NACOL

ACCUMULATOR CATALOGUE 2024

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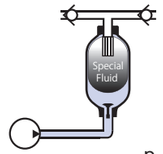

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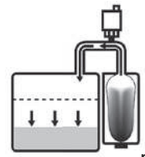
L series (Dynaclean)



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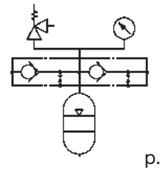
Reciprocating Nitrogen Gas Compressor



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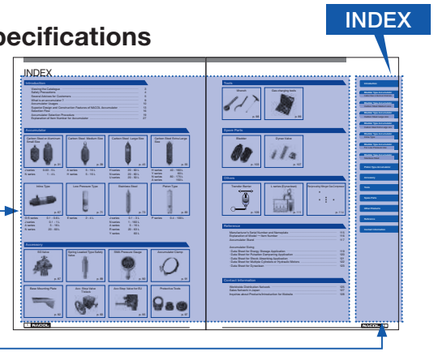
Viewing the Catalogue

How to search for products

● Searching by product name or specifications

- Search for the desired product from the Table of Contents (see pages 1 to 2)
- Searching from the Index
  You can also search from the Index at the right side of the catalogue.



● When deciding the desired product

We introduce a flow chart for selecting the appropriate accumulator.

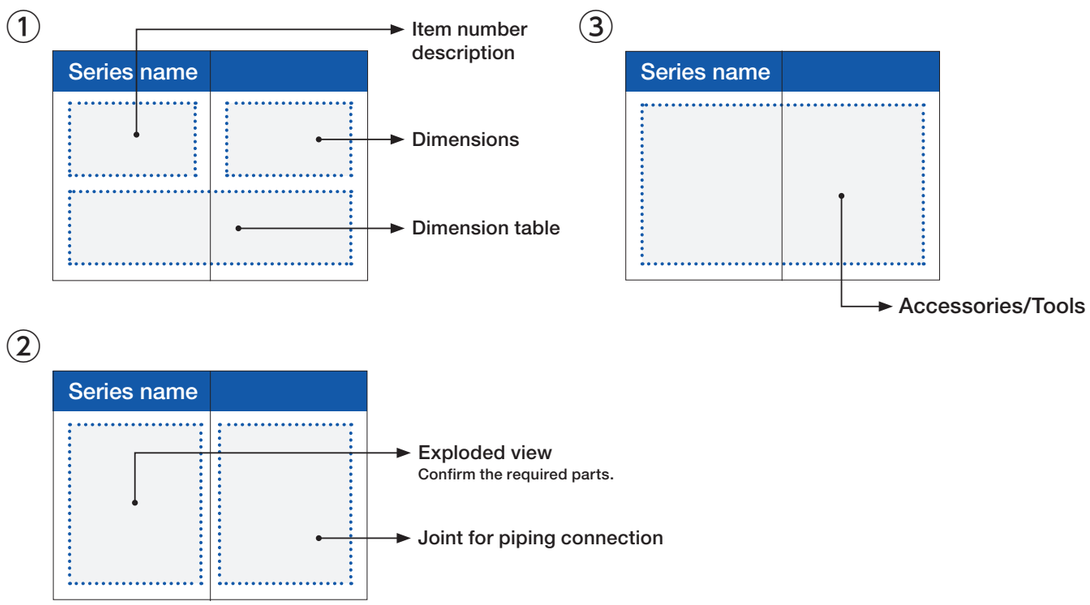
Continued on page 16.

● When searching from the product you have

Search after referring to the Manufacturer's Serial Number and Name Plate (see page 115) and Item Number Descriptions (see page 27), and after confirming the item number from the name plate attached to the product.

Viewing product information

Product pages (see from page 31 on), describe a single series in 3-page sets. (With the exception of some products)



Safety Precautions

In order to prevent damage to the lives, health, or property of our users and those around them, please adhere to the notices shown by the symbols.
The following explains the extent of injury and the damage if our products are treated improperly.

⚠ DANGER	: Indicates an imminent hazardous situation that, if not avoided, could result in death or serious injury.
⚠ WARNING	: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
⚠ CAUTION	: Indicates a hazardous situation that, if not avoided, could result in minor injury or cause damage to the accumulator or its parts in use.

⚠ DANGER

● Do not charge OXYGEN to avoid explosion. Charge the product with NITROGEN GAS only.
● Attach a pressure regulator to the nitrogen gas bottle. If the maximum allowable working pressure of the accumulator or pressure gauge is lower than the filling pressure of the nitrogen gas bottle, they could be damaged.

⚠ WARNING

● Neither this warning nor notes cover all the cases. Before using the product, read the instruction manual carefully, and always think of safety first.

● In order to use products safely, please strictly follow all the related laws and regulations of the installation destination.

● Use the products at pressure below the maximum allowable working pressure.
- If the product is used at pressure higher than the maximum allowable working pressure (highest available pressure) indicated on it, the product could be damaged.
- Install a pressure relief valve in hydraulic circuits, and use the accumulator and its fittings at pressure below the maximum allowable working pressure of them.

● Do not weld, cut or grind any parts of the products.
- There is a possibility to damage each equipment when our products (except the welding flange) are given any thermal processing such as welding etc., or any machine works such as cutting and grinding etc.

● Use the same thread size.
- If the unmatched threads (specification, diameter and pitch) are connected, there is a possibility that the thread parts are damaged while the pressure is rising up.

● Fasten the accumulator with clamps.
- The accumulator shall be fastened properly with plural clamps.
- If the accumulator moves or vibrates in the different directions to the piping or stand, the piping and/or the connection area between the accumulator and hydraulic piping could be damaged.
- After adjusting the axial lines of the Oil Port Valve Assembly and the hydraulic piping on a straight line, connect the accumulator body and the piping, and fix them in a way that the excessive stress cannot be applied on the each connection parts.
- Fixing forcibly, a load could be applied to the piping and the oil port valve assembly, causing damage or leakage.

● Do not use products in a corrosive environment.
- All products could be damaged when used in a corrosive environment.
- If parts with rusted or damaged screws are used, the screw parts could be damaged when the pressure rises.

● The precautions described in the instruction manuals and the precautions displayed on the products do not anticipate or assume all possible dangers. Therefore, operation, maintenance, and inspection of the products should not be limited to the matters described in the instruction manuals or displayed on the products, but should be the responsibility of the operator and should be fully considered for safety measures.

● Before disassembling, release the fluid and gas charging pressures down to an atmospheric pressure.
- If the pressure in the accumulator is not released down to an atmospheric pressure before the accumulator is disassembled, serious injuries could be caused by not only the liquid and nitrogen gas but also the scattered parts.

● Do not heat products.
- The pressure of nitrogen gas charged to the accumulator will rise as the temperature rises. If the gas pressure in the accumulator exceeds the maximum allowable working pressure by heat, the accumulator could be damaged.

● Use our special hanging tool to hang the accumulator.
- Hanging the accumulator with a wire or a rope may cause it to fall.

● When charging or discharging nitrogen gas, use protective equipment, such as gloves, safety shoes, safety glasses, and ear plugs. Keep your face away from the discharging port of nitrogen gas, and work with proper ventilation. In places where ventilation is not possible, connect a gas hose to the three-way valve, extend it outside, and release nitrogen gas from the hose.
- If the nitrogen gas is discharged with your face leaning toward the discharging port, the energy from the high pressure gas, the scattered dust, or the noise could cause injury.
- Discharging nitrogen gas in an airtight, underground pit or a small room could cause an oxygen deficiency.
- Discharging high-pressure nitrogen gas lowers temperatures, which causes the accumulator and gas charging 3-way valve, etc., to become cold.

● Before discarding the product, disassemble it completely so that it cannot be reassembled.
- Before discarding accumulators, discharge all the fluid and nitrogen gas completely down to an atmospheric pressure, remove the fluid, and disassemble the product. After confirming that those parts cannot be reassembled, hand over them to a licensed industrial waste service provider.

Several Advices for Customers

Notice to be paid when Accumulator selection is made.

1. At Accumulator sizing.

- Please add "Oil leak amount" and "Compressed liquid volume" upon "Required oil discharge volume (Vw)".
- Pressure loss amount which will occur between pump and Accumulator shall be deducted from the "Maximum working pressure (P3)", and the pressure loss amount which may occur between Accumulator and actuator shall be added upon "Minimum working pressure (P2)".
- Please make gas precharging (P1) at the pressure to suit "Working temperature range", refering to the "Calculation Example" of page 22.
- When designing the energy saving hydraulic circuit with an accumulator, it is important to install a pressure switch and to make the ON-OFF power of pump.

2. At Accumulator item number selection.

- Please select Accumulator which has enough specification such as allowable maximum working pressure and allowable oil flow speed to satisfy the concerned circuit specification.
- Please select Accumulator with suitable metalic and chemical material parts to meet the system fluid and working temperature.
- When you use fire resistant fluid (Water Glycol Fluid, HWBF and Phosphate Ester Fluid), please select Accumulator which inside surface is not coated.
- Prolonged use at the maximum working temperature will accelerate deterioration of the bladder.
  As a guideline, please use the temperature below 80% (70% when placed horizontally) of the maximum working temperature.

Notice to be paid previous to working Accumulator.

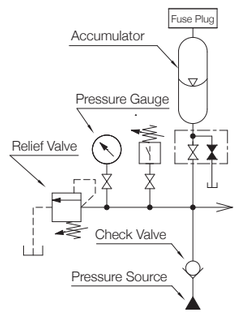
- Before Accumulator operation, please read "Accumulator Handling and Maintenance Manual" attentively and understand the contents of the manual fully.
- Accumulator is a pressure vessel. For using the accumulator, follow the notice on the maintenance manual.

Notice to be paid when Accumulator is installed.

- When connecting the Accumulator to piping, please select the joint and the valve which diameter is suitable for the required flow rate.
- Vertical installation with the oil port valve side down is most preferable for setting direction of Bladder Type Accumulator, but can be installed at an angle between vertical and horizontal. Bladder Type Accumulator cannot be placed upside-down.
- Piston Type Accumulator does not have any limits for setting direction.
- Care must be paid when Bladder Type Accumulator is installed horizontally as when installed this way, the "Maximum Allowable Oil Flow Speed" and "Allowable Compression Ratio" of the Accumulator decrease.
- Space axially above Accumulator is required in 300 mm approximately at the least for Accumulator maintenance purpose.
- When Accumulator is to be installed in a piping end, the fluid which goes into/out from it may not circulate well, and the fluid temperature in it may rise, and the bladder and the seals lifetime may become short. Please arrange the circuit where the service fluid circulates well.

⚠ WARNING · Accumulator coating at the time of shipment from NACOL is for temporary purpose. So, please treat suitable rust-prevention treatment to suit the environment.

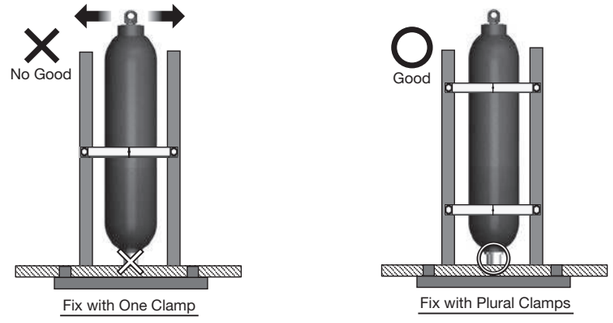
⚠ WARNING · Set relief valve between Accumulator and check valve as shown by the circuit sketch right side. Then, set the relief pressure lower than Accumulator maximum allowable working pressure.



Warning for Accumulator Installation

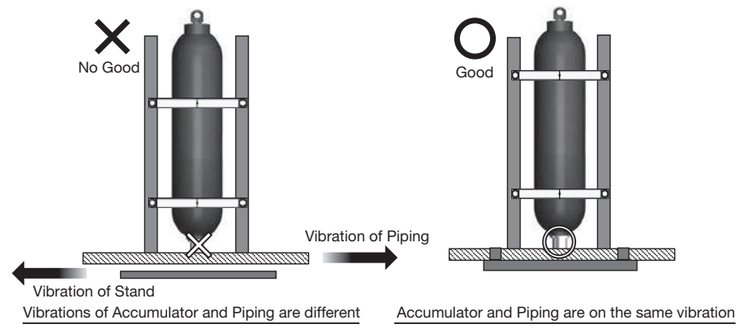
1. Fasten the accumulator with plural clamps.

- The accumulator shall be fastened properly with plural clamps.
  Applying excessive force may cause damage or leakage.



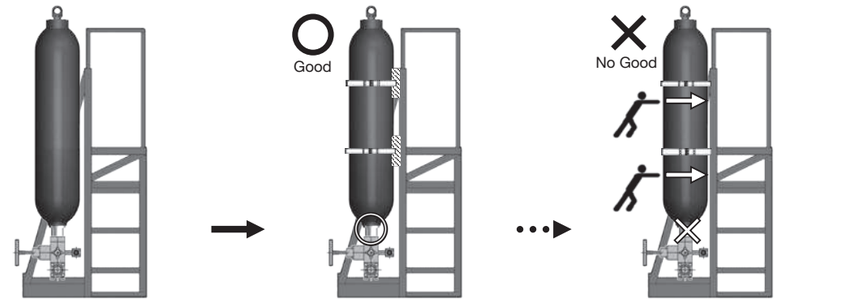
2. Fix the accumulator and the hydraulic piping on the same stand which has sufficient rigidity.

- If the accumulator moves or vibrates in the different directions to the piping, the load may be applied to the piping and/or the oil port valve, and they may be damaged.
  Use the stand which has sufficient load bearing capacity and rigidity.

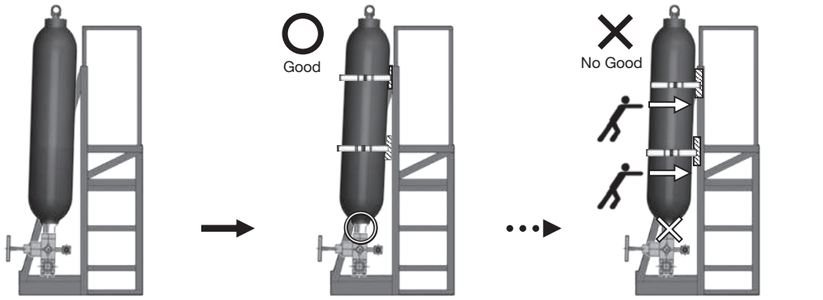


3. When fixing the accumulator on the stand, pay attention to the mounting method of clamps.

- If there is an interspace between the accumulator and the stand, do not fill the gap forcibly by clamps and fix it.
  Fill the interspace with spacers etc., and be careful not to apply excessive force.
  If the gap is forced out and it is fixed, load may be applied to the piping part or the oil port valve, and it may become the cause of failure or leakage.



Several Advices for Customers



When the back space of accumulator is not constant.

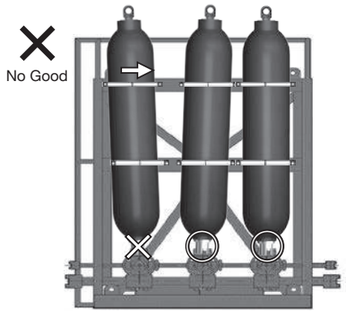
Good

By putting in the spacers which are in accord with interspace, excessive force is not applied to the accumulator.

No Good

Excessive force is applied to oil port valve etc., when accumulator is tightened with the spacers which are not in accord with interspace.

Excessive force is applied to oil port valve etc., if flange connection is done in the condition that the accumulator is pushed to the stand.



No Good

The accumulator has leaned.
The center of clamps has shifted.
By tightening of clamps, the bending moment generates in oil port valve etc.

If there is no appropriate interspace between the accumulator and the stand, do not push the accumulator to the stand by force, but redo construction. If it is fixed by force, load may be applied to the piping part or the oil port valve, and it may become the cause of failure or leakage.

Periodically confirm the tightness of the clamps, the ring nut, and the fixing tools for pipes and tighten them.

Notice to be paid at Gas Charging.

- Accumulator is not charged with nitrogen gas at the time of shipment from NACOL, in consideration of safety and also fatigue to bladder which may occur while transported. Please see "Accumulator Handling and Maintenance Manual " for further details.
  Please do gas precharging with nitrogen gas just before Accumulator operation **upto calculated pressure taking the temperature change into account**. (See page 20)
- Please use Gas Charging Tools after flashing them through with nitrogen gas. If not flashed, the dust may be transfered from these tools to Accumulator gas valve and may cause gas leak from the Accumulator gas valve. Please take off Gas Charging Tools from the Accumulator after gas charging as gas leak may be caused through these tools when left attached to the Accumulator. Then please keep the Gas Charging Tools in a case protecting them from dust and dirt.

Notice to be paid when operating Accumulator.

⚠ WARNING

- Hydraulic systems that incorporate gas-loaded accumulators shall automatically vent the accumulator liquid pressure or positively isolate the accumulator when the system is shut off. (from ISO 4413-2010)
- Please do not use Accumulator constantly with gas precharging pressure surpassing the minimum working pressure of the hydraulic system, as such condition may lead to premature bladder failure and oil port valve assembly parts breakages.
  Also, please do not leave gas precharged Accumulator unused or leave it precharged while Accumulator hydraulic circuit is stopped and left for more than one month.
- When one of the following phenomena can be seen, please stop the hydraulic system and check the precharged gas pressure after relieving the system pressure.
  - The pressure gauge needle in the Accumulator circuit begins to flutter suddenly.
  - Oil charge time becomes unusually short.
  - Movement of actuater becomes unordinarily slow.
  - Vibration or noise from pipe increases abnormally.
  - Level of hydraulic liquid in reservoir ascends or descends abnormally.

Notice for maintenance job.

- After one week of use, and then annually thereafter, please perform “gas pressure measurement” to check for leaks and appearance, and record the results.
  After measuring the gas pressure, adjust the excess or deficiency of the gas charging pressure in consideration of the temperature change.
  The measurement period may be shortened depending on the operating conditions such as the fluid used, operating temperature, and operating cycle.
  Please use the gas pressure measurement record to review the measurement period.

Notice to be paid when doing disassembly, assembly, and discarding.

- When fluid reservoir is installed in a position higher than Accumulator, please do maintenance jobs first closing Accumulator fluid stop valve and drain valve. When the hydraulic service fluid remains in the accumulator body, please remove it before bladder insertion.
- When you insert new bladder, please check that there are no abnormalities (rust, crack, corrosion, wear, and deformation) in each part. If there are any abnormalities, please replace the part to new one before the insertion of new bladder. Also, please insert new bladder after applying hydraulic service fluid to the outside surface of bladder.

Foreign Exchange and Foreign Trade Law, Japan

- Please contact our company when the order items and/or the quotation items are for the usages such as military weapon, nuclear power, and weapons of mass destruction. If the usages are for these purposes, the export shall be made after obtaining approval of the Japanese Ministry of Economy, Trade and Industry. Moreover, please do not deal with the enterprise and/or organization on the Foreign Users List provided by the Japanese Ministry of Economy, Trade and Industry.

What is an accumulator?

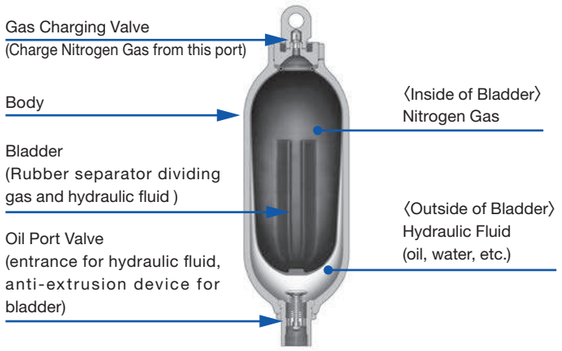
The accumulator is a pressure vessel (container) storing the pressurised hydraulic fluid (oil, water, etc.).

Function of Accumulator

Utilizing the compressibility of gas and the incompressible character of hydraulic fluid, the accumulator stores and discharges the fluid following the demand for fluid by the hydraulic system.
The accumulator is used for the various purposes in various kinds of industrial machines/facilities.
The usage is mainly classified into the following four categories.

1. Energy Storage	Speed Up/ Size Down of Pump / Electric Power Saving
2. Pressure Keeping	Leakage Compensation / Temperature Compensation / Counter Balance
3. Pulsation Absorption	Attenuation of the pressure pulsations created by the hydraulic pump.
4. Shock Dampening	Elimination of shock wave generated by closing of shutoff valve on hydraulic circuit or from conduct by the actuator.

Construction of Accumulator



Mechanism of Accumulator Operation

① Before Operation

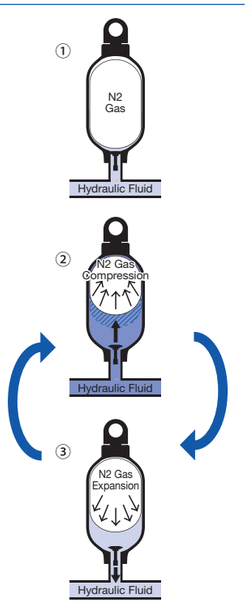
This is the state just the nitrogen gas has been precharged.
When the hydraulic pressure is lower than the precharged nitrogen gas pressure, the bladder expands fully in the accumulator body.

② Energy Storing Up

When the hydraulic pressure becomes higher than the precharged nitrogen gas pressure, the nitrogen gas is compressed and energy is stored.
(The slashed area of right figure shows usable stored oil volume.)

③ Stored Energy Release

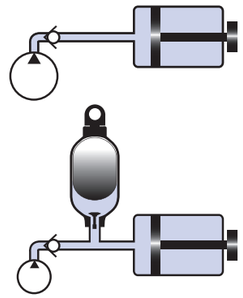
When the hydraulic pressure drops, the nitrogen gas expands and releases the stored energy.



Accumulator Usages

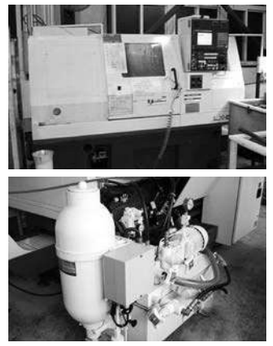
Saving Energy/Electricity (Energy Storage)

By installing accumulator, the oil pump capacity can be downsized and the stop idling operation of the electrical motor becomes available. So the downsizing of oil pump and electrical motor can decrease the peak electrical power.
Furthermore, by the stop idling operation of the electrical motor and the hydraulic pump, the electricity consumption can be reduced drastically. You can contribute to the reduction of CO2 amount of emission. Also, the temperature rise of the system fluid is suppressed, so the prevention of the system fluid deterioration can be attained. It helps to improve the working environment by reducing the noise.



- Miniaturization of Pump
- Stop idling Operation
- Suppression of Temperature Rise of System Fluid

Saving Energy
Saving Electricity

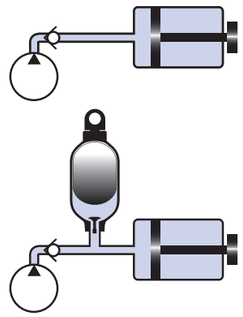


NC Lathe with oil hydraulic unit assembling accumulator for suppressing hydraulic pump electricity consumption.

Main Usages
- Oil Hydraulic Press
- Numerical Control Lathe
- Machining Center
- Other Overall Machine Tools

Speedup (Increasing of Speed)

By installing accumulator, the shortage of the pump output oil volume can be supplemented, and will help to speedup the actuator.

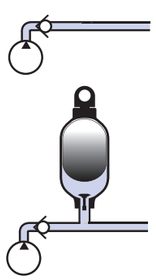


Speedup of motion cylinder for flight simulator.

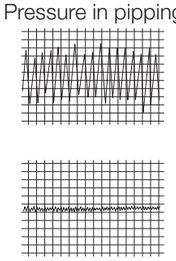
Main Usages
- Flight Simulator
- Oil Hydraulic Press
- Injection Moulding Machine
- Diecast Machine
- Overall Machine Tools

Pulsation Dampening

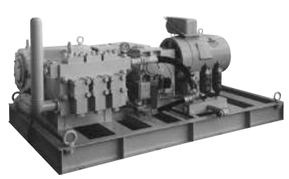
The pressure pulsations created by various types of the hydraulic pumps become a cause of the vibrations and noises and machine damages. By adopting accumulator, the pulsations can be attenuated.



Pressure in pipping



(While using the super pulse damper)



Pulsation Dampening for Plunger Pump

Main Usages
- Overall Machine Tools
- Descaling Unit
- High Pressure Cleaning Machine

Shock Dampening

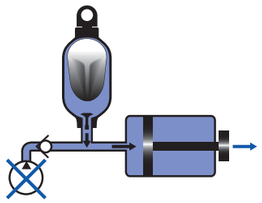
Rapid opening and closing of valves will create the shock waves in the hydraulic system and the noise occurs and they will damage the machine and/or the components of hydraulic system. By installing accumulator, it eliminates the shock and noise in the hydraulic system.

Shock dampening for fuel supply pipings to the aircraft.

Main Usages
- Various Pipelines
- Water Service Pipe

For Emergency Operation

In case the power source is cut off and the supply of operation fluid from the pump is stopped, the accumulator will provide the operation fluid until the machine stops in safety.

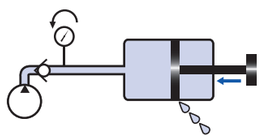


Controlling the angle of wing of the wind power generation and the brake circuit in emergency operation.

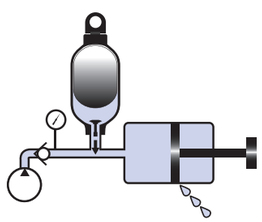
Main Usages
- Grinding Machine
- Emergency Shutdown Valve
- Refuel System
- Clamping
- Double Column Machining Centers
- Polishing Machine

Leakage Compensation

Accumulator can compensate for the pressure drop that will be caused by the oil leakage on the equipments these require to keep constant pressure condition for long time (Pressure maintaining circuit, etc.) and as the result, the pressure drop in such circuit can be minimized.



Pressure Drop

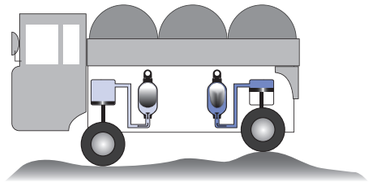


Pressure Preservation

Main Usages
- Oil Hydraulic Machine
- Clamping Equipment

Shock Absorber

The accumulator plays the role as the gas spring and absorbs the shocks from the bumpy roads. Also, it is used to raise and lower the vehicle body. It contributes for reducing passengers' fatigue compared with the metallic spring and the accumulators assist to make the heavy load bearing hydraulic system compact.

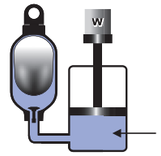


Used for the suspension of special vehicle.

Main Usages
- Suspension for Special Vehicle
- Coal Mill
- Cement Mill
- Cone Crusher

Counter Balance

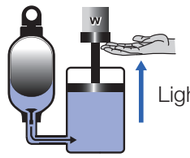
The gas pressure of the accumulator supports the heavy weight which are supported by the cylinder.



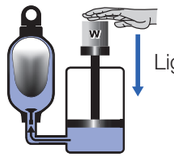
Balanced by the Pressure

Main Usages
- Tool Rest of Large Machine Tools
- Large Crane Facilities

When you need to move the heavy weight, you can easily move it by light power.



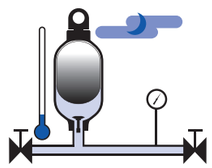
Light Power



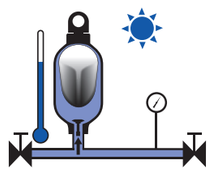
Light Power

Temperature Compensation

On the case of closed hydraulic circuit, the oil volume changes according the oil temperature change. The change creates hydraulic pressure up and down change, and becomes the cause of the damages of the hydraulic equipments. By installing accumulator, the pressure in circuit can be stabilized to an almost constant level.



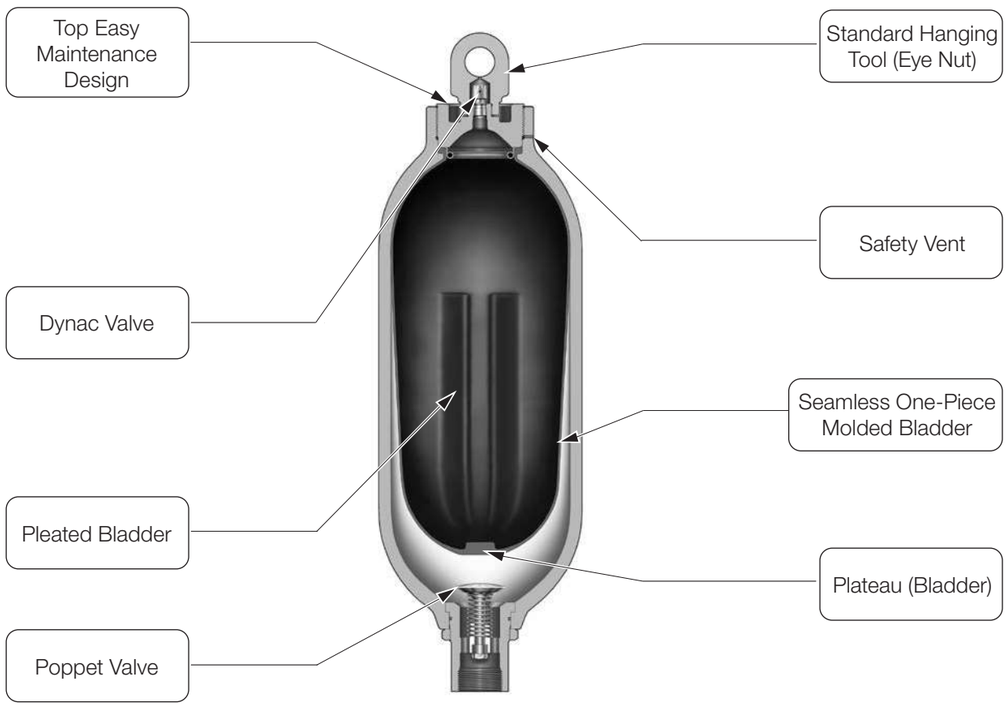
The volume decreased is supplemented.



The volume increased is absorbed.

Main Usages
- Plant Facilities
- Pipeline
- Boiler

Superior Design and Construction Features of NACOL Accumulator



Top Easy Maintenance Design Accumulator

Bladder replacement of NACOL Top Easy Maintenance Design Accumulators can be done very easily and in a short time as they have large openings at the top and the components parts are just a few. You can perform easily because number of parts is small.

No need to remove the accumulator from the piping for replacement of bladder.
Work hours can be greatly reduced, and suspending downtime of equipment can be shortened.
NACOL accumulator is an environmentally friendly product because it does not disperse the hydraulic fluid during the maintenance jobs.


Bladder Replacement Job

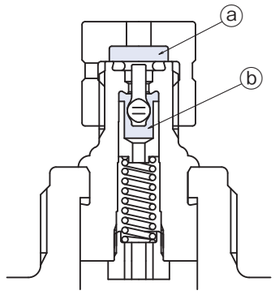
It is possible for you to inspect the inside of accumulator easily.
Therefore, it prevents bladder damage from inadequate installation at the time of bladder replacement.

Dynac Valve

The Dynac Valve is a gas charging valve which has also "Fuse" function.

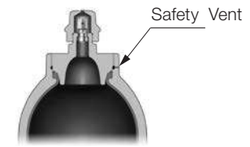
The function of Fuse
The NACOL Dynac Valve contains two parts (Right Figure ⓐ, ⓑ) whose fuse parts melt at the temperature 160±20℃ and vent the charged nitrogen gas in the event of fire or extreme heat.
This prevents the accumulator from becoming a potential bomb on such occasions.

The function of Dynac Valve
By installing Gas Charging 3-way Valve, nitrogen gas can be charged, sealed or released.
Compared with core type gas valve, Dynac Valve is superior in air tightness, durability and high-low temperature resistance.



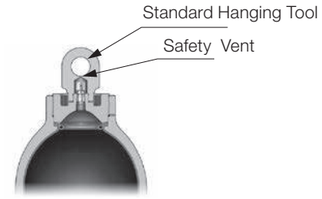
Safety Vent

The Safety Vent is a safety device which warns by the relieving sound.
The Safety Vent is a safety device which release the gas charge and warns the existence of the remaining gas in the accumulator by relieving sound before the accumulator is disassembled.



Standard Hanging Tool (Eye Nut)

Standard Hanging Tool makes accumulator install safer.
The tool is equipped with the product which weight is more than 20 kg.
This hanging tool has a vent for releasing gas discharged from the accumulator to the atmosphere.
After used as a hanging tool, it can be used as a valve cover for the protection of the Dynac Valve.
So, there is no need to keep the hanging tool in another place separately.



Bladder

NACOL Bladders are seamless one-piece molded bladders.
The bladders which are assembled to NACOL Bladder Type Accumulators are seamless one-piece molded bladders except those designated models (part of R/U/H Series).
Seamless one-piece molded bladders do not have seamed parts which result in the stress concentration, so they can remain stable to be used for a long time.
In general, the seamed parts of special rubber material is inferior to the seamed parts of nitrile rubber in adhesion and durability. But NACOL bladders are seamless one-piece molded bladders, so you do not have to worry about the seamed parts.

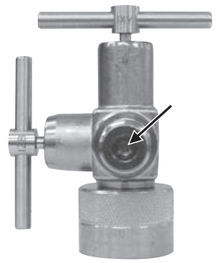
NACOL pleated bladders prevent bladder damage due to the bladder's turning up (U-turn phenomenon).
NACOL bladder forms a triangular "stelliform" pillar vertically owing to the pleated structure, and the pillar suppresses the bottom area of bladder to rise up by buoyancy. (U-turn phenomenon)

The plateau at the bottom of the bladder prevent the bladder damage.
Plateau reinforcement in the bladder prevents it from being damaged by sharp bending in the bottom portion of the bladder.


when gas is charged　natural shape　1/2 compression　1/4 compression

Gas Charging 3-way Valve

The Gas Charging 3-way Valve has a filter attached to the gas hose connection port.
This filter prevents foreign matter such as dirt and dust adhering to the gas hose and the nitrogen bottle from entering the Dynac Valve when charging nitrogen gas.



Integrated Production

NACOL offers quality stable products rapidly owing to our continuous production from design/development, shell manufacturing, bladder molding, through shipment.

Quality Management System

Quality management system in accordance with the ISO 9001 delivers quality assurance.

Design Verification

We verify the property and safety of products by conducting various tests (destructive test, fatigue test, operational test) and stress analysis.

Environment-friendly products

When disposing accumulator with segregation in mind, separation of the parts is easy as the accumulator is composed of small number of parts.
We have acquired Eco Action 21 and are promoting “Green Procurement” by procuring “parts, materials, and secondary materials” with low environmental impact.

Selection Flow

① For accumulator selection (New arrangement of the accumulator)

Accumulator Selection

Calculate by application and decide the gas volume.

- **Explanation of Calculation by Application** — Accumulator Selection Procedure [See page 18]
- **Gas Volume Calculation** — Accumulators for Multiple Cylinders (Hydraulic Motors) [See page 119]; Accumulators for Energy Storage [See page 120]; Accumulators for Pulsation Dampening [See page 121]; Accumulators for Shock Absorbing [See page 122]; Dynaclean [See page 123]
- **Volume Selection** — See [INDEX] Item Number Description for Finished Accumulator Products [See page 27]

Select the accumulator specifications.

- **Applicable Inspection/Standards** — Series Page [Product Page]
- **Maximum Allowable Working Pressure**
- **Oil Port Side Specifications**
- **Bladder Material**
- **Gas Charging Side Specifications**
- **Body Specifications**
- **Determination of the Accumulator Item Number**

Select the accumulator-related products.

- **Joint for piping connection** — Each Series Page [Product Page]
- **Accessories** — SG Valve [See page 87], Spring Loaded Type Safety Valve [See page 89]; Clamp [See page 91], Base Mounting Plate [See page 92]; Accumulator Stop Valve/T-block [See page 93]
- **Tools and Spare Parts** — Wrench [See page 98], Gas Charging Tools [See page 99]; Bladder [See page 103], Dynac Valve [See page 107]
- **Dimension Confirmation**

End

② For maintenance

Gas Charging
Bladder Exchange
Dynac Valve Exchange

↓

Confirmation of Accumulator Item Number

Manufacturer's Serial Number and Name Plate [See page 115]

↓

Part Item Number Selection

Gas Charging Tools [See page 99]
Bladder [See page 103]
Dynac Valve [See page 107]
See the Exploded View page of each series when you confirm the necessary seal parts or etc.

↓

Spare Parts Ordering

Inquires [See page 128]

↓

Maintenance *
a. Gas Charging and Inspection
b. Bladder Exchange
c. Dynac Valve Exchange

Safety Precautions [See page 4]
a. Gas Charging Tools [See page 99]
b. Exploded view [Product page] Cap Wrench [See page 98]
c. Dynac Valve [See page 107] Spring Nut Key [See page 107]

↓

End

Top Cap Exchange
Oil Port Valve Assembly Exchange
SG Valve Exchange

↓

Confirmation of the Manufacturer's Serial Number and the Accumulator Item Number

Manufacturer's Serial Number and Name Plate [See page 115]

Please contact us or our distributors about the item number.

↓

Spare Parts Ordering

Inquires [See page 128]

↓

Maintenance
d. Top Cap Exchange
e. Oil Port Valve Assembly Exchange
f. SG Valve Exchange

Safety Precautions [See page 4]
d. Exploded view [Product page] Cap Wrench[See page 98]
e. Exploded view [Product page] Ring Nut Wrench [See page 98]
f. SG Valve [See page 87]

↓

End

*Always read the instruction manual before performing maintenance work.

Accumulator Selection Procedure

Step 1 Calculation of Accumulator Gas Volume — p. 21, p. 119 – p. 123

Step 2 Selection of Maximum Allowable Working Pressure and Gas Volume — p. 24

Step 3 Confirmation of Allowable Charge/Discharge Flow Rate — p. 24

Step 4 Selection of Bladder Material — p. 24, p. 28

Step 5 Confirmation of Applicable Inspection/Standards — p. 24, p. 27

Step 6 Selection of Gas Charging Side Specifications — p. 25, p. 30, p. 87, p. 89, p. 90

Step 7 Selection of Joint for Piping Connection — p. 25, p. 118

Accumulator Selection Procedure

1. Calculation of Accumulator Gas Volume

1-1 Volume Formula Selection

Volume calculation formulas will change depending on the application. For applications, please refer to page 10.

Application	Calculation Formula
Energy Conservation	Energy Storage (1-3-1)
Emergency Operation	
Leakage Compensation	
Temperature Compensation	
Counterbalance	
Shock Absorber	
Pulsation Dampening	Pulsation Dampening (1-3-2)
Shock-absorbing	Shock-absorbing (1-3-3)
Oil tank dustproof	Dynaclean

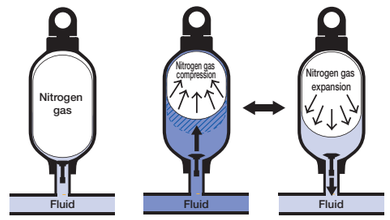
For dynaclean calculation, please refer to page 123, Dynaclean.

For other application calculations, please contact us.

1-2 Basis of the Formula

The accumulator charges and discharges the fluid by the compression and expansion of gas.
Gas volume calculation is calculated basically by Boyle's law, which shows the relationship between pressure and volume of gas.

$$P_1V_1^n = P_3V_3^n = P_2V_2^n$$



● Basic Calculation Terms

P_3	Maximum Working Pressure	(MPa・abs)
	Maximum pressure of the hydraulic pressure source Maximum pressure accumulated in the accumulator	
P_2	Minimum Working Pressure	(MPa・abs)
	Minimum pressure required to run the actuator Minimum pressure to be discharged from the accumulator	
P_1	Gas Charging Pressure	(MPa・abs)
	The pressure of nitrogen gas contained within the bladder	
V_3	Gas Volume at P_3	(L)
V_2	Gas Volume at P_2	(L)
V_1	Gas Volume at P_1	(L)
V_w	Required Oil Volume To Be Discharged From (Charged In) Accumulator	(L)
	V_2 minus V_3 difference is the oil volume discharged from (charged in) the accumulator.	
n	Polytropic Exponent	
	Gas is affected by the heat in the compression and expansion. The actual gas change is called the polytropic change, and in calculation it is used as the polytropic exponent.	

* For the pressure to be used in the calculation, convert to absolute pressure.
Absolute pressure (MPa · abs) = Gauge pressure (MPa · G) + 0.1013

● Gas Charging Pressure P_1

・At the maximum working temperature, gas charging pressure recommended value (range) is as follows.
For energy storage ····· 85% (80% to 90%) of P_2
For pulsation dampening ····· 60% (50% to 80%) of P_X
For shock absorbing ····· 60% (50% to 80%) of P_X

Px: Regular Circuit Pressure (MPa · abs)

・Bladder Compression Ratio
If the bladder compression ratio is larger than 4, the bladder life will be shortened.
Bladder Compression Ratio b (P_3 / P_1) ≤4 (when vertical)
In case of using J series, 145 to 175L of A/H/N series or 40, 60, 80, 120 L of H/N/Y series accumulator whose outer diameter of its body is 355.6 mm, allowable compression ratio may be smaller than 4 depending on usage conditions.
Please contact us if the accumulator is used under the following conditions.
・J series, 145 to 175L of A/H/N series : Bladder Compression Ratio b is more than 3.
・40, 60, 80, 120 L of H/N/Y series accumulator whose outer diameter of its shell is 355.6 mm:
The Bladder Compression Ratio b is more than 3.5.

・For energy storage calculation, **taking temperature change into account**, use Gas Charging Pressure of minimum working temperature at the time (Min. P1).
Gas Charging Pressure of minimum working temperature is determined by the following equation. (See page 22, Volume calculation example)

・Gas pressure will vary with changes in temperature.
The gas pressure at the time of charging, adjusted to match the room temperature, is obtained by the following equation.

・Formula for gas charging pressure actual change due to temperature change

$$P_1 = \{A \times (T_1 - T_0) + P_0 \times 10.1972\} / 10.1972$$

$$A = 10.1972 \times B \times P_0 - C \times \left(1 - \frac{1}{0.2039 \times P_0 + 1}\right)$$

$$B = \{488 - \sqrt{2065 \times 10^2 - (T_0 - 170)^2}\} / 10^4$$

$$C = \{8233 - \sqrt{6794 \times 10^4 - (T_0 - 696)^2}\} / 10^2$$

* It can be calculated easily with the NACOL volume calculation program.

P_0: Gas pressure before temperature change (MPa · abs)　T_0: Temperature before change (°C) [−35≤T_1≤110°C]
P_1: Gas pressure after temperature change (MPa · abs)　T_1: Temperature after change (°C)

● Polytropic Exponent m and n

A polytropic exponent can be calculated by an average pressure (Pa) or a regular circuit pressure (Px) and an oil charge/discharge time from the polytropic exponent list. Use m as the polytropic exponent at charge time, and n as the polytropic exponent at discharge time. In addition, a polytropic exponent can be obtained by calculation.

Average Pressure (MPa) \ Time		Oil Charge Time (Tm) · Oil Discharge Time (Tn) sec								
		<15	15≤, <30	30≤, <60	60≤, <120	120≤, <240	240≤, <480	480≤, <900	900≤, <1800	1800≤
Pressure : Pa Shock Pulsation : Px	<2.0	1.42	1.38	1.34	1.29	1.24	1.19	1.15	1.10	1.05
	2.0≤, <3.5	1.46	1.41	1.37	1.32	1.27	1.22	1.16	1.11	1.06
	3.5≤, <5.0	1.50	1.45	1.40	1.35	1.30	1.24	1.19	1.13	1.07
	5.0≤, < 6.5	1.54	1.50	1.44	1.39	1.33	1.27	1.22	1.16	1.10
	6.5≤, <8.0	1.59	1.54	1.49	1.43	1.37	1.31	1.25	1.19	1.12
	8.0≤, <9.5	1.64	1.59	1.53	1.47	1.41	1.35	1.28	1.22	1.15
	9.5≤, <11.0	1.69	1.64	1.58	1.52	1.45	1.39	1.32	1.26	1.18
	11.0≤, <12.5	1.74	1.69	1.62	1.56	1.50	1.43	1.36	1.29	1.22
	12.5≤, <14.0	1.80	1.74	1.67	1.61	1.54	1.47	1.40	1.33	1.25
	14.0≤, <15.5	1.85	1.79	1.72	1.66	1.59	1.51	1.44	1.37	1.29
	15.5≤, <17.0	1.90	1.84	1.77	1.70	1.63	1.56	1.48	1.41	1.32
	17.0≤, <18.5	1.96	1.90	1.83	1.75	1.68	1.60	1.53	1.45	1.36
	18.5≤, <20.0	2.01	1.95	1.88	1.80	1.73	1.65	1.57	1.49	1.40
	20.0≤, <21.5	2.07	2.00	1.93	1.85	1.78	1.70	1.61	1.53	1.44
	21.5≤, <23.0	2.12	2.06	1.98	1.90	1.83	1.74	1.66	1.58	1.48
	23.0≤, <24.5	2.18	2.11	2.03	1.96	1.87	1.79	1.70	1.62	1.52
	24.5≤, <26.0	2.24	2.17	2.09	2.01	1.92	1.84	1.75	1.66	1.56
	26.0≤, <27.5	2.29	2.22	2.14	2.06	1.97	1.89	1.79	1.71	1.60
	27.5≤, <29.0	2.35	2.28	2.19	2.11	2.02	1.93	1.84	1.75	1.64
	29.0≤, <30.5	2.40	2.33	2.25	2.16	2.07	1.98	1.89	1.79	1.68
	30.5≤, <32.0	2.46	2.39	2.30	2.21	2.12	2.03	1.93	1.84	1.72
	32.0≤, <33.5	2.52	2.44	2.36	2.27	2.18	2.08	1.98	1.88	1.76
	33.5≤, <35.0	2.58	2.50	2.41	2.32	2.23	2.13	2.03	1.93	1.81

*For nitrogen gas polytropic exponent at pressure exceeding 35 MPa, please contact us.
In addition, an polytropic exponent can also be obtained by calculation.
Average Working Pressure Pa: $\frac{P_3 + P_2}{2}$ Px: Regular Circuit Pressure

* When n<m, calculation must be made taking n as m, i.e.. n = m.
Example) If n = 1.6 and m = 1.8, n = m = 1.8

・Formula of Polytropic Exponent (empirical formula)

$$m\ (n) = 0.00938 \times P \times \left(2.5 + \sqrt{3.7 - \log_{10} T}\right) + 1.34 - 0.2 \times \log_{10} T + \frac{18 \times \sqrt{0.45 + \log_{10} T}}{10.1972 \times P + 95}$$

m: Polytropic exponent at the time of oil charge
n: Polytropic exponent at the time of oil discharge
P: Pa (average working pressure) or Px (regular circuit pressure) {MPa · abs}
T: Tm (oil charge time) or Tn (oil discharge time) {sec}

* Oil charge/oil discharge time less than 8 seconds will be 8 seconds, and equal to or greater than 1800 seconds will be 1800 seconds.
* It can be calculated easily with the NACOL volume calculation program.

1-3 Volume Calculation

You can easily calculate a volume using the NACOL volume calculation program.
To obtain the calculation program, please sign up from our website (https://www.nacol.co.jp).
For calculation on your own, please take advantage of the volume calculation sheet in the Reference on pages 119 to 121.

※ Please note that the calculation result is not guaranteed because actual working may be affected by piping method, pipe diameter, fluid viscosity and etc.

