

Accumulator

high pressure bladder type
conforming to AS 1210

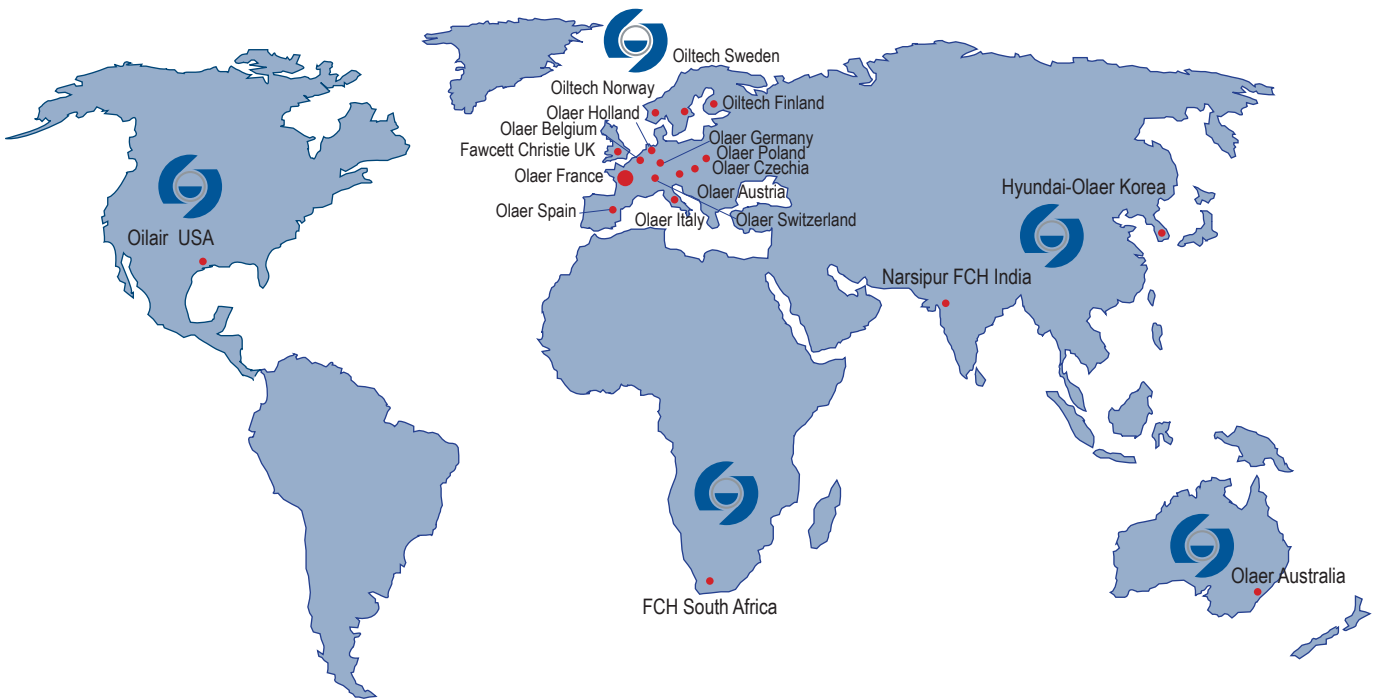


Standard Range



AS 1210

OLAER GROUP



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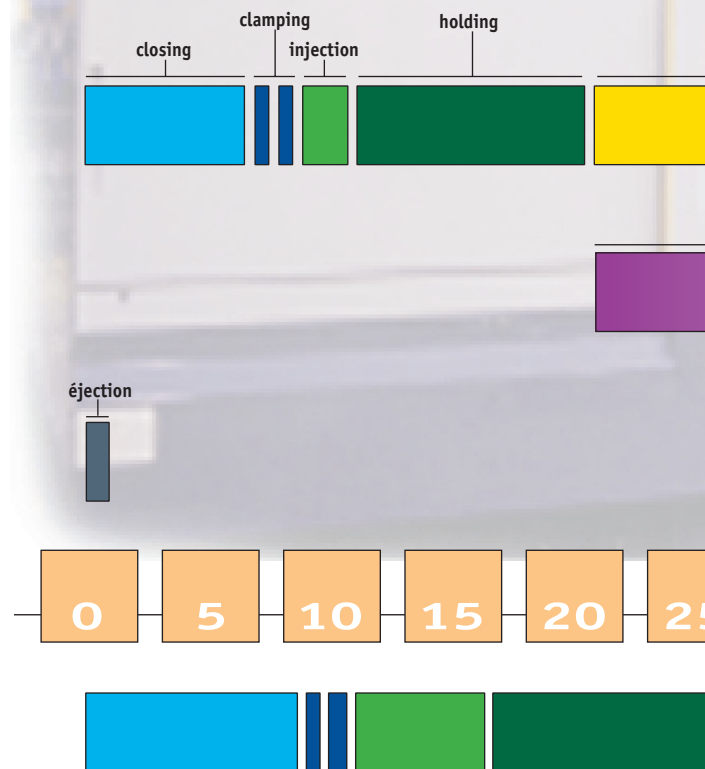
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- On a daily basis, the industrial world is confronted with two fundamental questions:

How

to **increase** production capacity ?
to **reduce** production costs ?

- Some companies still disregard smart solutions, wrongly assuming that they can afford to ignore them.
- Thanks to our bladder accumulators, we can offer you record breaking outputs at a reduced cost as well as an extended service life for your hydraulic systems.
- From now on, be the winner. Rationalise your needs by using AS 1210 approved accumulators.



moulding machines using the same intalled power.

