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NACOL
ACCUMULATOR

ACCUMULATOR CATALOGUE 2015

NACOL
NIPPON ACCUMULATOR CO., LTD.

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NIPPON ACCUMULATOR is constantly evolving as a specialized manufacturer of accumulators.

NACOL

NIPPON ACCUMULATOR CO., LTD., having continually made accumulators for over 60 years, thinking through the maintainability and safety of the products, offers the unique "Top Easy Maintenance Design Accumulator".
In response to increasing demand for "higher quality and safety" from our customers and the market, we have evolved a technology developed since our inception.
From now on, in the supply of energy-saving accumulator equipment, continuing to contribute to environmental protection, and always providing products and services to satisfy every customer, we will continue to evolve.

NIPPON ACCUMULATOR CO., LTD.
JAPAN FLUID POWER EQUIPMENTS MFG. (SHANGHAI) LTD.

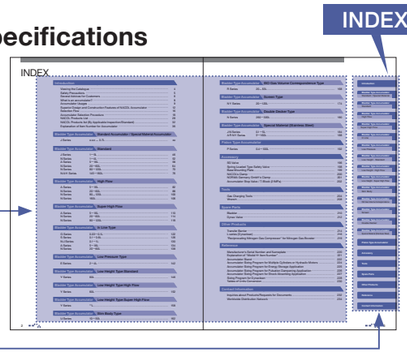
INDEX

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 2 to 3)
- Searching from the Index
  You can also search from the Index at the right side of the catalogue.



● We introduce a flow method for selecting the appropriate accumulator.

Continued on page 16.

● When searching from the product you have

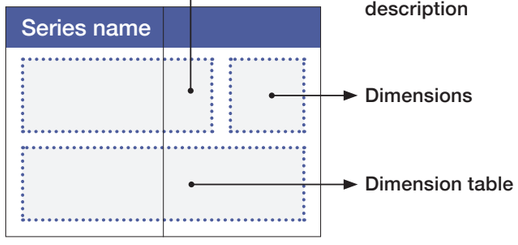
Search after referring to the Manufacturer's Serial Number and Name Plate (see page 220) and Item Number Descriptions (see page 36), and after confirming the item number from the name plate attached to the product.

From the product list (see page 28), confirm the product name, etc.

Viewing product information

Product pages (see from page 40 on), describe a single series in 3-page sets. (With the exception of some products)

1



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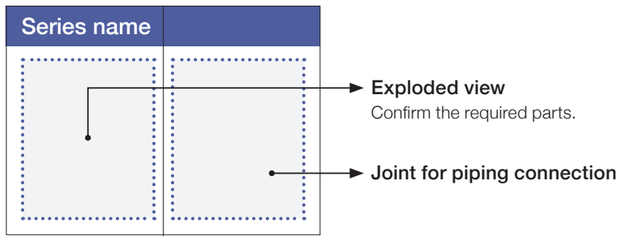

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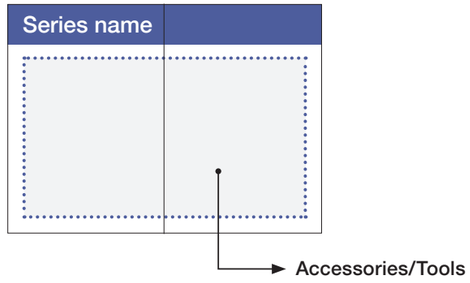


Safety Precautions

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 damage if our products are treated improperly.

⚠ DANGER	: Indicates an imminent hazardous situation that, if not avoided, will 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 cylinder. If the maximum allowable working pressure of the accumulator or pressure gauge is lower than the filling pressure of the nitrogen cylinder, they may 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 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 may be damaged.
  - Install a pressure relief valve in hydraulic circuits, and use the accumulator at pressure below the maximum allowable working pressure.
- Do not perform any machining.
  - All products (except welding flanges) may be damaged if they undergo machining including grinding, cutting, and thermal processing such as welding.
- Use screws of the same shape.
  - If parts with unmatched screw shape (in specifications, diameter and pitch) are connected, the screw parts may be damaged when the pressure rises.
- 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 may be damaged.
  - The pipe connected to the accumulator should be fixed on the stand which has sufficient rigidity.
  - 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 of the oil port valve assembly.
  - Periodically confirm the tightness of the clamps, the ring nut, and the fixing tools for pipes and tighten them.
- Do not use products in a corrosive environment.
  - All products may be damaged when used in a corrosive environment.
  - If parts with rusted or damaged screws are used, the screw parts may be damaged when the pressure rises.
- Follow the operating manual and work based on the knowledge of the person usually engaged in machine operation. The operations not described in the operating manual should be performed under total responsibility of the operator according to the common sense of an engineer, fully considering safety.
- 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 may 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 may be damaged.
- Use our special hanging tool to hang the accumulator.
  - Hanging the accumulator with a wire or rope may result in its falling.
- 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.
  - 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 may cause injury.
  - Discharging nitrogen gas in an airtight or a small room may 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.

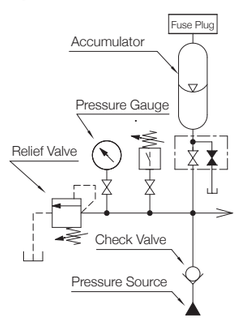
- Please select Accumulator which has enough specification such as allowable maximum working pressure and allowable oil flow speed to satisfy the concerned circuit specification.
- Please select Accumulator with suitable metalic and chemical material parts to meet the system fluid and working temperature.
- When you use fire resistant fluid (Water Glycol Fluid, HWBF and Phosphate Ester Fluid), please select Accumulator which inside surface is not coated.
- Please select Accumulator which may satisfy laws, rules, and regulations of the country where the Accumulator may be installed.

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.

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.

- Please adjust the gas charging pressure in consideration of the temperature change and check the leak and the appearance once every year.

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?

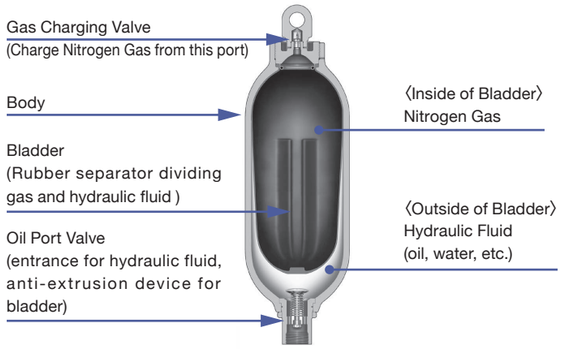
The accumulator is a pressure vessel (container) storing the pressurised hydraulic fluid (oil, water, etc).

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

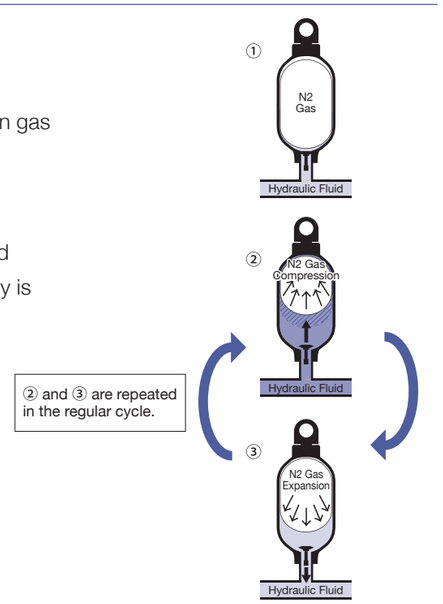
This is the state just the nitrogen gas has been precharged.
When the hydraulic pressure is lower than the precharged nitrogen gas pressure, the bladder expands fully in the accumulator body.

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

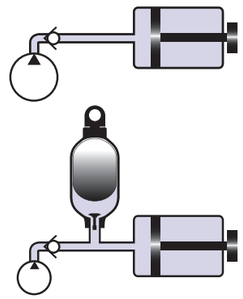
When the hydraulic pressure drops, the nitrogen gas expands and releases the stored energy.



Accumulator Usages

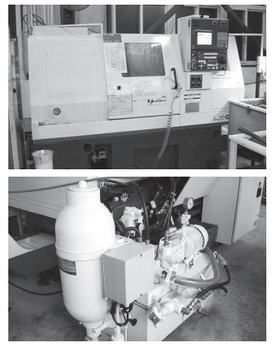
Saving Energy/Electricity (Energy Storage)

By installing accumulator, the oil pump capacity can be downsized and the idling-stop 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 idling-stop 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
- Idling-Stop Operation
- Suppression of Temperature Rise of System Fluid

Saving Energy
Saving Electricity

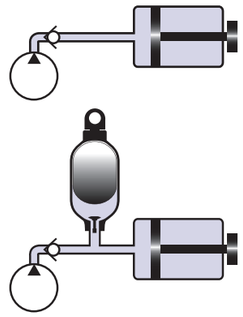


NC Lathe with oil hydraulic unit assembling accumulator for suppressing hydraulic pump electricity consumption.

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.

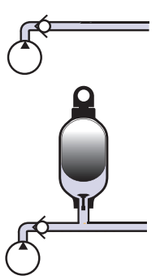


Speedup of motion cylinder for flight simulator.

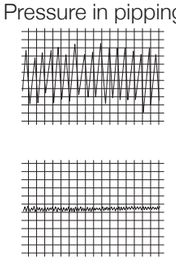
Main Usages
- Flight Simulator
- Oil Hydraulic Press
- Injection Moulding Machine
- Diecast Machine
- Overall Machine Tools

Pulsation Dampening

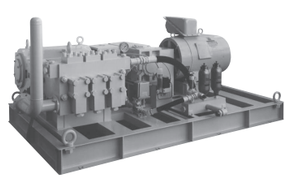
The pressure pulsations created by various types of the hydraulic pumps become a cause of the vibrations and noises and machine damages. By adopting accumulator, the pulsations can be attenuated.



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

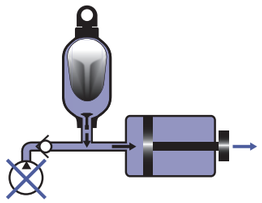
Rapid opening and closing of valves will create the shock waves in the hydraulic system and the noise occurs and they will damage the machine and/or the components of hydraulic system. By installing accumulator, it eliminates the shock in the hydraulic system.

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.

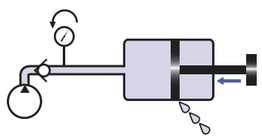


Controlling the angle of wing of the wind power generation and the brake circuit in emergency operation.

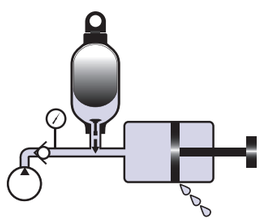
Main Usages
- Grinding Machine
- Emergency Shutdown Valve
- Refuel System
- Clamping
- Double Column Machining Centers
- Polishing Machine

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

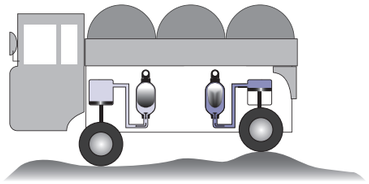


Pressure Preservation

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.

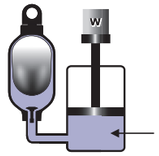


Used for the suspension of special vehicle.

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

Counter Balance

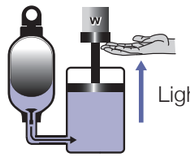
The gas pressure of the accumulator supports the heavy weight which are supported by the cylinder.



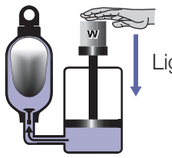
Balanced by the Pressure

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.



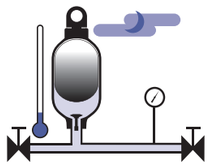
Light Power



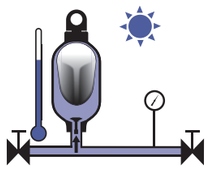
Light Power

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. y installing accumulator, the pressure in circuit can be stabilized to an almost constant level.



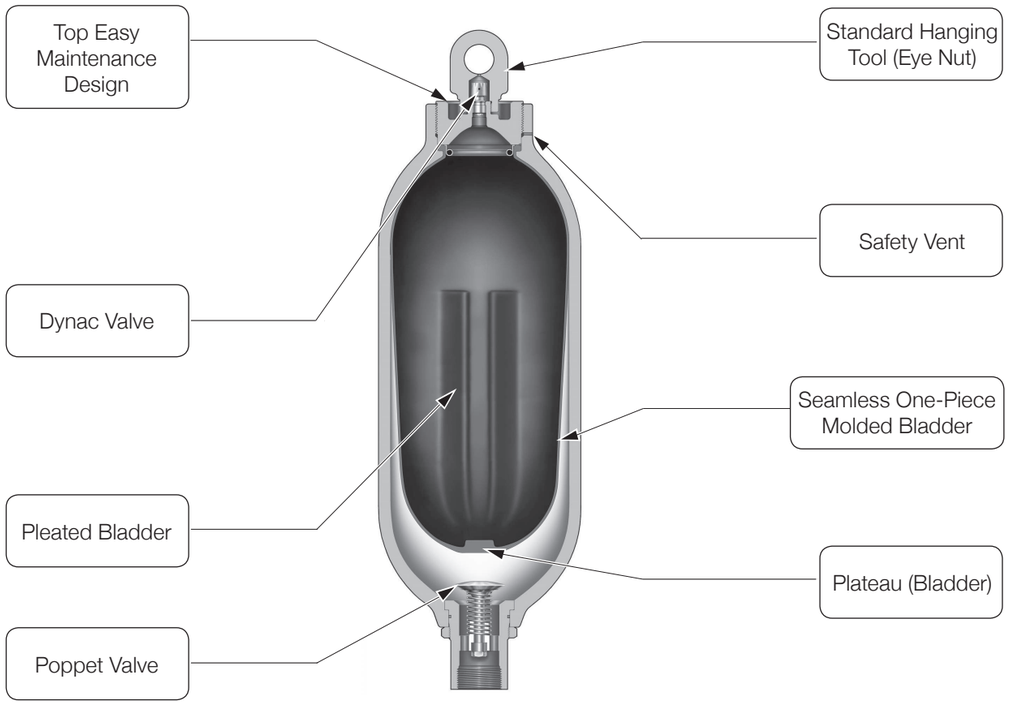
The volume decreased is supplemented.



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.
So you are free from hard work and save working hours.
NACOL accumulator is an environmentally friendly product because it does not disperse the hydraulic fluid during the maintenance jobs.

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.

Bladder Replacement Job

Dynac Valve

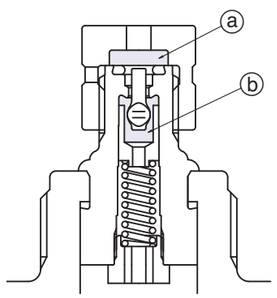
The Dynac Valve is a gas charging valve which has also "Fuse" function.

The function of Fuse

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

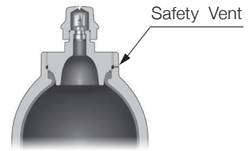
The function of Dynac Valve

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.



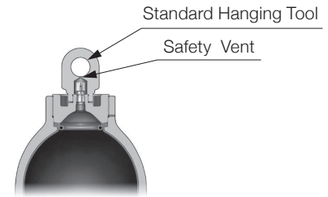
Safety Vent

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 20kg.
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)

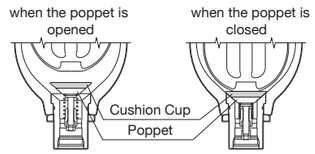
The plateau at the bottom of the bladder prevent the bladder damage.
Plateau reinforcement in the bladder prevents it from being damaged by sharp bending in the bottom portion of the bladder.

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

Poppet Valve

Poppet Valve prevents bladder damage
The poppet valve prevents bladder from extruding into the oil port valve and protects the bladder.

Cushion Cup
The poppet valve for the accumulator which maximum allowable working pressure is over 25MPa or which bladder material is CHC or FKM has the cushion cup for protecting the bottom area of bladder. (Except U series)
The cushion cup is made of rubber and is equipped to the poppet.



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.

Selection Flow

① For accumulator selection

Accumulator Selection

Select the available series by maximum allowable working pressure and gas volume.

- **Explanation of Calculation by Application** — Accumulator Selection Procedure [See page 18]
- **Gas Volume Calculation** — Accumulators for Multiple Cylinders (Hydraulic Motors) [See page 224]; Accumulators for Energy Storage [See page 225]; Accumulators for Pulsation Dampening [See page 226]; Accumulators for Shock Absorbing [See page 227]; Dynaclean [See page 228]
- **Series Selection** — NACOL Product List [See page 28]; Item Number Description for Finished Accumulator Products [See page 36]

Select the accumulator specifications.

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

Select the accumulatorrelated products.

- **Joint for piping connection** — Each Series Page [Product Page]
- **Accessories** — SG Valve [See page 196], Spring Loaded Type Safety Valve [See page 198]; Clamp [See page 200], Base Mounting Plate [See page 199]; Accumulator Stop Valve/T-block [See page 202]
- **Tools and Spare Parts** — Gas Charging Tools [See page 204], Wrench [See page 208]; Bladder [See page 210], Dynac Valve [See page 212]
- **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 220]
- **Part Item Number Selection** — Gas Charging Tools [See page 204]; Bladder [See page 210]; Dynac Valve [See page 212]
- **Spare Parts Ordering** — Inquires [See page 232]
- **Maintenance** *
  - a. Gas Charging and Inspection
  - b. Bladder Exchange
  - c. Dynac Valve Exchange

  Safety Precautions [See page 5]; a. Gas Charging Tools [See page 204]; b. Exploded view [Product page]; c. Dynac Valve [See page 212]

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 220]
- **Spare Parts Ordering** — Inquires [See page 232]
- **Maintenance** *
  - d. Top Cap Exchange
  - e. Oil Port Valve Assembly Exchange
  - f. SG Valve Exchange

  Safety Precautions [See page 5]; d. Exploded view [Product page]; e. Exploded view [Product page]; f. SG Valve [See page 196]

End

*Always read the instruction manual before performing maintenance work.

Accumulator Selection Procedure

Accumulator Selection Procedure

1. Calculation of Accumulator Gas Volume

1-1 Volume Formula Selection

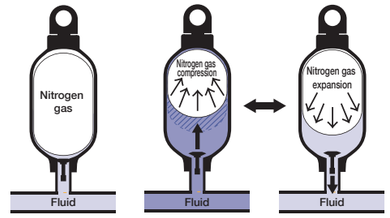
Volume calculation formulas will change depending on the application. For applications, please refer to page 9.

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 216, Dynaclean.
For other application calculations, please contact us.

1-2 Basis of the Formula

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



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.

● 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)
- 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 (ºC) [–35≤T_1≤110ºC]
P_1: Gas pressure after temperature change (MPa · abs)　T_1: Temperature after change (ºC)

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≤
<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

Pressure : Pa
Shock Pulsation : Px

*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　P: Pa (average working pressure) or Px (regular circuit pressure) {MPa · abs}
n: Polytropic exponent at the time of oil discharge　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 (http://www.nacol.co.jp).
For calculation on your own, please take advantage of the volume calculation sheet in the Reference on pages 225 to 227.

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 $F = \frac{a^{\frac{1}{n}} - 1}{a^{\frac{1}{m}}}$
a: Working pressure ratio P_3 / P_2

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

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

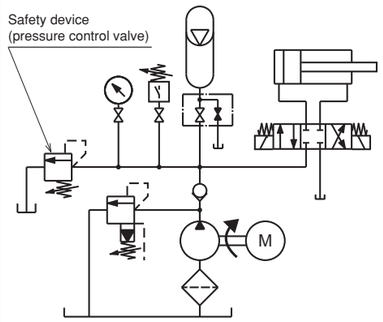
* Add the amount of leakage or compression of liquid to Vw.
* In order to enhance the power saving effect, it is important to set the total amount of oil in the actuator to Vw, and to allow idling stop to be executed on the accumulator by the pressure switch.
* Subtract from P_3 the pressure loss between 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 225.
* If multiple cylinders are used simultaneously, fill out the Accumulator Gas Volume Calculation sheet for multiple cylinders in the Technical Reference on page 224, 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 = 10 to 90°C
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 (90°C), 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. $P_1 = 0.85 \cdot P_2$
$= 0.85 \times 15.1013$ MPa · abs
$= 12.84$ MPa · abs

ii) Find Min. P1 at the minimum working temperature (10°C) by the "Formula for gas charging pressure actual change due to temperature change".

Min. $P_1 = 9.38$ MPa · abs

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

$$e = \frac{P_1}{P_2} = \frac{9.38}{(15 + 0.1013)}$$

$$\fallingdotseq 0.62$$

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

$$\text{Average working pressure (Pa)} = \frac{P_3 + P_2}{2} = \frac{20.1013 + 15.1013}{2}$$

$$\fallingdotseq 17.6 \text{MPa} \cdot \text{abs}$$

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

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

$$\fallingdotseq 17.9\text{sec}$$

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

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

$$\fallingdotseq 0.5\text{sec}$$

・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).

$$V_1 = \frac{V_W}{e \cdot \eta \cdot F} = \frac{26.9}{0.62 \times 0.95 \times 0.135} \fallingdotseq 339L$$

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)
P_m: Maximum allowable pulsation pressure (MPa)

* 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 226.

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

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

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

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/sec^2)
d: Pipe bore(mm)
L: Total pipe length(m)
γ: Weight volume ratio of the fluid(kg/m^3)
P_x: Regular circuit pressure(MPa)
P_m: Maximum allowable shock pressure(MPa)

* 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 227.

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 from the NACOL Product List on page 28.

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 Dynaclean series.

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

- Compare the flow rate with the allowable charge/discharge flow rate shown in the NACOL Product List on page 28.
- If the allowable charge/discharge flow rate of the standard series is not enough, select an accumulator from High Flow or Super 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 37.
- 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.

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

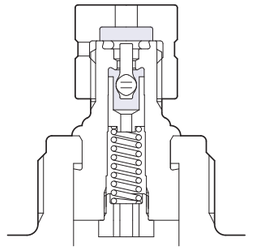
- Select the inspection and standards to be applied from ① Inspection and Standards Table in the Item Number Description for Finished Accumulator Products on page 36.
- For use at sea, ship's class standards will be applied.
- On the page for the selected series, confirm that the series, pressure, and 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

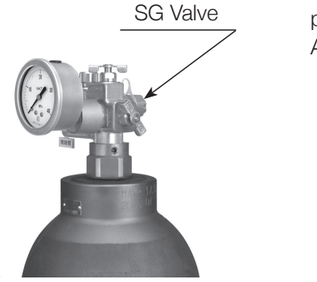
1. Dynac Valve

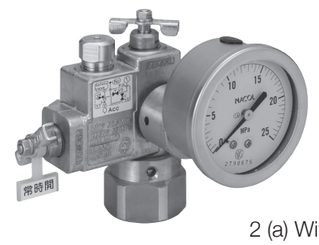


NACOL standard.
The Dynac valve is a gas charge valve with a fuse plug function.
The gas charging tools kit is required for charging, inspection, and pressure adjustment of nitrogen gas.
Sizes of connection screws include G1/4, G3/8, 1/2-20UNF, and 8V1, depending on the series and pressure. Please refer to the page for each series.
In addition, we provide an accumulator with an M16 x 2-screw-type gas charging valve, which complies with JIS B 8398 "Hydraulic fluid power -- Gas-loaded accumulators -- Dimensions of gas ports".
Please contact our sales department for more information.

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 39.
- Unless otherwise specified, select the fuse plug as the safety device of the SG valve.
- When external temperature reaches 160±20°C, 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.
- The pressure gauge used for the SG valve contains glycerin. Specify the pressure range according to the pressure to be used.
- For details on the SG valve and pressure gauge, please refer to "SG Valve" on page 196.
- For details on the safety valve, please refer to "Spring Loaded Type Safety Valve" on page 198.
- For details on the Dynac valve, please refer to "Dynac Valve" on page 212.

7. Selection of Joint for Piping Connection

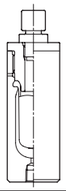
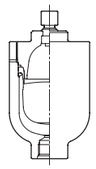
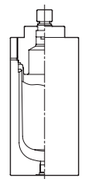
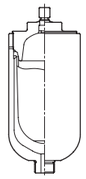
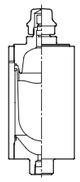
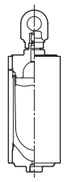
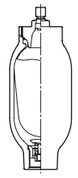
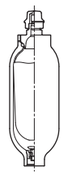
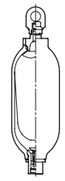
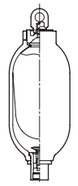
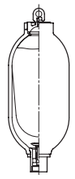
To connect the accumulator to the hydraulic circuit, a joint that matches the connection bore is required.
Select the necessary joint from the page for the selected series.

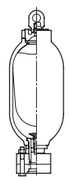
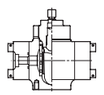
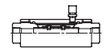
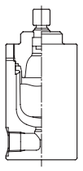
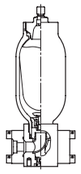
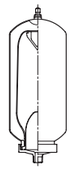
Points for selection

- For the Inline, High Flow, and Super High Flow types, the joints (flanges) are incorporated in the accumulator.
- Various standard flanges not listed in the catalog are also available.

NACOL Products list

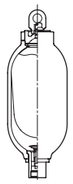
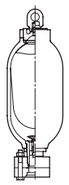
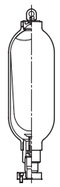
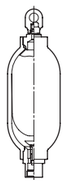
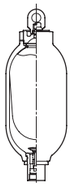
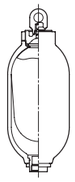
Bladder Type Accumulators: Standard Type

Specification	Standard Type																		Specification
Volume Classification	Less than 1L			1～5L						1～16L			20～120L		145～160L			Volume Classification
Series	J			J						N		A	N		N	A	H	Series
Material	Aluminum	Carbon Steel								Carbon Steel								Material
Name	—									—								Name
Typical Shape																		Typical Shape
Nominal Gas Volume (L)	0.03	0.1 0.3	0.5	0.5	1	1 2 3	4 5			1	2.5 4	5 6.3 10 16	20 30 40 50 60	80 120	160	150	145	Nominal Gas Volume (L)
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	16	25	25	35	10	10 17.5 25				21 23 35 45	21 35 45	17.5 21 23 35 45	17.5 21 23 35 49.4	15 21 25 28 33	15 21 23	26	35	MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1
Allowable Oil Flow Rate Vertically Installation (L/min)	—	12	12	12	60	60				120	120	300	600	900	1,200	900	900	Allowable Oil Flow Rate Vertically Installation (L/min)
Possible Oil Flow Rate (L/min) ※2	—	—	—	—	—	—			—	—	—	450	1,100	1,800	1,800	—	—	Possible Oil Flow Rate (L/min) ※2
Oil Port Connection	Rc1/4	Rc3/8	Rc3/4	G1/4	G1	Rc3/4				M42×2	M42×2	M42×2	M60×2	M75×2	M90×2	M75×2	M75×2	Oil Port Connection
Page	P40			P46						P52		P58	P64	P70	P76			Page

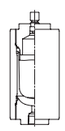
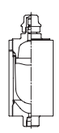
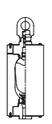
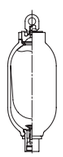
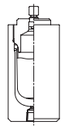
Specification	High Flow Type				Super High Flow Type					In-Line Type								Low Pressure	Specification
Volume Classification	5～16L	20～160L			5～120L					1L or less						5～60L		2～4L	Volume Classification
Series	A	N			A	N	N			G		S		J	N	A	N	E	Series
Material	Carbon Steel				Carbon Steel					Aluminum	Carbon Steel	Carbon Steel		Carbon Steel		Carbon Steel		Carbon Steel	Material
Name	High Flow				Super High Flow					—				Pulse Damper		Super Pulse Damper		—	Name
Typical Shape																			Typical Shape
Nominal Gas Volume (L)	5 6.3 10 16	20 30 40 50 60	80 120	160	5 6.3 10 16	20 30 40 50 60	80 120			0.03	0.1	0.1	0.6	0.1 1	1	5 6.3 10 16	20 30 40 50 60	2 4	Nominal Gas Volume (L)
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	17.5 21 23 35	17.5 21 23 35	15 21 25	15 21	21	21	21			14 25	28	21	21	25	21	21 23	17.5 21 23	0.95	MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1
Allowable Oil Flow Rate Vertically Installation (L/min)	600	1,200	1,800	2,400	1,200	2,400	3,600			—	—	Max. Passage Flow Rate 90	Max. Passage Flow Rate 400		300	300	300	45	Allowable Oil Flow Rate Vertically Installation (L/min)
Possible Oil Flow Rate (L/min) ※2	900	2,500	6,000	8,000	—	—	7,200			—	—	—	—	—	—	—	—	—	Possible Oil Flow Rate (L/min) ※2
Oil Port Connection	Flange MAX. 50A	Flange MAX. 65A	Flange MAX. 80A	Flange MAX. 100A	Flange MAX. 65A	Flange MAX. 100A	Flange ϕ75mm			Rc3/8 Rc1/2	20A 25A	Rc3/4	40A	Rc1/2 Rc3/4	Flange 32A	Flange 50A	Flange 50A	R1/2	Oil Port Connection
Page	P82	P88	P100	P106	P110	P114	P118			P122		P126		P130		P134	P138	P142	Page

※1 Depending on the applicable inspection/standard, the specified maximum allowable working pressure may not be reached. ※2 Maximum oil flow rate available under certain conditions.

Bladder Type Accumulators: Special Type

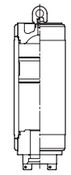
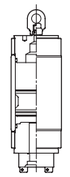
Specification	Standard Low Length Type	High Flow Low Length Type	Super High Flow Low Length Type	Slim Body Type	ISO Standard Size Type	Screen Type		Low Length Type	Double Decker Type
Volume Classification	60L	60L	60L	10～50L	20～63L	20～120L		60L	260～320
Series	Y	Y	Y	U	R	N		Y	N
Material	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel			Carbon Steel
Name	—	High Flow	Super High Flow	—	—	—			—
Typical Shape									
Nominal Gas Volume (L)	60	60	60	10 20 30 50	20 32 40 50 63	20 30 40 50 60	80 120	60	260 320
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	15 21 25 28 33	15 21 25	21	25	28	2	2	2	21
Allowable Oil Flow Rate Vertically Installation (L/min)	900	1,800	3,600	600	450	—			1,200
Possible Oil Flow Rate (L/min) ※2	1,800	6,000	7,200	—	—	—			—
Oil Port Connection	M75×2	Flange MAX. 80A	Flange φ75mm	M60×2 G2	M50×2	M60×2	M75×2	M75×2	M90×2
Page	P146	P152	P158	P162	P168	P174			P180

Bladder Type Accumulators: Special Material Type

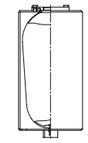
Specification	Stainless Steel Type										Low Length Type	Titanium Type
Volume Classification	Less than 1L		1～16L				20～160L				60L	0.7L
Series	J		J		N	A	R	N			Y	J
Material	Stainless Steel											Titanium
Name	—											—
Typical Shape												
Nominal Gas Volume (L)	0.1 0.3	0.5	1 2 3	4 5	1	5 6.3 10 16	20 32 40 50 63	20 30 40 50 60	80 120	160	60	0.7
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	10 25		5 10	7	50	11 21	8 13	21	7	7	7	21
Allowable Oil Flow Rate Vertically Installation (L/min)	12		60		120	300	450	600	600	900	600	—
Oil Port Connection	Rc3/8	Rc3/4	Rc3/4		Rc3/4	M42×2	M50×2	M60×2	M60×2	M75×2	M60×2	Rc3/4
Page	P184					P188						P40

※1 Depending on the applicable inspection/standard, the specified maximum allowable working pressure may not be reached. ※2 Maximum oil flow rate available under certain conditions.

Piston Type Accumulators

Specification	Piston Type					
Series	P					
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	17.5	21	22	25		
Material	Carbon Steel					
Typical Shape						
Nominal Gas Volume (L)	10 15 20 25 30 40 50 60	52 60 80 100	5 10 20	0.4 0.5 0.9 2 3	1.6 2.5 3.4 7.2 11	5 10 20 30 40
Allowable Oil Flow Rate (L/min)	4,500	8,400	1,500	360	900	3,000
Outer Diameter	267.4	355.6	152.4	82.6	127	216.3
Oil Port Connection	Flange MAX. 100A	Flange MAX. 100A	Flange MAX. 50A	Flange MAX. 15A	Flange MAX. 25A	Flange MAX. 65A
Page	P192					

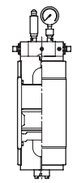
Dynaclean

Specification	Oil Tank Dust Prevention	
Series	L	
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	0.05	
Material	Carbon Steel	
Typical Shape		
Nominal Gas Volume (L)	20 30 40 50 60	60 80 120
Outer Diameter	267.4	355.6
Oil Port Connection	G2	
Page	P216	

Transfer Barrier Type

Specification	Special Fluid Transfer				
Volume Classificationa	5～160				60L (Low Length)
Series	A	N			Y
Material	Carbon Steel				
Typical Shape					
Nominal Gas Volume (L)	5 6.3 10 16	20 30 40 50 60	80 120	160	60
MAXIMUM ALLOWABLE WORKING PRESSURE (MPa) ※1	17.5 21 23	17.5 21 23	15 21 25	15 21 23	15 21 25
Allowable Oil Flow Rate Vertically Installation (L/min)	300	600	900	1,200	900
Oil Port Connection	M42×2	M60×2	M75×2	M90×2	M75×2
Page	P214				

Compressor



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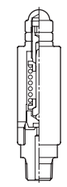
Spring Loaded Type Safety Valves



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NACOL Products list (By Applicable Inspection/Standard)

Bladder Type Accumulators: Standard Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
J	① ②	– J16MP – 003 –	A	B	⑧		○※2	Outside of Scope	–	40–45
	① ②	– J25MP – L01 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J25MP – L03 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J25MP – L05 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J35MP – L05 –	A	D	X	039	–	Outside of Scope	–	
	① ②	– J10MP – LL1 –	A	B	⑧		○	Outside of Scope	–	46–51
	① ②	– J10MP – LL2 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J10MP – LL3 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J10MP – LL4 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J10MP – LL5 –	A	B	⑧		○	Outside of Scope	–	
	① ②	– J10MP – LL1 –	A	X	⑧	412	○	Outside of Scope	–	
	① ②	– J10MP – LL2 –	A	X	⑧	412	○	Outside of Scope	–	
	① ②	– J10MP – LL3 –	A	X	⑧	412	○	Outside of Scope	–	
	① ②	– J10MP – LL4 –	A	X	⑧	412	○	Outside of Scope	–	
	① ②	– J10MP – LL5 –	A	X	⑧	412	○	Outside of Scope	–	
	① ②	– J10MP – LL1 –	A	X	⑧	297	○	Outside of Scope	–	
	① ②	– J17.5 – LL1 –	6	B	⑧		○	Outside of Scope	–	
	① ②	– J17.5 – LL2 –	6	B	⑧		○	Outside of Scope	–	
	① ②	– J17.5 – LL3 –	6	B	⑧		○	Outside of Scope	–	
	① ②	– J17.5 – LL4 –	6	B	⑧		○	Outside of Scope	–	
	① ②	– J17.5 – LL5 –	6	B	⑧		○	Outside of Scope	–	
	① ②	– J25MP – LL1 –	6	A	⑧		○	Outside of Scope	–	
	① ②	– J25MP – LL2 –	6	A	⑧		○	Outside of Scope	–	
	① ②	– J25MP – LL3 –	6	A	⑧		○	Outside of Scope	–	
	① ②	– J25MP – LL4 –	6	A	⑧		○	Outside of Scope	–	
	① ②	– J25MP – LL5 –	6	A	⑧		○	Outside of Scope	–	
N	① ②	– N21MP – LL1 –	6	7	⑧		○	Outside of Scope	○※3	52–57
	① ②	– N21MP – 2.5 –	6	7	⑧		○	Outside of Scope	○※3	
	① ②	– N21MP – LL4 –	6	7	⑧		○	Outside of Scope	○※3	
	① ②	– N23MP – LL1 –	6	7	⑧		○	Outside of Scope	–	
	① ②	– N35MP – LL1 –	6	7	⑧		○	Outside of Scope	–	
	① ②	– N35MP – 2.5 –	6	7	⑧		○	Outside of Scope	–	
	① ②	– N35MP – LL4 –	6	7	⑧		○	Outside of Scope	–	
	① ②	– N45MP – LL1 –	6	7	⑧		○	Outside of Scope	–	
	① ②	– N45MP – 2.5 –	6	7	⑧		○	Outside of Scope	–	
	① ②	– N45MP – LL4 –	6	7	⑧		○	Outside of Scope	–	
A	① ②	– A17.5 – LL5 –	6	7	⑧		○	○	–	58–63
	① ②	– A17.5 – 6.3 –	6	7	⑧		○	○	–	
	① ②	– A17.5 – L10 –	6	7	⑧		○	○	–	
	① ②	– A17.5 – L16 –	6	7	⑧		○	○	–	
	① ②	– A21MP – LL5 –	6	7	⑧		○	○	○※3	
	① ②	– A21MP – 6.3 –	6	7	⑧		○	○	○※3	
	① ②	– A21MP – L10 –	6	7	⑧		○	○	○※3	
	① ②	– A21MP – L16 –	6	7	⑧		○	○	○※3	
	① ②	– A23MP – LL5 –	6	7	⑧		○	○	–	
	① ②	– A23MP – 6.3 –	6	7	⑧		○	○	–	
	① ②	– A23MP – L10 –	6	7	⑧		○	○	–	
	① ②	– A23MP – L16 –	6	7	⑧		○	○	–	
	① ②	– A35MP – LL5 –	6	7	⑧		○	○	○※3	
	① ②	– A35MP – 6.3 –	6	7	⑧		○	○	○※3	
	① ②	– A35MP – L10 –	6	7	⑧		○	○	○※3	
	① ②	– A35MP – L16 –	6	7	⑧		○	○	○※3	
	① ②	– A45MP – LL5 –	6	7	⑧		○	○	–	
	① ②	– A45MP – 6.3 –	6	7	⑧		○	○	–	
	① ②	– A45MP – L10 –	6	7	⑧		○	○	–	
	① ②	– A45MP – L16 –	6	7	⑧		○	○	–	
N	① ②	– N17.5 – L20 –	6	7	⑧		○	○	–	64–69
	① ②	– N17.5 – L30 –	6	7	⑧		○	○	–	
	① ②	– N17.5 – L40 –	6	7	⑧		○	○	–	
	① ②	– N17.5 – L50 –	6	7	⑧		○	○	–	
	① ②	– N17.5 – L60 –	6	7	⑧		○	○	–	
	① ②	– N21MP – L20 –	6	7	⑧		○	○	○※3	
	① ②	– N21MP – L30 –	6	7	⑧		○	○	○※3	
	① ②	– N21MP – L40 –	6	7	⑧		○	○	○※3	
	① ②	– N21MP – L50 –	6	7	⑧		○	○	○※3	
	① ②	– N21MP – L60 –	6	7	⑧		○	○	○※3	
	① ②	– N23MP – L20 –	6	7	⑧		○	○	–	
	① ②	– N23MP – L30 –	6	7	⑧		○	○	–	
	① ②	– N23MP – L40 –	6	7	⑧		○	○	–	
	① ②	– N23MP – L50 –	6	7	⑧		○	○	–	
	① ②	– N23MP – L60 –	6	7	⑧		○	○	–	
	① ②	– N35MP – L20 –	6	7	⑧		○	○	○※3	
	① ②	– N35MP – L30 –	6	7	⑧		○	○	○※3	
	① ②	– N35MP – L40 –	6	7	⑧		○	○	○※3	
	① ②	– N35MP – L50 –	6	7	⑧		○	○	○※3	
	① ②	– N35MP – L60 –	6	7	⑧		○	○	○※3	

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
N	① ②	– N49.4MP – L20 –	6	7	⑧		○※2	–	–	64–69
	① ②	– N49.4MP – L30 –	6	7	⑧		○※2	–	–	
	① ②	– N49.4MP – L40 –	6	7	⑧		○※2	–	–	
	① ②	– N49.4MP – L50 –	6	7	⑧		○※2	–	–	
	① ②	– N49.4MP – L60 –	6	7	⑧		○※2	–	–	
	① ②	– N15MP – L80 –	6	7	⑧		○	○	–	70–75
	① ②	– N15MP – 120 –	6	7	⑧		○	○	–	
	① ②	– N21MP – L80 –	6	7	⑧		○	○	○※3	
	① ②	– N21MP – 120 –	6	7	⑧		○	○	○※3	
	① ②	– N25MP – L80 –	6	7	⑧		○	○	○※3	
	① ②	– N25MP – 120 –	6	7	⑧		○	○	○※3	
	① ②	– N28MP – L80 –	6	7	⑧		○	–	–	
	① ②	– N28MP – 120 –	6	7	⑧		○	–	–	
	① ②	– N33MP – L80 –	6	7	⑧		○	–	–	
	① ②	– N33MP – 120 –	6	7	⑧		○	–	–	
	① ②	– N15MP – 160 –	6	7	⑧		○	○	–	76–81
	① ②	– N21MP – 160 –	6	7	⑧		○	○	–	
	① ②	– N23MP – 160 –	6	7	⑧		○	○	○※3	
A	① ②	– A26MP – 160 –	6	7	⑧		○	–	–	
H	① ②	– H35MP – 160 –	6	7	⑧		○	–	–	

Bladder Type Accumulators: High Flow Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
A	① ②	– A17.5 – LL5 –	6	E	⑧		○	○	–	82–87
	① ②	– A17.5 – 6.3 –	6	E	⑧		○	○	–	
	① ②	– A17.5 – L10 –	6	E	⑧		○	○	–	
	① ②	– A17.5 – L16 –	6	E	⑧		○	○	–	
	① ②	– A17.5 – LL5 –	6	X	⑧	062	○	○	–	
	① ②	– A17.5 – 6.3 –	6	X	⑧	062	○	○	–	
	① ②	– A17.5 – L10 –	6	X	⑧	062	○	○	–	
	① ②	– A17.5 – L16 –	6	X	⑧	062	○	○	–	
	① ②	– A21MP – LL5 –	6	E	⑧		○	○	○※3	
	① ②	– A21MP – 6.3 –	6	E	⑧		○	○	○※3	
	① ②	– A21MP – L10 –	6	E	⑧		○	○	○※3	
	① ②	– A21MP – L16 –	6	E	⑧		○	○	○※3	
	① ②	– A21MP – LL5 –	6	X	⑧	062	○	○	○※3	
	① ②	– A21MP – 6.3 –	6	X	⑧	062	○	○	○※3	
	① ②	– A21MP – L10 –	6	X	⑧	062	○	○	○※3	
	① ②	– A21MP – L16 –	6	X	⑧	062	○	○	○※3	
	① ②	– A23MP – LL5 –	6	E	⑧		○	○	–	
	① ②	– A23MP – 6.3 –	6	E	⑧		○	○	–	
	① ②	– A23MP – L10 –	6	E	⑧		○	○	–	
	① ②	– A23MP – L16 –	6	E	⑧		○	○	–	
	① ②	– A23MP – LL5 –	6	X	⑧	062	○	○	–	
	① ②	– A23MP – 6.3 –	6	X	⑧	062	○	○	–	
	① ②	– A23MP – L10 –	6	X	⑧	062	○	○	–	
	① ②	– A23MP – L16 –	6	X	⑧	062	○	○	–	
	① ②	– A35MP – LL5 –	6	E	⑧		○	○	–	
	① ②	– A35MP – 6.3 –	6	E	⑧		○	○	–	
	① ②	– A35MP – L10 –	6	E	⑧		○	○	–	
	① ②	– A35MP – L16 –	6	E	⑧		○	○	–	
N	① ②	– N17.5 – L20 –	6	E	⑧		○	○	–	88–93
	① ②	– N17.5 – L30 –	6	E	⑧		○	○	–	
	① ②	– N17.5 – L40 –	6	E	⑧		○	○	–	
	① ②	– N17.5 – L50 –	6	E	⑧		○	○	–	
	① ②	– N17.5 – L60 –	6	E	⑧		○	○	–	
	① ②	– N21MP – L20 –	6	E	⑧		○	○	○※3	
	① ②	– N21MP – L30 –	6	E	⑧		○	○	○※3	
	① ②	– N21MP – L40 –	6	E	⑧		○	○	○※3	
	① ②	– N21MP – L50 –	6	E	⑧		○	○	○※3	
	① ②	– N21MP – L60 –	6	E	⑧		○	○	○※3	
	① ②	– N23MP – L20 –	6	E	⑧		○	○	–	
	① ②	– N23MP – L30 –	6	E	⑧		○	○	–	
	① ②	– N23MP – L40 –	6	E	⑧		○	○	–	
	① ②	– N23MP – L50 –	6	E	⑧		○	○	–	
	① ②	– N23MP – L60 –	6	E	⑧		○	○	–	
	① ②	– N35MP – L20 –	6	E	⑧		○	○	○※3	
	① ②	– N35MP – L30 –	6	E	⑧		○	○	○※3	
	① ②	– N35MP – L40 –	6	E	⑧		○	○	○※3	
	① ②	– N35MP – L50 –	6	E	⑧		○	○	○※3	
	① ②	– N35MP – L60 –	6	E	⑧		○	○	○※3	
	① ②	– N17.5 – L20 –	6	X	⑧	274	○	○	–	94–99
	① ②	– N17.5 – L30 –	6	X	⑧	274	○	○	–	
	① ②	– N17.5 – L40 –	6	X	⑧	274	○	○	–	
	① ②	– N17.5 – L50 –	6	X	⑧	274	○	○	–	
	① ②	– N17.5 – L60 –	6	X	⑧	274	○	○	–	

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
N	① ②	– N21MP – L20 –	6	X	⑧	274	○	○	○※3	94–99
	① ②	– N21MP – L30 –	6	X	⑧	274	○	○	○※3	
	① ②	– N21MP – L40 –	6	X	⑧	274	○	○	○※3	
	① ②	– N21MP – L50 –	6	X	⑧	274	○	○	○※3	
	① ②	– N21MP – L60 –	6	X	⑧	274	○	○	○※3	
	① ②	– N23MP – L20 –	6	X	⑧	274	○	○	–	
	① ②	– N23MP – L30 –	6	X	⑧	274	○	○	–	
	① ②	– N23MP – L40 –	6	X	⑧	274	○	○	–	
	① ②	– N23MP – L50 –	6	X	⑧	274	○	○	–	
	① ②	– N23MP – L60 –	6	X	⑧	274	○	○	–	
N	① ②	– N15MP – L80 –	6	E	⑧		○	○	–	100–105
	① ②	– N15MP – 120 –	6	E	⑧		○	○	–	
	① ②	– N15MP – L80 –	6	X	⑧	275	○	○	–	
	① ②	– N15MP – 120 –	6	X	⑧	275	○	○	–	
	① ②	– N21MP – L80 –	6	E	⑧		○	○	–	
	① ②	– N21MP – 120 –	6	E	⑧		○	○	–	
	① ②	– N21MP – L80 –	6	X	⑧	275	○	○	–	
	① ②	– N21MP – 120 –	6	X	⑧	275	○	○	–	
	① ②	– N25MP – L80 –	6	E	⑧		○	○	–	
	① ②	– N25MP – 120 –	6	E	⑧		○	○	–	
	① ②	– N15MP – 160 –	6	E	⑧		○	○	–	106–109
	① ②	– N21MP – 160 –	6	E	⑧		○	○	–	

