

Accumulators

Accumulators are mainly used to store pressure fluid and these are used as a hydraulic damper. Although various types of accumulators are developed today, proper selection should be made for the system.

When gas charge accumulators used as an auxiliary fluid power source such as the bladder type and the piston type, demanded volume and pressure of the pre-charge gas should be examined under the adiabatic change (compression and expansion).

Piston Type Accumulators

Piston type accumulators may be the most reliable one, since these do not have elements which gives such damages as making the accumulator unusable in the instant, while the response speed to the given pressure change may be a little inferior to that of bladder type accumulators.



Bladder Type

Piston Type

Specifications

Model Numbers	Gas Capacity <i>l</i>	Cylinder Bore Dia. mm	Max. Oper. Pressure Kgf/cm ²	Min. Oper. Pressure Kgf/cm ²	Mass (Approx) Kg.
AC-100-1-3080	1	100	210	3	26
AC-100-2.5-3080	2.5				33
AC-100-5-3080	5				45
AC-150-10-3080	10	150			115
AC-150-20-3080	20				162
AC-150-30-3080	30				210
AC-200-40-3080	40	200			270
AC-200-50-3080	50				310
AC-200-60-3080	60				380

Graphic Symbol

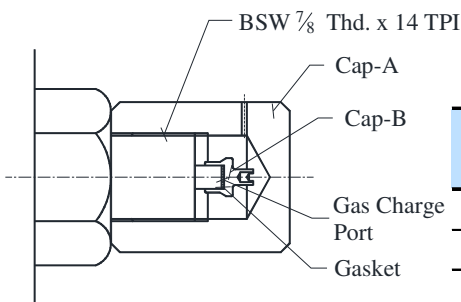
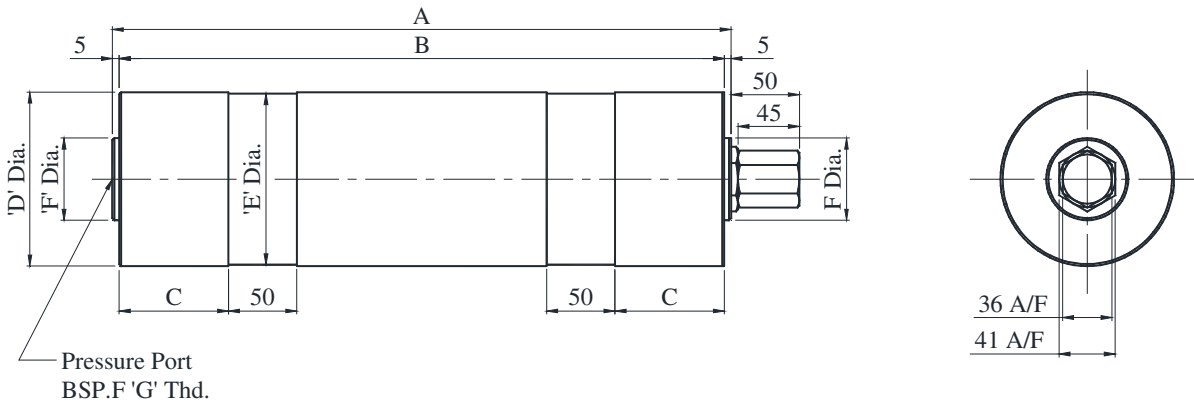


Model Number Designation

F	-AC	-100	-5	-30	80
Special Seals	Series Number	Cylinder Bore Dia. mm	Gas Capacity <i>l</i>	Design Number	Design Standard
F: Special seals Packing Fluoro Carbon Elastomers (Omit if not Required)	AC: Series Number	100	1	30	80
			2.5		
			5		
		150	10		
			20		
			30		
		200	40		
			50		
			60		

* Design numbers subject to change from 30 to 39, but installation dimensions remain as shown.

● AC-※-※-3080



Model Numbers	Cylinder Bore mm	Dimensions mm						
		A	B	C	D	E	F	G
AC-100-1-3080	100	453	384	80	127	125	60	1¼
AC-100-2.5-3080		645	576					
AC-100-5-3080		965	896					
AC-150-10-3080	150	981	912	80	190.7	187	90	2
AC-150-20-3080		1547	1478					
AC-150-30-3080		2113	2044					
AC-200-40-3080	200	1800	1731	150	224.5	240	110	2
AC-200-50-3080		2120	2051					
AC-200-60-3080		2435	2366					

Note:

Cap B is generally used to hold the gasket for preventing gas leakage at the Gas Charge Port and is also used as a tool for removing the 'valve Core' in the Gas Charge Port when necessary. Remove both Caps A and B when Charging Gas.