AC/NG Range

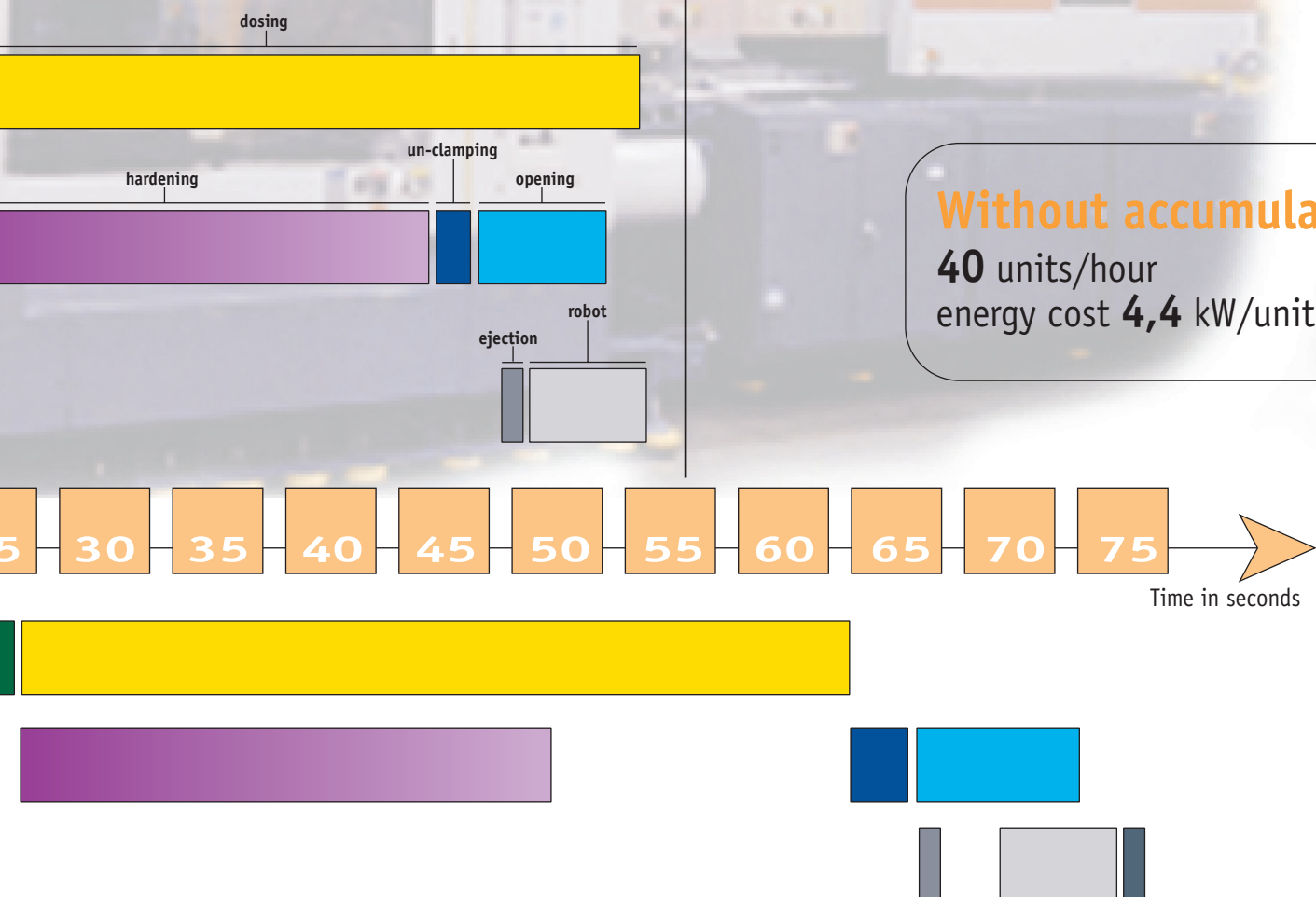
One application *

that speaks for itself

Faced with a sudden increase in demand a company specialising in producing plastic molded parts needed to **increase its production capacity** with minimal equipment modification while **decreasing the overall energy consumption.**

With accumulator
60 units/hour
energy cost 3,5 kW/unit

Without accumulator
40 units/hour
energy cost 4,4 kW/unit



* This survey was run in collaboration with one of the largest press manufacturers, on a 2500T press, manufacturing car bumpers.

● CONCEPT

This accumulator comprises a forged steel shell, a fluid port assembly and a rubber bladder compatible with a large number of fluids. Its special design allows the bladder (the strategic component) to compress and deform into 3 lobes in order for the accumulator to store, then to deliver the fluid under pressure, as required.

● YOUR BENEFITS

- To increase your production rates thanks to large instantaneous flow rates that only accumulators can provide.

- Some spare power available at any time.

Example : AC 5000A-00-34A

Average flow : 650 L/min.

Maximum pressure available : 320 bars

Minimum pressure available : 250 bars

Average power = Average flow x Average pressure/600 = 308 kW

- The accumulator's ability to run independently moderates its installation cost while reducing your equipment running cost.

- With a similar accumulator in compliance with AS1210, your OLAER accumulator is suitable for use in all states of Australia, New Zealand and accepted throughout Asia.

● TECHNICAL CHARACTERISTICS

The following technical characteristics are common to all type of accumulators.

Test pressure (bar) : 1.25 x Design pressure

Min./Max. working temperature acceptable (°Celsius) : - 20/+80

Min./Max. storage temperature (°Celsius) : - 40/+80

Shell material : Alloyed steel

Rubber compound : NBR, IIR, EPDM, VITON, etc.