1-3-1 Energy Storage Calculation

$$V_1 = \frac{V_W}{e \cdot \eta \cdot F}$$

V_1: Accumulator gas volume (L)
V_W: Required oil volume to be discharged from accumulator (L)
e: Gas charging pressure ratio P_1 / P_2
η: Accumulator gross efficiency 0.95
F: Oil discharge coefficient
a: Working pressure ratio P_3 / P_2

To determine the discharged volume from the accumulator gas volume, use the formula below:

$$V_W = V_1 \cdot e \cdot \eta \cdot F$$

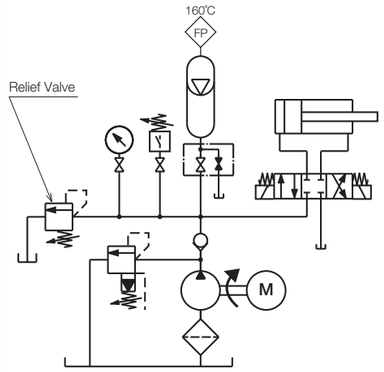
* Add the amount of leakage and/or compression of liquid to Vw.
* In order to enhance the power saving effect, it is important to set the total amount of oil in the actuator to Vw, and to allow idling stop to be executed on the accumulator by the pressure switch.
* Subtract from P_3 the pressure loss between the accumulator and the pump, and then add the pressure loss between the actuator and the accumulator to P_2.
* If larger "e" is taken, the accumulator gas volume can be smaller, but the life of the bladder will be shortened if "e" is more than 0.9.
* If larger "a" is taken, the accumulator gas volume can be smaller, but please pay attention to the compression ratio.
* Please refer to the volume calculation sheet on page 119.
* If multiple cylinders are used simultaneously, fill out the Accumulator Gas Volume Calculation sheet for multiple cylinders in the Technical Reference on page 122, and apply from our website. Then we will calculate the volume for you.

Volume calculation example

In advance, using the amount of hydraulic fluid that is charged in the accumulator, calculate the accumulator volume required for activating the cylinder.

Specification conditions

Di: Cylinder bore = ϕ300 mm (cross-sectional area (A) = 706.5 cm^2)
S: Cylinder stroke = 380 mm
V: Cylinder speed = 0.75 m/sec
F_c: Required cylinder power = 1,000 kN
⊿P: Pressure loss in piping etc. = 0.84 MPa
P_3: Maximum working pressure = 20 MPa
P_2: Minimum working pressure = Fc / A x 10 + P = 15 MPa
(Pay attention to the pressure loss P between the accumulator and actuator)
Q: Oil discharge volume from pump = 90 L/min
Working temperature = 20 to 80ºC
Service fluid = Petroleum hydraulic oil
*In calculation, convert all assigned pressure to the absolute pressure (MPa · abs).



1) Find the required oil volume to be discharged from accumulator Vw (required cylinder oil amount).

$$V = \frac{\pi \cdot Di^2}{4} \cdot S \cdot 10^{-6}$$
$$= \frac{\pi \cdot 300^2}{4} \times 380 \times 10^{-6}$$
$$\fallingdotseq 26.9L$$

2) **Considering the change in temperature during operation**, find the gas charging pressure (P_1) in the following steps.
i) For Max. P_1 at the maximum working temperature (80ºC), set the gas charging pressure ratio to 85%. (The gas charging pressure ratio can be up to 90% in consideration of the temperature change.)
Max. $P_1 = 0.85 \cdot P_2$
= 0.85 x 15.1013 MPa · abs
= 12.84 MPa · abs

ii) Find Min. P1 at the minimum working temperature (20ºC) by the "Formula for gas charging pressure actual change due to temperature change".
Min. P_1 = 10.11 MPa · abs

3) Find the gas charging pressure ratio (e) at the minimum working temperature.

$$e = \frac{P_1}{P_2} = \frac{10.11}{(15 + 0.1013)}$$
$$\fallingdotseq 0.67$$

4) Find the polytropic exponent (m, n).

$$\text{Average working pressure (Pa)} = \frac{P_3 + P_2}{2} = \frac{20.1013 + 15.1013}{2}$$
$$\fallingdotseq 17.6 MPa \cdot abs$$

・Find the oil charge time from Vw (the amount charged in the accumulator) and the pump flow rate.

$$\text{Oil Charge Time (Tm)} = \frac{V_W}{Q} = \frac{26.9}{90/60}$$
$$\fallingdotseq 17.9sec$$

・The cylinder operation time becomes the accumulator oil discharge time.

$$\text{Oil Discharge Time (Tn)} = \frac{S}{V} 10^{-3} = \frac{380}{0.75} \times 10^{-3}$$
$$\fallingdotseq 0.5sec$$

・From the nitrogen gas polytropic exponent list on page 20
m = 1.90 n = 1.96

5) Find the oil discharge coefficient (F) .

$$F = \frac{a^{\frac{1}{n}} - 1}{a^{\frac{1}{m}}} = \frac{\left(\frac{20.1013}{15.1013}\right)^{\frac{1}{1.96}} - 1}{\left(\frac{20.1013}{15.1013}\right)^{\frac{1}{1.90}}} \fallingdotseq 0.135$$

6) Find the accumulator gas volume (V_1).

$$V_1 = \frac{V_W}{e \cdot \eta \cdot F} = \frac{26.9}{0.67 \times 0.95 \times 0.135} \fallingdotseq 313L$$

1-3-2 Pulsation Dampening Calculation

$$V_1 = \frac{q \cdot F_1 \cdot \left(\frac{P_x}{P_1}\right)^{\frac{1}{n}}}{1 - \left(\frac{P_x}{P_m}\right)^{\frac{1}{n}}}$$

V_1: Accumulator gas volume (L)
q: Oil discharge volume per pump revolution (L/rev)
F_1: Pump oil discharge coefficient (from the list)
P_x: Regular circuit pressure (MPa·abs)
P_m: Maximum allowable pulsation pressure (MPa·abs)

* For gas charging pressure P_1, at the maximum working temperature, a value of 60% of Px is recommended. (Adjust the gas charging pressure ratio up to 80% of Px in consideration of the temperature change.)
* The maximum allowable pulsation pressure Pm is the maximum pressure that can be tolerated when an accumulator is used, rather than the pressure currently generated.
* For polytropic exponent n, use a value that is found at the intersection of less than 15 seconds and Px in the polytropic exponent list.
  If you use the polytropic exponent formula, use the value of 8 seconds.
* Please refer to the volume calculation sheet on page 120.

Pump Oil Discharge Coefficient (F_1) List

Pump Type		Pump Oil Discharge Coefficient F_1
Simplex	Single Action	0.60
	Double Action	0.25
Duplex	Single Action	0.25
	Double Action	0.15
Triplex	Single Action	0.13
	Double Action	0.06

* For a pump larger than triplex, vane pump, or gear pump, use 0.06 for F.

1-3-3 Shock Absorbing Calculation

$$V_1 = \frac{W \cdot v^2 \cdot (n-1) \cdot \left(\frac{P_x}{P_1}\right)^{\frac{1}{n}}}{203.94 \cdot g \cdot P_x \cdot \eta \left\{\left(\frac{P_m}{P_x}\right)^{\frac{n-1}{n}} - 1\right\}}$$

$$W = \frac{\pi \cdot d^2}{4} \cdot L \cdot \gamma \cdot 10^{-6}$$

V_1: Accumulator gas volume(L)
W: Weight of fluid in the line(kg)
v: Flow velocity(m/sec)
g: Acceleration of gravity 9.8(m/sec²)
d: Pipe bore(mm)
L: Total pipe length(m)
γ: Weight volume ratio of the fluid(kg/m³)
P_x: Regular circuit pressure(MPa·abs)
P_m: Maximum allowable shock pressure(MPa·abs)

* For gas charging pressure P_1, at the maximum working temperature, a value of 60% of Px is recommended. (Adjust the gas charging pressure ratio up to 80% of Px in consideration of the temperature change.)
* The maximum allowable shock pressure Pm is the maximum pressure that can be tolerated when an accumulator is used, rather than the pressure currently generated.
* For polytropic exponent n, use a value that is found at the intersection of less than 15 seconds and Px in the polytropic exponent list.
  If you use the polytropic exponent formula, use the value of 8 seconds.
* Please refer to the volume calculation sheet on page 121.

2. Selection of Maximum Allowable Working Pressure and Gas Volume

Based on the maximum allowable working pressure that will actually be used and gas volume calculation results, select an available series, maximum allowable working pressure, and gas volume.

Points for selection
- Select an accumulator with maximum allowable working pressure exceeding the designed circuit pressure.
- Maximum allowable working pressure used for pulsation dampening or shock absorbing should be higher than the maximum pressure generated without an accumulator.
- If the gas volume calculation result exceeds the volume of a single accumulator, use multiple accumulators.
- For pulsation dampening and shock absorbing, select the maximum allowable working pressure and gas volume from the pulsation and shock-specific series first.
  If corresponding maximum allowable working pressure and gas volume are not found, select from the standard series.
- For dust-proof oil tanks, select from the L series (Dynaclean).

3. Confirmation of Allowable Charge/Discharge Flow Rate

For the selected accumulators, confirm whether the allowable charge/discharge flow rate satisfies the flow rate in actual use.

Points for selection
- If the allowable charge/discharge flow rate of the standard series is not enough, select an accumulator from High Flow, Super High Flow, or Ultra High Flow series.
- Use multiple accumulators if the actual charge/discharge flow rate exceeds the allowable charge/discharge flow rate shown in the catalog.
- If multiple accumulators are used, aggregate the accumulator volume and satisfy the calculation result.

4. Selection of Bladder Material

Select a bladder material according to working temperature and fluid that you want to use.

Points for selection
- Select a bladder material according to ② Bladder Material Table in the Item Number Description for Finished Accumulator Products on page 28.
- Confirm that the selected bladder material can be used for production on the page for the selected series.
- If your desired fluid or temperature is not listed in the Bladder Material Table, please contact us.

※1 Bladders are made of rubber. The higher the operating temperature is, the larger the intermolecular gaps, and the greater the amount of nitrogen gas that permeates the rubber becomes.
The frequency of charging nitrogen gas increases when the accumulator is used in high temperature.

※2 Using the bladder in maximum working temperature in the long term accelerates deterioration of the bladder.
Use the 80% or less of maximum working temperature (70% when horizontal) as a guide.

5. Confirmation of Applicable Inspection/Standards

Select the inspection and standards corresponding to the destination or country where the accumulator will be installed.

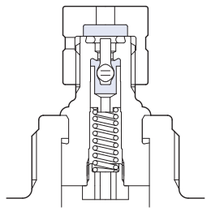
Points for selection
- Select the inspection and standards to be applied from ① Inspection and Standards Table in the Item Number Description for Finished Accumulator Products on page 27.
- For use at sea, ship's class standards will be applied.
- On the page for the selected series, confirm that the series, pressure, and volume comply with the inspection and standards.
- For inspection and standards not listed in the table, please contact us.

6. Selection of Gas Charging Side Specifications

Select the specifications of the gas charging port of the accumulator.

Gas charging side specifications	No.	Item
Standard	1	Dynac valve
SG valve	2(a)	SG valve + fuse plug
	2(b)	SG valve + spring loaded type safety valve

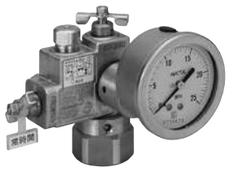
1. Dynac Valve



NACOL standard.
The Dynac valve is a gas charge valve with a fuse plug function.
The gas charging tools kit is required for charging, inspection, and pressure adjustment of nitrogen gas.
Sizes of connection screws include G1/4, G3/8, 1/2-20UNF, and 8V1, depending on the series and pressure. Please refer to the page for each series.

2. SG Valve

You can install a pressure gauge to charge gas or measure the gas charging pressure easily without gas charging tools.
As a safety device, select a spring loaded type safety valve or fuse plug.



2 (a) With the fuse plug

2 (b) With the spring loaded type safety valve

Points for selection

- Select the Dynac valve or SG valve from ⑥ Gas Charging Side Specifications in the Item Number Description for Finished Accumulator Products on page 30.
- Unless otherwise specified, select the fuse plug as the safety device of the SG valve (In case of PED inspection, the plug is used, not the fuse plug).
- When external temperature reaches 160±20ºC, the fuse plug parts melt, releasing the gases in the accumulator into the atmosphere.
- When pressure exceeds the pre-set value, the spring loaded type safety valve will release the gases in the accumulator into the atmosphere. Specify the set value of pressure according to the maximum allowable working pressure of the accumulator to be used.
- Glycerin Filled Pressure gauge or SMA Pressure gauge is used for SG valve.
  Specify the pressure range according to the pressure when Glycerin Filled Pressure gauge is used.
- For details on the SG valve and pressure gauge, please refer to "SG Valve" on page 88.
- For details on the safety valve, please refer to "Spring Loaded Type Safety Valve" on page 89.
- For details on the Dynac valve, please refer to "Dynac Valve" on page 107.

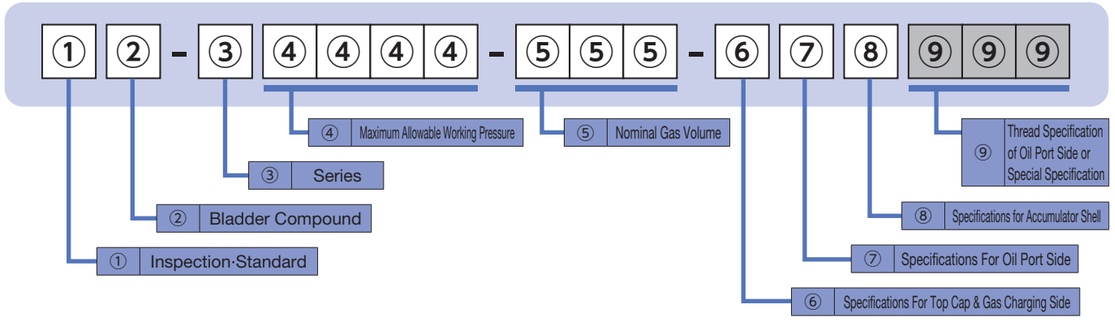
7. Selection of Joint for Piping Connection

To connect the accumulator to the hydraulic circuit, a joint that matches the connection size is required.
Select the necessary joint from the page for the selected series.

Points for selection

- For the Inline, High Flow, Super High Flow and Ultra High Flow types, the joints (flanges) are built into the accumulator.

Explanation of Item Number for Accumulator



① Inspection·Standard

Select the item number code corresponding to applicable legal requirements. Note that some models may neither be covered by nor support the standards.
In Japan, products used in food processing applications are subject to the Food Sanitation Act.
For accumulators meeting other inspection/standard requirements or if you have any questions, please contact us.

Symbol	Area	Country	Inspection·Regulation	Remarks
H	Overland	JAPAN	High Pressure Gas Safety Law, Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan) Application: Accumulators for pressure higher than 1 MPa inclusive, regardless of the gas volume. Related Organization: Ministry of Economy, Trade and Industry / Metropolitan/prefectural government	·METI License No.:MAB-374-E (Accumulator, MAB-374-N) Valve
P		JAPAN	High Pressure Gas Safety Law, Japan (Special Facilities) Application: Vessel connected to accumulator by piping etc. (Backup bottle) Related Organization: Ministry of Economy, Trade and Industry / Metropolitan/prefectural government	
F		JAPAN	Industrial Safety and Health Act, Japan (Class-2 Pressure Vessel) Application: Accumulators containing gas higher than 0.2 MPa and the volume more than 40 L Related Organization: Labor Standards Inspection Office, Ministry of Health, Labour and Welfare	
M		U.S.A.	ASME (ASME Boiler and Pressure Vessel Code Section VIII Div.1) Application: Accumulators with an inside diameter more than 152 mm and a pressure exceeding 100 kPa Related Organization: N.B. (NATIONAL BOARD)	·ASME Certificate No.: 12594 ·When ordering an accumulator, specify the customer's name and address as well as the name and address of installation in English, which will be included in a data report. ·For use in Canada, type approval from the relevant provincial government is required. ·When using an accumulator not covered by the ASME Code in Canada, please contact us in advance.
S		CANADA	B51 (Boiler, Pressure Vessel, and Pressure Piping Code) ASME (ASME Boiler and Pressure Vessel Code Section VIII Div.1) Application: Accumulators with an inside diameter more than 152 mm and a pressure exceeding 100 kPa Related Organization: Minister of Consumer and Commercial Relations	
R		EU	P.E.D.(97/23/EC) Application: Accumulators with a maximum allowable working pressure exceeding 0.5 bar and nominal gas volume exceeding 1 Liter Related Organization: CEN (European Committee for Standardization)	·CE marking: CE0035 ·CE marked accumulators conforming to the Pressure Equipment Directive (P.E.D.). ·These accumulators can circulate freely in Europe.
D		CHINA	Regulation for Production and Filling Licensing of Special Equipment Application: Accumulators Related Organization: State Administration for Market Regulation	·License No.: TS2200143 ·Unless otherwise specified, the ASME or JIS design code applies. ·When ordering an accumulator, specify the name and address of installation in English or Chinese, which will be included in an inspection certificate. ·"Supervisory Inspection for Safety Performance of the Products", which may be required after arrival in China, is not supported. It is the responsibility of the exporter to undergo the Inspection at the landing place in China. Please contact us for more information. ·When you export our products to China, please contact us in advance.
A		AUSTRALIA	AS 1210 (AUSTRARIAN STANDARD) Application: Accumulators with a design pressure exceeding 50 kPa Related Organization: Health and safety authority in the relevant Australian state	·Design registration is required in the state in which the accumulator will be installed.
U		MALAYSIA	FACTORIES AND MACHINERY ACT Application: All accumulators Related Organization: Malaysia Government	·When ordering an accumulator, specify the name and address of installation in English.
N		Other	NACOL (manufacturer's) Inspection	·These accumulators have passed pressure testing according to internal standards, but do not meet legal requirements.
B	Marine	U.S.A.	ABS American Bureau of Shipping	The ship owner should specify the applicable ship class. When ordering an accumulator, the following information is required (not required for JG). For new ships: ·Name of Shipyard ·Hull Number For ships in service: ·Name of Ship ·IMO Ship Identification Number For offshore application: When applying the shipping classification survey for offshore application, please contact us in advance.
C		TAIWAN	CR China Corporation Register of Shipping	
E		France	BV Bureau Veritas	
J		Japan	JG Ministry of Land, Infrastructure, Transport and Tourism, Japan	
K		Japan	NK Nippon Kaiji Kyokai	
L		U.K.	LR Lloyd's Register of Shipping	
Q		South Korea	KR Korean Register of Shipping	
V		Norway	DNV DNV AS	
Z		China	CCS China Classification Society	
X	Special	Special	Other Special Inspection	

② Bladder Compound

Select the item number code corresponding to the material suitable for "service fluid" and "service temperature". ※1

Symbol	Bladder Compound		Suitable Service Fluid	Allowable Service Temperature (℃) ※1	O-ring Material
N	Standard Nitrile Rubber	NBR	Turbine Oil (jis K2213) Fatty Acid Ester Fluid Water Glycol Fluid W/o Emulsion Fluid O/w Emulsion Fluid Biodegradable Fluid Tap Water Sea Water	–10 ~ +70	NBR ※ 2
B	Standard Nitrile Rubber bladder with oil port valve molded in	NBR			
H	Nitrile Rubber for high temperature use	H.NBR		–10 ~ +110	FKM ※ 2
L	Nitrile Rubber for low temperature use	L.NBR		–35 ~ +70	L.NBR ※ 3
F	Butyl Rubber	IIR	Phosphate Ester Fluid	–10 ~ +70	FKM ※ 2
E	Ethylene Propylene Rubber	EPDM	Phosphate Ester Based Fluid		EPDM ※ 2
C	Chloroprene Rubber	CR	Basic, Water	–20 ~ +80	CR ※ 2
G	Epichlorohydrin Rubber	CHC			FKM ※ 2
V	Fluorine Rubber	FKM			

※ 1 “Service Temperature” means the temperature of the fluid which contacts the bladder when it works. It is the accumulator's internal temperature.
※ 2 O-ring material for gas charging valve, for connection port of SG vavle and Top Cap, and for built in SG valve is NBR.
※ 3 When bladder compound is L.NBR, O-ring material for gas charging valve, for connection port of SG vavle and Top Cap, and for built in SG valve is also L.NBR.
※ 4 Regardless of the bladder compound, material of seal washer for SG valve is NBR.
※ 5 Please refer to page 104 ⑪ accessories supplied with bladder for further information.

* Use over a long period of time at the maximum allowable service temperature should be avoided since it accelerates bladder deterioration. Use at 80% of the maximum allowable service temperature (70% in the case of horizontal installation) or less is recommended.
* Fluorine rubber has excellent chemical resistance. However, be aware that the rubber swells with ether, ester, ketones, or methyl alcohol, hardens with anhydrous ammonia or activated amines, and is eroded by strong alkalis.
* Note that use with petroleum based fluids may cause the extraction of unspecified substances from synthetic rubber (bladder and O-ring), resulting in fluid discoloration.
* A button is located at the bladder bottom for J series accumulators. The standard bladder designation for the J series is "B".

① ② – ③ ④④④④ – ⑤⑤⑤ – ⑥ ⑦ ⑧ ⑨⑨⑨

- ① Inspection·Standard
- ② Bladder Compound
- ③ Series
- ④ Maximum Allowable Working Pressure
- ⑤ Nominal Gas Volume
- ⑥ Specifications For Top Cap & Gas Charging Side
- ⑦ Specifications For Oil Port Side
- ⑧ Specifications for Accumulator Shell
- ⑨ Thread Specification of Oil Port or Special Specification.

③ Series

Select the item number code corresponding to the series name.

Symbol	Series
A	A Series
E	E Series
G	G Series
H	H Series
J	J Series
N	N Series
P	P Series
R	R Series
S	S Series
U	U Series
Y	Y Series

④ Maximum Allowable Working Pressure

Select the item number code corresponding to a value exceeding the maximum working pressure (the maximum value of the actual accumulator working pressure).

* Maximum allowable working pressure: Maximum operable pressure of accumulators

Symbol				Maximum Allowable Working Pressure	
0	.	0	5	0.05	MPa
0	.	9	5	0.95	MPa
2	M	P	A	2	MPa
5	M	P	A	5	MPa
7	M	P	A	7	MPa
8	M	P	A	8	MPa
1	0	M	P	10	MPa
1	1	.	8	11.8	MPa
1	3	M	P	13	MPa
1	5	M	P	15	MPa
1	6	M	P	16	MPa
1	7	.	5	17.5	MPa
2	0	.	6	20.6	MPa
2	1	M	P	21	MPa
2	2	M	P	22	MPa
2	2	.	5	22.5	MPa
2	3	M	P	23	MPa
2	5	M	P	25	MPa
2	6	M	P	26	MPa
2	8	M	P	28	MPa
3	3	M	P	33	MPa
3	5	M	P	35	MPa
4	5	M	P	45	MPa
4	9	.	1	49.1	MPa
4	9	.	4	49.4	MPa
5	0	M	P	50	MPa
8	5	M	P	85	MPa

Symbol				Maximum Allowable Working Pressure	
2	1	0	B	210	bar
2	3	0	B	230	bar
2	5	0	B	250	bar
3	5	0	B	350	bar

※ For the accumulator with P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 23 MP -> 230B).

⑤ Nominal Gas Volume

Select the item number code corresponding to a value exceeding the required gas volume (L) calculated by accumulator sizing calculation.

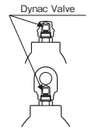
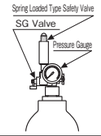
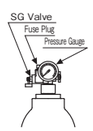
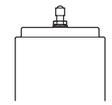
Symbol			Nominal Gas Volume	
0	0	3	0.03	L
L	0	1	0.1	L
L	0	3	0.3	L
L	0	4	0.4	L
L	0	5	0.5	L
L	0	6	0.6	L
L	0	7	0.7	L
L	0	9	0.9	L
L	L	1	1	L
1	.	6	1.6	L
L	L	2	2	L
2	.	5	2.5	L
L	L	3	3	L
3	.	4	3.4	L
L	L	4	4	L
L	L	5	5	L
6	.	3	6.3	L
7	.	2	7.2	L
L	1	0	10	L
L	1	5	15	L
L	1	6	16	L
L	2	0	20	L
L	2	5	25	L
L	2	9	29	L
L	3	0	30	L
L	3	2	32	L
R	3	2	32	L
L	4	0	40	L
R	4	0	40	L
Y	4	0	40	L
L	5	0	50	L
R	5	0	50	L
Y	5	2	52	L
L	6	0	60	L
Y	6	0	60	L
L	6	3	63	L
R	6	3	63	L
L	8	0	80	L
1	0	0	100	L
1	2	0	120	L
1	6	0	145 – 160	L
1	7	5	175	L

For the S series (Solefty), refer to the table below.

Symbol			Nominal Gas Volume	
L	0	2	0.1	L
L	L	1	0.6	L

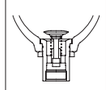
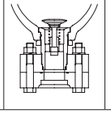
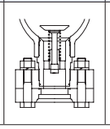
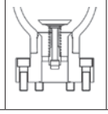
⑥ Specifications For Top Cap & Gas Charging Side

Select the item number code corresponding to the accessories, material, and top cap type on the gas charging side.

Attachments·Specification / Shape·Material	Dynac Valve		SG Valve Spring Loaded Type Safety Valve Pressure Gauge	SG Valve Fuse Plug Pressure Gauge	Core Type Gas Valve	Special Specification
	H Series	the other Series				
Standard Type		A	Q	R	C	X
Two Pieces Type		D				
Stainless Steel		P				
G1/4	A					
G3/8	M					
Image						

⑦ Specifications For Oil Port Side

Select the item number code corresponding to the required flow rate and service fluid.

Shape / Shape·Material	Standard (Internal Thread)	High Flow	Super High Flow	Ultra High Flow	Pulse Damper (IN-LINE Type)	Super Pulse Damper (IN-LINE Type)	Special Specification
Carbon Steel	A	E	Y	Q	U	V	X
Stainless Steel	D	G	M	–	Q	T	
Body: Plating Poppet Valve: Stainless Steel	C	F	N	–	R	S	
Image							–

Shape / Material of Button	Standard J Series Only
Carbon Steel	A
Stainless Steel	D
Aluminum	B
Image	

⑧ Specifications for Accumulator Body

Select the item number code corresponding to the accumulator shell material and inner/outer surface treatment specifications that suit the operating environment and service fluid.
Provide corrosion protection suitable for the installation location.

Body Material/ Paint Specification	Standard Material							Stainless Steel	Special Specification
	Inside & Outside Surfaces	Inside & Outside Surfaces	Inside Surface	Outside Surface	Inside Surface	Outside Surface	Inside & Outside Surfaces		
	Zinc Phosphate Treatment	Paint Coating	Paint Coating	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Paint Coating	Plating		
Image									
Petroleum Based Hydraulic Oil & Other Fluid	C	A	B		N		H	L	X
Water – Glycol Fluid	D	–	–		W				

Standard Paint Specification

Paint Coating: Heat Hardening Type Acrylic Resin

Coating Color: Munsell hue 5GY9/1

Standard Plating Specification

Plating: Electroless nickel plating (repair painting may be applied to the outer surface).

Remarks

- For J series 0.03 L accumulators are made of anodized aluminum.
- For standard products in the A, H, J, N, R, and Y series, the inner and outer surfaces are free of painting and treated by chemical conversion coating.
- Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨ Thread Specification of Oil Port or Special Specification.

- Standard items have three-digit showing the thread specification of the oil port valve or connection size of the flange.
- "X" in the item number means special specification and comes with three-digit numbers.

Please contact us if you have any questions.

Carbon Steel/Aluminum Small Size From 0.03 to 5 Liters

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	N	2	1	M	P	-	L	L	4	-	A	A	C	M	4	2

①APPLICABLE INSPECTION/STANDARD

H	-	JAPAN High Pressure Gas Safety Law (Japan)
R	-	EUROPE PED (2014/68/EU)
N	-	NACOL (Manufacturer's) Inspection
X	-	Special Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②BLADDER COMPOUND

B	-	Standard Nitrile Rubber (NBR) (J Series)
N	-	Standard Nitrile Rubber (NBR) (N Series)
H	-	Nitrile Rubber for High Temp. Use (H.NBR)
L	-	Nitrile Rubber for Low Temp. Use (L.NBR)
F	-	Butyl Rubber (IIR)
E	-	Ethylene Propylene Rubber (EPDM)
C	-	Chloroprene Rubber (CR)
G	-	Epichlorohydrin Rubber (CHC)
V	-	Fluorine Rubber (FKM)

③SERIES

J Series, N Series

④Maximum Allowable Working Pressure ※2

10 MPa, 11.8 MPa, 16 MPa, 17.5 MPa, 21 MPa, 23 MPa, 25 MPa, 35 MPa, 45 MPa, 85 MPa

⑤NOMINAL GAS VOLUME

0.03 L, 0.1 L, 0.3 L, 0.5 L, 1 L, 2 L, 2.5 L, 3 L, 4 L, 5 L

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

A	-	Standard Dynac Valve (G thread)
Q	-	SG Valve + Safety Valve + Pressure Gauge ※3
R	-	SG Valve + Fuse Plug + Pressure Gauge ※3

※3 Q and R cannot be selected for 45 MPa and 85 MPa.

⑦SPECIFICATION FOR OIL PORT SIDE

A	-	Standard Carbon Steel
B	-	Aluminum ※4
D	-	Stainless Steel ※5
X	-	For Special Specifications

⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

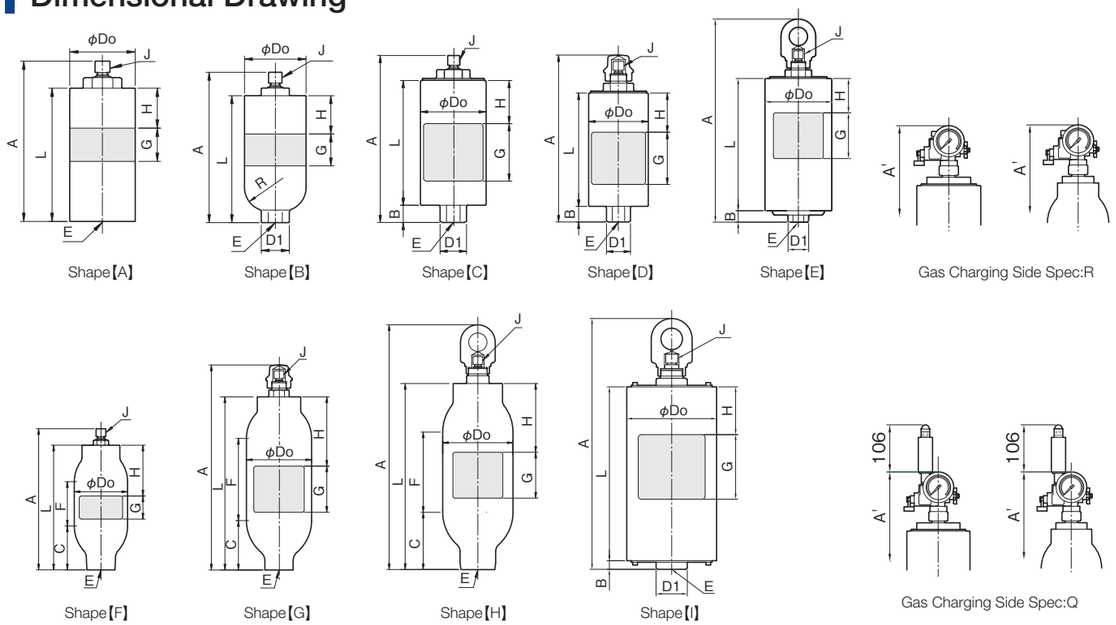
	SPECIFICATION OF SHELL	Inside Surface	Outside Surface	SERVICE FLUID
C -	0.03L Only Aluminum ※4, ※6	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
D -		Zinc Phosphate Treatment	Zinc Phosphate Treatment	Water-Glycol Fluid
A -		Paint Coating	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※7
B -	Other Carbon Steel	Paint Coating	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※7
N -		Zinc Phosphate Treatment	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W -		Zinc Phosphate Treatment	Paint Coating	Water-Glycol Fluid

⑨Oil Port Thread Specification or Special Specification

R	*	*	-	Oil Port Connection Thread Type and Thread Size
M	*	*		Oil Port Connection Thread Type and Thread Size
*	*	*	-	Special Specifications

※4 Water glycol fluids and some phosphate ester based fluids cannot be used for accumulators with a 0.03 L aluminum shell (⑧ Specification of Shell) and an aluminum button on the oil port side ("B" for ⑦ Specification for Oil Port Side). For more information, please contact us or the fluid manufacturer.
※5 When selecting D, please contact us.
※6 0.03 L accumulators are made of anodized aluminum.
※7 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

Dimensional Drawing



Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure MPa	Nominal Gas Volume L	Mass kg	Do mm	A mm	A' mm	L mm	B mm	C mm	F mm	H mm	G mm	D1 mm	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate L/min
HB-J11.8-003-ABCR02	A	11.8(16)※8	0.03	0.4	44	144 +3 0	–	110	–	–	–	31	50	–	G1/4	Rc1/4	–
HB-J25MP-L01-ABCR03	B	25	0.1	2	72	144 +3 0	–	107	–	–	–	21	50	Hex.30	G1/4	Rc3/8	12
HB-J25MP-L03-ABCR03	B	25	0.3	4	72	244 +3 0	–	207	–	–	–	60	50	Hex.30	G1/4	Rc3/8	12
HB-J25MP-L05-ABCR06	B	25	0.5	6	96.5	235 +3 0	–	198	–	–	–	60	50	Hex.41	G1/4	Rc3/4	12
NB-J35MP-L05-ADX039	A	35	0.5	8	98	238 +3 0	–	198	–	–	–	60	50	–	G3/8	G1/4 ※9	12
HB-J10MP-LL1-ABCR06	C	10	1	9	114.3	277 +4 0	–	203	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J10MP-LL2-ABCR06	C	10	2	12	114.3	413 +4 0	–	339	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J10MP-LL3-ABCR06	C	10	3	15	114.3	531 +4 0	–	457	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J17.5-LL1-ABCR06	D	17.5	1	11	120	318 +4 0	381 +4 0	215	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J17.5-LL2-ABCR06	D	17.5	2	15	120	454 +4 0	517 +4 0	351	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J17.5-LL3-ABCR06	D	17.5	3	19	120	572 +4 0	635 +4 0	469	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J25MP-LL1-AACR06	D	25	1	14	127	318 +4 0	381 +4 0	215	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J25MP-LL2-AACR06	D	25	2	19	127	454 +4 0	517 +4 0	351	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J25MP-LL3-AACR06	D	25	3	24	127	572 +4 0	635 +4 0	469	30	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J25MP-LL4-AACR06	E	25	4	33	146	641 +5 0	648 +4 0	486	25	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HB-J25MP-LL5-AACR06	E	25	5	37	146	741 +5 0	748 +4 0	586	25	–	–	75	90	Hex.41	G1/4	Rc3/4	60
HN-N23MP-LL1-AACM42	F	23	1	8	114.3	300 +8 0	397 +8 0	264	–	95	90	110	50	–	G1/4	M42x2	120
HN-N21MP-2.5-AACM42	G	21	2.5	15	139.8	438 +8 0	502 +8 0	369	–	107	172	150	90	–	G1/4	M42x2	120
HN-N21MP-LL4-AACM42	G	21	4	19	139.8	581 +8 0	645 +8 0	512	–	107	315	150	90	–	G1/4	M42x2	120
HN-N35MP-LL1-AACM42	F	35	1	14	127	331 +11 0	424 +9 0	291	–	112	89	110	50	–	G3/8	M42x2	120
HN-N35MP-2.5-AACM42	H	35	2.5	25	152.4	523 +11 0	530 +9 0	397	–	125	166	150	90	–	G3/8	M42x2	120
HN-N35MP-LL4-AACM42	H	35	4	33	152.4	666 +11 0	673 +9 0	540	–	125	309	150	90	–	G3/8	M42x2	120
HN-N45MP-LL1-AACM42	F	45	1	14	127	331 +11 0	–	291	–	112	89	110	50	–	G3/8	M42x2	120
HN-N45MP-2.5-AACM42	H	45	2.5	26	152.4	523 +11 0	–	397	–	125	166	150	90	–	G3/8	M42x2	120
HN-N45MP-LL4-AACM42	H	45	4	33	152.4	666 +11 0	–	540	–	125	309	150	90	–	G3/8	M42x2	120
XN-N85MP-LL1-AAC019	I	85	1	49	167	478 +11 0	–	323	23	–	–	120	90	Hex.85	G3/8	M42x2	–

※2 For the accumulator with P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 23 MP → 230 B).
※8 The allowable working pressure is 11.8 MPa for products certified according to the High Pressure Gas Safety Law, Japan. In the case of NACOL (Manufacturer's) Inspection, the maximum allowable working pressure is 16 MPa.
※9 O-Type Ring Seal (JIS B 2351-1:2000)
※10 In accordance with the High Pressure Gas Safety Law, Japan, the item number will be XN-N85MP-LL1-AAC019, and it will be the test item for the High Pressure Gas Equipment Test.

Typical Applicable Inspections / Standards

METI ※11	ASME ※12	PED ※13	CHINA ※14	NACOL ※15
H	M	R	D	N
○※8	Out of Scope	Out of Scope	Out of Scope	○※8
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
–	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
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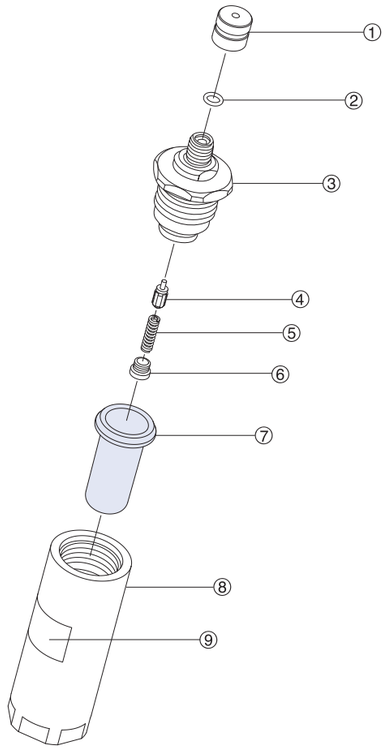
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
※10	Out of Scope	–	Out of Scope	○

※11 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※12 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※13 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※14 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※15 NACOL: NACOL (Manufacturer's) Inspection

Carbon Steel/Aluminum Small Size From 0.03 to 5 Liters

Typical Exploded View

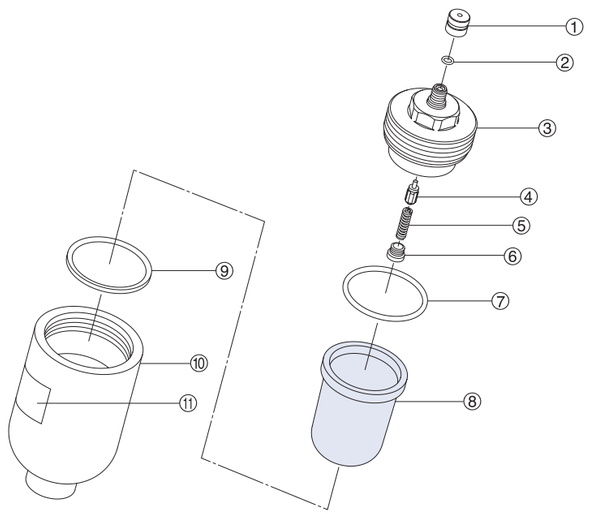
J series 0.03 L



①	Valve Cap
②	O-ring ※3 (Item No: 6071[0]7009)
③	Top Cap With Dynac Valve
④	Dynac Valve Packing With Valve Stem
⑤	Spring
⑥	Spring Nut
⑦	Bladder
⑧	Accumulator Body
⑨	Nameplate

※1 The typical exploded view for this series.
※2 If you purchase ⑦ bladder as the spare parts, ② O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

J series 0.1 – 0.5 L

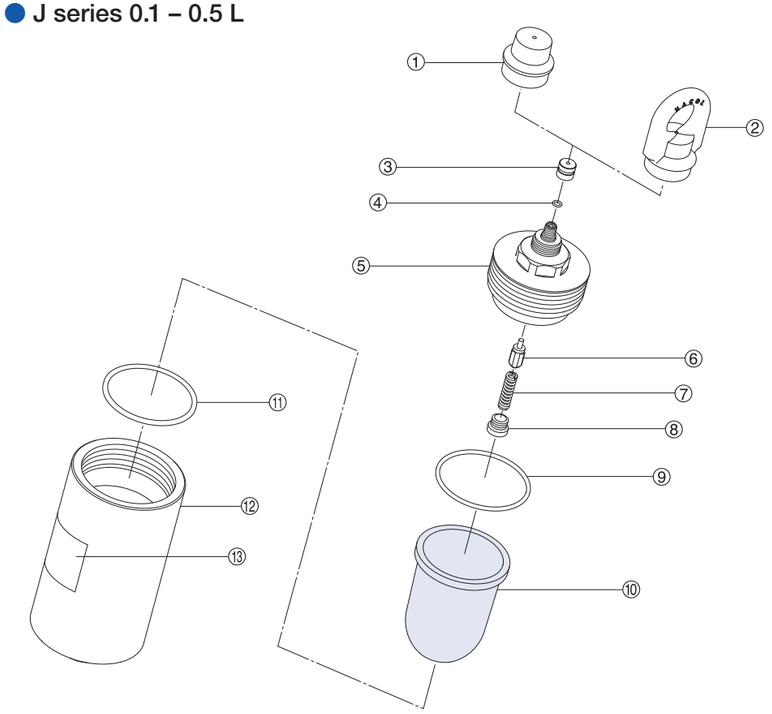


①	Valve Cap
②	O-ring ※3 (Item No: 6071[0]7009)
③	Top Cap With Dynac Valve
④	Dynac Valve Packing With Valve Stem
⑤	Spring
⑥	Spring Nut
⑦	O-ring ※3 (0.1-0.3 L) (Item No: 6071[0]2050)
	O-ring ※3 (0.5 L) (Item No: 6071[0]2070)
⑧	Bladder
⑨	Seat Ring
⑩	Accumulator Body
⑪	Nameplate

※1 The typical exploded view for this series.
※2 If you purchase ⑧ bladder as the spare parts, ②⑦ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Typical Exploded View

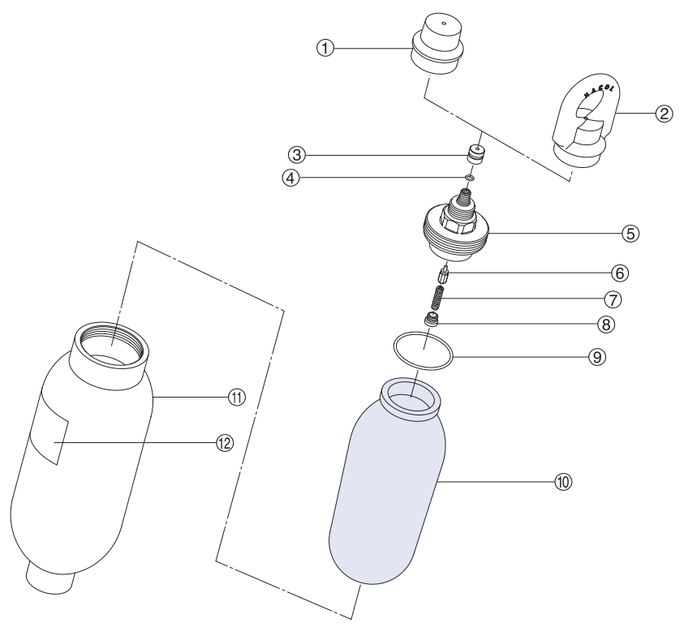
J series 0.1 – 0.5 L



①	Valve Cover
②	Eye Nut
③	Valve Cap
④	O-ring ※3 (Item No: 6071[0]7009)
⑤	Top Cap With Dynac Valve
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (1-3 L) (Item No: 6071[0]2100)
	O-ring ※3 (4-5 L) (Item No: 6071[0]2115)
⑩	Bladder
⑪	Seat Ring
⑫	Accumulator Body
⑬	Nameplate

※1 The typical exploded view for this series.
※2 If you purchase ⑦ bladder as the spare parts, ② O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different

N series 1 – 4 L



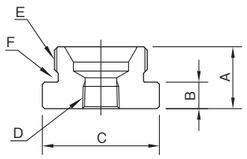
①	Valve Cover
②	Eye Nut ※4
③	Valve Cap
④	O-ring ※3 (Item No: 6071[0]7009)
⑤	Top Cap With Dynac Valve
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (1 L) (Item No: 6071[0]2060)
	O-ring ※3 (2.5-4 L) (Item No: 6071[0]2070)
⑩	Bladder
⑪	Accumulator Body
⑫	Nameplate

※1 The typical exploded view for this series.
※2 If you purchase ⑩ bladder as the spare parts, ④⑨ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 Only for 2.5 L and 4 L accumulator which maximum allowable working pressure is 35 MPa or more.

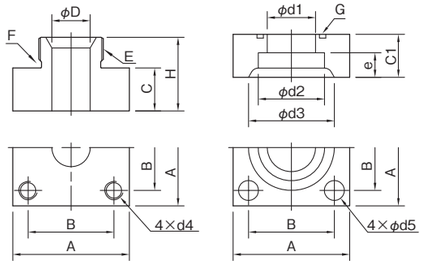
Piping Connection

Dimensional Drawing

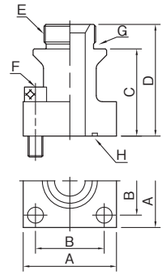
Bushing



Flange (with Counter Flange)



Valve Flange



※1 The above shows the shape of representative model. Confirm the actual shape with the drawing or the actual product.
※2 When there is no indication of maximum allowable working pressure of your accumulator in the column of “Applicable Acc. MAWP” of the following dimensional table, please contact us.