■ Instructions

● Hydraulic Oil to be used

Petroleum Base Oils use Petroleum Based Oil or Turbine Oils. Equally in Lubricating quality with group 1 or 2 of JIS 2213

Synthetic Fluids Synthetic Oils such as Phosphate Esters is usable in almost the same conditions as for the Petrolic one however a special packing (Fluoro Carbon Elastomers) is required. So specify with "F" on the head of Model Number.

● Gas to be used

Use only Nitrogen Gas (N2) and set the charging pressure of the Gas at 80 to 90% of the working pressure.

● Installation

To install the Accumulator use a mounting band and fix it tight on the accumulator console or the wall. Never support it only with the piping at the pressure port of the accumulator. The accumulator may be installed in any desired direction. However, it is generally installed vertically with gas charge port upside.

● Gas Filling Device

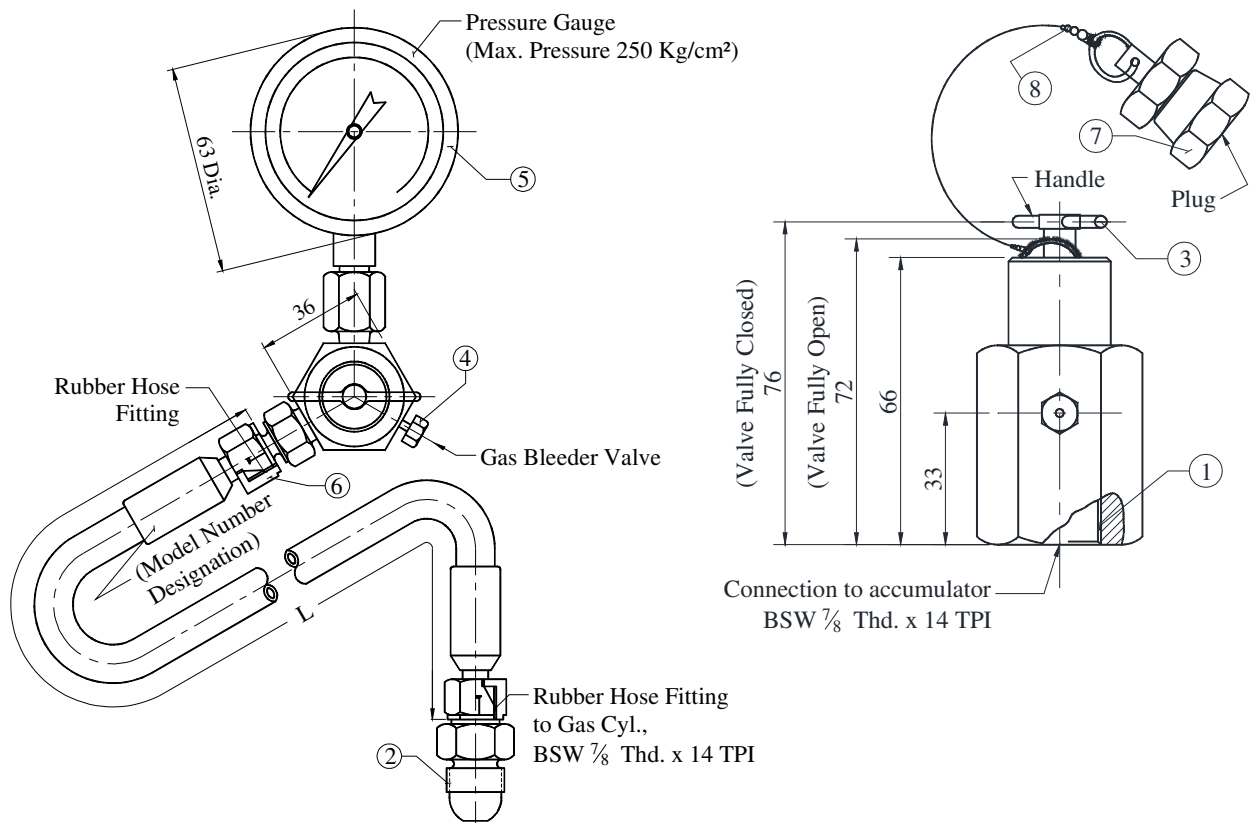
Use the three-way gas charging valve of our company for charging gas. The three-way gas charging valve is not included in the standard accessories for the accumulator, therefore specify it separately when ordering as for the details of the three-way gas charging valve and the method of gas charging.