Protections : Bare metal, electro-chemical coating, epoxy resins, PTFE

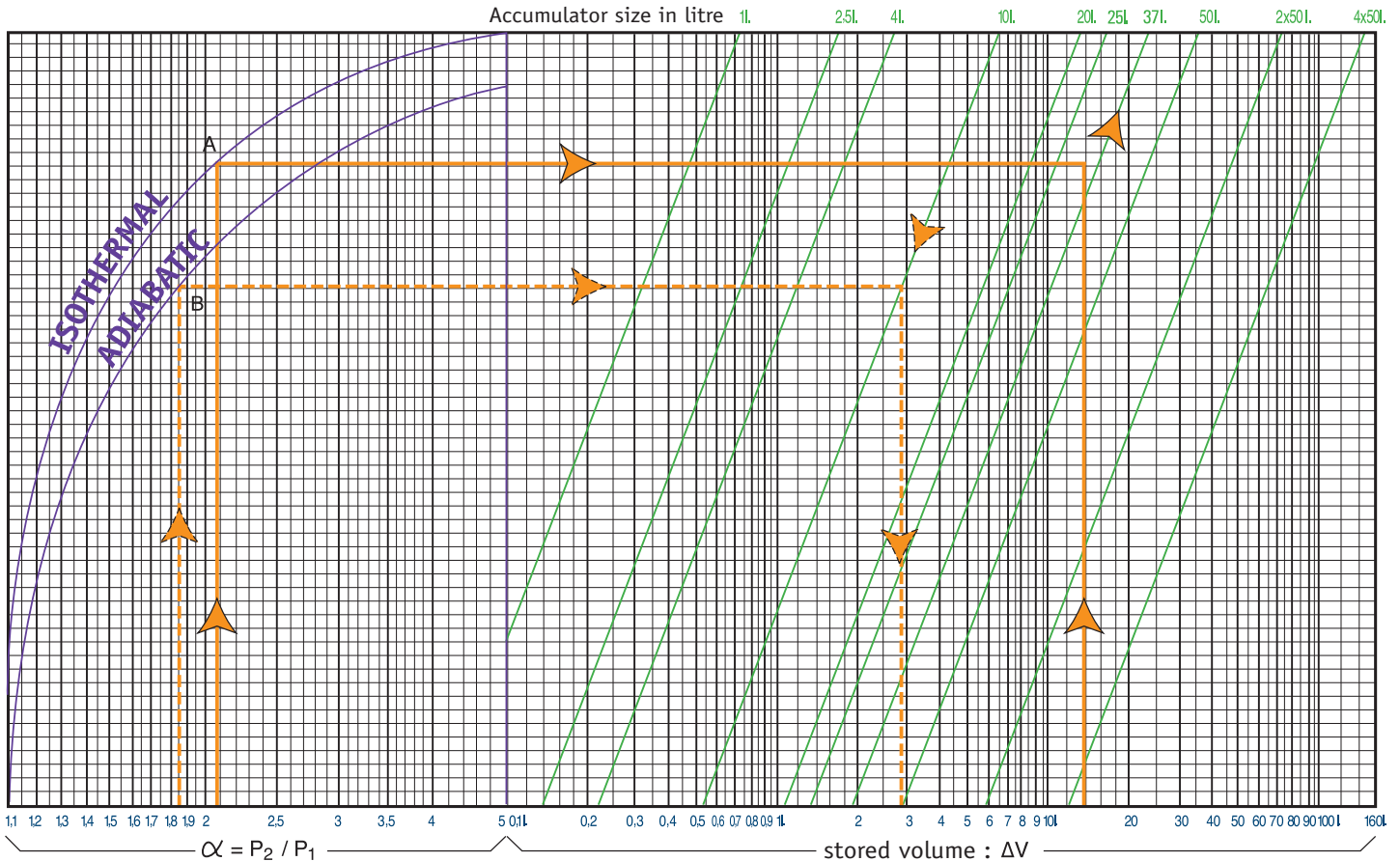


How to size ?

AC/NG Range

Olaer has developed some very sophisticated software simulating the behaviour of accumulators used in applications such as pulsation dampening, surge alleviation, thermal expansion and energy storage.

BASIC SIZING CHART FOR ACCUMULATOR USED IN ENERGY STORAGE



The above graphic is used to estimate the size of an accumulator used to store or deliver a certain volume of liquid within a given pressure range. These curves are the graphic representation of an adiabatic* cycle (fast cycling rate - $N = 1.4$) or isothermal* cycle for an accumulator working at 20°C with a precharge $P_0 = 0,9 P_1$

They do not take into consideration the real gas compression correction factor, the real adiabatic coefficient and the polytropic rate of the application. Depending on the application data, the influence of these factors may be significant, and require that some calculations adjustments be made.

*Reminder

Isothermal : the transformation is said to be isothermal when the compression or expansion of the gas occurs at a rate slow enough to allow a good thermal exchange, allowing the gas to remain at constant temperature.

Adiabatic : the transformation is said to be adiabatic when the cycle is quick and does not allow a temperature exchange with the ambient media.

Sizing of an accumulator

to be installed in the following conditions.

P_2 : Maximum available pressure : 210 bar

P_1 : Minimum working pressure : 100 bar

P_0 : Nitrogen precharge : 90 bar

ΔV : Volume to be stored : 14 L.

Condition : Isothermal (No temperature variation)

A/ Compression ratio $\alpha = P_2/P_1 = 210/100 = 2,1$

B/From the value 2,1 on the α axis, draw a vertical line that intersects the isothermal reference curve in A.

C/ From the value 14 on the ΔV axis , draw a vertical line. The intersection point of this line with the horizontal line meeting A indicates a required accumulator size of **37 L**.

Example of calculation of the volume drawn off from an accumulator

Accumulator size = 10 L.

$P_2 = 185$ bar ; $P_1 = 100$ bar ; $P_0 = 90$ bar ; Adiabatic condition

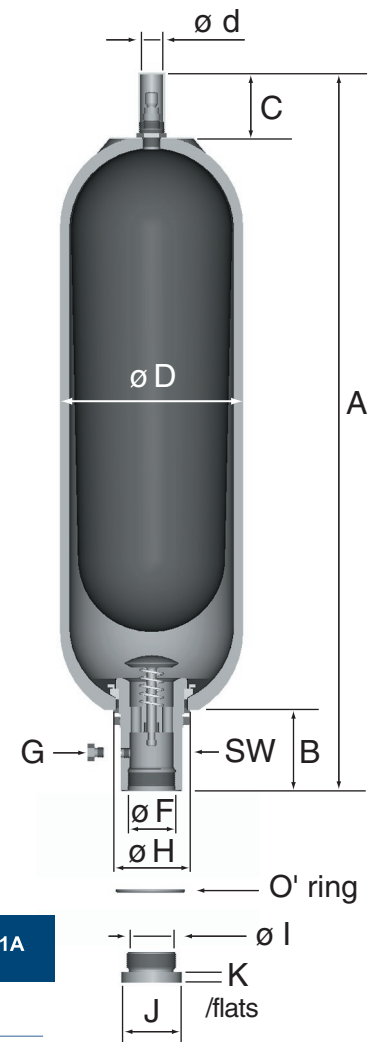
$\alpha = P_2/P_1 = 185/100 = 1,85$

$\Delta V = 2,8$ L.

Medium pressure standard AC Range - 210 bar From 10 to 50 litres Standard connection

BENEFITS

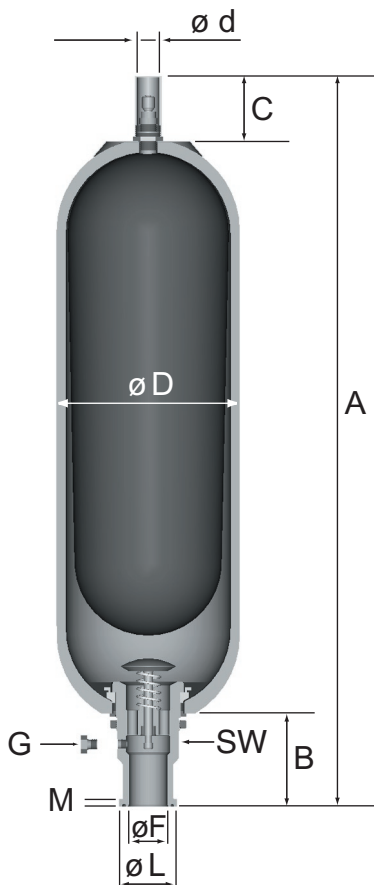
- Small diameter, ideal for space saving
- Medium pressure for a wide range of applications
- Improved corrosion protection for fluid port and protective cap
- Stronger gas valve
- Standard 1176 l/m high flow fluid port