Dimensional Table

Bushing

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	
									O-Ring	B.U. Ring
23 MPa	1 – 4 L	6RAM42R02N23M	Rc1/4	28	12	Hex.50	Rc1/4	M42x2	AS568 920	–
		6RAM42R03N23M	Rc3/8	28	12	Hex.50	Rc3/8	M42x2	AS568 920	–
		6RAM42R04N23M	Rc1/2	28	12	Hex.50	Rc1/2	M42x2	AS568 920	–
		6RAM42R06N23M	Rc3/4	28	12	Hex.50	Rc3/4	M42x2	AS568 920	–
35 MPa	1 – 4 L	6RAM42R03N35M	Rc3/8	57	22	Hex.65	Rc3/8	M42x2	AS568 920	Special B.U. Ring
		6RAM42R04N35M	Rc1/2	57	22	Hex.65	Rc1/2	M42x2	AS568 920	Special B.U. Ring
		6RAM42R06N35M	Rc3/4	57	22	Hex.65	Rc3/4	M42x2	AS568 920	Special B.U. Ring
45 MPa	1 – 4 L	6RAM42R02N45M	Rc1/4	57	22	Hex.65	Rc1/4	M42x2	AS568 920	Special B.U. Ring
		6RAM42R03N45M	Rc3/8	57	22	Hex.65	Rc3/8	M42x2	AS568 920	Special B.U. Ring
		6RAM42R04N45M	Rc1/2	57	22	Hex.65	Rc1/2	M42x2	AS568 920	Special B.U. Ring
		6RAM42R06N45M	Rc3/4	57	22	Hex.65	Rc3/4	M42x2	AS568 920	Special B.U. Ring

Flange (with Counter Flange)

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	H	e	D	C1	d1	d2	d3	d4	d5	E	F	G
																	O-Ring	O-Ring
23 MPa	1 – 4 L	6FAM4215AX036	15A	76	56	28	48	11	25	28	16	22.2	32	M12	13	M42x2	AS568 920	JIS B 2401-1 G35
		6FAM4220AX035	20A	76	56	28	48	12	25	28	20	27.7	38	M12	13	M42x2	AS568 920	JIS B 2401-1 G35
		6FAM4225AX034	25A	76	56	28	48	14	25	28	25	34.5	45	M12	13	M42x2	AS568 920	JIS B 2401-1 G35
		6FAM4232AN23M	32A	76	56	28	48	16	25	28	28	43.2	56	M12	13	M42x2	AS568 920	JIS B 2401-1 G35
		6FAM4240AX032	40A	100	73	36	56	18	48	36	37.5	49.1	63	M16	18	M42x2	AS568 920	JIS B 2401-1 G55
		6FAM4250AN23M	50A	100	73	36	56	20	48	36	47.5	61.1	75	M16	18	M42x2	AS568 920	JIS B 2401-1 G55
35 MPa	1 – 4 L	6FAM4215AX009	15A	68	48	36	71	12	16	28	12.3	22.2	37.5	M12	14	M42x2	AS568 920 (with B.U. Ring)	JIS B 2401-1 G30 (with B.U. Ring)
		6FAM4220AN35M	20A	68	48	36	71	12	16	28	16.2	27.7	43.5	M12	14	M42x2	AS568 920 (with B.U. Ring)	JIS B 2401-1 G30 (with B.U. Ring)
		6FAM4225AX006	25A	92	65	45	80	14	25	36	20	34.5	53	M16	18	M42x2	AS568 920 (with B.U. Ring)	JIS B 2401-1 G40 (with B.U. Ring)
		6FAM4232AN35M	32A	92	65	45	80	18	25	36	30	43.2	63	M16	18	M42x2	AS568 920 (with B.U. Ring)	JIS B 2401-1 G40 (with B.U. Ring)

Valve Flange

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	G	H
										O-Ring	O-Ring
23 MPa	1 – 4 L	6FAM4232DN23M	32A	76	56	71	91	M42x2	M12x45	AS568 920	JIS B 2401-1 G35
		6FAM4250DN23M	50A	100	73	64	84	M42x2	M16x55	AS568 920	JIS B 2401-1 G55
35 MPa	1 – 4 L	6FAM4225DX020	25A	95	65	101	136	M42x2	M16x60	AS568 920 (with B.U. Ring)	JIS B 2401-1 G30 (with B.U. Ring)
		6FAM4232DN35M	32A	100	70	70	105	M42x2	M16x60	AS568 920 (with B.U. Ring)	JIS B 2401-1 G35 (with B.U. Ring)
45 MPa	1 – 4 L	6FAM4232DN45M	32A	Φ140	70	54	89	M42x2	M16x60	AS568 920 (with B.U. Ring)	JIS B 2401-1 G30 (with B.U. Ring)

Accessories/Tools/Spare Parts

Series				J						J		N			
Maximum Allowable Working Pressure MPa				11.8/16	25	35	10			17.5	25	21/23	35	45	85
Nominal Gas Volume L				0.03	0.1 – 0.5	0.5	1 – 3			1 – 3	1 – 5	1 – 4	1 – 4	1 – 4	1
Gas Charging Tools	Gas Charging Tools Kit (※1)		p. 99	6GG ☐☐☐☐☐☐☐		6GH ☐☐☐☐☐☐☐	6GG ☐☐☐☐☐☐☐			6GG ☐☐☐☐☐☐☐			6GH ☐☐☐☐☐☐☐		※2
	Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)						6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)			–		
	Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)						6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)				–	
Fixing Tools	Accumulator Clamp		p. 91	–	0.5L:6081C098		6081C114			6081C120	1-3L:6081C128 4-5L:6081C146	1L:6081C114 2.5/4L:6081C140	1L:6081C128 2.5/4L:6081C152		6081C167
	Base Mounting Plate		p. 92	–						–					
Protective Tools	Eye Nut (Hanging Tool)		p. 97	–						6HTM32		6HTM32 (Cannot be installed to 1 L)	6HTM42 (Cannot be installed to 1 L)		6HTM42X01
	Valve Cover		p. 97	–						645049608		645049608 (Cannot be installed to 1 L)	645049705 (Cannot be installed to 1 L)		–
	Rubber Cover		p. 97	–						–		6BC091094 (Cannot be installed to 1 L)	6BC102107 (Cannot be installed to 1 L)		–
Bladder Replacement	Parts: Bladder		p. 103	65 ☐ J003A17A	65 ☐ J ☐☐☐ A17A	65 ☐ JL05U16A	65 ☐ J ☐☐☐ A17A			65 ☐ J ☐☐☐ A17 ☐	65 ☐ J ☐☐☐ 35C ☐	65 ☐ N ☐☐☐☐		65 ☐ N ☐☐☐ A	65 ☐ NLL1A
	Parts: Bladder Backup Ring			–						–		–			607220055
	Tools: Cap Wrench (※3)		p. 98	Please use a commercially available wrench. Hex.41			Please use a commercially available wrench. Hex.54			Please use a commercially available wrench. Hex.54		Please use a commercially available wrench. 1L: Hex.30 2.5/4L: Hex.41	Please use a commercially available wrench. 1L: Hex.54 2.5/4L: Hex.46		Please use a commercially available wrench. Hex.54
Dynac Valve Replacement (DV Spec.)	Parts: Dynac Valve Packing with Valve Stem		p. 107	645026400A	645071300A		645026400A			645026400A			645071300A		
	Parts: Spring		p. 107	645045500						645045500					
	Parts: Spring Nut		p. 107	645048200						645048200					
	Tools: Spring Nut Key		p. 98	6TWH04						6TWH04					
SG Valve Replacement (R/Q Spec.)	Parts: SG Valve		p. 87	–						6H ☐ -AV35MP-F03-M32A			6H ☐ -AV35MP-F03-M42A		–
	Parts: Fuse Plug		p. 88	–						6H-FP35MP-03-F03					–
	Parts: Spring Loaded Type Safety Valve		p. 88	–						6H-SV ☐☐☐☐ -03-F03					–
	Parts: Pressure Gauge Containing Glycerol		p. 88	–						6018DUF0206 ☐☐☐☐ G					–
	Parts: SMA Pressure Gauge		p. 88	–						6018KDF02 ☐☐ 35MP0					–
Oil Port Valve Replacement	Tools: Ring Nut Wrench		p. 98	–						–					

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
(Only a hose and an adaptor are required to SG valve.)
※2 Please refer to page 99 for 85 MPa.
※3 Dimensions may differ for products manufactured in the past. Please confirm the dimensions with the actual product in advance when you arrange a commercial wrench.

Carbon Steel Medium Size From 5 to 16 Liters

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	A	2	3	M	P	-	L	1	0	-	A	A	C	M	4	2

①APPLICABLE INSPECTION/STANDARD

H	JAPAN High Pressure Gas Safety Law (Japan)
M	U.S.A. ASME
R	EUROPE PED (2014/68/EU)
N	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②BLADDER COMPOUND

N	Standard Nitrile Rubber (NBR)
H	Nitrile Rubber for High Temp. Use (H.NBR)
L	Nitrile Rubber for Low Temp. Use (L.NBR)
F	Butyl Rubber (IIR)
E	Ethylene Propylene Rubber (EPDM)
C	Chloroprene Rubber (CR)
G	Epichlorohydrin Rubber (CHC)
V	Fluorine Rubber (FKM)

③SERIES

A Series, H Series

④Maximum Allowable Working Pressure ※2

23 MPa, 35 MPa, 45 MPa

⑤NOMINAL GAS VOLUME

5 L, 6.3 L, 10 L, 16 L

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

A	Standard Dynac Valve (G thread)
M	H Series Dynac Valve (G thread For High Pressure)
Q	SG Valve + Safety Valve + Pressure Gauge ※3
R	SG Valve + Fuse Plug + Pressure Gauge ※3

※3 Q and R cannot be selected for 45 MPa.

⑦SPECIFICATION FOR OIL PORT SIDE

A	Standard Carbon Steel
E	High Flow
Y	Super High Flow
X	For Special Specifications or High flow Manifold Type

⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

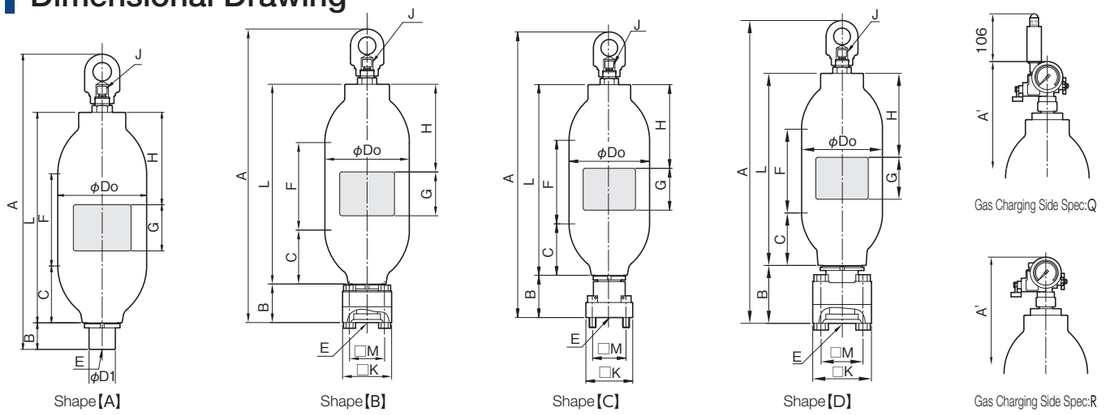
	SPECIFICATION OF SHELL	Inside Surface	Outside Surface	SERVICE FLUID
C	Standard Material (Carbon Steel)	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
D		Zinc Phosphate Treatment	Zinc Phosphate Treatment	Water-Glycol Fluid
A		Paint Coating	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
B		Paint Coating	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
N		Zinc Phosphate Treatment	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W		Zinc Phosphate Treatment	Paint Coating	Water-Glycol Fluid

※4 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨Oil Port Thread Specification or Special Specification

M * *	Oil Port Connection Thread Type and Thread Size
W * *	Oil Port Connection Diameter of Flange
* * *	Special Specifications
0 6 2	High Flow Manifold Type 23 MPa

Dimensional Drawing



Shape【A】 Shape【B】 Shape【C】 Shape【D】 Gas Charging Side Spec:Q Gas Charging Side Spec:R

Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※5	Do	A	A'	L	B	C	F	H	G	D1	Gas Charging Port Thread	Oil Port Thread	Allowable Oil Flow Rate	Possible Oil Flow Rate ※7
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	J	E	L/min	L/min
HN-A23MP-LL5-AACM42	A	23	5	27	190.7	574 $^{+12}_{0}$	581 $^{+12}_{0}$	390	58	123	134	160	90	57	G1/4	M42x2	300	450
HN-A23MP-6.3-AACM42	A	23	6.3	32	190.7	647 $^{+12}_{0}$	654 $^{+12}_{0}$	463	58	123	207	200	90	57	G1/4	M42x2	300	450
HN-A23MP-L10-AACM42	A	23	10	44	190.7	822 $^{+12}_{0}$	829 $^{+12}_{0}$	638	58	123	382	200	90	57	G1/4	M42x2	300	450
HN-A23MP-L16-AACM42	A	23	16	63	190.7	1,134 $^{+12}_{0}$	1,141 $^{+12}_{0}$	950	58	123	694	250	90	57	G1/4	M42x2	300	450
HN-A35MP-LL5-AACM42	A	35	5	45	216.3	591 $^{+15}_{0}$	598 $^{+15}_{0}$	398	67	131	127	160	90	57	G3/8	M42x2	300	450
HN-A35MP-6.3-AACM42	A	35	6.3	53	216.3	664 $^{+15}_{0}$	671 $^{+15}_{0}$	471	67	131	200	200	90	57	G3/8	M42x2	300	450
HN-A35MP-L10-AACM42	A	35	10	74	216.3	838 $^{+15}_{0}$	845 $^{+15}_{0}$	645	67	131	374	200	90	57	G3/8	M42x2	300	450
HN-A35MP-L16-AACM42	A	35	16	107	216.3	1,150 $^{+15}_{0}$	1,157 $^{+15}_{0}$	957	67	131	686	250	90	57	G3/8	M42x2	300	450
HN-H45MP-LL5-MACM42	A	45	5	45	216.3	591 $^{+15}_{0}$	—	398	67	131	127	160	90	57	G3/8	M42x2	300	450
HN-H45MP-6.3-MACM42	A	45	6.3	54	216.3	664 $^{+15}_{0}$	—	471	67	131	200	200	90	57	G3/8	M42x2	300	450
HN-H45MP-L10-MACM42	A	45	10	74	216.3	838 $^{+15}_{0}$	—	645	67	131	374	200	90	57	G3/8	M42x2	300	450
HN-H45MP-L16-MACM42	A	45	16	108	216.3	1,150 $^{+15}_{0}$	—	957	67	131	686	250	90	57	G3/8	M42x2	300	450

High Flow

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※5	Do	A	A'	L	B	C	F	H	G	K	M	Hexagon Bolt	Gas Charging Port Thread	Oil Port Thread	Allowable Oil Flow Rate	Possible Oil Flow Rate ※7
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		J	E	L/min	L/min
HN-A23MP-LL5-AECW50	B	23	5	32	190.7	605 $^{+12}_{0}$	612 $^{+12}_{0}$	390	89	123	134	160	90	112	80	M16x90	G1/4	MAX.50A	600	900
HN-A23MP-6.3-AECW50	B	23	6.3	37	190.7	678 $^{+12}_{0}$	685 $^{+12}_{0}$	463	89	123	207	200	90	112	80	M16x90	G1/4	MAX.50A	600	900
HN-A23MP-L10-AECW50	B	23	10	46	190.7	853 $^{+12}_{0}$	860 $^{+12}_{0}$	638	89	123	382	200	90	112	80	M16x90	G1/4	MAX.50A	600	900
HN-A23MP-L16-AECW50	B	23	16	67	190.7	1,165 $^{+12}_{0}$	1,172 $^{+12}_{0}$	950	89	123	694	250	90	112	80	M16x90	G1/4	MAX.50A	600	900
HN-A23MP-LL5-AXC062	C	23	5	31	190.7	617 $^{+12}_{0}$	624 $^{+12}_{0}$	390	101	123	134	160	90	112	80	M16x60 (Hexagon Socket Head Cap Screw)	G1/4	MAX.50A JIS B 2401-1 G60	600	900
HN-A23MP-6.3-AXC062	C	23	6.3	36	190.7	690 $^{+12}_{0}$	697 $^{+12}_{0}$	463	101	123	207	200	90	112	80	M16x60 (Hexagon Socket Head Cap Screw)	G1/4	MAX.50A JIS B 2401-1 G60	600	900
HN-A23MP-L10-AXC062	C	23	10	47	190.7	865 $^{+12}_{0}$	872 $^{+12}_{0}$	638	101	123	382	200	90	112	80	M16x60 (Hexagon Socket Head Cap Screw)	G1/4	MAX.50A JIS B 2401-1 G60	600	900
HN-A23MP-L16-AXC062	C	23	16	66	190.7	1,177 $^{+12}_{0}$	1,184 $^{+12}_{0}$	950	101	123	694	250	90	112	80	M16x60 (Hexagon Socket Head Cap Screw)	G1/4	MAX.50A JIS B 2401-1 G60	600	900
HN-A35MP-LL5-AECW50	B	35	5	55	216.3	646 $^{+15}_{0}$	653 $^{+15}_{0}$	398	122	131	127	160	90	132	92	M20x130	G3/8	MAX.50A	600	900
HN-A35MP-6.3-AECW50	B	35	6.3	63	216.3	719 $^{+15}_{0}$	726 $^{+15}_{0}$	471	122	131	200	200	90	132	92	M20x130	G3/8	MAX.50A	600	900
HN-A35MP-L10-AECW50	B	35	10	84	216.3	893 $^{+15}_{0}$	900 $^{+15}_{0}$	645	122	131	374	200	90	132	92	M20x130	G3/8	MAX.50A	600	900
HN-A35MP-L16-AECW50	B	35	16	117	216.3	1,205 $^{+15}_{0}$	1,212 $^{+15}_{0}$	957	122	131	686	250	90	132	92	M20x130	G3/8	MAX.50A	600	900

Super High Flow

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※5	Do	A	A'	L	B	C	F	H	G	K	M	Hexagon Bolt	Gas Charging Port Thread	Oil Port Thread	Allowable Oil Flow Rate	Possible Oil Flow Rate ※7
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		J	E	L/min	L/min
HN-A23MP-LL5-AYCW65	D	23	5	41	190.7	668 $^{+12}_{0}$	675 $^{+12}_{0}$	411	131	136	142	160	90	140	100	M20x130	G1/4	MAX.65A	1,200	—
HN-A23MP-6.3-AYCW65	D	23	6.3	45	190.7	733 $^{+12}_{0}$	740 $^{+12}_{0}$	476	131	136	207	200	90	140	100	M20x130	G1/4	MAX.65A	1,200	—
HN-A23MP-L10-AYCW65	D	23	10	56	190.7	903 $^{+12}_{0}$	910 $^{+12}_{0}$	646	131	136	377	200	90	140	100	M20x130	G1/4	MAX.65A	1,200	—
HN-A23MP-L16-AYCW65	D	23	16	76	190.7	1,219 $^{+12}_{0}$	1,226 $^{+12}_{0}$	962	131	136	693	250	90	140	100	M20x130	G1/4	MAX.65A	1,200	—

※2 For the accumulator with P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 23 MP → 230 B).
※5 Weight may vary depending on applicable inspections and standards. ※6 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※7 Maximum oil flow rate available under certain conditions.

Typical Applicable Inspections / Standards

METI ※8	ASME ※9	PED ※10	CHINA ※11	NACOL ※12
H	M	R	D	N
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	–	–	Out of Scope	○
○	–	–	Out of Scope	○
○	–	–	Out of Scope	○
○	–	–	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
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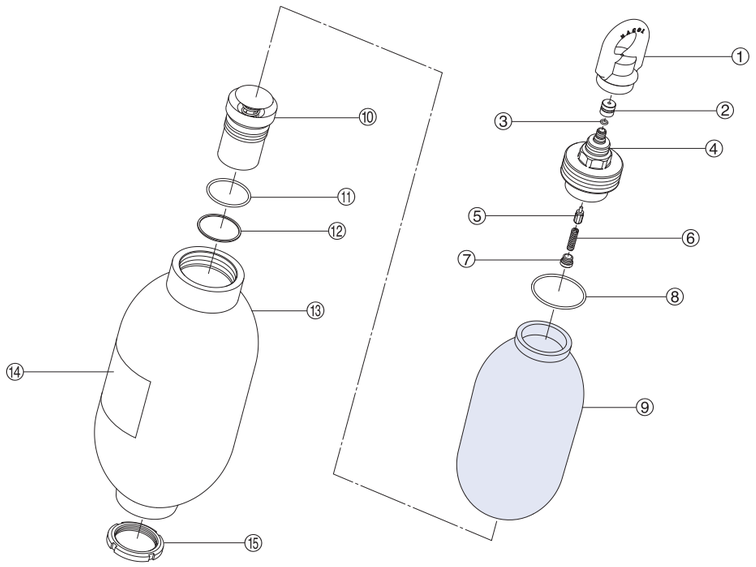
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○
○	○	○	Out of Scope	○

※8 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※9 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※10 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※11 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※12 NACOL: NACOL (Manufacturer's) Inspection

Carbon Steel Medium Size From 5 to 16 Liters

Typical Exploded View

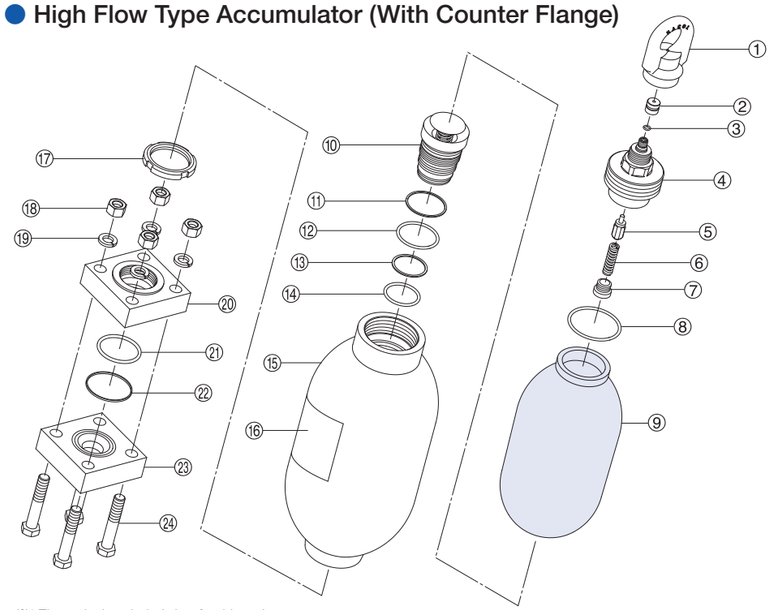
Standard Type



①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring ※3 (Item No: 6071 0 2070)
⑨	Bladder
⑩	Oil Port Valve Assembly
⑪	O-ring ※3 (Item No: 6071 0 2055)
⑫	Back Up Ring ※4 (Item No: 607212055)
⑬	Accumulator Body
⑭	Nameplate
⑮	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 Back up ring is needed only for more than 35 MPa.

High Flow Type Accumulator (With Counter Flange)

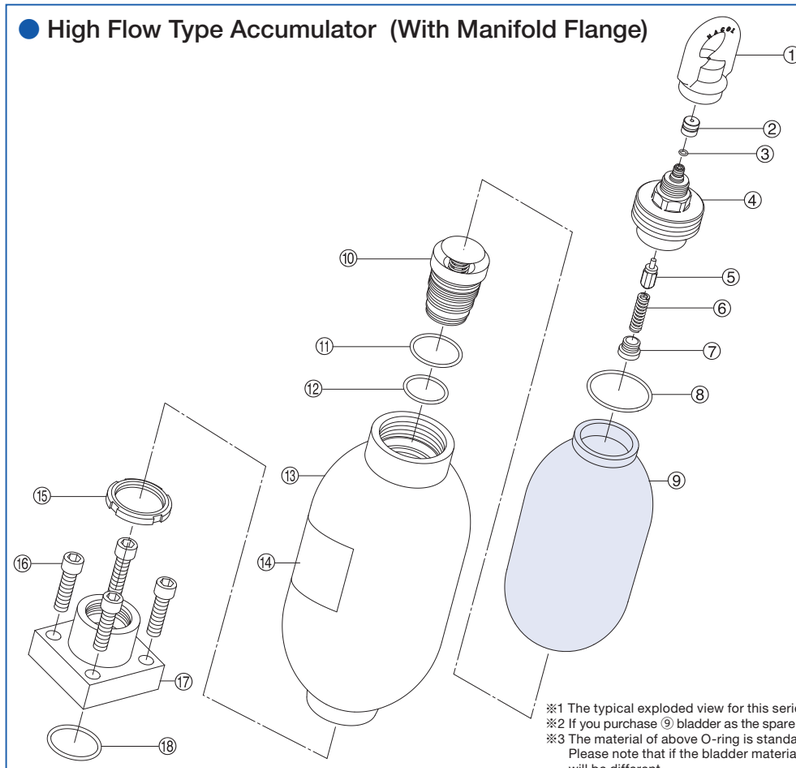


①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring ※3 (Item No: 6071 0 2070)
⑨	Bladder
⑩	Oil Port Valve Assembly
⑪	O-ring ※3 (Item No: 6071 0 2055)
⑫	Back Up Ring ※6 (Item No: 607212055)
⑬	Back Up Ring ※6 (Item No: 607210046)
⑭	O-ring ※3 (Item No: 6071 0 0046)
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Nut
⑲	Spring Washer
⑳	Flange
㉑	O-ring ※3 ※4 (Item No: 6071 0 2055) / O-ring ※3 ※5 (Item No: 6071 0 2050)
㉒	Back Up Ring ※6 (Item No: 607252050)
㉓	Counter Flange
㉔	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 This number is item number of the O-ring for 23 MPa.
※5 This number is item number of the O-ring for 35 MPa.
※6 Back up ring is needed only for higher than 35 MPa.

Typical Exploded View

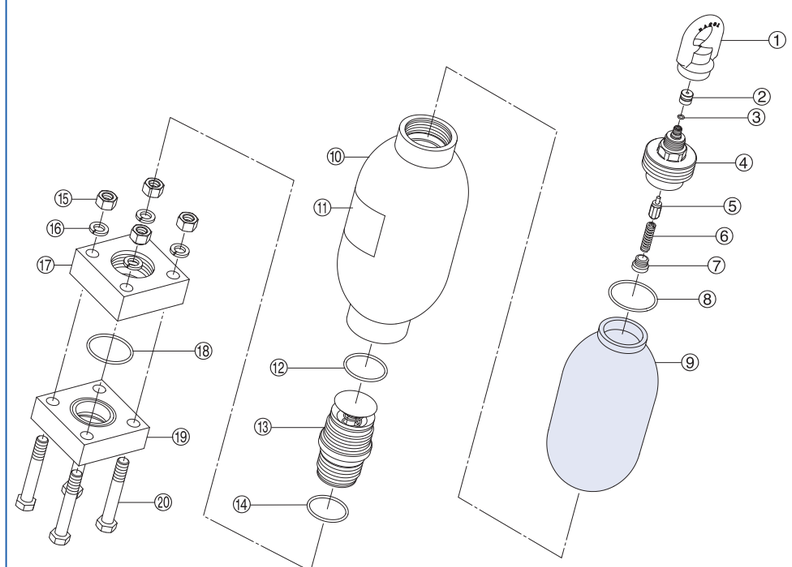
High Flow Type Accumulator (With Manifold Flange)



①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring ※3 (Item No: 6071 0 2070)
⑨	Bladder
⑩	Oil Port Valve Assembly
⑪	O-ring ※3 (Item No: 6071 0 2055)
⑫	O-ring ※3 (Item No: 6071 0 0046)
⑬	Accumulator Body
⑭	Nameplate
⑮	Ring Nut
⑯	Hexagon Socket Head Cap Screw
⑰	Flange
⑱	O-ring ※3 (Item No: 6071 0 2060)

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Super High Flow Type Accumulator



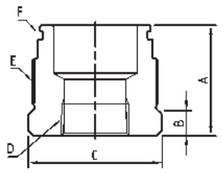
①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring ※3 (Item No: 6071 0 2070)
⑨	Bladder
⑩	Accumulator Body
⑪	Nameplate
⑫	O-ring ※3 (Item No: 6071 0 2070)
⑬	Oil Port Valve Assembly
⑭	O-ring ※3 (Item No: 6071 0 7230)
⑮	Nut
⑯	Spring Washer
⑰	Flange
⑱	O-ring ※3 (Item No: 6071 0 2070)
⑲	Counter Flange
⑳	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

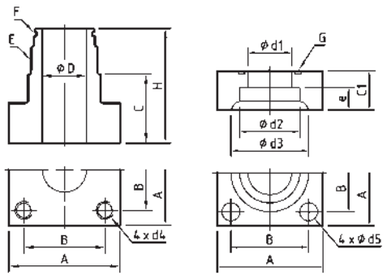
Piping Connection

Dimensional Drawing

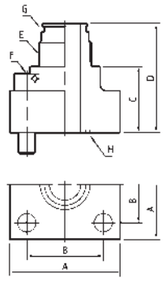
Bushing



Flange (with Counter Flange)



Valve Flange



※1 The above shows the shape of representative model. Confirm the actual shape with the drawing or the actual product.
※2 When there is no indication of maximum allowable working pressure of your accumulator in the column of "Applicable Acc. MAWP" of the following dimensional table, please contact us.

Dimensional Table

Bushing

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	
									O-Ring	B.U. Ring
23 MPa	5 – 16 L	6RCM42R03N23M	Rc3/8	42	12	Hex.41	Rc3/8	M42x2	JIS B 2401-1 P32	–
		6RCM42R04N23M	Rc1/2	42	12	Hex.41	Rc1/2	M42x2	JIS B 2401-1 P32	–
		6RCM42R06N23M	Rc3/4	42	12	Hex.41	Rc3/4	M42x2	JIS B 2401-1 P32	–
		6RCM42R08N23M	Rc1	60	30	Hex.46	Rc1	M42x2	JIS B 2401-1 P32	–
35 MPa	5 – 16 L	6RCM42R02N35M	Rc1/4	58	17	Hex.46	Rc1/4	M42x2	AS568 218	AS568 218
		6RCM42R03N35M	Rc3/8	58	17	Hex.46	Rc3/8	M42x2	AS568 218	AS568 218
		6RCM42R04N35M	Rc1/2	58	17	Hex.46	Rc1/2	M42x2	AS568 218	AS568 218

Flange (with Counter Flange)

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	H	D	C1	e	d1	d2	d3	d4	d5	E	F	G
																	O-Ring	O-Ring
23 MPa	5 – 16 L	6FCM4215AX033	15A	76	56	28	58	25	28	11	16	22.2	32	M12	13	M42x2	JIS B 2401-1 P32	JIS B 2401-1 G35
		6FCM4220AX032	20A	76	56	28	58	25	28	12	20	27.7	38	M12	13	M42x2	JIS B 2401-1 P32	JIS B 2401-1 G35
		6FCM4232AN23M	32A	76	56	28	58	25	28	16	28	43.2	56	M12	13	M42x2	JIS B 2401-1 P32	JIS B 2401-1 G35
		6FCM4240AX035	40A	100	73	36	66	47	36	18	37.5	49.1	63	M16	18	M42x2	JIS B 2401-1 P32	JIS B 2401-1 G55
		6FCM4250AN23M	50A	100	73	36	66	47	36	20	47.5	61.1	75	M16	18	M42x2	JIS B 2401-1 P32	JIS B 2401-1 G55
35 MPa	5 – 16 L	6FCM4220AN35M	20A	68	48	36	77	16	28	12	16.2	27.7	43.5	M12	14	M42x2	AS568 218 (with B.U. Ring)	JIS B 2401-1 G30 (with B.U. Ring)
		6FCM4225AX009	25A	92	65	45	86	25	36	14	21	34.5	53	M16	18	M42x2	AS568 218 (with B.U. Ring)	JIS B 2401-1 G40 (with B.U. Ring)
		6FCM4232AN35M	32A	92	65	45	86	25	36	18	30	43.2	63	M16	18	M42x2	AS568 218 (with B.U. Ring)	JIS B 2401-1 G40 (with B.U. Ring)
		6FCM4250AN35M	50A	128	90	50	91	43	50	25	43	61.1	84	M20	22	M42x2	AS568 218 (with B.U. Ring)	JIS B 2401-1 G55 (with B.U. Ring)

Valve Flange

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	G	H
										O-Ring	O-Ring
23 MPa	5 – 16 L	6FCM4232DN23M	32A	76	56	51	81	M42x2	M12x45	JIS B 2401-1 P32	JIS B 2401-1 G35
		6FCM4240DN23M	40A	92	65	56	86	M42x2	M16x55	JIS B 2401-1 P32	JIS B 2401-1 G45
		6FCM4250DN23M	50A	100	73	36	66	M42x2	M16x55	JIS B 2401-1 P32	JIS B 2401-1 G55
35 MPa	5 – 16 L	6FCM4225DX027	25A	φ106	52	110	151	M42x2	M16x55	AS568 218 (with B.U. Ring)	JIS B 2401-1 G35 (with B.U. Ring)
		6FCM4232DN35M	32A	100	70	54	95	M42x2	M16x60	AS568 218 (with B.U. Ring)	JIS B 2401-1 G35 (with B.U. Ring)

Accessories/Tools/Spare Parts

Series				A		H
Maximum Allowable Working Pressure MPa				23	35	45
Nominal Gas Volume L				5 – 16		
Gas Charging Tools	Gas Charging Tools Kit (※1)		p. 99	6GG ☐☐☐☐ ☐☐☐ ☐		6GH ☐☐☐☐ ☐☐☐☐ ☐
	Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)		
	Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)		
Fixing Tools	Accumulator Clamp		p. 91	6081C191	6081C215	
	Base Mounting Plate		p. 92	6BMP191P		
Protective Tools	Eye Nut (Hanging Tool)		p. 97	6HTM32	6HTM42	
	Valve Cover		p. 97	645049608	645049705	
	Rubber Cover		p. 97	6BC099102	6BC121124	
Bladder Replacement Parts	Bladder		p. 103	65 ☐ A ☐☐☐		65 ☐ H ☐☐☐ A
	Bladder Backup Ring			–		
Tools	Cap Wrench (※2)		p. 98	Please use a commercially available wrench. Hex.41	Please use a commercially available wrench. Hex.46	
Dynac Valve Replacement (DV Spec.) Parts	Dynac Valve Packing with Valve Stem		p. 107	645026400A	645071300A	
	Spring		p. 107	645045500		
	Spring Nut		p. 107	645048200		
Tools	Spring Nut Key		p. 98	6TWH04		
SG Valve Replacement (R/Q Spec.) Parts	SG Valve		p. 87	6H ☐ -AV35MP-F03-M32A	6H ☐ -AV35MP-F03-M42A	–
	Fuse Plug		p. 88	6H-FP35MP-03-F03		–
	Spring Loaded Type Safety Valve		p. 88	6H-SV ☐☐☐☐ -03-F03		–
	Pressure Gauge Containing Glycerol		p. 88	6018DUF0206 ☐☐☐☐ G		–
	SMA Pressure Gauge		p. 88	6018KDF02 ☐☐☐ 35MP ☐		–
Oil Port Valve Replacement Tools	Ring Nut Wrench		p. 98	6TWD075		

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
(Only a hose and an adaptor are required to SG valve.)
※2 Dimensions may differ for products manufactured in the past. Please confirm the dimensions with the actual product in advance when you arrange a commercial wrench.

Carbon Steel Large Size From 20 to 60 Liters

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	H	2	3	M	P	-	L	2	0	-	A	A	C	M	6	0

①APPLICABLE INSPECTION/STANDARD

H	JAPAN High Pressure Gas Safety Law (Japan)
M	U.S.A. ASME
R	EUROPE PED (2014/68/EU)
D	CHINA
N	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②BLADDER COMPOUND

N	Standard Nitrile Rubber (NBR)
H	Nitrile Rubber for High Temp. Use (H.NBR)
L	Nitrile Rubber for Low Temp. Use (L.NBR)
F	Butyl Rubber (IIR)
E	Ethylene Propylene Rubber (EPDM)
C	Chloroprene Rubber (CR)
G	Epichlorohydrin Rubber (CHC)
V	Fluorine Rubber (FKM)

③SERIES

H Series, N Series, U Series

④Maximum Allowable Working Pressure ※2

2 MPa, 21 MPa, 23 MPa, 25 MPa, 35 MPa, 45 MPa, 49.1 MPa, 50 MPa

⑤NOMINAL GAS VOLUME ※3

10 L, 20 L, 29 L, 30 L, 40 L, 50 L, 60 L

※3 For 10L, only the small diameter U series can be selected.

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

A	Standard Dynac Valve (G thread)
D	For 45/49.1/50 MPa/Top Cap Two Pieces Type/Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge ※4
R	SG Valve + Fuse Plug + Pressure Gauge ※4

※4 Q and R cannot be selected if the pressure exceeds 35 MPa/350 bar.

⑦SPECIFICATION FOR OIL PORT SIDE

A	Standard Carbon Steel
E	High Flow
Y	Super High Flow
X	For Special Specifications or High flow Manifold Type or Screen Type

⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

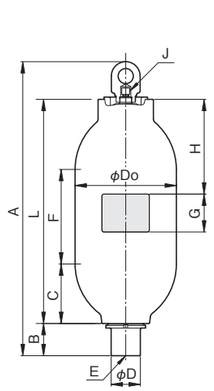
	SPECIFICATION OF SHELL	Inside Surface	Outside Surface	SERVICE FLUID
C	Standard Material (Carbon Steel)	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
D		Zinc Phosphate Treatment	Zinc Phosphate Treatment	Water-Glycol Fluid
A	※5	Paint Coating	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
B	※5	Paint Coating	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
N		Zinc Phosphate Treatment	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W		Zinc Phosphate Treatment	Paint Coating	Water-Glycol Fluid
X	Special Specifications			

※5 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

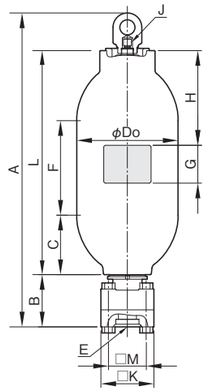
⑨Oil Port Thread Specification or Special Specification

M 6 0	Oil Port Connection Thread Type and Thread Size
W * *	Oil Port Connection Diameter of Flange
* * *	Special Specifications
0 3 2	35 MPa for China, Shell Material Special
1 0 0	Oil Port Connection Diameter of Flange 100 A
2 7 4	High Flow Manifold Type 23 MPa
5 0 1	Screen Type

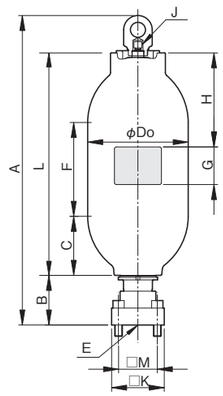
Dimensional Drawing



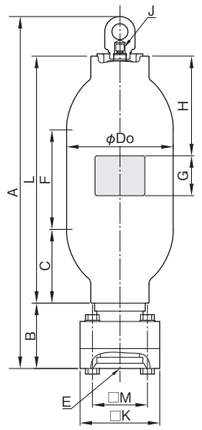
Shape【A】



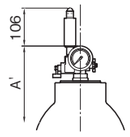
Shape【B】



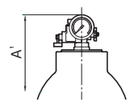
Shape【C】



Shape【D】



Gas Charging Side Spec:Q



Gas Charging Side Spec:R

Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※6	Do	A	A'	L	B	C	F	H	G	D1	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※8
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			L/min	L/min
HN-H23MP-L20-AACM60	A	23	20	84	267.4	852 +17 0	859 +17 0	668	85	157	326	250	90	77	G1/4	M60x2	600	1,100
NN-H23MP-L29-AACM60	A	23	29	111	267.4	1,071 +17 0	1,078 +17 0	887	85	157	545	250	90	77	G1/4	M60x2	600	1,100
HN-H23MP-L30-AACM60	A	23	30	114	267.4	1,097 +17 0	1,104 +17 0	913	85	157	571	250	90	77	G1/4	M60x2	600	1,100
HN-H23MP-L40-AACM60	A	23	40	143	267.4	1,336 +17 0	1,343 +17 0	1,152	85	157	810	400	90	77	G1/4	M60x2	600	1,100
HN-H23MP-L50-AACM60	A	23	50	179	267.4	1,634 +17 0	1,641 +17 0	1,450	85	157	1,108	700	90	77	G1/4	M60x2	600	1,100
HN-H23MP-L60-AACM60	A	23	60	201	267.4	1,821 +17 0	1,828 +17 0	1,637	85	157	1,295	700	90	77	G1/4	M60x2	600	1,100
HN-N35MP-L20-AACM60	A	35	20	161	298.5	865 +23 0	872 +23 0	671	95	164	320	250	90	77	G3/8	M60x2	600	1,100
NN-N35MP-L29-AACM60	A	35	29	211	298.5	1,104 +23 0	1,111 +23 0	910	95	164	559	250	90	77	G3/8	M60x2	600	1,100
HN-N35MP-L30-AACM60	A	35	30	212	298.5	1,110 +23 0	1,117 +23 0	916	95	164	565	250	90	77	G3/8	M60x2	600	1,100
HN-N35MP-L40-AACM60	A	35	40	262	298.5	1,325 +23 0	1,332 +23 0	1,131	95	164	780	400	90	77	G3/8	M60x2	600	1,100
HN-N35MP-L50-AACM60	A	35	50	331	298.5	1,647 +23 0	1,654 +23 0	1,453	95	164	1,102	700	90	77	G3/8	M60x2	600	1,100
HN-N35MP-L60-AACM60	A	35	60	363	298.5	1,785 +23 0	1,792 +23 0	1,591	95	164	1,240	700	90	77	G3/8	M60x2	600	1,100
DN-N35MP-L30-AAX032	A	35	30	218	298.5	1,110 +23 0	1,117 +23 0	916	95	164	565	250	90	77	G3/8	M60x2	600	1,100
DN-N35MP-L40-AAX032	A	35	40	265	298.5	1,325 +23 0	1,332 +23 0	1,131	95	164	780	400	90	77	G3/8	M60x2	600	1,100
DN-N35MP-L50-AAX032	A	35	50	337	298.5	1,647 +23 0	1,654 +23 0	1,453	95	164	1,102	700	90	77	G3/8	M60x2	600	1,100
DN-N35MP-L60-AAX032	A	35	60	372	298.5	1,785 +23 0	1,792 +23 0	1,591	95	164	1,240	700	90	77	G3/8	M60x2	600	1,100
DN-N45MP-L30-DACM60	A	45	30	218	298.5	1,110 +23 0	–	916	95	164	565	250	90	77	G3/8	M60x2	600	1,100
DN-N45MP-L40-DACM60	A	45	40	265	298.5	1,325 +23 0	–	1,131	95	164	780	400	90	77	G3/8	M60x2	600	1,100
DN-N45MP-L50-DACM60	A	45	50	337	298.5	1,647 +23 0	–	1,453	95	164	1,102	700	90	77	G3/8	M60x2	600	1,100
DN-N45MP-L60-DACM60	A	45	60	372	298.5	1,785 +23 0	–	1,591	95	164	1,240	700	90	77	G3/8	M60x2	600	1,100
HN-N49.1-L20-DACM60	A	49.1(50)※9	20	164	298.5	865 +23 0	–	671	95	164	320	250	90	77	G3/8	M60x2	600	1,100
HN-N49.1-L30-DACM60	A	49.1(50)※9	30	217	298.5	1,110 +23 0	–	916	95	164	565	250	90	77	G3/8	M60x2	600	1,100
HN-N49.1-L40-DACM60	A	49.1(50)※9	40	266	298.5	1,325 +23 0	–	1,131	95	164	780	400	90	77	G3/8	M60x2	600	1,100
HN-N49.1-L50-DACM60	A	49.1(50)※9	50	337	298.5	1,647 +23 0	–	1,453	95	164	1,102	700	90	77	G3/8	M60x2	600	1,100
HN-N49.1-L60-DACM60	A	49.1(50)※9	60	372	298.5	1,785 +23 0	–	1,591	95	164	1,240	700	90	77	G3/8	M60x2	600	1,100

※2 For the accumulator with P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 23 MP → 230 B).
※6 Weight may vary depending on applicable inspections and standards.
※7 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※8 Maximum oil flow rate available under certain conditions.
※9 For products certified according to NACOL (Manufacturer's) Inspection, Japan, the maximum allowable working pressure is 50 MPa.
※10 The Chinese inspection products with maximum working pressure of 23 MPa and nominal gas volume of 40 L and 60 L differ in overall length from the above.

Typical Applicable Inspections / Standards

METI ※11	ASME ※12	PED ※13	CHINA ※14	NACOL ※15
H	M	R	D	N
○	○	○	Out of Scope	○
–	–	–	Out of Scope	○
○	○	○	○	○
○	○	○	○※10	○
○	○	○	○	○
○	○	○	○※10	○
○	○	○	Out of Scope	○
–	–	–	Out of Scope	○
○	○	○	–	○
○	○	○	–	○
○	○	○	–	○
○	○	○	–	○
–	–	–	○	–
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–	–	–	○	–
–	–	–	○	–
–	–	–	○	–
–	–	–	○	–
–	–	–	○	–
○	–	–	Out of Scope	○
○	–	–	–	○
○	–	–	–	○
○	–	–	–	○
○	–	–	–	○

※11 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※12 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※13 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※14 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※15 NACOL: NACOL (Manufacturer's) Inspection

Carbon Steel Large Size From 20 to 60 Liters

Dimensional Table

High Flow

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※6	Do	A	A'	L	B	C	F	H	G	K	M	Hexagon Bolt	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※8
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				L/min	L/min
HN-H23MP-L20-AECW65	B	23	20	95	267.4	905 $^{+17}_{0}$	912 $^{+17}_{0}$	668	138	157	326	250	90	140	100	M20x130	G1/4	MAX.65A	1,200	2,500
NN-H23MP-L29-AECW65	B	23	29	122	267.4	1,124 $^{+17}_{0}$	1,131 $^{+17}_{0}$	887	138	157	545	250	90	140	100	M20x130	G1/4	MAX.65A	1,200	2,500
HN-H23MP-L30-AECW65	B	23	30	125	267.4	1,150 $^{+17}_{0}$	1,157 $^{+17}_{0}$	913	138	157	571	250	90	140	100	M20x130	G1/4	MAX.65A	1,200	2,500
HN-H23MP-L40-AECW65	B	23	40	154	267.4	1,389 $^{+17}_{0}$	1,396 $^{+17}_{0}$	1,152	138	157	810	400	90	140	100	M20x130	G1/4	MAX.65A	1,200	2,500
HN-H23MP-L50-AECW65	B	23	50	190	267.4	1,687 $^{+17}_{0}$	1,694 $^{+17}_{0}$	1,450	138	157	1,108	700	90	140	100	M20x130	G1/4	MAX.65A	1,200	2,500
HN-H23MP-L60-AECW65	B	23	60	212	267.4	1,874 $^{+17}_{0}$	1,881 $^{+17}_{0}$	1,637	138	157	1,295	700	90	140	100	M20x130	G1/4	MAX.65A	1,200	2,500
HN-H23MP-L20-AXC274	C	23	20	91	267.4	899 $^{+17}_{0}$	906 $^{+17}_{0}$	668	132	157	326	250	90	140	103	M22x80	G1/4	50A JIS B 2401-1 G60	1,200	2,500
NN-H23MP-L29-AXC274	C	23	29	118	267.4	1,118 $^{+17}_{0}$	1,125 $^{+17}_{0}$	887	132	157	545	250	90	140	103	M22x80	G1/4	50A JIS B 2401-1 G60	1,200	2,500
HN-H23MP-L30-AXC274	C	23	30	121	267.4	1,144 $^{+17}_{0}$	1,151 $^{+17}_{0}$	913	132	157	571	250	90	140	103	M22x80	G1/4	50A JIS B 2401-1 G60	1,200	2,500
HN-H23MP-L40-AXC274	C	23	40	150	267.4	1,383 $^{+17}_{0}$	1,390 $^{+17}_{0}$	1,152	132	157	810	400	90	140	103	M22x80	G1/4	50A JIS B 2401-1 G60	1,200	2,500
HN-H23MP-L50-AXC274	C	23	50	186	267.4	1,681 $^{+17}_{0}$	1,688 $^{+17}_{0}$	1,450	132	157	1,108	700	90	140	103	M22x80	G1/4	50A JIS B 2401-1 G60	1,200	2,500
HN-H23MP-L60-AXC274	C	23	60	208	267.4	1,868 $^{+17}_{0}$	1,875 $^{+17}_{0}$	1,637	132	157	1,295	700	90	140	103	M22x80	G1/4	50A JIS B 2401-1 G60	1,200	2,500
HN-N35MP-L20-AECW65	B	35	20	177	298.5	935 $^{+23}_{0}$	942 $^{+23}_{0}$	671	165	164	320	250	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
NN-N35MP-L29-AECW65	B	35	29	228	298.5	1,174 $^{+23}_{0}$	1,181 $^{+23}_{0}$	910	165	164	559	250	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
HN-N35MP-L30-AECW65	B	35	30	229	298.5	1,180 $^{+23}_{0}$	1,187 $^{+23}_{0}$	916	165	164	565	250	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
HN-N35MP-L40-AECW65	B	35	40	250	298.5	1,395 $^{+23}_{0}$	1,402 $^{+23}_{0}$	1,131	165	164	780	400	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
HN-N35MP-L50-AECW65	B	35	50	320	298.5	1,717 $^{+23}_{0}$	1,724 $^{+23}_{0}$	1,453	165	164	1,102	700	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
HN-N35MP-L60-AECW65	B	35	60	380	298.5	1,855 $^{+23}_{0}$	1,862 $^{+23}_{0}$	1,591	165	164	1,240	700	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
DN-N35MP-L30-AEX032	B	35	30	229	298.5	1,180 $^{+23}_{0}$	1,187 $^{+23}_{0}$	916	165	164	565	250	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
DN-N35MP-L40-AEX032	B	35	40	250	298.5	1,395 $^{+23}_{0}$	1,402 $^{+23}_{0}$	1,131	165	164	780	400	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
DN-N35MP-L50-AEX032	B	35	50	320	298.5	1,717 $^{+23}_{0}$	1,724 $^{+23}_{0}$	1,453	165	164	1,102	700	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500
DN-N35MP-L60-AEX032	B	35	60	380	298.5	1,855 $^{+23}_{0}$	1,862 $^{+23}_{0}$	1,591	165	164	1,240	700	90	160	110	M22x150	G3/8	MAX.65A	1,200	2,500

Super High Flow

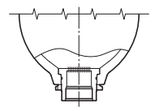
Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※6	Do	A	A'	L	B	C	F	H	G	K	M	Hexagon Bolt	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※8
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				L/min	L/min
HN-H23MP-L20-AYC100	D	23	20	118	267.4	965 $^{+17}_{0}$	972 $^{+17}_{0}$	703	163	185	333	250	90	200	138	M30x160	G1/4	MAX.100A	2,400	4,200
NN-H23MP-L29-AYC100	D	23	29	143	267.4	1,184 $^{+17}_{0}$	1,191 $^{+17}_{0}$	922	163	185	552	250	90	200	138	M30x160	G1/4	MAX.100A	2,400	4,200
HN-H23MP-L30-AYC100	D	23	30	145	267.4	1,210 $^{+17}_{0}$	1,217 $^{+17}_{0}$	948	163	185	578	250	90	200	138	M30x160	G1/4	MAX.100A	2,400	4,200
HN-H23MP-L40-AYC100	D	23	40	169	267.4	1,439 $^{+17}_{0}$	1,446 $^{+17}_{0}$	1,177	163	185	807	400	90	200	138	M30x160	G1/4	MAX.100A	2,400	4,200
HN-H23MP-L50-AYC100	D	23	50	203	267.4	1,747 $^{+17}_{0}$	1,754 $^{+17}_{0}$	1,485	163	185	1,115	700	90	200	138	M30x160	G1/4	MAX.100A	2,400	4,200
HN-H23MP-L60-AYC100	D	23	60	219	267.4	1,922 $^{+17}_{0}$	1,929 $^{+17}_{0}$	1,660	163	185	1,290	700	90	200	138	M30x160	G1/4	MAX.100A	2,400	4,200

Slim Body Type

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※6	Do	A	A'	L	B	C	F	H	G	D1	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※8
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			L/min	L/min
HN-U25MP-L10-AACM60	A	25	10	55	232	742 $^{+12}_{0}$	753 $^{+12}_{0}$	540	79	159	217	220	90	76	G1/4	M60x2	600	–
HN-U25MP-L20-AACM60	A	25	20	90	232	1,086 $^{+12}_{0}$	1,097 $^{+12}_{0}$	884	79	159	561	250	90	76	G1/4	M60x2	600	–
HN-U25MP-L30-AACM60	A	25	30	126	232	1,466 $^{+12}_{0}$	1,477 $^{+12}_{0}$	1,264	79	159	941	400	90	76	G1/4	M60x2	600	–
HN-U25MP-L50-AACM60	A	25	50	176	232	1,976 $^{+12}_{0}$	1,987 $^{+12}_{0}$	1,774	79	159	1,451	700	90	76	G1/4	M60x2	600	–

Screen Type

Screen type accumulators have a special oil port valve assembly with small holes for fluid passage, instead of an oil port assembly with a poppet valve. With the bladder bottom protected, the product is suitable for pulsation dampening and shock absorption in a low pressure line.
The oil port valve of screen type accumulator is made of stainless steel.