Model Number Designation

ACGD	-N	-20	80
Series Number	Type of Rubber Hose	Design Number	Design Standard
ACGD	N : No Rubber Hose 1 : 1 Meter long 3 : 3 Meter long	20	80

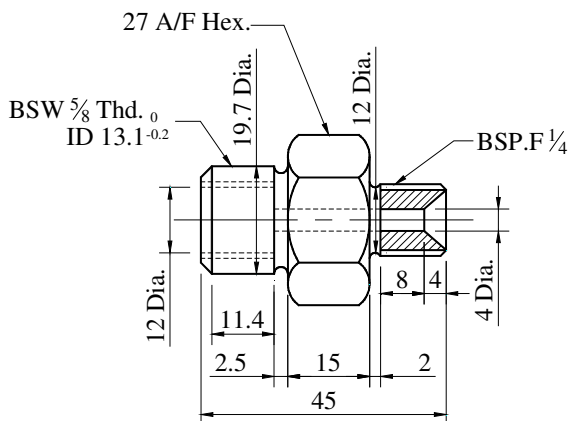
* Design numbers subject to change from 20 to 29, but installation dimensions remain as shown.

ACGD-N-2080

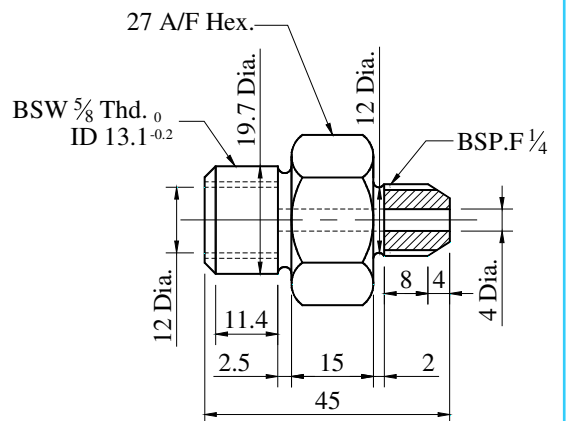


Adaptors

An adaptor as indicated below will required for fitment on to gas cylinder.



For Indigenous Hose Assmy.



For Imported Hose Assmy.

Procedure for Charging Gas in to Accumulator

- 1 (a) Remove the caps 'A' & 'B' of the accumulator (see page 2) and screw in the part 1 (page 3) of three-way gas charging valve to the gas charging port of the accumulator.
 - (b) If the accumulator is Nippon accumulator then screw-in the gas charging adaptor first to the gas charging port of the accumulator and then follow 1 (a).
- 2 Connect the part 2 (page 3) of the three-way gas charging valve to the nitrogen gas cylinder.
- 3 Turn the handle 3 clockwise until it comes to a stop. Now the valve core of the accumulator will be in open condition.
- 4 Now slowly open the cock of the gas cylinder to charge gas into the accumulator. To know if the gas is flowing, the gas bleeder valve 4 can be opened by turning counter clockwise and close by clockwise. Once it is known, turn it clockwise to close. If the cock of the gas cylinder is closed the pressure gauge 5 shows the pressure a little less than the charging pressure. Repeat the opening and closing operation of the cock of the gas cylinder, while constantly observing the pressure gauge. Close the cock after confirming that the gauge shows the required setting pressure in the accumulator. If the pressure of the gas so charged exceeds the pre-determined pressure then loosen the gas bleeder valve gradually to discharge the gas little by little till the gauge shows the required pressure.
- 5 Turn the handle 3 counter clockwise until it cannot be turned any further. Now the valve core of the accumulator will be closed and the gas is sealed. There after discharge the gas in the three-way gas charging valve by loosening the gas bleeder valve.
- 6 Lastly remove the three-way gas charging valve and mount the caps 'A' and 'B' on to the accumulator. However, in such case, to protect the pressure gauge the handle 3 should be turned counter clockwise until the valve core of the accumulator is fully closed.