Bladder Type Accumulators: Super High Flow Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
A	① ②	– A21MP – LL5 –	6	Y	⑧		○	○	–	110–113
	① ②	– A21MP – 6.3 –	6	Y	⑧		○	○	–	
	① ②	– A21MP – L10 –	6	Y	⑧		○	○	–	
	① ②	– A21MP – L16 –	6	Y	⑧		○	○	–	
N	① ②	– N21MP – L20 –	6	Y	⑧		○	○	–	114–117
	① ②	– N21MP – L30 –	6	Y	⑧		○	○	–	
	① ②	– N21MP – L40 –	6	Y	⑧		○	○	–	
	① ②	– N21MP – L50 –	6	Y	⑧		○	○	–	
	① ②	– N21MP – L60 –	6	Y	⑧		○	○	–	
	① ②	– N21MP – L80 –	6	Y	⑧		○	○	–	
	① ②	– N21MP – 120 –	6	Y	⑧		○	○	–	118–121

Bladder Type Accumulators: In-Line Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
G	① ②	– G14MP – 003 –	A	A	⑧	R03	○	Outside of Scope	–	122–125
	① ②	– G14MP – 003 –	A	A	⑧	R04	○	Outside of Scope	–	
	① ②	– G25MP – 003 –	A	A	⑧	R03	○	Outside of Scope	–	
	① ②	– G25MP – 003 –	A	A	⑧	R04	○	Outside of Scope	–	
	① ②	– G28MP – L01 –	A	A	⑧	W06	○	Outside of Scope	–	
	① ②	– G28MP – L01 –	A	A	⑧	W08	○	Outside of Scope	–	
S	① ②	– S21MP – L02 –	A	A	⑧		○	Outside of Scope	–	126–129
	① ②	– S21MP – LL1 –	A	A	⑧		○	Outside of Scope	–	
	① ②	– S21MP – LL1 –	A	X	⑧	426	○	Outside of Scope	–	
N	① ②	– N21MP – LL1 –	6	U	⑧		○	Outside of Scope	–	130–133
J	① ②	– J25MP – L01 –	A	U	⑧		○	Outside of Scope	–	
	① ②	– J25MP – LL1 –	6	U	⑧		○	Outside of Scope	–	
A	① ②	– A21MP – LL5 –	6	V	⑧		○	○	–	134–137
	① ②	– A21MP – 6.3 –	6	V	⑧		○	○	–	
	① ②	– A21MP – L10 –	6	V	⑧		○	○	–	
	① ②	– A21MP – L16 –	6	V	⑧		○	○	–	
	① ②	– A23MP – LL5 –	6	V	⑧		○	○	–	
	① ②	– A23MP – 6.3 –	6	V	⑧		○	○	–	
	① ②	– A23MP – L10 –	6	V	⑧		○	○	–	
	① ②	– A23MP – L16 –	6	V	⑧		○	○	–	
N	① ②	– N17.5 – L20 –	6	V	⑧		○	○	–	138–141
	① ②	– N17.5 – L30 –	6	V	⑧		○	○	–	
	① ②	– N17.5 – L40 –	6	V	⑧		○	○	–	
	① ②	– N17.5 – L50 –	6	V	⑧		○	○	–	
	① ②	– N17.5 – L60 –	6	V	⑧		○	○	–	
	① ②	– N21MP – L20 –	6	V	⑧		○	○	–	
	① ②	– N21MP – L30 –	6	V	⑧		○	○	–	
	① ②	– N21MP – L40 –	6	V	⑧		○	○	–	
	① ②	– N21MP – L50 –	6	V	⑧		○	○	–	
	① ②	– N21MP – L60 –	6	V	⑧		○	○	–	
	① ②	– N23MP – L20 –	6	V	⑧		○	○	–	
	① ②	– N23MP – L30 –	6	V	⑧		○	○	–	
	① ②	– N23MP – L40 –	6	V	⑧		○	○	–	
	① ②	– N23MP – L50 –	6	V	⑧		○	○	–	
	① ②	– N23MP – L60 –	6	V	⑧		○	○	–	

Bladder Type Accumulators: Low Pressure Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
E	① ②	– E0.95 – LL2 –	C	A	A		○	○	–	142–145
	① ②	– E0.95 – LL4 –	C	A	A		○	○	–	

Bladder Type Accumulators: Low Height Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
Y	① ②	– Y15MP – L60 –	6	7	⑧		○	○	–	146–151
	① ②	– Y21MP – L60 –	6	7	⑧		○	○	○※3	
	① ②	– Y25MP – L60 –	6	7	⑧		○	○	○※3	
	① ②	– Y28MP – L60 –	6	7	⑧		○	○	–	
	① ②	– Y33MP – L60 –	6	7	⑧		○	○	–	

Bladder Type Accumulators: Low Height Type High Flow

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
Y	① ②	– Y15MP – L60 –	6	E	⑧		○	○	–	152–157
	① ②	– Y15MP – L60 –	6	X	⑧	275	○	○	–	
	① ②	– Y21MP – L60 –	6	E	⑧		○	○	–	
	① ②	– Y21MP – L60 –	6	X	⑧	275	○	○	–	
	① ②	– Y25MP – L60 –	6	E	⑧		○	○	–	

Bladder Type Accumulators: Low Height Type Super High Flow

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
Y	① ②	– Y21MP – L60 –	6	Y	⑧		○	○	–	158–161

Bladder Type Accumulators: Slim Body Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
U	① ②	– U25MP – L10 –	6	7	⑧		○	○	–	162–167
	① ②	– U25MP – L20 –	6	7	⑧		○	○	–	
	① ②	– U25MP – L30 –	6	7	⑧		○	○	–	
	① ②	– U25MP – L50 –	6	7	⑧		○	○	–	
	① ②	– U25MP – L10 –	6	7	⑧	G16	○	○	–	
	① ②	– U25MP – L20 –	6	7	⑧	G16	○	○	–	
	① ②	– U25MP – L30 –	6	7	⑧	G16	○	○	–	
	① ②	– U25MP – L50 –	6	7	⑧	G16	○	○	–	

Bladder Type Accumulators: ISO Standard Size Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
R	① ②	– R28MP – L20 –	6	7	⑧		○	○	–	168–173
	① ②	– R28MP – L32 –	6	7	⑧		○	○	–	
	① ②	– R28MP – L40 –	6	7	⑧		○	○	–	
	① ②	– R28MP – L50 –	6	7	⑧		○	○	–	
	① ②	– R28MP – L63 –	6	7	⑧		○	○	–	

Bladder Type Accumulators: Screen Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
N	① ②	– N2MPA – L20 –	6	X	⑧	397	○	○	–	174–179
	① ②	– N2MPA – L30 –	6	X	⑧	397	○	○	–	
	① ②	– N2MPA – L40 –	6	X	⑧	397	○	○	–	
	① ②	– N2MPA – L50 –	6	X	⑧	397	○	○	–	
	① ②	– N2MPA – L60 –	6	X	⑧	397	○	○	–	
Y	① ②	– Y2MPA – L60 –	6	X	⑧	397	○	○	–	
N	① ②	– N2MPA – L80 –	6	X	⑧	397	○	○	–	
	① ②	– N2MPA – 120 –	6	X	⑧	397	○	○	–	

Bladder Type Accumulators: Double Decker Type

Series	Item Number					Inspection/Standard ※1	METI H	ASME M	P.E.D R	Page
B	①	Z – B21MP – 100 –	X	X	⑧	025	–	○	–	180–183
	①	Z – B21MP – 160 –	X	X	⑧	025	–	○	–	
N	① ②	– N21MP – 160 –	X	7	⑧	017	○	○	–	

※1 METI:High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan) ASME:Mmainly For U.S.A. ASME:Mmainly For U.S.A.
※2 The maximum allowable working pressure varies depending on the applicable inspection/standard. For details, please refer to the page for each product.
※3 For products subject to P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 21 MPa -> 210 B).
※4 Subject to separate consultation. Please contact our sales department.

Bladder Type Accumulators: Stainless Steel Type

Series	Item Number / Inspection/Standard ※1		METI H	ASME M	P.E.D R	Page
J	① ② – J 5 M P A – L L 1 – P D ⑧		○	Outside of Scope	–	184–187
	① ② – J 5 M P A – L L 2 – P D ⑧		○	Outside of Scope	–	
	① ② – J 5 M P A – L L 3 – P D ⑧		○	Outside of Scope	–	
	① ② – J 7 M P A – L L 4 – P D ⑧		○	Outside of Scope	–	
	① ② – J 7 M P A – L L 5 – P D ⑧		○	Outside of Scope	–	
	① ② – J 1 0 M P – L 0 1 – P D ⑧		○	Outside of Scope	–	
	① ② – J 1 0 M P – L 0 3 – P D ⑧		○	Outside of Scope	–	
	① ② – J 1 0 M P – L 0 5 – P D ⑧		○	Outside of Scope	–	
	① ② – J 1 0 M P – L L 1 – P D ⑧		○	Outside of Scope	–	
	① ② – J 1 0 M P – L L 2 – P D ⑧		○	Outside of Scope	–	
	① ② – J 1 0 M P – L L 3 – P D ⑧		○	Outside of Scope	–	
	① ② – J 2 5 M P – L 0 1 – P D ⑧		○※2	Outside of Scope	–	
	① ② – J 2 5 M P – L 0 3 – P D ⑧		○※2	Outside of Scope	–	
	① ② – J 2 5 M P – L 0 5 – P D ⑧		○※2	Outside of Scope	–	
N	① ② – N 5 0 M P – L L 1 – P D ⑧	019	–	Outside of Scope	–	
Y	① ② – Y 7 M P A – L 6 0 – P D ⑧		○	○	–	188–191
N	① ② – N 7 M P A – L 8 0 – P D ⑧		○	○	–	
	① ② – N 7 M P A – 1 2 0 – P D ⑧		○	○	–	
	① ② – N 7 M P A – 1 6 0 – P D ⑧		○	○	–	
R	① ② – R 8 M P A – L 2 0 – P D ⑧		○	○	–	
	① ② – R 8 M P A – L 3 2 – P D ⑧		○	○	–	
	① ② – R 8 M P A – L 4 0 – P D ⑧		○	○	–	
	① ② – R 8 M P A – L 5 0 – P D ⑧		○	○	–	
	① ② – R 8 M P A – L 6 3 – P D ⑧		○	○	–	
A	① ② – A 1 1 M P – L L 5 – P D ⑧		○	○	–	
	① ② – A 1 1 M P – 6 . 3 – P D ⑧		○	○	–	
	① ② – A 1 1 M P – L 1 0 – P D ⑧		○	○	–	
	① ② – A 1 1 M P – L 1 6 – P D ⑧		○	○	–	
R	① ② – R 1 3 M P – L 2 0 – P D ⑧		○	○	–	
	① ② – R 1 3 M P – L 3 2 – P D ⑧		○	○	–	
	① ② – R 1 3 M P – L 4 0 – P D ⑧		○	○	–	
	① ② – R 1 3 M P – L 5 0 – P D ⑧		○	○	–	
	① ② – R 1 3 M P – L 6 3 – P D ⑧		○	○	–	
A	① ② – A 2 1 M P – L L 5 – P D ⑧		○	○	–	
	① ② – A 2 1 M P – 6 . 3 – P D ⑧		○	○	–	
	① ② – A 2 1 M P – L 1 0 – P D ⑧		○	○	–	
	① ② – A 2 1 M P – L 1 6 – P D ⑧		○	○	–	
N	① ② – N 2 1 M P – L 2 0 – P D ⑧		○※2	○	–	
	① ② – N 2 1 M P – L 3 0 – P D ⑧		○※2	○	–	
	① ② – N 2 1 M P – L 4 0 – P D ⑧		○※2	○	–	
	① ② – N 2 1 M P – L 5 0 – P D ⑧		○※2	○	–	
	① ② – N 2 1 M P – L 6 0 – P D ⑧		○※2	○	–	

Bladder Type Accumulators: Titanium Type

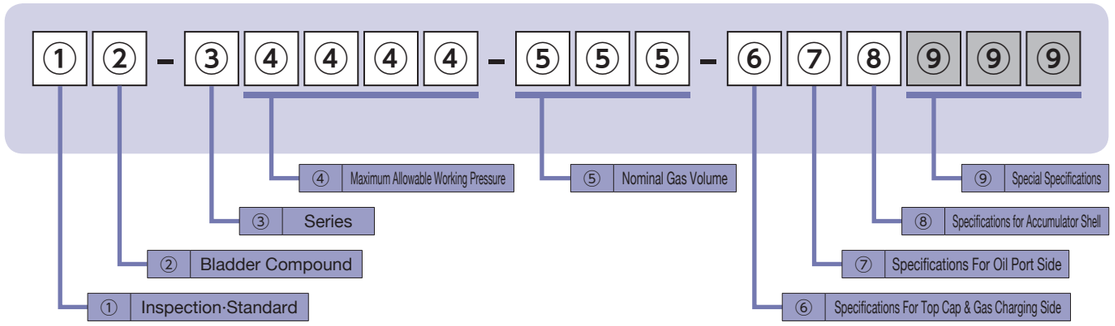
Series	Item Number / Inspection/Standard ※1		METI H	ASME M	P.E.D R	Page
J	① ② – J 2 1 M P – L 0 7 – X X X	012	–	Outside of Scope	–	40–45

Piston Type Accumulators

Series	Item Number / Inspection/Standard ※1		METI H	ASME M	P.E.D R	Page
P	① N – P 2 5 M P – L 0 4 – ⑥ X ⑧	348	○	Outside of Scope	–	192–195
	① N – P 2 5 M P – L 0 5 – ⑥ X ⑧	348	○	Outside of Scope	–	
	① N – P 2 5 M P – L 0 9 – ⑥ X ⑧	348	○	Outside of Scope	–	
	① N – P 2 5 M P – L L 2 – ⑥ X ⑧	348	○	Outside of Scope	–	
	① N – P 2 5 M P – L L 3 – ⑥ X ⑧	348	○	Outside of Scope	–	
	① N – P 2 5 M P – 1 . 6 – ⑥ X ⑧	401	○	Outside of Scope	–	
	① N – P 2 5 M P – 2 . 5 – ⑥ X ⑧	401	○	Outside of Scope	–	
	① N – P 2 5 M P – 3 . 4 – ⑥ X ⑧	401	○	Outside of Scope	–	
	① N – P 2 5 M P – 7 . 2 – ⑥ X ⑧	401	○	Outside of Scope	–	
	① N – P 2 5 M P – L 1 1 – ⑥ X ⑧	401	○	Outside of Scope	–	
	① N – P 2 2 M P – L L 5 – ⑥ X ⑧	350	○	Outside of Scope	–	
	① N – P 2 2 M P – L 1 0 – ⑥ X ⑧	350	○	Outside of Scope	–	
	① N – P 2 2 M P – L 2 0 – ⑥ X ⑧	350	○	Outside of Scope	–	
	① N – P 2 5 M P – L L 5 – ⑥ X ⑧	351	○	※4	–	
	① N – P 2 5 M P – L 1 0 – ⑥ X ⑧	351	○	※4	–	
	① N – P 2 5 M P – L 2 0 – ⑥ X ⑧	351	○	※4	–	
	① N – P 2 5 M P – L 3 0 – ⑥ X ⑧	351	○	※4	–	
	① N – P 2 5 M P – L 4 0 – ⑥ X ⑧	351	○	※4	–	
	① N – P 1 7 . 5 – L 1 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 1 5 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 2 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 2 5 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 3 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 4 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 5 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 1 7 . 5 – L 6 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 2 1 M P – Y 5 2 – ⑥ X ⑧	352	○	※4	–	
	① N – P 2 1 M P – Y 6 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 2 1 M P – L 8 0 – ⑥ X ⑧	352	○	※4	–	
	① N – P 2 1 M P – 1 0 0 – ⑥ X ⑧	352	○	※4	–	

※1 METI:High Pressure Gas Safety Law Japan (Authorized Product by Ministry of Economy, Trade and Industry of Japan) ASME:Mmainly For U.S.A. ASME:Mmainly For U.S.A.
※2 The maximum allowable working pressure varies depending on the applicable inspection/standard. For details, please refer to the page for each product.
※3 For products subject to P.E.D. inspection, the maximum allowable working pressure designated in each item number is in units of bar, not MPa (e.g. 21 MPa -> 210 B).
※4 Subject to separate consultation. Please contact our sales department.

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 1MPa 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	Accumulator
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 40L 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.	ASME
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		EUROPE	P.E.D.(97/23/EC) Application: Accumulators with a maximum allowable working pressure exceeding 0.5 bar 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.	CE 0035
D		CHINA	Supervision Administration Regulation for Manufacturer of Boiler and Pressure Vessel, China Application: Accumulators Related Organization: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China	·License No.: TS2200143-2018 ·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.	TS2200143-2018
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.	
1		RUSSIA	TP TC 032/2013 Application: Accumulators Related Organization: Russia, Kazakhstan and Belarus Customs Union	·When you export our products to Russia, please contact us in advance.	EAC
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	
G		Germany	GL	DNV GL AS	
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 GL 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".

Symbol	Bladder Compound		Suitable Service Fluid	Allowable Service Temperature (℃)	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
B	Standard Nitrile Rubber bladder with oil port valve molded in	NBR			
H	Nitrile Rubber for high temperature use	H.NBR		−10 ～ +110	FKM
L	Nitrile Rubber for low temperature use	L.NBR		−35 ～ +70	L.NBR
F	Butyl Rubber	IIR	Phosphate Ester Fluid	−10 ～ +70	FKM
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			

* 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 ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

- 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 Special Specifications

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 . 6 M	0.6 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 4 M P	14 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

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. 21 MP -> 210 B).

⑤ Nominal Gas Volume

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

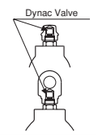
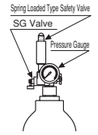
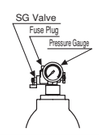
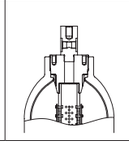
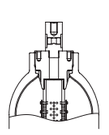
Symbol	Nominal Gas Volume
0 0 3	0.03 L
L 0 1	0.1 L
L 0 3	0.3 L
L 0 4	0.4 L
L 0 5	0.5 L
L 0 6	0.6 L
L 0 7	0.7 L
L 0 9	0.9 L
L L 1	1 L
1 . 6	1.6 L
L L 2	2 L
2 . 5	2.5 L
L L 3	3 L
3 . 4	3.4 L
L L 4	4 L
L L 5	5 L
6 . 3	6.3 L
7 . 2	7.2 L
L 1 0	10 L
L 1 1	11 L
L 1 5	15 L
L 1 6	16 L
L 2 0	20 L
R 2 0	20 L
L 2 5	25 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
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

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

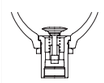
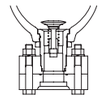
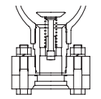
⑥ Specifications For Top Cap & Gas Charging Side

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	Transfer Barrier For Fluid	Transfer Barrier For Gas	Special Specification
	G Thread	UNF Thread						
Standard Type	**A**	**U**	**Q**	**R**	**C**	**T**	**B**	**X**
Two Pieces Type	**D**	**K**						
Plating	**H**	**L**						
Stainless Steel	**P**	**N**						
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	Pulse Damper (IN-LINE Type)	Super Pulse Damper (IN-LINE Type)	Special Specification
Carbon Steel	**A**	**E**	**Y**	**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	Stainless Steel (Made in China)	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**	**Q**	**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 and G 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.
- Except for the E series, 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 Special Specifications

For special specifications, the item number designation includes a three-digit number. Please contact us if you have any questions. The three-digit number is omitted when special specifications are not used.

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER COMPOUND
B	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)

MAWP ④④④④
1 1 . 8
1 6 M P
2 1 M P
2 5 M P
3 5 M P

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
0 0 3
L 0 1
L 0 3
L 0 5
L 0 7

③	SERIES
J	J Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)

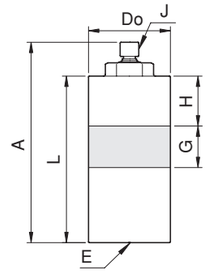
⑦	SPECIFICATION FOR OIL PORT SIDE
B	Aluminum ※3
D	Stainless Steel ※4

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	0.03L Only Aluminum ※3, ※5	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※6
B	0.7L Only Titanium	Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※6
N	Other Carbon Steel	Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

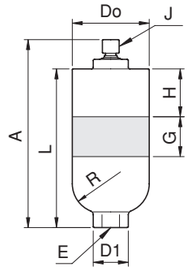
※3 Water glycol fluids and some phosphate ester based fluids cannot be used for accumulators with a 0.03 L aluminum shell (⑧ Specification of Shell) and an aluminum button on the oil port side ("B" for ⑦ Specification for Oil Port Side). For more information, please contact us or the fluid manufacturer.
※4 When selecting D, please contact us.
※5 0.03 L accumulators are made of anodized aluminum.
※6 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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

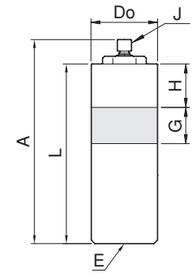
Dimensional Drawing



Maximum Allowable Working Pressure
16(11.8)/35MPa



Maximum Allowable Working Pressure
25MPa



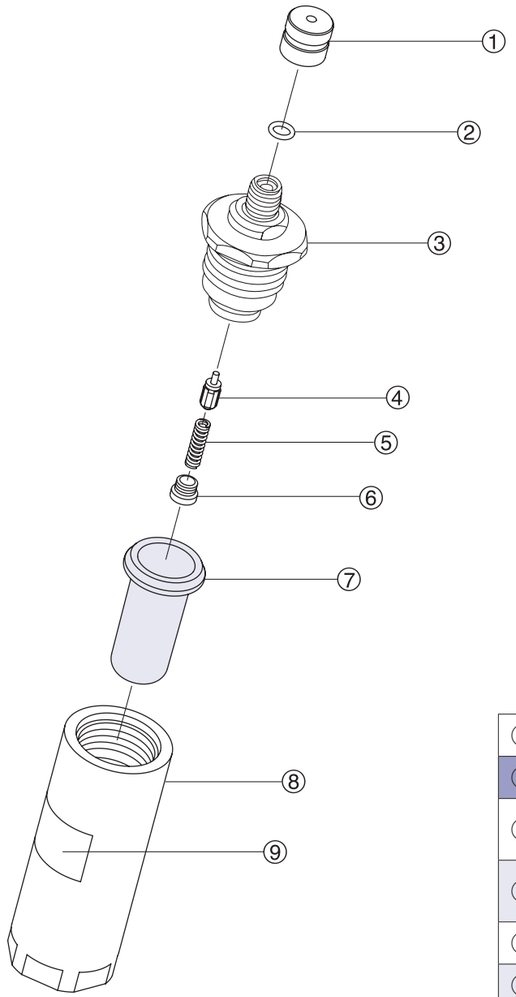
Maximum Allowable Working Pressure
21MPa

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	L mm	H mm			G mm	ϕDo±1% mm	D1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
16(11.8) ※7	①② - J 1 6 M P - 0 0 3 - A B ⑧	0.03	0.39	144 +3 0	110	32			50	44	—	—	Rc1/4	G1/4	—
21	①② - J 2 1 M P - L 0 7 - X X X012	0.7	6	302 +3 0	267	60				98.5	—	—	—		—
25	①② - J 2 5 M P - L 0 1 - A B ⑧	0.1	2.2	144 ±3	107	20				72	Hex.30	27	Rc3/8		12L/min
	①② - J 2 5 M P - L 0 3 - A B ⑧	0.3	3.6	244 ±3	207	60									
	①② - J 2 5 M P - L 0 5 - A B ⑧	0.5	5.7	235 +3 0	198					96.5	Hex.41	37	Rc3/4		
35	①② - J 3 5 M P - L 0 5 - A D X039	0.5	7	238 +3 0	198	60				98	—	—	G1/4	G3/8 ※9	

※7 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※8 For products certified according to the High Pressure Gas Safety Law, Japan, the maximum allowable working pressure is 11.8 MPa.
※9 O-Type Ring Seal (JIS B 2351-1:2000)

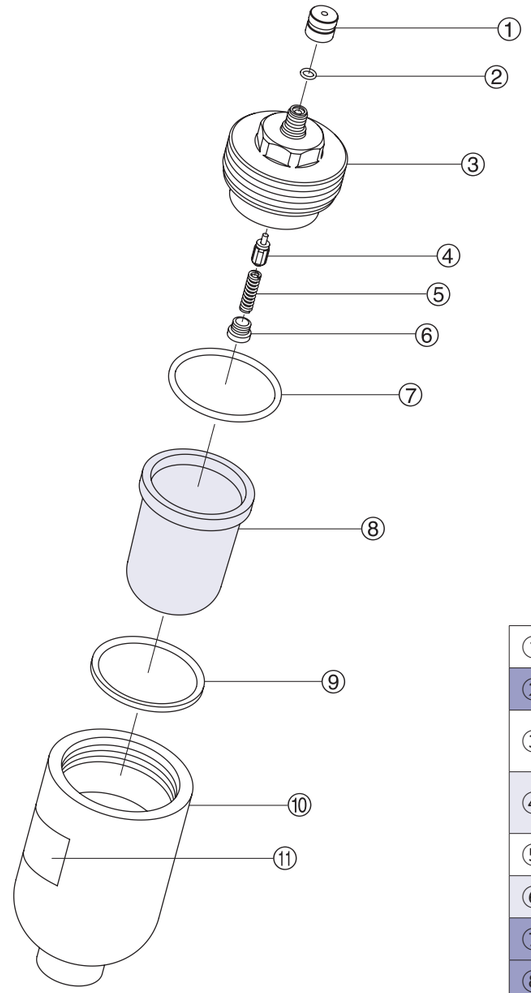
Typical Exploded View



①	Valve Cap
②	O-ring
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, ②o-ring will be attached with the bladder.

Typical Exploded View



①	Valve Cap
②	O-ring
③	Top Cap With Dynac Valve
④	Dynac Valve Packing With Valve Stem
⑤	Spring
⑥	Spring Nut
⑦	O-ring
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, ②⑦o-rings will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure (MPa)					11.8/16	21			25	35
Item Number of Accumulator					①②-J11．8-003-AB⑧	①②-J21MP-L07-XXX012			①②-J25MP-L01-AB⑧	①②-J35MP-L05-ADX039
					N②-J16MP-003-AB⑧				①②-J25MP-L03-AB⑧	
									①②-J25MP-L05-AB⑧	
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□				6GG□□□□□□□	6GH□□□□□□□
	For Installation	NACOL Clamp		☞P200	—	—			6K097N(0.5L only)	—
		NORMA Clamp		☞P201	—				6081C095(0.5L only)	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—	
Bladder Replacement	Parts	Bladder		☞P210	65②J003A17A	65②JL07TB3A			65②J⑤⑤⑤A17A	65②JL05U16A
		Bladder Back Up Ring			—				—	
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)				— (Please use a commercially available wrench.)	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A	
		Spring		☞P212	645045500				645045500	
		Spring Nut		☞P212	645048200				645048200	
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—				—	
Separately Available Parts	Eye Nut (Hanging Tool)				—				—	
	Valve Cover				—				—	
	Exclusively for Q/R Spec.	SG Valve		☞P196	—				—	
		Pressure Gauge Containing Glycerol		☞P197	—				—	
		Spring Loaded Type Safety Valve		☞P198	—				—	
		Fuse Plug		☞P197	—				—	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER COMPOUND
B	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)

MAWP ④④④④	
1 0 M P	
1 7 . 5	
2 5 M P	

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤	
L L 1	
L L 2	
L L 3	
L L 4	
L L 5	

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
J	J Series

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※3
B	Aluminum ※4

※3 When selecting D, please contact us.

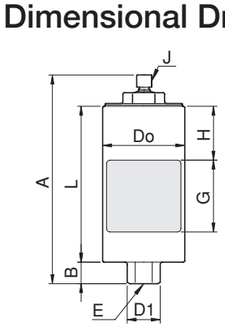
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil -Water + Glycol Fluid & Other Fluid

※4 Water glycol fluids and some phosphate ester based fluids cannot be used for accumulators with 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.

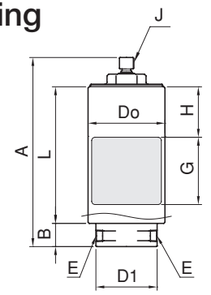
※5 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

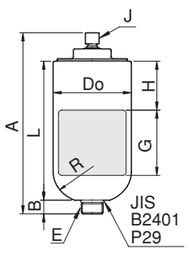
Dimensional Drawing



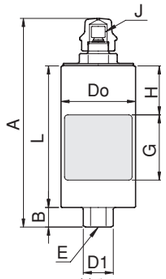
LL1
LL2
①②-J10MP-LL3-AB⑧
LL4
LL5



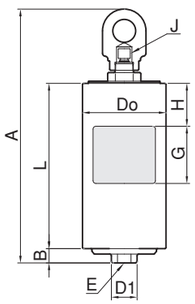
LL1
LL2
①②-J10MP-LL3-AX⑧412
LL4
LL5



LL1
①②-J10MP-LL1-AX⑧297



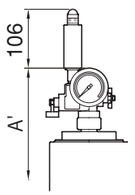
LL1
LL2
LL3
**-J17.5-LL2-⑥B⑧
①②-J25MP-LL2-⑥A⑧



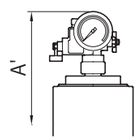
①②-J17.5-LL4/LL5-⑥B⑧
①②-J25MP-LL4/LL5-⑥A⑧

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +3 0 mm	A' +4 0 mm	L mm			B mm	H mm	G mm	φDo±1% mm	D1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
10	①②-J10MP-LL1-AB⑧	1	7	277	—	203			30	75	90	114.3	Hex.41	—	Rc3/4	G1/4	60L/min
	①②-J10MP-LL2-AB⑧	2	9	413		339											
	①②-J10MP-LL3-AB⑧	3	11	531		457											
	①②-J10MP-LL4-AB⑧	4	17	543		470						133					
	①②-J10MP-LL5-AB⑧	5	20	643		570											
	①②-J10MP-LL1-AX⑧412	1	8.7	282	—	203			35			114.3	φ98	—	Rc3/8		
	①②-J10MP-LL2-AX⑧412	2	10.7	418		339											
	①②-J10MP-LL3-AX⑧412	3	12.7	536		457											
	①②-J10MP-LL4-AX⑧412	4	19	548		470						133	φ108				
	①②-J10MP-LL5-AX⑧412	5	22	648		570											
	①②-J10MP-LL1-AX⑧297	1	11	278	—	213			21			120	—	51	G1		
17.5	①②-J17.5-LL1-⑥B⑧	1	11	318	381	215			30			120	Hex.41	—	Rc3/4		
	①②-J17.5-LL2-⑥B⑧	2	14	454	517	351											
	①②-J17.5-LL3-⑥B⑧	3	17	572	635	469											
	①②-J17.5-LL4-⑥B⑧	4	23	641	486	486			25			139.8					
	①②-J17.5-LL5-⑥B⑧	5	27	741	586	586											
25	①②-J25MP-LL1-⑥A⑧	1	13	318	381	215			30			127					
	①②-J25MP-LL2-⑥A⑧	2	18	454	517	351											
	①②-J25MP-LL3-⑥A⑧	3	23	572	635	469											
	①②-J25MP-LL4-⑥A⑧	4	29	641	648	486			25			146					
	①②-J25MP-LL5-⑥A⑧	5	34	741	748	586											



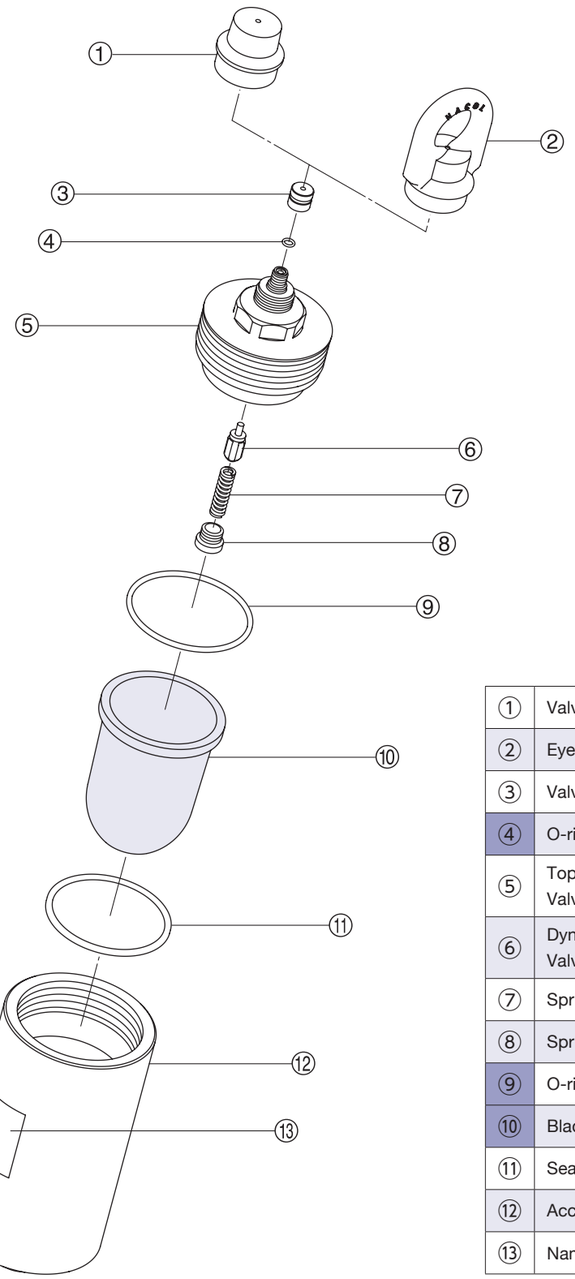
Gas Charging Side Spec:Q



Gas Charging Side Spec:R

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

Typical Exploded View



①	Valve Cover
②	Eye Nut
③	Valve Cap
④	O-ring
⑤	Top Cap With Dynac Valve
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder
⑪	Seat Ring
⑫	Accumulator Body
⑬	Nameplate

※1 The typical exploded view for this series.
※2 If you purchase ⑩ bladder as the spare parts, ④⑨o-rings will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa				10				10	17.5	25
Item Number of Accumulator				①②-J10MP-LL1-AX⑧297	①②-J10MP-LL1-AB⑧			①②-J10MP-LL1-AX⑧412	①②-J17.5-LL1-⑥B⑧	①②-J25MP-LL1-⑥A⑧
					①②-J10MP-LL2-AB⑧			①②-J10MP-LL2-AX⑧412	①②-J17.5-LL2-⑥B⑧	①②-J25MP-LL2-⑥A⑧
					①②-J10MP-LL3-AB⑧			①②-J10MP-LL3-AX⑧412	①②-J17.5-LL3-⑥B⑧	①②-J25MP-LL3-⑥A⑧
					①②-J10MP-LL4-AB⑧			①②-J10MP-LL4-AX⑧412	①②-J17.5-LL4-⑥B⑧	①②-J25MP-LL4-⑥A⑧
					①②-J10MP-LL5-AB⑧			①②-J10MP-LL5-AX⑧412	①②-J17.5-LL5-⑥B⑧	①②-J25MP-LL5-⑥A⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □			6GG□□□□ □□□ □		
	For Installation	NACOL Clamp		☞P200	6K120N	6K114N(3L or less) 6K133N(4L or more)		6K114N(3L or less) 6K133N(4L or more)	6K120N(3L or less) 6K139N(4L or more)	6K127N(3L or less) 6K146N(4L or more)
		NORMA Clamp		☞P201	6081C120	6081C114(3L or less) 6081C133(4L or more)		6081C114(3L or less) 6081C133(4L or more)	6081C120(3L or less) 6081C140(4L or more)	6081C128(3L or less) 6081C146(4L or more)
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	–			–		
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	–			–		
Bladder Replacement	Parts	Bladder		☞P210	65②J⑤⑤⑤A17A			65②J⑤⑤⑤A17A		65②J⑤⑤⑤35CA
		Bladder Back Up Ring			–			–		
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)			— (Please use a commercially available wrench.)		
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A		
		Spring		☞P212	645045500			645045500		
		Spring Nut		☞P212	645048200			645048200		
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04		
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	–			–		
Separately Available Parts	Eye Nut (Hanging Tool)				–			–	6HTM32	
	Valve Cover				–			–	645049608	
	For Q/R Spec.	SG Valve		☞P196	–			–	6H□-AV35MP-F03-M32A	
		Pressure Gauge Containing Glycerol		☞P197	–			–	6018DUF0206□□□□G	
		Spring Loaded Type Safety Valve		☞P198	–			–	6H-SV□□□□-03-F03	
		Fuse Plug		☞P197	–			–	6H-FP35MP-03-F03	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
R	EUROPE	P.E.D. (97/23/EC)
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 1 M P
2 3 M P
3 5 M P
4 5 M P
2 1 0 B

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L L 1
2 . 5
L L 4

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard 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 for 45MPa.

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※5

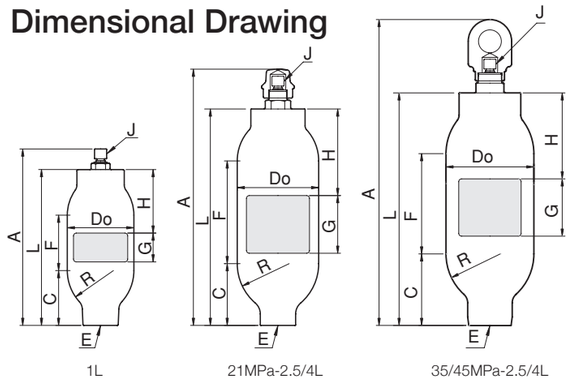
※5 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※6
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※6
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

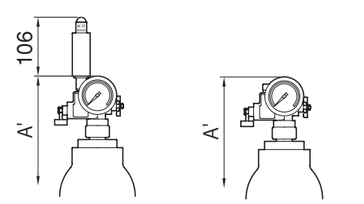
※6 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



1L　21MPa-2.5/4L　35/45MPa-2.5/4L



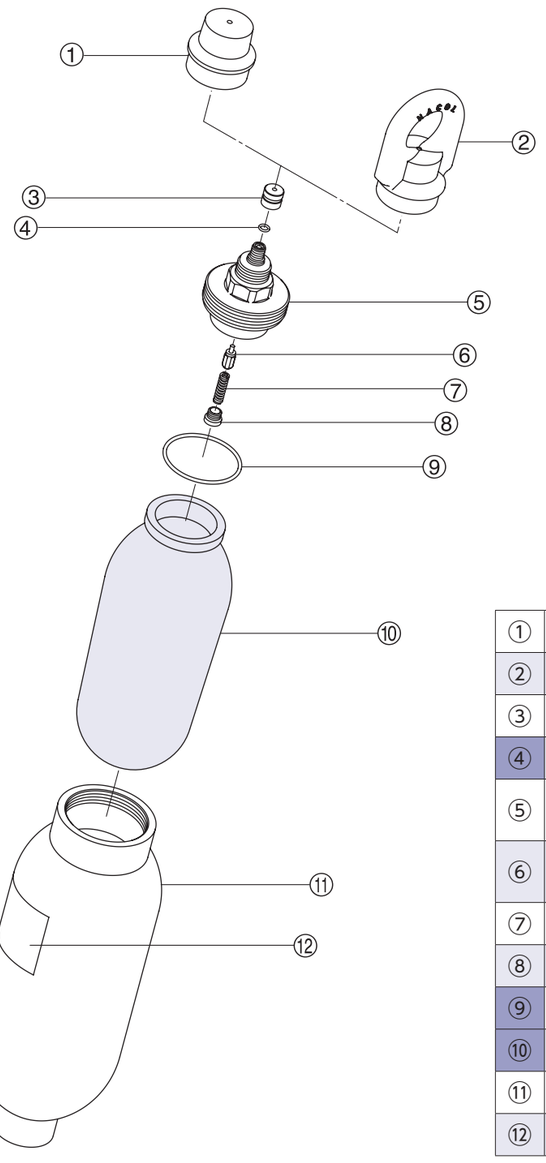
Gas Charging Side Spec:Q　Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	A' mm	L mm			C mm	F mm	H mm	G mm	ϕDo±1% mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
21	①②-N21MP-LL1-⑥⑦⑧	1	7	300 +8 0	397 +8 0	264			95	90	110	50	114.3	80	M42x2	G1/4	120L/min
	①②-N21MP-2.5-⑥⑦⑧	2.5	13	438 +8 0	502 +8 0	369			107	172	150	90	139.8	90			
	①②-N21MP-LL4-⑥⑦⑧	4	18	581 +8 0	645 +8 0	512				315							
23	①②-N23MP-LL1-⑥⑦⑧	1	7	300 +8 0	397 +8 0	264			95	90	110	50	114.3	80			
35	①②-N35MP-LL1-⑥⑦⑧	1	14.5	331 +9 0	424 +9 0	291			112	89			127			G3/8	
	①②-N35MP-2.5-⑥⑦⑧	2.5	23	523 +9 0	530 +9 0	397			125	166	150	90	152.4	95			
	①②-N35MP-LL4-⑥⑦⑧	4	30	666 +9 0	673 +9 0	540				309							
45	①②-N45MP-LL1-⑥⑦⑧	1	14.5	331 +9 0	—	291			112	89	110	50	127	80			
	①②-N45MP-2.5-⑥⑦⑧	2.5	23	523 +9 0	—	397			125	166	150	90	152.4	95			
	①②-N45MP-LL4-⑥⑦⑧	4	30	666 +9 0		540				309							

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

Typical Exploded View



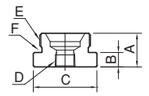
①	Valve Cover
②	Eye Nut ※3
③	Valve Cap
④	O-ring
⑤	Top Cap With Dynac Valve
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder
⑪	Accumulator Body
⑫	Nameplate

※1 The typical exploded view for this series.
※2 If you purchase ⑩ bladder as the spare parts, ④⑨o-rings will be attached with the bladder.
※3 Only for 2.5L and 4L accumulator which maximum allowable working pressure is 35MPa or more.

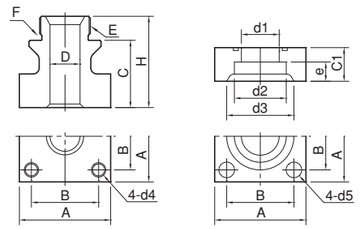
Piping Connection

Dimensional Drawing

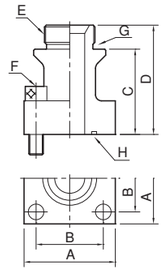
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
21MPa 23MPa	6RAM42R02N23M	Rc1/4	28	12	ϕ53 (Width across flat 50)	Rc1/4	M42x2	AS568 920	–
	6RAM42R03N23M	Rc3/8				Rc3/8			
	6RAM42R04N23M	Rc1/2				Rc1/2			
	6RAM42R06N23M	Rc3/4				Rc3/4			
35MPa	6RAM42R02N35M	Rc1/4	57	22	ϕ70 (Width across flat 65)	Rc1/4			Special B.U. Ring
	6RAM42R03N35M	Rc3/8				Rc3/8			
	6RAM42R04N35M	Rc1/2				Rc1/2			
	6RAM42R06N35M	Rc3/4				Rc3/4			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	ϕD	C1	ϕ d1	ϕ d2	ϕ d3	ϕ d4	ϕ d5	E	F		G
																O-Ring	B.U. Ring	
21MPa	6FAM4215AN21M	15A	54	36	22	42	11	16	22	16	22.2	32	M10	11	M42x2	AS568 920	–	G25
	6FAM4215LX003	15A	76	56	56	76		25	28				M12	13				G40
	6FAM4220LX005	20A					12			20	27.7	38						
	6FAM4225LX001	25A					14			25	34.5	45						
	6FAM4232LN21M	32A					16			31.5	43.2	56						
	6FAM4240AX008	40A	100	73	36	56	18	48	36	37.5	49.1	63	M16	18				G60
	6FAM4250AN21M	50A					20			47.5	61.1	75						
35MPa	6FAM4215AX009	15A	68	48		71	12	16	28	12.3	22.2	37.5	M12	14			AS568 920	G30
	6FAM4220AN35M	20A								16.2	27.7	43.5						
	6FAM4225AX006	25A	92	65	45	80	14	25	36	21	34.5	53	M16	18				G40

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
21MPa	6FAM4232DN21M	32A	76	56	71	91	M42x2	M12x45	AS568 920	–	G40
	6FAM4250DN21M	50A	100	73	36	84		M16x55			G60
35MPa	6FAM4225DX020	25A	95	65	35	136		M16x60		AS568 920	G30
	6FAM4232DN35M	32A	100	70	70	105					G35

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa				21	23			35	45
Item Number of Accumulator				①②-N21MP-LL1-⑥⑦⑧	①②-N23MP-LL1-⑥⑦⑧			①②-N35MP-LL1-⑥⑦⑧	①②-N45MP-LL1-⑥⑦⑧
				①②-N21MP-2.5-⑥⑦⑧				①②-N35MP-2.5-⑥⑦⑧	①②-N45MP-2.5-⑥⑦⑧
				①②-N21MP-LL4-⑥⑦⑧				①②-N35MP-LL4-⑥⑦⑧	①②-N45MP-LL4-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □			6GH□□□□ □□□ □	
	For Installation	NACOL Clamp		☞P200	1L:6K114N 2.5/4L:6K139N	6K114N		1L:6K127N 2.5/4L:6K152N	
		NORMA Clamp		☞P201	1L:6081C114 2.5/4L:6081C140	6081C114		1L:6081C128 2.5/4L:6081C152	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—			—	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—			—	
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A			65②N⑤⑤⑤A	
		Bladder Back Up Ring			—			—	
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)			— (Please use a commercially available wrench.)	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A	
		Spring		☞P212	645045500			645045500	
		Spring Nut		☞P212	645048200			645048200	
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—			—	
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32 (Cannot be installed to 1L)	—		6HTM42 (Cannot be installed to 1L)	
	Valve Cover				645049608 (Cannot be installed to 1L)	—		645049705 (Cannot be installed to 1L)	
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A			6H□-AV35MP-F03-M42A	—
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G			6018DUF0206□□□□G	—
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03			6H-SV□□□□-03-F03	—
		Fuse Plug		☞P197	6H-FP35MP-03-F03			6H-FP35MP-03-F03	—

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
1 7 . 5
2 1 M P
2 3 M P
3 5 M P
4 5 M P
2 1 0 B
3 5 0 B

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤⑤⑤
L L 5
6 . 3
L 1 0
L 1 6

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard 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 for 45MPa.

③	SERIES
A	A Series

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※5

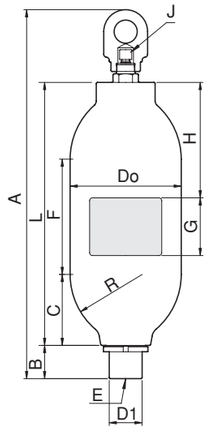
※5 When selecting D, please contact us.

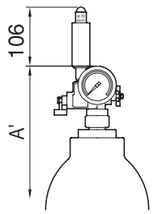
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※6
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※6
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※6 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.