Designation	AC10-21A	AC20-21A	AC25-21A	AC37-21A	AC50-21A
Maximum Pressure in bars	210	210	210	210	210
Nominal Gas Volume in litres	9.4	18.8	24.5	35.2	49.2
Maximum Flow rate in l/min	1176	1176	1176	1176	1176
Weight in kg	27	42	55	66	92
ø D max	222	222	222	222	222
A max height	585	891	1041	1428	1933
Connection ø F	2" BSPF				
ø I Connection with reducing bush	1" BSPF *				
K	13	13	13	13	13
B	103	103	103	103	103
C	80	80	80	80	80
ø d	22.5	22.5	22.5	22.5	51
ø H	101	101	101	101	101
SW on flats	70	70	70	70	70
G bleed plug	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f
O'-ring ø int x ø tore	54x3	54x3	54x3	54x3	54x3
Accessories					
Part Number clamps x (quantity)	C228 x 2				
Part Number support bracket	E170				

* Note

STD sizes : 1/2", 3/4" and 1" BSPF. Other sizes also available on request, see adaptor table page 15



Medium pressure standard AC Range - 210 bar
From 10 to 50 litres
SAE connection

BENEFITS

- Small diameter, ideal for space saving
- Medium pressure for a wide range of applications
- Improved corrosion protection for fluid port and protective cap
- Stronger gas valve
- Standard 1176 l/m high flow fluid port
- Connection without thread

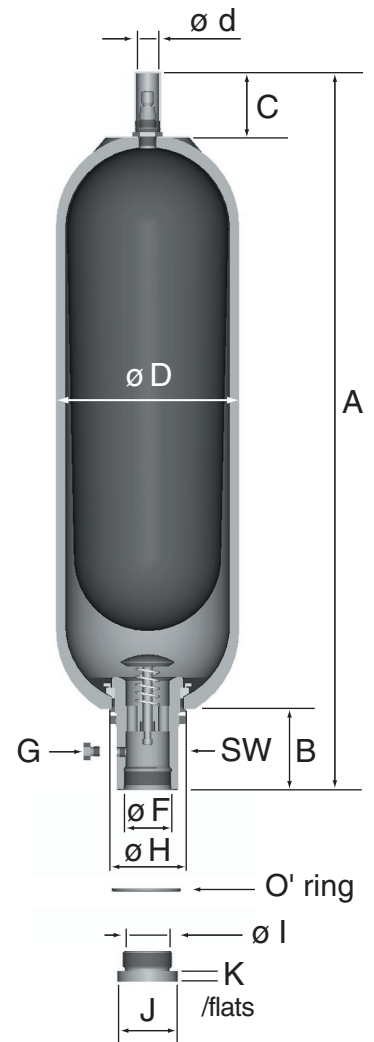
Designation	AC10-21A	AC20-21A	AC25-21A	AC37-21A	AC50-21A
Maximum Pressure in bars	210	210	210	210	210
Nominal Gas Volume in litres	9.4	18.8	24.5	35.2	49.2
Maximum Flow rate in l/min	1176	1176	1176	1176	1176
Weight in kg	27	42	55	66	92
ø D max	222	222	222	222	222
A max height	600	906	1056	1443	1948
Connections - Code 62	1½" SAE 6000 psi *				
ø F	47	47	47	47	47
ø L	71.4	71.4	71.4	71.4	71.4
M	9.5	9.5	9.5	9.5	9.5
B	103	103	103	103	103
C	80	80	80	80	80
ø d	22.5	22.5	22.5	22.5	51
ø H	101	101	101	101	101
SW on flats	70	70	70	70	70
G bleed plug	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f
Accessories					
Part Number clamps x (quantity)	C228 x 2				
Part Number support bracket	E170				

*** Note**

Code 61 available on request (2" SAE 3000 psi)

High pressure AC range - 345 bar From 0,16 to 50 litres Standard connection

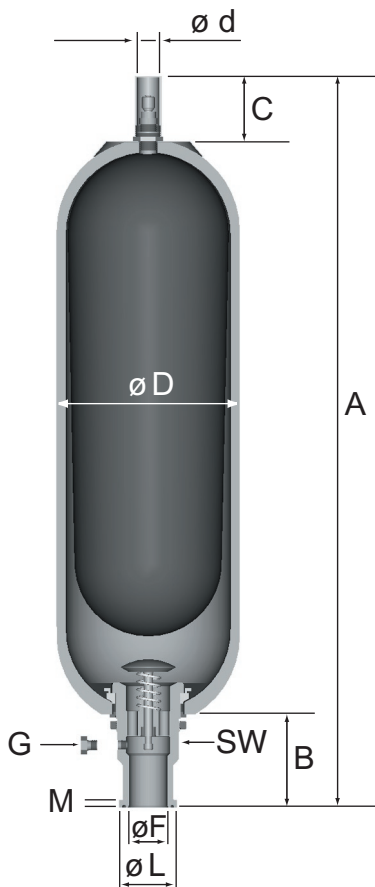
Designation	0B-341	0F-341	011-40A	025-40A	04-34A
Maximum Pressure in bars	345	345	400	400	345
Nominal Gas Volume in litres	0.16	0.6	1	2.4	3.8
Maximum Flow rate in l/min	27	109	336	336	564
Weight in kg	2	2.7	5.7	10	14
ø D max	56	92	118	118	170
A max height	292	266	321	522	446
Connection ø F	3/4" BSPM		3/4" BSPF		1 1/4" BSPF
ø I Connection with reducing bush	-		3/8" BSPF		3/4" BSPF
K	-	-	8	8	10
B	36	37	54	54	65
C	40	40	80	80	80
ø d	16	16	22.5	22.5	22.5
ø H	26	35	50	50	68
SW on flats	23	32	32	32	50
O'-ring ø int x ø tore	21.3x2.4	21.3x2.4	21.3x2.4	21.3x2.4	36.2x3
Accessories					
Part Number clamps x (quantity)	-	-	A120 x2		B170 x 2
Part Number support bracket	-	-	-		E120



Designation	AC10-34A	AC20-34A	AC25-34A	AC37-34A	AC50-34A
Maximum Pressure in bars	345	345	345	345	345
Nominal Gas Volume in litres	9.4	18.8	24.5	35.2	49.2
Maximum Flow rate in l/min	1176	1176	1176	1176	1176
Weight in kg	30	46	53	74	102
ø D max	229	229	229	229	229
A max height	585	891	1041	1428	1933
Connection ø F	2" BSPF				
ø I Connection with reducing bush	1" BSPF *				
K	13	13	13	13	13
B	103	103	103	103	103
C	80	80	80	80	80
ø d	22.5	22.5	22.5	22.5	51
ø H	101	101	101	101	101
SW on flats	70	70	70	70	70
G bleed plug	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f
O'-ring ø int x ø tore	54x3	54x3	54x3	54x3	54x3
Accessories					
Part Number clamps x (quantity)	C228 x 2				
P/N support bracket	E170				

*** Note**

STD sizes : 1/2", 3/4", and 1" BSPF. Other sizes also available on request, see adaptor table page 15.



