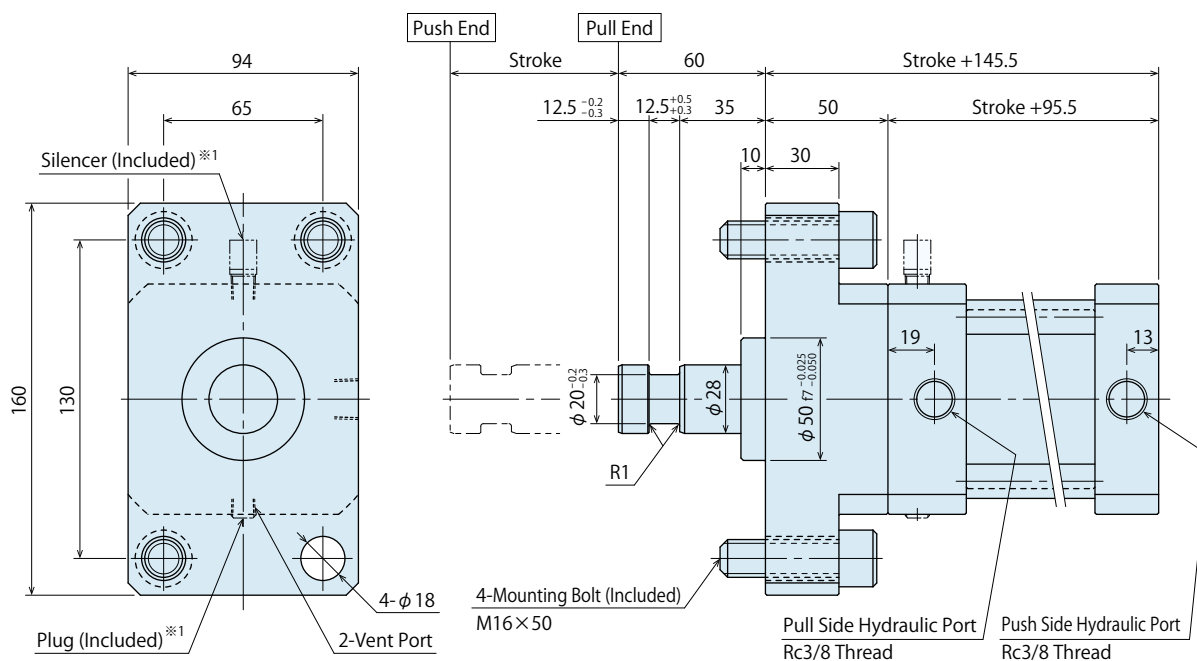
Mounting Shape **A**: Compact Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA0630-ACF.

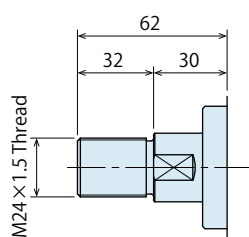


Mounting Shape **B**: Flange Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ ※ This drawing shows the pull end state of PCA0630-BCF.

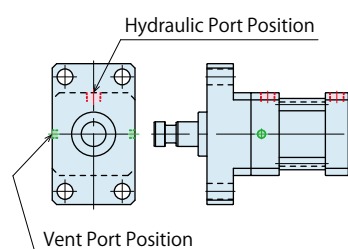


Rod Shape **T**: Male Thread



Port Position **R**: Side

(Only when selecting Mounting Shape **B**)