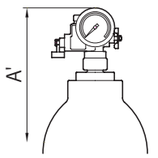
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



Gas Charging Side Spec:R

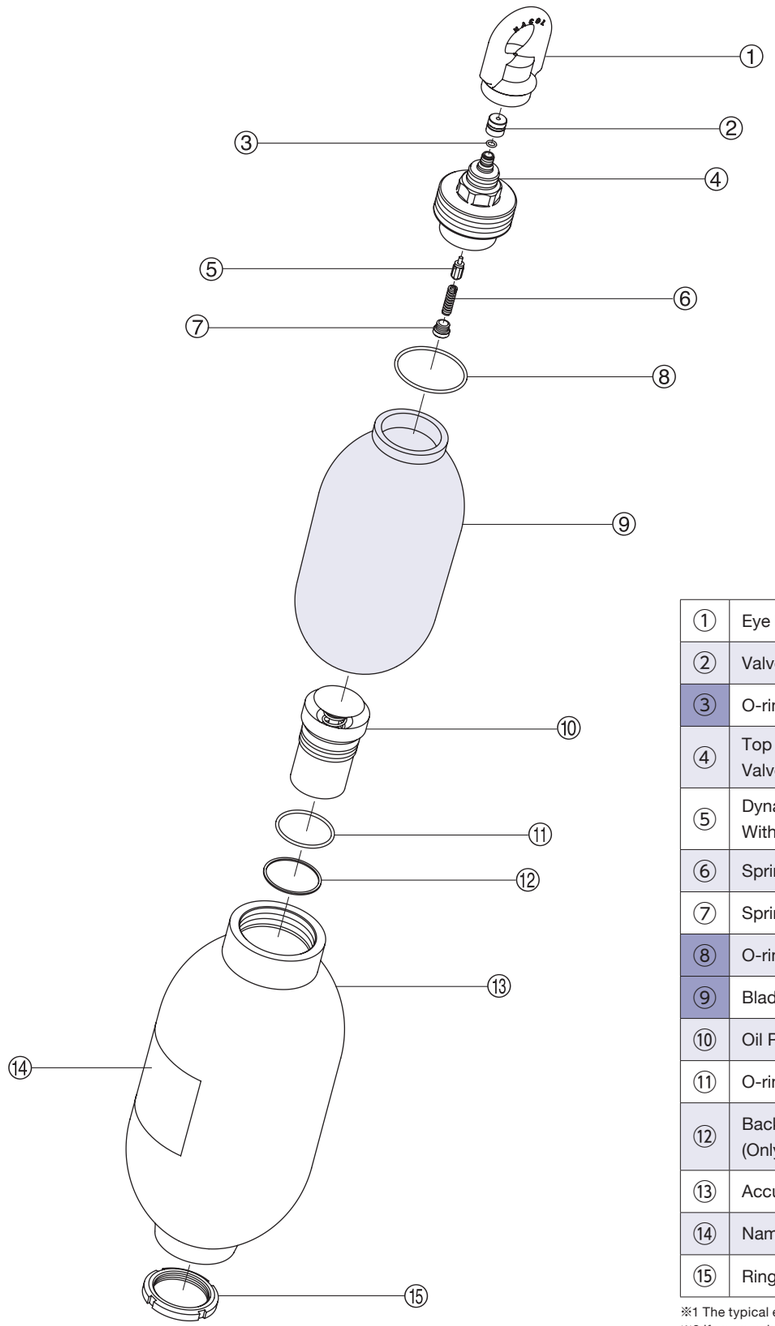
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+12}_{0}$ mm	A' $^{+12}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
17.5	①②-A17.5-LL5-⑥⑦⑧	5	23	574	581	390			58	123	134	200	90	190.7	57	125	M42x2	G1/4	300L/min	450L/min ※8
	①②-A17.5-6.3-⑥⑦⑧	6.3	25	647	654	463					207									
	①②-A17.5-L10-⑥⑦⑧	10	32	822	829	638					382									
	①②-A17.5-L16-⑥⑦⑧	16	47	1,134	1,141	950					694	250								
21	①②-A21MP-LL5-⑥⑦⑧	5	27	574	581	390					134	200								
	①②-A21MP-6.3-⑥⑦⑧	6.3	30	647	654	463					207									
	①②-A21MP-L10-⑥⑦⑧	10	39	822	829	638					382									
	①②-A21MP-L16-⑥⑦⑧	16	58	1,134	1,141	950					694	250								
23	①②-A23MP-LL5-⑥⑦⑧	5	29	574	581	390					134	200								
	①②-A23MP-6.3-⑥⑦⑧	6.3	32	647	654	463					207									
	①②-A23MP-L10-⑥⑦⑧	10	41	822	829	638					382									
	①②-A23MP-L16-⑥⑦⑧	16	59	1,134	1,141	950					694	250								
35	①②-A35MP-LL5-⑥⑦⑧	5	35	591	598	398			67	131	127	200		216.3		135		G3/8		
	①②-A35MP-6.3-⑥⑦⑧	6.3	57	664	671	471					200									
	①②-A35MP-L10-⑥⑦⑧	10	74	838	845	645					374									
	①②-A35MP-L16-⑥⑦⑧	16	97	1,150	1,157	957					686	250								
45	①②-A45MP-LL5-⑥⑦⑧	5	35	591	—	398					127	200								
	①②-A45MP-6.3-⑥⑦⑧	6.3	57	664		471					200									
	①②-A45MP-L10-⑥⑦⑧	10	74	838		645					374									
	①②-A45MP-L16-⑥⑦⑧	16	97	1,150		957					686	250								

※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.

Typical Exploded View



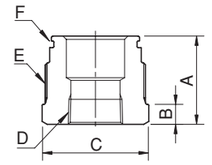
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring
⑨	Bladder
⑩	Oil Port Valve Assembly
⑪	O-ring
⑫	Back Up Ring (Only for 35MPa or more)
⑬	Accumulator Body
⑭	Nameplate
⑮	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧o-rings will be attached with the bladder.

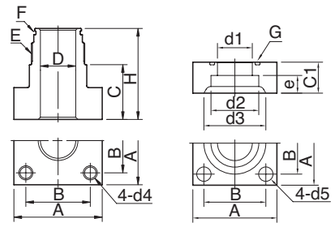
Piping Connection

Dimensional Drawing

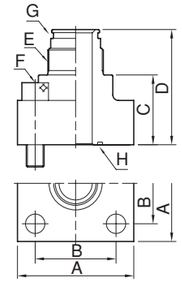
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
17.5MPa 21MPa 23MPa	6RCM42R02N23M	Rc1/4	42	12.7	φ44 (Width across flat 41)	Rc1/4	M42x2	JIS B2401 P32	—
	6RCM42R03N23M	Rc3/8				Rc3/8			
	6RCM42R04N23M	Rc1/2				Rc1/2			
	6RCM42R06N23M	Rc3/4				Rc3/4			
	6RCM42R08N23M	Rc1	60	30	φ50 (Width across flat 46)	Rc1			
	6RCM42R10N23M	Rc1-1/4	70	40	φ65 (Width across flat 60)	Rc1-1/4			
35MPa	6RCM42R02N35M	Rc1/4	58	17	φ50 (Width across flat 46)	Rc1/4		AS568 218	AS568 218
	6RCM42R03N35M	Rc3/8				Rc3/8			
	6RCM42R04N35M	Rc1/2				Rc1/2			
	6RCM42R06N35M	Rc3/4				Rc3/4			
	6RCM42R08N35M	Rc1	76	35	φ60 (Width across flat 55)	Rc1			
	6RCM42R10N35M	Rc1-1/4	81	40	φ65 (Width across flat 60)	Rc1-1/4			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	φD	C1	φ d1	φ d2	φ d3	φ d4	φ d5	E	F		G
																O-Ring	B.U. Ring	
17.5MPa 21MPa	6FCM4215AX007	15A	76	56	28	58	11	25	28	16	22.2	32	M12	13	M42x2	JIS B2401 P32	—	G40
	6FCM4220AX006	20A					12			20	27.7	38						
	6FCM4225AX005	25A					14			25	34.5	45						
	6FCM4232AN21M	32A					16			31.5	43.2	56						
	6FCM4240AX013	40A	100	73	36	66	18	47	36	37.5	49.1	63	M16	18				G60
	6FCM4250AN21M	50A					20			47.5	61.1	75						
35MPa	6FCM4215AX015	15A	68	48	36	77	12	16	28	12.3	22.2	37.5	M12	14		AS568 218	AS568 218	G30
	6FCM4220AN35M	20A								16.2	27.7	43.5						
	6FCM4225AX009	25A	92	65	45	86	14	25	36	21	34.5	53	M16	18				G40
	6FCM4232AN35M	32A					18		36	30	43.2	63						
	6FCM4250AN35M	50A	132	92	50	91	25	35	50	35	61.1	84	M20	22				G50

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
17.5MPa 21MPa	6FCM4232DN21M	32A	76	56	51	81	M42x2	M12x45	JIS B2401 P32	—	G40
	6FCM4240DN21M	40A	92	65	36	86		M16x55			G50
	6FCM4250DN21M	50A	100	73		66					G60
35MPa	6FCM4225DN35M	25A	95	65	54	95		M16x60	AS568 218	AS568 218	G30
	6FCM4225DX027	25A	φ106	52	110	151		M16x55			G35
	6FCM4232DN35M	32A	100	70	54	95		M16x60			

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa				17.5	21			23	35	45
Item Number of Accumulator				①②-A17.5-LL5-⑥⑦⑧	①②-A21MP-LL5-⑥⑦⑧			①②-A23MP-LL5-⑥⑦⑧	①②-A35MP-LL5-⑥⑦⑧	①②-A45MP-LL5-⑥⑦⑧
				①②-A17.5-6.3-⑥⑦⑧	①②-A21MP-6.3-⑥⑦⑧			①②-A23MP-6.3-⑥⑦⑧	①②-A35MP-6.3-⑥⑦⑧	①②-A45MP-6.3-⑥⑦⑧
				①②-A17.5-L10-⑥⑦⑧	①②-A21MP-L10-⑥⑦⑧			①②-A23MP-L10-⑥⑦⑧	①②-A35MP-L10-⑥⑦⑧	①②-A45MP-L10-⑥⑦⑧
				①②-A17.5-L16-⑥⑦⑧	①②-A21MP-L16-⑥⑦⑧			①②-A23MP-L16-⑥⑦⑧	①②-A35MP-L16-⑥⑦⑧	①②-A45MP-L16-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □			6GG□□□□ □□□ □	6GH□□□□ □□□ □	
	For Installation	NACOL Clamp		☞P200	6K190N			6K190N	6K216N	
		NORMA Clamp		☞P201	6081C191			6081C191	6081C215	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	6BMP190N			6BMP190N		
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP191			6BMP191		
Bladder Replacement	Parts	Bladder		☞P210	65②A⑤⑤⑤A			65②A⑤⑤⑤A		
		Bladder Back Up Ring			—			—		
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)			— (Please use a commercially available wrench.)		
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A		
		Spring		☞P212	645045500			645045500		
		Spring Nut		☞P212	645048200			645048200		
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04		
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD075			6TWD75		
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32			6HTM32	6HTM42	
	Valve Cover				645049608			645049608	645049705	
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A			6H□-AV35MP-F03-M32A	6H□-AV35MP-F03-M42A	—
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G			6018DUF0206□□□□G		—
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03			6H-SV□□□□-03-F03		—
		Fuse Plug		☞P197	6H-FP35MP-03-F03			6H-FP35MP-03-F03		—

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
1 7 . 5
2 1 M P
2 3 M P
3 5 M P
4 9 . 1
4 9 . 4
2 1 0 B
3 5 0 B

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤⑤⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
D	Top Cap Two Pieces Type (For 49.1/49.4MPa) 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 for 49.1/49.4MPa.

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※5

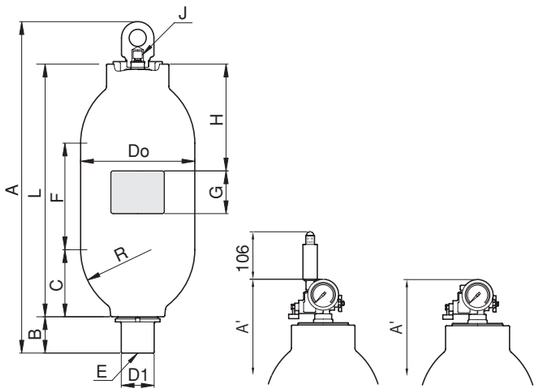
※5 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※6
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※6
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※6 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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



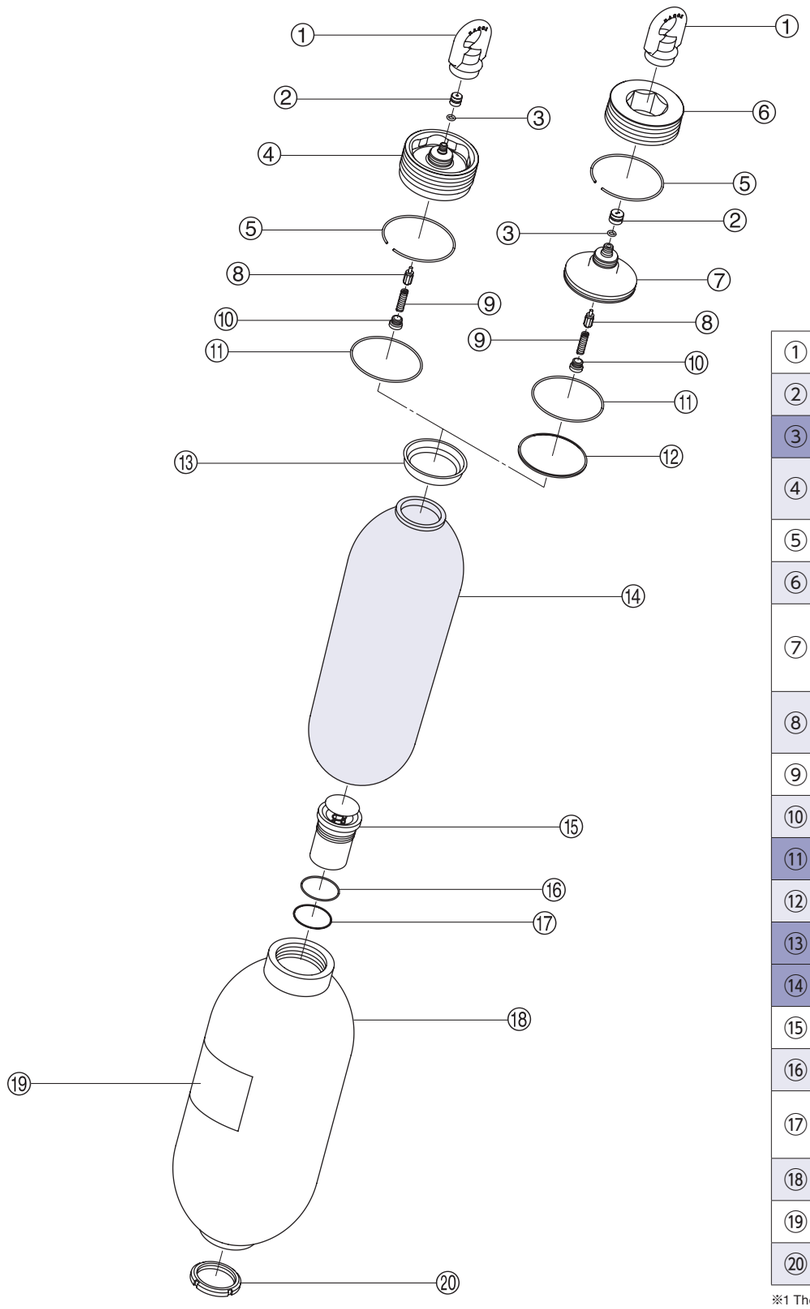
Gas Charging Side Spec:Q　Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
17.5	①②-N17.5-L20-⑥⑦⑧	20	75	852	859	668			85	157	326	250	90	267.4	77	160	M60x2	G1/4	600L/min	1,100L/min ※9
	①②-N17.5-L30-⑥⑦⑧	30	97	1,097	1,104	913					571									
	①②-N17.5-L40-⑥⑦⑧	40	123	1,312	1,319	1,128					786	400								
	①②-N17.5-L50-⑥⑦⑧	50	156	1,634	1,641	1,450					1,108	700								
	①②-N17.5-L60-⑥⑦⑧	60	168	1,772	1,779	1,588					1,246									
21	①②-N21MP-L20-⑥⑦⑧	20	85	852	859	668					326	250				165				
	①②-N21MP-L30-⑥⑦⑧	30	112	1,097	1,104	913					571									
	①②-N21MP-L40-⑥⑦⑧	40	140	1,312	1,319	1,128					786	400								
	①②-N21MP-L50-⑥⑦⑧	50	180	1,634	1,641	1,450					1,108	700								
	①②-N21MP-L60-⑥⑦⑧	60	190	1,772	1,779	1,588					1,246									
23	①②-N23MP-L20-⑥⑦⑧	20	90	852	859	668					326	250								
	①②-N23MP-L30-⑥⑦⑧	30	118	1,097	1,104	913					571									
	①②-N23MP-L40-⑥⑦⑧	40	148	1,312	1,319	1,128					786	400								
	①②-N23MP-L50-⑥⑦⑧	50	190	1,634	1,641	1,450					1,108	700								
	①②-N23MP-L60-⑥⑦⑧	60	200	1,772	1,779	1,588					1,246									
35	①②-N35MP-L20-⑥⑦⑧	20	150	865	872	671			95	164	320	250		298.5		200		G3/8		
	①②-N35MP-L30-⑥⑦⑧	30	205	1,100	1,117	916					565									
	①②-N35MP-L40-⑥⑦⑧	40	255	1,325	1,332	1,131					780	400								
	①②-N35MP-L50-⑥⑦⑧	50	330	1,647	1,654	1,453					1,102	700								
	①②-N35MP-L60-⑥⑦⑧	60	355	1,785	1,792	1,591					1,240									
49.4 (49.1) ※8	①②-N49.4-L20-⑥⑦⑧	20	150	865	–	671					320	250								
	①②-N49.4-L30-⑥⑦⑧	30	205	1,100		916					565									
	①②-N49.4-L40-⑥⑦⑧	40	255	1,325		1,131					780	400								
	①②-N49.4-L50-⑥⑦⑧	50	330	1,647		1,453					1,102	700								
	①②-N49.4-L60-⑥⑦⑧	60	355	1,785		1,591					1,240									

※7 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※8 For products certified according to the High Pressure Gas Safety Law, Japan, the maximum allowable working pressure is 49.1 MPa.
※9 Maximum oil flow rate available under certain conditions.

Typical Exploded View



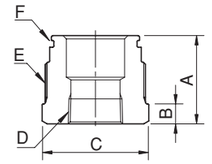
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Back Up Ring (Only for 35MPa or more)
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, ③⑪o-rings and ⑬ bladder cap will be attached with the bladder.

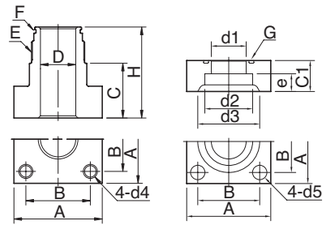
Piping Connection

Dimensional Drawing

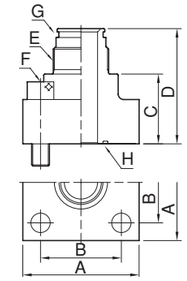
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
17.5MPa 21MPa 23MPa	6RCM60R02N23M	Rc1/4	53	12	ϕ64 (Width across flat 60)	Rc1/4	M60x2	JIS B2401 G50	–
	6RCM60R03N23M	Rc3/8				Rc3/8			
	6RCM60R04N23M	Rc1/2				Rc1/2			
	6RCM60R06N23M	Rc3/4				Rc3/4			
	6RCM60R08N23M	Rc1				Rc1			
	6RCM60R10N23M	Rc1-1/4				Rc1-1/4			
	6RCM60R12N23M	Rc1-1/2	77	36	ϕ85 (Width across flat 80)	Rc1-1/2			
35MPa	6RCM60R02N35M	Rc1/4	73	20	ϕ75 (Width across flat 70)	Rc1/4		AS568 225	AS568 225
	6RCM60R03N35M	Rc3/8				Rc3/8			
	6RCM60R04N35M	Rc1/2				Rc1/2			
	6RCM60R06N35M	Rc3/4				Rc3/4			
	6RCM60R08N35M	Rc1				Rc1			
	6RCM60R10N35M	Rc1-1/4	85	32		Rc1-1/4			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	ϕD	C1	ϕ d1	ϕ d2	ϕ d3	ϕ d4	ϕ d5	E	F		G
																O-Ring	B.U. Ring	
17.5MPa 21MPa	6FCM6015AX009	15A	76	56	28	69	11	30	28	16	22.2	32	M12	13	M60x2	JIS B2401 G50	–	G40
	6FCM6020AX008	20A					12			20	27.7	38						
	6FCM6025AX007	25A					14			25	34.5	45						
	6FCM6032AN21M	32A					16			31.5	43.2	56						
	6FCM6040LX010	40A	100	73	62	103	18	47.5	36	37.5	49.1	63	M16	18				G60
	6FCM6050LN21M	50A					20			47.5	61.1	75						
	6FCM6065AN21M	65A	128	92	45	86	22	60	45	60	77.1	95	M20	22				G75
35MPa	6FCM6015AX014	15A	68	48	36	89	12	16	28	12.3	22.2	37.5	M12	14		AS568 225	AS568 225	G30
	6FCM6020AN35M	20A								16.2	27.7	43.5						
	6FCM6025AX012	25A	92	65	45	98	14	30	36	21	34.5	53	M16	18				G40
	6FCM6032AN35M	32A					18			30	43.2	63						
	6FCM6040AN35M	40A	110	75			20	35	45	35	49.1	70	M18	20				G45
	6FCM6050AN35M	50A	128	90	50	103	25		50	43	61.1	84	M20	22				G55

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
17.5MPa 21MPa	6FCM6032DN21M	32A	76	56	83	124	M60x2	M12x45	JIS B2401 G50	–	G40
	6FCM6040DX001	40A	92	65	119	160		M16x55			G50
	6FCM6050KN21M	50A	100	73	62	103					G60
35MPa	6FCM6025DX055	25A	ϕ106	52	115	168		M16x55	AS568 225	AS568 225	G35
	6FCM6032DN35M	32A	100	70	91	144		M16x60			
	6FCM6040DN35M	40A	105	75	47	100		M16x65			
	6FCM6050DN35M	50A	132	92	60	113		M20x80			G50

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa				17.5	21			23	35	49.4(49.1)
Item Number of Accumulator				①②-N17.5-L20-⑥⑦⑧	①②-N21MP-L20-⑥⑦⑧			①②-N23MP-L20-⑥⑦⑧	①②-N35MP-L20-⑥⑦⑧	①②-N49.4-L20-⑥⑦⑧
				①②-N17.5-L30-⑥⑦⑧	①②-N21MP-L30-⑥⑦⑧			①②-N23MP-L30-⑥⑦⑧	①②-N35MP-L30-⑥⑦⑧	①②-N49.4-L30-⑥⑦⑧
				①②-N17.5-L40-⑥⑦⑧	①②-N21MP-L40-⑥⑦⑧			①②-N23MP-L40-⑥⑦⑧	①②-N35MP-L40-⑥⑦⑧	①②-N49.4-L40-⑥⑦⑧
				①②-N17.5-L50-⑥⑦⑧	①②-N21MP-L50-⑥⑦⑧			①②-N23MP-L50-⑥⑦⑧	①②-N35MP-L50-⑥⑦⑧	①②-N49.4-L50-⑥⑦⑧
				①②-N17.5-L60-⑥⑦⑧	①②-N21MP-L60-⑥⑦⑧			①②-N23MP-L60-⑥⑦⑧	①②-N35MP-L60-⑥⑦⑧	①②-N49.4-L60-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □			6GG□□□□ □□□ □	6GH□□□□ □□□ □	
	For Installation	NACOL Clamp		☞P200	6KH267			6KH267	6KH298	
		NORMA Clamp		☞P201	6081C267			6081C267	6081C298	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199						
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP267			6BMP267		
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A			65②N⑤⑤⑤A		
		Bladder Back Up Ring			—			—	64008250120	
	Tools	Cap Wrench		☞P208	6TWH81			6TWH81		6TWH63
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A		
		Spring		☞P212	645045500			645045500		
		Spring Nut		☞P212	645048200			645048200		
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04		
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD105			6TWD105		
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32			6HTM32	6HTM42	6HTM42H63
	Valve Cover				645049608			645049608	645049705	
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A			6H□-AV35MP-F03-M32A	6H□-AV35MP-F03-M42A	—
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G			6018DUF0206□□□□G		—
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03			6H-SV□□□□-03-F03		—
		Fuse Plug		☞P197	6H-FP35MP-03-F03			6H-FP35MP-03-F03		—

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
1 5 M P
2 1 M P
2 5 M P
2 8 M P
3 3 M P
2 1 0 B
2 5 0 B

※2 MAWP: Maximum Allowable Working Pressure

※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤⑤⑤
L 8 0
1 2 0

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
D	Top Cap Two Pieces Type (only for 25MPa or more) Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※4

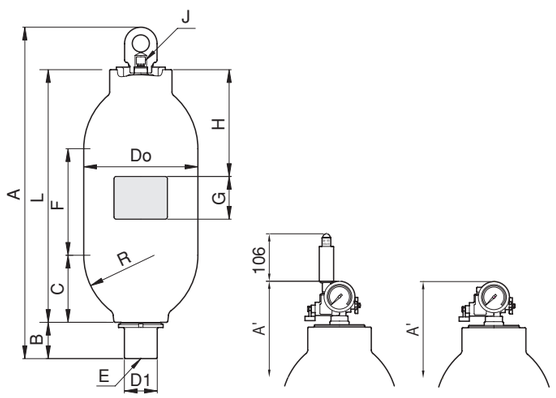
※4 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



Gas Charging Side Spec:Q Gas Charging Side Spec:R

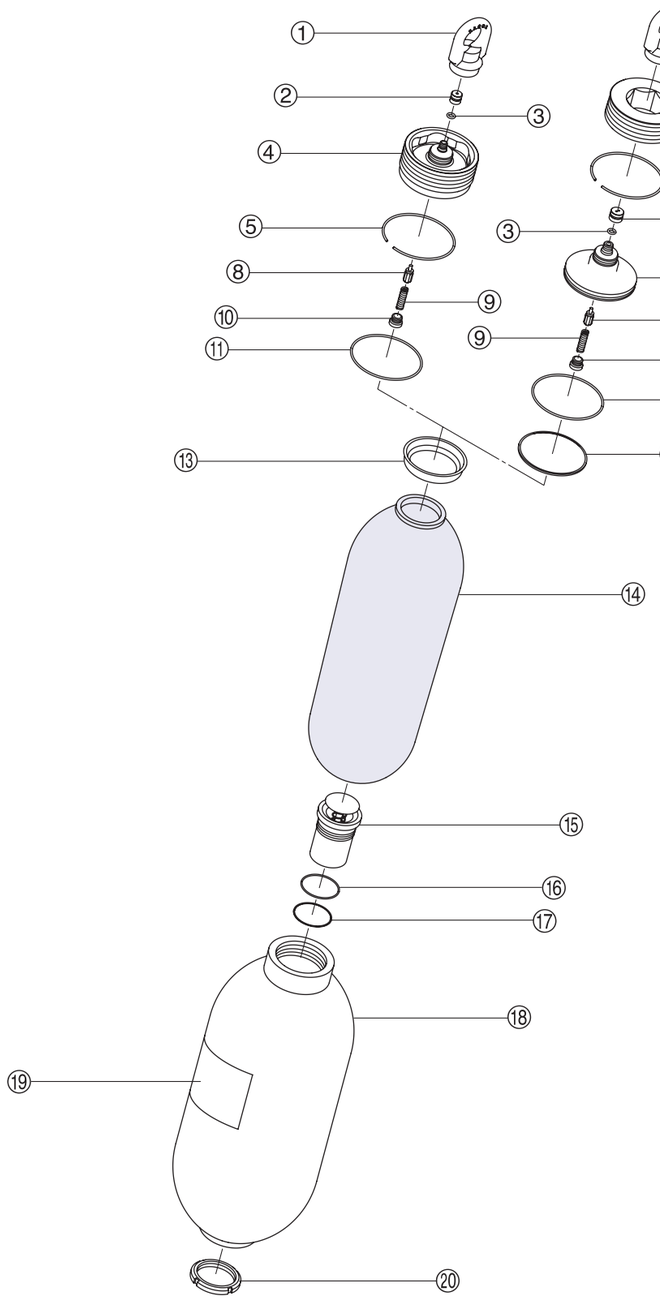
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	ϕDo±1% mm	ϕD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
15	①②-N15MP-L80-⑥⑦⑧	80	210	1,541	1,547	1,343			99	210	893	400	90	355.6	92.5	210	M75x2	G1/4	900L/min	1,800L/min ※7
	①②-N15MP-120-⑥⑦⑧	120	270	1,993	1,999	1,795					1,345	1,000								
21	①②-N21MP-L80-⑥⑦⑧	80	270	1,541	1,547	1,343					893	400				230				
	①②-N21MP-120-⑥⑦⑧	120	360	1,993	1,999	1,795					1,345	1,000								
25	①②-N25MP-L80-⑥⑦⑧	80	310	1,541	1,547	1,343					893	400								
	①②-N25MP-120-⑥⑦⑧	120	410	1,993	1,999	1,795					1,345	1,000								
28	①②-N28MP-L80-⑥⑦⑧	80	270	1,541	1,547	1,343					893	400						G3/8		
	①②-N28MP-120-⑥⑦⑧	120	360	1,993	1,999	1,795					1,345	1,000								
33	①②-N33MP-L80-⑥⑦⑧	80	310	1,541	1,547	1,343					893	400								
	①②-N33MP-120-⑥⑦⑧	120	410	1,993	1,999	1,795					1,345	1,000								

※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 Exploded View



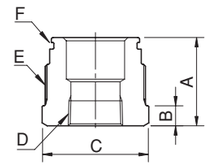
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Back Up Ring (Only for 25MPa or more)
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, ③⑪o-rings and ⑬ bladder cap will be attached with the bladder.

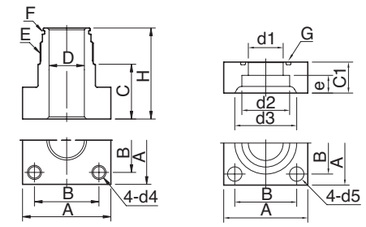
Piping Connection

Dimensional Drawing

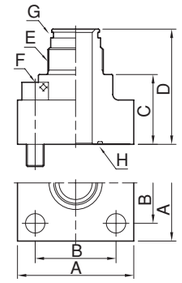
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
15MPa 21MPa 25MPa	6RCM75R03N25M	Rc3/8	66	20	φ80 (Width across flat 75)	Rc3/8	M75x2	JIS B2401 G65	–
	6RCM75R04N25M	Rc1/2				Rc1/2			
	6RCM75R06N25M	Rc3/4				Rc3/4			
	6RCM75R08N25M	Rc1				Rc1			
	6RCM75R10N25M	Rc1-1/4				Rc1-1/4			
	6RCM75R12N25M	Rc1-1/2				Rc1-1/2			
28MPa 33MPa	6RCM75R03N35M	Rc3/8	68			Rc3/8			JIS B2407 G65
	6RCM75R04N35M	Rc1/2				Rc1/2			
	6RCM75R06N35M	Rc3/4				Rc3/4			
	6RCM75R08N35M	Rc1				Rc1			
	6RCM75R10N35M	Rc1-1/4				Rc1-1/4			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	φD	C1	φ d1	φ d2	φ d3	φ d4	φ d5	E	F		G
																O-Ring	B.U. Ring	
15MPa 21MPa	6FCM7515AX007	15A	100	73	38	84	11	47.5	36	16	22.2	32	M16	18	M75x2	JIS B2401 G65	–	G60
	6FCM7520AX006	20A					12			20	27.7	38						
	6FCM7525AX005	25A					14			25	34.5	45						
	6FCM7532AX004	32A					16			31.5	43.2	56						
	6FCM7540AX003	40A					18			37.5	49.1	63						
	6FCM7550AN21M	50A					20			47.5	61.1	75						
	6FCM7565AN21M	65A	128	92	45	91	22	50	45	60	77.1	95	M20	22				G75
25MPa 28MPa 33MPa	6FCM7532AN35M	32A	92	65	45	93	18	30	36	30	43.2	63	M16	18			JIS B2407 G65	G40
	6FCM7550AN35M	50A	132	92	50	97	25	35	50	35	61.1	84	M20	22				G50

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
15MPa 21MPa	6FCM7532DN21M	32A	76	56	92	138	M75x2	M12x45	JIS B2401 G65	–	G40
	6FCM7540DX013	40A	92	65	122	168		M16x60			G50
	6FCM7550DN21M	50A	100	73	91	137		M16x55			G60
	6FCM7565DN21M	65A	128	92	64	110		M20x80			G75
25MPa 28MPa 33MPa	6FCM7525DX030	25A	φ106	52	125	173		M16x55		JIS B2407 G65	G35
	6FCM7550DN35M	50A	132	92	67	115		M20x80			G50

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa				15	21			25	28	33
Item Number of Accumulator				①②-N15MP-L80-⑥⑦⑧	①②-N21MP-L80-⑥⑦⑧			①②-N25MP-L80-⑥⑦⑧	①②-N28MP-L80-⑥⑦⑧	①②-N33MP-L80-⑥⑦⑧
				①②-N15MP-120-⑥⑦⑧	①②-N21MP-120-⑥⑦⑧			①②-N25MP-120-⑥⑦⑧	①②-N28MP-120-⑥⑦⑧	①②-N33MP-120-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □			6GH□□□□ □□□ □		
	For Installation	NACOL Clamp		☞P200	6KH355			6KH355		
		NORMA Clamp		☞P201	6081C350			6081C350		
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	–			–		
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	–			–		
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A			65②N⑤⑤⑤A		
		Bladder Back Up Ring			–			640082501120		
	Tools	Cap Wrench		☞P208	6TWH100			6TWH63		
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A		
		Spring		☞P212	645045500			645045500		
		Spring Nut		☞P212	645048200			645048200		
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04		
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD120			6TWD120		
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42			6HTM42H63		
	Valve Cover				645049705			645049705		
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A			6H□-AV35MP-F03-M42A		
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G			6018DUF0206□□□□G		
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03			6H-SV□□□□-03-F03		
		Fuse Plug		☞P197	6H-FP35MP-03-F03			6H-FP35MP-03-F03		

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④ ④ ④ ④	
1 5 M P	15MPa
2 1 M P	21MPa
2 3 M P	23MPa
2 6 M P	26MPa
3 5 M P	35MPa
2 3 0 B	230Bar

※2 MAWP: Maximum Allowable Working Pressure
※3 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).

NOMINAL GAS VOLUME ⑤ ⑤ ⑤	
1 6 0	160L

③	SERIES
A	A Series
H	H Series
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
D	Top Cap Two Pieces Type (only for 23MPa) Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※4

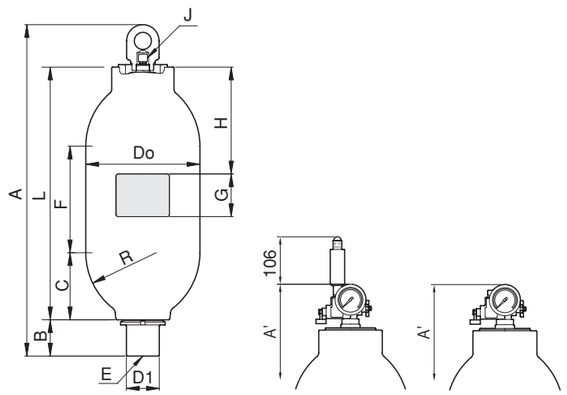
※4 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



Gas Charging Side Spec:Q　Gas Charging Side Spec:R

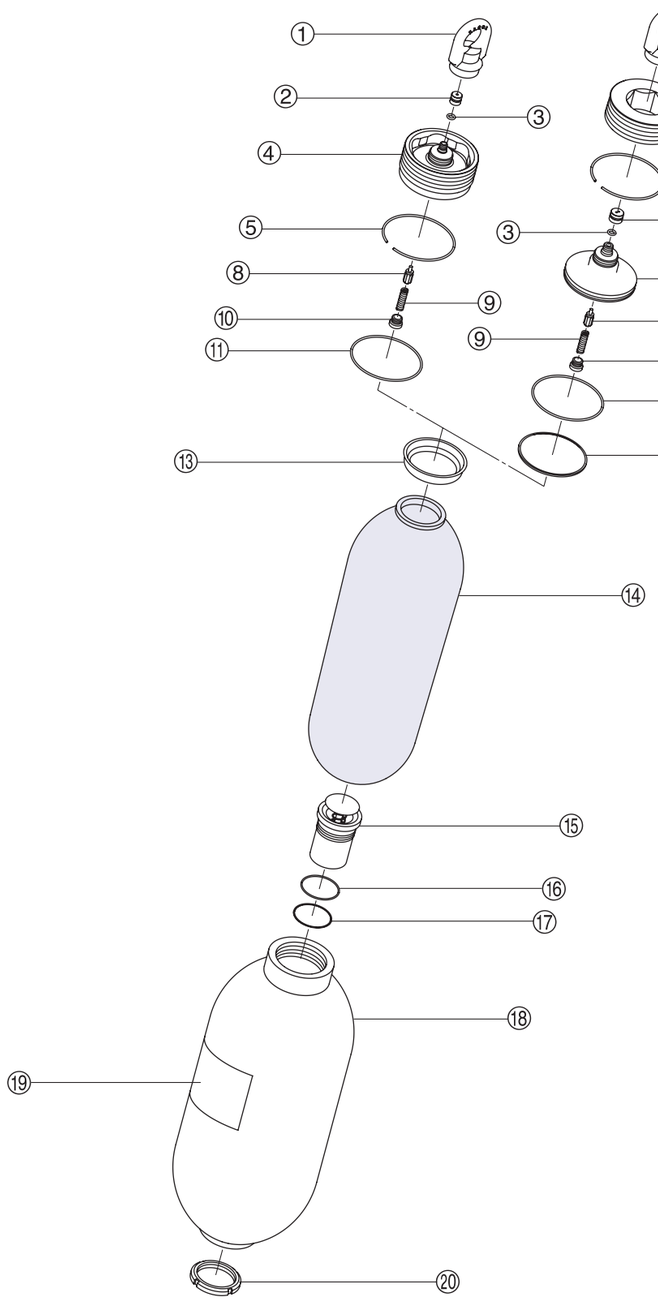
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
15	①②-N15MP-160-⑥⑦⑧	160	370	2,088	2,094	1,870			119	246	1,340	1,000	90	406.4	111	260	M90x2	G1/4	1,200L/min	1,800L/min ※7
21	①②-N21MP-160-⑥⑦⑧		490																	
23	①②-N23MP-160-⑥⑦⑧		500															G3/8		
26	①②-A26MP-160-⑥⑦⑧	150	460	2,104	2,111	1,875			97	256	1,342					280	M75x2		900L/min	–
35	①②-H35MP-160-⑥⑦⑧	145	540	2,107	2,114	1,878				252	1,337				92.5	300				

※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 Exploded View



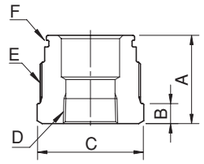
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Back Up Ring (Only for 26MPa or more)
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, ③⑪o-rings and ⑬ bladder cap will be attached with the bladder.
※3 Instead of ⑪o-ring, ⑫ bladder back up ring is used for A series (150L) and H series (145L) accumulator.

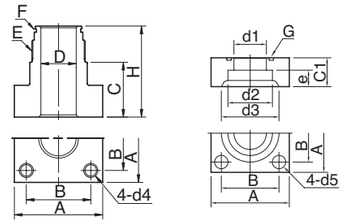
Piping Connection

Dimensional Drawing

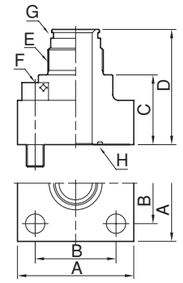
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
15MPa 21MPa 23MPa	6RCM90R06N25M	Rc3/4	71	20	ϕ100 (Width across flat 90)	Rc3/4	M90x2	JIS B2401 G80	—
	6RCM90R08N25M	Rc1				Rc 1			
	6RCM90R10N25M	Rc1-1/4				Rc1-1/4			
	6RCM90R12N25M	Rc1-1/2				Rc1-1/2			
	6RCM90R16N25M	Rc2				Rc 2			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	ϕD	C1	ϕ d1	ϕ d2	ϕ d3	ϕ d4	ϕ d5	E	F		G
																O-Ring	B.U. Ring	
15MPa 21MPa	6FCM9025AX003	25A	100	73	38	89	14	47.5	36	25	34.5	45	M16	18	M90x2	JIS B2401 G80	—	G60
	6FCM9032AX002	32A					16			31.5	43.2	56						
	6FCM9040AX001	40A					18			37.5	49.1	63						
	6FCM9050AN21M	50A					20			47.5	61.1	75						

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
15MPa	6FCM9032DN21M	32A	76	56	103	154	M90x2	M12x45	JIS B2401 G80	—	G40
21MPa	6FCM9050DN21M	50A	100	73	120	171		M16x55			G60
26MPa	6FCM7525DX030	25A	ϕ106	52	125	173	M75x2	M16x55	JIS B2401 G65	JIS B2407 G65	G35
35MPa	6FCM7525DX031								AS568 229	AS568 229	

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa				15	21			23	26	35
Item Number of Accumulator				①②-N15MP-160-⑥⑦⑧	①②-N21MP-160-⑥⑦⑧			①②-N23MP-160-⑥⑦⑧	①②-A26MP-160-⑥⑦⑧	①②-H35MP-160-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□□			6GH□□□□□□□□		
	For Installation	NACOL Clamp		☞P200	6KH406			6KH406		
		NORMA Clamp		☞P201	6081C406			6081C406		
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—			—		
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—			—		
Bladder Replacement	Parts	Bladder		☞P210	65②N160A			65②N160A		65②H160A
		Bladder Back Up Ring			—			640082501160		
	Tools	Cap Wrench		☞P208	6TWH100			6TWH63	— (Please use a commercially available wrench.)	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A		
		Spring		☞P212	645045500			645045500		
		Spring Nut		☞P212	645048200			645048200		
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04		
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD140			6TWD140		6TWD120
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42			6HTM42H63	6HTM42	
	Valve Cover				645049705			645049705		
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A			6H□-AV35MP-F03-M42A		
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G			6018DUF0206□□□□G		
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03			6H-SV□□□□-03-F03		
		Fuse Plug		☞P197	6H-FP35MP-03-F03			6H-FP35MP-03-F03		

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D.(97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④	
17.5	1 7 . 5
21	2 1 M P
23	2 3 M P
35	3 5 M P
10.5	2 1 0 B
17.5	3 5 0 B

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤⑤⑤	
5L	L L 5
6.3L	6 . 3
10L	L 1 0
16L	L 1 6

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
A	A Series

⑦	SPECIFICATION FOR OIL PORT SIDE
E	High Flow Type Carbon Steel
G	High Flow Type Stainless Steel ※4

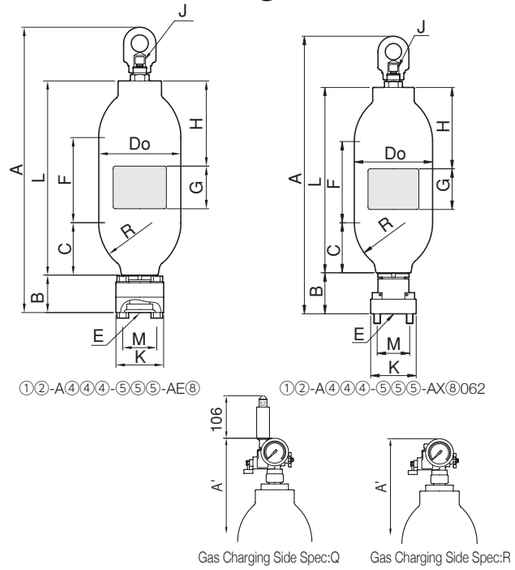
※4 When selecting G, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



①②-A④④④-⑤⑤⑤-AE⑧

①②-A④④④-⑤⑤⑤-AX⑧062

Gas Charging Side Spec:Q

Gas Charging Side Spec:R

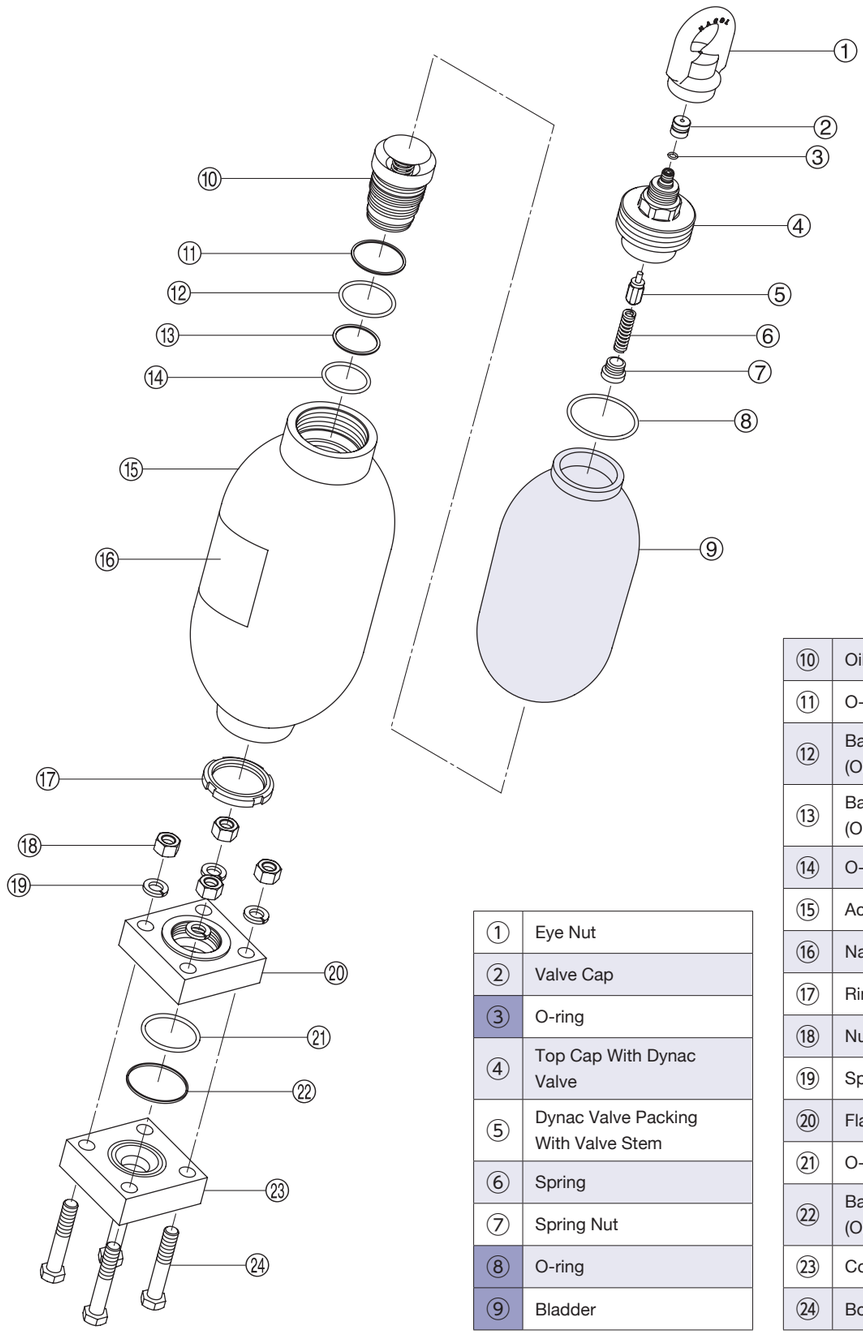
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +12 0 mm	A' +12 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
17.5	①②-A17.5-LL5-⑥E⑧	5	28	605	612	390			89	123	134	200	90	190.7	112	80 (M16x90)	125	MAX.50A	G1/4	600L/min	900L/min ※7
	①②-A17.5-6.3-⑥E⑧	6.3	30	678	685	463					207										
	①②-A17.5-L10-⑥E⑧	10	37	853	860	638					382										
	①②-A17.5-L16-⑥E⑧	16	52	1,165	1,172	950					694	250									
	①②-A17.5-LL5-⑥X⑧062	5	27	617	624	390			101		134	200				80 (M16x60)		MAX.50A JIS 2401 G60			
	①②-A17.5-6.3-⑥X⑧062	6.3	29	690	697	463					207										
	①②-A17.5-L10-⑥X⑧062	10	36	865	872	638					382										
	①②-A17.5-L16-⑥X⑧062	16	51	1,177	1,184	950					694	250									
21	①②-A21MP-LL5-⑥E⑧	5	32	605	612	390			89		134	200				80 (M16x90)		MAX.50A			
	①②-A21MP-6.3-⑥E⑧	6.3	35	678	685	463					207										
	①②-A21MP-L10-⑥E⑧	10	44	853	860	638					382										
	①②-A21MP-L16-⑥E⑧	16	61	1,165	1,172	950					694	250									
	①②-A21MP-LL5-⑥X⑧062	5	31	617	624	390			101		134	200				80 (M16x60)		MAX.50A JIS 2401 G60			
	①②-A21MP-6.3-⑥X⑧062	6.3	34	690	697	463					207										
	①②-A21MP-L10-⑥X⑧062	10	43	865	872	638					382										
	①②-A21MP-L16-⑥X⑧062	16	60	1,177	1,184	950					694	250									
23	①②-A23MP-LL5-⑥E⑧	5	34	605	612	390			89		134	200				80 (M16x90)		MAX.50A			
	①②-A23MP-6.3-⑥E⑧	6.3	37	678	685	463					207										
	①②-A23MP-L10-⑥E⑧	10	46	853	860	638					382										
	①②-A23MP-L16-⑥E⑧	16	64	1,165	1,172	950					694	250									
	①②-A23MP-LL5-⑥X⑧062	5	33	617	624	390			101		134	200				80 (M16x60)		MAX.50A JIS 2401 G60			
	①②-A23MP-6.3-⑥X⑧062	6.3	36	690	697	463					207										
	①②-A23MP-L10-⑥X⑧062	10	45	865	872	638					382										
	①②-A23MP-L16-⑥X⑧062	16	63	1,177	1,184	950					694	250									
35	①②-A35MP-LL5-⑥E⑧	5	40	646	653	398			122	131	127	200		216.3	132	92 (M20x130)	135	MAX.50A	G3/8		
	①②-A35MP-6.3-⑥E⑧	6.3	52	719	726	471					200										
	①②-A35MP-L10-⑥E⑧	10	62	889	900	645					374										
	①②-A35MP-L16-⑥E⑧	16	81	1,209	1,212	957					686	250									

