OLAER®
FAWCETT CHRISTIE

The Professional Choice

Accumulator Range

Datasheets 2012

OLAER
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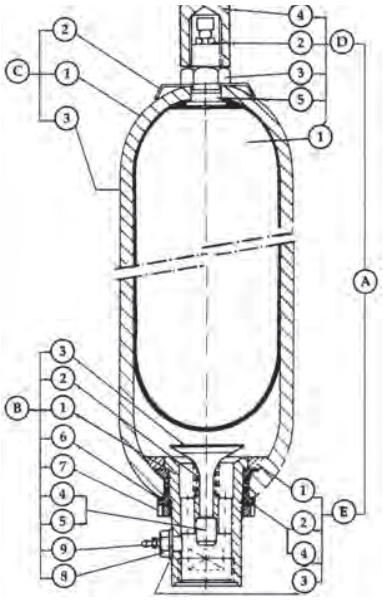
Standard Bladder Accumulator

207, 310, 345, 420 & 480 bar



A	**Bladder Kit comprising:**
D	**Bladder assembly**
D1	Bladder
D2	Gas valve assembly
D3	Locknut
D4	Protective cap
D5	'O' ring stem
E	**Anti extrusion ring assembly**
E1	Anti extrusion ring
E2	'O' ring fluid port*
E3	Bonded seal
E4	Back-up ring
B	**Fluid port assembly comprising**
B1	Fluid port body
B2	Spring
B3	Poppet valve
B4	Collett
B5	Piston
B6	Flanged washer
B7	Locking ring
B8	Bleed adaptor*
B9	Bleed valve*
C	**Shell assembly comprising:**
C1	Shell
C2	Label
C3	Label warning

Note: Models 1/54 litres detailed above. Models 0.6 litres have Gas Valve assembly integral with bladder stem without protective cap fitted.
* Not fitted on all models

Specification

Shell

Oil Service - seamless shell, designed and manufactured to PED 97/23/EEC and CE marked. Material - Chromium-molybdenum steel. Working pressure 207, 310, 345, 420 and 480 bar. Water service as above with shell interior epoxy resin lined.

Label

With assembly specification and installation details.

Witness hydro-pneumatic pressure tests

A hydrostatic test is carried out on all our accumulator shells. However we can carry out additional pressure tests on the complete accumulators with or without witness by a specified inspection authority and/or customer as an optional extra. Please request a price if required.

Material Certification

Available on request for all major pressure loaded parts to EN 10204 3.1

Finish

One coat primer paint as standard. Special paints available.

Bladder

Totally enclosed construction with an extensive range of elastomers available. See Bladder information for further details.

Fluid Port Assembly

Integral high-flow port and poppet valve assembly with an anti-extrusion ring. For options see overleaf.

Safety

All gas-loaded accumulators are pressurised vessels and it is recommended that safety consideration be given to the application in which they are used. A relief valve should always be fitted to the hydraulic system with the option of a burst disc to protect the accumulator. If there is a fire risk in the vicinity of the accumulator, then a fusible/eutectic plug should be fitted. See Installation and Servicing data sheet for information regarding installation of accumulators.

Accessories

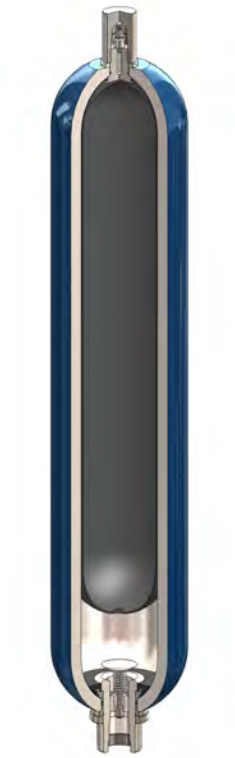
A complete range of accumulator accessories are available from OLAER Fawcett Christie.

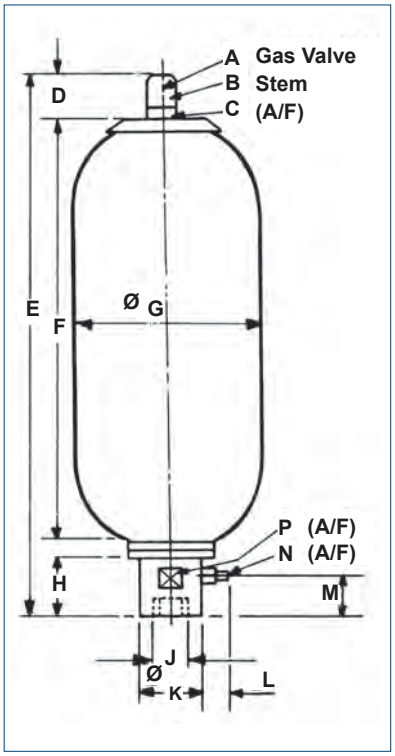
Spare Parts

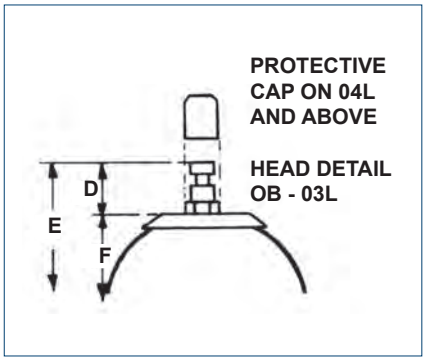
Available on request.

Nominal Capacity Litres	Effective Gas vol. Litres	Work press. bar	Max Flow Rate lt/min	Weight Dry Kilo	Dimensions in mm unless stated otherwise and subject to manufacturer's tolerances													
					A Inches	B Inches	C	D	E	F	G	H	J Inches	K	L	M	N	P
OB	0.16	345	27	2.00	¼ BSP	5/8 UNF	24	40	292	205	55	36	¾ BSPM	26	-	-	-	23
OF	0.60	345	109	2.70	¼ BSP	5/8 UNF	24	40	266	175	90	37	¾ BSPF	35	-	-	-	32
011	1.15	207	109	5.4	¼ BSP	5/8 UNF	24	40	292	200	115	37	¾ BSPF	35	-	-	-	32
011	1.15	345	109	5.7	¼ BSP	5/8 UNF	23	40	292	200	115	37	¾ BSPF	35	-	-	-	32
03	2.5	345	215	10.00	¼ BSP	5/8 UNF	23	40	506	402	115	49	1 BSPF	44	5	32	15	41
04	3.8	207	477	15.20	¼ BSP	7/8 UNF	33	78	455	289	169	74	1 ¼ BSPF	60	36	39	9	55
04	3.8	345	477	15.20	¼ BSP	7/8 UNF	33	78	455	289	169	74	1 ¼ BSPF	60	36	39	9	55
10	9.4	207	749	35.00	¼ BSP	7/8 UNF	33	78	575	407	219	70	2 BSPF	76	36	46	9	69
10	9.4	310	749	35.00	¼ BSP	7/8 UNF	33	78	575	407	219	70	2 BSPF	76	36	46	9	69
10	9.4	345	749	35.00	¼ BSP	7/8 UNF	33	78	575	407	221	70	2 BSPF	76	36	46	9	69
10	9.4	420	749	34.00	¼ BSP	7/8 UNF	33	78	575	407	229	70	2 BSPF	76	36	46	9	69
10	9.4	480	749	34.00	¼ BSP	7/8 UNF	33	78	575	407	229	70	2 BSPF	76	36	46	9	69
20	18.8	207	749	55.00	¼ BSP	7/8 UNF	33	78	886	718	219	70	2 BSPF	76	36	46	9	69
20	18.8	310	749	55.00	¼ BSP	7/8 UNF	33	78	886	718	219	70	2 BSPF	76	36	46	9	69
20	18.8	345	749	55.00	¼ BSP	7/8 UNF	33	78	886	718	221	70	2 BSPF	76	36	46	9	69
20	18.8	420	749	54.00	¼ BSP	7/8 UNF	33	78	886	718	229	70	2 BSPF	76	36	46	9	69
20	18.8	480	749	54.00	¼ BSP	7/8 UNF	33	78	886	718	229	70	2 BSPF	76	36	46	9	69
28	25.8	207	749	61.00	¼ BSP	7/8 UNF	33	78	1158	990	221	70	2 BSPF	76	36	46	9	69
28	25.8	345	749	61.00	¼ BSP	7/8 UNF	33	78	1158	990	221	70	2 BSPF	76	36	46	9	69
37	35.2	207	749	91.00	¼ BSP	7/8 UNF	33	78	1407	1239	219	70	2 BSPF	76	36	46	9	69
37	35.2	310	749	91.00	¼ BSP	7/8 UNF	33	78	1407	1239	219	70	2 BSPF	76	36	46	9	69
37	35.2	345	749	91.00	¼ BSP	7/8 UNF	33	78	1407	1239	221	70	2 BSPF	76	36	46	9	69
37	35.2	420	749	86.00	¼ BSP	7/8 UNF	33	78	1407	1239	229	70	2 BSPF	76	36	46	9	69
37	35.2	480	749	86.00	¼ BSP	7/8 UNF	33	78	1407	1239	229	70	2 BSPF	76	36	46	9	69
54	49.2	207	749	130.00	¼ BSP	M50x 1.5	69	66	1922	1766	219	70	2 BSPF	76	36	46	9	69
54	49.2	310	749	130.00	¼ BSP	M50x 1.5	69	66	1922	1766	219	70	2 BSPF	76	36	46	9	69
54	49.2	345	749	130.00	¼ BSP	M50x 1.5	69	66	1922	1766	221	70	2 BSPF	76	36	46	9	69
54	49.2	420	749	119.00	¼ BSP	M50x 1.5	69	66	1922	1766	229	70	2 BSPF	76	36	46	9	69
54	49.2	480	749	119.00	¼ BSP	M50x 1.5	69	66	1922	1766	229	70	2 BSPF	76	36	46	9	69

Note: Dimensions are based on current stock and are subject to change without prior notice.