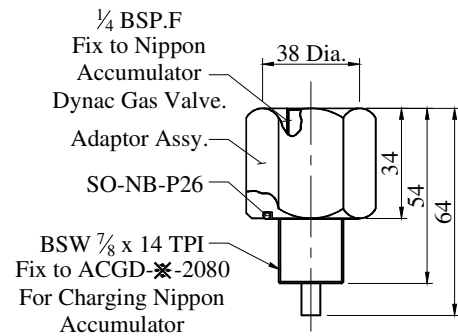
If gas cylinder is to be disconnected retaining the three-way gas charging valve on the accumulator, disconnect the flexible (rubber) hose fitting 6 from the three-way gas charging valve and screw-on the plug 7 on it. When the three-way gas charging valve is retained on the accumulator, all that is required to check the pressure is only to turn the handle 3 clockwise until it comes to a stop.

Note:

To discharge gas from accumulator mount the three-way gas charging valve on to ACGV-2080 open the bleeder valve 4 and turn the handle 3 clockwise to open the valve core of the accumulator.

For Nippon accumulator mount the adaptor on DYNAC gas valve and mount the three-way gas charging valve on to the adaptor and then follow the procedure as mentioned above.

Adaptor for Nippon Accumulator



Nippon Accumulator (Bladder Type)

■ Model Number Designation

$\frac{H}{①} \frac{B}{②} - \frac{J}{③} \frac{25MP}{④} - \frac{LL5}{⑤} - \frac{A}{⑥} \frac{A}{⑦} \frac{C}{⑧}$

① Applicable Inspection/Standard

ITEM #	Inspection/Standard
H	High Pressure Gas Safety Law (Japan Authorization) Inspection Product
N	NACOL (NACOL Company Inspection)

Please select the ITEM # which suits the regulations at the place for the accumulator installation.

② Bladder Compound

ITEM #	Bladder Compound	Suitable Service Fluid	Allowable Service Temp	O-Ring Material
B	Standard Nitrile Rubber (NBR)	Turbine Oil (JIS K2213), Fatty Ester Fluid, Water Glycol Fluid, W/O Emulsion Fluid, O/W Emulsion Fluid, Biodegradable Fluid, Tap Water, Sea Water	-10 ~ +70 ⁰ C	NBR
H	Nitrile Rubber for High Temp. (H.NBR)		-10 ~ +110 ⁰ C	FKM
L	Nitrile Rubber for Low Temp. (L.NBR)		-35 ~ +70 ⁰ C	L.NBR
F	Butyl Rubber (IIR)	Phosphate Ester Fluid	-10 ~ +70 ⁰ C	FKM
E	Ethylene Propylene Rubber (EPDM)	Phosphate Ester Based Fluid		EPDM
C	Chloroprene Rubber (CR)	Basic, Water	-20 ~ +80 ⁰ C	CR
V	Fluorine Rubber (FKM)			FKM

Please select the ITEM # of Bladder Compound which suits “Service Fluids” and “service Temperature”.

③ Series

ITEM #	Series Name
J	J Series

Please select the ITEM # which shows the Series Name

④ Maximum Allowable Working Pressure (MAWP)

ITEM #	MAWP
10MP	100 Kgf/cm ²
16MP	160 Kgf/cm ²
17.5MP	175 Kgf/cm ²
25MP	250 Kgf/cm ²
35MP	350 Kgf/cm ²

Please select the ITEM # which value exceeds the maximum operation pressure.

The Maximum Allowable Working Pressure (MAWP) is the maximum pressure, which is permitted to load the accumulator.

⑤ Gas Volume

ITEM #	Gas Volume	ITEM #	Gas Volume
003	0.03L	LL1	1L
L01	0.1L	LL2	2L
L03	0.3L	LL3	3L
L05	0.5L	LL4	4L
		LL5	5L

Please select the ITEM # which value exceeds the required Gas Volume (L) calculated by accumulator sizing calculation.

⑥ Specification for Accumulator Cap & Gas Charging Side

ITEM #	Gas Charging Side Specification	Acc. Cap Specification	Shape
A	Dynac Gas Valve (BSP.F Thread)	Standard Type	
H		Plating	
P		Stainless steel	

Please select the ITEM # which suits the gas charging side specification, accumulator cap specification and material. The ITEM # of standard accumulator is "A".