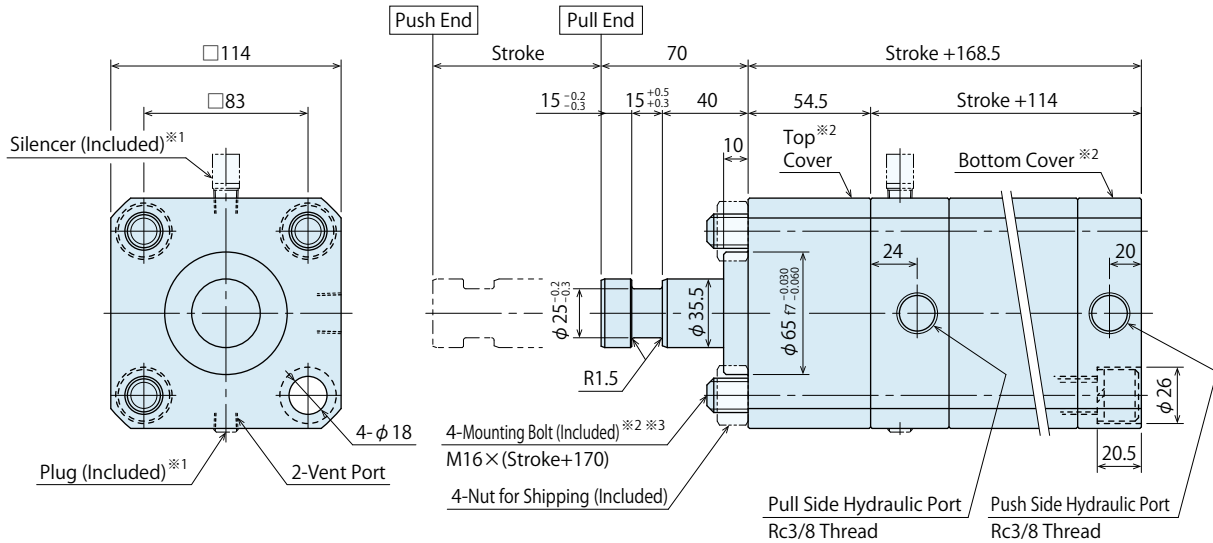
Notes :

- ※1. Mount the attached silencer and plug to the applicable vent port.
- ※2. The top cover and bottom cover of Mounting Shape **A** Compact Model are temporarily tightened. Pressure supply to the product without mounted on the mold leads to damages. Make sure to mount the product on the mold and tighten the attached bolts before pressure supply.
- ※3. Mounting bolt length of Mounting Shape **A** Compact Model is in 10mm increments with the number of units counted as one.

External Dimensions : PCA0800

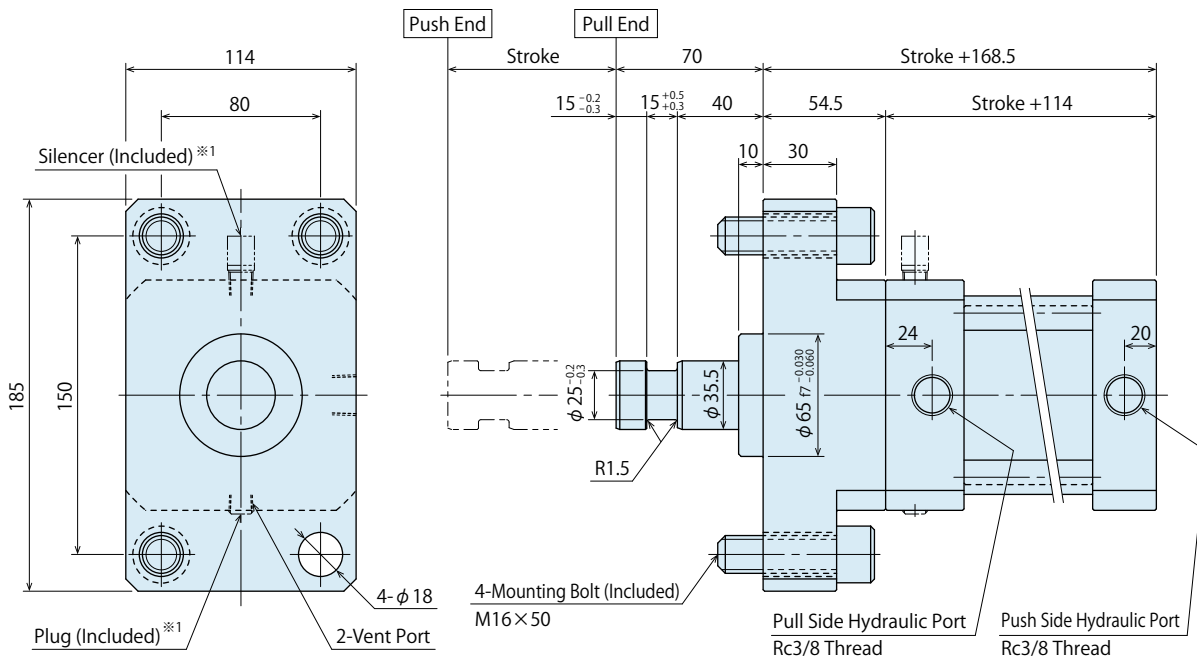
Mounting Shape **A**: Compact Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA0800-ACF.