Standard Bladder Accumulator

Model numbers

54 - 0 - 0A - 00 - 20 - 1

Nominal Volume - Litres

Bladder Material

0 = Nitrile Standard
1 = Butyl
2 = Low Temperature Nitrile
3 = Low Permeability Nitrile
6 = Viton
8 = High Temperature Nitrile

Bladder stem/ Gas valve

0B-0F
0A = 5/8" UNF/1/4" BSPM
9A = 5/8" UNF/302-32
SA = as 0A but corrosive service

01-37L
7/8" UNF/1/4" BSPM
7/8" UNF/302-32

54L
M50 x 1.5 / 1.4" BSPM
7/8" UNF / 302-32

Shell and Fluid port options

00 = Oil Service
02 = Low/medium corrosive service
03 = Underground mining - water service
04 = Underground mining - oil service
13 = NPT fluid port - oil service

14 = NPT fluid port - Low/medium corrosive service
W6 = Stainless steel externals, unlined shell
Note: for other assembly options contact Olaer Fawcett Christie
DN - SAE 6000 flange nipple

Maximum Working Pressure

20 = 207 bar
34 = 345 bar
42 = 420 bar
31= 310 bar
35 = 350 bar

Design standard/Authority Approval

1 = Lloyds/CE

ASME Bladder Accumulator

207,310, 345 & 420 bar

Specification

Shell

Oil Service - seamless shell, designed and manufactured to ASME VIII Division 1'U' coded.

Label

With assembly specification and installation details.

Witness hydro-pneumatic pressure tests

All our accumulator shells are pressure tested. An additional hydro-pneumatic pressure test on the complete accumulator can be undertaken with or without a specific inspection authority as an optional extra.

Material Certification

Available on request for all major pressure loaded parts.

Finish

One coat primer paint as standard. Special paints available.

Bladder

Totally enclosed construction with an extensive range of elastomers available. See Bladder information for further details.

Fluid Port Assembly

Integral high-flow port and poppet valve assembly with an anti-extrusion ring. For options see overleaf.

Safety

All gas-loaded accumulators are pressurised vessels and it is recommended that safety consideration be given to the application in which they are used. A relief valve should always be fitted to the hydraulic system with the option of a burst disc to protect the accumulator. If there is a fire risk in the vicinity of the accumulator, then a fusible/eutectic plug should be fitted. See Installation and Servicing data sheet for information regarding installation of accumulators.

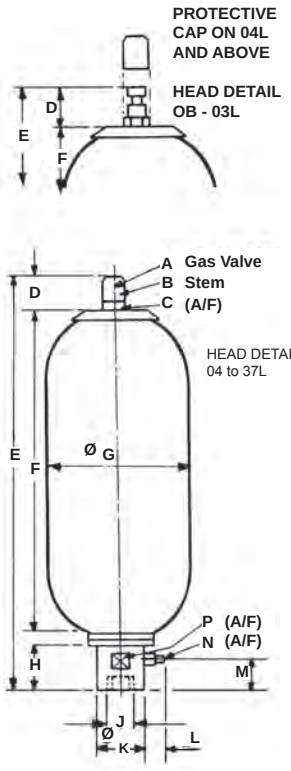
Accessories

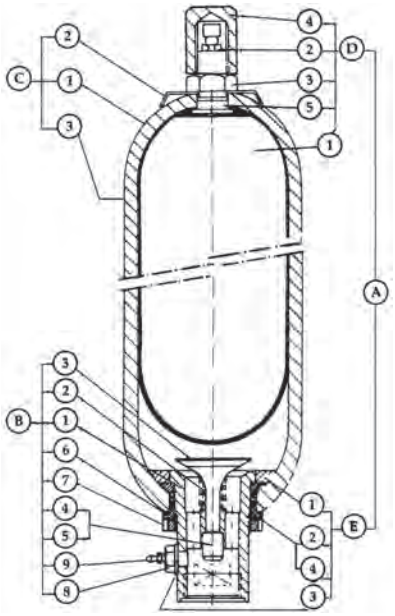
A complete range of accumulator accessories are available from OLAER Fawcett Christie.

Spare Parts

Available on request.

Nominal Capacity *Litres*	Effective Gas vol. *Litres*	Work press. *bar*	Max Flow Rate *lt/min*	Weight Dry *Kilo*	Dimensions in mm unless stated otherwise and subject to manufacturer's tolerances													
					A *Inches*	B *Inches*	C	D	E	F	G	H	J *Inches*	K	L	M	N	P
04	3.8	207	477	15.00	¼ BSP	⅞ UNF	34	78	455	289	171	74	1¼ BSPF	60	36	39	9	55
04	3.8	345	477	16.00	¼ BSP	⅞ UNF	34	78	455	289	173	74	1¼ BSPF	60	36	39	9	55
04	3.8	420	477	16.00	¼ BSP	⅞ UNF	34	78	455	289	173	74	1¼ BSPF	60	36	39	9	55
10	9.4	207	749	36.00	¼ BSP	⅞ UNF	34	78	575	407	230	70	2 BSPF	76	36	46	9	69
10	9.4	276	749	36.00	¼ BSP	⅞ UNF	34	78	575	407	230	70	2 BSPF	76	36	46	9	69
10	9.4	345	749	54.00	¼ BSP	⅞ UNF	34	78	575	407	243	70	2 BSPF	76	36	46	9	69
10	9.4	420	749	54.00	¼ BSP	⅞ UNF	34	78	575	407	243	70	2 BSPF	76	36	46	9	69
20	18.8	207	749	54.00	¼ BSP	⅞ UNF	34	78	886	718	230	70	2 BSPF	76	36	46	9	69
20	18.8	276	749	54.00	¼ BSP	⅞ UNF	34	78	886	718	230	70	2 BSPF	76	36	46	9	69
20	18.8	345	749	100.00	¼ BSP	⅞ UNF	34	78	886	718	243	70	2 BSPF	76	36	46	9	69
20	18.8	420	749	100.00	¼ BSP	⅞ UNF	34	78	886	718	243	70	2 BSPF	76	36	46	9	69
37	35.2	207	749	100.00	¼ BSP	⅞ UNF	34	78	1407	1239	230	70	2 BSPF	76	36	46	9	69
37	35.2	276	749	100.00	¼ BSP	⅞ UNF	34	78	1407	1239	230	70	2 BSPF	76	36	46	9	69
37	35.2	345	749	152.00	¼ BSP	⅞ UNF	34	78	1407	1239	243	70	2 BSPF	76	36	46	9	69
37	35.2	420	749	152.00	¼ BSP	⅞ UNF	34	78	1407	1239	243	70	2 BSPF	76	36	46	9	69
54	49.2	207	749	138.00	¼ BSP	M50x 1.5	70	66	1922	1766	230	70	2 BSPF	76	36	46	9	69
54	49.2	276	749	138.00	¼ BSP	M50x 1.5	70	66	1922	1766	230	70	2 BSPF	76	36	46	9	69
54	49.2	345	749	220.00	¼ BSP	M50x 1.5	70	66	1980	1824	243	70	2 BSPF	76	36	46	9	69
54	49.2	420	749	220.00	¼ BSP	M50x 1.5	70	66	1980	1824	243	70	2 BSPF	76	36	46	9	69
54	49.2	459	749	220.00	¼ BSP	M50x 1.5	70	66	1980	1824	243	70	2 BSPF	76	36	46	9	69





A	**Bladder Kit comprising:**
D	**Bladder assembly**
D1	Bladder
D2	Gas valve assembly
D3	Locknut
D4	Protective cap
D5	'0' ring stem
E	**Anti extrusion ring assembly**
E1	Anti extrusion ring
E2	'0' ring fluid port*
E3	Bonded seal
E4	Back-up ring
B	**Fluid port assembly comprising**
B1	Fluid port body
B2	Spring
B3	Poppet valve
B4	Collett
B5	Piston
B6	Flanged washer
B7	Locking ring
B8	Bleed adaptor*
B9	Bleed valve*
C	**Shell assembly comprising:**
C1	Shell
C2	Label
C3	Label warning

**Not fitted on all models*

The information in this datasheet is subject to change without prior notice.