Enlarged view of the lower part of screen type accumulator

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※6	Do	A	A'	L	B	C	F	H	G	D1	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※8
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			L/min	L/min
HN-H2MPA-L20-AXC501	A	2	20	94	267.4	803 $^{+17}_{0}$	810 $^{+17}_{0}$	668	36	157	326	250	90	77	G1/4	M60x2	–	–
NN-H2MPA-L29-AXC501	A	2	29	121	267.4	1,022 $^{+17}_{0}$	1,029 $^{+17}_{0}$	887	36	157	545	250	90	77	G1/4	M60x2	–	–
HN-H2MPA-L30-AXC501	A	2	30	124	267.4	1,048 $^{+17}_{0}$	1,055 $^{+17}_{0}$	913	36	157	571	250	90	77	G1/4	M60x2	–	–
HN-H2MPA-L40-AXC501	A	2	40	153	267.4	1,287 $^{+17}_{0}$	1,294 $^{+17}_{0}$	1,152	36	157	810	400	90	77	G1/4	M60x2	–	–
HN-H2MPA-L50-AXC501	A	2	50	189	267.4	1,585 $^{+17}_{0}$	1,592 $^{+17}_{0}$	1,450	36	157	1,108	700	90	77	G1/4	M60x2	–	–
HN-H2MPA-L60-AXC501	A	2	60	211	267.4	1,772 $^{+17}_{0}$	1,779 $^{+17}_{0}$	1,637	36	157	1,295	700	90	77	G1/4	M60x2	–	–

※6 Weight may vary depending on applicable inspections and standards.
※7 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※8 Maximum oil flow rate available under certain conditions.
※10 The Chinese inspection products with maximum working pressure of 23 MPa and nominal gas volume of 40 L and 60 L differ in overall length from the above.

Typical Applicable Inspections / Standards

METI ※11	ASME ※12	PED ※13	CHINA ※14	NACOL ※15
H	M	R	D	N
○	○	○	Out of Scope	○
–	–	–	Out of Scope	○
○	○	○	○	○
○	○	○	○※10	○
○	○	○	○	○
○	○	○	○※10	○
○	○	○	Out of Scope	○
–	–	–	Out of Scope	○
○	○	○	○	○
○	○	○	○※10	○
○	○	○	○	○
○	○	○	○※10	○
○	○	○	Out of Scope	○
–	–	–	Out of Scope	○
○	○	○	–	○
○	○	○	–	○
○	○	○	–	○
○	○	○	–	○
–	–	–	○	–
–	–	–	○	–
–	–	–	○	–
–	–	–	○	–

METI ※11	ASME ※12	PED ※13	CHINA ※14	NACOL ※15
H	M	R	D	N
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○

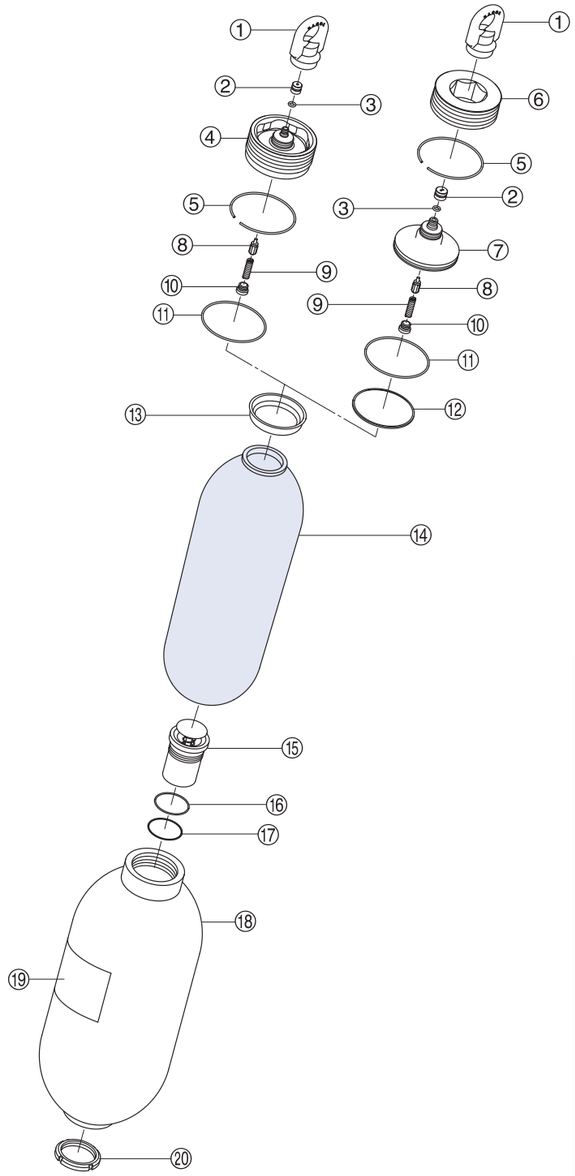
METI ※11	ASME ※12	PED ※13	CHINA ※14	NACOL ※15
H	M	R	D	N
○	○	–	Out of Scope	○
–	–	–	Out of Scope	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○

※11 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※12 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※13 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※14 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※15 NACOL: NACOL (Manufacturer's) Inspection

Carbon Steel Large Size From 20 to 60 Liters

Typical Exploded View

Standard Type

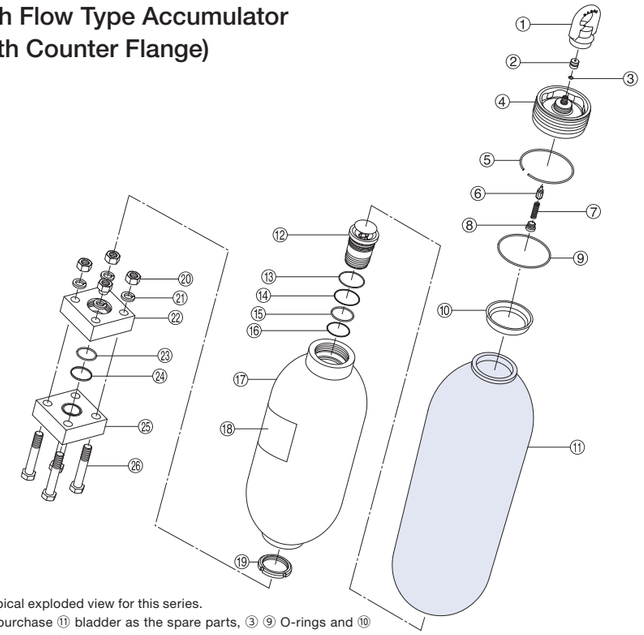


①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring ※3 (Item No: 6071[0]2105)
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring ※3 (Item No: 6071[0]2075)
⑰	Back Up Ring ※4 (Item No: 607222075)
⑱	Accumulator Body
⑲	Nameplate
⑳	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑭ bladder as the spare parts, ③ ⑪ O-rings and ⑬ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber. Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 Back up ring is needed only for higher than 35 MPa.

Typical Exploded View

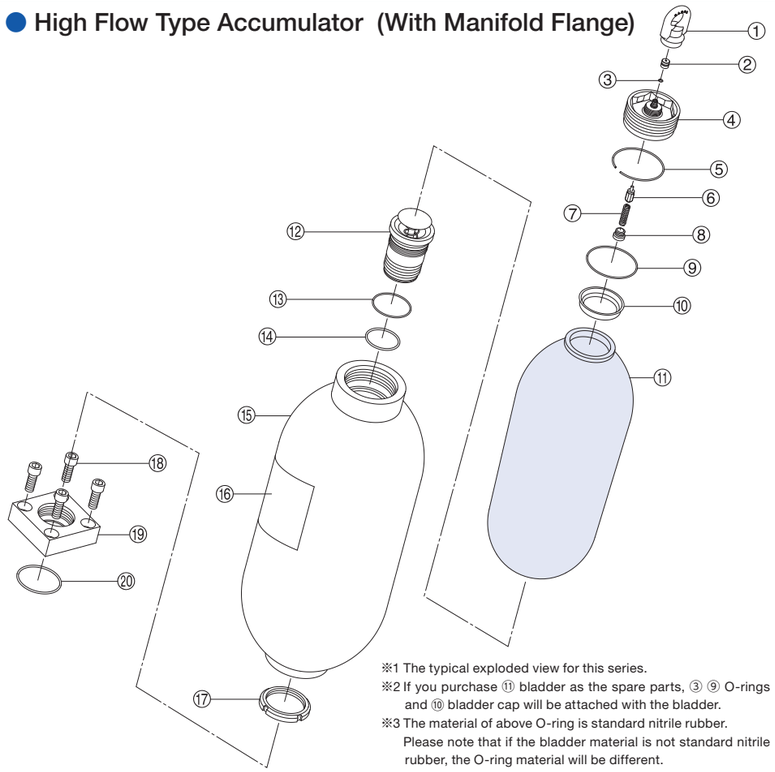
High Flow Type Accumulator (With Counter Flange)



①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071[0]2105)
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring ※3 (Item No: 6071[0]2075)
⑭	Back Up Ring ※6 (Item No: 607212075)
⑮	Back Up Ring ※6 (Item No: 607217230)
⑯	O-ring ※3 (Item No: 6071[0]7230)
⑰	Accumulator Body
⑱	Nameplate
⑲	Ring Nut
⑳	Nut
㉑	Spring Washer
㉒	Flange
㉓	O-ring ※3 ※4 (Item No: 6071[0]2070)
	O-ring ※3 ※5 (Item No: 6071[0]2060)
㉔	Back Up Ring ※6 (Item No: 607252060)
㉕	Counter Flange
㉖	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ ⑨ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber. Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 This number is item number of the O-ring for 23 Mpa.
※5 This number is item number of the O-ring for 35 Mpa.
※6 Back up ring is needed only for higher than 35 MPa.

High Flow Type Accumulator (With Manifold Flange)



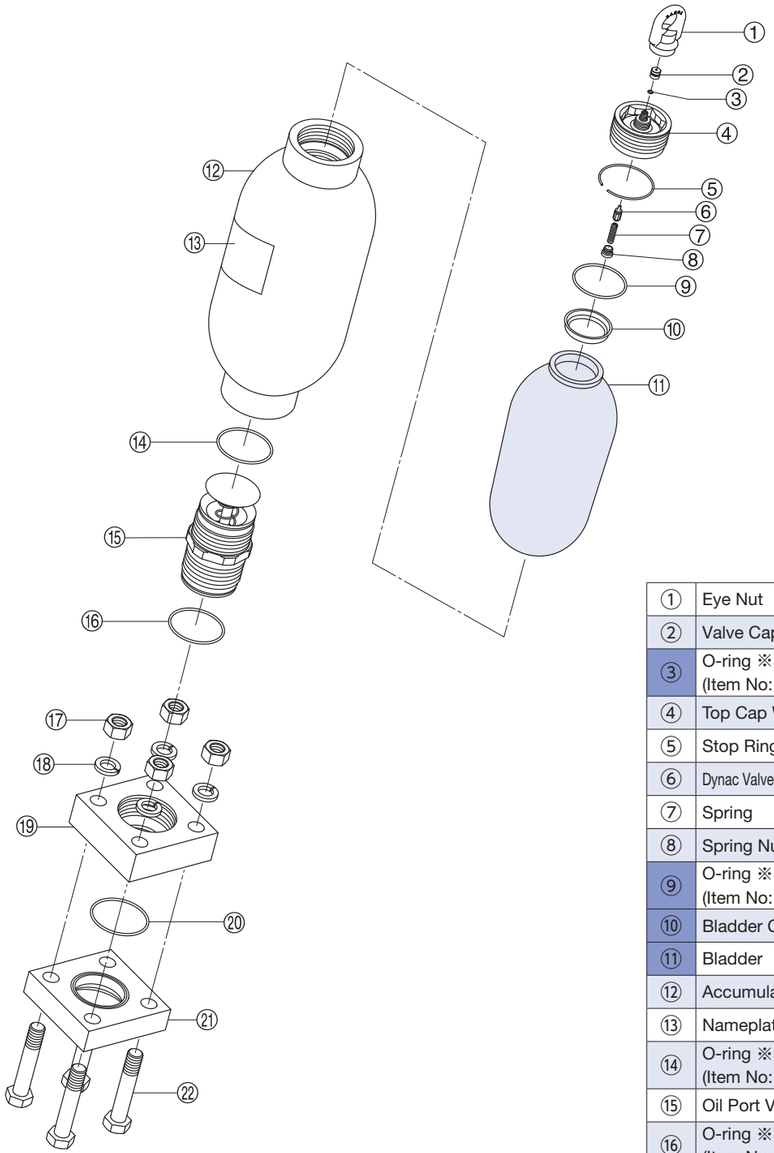
①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071[0]2105)
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring ※3 (Item No: 6071[0]2075)
⑭	O-ring ※3 (Item No: 6071[0]7230)
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Hexagon Socket Head Cap Screw
⑲	Flange
⑳	O-ring ※3 (Item No: 6071[0]2060)

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ ⑨ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber. Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Carbon Steel Large Size From 20 to 60 Liters

Typical Exploded View

● Super High Flow Type Accumulator

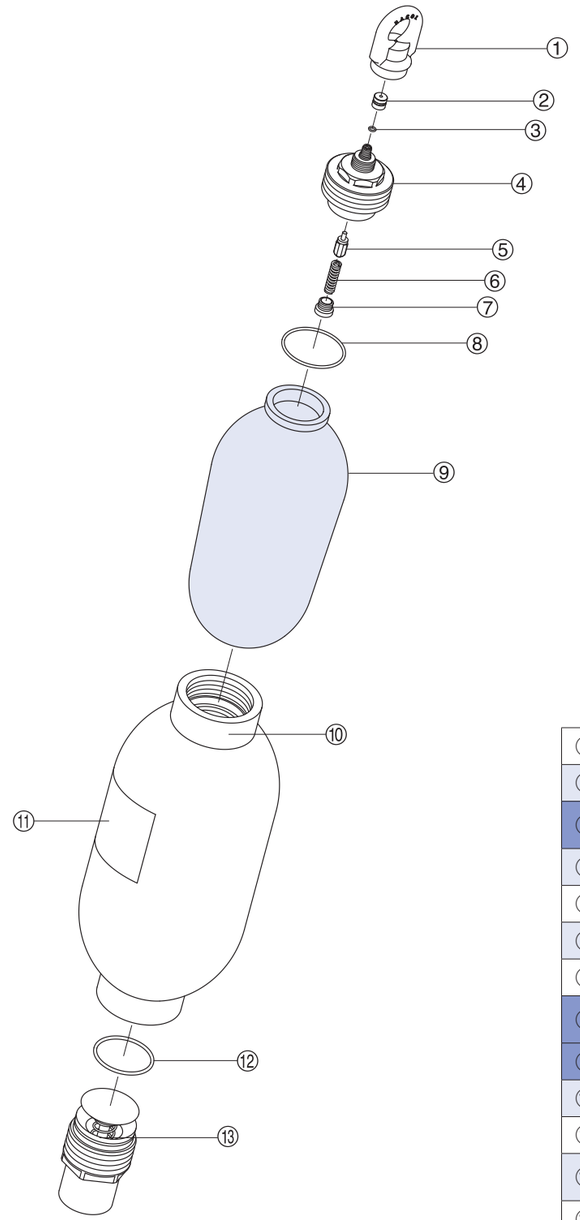


①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071[0]2105)
⑩	Bladder Cap
⑪	Bladder
⑫	Accumulator Body
⑬	Nameplate
⑭	O-ring ※3 (Item No: 6071[0]2105)
⑮	Oil Port Valve Assembly
⑯	O-ring ※3 (Item No: 6071[0]2105)
⑰	Nut
⑱	Spring Washer
⑲	Flange
⑳	O-ring ※3 (Item No: 6071[0]2105)
㉑	Counter Flange
㉒	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ ⑨ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Typical Exploded View

● Slim Type Accumulator



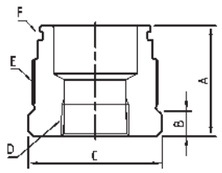
①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring ※3 (Item No: 6071[0]2085)
⑨	Bladder
⑩	Accumulator Body
⑪	Nameplate
⑫	O-ring ※3 (Item No: 6071[0]2080)
⑬	Oil Port Valve Assembly

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③ ⑧ O-rings will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

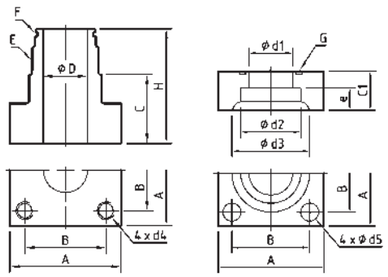
Piping Connection

Dimensional Drawing

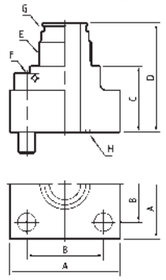
Bushing



Flange (with Counter Flange)



Valve Flange



※1 The above shows the shape of representative model. Confirm the actual shape with the drawing or the actual product.
※2 When there is no indication of maximum allowable working pressure of your accumulator in the column of "Applicable Acc. MAWP" of the following dimensional table, please contact us.

Dimensional Table

Bushing

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	
									O-Ring	B.U. Ring
23 MPa	H 20 – 60 L	6RCM60R02N23M	Rc1/4	53	12	Hex.60	Rc1/4	M60x2	JIS B 2401-1 G50	–
		6RCM60R03N23M	Rc3/8	53	12	Hex.60	Rc3/8	M60x2	JIS B 2401-1 G50	–
		6RCM60R04N23M	Rc1/2	53	12	Hex.60	Rc1/2	M60x2	JIS B 2401-1 G50	–
		6RCM60R06N23M	Rc3/4	53	12	Hex.60	Rc3/4	M60x2	JIS B 2401-1 G50	–
		6RCM60R08N23M	Rc1	53	12	Hex.60	Rc1	M60x2	JIS B 2401-1 G50	–
		6RCM60R10N23M	Rc1-1/4	53	12	Hex.60	Rc1-1/4	M60x2	JIS B 2401-1 G50	–
25 MPa	U 10 – 50 L	6RCM60R06X014	Rc3/4	63	20	Hex.70	Rc3/4	M60x2	AS568 225	–
		6RCM60R08X014	Rc1	63	20	Hex.70	Rc1	M60x2	AS568 225	–
35 MPa	N 20 – 60 L	6RCM60R02N35M	Rc1/4	73	20	Hex.70	Rc1/4	M60x2	AS568 225	AS568 225
		6RCM60R03N35M	Rc3/8	73	20	Hex.70	Rc3/8	M60x2	AS568 225	AS568 225
		6RCM60R04N35M	Rc1/2	73	20	Hex.70	Rc1/2	M60x2	AS568 225	AS568 225
		6RCM60R06N35M	Rc3/4	73	20	Hex.70	Rc3/4	M60x2	AS568 225	AS568 225
		6RCM60R08N35M	Rc1	73	20	Hex.70	Rc1	M60x2	AS568 225	AS568 225
		6RCM60R10N35M	Rc1-1/4	85	32	Hex.70	Rc1-1/4	M60x2	AS568 225	AS568 225
45 MPa 49.1 MPa 50 MPa	N 20 – 60 L	6RCM60R04N50M	Rc1/2	73	20	Hex.70	Rc1/2	M60x2	AS568 225	AS568 225
		6RCM60R06N50M	Rc3/4	73	20	Hex.70	Rc3/4	M60x2	AS568 225	AS568 225

Flange (with Counter Flange)

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	H	D	C1	e	d1	d2	d3	d4	d5	E	F	G
																	O-Ring	O-Ring
23 MPa	H 20 – 60 L	6FCM6015AX070	15A	76	56	28	69	28	28	11	16	22.2	32	M12	13	M60x2	JIS B 2401-1 G50	JIS B 2401-1 G35
		6FCM6020AX069	20A	76	56	28	69	28	28	12	20	27.7	38	M12	13	M60x2	JIS B 2401-1 G50	JIS B 2401-1 G35
		6FCM6025AX068	25A	76	56	28	69	28	28	14	25	34.5	45	M12	13	M60x2	JIS B 2401-1 G50	JIS B 2401-1 G35
		6FCM6032AN23M	32A	76	56	28	69	28	28	16	28	43.2	56	M12	13	M60x2	JIS B 2401-1 G50	JIS B 2401-1 G35
		6FCM6050AN23M	50A	100	73	36	77	40	36	20	47.5	61.1	75	M16	18	M60x2	JIS B 2401-1 G50	JIS B 2401-1 G55
35 MPa	N 20 – 60 L	6FCM6020AN35M	20A	68	48	36	89	16	28	12	16.2	27.7	43.5	M12	14	M60x2	AS568 225 (with B.U. Ring)	JIS B 2401-1 G30 (with B.U. Ring)
		6FCM6032AN35M	32A	92	65	45	98	30	36	18	30	43.2	63	M16	18	M60x2	AS568 225 (with B.U. Ring)	JIS B 2401-1 G40 (with B.U. Ring)
		6FCM6050AN35M	50A	132	92	50	103	35	50	25	38.3	61.1	84	M20	22	M60x2	AS568 225 (with B.U. Ring)	JIS B 2401-1 G50 (with B.U. Ring)

Valve Flange

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	G	H
										O-Ring	O-Ring
23 MPa	H 20 – 60 L	6FCM6032DN23M	32A	76	56	83	124	M60x2	M12x45	JIS B 2401-1 G50	JIS B 2401-1 G35
		6FCM6040DX057	40A	92	65	119	160	M60x2	M16x55	JIS B 2401-1 G50	JIS B 2401-1 G45
		6FCM6050KN23M	50A	100	73	62	103	M60x2	M16x55	JIS B 2401-1 G50	JIS B 2401-1 G55
25 MPa	U 10 – 50 L	6FCM6050DX034	50A	100	73	36	79	M60x2	M16x55	AS568 225	JIS B 2401-1 G55
35 MPa	N 20 – 60 L	6FCM6032DN35M	32A	100	70	91	144	M60x2	M16x60	AS568 225 (with B.U. Ring)	JIS B 2401-1 G35 (with B.U. Ring)
		6FCM6050DN35M	50A	132	92	60	113	M60x2	M20x80	AS568 225 (with B.U. Ring)	JIS B 2401-1 G50 (with B.U. Ring)

Accessories/Tools/Spare Parts

Series				H	N		U
Maximum Allowable Working Pressure MPa				2/23	35	45/49.1/50	25
Nominal Gas Volume L				20 – 60			10 – 50
Gas Charging Tools	Gas Charging Tools Kit (※1)		p. 99	6GG ☐☐☐☐☐☐☐☐	6GH ☐☐☐☐☐☐☐☐		6GG ☐☐☐☐☐☐☐☐
	Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)			
	Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)			
Fixing Tools	Accumulator Clamp		p. 91	6081C267	6081C298		6081C232
	Base Mounting Plate		p. 92	6BMP267P			–
Protective Tools	Eye Nut (Hanging Tool)		p. 97	6HTM32	6HTM42	6HTM42H63	6HTM32
	Valve Cover		p. 97	645049608	645049705		645049608
	Rubber Cover		p. 97	6BC144152	6BC172180		–
Bladder Replacement Parts	Bladder		p. 103	65 ☐ H ☐☐☐☐	65 ☐ N ☐☐☐☐	65 ☐ N ☐☐☐ A	65 ☐ U ☐☐☐☐
	Bladder Backup Ring			–		64008250120	–
Bladder Replacement Tools	Cap Wrench		p. 98	6TWH81		6TWH63	Please use a commercially available wrench. Hex.60
Dynac Valve Replacement (DV Spec.) Parts	Dynac Valve Packing with Valve Stem		p. 107	645026400A	645071300A		645026400A
	Spring		p. 107	645045500			
	Spring Nut		p. 107	645048200			
Dynac Valve Replacement (DV Spec.) Tools	Spring Nut Key		p. 98	6TWH04			
SG Valve Replacement (R/Q Spec.) Parts	SG Valve		p. 87	6H ☐ -AV35MP-F03-M32A	6H ☐ -AV35MP-F03-M42A	–	6H ☐ -AV35MP-F03-M32A
	Fuse Plug		p. 88	6H-FP35MP-03-F03		–	6H-FP35MP-03-F03
	Spring Loaded Type Safety Valve		p. 88	6H-SV ☐☐☐☐ -03-F03		–	6H-SV ☐☐☐☐ -03-F03
	Pressure Gauge Containing Glycerol		p. 88	6018DUF0206 ☐☐☐☐ G		–	6018DUF0206 ☐☐☐☐ G
	SMA Pressure Gauge		p. 88	6018KDF02 ☐☐ 35MP0		–	6018KDF02 ☐☐ 35MP0
Oil Port Valve Replacement Tools	Ring Nut Wrench		p. 98	6TWD105			Please use a commercially available wrench. Hex.85

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
(Only a hose and an adaptor are required to SG valve.)

Carbon Steel Extra Large Size From 40 to 175 Liters

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	H	1	5	M	P	-	L	8	0	-	A	A	C	M	7	5

①APPLICABLE INSPECTION/STANDARD

H	-	JAPAN High Pressure Gas Safety Law (Japan)
M	-	U.S.A. ASME
R	-	EUROPE PED (2014/68/EU)
D	-	CHINA
N	-	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②BLADDER COMPOUND

N	-	Standard Nitrile Rubber (NBR)
H	-	Nitrile Rubber for High Temp. Use (H.NBR)
L	-	Nitrile Rubber for Low Temp. Use (L.NBR)
F	-	Butyl Rubber (IIR)
E	-	Ethylene Propylene Rubber (EPDM)
C	-	Chloroprene Rubber (CR)
G	-	Epichlorohydrin Rubber (CHC)
V	-	Fluorine Rubber (FKM)

③SERIES

H Series, N Series, Y Series

④Maximum Allowable Working Pressure ※2

2 MPa, 7 MPa, 15 MPa, 21 MPa, 23 MPa, 25 MPa, 26 MPa, 33 MPa, 35 MPa

⑤NOMINAL GAS VOLUME

40 L, 60 L, 80 L, 120 L, 145 L, 150 L, 160 L, 175 L

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

A	-	Standard Dynac Valve (G thread)
D	-	Top Cap Two Pieces Type/ Dynac Valve (G thread)
M	-	H series Dynac valve/ (G thread for high pressure)
Q	-	SG Valve + Safety Valve + Pressure Gauge
R	-	SG Valve + Fuse Plug + Pressure Gauge

⑦SPECIFICATION FOR OIL PORT SIDE

A	-	Standard Carbon Steel
E	-	High Flow
Y	-	Super High Flow
Q	-	Ultra High Flow
X	-	For Special Specifications or High flow Manifold Type or Screen Type

⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

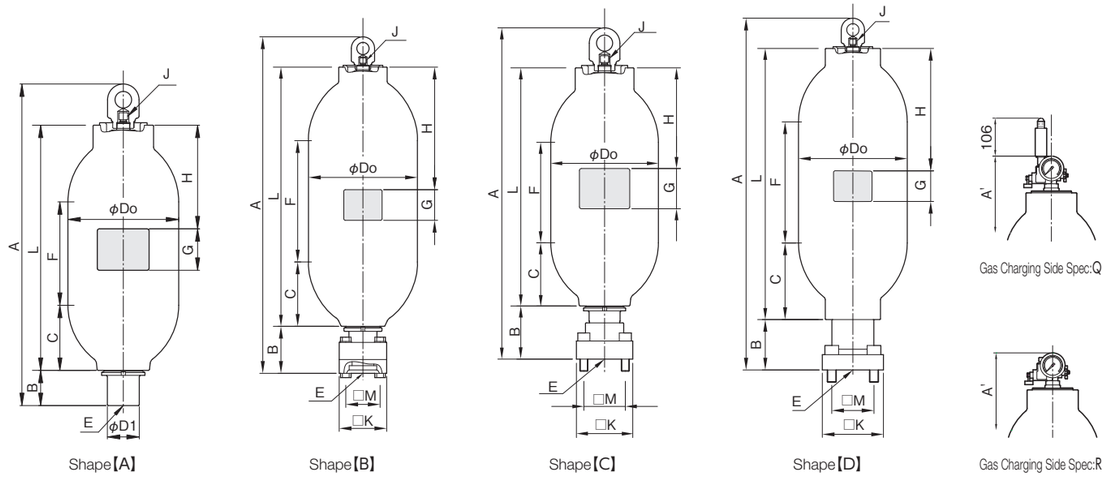
		SPECIFICATION OF SHELL	Inside Surface	Outside Surface	SERVICE FLUID
C	-	Standard Material (Carbon Steel)	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
D	-		Zinc Phosphate Treatment	Zinc Phosphate Treatment	Water-Glycol Fluid
A	- ※3		Paint Coating	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
B	- ※3		Paint Coating	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
N	-		Zinc Phosphate Treatment	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W	-		Zinc Phosphate Treatment	Paint Coating	Water-Glycol Fluid
X	-	Special Specifications			

※3 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨Oil Port Thread Specification or Special Specification

M	*	*	-	Oil Port Connection Thread Type and Thread Size
W	*	*	-	Oil Port Connection Diameter of Flange
*	*	*		Special Specifications
1	0	0		Oil Port Connection Diameter of Flange 100 A
2	7	5	-	High Flow Manifold Type 21 MPa
3	9	7	-	Screen Type

Dimensional Drawing



Shape【A】 Shape【B】 Shape【C】 Shape【D】

Gas Charging Side Spec:Q

Gas Charging Side Spec:R

Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※4	Do	A	A'	L	B	C	F	H	G	D1	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※6
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			L/min	L/min
HN-N75MPA-175-AACM90	A	7	175	284	406.4	2,093 +20 0	2,100 +20 0	1,876	119	272	1,319	1,000	90	111	G1/4	M90x2	1,200	1,800
HN-H15MP-Y40-AACM75	A	15	40	130	355.6	1,023 +17 0	1,030 +17 0	826	99	210	376	400	90	92.5	G1/4	M75x2	900	1,800
HN-H15MP-Y60-AACM75	A	15	60	170	355.6	1,285 +17 0	1,292 +17 0	1,088	99	210	638	400	90	92.5	G1/4	M75x2	900	1,800
HN-H15MP-L80-AACM75	A	15	80	215	355.6	1,540 +17 0	1,547 +17 0	1,343	99	210	893	400	90	92.5	G1/4	M75x2	900	1,800
HN-H15MP-120-AACM75	A	15	120	289	355.6	2,008 +17 0	2,015 +17 0	1,811	99	210	1,361	1,000	90	92.5	G1/4	M75x2	900	1,800
DN-H15MP-Y60-AACM75	A	15	60	174	355.6	1,285 +17 0	1,292 +17 0	1,088	99	210	638	400	90	92.5	G1/4	M75x2	900	1,800
DN-H15MP-L80-AACM75	A	15	80	208	355.6	1,540 +17 0	1,547 +17 0	1,343	99	210	893	400	90	92.5	G1/4	M75x2	900	1,800
DN-H15MP-120-AACM75	A	15	120	277	355.6	1,992 +17 0	1,999 +17 0	1,795	99	210	1,345	1,000	90	92.5	G1/4	M75x2	900	1,800
HN-H21MP-Y40-AACM75	A	21	40	167	355.6	1,023 +17 0	1,030 +17 0	826	99	210	376	400	90	92.5	G1/4	M75x2	900	1,800
HN-H21MP-Y60-AACM75	A	21	60	224	355.6	1,285 +17 0	1,292 +17 0	1,088	99	210	642	400	90	92.5	G1/4	M75x2	900	1,800
HN-H21MP-L80-AACM75	A	21	80	276	355.6	1,540 +17 0	1,547 +17 0	1,343	99	210	897	400	90	92.5	G1/4	M75x2	900	1,800
HN-H21MP-120-AACM75	A	21	120	372	355.6	2,008 +17 0	2,015 +17 0	1,811	99	210	1,365	1,000	90	92.5	G1/4	M75x2	900	1,800
HN-N21MP-160-AACM90	A	21	160	497	406.4	2,087 +20 0	2,095 +20 0	1,870	119	246	1,340	1,000	90	111	G1/4	M90x2	1,200	1,800
HN-N23MP-160-AACM90	A	23	150	538	406.4	2,087 +20 0	2,093 +20 0	1,870	119	246	1,340	1,000	90	111	G3/8	M90x2	1,200	1,800
DN-H21MP-Y60-AACM75	A	21	60	228	355.6	1,285 +17 0	1,292 +17 0	1,088	99	210	638	400	90	92.5	G1/4	M75x2	900	1,800
DN-H21MP-L80-AACM75	A	21	80	275	355.6	1,540 +17 0	1,547 +17 0	1,343	99	210	893	400	90	92.5	G1/4	M75x2	900	1,800
DN-H21MP-120-AACM75	A	21	120	369	355.6	1,992 +17 0	1,999 +17 0	1,795	99	210	1,345	1,000	90	92.5	G1/4	M75x2	900	1,800
DN-H21MP-160-AACM90	A	21	160	504	406.4	2,087 +20 0	2,094 +20 0	1,870	119	246	1,340	1,000	90	111	G1/4	M90x2	1,200	1,800
HN-Y25MP-L60-DACM75	A	25	60	255	355.6	1,286 +17 0	1,293 +17 0	1,088	99	210	638	400	90	92.5	G3/8	M75x2	900	1,800
HN-N25MP-L80-DACM75	A	25	80	315	355.6	1,541 +17 0	1,548 +17 0	1,343	99	210	893	400	90	92.5	G3/8	M75x2	900	1,800
HN-N25MP-120-DACM75	A	25	120	422	355.6	1,993 +17 0	2,000 +17 0	1,795	99	210	1,345	1,000	90	92.5	G3/8	M75x2	900	1,800
HN-A26MP-160-AACM75	A	26	150	490	406.4	2,104 +17 0	2,112 +17 0	1,875	97	256	1,342	1,000	90	111	G3/8	M75x2	900	—
HN-Y33MP-L60-DACM75	A	33	60	264	355.6	1,286 +17 0	1,293 +17 0	1,088	99	210	638	400	90	92.5	G3/8	M75x2	900	1,800
HN-N33MP-L80-DACM75	A	33	80	319	355.6	1,541 +17 0	1,548 +17 0	1,343	99	210	893	400	90	92.5	G3/8	M75x2	900	1,800
HN-N33MP-120-DACM75	A	33	120	430	355.6	1,993 +17 0	2,000 +17 0	1,795	99	210	1,345	1,000	90	92.5	G3/8	M75x2	900	1,800
DN-Y33MP-L60-DACM75	A	33	60	264	355.6	1,286 +17 0	1,293 +17 0	1,088	99	210	638	400	90	92.5	G3/8	M75x2	900	1,800
DN-N33MP-L80-DACM75	A	33	80	319	355.6	1,541 +17 0	1,548 +17 0	1,343	99	210	893	400	90	92.5	G3/8	M75x2	900	1,800
DN-N33MP-120-DACM75	A	33	120	430	355.6	1,993 +17 0	2,000 +17 0	1,795	99	210	1,345	1,000	90	92.5	G3/8	M75x2	900	1,800
HN-H35MP-160-MACM75	A	35	145	618	406.4	2,107 +20 0	2,114 +20 0	1,878	97	252	1,337	1,000	90	92.5	G3/8	M75x2	900	—

※2 For the accumulator with P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 23 MP → 230 B).
※4 Weight may vary depending on applicable inspections and standards. ※5 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product. ※6 Maximum oil flow rate available under certain conditions.

Typical Applicable Inspections / Standards

METI ※7	ASME ※8	PED ※9	CHINA ※10	NACOL ※11
H	M	R	D	N
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
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○	–	–	○	○

※7 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※8 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※9 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※10 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※11 NACOL: NACOL (Manufacturer's) Inspection

Carbon Steel Extra Large Size From 40 to 175 Liters

Dimensional Table

High Flow

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※4	Do	A	A'	L	B	C	F	H	G	□K			□M	Hexagon Bolt	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※6
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			mm				L/min	L/min
HN-N75MPA-175-AEC100	B	7	175	313	406.4	2,150 $^{+20}_{0}$	2,157 $^{+20}_{0}$	1,876	176	272	1,319	1,000	90	200			138	M30×160	G1/4	MAX.100A	2,400	8,000
HN-H15MP-Y40-AEC W80	B	15	40	146	355.6	1,078 $^{+17}_{0}$	1,085 $^{+17}_{0}$	826	154	210	376	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H15MP-Y60-AEC W80	B	15	60	184	355.6	1,340 $^{+17}_{0}$	1,347 $^{+17}_{0}$	1,088	154	210	638	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H15MP-L80-AEC W80	B	15	80	224	355.6	1,595 $^{+17}_{0}$	1,602 $^{+17}_{0}$	1,343	154	210	893	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H15MP-120-AEC W80	B	15	120	298	355.6	2,063 $^{+17}_{0}$	2,070 $^{+17}_{0}$	1,811	154	210	1,361	1,000	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
DN-H15MP-Y60-AEC W80	B	15	60	187	355.6	1,341 $^{+17}_{0}$	1,347 $^{+17}_{0}$	1,088	154	210	638	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
DN-H15MP-L80-AEC W80	B	15	80	221	355.6	1,596 $^{+17}_{0}$	1,602 $^{+17}_{0}$	1,343	154	210	893	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
DN-H15MP-120-AEC W80	B	15	120	290	355.6	2,048 $^{+17}_{0}$	2,054 $^{+17}_{0}$	1,795	154	210	1,345	1,000	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H15MP-Y40-AXC275	C	15	40	139	355.6	1,027 $^{+17}_{0}$	1,289 $^{+17}_{0}$	826	103	210	376	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H15MP-Y60-AXC275	C	15	60	177	355.6	1,289 $^{+17}_{0}$	1,296 $^{+17}_{0}$	1,088	103	210	638	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H15MP-L80-AXC275	C	15	80	217	355.6	1,544 $^{+17}_{0}$	1,551 $^{+17}_{0}$	1,343	103	210	893	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H15MP-120-AXC275	C	15	120	291	355.6	2,012 $^{+17}_{0}$	2,019 $^{+17}_{0}$	1,811	103	210	1,361	1,000	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H21MP-Y40-AEC W80	B	21	40	183	355.6	1,078 $^{+17}_{0}$	1,085 $^{+17}_{0}$	826	154	210	372	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H21MP-Y60-AEC W80	B	21	60	233	355.6	1,340 $^{+17}_{0}$	1,347 $^{+17}_{0}$	1,088	154	210	642	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H21MP-L80-AEC W80	B	21	80	285	355.6	1,595 $^{+17}_{0}$	1,602 $^{+17}_{0}$	1,343	154	210	897	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-H21MP-120-AEC W80	B	21	120	381	355.6	2,063 $^{+17}_{0}$	2,070 $^{+17}_{0}$	1,811	154	210	1,365	1,000	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
HN-N21MP-160-AEC100	B	21	160	522	406.4	2,144 $^{+20}_{0}$	2,151 $^{+20}_{0}$	1,870	176	246	1,340	1,000	90	200			138	M30×160	G1/4	MAX.100A	2,400	8,000
DN-H21MP-Y60-AEC W80	B	21	60	241	355.6	1,341 $^{+17}_{0}$	1,347 $^{+17}_{0}$	1,088	154	210	638	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
DN-H21MP-L80-AEC W80	B	21	80	288	355.6	1,596 $^{+17}_{0}$	1,602 $^{+17}_{0}$	1,343	154	210	893	400	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
DN-H21MP-120-AEC W80	B	21	120	382	355.6	2,048 $^{+17}_{0}$	2,054 $^{+17}_{0}$	1,795	154	210	1,345	1,000	90	155			112	M22×140	G1/4	MAX.80A	1,800	6,000
DN-H21MP-160-AEC100	B	21	160	529	406.4	2,144 $^{+20}_{0}$	2,151 $^{+20}_{0}$	1,870	176	246	1,340	1,000	90	200			138	M30×160	G1/4	MAX.100A	2,400	8,000
HN-H21MP-Y40-AXC275	C	21	40	176	355.6	1,078 $^{+17}_{0}$	1,085 $^{+17}_{0}$	826	103	210	372	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H21MP-Y60-AXC275	C	21	60	226	355.6	1,289 $^{+17}_{0}$	1,296 $^{+17}_{0}$	1,088	103	210	642	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H21MP-L80-AXC275	C	21	80	278	355.6	1,544 $^{+17}_{0}$	1,551 $^{+17}_{0}$	1,343	103	210	897	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-H21MP-120-AXC275	C	21	120	374	355.6	2,012 $^{+17}_{0}$	2,019 $^{+17}_{0}$	1,811	103	210	1,365	1,000	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
DN-H21MP-Y60-AXC275	C	21	60	226	355.6	1,289 $^{+17}_{0}$	1,296 $^{+17}_{0}$	1,088	103	210	638	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
DN-H21MP-L80-AXC275	C	21	80	281	355.6	1,544 $^{+17}_{0}$	1,551 $^{+17}_{0}$	1,343	103	210	893	400	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
DN-H21MP-120-AXC275	C	21	120	375	355.6	1,996 $^{+17}_{0}$	2,003 $^{+17}_{0}$	1,795	103	210	1,345	1,000	90	155			112	M22×55 (Hexagon Socket Head Cap Screw)	G1/4	MAX.80A	1,800	6,000
HN-Y25MP-L60-DEC W80	B	25	60	284	355.6	1,376 $^{+17}_{0}$	1,383 $^{+17}_{0}$	1,088	189	210	638	400	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
HN-N25MP-L80-DEC W80	B	25	80	330	355.6	1,631 $^{+17}_{0}$	1,638 $^{+17}_{0}$	1,343	189	210	893	400	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
HN-N25MP-120-DEC W80	B	25	120	430	355.6	2,083 $^{+17}_{0}$	2,090 $^{+17}_{0}$	1,795	189	210	1,345	1,000	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
HN-Y33MP-L60-DEC W80	B	33	60	294	355.6	1,376 $^{+17}_{0}$	1,383 $^{+17}_{0}$	1,088	189	210	638	400	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
HN-N33MP-L80-DEC W80	B	33	80	349	355.6	1,631 $^{+17}_{0}$	1,638 $^{+17}_{0}$	1,343	189	210	893	400	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
HN-N33MP-120-DEC W80	B	33	120	460	355.6	2,083 $^{+17}_{0}$	2,090 $^{+17}_{0}$	1,795	189	210	1,345	1,000	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
DN-Y33MP-L60-DEC W80	B	33	60	294	355.6	1,376 $^{+17}_{0}$	1,383 $^{+17}_{0}$	1,088	189	210	638	400	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
DN-N33MP-L80-DEC W80	B	33	80	349	355.6	1,631 $^{+17}_{0}$	1,638 $^{+17}_{0}$	1,343	189	210	893	400	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000
DN-N33MP-120-DEC W80	B	33	120	460	355.6	2,083 $^{+17}_{0}$	2,090 $^{+17}_{0}$	1,795	189	210	1,345	1,000	90	190			130	M30×180	G3/8	MAX.80A	1,800	6,000

Typical Applicable Inspections / Standards

METI	ASME	PED	CHINA	NACOL
H	M	R	D	N
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
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–	–	–	○	–
–	–	–	○	–
–	–	–	○	–

Carbon Steel Extra Large Size From 40 to 175 Liters

Dimensional Table

Super High Flow

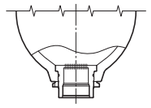
Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※4	Do	A	A'	L	B	C	F	H	G	□K			□M	Hexagon Bolt	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※6
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			mm				L/min	L/min
HN-H21MP-L60-AYC100	D	21	60	250	355.6	1,407 $^{+17}_{0}$	1,414 $^{+17}_{0}$	1,144	165	250	658	400	90	200			138	M30×90 (Hexagon Socket Head Cap Screw)	G1/4	MAX.100A	3,600	7,200
HN-H21MP-L80-AYC100	D	21	80	303	355.6	1,662 $^{+17}_{0}$	1,669 $^{+17}_{0}$	1,399	165	250	913	400	90	200			138	M30×90 (Hexagon Socket Head Cap Screw)	G1/4	MAX.100A	3,600	7,200
HN-H21MP-120-AYC100	D	21	120	397	355.6	2,114 $^{+17}_{0}$	2,121 $^{+17}_{0}$	1,851	165	250	1,365	1,000	90	200			138	M30×90 (Hexagon Socket Head Cap Screw)	G1/4	MAX.100A	3,600	7,200
DN-H21MP-Y60-AYC100	D	21	60	270	355.6	1,417 $^{+17}_{0}$	1,424 $^{+17}_{0}$	1,154	165	250	654	400	90	200			138	M30×90 (Hexagon Socket Head Cap Screw)	G1/4	MAX.100A	3,600	7,200
DN-H21MP-L80-AYC100	D	21	80	320	355.6	1,672 $^{+17}_{0}$	1,679 $^{+17}_{0}$	1,409	165	250	909	400	90	200			138	M30×90 (Hexagon Socket Head Cap Screw)	G1/4	MAX.100A	3,600	7,200
DN-H21MP-120-AYC100	D	21	120	410	355.6	2,124 $^{+17}_{0}$	2,131 $^{+17}_{0}$	1,861	165	250	1,361	1,000	90	200			138	M30×90 (Hexagon Socket Head Cap Screw)	G1/4	MAX.100A	3,600	7,200

Ultra High Flow

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※4	Do	A	A'	L	B	C	F	H	G	□K			□M	Hexagon Bolt	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※6
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			mm				L/min	L/min
HN-H21MP-Y60-AQC125	C	21	60	327	355.6	1,392 $^{+17}_{0}$	1,399 $^{+17}_{0}$	1,172	122	229	707	400	90	φ325			φ261	M33×100 (Hexagon Socket Head Cap Screw)	G1/4	125A	9,000	12,000
HN-H21MP-L80-AQC125	C	21	80	403	355.6	1,647 $^{+17}_{0}$	1,654 $^{+17}_{0}$	1,427	122	229	962	400	90	φ325			φ261	M33×100 (Hexagon Socket Head Cap Screw)	G1/4	125A	9,000	12,000
HN-H21MP-120-AQC125	C	21	120	495	355.6	2,099 $^{+17}_{0}$	2,106 $^{+17}_{0}$	1,879	122	229	1,414	1,000	90	φ325			φ261	M33×100 (Hexagon Socket Head Cap Screw)	G1/4	125A	9,000	12,000

Screen Type

Screen type accumulators have a special oil port valve assembly with small holes for fluid passage, instead of an oil port assembly with a poppet valve. With the bladder bottom protected, the product is suitable for pulsation dampening and shock absorption in a low pressure line.