⑦ Specification for Oil Port Side

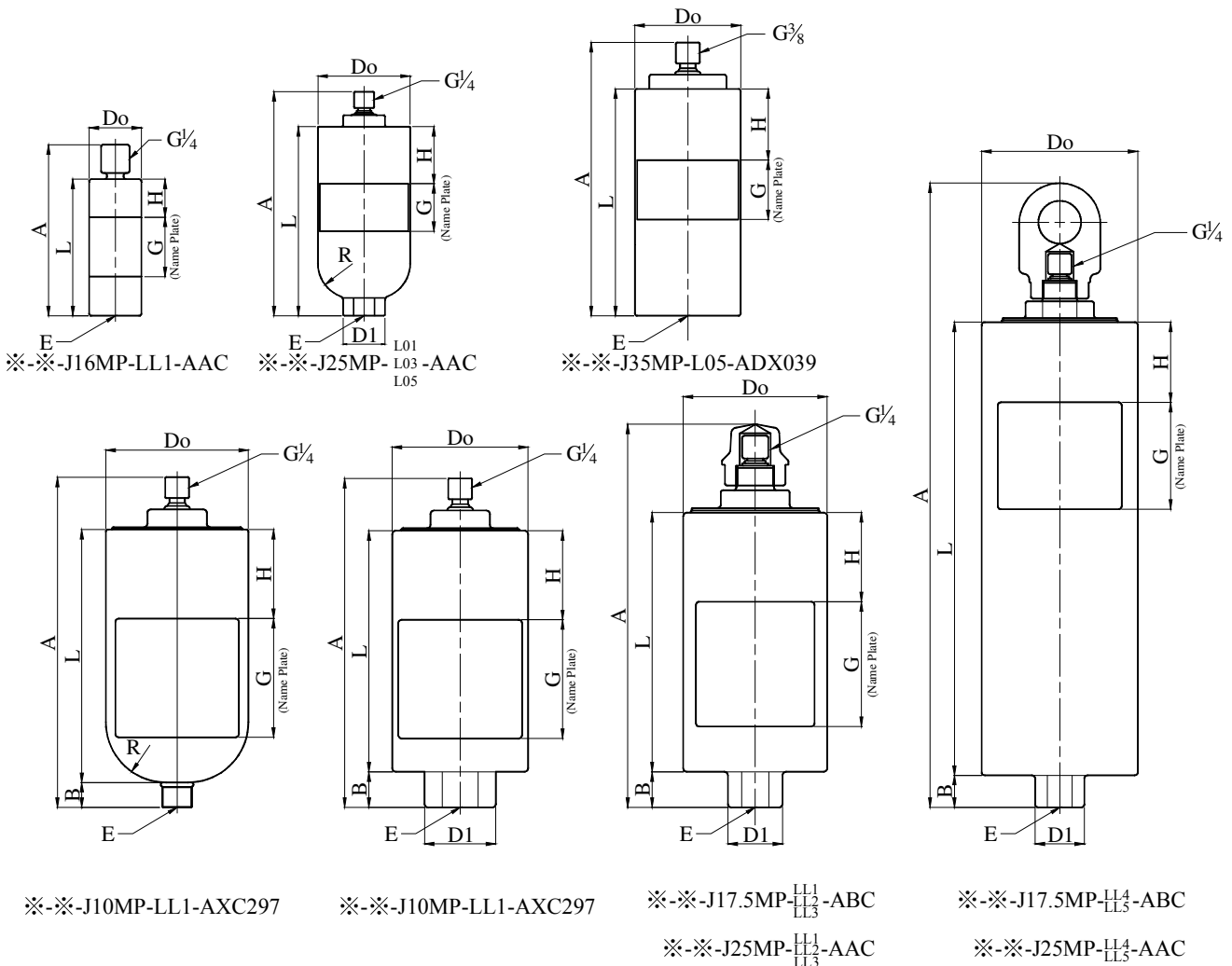
ITEM #	Oil Port Side Specification	Valve Material Specification	Applicable Model
A	Standard Type	Carbon steel	250:1 ~ 5L
D		Stainless Steel	All stainless J Series Accumulator Accumulator made of carbon steel:350:0.5L

Please select the ITEM # which valve material suits the service fluid. The ITEM # "A" is for the standard 1L or larger accumulator which MAWP is 250Kgf/cm². The ITEM # "D" is for all stainless accumulator or 0.5L Carbon steel accumulator which MAWP is 350Kgf/cm²

⑧ Specification for Accumulator Shell

ITEM #	Material of Shell	Treatment Specification	Service Fluid
C	Standard Material Carbon Steel	Zinc Phosphate Treatment on inside & Outside Surface (Standard spec.)	Petroleum based Hydraulic Oil & other Fluid
D			Fire Resistant (WG)

Please select the ITEM # which material of Shell, operating circumstance and service fluid.