※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 Exploded View

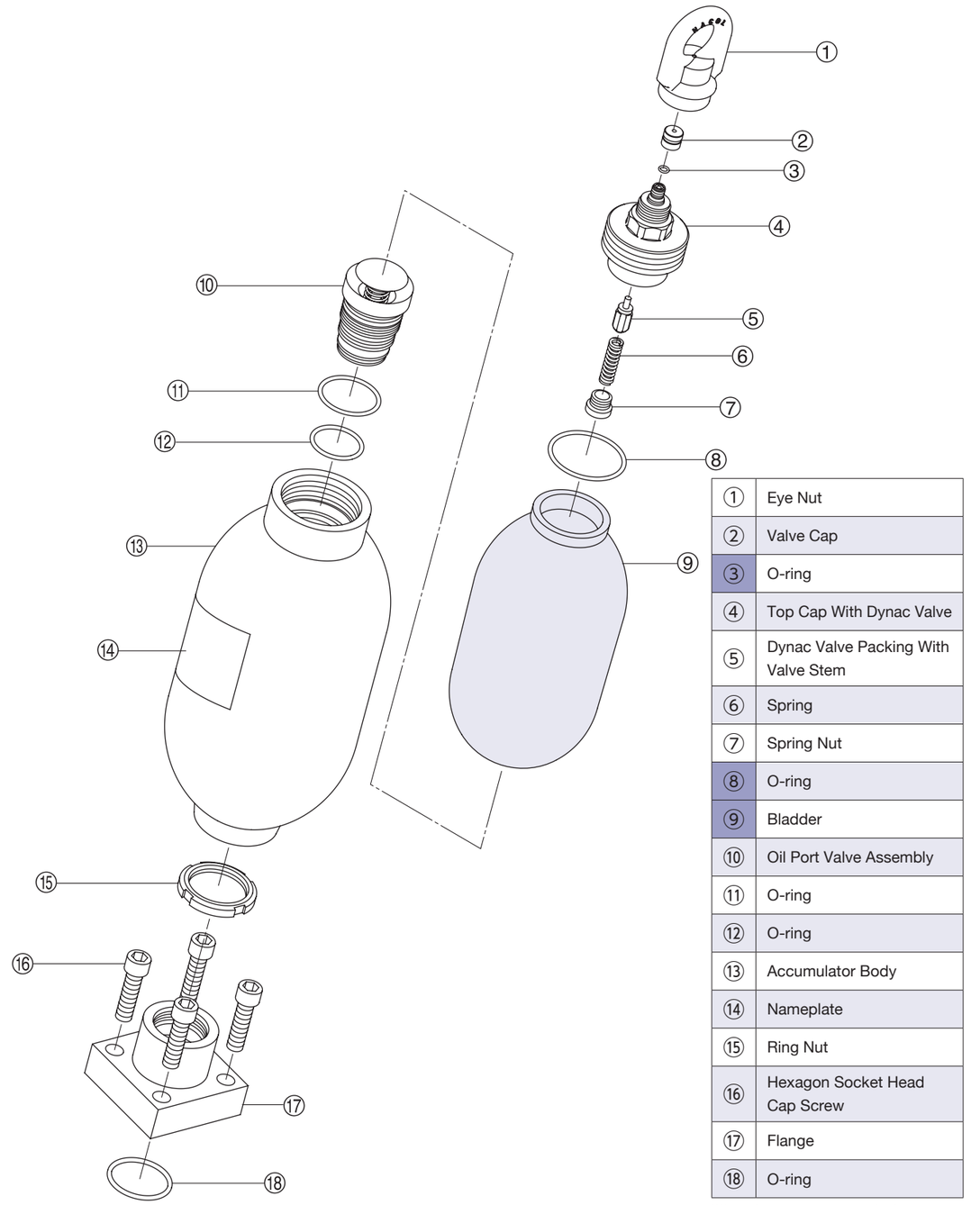


①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring
⑨	Bladder

⑩	Oil Port Valve Assembly
⑪	O-ring
⑫	Back Up Ring (Only for 35MPa or more)
⑬	Back Up Ring (Only for 35MPa or more)
⑭	O-ring
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Nut
⑲	Spring Washer
⑳	Flange
㉑	O-ring
㉒	Back Up Ring (Only for 35MPa or more)
㉓	Counter Flange
㉔	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧o-rings will be attached with the bladder.

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring
⑨	Bladder
⑩	Oil Port Valve Assembly
⑪	O-ring
⑫	O-ring
⑬	Accumulator Body
⑭	Nameplate
⑮	Ring Nut
⑯	Hexagon Socket Head Cap Screw
⑰	Flange
⑱	O-ring

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧o-rings will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					17.5MPa	21MPa			23MPa	35MPa
Item Number of Accumulator					①②-A17.5-LL5-⑥E⑧	①②-A21MP-LL5-⑥E⑧			①②-A23MP-LL5-⑥E⑧	①②-A35MP-LL5-⑥E⑧
					①②-A17.5-6.3-⑥E⑧	①②-A21MP-6.3-⑥E⑧			①②-A23MP-6.3-⑥E⑧	①②-A35MP-6.3-⑥E⑧
					①②-A17.5-L10-⑥E⑧	①②-A21MP-L10-⑥E⑧			①②-A23MP-L10-⑥E⑧	①②-A35MP-L10-⑥E⑧
					①②-A17.5-L16-⑥E⑧	①②-A21MP-L16-⑥E⑧			①②-A23MP-L16-⑥E⑧	①②-A35MP-L16-⑥E⑧
					①②-A17.5-LL5-⑥X⑧062	①②-A21MP-LL5-⑥X⑧062			①②-A23MP-LL5-⑥X⑧062	
					①②-A17.5-6.3-⑥X⑧062	①②-A21MP-6.3-⑥X⑧062			①②-A23MP-6.3-⑥X⑧062	
					①②-A17.5-L10-⑥X⑧062	①②-A21MP-L10-⑥X⑧062			①②-A23MP-L10-⑥X⑧062	
					①②-A17.5-L16-⑥X⑧062	①②-A21MP-L16-⑥X⑧062			①②-A23MP-L16-⑥X⑧062	
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□□ □				6GG□□□□ □□□□ □	6GH□□□□ □□□□ □
	For Installation	NACOL Clamp		☞P200	6K190N				6K190N	6K216N
		NORMA Clamp		☞P201	6081C191				6081C191	6081C215
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	6BMP190N				6BMP190N	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP191				6BMP191	
Bladder Replacement	Parts	Bladder		☞P210	65②A⑤⑤⑤A				65②A⑤⑤⑤A	
		Bladder Back Up Ring			—				—	
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)				— (Please use a commercially available wrench.)	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A	
		Spring		☞P212	645045500				645045500	
		Spring Nut		☞P212	645048200				645048200	
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD075				6TWD75	
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32				6HTM32	6HTM42
	Valve Cover				645049608				645049608	645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A				6H□-AV35MP-F03-M32A	6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G	
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03	
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④ ④ ④ ④
1 7 . 5
2 1 M P
2 3 M P
3 5 M P
2 1 0 B
3 5 0 B

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
N	N Series

⑦	SPECIFICATION FOR OIL PORT SIDE
E	High Flow Type Carbon Steel
G	High Flow Type Stainless Steel ※4

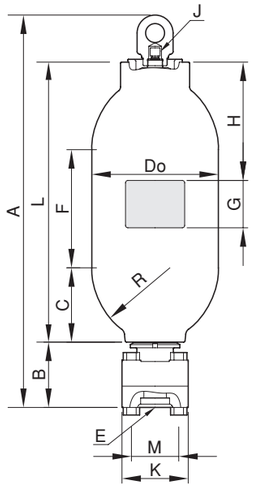
※4 When selecting G, please contact us.

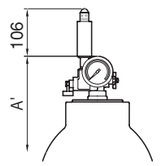
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

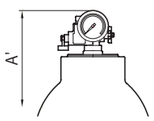
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



Gas Charging Side Spec:R

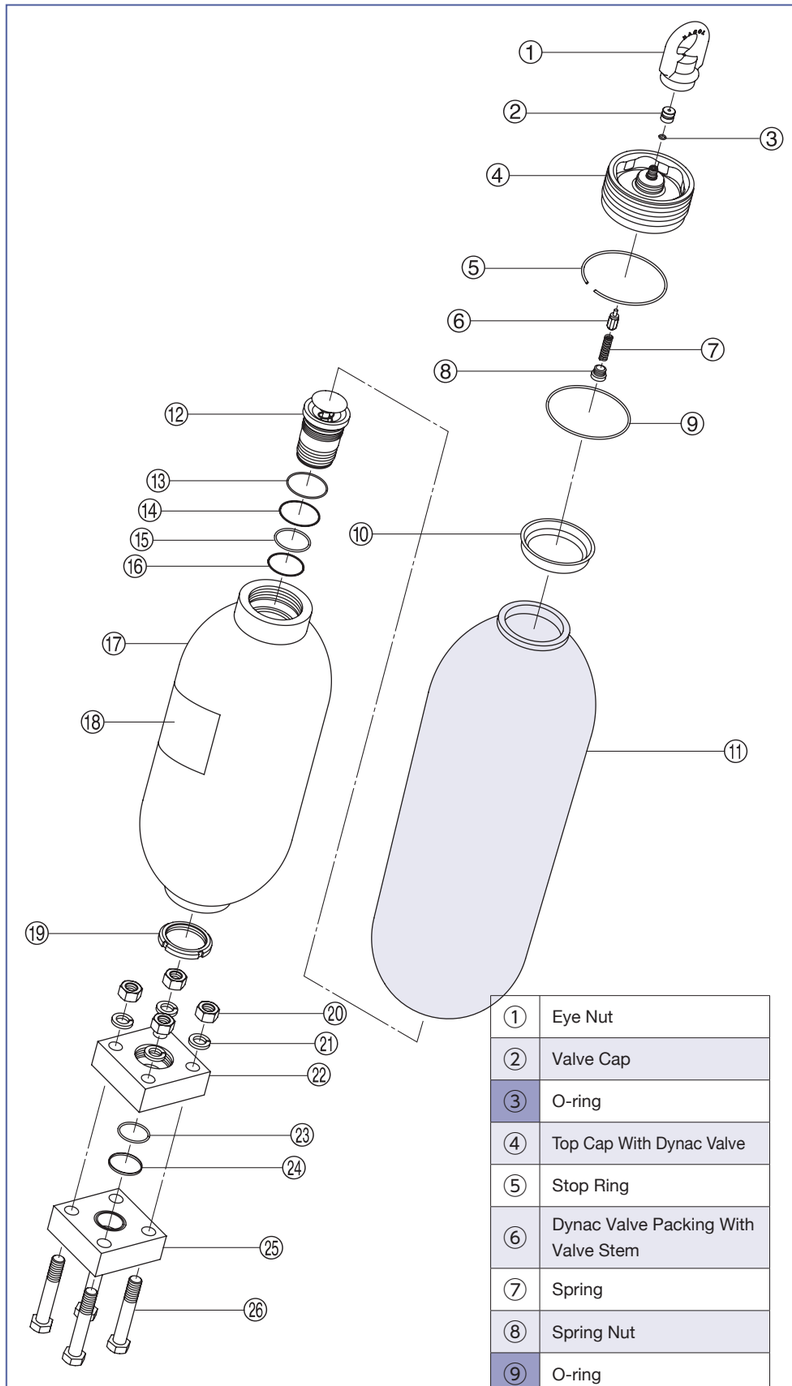
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
17.5	① ② - N 1 7 . 5 - L 2 0 - ⑥ E ⑧	20	85	905	912	668			138	157	326	250	90	267.4	140	100(M20x130)	160	MAX.65A	G1/4	1,200L/min	2,500L/min ※7
	① ② - N 1 7 . 5 - L 3 0 - ⑥ E ⑧	30	107	1,150	1,157	913					571										
	① ② - N 1 7 . 5 - L 4 0 - ⑥ E ⑧	40	133	1,365	1,372	1,128					786	400									
	① ② - N 1 7 . 5 - L 5 0 - ⑥ E ⑧	50	166	1,687	1,694	1,450					1,108	700									
	① ② - N 1 7 . 5 - L 6 0 - ⑥ E ⑧	60	178	1,825	1,832	1,588					1,246										
21	① ② - N 2 1 M P - L 2 0 - ⑥ E ⑧	20	95	905	912	668					326	250					165				
	① ② - N 2 1 M P - L 3 0 - ⑥ E ⑧	30	122	1,150	1,157	913					571										
	① ② - N 2 1 M P - L 4 0 - ⑥ E ⑧	40	150	1,365	1,372	1,128					786	400									
	① ② - N 2 1 M P - L 5 0 - ⑥ E ⑧	50	190	1,687	1,694	1,450					1,108	700									
	① ② - N 2 1 M P - L 6 0 - ⑥ E ⑧	60	200	1,825	1,832	1,588					1,246										
23	① ② - N 2 3 M P - L 2 0 - ⑥ E ⑧	20	100	905	912	668					326	250									
	① ② - N 2 3 M P - L 3 0 - ⑥ E ⑧	30	128	1,150	1,157	913					571										
	① ② - N 2 3 M P - L 4 0 - ⑥ E ⑧	40	158	1,365	1,372	1,128					786	400									
	① ② - N 2 3 M P - L 5 0 - ⑥ E ⑧	50	200	1,687	1,694	1,450					1,108	700									
	① ② - N 2 3 M P - L 6 0 - ⑥ E ⑧	60	210	1,825	1,832	1,588					1,246										
35	① ② - N 3 5 M P - L 2 0 - ⑥ E ⑧	20	155	935	942	671			165	164	320	250		298.5	160	110(M22x150)	200		G3/8		
	① ② - N 3 5 M P - L 3 0 - ⑥ E ⑧	30	205	1,180	1,187	916					565										
	① ② - N 3 5 M P - L 4 0 - ⑥ E ⑧	40	250	1,395	1,402	1,131					780	400									
	① ② - N 3 5 M P - L 5 0 - ⑥ E ⑧	50	320	1,717	1,724	1,453					1,102	700									
	① ② - N 3 5 M P - L 6 0 - ⑥ E ⑧	60	345	1,855	1,862	1,591					1,240										

※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 Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap

⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring
⑭	Back Up Ring (Only for 35MPa or more)
⑮	Back Up Ring (Only for 35MPa or more)
⑯	O-ring
⑰	Accumulator Body
⑱	Nameplate
⑲	Ring Nut
⑳	Nut
㉑	Spring Washer
㉒	Flange
㉓	O-ring
㉔	Back Up Ring (Only for 35MPa or more)
㉕	Counter Flange
㉖	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					17.5	21			23	35
Item Number of Accumulator					①②-N17.5-L20-⑥E⑧	①②-N21MP-L20-⑥E⑧			①②-N23MP-L20-⑥E⑧	①②-N35MP-L20-⑥E⑧
					①②-N17.5-L30-⑥E⑧	①②-N21MP-L30-⑥E⑧			①②-N23MP-L30-⑥E⑧	①②-N35MP-L30-⑥E⑧
					①②-N17.5-L40-⑥E⑧	①②-N21MP-L40-⑥E⑧			①②-N23MP-L40-⑥E⑧	①②-N35MP-L40-⑥E⑧
					①②-N17.5-L50-⑥E⑧	①②-N21MP-L50-⑥E⑧			①②-N23MP-L50-⑥E⑧	①②-N35MP-L50-⑥E⑧
					①②-N17.5-L60-⑥E⑧	①②-N21MP-L60-⑥E⑧			①②-N23MP-L60-⑥E⑧	①②-N35MP-L60-⑥E⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □	6GH□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6KH267				6KH267	6KH298
		NORMA Clamp		☞P201	6081C267				6081C267	6081C298
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199						
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP267				6BMP267	
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A				65②N⑤⑤⑤A	
		Bladder Back Up Ring			–				–	
	Tools	Cap Wrench		☞P208	6TWH81				6TWH81	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A	
		Spring		☞P212	645045500				645045500	
		Spring Nut		☞P212	645048200				645048200	
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD105				6TWD105	
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32				6HTM32	6HTM42
	Valve Cover				645049608				645049608	645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A				6H□-AV35MP-F03-M32A	6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G	
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03	
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
1 7 . 5
2 1 M P
2 3 M P
2 1 0 B

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤⑤⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
E	High Flow Type Carbon Steel
G	High Flow Type Stainless Steel ※4

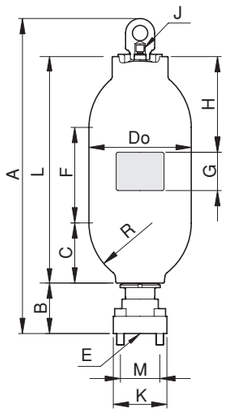
※4 When selecting G, please contact us.

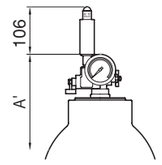
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

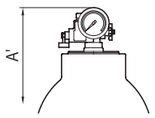
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



Gas Charging Side Spec:R

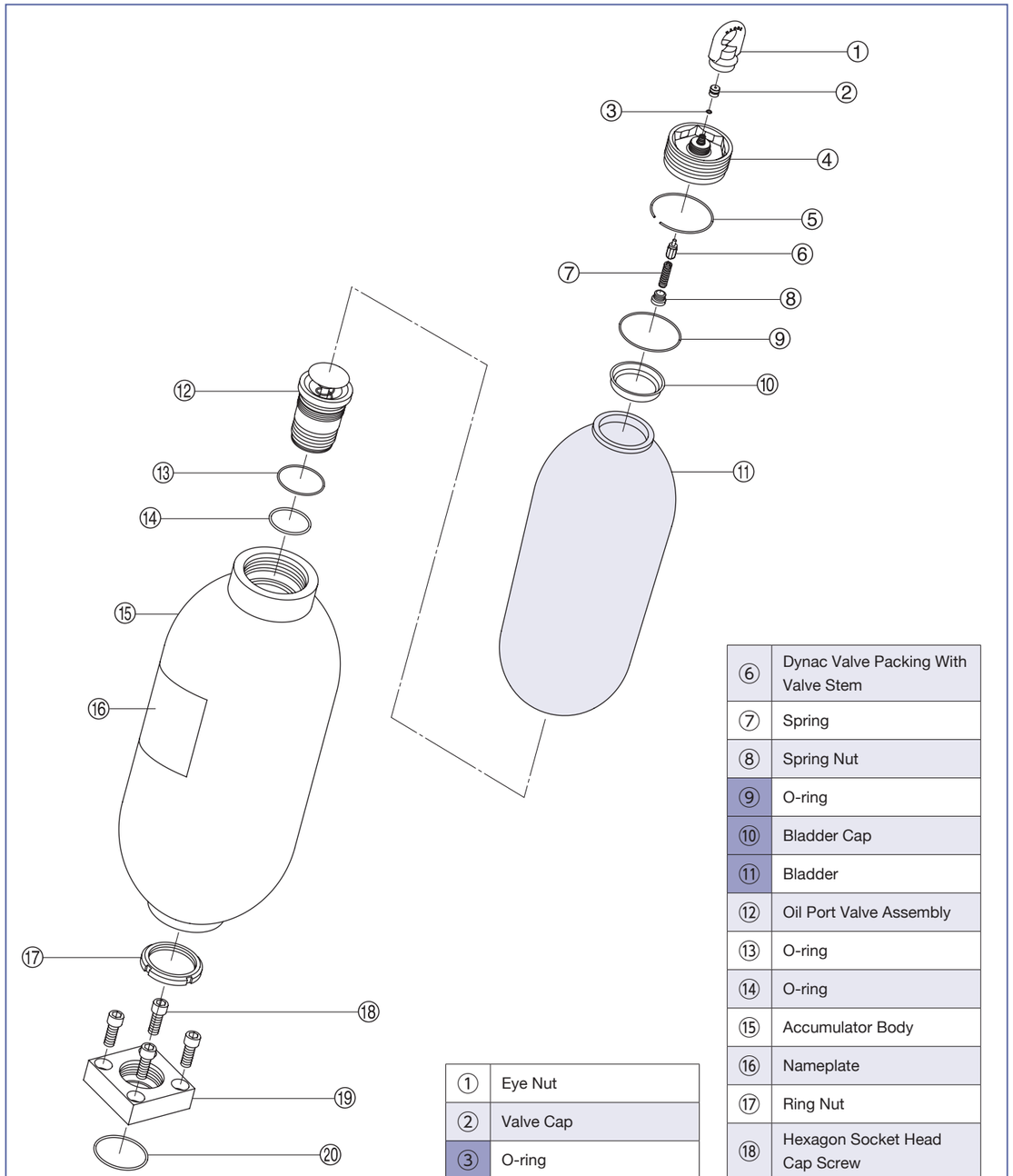
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
17.5	①② - N 1 7 . 5 - L 2 0 - ⑥ X ⑧ 274	20	82	899	906	668			132	157	326	250	90	267.4	140	103 (M22x80)	160	φ50mm	G1/4	1,200L/min	2,500L/min ※7
	①② - N 1 7 . 5 - L 3 0 - ⑥ X ⑧ 274	30	104	1,144	1,151	913					571										
	①② - N 1 7 . 5 - L 4 0 - ⑥ X ⑧ 274	40	130	1,359	1,366	1,128					786	400									
	①② - N 1 7 . 5 - L 5 0 - ⑥ X ⑧ 274	50	163	1,681	1,688	1,450					1,108	700									
	①② - N 1 7 . 5 - L 6 0 - ⑥ X ⑧ 274	60	175	1,819	1,826	1,588					1,246										
21	①② - N 2 1 M P - L 2 0 - ⑥ X ⑧ 274	20	92	899	906	668					326	250					165				
	①② - N 2 1 M P - L 3 0 - ⑥ X ⑧ 274	30	119	1,144	1,151	913					571										
	①② - N 2 1 M P - L 4 0 - ⑥ X ⑧ 274	40	147	1,359	1,366	1,128					786	400									
	①② - N 2 1 M P - L 5 0 - ⑥ X ⑧ 274	50	187	1,681	1,688	1,450					1,108	700									
	①② - N 2 1 M P - L 6 0 - ⑥ X ⑧ 274	60	197	1,819	1,826	1,588					1,246										
23	①② - N 2 3 M P - L 2 0 - ⑥ X ⑧ 274	20	97	899	906	668					326	250									
	①② - N 2 3 M P - L 3 0 - ⑥ X ⑧ 274	30	125	1,144	1,151	913					571										
	①② - N 2 3 M P - L 4 0 - ⑥ X ⑧ 274	40	155	1,359	1,366	1,128					786	400									
	①② - N 2 3 M P - L 5 0 - ⑥ X ⑧ 274	50	197	1,681	1,688	1,450					1,108	700									
	①② - N 2 3 M P - L 6 0 - ⑥ X ⑧ 274	60	207	1,819	1,826	1,588					1,246										

※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 Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring

⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring
⑭	O-ring
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Hexagon Socket Head Cap Screw
⑲	Flange
⑳	O-ring

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					17.5	21			23
Item Number of Accumulator					①②-N17.5-L20-⑥X⑧274	①②-N21MP-L20-⑥X⑧274			①②-N23MP-L20-⑥X⑧274
					①②-N17.5-L30-⑥X⑧274	①②-N21MP-L30-⑥X⑧274			①②-N23MP-L30-⑥X⑧274
					①②-N17.5-L40-⑥X⑧274	①②-N21MP-L40-⑥X⑧274			①②-N23MP-L40-⑥X⑧274
					①②-N17.5-L50-⑥X⑧274	①②-N21MP-L50-⑥X⑧274			①②-N23MP-L50-⑥X⑧274
					①②-N17.5-L60-⑥X⑧274	①②-N21MP-L60-⑥X⑧274			①②-N23MP-L60-⑥X⑧274
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□□ □				6GG□□□□ □□□□ □
	For Installation	NACOL Clamp		☞P200	6KH267				6KH267
		NORMA Clamp		☞P201	6081C267				6081C267
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199					
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP267				6BMP267
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A				65②N⑤⑤⑤A
		Bladder Back Up Ring			–				–
	Tools	Cap Wrench		☞P208	6TWH81				6TWH81
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A
		Spring		☞P212	645045500				645045500
		Spring Nut		☞P212	645048200				645048200
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD105				6TWD105
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32				6HTM32
	Valve Cover				645049608				645049608
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A				6H□-AV35MP-F03-M32A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④	
1 5 M P	
2 1 M P	
2 5 M P	

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤	
L 8 0	
1 2 0	

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
D	Top Cap Two Pieces Type (only for 25MPa or more) Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
E	High Flow Type Carbon Steel
G	High Flow Type Stainless Steel ※3

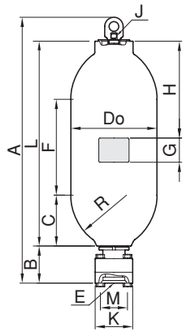
※3 When selecting G, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※4
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※4
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

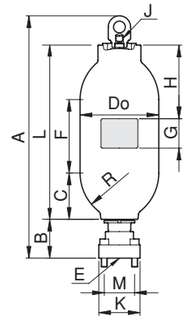
※4 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

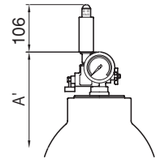
Dimensional Drawing



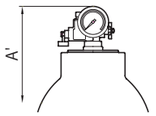
①②-N④④④-⑤⑤⑤-AE⑧



①②-N④④④-⑤⑤⑤-AX⑧275



Gas Charging Side Spec:Q



Gas Charging Side Spec:R

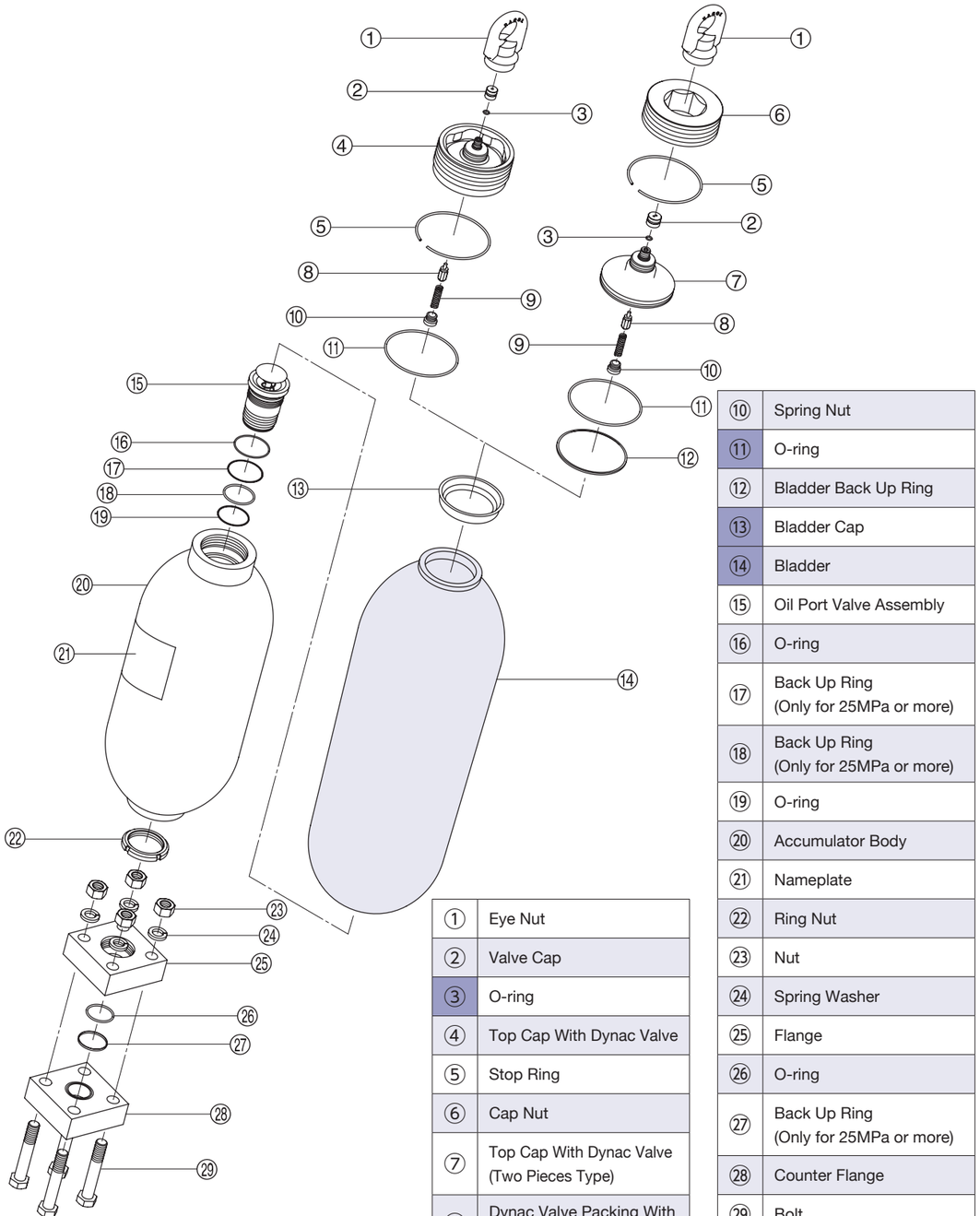
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
15	①②-N15MP-L80-⑥E⑧	80	230	1,596	1,602	1,343			154	210	893	400	90	355.6	155	112 (M22x140)	210	MAX.80A	G1/4	1,800L/min	6,000L/min ※6
	①②-N15MP-120-⑥E⑧	120	290	2,048	2,054	1,795					1,345	1,000									
	①②-N15MP-L80-⑥X⑧275	80	216	1,546	1,552	1,343			104		893	400				112 (M22x55)		φ68mm			
	①②-N15MP-120-⑥X⑧275	120	276	1,998	2,004	1,795					1,345	1,000									
21	①②-N21MP-L80-⑥E⑧	80	290	1,596	1,602	1,343			154		893	400				112 (M22x140)	230	MAX.80A			
	①②-N21MP-120-⑥E⑧	120	380	2,048	2,054	1,795					1,345	1,000									
	①②-N21MP-L80-⑥X⑧275	80	276	1,546	1,552	1,343			104		893	400				112 (M22x55)		φ68mm			
	①②-N21MP-120-⑥X⑧275	120	366	1,998	2,004	1,795					1,345	1,000									
25	①②-N25MP-L80-⑥E⑧	80	330	1,627	1,633	1,343			185		893	400			190	130 (M30x180)		MAX.80A	G3/8		
	①②-N25MP-120-⑥E⑧	120	430	2,079	2,085	1,795					1,345	1,000									

※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.

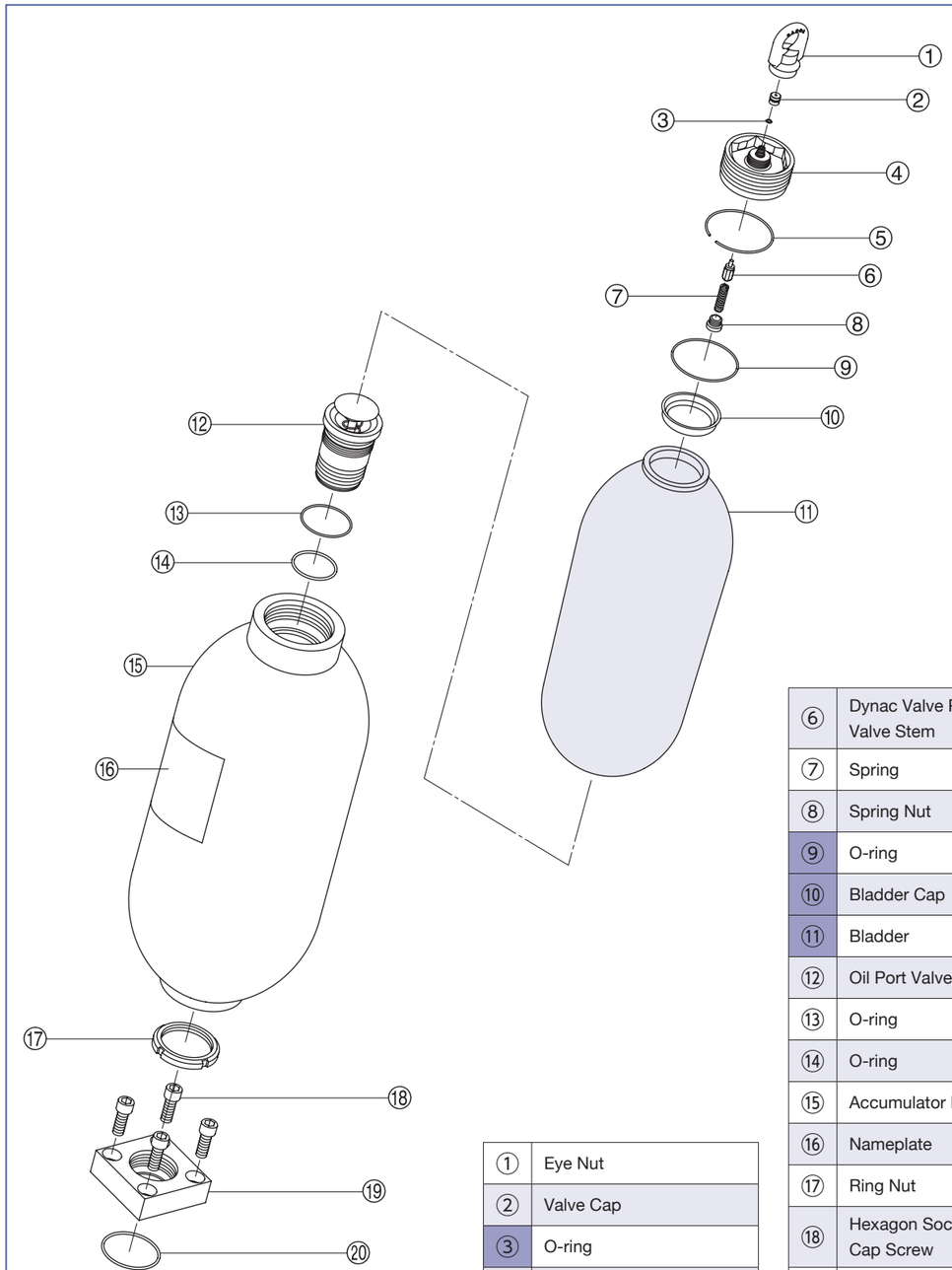
Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
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
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Back Up Ring (Only for 25MPa or more)
⑱	Back Up Ring (Only for 25MPa or more)
⑲	O-ring
⑳	Accumulator Body
㉑	Nameplate
㉒	Ring Nut
㉓	Nut
㉔	Spring Washer
㉕	Flange
㉖	O-ring
㉗	Back Up Ring (Only for 25MPa or more)
㉘	Counter Flange
㉙	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑭ bladder as the spare parts, ③⑪o-rings and ⑬ bladder cap will be attached with the bladder.

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring

⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring
⑭	O-ring
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Hexagon Socket Head Cap Screw
⑲	Flange
⑳	O-ring

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa				15	21			25
Item Number of Accumulator				①②-N15MP-L80-⑥E⑧	①②-N21MP-L80-⑥E⑧			①②-N25MP-L80-⑥E⑧
				①②-N15MP-120-⑥E⑧	①②-N21MP-120-⑥E⑧			①②-N25MP-120-⑥E⑧
				①②-N15MP-L80-⑥X⑧275	①②-N21MP-L80-⑥X⑧275			
				①②-N15MP-120-⑥X⑧275	①②-N21MP-120-⑥X⑧275			
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □			6GH□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6KH355			6KH355
		NORMA Clamp		☞P201	6081C350			6081C350
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—			—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—			—
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A			65②N⑤⑤⑤A
		Bladder Back Up Ring			—			640082501120
	Tools	Cap Wrench		☞P208	6TWH100			6TWH63
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A			645026400A
		Spring		☞P212	645045500			645045500
		Spring Nut		☞P212	645048200			645048200
	Tools	Spring Nut Key		☞P212	6TWH04			6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD120			6TWD120
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42			6HTM42H63
	Valve Cover				645049705			645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A			6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G			6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03			6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03			6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④	
1 5 M P	
2 1 M P	

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
1 6 0

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
E	High Flow Type Carbon Steel
G	High Flow Type Stainless Steel ※3

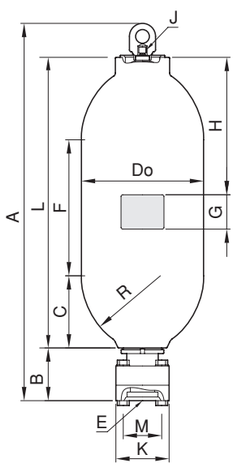
※3 When selecting G, please contact us.

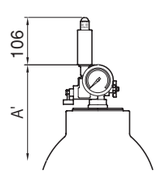
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※4
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※4
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other 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.

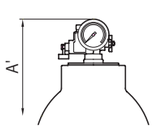
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



Gas Charging Side Spec:R

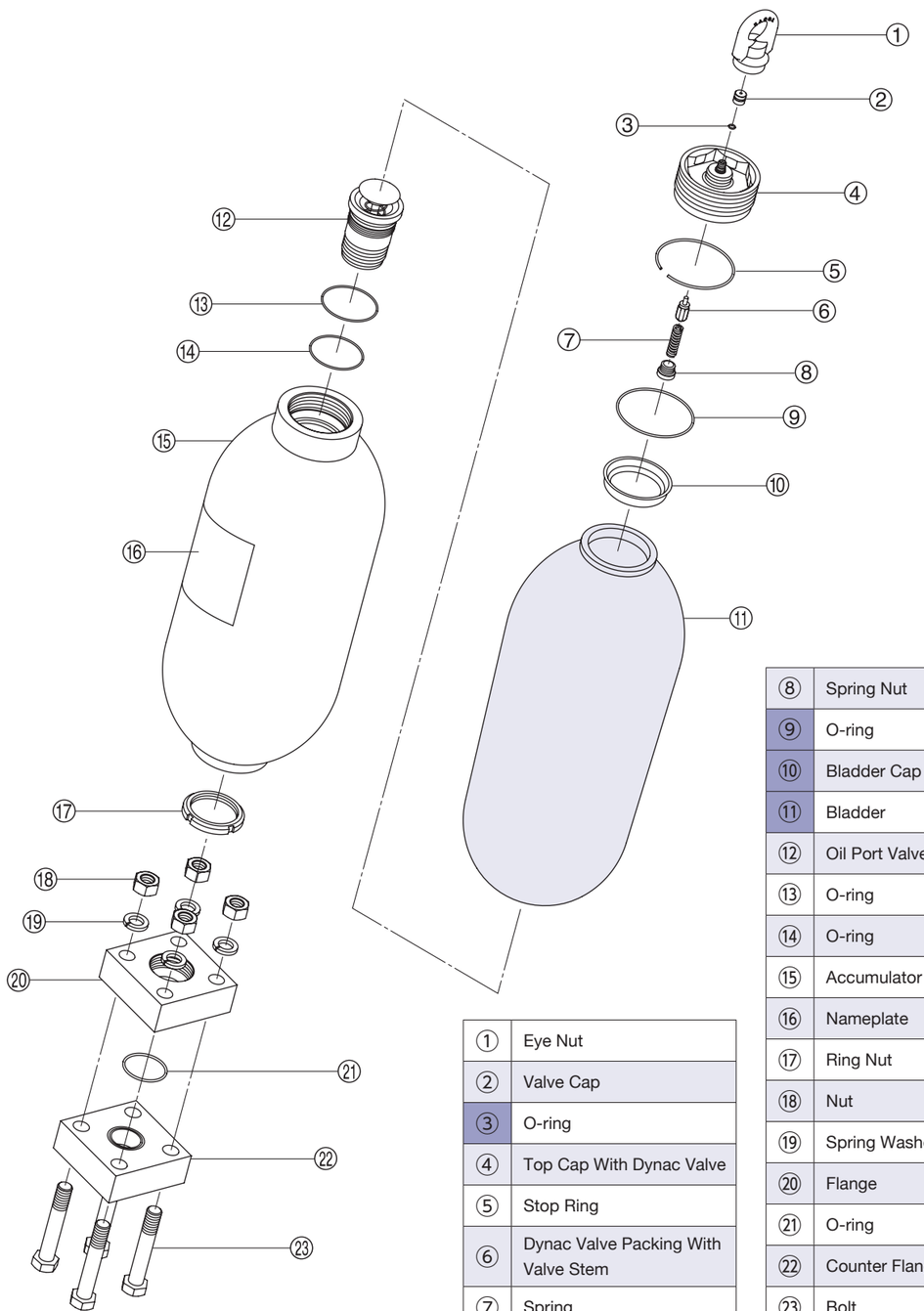
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
15	①② - N 1 5 M P - 1 6 0 - ⑥ E ⑧	160	400	2,146	2,152	1,870			177	246	1,340	1,000	90	406.4	200	138(M30x160)	260	MAX.100A	G1/4	2,400L/min	8,000L/min ※6
21	①② - N 2 1 M P - 1 6 0 - ⑥ E ⑧		520																		

※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 Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring

⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring
⑭	O-ring
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Nut
⑲	Spring Washer
⑳	Flange
㉑	O-ring
㉒	Counter Flange
㉓	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					15	21
Item Number of Accumulator					①②-N15MP-160-⑥E⑧	①②-N21MP-160-⑥E⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□	
	For Installation	NACOL Clamp		☞P200	6KH406	
		NORMA Clamp		☞P201	6081C406	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—	
Bladder Replacement	Parts	Bladder		☞P210	65②N160A	
		Bladder Back Up Ring			—	
	Tools	Cap Wrench		☞P208	6TWH100	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A	
		Spring		☞P212	645045500	
		Spring Nut		☞P212	645048200	
	Tools	Spring Nut Key		☞P212	6TWH04	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD140	
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42	
	Valve Cover				645049705	
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A	
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G	
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03	
		Fuse Plug		☞P197	6H-FP35MP-03-F03	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit. (Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 1 M P

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L L 5
6 . 3
L 1 0
L 1 6

③	SERIES
A	A Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
Y	Super High Flow Type Carbon Steel
M	Super High Flow Type Stainless Steel ※2

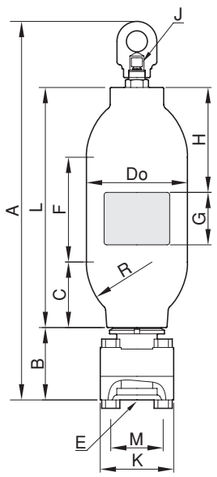
※2 When selecting M, please contact us.