Enlarged view of the lower part of screen type accumulator

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※4	Do	A	A'	L	B	C	F	H	G	D1			Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※6
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm					L/min	L/min
HN-H2MPA-Y40-AXC397	A	2	40	132	355.6	961 $^{+17}_{0}$	968 $^{+17}_{0}$	826	37	210	376	400	90	91.5			G1/4	M75x2	—	—
HN-Y2MPA-L60-AXC397	A	2	60	170	355.6	1,223 $^{+17}_{0}$	1,230 $^{+17}_{0}$	1,088	37	210	638	400	90	91.5			G1/4	M75x2	—	—
HN-N2MPA-L80-AXC397	A	2	80	210	355.6	1,478 $^{+17}_{0}$	1,485 $^{+17}_{0}$	1,343	37	210	893	400	90	91.5			G1/4	M75x2	—	—
HN-N2MPA-120-AXC397	A	2	120	270	355.6	1,930 $^{+17}_{0}$	1,937 $^{+17}_{0}$	1,795	37	210	1,345	1,000	90	91.5			G1/4	M75x2	—	—

※4 Weight may vary depending on applicable inspections and standards.
※5 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※6 Maximum oil flow rate available under certain conditions.

Typical Applicable Inspections / Standards

METI ※7	ASME ※8	PED ※9	CHINA ※10	NACOL ※11
H	M	R	D	N
○	○	○	—	○
○	○	○	—	○
○	○	○	—	○
—	—	—	○	—
—	—	—	○	—
—	—	—	○	—

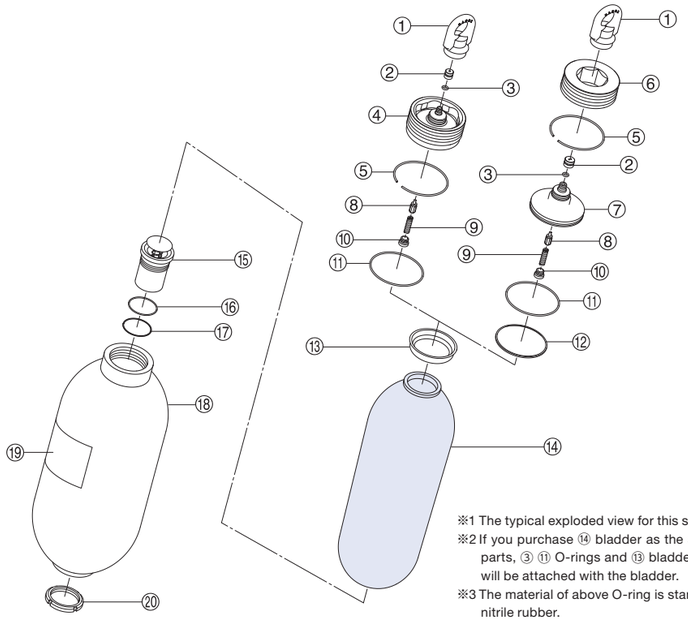
METI ※7	ASME ※8	PED ※9	CHINA ※10	NACOL ※11
H	M	R	D	N
○	○	-	-	○
○	○	-	-	○
○	○	-	-	○

METI ※7	ASME ※8	PED ※9	CHINA ※10	NACOL ※11
H	M	R	D	N
○	○	—	—	○
○	○	—	—	○
○	○	—	—	○
○	○	—	—	○

※7 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※8 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※9 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※10 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※11 NACOL: NACOL (Manufacturer's) Inspection

Typical Exploded View

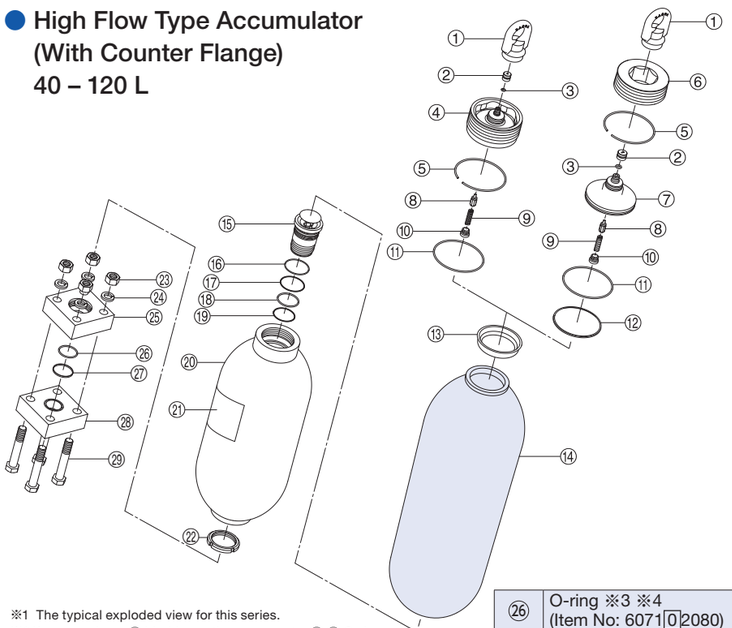
Standard Type 40 – 120 L



①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring ※3 (Item No: 6071 0 2120)
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring ※3 (Item No: 6071 0 2090)
⑰	Back Up Ring ※4 (Item No: 607222090)
⑱	Accumulator Body
⑲	Nameplate
⑳	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑭ bladder as the spare parts, ③ ⑪ O-rings and ⑬ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 Back up ring is needed only for higher than 25 MPa.

High Flow Type Accumulator (With Counter Flange) 40 – 120 L

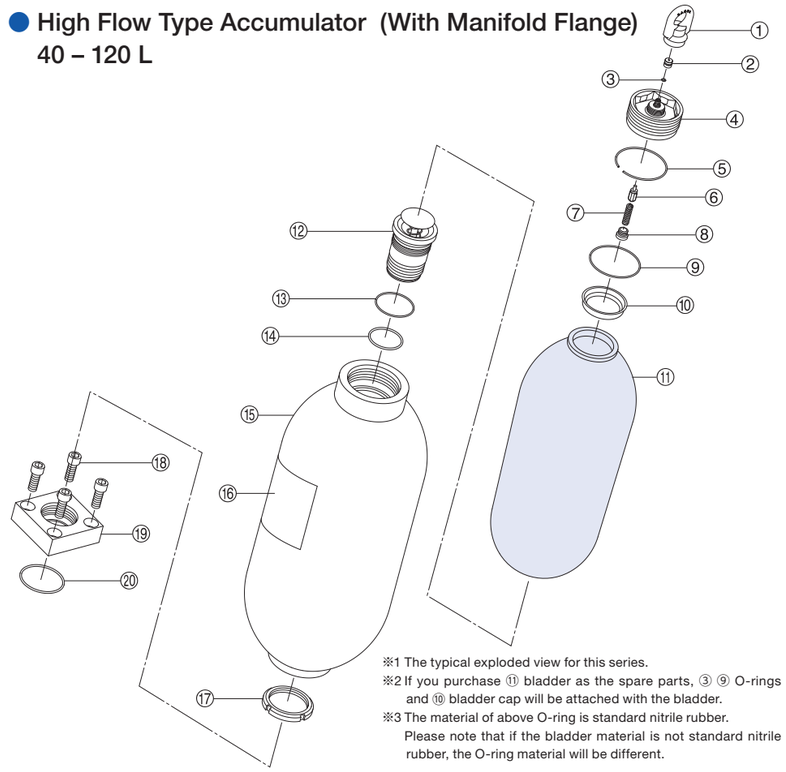


①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring ※3 (Item No: 6071 0 2120)
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring ※3 (Item No: 6071 0 2090)
⑰	Back Up Ring ※6 (Item No: 607222090)
⑱	Back Up Ring ※6 (Item No: 607222080)
⑲	O-ring ※3 (Item No: 6071 0 2080)
⑳	Accumulator Body
㉑	Nameplate
㉒	Ring Nut
㉓	Nut
㉔	Spring Washer
㉕	Flange
㉖	O-ring ※3 ※4 (Item No: 6071 0 2080)
㉗	O-ring ※3 ※5 (Item No: 6071 0 2070)
㉘	Back Up Ring ※6 (Item No: 607252070)
㉘	Counter Flange
㉙	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑭ bladder as the spare parts, ③ ⑪ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.
※4 This number is item number of the O-ring for 15 MPa and 21 MPa.
※5 This number is item number of the O-ring for 25 MPa.
※6 Back up ring is needed only for higher than 25 MPa.

Typical Exploded View

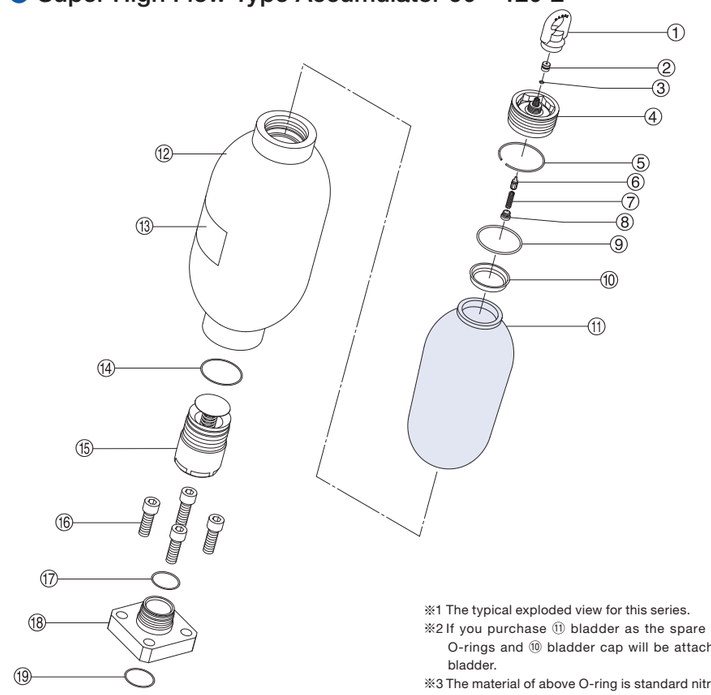
High Flow Type Accumulator (With Manifold Flange) 40 – 120 L



①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071 0 2120)
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring ※3 (Item No: 6071 0 2090)
⑭	O-ring ※3 (Item No: 6071 0 2080)
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Hexagon Socket Head Cap Screw
⑲	Flange
⑳	O-ring ※3 (Item No: 6071 0 2105)

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ ⑨ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Super High Flow Type Accumulator 60 – 120 L



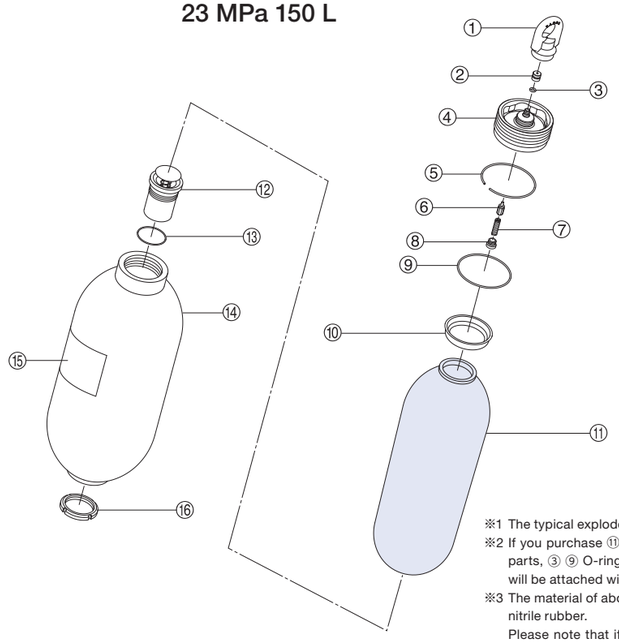
①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071 0 7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071 0 2120)
⑩	Bladder Cap
⑪	Bladder
⑫	Accumulator Body
⑬	Nameplate
⑭	O-ring ※3 (Item No: 6071 0 2120)
⑮	Oil Port Valve Assembly
⑯	Hexagon Socket Head Cap Screw
⑰	O-ring ※3 (Item No: 6071 0 2090)
⑱	Flange
⑲	O-ring ※3 (Item No: 6071 0 2085)

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ ⑨ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Carbon Steel Extra Large Size From 40 to 175 Liters

Typical Exploded View

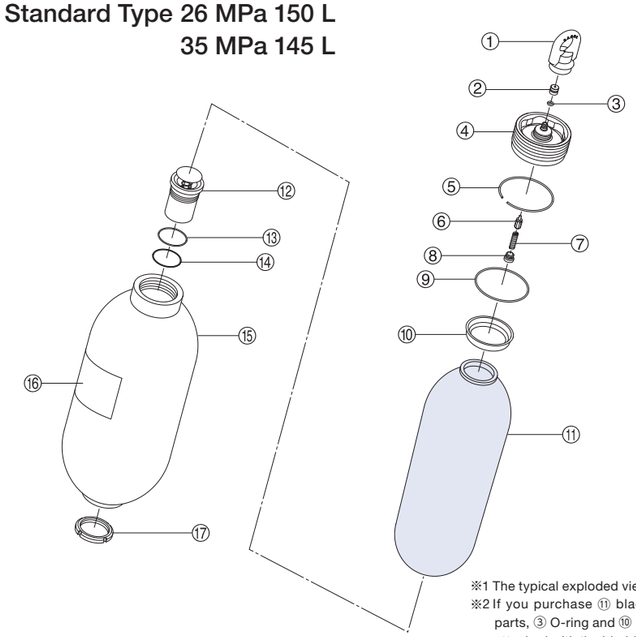
Standard Type 7 MPa 175 L
21 MPa 160 L
23 MPa 150 L



①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071[0]2145)
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring ※3 (Item No: 6071[0]1110)
⑭	Accumulator Body
⑮	Nameplate
⑯	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ ⑨ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Standard Type 26 MPa 150 L
35 MPa 145 L

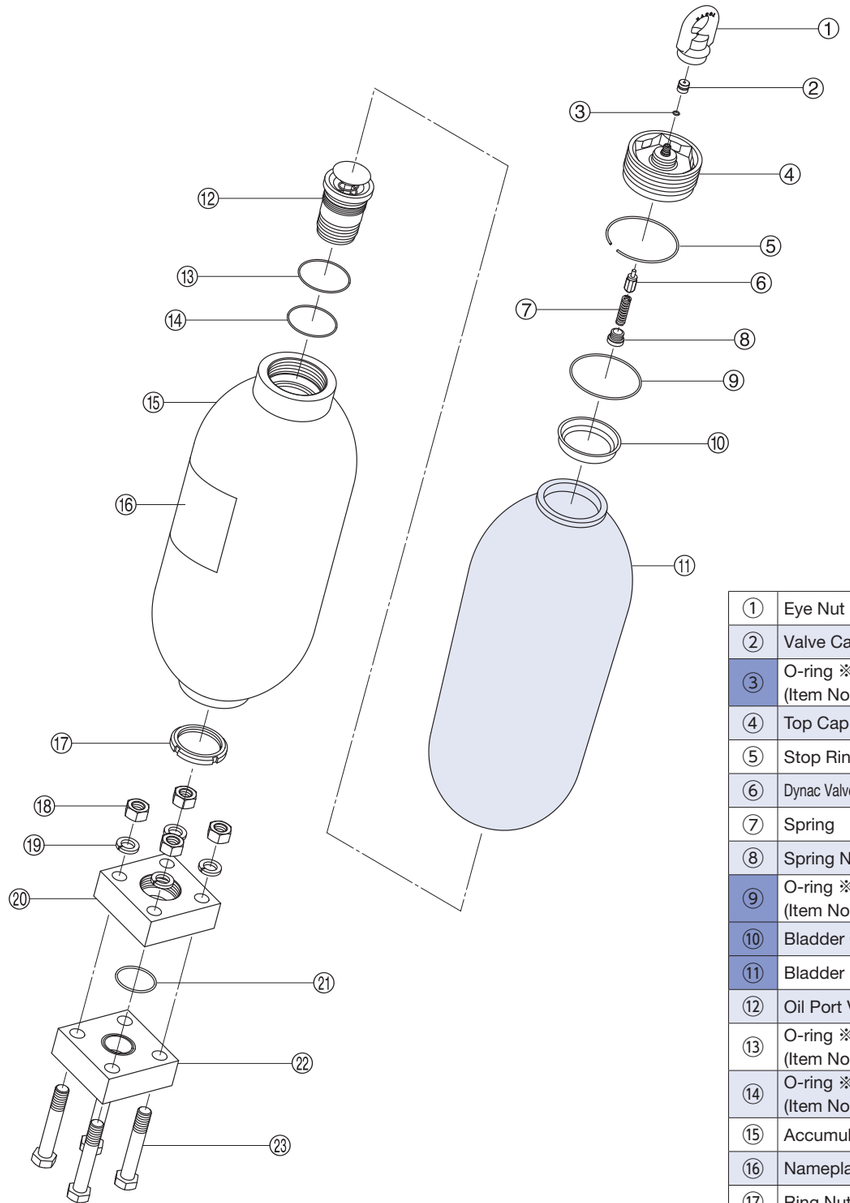


①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	Bladder Back Up Ring
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring ※3 (Item No: 6071[0]2090)
⑭	Back Up Ring (Item No: 607222090)
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③ O-ring and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

Typical Exploded View

High Flow Type Accumulator (With Counter Flange) 160 L/175 L



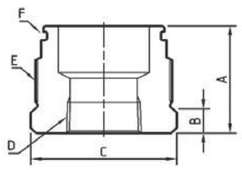
①	Eye Nut
②	Valve Cap
③	O-ring ※3 (Item No: 6071[0]7009)
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring ※3 (Item No: 6071[0]2145)
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring ※3 (Item No: 6072[0]2110)
⑭	O-ring ※3 (Item No: 6071[0]2105)
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Nut
⑲	Spring Washer
⑳	Flange
㉑	O-ring ※3 (Item No: 6071[0]2105)
㉒	Counter Flange
㉓	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑭ bladder as the spare parts, ③ ⑪ O-rings and ⑩ bladder cap will be attached with the bladder.
※3 The material of above O-ring is standard nitrile rubber.
Please note that if the bladder material is not standard nitrile rubber, the O-ring material will be different.

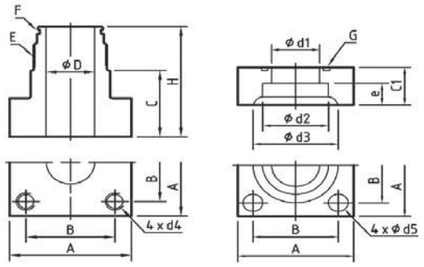
Piping Connection

Dimensional Drawing

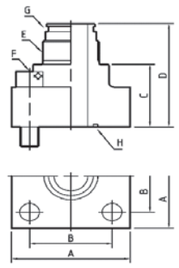
Bushing



Flange (with Counter Flange)



Valve Flange



※1 The above shows the shape of representative model. Confirm the actual shape with the drawing or the actual product.
※2 When there is no indication of maximum allowable working pressure of your accumulator in the column of "Applicable Acc. MAWP" of the following dimensional table, please contact us.

Dimensional Table

Bushing

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F O-Ring
2 MPa 7 MPa 15 MPa 21 MPa 23 MPa 25 MPa	Y40 – 120 L	6RCM75R06N25M	Rc3/4	66	20	Hex.75	Rc3/4	M75x2	JIS B 2401-1 G65
		6RCM75R08N25M	Rc1	66	20	Hex.75	Rc1/2	M75x2	JIS B 2401-1 G65
		6RCM75R10N25M	Rc1-1/4	66	20	Hex.75	Rc3/4	M75x2	JIS B 2401-1 G65
		6RCM75R12N25M	Rc1-1/2	66	20	Hex.75	Rc1-1/2	M75x2	JIS B 2401-1 G65
	150 L 160 L 175 L	6RCM90R06N25M	Rc3/4	71	20	Hex.90	Rc3/4	M90x2	JIS B 2401-1 G80
		6RCM90R08N25M	Rc1	71	20	Hex.90	Rc1	M90x2	JIS B 2401-1 G80
		6RCM90R10N25M	Rc1-1/4	71	20	Hex.90	Rc1-1/4	M90x2	JIS B 2401-1 G80
		6RCM90R12N25M	Rc1-1/2	71	20	Hex.90	Rc1-1/2	M90x2	JIS B 2401-1 G80
		6RCM90R16N25M	Rc2	71	20	Hex.90	Rc2	M90x2	JIS B 2401-1 G80

Flange (with Counter Flange)

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	H	D	C1	e	d1	d2	d3	d4	d5	E	F O-Ring	G O-Ring
2 MPa 15 MPa 21 MPa	Y40 – 120 L	6FCM7540AX035	40A	73	38	38	84	47.5	36	18	37.5	49.1	63	M16	18	M75x2	JIS B 2401-1 G65	JIS B 2401-1 G55
		6FCM7550AN23M	50A	73	38	38	84	47.5	36	20	47.5	61.1	75	M16	18	M75x2	JIS B 2401-1 G65	JIS B 2401-1 G55
		6FCM7565AN23M	65A	128	92	45	91	50	45	22	60	77.1	95	M20	M12	M75x2	JIS B 2401-1 G65	JIS B 2401-1 G70
25 MPa 26 MPa 33 MPa	Y60 – 120 L 150 L	6FCM7532AN35M	32A	92	65	45	93	30	36	18	30	43.2	63	M16	18	M75x2	JIS B 2401-1 G65 (with B.U. Ring)	JIS B 2401-1 G40 (with B.U. Ring)
		6FCM7550AN35M	50A	132	92	50	97	35	50	25	38.3	61.1	84	M20	22	M75x2	JIS B 2401-1 G65 (with B.U. Ring)	JIS B 2401-1 G50 (with B.U. Ring)

Valve Flange

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	D	E	F	G O-Ring	H O-Ring
2 MPa 15 MPa 21 MPa	Y40 – 120 L	6FCM7532DN23M	32A	76	56	92	138	M75x2	M12x45	JIS B 2401-1 G65	JIS B 2401-1 G35
		6FCM7550DN23M	50A	100	73	91	137	M75x2	M16x55	JIS B 2401-1 G65	JIS B 2401-1 G55
25 MPa 26 MPa 33 MPa	Y60 – 120 L 150 L	6FCM7550DN35M	50A	132	92	67	115	M75x2	M20x80	JIS B 2401-1 G65 (with B.U. Ring)	JIS B 2401-1 G50 (with B.U. Ring)
7 MPa 21 MPa 23 MPa	150 L 160 L 175 L	6FCM9032DN23M	32A	76	56	103	154	M90x2	M12x45	JIS B 2401-1 G80	JIS B 2401-1 G35
		6FCM9050DN23M	50A	100	73	120	171	M90x2	M16x60	JIS B 2401-1 G80	JIS B 2401-1 G55
35 MPa	145 L	6FCM7525DX031	25A	106	52	125	173	M75x2	M16x55	AS568 229 (with B.U. Ring)	JIS B 2401-1 G35 (with B.U. Ring)

Accessories/Tools/Spare Parts

Series				H·N·Y	H·N	N	N·Y	A·H
Maximum Allowable Working Pressure MPa				2/15/21	7/21	23	25/33	26/35
Nominal Gas Volume L				Y40/Y60/80/120	160/175	150	Y60/80/120	145/150
Gas Charging Tools	Gas Charging Tools Kit (※1)		p. 99	6GG ☐☐☐☐ ☐☐☐ ☐		6GH ☐☐☐☐☐☐☐☐		
	Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)				
	Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)				
Fixing Tools	Accumulator Clamp		p. 91	6081C350	6081C406		6081C350	6081C406
	Base Mounting Plate		p. 92	–				
Protective Tools	Eye Nut (Hanging Tool)		p. 97	6HTM42			6HTM42H63	6HTM42
	Valve Cover		p. 97	645049705				
	Rubber Cover		p. 97	6BC164172(2 MPa/15 MPa) 6BC172180(21 MPa)	※3	6BC197205	6BC182190	–
Bladder Replacement Parts	Bladder		p. 103	65 ☐☐☐☐☐☐				
	Bladder Backup Ring			–			640082501120	640082501160
Bladder Replacement Tools	Cap Wrench (※3)		p. 98	6TWH100			6HTH63	Please use a commercially available wrench. Hex.85
Dynac Valve Replacement (DV Spec.) Parts	Dynac Valve Packing with Valve Stem		p. 107	645026400A		645071300A		
	Spring		p. 107	645045500				
	Spring Nut		p. 107	645048200				
Dynac Valve Replacement (DV Spec.) Tools	Spring Nut Key		p. 98	6TWH04				
SG Valve Replacement (R/Q Spec.) Parts	SG Valve		p. 87	6H ☐ -AV35MP-F03-M42A				
	Fuse Plug		p. 88	6H-FP35MP-03-F03				
	Spring Loaded Type Safety Valve		p. 88	6H-SV ☐☐☐☐ -03-F03				
	Pressure Gauge Containing Glycerol		p. 88	6018DUF0206 ☐☐☐☐ G				
	SMA Pressure Gauge		p. 88	6018KDF02 ☐☐ 35MP0				
Oil Port Valve Replacement Tools	Ring Nut Wrench		p. 98	6TWD120	6TWD140		6TWD120	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
(Only a hose and an adaptor are required to SG valve.)
※2 Dimensions may differ for products manufactured in the past. Please confirm the dimensions with the actual product in advance when you arrange a commercial wrench.
※3 6BC172180 is available for an accumulator of 7 MPa 175 L, and 6BC182190 is available for an accumulator of 21 MPa 160 L. Please refer to page 95 for details.

In Line Type From 0.1 to 60 Liters Carbon Steel

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	S	2	1	M	P	-	L	0	2	-	A	A	C	R	0	6

①APPLICABLE INSPECTION/STANDARD

H	- JAPAN High Pressure Gas Safety Law (Japan)
M	- U.S.A. ASME
D	- CHINA
N	- NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②BLADDER COMPOUND

N	- Standard Nitrile Rubber (NBR)
B	- Standard Nitrile Rubber (NBR for J Series)
H	- Nitrile Rubber for High Temp. Use (H.NBR)
L	- Nitrile Rubber for Low Temp. Use (L.NBR)
F	- Butyl Rubber (IIR)
E	- Ethylene Propylene Rubber (EPDM)
C	- Chloroprene Rubber (CR)
G	- Epichlorohydrin Rubber (CHC)
V	- Fluorine Rubber (FKM)

③SERIES

S Series, G Series, J Series, A Series, H Series

④Maximum Allowable Working Pressure

21 MPa, 23 MPa, 25 MPa, 28 MPa

⑤NOMINAL GAS VOLUME

0.1 L, 0.6 L, 1 L, 5 L, 6.3 L, 10 L
16 L, 20 L, 29 L, 30 L, 40 L, 50 L, 60 L

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

A	- Standard Dynac Valve (G1/4)
Q	- SG Valve,Spring Loaded Type Safety valve and Pressure Gauge
R	- SG Valve, Fuse Plug and Pressure Gauge

⑦SPECIFICATION FOR OIL PORT SIDE

A	- Standard Carbon Steel
U	- Pulse Damper
V	- Super Palse Dumper
X	- Special Specifications

⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

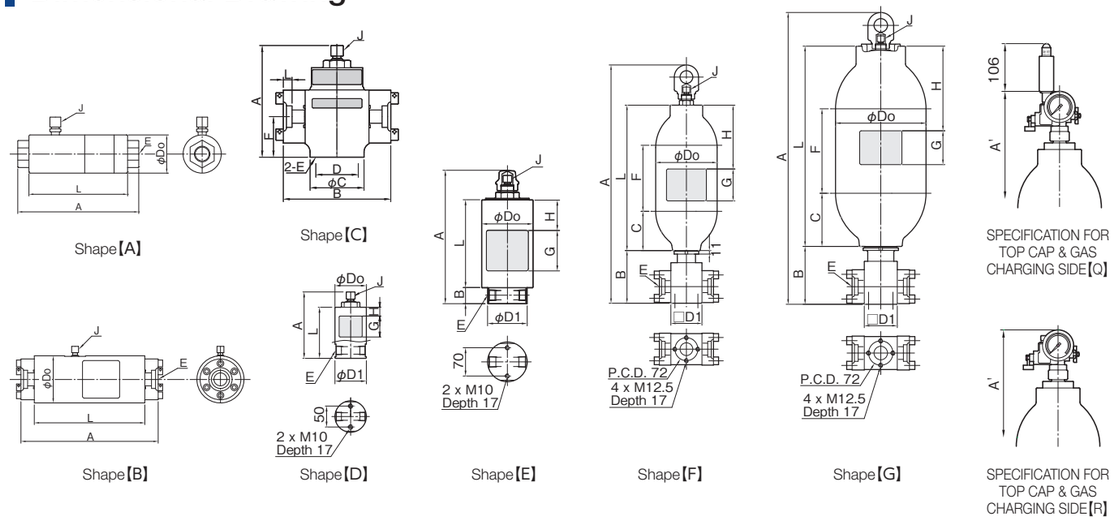
	SPECIFICATION OF SHELL	Inside Surface	Outside Surface	SERVICE FLUID
C	Standard Material (Carbon Steel)	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
D		Zinc Phosphate Treatment	Zinc Phosphate Treatment	Water-Glycol Fluid
A	※2	Paint Coating※3	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
B	※2	Paint Coating※3	Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
N		Zinc Phosphate Treatment	Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W		Zinc Phosphate Treatment	Paint Coating	Water-Glycol Fluid

※2 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids
※3 Inside paint coating is not available for S Series and G Series.

⑨Oil Port Thread Specification or Special Specification

R * *	- Oil Port Connection Thread Type and Thread Size
W * *	- Oil Port Connection Diameter of Flange
* * *	- Special specification comes with three-digit numbers.

Dimensional Drawing



Dimensional Table

In Line Type Pulse Damper

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass	Max. Transit Oil Flow Volume	Do	A	A'	L	B	C	D	F	H	G	D1	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate
		MPa	L	kg	L/min	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			
HN-S21MP-L02-AACR06	A	21	0.1	3.7	90	65	206	–	168	–	–	–	–	–	–	–	G1/4	Rc3/4	–
HN-S21MP-LL1-AACW40	B	21	0.6	27	400	127	370	–	298	–	–	–	–	–	–	–	G1/4	40A	–
HN-G28MP-L01-AACW06	C	28	0.1	12.2	–	–	179	–	12	172	85	68	65	–	–	–	G1/4	20A	–
HN-G28MP-L01-AACW08	C	28	0.1	12	–	–	179	–	14	172	85	68	65	–	–	–	G1/4	25A	–
HB-J25MP-L01-AUCR04	D	25	0.1	3.2	–	75	159 $^{+3}_{0}$	–	122	–	–	–	–	21	50	75	G1/4	Rc1/2	–
HB-J25MP-LL1-AUCR06	E	25	1	15.4	–	127	328 $^{+3}_{0}$	391 $^{+7}_{0}$	215	40	–	–	–	75	50	127	G1/4	Rc3/4	–

※4 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※5 Shell diameter (Do) of S series with nominal gas volume 0.6 L differs depending on the production period. Please make sure the dimensions in advance.

In Line Type Super Pulse Damper

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass	Do	A	A'	L	B	C	F	H	G	D1	Hexagon Bolt	Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				L/min
HN-A23MP-LL5-AVCW50	F	23	5	41	190.7	698 $^{+12}_{0}$	705 $^{+12}_{0}$	411	161	136	142	160	90	98	M16×55	G1/4	MAX.50A	300
HN-A23MP-6.3-AVCW50	F	23	6.3	45	190.7	763 $^{+12}_{0}$	770 $^{+12}_{0}$	476	161	136	207	200	90	98	M16×55	G1/4	MAX.50A	300
HN A23MP-L10-AVCW50	F	23	10	56	190.7	933 $^{+12}_{0}$	940 $^{+12}_{0}$	646	161	136	377	200	90	98	M16×55	G1/4	MAX.50A	300
HN A23MP-L16-AVCW50	F	23	16	76	190.7	1,249 $^{+12}_{0}$	1,256 $^{+12}_{0}$	962	161	136	693	250	90	98	M16×55	G1/4	MAX.50A	300
HN H23MP-L20-AVCW50	G	23	20	96	267.4	938 $^{+17}_{0}$	945 $^{+17}_{0}$	668	171	157	326	250	90	98	M16×55	G1/4	MAX.50A	300
NN-H23MP-L29-AVCW50	G	23	29	123	267.4	1,157 $^{+17}_{0}$	1,164 $^{+17}_{0}$	887	171	157	545	250	90	98	M16×55	G1/4	MAX.50A	300
HN-H23MP-L30-AVCW50	G	23	30	126	267.4	1,183 $^{+17}_{0}$	1,190 $^{+17}_{0}$	913	171	157	571	250	90	98	M16×55	G1/4	MAX.50A	300
HN-H23MP-L40-AVCW50	G	23	40	155	267.4	1,422 $^{+17}_{0}$	1,429 $^{+17}_{0}$	1,152	171	157	786	400	90	98	M16×55	G1/4	MAX.50A	300
HN-H23MP-L50-AVCW50	G	23	50	191	267.4	1,720 $^{+17}_{0}$	1,727 $^{+17}_{0}$	1,450	171	157	1,108	700	90	98	M16×55	G1/4	MAX.50A	300
HN-H23MP-L60-AVCW50	G	23	60	213	267.4	1,907 $^{+17}_{0}$	1,914 $^{+17}_{0}$	1,637	171	157	1,254	700	90	98	M16×55	G1/4	MAX.50A	300

※6 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.

Typical Applicable Inspections / Standards

METI ※7	ASME ※8	PED ※9	CHINA ※10	NACOL ※11
H	M	R	D	N
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○

METI ※7	ASME ※8	PED ※9	CHINA ※10	NACOL ※11
H	M	R	D	N
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
–	–	–	Out of Scope	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○
○	○	–	–	○

※7 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※8 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※9 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※10 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※11 NACOL: NACOL (Manufacturer's) Inspection

Accessories/Tools/Spare Parts

Series					S		G	J			J	A	H
Maximum Allowable Working Pressure MPa					21		28	25			25	23	23
Nominal Gas Volume L					0.1	0.6	0.1	0.1			1	5 – 16	20 – 60
Gas Charging Tools	Gas Charging Tools Kit (※1)			p. 99	6GG ☐☐☐☐☐☐☐☐						6GG ☐☐☐☐☐☐☐☐		
	Hose Extension Adapter			p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)						6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)		
	Hose Valve			p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)						6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)		
Fixing Tools	Accumulator Clamp			p. 91	–	6081C128	–	–			6081C128	6081C191	6081C267
	Base Mounting Plate			p. 92	–						–		
Protective Tools	Eye Nut (Hanging Tool)			p. 97	–						6HTM32		
	Valve Cover			p. 97	–						645049608		
	Rubber Cover			p. 97	–						–	6BC099102	6BC144154
Bladder Replacement	Parts	Bladder		p. 103	65 ☐ SL02A	65 ☐ SLL1A	65 ☐ GL01A	65 ☐ JL01A17A			65 ☐ JLL135C ☐	65 ☐ A ☐☐☐☐	65 ☐ H ☐☐☐☐
		Bladder Backup Ring			–						–		
	Tools	Cap Wrench (※2)		p. 98	–			Please use a commercially available wrench. Hex.41			Please use a commercially available wrench. Hex. 54	Please use a commercially available wrench. Hex.41	6TWH81
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		p. 107	–						645026400A		
		Spring		p. 107	–						645045500		
		Spring Nut		p. 107	–						645048200		
	Tools	Spring Nut Key		p. 98	–						6TWH04		
SG Valve Replacement (R/Q Spec.)	Parts	SG Valve		p. 87	–						6H ☐ -AV35MP-F03-M32A		
		Fuse Plug		p. 88	–						6H-FP35MP-03-F03		
		Spring Loaded Type Safety Valve		p. 88	–						6H-SV ☐☐☐☐ -03-F04		
		Pressure Gauge Containing Glycerol		p. 88	–						6018DUF0206 ☐☐☐☐ G		
		SMA Pressure Gauge		p. 88	–						6018KDF02 ☐☐ 35MP0		
Oil Port Valve Replacement	Tools	Ring Nut Wrench		p. 98	–						–	6TWD075	6TWD105

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
(Only a hose and an adaptor are required to SG valve.)
※2 Dimensions may differ for products manufactured in the past. Please confirm the dimensions with the actual product in advance when you arrange a commercial wrench.

For Low Pressure Use From 2 to 4 Liters Carbon Steel

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
N	N	-	E	0	.	9	5	-	L	L	2	-	C	A	N	R	0	4

①APPLICABLE INSPECTION/STANDARD
N - NACOL (Manufacturer's) Inspection

②BLADDER COMPOUND
N - Standard Nitrile Rubber (NBR)

③SERIES
E - E Series

④Maximum Allowable Working Pressure
0.95 MPa

⑤NOMINAL GAS VOLUME
2 L, 4 L

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
C - Core Type Gas Valve

⑦SPECIFICATION FOR OIL PORT SIDE
A - Carbon steel with zinc plating (standard)
D - Stainless steel

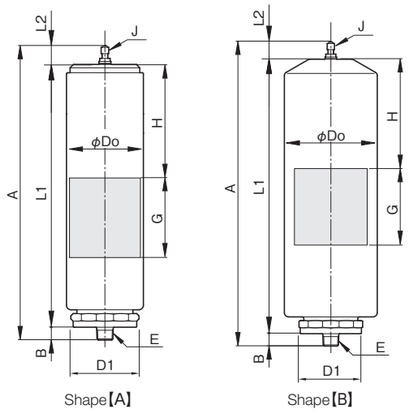
⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

	SPECIFICATION OF SHELL	Inside Surface	Outside Surface	SERVICE FLUID
N -	Standard Material (Carbon Steel)	Zinc Phosphate Treatment	Paint coating	Tap water, Sea water Petroleum Based Hydraulic Oil and other

Standard paint coating for E series is as follows:
Outside Surface:
-Paint:Heat hardening Type Acrylic Resin
-color:Munsell Hue No. 5GY9/1

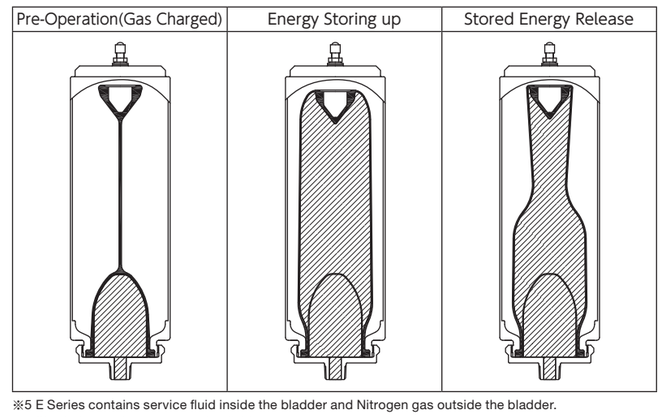
⑨Oil Port Thread Specification or Special Specification
R 0 4 - Oil port thread size R1/2
* * * - Special Specifications

Dimensional Drawing



Shape【A】

Shape【B】



※5 E Series contains service fluid inside the bladder and Nitrogen gas outside the bladder.
Shaded area shows the service fluid.
The structure enable the accumulator shell not to contact the service fluid.

Dimensional Table

Item Number	Shape	Maximum Allowable Working Pressure MPa	Nominal Gas Volume L	Mass kg	Do mm	A mm	L1 mm	L2 mm	B mm	H mm	G mm	D1 mm			Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate L/min
NN-E0.95-LL2-CANR04	A	0.95	2	3.4	101.6	389	348	24	17	150	90	Hex.85			8V1	R1/2	45
NN-E0.95-LL4-CANR04	B	0.95	4	4.4	127	418	377	24	17	150	90	Hex.85			8V1	R1/2	45

※1 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※2 Please use E Seriel Accumulator at normal temperature.
※3 The expiration date for use of E series accumulator is for 10 years after production.

Typical Applicable Inspections / Standards

METI ※6	ASME ※7	PED ※8	CHINA ※9	NACOL ※10
H	M	R	D	N
Out of Scope	Out of Scope	–	Out of Scope	○
Out of Scope	Out of Scope	–	Out of Scope	○

※6 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※7 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※8 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※9 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※10 NACOL: NACOL (Manufacturer's) Inspection

Accessories/Tools/Spare Parts

Series				E	
Maximum Allowable Working Pressure MPa				0.95	
Nominal Gas Volume L				2	4
Gas Charging Tools	Gas Charging Tools Kit (※4)		p. 99	6GT ✱✱✱✱✱✱✱	
	Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)	
	Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)	
Fixing Tools	Accumulator Clamp		p. 91	–	6081C128
	Base Mounting Plate		p. 92	–	

※4 Nitrogen gas charging, inspection, or pressure adjustment requires gas charging tool kit. Please refer to page 99 for further information.

Stainless Steel From 0.1 to 3 Liters

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	B	-	J	1	0	M	P	-	L	L	1	-	P	D	L	R	0	6

①APPLICABLE INSPECTION/STANDARD
- **H** - JAPAN High Pressure Gas Safety Law (Japan)
- **N** - NACOL (Manufacturer's) Inspection
- **X** - Speciall Inspection

②BLADDER COMPOUND
- **B** - Standard Nitrile Rubber (NBR) (J Series)
- **H** - Nitrile Rubber for High Temp. Use (H.NBR)
- **L** - Nitrile Rubber for Low Temp. Use (L.NBR)
- **F** - Butyl Rubber (IIR)
- **E** - Ethylene Propylene Rubber (EPDM)
- **C** - Chloroprene Rubber (CR)
- **G** - Epichlorohydrin Rubber (CHC)
- **V** - Fluorine Rubber (FKM)

③SERIES
- **J** - J Series

④Maximum Allowable Working Pressure
- 10 – 25 MPa

⑤NOMINAL GAS VOLUME
- 0.1 – 3 L

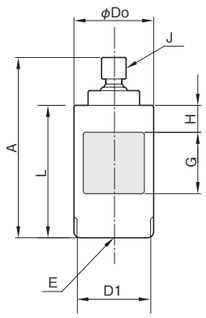
⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
- **P** - Dynac Valve (G thread)(Material: SUS304)
- **X** - Special Specifications

⑦SPECIFICATION FOR OIL PORT SIDE
- **D** - Stainless Steel (Material: SUS304)
- **X** - Special Specifications

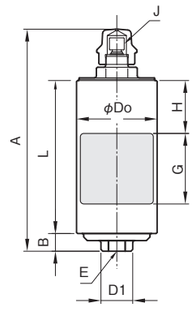
⑧SPECIFICATION OF SHELL / SURFACE TREATMENT
- **L** - Stainless Steel (Material: SUS304)
- **X** - Special Specifications

⑨Oil Port Thread Specification or Special Specification
- **R * *** - Oil Port Connection Thread Type and Thread Size
- **0 5 7** - Stainless Steel (Material: SUS316)
- *** * *** - Special Specifications

Dimensional Drawing



Shape【A】



Shape【B】

Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass	Do	A	L	B	H	G	D1			Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate	Possible Oil Flow Rate ※7
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm					L/min	L/min
HB-J10MP-L01-XXX057	A	10	0.1	2	65	144 $^{+3}_{0}$	107	–	21	50	Hex.60			G1/4	Rc3/8	12	–
HB-J10MP-L03-XXX057	A	10	0.3	3	65	244 $^{+3}_{0}$	207	–	60	50	Hex.60			G1/4	Rc3/8	12	–
HB-J10MP-L05-XXX057	A	10	0.5	6	89.1	233 $^{+3}_{0}$	198	–	60	50	Hex.85			G1/4	Rc3/4	12	–
HB-J10MP-LL1-PDLR06	B	10	1	14	120	313 $^{+4}_{0}$	215	25	75	50	Hex.41			G1/4	Rc3/4	60	–
HB-J10MP-LL2-PDLR06	B	10	2	18	120	449 $^{+4}_{0}$	351	25	75	50	Hex.41			G1/4	Rc3/4	60	–
HB-J10MP-LL3-PDLR06	B	10	3	23	120	567 $^{+4}_{0}$	469	25	75	50	Hex.41			G1/4	Rc3/4	60	–
HB-J20.6-L01-PDLR03	A	20.6(25)※1	0.1	3	75	148 $^{+3}_{0}$	114	–	21	50	Hex.70			G1/4	Rc3/8	12	–
HB-J20.6-L03-PDLR03	A	20.6(25)※1	0.3	5	75	248 $^{+3}_{0}$	214	–	60	50	Hex.70			G1/4	Rc3/8	12	–
HB-J20.6-L05-PDLR06	A	20.6(25)※1	0.5	9	100	241 $^{+3}_{0}$	206	–	60	50	Hex.95			G1/4	Rc3/4	12	–

※1 For products certified according to NACOL (Manufacturer's) Inspection, Japan, the maximum allowable working pressure is 25 MPa.
※2 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.

