Non-Leak Valve Unit

Model **BC**

Electric control type non-leak hydraulic valve unit. Various choices of circuits and combinations.

Directional control valve that actuates the non-leak valve by switching internal air solenoid valve with electric control. It maintains pressure and prevents a die from falling even when pressure supply is cut from hydraulic pressure source.

- **Ensures safety with the pressure switch**

  The pressure switch detects pressure reduction in case of accident such as hydraulic hose damage, and immediately stops the press machine.

- **Maintains the set pressure with the pressure relief valve** ※ Only when selecting pressure relief valve option.

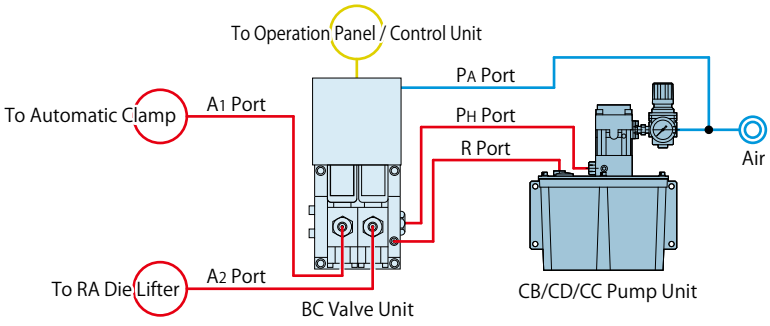
  Even if oil temperature rises by continuous operation of the press machine, the pressure relief valve maintains the set pressure 24.5 $^{+2.45}_{0}$ MPa.

- **Free Layout**

  Hydraulic pressure is easily supplied and controlled with CB/CD/CC pump unit. Since the pump unit and non-leak valve unit are separated, it is more free to layout than the united type CP/CR/CS unit.

- **Application Example**

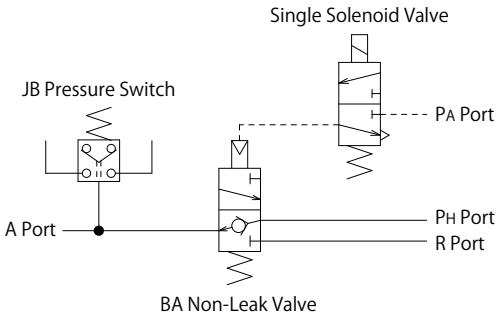
  The drawing shows when controlling automatic clamp and RA die lifter separately used in the combination with two-circuit BC valve unit.



Circuit Symbol

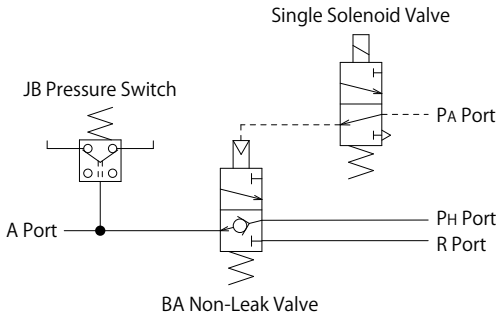
● **C** : Single Solenoid Circuit for Clamp (Normal Open)

Clamp locks under non-power distribution.



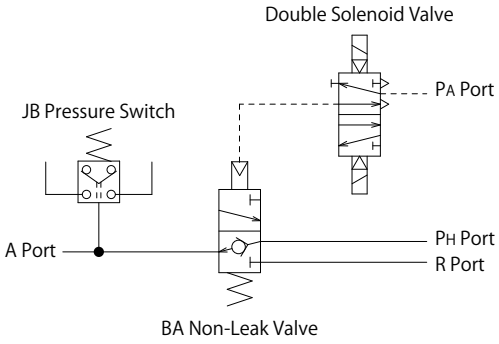
● **D** : Single Solenoid Circuit for Die Lifter (Normal Close)

Die lifter retracts under non-power distribution.