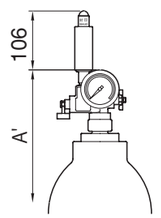
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※3
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※3
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

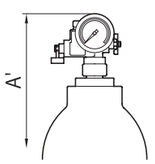
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



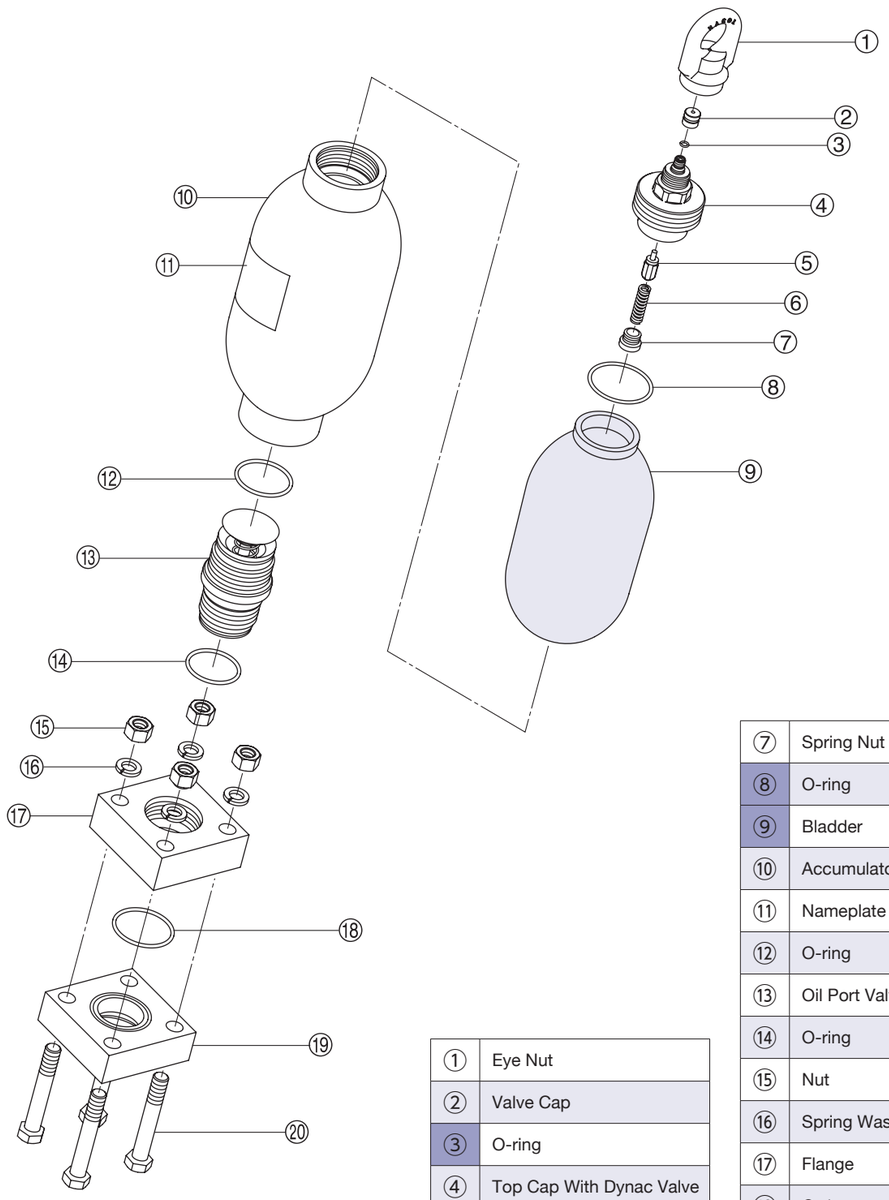
Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +7 0 mm	A' +7 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
21	①② - A 2 1 M P - L L 5 - ⑥ Y ⑧	5	43	668	675	411			131	136	142	160	90	190.7	140	100(M20x130)	125	MAX.65A	G1/4	1,200L/min
	①② - A 2 1 M P - 6 . 3 - ⑥ Y ⑧	6.3	47	733	740	476					207	200								
	①② - A 2 1 M P - L 1 0 - ⑥ Y ⑧	10	55	903	910	646					377									
	①② - A 2 1 M P - L 1 6 - ⑥ Y ⑧	16	72	1,219	1,226	962					693									

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

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring

⑦	Spring Nut
⑧	O-ring
⑨	Bladder
⑩	Accumulator Body
⑪	Nameplate
⑫	O-ring
⑬	Oil Port Valve Assembly
⑭	O-ring
⑮	Nut
⑯	Spring Washer
⑰	Flange
⑱	O-ring
⑲	Counter Flange
⑳	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧o-rings will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					21
Item Number of Accumulator					①②-A21MP-LL5-⑥Y⑧
					①②-A21MP-6.3-⑥Y⑧
					①②-A21MP-L10-⑥Y⑧
					①②-A21MP-L16-⑥Y⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6K190N
		NORMA Clamp		☞P201	6081C191
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—
Bladder Replacement	Parts	Bladder		☞P210	65②A⑤⑤⑤A
		Bladder Back Up Ring			—
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A
		Spring		☞P212	645045500
		Spring Nut		☞P212	645048200
	Tools	Spring Nut Key		☞P212	6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	— (Please use a commercially available wrench.)
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32
	Valve Cover				645049608
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit. (Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 1 M P

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
N	N Series

⑦	SPECIFICATION FOR OIL PORT SIDE
Y	Super High Flow Type Carbon Steel
M	Super High Flow Type Stainless Steel ※2

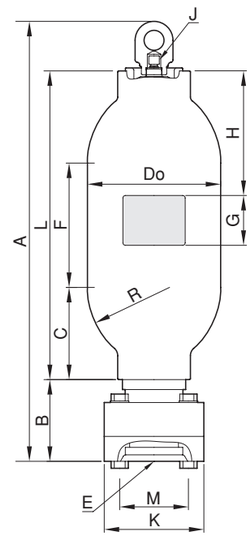
※2 When selecting M, please contact us.

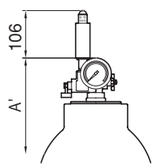
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※3
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※3
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

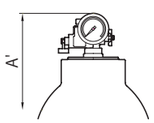
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



Gas Charging Side Spec:R

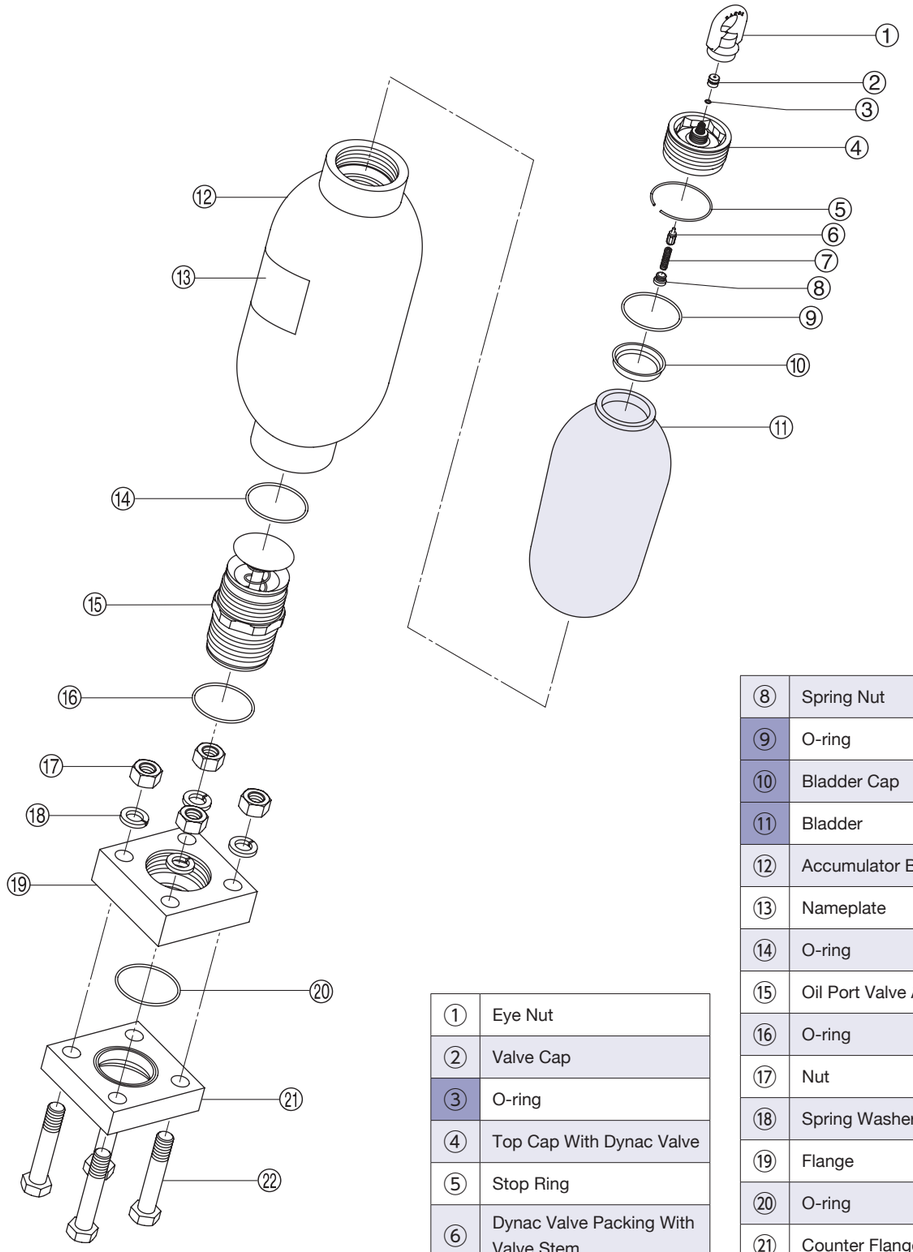
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
21	①②-N21MP-L20-⑥Y⑧	20	123	966	973	703			164	185	333	250	90	267.4	200	138(M30x160)	165	MAX.100A	G1/4	2,400L/min	4,200L/min ※5
	①②-N21MP-L30-⑥Y⑧	30	150	1,211	1,218	948					578										
	①②-N21MP-L40-⑥Y⑧	40	178	1,426	1,433	1,163					793	400									
	①②-N21MP-L50-⑥Y⑧	50	218	1,748	1,755	1,485					1,115	700									
	①②-N21MP-L60-⑥Y⑧	60	228	1,886	1,893	1,623					1,253										

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

※5 Maximum oil flow rate available under certain conditions.

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Accumulator Body
⑬	Nameplate
⑭	O-ring
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Nut
⑱	Spring Washer
⑲	Flange
⑳	O-ring
㉑	Counter Flange
㉒	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					21
Item Number of Accumulator					①②-N21MP-L20-⑥Y⑧
					①②-N21MP-L30-⑥Y⑧
					①②-N21MP-L40-⑥Y⑧
					①②-N21MP-L50-⑥Y⑧
					①②-N21MP-L60-⑥Y⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6KH267
		NORMA Clamp		☞P201	6081C267
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A
		Bladder Back Up Ring			—
	Tools	Cap Wrench		☞P208	6TWH81
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A
		Spring		☞P212	645045500
		Spring Nut		☞P212	645048200
	Tools	Spring Nut Key		☞P212	6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	— (Please use a commercially available wrench.)
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32
	Valve Cover				645049608
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit. (Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 1 M P

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 8 0
1 2 0

※1 MAWP: Maximum Allowable Working Pressure

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
Y	Super High Flow Type Carbon Steel
M	Super High Flow Type Stainless Steel ※2

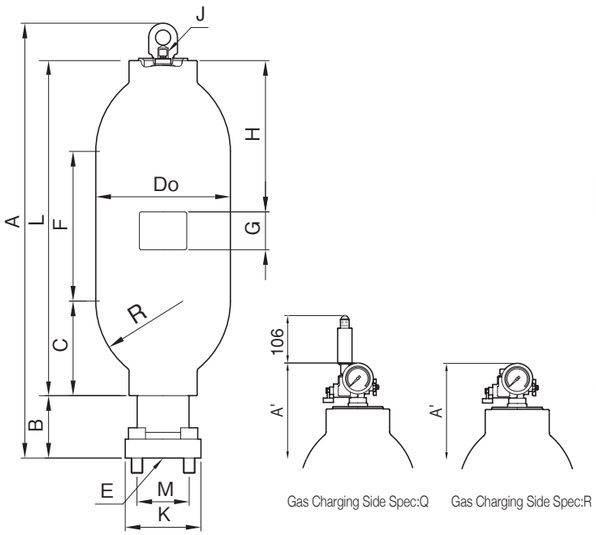
※2 When selecting M, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※3
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※3
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



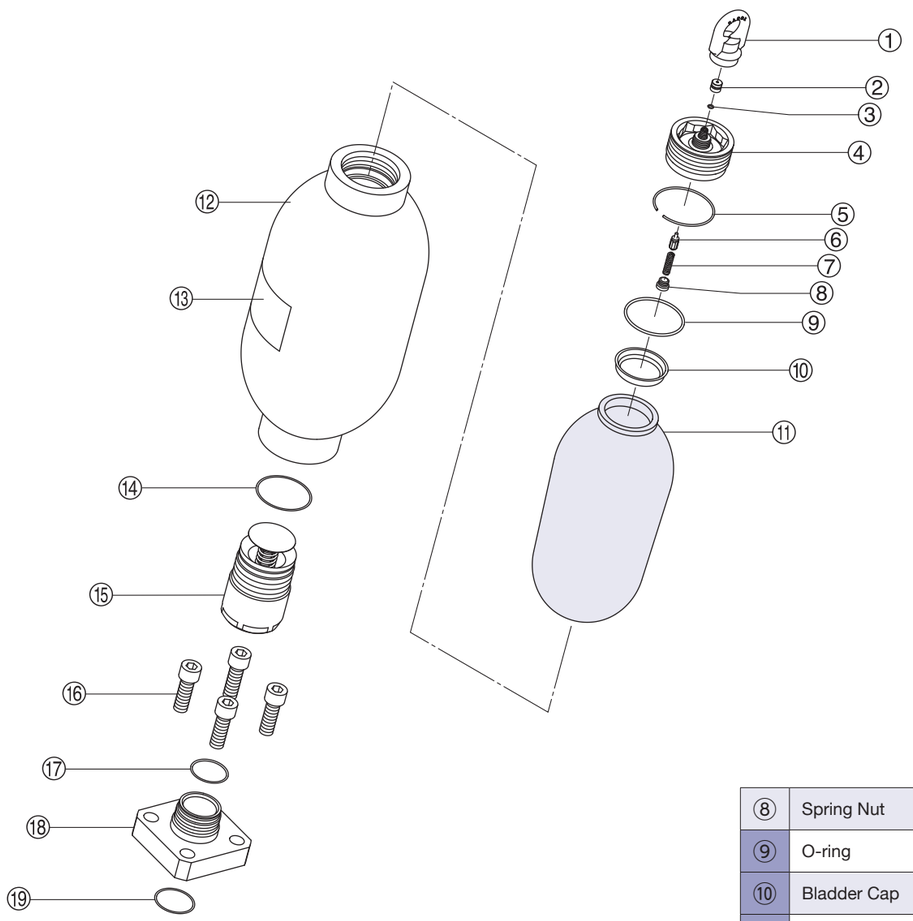
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
21	①②-N21MP-L80-⑥Y⑧	80	300	1,663	1,670	1,399			165	250	909	400	90	355.6	200	138(M30x90)	230	φ75mm	G1/4	3,600L/min	7,200L/min ※5
	①②-N21MP-120-⑥Y⑧	120	390	2,115	2,122	1,851					1,361	1,000									

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

※5 Maximum oil flow rate available under certain conditions.

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Accumulator Body
⑬	Nameplate
⑭	O-ring
⑮	Oil Port Valve Assembly
⑯	Hexagon Socket Head Cap Bolt
⑰	O-ring
⑱	Flange
⑲	O-ring

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					21
Item Number of Accumulator					①②-N21MP-L80-⑥Y⑧
					①②-N21MP-120-⑥Y⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□
	For Installation	NACOL Clamp		☞P200	6KH355
		NORMA Clamp		☞P201	6081C350
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A
		Bladder Back Up Ring			—
	Tools	Cap Wrench		☞P208	6TWH100
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A
		Spring		☞P212	645045500
		Spring Nut		☞P212	645048200
	Tools	Spring Nut Key		☞P212	6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	— (Please use a commercially available wrench.)
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42
	Valve Cover				645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit. (Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④④④④
1 1 . 8
1 4 M P
2 5 M P
2 8 M P

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
0 0 3
L 0 1

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Dynac Valve (G thread)

③	SERIES
G	G Series

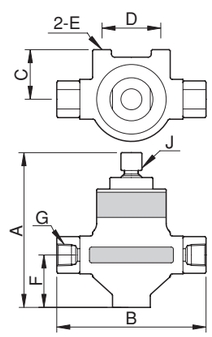
⑦	SPECIFICATION FOR OIL PORT SIDE
A	Standard Material

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material	0.03L: Alumite Treatment ※2	Petroleum Based Hydraulic Oil & Other Fluid
D		0.1L: Zinc Phosphate Treatment	Water + Glycol Fluid

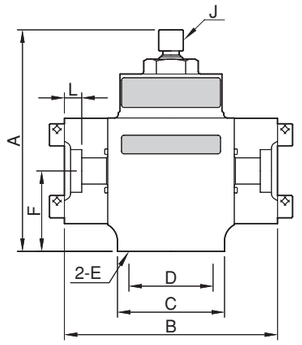
※2 Water glycol fluids and some phosphate ester based fluids cannot be used for accumulators with a 0.03 L aluminum shell (⑧ Specification of Shell). For more information, please contact us or the fluid manufacturer.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



①②-G $^{14MP}_{25MP}$-003-AA⑧R0＊



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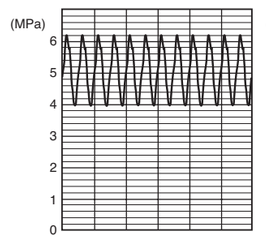
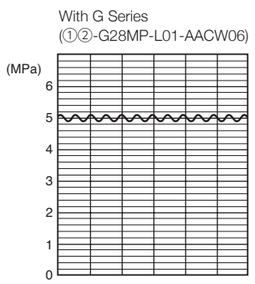




Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	B mm	C mm			D mm	E (Thread for Fixation) mm	F mm	L mm	G mm	J
14 (11.8) ※4	①②-G14MP-003-AA⑧R03	0.03	1.4	147	142	47			56	M8	50	–	Rc3/8	G1/4
	①②-G14MP-003-AA⑧R04												Rc1/2	
25 (11.8) ※4	①②-G25MP-003-AA⑧R03		2.0	152	152	60				M10	55		Rc3/8	
	①②-G25MP-003-AA⑧R04												Rc1/2	
28	①②-G28MP-L01-AA⑧W06	0.1	10	179	172	65			68		65	12	20A	
	①②-G28MP-L01-AA⑧W08											14	25A	

※3 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※4 For products certified according to the High Pressure Gas Safety Law, Japan, the maximum allowable working pressure is 11.8 MPa.

Accessories/Tools

Maximum Allowable Working Pressure MPa					14(11.8)	25(11.8)			28
Item Number of Accumulator					①②-G14MP-003-AA⑧R03	①②-G25MP-003-AA⑧R03			①②-G28MP-L01-AA⑧W06
					①②-G14MP-003-AA⑧R04	①②-G25MP-003-AA⑧R04			①②-G28MP-L01-AA⑧W08
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	—				—
		NORMA Clamp		☞P201	—				—
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—
Bladder Replacement	Parts	Bladder		☞P210	65②G003A	65②G003A			65②GL01A
		Bladder Back Up Ring			—				—
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)				— (Please use a commercially available wrench.)
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A
		Spring		☞P212	645045500				645045500
		Spring Nut		☞P212	645048200				645048200
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—				—
Separately Available Parts	Eye Nut (Hanging Tool)				—				—
	Valve Cover				—				—
	Exclusively for Q/R Spec.	SG Valve		☞P196	—				—
		Pressure Gauge Containing Glycerol		☞P197	—				—
		Spring Loaded Type Safety Valve		☞P198	—				—
		Fuse Plug		☞P197	—				—

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
2 1 M P

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
L 0 2
L L 1

③	SERIES
S	S Series

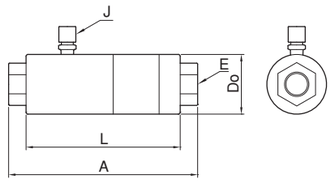
⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Dynac Valve (G thread)

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel

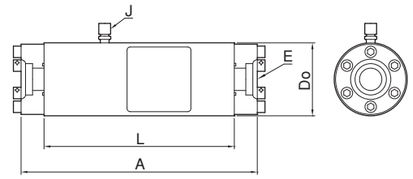
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface: Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing

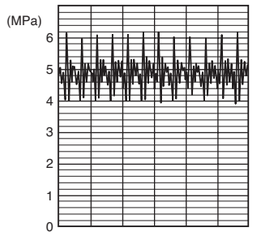


①②-S21MP-L02-AA⑧

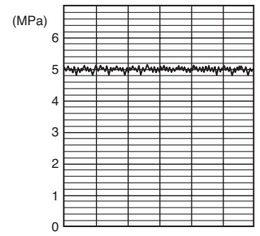


①②-S21MP-LL1-AA⑧

Without Accumulator



With S Series
(①②-S21MP-L02-AAC)



Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	Max. Transit Oil Flow Volume L/min	A mm	L mm			φDo mm	E	J
21	①②-S21MP-L02-AA⑧	0.1	3.3	90	206	168			65	Rc3/4	G1/4
	①②-S21MP-LL1-AA⑧	0.6	19	400	370	298			114.3	40A	

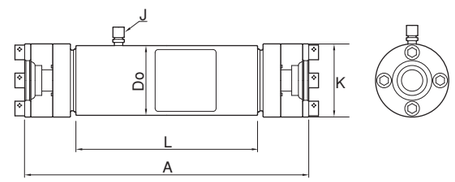
※3 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.

S series allowing for correct flange orientation

When removing ①②-S21MP-LL1-AA⑧ listed above from piping for bladder replacement, accumulator bolt hole positions must be marked in advance to ensure the correct orientation relative to the pipe flange upon reassembly.
①②-S21MP-LL1-AX⑧426 listed below allows for the correct orientation relative to the pipe flange without troublesome work.

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	Max. Transit Oil Flow Volume L/min	A mm	L mm			φDo mm	φK mm	E	J
21	①②-S21MP-LL1-AX⑧426	0.6	28	400	466	306			114.3	120	40A	G1/4

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



①②-S21MP-LL1-AX⑧426

Accessories/Tools

Maximum Allowable Working Pressure MPa					21	21
Item Number of Accumulator					①②-S21MP-L02-AA⑧	①②-S21MP-LL1-AA⑧
						①②-S21MP-LL1-AX⑧426
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □	
	For Installation	NACOL Clamp		☞P200	—	6K114N
		NORMA Clamp		☞P201	—	6081C114
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—	
Bladder Replacement	Parts	Bladder		☞P210	65②SL02A	65②SLL1A
		Bladder Back Up Ring			—	
	Tools	Cap Wrench		☞P208	—	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	—	
		Spring		☞P212	—	
		Spring Nut		☞P212	—	
	Tools	Spring Nut Key		☞P212	—	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—	
Separately Available Parts	Eye Nut (Hanging Tool)				—	
	Valve Cover				—	
	Exclusively for Q/R Spec.	SG Valve		☞P196	—	
		Pressure Gauge Containing Glycerol		☞P197	—	
		Spring Loaded Type Safety Valve		☞P198	—	
		Fuse Plug		☞P197	—	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER COMPOUND
N	Standard Nitrile Rubber (NBR)
B	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 The item number of Standard Nitrile Rubber (NBR) for N series is N, and for J series is B.

MAWP ④ ④ ④ ④	
2 1 M P	
2 5 M P	

※3 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤	
L 0 1	
L L 1	

③	SERIES
N	N Series
J	J Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

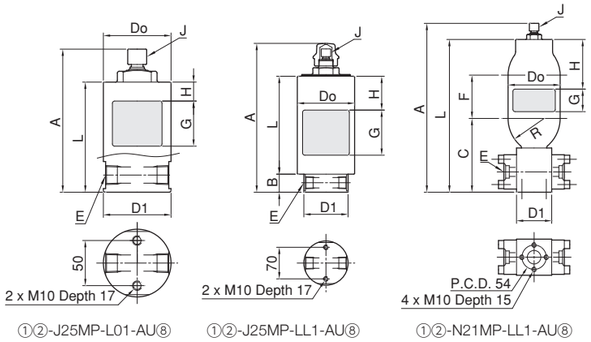
⑦	SPECIFICATION FOR OIL PORT SIDE
U	Carbon Steel Pulse Damper

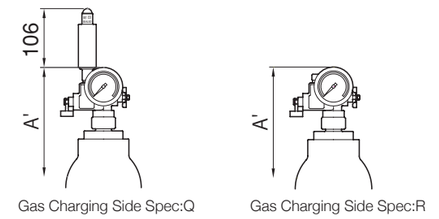
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※4
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※4
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other 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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	A' mm	L mm			B mm	C mm	F mm	H mm	G mm	ϕDo±1% mm	D1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
21	①②-N21MP-LL1-⑥U⑧	1	12.6	368 +8 0	465 +8 0	322.5			—	163.5	90	110	50	114.3	□78	75	MAX.32A	G1/4	300L/min
25	①②-J25MP-L01-AU⑧	0.1	2.9	159 +3 0	—	122				—	—	35		75	Width Across Flat 70	—	Rc1/2		—
	①②-J25MP-LL1-⑥U⑧	1	14.6	328 +3 0	391 +3 0	215			40			75	90	127	Width Across Flat 95	—	Rc3/4		

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

Accessories/Tools

Maximum Allowable Working Pressure MPa					21	25			25
Item Number of Accumulator					①②-N21MP-LL1-⑥U⑧	①②-J25MP-L01-AU⑧			①②-J25MP-LL1-⑥U⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6K114N	—			6K127N
		NORMA Clamp		☞P201	6081C114	—			6081C128
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—
Bladder Replacement	Parts	Bladder		☞P210	65②NLL1A	65②JL01A17A			65②JLL135CA
		Bladder Back Up Ring			—				—
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)				— (Please use a commercially available wrench.)
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A
		Spring		☞P212	645045500				645045500
		Spring Nut		☞P212	645048200				645048200
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—				—
Separately Available Parts	Eye Nut (Hanging Tool)				—				6HTM32
	Valve Cover				—				645049608
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A	—			6H□-AV35MP-F03-M32A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G	—			6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03	—			6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03	—			6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 1 M P
2 3 M P

※1 MAWP: Maximum Allowable Working Pressure

③	SERIES
A	A Series

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L L 5
6 . 3
L 1 0
L 1 6

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

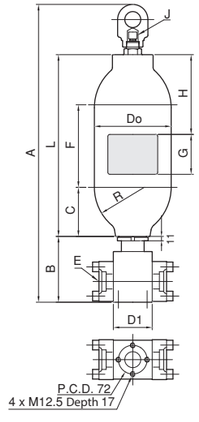
⑦	SPECIFICATION FOR OIL PORT SIDE
V	Carbon Steel Super Pulse Damper

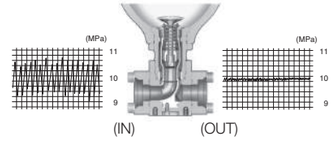
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※2
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※2
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

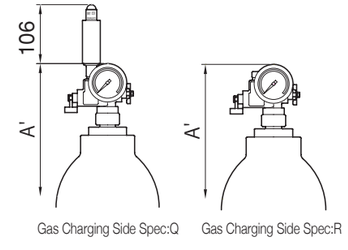
※2 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing







Gas Charging Side Spec:Q　Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+12}_{0}$ mm	A' $^{+12}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	ϕDo±1% mm	D1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
21	①② - A 2 1 M P - L L 5 - ⑥ V ⑧	5	33	698	705	411			161	136	142	160	90	190.7	□98	125	MAX.50A	G1/4	300L/min
	①② - A 2 1 M P - 6 . 3 - ⑥ V ⑧	6.3	37	763	770	476					207	200							
	①② - A 2 1 M P - L 1 0 - ⑥ V ⑧	10	45	933	940	646					377								
	①② - A 2 1 M P - L 1 6 - ⑥ V ⑧	16	62	1,249	1,256	962					693	250							
23	①② - A 2 3 M P - L L 5 - ⑥ V ⑧	5	35	698	705	411					142	160							
	①② - A 2 3 M P - 6 . 3 - ⑥ V ⑧	6.3	39	763	770	476					207	200							
	①② - A 2 3 M P - L 1 0 - ⑥ V ⑧	10	47	933	940	646					377								
	①② - A 2 3 M P - L 1 6 - ⑥ V ⑧	16	64	1,249	1,256	962					693	250							

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

Accessories/Tools

Maximum Allowable Working Pressure MPa					21	23
Item Number of Accumulator					①②-A21MP-LL5-⑥V⑧	①②-A23MP-LL5-⑥V⑧
					①②-A21MP-6.3-⑥V⑧	①②-A23MP-6.3-⑥V⑧
					①②-A21MP-L10-⑥V⑧	①②-A23MP-L10-⑥V⑧
					①②-A21MP-L16-⑥V⑧	①②-A23MP-L16-⑥V⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□	
	For Installation	NACOL Clamp		☞P200	6K190N	
		NORMA Clamp		☞P201	6081C191	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	6BMP190N	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP191	
Bladder Replacement	Parts	Bladder		☞P210	65②A⑤⑤⑤A	
		Bladder Back Up Ring			—	
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A	
		Spring		☞P212	645045500	
		Spring Nut		☞P212	645048200	
	Tools	Spring Nut Key		☞P212	6TWH04	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD075	
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32	
	Valve Cover				645049608	
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A	
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G	
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03	
		Fuse Plug		☞P197	6H-FP35MP-03-F03	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④	
1 7 . 5	
2 1 M P	
2 3 M P	

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
N	N Series

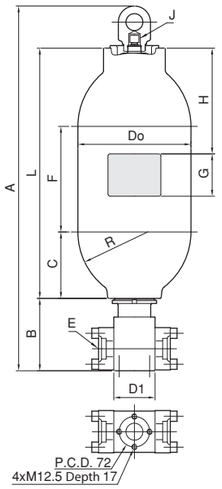
⑦	SPECIFICATION FOR OIL PORT SIDE
V	Carbon Steel Super Pulse Damper

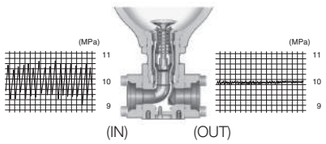
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※3
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※3
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

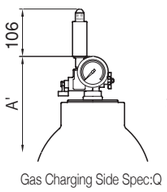
※3 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

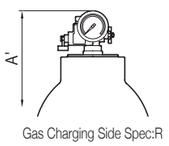
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing









Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	D1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
17.5	①②-N17.5-L20-⑥V⑧	20	87	938	945	668			171	157	326	250	90	267.4	□98	160	MAX.50A	G1/4	300L/min
	①②-N17.5-L30-⑥V⑧	30	109	1,183	1,190	913					571								
	①②-N17.5-L40-⑥V⑧	40	135	1,398	1,405	1,128					786	400							
	①②-N17.5-L50-⑥V⑧	50	168	1,720	1,727	1,450					1,108	700							
	①②-N17.5-L60-⑥V⑧	60	177	1,858	1,865	1,588					1,246								
21	①②-N21MP-L20-⑥V⑧	20	97	938	945	668					326	250				165			
	①②-N21MP-L30-⑥V⑧	30	124	1,183	1,190	913					571								
	①②-N21MP-L40-⑥V⑧	40	150	1,398	1,405	1,128					786	400							
	①②-N21MP-L50-⑥V⑧	50	190	1,720	1,727	1,450					1,108	700							
	①②-N21MP-L60-⑥V⑧	60	200	1,858	1,865	1,588					1,246								
23	①②-N23MP-L20-⑥V⑧	20	102	938	945	668					326	250							
	①②-N23MP-L30-⑥V⑧	30	130	1,183	1,190	913					571								
	①②-N23MP-L40-⑥V⑧	40	160	1,398	1,405	1,128					786	400							
	①②-N23MP-L50-⑥V⑧	50	202	1,720	1,727	1,450					1,108	700							
	①②-N23MP-L60-⑥V⑧	60	212	1,858	1,865	1,588					1,246								

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

Accessories/Tools

Maximum Allowable Working Pressure MPa					17.5	21			23
Item Number of Accumulator					①②-N17.5-L20-⑥V⑧	①②-N21MP-L20-⑥V⑧			①②-N23MP-L20-⑥V⑧
					①②-N17.5-L30-⑥V⑧	①②-N21MP-L30-⑥V⑧			①②-N23MP-L30-⑥V⑧
					①②-N17.5-L40-⑥V⑧	①②-N21MP-L40-⑥V⑧			①②-N23MP-L40-⑥V⑧
					①②-N17.5-L50-⑥V⑧	①②-N21MP-L50-⑥V⑧			①②-N23MP-L50-⑥V⑧
					①②-N17.5-L60-⑥V⑧	①②-N21MP-L60-⑥V⑧			①②-N23MP-L60-⑥V⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6KH267				6KH267
		NORMA Clamp		☞P201	6081C267				6081C267
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199					
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP267				6BMP267
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A				65②N⑤⑤⑤A
		Bladder Back Up Ring			–				–
	Tools	Cap Wrench		☞P208	6TWH81				6TWH81
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A
		Spring		☞P212	645045500				645045500
		Spring Nut		☞P212	645048200				645048200
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD105				6TWD105
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32				6HTM32
	Valve Cover				645049608				645049608
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A				6H□-AV35MP-F03-M32A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④④④④
0 . 9 5

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
L L 2
L L 4

③	SERIES
E	E Series

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

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
A	Standard Material (Carbon Steel)	Inside & Outside Surface: Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid

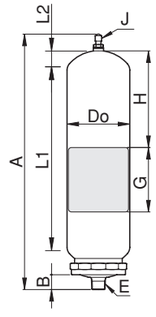
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

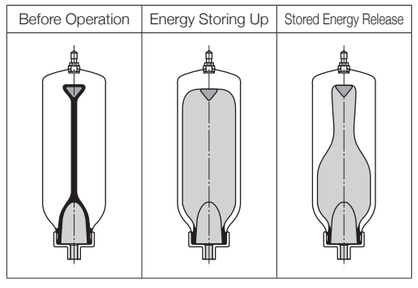
The standard paint coating for E series is as follows:
Outside Surface:
- Paint: Heat Hardening Type Acrylic Resin
- Color: Munsell Hue No.5GY9/1

Inside Surface:
- Paint: Epoxy Resin
- Color: Brown

When the fire resistant fluid or the fluid harmful for the paint were used, there would be a possibility of pealing off of the painting from the inside surface. So, on such case, please contact our sales department about the suitable specification before you issue an order.

Dimensional Drawing





Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	L1 mm	L2 mm			B mm	H mm	G mm	ϕDo mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
0.95	N ② - E 0 . 9 5 - L L 2 - C A A	2	1.9	391	267	34			23	150	90	97.4	R1/2	8V1	45L/min
	N ② - E 0 . 9 5 - L L 4 - C A A	4	2.5	416	278	39.5						127			

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

Accessories/Tools

Maximum Allowable Working Pressure MPa					0.95	0.95
Item Number of Accumulator					①②-E0.95-LL2-CAA	①②-E0.95-LL4-CAA
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GT□□□□ □□□ □	
	For Installation	NACOL Clamp		☞P200	—	6K127N
		NORMA Clamp		☞P201	—	6081C128
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—	
Bladder Replacement	Parts	Bladder		☞P210	—	
		Bladder Back Up Ring			—	
	Tools	Cap Wrench		☞P208	—	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	—	
		Spring		☞P212	—	
		Spring Nut		☞P212	—	
	Tools	Spring Nut Key		☞P212	—	
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—	
Separately Available Parts	Eye Nut (Hanging Tool)				—	
	Valve Cover				—	
	Exclusively for Q/R Spec.	SG Valve		☞P196	—	
		Pressure Gauge Containing Glycerol		☞P197	—	
		Spring Loaded Type Safety Valve		☞P198	—	
		Fuse Plug		☞P197	—	

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
R	EUROPE	P.E.D. (97/23/EC)
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④ ④ ④ ④	
1 5 M P	
2 1 M P	
2 5 M P	
2 8 M P	
3 3 M P	
2 1 0 B	
2 5 0 B	

※2 MAWP: Maximum Allowable Working Pressure
※3 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. 21 MP -> 210 B).

NOMINAL GAS VOLUME ⑤ ⑤ ⑤	
L 6 0	

③	SERIES
Y	Y Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
D	Top Cap Two Pieces Type (For 25MPa) Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※4

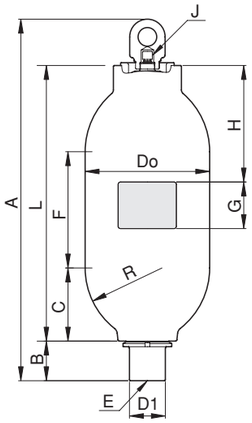
※4 When selecting D, please contact us.

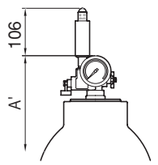
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

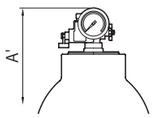
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing





Gas Charging Side Spec:Q



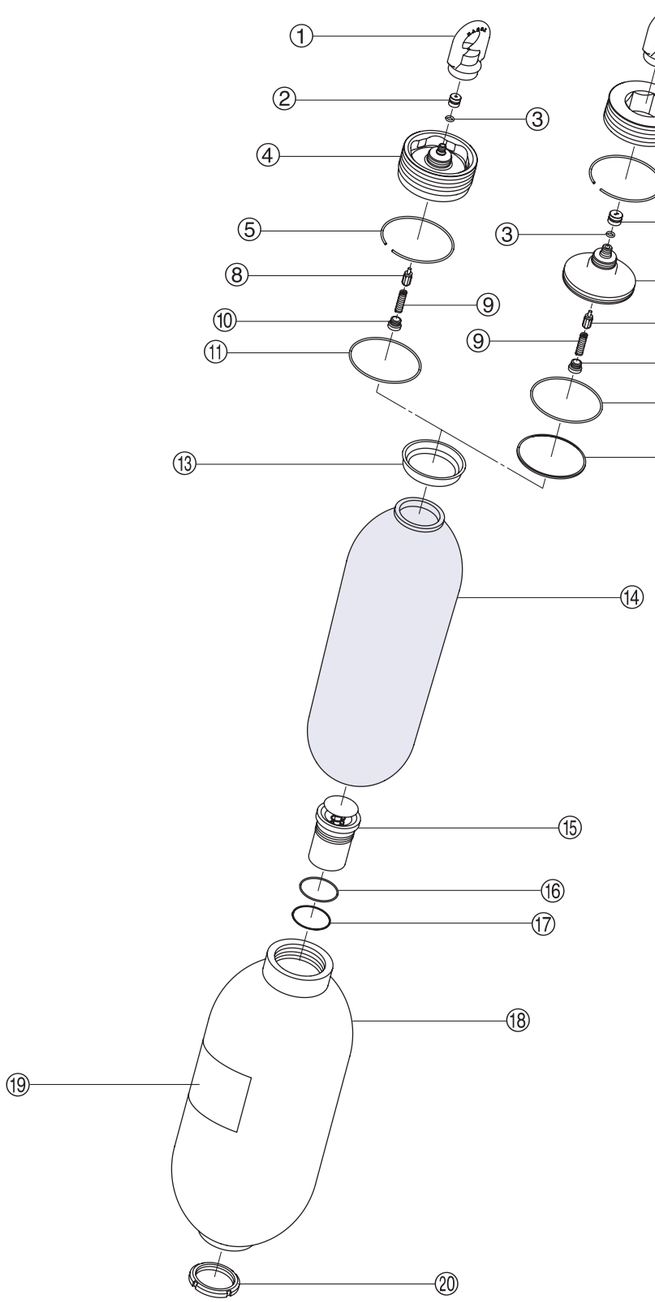
Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
15	①② - Y 1 5 M P - L 6 0 - ⑥⑦⑧	60	170	1,286	1,292	1,088			99	210	638	400	90	355.6	92.5	210	M75x2	G1/4	900L/min	1,800L/min ※7
21	①② - Y 2 1 M P - L 6 0 - ⑥⑦⑧		220													230		G3/8		
25	①② - Y 2 5 M P - L 6 0 - ⑥⑦⑧		250																	
28	①② - Y 2 8 M P - L 6 0 - ⑥⑦⑧		220																	
33	①② - Y 3 3 M P - L 6 0 - ⑥⑦⑧		250																	

※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 Exploded View



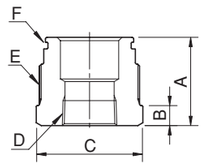
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring
⑩	Spring Nut
⑪	O-ring
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Back Up Ring (Only for 25MPa or more)
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, ③⑪o-rings and ⑬ bladder cap will be attached with the bladder.

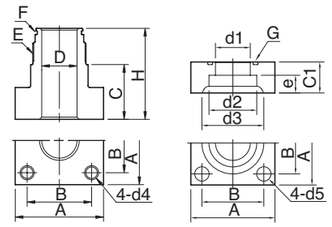
Piping Connection

Dimensional Drawing

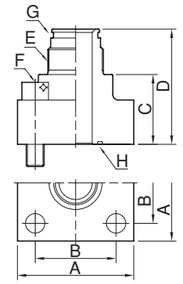
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
15MPa 21MPa 25MPa	6RCM75R03N25M	Rc3/8	66	20	φ80 (Width across flat 75)	Rc3/8	M75x2	JIS B2401 G65	–
	6RCM75R04N25M	Rc1/2				Rc1/2			
	6RCM75R06N25M	Rc3/4				Rc3/4			
	6RCM75R08N25M	Rc1				Rc 1			
	6RCM75R10N25M	Rc1-1/4				Rc 1-1/4			
	6RCM75R12N25M	Rc1-1/2				Rc 1-1/2			
28MPa 33MPa	6RCM75R03N35M	Rc3/8	68			Rc3/8			JIS B2407 G65
	6RCM75R04N35M	Rc1/2				Rc1/2			
	6RCM75R06N35M	Rc3/4				Rc3/4			
	6RCM75R08N35M	Rc1				Rc 1			
	6RCM75R10N35M	Rc1-1/4				Rc 1-1/4			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	φD	C1	φ d1	φ d2	φ d3	φ d4	φ d5	E	F		G
																O-Ring	B.U. Ring	
15MPa 21MPa	6FCM7515AX007	15A	100	73	38	84	11	47.5	36	16	22.2	32	M16	18	M75x2	JIS B2401 G65	–	G60
	6FCM7520AX006	20A					12			20	27.7	38						
	6FCM7525AX005	25A					14			25	34.5	45						
	6FCM7532AX004	32A					16			31.5	43.2	56						
	6FCM7540AX003	40A					18			37.5	49.1	63						
	6FCM7550AN21M	50A					20			47.5	61.1	75						
	6FCM7565AN21M	65A	128	92	45	91	22	50	45	60	77.1	95	M20	22				G75
25MPa 28MPa 33MPa	6FCM7532AN35M	32A	92	65	45	93	18	30	36	30	43.2	63	M16	18			JIS B2407 G65	G40
	6FCM7550AN35M	50A	132	92	50	97	25	35	50	35	61.1	84	M20	22				G50

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
15MPa 21MPa	6FCM7532DN21M	32A	76	56	92	138	M75x2	M12x45	JIS B2401 G65	–	G40
	6FCM7540DX013	40A	92	65	122	168		M16x60			G50
	6FCM7550DN21M	50A	100	73	91	137		M16x55			G60
	6FCM7565DN21M	65A	128	92	64	110		M20x80			G75
25MPa 28MPa 33MPa	6FCM7525DX030	25A	φ106	52	125	173		M16x55		JIS B2407 G65	G35
	6FCM7550DN35M	50A	132	92	67	115		M20x80			G50

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa					15	21			25	28	33
Item Number of Accumulator					①②-Y15MP-L60-⑥⑦⑧	①②-Y21MP-L60-⑥⑦⑧			①②-Y25MP-L60-⑥⑦⑧	①②-Y28MP-L60-⑥⑦⑧	①②-Y33MP-L60-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□□				6GH□□□□□□□□		
	For Installation	NACOL Clamp		☞P200	6KH355				6KH355		
		NORMA Clamp		☞P201	6081C350				6081C350		
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—		
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—		
Bladder Replacement	Parts	Bladder		☞P210	65②YL60A				65②YL60A		
		Bladder Back Up Ring			—				640082501120		
	Tools	Cap Wrench		☞P208	6TWH100				6TWH63		
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A		
		Spring		☞P212	645045500				645045500		
		Spring Nut		☞P212	645048200				645048200		
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04		
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD120				6TWD120		
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42				6HTM42H63		
	Valve Cover				645049705				645049705		
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A				6H□-AV35MP-F03-M42A		
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G		
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03		
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03		

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
S	CANADA	ASME + B51
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
1 5 M P
2 1 M P
2 5 M P

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
L 6 0

③	SERIES
Y	Y Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
D	Top Cap Two Pieces Type (For 25MPa) Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
E	High Flow Type Carbon Steel
G	High Flow Type Stainless Steel

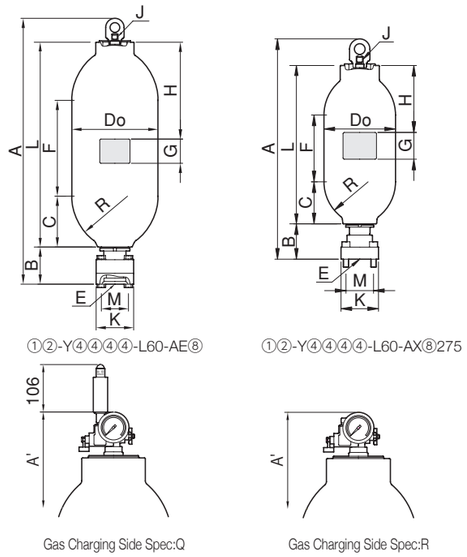
※3 When selecting G, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※4
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※4
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other 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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



①②-Y④④④④-L60-AE⑧ ①②-Y④④④④-L60-AX⑧275

Gas Charging Side Spec:Q Gas Charging Side Spec:R

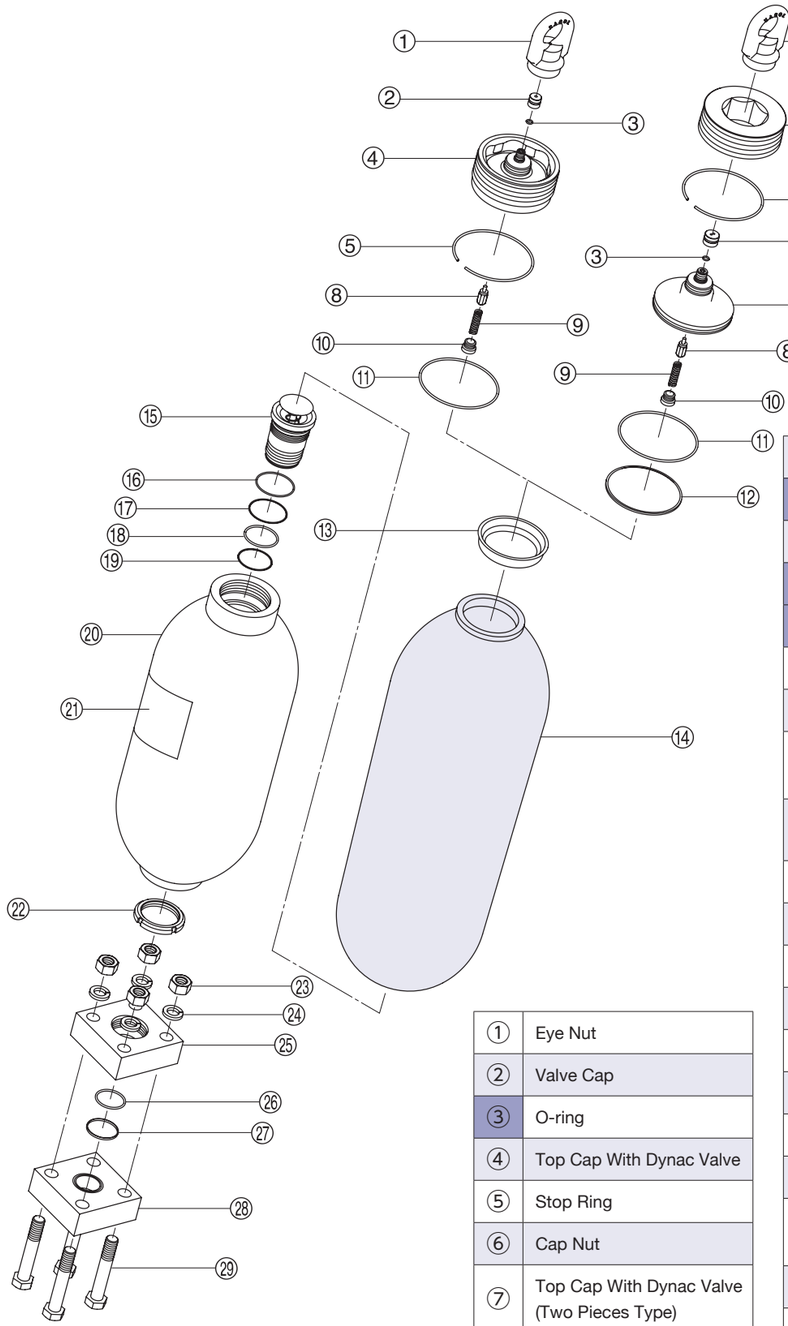
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
15	①②-Y15MP-L60-⑥E⑧	60	190	1,341	1,347	1,088			154	210	638	400	90	355.6	155	112 (M22x140)	210	MAX.80A	G1/4	1,800L/min	6,000L/min ※6
	①②-Y15MP-L60-⑥X⑧275		176	1,291	1,297				104							112 (M22x55)		φ68mm			
21	①②-Y21MP-L60-⑥E⑧		240	1,341	1,347				154							112 (M22x140)	230	MAX.80A			
	①②-Y21MP-L60-⑥X⑧275		226	1,291	1,297				104							112 (M22x55)		φ68mm			
25	①②-Y25MP-L60-⑥E⑧		270	1,372	1,378				185						190	130 (M30x180)		MAX.80A	G3/8		

※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 Exploded View

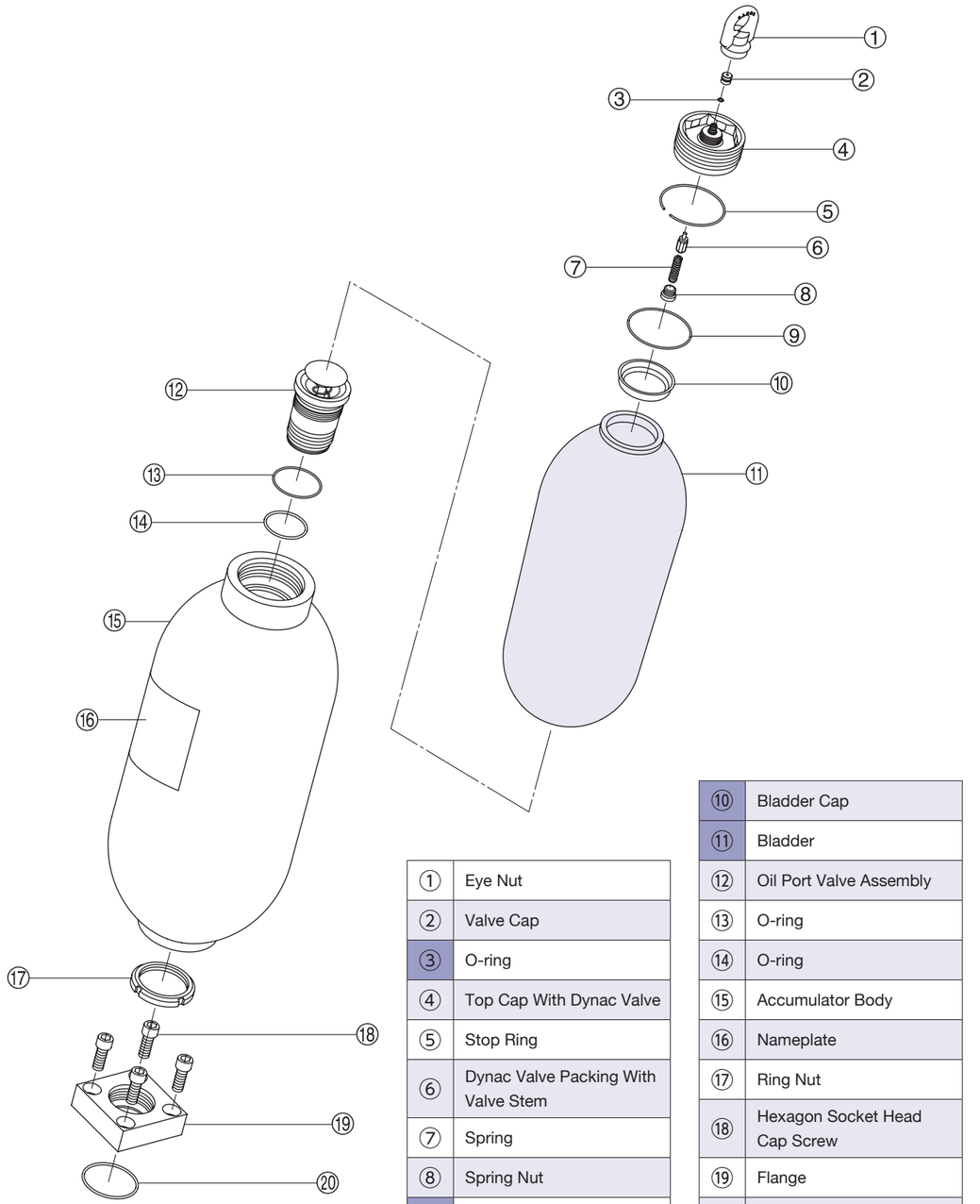


①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Cap Nut
⑦	Top Cap With Dynac Valve (Two Pieces Type)
⑧	Dynac Valve Packing With Valve Stem
⑨	Spring

⑩	Spring Nut
⑪	O-ring
⑫	Bladder Back Up Ring
⑬	Bladder Cap
⑭	Bladder
⑮	Oil Port Valve Assembly
⑯	O-ring
⑰	Back Up Ring (Only for 25MPa or more)
⑱	Back Up Ring (Only for 25MPa or more)
⑲	O-ring
⑳	Accumulator Body
㉑	Nameplate
㉒	Ring Nut
㉓	Nut
㉔	Spring Washer
㉕	Flange
㉖	O-ring
㉗	Back Up Ring (Only for 25MPa or more)
㉘	Counter Flange
㉙	Bolt

※1 The typical exploded view for this series.
※2 If you purchase ⑭ bladder as the spare parts, ③⑪o-rings and ⑬ bladder cap will be attached with the bladder.