ASME Bladder Accumulator

Model numbers

54 - 0 - 0A - 00 - 20 - 4

Nominal Volume - Litres

Bladder Material

0 = Nitrile Standard
1 = Butyl
2 = Low Temperature Nitrile
3 = Low permeability
6 = Viton
8 = High Temperature Nitrile

Bladder stem/ Gas valve

0A = ¼" BSP Gas Valve, Carbon Steel Trim
SA = ¼" BSP Gas Valve, St. Steel Trim
3F = ¼" BSP St. Steel Gas Valve, St. Steel Trim

Shell and Fluid port options

207/276 bar
00 = Oil Service
02 = Low/medium corrosive service
W6 = Stainless steel externals, unlined shell
13 = As "00" except NPT Female conn.
14 = AS "02" except NPT Female conn.

345/420 bar
FJ = Oil Service
FH = Low/medium corrosive service
FS = As "W6" except NPT Female conn.
FR = As "FJ" except NPT Female conn.
FQ = As "FH" except NPT Female conn.

Maximum Working Pressure

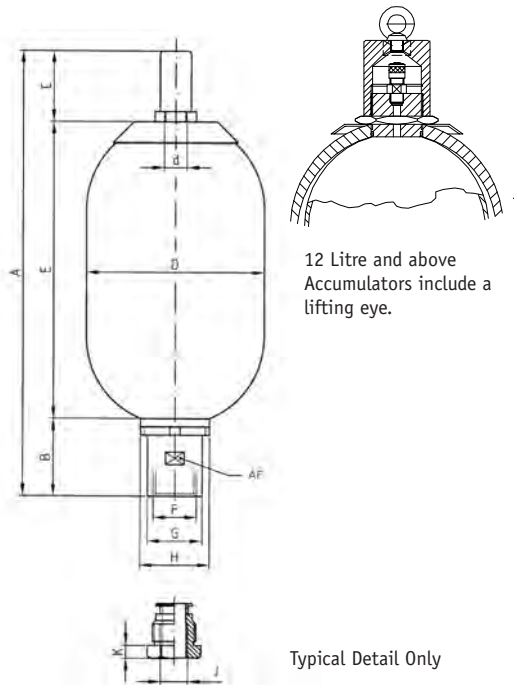
20 = 207 bar (3,000 psi)
27 = 276 bar (4,000 psi)
34 = 345 bar (5,000 psi)
42 = 420 bar (6,000 psi)
45 = 459 bar (6,666 psi)

Design standard/Authority Approval

4 = ASME VIII - 'U' coded
CE marking of ASME accumulators possible - contact us.

High Pressure Bladder Accumulator

1 to 54 Litres, 690 / 760 bar



12 Litre and above Accumulators include a lifting eye.

Typical Detail Only

Specification

Shell

Chrome Molybdenum Steel designed to CE/ ASME.

Capacities

1,3 and 5 litres - Working pressure up to 690 bar

12 - 54 litres - Working pressure up to 760 bar

Material Certification

Material certificates to BS EN 10204 3.1

Design Temperature

-20˚C to + 100˚C

Fluid Port Connection

- 1, 3 and 5 litres - 1" BSPF (adapted to 1/2" NPT F as standard)
- 12 - 54 litres - 2" BSP (adapted to 1/2" NPT F as standard)
- Other customer specific connections are available on request (e.g. BSPF, Autoclave)

Gas Port

1/4" BSP H.P. gas valve stainless steel (others available on request).

Gas Charging

690/760 bar via 1/4" BSP male connection

Finish

One coat primer paint as standard. Special paints available.

Nominal Size Litres	Gas Volume *(Litre)*	Max Working Pressure *(bar)*	Weight dry Nominal *(kg)*	Q max. *(l/min)*	A	B	C	ø D	ø d	E	F	ø G	ø H	AF	J*	K
1 Litres	1,1	690	9	240	376	68	69	122	22	239	G 1"	48	68	45	1/2" NPT F	10
3 Litres	2,4	690	15	240	551	68	69	122	22	414	G 1"	48	68	45	1/2" NPT F	10
5 Litres	5	690	29	450	900	68	69	122	22	763	G 1"	48	68	45	1/2" NPT F	10
12 Litres	11	690/760	97	900	768	84	166	261	50	518	G 2"	82	110	77	1/2" NPT F	13
20 Litres	16,5	690/760	134	900	978	84	166	261	50	728	G 2"	82	110	77	1/2" NPT F	13
37 Litres	33,4	690/760	227	900	1500	84	166	261	50	1250	G 2"	82	110	77	1/2" NPT F	13
54 Litres	48	690/760	318	900	2015	84	166	261	50	1765	G 2"	82	110	77	1/2" NPT F	13

** Other connections available*

Oil & Gas Bladder Accumulators

207, 310, 345, 420 & 480 bar

Specification

Shell

Oil Service - seamless shell, designed and manufactured to PED 97/23/EEC and CE marked. Material - Chromium-molybdenum steel. Working pressure 207, 310, 345, 420 and 480 bar. Water service as above with shell interior epoxy resin lined.

Label

With assembly specification and installation details

Witness Hydro-pneumatic Pressure tests

These can be carried out on complete accumulators and can be undertaken for a specific inspection authority and/or customer requirement as an optional extra.

Material Certification

Available on request for all major pressure loaded parts to EN 10204 3.1

Finish

One coat primer paint as standard. Special paints available.

Bladder

Totally enclosed construction with an extensive range of elastomers available. See Bladder information for further details.

Fluid Port Assembly

Integral high-flow port and poppet valve assembly with an anti-extrusion ring. For options see overleaf.

Safety

All gas-loaded accumulators are pressurised vessels and it is recommended that safety consideration be given to the application in which they are used. A relief valve should always be fitted to the hydraulic system with the option of a burst disc to protect the accumulator. If there is a fire risk in the vicinity of the accumulator, then a fusible/ eutectic plug should be fitted. See Installation and Servicing data sheet for information regarding installation of accumulators.

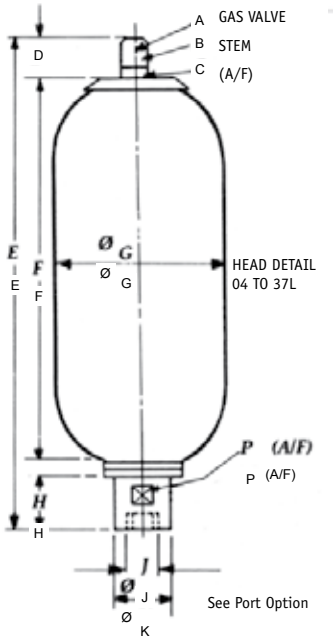
Accessories

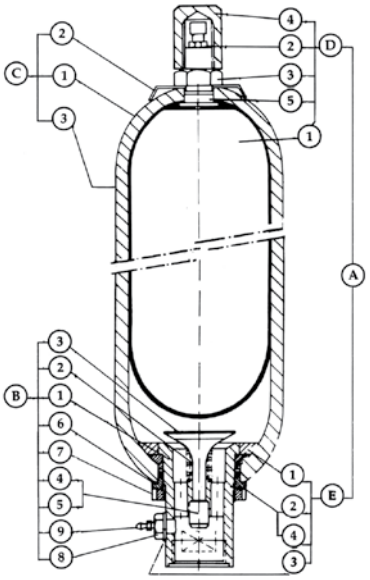
A complete range of accumulator accessories are available from Olaer Fawcett Christie.

Spare Parts

Available on request.

Nominal Capacity Litres	Effective Gas vol. Litres	Work pressure bar	Max Flow Rate lt/min	Weight Dry Kilo	Dimensions in mm unless stated otherwise and subject to manufacturer's tolerances									
					A Inches	B Inches	C	D	E	F	G	H	K	P
10	9.4	207	749	27.00	¼ BSP	⅞ UNF	28	78	575	407	221	50	76	69
10	9.4	310	749	27.00	¼ BSP	⅞ UNF	28	78	575	407	221	50	76	69
10	9.4	345	749	30.00	¼ BSP	⅞ UNF	28	78	575	407	221	50	76	69
10	9.4	390/420/480	749	40.00	¼ BSP	⅞ UNF	28	78	575	407	228	50	76	69
20	18.8	207	749	42.00	¼ BSP	⅞ UNF	28	78	886	718	221	50	76	69
20	18.8	310	749	42.00	¼ BSP	⅞ UNF	28	78	886	718	221	50	76	69
20	18.8	345	749	46.00	¼ BSP	⅞ UNF	28	78	886	718	221	50	76	69
20	18.8	390/420/480	749	54.00	¼ BSP	⅞ UNF	28	78	886	718	228	50	76	69
28	25.8	207	749	55.00	¼ BSP	⅞ UNF	28	78	1158	990	221	50	76	69
28	25.8	310	749	55.00	¼ BSP	⅞ UNF	28	78	1158	990	221	50	76	69
28	25.8	345	749	61.00	¼ BSP	⅞ UNF	28	78	1158	990	221	50	76	69
28	25.8	390/420/480	749	70.00	¼ BSP	⅞ UNF	28	78	1158	990	228	50	76	69
37	35.2	207	749	66.00	¼ BSP	⅞ UNF	28	78	1407	1239	221	50	76	69
37	35.2	310	749	66.00	¼ BSP	⅞ UNF	28	78	1407	1239	221	50	76	69
37	35.2	345	749	74.00	¼ BSP	⅞ UNF	28	78	1407	1239	221	50	76	69
37	35.2	390/420/480	749	86.00	¼ BSP	⅞ UNF	28	78	1407	1239	228	50	76	69
54	49.2	207	749	92.00	¼ BSP	M50x 1.5	69	66	1922	1766	221	50	76	69
54	49.2	310	749	92.00	¼ BSP	M50x 1.5	69	66	1922	1766	221	50	76	69
54	49.2	345	749	102.00	¼ BSP	M50x 1.5	69	66	1922	1766	221	50	76	69
54	49.2	390/420/480	749	119.00	¼ BSP	M50x 1.5	69	66	1922	1766	228	50	76	69





Note: Models 1/54 litres detailed above. Models 0.6 litres and below have Gas Valve assembly integral with bladder stem without protective cap fitted.