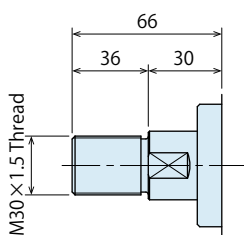


Mounting Shape **B**: Flange Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA0800-BCF.

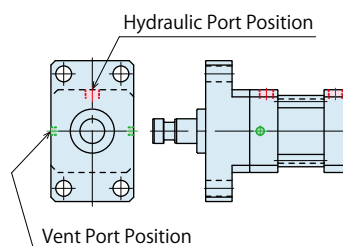


Rod Shape **T**: Male Thread



Port Position **R**: Side

(Only when selecting Mounting Shape **B**)



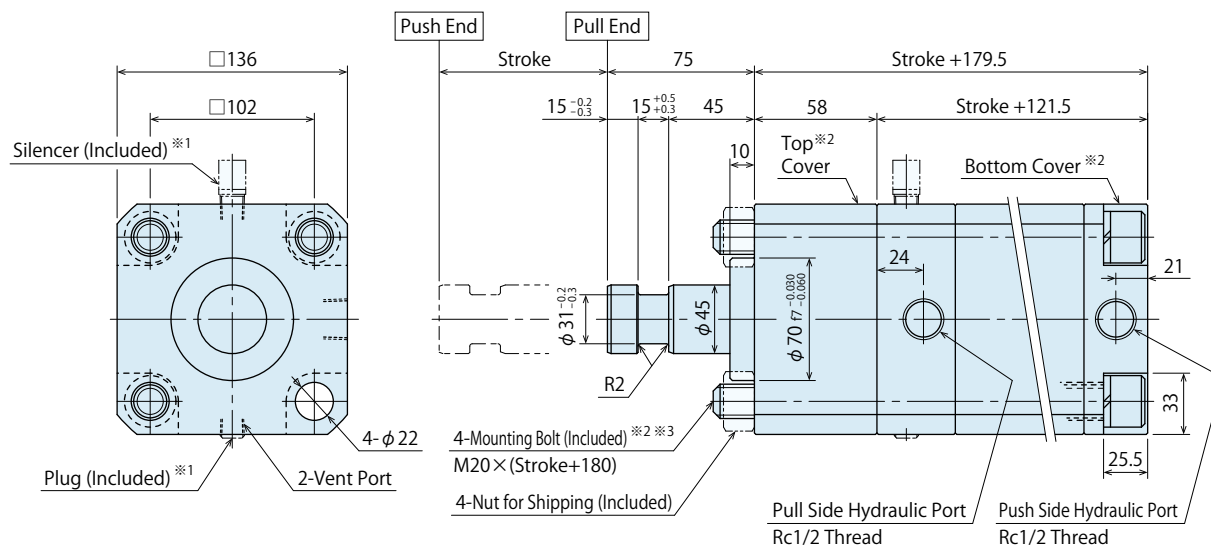
Notes :

- ※1. Mount the attached silencer and plug to the applicable vent port.
- ※2. The top cover and bottom cover of Mounting Shape **A** Compact Model are temporarily tightened. Pressure supply to the product without mounted on the mold leads to damages. Make sure to mount the product on the mold and tighten the attached bolts before pressure supply.
- ※3. Mounting bolt length of Mounting Shape **A** Compact Model is in 10mm increments with the number of units counted as one.