Typical Applicable Inspections / Standards

METI ※3	ASME ※4	PED ※5	CHINA ※6	NACOL ※7
H	M	R	D	N
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	–	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○※1
○	Out of Scope	Out of Scope	Out of Scope	○※1
○	Out of Scope	Out of Scope	Out of Scope	○※1

※3 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※4 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※5 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※6 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※7 NACOL: NACOL (Manufacturer's) Inspection

Accessories/Tools/Spare Parts

Series					J				
Maximum Allowable Working Pressure MPa					10		20.6(25)		10
Nominal Gas Volume L					0.1&0.3	0.5	0.1&0.3	0.5	1 – 3
Gas Charging Tools		Gas Charging Tools Kit (※1)		p. 99	6GG ☐☐☐☐ ☐☐☐ ☐				
		Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)				
		Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)				
Fixing Tools		Accumulator Clamp		p. 91	–		6081C098(0.5 L only)		6081C120
		Base Mounting Plate		p. 92	–				
Protective Tools		Eye Nut (Hanging Tool)		p. 97	–				
		Valve Cover		p. 97	–				645058201
		Rubber Cover		p. 97	–				
Bladder Replacement	Parts	Bladder		p. 103	65 ☐ J ☐☐☐ U16U				
		Bladder Backup Ring			–				
	Tools	Cap Wrench (※2)		p. 98	Please use a commercially available wrench. Hex.41	Please use a commercially available wrench. Hex.60	Please use a commercially available wrench. Hex.38	Please use a commercially available wrench. Hex.60	Please use a commercially available wrench. Hex.54
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		p. 107	645026400A				
		Spring		p. 107	645045500				
		Spring Nut		p. 107	645048200				
	Tools	Spring Nut Key		p. 98	6TWH04				
SG Valve Replacement (R/Q Spec.)	Parts	SG Valve		p. 87	–				
		Fuse Plug		p. 88	–				
		Spring Loaded Type Safety Valve		p. 88	–				
		Pressure Gauge Containing Glycerol		p. 88	–				
		SMA Pressure Gauge		p. 88	–				
Oil Port Valve Replacement	Tools	Ring Nut Wrench		p. 98	–				

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
※2 Dimensions may differ for products manufactured in the past. Please confirm the dimensions with the actual product in advance when you arrange a commercial wrench.

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	A	1	1	M	P	-	L	L	5	-	P	D	L	M	4	2

①APPLICABLE INSPECTION/STANDARD	
H	- JAPAN High Pressure Gas Safety Law (Japan)
F	- JAPAN Industrial Safety and Health Act (Class-2 Pressure Vessel)
M	- U.S.A. ASME
A	- AS1210
N	- NACOL (Manufacturer's) Inspection
X	- Speciall Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②BLADDER COMPOUND	
N	- Standard Nitrile Rubber (NBR)
H	- Nitrile Rubber for High Temp. Use (H.NBR)
L	- Nitrile Rubber for Low Temp. Use (L.NBR)
F	- Butyl Rubber (IIR)
E	- Ethylene Propylene Rubber (EPDM)
C	- Chloroprene Rubber (CR)
G	- Epichlorohydrin Rubber (CHC)
V	- Fluorine Rubber (FKM)

※2 Depending on the material, there is a volume that cannot be produced.

③SERIES	
A	- A Series
H	- H Series
N	- N Series
R	- R Series
Y	- Y Series

④Maximum Allowable Working Pressure
7 – 50 MPa

⑤NOMINAL GAS VOLUME
1 – 160 L

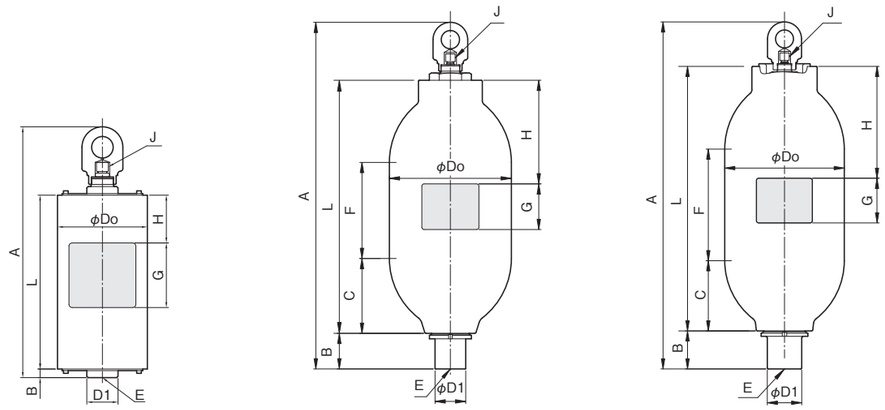
⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE	
P	- Dynac Valve (G thread)(Material: SUS304)
X	- Special Specifications

⑦SPECIFICATION FOR OIL PORT SIDE	
D	- Stainless Steel (Material: SUS304)
X	- Special Specifications

⑧SPECIFICATION OF SHELL / SURFACE TREATMENT	
L	- Stainless Steel (Material: SUS304)
X	- Special Specifications

⑨Oil Port Thread Specification or Special Specification	
M * *	- Oil Port Connection Thread Type and Thread Size
0 1 9	- High Pressure Gas Equipment Test Applied
* * *	- Special Specifications

Dimensional Drawing



Shape【A】 Shape【B】 Shape【C】

Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass	Do	A	L	B	C	F	H	G	D1			Gas Charging Port Thread	Oil Port Thread	Allowable Oil Flow Rate
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm			J	E	L/min
XN-N50MP-LL1-PDL019	A	50	1	49	167	466 $^{+12}_{0}$	323	16	–	–	120	90	Hex.54			G3/8	Rc3/4	120
HN-A11MP-LL5-PDLM42	B	11	5	26	190.7	574 $^{+12}_{0}$	390	58	123	134	160	90	57			G1/4	M42x2	300
HN-A11MP-6.3-PDLM42	B	11	6.3	30	190.7	647 $^{+12}_{0}$	463	58	123	207	200	90	57			G1/4	M42x2	300
HN-A11MP-L10-PDLM42	B	11	10	40	190.7	822 $^{+12}_{0}$	638	58	123	382	200	90	57			G1/4	M42x2	300
HN-A11MP-L16-PDLM42	B	11	16	57	190.7	1,134 $^{+12}_{0}$	950	58	123	694	250	90	57			G1/4	M42x2	300
HN-A20.6-LL5-PDLM42	B	20.6(21)※3	5	44	216.3	577 $^{+15}_{0}$	393	58	128	126	160	90	57			G1/4	M42x2	300
HN-A20.6-6.3-PDLM42	B	20.6(21)※3	6.3	52	216.3	650 $^{+15}_{0}$	466	58	128	199	200	90	57			G1/4	M42x2	300
HN-A20.6-L10-PDLM42	B	20.6(21)※3	10	71	216.3	824 $^{+15}_{0}$	640	58	128	373	200	90	57			G1/4	M42x2	300
HN-A20.6-L16-PDLM42	B	20.6(21)※3	16	102	216.3	1,136 $^{+15}_{0}$	952	58	128	685	250	90	57			G1/4	M42x2	300
HN-R8MPA-L20-PDLM50	B	8	20	53	244.5	921 $^{+23}_{0}$	716	78	169	365	250	90	67.2			G1/4	M50x2	450
HN-R8MPA-L32-PDLM50	B	8	32	71	244.5	1,240 $^{+23}_{0}$	1,035	78	169	684	400	90	67.2			G1/4	M50x2	450
HN-R8MPA-L40-PDLM50	B	8	40	84	244.5	1,452 $^{+23}_{0}$	1,247	78	169	896	400	90	67.2			G1/4	M50x2	450
HN-R8MPA-L50-PDLM50	B	8	50	99	244.5	1,718 $^{+23}_{0}$	1,513	78	169	1,162	700	90	67.2			G1/4	M50x2	450
HN-R8MPA-L63-PDLM50	B	8	63	121	244.5	2,062 $^{+23}_{0}$	1,857	78	169	1,506	1,000	90	67.2			G1/4	M50x2	450
HN-R13MP-L20-PDLM50	B	13	20	77	244.5	921 $^{+23}_{0}$	716	78	164	375	250	90	67.2			G1/4	M50x2	450
HN-R13MP-L32-PDLM50	B	13	32	104	244.5	1,240 $^{+23}_{0}$	1,035	78	164	694	400	90	67.2			G1/4	M50x2	450
HN-R13MP-L40-PDLM50	B	13	40	123	244.5	1,452 $^{+23}_{0}$	1,247	78	164	906	400	90	67.2			G1/4	M50x2	450
HN-R13MP-L50-PDLM50	B	13	50	146	244.5	1,718 $^{+23}_{0}$	1,513	78	164	1,172	700	90	67.2			G1/4	M50x2	450
HN-R13MP-L63-PDLM50	B	13	63	179	244.5	2,062 $^{+23}_{0}$	1,857	78	164	1,516	1,000	90	67.2			G1/4	M50x2	450
DN-H13MP-R32-PDLM50	B	13	32	104	244.5	1,240 $^{+23}_{0}$	1,035	78	164	694	400	90	67.2			G1/4	M50x2	450
DN-H13MP-R40-PDLM50	B	13	40	123	244.5	1,452 $^{+23}_{0}$	1,247	78	164	906	400	90	67.2			G1/4	M50x2	450
DN-H13MP-R50-PDLM50	B	13	50	146	244.5	1,718 $^{+23}_{0}$	1,513	78	164	1,172	700	90	67.2			G1/4	M50x2	450
DN-H13MP-R63-PDLM50	B	13	63	179	244.5	2,062 $^{+23}_{0}$	1,857	78	164	1,516	1,000	90	67.2			G1/4	M50x2	450
HN-Y7MPA-L60-PDLM60	C	7	60	127	355.6	1,272 $^{+17}_{0}$	1,088	85	230	608	400	90	77			G1/4	M60x2	600
HN-N7MPA-L80-PDLM60	C	7	80	156	355.6	1,527 $^{+17}_{0}$	1,343	85	230	863	400	90	77			G1/4	M60x2	600
HN-N7MPA-120-PDLM60	C	7	120	208	355.6	1,979 $^{+17}_{0}$	1,795	85	230	1,315	1,000	90	77			G1/4	M60x2	600
HN-N7MPA-160-PDLM75	C	7	160	294	406.4	2,068 $^{+20}_{0}$	1,870	99	262	1,322	1,000	90	92.5			G1/4	M75x2	900
DN-H7MPA-Y60-PDLM60	C	7	60	127	355.6	1,272 $^{+17}_{0}$	1,088	85	230	608	400	90	77			G1/4	M60x2	600
DN-H7MPA-L80-PDLM60	C	7	80	156	355.6	1,527 $^{+17}_{0}$	1,343	85	230	863	400	90	77			G1/4	M60x2	600
DN-H7MPA-120-PDLM60	C	7	120	208	355.6	1,979 $^{+17}_{0}$	1,795	85	230	1,315	1,000	90	77			G1/4	M60x2	600
DN-H7MPA-160-PDLM75	C	7	160	294	406.4	2,068 $^{+20}_{0}$	1,870	99	262	1,322	1,000	90	92.5			G1/4	M75x2	900

※3 For products certified according to NACOL (Manufacturer's) Inspection, Japan, the maximum allowable working pressure is 21 MPa.
※4 High Pressure Gas Equipment Test shall be applied when following the High Pressure Gas Safety Law, Japan.
※5 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.

Typical Applicable Inspections / Standards

METI ※6	ASME ※7	PED ※8	CHINA ※9	NACOL ※10
H	M	R	D	N
– ※4	Out of Scope	Out of Scope	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○
○	○	–	Out of Scope	○※3
○	○	–	Out of Scope	○※3
○	○	–	Out of Scope	○※3
○	○	–	Out of Scope	○※3
○	○	–	Out of Scope	○
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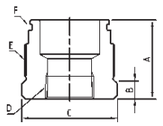
※6 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※7 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※8 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※9 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※10 NACOL: NACOL (Manufacturer's) Inspection

Piping Connection

Dimensional Drawing

Bushing



※1 The above shows the shape of representative model. Confirm the actual shape with the drawing or the actual product.
※2 When there is no indication of maximum allowable working pressure of your accumulator in the column of "Applicable Acc. MAWP" of the following dimensional table, please contact us.

Dimensional Table

Bushing

(mm)

Applicable Acc. MAWP	Applicable Acc. Nominal Gas Volume L	Item Number	Connection Port Size	A	B	C	E	F O-Ring
11 MPa 20.6 MPa (21 MPa)	5 – 16	6RCM42R03N23MU04	Rc3/8	42	12	Hex.41	M42x2	JIS B 2401-1 P32
		6RCM42R04N23MU04	Rc1/2	42	12	Hex.41	M42x2	JIS B 2401-1 P32
		6RCM42R06N23MU04	Rc3/4	42	12	Hex.41	M42x2	JIS B 2401-1 P32
		6RCM42R08N23MU04	Rc1	60	30	Hex.46	M42x2	JIS B 2401-1 P32
8 MPa 13 MPa	20 – 63	6RCM50R03N25MU04	Rc3/8	52	12	Hex.54	M50x2	JIS B 2401-1 G40
		6RCM50R04N25MU04	Rc1/2	52	12	Hex.54	M50x2	JIS B 2401-1 G40
		6RCM50R06N25MU04	Rc3/4	52	12	Hex.54	M50x2	JIS B 2401-1 G40
		6RCM50R08N25MU04	Rc1	52	12	Hex.54	M50x2	JIS B 2401-1 G40
7 MPa	60 – 120	6RCM60R06N23MU04	Rc3/4	53	12	Hex.60	M60x2	JIS B 2401-1 G50
		6RCM60R08N23MU04	Rc1	53	12	Hex.60	M60x2	JIS B 2401-1 G50
		6RCM60R10N23MU04	Rc1-1/4	53	12	Hex.60	M60x2	JIS B 2401-1 G50
7 MPa	160	6RCM75R06N25MU04	Rc3/4	66	20	Hex.75	M75x2	JIS B 2401-1 G65
		6RCM60R08N25MU04	Rc1	66	20	Hex.75	M75x2	JIS B 2401-1 G65
		6RCM75R10N25MU04	Rc1-1/4	66	20	Hex.75	M75x2	JIS B 2401-1 G65
		6RCM60R12N25MU04	Rc1-1/2	66	20	Hex.75	M75x2	JIS B 2401-1 G65
		6RCM75R16N25MU04	Rc2	85	39	Hex.85	M75x2	JIS B 2401-1 G65

Accessories/Tools/Spare Parts

Series					N	A			R/H		Y/N/H	N/H
Maximum Allowable Working Pressure MPa					50	11	20.6(21)		8	13	7	7
Nominal Gas Volume L					1	5 – 16			20 – 63		60 – 120	160
Gas Charging Tools		Gas Charging Tools Kit (※1)		p. 99	6GH ☐☐☐☐ ☐☐☐ ☐	6GG ☐☐☐☐☐☐☐☐			6GG ☐☐☐☐☐☐☐☐			
		Hose Extension Adapter		p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)				6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)			
		Hose Valve		p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)				6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)			
Fixing Tools		Accumulator Clamp		p. 91	6081C167	6081C191	6081C215		6081C246		6081C350	6081C406
		Base Mounting Plate		p. 92	–	–			–			
Protective Tools		Eye Nut (Hanging Tool)		p. 97	6HTM42U04	6HTM32U04			6HTM42U04			
		Valve Cover		p. 97	645058301	645058201			645058301			
		Rubber Cover		p. 97	–	–			–			
Bladder Replacement	Parts	Bladder		p. 103	65 ☐ NLL1U	65 ☐ A ☐☐☐ U			65 ☐☐☐☐☐ U		65 ☐☐☐☐☐ U	65 ☐☐ 160U
		Bladder Backup Ring			–	–			–			
	Tools	Cap Wrench (※2)		p. 98	Please use a commercially available wrench. Hex.54	Please use a commercially available wrench. Hex.41			Please use a commercially available wrench. Hex.85		6TWH100	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		p. 107	645071300A	645026400A			645026400A			
		Spring		p. 107	645045500				645045500			
		Spring Nut		p. 107	645048200				645048200			
	Tools	Spring Nut Key		p. 98	6TWH04				6TWH04			
SG Valve Replacement (R/Q Spec.)	Parts	SG Valve		p. 87	–				–			
		Fuse Plug		p. 88	–				–			
		Spring Loaded Type Safety Valve		p. 88	–				–			
		Pressure Gauge Containing Glycerol		p. 88	–				–			
		SMA Pressure Gauge		p. 88	–				–			
Oil Port Valve Replacement	Tools	Ring Nut Wrench		p. 98	–	6TWD075			6TWD085		6TWD105	6TWD120

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
※2 Dimensions may differ for products manufactured in the past. Please confirm the dimensions with the actual product in advance when you arrange a commercial wrench.

Carbon Steel From 0.4 to 100 Liters

Explanation of Item Number (For details, please refer to p. 27-30.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	P	2	5	M	P	-	L	0	4	-	A	X	N	3	4	8

①APPLICABLE INSPECTION/STANDARD

H	- JAPAN High Pressure Gas Safety Law (Japan)
M	- U.S.A. ASME
D	- CHINA
N	- NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by the standards nor supported by NACOL (Manufacturer).

②PISTON SPECIFICATION

N	- Standard (Piston Seal: NBR) ※2

※2 If the special material is required, please contact our sales department.

③SERIES

P	- P Series

④Maximum Allowable Working Pressure ※2

17.5 – 25 MPa

⑤NOMINAL GAS VOLUME

0.4 – 100 L

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

A	- Standard Dynac Valve (G thread)
Q	- SG Valve + Safety Valve + Pressure Gauge
R	- SG Valve + Fuse Plug + Pressure Gauge
X	- Special Specifications

⑦SPECIFICATION FOR OIL PORT SIDE

X	- Standard With Counter Flange
A	- With Manifold Flange

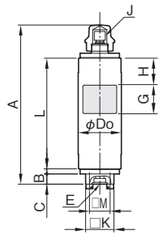
⑧SPECIFICATION OF SHELL / SURFACE TREATMENT

	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
N	- Standard Material (Carbon Steel)	Outside Paint Coating (Standard)	Petroleum Based Hydraulic Oil & Other Fluid

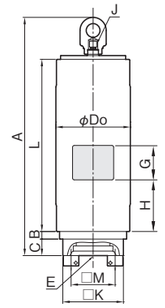
⑨Oil Port Thread Specification or Special Specification

* * * - Special Specifications

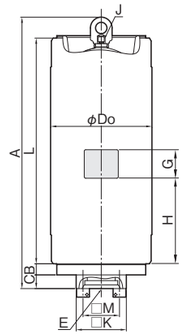
Dimensional Drawing



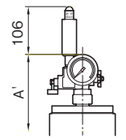
Shape【A】



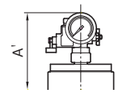
Shape【B】



Shape【C】



Gas Charging Side Spec:Q



Gas Charging Side Spec:R

Dimensional Table

Standard

Item Number	Shape	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※5	Do	A	A'	L	B	C	K	M	H	G			Gas Charging Port Thread J	Oil Port Thread E	Allowable Oil Flow Rate
		MPa	L	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm					L/min
HN-P25MP-L04-AXN348	A	25	0.4	10	82.6	359 $^{+7}_{0}$	423 $^{+7}_{0}$	267	10	22	54	36(M10×35)	110	50			G1/4	15A	360
HN-P25MP-L05-AXN348	A	25	0.5	10	82.6	389 $^{+7}_{0}$	453 $^{+7}_{0}$	297	10	22	54	36(M10×35)	110	50			G1/4	15A	360
HN-P25MP-L09-AXN348	A	25	0.9	12	82.6	508 $^{+7}_{0}$	572 $^{+7}_{0}$	416	10	22	54	36(M10×35)	110	50			G1/4	15A	360
HN-P25MP-LL2-AXN348	A	25	2	19	82.6	836 $^{+7}_{0}$	900 $^{+7}_{0}$	744	10	22	54	36(M10×35)	110	50			G1/4	15A	360
HN-P25MP-1.6-AXN401	B	25	1.6	27	127	545 $^{+7}_{0}$	552 $^{+7}_{0}$	378	10	35	85	58(M12×50)	114	50			G1/4	25A	900
HN-P25MP-2.5-AXN401	B	25	2.5	32	127	660 $^{+7}_{0}$	667 $^{+7}_{0}$	493	10	35	85	58(M12×50)	114	90			G1/4	25A	900
HN-P25MP-3.4-AXN401	B	25	3.4	40	127	774 $^{+7}_{0}$	781 $^{+7}_{0}$	607	10	35	85	58(M12×50)	114	90			G1/4	25A	900
HN-P25MP-7.2-AXN401	B	25	7.2	49	127	1,240 $^{+7}_{0}$	1,247 $^{+7}_{0}$	1,073	10	35	85	58(M12×50)	300	90			G1/4	25A	900
HN-P22MP-LL5-AXN350	B	22	5	56	152.4	814 $^{+10}_{0}$	821 $^{+10}_{0}$	631	18	36	100	73(M16×55)	300	90			G1/4	50A	1,500
HN-P22MP-L10-AXN350	B	22	10	72	152.4	1,191 $^{+10}_{0}$	1,198 $^{+10}_{0}$	1,008	18	36	100	73(M16×55)	300	90			G1/4	50A	1,500
HN-P22MP-L20-AXN350	B	22	20	105	152.4	1,945 $^{+10}_{0}$	1,952 $^{+10}_{0}$	1,762	18	36	100	73(M16×55)	300	90			G1/4	50A	1,500
HN-P25MP-LL5-AXN351	B	25	5	114	216.3	724 $^{+10}_{0}$	731 $^{+10}_{0}$	518	22	60	150	108(M22×90)	300	90			G1/4	65A	3,000
HN-P25MP-L10-AXN351	B	25	10	132	216.3	920 $^{+10}_{0}$	927 $^{+10}_{0}$	714	22	60	150	108(M22×90)	300	90			G1/4	65A	3,000
HN-P25MP-L20-AXN351	B	25	20	169	216.3	1,313 $^{+10}_{0}$	1,320 $^{+10}_{0}$	1,107	22	60	150	108(M22×90)	300	90			G1/4	65A	3,000
HN-P25MP-L30-AXN351	B	25	30	206	216.3	1,706 $^{+10}_{0}$	1,713 $^{+10}_{0}$	1,500	22	60	150	108(M22×90)	300	90			G1/4	65A	3,000
HN-P25MP-L40-AXN351	B	25	40	242	216.3	2,099 $^{+10}_{0}$	2,106 $^{+10}_{0}$	1,893	22	60	150	108(M22×90)	300	90			G1/4	65A	3,000
HN-P17.5-L10-AXN352	B	17.5	10	162	267.4	815 $^{+10}_{0}$	821 $^{+10}_{0}$	621	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L15-AXN352	B	17.5	15	177	267.4	920 $^{+10}_{0}$	926 $^{+10}_{0}$	753	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L20-AXN352	B	17.5	20	199	267.4	1,052 $^{+10}_{0}$	1,058 $^{+10}_{0}$	885	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L25-AXN352	B	17.5	25	220	267.4	1,184 $^{+10}_{0}$	1,190 $^{+10}_{0}$	1,017	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L30-AXN352	B	17.5	30	241	267.4	1,316 $^{+10}_{0}$	1,322 $^{+10}_{0}$	1,149	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L40-AXN352	B	17.5	40	283	267.4	1,580 $^{+10}_{0}$	1,586 $^{+10}_{0}$	1,413	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L50-AXN352	B	17.5	50	325	267.4	1,844 $^{+10}_{0}$	1,850 $^{+10}_{0}$	1,677	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P17.5-L60-AXN352	B	17.5	60	367	267.4	2,108 $^{+10}_{0}$	2,114 $^{+10}_{0}$	1,941	23	48	176	128(M30×90)	300	90			G1/4	100A	4,500
HN-P21MP-Y52-AXN352	C	21	52	526	355.6	1,406 $^{+10}_{0}$	1,474 $^{+10}_{0}$	1,246	39	48	176	128(M30×90)	300	90			G1/4	100A	8,400
HN-P21MP-Y60-AXN352	C	21	60	555	355.6	1,520 $^{+10}_{0}$	1,588 $^{+10}_{0}$	1,360	39	48	176	128(M30×90)	300	90			G1/4	100A	8,400
HN-P21MP-L80-AXN352	C	21	80	626	355.6	1,804 $^{+10}_{0}$	1,872 $^{+10}_{0}$	1,644	39	48	176	128(M30×90)	300	90			G1/4	100A	8,400
HN-P21MP-100-AXN352	C	21	100	697	355.6	2,088 $^{+10}_{0}$	2,156 $^{+10}_{0}$	1,928	39	48	176	128(M30×90)	300	90			G1/4	100A	8,400

※3 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※4 Some dimensions of products as per the ASME Code or inspection requirements in China may vary. For piston type accumulators for overseas use, please contact our sales department.
※5 Weight may vary depending on applicable inspections and standards.

Typical Applicable Inspections / Standards

METI ※6	ASME ※7	PED ※8	CHINA ※9	NACOL ※10
H	M	R	D	N
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	Out of Scope	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	Out of Scope	—	Out of Scope	○
○	※4	—	Out of Scope	○
○	※4	—	Out of Scope	○
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※6 METI: High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)
※7 ASME: ASME Boiler and Pressure Vessel Code Section VIII Div.1. Mainly For U.S.A.
※8 PED: European Pressure Equipment Directive (PED) 2014/68/EU
※9 CHINA: Regulation for Production and Filling Licensing of Special Equipment, China
※10 NACOL: NACOL (Manufacturer's) Inspection

Accessories/Tools/Spare Parts

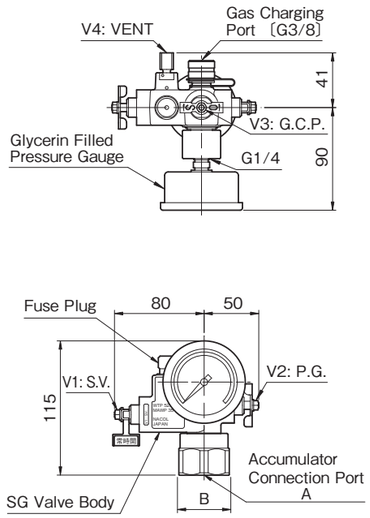
Series				P					P		
Maximum Allowable Working Pressure MPa				17.5	21	22			25		
Nominal Gas Volume L				10 – 60	52 – 100	5 – 20			0.4 – 2	1.6 – 7.2	5 – 40
Gas Charging Tools	Gas Charging Tools Kit (※1)		 p. 99	6GG ☐☐☐☐☐☐☐☐					6GG ☐☐☐☐☐☐☐☐		
	Hose Extension Adapter		 p. 101	6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)					6ADG03022 (Maximum Allowable Working Pressure: 29.5 MPa)		
	Hose Valve		 p. 102	6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)					6XN-HV35MP-F03-F03 (Maximum Allowable Working Pressure: 35 MPa)		
Fixing Tools	Accumulator Clamp		 p. 91	6081C267	6081C355	6081C152			–	6081C128	6081C215
	Base Mounting Plate		 p. 92	–					–		
Protective Tools	Eye Nut (Hanging Tool)		 p. 97	6HTM42		6HTM32			6HTM32		
	Valve Cover		 p. 97	645049705		645049608			645049608		
	Rubber Cover		 p. 97	–					–		
Bladder Replacement	Parts	Bladder	 p. 103	–					–		
		Bladder Backup Ring		–					–		
	Tools	Cap Wrench	 p. 98	–					–		
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem	 p. 107	645026400A					645026400A		
		Spring	 p. 107	645045500					645045500		
		Spring Nut	 p. 107	645048200					645048200		
	Tools	Spring Nut Key	 p. 98	6TWH04					6TWH04		
SG Valve Replacement (R/Q Spec.)	Parts	SG Valve	 p. 87	6H ☐ -AV35MP-F03-M42A		6H ☐ -AV35MP-F03-M32A			6H ☐ -AV35MP-F03-M32A		
		Fuse Plug	 p. 88	6H-FP35MP-03-F03					6H-FP35MP-03-F03		
		Spring Loaded Type Safety Valve	 p. 88	6H-SV ☐☐☐☐ -03-F03					6H-SV ☐☐☐☐ -03-F03		
		Pressure Gauge Containing Glycerol	 p. 88	6018DUF0206 ☐☐☐☐ G					6018DUF0206 ☐☐☐☐ G		
		SMA Pressure Gauge	 p. 88	6018KDF02 ☐☐☐ 35MP ☐					6018KDF02 ☐☐☐ 35MP ☐		
Oil Port Valve Replacement	Tools	Ring Nut Wrench	 p. 98	–					–		

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tool kit. Please refer to page 99 for further information.
(Only a hose and an adaptor are required to SG valve.)

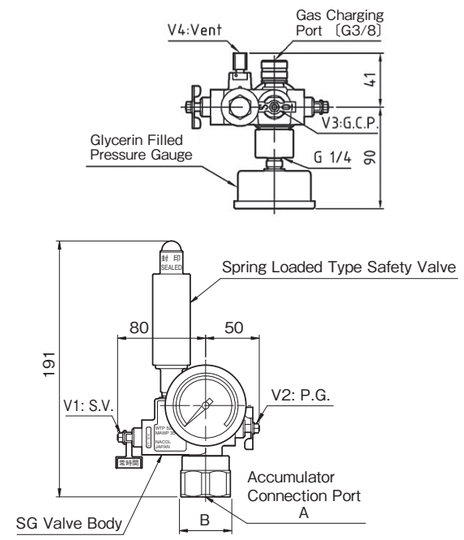
SG Valve

A permanent pressure gauge can be installed on accumulators with a gas volume of 1 L or more (Except for some models, such as S series) Without a gas charging 3-way valve, gas charging and gas charging pressure measurement can be done easily by connecting a gas charging hose to the gas harging port (V3).
A fuse plug or spring loaded type safety valve is available as a safety device.

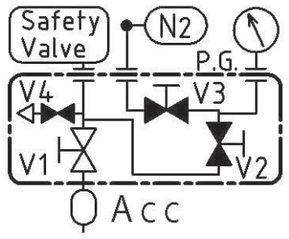
SG Valve with Fuse Plug



SG Valve with Spring Loaded Type Safety Valve



Circuit



Valve Number (V1 – V4)

V1: S.V.	(Main Circuit Stop Valve)
V2: P.G.	(Pressure Gauge Circuit Stop Valve)
V3: G.C.P.	(Gas Charging Circuit Stop Valve)
V4: VENT	(Vent Circuit Stop Valve)

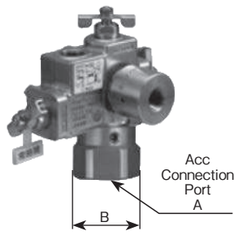
※ Pressure gauge in the above dimensions is glycerine filled pressure gauge.

SG Valve

Select SG valve refering to "Accessory/Tool/Parts List" page of the accumulator and to the applicable bladder compound.
SG valve is in accordance with High Pressure Gas Safety Law, Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan.

Item Number ※	Sealing Material	A	B	Applicable Bladder Compound.
6HN-AV35MP-F03-M32A	NBR	M32x2	Hex.41	Other than L.NBR
6HL-AV35MP-F03-M32A	L.NBR	M32x2	Hex.41	L.NBR
6HN-AV35MP-F03-M42A	NBR	M42x2	Hex.54	Other than L.NBR
6HL-AV35MP-F03-M42A	L.NBR	M42x2	Hex.54	L.NBR

※ Item number of SG valve only. Safety device (fuse plug or spring loaded type safety valve) and pressure gauge for SG valve (glycerine filled pressure gauge/SMA pressure gauge) have to be arranged separately.



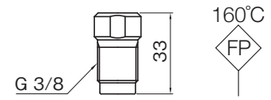
Safety Device

Select ① Fuse Plug or ② Spring Loaded Type Safety Valve.
Unless otherwise specified, please choose ① Fuse Plug.

① Fuse Plug

Like NACOL's standard gas charging valve (Dynac Valve), the packing melts at an external temperature of 160±20 ºC or more to release the gas in the accumulator to the atmosphere.
For the detailed structure, etc., please see the description of the Dynac Valve on page 107.

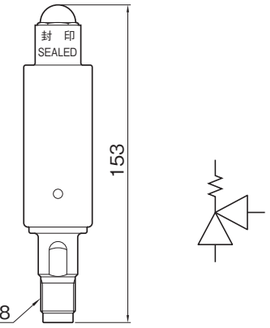
Item Number
6H-FP35MP-03-F03



② Spring Loaded Type Safety Valve

This valve vents gas from an accumulator to the atmosphere when a predetermined gas pressure has been reached.
For details, please see the description of the spring loaded type safety valve on page 89.

Item Number	Blowout Pressure
6H-SV10MP-03-F03	10 MPa
6H-SV15MP-03-F03	15 MPa
6H-SV17.5-03-F03	17.5 MPa
6H-SV21MP-03-F03	21 MPa
6H-SV23MP-03-F03	23 MPa
6H-SV25MP-03-F03	25 MPa
6H-SV28MP-03-F04	28 MPa
6H-SV35MP-03-F03	35 MPa



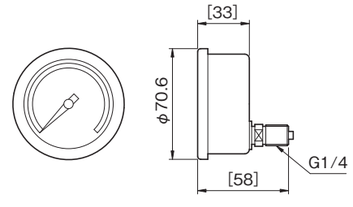
Pressure Gauge for SG Valve

Select ① Glycerin Filled Pressure Gauge or ② SMA Pressure Gauge. Unless otherwise specified, please choose ① Glycerin Filled Pressure Gauge.

① Glycerin Filled Pressure Gauge

Glycerin filled bourdon tube pressure gauge. Referring to the table below, please select a pressure gauge suitable for the service pressure.
NACOL offers a custom glycerin filled pressure gauge with a scale plate angled at 10º.
For vertical installation, the gauge can be prevented from loosening due to vibration by mounting it with the point at half the maximum scale value facing straight up.

Item Number	Maximum Scale	Reccomended Gauge Range
6018DUF02061.6MG	1.6 MPa	0.48 – 1.04 MPa
6018DUF02062.5MG	2.5 MPa	0.75 – 1.63 MPa
6018DUF02066MPAG	6 MPa	1.8 – 3.9 MPa
6018DUF020616MPG	16 MPa	4.8 – 10.4 MPa
6018DUF020625MPG	25 MPa	7.5 – 16.2 MPa
6018DUF020640MPG	40 MPa	12.0 – 26.0 MPa
6018DUF020660MPG	60 MPa	18.0 – 39.0 MPa



② SMA Pressure Gauge

Digital pressure gauge that can output the measured pressure externally.
For details, please see page 90.

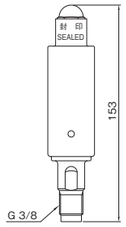
Item Number	Output	Receiver
6018KDF02Z135MP0	Wireless	Attached
6018KDF02Z035MP0	Wireless	—
6018KDF02V035MP0	Wired	—

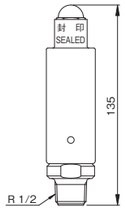
※Washer for SG vavle connection
(Item Number: 645074600)
Please use a washer for SG valve connection.

Accessory

Spring Loaded Type Safety Valve made by NACOL

This valve vents gas from an accumulator to the atmosphere when a predetermined gas pressure has been reached or exceeded.
It is certified according to the "High Pressure Gas Safety Law, Japan."
With two connection diameters supported, the valve is also available for products other than NACOL accumulators.





Explanation of Item Number

6	H	-	S	V	④	④	④	④	-	0	3	-	⑥	⑥	⑥
①	②		③							⑤					

③ Spring Loaded Type Safety Valve

⑤ Blowout Port Diameter

Inspection/Standard

②	Inspection/Standard
H	High Pressure Gas Safety Law, Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan)

Blowout Pressure

④				Blowout Pressure ※
1	0	M	P	10 MPa
1	5	M	P	15 MPa
1	7	.	5	17.5 MPa
2	1	M	P	21 MPa
2	3	M	P	23 MPa
2	5	M	P	25 MPa
2	8	M	P	28 MPa
3	5	M	P	35 MPa

Connection Diameter

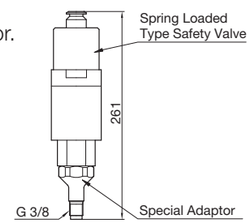
⑥			Connection Diameter
F	0	3	G3/8
R	0	4	R1/2

※ Predetermined pressure should be 1.1 times or more of the circuit pressure and less than maximum allowable working pressure of accumulator or other devices.
Please exercise caution when performing operation at close to the predetermined pressure.
The Spring Loaded Type Safety Valve starts discharging at 95 to 105% of a predetermined pressure.
※ Do not use in locations where excessive vibration occurs. Malfunction may occur due to vibration.

Accessory

Spring Loaded Type Safety Valve made by MERCER VALVE CO., INC

It is certified according to "ASME code." It can be installed to SG valve using special adaptor.



Example of Item number

602491M2C61P5641

Item number of special adaptor

6ADN06F03U04

Inspection/Standard	ASME Boiler and Pressure Vessel Code Section VIII, Division 1
Range of Predetermined Pressure	751 – 5076 psi
Connection port	1 1/16-12 SAE J 1926-1 STRAIGHT THREAD ORING PORT INLET
Start to discharge Pressure	90% of Predetermined Pressure
Blowout Pressure	97 – 103% of Predetermined Pressure
Adaptor Connection	G3/8

Caution Secure the spring loaded type safety valve and the adaptor so that excessive force is not applied due to vibration.

Accessory

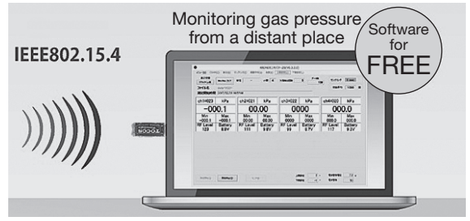
NACOL SMA Pressure Gauge (Smart Monitoring for Accumulator)

NACOL Accumulator supports IoT!

Installation Example

Wireless type

Wired type



Display at easy-to-see location

※ External display monitor is not attached.

Features

① NACOL SMA Pressure enables to monitor gas pressure, installing on SG valve.
② Wireless communication range is 30 meters at standard and 60 meters at ideal environment.
③ One USB receiver can collectively monitor up to 32 accumulators, using dedicated software.
④ You can freely display the pressure at an easy-to-see location using a external display monitor when wired.
⑤ It can function as a pressure switch with wired output.
⑥ Alarm setting can visualize the abnormality of the accumulator.
⑦ Simply need to connect a 100 V power supply. Display offers easy-to-see flexible rotation.

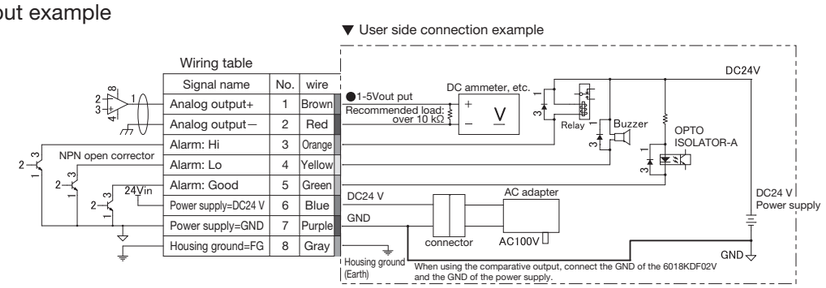
Specifications

Output	Wireless IEEE802.15.4	Wired analog DC 1 – 5 V
Pressure range	0 – 35 MPa	
Display	4digit LCD display with backlight	
Accuracy	±0.25% F.S +1digit	
Material	Gas contact part: SUS316L	
	Case: ABS resin	
Power	Outlet AC100 V	
Alarm	–	Hi / Lo / Go (50 mA/35 V)
Allowable Temperature	-20 – 70℃	
Mass	160 g	
Accessory	Washer to connect SG valve	
	AC adapter 100 V / Connection cable 1 meter	
	USB receiver	–
	CD software	–

※ Wireless type cannot be used overseas because of restriction.

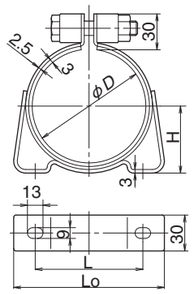
Analog output example

▼ User side connection example

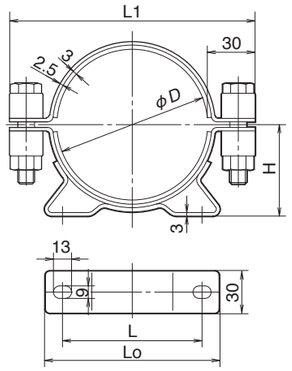


Item Number	Output	Receiver
6018KDF02Z135MP0	Wireless	Attached
6018KDF02Z035MP0	Wireless	Without
6018KDF02V035MP0	Wired	–

Accumulator Clamp



6081C098



6081C114 – C406

Item Number	Applicable Accumulators			ϕ D mm	H +4 −1 mm	L±2 mm	Lo +2 −4 mm	L1 mm	Acc. Mounting Interval (Reference) mm	Base Mounting Plate
	Series	Maximum Allowable Working Pressure: MPa	Nominal Gas Volume: L							
6081C098	J	25, 35	0.5	98	57.5	90	126	–	185	–
6081C114	H / N	23	1	114	66	100	138	174	200	
	J	10 (Made of Carbon Steel)	1 – 3							
6081C120	J	10 (Made of Stainless Steel), 17.5	1 – 3	120	69			180	210	
6081C128	E	0.95	4	128	73	136	172	188	215	
	J	25	1 – 3							
	H / N	35, 45	1							
	P	25	1.6 – 7.2							
	S ※1	21	0.6							
6081C140	H / N	21	2.5 & 4	140	79			200	230	
6081C146	J	25	4 & 5	146	82			206	235	
6081C152	H / N	35, 45	2.5 & 4	152	85	148	184	212	240	
	P	22	5 – 20							
6081C167	N	50, 85	1	167	92			227	255	
6081C191	A	11, 23	5 – 16	191	104			251	280	6BMP191P
6081C215	A / H	20.6 (Made of Stainless Steel), 35, 45	5 – 16	215	116	216	254	275	300	
	P	25	5 – 40							–
6081C232	U	25	10 – 50	232	124			292	320	
6081C246	R / H	8, 13	20 – 63	246	132	248	300	306	330	
6081C267	H / N	2, 23	20 – 60	267	142			327	350	6BMP267P
	P	17.5	10 – 60							
6081C298	H / N	35, 45, 49.1, 50	20 – 60	298	158	280	336	358	400	
6081C350	H / Y	2, 7, 15, 21, 25, 33	40&60 ※2	350	184	345	410	410	450	–
	H / N		80 & 120							
	P	21	52 – 100							
6081C406	H / N	7, 15, 21, 23	150 – 175	406	212	384	460	466	500	
	H	35	145							

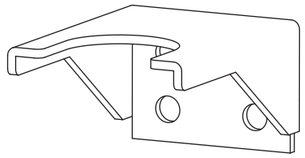
※1 It is for the accumulator whose shell diameter 127 mm and nominal gas volume is 0.6 L.
Depending on manufacture date, S series accumulator whose nominal gas volume is 0.6 L differs the dimension of the accumulator shell diameter.
Please confirm the dimensions with the actual product before the order.
※2 It is for the accumulator whose shell diameter is 355.6 mm and nominal gas volume is 40/60 L.
※3 Dimensions without tolerance indication are for reference. Please confirm the latest dimensions with the actual product or its drawing.
※4 Accumulator Clamp is manufactured by NORMA Germany GmbH.
※5 When ordering a base mounting plate (See page 92), pay attention to compatibility with the clamp.

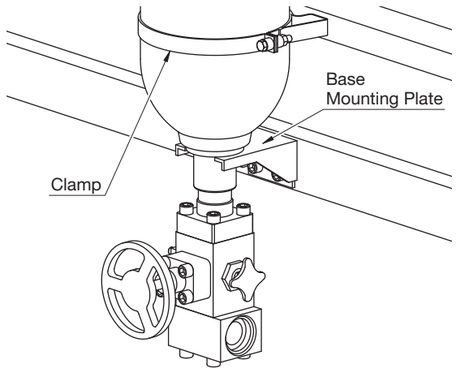
Caution

- When fixing the accumulator on the stand, pay attention to the way of fixing. If there is an interspace between the accumulator and the stand, fill the interspace with spacers etc. Fixing them unreasonable way would result in the damage/leakage of the oil port valve assembly.
- Make sure that the clamp does not support the overall weight of an accumulator. The clamp may be unable to support the accumulator due to the installation condition or vibration.
- Secure each accumulator with multiple clamps. If the vibration of the accumulator is inconsistent with that of the piping or stand, the pipes and connections may be damaged.
- Do not operate accumulators with clamps, bolts, pipe fittings, or ring nuts loosened. Continued use under such conditions may cause damage to the connections, including the oil port valve assembly, resulting in fluid leakage.

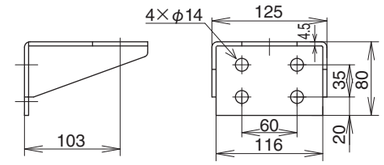
Base Mounting Plate

Base mounting plate is bolt fix type plate for fixing the accumulator.
The base mounting plate can be used in combination with accumulator clamps to secure an accumulator.

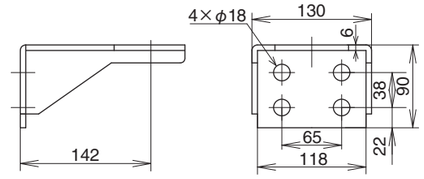




6BMP191P



6BMP267P



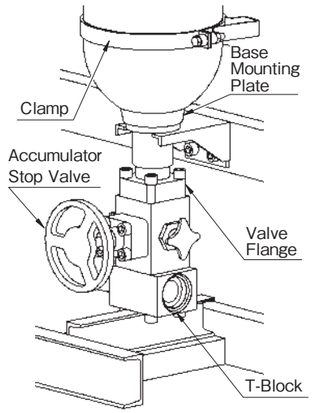
Applicable Accumulators

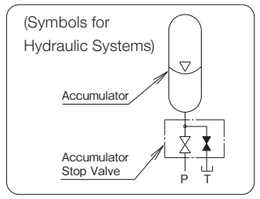
Item Number	Applicable Accumulators			Acc. Shell Diameter ϕDo mm	Accumulator Clamp
	Series	Max Allowable Working Pressure:MPa	Nominal Gas Volume:L		
6BMP191P	A/H	23/35/45	5 – 16	190.7/216.3	6081C191/6081C215
6BMP267P	H/N	23/35/45/49.1/50	20 – 60	267.4/298.5	6081C267/6081C298

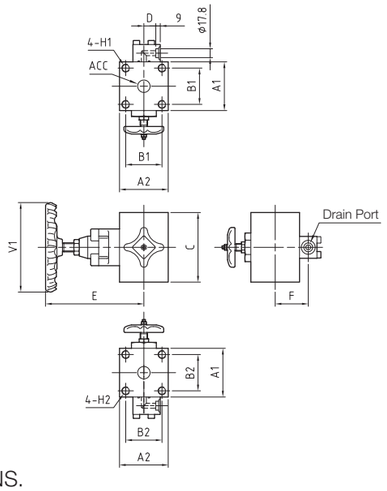
※1 The base mounting plate can be used with the accumulator whose oil port valve is a standard carbon steel type.
※2 6BMP191P can be used by putting the flat side down.
※3 6BMP267P cannot be used with the 40 L and 60 L accumulators whose body diameter is 355.6 mm.

Accumulator Stop Valve (for 21 MPa)/T-Block (for 23 MPa)

This valve is an accumulator stop valve integrating a main valve and a drain valve. It can relieve the accumulator hydraulic pressure by closing the main valve and opening the drain valve, facilitating maintenance (bladder replacement, etc.) and checking of gas charging pressure.







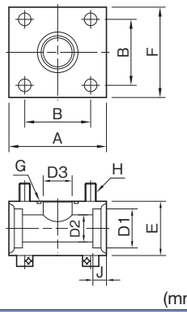
The above accumulator stop valve shows the shape of 6080HFACC3210NS.

Accumulator Stop Valve Size Chart

(mm)

Item Number \ Heads	A1	A2	B1	B2	C	D	E	F	H1	H2	V1	Oil Control
6080HFACC321023	76	76	56	56	110	24	203	60.5	M12	M12	180	NO
6080HFACC3210NS	98	98	73	73	140		208	66.5	M16	M16	140	NO
6080HFACC3210NN							255					YES
6080HFACC5010NS	138	155		103	150	78	258	89	M16	M22	180	NO
6080HFACC5010NN							341					YES
6080HFACC5010NSL			103				258		M22			NO
6080HFACC5010NNL							341					YES

The accumulator stop valve is connected to an accumulator with a valve flange.
For valve flange dimensions, please refer to the page about pipe connectors for each series.