A	**Bladder Kit comprising:**
D	**Bladder assembly**
D1	Bladder
D2	Gas valve assembly
D3	Locknut
D4	Protective cap
D5	'O' ring stem
E	**Anti extrusion ring assembly**
E1	Anti extrusion ring
E2	'O' ring fluid port
E3	Bonded seal
E4	Back-up ring
B	**Fluid port assembly comprising**
B1	Fluid port body
B2	Spring
B3	Poppet valve
B4	Collett
B5	Piston
B6	Flanged washer
B7	Locking ring
B8	Bleed adaptor
B9	Bleed valve
C	**Shell assembly comprising:**
C1	Shell
C2	Label
C3	Label warning

Oil & Gas Bladder Accumulators

Model numbers

54 - 0 - SA - CZ - 20 - 1 - Ex

Nominal Volume - Litres

Bladder Material

0 = Nitrile Standard
2 = Low Temperature Nitrile
3 = Low permeability Nitrile (23E-10cm³/s/cm/Hg)
6 = Viton
K = Special low temperature Nitrile

Bladder Stem / Gas Valve

SA = 1/4" BSP Gas Valve, Stainless Steel Trim
3F = 1/4" BSP St. Steel Gas Valve, Stainless Steel Trim
3L = As 'SA' but fitted with additional seals

Shell and Fluid Port options (J)

CZ = Unlined Shell, St.Steel Externals, 1/2" NPTF Port
DL = Unlined Shell, St.Steel Externals, 1/2" BSPF Port
DR = Unlined Shell, St.Steel Externals, 1/2" NPTF Double Seal Locking Ring
DU = Unlined Shell, St.Steel Externals, 1" NPTF Port
DW = Unlined Shell, St.Steel Externals, 3/4" NPTF Port
EZ = Unlined Shell, St.Steel Externals, 3/4 BSPF Port
W6 = Unlined Shell, St.Steel Externals, 2" BSPF Port

Maximum Working Pressure

20 = 207 bar
31 = 310 bar
34 = 345 bar
35 = 350 bar
42 = 420 bar
48 = 480 bar
Higher pressure units available on request

Design Standard/Authority Approval

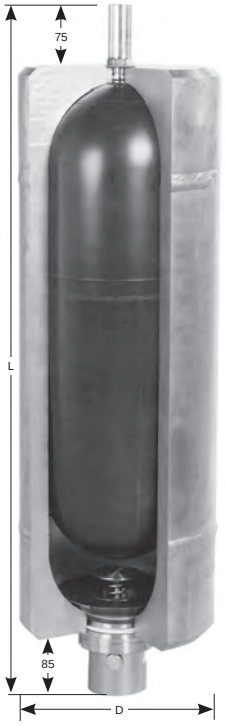
1 = Lloyds/CE

Special Approvals

Ex = ATEX Approval to 94/9/EC
ATEX - Accumulator conforms to ATEX DIRECTIVE 94/9/EC (non electrical equipment) Equipment Group II, category 2, atmosphere type GD. The equipment can be used in zone 1 & zone 2 above ground.

Stainless Steel Bladder Accumulator

Up to 345 bar



Specification

Design Features include

- 316 Stainless steel welded construction.
- Design approved to PD 5500 Cat 1/CE marked (ASME VIII Div 1 available if required).
- U code option available, for more information please contact us.
- Working pressure up to 345 bar.
- Optional bladder materials to suit system fluid (see bladder details data sheet).
- Optional fluid end connections threaded or flanged.
- Material certification to BS EN 10204 3.1 if requested.
- Other accessories available on request (e.g. Charging sets, clamps, brackets).

Benefits

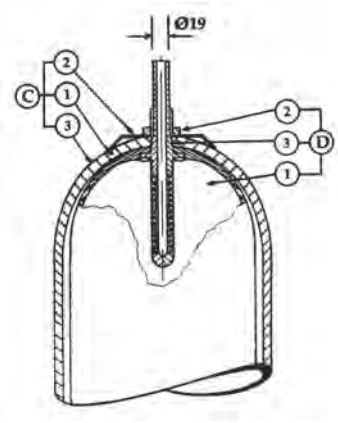
- Lower weight compared with piston accumulator constructions.
- High corrosion resistance typically for sub-sea environment.
- Low inertia and fast response for control system applications.

Nominal Capacity (I)	Effective Gas Vol. (I)	Working Pressure (bar)	L (mm)	D (mm)	Weight (kg)
10	9.4	80	575	220	45
10	9.4	150	575	228	54
10	9.4	207	575	237	66
10	9.4	280	575	254	86
10	9.4	345	575	267	103
12	11.1	80	675	220	52
12	11.1	150	675	228	63
12	11.1	207	675	237	78
12	11.1	280	675	254	103
12	11.1	345	675	267	124
20	18.8	80	885	220	63
20	18.8	150	885	228	79
20	18.8	207	885	237	100
20	18.8	280	885	254	135
20	18.8	345	885	267	219
28	25.8	80	1150	220	81
28	25.8	150	1150	228	102
28	25.8	207	1150	237	130
28	25.8	280	1150	254	178
28	25.8	345	1150	267	219
37	35.2	80	1405	220	95
37	35.2	150	1405	228	122
37	35.2	207	1405	237	157
37	35.2	280	1405	254	217
37	35.2	345	1405	267	269
54	49.2	80	1920	220	124
54	49.2	150	1920	228	162
54	49.2	207	1920	237	212
54	49.2	280	1920	254	297
54	49.2	345	1920	267	370

NB. The above weights and dimensions are based on our standard CE marked accumulators.

Transfer Barrier Accumulator

207, 310, 345 & 420 bar



Specification

Shell
Oil Service - seamless shell, designed and manufactured to European specifications CE marked. Material - Chromium-molybdenum steel. Working pressure 207, 310, 345 and 420 bar. Water service as above with shell interior epoxy resin lined.

Label
With assembly specification and installation details.

Witness hydro-pneumatic pressure tests
These can be carried out on complete accumulators and can be undertaken for a specific inspection authority and/or customer requirement as an optional extra.

Material Certification
Available on request for all major pressure loaded parts to EN 10204 3.1

Finish
One coat primer paint as standard. Special paints available.

Bladder
Totally enclosed construction with an extensive range of elastomers available. See Bladder information for further details.

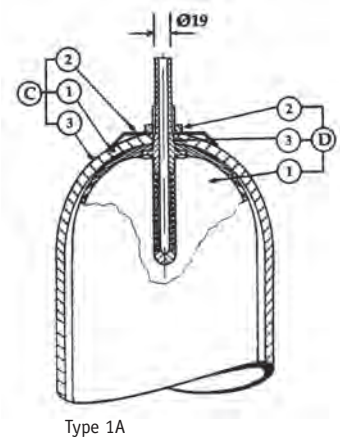
Fluid Port Assembly
Integral high-flow port and poppet valve assembly with an anti-extrusion ring. For options see overleaf.

Safety
All gas-loaded accumulators are pressurised vessels and it is recommended that safety consideration be given to the application in which they are used. A relief valve should always be fitted to the hydraulic system with the option of a burst disc to protect the accumulator. If there is a fire risk in the vicinity of the accumulator, then a fusible/eutectic plug should be fitted. See Installation and Servicing data sheet for information regarding installation of accumulators.

Accessories
A complete range of accumulator accessories are available from OLAER Fawcett Christie.

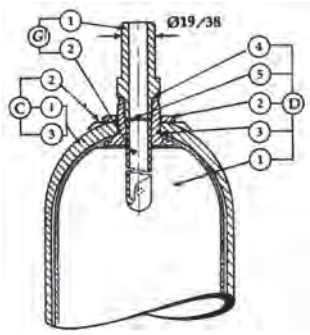
Spare Parts
Available on request.