External Dimensions : PCA1000

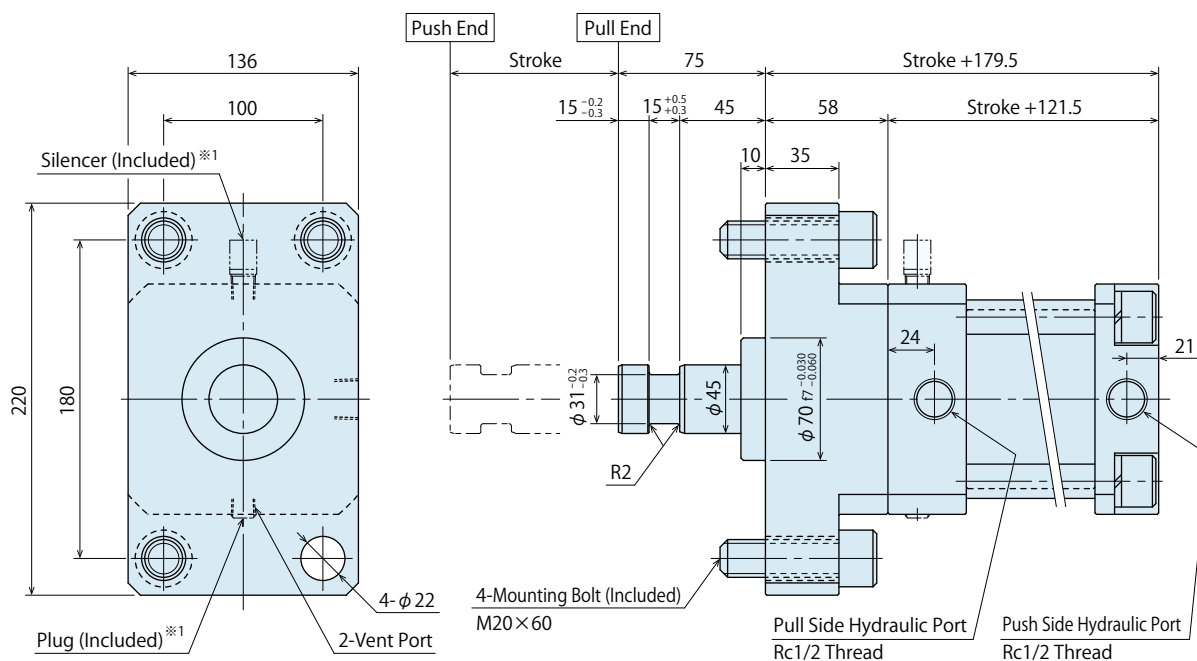
Mounting Shape **A**: Compact Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA1000-ACF.

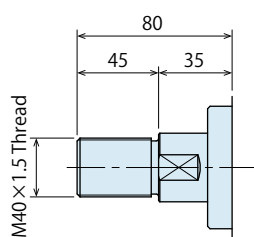


Mounting Shape **B**: Flange Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA1000-BCF.

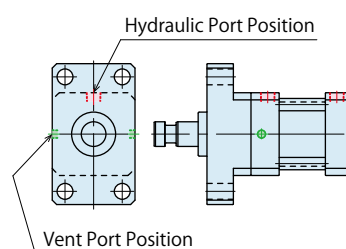


Rod Shape **T**: Male Thread



Port Position **R**: Side

(Only when selecting Mounting Shape **B**)



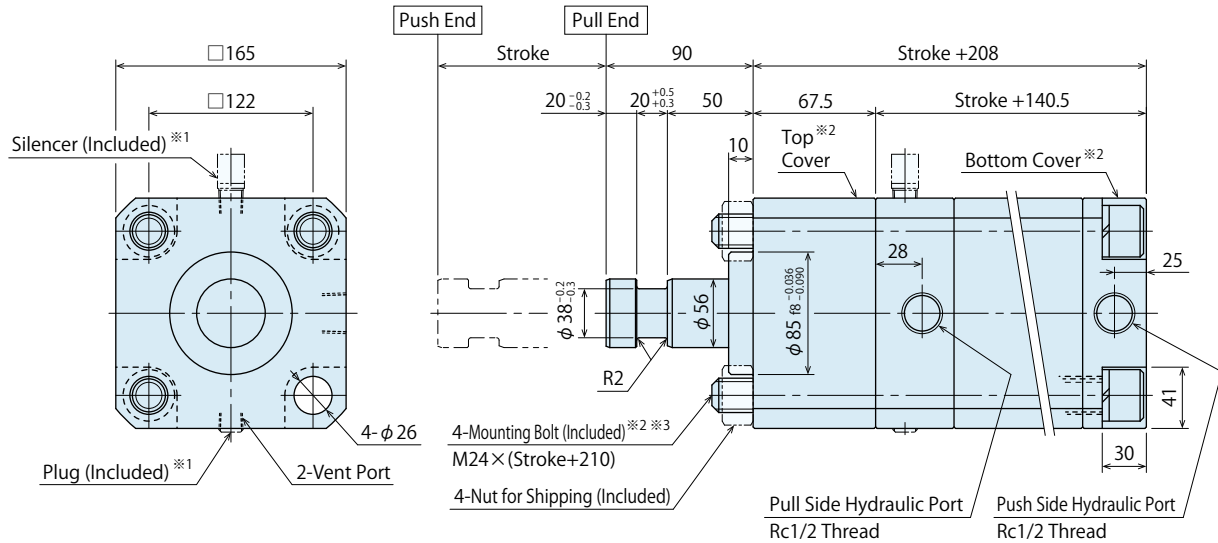
Notes :

- ※1. Mount the attached silencer and plug to the applicable vent port.
- ※2. The top cover and bottom cover of Mounting Shape **A** Compact Model are temporarily tightened. Pressure supply to the product without mounted on the mold leads to damages. Make sure to mount the product on the mold and tighten the attached bolts before pressure supply.
- ※3. Mounting bolt length of Mounting Shape **A** Compact Model is in 10mm increments with the number of units counted as one.