"J" Series Accumulators

ITEM Model Numbers	Gas Volume (L)	Mass (D spec) (Kg)	A mm	L mm	B mm	H mm	G mm	D0±1% Dia. mm	D1 Dia. mm	R mm	E
※※-J16MP-003-ABC Note 1	0.03	0.39	114	110	-	32	50	44	-	-	Rc ¹ / ₄
※※-J10MP-LL1-AXC297	1	11	278	213	21	75	100	120	-	50.8	BSP.F 1
※※-J1MP-LL1-ABC Note 2	1	11	277	203	30	75	100	114.3	Hex.54	-	Rc ³ / ₄
※※-J17.5-LL1-ABC	1	11	318	215	30	75	100	120	Hex.41	-	Rc ³ / ₄
※※-J17.5-LL2-ABC	2	14	454	351							
※※-J17.5-LL3-ABC	3	17	572	469							
※※-J17.5-LL4-ABC	4	23	646	486							
※※-J17.5-LL5-ABC	5	27	746	586							
								139.8			
※※-J25MP-L01-ABC	0.1	2.2	144	107	-	20	50	72	Hex.30	27	Rc ³ / ₈
※※-J25MP-L03-ABC	0.3	3.6	244	207							
※※-J25MP-L05-ABC	0.5	5.7	235	198							
								96.5	Hex.41	37	Rc ³ / ₄
※※-J25MP-LL1-AAC	1	13	318	215	30	75	100	127	Hex.41	-	Rc ³ / ₄
※※-J25MP-LL2-AAC	2	18	454	351							
※※-J25MP-LL3-AAC	3	23	572	469							
※※-J25MP-LL4-AAC	4	29	646	486							
※※-J25MP-LL5-AAC	5	34	746	586							
								146			
※※-J35MP-L05-ADX039	0.5	7	238	198	-	60	50	98	-	-	BSP.F ³ / ₈

Note 1 : When the High Pressure Gas Safety Law, Japan is applied, Maximum allowable working pressure will be 118 Kg/cm² (160 Kg/cm² → 118 Kg/cm²)

Note 2 : The applicable inspection for N※-J100-LL1-ABC is NACOL Company Inspection Only.

Nippon Accumulator (Bladder Type)

■ Model Number Designation

$\frac{H}{①} \frac{N}{②} - \frac{N}{③} \frac{21MP}{④} - \frac{L16}{⑤} - \frac{A}{⑥} \frac{A}{⑦} \frac{C}{⑧}$

① Applicable Inspection/Standard

ITEM #	Inspection/Standard
H	High Pressure Gas Safety Law (Japan Authorization) Inspection Product
N	NACOL (NACOL Company Inspection)
R	PED (CE Marking)

Please select the ITEM # which suits the regulations at the place for the accumulator installation.

② Bladder Compound

ITEM #	Bladder Compound	Suitable Service Fluid	Allowable Service Temp.	O-Ring Material
N	Standard Nitrile Rubber (NBR)	Turbine Oil (JIS K2213), Fatty Ester Fluid, Water Glycol Fluid, W/O Emulsion Fluid, O/W Emulsion Fluid, Biodegradable Fluid, Tap Water, Sea Water	-10 ~ +70°C	NBR
H	Nitrile Rubber for High Temp. (H.NBR)		-10 ~ +110°C	FKM
L	Nitrile Rubber for Low Temp. (L.NBR)		-35 ~ +70°C	L.NBR
F	Butyl Rubber (IIR)	Phosphate Ester Fluid	-10 ~ +70°C	FKM
E	Ethylene Propylene Rubber (EPDM)	Phosphate Ester Based Fluid		EPDM
C	Chloroprene Rubber (CR)	Basic, Water	-10 ~ +80°C	CR

Please select the ITEM # of Bladder Compound which suits “Service Fluids” and “service Temperature”.