Nominal Capacity Litres	Effective Gas vol. Litres	Work press. bar	Max Flow Rate lt/min	Weight Dry Kilo	Dimensions in mm unless stated otherwise and subject to manufacturer's tolerances												
					B Inches	C	D	E	F	G	H	J Inches	K	L	M	N	P
10	9.4	207	749	27.00	⅞ UNF	34	76	575	407	221	70	2 BSPF	76	36	46	9	69
10	9.4	310	749	30.00	⅞ UNF	34	76	575	407	221	70	2 BSPF	76	36	46	9	69
10	9.4	345	749	30.00	⅞ UNF	34	76	575	407	228	70	2 BSPF	76	36	46	9	69
10	9.4	420	749	34.00	⅞ UNF	34	76	575	407	228	70	2 BSPF	76	36	46	9	69
20	18.8	207	749	46.00	⅞ UNF	34	76	886	718	221	70	2 BSPF	76	36	46	9	69
20	18.8	310	749	46.00	⅞ UNF	34	76	886	718	221	70	2 BSPF	76	36	46	9	69
20	18.8	345	749	46.00	⅞ UNF	34	76	886	718	228	70	2 BSPF	76	36	46	9	69
20	18.8	420	749	54.00	⅞ UNF	34	76	886	718	228	70	2 BSPF	76	36	46	9	69
28	25.8	207	749	61.00	⅞ UNF	34	76	1158	990	221	70	2 BSPF	76	36	46	9	69
28	25.8	345	749	61.00	⅞ UNF	34	76	1158	990	228	70	2 BSPF	76	36	46	9	69
37	35.2	207	749	74.00	⅞ UNF	34	76	1407	1239	228	70	2 BSPF	76	36	46	9	69
37	35.2	310	749	74.00	⅞ UNF	34	76	1407	1239	221	70	2 BSPF	76	36	46	9	69
37	35.2	345	749	74.00	⅞ UNF	34	76	1407	1239	221	70	2 BSPF	76	36	46	9	69
37	35.2	420	749	86.00	⅞ UNF	34	76	1407	1239	228	70	2 BSPF	76	36	46	9	69
54	49.2	207	749	102.00	M50x 1.5	70	94	1922	1766	228	70	2 BSPF	76	36	46	9	69
54	49.2	310	749	102.00	M50x 1.5	70	94	1922	1766	221	70	2 BSPF	76	36	46	9	69
54	49.2	345	749	102.00	M50x 1.5	70	94	1922	1766	228	70	2 BSPF	76	36	46	9	69
54	49.2	420	749	119.00	M50x 1.5	70	94	1922	1766	228	70	2 BSPF	76	36	46	9	69



Type 1A
10-37 litre models

Key	Item
C	**Shell assembly comrpising**
C1	Shell
C2	Label
C3	Warning label
D	**Bladder assembly comprising**
D1	Bladder
D2	Stem tube
D3	'O' ring system



Type 1A 19mm
Type 7A 38mm
54 litre models only

Key	Item
C	**Shell assembly comrpising**
C1	Shell
C2	Label
C3	Warning label
D	**Bladder assembly comprising**
D1	Bladder
D2	Stem tube
D3	'O' ring system
D4	'O' ring seal
D5	Flat seal
G	**End fitting assembly**
G1	T.B. adaptor
G2	Stem tube

Transfer Barrier Accumulator

Model numbers

54 - 0 - 1A - 00 - 20 - 1

Nominal Volume - Litres

Bladder Material

0 = Nitrile Standard
1 = Butyl
2 = Low Temperature Nitrile
3 = Low permeability

Other materials available

Bladder kit
Quote full part No. typically 5401A-00 which will include the bladder assembly with stem, 'O' seal, lock nut, flat seal and adaptor, 'O' seal anti-extrusion ring, fluid port, 'O' seal and back up ring and bleed plug bonded seal.

Bladder stem/ Gas valve

10 - 37L
1A = ⅞" UNF/19mm
7G = ⅞" UNF M St. Steel
DA = ⅞" UNF/19mm St. Steel

54L
1A = M50 x 1.5 /19mm
7A = M50 x 1.5 /38mm
DA = M50 x 1.5 /19mm St. Steel
2H = M50 x 1.5 /38mm St. Steel
5L = M50 x 1.5 /1" BSP Fem
7G = ⅞"UNF St. Steel
M50 x 1.5 / 1.4" BSPM
7/8" UNF / 302-32

Shell and Fluid port options

00 = Oil Service
02 = Low/medium corrosive service
04 = NPT fluid port Low/medium corrosive service
13 = NPT fluid port - oil service

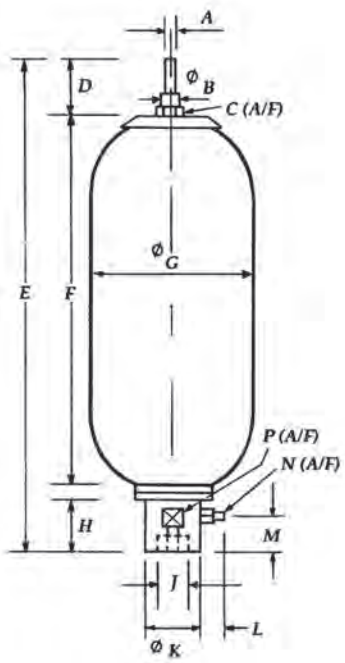
Note: for other assembly options contact Olaer Fawcett Christie

Maximum Working Pressure

20 = 207 bar
34 = 345 bar
42 = 420 bar
31= 310 bar
35 = 350 bar

Design standard/Authority Approval

1 = Lloyds/CE



Bladder Details

Materials

Olaer Fawcett Christie offer a wide range of bladder materials to suit most applications. Please consult head office for details of bladder compatibility with fluid and fluid temperature.

Bladder Kit

Comprises of: bladder assembly (bladder, integral stem, gas valve, protective cap*, stem 'O' seal), anti-extrusion ring, 'O' fluid port ring, back-up ring and seal and bleed plug*.

Always quote full part number e.g. 5410A-00 54L, capacity, Butyl Rubber, 1/4"BSP.

*4 Litres capacity and above.

Table 1 - Material according to temperature range

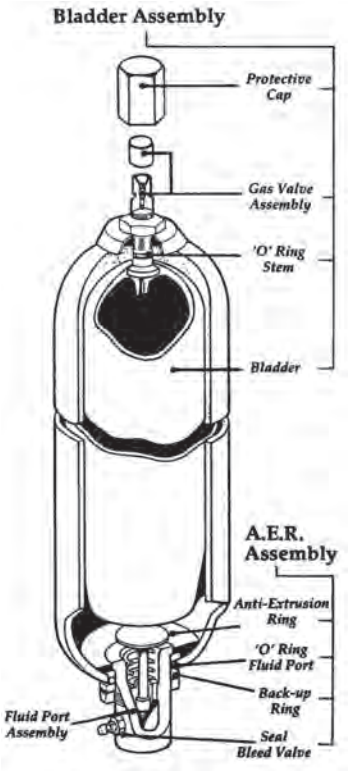
Range of bladder materials available with their corresponding working temperature range when handling non-aggressive fluids.

Material Code	Bladder Material	Temperature Range (Deg. C)			
		Static		Dynamic	
0	Nitrile	-20	100	-15	100
1	Butyl	-15	120	-15	120
2	Low Temp Nitrile	-40	70	-25	70
3	Low Permeability Nitrile	0	105		
6	Fluorocarbon (Viton)	-20	130		
7	High Aromatic Nitrile	0	105		
8	High Temp Nitrile	0	150		
9	EPI - Chlorohydin 100	-20	120		
A	Ethylene Propylene (EP)	-20	120		
B	EPI - Chlorohydin 200	-40	120		
K	Special Low Temp Nitrile	-79	100	-59	100
L	Peroxide Cured EPDM	please contact us for details			
M	High Temperature Flurocarbon	-10	200		
N	Low Temp Nitrile	-45	70		

Table 2 - Bladder capacity / overall dimensions

Accumulator Capacity (l) Nominal	Dimension		Stem Diameters		
	"H"	"D"	5/8" (16mm)	7/8" (22mm)	2" (50mm)
0.16	154	41	*		
0.6	132	73	*		
1.15 (1.25)	147	91	*	*	
3	335	100	*	*	
4	203	142		*	
5	680	100		*	
6	305	142		*	
9 (10)	570	142		*	
12.5	655	142		*	
10	283	198		*	*
12	406	198			*
20	610	198		*	*
24.5	719	198			*
28	880	198		*	
37	1128	198		*	*
42	1280	198		*	
54	1603	198		*	*

Standard Bladder Accumulator Spare Parts



Recommended Spare Parts

Bladder Kit

Bladder assembly

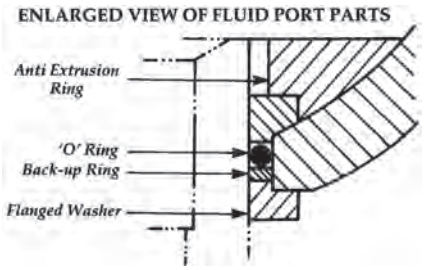
Anti-extrusion ring assembly

Anti-Extrusion Ring Assembly

Anti-extrusion ring, 'O' ring fluid port, back-up ring, sealed bleed valve (03 to 54L).

Fluid Port Assembly

Body Fluid port, poppet valve assembly, flanged washer, locking ring, bleed valve assembly (03 to 54L).