T-Block Size Chart

(mm)

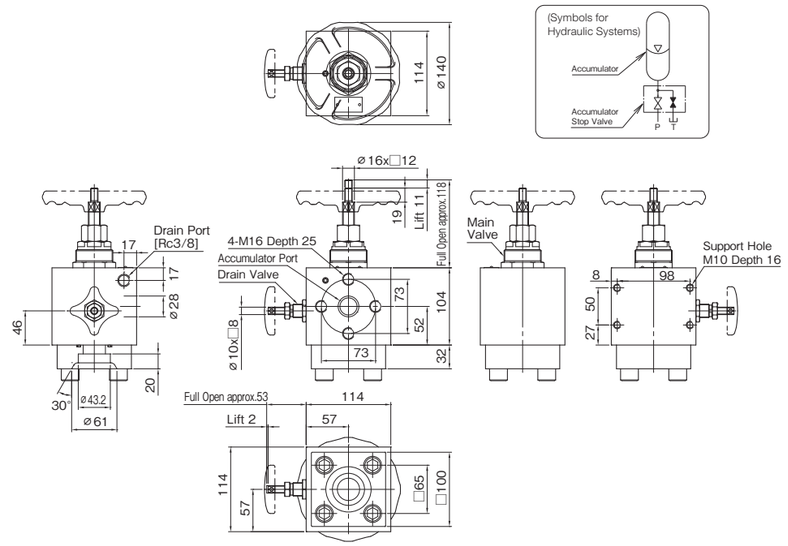
Item Number \ Heads	A	B	D1	D2	D3	E	F	G	H	J	Applicable Stop Valves
6WT032020020N23M	108	56	27.7	20	28	46	76	JIS B 2401-1 G35	M12	12	6080HFACC321023
6WT032032032N23M			43.2	30		60	100			15	
6WT050032032N23M	140	73	43.2	30		60			M16	16	6080HFACC3210NS 6080HFACC3210NN
6WT050050050N23M			75	61.1		80				20	
6WT080050050N23M	175	103			48		140	JIS B 2401-1 G60	M22		6080HFACC5010NS 6080HFACC5010NN 6080HFACC5010NSL 6080HFACC5010NNL

Accumulator Stop Valve (for 35 MPa)

Compact Design, Low-Cost High Pressure Stop Valve

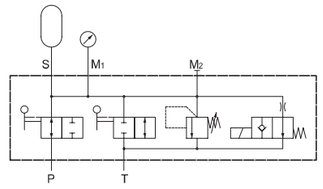
Item	Item Number
Stop Valve	6080HFL35ACC321011H

※ Since the outer diameter of the main valve handle is larger than the dimension of valve body, please pay attention to the installation space.



Accumulator Stop Valve for EU

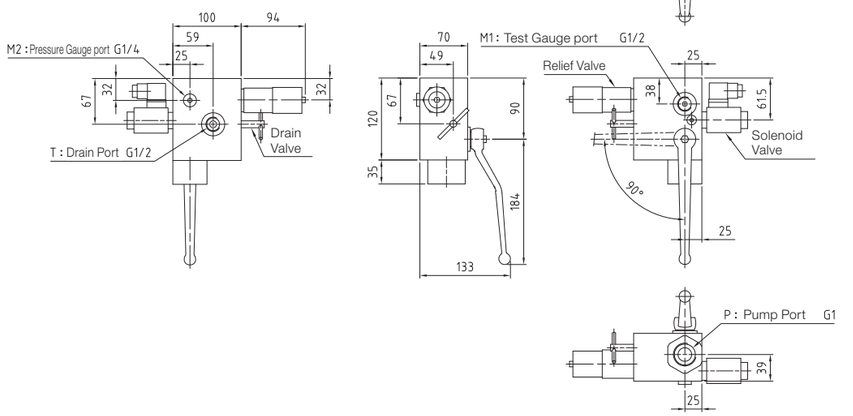
Accumulator Stop Valve for EU is a accessory to protect from excess pressure on the fluid side and to relieve accumulators.
This valve complies with the requirements of the European Pressure Equipment Directive (PED), and enables to simplify the hydraulic circuit.
The relief valve is in accordance with CE marking.
Solenoid valve is attached as a safety device to open and release the pressure of the accumulator in case of power outage.
3 models available equivalent to 20A, 32A, and 50A. 20A is bushing connection and 32A and 50A are flange connection.



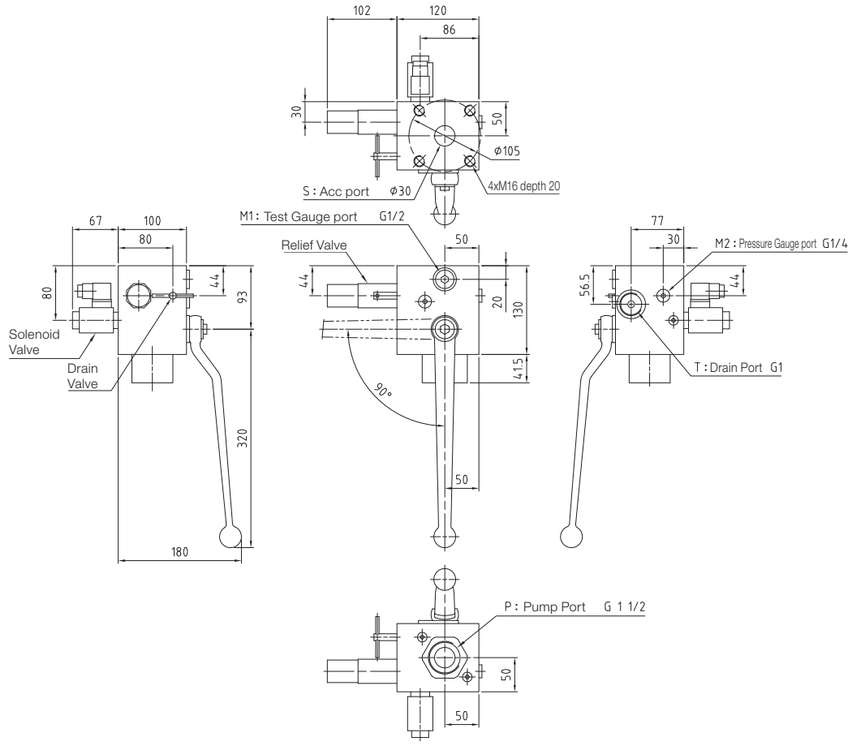
Circuit Diagram

Item Number	6080RSA20GF11T280EY1	6080RSA32HF11T315EY1	6080RSA50MF11T315EY1
Model	NG20	NG32	NG50
Set Pressure of Relief Valve	280 bar	315 bar	315 bar
Solenoid Valve	Open when de-energized 24 V DC		
Mass	8 kg	13 kg	25 kg
S Port	M33×2	Flange Connection	Flange Connection
M1 Port	G1/2	G1/2	G1/2
M2 Port	G1/4	G1/4	G1/4
P Port	G1	G1 1/2	G2
T Port	G1/2	G1/2	G1 1/2

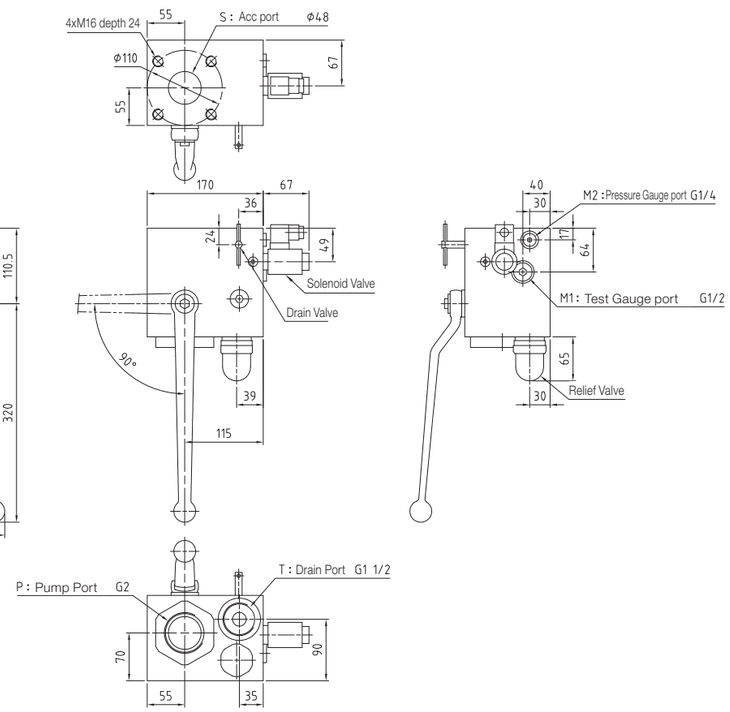
6080RSA20GF11T280EY1



6080RSA32HF11T315EY1



6080RSA50MF11T315EY1



Protective Equipment

Eye Nut

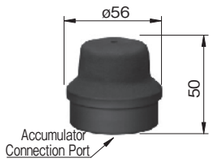
Eye Nut is a Hanging tool that makes accumulator installation safer. Eye Nut is equipped with an accumulator whose weight is more than 20 kg.
After being installed as a hanging tool, it is used as a valve cover for the protection of the Dynac Valve.

Item Number	Material	Accumulator Connection Port	Remarks
6HTM32	Carbon Steel	M32x2	
6HTM42	Carbon Steel	M42x2	
6HTM32H63	Carbon Steel	M32x2	For Two Pieces Type Top Cap
6HTM42H63	Carbon Steel	M42x2	For Two Pieces Type Top Cap
6HTM32U04	Stainless Steel	M32x2	
6HTM42U04	Stainless Steel	M42x2	

Valve Cover

Valve Cover is equipment which protects the Dynac Valve.

Item Number	Material	Accumulator Connection Port
645049608	Carbon Steel	M32x2
645049705	Carbon Steel	M42x2
645058201	Stainless Steel	M32x2
645058301	Stainless Steel	M42x2

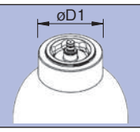


Rubber Boots

Rubber Boots are caps made of rubber. Rubber Boots protect the gas charging side of the accumulator when the accumulator is installed in a place there is a lot of trash, metal powder, and dust.
Use the Valve cover together. It is not available with Eye Nut.

Item Number	Applicable Accumulators					Applicable Valve cover
	Series	Maximum Allowable Working Pressure: MPa	Nominal Gas Volume: L	Outer diameter of Accumulator shell on the gas charging side ϕ D1 (※1) Min. mm	Outer diameter of Accumulator shell on the gas charging side ϕ D1 (※1) Max. mm	
6BC091094	N	21	2.5 & 4	91	94	645049608
6BC102107	N	35/45	2.5 & 4	102	107	645049705
6BC099102	A	23	5 – 16	98.5	101.5	645049608
6BC121124	A	35	5 – 16	120.5	123.5	645049705
	H	45				
6BC144152	H	23	20 – 60	144	152	645049608
6BC172180	N	7	175	172	180	645049705
	H/N	35/45/49.1/50	20 – 60			
	H/N/Y	21	40 (※2)/60 (※2)/80/120			
6BC164172	H/N/Y	15	40 (※2)/60 (※2)/80/120	164	172	645049705
6BC182190	N/Y	25	60 (※2)/80/120	182	190	645049705
	N	15	160			
6BC197205	H/N	21/23	150/160	197	205	645049705

※1 The dimension may differ from the above list depending on the accumulator's inspection, regulation and/or manufacture date.
Confirm the outer diameter of the gas charging side ϕD1 before the arrangement.



※2 It is for the accumulator whose shell outer diameter is 355.6 mm and nominal gas volume is 40/60 L.

Wrench

Disassembling/assembling NACOL's accumulators requires using special wrenches.
Three types of special wrenches are available for different purposes.

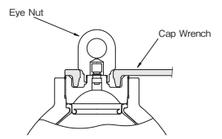
Cap Wrench

This wrench is used to disassemble/assemble the top cap.
For information about how to use it, please refer to the instruction manual. Use the hoisting attachment supplied with the product to prevent the top cap from coming off.

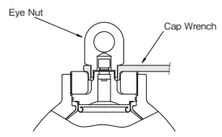
Picture	Item Number	Series	Acc. Gas Volume: L	Top Cap Type
 The size differs depending on the item number.	6TWH81	N	20 – 60	One Piece Type
		H	20 – 60	
	6TWH100	N	80, 120	
		N	150, 160, 175	
		Y	60	
		H	Y40, Y60, 80, 120	
		H	160 (Except for the 35 MPa type)	
	6TWH63	N	20 – 60	Two Pieces Type
		N	80, 120	
		N	160	
		Y	60	

※1 For models not listed above, use a commercially available wrench.
※2 For stainless steel accumulators, use a commercially available wrench.

Cap Wrench & Hoisting Attachment in Place



Top Cap One Piece Type



Top Cap Two Pieces Type

Ring Nut Wrench

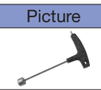
This wrench is used to disassemble/assemble the oil port valve assembly. For information about how to use it, please refer to the instruction manual.

Picture	Item Number	Accumulator Shell Material	Series	Accumulator Nominal Gas Volume: L	Accumulator Shell Diameter: mm
 The size differs depending on the item number.	6TWD075	Carbon Steel	A	5 – 16	190.7, 216.3
		Stainless Steel	A	5 – 16	190.7
		Carbon Steel	H	5 – 16	190.7, 216.3
		Stainless Steel	H	5 – 16	190.7
	6TWD085	Stainless Steel	R	20 – 63	244.5
		Stainless Steel	H	20 – 63	244.5
	6TWD105	Carbon Steel	N	20 – 60	267.4, 298.5
		Stainless Steel	N	80, 120	355.6
		Stainless Steel	Y	60	355.6
		Stainless Steel	N	20 – 60	298.5
		Carbon Steel	H	20 – 60	267.4, 298.5
		Stainless Steel	H	Y60, 80, 120	355.6
	6TWD120	Carbon steel	H	Y40, Y60, 80, 120	355.6
		Carbon Steel	N	80, 120	355.6
		Carbon Steel	H (Only for the 35 MPa type)	145	406.4
		Carbon Steel	Y	60	355.6
		Stainless Steel	N	160	406.4
		Stainless Steel	H	160	406.4
	6TWD140	Carbon Steel	N	160	406.4
		Carbon Steel	A	150	406.4
		Carbon Steel	H (Except for the 35 MPa type)	150, 160, 175	406.4

※1 For models not listed above, use a commercially available wrench.
※2 For super high flow type accumulators, use a commercially available wrench.
※3 The shape of Ring Nut may differ depending on the manufacture date. Hexagonal Ring Nut cannot be used with Ring Nut Wrench listed above. When ordering the Ring Nut for the accumulator currently used, please confirm the shape of Ring Nut.

Spring Nut Key

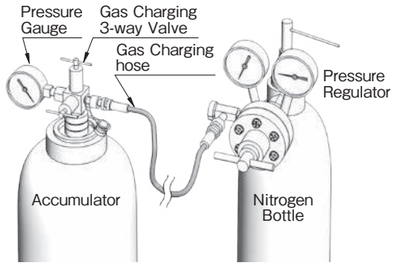
Spring Nut key is used for replacement of the Dynac Valve parts. For information about how to use it, please refer to the catalogue P.107 and instruction manual.

Picture	Item Number
	6TWH04

※4 Spring Nut Key (6TWH04) cannot be used for the accumulator manufactured before January, 1992.
Outer hexagon size of the spring nut before January, 1992 is 10 mm.

Gas Charging Tools

NACOL Accumulator gas charging or checking of gas charging pressure requires a special gas charging tools kit.
(For the accumulator with SG valve, only a hose and an adaptor are required.)



⚠ Caution

●Do not operate the accumulator with a gas charging 3-way valve attached.

· Operating the accumulator with a gas charging 3-way valve attached causes gas leakage, defective operation and bladder broken.

· For measuring the pressure at all times, please use the SG valve.

Gas Charging Tools Kit

A gas charging 3-way valve, a pressure gauge, a gas charging hose, and an adapter are contained in a dedicated tool box.
The dedicated tool box can accommodate several cap wrenches, pressure gauges and adapters.
Note that the gas charging hose longer than 5 m is packaged in a cardboard carton.
The item number for the standard kit is shown on page 101.

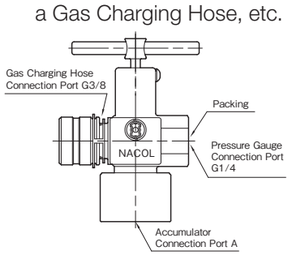
Explanation of Item Number

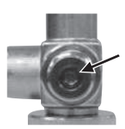
① Gas charging 3-Way Valve		② Pressure Gauge				③ Gas Charging Hose			④ Adapter
6	①	①	– ②	②	②	② – ③	③	③	– ④




① Gas Charging 3-way Valve

Gas charging hose connection port has a filter function to remove trash and dust in a nitrogen gas cylinder and/or a Gas Charging Hose, etc.

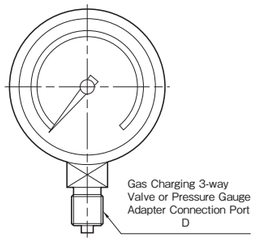



Filter

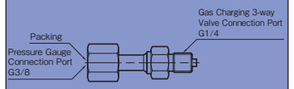
Item Number of Kit			Specification		Item Number of Single item
6	①	①	Accumulator Connection Port A	Maximum Allowable Working Pressure	
6	G	G	G1/4	35 MPa	6M3G02
6	G	H	G3/8	50 MPa	6H3G03
6	G	T	8V1	0.95 MPa	6L38V1
6	G	W	W22-14	35 MPa	6M3W22
– ※1			G3/8	85 MPa	6S3G03X03

No Gas Charging 3-way valve is required when the SG Valve is available.
※1. It cannot be packed in dedicated tool box.The gas charging tools kit including in this gas charging 3-way valve is packed in a cardboard carton.
It is for an 85 MPa accumulator, not sold as an above kit item.

② Pressure Gauge



※ Pressure Gauge Adapter
40 MPa and 60 MPa pressure gauges come with a pressure gauge adapter.



Item Number of Kit				Specification				Item Number of Single Item
②	②	②	②	Maximum Scale of Pressure Gauge	Recommended Gauge Range	Connection Port D	Pressure Gauge Adapter ※	
0	.	4	M	0.4 MPa	0.12 – 0.26 MPa	G1/4	–	6018ATF02060.4M
1	M	P	A	1 MPa	0.30 – 0.65 MPa	G1/4	–	6018ATF02061MPA
1	.	6	M	1.6 MPa	0.48 – 1.04 MPa	G1/4	–	6018ATF02061.6M
2	.	5	M	2.5 MPa	0.75 – 1.63 MPa	G1/4	–	6018ATF02062.5M
4	M	P	A	4 MPa	1.20 – 2.60 MPa	G1/4	–	6018ATF02064MPA
6	M	P	A	6 MPa	1.80 – 3.90 MPa	G1/4	–	6018ATF02066MPA
1	0	M	P	10 MPa	3.00 – 6.50 MPa	G1/4	–	6018ATF020610MP
1	6	M	P	16 MPa	4.80 – 10.40 MPa	G1/4	–	6018ATF020616MP
2	5	M	P	25 MPa	7.50 – 16.20 MPa	G1/4	–	6018ATF020625MP
4	0	M	P	40 MPa	12.0 – 26.0 MPa	G3/8	Attached	6018ATF031040MP
6	0	M	P	60 MPa	18.0 – 39.0 MPa	G3/8	Attached	6018ATF031060MP
– ※2				70 MPa	0 – 70.0 MPa	G1/4	–	6018KDF02B070MP0

No pressure gauge is required when the SG Valve is available.
The maximum gauge scale value should be 1.5 to 4 times the maximum pressure value to be measured.
※2. Pressure Gauge for 70 MPa has digital display.
It is for an 85 MPa accumulator, not sold as an above kit item.

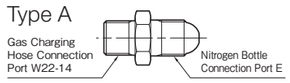
③ Gas Charging Hose

Item Number of Kit			Specification		Item Number of Single Item
③	③	③	Hose Length L	Maximum Allawable Working Pressure	
H	0	2	2 m	21 MPa	6075H21MP02
H	0	3	3 m	21 MPa	6075H21MP03
H	0	4	4 m	21 MPa	6075H21MP04
H	0	5	5 m	21 MPa	6075H21MP05
H	1	0	10 m	21 MPa	6075H21MP10
H	1	5	15 m	21 MPa	6075H21MP15
B	0	2	2 m	29.5 MPa	6075H29.502
B	0	4	4 m	29.5 MPa	6075H29.504

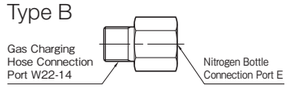
If the gas charging hose is short, please use a hose extension adapter (see page 101).
The dedicated tool box can accommodate a hose of up to 5 m.
When delivering a gas charging tools kit including a hose longer than 5 m, the hose is packed separately in a cardboard carton.
Please contact us about Gas Charging Hose for 85 MPa.

④ Adapter

Type A



Type B



Item Number of Kit	Specification				Item Number of Single Item
④	Country	Type	Nitrogen Bottle Connection Port E	Maximum Allawable Working Pressure	
A	Japan	A	W23-14	20 MPa	6AD023022C
G	United Kingdom	A	G5/8	20 MPa	6ADG05022C
U	United States	A	0.960-14NGO-RH	20 MPa	6AD096022C
D	Germany	B	W24.32-14	20 MPa	6AD243022C
C	China	B	G5/8	20 MPa	6ADF05022C
K	Republic of Korea	B	W22-14	20 MPa	6ADW22022C

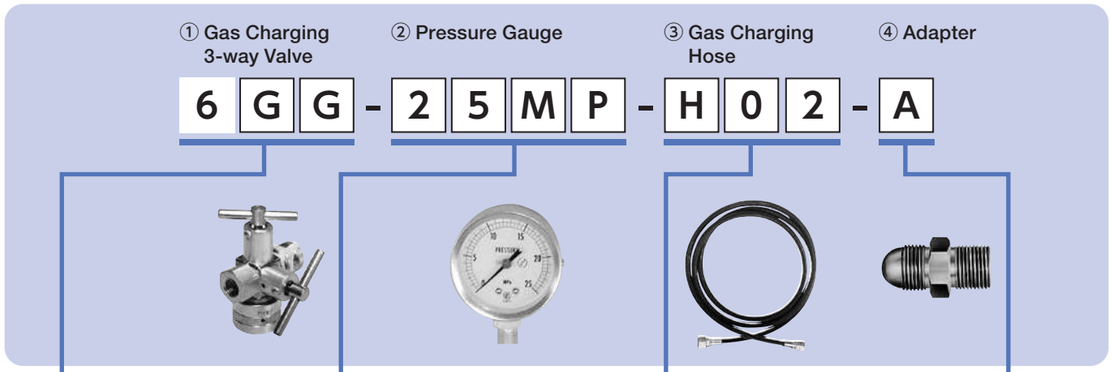
Above listed adapters can also be used for the pressure regulator (See page 102).

Gas Charging tools

Gas Charging Tools Kit　Standard Kit

For the standard kit, a gas charging 3-way valve (6M3G02), a pressure gauge (6018ATF020625MP), a gas charging hose (6075H21MP02), and an adapter (6AD023022C) are contained in a dedicated tool box.

Item Number of Standard Kit



Gas Charging 3-way Valve		
6	①	①
6	G	G
Accumulator Connection Port		
G1/4		
Maximum Allowable Working Pressure		
35 MPa		

Pressure Gauge			
②	②	②	②
2	5	M	P
Maximum Scale of Pressure Gauge			
25 MPa			

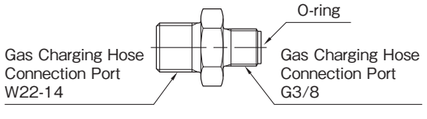
Gas Charging Hose		
③	③	③
H	0	2
Hose Length		
2 m		
Maximum Allowable Working Pressure		
21 MPa		

Adapter
④
A
Country
Japan
Nitrogen Bottle Connection Port
W23-14
Maximum Allowable Working Pressure
20 MPa

Hose Extention Adapter

This adapter is used to extend the gas charging hose. It is useful when the gas charging hose is shorter than the required length.

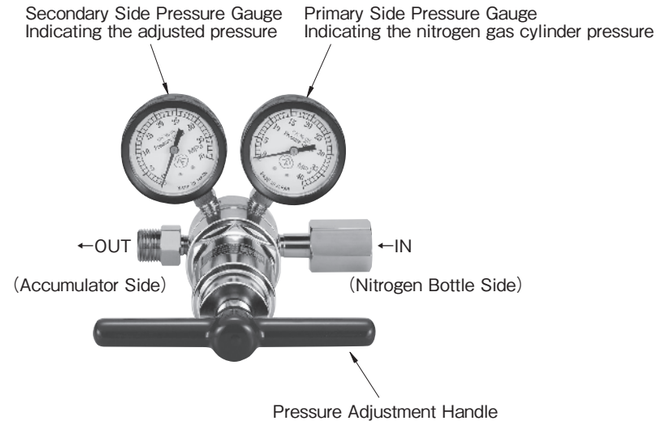
Item Number	Maximum Allowable Working Pressure	Connection Port
6ADG03022	29.5MPa	W22-14 G3/8



Pressure Regulator

When charging an accumulator with nitrogen gas, using a pressure regulator is recommended.
A nitrogen gas cylinder pressure higher than the maximum allowable working pressure of the accumulator or gas charging tools may cause damage to the equipment.

Item Number	Primary Side Pressure	Secondary Side Pressure	Inlet Connection (IN)	Outlet Connection (OUT)	Maximum Allowable Working Pressure
6084YR5062R11182323	0 – 40 MPa	0 – 40 MPa	W22-14 Cap Nut	W22-14 External Thread	20 MPa

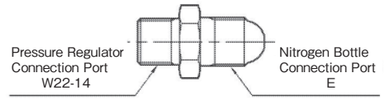


Adapter for Pressure Regulator

The adapter is used to connect the pressure regulator and a nitrogen gas cylinder.
It is mainly used for the connection of nitrogen gas bottle in West Japan and pressure regulator.

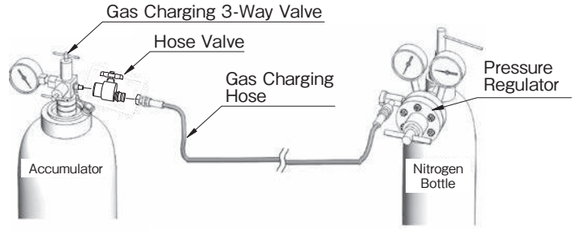
Item Number	Specification		
	Country	Nitrogen Bottle Connection Port E	Maximum Allowable Working Pressure
6AD023022C	Japan	W23-14	20 MPa

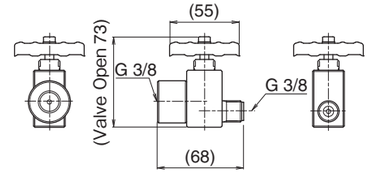
※ The adapter can be also be used with a gas charging hose (see page 100).



Hose Valve

This valve is used to connect the gas charging 3-way valve and the gas charging hose.
Hose valve enables to open/close the valve at hand by connecting to the gas charging 3-way valve.
It is useful when the accumulator to be charged with nitrogen gas is far away from the nitrogen gas cylinder.





Item Number	Inlet Connection	Outlet Connection	Maximum Allowable Working Pressure
6XN-HV35MP-F03-F03	G3/8	G3/8	35 MPa

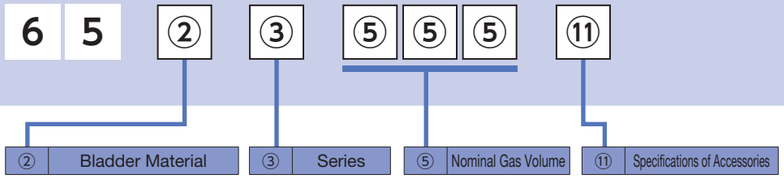
Bladder

Since bladders are consumables, periodically replacing them is recommended. Periodic bladder replacement ensures operation without emergency system shutdown.

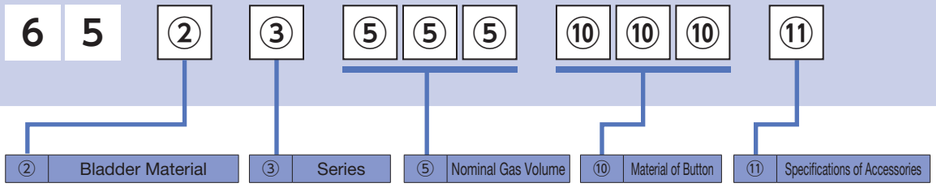
When ordering accumulator bladders listed in the catalogue, please refer to the page about accessories/tools/spare parts for each series along with the following information.

When ordering special items (accumulator item number containing "X") or accumulator bladders not listed in the catalogue, please refer to page 115 and inform us of the serial number of the accumulator in use.

Item Number of Bladders without a Button



Item Number of Bladders with a Button



② Bladder Material

Select the item number code corresponding to the material suitable for "service fluid" and "service temperature" for the accumulator in use. ※2

※1 J series standard nitrile bladders with a button are designated by "B".

※2 “Service Temperature” means the temperature of the fluid which contacts the bladder when it works. It is the accumulator's internal temperature.

Symbol	Bladder Material		Service Fluid	Allowable Service Temparature (℃) ※2	Attached O-ring material for Top Cap	Attached O-ring material for Gas Charging Valve, for connection port of SG Valve and Top Cap, and for Pressure Gauge
N	Standard Nitrile Rubber	NBR	Turbine Oil Fatty Acid Ester Fluid Water Glycol Fluid W/O Emulsion Fluid O/W Emulsion Fluid Biodegradable Fluid Tap Water Sea Water	−10 – +70	NBR	NBR
B	Standard Nitrile Rubber with Button ※1	NBR				
H	Nitrile Rubber for High Temparature Use	H.NBR		−10 – +110	FKM	
L	Nitrile Rubbler for Low Temparature Use	L.NBR		−35 – +70	L.NBR	L.NBR
F	Butyl Rubber	IIR	Phosphate Ester Fluid	−10 – +70	FKM	NBR
E	Ethylene Propylene Rubber	EPDM	Phosphate Ester Based Fluid		EPDM	
C	Chloroprene Rubber	CR	Basic, Water	−20 – +80	CR	
G	Epichlorohydrin Rubber	CHC			FKM	
V	Fluorine Rubber	FKM				

③ Series

Select the item number code corresponding to the series name of the accumulator in use.

※3 Please designate "N" for A series accumulators with a nominal gas volume of 150 L.

Symbol	Series
A	A Series ※3
G	G Series
H	H Series

Symbol	Series
J	J Series
N	N Series

Symbol	Series
R	R Series
S	S Series

Symbol	Series
U	U Series
Y	Y Series

⑤ Nominal Gas Volume

Select the item number code corresponding to the nominal gas volume of the accumulator in use.

Symbol	Nominal Gas volume
0 0 3	0.03 L
L 0 1	0.1 L
L 0 3	0.3 L
L 0 5	0.5 L
L L 1	1 L
L L 2	2 L
2 . 5	2.5 L
L L 3	3 L
L L 4	4 L
L L 5	5 L
6 . 3	6.3 L

Symbol	Nominal Gas volume
L 1 0	10 L
L 1 6	16 L
L 2 0	20 L
R 2 0	20 L
L 3 0	30 L
L 3 2	32 L
R 3 2	32 L
L 4 0	40 L
R 4 0	40 L
Y 4 0	40 L
L 5 0	50 L

Symbol	Nominal Gas volume
R 5 0	50 L
L 6 0	60 L
Y 6 0	60 L ※4
L 6 3	63 L
R 6 3	63 L
L 8 0	80 L
1 2 0	120 L
1 6 0	145 – 160 L
1 7 5	175 L

Gas volume of S series are as follows.

Symbol	Nominal Gas volume
L 0 2	0.1 L
L L 1	0.6 L

※4 Only for H series accumulators with an accumulator shell diameter of 355.6 mm.

⑩ Button Material

Select the item number code corresponding to the button material suitable for the volume, maximum allowable working pressure, and material of the accumulator in use.

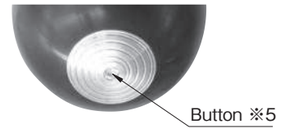
※5 The button is made of a metal plate (material listed below) and located at the bladder bottom.

※6 Water glycol fluids and some phosphate ester based fluids cannot be used for accumulators having bladders with an aluminum button. For more information, please contact us or the fluid manufacturer.

※7 For the A, G, H, N, R, S, U, and Y series, the bladder does not have a button; no button material designation (⑩) is required for this bladder.

※8 Select stainless steel button for stainless steel accumulators.

Symbol	0.03 – 0.5 L	17.5 MPa 1 – 5 L	25 MPa 1 – 5 L
A17	Standard (Material: Aluminum)		–
35C	–		Standard (Material: Carbon Steel)
U16	Stainless Steel		



⑪ Accessories Supplied with Bladders

Select the item number code corresponding to the gas charging side specifications of the accumulator in use.

※9 Bladders come with an O-ring, etc., required for replacement. Accessories vary depending on the accumulator.
For accumulators with a separate type top cap, please check the bladder back up ring in use before ordering a new bladder.
Please reuse the bladder back up ring if no abnormality is found.
If any damage or deformation has been found, order a new bladder and bladder back up ring for replacement.

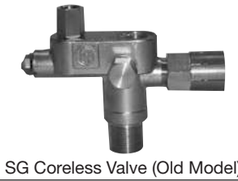
※10 Bladders for stainless steel accumulators do not come with a bladder cap.
For stainless steel accumulators, please check the bladder cap in use before ordering a new bladder.
Please reuse the bladder cap if no abnormality is found.
If any damage, deformation, or rust has been found, order a new bladder and bladder cap for replacement.

※11 For the shapes of the SG valve and the SG coreless valve, please see the photos below. The SG coreless valve has been discontinued.

Symbol	Application	Accessories
A	Accumulator with Dynac Valve	O-ring for Top Cap and O-ring for Gas Charging Valve (Bladder Cap)
G	Accumulator with SG valve	O-ring for Top Cap, O-ring for Gas Charging Valve, O-ring for connection port of SG valve and Top Cap, and O-ring for Pressure Gauge (Bladder Cap)
U	Stainless Steel Accumulator	O-ring for Top Cap and O-ring for Gas Charging Valve
C	Accumulator with Core Type Gas Charging Valve	O-ring for Top Cap and O-ring for Gas Charging Valve, (Bladder Cap), Core, Core Rotator, (Valve Cap)
S	Accumulator with SG Coreless Valve	O-ring for Top Cap and O-ring for Gas Charging Valve (Bladder Cap), Seal Washer (W30,W8S1)
No Symbol	Only Bladder	None

※ Bladder Cap comes with bladders of 20 L or bigger (Except for Stainless Steel Accumulator)

SG Valve

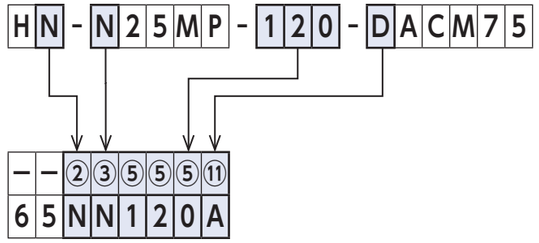


SG Coreless Valve (Old Model)

Identify Bladder item number from Item Number of Accumulators

- Bladder item number is determined by Bladder compound, Series, Nominal Gas Volume, Button material (J series only) and accessories.
- Accumulator inspection/standard have nothing to do with the bladder item number.
- Max allowable working pressure of accumulator have nothing to do with the bladder item number.
- Specification of oil port side such as high flow type and pulse dumper (except for J series) have nothing to do with the bladder item number.
- Bladders cannot be used for different series of accumulators even if the nominal gas volume are the same.
- The same symbol may be used depending on the subject.
  “H” shows NBR for high temperature use for bladders, and also ”H” shows H series for series.

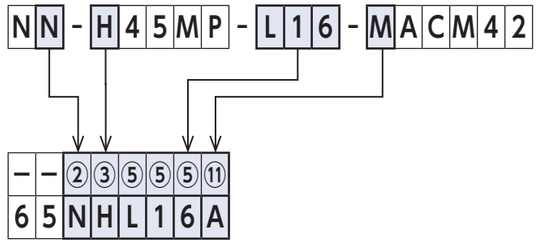
Item number of accumulator



Item number of bladder

65 shows the item number is for a spare bladder.
② Symbol of bladder compound is same as the second letter of item number of Acc.
③ Symbol of series is same as the third letter of item number of Acc.
⑤ Symbol of nominal gas volume is the same as 8-10th letter of item number of Acc.
⑪ When symbol of specification of Acc is "D" two pieces type Dynac Valve, accessory symbol of item number of bladder is "A."
Please refer to page 104 for further information of accessories supplied with bladder.

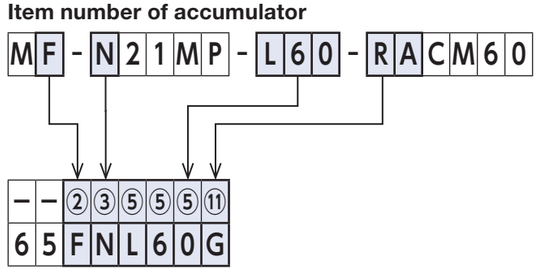
Item number of accumulator



Item number of bladder

65 shows the item number is for a spare bladder
② Symbol of bladder compound is same as the second letter of item number of Acc.
③ Symbol of series is same as the third letter of item number of Acc.
⑤ Symbol of nominal gas volume is the same as 8-10th letter of item number of Acc.
⑪ When symbol of specification of Acc is "M" G3/8 Dynac Valve, accessory symbol of item number of bladder is "A."
※Please be careful not to select "65HNL16A."

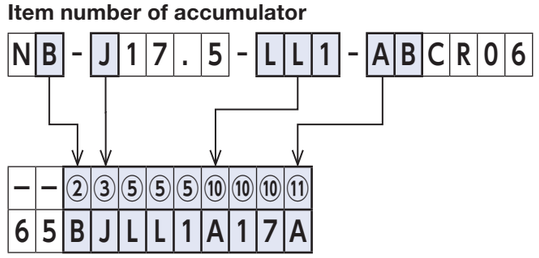
Item number of accumulator



Item number of bladder

65 shows the item number is for a spare bladder
② Symbol of bladder compound is same as the second letter of item number of Acc.
③ Symbol of series is same as the third letter of item number of Acc.
⑤ Symbol of nominal gas volume is the same as 8-10th letter of item number of Acc.
⑪ When symbol of specification of Acc is "R" SG valve, Fuse plug and Pressure gauge accessory symbol of item number of bladder is "G."
Please refer to page 104 for further information of accessories supplied with bladder.

Item number of accumulator



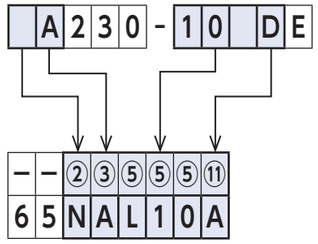
Item number of bladder

② Symbol of standard NBR with button for J series is "B."
⑩ Please make sure specification of oil port side of J series. "B" shows button material as aluminum, so select "A17." Please refer to page 104 for detailed information of button material.

Identify Bladder item number from Model of Accumulators

- In model, there is no symbol if the bladder material is NBR.
- In model, the unit of maximum allowable working pressure is shown in kg/cm^2.
- When identifying bladders of J series from model, make sure the maximum allowable working pressure of the accumulator.
- Currently available accumulators have both item number and model, but some obsolete ones have only model.
- Please refer to page 116 for details of model.
- If you find the item number of the accumulator, please refer to "Identify Bladder item number from Item Number of Accumulators" on the left page.
- If you have any questions, please contact our sales department.

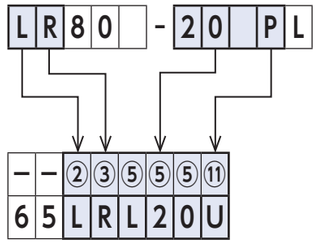
Model of accumulator



Item number of bladder

65 shows the item number is for a spare bladder.
② Since the bladder compound is NBR, there is no symbol in the model. Enter the corresponding symbol "N."
③ Symbol of series is same as the model of Acc.
⑤ Nominal gas volume is shown with 3 digit in item number of bladder. Enter the corresponding symbol "L10."
⑪ When symbol of specification of Acc is "D" Dynac Valve, accessory symbol of item number of bladder is "A."
Please refer to page 104 for further information of accessories supplied with bladder.
Specifications of Acc. Shell and oil port side have nothing to do with item number of the bladder, except for J series.

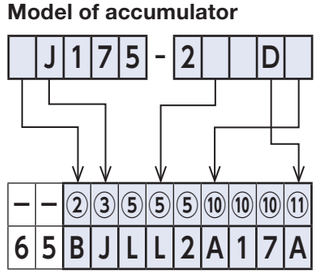
Model of accumulator



Item number of bladder

65 shows the item number is for a spare bladder.
② Symbol of bladder compound is same as the model of Acc.
③ Symbol of series is same as the model of Acc.
⑤ Nominal gas volume is shown with 3 digit in item number of bladder. Enter the corresponding symbol "L20."
⑪ When symbol of Top Cap and gas charging side is "P" stainless steel, Dynac Valve, accessory symbol of item number of bladder is "U."

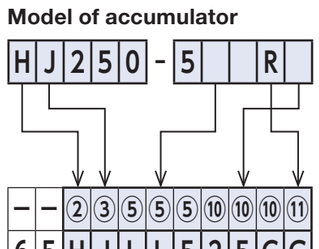
Model of accumulator



Item number of bladder

65 shows the item number is for a spare bladder.
② Since the bladder compound is NBR, there is no symbol in the model. Enter the corresponding symbol "B" for J series.
③ Symbol of series is same as the model of Acc.
⑤ Nominal gas volume is shown with 3 digit in item number of bladder. Enter the corresponding symbol "LL2."
⑩ There is no symbol for Acc. Shell & oil port side and the Maximum allowable pressure is 17.5 MPa.
Enter the corresponding symbol "A17" standard (button material: Aluminum)
Please refer to page 104 for detailed information of button material.
⑪ When symbol of Top Cap and gas charging side is "D" Top Cap for less than 16 L (Dynac Valve), accessory symbol of item number of bladder is "A."

Model of accumulator



Item number of bladder

65 shows the item number is for a spare bladder.
② Symbol of bladder compound is same as the model of Acc.
③ Symbol of series is same as the model of Acc.
⑤ Nominal gas volume is shown with 3 digit in item number of bladder. Enter the corresponding symbol "LL5."
⑩ There is no symbol for Acc. Shell & oil port side and the Maximum allowable pressure is 25 MPa.
Enter the corresponding symbol "35C" standard (button material: Carbon Steel).
Please refer to page 104 for detailed information of button material.
⑪ When symbol of Top Cap and gas charging side is "R" SG valve + Fuse Plug + Pressure Gauge, accessory symbol of item number of bladder is "G."

Dynac Valve

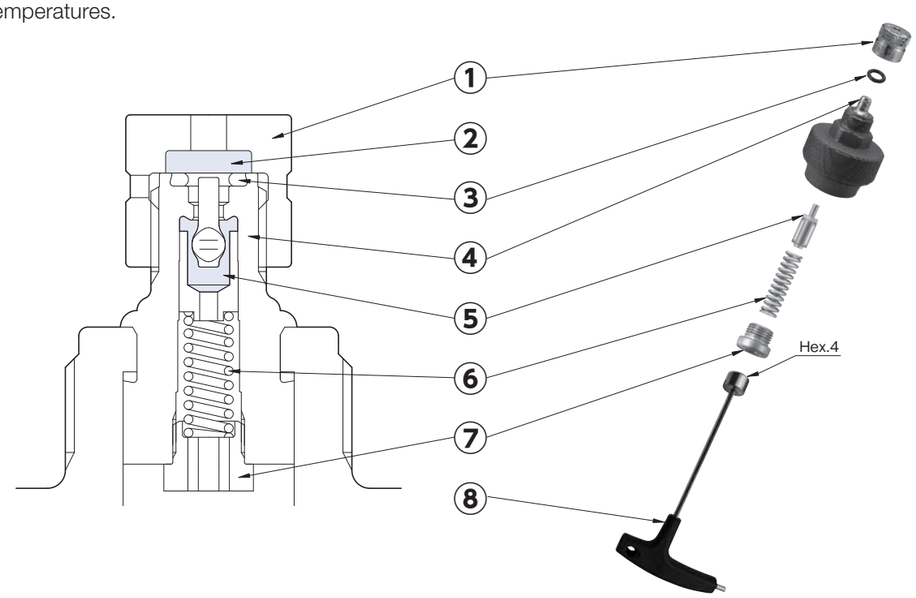
Dynac Valve is a gas valve that also serves as a "fuse plug."

Function of Fuse Plug

In the event of extremely high temperatures, such as a fire, the packing (② and ⑤ in the figure below) melts to release the gas in the accumulator to the atmosphere when a predetermined temperature (160±20ºC) has been reached or exceeded.
By using the valve in combination with a relief valve to prevent pressure build-up on the fluid side, the Dynac Valve can serve as a safety device pursuant to the High Pressure Gas Safety Law, Japan, and Article 6, Paragraph 1, No. 19 of the General High Pressure Gas Safety Regulations.

Function of Gas Valve

Dynac Valve provided works in three ways: charging, retaining, and venting accumulator nitrogen gas.
Compared to traditional gas valves, the Dynac Valve offers excellent air tightness, durability, and resistance to high/low temperatures.



Number	Item	Item Number	Thread Size
① ②	Valve Cap with Fuse Packing ※1	645024106A (Brass)	G1/4
		645051802A (Stainless Steel)	
		645025702A (Brass)	G3/8
③	O-ring (AS568009) ※2	607107009	–
④	Dynac Valve Body (Assembled with Top Cap)	–	G1/4
		–	G3/8
⑤	Packing with Valve Stem ※1	645026400A (color: transparence)	G1/4
		645071300A (color: bluish semi-transparence)	G3/8
⑥	Spring	645045500	–
⑦	Spring Nut	645048200	–

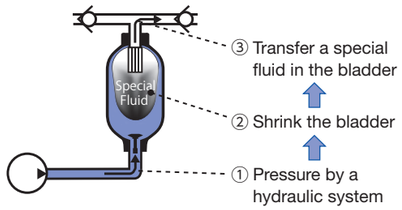
※1 Packing deteriorates over years, periodically replacing them is recommended.
※2 The material of above O-ring is Standard Nitrile Rubber.
There are cases in which another item number O-ring is used if the bladder material of the bladder is not Standard Nitrile Rubber.

⑧	Spring Nut Key ※3	6TWH04

※3 Spring Nut Key (6TWH04) is required when replacing ⑤, ⑥ and ⑦.
Spring Nut Key (6TWH04) cannot be used for the accumulator manufactured before January, 1992.
The spring nut before January, 1992 is 10 mm (hexagon outer nut size).

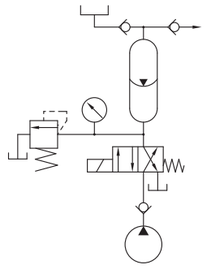
Function

Transfer Barrier type accumulator allows transferring the fluid by storing the fluid inside the bladder and pressuring the outside of the bladder by a hydraulic system.
A dedicated pump and/or valve are needed in case of transferring special fluids such as chemical plants, chemicals, food, and gas.
A dedicated pump and valve suitable for the special fluid are difficult to be obtained and these items are expensive.
Combining a Hydraulic unit and transfer barrier type accumulator, it can transfer special fluid at low cost.
For information about how to use transfer barrier type accumulators, please contact us.



Installation example

Transfer barrier type accumulator is installed in a hydraulic system. The right circuit diagram is an installation example.