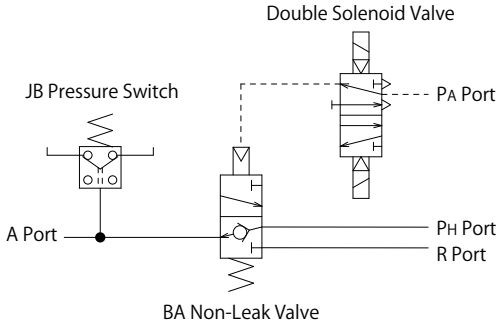
● **U** : Double Solenoid Circuit for Clamp

Clamp maintains the condition under non-power distribution.



● **V** : Double Solenoid Circuit for Die Lifter

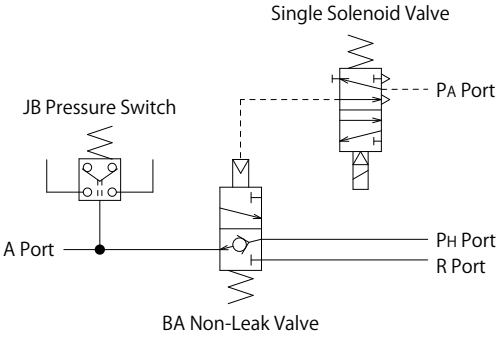
Die lifter maintains the condition under non-power distribution.



● **G** : Single Solenoid Circuit for Clamp (Normal Open)

Clamp locks under non-power distribution.

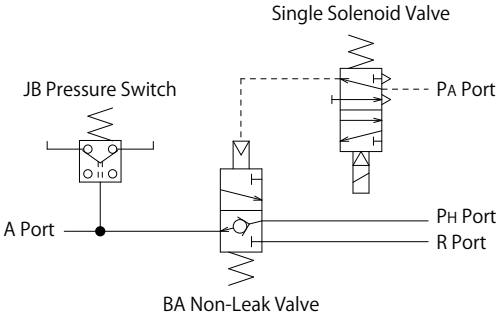
Select this option when using it with **U** circuit.



● **H** : Single Solenoid Circuit for Die Lifter (Normal Close)

Die lifter retracts under non-power distribution.

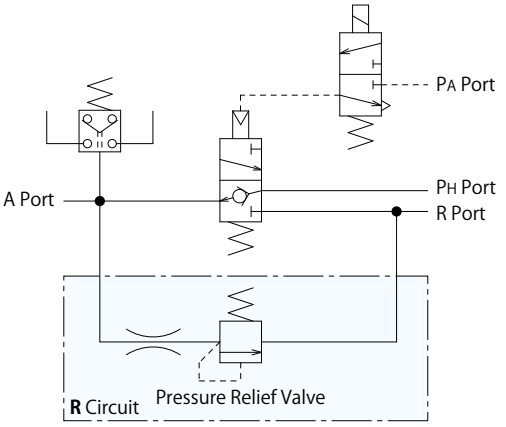
Select this option when using it with **U** circuit.



● **R** : Pressure Relief Valve

Pressure relief valve maintains the set pressure : $24.5\ ^{+2.45}_{0}$ MPa even when oil temperature rises.

The drawing below shows the state that R circuit (with pressure relief valve) is combined with C circuit.



Notes

1. PA Port : Air Source
   PH Port : Hydraulic Source
   R Port : Drain Port
   A Port : To Automatic Clamp or RA Die Lifter
2. Filters are built in PH and A port.
3. Please contact us for circuits other than shown in the drawing.

Clamp Hydraulic Unit Operation Control Panel
Die Lifter Pre-Roller
Accessories
Cautions Company Profile
Clamp
GA
GD
GB
GE
GP
GN
Hydraulic Unit
CP
CR
CS
Pump Unit
CB
CD
CC
Valve Unit
BC
BH
MV
Operational Control Panel
YP
YA

Model No. Indication

BC00 [N] [1] - [CRCR] - [1] [0] - [GR] [P]

1 2 3 4 5 6 7

1 Working Pressure Code

M : 24.5 MPa Without Pressure Relief Valve
N : 24.5 MPa With Pressure Relief Valve ※1

2 Design No.

1 : Revision Number

3 Circuit Symbol

C : Single Solenoid Circuit for Clamp (Normal Open)
D : Single Solenoid Circuit for Die Lifter (Normal Close)
U : Double Solenoid Circuit for Clamp
V : Double Solenoid Circuit for Die Lifter
G : Single Solenoid Circuit for Clamp (Normal Open)※2
H : Single Solenoid Circuit for Die Lifter (Normal Close)※2
R : Pressure Relief Valve ※1