External Dimensions : PCA1250

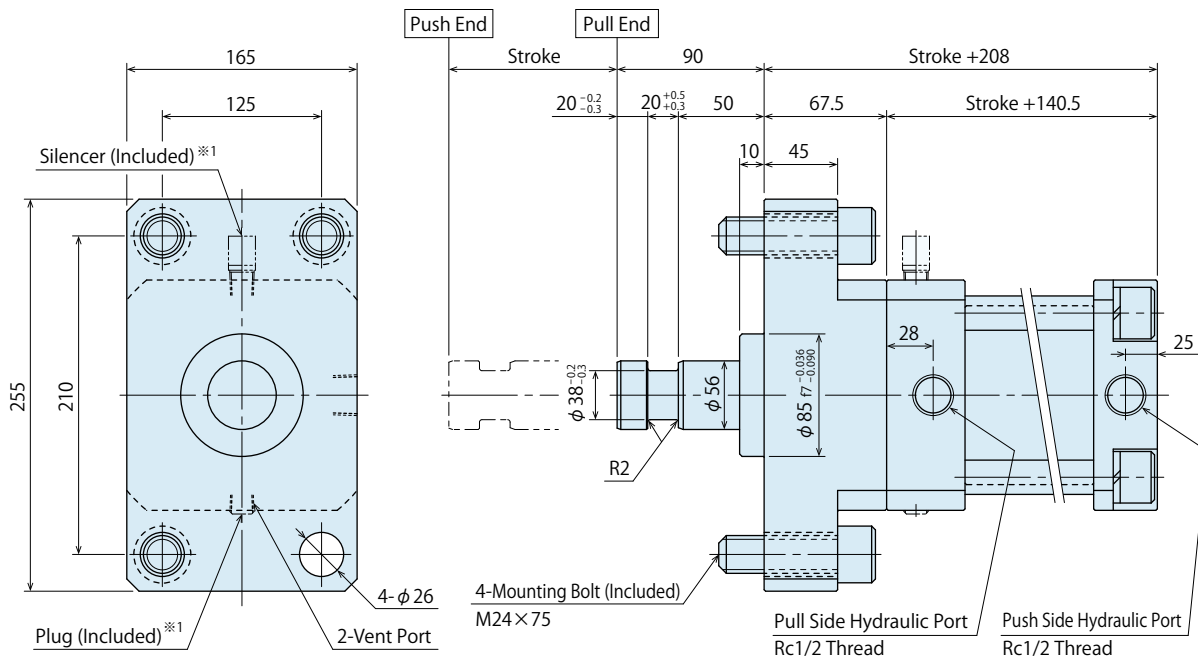
Mounting Shape **A**: Compact Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA1250-ACF.



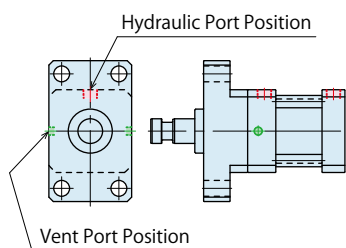
Mounting Shape **B**: Flange Model, Rod Shape **C**: Coupling, Port Position **F**: Front

※ This drawing shows the pull end state of PCA1250-BCF.