High pressure AC range - 345 bar
From 10 to 50 litres
SAE connection

BENEFITS FOR STANDARD & SAE CONNECTIONS

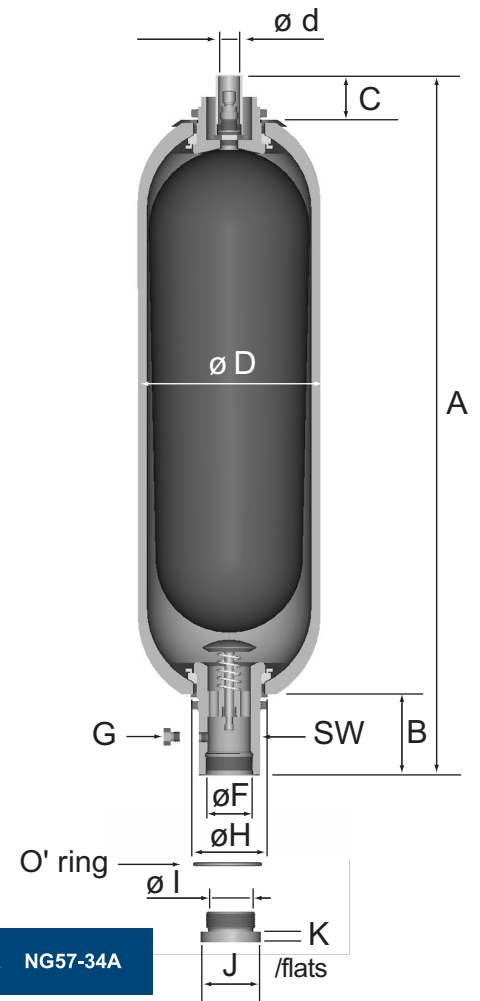
- Heavy duty applications
- Improved corrosion protection for fluid port and protective cap
- Stronger gas valve
- Standard 1176 l/m high flow fluid port
- Connection without thread for SAE

Designation	AC10-34A	AC20-34A	AC25-34A	AC37-34A	AC50-34A
Maximum Pressure in bars	345	345	345	345	345
Nominal Gas Volume in litres	9.4	18.8	24.5	35.2	49.2
Maximum Flow rate in l/min	1176	1176	1176	1176	1176
Weight in kg	30	46	53	74	102
ø D max	229	229	229	229	229
A max height	625	931	1081	1468	1973
Connections	1 ½" SAE 6000 psi				
ø F	34	34	34	34	34
ø L	63.8	63.8	63.8	63.8	63.8
M	12.5	12.5	12.5	12.5	12.5
B	143	143	143	143	143
C	80	80	80	80	80
ø d	22.5	22.5	22.5	22.5	51
ø H	101	101	101	101	101
SW on flats	70	70	70	70	70
G bleed plug	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f
Accessories					
Part Number clamps x (quantity)	C228 x 2				
P/N support bracket	E170				

High pressure NG Range - 345 bar
From 10 to 57 litres, top repairable
Standard connection

BENEFITS

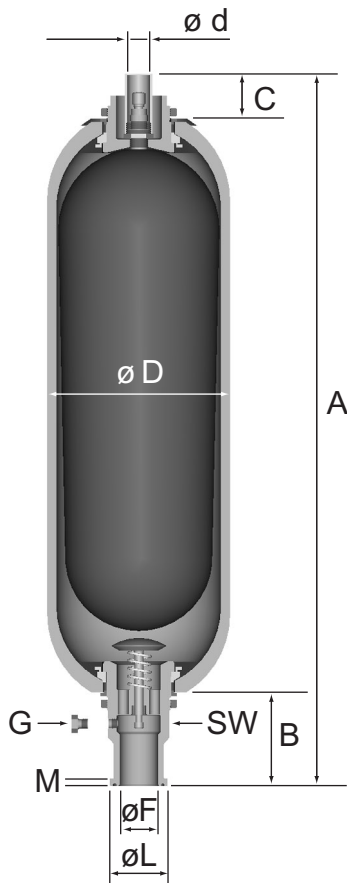
- Heavy duty range
- Repairable in situ
- Improved corrosion protection for fluid port and protective cap
- Stronger gas valve
- Standard 1176 l/m high flow fluid port



Designation	NG10-34A	NG20-34A	NG37-34A	NG50-34A	NG57-34A
Maximum Pressure in bars	345	345	345	345	345
Nominal Gas Volume in litres	9.4	18.8	35.2	49.2	52.2
Maximum Flow rate in l/min	1176	1176	1176	1176	1176
Weight in kg	33	49	77	105	125
ø D max	229	229	229	229	229
A max height	581	892	1413	1911	2003
Connection ø F	2" BSPF				
ø I Connection with reducing bush	1" BSPF *				
K	13	13	13	13	13
B	103	103	103	103	103
C	80	80	80	80	80
ø d	22.5	22.5	22.5	22.5	22.5
ø H	101	101	101	101	101
SW on flats	70	70	70	70	70
G bleed plug	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f
O'-ring ø int x ø tore	54x3	54x3	54x3	54x3	54x3
Accessories					
Part Number clamps	C228 x 2				
Part Number support bracket	E170				

*** Note**

STD sizes : 1/2", 3/4", and 1" BSPF. Other sizes also available on request.



High pressure NG Range - 345 bar
From 10 to 57 litres, top repairable
SAE connection

BENEFITS

- Heavy duty range
- Repairable in situ
- Improved corrosion protection for fluid port and protective cap
- Stronger gas valve
- Standard 1176 l/m high flow fluid port
- Connection without thread