Notes
※1. When choosing 1 Working Pressure Code **N** : With pressure relief valve,
please select 3 Circuit Symbol **R**:Pressure relief valve after circuit symbol which requires pressure relief valve.
(Ex.) When choosing three circuits C, C, D
With three pressure relief valves on every circuit : BC00N1-CRCRDR-□-□
With pressure relief valves only on C circuits : BC00N1-CRCRD-□-□
No pressure relief valve on circuits : BC00M1-CCD-□-□
※2. Please select 3 Circuit Symbol **G**, **H** only when using it with circuit symbol **U**.

4 Control Voltage

1 : AC 100 V
2 : AC 200 V
3 : AC 110 V
4 : AC 220 V
5 : DC 24 V

5 Fluid Code

0 : General Hydraulic Oil (Equivalent to ISO-VG-32)
S : Silicon Oil
G : Water-Glycol

6 Option

Blank : Standard (Piping Block on the Right)
GR : Primary Pressure Gauge on the Right (Piping Block on both side)
GL : Primary Pressure Gauge on the Left (Piping Block on both side)
H : Piping Block on both side (P_H Port)

7 Unit of Pressure Gauge

Blank : MPa (Standard)
N : PSI (used only in USA)/ NPT-Thread Fitting
P : PSI (used only in USA)/ Rc-Thread Fitting

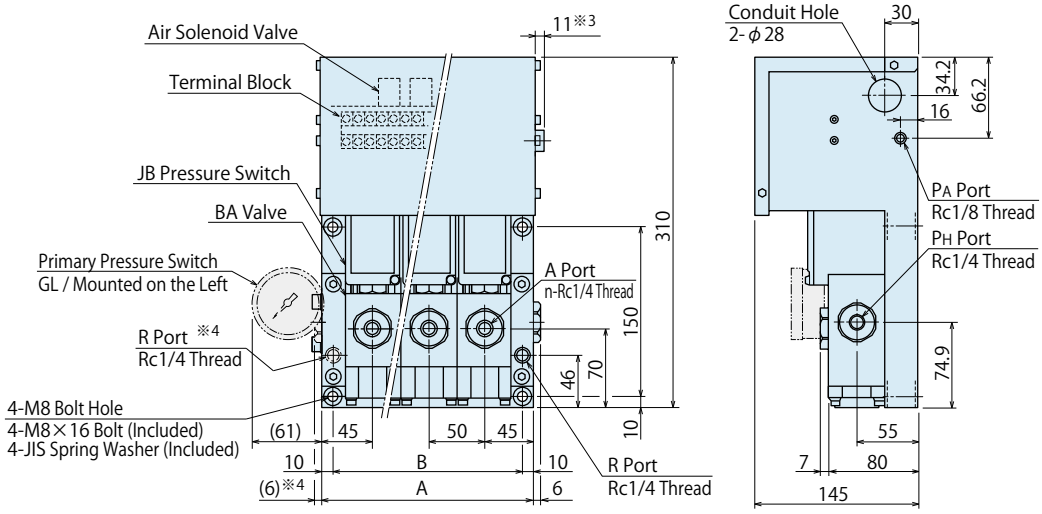
Specifications

Model No.			BC00M1-□-□-□	BC00N1-□R-□-□
Working Hydraulic Pressure			24.5 MPa	
Withstanding Pressure			36.8 MPa	
Operating Temperature			0 ～ 70 ℃	
Use Frequency			Less than 2.5 min. /cycle	Less than 20 cycles/day
Main Components	Non-Leak Valve	Model No.	BA5011-0	BA5011-0 / BA5R11-0 (With Pressure Relief Valve)
		Orifice	12.6 mm^2 (PH Port → A Port)	52.8 mm^2 (A Port → R Port)
	Pressure Switch (For Clamp)	Model No.	JB2800-M0	
		Operation Mode / Set Pressure	Pressure Increase Detection / INC. 17.6 MPa	
	Pressure Switch (For RA Die Lifter)	Model No.	JB1000-M0	
		Operation Mode / Set Pressure	Pressure Decrease Detection / DEC. 2.94 MPa	
	Pressure Relief Valve	Model No.	-	BR5N11-0
		Set Pressure	-	24.5 $^{+2.45}_{0}$ MPa

Notes

1. Please contact us for other special fluids.
2. If fluid viscosity is higher than specified, action time will be longer.
3. If using it at low temperature action time will be longer because of high viscosity of hydraulic oil.
4. Be sure to set an automatic drain air filter when air contains a large amount of moisture, or air supplying pipe is located at the end.
5. Operating pressure should be no more than working hydraulic pressure in the specification.
   If using it at higher temperature than working hydraulic pressure, it leads to damage.