Accumulator Reference	Oil Service Bladder Kit	Corrosion Service Bladder Kit	Oil Service Anti Ex-ring Assembly	Corrosion Service Anti Ex-ring Assembly	Oil Service Fluid Port Assembly	Corrosion Service Fluid Port Assembly
0B	0B00A-00	0B0SA-02	0B0**-00	0B0**-02	0B***-00	0B***-02
0F	0F00A-00	0F0SA-02	0F0**-00	0F0**-02	0F***-00	0F***-02
01C	01C00A-00	01C0SA-02	0F0**-00	0F0**-02	0F***-00	0F***-02
03C	03C00A-00	03C0SA-02	030**R7	03C0**-02	03C***-00	03C***-02
04	0400A-00	0400SA-00	040**-00	040**-02	04***-00	04***-02
10	1000A-00	100SA-02	100**-00	100**-02	10***-00	10***-02
20	2000A-00	200SA-02	100**-00	100**-02	10***-00	10***-02
28	2800A-00	280SA-02	100**-00	100**-02	10***-00	10***-02
37	3700A-00	370SA-02	100**-00	100**-02	10***-00	10***-02
54	5400A-00	540SA-02	100**-00	100**-02	10***-00	10***-02

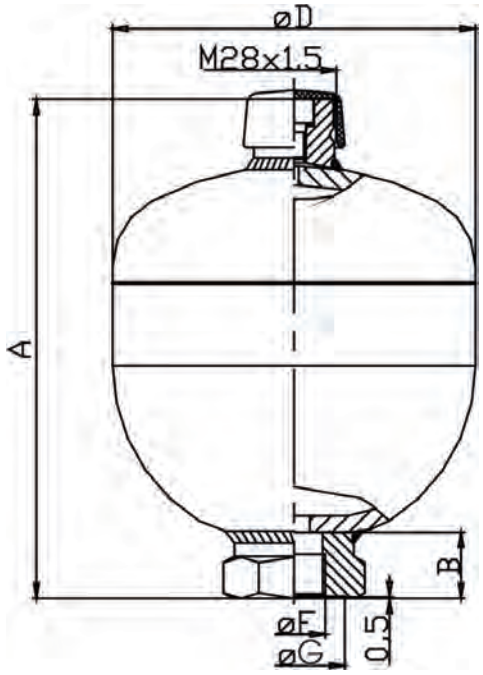
Other rubber material information available upon request.

Accumulator Reference	Gas Valve Core	Gas Valve Assembly	'O' Ring Fluid Port	Back-up Ring	Oil Service Locking Ring	Corrosion Service Locking Ring
0B	43001-099	N/A	40127-A00	40366-P00	24950-V29	24950-006
0F	43001-099	N/A	40294-A00	40367-P00	25010-V29	25010-006
01C	N/A	10053-S03	40294-A00	40367-P00	25010-V29	25010-006
03C	N/A	10053-S03	40306-A00	40875-P00	25060-V29	25060-006
04	N/A	10053-S03	40002-A00	40369-P00	25100-V29	25100-006
10-54	N/A	10053-S03	40003-A00	40370-P00	25150-V29	25150-006

Note: Gas valve assembly integral with bladder on 0B to 0F accumulators. Protective cap fitted on 01-54L accumulators only.
NA = Not applicable. Bleed assembly fitted on 03-54L accumulators only.

Diaphragm Accumulator

100-250 bar

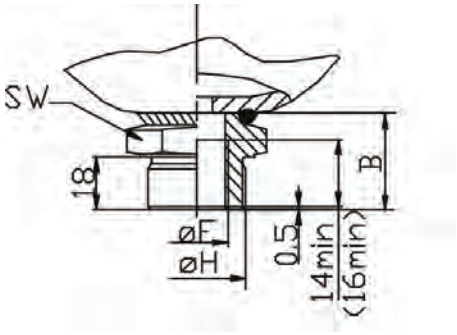


Form A

Specification

Approval

All accumulators of this range are manufactured, approved and certified according to Directive 97/23/EC of the European Parliament. Other approvals are available upon request.



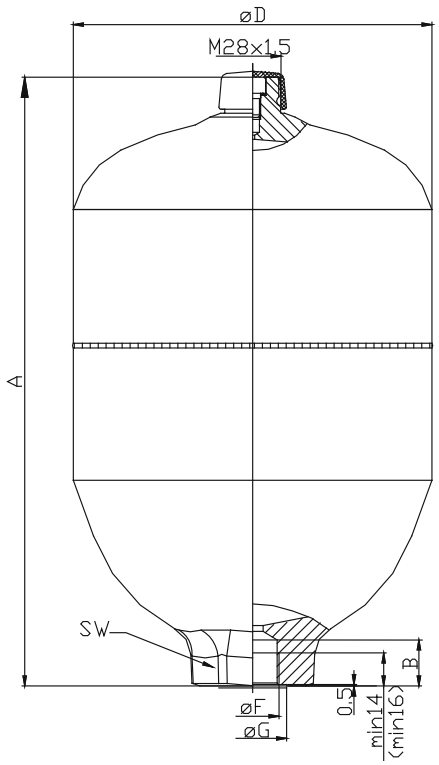
Form B

Type OLM/ELM	Gas Volume Vo (L)	MWP (bar)	Fluid Form Connection	P max/ Po	P max- P min	Weight (kg)	Temperature Range	Dimensions							
								A	B	Ø D	Ø G	Ø F	H	SW	Mounting
108492-01125	0.075	250	A	8:1	210	0.7	-10°C/+80°C	111	20	64	29	G ½"	-	32	-
108493-01125	0.16	250	A	6:1	210	1	-10°C/+80°C	120	20	75	29	G ½"	-	32	-
109866-01125	0.32	210	A	8:1	140	1.4	-10°C/+80°C	134	20	93	29	G ½"	-	32	-
108495-01125	0.5	210	A	8:1	175	2	-20°C/+80°C	152	22	106	34	G ½"	-	41	-
108496-01125	0.5	210	B	8:1	175	2	-20°C/+80°C	163	33	106	-	G ½"	M33x1.5	41	M33x1.5
108497-01125	0.75	210	A	8:1	175	2.6	-20°C/+80°C	166	22	122	34	G ½"	-	41	-
108498-01125	0.75	210	B	8:1	175	2.6	-20°C/+80°C	177	33	122	-	G ½"	M33x1.5	41	M33x1.5
109847-01125	1.0	210	A	8:1	170	3.5	-20°C/+80°C	180	22	136	34	G ½"	-	41	-
109848-01125	1.0	210	B	8:1	170	3.5	-20°C/+80°C	191	33	136	-	G ½"	M33x1.5	41	M33x1.5
108502-01125	1.4	140	A	8:1	120	4.2	-20°C/+80°C	191	22	147	34	G ½"	-	41	-
108503-01125	1.4	140	B	8:1	120	4.2	-20°C/+80°C	202	33	147	-	G ½"	M33x1.5	41	M33x1.5
109965-01125	1.4	210	A	8:1	140	6	-20°C/+80°C	198	22	155	-	G ½"	-	41	-
109966-01125	1.4	210	B	8:1	140	6	-20°C/+80°C	209	33	155	34	G ½"	M33x1.5	41	M33x1.5
110132-01125	1.4	250	A	8:1	140	5	-20°C/+80°C	195	22	152	34	G ½"	-	41	-
110133-01125	1.4	250	B	8:1	140	6	-20°C/+80°C	206	33	152	-	G ½"	M33x1.5	41	M33x1.5
108504-01125	2.0	100	A	8:1	80	4.7	-10°C/+80°C	240	22	144	34	G ½"	-	41	-
110134-01125	2.0	250	A	8:1	150	7.5	-10°C/+80°C	251	22	155	33	G ¾"	-	41	-
108879-01125	2.8	250	A	6:1	140	10	-10°C/+80°C	268	21	174	33	G ¾"	-	41	-
108505-01125	3.5	250	A	4:1	140	11	-10°C/+80°C	307	22	174	33	G ¾"	-	41	-

Manufacturing tolerances are not considered.

Diaphragm Accumulator

350 bar

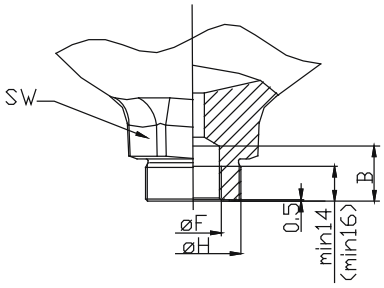


Form A

Specification

Approval

All accumulators of this range are manufactured, approved and certified according to Directive 97/23/EC of the European Parliament. Other approvals are available upon request.



Form B

Type OLM/ELM	Gas Volume Vo (L)	MWP (bar)	Fluid Form Connection	P max/ Po	Pmax-Pmin	Weight (kg)	Temperature Range	Dimensions							
								A	B	Ø D	Ø G	Ø F	H	SW	Mounting
109318-01125	0.75	350	A	8:1	150	4	-20°C/+80°C	173	22	128.5	34	G ½"	-	41	-
109319-01125	0.75	350	B	8:1	150	4	-20°C/+80°C	184	33	128.5	-	G ½"	M33x1.5	41	M33x1.5
109321-01125	1.4	350	A	8:1	150	7	-20°C/+80°C	198	22	156	34	G ½"	-	41	-
109322-01125	1.4	350	B	8:1	150	7	-20°C/+80°C	220	44	156	-	G ½"	M33x1.5	41	M33x1.5
110060-01125	2.0	350	A	8:1	200	9.5	-10°C/+80°C	251	22	156	34	G ¾"		41	-
110061-01125	2.0	350	B	8:1	200	9.5	-10°C/+80°C	269	40	156	-	G ¾"	M45x1,5	50	M45x1.5
109758-01125	2.8	350	A	6:1	200	14,3	-10°C/+80°C	264	23	180	34	G ¾"	-	55	-
109759-01125	2.8	350	B	6:1	200	14,5	-10°C/+80°C	285	26	180	-	G ¾"	M45x1,5	55	M45x1.5
109849-01125	3.5	350	A	4:1	200	16	-10°C/+80°C	304	23	180	34	G ¾"	-	55	-
109850-01125	3.5	350	B	4:1	200	16,5	-10°C/+80°C	325	26	180	-	G ¾"	M45x1,5	55	M45x1,5

Manufacturing tolerances are not considered.