Port Position **R**: Side

(Only when selecting Mounting Shape **B**)

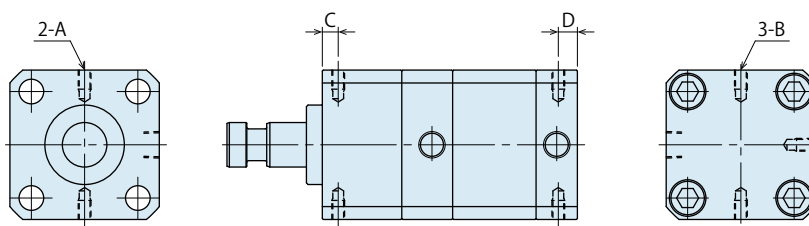


Notes :

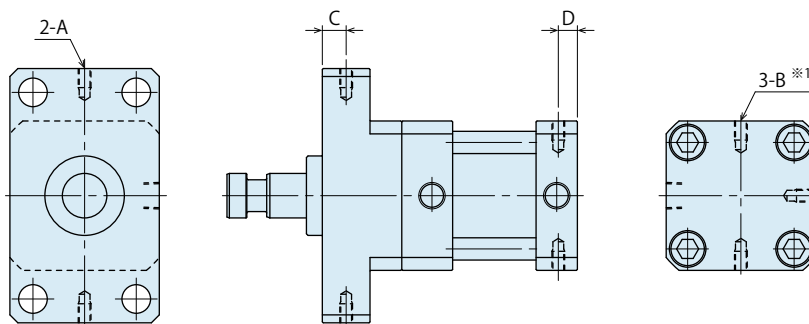
- ※1. Mount the attached silencer and plug to the applicable vent port.
- ※2. The top cover and bottom cover of Mounting Shape **A** Compact Model are temporarily tightened. Pressure supply to the product without mounted on the mold leads to damages. Make sure to mount the product on the mold and tighten the attached bolts before pressure supply.
- ※3. Mounting bolt length of Mounting Shape **A** Compact Model is in 10mm increments with the number of units counted as one.

● Tap Hole Position for Hanger Bolt

Mounting Shape A : Compact Model



Mounting Shape B : Flange Model



(mm)

Mounting Shape	Model No.	A	B	C	D
A Compact Model	PCA0800-A□□	M8×1.25 Thread Depth 15	M8×1.25 Thread Depth 15	10	15
	PCA1000-A□□	M10×1.5 Thread Depth 19	M10×1.5 Thread Depth 19	12	15
	PCA1250-A□□	M12×1.75 Thread Depth 23	M12×1.75 Thread Depth 23	14	20
B Flange Model	PCA0800-B□□	M8×1.25 Thread Depth 15	M8×1.25 Thread Depth 15	15	15
	PCA1000-B□□	M10×1.5 Thread Depth 19	M10×1.5 Thread Depth 19	18	15
	PCA1250-B□□	M12×1.75 Thread Depth 23	M12×1.75 Thread Depth 23	22	20

Notes :

1. PCA0400/0630 has no tap holes for hanger bolt.

※1. The tap hole position for hanger bolt of the push side hydraulic port is three sides other than the push side hydraulic port regardless of the port position.

● Options Please contact us for further information.

● Built-in Action Confirmation Switch

Magnetostrictive Sensor

High-Power Core Pull Cylinder with Built-in Magnetostrictive Sensor
 For Action Confirmation of Cylinder

Lead Switch Model

High-Power Core Pull Cylinder with Built-in Lead Switch
 For Action Confirmation of Cylinder

● Accessory Please contact us for further information.

● Limit Switch Unit

Install the limit switch unit on high-power core pull cylinder for action confirmation of cylinder.

Cautions

Notes for Design

- Check specifications.
 - Please use each product according to the specifications. Applying excessive load on the cylinder leads to deformation, galling and oil leak.
 - Since this product is used under various conditions, the suitability to the system should be decided by a hydraulic/pneumatic system designer or the person who decides specifications after an analysis and test as needed.
- Notes for Circuit Design
 - Please read "Notes on Hydraulic Cylinder Speed Control Unit" to assist with proper hydraulic circuit designing. Improper circuit design may lead to malfunctions and damages. (Refer to page 14)
 - Ensure there is no possibility of supplying hydraulic pressure to the push and pull ports simultaneously.
- Make sure no force outside the axial direction is applied to the rod.
 - Applying offset load on the rod leads to deformation, galling and oil leak.
- Please use it with extra stroke taken into consideration.
 - The ability of hydraulic cylinder is not fully exerted at the full stroke position (push end). (Pulling force is decreased to 80% ~ 85%.) Use it with extra stroke taken into consideration.
- Vent port must be open to the atmosphere.
 - Vent port must be open to the atmosphere for smooth cylinder operation. Make sure not to block the vent port when designing and mounting molds. Prevent the invasion of liquid from the vent port.