③ Series

ITEM #	Series Name	Allowable Oil Flow in/out Speed when vertically installed (16 ~ 320 cSt)		
N	N Series (1 ~ 4L)	N Series	1 ~ 4L	120 L/min.
A	A Series (6 ~ 16L)	A Series	5 ~ 16L	300 L/min.

Please select the ITEM # which shows the series name

④ Maximum Allowable Working Pressure (MAWP)

ITEM #	MAWP	In case ① is R	
		ITEM #	MAWP
17.5MP	175 Kg/cm ²		
21MP	210 Kg/cm ²	210B	210 Kg/cm ²
23MP	230 Kg/cm ²	235B	235 Kg/cm ²
35MP	350 Kg/cm ²		
45MP	450 Kg/cm ²		

Please select the ITEM # which value exceeds the maximum operation pressure.

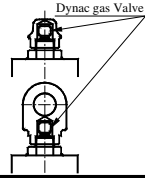
The Maximum Allowable Working Pressure (MAWP) is the maximum pressure, which is permitted to load the accumulator.

⑤ Gas Volume

ITEM #	Gas Volume
LL1	1L
2.5	2.5L
LL4	4L
LL5	5L
6.3	6.3L
L10	10L
L16	16L

Please select the ITEM # which value exceeds the required Gas Volume (L) calculated by accumulator sizing calculation.

⑥ Specification for Accumulator Cap & Gas Charging Side

ITEM #	Gas Charging Side Specification	Acc. Cap Specification	Shape
A	Dynac Gas Valve (BSP.F Thread)	Standard Type	
H		Plating	
P		Stainless steel	

Please select the ITEM # which suits the gas charging side specification, accumulator cap specification and material.

⑦ Specification for Oil Port Side

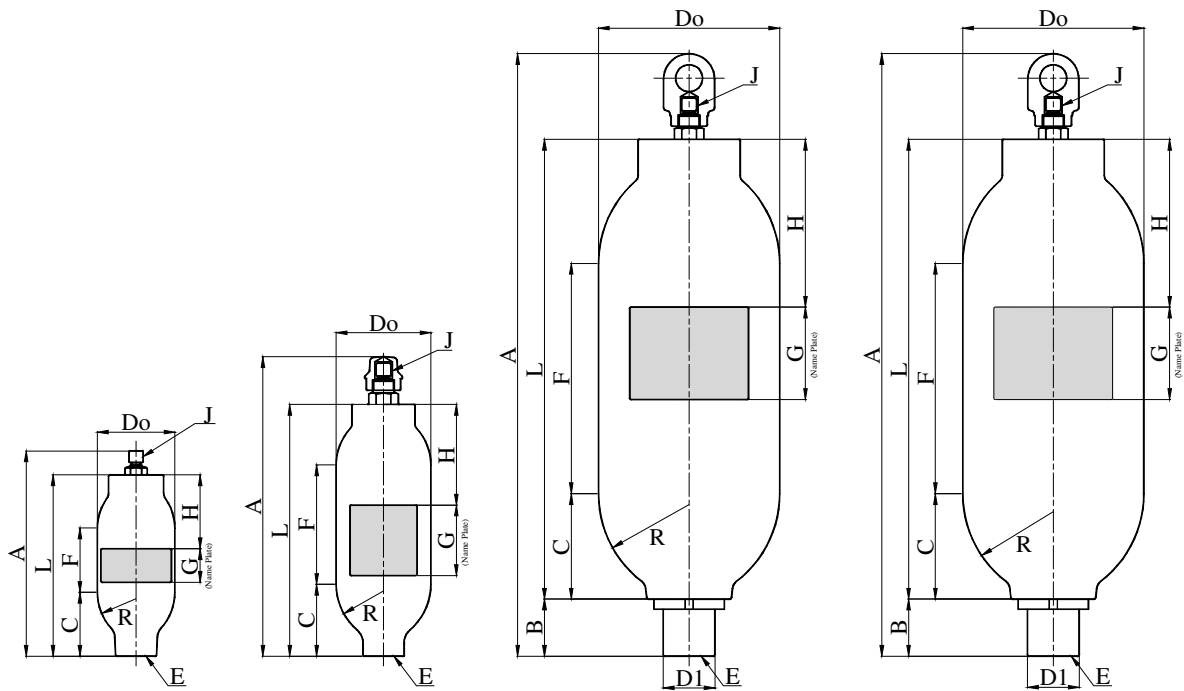
ITEM #	Oil Port Side Specification	Valve Material Specification
A	Standard Type	Standard Material (Carbon Steel)
D		Stainless Steel material

Please select the ITEM # which valve material suits the service fluid.