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring

⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring
⑭	O-ring
⑮	Accumulator Body
⑯	Nameplate
⑰	Ring Nut
⑱	Hexagon Socket Head Cap Screw
⑲	Flange
⑳	O-ring

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					15	21			25
Item Number of Accumulator					①②-Y15MP-L60-⑥X⑧	①②-Y21MP-L60-⑥X⑧			①②-Y25MP-L60-⑥⑦⑧
					①②-Y15MP-L60-⑥X⑧275	①②-Y21MP-L60-⑥X⑧275			
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□□				6GH□□□□□□□□
	For Installation	NACOL Clamp		☞P200	6KH355				6KH355
		NORMA Clamp		☞P201	6081C350				6081C350
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—
Bladder Replacement	Parts	Bladder		☞P210	65②YL60A				65②YL60A
		Bladder Back Up Ring			—				640082501120
	Tools	Cap Wrench		☞P208	6TWH100				6TWH63
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A
		Spring		☞P212	645045500				645045500
		Spring Nut		☞P212	645048200				645048200
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD120				6TWD120
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42				6HTM42H63
	Valve Cover				645049705				645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A				6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP	
④ ④ ④ ④	
2 1 M P	

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME
⑤ ⑤ ⑤
L 6 0

③	SERIES
Y	Y Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
Y	Super High Flow Type Carbon Steel
M	Super High Flow Type Stainless Steel

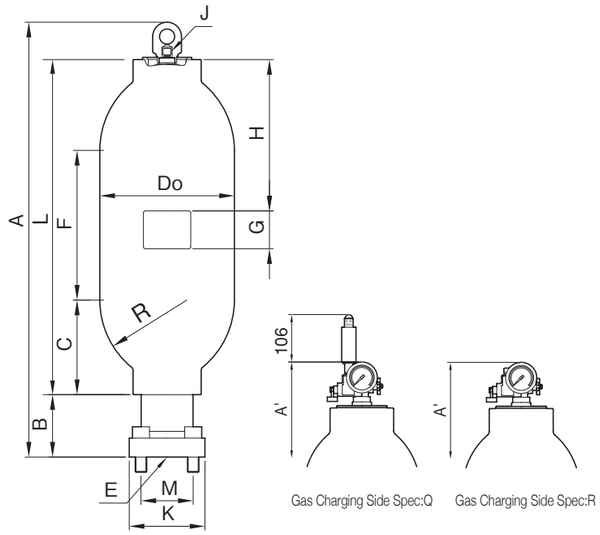
※2 When selecting M, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※3
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※3
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



Gas Charging Side Spec:Q　　Gas Charging Side Spec:R

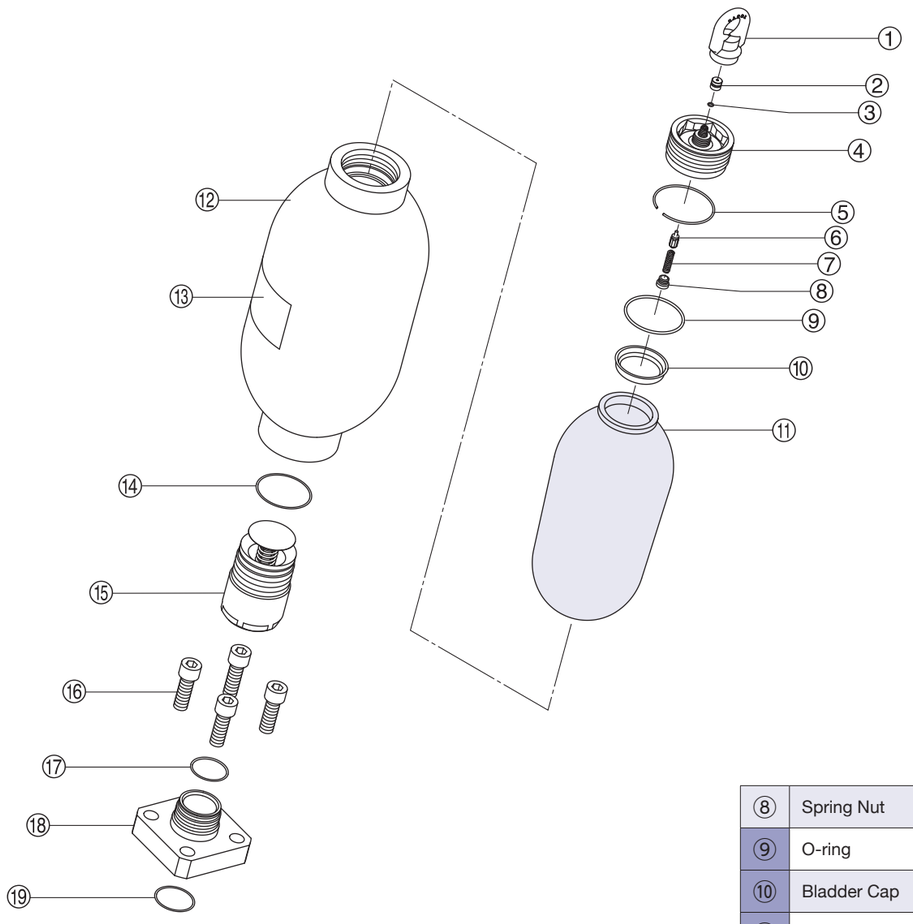
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	□K mm	□M mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]	Possible Oil Flow Rate
	①②-Y21MP-L60-⑥Y⑧	60	250	1,408	1,414	1,144			165	250	654	400	90	355.6	200	138(M30x90)	230	φ75mm	G1/4	3,600L/min	7,200L/min ※5

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

※5 Maximum oil flow rate available under certain conditions.

Typical Exploded View



①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Accumulator Body
⑬	Nameplate
⑭	O-ring
⑮	Oil Port Valve Assembly
⑯	Hexagon Socket Head Cap Bolt
⑰	O-ring
⑱	Flange
⑲	O-ring

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

Accessories/Tools

Maximum Allowable Working Pressure MPa					21
					①②-Y21MP-L60-⑥Y⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□
	For Installation	NACOL Clamp		☞P200	6KH355
		NORMA Clamp		☞P201	6081C350
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—
Bladder Replacement	Parts	Bladder		☞P210	65②Y⑤⑤⑤A
		Bladder Back Up Ring			—
	Tools	Cap Wrench		☞P208	6TWH100
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A
		Spring		☞P212	645045500
		Spring Nut		☞P212	645048200
	Tools	Spring Nut Key		☞P212	6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	— (Please use a commercially available wrench.)
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42
	Valve Cover				645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit. (Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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 gas volume, some bladder materials may not be supported by NACOL products.

MAWP ④ ④ ④ ④
2 5 M P

※3 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 1 0
L 2 0
L 3 0
L 5 0

③	SERIES
U	U Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※4

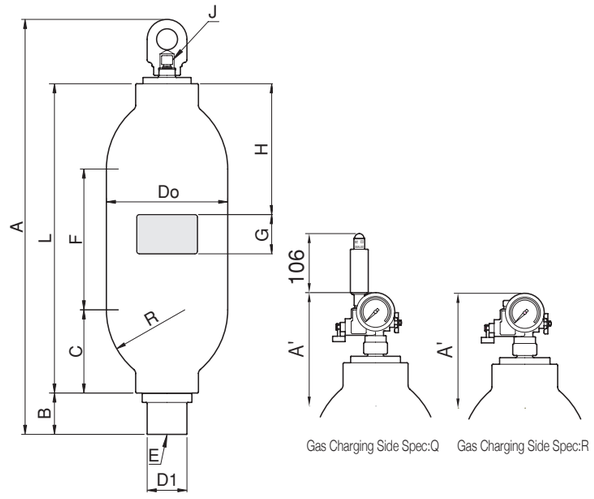
※4 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



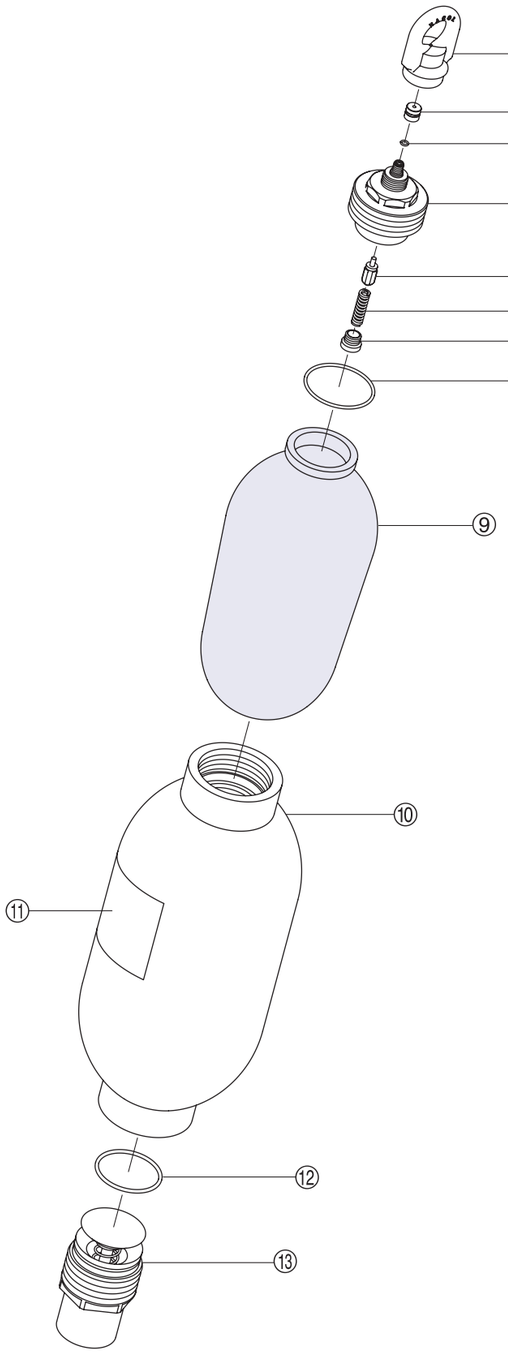
Gas Charging Side Spec:Q　Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +12 0 mm	A' +12 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
25	①②-U25MP-L10-⑥⑦⑧	10	55	742	749	540			79	159	218	200	90	232	76	150	M60x2	G1/4	600L/min
	①②-U25MP-L20-⑥⑦⑧	20	90	1,086	1,093	884					562	250							
	①②-U25MP-L30-⑥⑦⑧	30	126	1,466	1,473	1,264					942	400							
	①②-U25MP-L50-⑥⑦⑧	50	176	1,976	1,983	1,774					1,452	700							
	①②-U25MP-L10-⑥⑦⑧G16	10	55	742	749	540					218	200					G2		
	①②-U25MP-L20-⑥⑦⑧G16	20	90	1,086	1,153	884					562	250							
	①②-U25MP-L30-⑥⑦⑧G16	30	126	1,466	1,533	1,264					942	400							
	①②-U25MP-L50-⑥⑦⑧G16	50	176	1,976	2,043	1,774					1,452	700							

※6 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※7 U series 10 L, 30 L and 50 L accumulators use a seamed bladder (not a seamless one-piece bladder).

Typical Exploded View



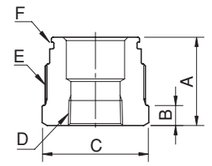
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring
⑨	Bladder
⑩	Accumulator Body
⑪	Nameplate
⑫	O-ring
⑬	Oil Port Valve Assembly

※1 The typical exploded view for this series.
※2 If you purchase ⑨ bladder as the spare parts, ③⑧o-rings will be attached with the bladder.

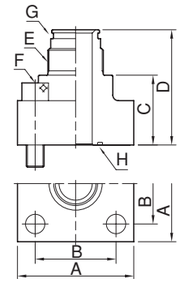
Piping Connection

Dimensional Drawing

Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
25MPa	6RCM60R02X014	Rc1/4	63	20	φ75 (Width across flat 70)	Rc1/4	M60x2	AS568 225	—
	6RCM60R03X014	Rc3/8				Rc3/8			
	6RCM60R04X014	Rc1/2				Rc1/2			
	6RCM60R06X014	Rc3/4				Rc3/4			
	6RCM60R08X014	Rc1				Rc1			

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
25MPa	6FCM6050DX034	50A	100	73	36	79	M60x2	M16x55	AS568 225	—	G55

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa					25
Item Number of Accumulator					①②-U25MP-L10-⑥⑦⑧
					①②-U25MP-L20-⑥⑦⑧
					①②-U25MP-L30-⑥⑦⑧
					①②-U25MP-L50-⑥⑦⑧
					①②-U25MP-L10-⑥⑦⑧G16
					①②-U25MP-L20-⑥⑦⑧G16
					①②-U25MP-L30-⑥⑦⑧G16
					①②-U25MP-L50-⑥⑦⑧G16
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□□ □
	For Installation	NACOL Clamp		☞P200	6KH232
		NORMA Clamp		☞P201	6081C232
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—
Bladder Replacement	Parts	Bladder		☞P210	65②U⑤⑤⑤A
		Bladder Back Up Ring			—
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A
		Spring		☞P212	645045500
		Spring Nut		☞P212	645048200
	Tools	Spring Nut Key		☞P212	6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	— (Please use a commercially available wrench.)
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32
	Valve Cover				645049608
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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 gas volume, some bladder materials may not be supported by NACOL products.

MAWP ④ ④ ④ ④
2 8 M P

※3 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 2 0
L 3 2
L 4 0
L 5 0
L 6 3

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
R	R Series

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※4

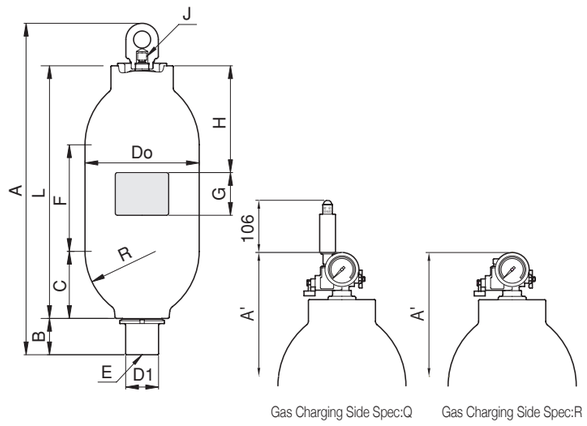
※4 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing

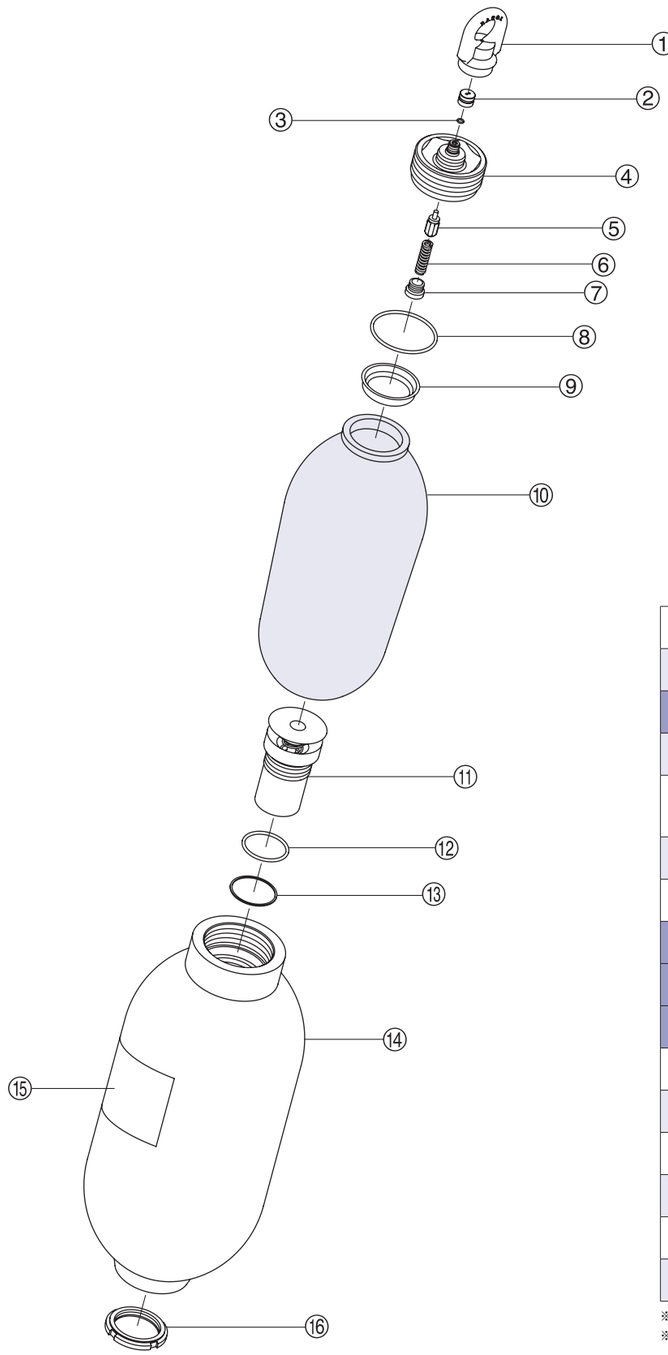


Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A $^{+17}_{0}$ mm	A' $^{+17}_{0}$ mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt] L
28	①② - R 2 8 M P - L 2 0 - ⑥⑦⑧	20	105	896	903	719			78	164	375	250	90	267.4	67.2	165	M50x2	G3/8	450L/min
	①② - R 2 8 M P - L 3 2 - ⑥⑦⑧ ※6	32	145	1,215	1,222	1,038					694	400							
	①② - R 2 8 M P - L 4 0 - ⑥⑦⑧ ※6	40	180	1,427	1,434	1,250					906								
	①② - R 2 8 M P - L 5 0 - ⑥⑦⑧	50	215	1,693	1,700	1,516					1,172	700							
	①② - R 2 8 M P - L 6 3 - ⑥⑦⑧	63	265	2,037	2,044	1,860					1,516	1,000							

※6 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※7 R series 32 L and 40 L accumulators use a seamed bladder (not a seamless one-piece bladder).

Typical Exploded View



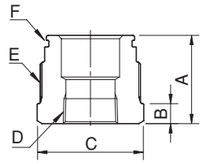
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Dynac Valve Packing With Valve Stem
⑥	Spring
⑦	Spring Nut
⑧	O-ring
⑨	Bladder Cap
⑩	Bladder
⑪	Oil Port Valve Assembly
⑫	O-ring
⑬	Back Up Ring
⑭	Accumulator Body
⑮	Nameplate
⑯	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑩ bladder as the spare parts, ③⑧o-rings and ⑨ bladder cap will be attached with the bladder.

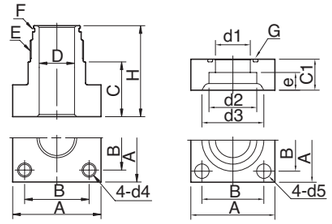
Piping Connection

Dimensional Drawing

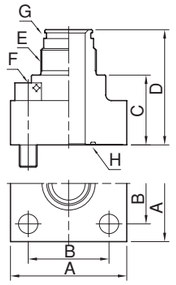
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
28MPa	6RCM50R02N28M	Rc1/4	53	12	φ60 (Width across flat 54)	Rc1/4	M50x2	JIS B2401 G40	JIS B2407 G40
	6RCM50R03N28M	Rc3/8				Rc3/8			
	6RCM50R04N28M	Rc1/2				Rc1/2			
	6RCM50R06N28M	Rc3/4				Rc3/4			
	6RCM50R08N28M	Rc1				Rc1			
	6RCM50R10N28M	Rc1-1/4	77	36	φ65 (Width across flat 60)	Rc1-1/4			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	φD	C1	φ d1	φ d2	φ d3	φ d4	φ d5	E	F		G
																O-Ring	B.U. Ring	
28MPa	6FCM5050AN28M	50A	130	90	50	91	20	30	50	43.1	61.1	79	M20	22	M50x2	JIS B2401 G40	JIS B2407 G40	G55

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
28MPa	6FCM5025DX007	25A	φ106	52	110	151	M50x2	M16x55	JIS B2401 G40	JIS B2407 G40	G35
	6FCM5032DX002	32A	106	77	36	77		M16x60			G40
	6FCM5040DX001	40A	105	73	53	94					

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa					28
Item Number of Accumulator					①②-R28MP-L20-⑥⑦⑧
					①②-R28MP-L32-⑥⑦⑧
					①②-R28MP-L40-⑥⑦⑧
					①②-R28MP-L50-⑥⑦⑧
					①②-R28MP-L63-⑥⑦⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GH□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6KH267
		NORMA Clamp		☞P201	6081C267
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP267
Bladder Replacement	Parts	Bladder		☞P210	65②R⑤⑤⑤A
		Bladder Back Up Ring			—
	Tools	Cap Wrench		☞P208	6TWH81
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A
		Spring		☞P212	645045500
		Spring Nut		☞P212	645048200
	Tools	Spring Nut Key		☞P212	6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD085
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42
	Valve Cover				645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 M P A

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0
L 8 0
1 2 0

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
R	SG Valve + Fuse Plug + Pressure Gauge

③	SERIES
N	N Series
Y	Y Series

⑦	SPECIFICATION FOR OIL PORT SIDE
X	Screen Type

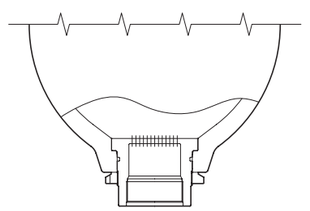
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※2
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※2
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other 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.

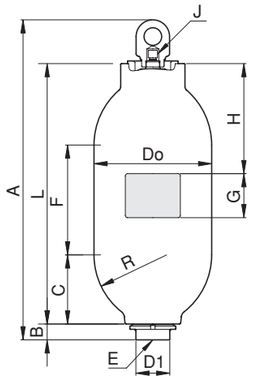
⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

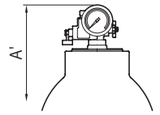
Dimensional Drawing

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 a screen type accumulator
The oil port valve assembly is provided with holes for fluid passage.





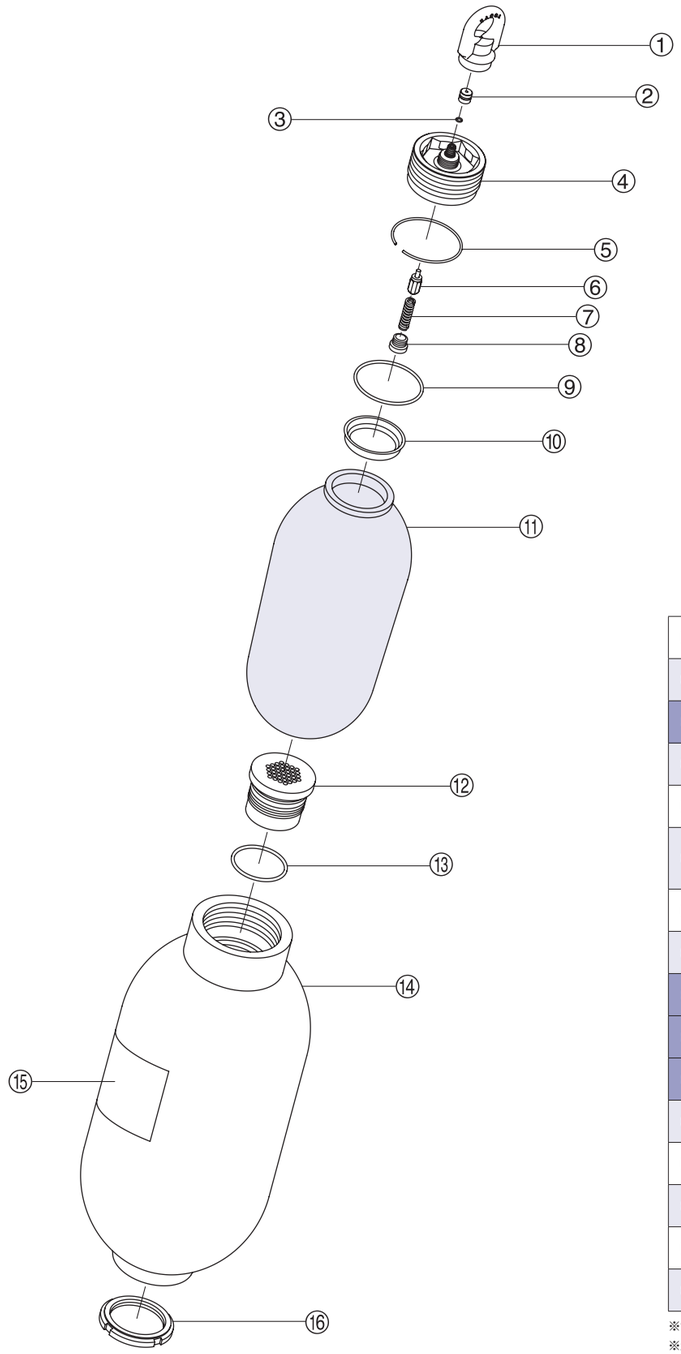
Gas Charging Side Spec:R

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +17 0 mm	A' +17 0 mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD1 mm	R mm	E	J
2	①②-N2MPA-L20-⑥X⑧397	20	75	803	810	668			36	157	326	250	90	267.4	77	160	M60x2	G1/4
	①②-N2MPA-L30-⑥X⑧397	30	97	1,048	1,055	913					571							
	①②-N2MPA-L40-⑥X⑧397	40	123	1,263	1,270	1,128					786	400						
	①②-N2MPA-L50-⑥X⑧397	50	156	1,585	1,592	1,450					1,108	700						
	①②-N2MPA-L60-⑥X⑧397	60	168	1,723	1,730	1,588					1,246							
	①②-Y2MPA-L60-⑥X⑧397	60	170	1,224	1,230	1,088			37	210	638	400		355.6	91.5	210	M75x2	
	①②-N2MPA-L80-⑥X⑧397	80	210	1,479	1,485	1,343					893							
	①②-N2MPA-120-⑥X⑧397	120	270	1,931	1,937	1,795					1,345	1,000						

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

Typical Exploded View



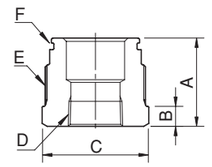
①	Eye Nut
②	Valve Cap
③	O-ring
④	Top Cap With Dynac Valve
⑤	Stop Ring
⑥	Dynac Valve Packing With Valve Stem
⑦	Spring
⑧	Spring Nut
⑨	O-ring
⑩	Bladder Cap
⑪	Bladder
⑫	Oil Port Valve Assembly
⑬	O-ring
⑭	Accumulator Body
⑮	Nameplate
⑯	Ring Nut

※1 The typical exploded view for this series.
※2 If you purchase ⑪ bladder as the spare parts, ③⑨o-rings and ⑩ bladder cap will be attached with the bladder.

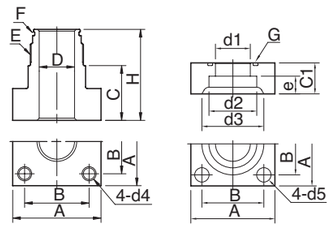
Piping Connection

Dimensional Drawing

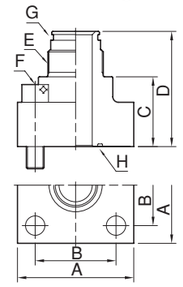
Bushing



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.	Item Number	Connection Port Size	A	B	C	D	E	F O-Ring
2MPa	N Series 20–60L	6RCM60R02N23M	Rc1/4	53	12	ϕ64 (Width across flat 60)	Rc1/4	M60x2	JIS B2401 G50
		6RCM60R03N23M	Rc3/8				Rc3/8		
		6RCM60R04N23M	Rc1/2				Rc1/2		
		6RCM60R06N23M	Rc3/4				Rc3/4		
		6RCM60R08N23M	Rc1				Rc1		
		6RCM60R10N23M	Rc1-1/4				Rc1-1/4		
		6RCM60R12N23M	Rc1-1/2	77	36	ϕ85 (Width across flat 80)	Rc1-1/2		
2MPa	Y Series 60L N Series 80–120L	6RCM75R03N25M	Rc3/8	66	20	ϕ80 (Width across flat 75)	Rc3/8	M75x2	JIS B2401 G65
		6RCM75R04N25M	Rc1/2				Rc1/2		
		6RCM75R06N25M	Rc3/4				Rc3/4		
		6RCM75R08N25M	Rc1				Rc 1		
		6RCM75R10N25M	Rc1-1/4				Rc 1-1/4		
		6RCM75R12N25M	Rc1-1/2				Rc 1-1/2		

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Applicable ACC.	Item Number	CPS	A	B	C	H	e	ϕD	C1	ϕ d1	ϕ d2	ϕ d3	ϕ d4	ϕ d5	E	F O-Ring	G
2MPa	N Series 20–60L	6FCM6015AX009	15A	76	56	28	69	11	30	28	16	22.2	32	M12	13	M60x2	JIS B2401 G50	G40
		6FCM6020AX008	20A					12			20	27.7	38					
		6FCM6025AX007	25A					14			25	34.5	45					
		6FCM6032AN21M	32A					16			31.5	43.2	56					
		6FCM6040LX010	40A	100	73	62	103	18	47.5	36	37.5	49.1	63	M16	18			G60
		6FCM6050LN21M	50A					20			47.5	61.1	75					
		6FCM6065AN21M	65A	128	92	45	86	22	60	45	60	77.1	95	M20	22			G75
	Y Series 60L N Series 80–120L	6FCM7515AX007	15A	100	73	38	84	11	47.5	36	16	22.2	32	M16	18	M75x2	JIS B2401 G65	G60
		6FCM7520AX006	20A					12			20	27.7	38					
		6FCM7525AX005	25A					14			25	34.5	45					
		6FCM7532AX004	32A					16			31.5	43.2	56					
		6FCM7540AX003	40A					18			37.5	49.1	63					
		6FCM7550AN21M	50A					20			47.5	61.1	75					
		6FCM7565AN21M	65A	128	92	45	91	22	50	45	60	77.1	95	M20	22			G75

Valve Flange

(mm)

Applicable ACC. MAWP	Applicable ACC.	Item Number	CPS	A	B	C	D	E	F	G O-Ring	H
2MPa	N Series 20–60L	6FCM6032DN21M	32A	76	56	83	124	M60x2	M12x45	JIS B2401 G50	G40
		6FCM6040DX001	40A	92	65	119	160		M16x55		G50
		6FCM6050DN21M	50A	100	73	62	103				G60
	Y Series 60L N Series 80–120L	6FCM7532DN21M	32A	76	56	92	138	M75x2	M12x45	JIS B2401 G65	G40
		6FCM7540DX013	40A	92	65	122	168		M16x60		G50
		6FCM7550DN21M	50A	100	73	91	137		M16x55		G60
		6FCM7565DN21M	65A	128	92	64	110		M20x80		G75

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa					2	2			2
Item Number of Accumulator					①②-N2MPA-L20-⑥X⑧397	①②-N2MPA-L80-⑥X⑧397			①②-Y2MPA-L60-⑥X⑧397
					①②-N2MPA-L30-⑥X⑧397	①②-N2MPA-120-⑥X⑧397			
					①②-N2MPA-L40-⑥X⑧397				
					①②-N2MPA-L50-⑥X⑧397				
					①②-N2MPA-L60-⑥X⑧397				
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□□ □				6GG□□□□ □□□□ □
	For Installation	NACOL Clamp		☞P200	6KH267	6KH355			6KH355
		NORMA Clamp		☞P201	6081C267	6081C350			6081C350
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199		—			—
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	6BMP267	—			—
Bladder Replacement	Parts	Bladder		☞P210	65②N⑤⑤⑤A				65②YL60A
		Bladder Back Up Ring			—				—
	Tools	Cap Wrench		☞P208	6TWH81	6TWH100			6TWH100
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A
		Spring		☞P212	645045500				645045500
		Spring Nut		☞P212	645048200				645048200
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD105	6TWD120			6TWD120
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32	6HTM42			6HTM42
	Valve Cover				645049608	645049705			645049705
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M32A	6H□-AV35MP-F03-M42A			6H□-AV35MP-F03-M42A
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number (Back Up Bottle Side)

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
P	JAPAN	High Pressure Gas Safety Law, Japan (Specified Facilities)
M	U.S.A.	ASME
N	OTHER	NACOL (Manufacturer's) Inspection

②	BLADDER COMPOUND
Z	No Bladder

MAWP ④ ④ ④ ④
2 1 M P

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
1 0 0
1 6 0

③	SERIES
B	Back Up Bottle

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
X	When ⑨ is 025 : Dynac Gas Valve
X	When ⑨ is 048 : SG Valve + Spring Loaded Type Safety Valve + Pressure Gauge
X	When ⑨ is 049 : SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
X	When ⑨ is 025 or 048 or 049 : Flange Connection Type

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface: Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid

⑨⑨⑨	SPECIAL SPECIFICATION
＊＊＊	3 digits number (025, 048, 049) shall be filled in.

Dimensional Table (Back Up Bottle Side)

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	A' mm	L mm			B mm	C mm	F mm	H mm	G mm	φDo±1% mm	φD2 mm	φD3 mm	K	J
21	①Z - B 2 1 M P - 1 0 0 - X X ⑧025	100	340	1,462 +12 0	1,451 +12 0	1,247			65	284	717	1,000	90	406.4	260	300	M20x2.5	G1/4
	①Z - B 2 1 M P - 1 6 0 - X X ⑧025	160	495	2,085 +15 0	2,076 +15 0	1,870					1,340							

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

Explanation of Item Number (Accumulator Side)

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
M	U.S.A.	ASME
N	OTHER	NACOL (Manufacturer's) Inspection

②	BLADDER 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)

MAWP ④ ④ ④ ④
2 1 M P

※3 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
1 6 0

③	SERIES
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel ※4

※4 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface : Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface : Standard Paint Coating Outside Surface : Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid ※5
N		Inside Surface : Zinc Phosphate Treatment Outside Surface : Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surface : Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

※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.

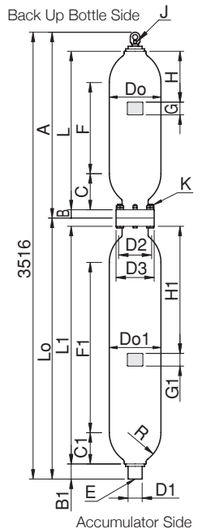
⑨⑨⑨	SPECIAL SPECIFICATION
017	3 digits number (017) shall be filled in.

Dimensional Table (Accumulator Side)

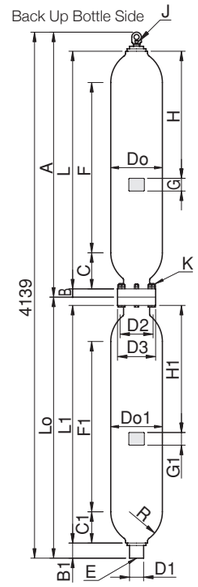
Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	Lo mm	L1 mm	B1 mm			C1 mm	F1 mm	H1 mm	G1 mm	φDo1±1% mm	φD1 mm	R mm	E	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
21	①②- N 2 1 M P - 1 6 0 - X ⑦⑧017	160	490	2,054 +15 0	1,870	119			246	1,340	1,000	90	406.4	111	260	M90x2	1,200L/min

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

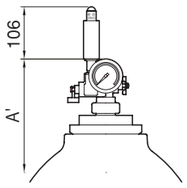
Dimensional Drawing



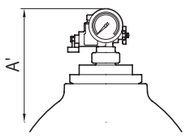
Accumulator Side 260L



Accumulator Side 320L



When ⑨ is 048

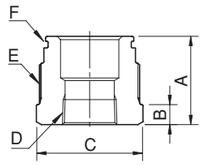


When ⑨ is 049

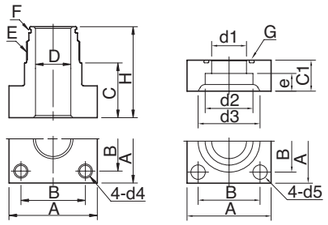
Piping Connection

Dimensional Drawing

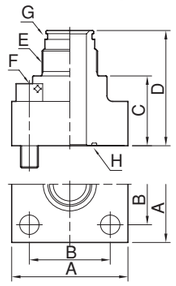
Bushing



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	Item Number	Connection Port Size	A	B	C	D	E	F	
								O-Ring	B.U. Ring
21MPa	6RCM90R06N25M	Rc3/4	71	20	ϕ100 (Width across flat 90)	Rc3/4	M90x2	JIS B2401 G80	—
	6RCM90R08N25M	Rc1				Rc 1			
	6RCM90R10N25M	Rc1-1/4				Rc 1-1/4			
	6RCM90R12N25M	Rc1-1/2				Rc 1-1/2			
	6RCM90R16N25M	Rc2				Rc 2			

Flange (with Counter Flange)

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	H	e	ϕD	C1	ϕ d1	ϕ d2	ϕ d3	ϕ d4	ϕ d5	E	F		G
																O-Ring	B.U. Ring	
21MPa	6FCM9025AX003	25A	100	73	38	89	14	47.5	36	25	34.5	45	M16	18	M90x2	JIS B2401 G80	—	G60
	6FCM9032AX002	32A					16			31.5	43.2	56						
	6FCM9040AX001	40A					18			37.5	49.1	63						
	6FCM9050AN21M	50A					20			47.5	61.1	75						

Valve Flange

(mm)

Applicable ACC. MAWP	Item Number	CPS	A	B	C	D	E	F	G		H
									O-Ring	B.U. Ring	
21MPa	6FCM9032DN21M	32A	76	56	103	154	M90x2	M12x45	JIS B2401 G80	—	G40
	6FCM9050DN21M	50A	100	73	120	171		M16x55			G60

CPS:Connection Port Size MAWP: Maximum Allowable Working Pressure

Accessories/Tools

Maximum Allowable Working Pressure MPa					21 (Back Up Bottle)	21 (Accumulator)
Item Number of Accumulator					①Z-B21MP-100-XX⑧025	①②-N21MP-160-X⑦⑧017
					①Z-B21MP-160-XX⑧025	
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□□□□□	—
	For Installation	NACOL Clamp		☞P200	6KH406	
		NORMA Clamp		☞P201	6081C406	
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—	
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—	
Bladder Replacement	Parts	Bladder		☞P210	—	65②N160A
		Bladder Back Up Ring			—	
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)	
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A	—
		Spring		☞P212	645045500	—
		Spring Nut		☞P212	645048200	—
	Tools	Spring Nut Key		☞P212	6TWH04	—
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—	6TWD140
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42	—
	Valve Cover				645049705	—
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A	—
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G	—
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03	—
		Fuse Plug		☞P197	6H-FP35MP-03-F03	—

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER COMPOUND
N	Standard Nitrile Rubber (NBR)
B	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 The item number code for standard nitrile rubber is "N" for the N series and "B" for the J series.

④④④④ MAWP
5 M P A
7 M P A
1 0 M P
2 0 . 6
2 5 M P
5 0 M P

※3 MAWP: Maximum Allowable Working Pressure

⑤⑤⑤ NOMINAL GAS VOLUME	⑤⑤⑤ NOMINAL GAS VOLUME
L 0 1	L L 2
L 0 3	L L 3
L 0 5	L L 4
L L 1	L L 5

③	SERIES
J	J Series
N	N Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
P	Top Cap Stainless Steel Dynac Valve (G thread)

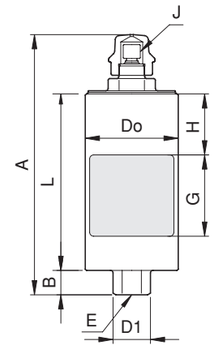
⑦	SPECIFICATION FOR OIL PORT SIDE
D	Stainless Steel

⑧	SPECIFICATION OF SHELL	SERVICE FLUID
L	Stainless Steel	Petroleum Based Hydraulic Oil & Other Fluid
Q	Stainless Steel (Made in China)	Petroleum Based Hydraulic Oil & Other Fluid
E	Stainless Steel	Water + Glycol Fluid

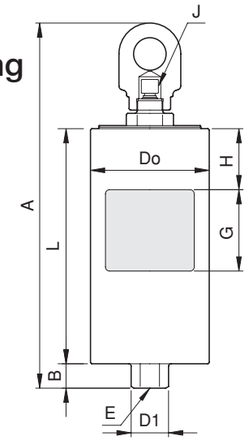
※4 The standard type of stainless steel is Stainless Steel 304. Stainless Steel 316 and 316L are also available. Please contact us for more information.

⑨⑨⑨	SPECIAL SPECIFICATION
***	For special specifications, the item number designation includes a three-digit number.