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Diaphragm Accumulator

Additional Range

Specification

The additional diaphragm accumulator range offers further pressure and connection options to our standard range.

	Type number	Part number	Gas volume litres	Max working pressure bar	Maximum pressure ratio	Dimension D x H	Fluid connections	Gas connections
Welded version	D0.07-250	007-1315-074-611	0.07	250	8:1	64 x 117	M14 x 1.5 External thread	M28 x 1.5
	D0.07-500	007-1315-054-811	0.07	500	8:1	85 x 105	G ¼	M28 x 1.5
	D0.32-160	032-1315-024-611	0.32	250	8:1	92 x 147	M16 x 1.5	M28 x 1.5
	D0.05-160	050-1315-094-511	0.5	160	8:1	105 x 160	M22 x 1.5	M28 x 1.5
	D0.75-180	075-1315-074-611	0.75	180	8:1	123 x 175	M22 x 1.5	M28 x 1.5
	D0.75-250	075-1315-013-611	0.75	250	8:1	127 x 184	G ½	M28 x 1.5
	D1.0-200	100-1315-063-611	1.00	200	8:1	138 x 191	M22 x 1.5	M28 x 1.5
	D1.3-50	130-1315-024-311	1.30	50	8:1	142 x 195	M22 x 1.5	M28 x 1.5
	D1.4-180	140-1315-033-611	1.40	180	8:1	150 x 205	M22 x 1.5	M28 x 1.5
	D1.4-250	140-1315-012-611	1.40	250	8:1	157 x 202	G ½	M28 x 1.5
	D2.0-100E	200-1315-023-411	2.00	100	8:1	175 x 220	G ½	M28 x 1.5
	D3.5-250	350-1315-013-611	3.50	250	8:1	175 x 310	G ¾	M28 x 1.5
	D5.0-20	500-1315-032-211	5.00	20	8:1	232 x 276	M16 x 1.5	Filling Valve
Repairable version	D1.5-330	150-1315-072-744 150-1315-082-711	1.50	330	8:1	195 x 205	M27 x 2 G ¾	M28 x 1.5 M28 x 1.5
	D2.0-250	200-1315-032-611	2.00	250	8:1	210 x 195	G ½	M28 x 1.5

Type D5.0-40 (part number: 500-1315-042-311) has now been discontinued, Dec 2008.

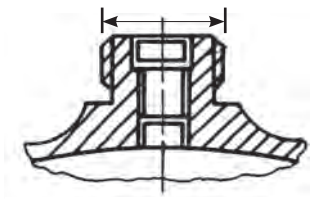
Charging Equipment

For accumulators with M28 x 1.5 Gas connection

OLAER Fawcett Christie part number	Type number	Pressure gauges range (bar)	Pressure gauges Part number
040-1315-083-000	DFM 40	0 - 40	063-2417-003-040
100-1315-083-000	DFM 100	0 - 100	063-2417-003-100
250-1315-113-014	DFM 250	0 - 250	63-2417-003-250
400-1315-083-000	DFM 400	0 - 400	063-2417-003-400

If requested we can pre-charge all diaphragm accumulators prior to dispatch.

M28 x 1.5



Accumulator with
M28 x 1.5 Gas Connection

Polypropylene Pulsation Damper

Fluid end connection threaded to suit customers requirements

Specification

Design Features include:

- Manufactured from high grade Polypropylene.
- Lightweight construction, non repairable units.
- Low cost alternative to stainless steel at low pressure.
- Nominal capacities 0.1 litre to 2 litres.
- Working pressures of up to 10 bar.
- Wide range of separator materials available.

Warning

These units are recognised by the prefix 'PPD' and have a shell and head made from polypropylene. This makes them lightweight, low cost and good chemical compatibility. The maximum working pressure of this range is 10 Bar.

The polypropylene dampers are designed for a maximum life of 10 years. The replacement of the internal bladder is not recommended for this range. It should be noted that this model of damper is Non-Repairable in design.

WARNING – Do NOT attempt to disassemble these units. Replace with new if necessary.

The fitting of any permanent pressure gauge is strongly prohibited, however if fitted without manufacturers knowledge then the gauge should be appropriate for the maximum design pressure of 10 bar. The recommended nitrogen pressure setting for pulsation damping is 80% of the mean line pump pressure.

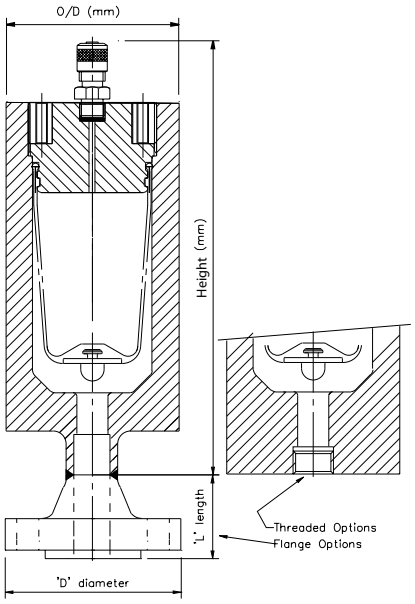
WARNING – Use dry Nitrogen only
Do NOT fill with more than 8 Bar Nitrogen Maximum

If in doubt please contact OLAER Fawcett Christie technical department direct.

Volume Range					
Volume (Litres)	**0.1**	**0.25**	**0.5**	**1**	**2**
Diameter (mm)	70	90	110	140	140
Length	190	212	242	262	397

Note: Shaded cells represent standard stock sizes

Stainless Steel Pulsation Dampers



Specification

Design Features include

CE certified in accordance with the PED (97/23/EC) where applicable. Manufactured from high grade Stainless Steel, other materials available.

- Nominal capacities 0.1 litre to 5 litres.
- Working pressures of up to 690 bar
- Wide range of separator materials available
- Designed to PD5500, ASME VIII Div 1 available as an option.
- Material certifications are available to EN10204 3.1 b
- Third party witness is available on request.
- NACE MR0175 compliance is available on request.

APD Range

Volume (litres)							
	0.1	0.25	0.5	1	2	3	5
Height (mm)	190	212	242	262	397	425	437
O/D (mm)	60	76	90	127	127	153	170
Weight (kg)	2.7	4.5	6	15	20	31	33
M.W.P. (bar)	350	300	250	180	180	250	120

BPD Range

Volume (litres)							
	0.1	0.25	0.5	1	2	3	5
Height (mm)	202	236	272	290	426	448	472
O/D (mm)	76	102	127	146	146	170	190
Weight (kg)	5.4	12	21	27	37	52	55
M.W.P. (bar)	690	690	690	450	450	430	300

Optional Flange Available

		Nominal Flange Sizes					
	Dimensions (mm)	½"	¾"	1"	1 ¼"	1 ½"	2
150lb	Diameter "D"	88.9	98.4	107.9	117.5	127	152.4
	Length "L"	47.6	52.4	55.6	57.1	61.9	63.5
	Weight (kg)	0.5	0.7	1.1	1.5	1.8	2.7
300lb	Diameter "D"	95.2	117.5	123.8	133.4	155.6	165.1
	Length "L"	52.4	57.1	61.9	65.1	68.3	69.8
	Weight (kg)	0.8	1.3	1.7	2.2	3.2	3.6
600lb	Diameter "D"	95.2	117.5	123.8	133.4	155.6	165.1
	Length "L"	52.4	57.1	61.9	66.7	69.8	73
	Weight (kg)	0.9	1.5	1.9	2.6	3.3	4.7
900lb	Diameter "D"	120.6	130.2	149.2	158.7	177.8	215.9
	Length "L"	60.3	69.8	73	73	82.5	101.6
	Weight (kg)	1.9	2.6	3.8	4.4	6.1	11.1
1500lb	Diameter "D"	120.6	130.2	149.2	158.7	177.8	215.9
	Length "L"	60.3	69.8	73	73	82.5	101.6
	Weight (kg)	1.9	2.6	3.8	4.4	6.1	11.1
2500lb	Diameter "D"	133.3	139.7	158.8	184.2	203.2	235
	Length "L"	73	79	89	95	111	127
	Weight (kg)	3.6	4.1	5.9	9	13	19

Stainless Steel Pulsation Dampers

Model numbers

APD - 001 - 0 - 001

Damper Type

APD = Standard Pressure
BPD = High Pressure
CPD = ASME Standard Pressure
DPD = ASME High Presure
EPD = 'Special' Alternative Materials

Nominal Volume - Litres

001 = 0.1
025 = 0.25
050 = 0.5
100 = 1
200 = 2
300 = 3
500 = 5

Bladder Material

0 = NITRILE
A = EPDM
6 = VITON

Other bladder materials available on request.