External Dimensions



(mm)

Valve Number of Connection (n)	1	2	3	4
A	90	140	190	240
B	70	120	170	220

Notes

※3. Dimension when choosing circuit symbol **U**, **V**, **G**, **H**.
※4. Dimension when choosing Option **H**：piping block on both side (PH port).

Cautions

Notes on Installation (Cautions for Hydraulic Series)

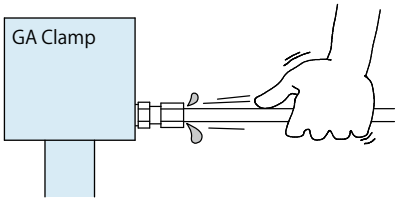
1) Check the fluid to use
- Please use the appropriate fluid by referring to the Hydraulic Fluid List.
- If hydraulic oil with viscosity grade higher than ISO-VG-32 is used, action time would be longer.
- If using it at low temperature, action time will be longer because the viscosity of hydraulic oil becomes higher.

2) 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 fluid leakage 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.

3) Applying sealing tape
- Wrap with tape 1 to 2 times following the screwing direction.
- Pieces of the sealing tape can lead to air leaks and malfunction.
- In order to prevent a foreign substance from going into the product during piping, it should be carefully cleaned.

4) Air bleeding in the hydraulic circuit
- If the hydraulic circuit has excessive air, the action time may become very long.
  After installing the hydraulic circuit, or if the pump run out of oil, be sure to bleed air by the following step.

① Reduce hydraulic supply pressure to less than 2MPa.
② Please loosen the cap nut of pipe fitting that is closest to clamps・RA die lifters by one full turn.
③ Wiggle the pipeline to loosen the outlet of pipeline fitting. The hydraulic fluid mixed with air comes out.



④ Tighten the cap nut after bleeding.
⑤ It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit.

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

Hydraulic Fluid List

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	

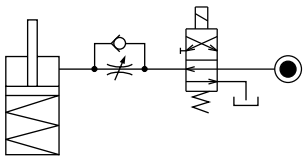
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Cautions
Notes on Installation (For Hydraulic Series)
Hydraulic Fluid List
Speed Control Circuit of Hydraulic Cylinder & Notes
Notes on Handling
Maintenance / Inspection
Warranty
Company Profile
Company Profile
Our Products
History
Sales Office

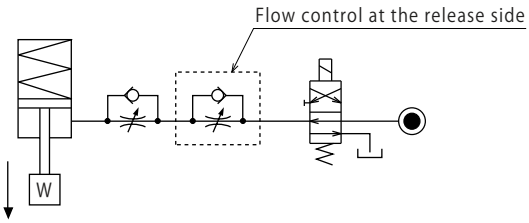
Speed Control Circuit of Hydraulic Cylinder and Notes

If the hydraulic cylinder speed is controlled, the circuit should be designed with the following points taken into consideration. Review these notes prior to installation as the wrong circuit design may lead to machine malfunction and damage.

● Flow control circuit for single acting cylinder.
For spring return type single acting cylinders, restricting flow during release can extremely slow down or prevent release action. The preferred method is to control the flow during the lock action and use a valve that has free-flow in the release direction. Also, it is preferred to provide a flow control valve at each actuator.

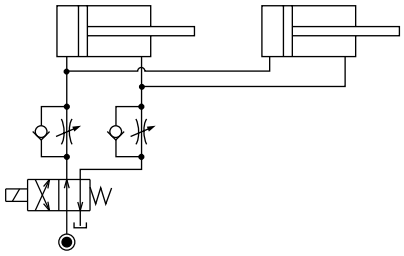


If the release action is accelerated by excessive hydraulic flow the cylinder may sustain damage. In this case add flow control to regulate flow.