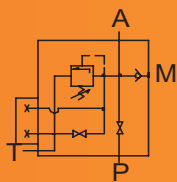
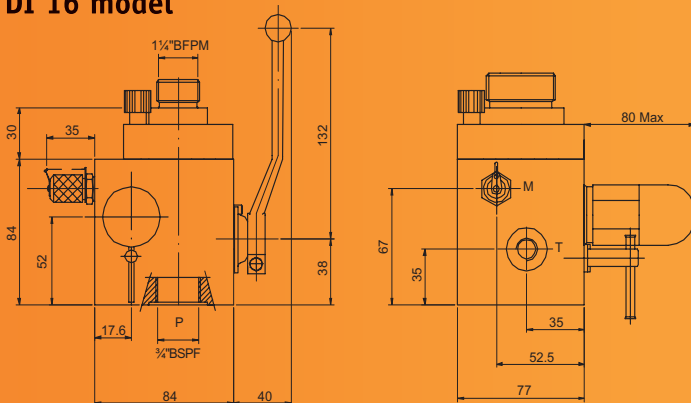
Designation	NG10-34A	NG20-34A	NG37-34A	NG50-34A	NG57-34A
Maximum Pressure in bars	345	345	345	345	345
Nominal Gas Volume in litres	9.4	18.8	35.2	49.2	52.2
Maximum Flow rate in l/min	1176	1176	1176	1176	1176
Weight in kg	33	49	77	105	125
ø D max	229	229	229	229	229
A max height	621	932	1453	1951	2043
Connections	1 ½ " SAE 6000 psi				
ø F	34	34	34	34	34
ø L	63.8	63.8	63.8	63.8	63.8
M	12.5	12.5	12.5	12.5	12.5
B	143	143	143	143	143
C	80	80	80	80	80
ø d	22.5	22.5	22.5	22.5	22.5
ø H	101	101	101	101	101
SW on flats	70	70	70	70	70
G bleed plug	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f	Hex 19 a/f
Accessories					
Part Number clamps x (quantity)	C228 x 2				
Part Number support bracket	E170				

Safety blocks

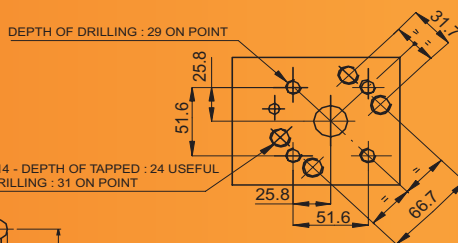
Safety blocks are designed to incorporate the variety of functions necessary for the correct operation of an hydraulic system fitted with accumulators. This includes manual and/or electric drain, isolation, flow control and pressure relief. Channel cross section : 10 mm (DI 10 block), 16 mm (DI 16 block), 20 mm (DI 20 block), 24 mm (DI 24 block), 32 mm (DI 32 block).

Maximum working pressure : 210 to 345 bars depending on models. For more information, please contact OLAER Fawcett Christie.

DI 16 model

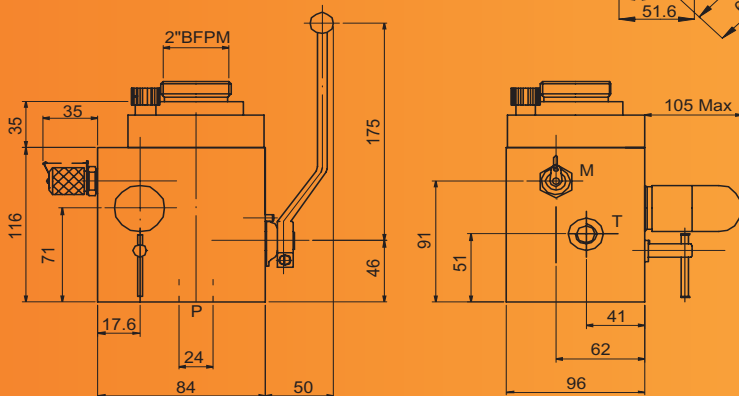


DEPTH OF DRILLING : 29 ON POINT

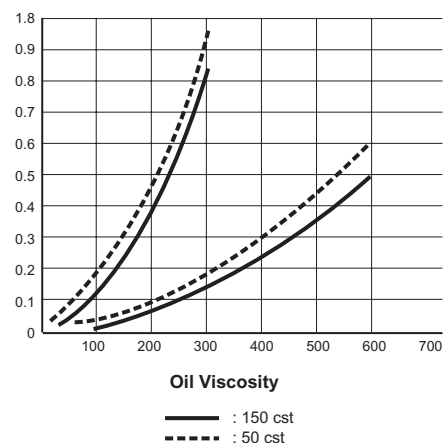


DI 24 model

4 HOLES ϕ M14 - DEPTH OF TAPPED : 24 USEFUL
DEPTH OF DRILLING : 31 ON POINT

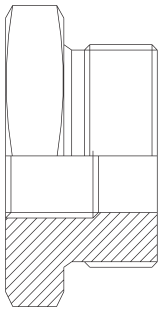


DI 16- DI 24



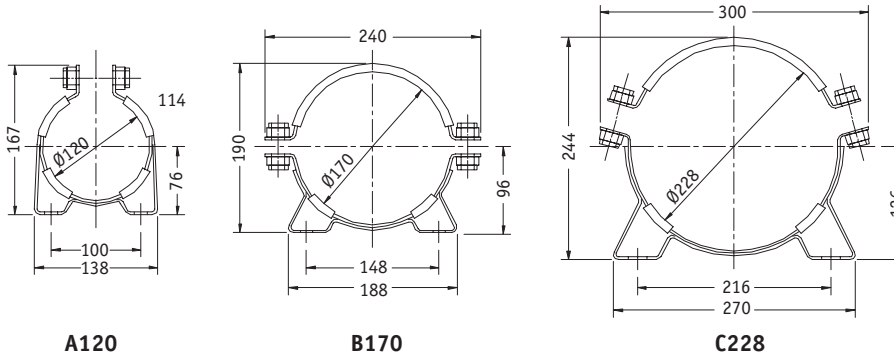
designation	bore (mm)	isolation	accumulator connection	recommended series
DI 16MS/1/345CV	16	manual	1 1/4"	4 litre - 345 bar
DI 24MS/3/210CV	24	manual	2"	AC (10 to 50 litre) - 210 bar
DI 24MS/3/345CV	24	manual	2"	AC & NG (10 to 57 litre) - 345 bar

Reducing bushes



part number	accumulator series	connection to accumulator	available female thread
50038-V10	(4 litre)	1¼" BSPM	½" BSPF
50040-V10	(4 litre)	1¼" BSPM	¾" BSPF
045.024-00223	AC/NG	2" BSPM	blind
045.568-00223	AC/NG	2" BSPM	½" BSPF
045.569-00223	AC/NG	2" BSPM	¾" BSPF
045.570-00223	AC/NG	2" BSPM	1" BSPF

Saddle clamps



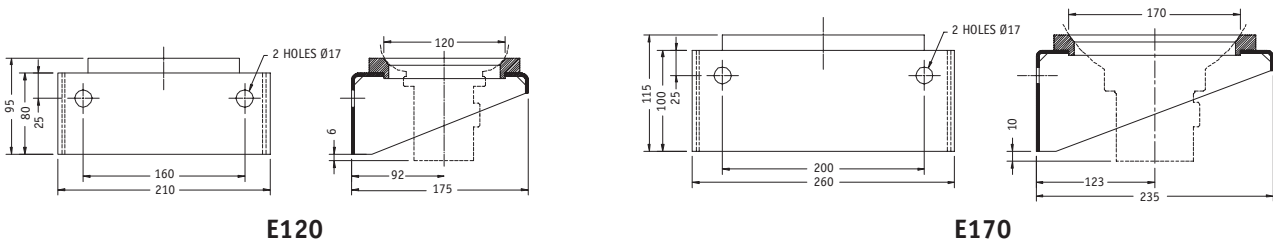
A120

B170

C228

designation	part number	saddle clamps
A120	20057004725	AC (1 to 2,5 litre)
B170	20126704725	AC (4 litre)
C228	20057104725	NG, AC (10 to 57 litre)

Support brackets



E120

E170

designation	part number	support brackets
E120	20118704750	AC (4 litre)
E170	20109004750	NG, AC (10 to 57 litre)

Above dimensions are in mm and are subject to manufacturing tolerances.