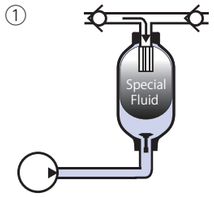


Benefit

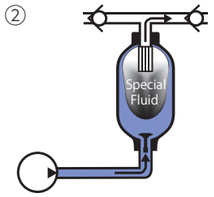
· It is available to use the general hydraulic system.
· Needless to use the dedicated device, and this device is low cost and easy to available.

How to work

Repeat ① and ②.

① 

Store the special fluid in the accumulator's bladder from the special fluid tank by its own weight.

② 

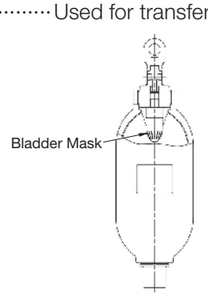
When working fluid from the pump is taken in the oil port side of the accumulator, it pushes the special fluid in the bladder to the next place.

Caution

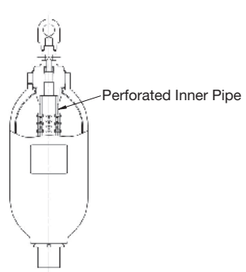
· It is possible that working fluid may enter the special fluid side when the bladder is damaged.
· If there is a difference in specific gravity between the special fluid to be transferred and the hydraulic fluid discharged from the hydraulic power source for transfer, it is necessary to pay attention to the discharge amount.
· Transfer pipe needs to be arranged on the customer's side. Select the Pipe size with attention to fluid, working condition, and etc.
· For Simplified Transfer Barrier, do not apply pressure exceeding 2 MPa while the bladder is pressed against the bladder mask. It may cause damage to the bladder mask.

Types

· Simplified Transfer Barrier ····· Used for transferring liquid or gas.
· Transfer Barrier For Fluid ····· Used for transferring special fluid of liquid.
· Transfer Barrier For Gas ····· Used for transferring special fluid of gas.



Simplified Transfer Barrier



Fluid/Gas Transfer Barrier

※ Explanation of Item Number, Dimensional Drawing, and Dimensional Table are an example of Simplified Transfer Barrier. For information about Transfer Barrier except for the below, please contact us.

Explanation of Item Number

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
H	N	-	A	2	3	M	P	-	L	L	5	-	X	A	C	0	8	1

①APPLICABLE INSPECTION/STANDARD

P	-	JAPAN High Pressure Gas Safety Law (Japan Authorization) ※1
M	-	U.S.A. ASME
N	-	NACOL (manufacturer's) inspection

※1 In case of transferring gas in Japan, it needs Special Facilities Inspection.

②BLADDER COMPOUND

N	-	Standard Nitrile Rubber(NBR)
H	-	Nitrile Rubber for High Temp.Use (H.NBR)
L	-	Nitrile Rubber for Low Temp.Use (L.NBR)
F	-	Butyl Rubber (IIR)
E	-	Ethylene Propylene Rubber (EPDM)
C	-	Chloroprene Rubber (CR)
G	-	Epichlorohydrin Rubber (CHC)
V	-	Fluorine Rubber (FKM)

③Series

A Series, H Series, N Series

④Maximum Allowable Working Pressure

21 MPa, 23 MPa

⑤NOMINAL GAS VOLUME

5 L, 6.3 L, 10 L, 16 L, 20 L, 29 L, 30 L, 40 L, 50 L, 60 L, 80 L, 120 L, 160 L

※2 Nominal gas volume 5 – 16L can be selected simplified transfer barrier only.

⑥SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE

X	-	Special Specification ※3

※3 Transfer Type is X

⑦SPECIFICATION FOR OIL PORT SIDE

A	-	Carbon Steel

⑧SPECIFICATION OF SHELL / TREATMENT

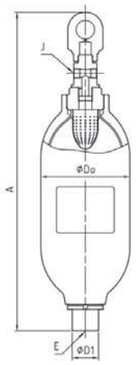
		SPECIFICATION OF SHELL	INSIDE TREATMENT	OUTSIDE TREATMENT	SERVUCE FLUID
C	-	Standard Material (Carbon Steel)	Zinc Phosphate Treatment (Standard)	Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D	-		Zinc Phosphate Treatment (Standard)	Zinc Phosphate Treatment (Standard)	Water - Glycol Fluid
A	- ※4		Standard Paint Coating	Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
B	- ※4		Standard Paint Coating	Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
N	-		Zinc Phosphate Treatment (Standard)	Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W	-		Zinc Phosphate Treatment (Standard)	Standard Paint Coating	Water - Glycol Fluid

※4 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint

⑨SPECIAL SPECIFICATION

0 8 1	-	Simplified Transfer Barrier with Gas charging side tee (2-Rc1/2) and M32 Eye Nut.
0 8 5	-	Simplified Transfer Barrier with Gas charging side tee (2-RC1/2) and M42 Eye Nut.

Dimensional Drawing



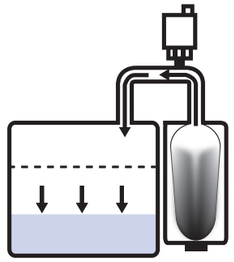
Dimensional Table

Item Number	Maximum Allowable Working Pressure	Nominal Gas Volume	Mass ※5	Do	A	D1	Gas Charging Side Thread Size J	Oil Port Side Tread Size E	Piping Connection	Allowable Oil Flow Rate
	MPa	L	kg	mm	mm	mm				L/min
NN-A23MP-LL5-XAC081	23	5	32	190.7	628 $^{+12}_{0}$	57	2-Rc1/2	M42x2	p. 43	120
NN-A23MP-6.3-XAC081	23	6.3	37	190.7	701 $^{+12}_{0}$	57	2-Rc1/2	M42x2	p. 43	120
NN-A23MP-L10-XAC081	23	10	49	190.7	876 $^{+12}_{0}$	57	2-Rc1/2	M42x2	p. 43	120
NN-A23MP-L16-XAC081	23	16	68	190.7	1,188 $^{+12}_{0}$	57	2-Rc1/2	M42x2	p. 43	120
NN-H23MP-L20-XAC081	23	20	89	267.4	939 $^{+17}_{0}$	77	2-Rc1/2	M60x2	p. 53	120
NN-H23MP-L29-XAC081	23	29	116	267.4	1,158 $^{+17}_{0}$	77	2-Rc1/2	M60x2	p. 53	120
NN-H23MP-L30-XAC081	23	30	119	267.4	1,184 $^{+17}_{0}$	77	2-Rc1/2	M60x2	p. 53	120
NN-H23MP-L40-XAC081	23	40	148	267.4	1,423 $^{+17}_{0}$	77	2-Rc1/2	M60x2	p. 53	120
NN-H23MP-L50-XAC081	23	50	184	267.4	1,721 $^{+17}_{0}$	77	2-Rc1/2	M60x2	p. 53	120
NN-H23MP-L60-XAC081	23	60	206	267.4	1,908 $^{+17}_{0}$	77	2-Rc1/2	M60x2	p. 53	120
NN-H21MP-Y60-XAC085	21	60	229	355.6	1,374 $^{+17}_{0}$	92.5	2-Rc1/2	M75x2	p. 65	120
NN-H21MP-L80-XAC085	21	80	281	355.6	1,629 $^{+17}_{0}$	92.5	2-Rc1/2	M75x2	p. 65	120
NN-H21MP-120-XAC085	21	120	377	355.6	2,097 $^{+17}_{0}$	92.5	2-Rc1/2	M75x2	p. 65	120
NN-N21MP-160-XAC085	21	160	502	406.4	2,176 $^{+20}_{0}$	111	2-Rc1/2	M90x2	p. 65	120

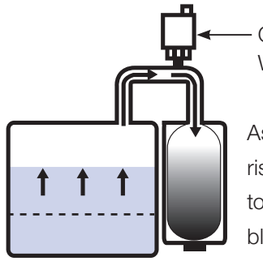
※5 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.

Function

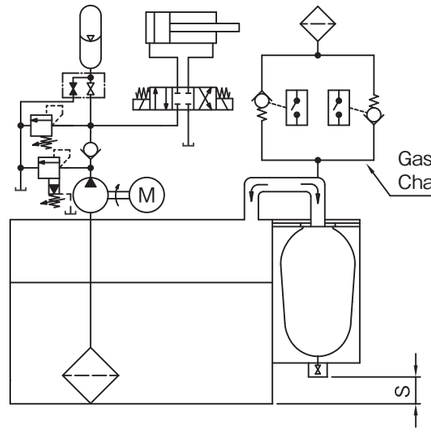
Dynaclean can be used with a sealed oil tank to minimize entry of dust/moisture, fluid contamination, oxidative degradation, and moisture evaporation (for water based fluids). As the tank oil level increases/decreases with actuator operation, the volume of air space in the tank changes accordingly; Dynaclean has a bladder that expands or contracts to accommodate the change. Dynaclean also accommodates changes in the volume of oil/air space caused by temperature changes. In addition, Dynaclean can be provided with a sensor-equipped gas relief and charge valve to detect the difference between internal and external air pressures for gas relief/charge monitoring.



As the fluid level in the tank drops, Dynaclean supplies air to the tank. The Dynaclean bladder contracts.

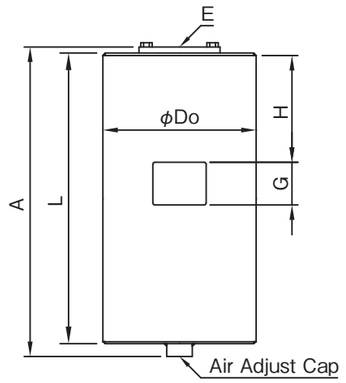


As the fluid level in the tank rises, the air in the tank returns to Dynaclean. The Dynaclean bladder expands.



S: Maintenance space over 200 mm is needed.

Dimensional Drawing



Explanation of Item Number (For more information, refer to page 27.)

①	②	-	③	④	④	④	④	-	⑤	⑤	⑤	-	⑥	⑦	⑧	⑨	⑨	⑨
N	N	-	L	0	.	0	5	-	L	2	0	-	Y	A	C	F	1	6

①APPLICABLE INSPECTION/STANDARD
N - NACOL (Manufacturer's) Inspection

②BLADDER COMPOUND
N - Standard Nitrile Rubber (NBR)

③Series
L Series

④Maximum Allowable Working Pressure
0.05 MPa

⑤NOMINAL GAS VOLUME
20 – 120L

⑥DYNACLEAN SPECIFICATION

⑦DYNACLEAN SPECIFICATION

⑧SPECIFICATION OF SHELL / TREATMENT

	SPECIFICATION OF SHELL	INSIDE TREATMENT	OUTSIDE TREATMENT	SERVICE FLUID
C -	Standard Material (Carbon Steel)	Zinc Phosphate Treatment	Zinc Phosphate Treatment	Air, Nitrogen Gas, Others
N -			Standard Paint Coating	

⑨THREAD SPECIFICATION OF OIL PORT OR SPECIAL SPECIFICATION

F * * -	Thread specification and thread size
R * * -	Thread specification and thread size
* * * -	Special specification

Item Number of Bladder

6	5	N	L	⑤	⑤	⑤	1	1	A

② BLADDER COMPOUND
Standard Nitrile Rubber (NBR)

⑤ Nominal Gas Volume

④ Accessory
Gas charging valve

⑤ Nominal Gas Volume

Select the code of item number which shows nominal gas volume of Dynaclean in use.

Code	Nominal Gas Volume
L20	20 L
L30	30 L
L40	40 L
L50	50 L
L60	60 L
L80	80 L
120	120 L
Y60	60 L

※shell diameter ϕ355.6

Dimensional Table

Standard

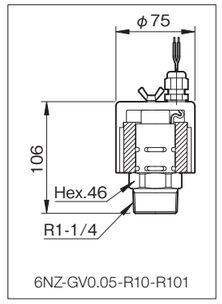
Item Number	Maximum Allowable Working Pressure MPa	Nominal Gas Volume L	Max.Transit Volume L	Mass kg	ϕDo mm	A mm	L mm	H mm	G mm	E mm			Accessories NORMA's Clamp	Accessories Base Mounting Plate exclusively for NORMA's Clamp
N N-L0.05-L20-YA⑧F16	0.05	20	11	36	267.4	590 +17 0	546	250	100	G2			6081C267	6BMP267P
N N-L0.05-L30-YA⑧F16		30	16.5	47		825 +17 0	781							
N N-L0.05-L40-YA⑧F16		40	22	56		1,029 +17 0	985							
N N-L0.05-L50-YA⑧F16		50	27.5	69		1,332 +17 0	1,288							
N N-L0.05-L60-YA⑧F16		60	33	74		1,472 +17 0	1,428							
N N-L0.05-Y60-YA⑧F16		60	33	62	355.6	949 +17 0	905						6081C350	–
N N-L0.05-L80-YA⑧F16		80	44	74		1,204 +17 0	1,160							
N N-L0.05-120-YA⑧F16		120	66	97		1,633 +17 0	1,589							

※1 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※2 Above item is usable to be only upright. Please contact us when installation space is limited and you wish to install in a position other than upright.

L Series (Dynaclean) From 20 to 120 Liters

Gas Relief and Charge Valve

A gas relief and charge valve mounted on Dynaclean protects the tank, piping, and Dynaclean from damage due to abnormal air pressure in the sealed tank (when the tank air pressure exceeds the set pressure of the gas relief and charge valve, the valve is activated for air relief or charging).
The gas relief and charge valve may be available with or without a sensor.



Item Number		
	without sensor	6NZ-GV0.05-R10-R10
	with sensor	6NZ-GV0.05-R10-R101
Maximum Allowable Working Pressure (MPa)		0.05
Gas Charge Set Pressure (MPa)		–0.02
Gas Relief Set Pressure (MPa)		0.02

Specification of Gas Relief and Charge Valve Sensor

Load Voltage	AC DC 24 V	AC DC 100 V
Max. Load Current	50 mA	20 mA
Length of Lead Wire	0.5 m	

Gas Volume Calculation

Calculate the gas volume of Dynaclean V_1 (L) as follows.

1) Operating Condition

Oil Tank Volume (L)	V_T	—
Total Oil Volume in Oil Tank (L)	V	—
Max. Fluid Level Change (L)	V_O	Difference between the highest and lowest fluid levels
Air Volume in Oil Tank (L)	V_A	$V_A = V_T - V$
Specific Gravity of Fluid	γ	—
Max. Operating Temperature (℃)	T_H	—
Min. Operating Temperature (℃)	T_L	—

2) Coefficient of thermal expansion
Refer to the table on the right to determine the coefficient of thermal expansion α corresponding to the specific gravity of the fluid γ.

Relation between Specific Gravity and Coefficient of Thermal Expansion

Specific Gravity	Coefficient of Thermal Expansion: α
0.867 – 0.874	0.00077
0.875 – 0.882	0.00076
0.883 – 0.891	0.00075
0.892 – 0.902	0.00074
0.903 – 0.912	0.00073
0.913 – 0.923	0.00072
0.924 – 0.937	0.00071
0.938 – 0.951	0.00070
0.952 – 0.964	0.00069
0.965 – 0.975	0.00068
0.976 – 0.986	0.00067
0.987 – 1.000	0.00066
1.001 – 1.075	0.00063

3) Calculate the thermal expansion of oil O_H (L).

$$O_H = V \cdot \alpha (T_H - T_L)$$

4) Calculate the thermal expansion of air A_H (L).

$$A_H = V_A \left(\frac{T_H + 273}{T_L + 273} - 1 \right)$$

5) Calculate the maximum transit oil flow amount of Dynaclean V_W (L).

$$V_W = V_O + O_H + A_H$$

6) Calculate the gas volume of Dynaclean V_1 (L).

$$V_1 = \frac{V_W}{0.55}$$

Determination of the nominal gas volume

Select a Dynaclean with a nominal gas volume exceeding the calculated gas volume of Dynaclean V_1 (L).
A volume calculation sheet is available on page 123.

"Booster" for Nitrogen Gas Booster

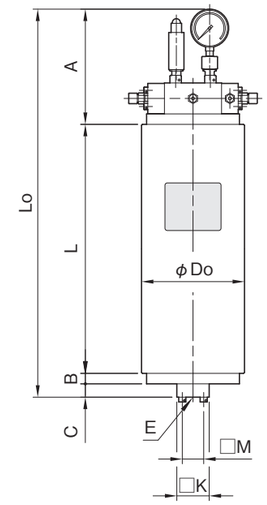
Function

The "Booster" can be incorporated in a hydraulic unit and connected to a nitrogen gas cylinder on the gas side to generate high pressure gas.

Seal material : Teflon
Maximum Allowable Working Pressure : 25 MPa
Hydrostatic Test Pressure : 37.5 MPa
Gas Name : Nitrogen Gas
Pressure Gauge : 50 MPa
Capacity : 1,000 m^3/day

A "Booster" used in the nitrogen gas booster is treated as a "reciprocating compressor" in accordance with the High Pressure Gas Safety Law, Japan. In line with the High Pressure Gas Safety Law, Japan, a "reciprocating compressor" for the nitrogen gas booster is offered after passing a high pressure gas production facility inspection.

Dimensional Drawing

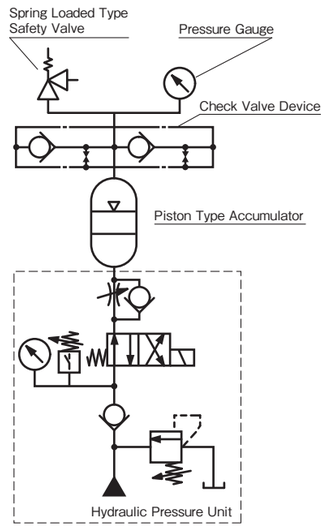


Dimensional Table

Item Number	Nominal Gas Volume L	Mass kg	L mm	Lo mm	A mm	B mm	C mm	Do mm	K mm	M mm	E
XN-P25MP-LL5-XXN034	5	116	518	810 +8 0	242	28	22	216.3 (applicable Clamp (6081C215))	68	45 (M10×35)	10A
XN-P25MP-L10-XXN034	10	146	714	1,006 +8 0							

※ Dimensions without tolerance indication are for reference. Please confirm the latest dimensions with the actual product or its drawing.
※ A "Booster" is a product that combines a piston type accumulator and a check valve. The fluid may enter the gas side depending on the operating conditions. Failure to remove the fluid from the gas side may result in the inability to obtain a sufficient flow-out speed.

The customer is recommended to make a hydraulic unit for the nitrogen gas booster with reference to the circuit diagram shown on the right.



Manufacturer's Serial Number and Nameplate

When making inquiries about NACOL products or ordering replacement parts, please provide the serial number marked on the accumulator shell and the item number indicated on the nameplate.

Accumulator

Manufacturer's Serial Number

All of NACOL's accumulators are marked with Manufacturer's Serial Numbers. A Manufacturer's Serial Number is seven numerical digits following two alphabetical letters.

※1 For accumulators manufactured before September 1982, the number of numerical digits differs.

※2 Marking position for accumulators manufactured before 1999.

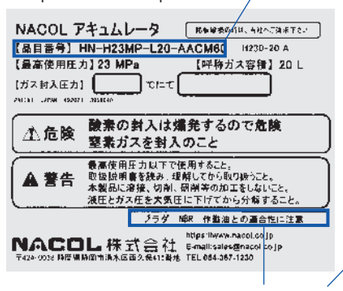
Marking Sample

Nameplate

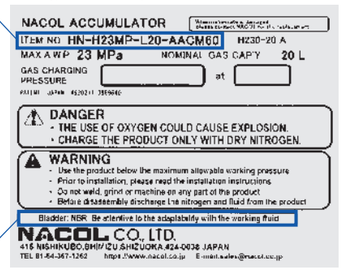
An accumulator nameplate contains product information.
The information may differ depending on the period of production.

Item Number ※3

Japanese Sample



English Sample

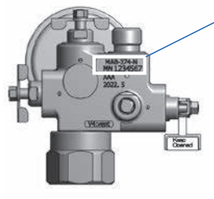


Bladder Compound

The material of the original bladder incorporated in the accumulator upon shipment is indicated.

※3 Refer to explanation of an item number p. 27.

SG Valve



Manufacturer's Serial Number

All of NACOL's SG valves are marked with the Manufacturer's Serial Numbers.
A Manufacturer's Serial Number is seven numerical digits following two alphabetical letters.

Marking sample

Spring Loaded Type Safety Valve

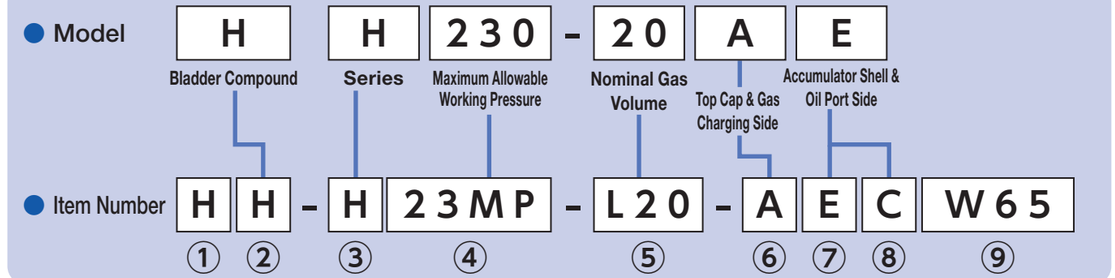
Manufacturer's Serial Number

All of NACOL's Spring Loaded Type Safety Valve are marked with the Manufacturer's Serial Numbers.
A Manufacturer's Serial Number consists of seven numerical digits.

Marking Sample

Explanation of "Model → Item Number"

Model and Item Number designations are described below.



For the details of item number, please refer to "Explanation of Item Number" on page 27.

① Applicable inspection/standards cannot be identified by model.
② The bladder material code in the item number is the same as the model designation; if there is no code in the model designation, the material is Standard Nitrile Rubber (NBR).
③ The series name code in the item number is the same as the model designation.
④ The maximum allowable working pressure designation includes a pressure unit. The previous model designation uses kg/cm^2 as the pressure unit.
⑤ The gas volume designation is a three-digit code (unit: L).
⑥ This code should match "Top Cap/Gas Charging Side Specification" in the model designation.

Model: Top Cap/Gas Charging Side Specification

Gas Charging Side Specification \ Top Cap Specification	Top Cap for Less than 16L 2 Pieces Type Top Cap for More than 20L	Top Cap for More than 20L	Plating	Stainless Steel
Dynac Valve	D	A	H	P
SG Coreless Valve + Spring Loaded Type Safety Valve + Pressure Gauge	S	E		
SG Coreless Valve + Plug + Pressure Gauge	S1			
SG Coreless Valve only	S2			
SG Coreless Valve + Fuse Plug + Pressure Gauge	S4	F		
SG Coreless Valve + Plug + Pressure Gauge Adaptor	S5			
SG Valve + Spring Loaded Type Safety Valve + Pressure Gauge	Q			
SG Valve + Fuse Plug + Pressure Gauge	R			
Transfer Barrier	T			
Core Type Gas Valve	C			
Dynac Valve, 8V1 Type	W (without symbol)			
Other	X			

⑦⑧ This code should match "Accumulator Shell/Oil Port Side Specification" in the model designation. For an item number, oil port side and accumulator shell specifications are designated separately.

Model: Accumulator Shell/Oil Port Side Specification

Oil Port Side Specification \ Accumulator Shell Specification		Standard	Plating	Stainless Steel
Standard Internal Thread	Standard Material	A (without symbol)		
	Plating	C	H	
	Stainless Steel	D	I	L
High Flow	Standard Material	E		
	Plating	F	J	
	Stainless Steel	G	K	M
Super High Flow	Standard Material	Y		
Pulse Damper	Standard Material	U		
Super Pulse Damper	Standard Material	V		
Other		X		

※1 Fire Resistant Fluid:N

⑨ Special specification cannot be identified from model designation.

Accumulator Stand

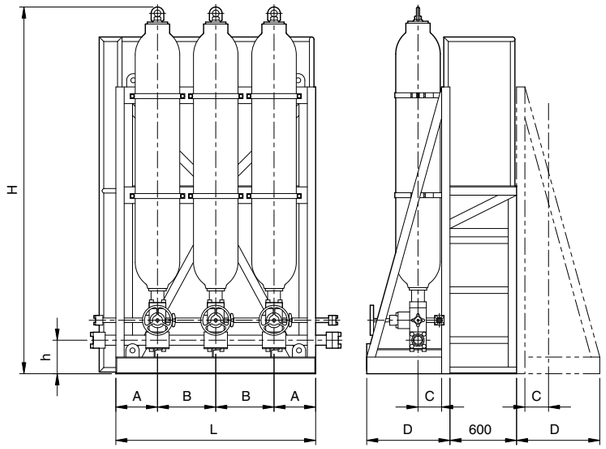
The accumulator stand facilitates installation/ maintenance work.

The dimensions of an accumulator stand used with T-Blocks and accumulator stop valves are shown on the right.

※ They are auxiliary dimensions by using 21 MPa accumulators.

※ In case of Nominal Gas Volume 20 – 60 L, auxiliary dimensions for 23 MPa accumulators are described.

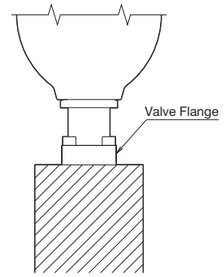
The dimensions take into consideration the transportation height and installation workability. When fabricating the stand, please refer to the stand dimensions and pipe sizing table shown below.



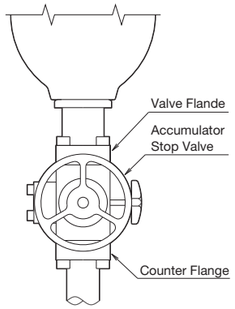
Nominal Gas Volume of Acc. (L)	A (mm)	B (mm)	L (mm)					C (mm)	D (mm)	Remarks
			1 piece	2 pcs (W4 pcs)	3 pcs (W6 pcs)	4 pcs (W8 pcs)	5 pcs (W10 pcs)			
20 – 60	250	350	500	850	1,200	1,550	1,900	142	500	Use Clamp 6081C267
120	300	450	600	1,050	1,500	1,950	2,400	184	525	Use Clamp 6081C350
160	300	500	600	1,100	1,600	2,100	2,600	212	560	Use Clamp 6081C406

Main Pipe Size	Accumulator Stop Valve		h (mm)	H (mm)						
	HF-ACC-32×10N*	HF-ACC-50×10N*		Acc : 20 L	Acc : 30 L	Acc : 40 L	Acc : 50 L	Acc : 60 L	Acc : 120 L	Acc : 160 L
1 (25A)	○	–	142	1,219	1,464	1,703	2,001	2,188	2,334	2,447
1¼ (32A)	○	–	142	1,226	1,471	1,710	2,008	2,195	2,341	2,454
1½ (40A)	○	–	161	1,245	1,490	1,729	2,027	2,214	2,360	2,473
2 (50A)	○	○	161	1,255	1,500	1,739	2,037	2,224	2,370	2,483
2½ (65A)	–	○	176	1,290	1,535	1,774	2,072	2,259	2,405	2,518
3 (80A)	–	○	176	1,299	1,544	1,783	2,081	2,268	2,414	2,527

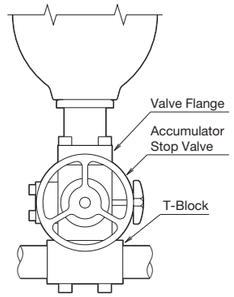
Variation of Fittings for Accumulator Pipings



Manifold Connection



Connection using Acc. Stop Valve and Counter Flange



Connection using Acc. Stop Valve and T-Block

List of Fittings for Piping (for 21 MPa)

Applicable Acc. Nominal Gas Volume (L)	Valve Flange	Acc. Stop Valve	Counter Flange	T-Block
1 – 4	6FAM42 32D N23M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N23M
5 – 16	6FCM42 32D N23M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N23M
20 – 60	6FCM60 32D N23M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N23M
	6FCM60 50K N23M	6080 HFACC 3210NS	SSA50	6WT 050 0** 0** N23M
		6080 HFACC 3210NN		
		6080 HFACC 5010NS	SSA80	6WT 080 050 050 N23M
		6080 HFACC 5010NN		
Y40 Y60 80 – 120	6FCM75 32D N23M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N23M
	6FCM75 50D N23M	6080 HFACC 3210NS	SSA50	6WT 050 0** 0** N23M
		6080 HFACC 3210NN		
		6080 HFACC 5010NS	SSA80	6WT 080 050 050 N23M
		6080 HFACC 5010NN		
	6FCM75 80D N21M	6080 HFACC 5010NSL	SSA80	6WT 080 050 050 N23M
		6080 HFACC 5010NNL		
160, 175	6FCM90 32D N23M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N23M
	6FCM90 50D N23M	6080 HFACC 3210NS	SSA50	6WT 050 0** 0** N23M
		6080 HFACC 3210NN		
		6080 HFACC 5010NS	SSA80	6WT 080 050 050 N23M
		6080 HFACC 5010NN		
	6FCM90 80D X007	6080 HFACC 5010NSL	SSA80	6WT 080 050 050 N23M
		6080 HFACC 5010NNL		

List of Fittings for Piping (for 35 MPa)

Applicable Acc. Nominal Gas Volume (L)	Valve Flange	Acc. Stop Valve	Counter Flange	T-Block
5 – 16	6FCM42 25D X027	6080 HFL35ACC 321011 6080 HFL35ACC 321011H	Acc. Stop Valve includes the Counter Flange. Please refer p. 94 and confirm a piping connecting position.	–
20 – 60	6FCM60 25D X055			
R20 – 63	6FCM50 25D X007			
145	6FCM75 25D X031			

Accumulator Sizing Program for Energy Storage Application

Date:

Customer Name:

Accumulator Application (Name of System)					Please fill in the each ☐ then send this data sheet to NACOL. We are pleased to select the most suitable accumulator for you.
Max. Working Temperature	T_H	☐ ℃	Service Fluid	☐	⇒ Suitable Bladder Compound ＿＿＿＿＿＿
Min. Working Temperature	T_L	☐ ℃			

Note : In all calculations, the absolute pressure shall be used. (absolute pressure = gauge pressure + 0.1013 MPa)

Customer's specification	Required oil volume to be discharged from Accumulator	V_W	☐	L		
	Max. Working Pressure	P_3	☐	MPa · G	$(P_3 + 0.1013) \leqq 4 \times P_{1L}$	
	Min. Working Pressure	P_2	☐	MPa · G	P_2 is to be determined taking pressure loss (△P) into consideration (△P= MPa)	
	Charged gas pressure at the highest temperature	P_{1H}		MPa · abs	$P_{1H} = (P_2 + 0.1013) \times 0.85$ (at Highest Working Temperature)	
	Oil Charge Time	T_m		sec	Time necessary to charge Vw into the Accumulator (oil discharge volume from pump = ☐ L/min)	
	Oil Discharge Time	T_n	☐	sec	Time necessary to discharge Vw from the Accumulator	
Applicable factors	Charged gas pressure at the lowest temperature	P_{1L}		MPa · abs	Calculate from the FORMULA shown below	
	Gas Charging Pressure Ratio	e		–	$e = P_{1L} \div (P_2 + 0.1013)$ When $(e = P_{1H} \div P_2 + 0.1013) > 0.9$, bladder life will be shortened.	
	Working Pressure Ratio	a		–	$a = (P_3 + 0.1013) \div (P_2 + 0.1013)$	
	Mean Accumulator Circuit Pressure	P_a		MPa · abs	$P_a = (P_3 + P_2) \div 2 + 0.1013$	
	Polytropic Exponent at Oil Charge Time	m		–	Intersecting point of Tm and Pa as given by the table of N_2 gas polytropic exponents. (see page 20)	
	Polytropic Exponent at Oil Discharge Time	n		–	Intersecting point of Tn and Pa as given by the table of N_2 gas polytropic exponents. (see page 20)	
	Accumulator Gross Efficiency	η	0.95	–		
	Oil Discharge Coefficient	F		–	Given from the following formula.	
	Accumulator Gas Capacity	V_1		L	Given from the following formula.	
	Max. Required Oil Velocity	Q		L/sec	Q = Vw ÷ Tm or Tn ÷ pieces. Either Standard Type or High Flow Type as selected from catalogue specifications.	

(FORMULA)

$$C = \{8233 - \sqrt{6794 \times 10^4 - (T_H - 696)^2}\} / 10^2 \qquad P_{1L} = \{A \times (T_L - T_H) + P_{1H} \times 10.1972\} / 10.1972$$

$$B = \{488 - \sqrt{2065 \times 10^2 - (T_H - 170)^2}\} / 10^4 \qquad F = \frac{(a)^{\frac{1}{(n)}} - 1}{(a)^{\frac{1}{(m)}}}$$

$$A = 10.1972 \times B \times P_{1H} - C \times \left(1 - \frac{1}{0.2039 \times P_{1H} + 1}\right) \qquad V_1 = \frac{(V_W)}{(e) \cdot 0.95 \cdot (F)}$$

Selected Accumulator Item #	Q'ty /	Fittings	☐ Bushing ( ) · ☐ Flange ( )
Inspection certificate required by the customer	METI Japan · ASME · CE ( )	Country of Installation	

NACOL CO., LTD. Sales Department will be happy to review your Accumulator requirements with any special Accumulator manufacturing codes or specifications.
We will review your specific requirements in detail to provide you with the most suitable and economical Accumulator.

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https://www.nacol.co.jp E-mail: sales@nacol.co.jp

Accumulator Sizing Program for Pulsation Dampening Application

Date:

Customer Name:

Accumulator Application (Name of System)					Please fill in the each ☐ then send this data sheet to NACOL. We are pleased to select the most suitable accumulator for you.
Max. Working Temperature	T_H	☐ ℃	Service Fluid	☐	⇒ Suitable Bladder Compound ＿＿＿＿＿＿
Min. Working Temperature	T_L	☐ ℃			

Note : In all calculations, the absolute pressure shall be used. (absolute. pressure = gage pressure + 0.1013 MPa.)

Customer's specification	Regular Circuit Pressure	P_x	☐	MPa · G	
	Maximum Pulsation Pressure Generated Now	P_h	☐	MPa · G	$P_h \leqq$ Max. Allowable Working Pressure of Accumulator
	Max. Allowable Pulsation Pressure	P_m	☐	MPa · G	$P_m = P_x + \alpha$
	Gas Charging Pressure	P_1		MPa · abs	$P_1 = (P_x + 0.1013) \times 0.6$ (Max. Working Temperature)
	Polytropic Exponent	n		–	Intersectional point from P_x and T <15 given by the table of N_2 gas polytropic exponents. (see page 20)
	Discharging Volume of Pump	Q	☐	L/min	Pump Sort { ☐ Piston (Simplex, Duplex, or more), (single, double) acting ☐ Vane ☐ Gear ☐ Others ( )
	Revolution of Pump	N	☐	rpm	
	Discharging Volume of Pump Per One Revolution	q		L/rev	q = Q ÷ N
	Discharge Coefficient of Pump	F_1			See the table below (When pump is larger than triplex, vane or gear pump, F1 should be 0.06)
	Accumulator Capacity	V_1		L	Given from the following formula.

(FORMULA)

$$V_1 = \frac{(q) \cdot (F_1) \cdot \left(\frac{(P_X + 0.1013)}{(P_1)}\right)^{\frac{1}{(n)}}}{1 - \left(\frac{(P_X + 0.1013)}{(P_m + 0.1013)}\right)^{\frac{1}{(n)}}} = \_\_\_\_ L$$

Pump Sort		F_1
single	single	0.60
	double	0.25
duplex	single	0.25
	double	0.15
triplex	single	0.13
	double	0.06

Note:
For pulsation dampening, please use an accumulator which maximum allowable working pressure is higher than the maximum pulsation pressure generated befor installing of an accumulator.

Selected Accumulator Item #	Q'ty /	Fittings	☐ Bushing ( ) · ☐ Flange ( )
Inspection certificate required by the customer	METI Japan · ASME · CE ( )	Country of Installation	

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Accumulator Sizing Program for Shock Absorbing Application

Date:

Customer Name:

Accumulator Application (Name of System)					Please fill in the each ☐ then send this data sheet to NACOL. We are pleased to select the most suitable accumulator for you.
Max. Working Temperature	T_H		℃	Service Fluid	⇒ Suitable Bladder Compound ＿＿＿＿＿＿
Min. Working Temperature	T_L		℃		

Note : In all calculations, the absolute pressure shall be used. (absolute pressure = gauge pressure + 0.1013 MPa.)

Customer's specification					
	Regular Circuit Pressure	P_x		MPa · G	
	Maximum Shock Pressure Generated Now	P_h		MPa · G	$P_h \leqq$ Max. Allowable Working Pressure of Accumulator
	Max. Allowable Shock Pressure	P_m		MPa · G	$P_m = P_x + \alpha$
	Gas Charging Pressure	P_1		MPa · abs	$P_1 = (P_x + 0.1013) \times 0.6$ (Max. Working Temperature)
	Polytropic Exponent	n		—	Intersectional point from Px and T <15 given by the table of N2 gas polytropic exponents. (see page 20)
	Pipe Length	L		m	
	Inside Diameter of Pipe	d		mm	
	Discharging Volume of Pump	Q		L/min	
	Flow Velocity	v		m/sec	V = pump discharge volume ÷ square measure of pipe cross section.
	Acceleration of Gravity	g	9.8	m/sec^2	
	Specific Weight of Fluid	γ		kg/m^3	Turbine oil ≒ 880, W.G. ≒ 1,100, Water ≒ 1,000
	Accumulator Gross Efficiency	η	0.95	—	
	Weight of Fluid Inside The Line	W		kg	Given from the following formula
	Accumulator Capacity	V_1		L	Given from the following formula

(FORMULA)

$$W = \frac{\pi \cdot (d)^2}{4} \cdot (L) \cdot (\gamma) \cdot 10^{-6}$$

$$V_1 = \frac{(W) \cdot (v)^2 \cdot ((n) - 1) \cdot \left(\frac{(P_X + 0.1013)}{(P_1)} \right)^{\frac{1}{(n)}}}{1998.6 \cdot (P_X) \cdot 0.95 \left\{ \left(\frac{P_X + 0.1013}{P_m + 0.1013} \right)^{\frac{(n)-1}{(n)}} - 1 \right\}} = \_\_\_\_ L$$

Note:
For shock absorbing, please use an accumulator which maximum allowable working pressure is higher than the maximum shock pressure generated before installing of an accumulator.

Selected Accumulator Item #	Q'ty /	Fittings	☐ Bushing ( ) · ☐ Flange ( )
Inspection certificate required by the customer	METI Japan · ASME · CE ( )	Country of Installation	

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Accumulator Sizing Program for Multiple Cylinders or Hydraulic Motors (Data Sheet)

Please fill in the each ☐ then send this data sheet to NACOL. We are pleased to select the most suitable accumulator for you.

To: NACOL CO., LTD.
Sales Department

Your Company : Date:
Dept. or Sect. : Your Name :
TEL : FAX :

Accumulator Application (System Name)					
Customer's Specification	Service Fluid				⇒ Suitable Bladder Compound ＿＿＿＿＿＿
	Fluid Temperature	T	☐ ～ ☐	℃	
	Cycle Time	C		sec	
	Max. Working Pressure	P_3		MPa · G	
	Min. Working Pressure	P_2		MPa · G	
	Pump Discharging Volume (Pump Q'ty)	Q	(units)	L/min	
	Motor			kW	

[How to fill in the data]
A column: Fill in the each work step name from the first step of the first cycle till the first step of the second cycle.
(To fill in the first step of the second cycle is from the purpose to know the idle time between the first cycle and the second cycle.)
Note: When you fill in No.1 column to show an operation of the actuater, the computer treats this as Accumulators have been charged necessary oil volume beforehand.
B column: This column shall be filled in only when cylinder shall be actuated. Direction of the pressurization shall be shown by a mark ○ upon H or R
(H : pressurization of the CapEnd side. R: Rod side pressurization) Then the columns ① thru ③ shall be filled in.
C column: This column ④ and ⑤ shall be filled in only when oil motor shall be actuated. (④ shall show displacement oil volume per one revolution)
D column: When you know the required oil volume, fill in that volume into this column ⑥.
(when B or C column has already been filled in, it is not necessary to fill in this column)
E column: When you know the discharging volume of pump, fill in that volume into this column ⑦.
(when B or C or D column has already been filled in, it is unnecessary to fill in this column)
F column: Starting time and end time of each step shall be filled into ⑧ and ⑨ setting the Starting Time of the first step as Zero (0).
G column: Enter the total leakage volume of the hydraulic equipment in ⑩.

		B :Cylinder Spec.			C :Oil Motor Spec.		D :Required Oil Volume	E :Flow Rate	F :Operation Time		G :Leakage
		Pressurized side. H:Cap end side R:Rod end side	Tube. I.D.	Rod O.D.	Stroke	Displacement volume	Revolution			Starting Time	Ending Time	
No.	A : Name of Each Work Step		① ϕ Do mm	② ϕ d mm	③ S mm	④ q cc/rev	⑤ N rpm	⑥ L	⑦ L／min	⑧ sec	⑨ sec	⑩ L
1		H. R										
2		H. R										
3		H. R										
4		H. R										
5		H. R										
6		H. R										
7		H. R										
8		H. R										
9		H. R										
10		H. R										
11		H. R										
12		H. R										
13		H. R										
14		H. R										
15		H. R										
16		H. R										
17		H. R										
18		H. R										
19		H. R										
20		H. R										

NACOL CO., LTD. Sales Department will be happy to review your Accumulator requirements with any special Accumulator manufacturing codes or specifications.
We will review your specific requirements in detail to provide you with the most suitable and economical Accumulator.

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Sizing Program for Dynaclean

Date:

Customer Name:

Accumulator Application (Name of System)					Please fill in the each ☐ then send this data sheet to NACOL. We are pleased to select the most suitable accumulator for you.
Max. Working Temperature	T_H		℃	Service Fluid	⇒ Suitable Bladder Compound ＿＿＿＿＿＿
Min. Working Temperature	T_L		℃		

Note : In all calculations, the absolute pressure shall be used. (absolute pressure = gauge pressure + 0.1013 MPa)

Customer's specification	Volume of Oil Tank	V_T		L	
	Max. Oil Volume in Oil Tank	V		L	
	Max.Change Amount of Oil Volume	V_O		L	
	Air Volume in Oil Tank	V_A		L	$V_A = V_T - V$
	Thermal expansion coefficient of the system fluid (at normal temp.)	α		–	See the table below
Applicable factors	Oil Volume of Thermal Swell	O_H		L	Given from the following formula
	Air Volume of Thermal Expansion	A_H		L	Given from the following formula
	Max. Air Volume Into / Out of Dynaclean	V_W		L	Given from the following formula
	Capacity of Dynaclean	V_1		L	Given from the following formula

(FORMULA)

$$O_H = (V) \cdot (\alpha) \cdot \left((T_H) - (T_L)\right) = \_\_\_\_\_ \text{ L}$$

$$A_H = (V_A) \cdot \left(\frac{(T_H)+273}{(T_L)+273} - 1\right) = \_\_\_\_\_ \text{ L}$$

$$V_W = (V_O) + (O_H) + (A_H) = \_\_\_\_\_ \text{ L}$$

$$V_1 = \frac{(V_W)}{0.55} = \_\_\_\_\_ \text{ L}$$

Table of specific gravitythermal expansion coeffient

Specific Gravity	Thermal Expansion Coefficient : α
0.867 – 0.874	0.00077
0.875 – 0.882	0.00076
0.883 – 0.891	0.00075
0.892 – 0.902	0.00074
0.903 – 0.912	0.00073
0.913 – 0.923	0.00072
0.924 – 0.937	0.00071
0.938 – 0.951	0.00070
0.952 – 0.964	0.00069
0.965 – 0.975	0.00068
0.976 – 0.986	0.00067
0.987 – 1.000	0.00066
1.001 – 1.075	0.00063

Selected Dynaclean Item #	Q'ty /	Remarks	

NACOL CO., LTD. Sales Department will be happy to review your Accumulator requirements with any special Accumulator manufacturing codes or specifications.
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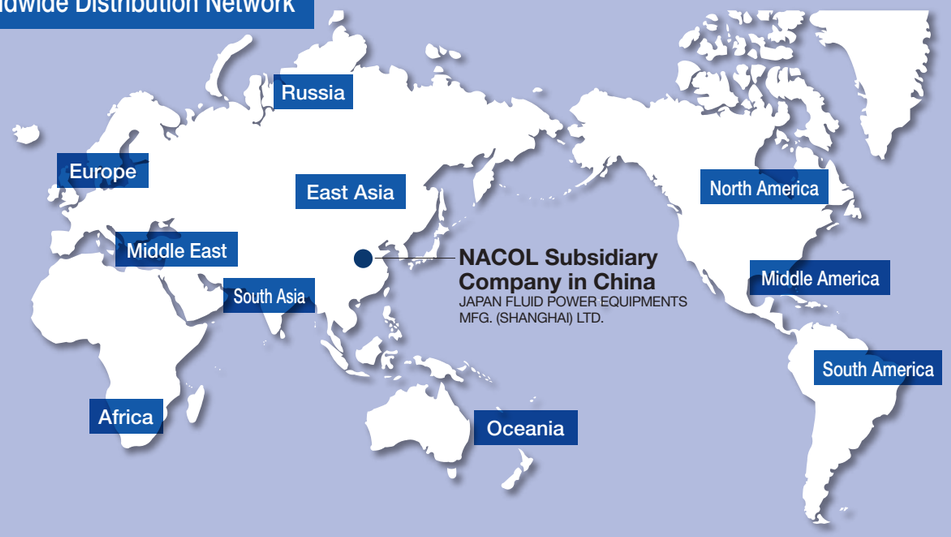

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Kedoya Utara Kebon Jeruk Jakarta Barat DKI Jakarta Raya
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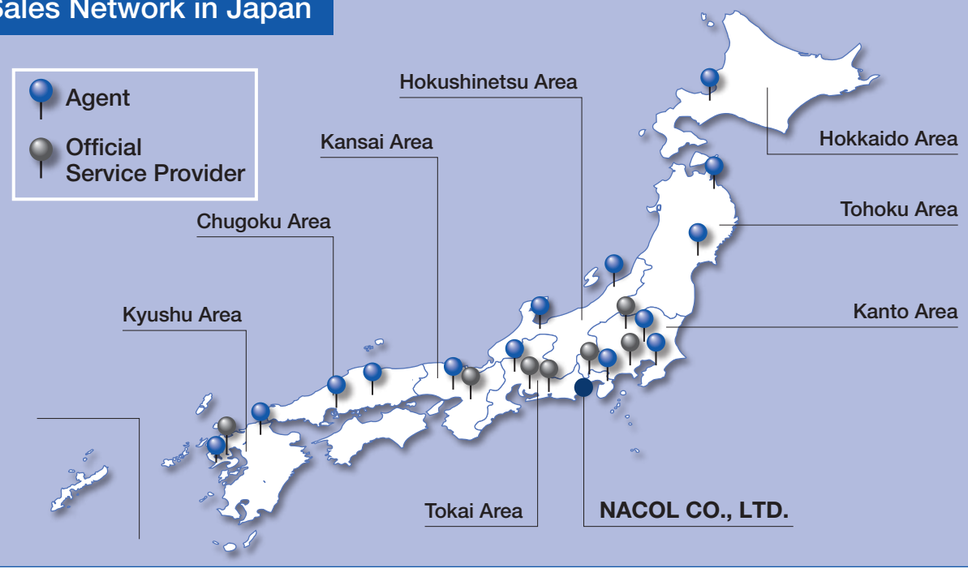
Agents and Official Service Providers in Japan

Sales Network in Japan



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	SOWA KIKAI CO., LTD. 4-151-1 Omano-cho, Koshigaya City, Saitama, 343-0844 TEL: +81-48-988-1498 / FAX: +81-48-985-3315	**MARUNISEIKI CORPORATION** 3-167-7 Honchodori, Tsurumi-ku, Yokohama City, Kanagawa, 230-0048 TEL: +81-45-501-8426 / FAX: +81-45-521-5757
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