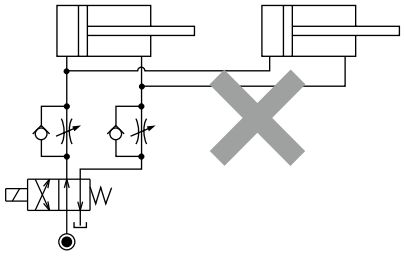


● Flow control circuit for double acting cylinder.
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

【Meter-out circuit】

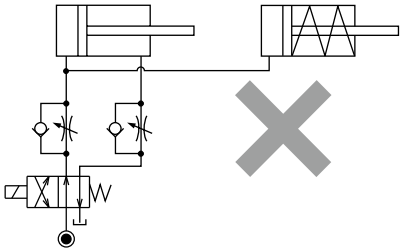


【Meter-in circuit】



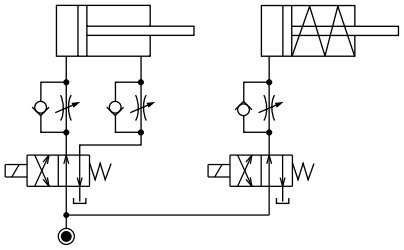
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

① Single acting components should not be used in the same flow control circuit as the double acting components. The release action of the single acting cylinders may become erratic or very slow.

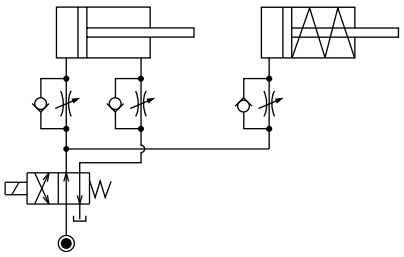


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

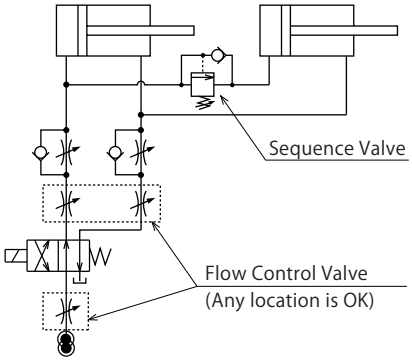
○Separate the control circuit.



○Reduce the influence of double acting cylinder control unit. However, due to the back pressure in tank line, single action cylinder is activated after double action cylinder work.



② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection, if the back pressure is more than the set pressure then the system will not work as it is.



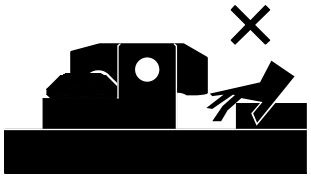
Cautions

Notes on Handling

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

2) Do not handle or remove the machine unless the safety is ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
② Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
③ After stopping the machine, do not remove until the temperature cools down.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch clamps (cylinders) while they are working. Otherwise, your hands may be injured.

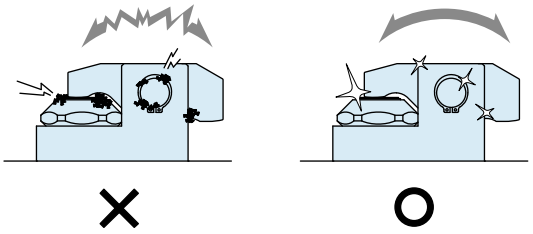


4) Do not disassemble or modify it.
- If the equipment is taken apart or modified, the warranty will be void even within the warranty period.

Maintenance・Inspection

1) Removal of the machine and shut-off of pressure source
- Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

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



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

4) Regularly tighten bolts and pipe line, mounting bolts, nuts, circlips and cylinders to ensure proper use.

5) Make sure the hydraulic fluid has not deteriorated.

6) Make sure there is smooth action and no abnormal noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated properly.

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

8) 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 operator judgment, resulting in defect.
③ If it is used or handled in inappropriate way by the operator.
(Including damage caused by the misconduct of a 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 Defects caused by natural disasters or calamities not attributable to our company.
⑦ Parts expenses or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

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

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