Charging kits

Charging kits are used to inflate, check, top-up or vent the nitrogen gas precharge in all accumulators.

They are to be screwed to the gas valve and connected to the gas regulator that fits the Nitrogen bottles.

They are supplied in a case that includes the various accessories specific to models VG3 and VGU.

MODEL Standard

The VG3 charging kit is exclusively dedicated to fit OLAER accumulators.



TECHNICAL DATA

Maximum working pressure : 550 bar

ORDERING CODE

Example : VG3 250 1 TS2 1

250 = Gauge, available for pressure up to :
6/10/25/60/100/160/250/400/600

TS 2 : Flexible hose for maximum pressure 400 bar

TS 6 : Flexible hose for maximum pressure 550 bar

MODEL VGU

The universal VGU charging kit has been designed to fit any brand of accumulators on the market.



TECHNICAL DATA

Maximum working pressure : 340 bar

ORDERING CODE

Example : VGU/F 25/250 7 TS2 3

25/250 = Gauge, available for pressure up to :
6/10/25/60/100/160/250/400 bar

Upon request :

- Bull nose adaptors available to fit various foreign gas bottles,
- Flexible hose in custom length
- Special gas valve adaptors

Ordering an accumulator

AC10 00A-10-21A

Accumulator Code

Small Volume		Standard - AC		Top repairable - NG	
Code	Volume	Code	Volume	Code	Volume
OB	0.16	AC10	10	NG10	10
OF	0.6	AC20	20	NG20	20
O11	1.15	AC25	25	NG37	37
O25	2.5	AC37	37	NG50	50
O4	4	AC50	50	NG57	57

Accumulator Construction

Fluid	Working Temperature	Construction Code
Mineral oils	-20°C + 80°C	00A-10* (standard BSP female)
Mineral oils	-20°C + 80°C	00A-40 (SAE code 62)
Water	0°C + 50°C	00A-02
Water	0°C + 80°C	00A-P1
Esther Phosphate	-20°C + 80°C	ASA-10
Mineral oils	-20°C + 80°C	33F-T2 (Off shore spec.)**

* except for OB & OF models, construction code : 00A-00

** all external stainless steel except for shell and name plate - low permeability bladder
Other fluids and other temperatures are available, please contact OLAER.

Maximum working Pressure Code

Code	Maximum working pressure
21	210 Bar AC
34	345 Bar OB - OF - O4 - AC - NG
40	400 Bar O11 - O25

Other maximum working pressure available on request, please contact OLAER.

Design Standard

Code	Design
1	British standard (only available for OB and OF accumulators)
A	Australian standard

Other approval available on request, please contact OLAER.

Nitrogen Precharge (in Bar at 20°C)

To be specified when placing your order

Ordering accessories and peripheral materials

When ordering, please refer to part numbers indicated on pages 14,15 & 16.

Prior to any installation, it is necessary to visually check the accumulator in order to detect any possible damage incurred during transport. For optimal operation, the accumulator needs to be located as close as possible to the "application". It may be installed vertically (gas valve facing up), or horizontally.

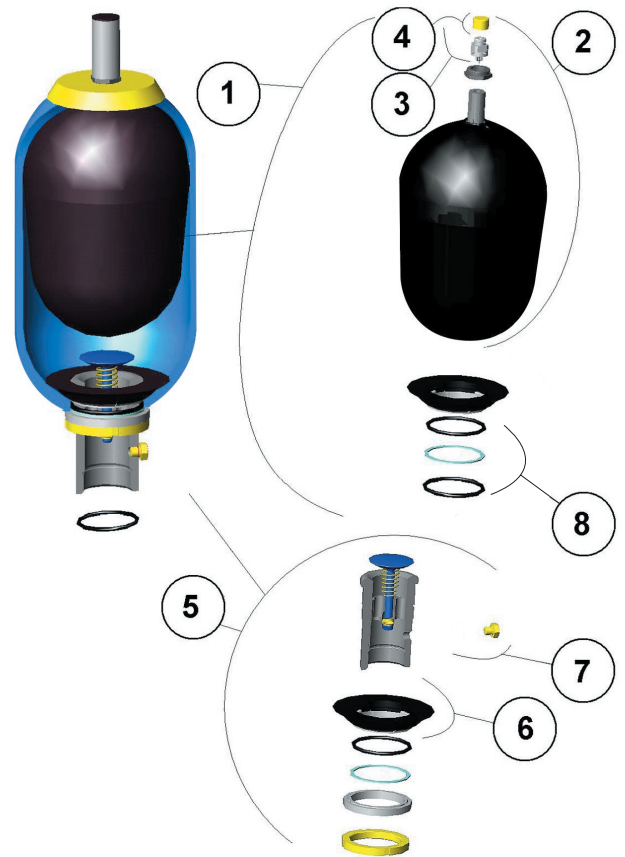
- Avoid standing in the alignment of the connections
- Consider the environmental conditions and if needed, protect the accumulator against heat sources, electrical and magnetic fields, lightning strikes, humidity and foul weather
- Keep 200 mm over the top of the gas valve free of encumbrance to allow the use of a charging head
- Allow free access to the oil drain
- Keep all markings visible
- Install in such a way so as to prevent any undue stress on the pipe work, either directly or indirectly.
- Clamp the accumulator tightly to a fixed support or alternatively guard it to limit its displacement in case of a connection failure to the hydraulic system.
- Connect the accumulator to the hydraulic system using the right connectors or flanges
- Check the compatibility of the fluid with the materials used
- Insure that the maximum design pressure of the accumulator exceeds the maximum system pressure
- Insure that pressure and temperature limits are not exceeded
- Equip the hydraulic system with a pressure relief device
- If necessary, add-on a burst disk to account for risks of over pressure associated with thermodynamics effects.
- Install an appropriate filtration unit and/or organise regular internal inspections as often as is necessary when dealing with abrasive fluids.