Installation Notes

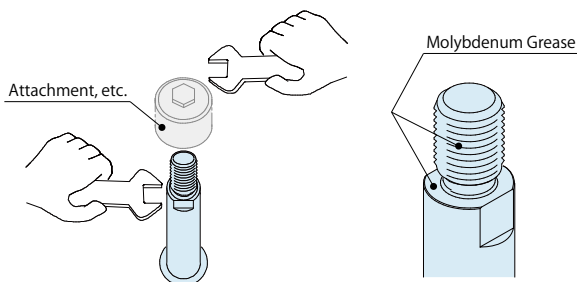
- Check the fluid to use.
 - Please use the appropriate fluid by referring to the Hydraulic Fluid List.
- Procedure before Piping
 - The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
 - The dust and cutting chips in the circuit may lead to oil leak and malfunction.
 - Our products, except some valves, are not equipped with protective function to prevent dust and cutting chips going into the hydraulic system and pipeline.
- Applying Sealing Tape
 - Wrap with tape 1 to 2 times following the screwing direction.
 - Pieces of the sealing tape can lead to oil leak and malfunction.
 - In order to prevent a foreign substance from going into the product during piping, it should be carefully cleaned.
- Cylinder Installation
 - Use four hexagon socket bolts and tighten them with the torque shown in the chart below. Installation failure leads to oil leak and deformation and damage of the cylinder.
- Trial Operation Method
 - There is a lot of air in the circuit just after installation. If high pressure with large flow rate is supplied under such condition, an action time will be extremely fast leading to severe damage on a cylinder. Make sure to perform running-in operation with low pressure with small flow rate and release the air in the circuit.
- Operating Speed Adjustment
 - Excessive operating speed of the cylinder may lead to wear-out or damage the internal components.
 - Install a speed control valve 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 cylinder leading to damage of a machine or device.
 - When controlling the speed with the flow control valve, make sure there is no excessively high pressure in the hydraulic circuit.
 - Speed control may not be conducted if there is excessive air in the hydraulic circuit.
 - The viscosity of fluid will decrease when its temperature increases. This will slow the operating speed of the cylinder. Adjust the speed under the proper temperature condition.
- Air Bleeding in the Hydraulic Circuit
 - If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.
 - Reduce hydraulic pressure to less than 2MPa.
 - Loosen the cap nut of pipe fitting closest to the cylinder by one full turn.
 - Wiggle the pipeline to loosen the outlet of pipe fitting. Hydraulic fluid mixed with air comes out.

Mounting Shape	Model No.	Thread Size	Strength Grade	Tightening Torque (N·m)
A Compact Model	PCA0400-A□□	M10	12.9	50
	PCA0630-A□□	M14	12.9	125
	PCA0800-A□□	M16	12.9	200
	PCA1000-A□□	M20	12.9	400
	PCA1250-A□□	M24	10.9	630
B Flange Model	PCA0400-B□□	M12	12.9	80
	PCA0630-B□□	M16	12.9	200
	PCA0800-B□□	M16	12.9	200
	PCA1000-B□□	M20	12.9	400
	PCA1250-B□□	M24	10.9	630

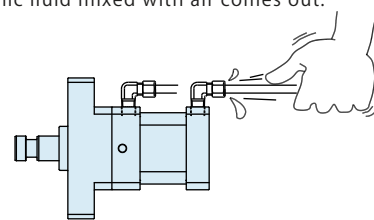
- Top cover and bottom cover of mounting shape **A** compact model are temporarily tightened. Pressure supply to the product without mounted on the mold leads to damages. Make sure to mount the product on the mold and tighten the attached bolts before pressure supply.

Attachment Installation

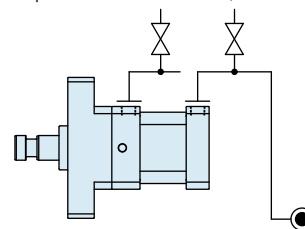
- For using rod shape **T** : Male Thread, when mounting and removing the attachment, stop the piston with a spanner or adjustable wrench at edge. In order to stabilize tightening axial force, apply molybdenum grease on the thread part and seating surface. (Grease is applied before shipment.)
Installation failure leads to deformation and damage of the clamp. Make sure to conduct routine inspection to maintain secure tightening.