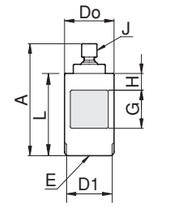
Dimensional Drawing



①②-J 5MPA / 10MP LL1 -LL2-PD⑧ LL3



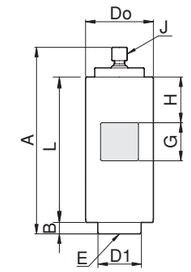
①②-J7MPA- LL4 / LL5 -PD⑧



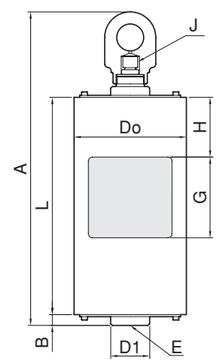
①②-J10MP- L01 / L05 -PD⑧

①②-J25MP- L01 / L03 -PD⑧

①②-J25MP-L05-PD⑧



①②-J10MP-L03-PD⑧



①②-N50MP-LL1-PD⑧019

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A +3 0 mm	L mm	B mm			H mm	G mm	φDo±1% mm	D1 mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
5	①②-J5MPA-LL1-PD⑧	1	7	318	215	30			75	90	114.3	Hex.41	Rc3/4	G1/4	60L/min
	①②-J5MPA-LL2-PD⑧	2	9	454	351										
	①②-J5MPA-LL3-PD⑧	3	11	572	469										
7	①②-J7MPA-LL4-PD⑧	4	22	646	486						139.8	Hex.65			
	①②-J7MPA-LL5-PD⑧	5	26	746	586										
10	①②-J10MP-L01-PD⑧	0.1	2	144	107	—			35	50	65	Hex.60	Rc3/8		12L/min
	①②-J10MP-L03-PD⑧	0.3	3	253	206	10			60			Hex.41			
	①②-J10MP-L05-PD⑧	0.5	5	233	198	—					90	Hex.85	Rc3/4		
10	①②-J10MP-LL1-PD⑧	1	9	318	215	30			75	90	120	Hex.41			60L/min
	①②-J10MP-LL2-PD⑧	2	13	454	351										
	①②-J10MP-LL3-PD⑧	3	16	572	469										
25 (20.6) ※6	①②-J25MP-L01-PD⑧	0.1	3	148	114	—			35	50	75	Hex.70	Rc3/8		12L/min
	①②-J25MP-L03-PD⑧	0.3	6	248	214	—			60						
	①②-J25MP-L05-PD⑧	0.5	9	251.5	206	—					100	Hex.95	Rc3/4		
50	①②-N50MP-LL1-PD⑧019	1	48	466	323	16			75	90	167	Hex.54		G3/8	120L/min

※5 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※6 For products certified according to the High Pressure Gas Safety Law, Japan, the maximum allowable working pressure is 20.6 MPa.

Accessories/Tools

Maximum Allowable Working Pressure MPa					5	7			10	10	25(20.6)	50
Item Number of Accumulator					①②-J5MPA-LL1-PD⑧	①②-J7MPA-LL4-PD⑧			①②-J10MP-L01-PD⑧	①②-J10MP-LL1-PD⑧	①②-J25MP-L01-PD⑧	①②-N50MP-LL1-PD⑧019
					①②-J5MPA-LL2-PD⑧	①②-J7MPA-LL5-PD⑧			①②-J10MP-L03-PD⑧	①②-J10MP-LL2-PD⑧	①②-J25MP-L03-PD⑧	
					①②-J5MPA-LL3-PD⑧				①②-J10MP-L05-PD⑧	①②-J10MP-LL3-PD⑧	①②-J25MP-L05-PD⑧	
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □			6GH□□□□ □□□ □
	For Installation	NACOL Clamp		☞P200	6K114N	6K139N			6K097N(0.5L only)	6K120N	—	—
		NORMA Clamp		☞P201	6081C114	6081C140			6081C089(0.5L only)	6081C120	—	—
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—			
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—			
Bladder Replacement	Parts	Bladder		☞P210	65②J⑤⑤⑤U16A				65②J⑤⑤⑤U16A			65②NLL1A
		Bladder Back Up Ring			—				—			
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)				— (Please use a commercially available wrench.)			
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A			
		Spring		☞P212	645045500				645045500			
		Spring Nut		☞P212	645048200				645048200			
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04			
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—				—			
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM32U04				—	6HTM32U04	—	6HTM42U04
	Valve Cover				645058201				—	645058201	—	645058301
	Exclusively for Q/R Spec.	SG Valve		☞P196	—				—			
		Pressure Gauge Containing Glycerol		☞P197	—				—			
		Spring Loaded Type Safety Valve		☞P198	—				—			
		Fuse Plug		☞P197	—				—			

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan)
F		Industrial Safety and Health Act (Japan)
M	U.S.A.	ASME
A	AUSTRALIA	AS 1210
N	OTHER	NACOL (Manufacturer's) Inspection

※1 Some models may neither be covered by nor support the standards.

②	BLADDER 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)

MAWP ④④④④
7 M P A
8 M P A
1 1 M P
1 3 M P
2 0 . 6
2 1 M P

※2 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
L L 5
6 . 3
L 1 0
L 1 6
L 2 0

NOMINAL GAS VOLUME ⑤⑤⑤
L 3 0
L 3 2
L 4 0
L 5 0
L 6 0

NOMINAL GAS VOLUME ⑤⑤⑤
L 6 3
L 8 0
1 2 0
1 6 0

③	SERIES
A	A Series
R	R Series
N	N Series
Y	Y Series

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
P	Top Cap Stainless Steel Dynac Valve (G thread)

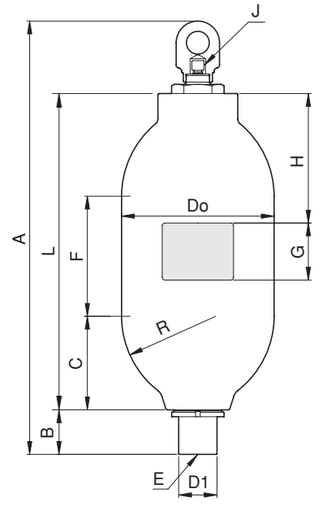
⑦	SPECIFICATION FOR OIL PORT SIDE
D	Stainless Steel

⑧	SPECIFICATION OF SHELL	SERVICE FLUID
L	Stainless Steel	Petroleum Based Hydraulic Oil & Other Fluid
Q	Stainless Steel (Made in China)	Petroleum Based Hydraulic Oil & Other Fluid
E	Stainless Steel	Water + Glycol Fluid

※3 The standard type of stainless steel is Stainless Steel 304. Stainless Steel 316 and 316L are also available. Please contact us for more information.

⑨⑨⑨	SPECIAL SPECIFICATION
* * *	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing



Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	L mm	B mm			C mm	F mm	H mm	G mm	ϕDo±1% mm	ϕD1 mm	R mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
7	①②-Y7MPA-L60-PD⑧	60	130	1,272 +18 0	1,088	85			230	608	400	90	355.6	77	240	M60x2	G1/4	600L/min
	①②-N7MPA-L80-PD⑧	80	160	1,527 +18 0	1,343					863								
	①②-N7MPA-120-PD⑧	120	205	1,979 +18 0	1,795					1,315	1,000							
	①②-N7MPA-160-PD⑧	160	285	2,068 +18 0	1,870	99			262	1,322			406.4	92.5	275	M75x2		900L/min
8	①②-R8MPA-L20-PD⑧	20	50	921 +18 0	716	78			169	365	250		244.5	67.2	165	M50x2		450L/min
	①②-R8MPA-L32-PD⑧ ※6	32	65	1,240 +18 0	1,035					684	400							
	①②-R8MPA-L40-PD⑧ ※6	40	80	1,452 +18 0	1,247					896								
	①②-R8MPA-L50-PD⑧	50	95	1,718 +18 0	1,513					1,162	700							
	①②-R8MPA-L63-PD⑧	63	120	2,062 +18 0	1,857					1,506	1,000							
11	①②-A11MP-LL5-PD⑧	5	29	574 +12 0	390	58			123	134	160		190.7	57	125	M42x2		300L/min
	①②-A11MP-6.3-PD⑧	6.3	33	647 +12 0	463					207	200							
	①②-A11MP-L10-PD⑧	10	41	822 +12 0	638					382								
	①②-A11MP-L16-PD⑧	16	59	1,134 +12 0	950					694	250							
13	①②-R13MP-L20-PD⑧	20	70	921 +18 0	716	78			164	375	250		244.5	67.2	165	M50x2		450L/min
	①②-R13MP-L32-PD⑧ ※6	32	95	1,240 +18 0	1,035					694	400							
	①②-R13MP-L40-PD⑧ ※6	40	115	1,452 +18 0	1,247					906								
	①②-R13MP-L50-PD⑧	50	140	1,718 +18 0	1,513					1,172	700							
	①②-R13MP-L63-PD⑧	63	170	2,062 +18 0	1,857					1,516	1,000							
21 (20.6) ※5	①②-A21MP-LL5-PD⑧	5	29	577 +12 0	393	58			123	134	160		216.3	57	135	M42x2		300L/min
	①②-A21MP-6.3-PD⑧	6.3	33	650 +12 0	466					207	200							
	①②-A21MP-L10-PD⑧	10	41	824 +12 0	640					382								
	①②-A21MP-L16-PD⑧	16	59	1,136 +12 0	952					694	250							
	①②-N21MP-L20-PD⑧	20	130	885 +18 0	668	85			157	324	250		298.5	77	200	M60x2		600L/min
	①②-N21MP-L30-PD⑧	30	180	1,130 +18 0	913					569								
	①②-N21MP-L40-PD⑧	40	225	1,345 +18 0	1,128					784	400							
	①②-N21MP-L50-PD⑧	50	295	1,667 +18 0	1,450					1,106	700							
	①②-N21MP-L60-PD⑧	60	320	1,805 +18 0	1,588					1,244								

※4 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※5 For products certified according to the High Pressure Gas Safety Law, Japan, the maximum allowable working pressure is 20.6 MPa.
※6 R series 32 L and 40 L accumulators use a seamed bladder (not a seamless one-piece bladder).

Accessories/Tools

Maximum Allowable Working Pressure MPa					7	7			8	11	13	21(20.6)	21(20.6)
Item Number of Accumulator					①②-Y7MPA-L60-PD⑧	①②-N7MPA-160-PD⑧			①②-R8MPA-L20-PD⑧	①②-A11MP-LL5-PD⑧	①②-R13MP-L20-PD⑧	①②-A21MP-LL5-PD⑧	①②-N21MP-L20-PD⑧
					①②-N7MPA-L80-PD⑧				①②-R8MPA-L32-PD⑧	①②-A11MP-6.3-PD⑧	①②-R13MP-L32-PD⑧	①②-A21MP-6.3-PD⑧	①②-N21MP-L30-PD⑧
					①②-N7MPA-120-PD⑧				①②-R8MPA-L40-PD⑧	①②-A11MP-L10-PD⑧	①②-R13MP-L40-PD⑧	①②-A21MP-L10-PD⑧	①②-N21MP-L40-PD⑧
									①②-R8MPA-L50-PD⑧	①②-A11MP-L16-PD⑧	①②-R13MP-L50-PD⑧	①②-A21MP-L16-PD⑧	①②-N21MP-L50-PD⑧
									①②-R8MPA-L63-PD⑧		①②-R13MP-L63-PD⑧		①②-N21MP-L60-PD⑧
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □				
	For Installation	NACOL Clamp		☞P200	6KH355	6KH406			6KH244	6K190N	6KH244	6K216N	6KH298
		NORMA Clamp		☞P201	6081C350	6081C406			6081C246	6081C191	6081C246	6081C215	6081C298
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—				
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—				6BMP267
Bladder Replacement	Parts	Bladder		☞P210	65②③⑤⑤⑤A				65②③⑤⑤⑤A				
		Bladder Back Up Ring			—				—				
	Tools	Cap Wrench		☞P208	— (Please use a commercially available wrench.)				— (Please use a commercially available wrench.)				
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A				
		Spring		☞P212	645045500				645045500				
		Spring Nut		☞P212	645048200				645048200				
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04				
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	6TWD105	6TWD120			6TWD085	6TWD075	6TWD085	6TWD075	6TWD105
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42U04				6HTM42U04	6HTM32U04	6HTM42U04	6HTM32U04	6HTM42U04
	Valve Cover				645058301				645058301	645058201	645058301	645058201	645058301
	Exclusively for Q/R Spec.	SG Valve		☞P196	—				—				
		Pressure Gauge Containing Glycerol		☞P197	—				—				
		Spring Loaded Type Safety Valve		☞P198	—				—				
		Fuse Plug		☞P197	—				—				

※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

Accumulator

Explanation of Item Number

① ② – ③ ④ ④ ④ ④ – ⑤ ⑤ ⑤ – ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

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

※1 Some models may neither be covered by nor support the standards.

②	BLADDER COMPOUND
N	Standard ※2

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

MAWP ④④④④
17.5
21MP
22MP
25MP

※3 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤⑤⑤
L04
L05
L09
1.6
LL2
2.5
LL3
3.4

NOMINAL GAS VOLUME ⑤⑤⑤
LL5
7.2
L10
L11
L15
L20
L25
L30

NOMINAL GAS VOLUME ⑤⑤⑤
L40
L50
Y52
L60
Y60
L80
100

③	SERIES
P	P Series

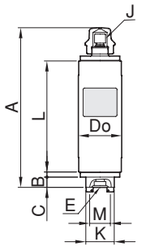
⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
A	Top Cap Standard Dynac Valve (G thread)
Q	SG Valve + Safety Valve + Pressure Gauge
R	SG Valve + Fuse Plug + Pressure Gauge
X	Special Specification

⑦	SPECIFICATION FOR OIL PORT SIDE
A	With Manifold Flange
X	With Counter Flange

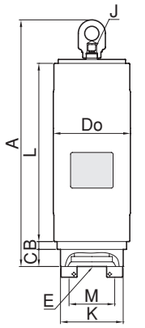
⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surface: Zinc Phosphate Treatment	Petroleum Based Hydraulic Oil & Other Fluid
N		Inside Surface:Zinc Phosphate Treatment Outside Surface:Standard Paint Coating (Standard)	

⑨⑨⑨	SPECIAL SPECIFICATION
***	For special specifications, the item number designation includes a three-digit number.

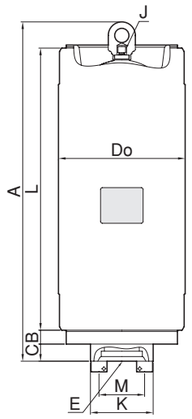
Dimensional Drawing



①N-P25MP-⑤⑤⑤-⑥X⑧348



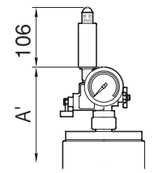
①N-P25MP-⑤⑤⑤-⑥X⑧401
①N-P22MP-⑤⑤⑤-⑥X⑧350
①N-P25MP-⑤⑤⑤-⑥X⑧351
①N-P17．5-⑤⑤⑤-⑥X⑧352



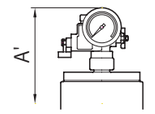
①N-P21MP-⑤⑤⑤-⑥X⑧352

Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	L mm	A mm	A' mm			B mm	C mm	φDo±1% mm	□K mm	□M mm	E	J	Allowable Oil Flow Rate [When Vertically Installed 16–320cSt]
25	① N-P25MP-L04-⑥X⑧348	0.4	9	267	359 +4 −2	422 +4 −2			10	22	82.6	54	36 (M10x35)	15A	G1/4	360L/min
	① N-P25MP-L05-⑥X⑧348	0.5	10	297	389 +4 −2	452 +4 −2										
	① N-P25MP-L09-⑥X⑧348	0.9	11	416	508 +4 −2	571 +4 −2										
	① N-P25MP-LL2-⑥X⑧348	2	17	744	836 +4 −2	899 +4 −2										
	① N-P25MP-LL3-⑥X⑧348	3	22	1,042	1,134 +4 −2	1,197 +4 −2										
25	① N-P25MP-1.6-⑥X⑧401	1.6	25	378	545 +6 0	549 +6 0			10	35	127	85	58 (M12x45)	25A		900L/min
	① N-P25MP-2.5-⑥X⑧401	2.5	29	493	660 +6 0	664 +6 0										
	① N-P25MP-3.4-⑥X⑧401	3.4	33	607	774 +6 0	778 +6 0										
	① N-P25MP-7.2-⑥X⑧401	7.2	49	1,073	1,240 +6 0	1,244 +6 0										
	① N-P25MP-L11-⑥X⑧401	11	66	1,540	1,707 +6 0	1,711 +6 0										
22	① N-P22MP-LL5-⑥X⑧350	5	48	631	814 +8 0	811 +8 0			18	36	152.4	100	73 (M16x55)	50A		1,500L/min
	① N-P22MP-L10-⑥X⑧350	10	63	1,008	1,191 +8 0	1,188 +8 0										
	① N-P22MP-L20-⑥X⑧350	20	92	1,762	1,945 +8 0	1,942 +8 0										
25	① N-P25MP-LL5-⑥X⑧351	5	103	518	724 +8 0	729 +8 0			22	60	216.3	150	108 (M22x90)	65A		3,000L/min
	① N-P25MP-L10-⑥X⑧351	10	121	714	920 +8 0	925 +8 0										
	① N-P25MP-L20-⑥X⑧351	20	156	1,107	1,313 +8 0	1,318 +8 0										
	① N-P25MP-L30-⑥X⑧351	30	191	1,500	1,706 +8 0	1,711 +8 0										
	① N-P25MP-L40-⑥X⑧351	40	226	1,893	2,099 +8 0	2,104 +8 0										
17.5	① N-P17.5-L10-⑥X⑧352	10	158	621	788 +8 0	794 +8 0			23	48	267.4	176	128 (M30x90)	100A		4,500L/min
	① N-P17.5-L15-⑥X⑧352	15	177	753	920 +8 0	926 +8 0										
	① N-P17.5-L20-⑥X⑧352	20	196	885	1,052 +8 0	1,058 +8 0										
	① N-P17.5-L25-⑥X⑧352	25	215	1,017	1,184 +8 0	1,190 +8 0										
	① N-P17.5-L30-⑥X⑧352	30	235	1,149	1,316 +8 0	1,322 +8 0										
	① N-P17.5-L40-⑥X⑧352	40	271	1,413	1,580 +8 0	1,586 +8 0										
	① N-P17.5-L50-⑥X⑧352	50	309	1,677	1,844 +8 0	1,850 +8 0										
	① N-P17.5-L60-⑥X⑧352	60	346	1,941	2,108 +8 0	2,114 +8 0										
21	① N-P21MP-Y52-⑥X⑧352	52	419	1,246	1,406 +8 0	1,473 +8 0			39	48	355.6					8,400L/min
	① N-P21MP-Y60-⑥X⑧352	60	445	1,360	1,804 +8 0	1,587 +8 0										
	① N-P21MP-L80-⑥X⑧352	80	509	1,644	1,916 +8 0	1,871 +8 0										
	① N-P21MP-100-⑥X⑧352	100	573	1,928	2,088 +8 0	2,155 +8 0										



Gas Charging Side Spec:Q



Gas Charging Side Spec:R

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

Accessories/Tools

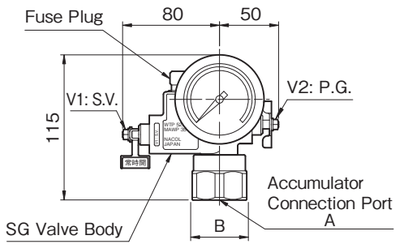
Maximum Allowable Working Pressure MPa					17.5	21			22	25	25	25
Item Number of Accumulator					①N-P17.5-L10-⑥X⑧352	①N-P21MP-Y52-⑥X⑧352			①N-P22MP-LL5-⑥X⑧350	①N-P25MP-L04-⑥X⑧348	①N-P25MP-1.6-⑥X⑧401	①N-P25MP-LL5-⑥X⑧351
					①N-P17.5-L15-⑥X⑧352	①N-P21MP-Y60-⑥X⑧352			①N-P22MP-L10-⑥X⑧350	①N-P25MP-L05-⑥X⑧348	①N-P25MP-2.5-⑥X⑧401	①N-P25MP-L10-⑥X⑧351
					①N-P17.5-L20-⑥X⑧352	①N-P21MP-L80-⑥X⑧352			①N-P22MP-L20-⑥X⑧350	①N-P25MP-L09-⑥X⑧348	①N-P25MP-3.4-⑥X⑧401	①N-P25MP-L20-⑥X⑧351
					①N-P17.5-L25-⑥X⑧352	①N-P21MP-100-⑥X⑧352				①N-P25MP-LL2-⑥X⑧348	①N-P25MP-7.2-⑥X⑧401	①N-P25MP-L30-⑥X⑧351
					①N-P17.5-L30-⑥X⑧352					①N-P25MP-LL3-⑥X⑧348	①N-P25MP-L11-⑥X⑧401	①N-P25MP-L40-⑥X⑧351
					①N-P17.5-L40-⑥X⑧352							
					①N-P17.5-L50-⑥X⑧352							
					①N-P17.5-L60-⑥X⑧352							
Optional Parts	Gas Charging Tools Kit ※1			☞P204	6GG□□□□ □□□ □				6GG□□□□ □□□ □			
	For Installation	NACOL Clamp		☞P200	6KH267	6KH355			6K152N	—	6K127N	6K216N
		NORMA Clamp		☞P201	6081C267	6081C350			6081C152	—	6081C128	6081C215
		Base Mounting Plate (Exclusively for NACOL Clamp)		☞P199	—				—			
		Base Mounting Plate (Exclusively for NORMA Clamp)		☞P199	—				—			
Bladder Replacement	Parts	Bladder		☞P210	—				—			
		Bladder Back Up Ring			—				—			
	Tools	Cap Wrench		☞P208	—				—			
Dynac Valve Replacement (DV Spec.)	Parts	Dynac Valve Packing with Valve Stem		☞P212	645026400A				645026400A			
		Spring		☞P212	645045500				645045500			
		Spring Nut		☞P212	645048200				645048200			
	Tools	Spring Nut Key		☞P212	6TWH04				6TWH04			
For Oil Port Valve Assembly	Tools	Ring Nut Wrench		☞P209	—				—			
Separately Available Parts	Eye Nut (Hanging Tool)				6HTM42				6HTM32			
	Valve Cover				645049705				645049608			
	Exclusively for Q/R Spec.	SG Valve		☞P196	6H□-AV35MP-F03-M42A				6H□-AV35MP-F03-M32A			
		Pressure Gauge Containing Glycerol		☞P197	6018DUF0206□□□□G				6018DUF0206□□□□G			
		Spring Loaded Type Safety Valve		☞P198	6H-SV□□□□-03-F03				6H-SV□□□□-03-F03			
		Fuse Plug		☞P197	6H-FP35MP-03-F03				6H-FP35MP-03-F03			

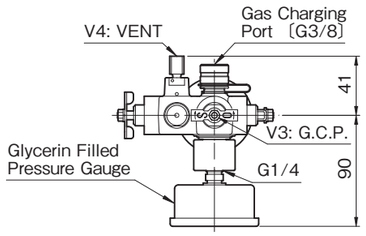
※1 Nitrogen gas charging, inspection, or pressure adjustment requires a gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)

SG Valve

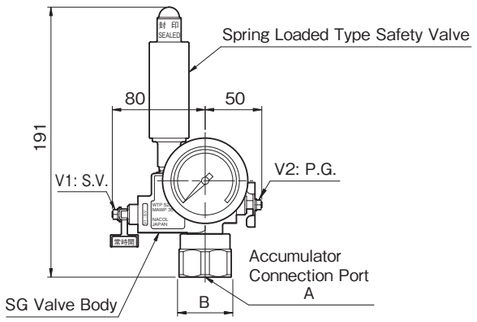
A permanent pressure gauge can be installed on accumulators with a gas volume of 1 L or more.
(Except for some models, such as the S and G series) Without a gas charging 3-way valve, gas charging and gas charging pressure measurement can be done easily by connecting a gas charging hose to the gas charging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

SG Valve with Fuse Plug

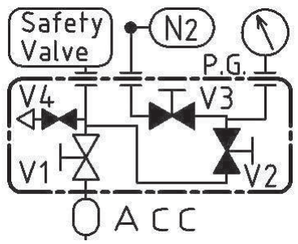




SG Valve with Spring Loaded Type Safety Valve



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)

Explanation of Item Number

6	H	N	–	A	V	3	5	M	P	–	F	0	3	–	M	3	2	A
①	②	③		④		⑤					⑥				⑦			

④ SG Valve
⑤ Maximum Allowable Working Pressure

Inspection/Standard

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

Sealing Material

③	Sealing Material
N	NBR
V	Fluorine Rubber

Set Nut ※1

⑦	A	B
M32A	M32 x 2	Hex.41
M42A	M42 x 2	Hex.54

※1 The size of a set nut may change with manufacture periods.
When unknown, please inform us the serial number of an accumulator. (See P220)

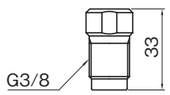
Safety Device

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

① Fuse Plug

Like NACOL's standard gas charging valve (Dynac Valve), the packing melts at an external temperature of 160±20 °C 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 212.

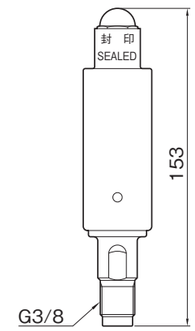
Item Number
6H-FP35MP-03-F03

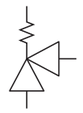


② Spring Loaded Type Safety Valve

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 198.

Item Number	Blowout Pressure
6H-SV15MP-03-F03	15 MPa
6H-SV17.5-03-F03	17.5 MPa
6H-SV21MP-03-F03	21 MPa
6H-SV35MP-03-F03	35 MPa

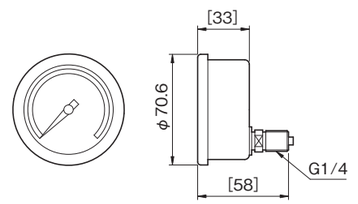




Glycerin Filled Pressure Gauge

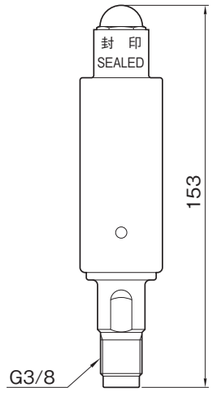
Referring to the table below, please select a pressure gauge suitable for the service pressure.
NACOL offers a custom glycerin filled pressure gauge with a scale plate angled at 10°.
For vertical installation, the gauge can be prevented from loosening due to vibration by mounting it with the point at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

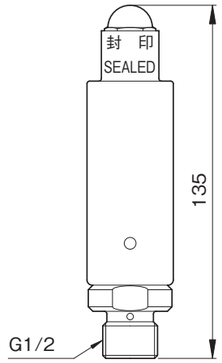
Item Number	Maximum Scale	Reccomended Gauge Range
6018DUF02061.6MG	1.6 MPa	0.48～1.04 MPa
6018DUF02062.5MG	2.5 MPa	0.75～1.63 MPa
6018DUF02066MPAG	6 MPa	1.8～3.9 MPa
6018DUF020616MPG	16 MPa	4.8～10.4 MPa
6018DUF020625MPG	25 MPa	7.5～16.2 MPa
6018DUF020640MPG	40 MPa	12.0～26.0 MPa
6018DUF020660MPG	60 MPa	18.0～39.0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

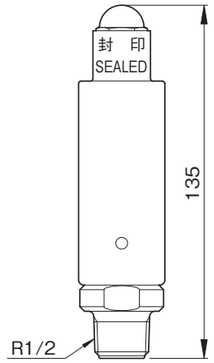


Spring Loaded Type Safety Valve

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 three connection diameters supported, the valve is also available for accumulators other than NACOL products.







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 ※
7	M	P	A	7 MPa
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

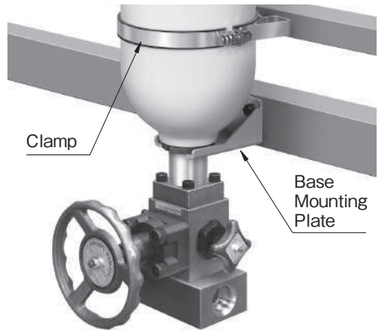
Connection Diameter

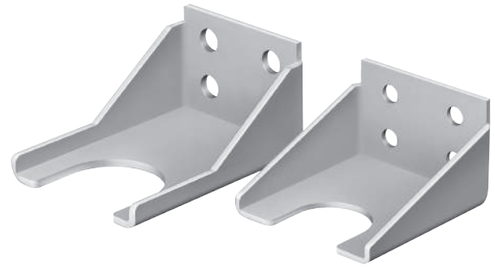
⑥			Connection Diameter
F	0	3	G3/8
F	0	4	G1/2
R	0	4	R1/2

※ The Spring Loaded Type Safety Valve starts venting at 97 to 100% of a predetermined pressure.
Please exercise caution when performing operation at close to the predetermined pressure.

Base Mounting Plate

The base mounting plate is used to fix an accumulator. It can be mounted in upward or downward orientation as specified.
The base mounting plate can be used in combination with dedicated clamps to secure an accumulator.

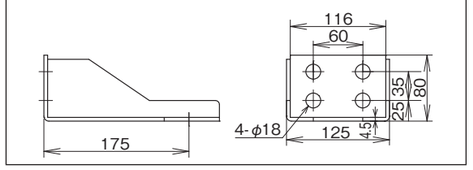




Bolt Fix Type

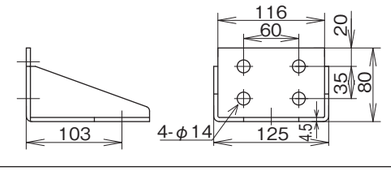
Base mounting plates available for use in conjunction with NACOL's clamps

6BMP190N

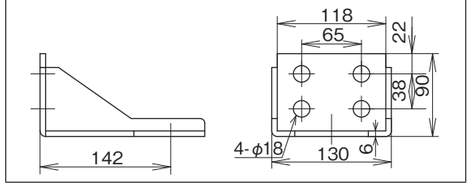


Base mounting plates available for use in conjunction with NORMA Germany GmbH's clamps

6BMP191



6BMP267

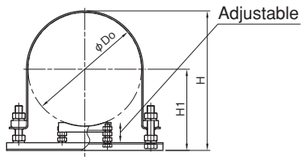


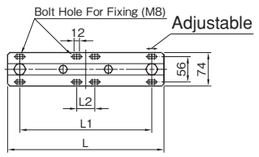
Applicable Accumulators

Series	Gas Volume: L	Item Number	
A/H	5～16	6BMP190N	6BMP191
N/H	20～60	Coming Soon	6BMP267
R/H	20～63	Coming Soon	6BMP267

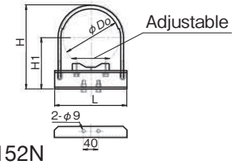
※1: Not available for use with super high flow type accumulators.
※2: Not available for use with high flow type accumulators depending on the model. For more information, please contact us※
※3: When ordering a base mounting plate, pay attention to compatibility with the clamp (see pages 200 to 201).
・NACOL's clamps cannot be used in conjunction with 6BMP191/6BMP267.
・NORMA Germany GmbH's clamps cannot be used in conjunction with 6BMP190N.
※4: The base mounting plates listed above cannot be used with H series and Y series 60 L accumulators (accumulator shell diameter: 355.6 mm).

NACOL's Clamp

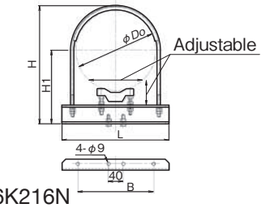




6KH232～6KH406



6K097N～6K152N



6K190N～6K216N

Features
① An adjustment function designed to prevent application of excessive force to the accumulator facilitates safe installation.
② The clamp can be easily bolted to an accumulator stand, etc.
③ The clamp can be used in combination with a base mounting plate to secure an accumulator.(Only some models).

Item Number	Applicable Accumulators			Acc. Body Diameter ϕDo mm	L mm	H mm	H1 mm	Base Mounting Plate
	Series	Max Allawable Working Pressure: MPa	Nominal Gas Volume: L					
6K097N	J	10	0.5	89.1	140	160	104	–
		25	0.5	96.5		167	108	
6K114N	N/H	21, 23	1	114.3	169	186	118	
	J	5,10 (Made of Carbon Steel)	1～3					
	S	21	0.6					
6K120N	J	10 (Made of Stainless Steel), 17.5	1～3	120		192	121	
6K127N	E	0.95	4	127		200	125	
	J	25	1～3					
	N/H	35, 45	1					
	P	25	1.6～7.2					
6K133N	J	10	4 & 5	133	196	206	128	
6K139N	N/H	21	2.5 & 4	139.8		213	132	
	J	7, 17.5	4 & 5					
6K146N	J	25	4 & 5	146		220	136	
6K152N	N/H	35, 45	2.5 & 4	152.4		227	139	
	P	22	5～20					

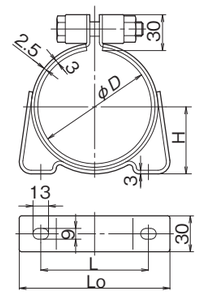
Item Number	Applicable Accumulators			Acc. Body Diameter ϕDo mm	B mm	L mm	H mm	H1 mm	Base Mounting Plate
	Series	Max Allawable Working Pressure: MPa	Nominal Gas Volume: L						
6K190N	A/H	11, 17.5, 21, 23	5～16	190.7	155	263	292	186	6BMP190N
6K216N	A/H	21 (Made of Stainless Steel), 35, 45	5～16	216.3	180	290	320	201	
	P	25	5～40						–

Item Number	Applicable Accumulators			Acc. Body Diameter ϕDo mm	L mm	L1 mm	L2 mm	H mm	H1±3 mm	Base Mounting Plate
	Series	Max Allawable Working Pressure: MPa	Nominal Gas Volume: L							
6KH232	U	25	10～50	232	346	292	40	291	172	–
6KH244	R/H	8, 13	20～63	244.5				304	178	
6KH267	N/H	2, 17.5, 21, 23	20～60	267.4				327	190	Coming Soon
	P	17.5	10～60							
	R	28	20～63							
6KH298	N	21 (Made of Stainless Steel), 35, 49.4 (49.1)	20～60	298.5	486	342		359	206	
6KH355	Y/H	2, 7, 15, 21, 25, 28, 33	60 & Y60	355.6		400		418	236	–
	N/H		80 & 120							
	P		17.5							
6KH406	A	26	150	406.4		450		470	262	
	N/H	7,15, 21, 23	160							
	H	35	145							

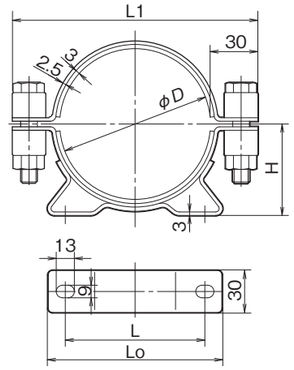
※1 Mounting dimensions differ between the above clamps and NORMA Germany GmbH's clamps.
※2 Mounting dimensions differ between the above 6KH232, 6KH244, 6KH267, 6KH298, 6KH355, 6KH406 and old design 6K232N, 6K244N, 6K267N, 6K298N, 6K355N, 6K406N.
※3 When ordering a base mounting plate (see page 199), pay attention to compatibility with the clamp.
- NACOL's clamps cannot be used in conjunction with 6BMP191/6BMP267.
- NORMA Germany GmbH's clamps cannot be used in conjunction with 6MBP190N.

Caution
- 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 may be damaged.
- The pipe connected to the accumulator should be fixed on the stand which has sufficient rigidity.
- 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 of the oil port valve assembly.
- Periodically confirm the tightness of the clamps, the ring nut, and the fixing tools for pipes and tighten them.

NORMA Germany GmbH's Clamp



6081C089～C095



6081C114～C406

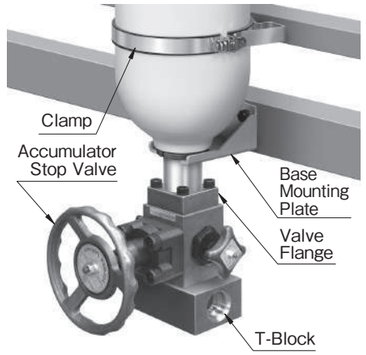
Item Number	Applicable Accumulators			ϕ D mm	H +4 −1 mm	L±2 mm	Lo +2 −4 mm	L1 mm	ACC Mounting Interval (Reference) mm	Base Mounting Plate
	Series	Maximum Allawable Working Pressure: MPa	Nominal Gas Volume: L							
6081C089	J	10	0.5	89	53	82	112	–	175	–
6081C095	J	25	0.5	95	56	90	126	–	185	
6081C114	N/H	21, 23	1	114	66	100	138	174	200	
	J	5, 10 (Made of Carbon Steel)	1～3							
	S	21	0.6							
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							
	N/H	35, 45	1							
	P	25	1.6～7.2							
6081C133	J	10	4 & 5	133	75			193	220	
6081C140	N/H	21	2.5 & 4	140	79			200	230	
	J	7, 17.5	4 & 5							
6081C146	J	25	4 & 5	146	82			206	235	
6081C152	N/H	35, 45	2.5 & 4	152	85	148	184	212	240	
	P	22	5～20							
6081C191	A/H	11, 17.5, 21, 23	5～16	191	104			251	280	6BMP191
6081C215	A/H	21(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	N/H	2, 17.5, 21, 23	20～60	267	142			327	350	6BMP267
	P	17.5	10～60							
	R	28	20～63							
6081C298	N/H	21 (Made of Stainless Steel), 35, 49.4(49.1)	20～60	298	158	280	336	358	400	
6081C350	Y/H	2, 7, 15, 21, 25, 28, 33	60	350	184	345	410	410	450	–
	N/H		80 & 120							
	P		52～100							
6081C406	A	26	150	406	212	384	460	466	500	
	N/H	7, 15, 21, 23	160							
	H	35	145							

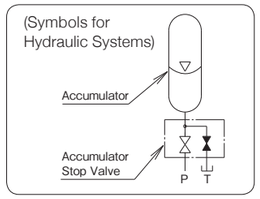
※1 Dimensions without tolerance indication are for reference. Please confirm the latest dimensions with the actual product or its drawing.
※2 Mounting dimensions differ between the above clamps and NACOL's clamps.
※3 When ordering a base mounting plate (see page 199), pay attention to compatibility with the clamp.
- NORMA Germany GmbH's clamps cannot be used in conjunction with 6BMP190N.
- NACOL's clamps cannot be used in conjunction with 6BMP191/6BMP267.

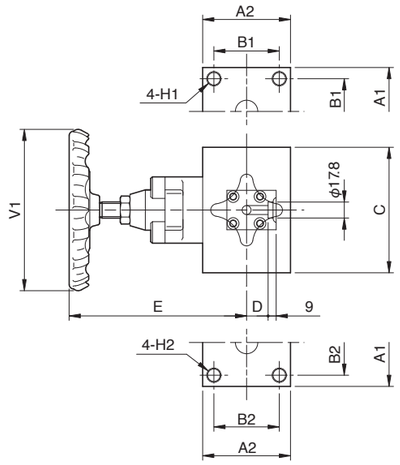
Caution
- When mounting the clamp, avoid applying excessive force to hydraulic circuit connections (oil port valve assembly, fittings, and pipes).
- Make sure that the clamp does not support the overall weight of an accumulator. The clamp may be unable to support the accumulator due to the installation 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.

Accumulator Stop Valves/T-Block(for 21MPa)

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.





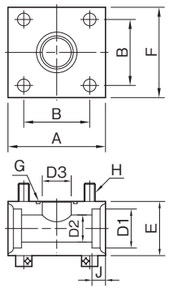


Accumulator Stop Valve Size Chart

(mm)

Item Number \ Heads	A1	A2	B1	B2	C	D	E	H1	H2	V1	Oil Control Function
6080HFACC321023	76	76	56	56	110	24	203	M12	M12	180	NO
6080HFACC3210NS	98	98	73	73	140		208	M16	M16	140	
6080HFACC3210NN							255				YES
6080HFACC5010NS	138	155	73	103	150	78	258	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
6WT032020020N21M	108	56	27.7	20	32	46	76	JIS B2401 G40	M12	12	6080HFACC321023
6WT032032032N21M			43.2	30		60	100			16	
6WT050020020N21M	140	73	27.7	20		46			M16	12	6080HFACC3210NS 6080HFACC3210NN
6WT050032032N21M			43.2	30		60				16	
6WT050050050N21M			61.1	43		80				20	
6WT080050050N21M	175	103			48		140	JIS B2401 G65	M22		6080HFACC5010NS 6080HFACC5010NN 6080HFACC5010NSL 6080HFACC5010NNL

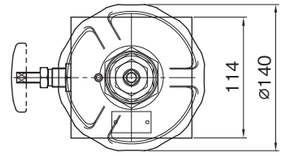
Accumulator Stop Valve (for 35MPa)

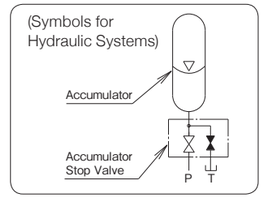
Compact Design, Low-Cost High Pressure Stop Valve

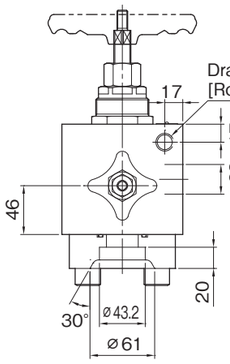
Item	Item Number
Stop Valve Without Handle	6080HFL35ACC321011
Stop Valve With Handle	6080HFL35ACC321011H

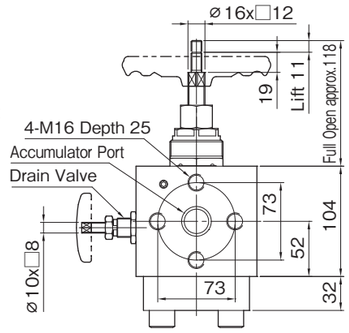
NEW!

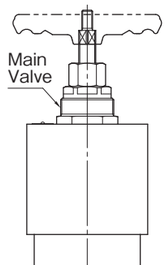
※1 Stop Valve without Handle is a standard model. When you purchase the Stop Valve without Handle, please use commercially available tools for opening and closing of valves.
※2 Since the outer diameter of the main valve handle is larger than the dimension of valve body, please pay attention to the installation space.

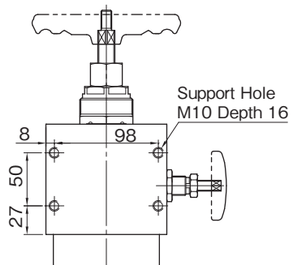


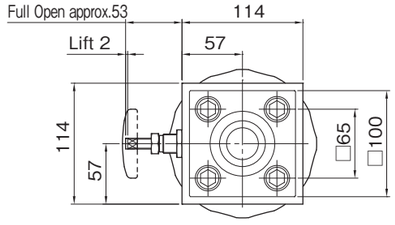






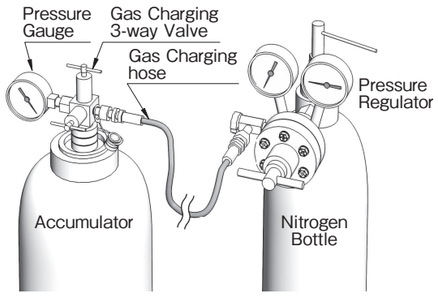






Gas Charging Tools

NACOL Accumulator gas charging or checking of gas charging pressure requires a special gas charging tools kit.
(Only a hose and an adaptor are required for R or Q specification accumulator with SG valve.)



⚠ Caution

- After nitrogen gas charging, inspection, and pressure adjustment, be sure to remove the gas charging 3-way valve from the accumulator.
- 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.

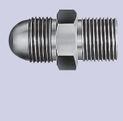
Note that the pressure gauge 6018AUF031060MP and gas charging hose longer than 5 m (6075H20.510, 6075H20.515, etc.) are packaged separately in cardboard cartons.

The dedicated tool box can accommodate several cap wrenches, pressure gauges (except for 6018AUF031060MP), and adapters.

The item number for the standard kit is shown on page 206.

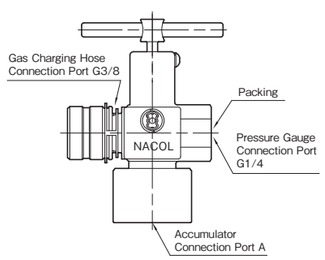
Explanation of Item Number

Gas Charging 3-way Valve			Pressure Gauge				Gas Charging Hose			Adapter
6	①	①	②	②	②	②	③	③	③	④



①Gas Charging 3-way Valve

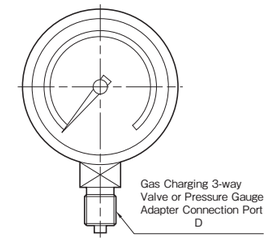
The valve has a filter function to remove dust in a nitrogen gas cylinder.



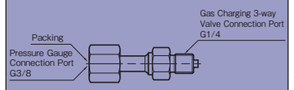
Item Number of Tools Kit			Specification		Item Number of Single Article
6	①	①	Accumulator Connection Port A	Maximum Allowable Working Pressure	
6	**G**	**G**	G1/4	35 MPa	6M3G02
6	**G**	**H**	G3/8	50 MPa	6H3G03
6	**G**	**T**	8V1	0.95 MPa	6L38V1
6	**G**	**U**	1/2-20UNF	25 MPa	6M3U04J
6	**G**	**W**	W22-14	35 MPa	6M3W22

No Gas Charging 3-way valve is required when the SG Valve is available.

②Pressure 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	6018AUF031060MP

No pressure gauge is required when the SG Valve is available.
The maximum gauge scale value should be 1.5 to 3 times the maximum pressure value to be measured.
The pressure gauge "6018AUF031060MP" (maximum scale value: 60 MPa) cannot be accommodated in the dedicated tool box.
When delivering a gas charging tools kit including this pressure gauge, the gauge is packaged separately in a cardboard carton.

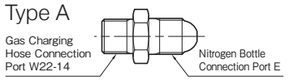
③Gas Charging Hose

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	20.5 MPa	6075H20.502
H	**0**	**3**	3 m	20.5 MPa	6075H20.503
H	**0**	**4**	4 m	20.5 MPa	6075H20.504
H	**0**	**5**	5 m	20.5 MPa	6075H20.505
H	**1**	**0**	10 m	20.5 MPa	6075H20.510
H	**1**	**5**	15 m	20.5 MPa	6075H20.515
B	**0**	**2**	2 m	29.5 MPa	6075H29.502
B	**0**	**4**	4 m	29.5 MPa	6075H29.504

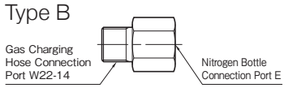
If the gas charging hose is short, please use a hose extension adapter (see page 206).
The dedicated tool box can accommodate a hose of up to 5 m.
When delivering a gas charging tools kit including a hose longer than 5 m, the hose is packaged separately in a cardboard carton.

④Adapter

Type A



Type B



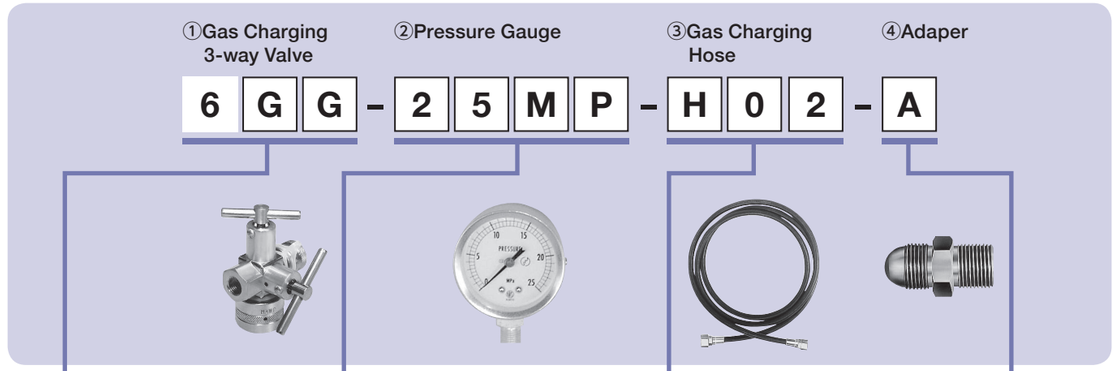
Item Number of Kit	Specification				Item Number of Single Item
④	Country	Type	Nitrogen Bottle Connection Port E	Maximum Allawable Working Pressure	
A	Japan	A	W23-14	20 MPa	6AD023022C
G	United Kingdom	A	G5/8	20 MPa	6ADG05022
U	United States	A	0.960-14NGO-RH	20 MPa	6AD096022C
D	Germany	B	W24.32-14	20 MPa	6AD243022C
C	China	B	G5/8	25 MPa	6ADF05022C
K	Republic of Korea	B	W22-14	20 MPa	6ADW22022

The adapter which last digit of item number is C can also be used for the pressure regulator (See page 207).