It is strictly forbidden to :

- Weld, screw or rivet anything onto the accumulator body
- Operate in any way that may alter the mechanical properties of the accumulator.
- Use the accumulator for construction purposes. (No stress or loading)
- Modify the accumulator without prior approval from the manufacturer
- Use any other gas than nitrogen for precharging

Commissioning

Refer to commissioning instructions supplied with the accumulator.



Item	Spare parts
1	Bladder kit
2*	Bladder assembly
3*	Gas valve assembly
4	Gas valve cap
5	Fluid port assembly
6	Anti extrusion ring
7*	Drain plug with seal (1)
8*	Seal kit

(1) For accumulators 10 to 57 litre

* These parts are supplied as a kit with instructions.

HOW TO ORDER THE BLADDER KIT

When placing your order, please indicate the accumulator part number.

Example :

Bladder kit to suit : AC10 00A-10-21A

What you need to know :

- Hydraulic accumulators are considered as pressure vessels.
- AS1210 - Australian Standard for design and construction of pressure equipment.
- AS3788 - Australian Standard for in service inspection of pressure equipment.
- AS4343 - Australian Standard for hazard levels of pressure equipment.

Requirements for end users regarding OH&S

Registration

In most states, accumulators with $P \times V > 100^*$ must be registered with your local OH&S authority (Workcover, Worksafe, etc..)

P = Design Pressure (Mpa)

V = Vessel Volume (Ltr)

*Level C based on AS4343 : 1999

Inspection

Each owner is responsible for ensuring that the thoroughness and frequency of inspection is appropriate and adequate for the continued safe operation of the pressure equipment.

To determine the need for inspection, product of design pressure (Mpa) and vessel volume (ltr) needs to be related to below table (based on AS3788:2001).

Pressure Equipment	Commissioning insp.required ?	1st yearly insp.required?	External inspection	Inspection period	
				Nominal internal inspection	Extended internal inspection
10.1 Accumulators with non-corrosive non-toxic and non flammable contents					
PV < 100 MPaL	N	N			
PV > 100 < 200 MPaL	Y	N			
PV > 200 MPaL	Y	Y	2	12	12
10.2 Other (i.e. chem service)	Y	Y	2	4	4

Example : Using above table determine nominal inspection periods for AC1000A-10-21A.

P = 21Mpa

V = 10 Ltr

$P \times V = 210$

Therefore next external inspection is due 2 years after the commissioning date and next internal inspection is due 12 years after the commissioning date.

All pressure vessel inspections shall be carried out by a competent person.

OLAER Fawcett Christie employ the services of a competent person to complete the inspection.

OLAER Fawcett Christie design and manufacture hydro pneumatic accumulators to various foreign national standards allowing accumulators to be used in all countries.

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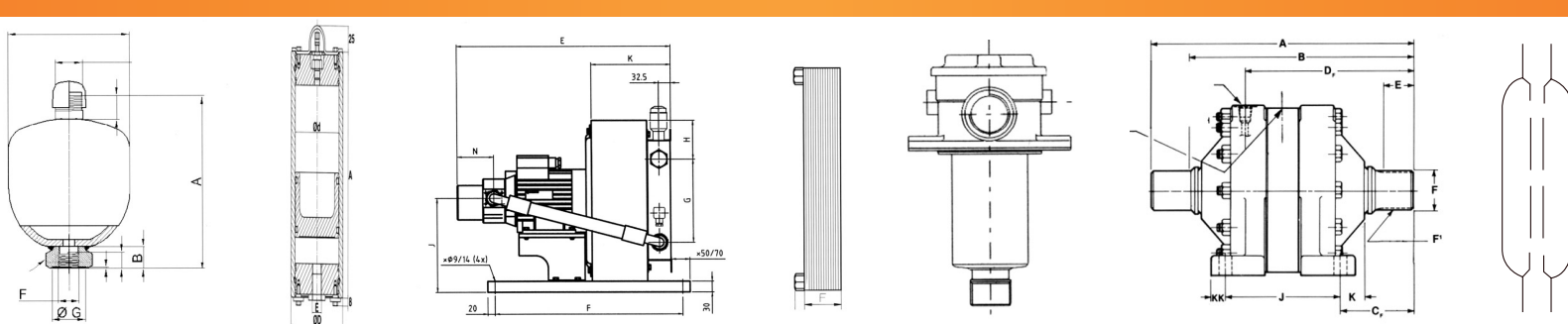
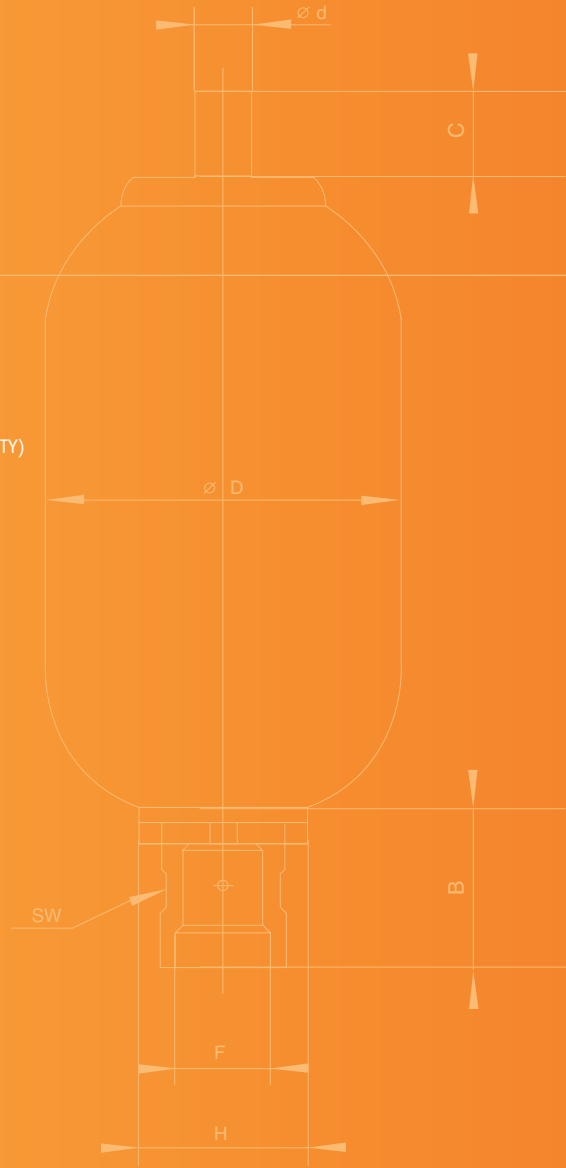
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