Rod Shape	Model No.	Head Thread Size	Tightening Torque (N·m)
T Male Thread	PCA0400-□T□	M16×1.5	95
	PCA0630-□T□	M24×1.5	350
	PCA0800-□T□	M30×1.5	730
	PCA1000-□T□	M40×1.5	1390



- Tighten the cap nut after bleeding.
- It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit. (Set an air bleeding valve at the highest point inside the circuit.)



Checking Looseness and Retightening

- At the beginning of installation, bolts may be tightened lightly. Check torque and re-tighten as required.

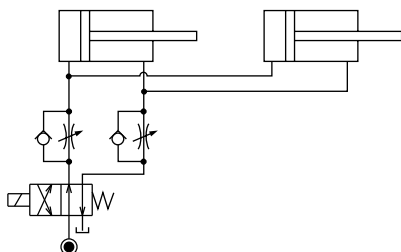
Notes on Hydraulic Cylinder Speed Control Circuit

Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

1) Speed Control Circuit

- For speed control it should have meter-in circuits for both the push and pull sides. In the case of meter-in circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply.

【Meter-in Circuit】

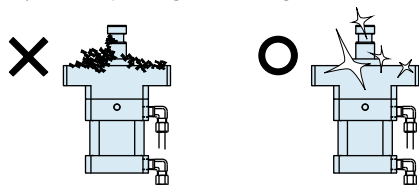


Notes on Handling

- It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- Do not handle or remove the product unless the safety protocols are ensured.
 - The machine and equipment can only be inspected or prepared when it is confirmed that the preventative devices are in place.
 - Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the pressure and power supply and make sure no pressure exists in the hydraulic · air circuit.
 - After stopping the machine, do not remove until the product cools down.
 - Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

Maintenance/Inspection

- Removal of the Machine and Shut-off of Air Source
 - Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the pressure source and power source and make sure no pressure exists in the hydraulic · air circuit.
 - Make sure there is no abnormality in the bolts and respective parts before restarting.
- Regularly clean the area around the cylinder.
 - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunction and oil leak.



Warranty

- Warranty Period
 - The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.
- 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.
 - If the stipulated maintenance and inspection are not carried out.
 - If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.

Hydraulic Fluid List

- Please use appropriate fluid referring to the fluid lists below.
- Appropriate fluid differs depending on materials of cylinder packing. Check the appropriate fluid on specifications.

General Hydraulic Oil ISO Viscosity Grade ISO-VG-32

Maker	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New Mighty Super 32
ExxonMobil	Mobil DTE 24	Mobil DTE 24 Light
Matsumura Oil	Hydol AW-32	-
Castrol	Hyspin AWS 32	-

Water · Glycol ISO Viscosity Grade ISO-VG-32

Maker	Water · Glycol
JX Nippon Oil & Energy	Hyrando FRZ32
Cosmo Oil	Cosmo Fluid HQ46
Matsumura Oil	Hydol HAW32

Silicon Oil ISO Viscosity Grade ISO-VG-68

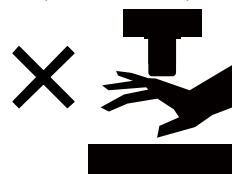
Maker	Silicon Oil
Shin-Etsu Chemical	KF-50-100cs

Fatty Acid Ester

Maker	Fatty Acid Ester	ISO Viscosity Grade
Showa Shell Sekiyu	Shell Iru Fluid DU56	(ISO-VG-56)
Idemitsu Kosan	Firgist ES	ISO-VG-68
JX Nippon Oil & Energy	Hyrando S556	(ISO-VG-56)
Cosmo Oil	Cosmo Fluid E46	ISO-VG-46
Nippon Quaker Chemical	QUINTOLUBRIC® 822-200	ISO-VG-46

Note: As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

- Do not touch cylinders while they are working. Otherwise, your hands may be injured.



- Do not disassemble or modify it.
 - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.
- Please do not pour water / oil over the product.
 - It may lead to malfunction or deterioration of the product and cause an accident.
- If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
- Regularly tighten bolts and pipe line and mounting bolts to ensure proper use.
- Make sure the hydraulic fluid has not deteriorated.
- Make sure there is smooth action and no abnormal noise.
 - Especially when it is restarted after being left unused for a long period, make sure it can be operated properly.
- The products should be stored in the cool and dark place without direct sunshine or moisture.
- Please contact us for overhaul and repair.

KOSMEK

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- FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.
- SPECIFICATIONS IN THIS LEAFLET ARE SUBJECT TO CHANGE WITHOUT NOTICE.



<http://www.kosmek.co.jp>