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 (6075H20.502), 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			

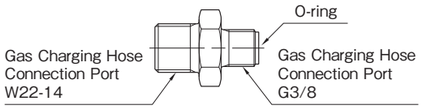
Gas Charging Hose		
③	③	③
H	0	2
Hose Length		
2 m		
Maximum Allowable Working Pressure		
20.5 MPa		

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	29.5 MPa	W22-14 G3/8

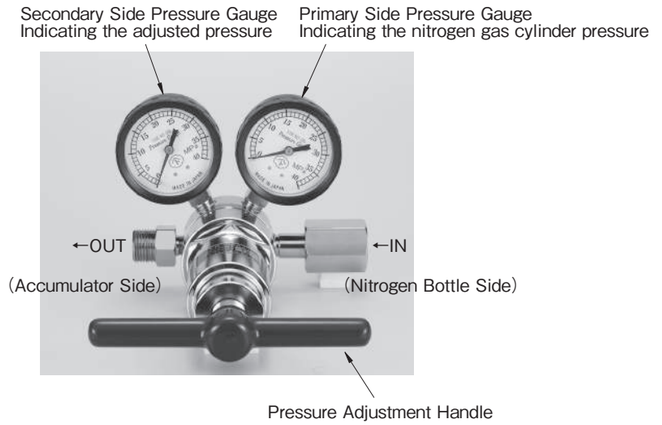


Pressure Regulator

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

This pressure regulator is not complying with any overseas regulations.
Before purchasing, please confirm the laws and regulations of your country / region.

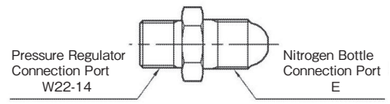


Adapter for Pressure Regulator

This adapter is used to connect the pressure regulator and a nitrogen gas cylinder.

Item Number	Specification		
	Country	Nitrogen Bottle Connection Port E	Maximum Allowable Working Pressure
6AD023022C	Japan	W23-14	35 MPa

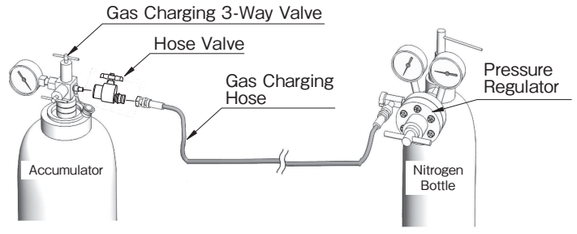
※ The adapter can also be used with a gas charging hose (see page 205).

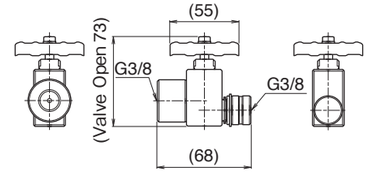


Hose Valve

This valve is used to connect the gas charging 3-way valve and the gas charging hose.
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





Wrench

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

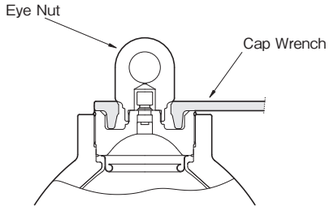
Cap Wrench

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.

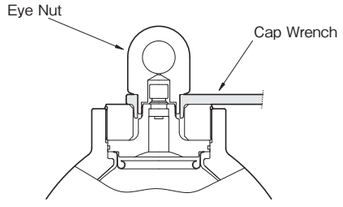
Picture	Item Number	Series	ACC Gas Volume: L	Top Cap Type
 The size differs depending on the item number.	6TWH81	N	20～60	One Piece Type
		R	20～63	
		H	20～60 (Except for the 35 MPa type)	
	6TWH100	N	80, 120	
		N	160	
		Y	60	
		H	Y60, 80, 120 (Except for the 33 MPa type)	
		H	160 (Except for the 35 MPa 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 deffers 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	Carbon Steel	R	20～63	267.4
		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
		Carbon Steel	H (Only for the 33 MPa type)	Y60, 80, 120	355.6
		Stainless Steel	H	Y60, 80, 120	355.6
	6TWD120	Carbon Steel	N	80, 120	355.6
		Carbon Steel	H (Only for the 35 MPa type)	160	406.4
		Carbon Steel	Y	60	355.6
		Stainless Steel	N	160	406.4
		Carbon Steel	H (Except for the 33 MPa type)	Y60, 80, 120	355.6
		Stainless Steel	H	160	406.4
	6TWD140	Carbon Steel	N	160	406.4
		Carbon Steel	A	160	406.4
		Carbon Steel	H (Except for the 35 MPa type)	160	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.

Spring Nut Key

For information about Spring Nut Key, please refer to the Dynac Valve (See page 212).

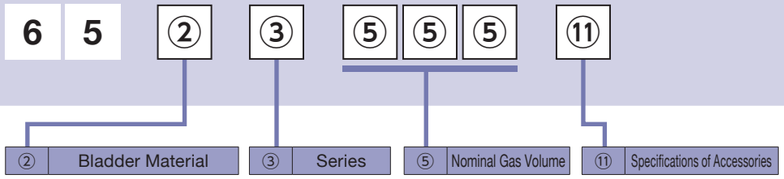
Bladder

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

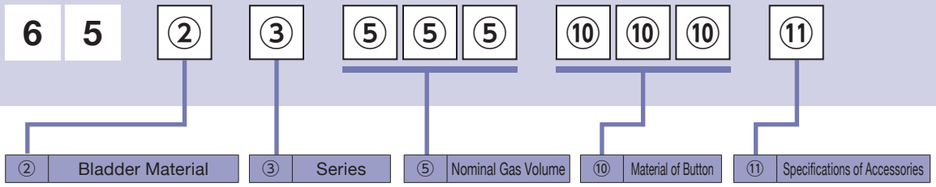
When ordering accumulator bladders listed in the catalogue, please refer to the page about accessories/tools for each series along with the following information.

When ordering special items (accumulator item number containing "X") or accumulator bladders not listed in the catalogue, please refer to page 220 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.
※1 J series standard nitrile bladders with a button are designated by "B".

Symbol	Bladder Material		Service Fluid	Allowable Service Temparature (℃)	O-ring Material
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
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
F	Butyl Rubber	IIR	Phosphate Ester Fluid	−10〜+70	FKM
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.
※2 Please designate "N" for A series accumulators with a nominal gas volume of 150 L.

Symbol	Series
A	A Series ※2
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 2 5	25 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
L 5 0	50 L

Symbol	Nominal Gas volume
R 5 0	50 L
L 6 0	60 L
Y 6 0	60 L ※3
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

Gas volume of S series are as follows.

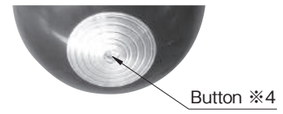
Symbol	Nominal Gas volume
L 0 2	0.1 L
L L 1	0.6 L

※3 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.
※4 The button is made of a metal plate (material listed below) and located at the bladder bottom.
※5 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.
※6 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.

Symbol	0.03〜0.5L	For 17.5 MPa 1〜5L	For 25 MPa 1〜5L
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.
※7 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.
※8 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.
※9 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 Accumulator with SG valve	O-ring for Top Cap and O-ring for Gas Charging Valve (Bladder Cap)
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

SG Valve

SG Coreless Valve (Old Model)

Dynac Valve

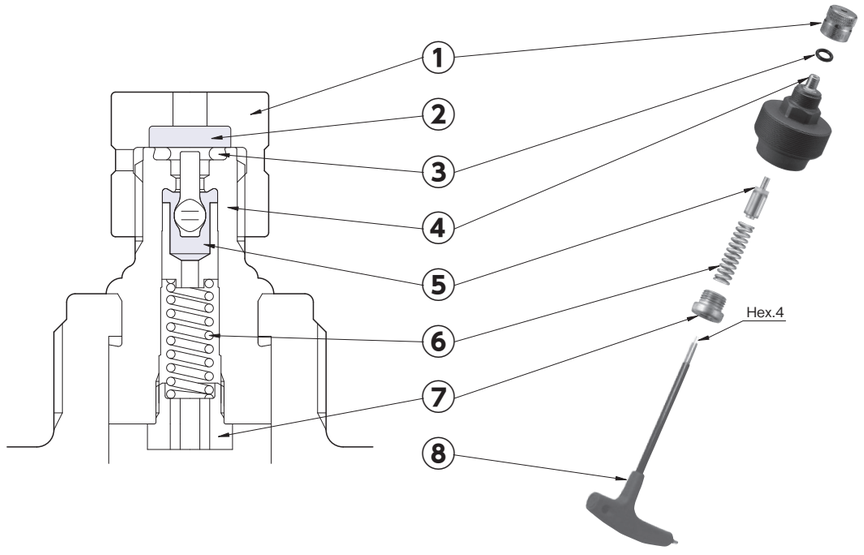
Dynac Valve is a gas valve that also serves as a "fuse plug".

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±20 °C) has been reached or exceeded.
By using the valve in combination with a pressure control 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)	
		645045301A (Brass)	G3/8
		645024204A (Brass)	1/2-20UNF
		645052000A (Stainless Steel)	
③	O-ring (AS568009)	–	–
④	Dynac Valve Body (Assembled with Top Cap)	–	G1/4
		–	G3/8
		–	1/2-20UNF
⑤	Packing with Valve Stem ※1	645026400A	–
⑥	Spring	645045500	–
⑦	Spring Nut	645048200	–

※1 Packing deteriorates over years, periodically replacing them is recommended

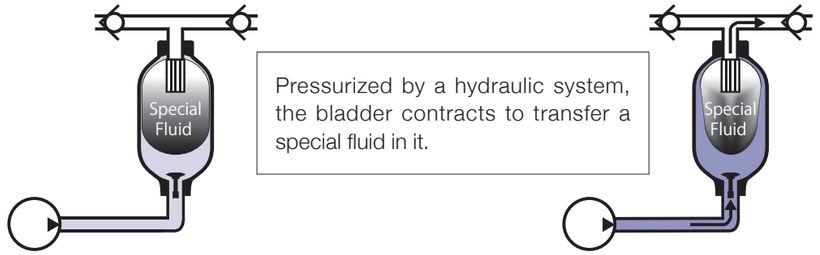
⑧	Spring Nut Key ※2	6TWH04

※2 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 10mm (hexagon outer nut size).

Transfer Barrier 5 ～ 160L

Function

Transfer barrier type accumulators allow a hydraulic system using general hydraulic fluid to transfer a special fluid without a special fluid pump.



Pressurized by a hydraulic system, the bladder contracts to transfer a special fluid in it.

※1 For information about how to use transfer barrier type accumulators, please contact us.

Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
H	JAPAN	High Pressure Gas Safety Law (Japan Authorization)
F		Industrial Safety and Health Law (Japan)
M	U.S.A.	ASME
N	OTHER	NACOL (manufacturer's) Inspection

②	BLADDER 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)

③	SERIES
A	A Series
N	N Series
Y	Y Series

MAWP ④ ④ ④ ④
2 1 M P

※2 This table assumes that the maximum allowable working pressure (MAWP) is 21 MPa, but other pressures are also supported. Please contact us for details.

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L L 5
6 . 3
L 1 0
L 1 6
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0
L 8 0
1 2 0
1 6 0

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
T	Transfer Barrier For Fluid
B	Transfer Barrier For Gas
X	Simplified Transfer Barrier ※3

※3 It cannot be used when the pressure difference is 2MPa or more.

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Carbon Steel
D	Stainless Steel

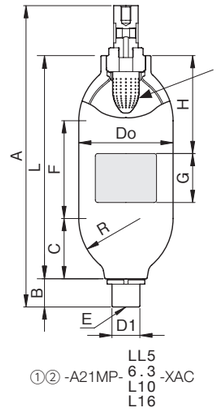
※4 When selecting D, please contact us.

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surfaces: Zinc Phosphate Treatment (Standard)	Petroleum Based Hydraulic Oil & Other Fluid
D			Water + Glycol Fluid
A		Inside & Outside Surfaces: Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid ※5
B		Inside Surface: Standard Paint Coating Outside Surface: Zinc Phosphate Treatment	
N		Inside Surface: Zinc Phosphate Treatment Outside Surface: Standard Paint Coating	Petroleum Based Hydraulic Oil & Other Fluid
W			Water + Glycol Fluid
H		Inside & Outside Surfaces: Standard Plating	Petroleum Based Hydraulic Oil ·Water + Glycol Fluid & Other Fluid

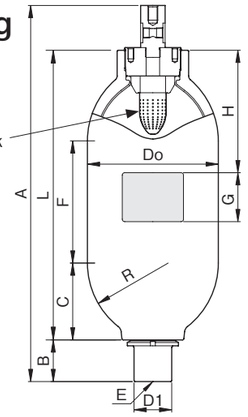
※5 Inner surface coating is unsuitable when using fire resistant fluids that may cause the paint to peel off, such as phosphate ester based fluids and water glycol fluids.

⑨⑨⑨	SPECIFICATION FOR OIL PORT SIDE
＊＊＊	For special specifications, the item number designation includes a three-digit number.

Dimensional Drawing

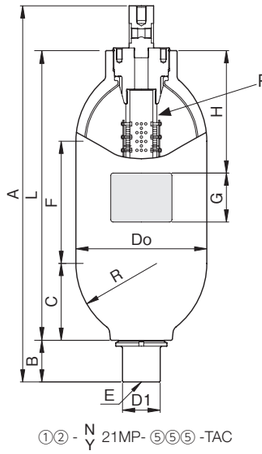


①② -A21MP- LL5 / 6.3 / L10 / L16 -XAC



①② - N/Y 21MP- ⑤⑤⑤ -XAC

Simplified Transfer Barrier



①② - N/Y 21MP- ⑤⑤⑤ -TAC

Fluid/Gas Transfer Barrier

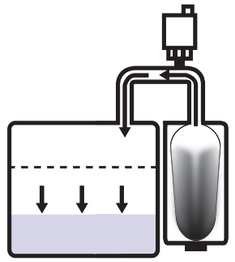
Dimensional Table

Maximum Allowable Working Pressure MPa	Item Number	Nominal Gas Volume L	Mass kg	A mm	L mm	B mm	C mm			F mm	H mm	G mm	ϕDo±1% mm	ϕD1 mm	R mm	E	Allowable Oil Flow Rate (When Vertically Installed:16～320cSt)	Bladder	Ring Nut Wrench	Accessories NACOL's Clamp	Accessories Base Mounting Plate exclusively for NACOL's Clamp	Accessories NORMA's Clamp	Accessories Base Mounting Plate exclusively for NORMA's Clamp
21	①②-A21MP-LL5-⑥⑦⑧	5	28	630 +12 0	390	58	123			134	160	100	190.7	57	125	M42 × 2	300 L/min	65 ② ALL5	6TWD075	6K190N	6BMP190N	6081C191	6BMP191
	①②-A21MP-6.3-⑥⑦⑧	6.3	31	695 +12 0	463					207	200							65 ② A6.3					
	①②-A21MP-L10-⑥⑦⑧	10	40	870 +12 0	638					382								65 ② AL10					
	①②-A21MP-L16-⑥⑦⑧	16	59	1,182 +12 0	950					694	250							65 ② AL16					
	①②-N21MP-L20-⑥⑦⑧	20	95	845 +17 0	668	85	157			326			267.4	77	165	M60 × 2	600 L/min	65 ② NL20	6TWD105	6KH267	Coming Soon	6081C267	6BMP267
	①②-N21MP-L30-⑥⑦⑧	30	122	1,090 +17 0	913					571								65 ② NL30					
	①②-N21MP-L40-⑥⑦⑧	40	150	1,305 +17 0	1,128					786	400							65 ② NL40					
	①②-N21MP-L50-⑥⑦⑧	50	190	1,627 +17 0	1,450					1,108	700							65 ② NL50					
	①②-N21MP-L60-⑥⑦⑧	60	200	1,765 +17 0	1,588					1,246								65 ② NL60					
	①②-Y21MP-L60-⑥⑦⑧	60	230	1,279 +17 0	1,088	99	210			638	400		355.6	92.5	230	M75 × 2	900 L/min	65 ② YL60	6TWD120	6KH355	–	6081C350	–
	①②-N21MP-L80-⑥⑦⑧	80	280	1,534 +17 0	1,343					893								65 ② NL80					
	①②-N21MP-120-⑥⑦⑧	120	370	1,986 +17 0	1,795					1,345	1,000							65 ② N120					
	①②-N21MP-160-⑥⑦⑧	160	500	2,081 +17 0	1,870	119	246			1,340			406.4	111	260	M90 × 2	1,200 L/min	65 ② N160	6TWD140	6KH406	–	6081C406	–

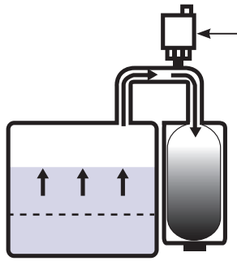
※6 Dimensions without tolerance indication are for reference. Please confirm the dimensions with the actual product.
※7 This table assumes that the maximum allowable working pressure (MAWP) is 21 MPa, but other pressures are also supported. Please contact us for details.
※8 Please refer to the page about pipe connectors for each series.

Function

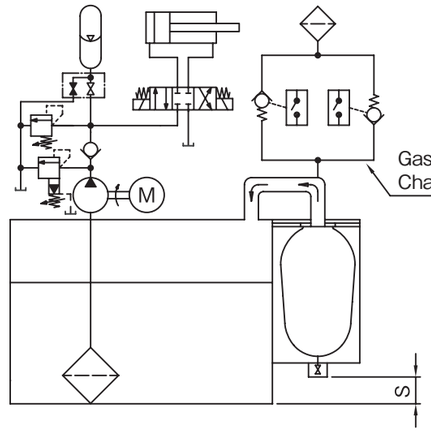
Dynaclean can be used with a sealed oil tank to minimize entry of dust/moisture, fluid contamination, oxidative degradation, and moisture evaporation (for water based fluids). As the tank oil level increases/decreases with actuator operation, the volume of air space in the tank changes accordingly; Dynaclean 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.

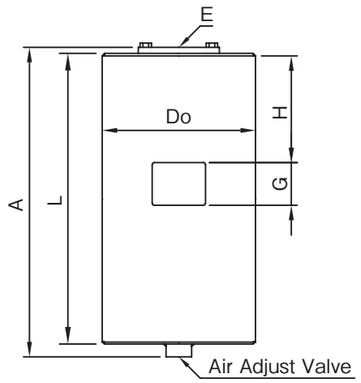


As the fluid level in the tank rises, the air in the tank returns to Dynaclean. The Dynaclean bladder expands.



S: Maintenance space over 200 mm is needed.

Dimensional Drawing



Explanation of Item Number

① ② - ③ ④ ④ ④ ④ - ⑤ ⑤ ⑤ - ⑥ ⑦ ⑧ ⑨ ⑨ ⑨

①	APPLICABLE INSPECTION/STANDARD	
N	OTHER	NACOL (manufacturer's) Inspection

②	BLADDER 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)

③	SERIES
L	L Series

MAWP ④ ④ ④ ④
0 . 0 5

※1 MAWP: Maximum Allowable Working Pressure

NOMINAL GAS VOLUME ⑤ ⑤ ⑤
L 2 0
L 3 0
L 4 0
L 5 0
L 6 0
Y 6 0
L 8 0
1 2 0

⑥	SPECIFICATION FOR TOP CAP & GAS CHARGING SIDE
Y	Dynaclean

⑦	SPECIFICATION FOR OIL PORT SIDE
A	Standard

⑧	SPECIFICATION OF SHELL	SURFACE TREATMENT	SERVICE FLUID
C	Standard Material (Carbon Steel)	Inside & Outside Surfaces: Zinc Phosphate Treatment (Standard)	Air, Nitrogen Gas, Others
N		Outside Surface: Standard Paint Coating Inside Surface: Zinc Phosphate Treatment	

⑨⑨⑨	SPECIAL SPECIFICATION
***	For special specifications, the item number designation includes a three-digit number.

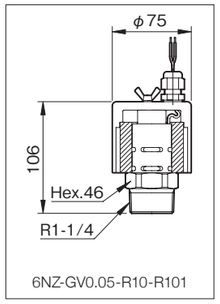
Dimensional Table

Item Number	Nominal Gas Volume L	Max. Transit Volume L	Mass kg	A+17 mm	L mm	H mm	G mm			E	ϕDo±1% mm	Accessories NACOL's Clamp	Accessories Base Mounting Plate exclusively for NACOL's Clamp	Accessories NORMA's Clamp	Accessories Base Mounting Plate exclusively for NORMA's Clamp
N ② - L 0 . 0 5 - L 2 0 - Y A ⑧	20	11	36	590	546	250	100			G2	267.4	6KH267	Coming Soon	6081C267	6BMP267
N ② - L 0 . 0 5 - L 3 0 - Y A ⑧	30	16.5	47	825	781										
N ② - L 0 . 0 5 - L 4 0 - Y A ⑧	40	22	56	1,029	985										
N ② - L 0 . 0 5 - L 5 0 - Y A ⑧	50	27.5	69	1,332	1,288										
N ② - L 0 . 0 5 - L 6 0 - Y A ⑧	60	33	74	1,472	1,428										
N ② - L 0 . 0 5 - Y 6 0 - Y A ⑧	60	33	60	949	905						355.6	6KH355	–	6081C350	–
N ② - L 0 . 0 5 - L 8 0 - Y A ⑧	80	40.7	74	1,204	1,160										
N ② - L 0 . 0 5 - 1 2 0 - Y A ⑧	120	66	97	1,633	1,589										

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

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.



6NZ-GV0.05-R10-R101

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

Gas Volume Calculation

Calculate the gas volume of Dynaclean V1 (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 228.

"Reciprocating Nitrogen Gas Compressor" for Nitrogen Gas Booster

Function

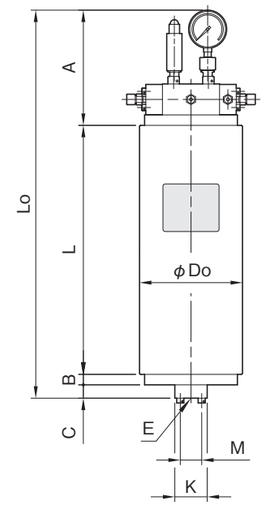
The "reciprocating nitrogen gas compressor" can be incorporated in a hydraulic unit and connected to a nitrogen gas cylinder on the gas side to generate high pressure gas.

Seal material: Teflon
Max. Allowable Working Pressure: 25 MPa
Hydrostatic Test Pressure: 37.5 MPa
Gas Name: Nitrogen Gas
Spring Loaded Type Safety Valve: 25 MPa
Pressure Gauge: 50 MPa

A "piston type accumulator" used in the nitrogen gas booster is treated as a "reciprocating nitrogen gas compressor" in accordance with the High Pressure Gas Safety Law, Japan.

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

Dimensional Drawing

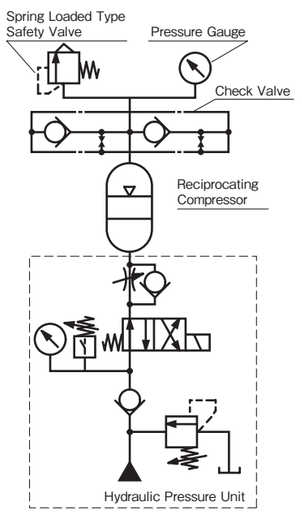


Dimensional Table

Item Number	Nominal Gas Volume L	Mass kg	L mm	Lo +8 0 mm	A mm	B mm	C mm	φDo±1% mm	□K mm	□M mm	E
XN-P25MP-LL5-XX⑧034	5	109	518	810	242	28	22	216.3 (6K216N) (6081C215)	68	45 (M10 × 35)	10A
XN-P25MP-L10-XX⑧034	10	126	714	1,006							

※ Dimensions without tolerance indication are for reference. Please confirm the latest dimensions with the actual product or its drawing.
※ For accumulator shell specifications (⑧), please select the item number code from "⑧ Accumulator Shell Specification" for piston type accumulators (see page 192).
※ For piston type accumulators, the fluid may enter the gas side depending on the operating conditions. Failure to remove the fluid from the gas side may result in 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 name plate.

Manufacturer's Serial Number

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

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

※ Marking position for accumulators manufactured before 1999.

Marking Sample

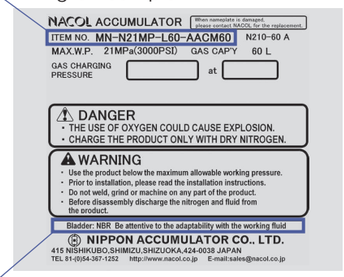
Nameplate

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

Item Number ※3

Japanese Sample

English Sample



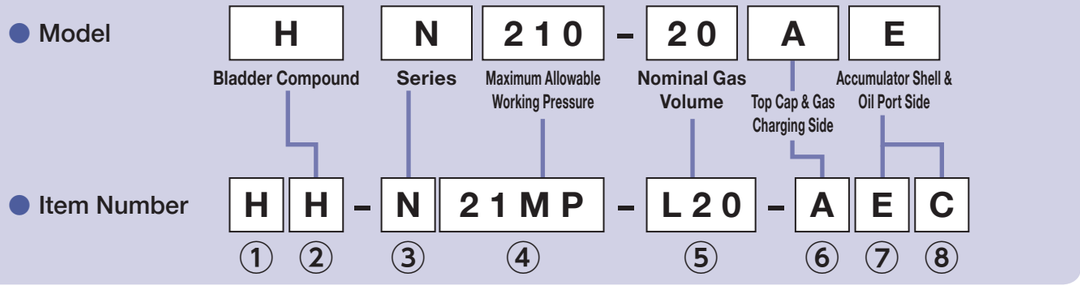
Bladder Compound

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

※3 Refer to explanation of an item number P36.

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 36.

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 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 designation system uses kg/cm^2 pressure designation includes a pressure unit. The previous designation system 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

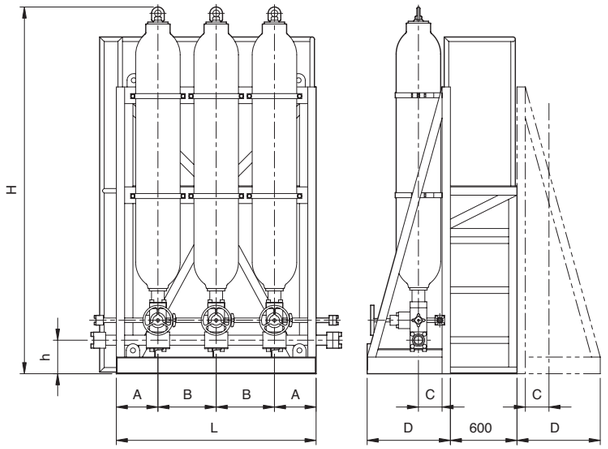
Oil Port Side Specification \ Accumulator Shell Specification		Standard	Plating	Stainless Steel
Standard Internal Thread	Standard Material	A (without symbol)		
	(※1)	B		
	Plating	C	H	
	Stainless Steel	D	I	L
High Flow	Standard Material	E		
	Plating	F	J	
	Stainless Steel	G	K	M
Meta High Flow (※2)	Standard Material	W		
	Stainless Steel	O	P	
Super High Flow	Standard Material	Y		
	Plating			
Pulse Damper	Standard Material	U		
	Plating			
Super Pulse Damper	Standard Material	V		
	Plating			
Other		X		

※1 Poppet/Poppet Fitting: Stainless Steel ※2 Meta high flow type accumulators have been discontinued. ※3 Fire Resistant Fluid: N

Accumulator Stand

The accumulator stand facilitates installation/ maintenance work.

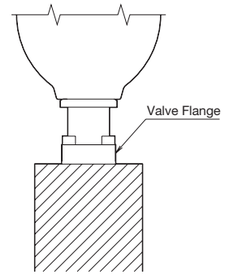
The dimensions of an accumulator stand used with T-blocks and accumulator stop valves are shown on the right.
(They are auxiliary dimensions by using 21MPa accumulators.)
The dimensions take into consideration the transportation height and installation workability. When fabricating the stand, please refer to the stand dimensions and pipe sizing table shown below.



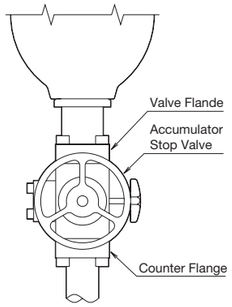
Nominal Gas Volume of ACC (L)	A(mm)	B(mm)	L(mm)					C(mm)	D(mm)	Remarks
			1 piece	2 pcs (W4 pcs)	3 pcs (W6 pcs)	4 pcs (W8 pcs)	5 pcs (W10 pcs)			
20~60	250	350	500	850	1,200	1,550	1,900	142	500	Use Clamp 6081C267
120	300	450	600	1,050	1,500	1,950	2,400	184	525	Use Clamp 6081C350
160	300	500	600	1,100	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:20L	ACC:30L	ACC:40L	ACC:50L	ACC:60L	ACC:120L	ACC:160L
1(25A)	○	–	142	1,219	1,464	1,679	2,001	2,139	2,334	2,447
1¼(32A)	○	–	142	1,226	1,471	1,686	2,008	2,146	2,341	2,454
1½(40A)	○	–	161	1,245	1,490	1,705	2,027	2,165	2,360	2,473
2(50A)	○	○	161	1,255	1,500	1,715	2,037	2,175	2,370	2,483
2½(65A)	–	○	176	1,290	1,535	1,750	2,072	2,210	2,405	2,518
3(80A)	–	○	176	1,299	1,544	1,759	2,081	2,219	2,414	2,527

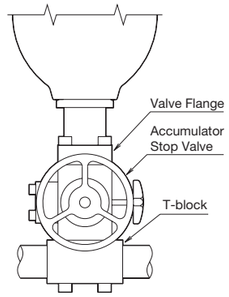
Variation of Fittings for Accumulator Pipings



Manifold Connection



Connection using Acc. Stop Valve and Counter Flange



Connection using Acc. Stop Valve and T-block

List of Fittings for Pipings (for 21MPa)

Applicable Acc. (lit)	Valve Flange	Acc. Stop Valve	Counter Flange	T-block
1–4	6FAM42 32D N21M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N21M
5–16	6FCM42 32D N21M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N21M
20–60	6FCM60 32D N21M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N21M
	6FCM60 50K N21M	6080 HFACC 3210NS	SSA50	6WT 050 0** 0** N21M
		6080 HFACC 3210NN		
		6080 HFACC 5010NS	SSA80	6WT 080 050 050 N21M
		6080 HFACC 5010NN		
	6FCM60 80D X027	6080 HFACC 5010NSL	SSA80	6WT 080 050 050 N21M
		6080 HFACC 5010NNL		
Y60 80–120	6FCM75 32D N21M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N21M
	6FCM75 50D N21M	6080 HFACC 3210NS	SSA50	6WT 050 0** 0** N21M
		6080 HFACC 3210NN		
		6080 HFACC 5010NS	SSA80	6WT 080 050 050 N21M
		6080 HFACC 5010NN		
	6FCM75 80D N21M	6080 HFACC 5010NSL	SSA80	6WT 080 050 050 N21M
		6080 HFACC 5010NNL		
160	6FCM90 32D N21M	6080 HFACC 321023	SSA32	6WT 032 0** 0** N21M
	6FCM90 50D N21M	6080 HFACC 3210NS	SSA50	6WT 050 0** 0** N21M
		6080 HFACC 3210NN		
		6080 HFACC 5010NS	SSA80	6WT 080 050 050 N21M
		6080 HFACC 5010NN		
	6FCM90 80D X007	6080 HFACC 5010NSL	SSA80	6WT 080 050 050 N21M
		6080 HFACC 5010NNL		

List of Fittings for Piping (for 35MPa)

Applicable Acc. (lit)	Valve Flange	Acc. Stop Valve	Counter Flange	T-Blcok
5–16	6FCM42 25D X027	6080 HFL35ACC 321011 6080 HFL35ACC 321011H	Acc. Stop Valve includes the Counter Flange. Please refer P203 and confirm a piping connecting position.	–
20–60	6FCM60 25D X055			
R20–63	6FCM50 25D X007			
Y60, 80–120	6FCM75 25D X030			
160	6FCM75 25D X031			

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: NIPPON ACCUMULATOR 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	☐ – ☐	°C		
	Cycle Time	C	☐	sec		
	Max. Working Pressure	P_3	☐	MPa		
	Min. Working Pressure	P_2	☐	MPa		
	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).

		B :Cylinder Spec.				C :Oil Motor Spec.		D :Required Oil Volume	E :Flow Rate	F :Operation Time	
		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		①ϕ Do mm	② ϕ d mm	③ S mm	④ qcc/rev	⑤ N rpm	⑥ L	⑦ L/min	⑧ sec	⑨ sec
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									

NIPPON ACCUMULATOR 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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TEL : +81-54 -367-1252 FAX : +81-54-367-1951
http://www.nacol.co.jp E-mail: sales@nacol.co.jp

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	☐ °C	Service Fluid ☐	⇒ Suitable Bladder Compound	
Min. Working Temperature	T_L	☐ °C			

*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 · abs	$P_3 \leqq 4 \times P_{1L}$
	Min. Working Pressure	P_2	☐	MPa · abs	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	P1H = P2×0.9 (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		–	When ($e = P_{1L} \div P_2$) > 0.9, bladder life will be shortened.
	Working Pressure Ratio	a		–	$a = P_3 \div P_2$
	Mean Accumulator Circuit Pressure	P_a		MPa · abs	$Pa = (P_3 + P_2) \div 2$
	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 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)

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

$$P_{1L} = \{\boxed{A} \times (\boxed{T_L} - \boxed{T_H}) + \boxed{P_H} \times 10.1972\} / 10.1972$$

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

$$F = \frac{(a)^{\frac{1}{(n)}} - 1}{(a)^{\frac{1}{(m)}}}$$

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

$$V_1 = \frac{(V_W)}{(e) \cdot 0.95 \cdot (F)}$$

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

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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		°C	Service Fluid	⇒ Suitable Bladder Compound ＿＿＿＿＿＿
Min. Working Temperature	T_L		°C		

*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 · abs	
	Maximum Pulsation Pressure Generated Now	P_h		MPa · abs	$P_h \leqq$ Max. Allowable Working Pressure of Accumulator
	Max. Allowable Pulsation Pressure	P_m		MPa · abs	$P_m = P_x + \alpha$
	Gas Charging Pressure	P_1		MPa · abs	$P_1 = P_x \times 0.6$ (at °C)
	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	$q = Q \div N$
	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.

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

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 ( )	Remarks	

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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		°C	Service Fluid	⇒ Suitable Bladder Compound ＿＿＿＿＿＿
Min. Working Temperature	T_L		°C		

*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 · abs	
	Maximum Shock Pressure Generated Now	P_h		MPa · abs	Ph ≦ Max. Allowable Working Pressure of Accumulator
	Max. Allowable Shock Pressure	P_m		MPa · abs	$P_m = P_x + \alpha$
	Gas Charging Pressure	P_1		MPa · abs	$P_1 = P_x \times 0.6$ (at °C)
	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

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

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

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 ( )	Remarks	

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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	☐ °C	Service Fluid	☐	⇒ Suitable Bladder Compound _____
Min. Working Temperature	T_L	☐ °C			

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

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

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

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

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

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 Accumulator Item #	Q'ty	/ ☐☐-☐☐☐☐-☐☐☐-☐☐☐	Remarks	

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Tables of Units Conversion

(The number of digits and the indication method for each value are based on convenience.)

PRESSURE · STRESS

Pa, N/m^2	kPa	MPa, N/mm^2	bar, $Mdyn/cm^2$	kgf/cm^2	psi, lbf/in^2	atm
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}	1.45038×10^{-4}	9.86923×10^{-6}
1×10^{3}	**1**	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}	1.45038×10^{-1}	9.86923×10^{-3}
1×10^{6}	1×10^{3}	**1**	1×10	1.01972×10	1.45038×10^{2}	9.86923
1×10^{5}	1×10^{2}	1×10^{-1}	**1**	1.01972	1.45038×10	9.86923×10^{-1}
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	**1**	1.42233×10	9.67841×10^{-1}
6.89476×10^{3}	6.89476	6.89476×10^{-3}	6.89476×10^{-2}	7.03070×10^{-2}	**1**	6.80460×10^{-2}
1.01325×10^{5}	1.01325×10^{2}	1.01325×10^{-1}	1.01325	1.03323	1.46959×10	**1**

LENGTH · DISTANCE

mm	m	km	in	ft	yd	mile
1	0.00100	-	0.03937	0.00328	0.00109	-
1000.00	**1**	0.00100	39.3701	3.28084	1.09361	0.00062
-	1000.00	**1**	39370.1	3280.84	1093.61	0.62137
25.3995	0.02540	-	**1**	0.08333	0.02778	–
304.794	0.30479	0.00030	12.0000	**1**	0.33333	0.00019
914.383	0.91438	0.00091	36.0000	3.00000	**1**	0.00057
-	1609.34	1.60934	63360.0	5280.00	1760.00	**1**

VOLUME

cm^3	m^3	L	in^3	ft^3	gal(UK)	gal(US)
1	0.000001	0.001000	0.061024	0.000035	0.000220	0.000264
1000000	**1**	1000.000	61023.74	35.31467	219.9692	264.1721
1000.000	0.001000	**1**	61.02374	0.035315	0.219969	0.264172
16.38706	0.000016	0.016387	**1**	0.000579	0.003605	0.004329
28316.85	0.028317	28.31685	1728.000	**1**	6.228835	7.480519
4546.090	0.004546	4.546090	277.4194	0.160544	**1**	1.200950
3785.412	0.003785	3.785412	231.0000	0.133681	0.832674	**1**

TEMPERATURE

℃	°F	℃	°F	℃	°F	℃	°F	℃	°F	℃	°F
-40	-40.0	-13	8.6	14	57.2	41	105.8	68	154.4	95	203.0
-39	-38.2	-12	10.4	15	59.0	42	107.6	69	156.2	96	204.8
-38	-36.4	-11	12.2	16	60.8	43	109.4	70	158.0	97	206.6
-37	-34.6	-10	14.0	17	62.6	44	111.2	71	159.8	98	208.4
-36	-32.8	-9	15.8	18	64.4	45	113.0	72	161.6	99	210.2
-35	-31.0	-8	17.6	19	66.2	46	114.8	73	163.4	100	212.0
-34	-29.2	-7	19.4	20	68.0	47	116.6	74	165.2	101	213.8
-33	-27.4	-6	21.2	21	69.8	48	118.4	75	167.0	102	215.6
-32	-25.6	-5	23.0	22	71.6	49	120.2	76	168.8	103	217.4
-31	-23.8	-4	24.8	23	73.4	50	122.0	77	170.6	104	219.2
-30	-22.0	-3	26.6	24	75.2	51	123.8	78	172.4	105	221.0
-29	-20.2	-2	28.4	25	77.0	52	125.6	79	174.2	106	222.8
-28	-18.4	-1	30.2	26	78.8	53	127.4	80	176.0	107	224.6
-27	-16.6	0	32.0	27	80.6	54	129.2	81	177.8	108	226.4
-26	-14.8	1	33.8	28	82.4	55	131.0	82	179.6	109	228.2
-25	-13.0	2	35.6	29	84.2	56	132.8	83	181.4	110	230.0
-24	-11.2	3	37.4	30	86.0	57	134.6	84	183.2	111	231.8
-23	-9.4	4	39.2	31	87.8	58	136.4	85	185.0	112	233.6
-22	-7.6	5	41.0	32	89.6	59	138.2	86	186.8	113	235.4
-21	-5.8	6	42.8	33	91.4	60	140.0	87	188.6	114	237.2
-20	-4.0	7	44.6	34	93.2	61	141.8	88	190.4	115	239.0
-19	-2.2	8	46.4	35	95.0	62	143.6	89	192.2	116	240.8
-18	-0.4	9	48.2	36	96.8	63	145.4	90	194.0	117	242.6
-17	1.4	10	50.0	37	98.6	64	147.2	91	195.8	118	244.4
-16	3.2	11	51.8	38	100.4	65	149.0	92	197.6	119	246.2
-15	5.0	12	53.6	39	102.2	66	150.8	93	199.4	120	248.0
-14	6.8	13	55.4	40	104.0	67	152.6	94	201.2	121	249.8

$C^\circ = 5/9 \times (F^\circ - 32)$ $\qquad$ $F^\circ = 9/5 \times C^\circ + 32$

MASS

g	kg	oz	lb	t
1	0.00100	0.03527	0.00220	-
1000.00	**1**	35.2739	2.20462	0.00100
28.3495	0.02835	**1**	0.06250	0.00003
453.592	0.45359	16.0000	**1**	0.00045
-	1000.00	35,277.0	2204.62	**1**

VISCOSITY

Pa · s	cP	P	$kgf\cdot s/m^2$	$lbf\cdot s/in^2$
1	1×10^{3}	1×10	0.101972	1.45038×10^{-4}
1×10^{-3}	**1**	1×10^{-2}	1.01972×10^{-4}	1.45038×10^{-7}
1×10^{-1}	1×10^{2}	**1**	1.01972×10^{-2}	1.45038×10^{-5}
9.80665	9.80665×10^{3}	9.80665×10	**1**	1.42233×10^{-3}
6.89476×10^{3}	6.89476×10^{6}	6.89476×10^{4}	7.03070×10^{2}	**1**

KINETIC VISCOSITY

m^2/s	cSt	St	ft^2/s	m^2/h
1	1×10^{6}	1×10^{4}	1.07639×10	3.60000×10^{3}
1×10^{-6}	**1**	1×10^{-2}	1.07639×10^{-5}	3.60000×10^{-3}
1×10^{-4}	1×10^{2}	**1**	1.07639×10^{-3}	3.60000×10^{-1}
9.29030×10^{-2}	9.29030×10^{4}	9.29030×10^{2}	**1**	3.34451×10^{2}
2.77778×10^{-4}	2.77778	2.77778×10^{2}	2.98998×10^{-3}	**1**

WORK, ENERGY, HEAT QUANTITY

J	kW·h	erg	kgf·m	kcal
1	2.77778×10^{-7}	1×10^{7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	**1**	3.60000×10^{13}	3.67098×10^{5}	8.60000×10^{2}
1×10^{-7}	2.77778×10^{-14}	**1**	1.01972×10^{-7}	2.38889×10^{-11}
9.80665	2.72407×10^{-6}	9.80665×10^{7}	**1**	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.18605×10^{10}	4.26858×10^{2}	**1**

FORCE

N	dyn	kgf	pdl	lbf
1	1×10^{5}	1.01972×10^{-1}	7.23301	0.22481
1×10^{-5}	**1**	1.01972×10^{-6}	7.23301×10^{-5}	2.24809×10^{-6}
9.80665	9.80665×10^{5}	**1**	7.09316×10	2.20462
0.13826	1.38255×10^{4}	1.40981×10^{-2}	**1**	3.10810×10^{-2}
4.44822	4.44822×10^{5}	0.45359	3.21740×10	**1**

POWER

kW	W	PS	HP	kgf·m/s
1	1×10^{3}	1.35962	1.34102	1.01972×10^{2}
1×10^{-3}	**1**	1.35962×10^{-3}	1.34102×10^{-3}	1.01972×10^{-1}
7.35500×10^{-1}	7.35500×10^{2}	**1**	9.86322×10^{-1}	7.50001×10
7.45700×10^{-1}	7.45700×10^{2}	1.01387	**1**	7.60402×10
9.80665×10^{-3}	9.80665	1.33333×10^{-2}	1.31509×10^{-2}	**1**

TORQUE

cN·m	N·m	gf·cm	kgf·cm	kgf·m
0.10000	0.00100	10.1972	0.01020	0.00010
1	0.01000	101.972	0.10197	0.00102
100.000	**1**	10197.2	10.1972	0.10197
0.00981	0.00010	**1**	0.00100	0.00001
9.80665	0.09807	1000.00	**1**	0.01000
980.665	9.80665	100000	100.000	**1**

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http://www.nacol.co.jp
The website provides product information, product release announcements, and technical data.
It also welcomes customer inquiries and requests for documents.
You can download CAD data (DXF) from the website by subscribing as a member.

The following documents are available free of charge.

- **Products Catalogue [CD-ROM or Print]**
  (・Japanese ・English ・Chinese)
- **Handling Manual [Print]**
  (・Japanese ・English ・Chinese)
- **Technical Data [CD-ROM]**
  (・Japanese ・English)

Contents

- **Accumulator Sizing Programs**

  Accumulator sizing programs are available for easy and accurate calculation of accumulator sizes.

  1. Energy Storage Application
     Calculation of the accumulator size and determination of the flow out speed
  2. Shock Absorbing Application
     Calculation of the accumulator size for absorbing shock caused by water hammer, moving objects, or falling objects
  3. Pulsation Dampening Application
     Calculation of the accumulator size for pump pulsation dampening
  4. Dynaclean
     Calculation of the Dynaclean size
  5. Gas Pressure Change with Temperature Change
     Calculation of changes in gas charging pressure with temperature changes
  6. Required Number of Nitrogen Gas Cylinders
     Calculation of the number of nitrogen gas cylinders required to efficiently charge an accumulator with nitrogen gas

- **CAD Data**

  Drawing data (DXF) is available for use with CAD software.
  The data is in DXF format.
  While the drawings are as per standard accumulator specifications, they also show the upper structure of the SG valve + spring loaded type safety valve (Q) or the fuse plug (R). You can change the gas charging side specification, if required.

- **Video Comparing Bladder Replacement Work between NACOL Accumulators and Other Accumulators**

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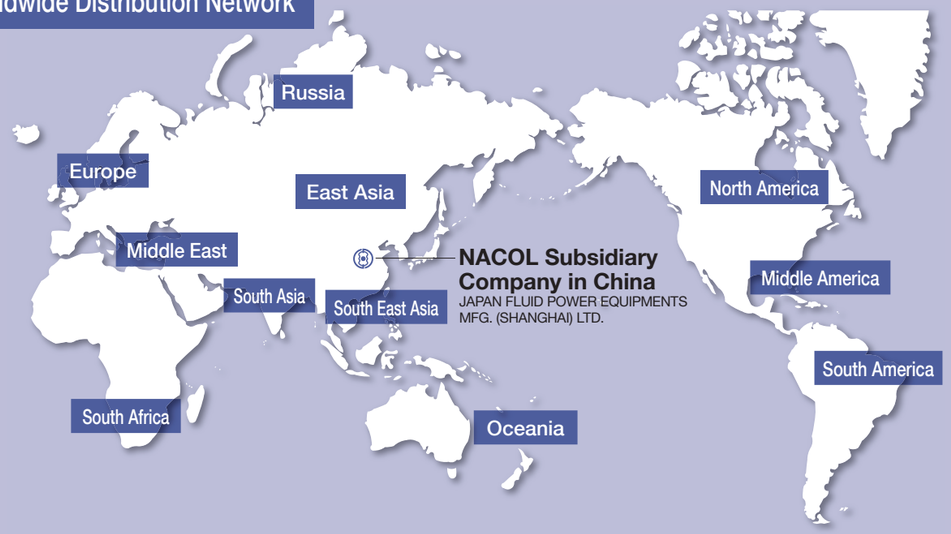

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