⑧ Specification for Accumulator Shell

ITEM #	Material of Shell	Treatment Specification	Service Fluid
C	Standard Material Carbon Steel	Zinc Phosphate Treatment on Inside & Outside Surface (Standard spec.)	Petroleum based Hydraulic Oil & other Fluid
D			Fire Resistant (WG)

Please select the ITEM # which material of Shell suits the operating circumstance and service fluid.



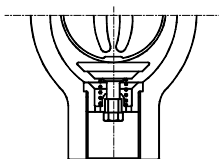
21MP
23MP
35MP
45MP
※-※-**N**-LL1-AAC

21MP
35MP
45MP
※-※-**N**-2.5-LL4-AAC

17.5MP LL5
21MP 6.3
23MP L10
※-※-**A**-L16-AAC

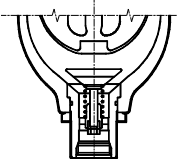
17.5MP LL5
21MP 6.3
23MP L10
※-※-**A**-L16-AAC

Cushion cup Made of Rubber for 1~4L.



The poppet valve for the accumulator which maximum allowable working pressure is 350 Kg/cm² or 450 Kg/cm² has the cushion cup.

Cushion cup Made of Rubber for 5~16L.



The poppet valve for the accumulator which maximum allowable working pressure is 235 Kg/cm² has the cushion cup.

ITEM Model Numbers	Gas Volume (L)	Mass (D spec) (Kg)	A mm	L mm	B mm	C mm	F mm	H mm	G mm	Do Dia.±1% mm	D1 Dia. mm	R mm	E	J Standard
※※-N ^{21MP} / _{23MP} -LL1-AAC	1	7	300 ⁺⁸ ₀	264	-	95	90	110	50	114.3	-	80	M42 x 2	G 3/8
※※-N21MP-2.5-AAC	2.5	13	438 ⁺⁸ ₀	369		107	172	150	100	139.8		90		
※※-N21MP-LL4-AAC	4	18	581 ⁺⁸ ₀	512		315	150							
※※-N ^{17.5MP} / _{21MP} / _{23MP} -LL1-AAC	1	14.5	331 ⁺⁹ ₀	291	-	112	89	110	50	127	-	80	M42 x 2	G 3/8
※※-N ^{35MP} / _{45MP} -2.5-AAC	2.5	23	466 ⁺⁹ ₀	397		125	166	150	100	152.4		95		
※※-N ^{17.5MP} / _{21MP} / _{23MP} -LL4-AAC	4	30	609 ⁺⁹ ₀	540		309	150							
※※-A ^{17.5MP} / _{21MP} / _{23MP} -LL5-AAC	5	23, 27, 29	574 ⁺¹² ₀	390	58	123	142	200	100	190.7	57	125	M42 x 2	G 1/4
※※-A ^{17.5MP} / _{21MP} / _{23MP} -6.3-AAC	6.3	25, 30, 32	647 ⁺¹² ₀	463			207							
※※-A ^{17.5MP} / _{21MP} / _{23MP} -L10-AAC	10	32, 39, 41	817 ⁺¹² ₀	633			377							
※※-A ^{17.5MP} / _{21MP} / _{23MP} -L16-AAC	16	47, 58, 59	1,137 ⁺¹² ₀	953			697							
※※-A ^{35MP} / _{45MP} -LL5-AAC	5	35	591 ⁺¹² ₀	398	67	131	135	200	100	216.3	57	135	M42 x 2	G 3/8
※※-A ^{35MP} / _{45MP} -6.3-AAC	6.3	57	664 ⁺¹² ₀	471			200							
※※-A ^{35MP} / _{45MP} -L10-AAC	10	74	834 ⁺¹² ₀	641			370							
※※-A ^{35MP} / _{45MP} -L16-AAC	16	97	1,154 ⁺¹² ₀	961			690							