Fluid End Connection

0001 = 1/2" BSP (F)
0002 = 3/4" BSP (F)
0003 = 1" BSP (F)
0004 = 1 1/2" BSP (F)
0005 = 1/2" NPT (F)
0006 = 2" BSP (F)
0007 = 3/4" NPT (F)

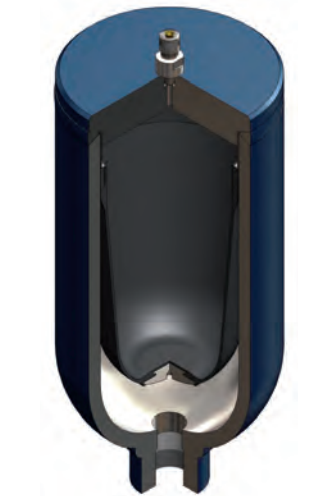
0010 = 1/2" 150 lb R/F Flange
0011 = 1"150 lb R/F Flange
0012 = 1/2" 300 lb R/F Flange
0013 = 1" 300 lb R/F Flange
0016 = 2" 150 lb R/F Flange
0032 = 2" 300 lb R/F Flange

Other thread and flange options available on request.

Hydracushions

50, 172 & 210 bar

Type A



Type B

Type C

Specification

Shell

0.13 litre capacity - deep drawn stainless steel. Working pressure - 50 bar.

1.0 to 4.0 litre capacity - deep drawn low carbon steel. Working pressure - 172 bar & 210 bar.

Head

0.13 litre capacity - stainless steel welded to shell.

1.0 to 4.0 litre capacity - low carbon steel welded to shell.

Finish

0.13 litre capacity - natural.

1.0 to 4.0 litre capacity. One coat primer as standard. Special paints available.

Gas Valve Assembly

Valve body fitted with valve core and sealing cap.

Bladder

Open ended, one piece in nitrile rubber, bonded to a steel ring band having a steel button to prevent extrusion through fluid port on nitrogen precharge.

Fluid Port

Welded to shell, BSP connection

Safety

All gas-loaded accumulators are gas pressurised vessels and it is recommended that safety consideration be given to the application in which they are used. A relief valve should always be fitted to the hydraulic system with the option of a burst disc to protect the accumulator. If there is a fire risk in the vicinity of the accumulator, then a fusible/ eutectic plug should be fitted.

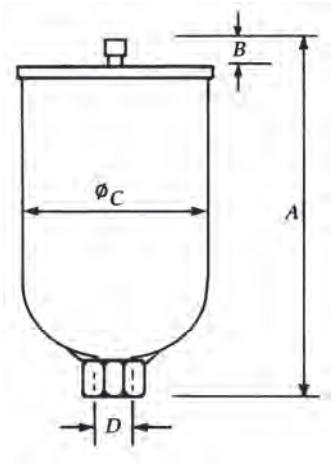
Fork Lift Truck Applications

The adjacent table shows the recommended size of Hydracushions for load shock elimination on fork lift trucks.

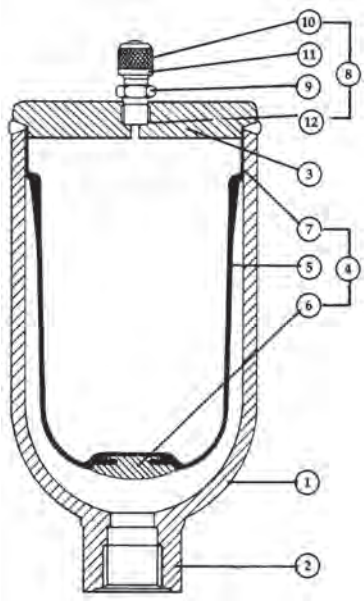
Recommended Sizes	
Truck load (kg)	**Hydracushion**
up to 1360	0.5L
1360 to 3628	1L
3628-5450	2L
5450 upwards	4L

Dimensions

Type A

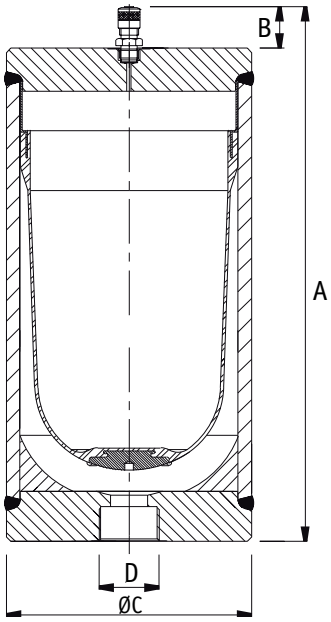


Type B



Key	Items
1	Shell
2	Fluid Port
3	Head
4	Bladder Assembly
5	Bladder
6	Button
7	Ring Band
8	Gas Valve Assembly
9	Gas Valve Body
10	Sealing Cap
11	Valve Core
12	'O' Ring

Type C



Maximum working pressure 50 bar

Precharge pressure to suit application

Model number	*Type*	Gas Volume (litres)	Approx.Weight (kg)	Max. Flow Rate (litre/min)	Dimensions in mm unless stated otherwise			
					A	B	C	D
HC0A04A-02-05	A	0.13	0.3	40	148	13	50	3/4" BSPF

Maximum working pressure 172 bar

Precharge pressure to suit application

Model number	*Type*	Gas Volume (litres)	Approx. Weight *(kg)*	Max Flow Rate *(litre/min)*	Dimensions in mm unless stated otherwise			
					A	B	C	D
HC0E00A-00-17	B	0.5	3.18	159	210	30	94	1/2" BSPF
HC0100A-00-17	B	1.0	6.35	204	252	30	117	3/4" BSPF
HC0200A-00-17	B	2.0	11.10	363	314	30	147	1" BSPF
HCF0400A-00-17	C	4.0	23	470	358	13	172	1 1/4" BSPF

Hydracushions

Model numbers

HC - 01 - 0 - 0A - 00 - 17

Hydracushions Accumulator Type

HC = Existing Hydracushion Range (Type A & B)
HCF = New Hydracushion Range (Type C)

Nominal Volume - Litres

0E = 0.5L
01 = 1L
02 = 2L
04 = 4L **(Type C only)**

Bladder Material

0 = Nitrile

Gas Valve Connection

0A - 1/4 " BSPM 0.5 to 4.0 litre only
4A - 0.302" x 32 T.P.I.

Construction

00 = Oil Service - 0.5 to 4.0 litres only
02 = Water Service - 0.13 litres only

Maximum Working Pressure

05 - 50 bar 0.13 litres only
17 - 172 bar
21 - 210 bar } Options for 1, 2 and 4 litres
22 - 215 bar

Spares

10031 - S03 Gas valve assembly 1/4" BSP (0.5 - 4L)

10051 - S03 Gas valve assembly 0.32" x 32 T.P.I. (0.5 - 4L)

43001 - 009 Gas valve core (0.13L)

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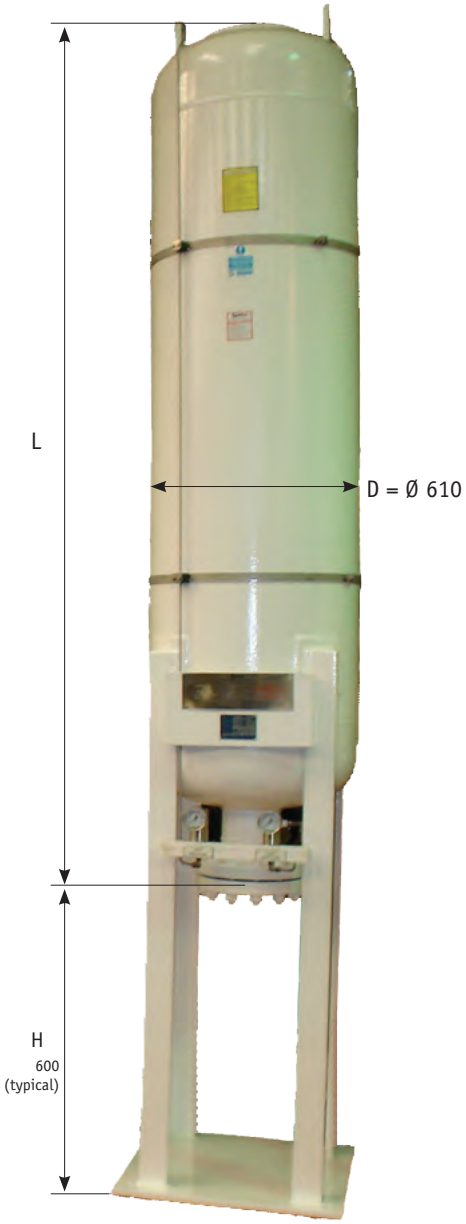
Large Volume Alleviators



Optional legs or side brackets

Specification

OLAER Fawcett Christie Alleviators are designed to control surge by providing an elastomer bladder precharged with nitrogen, contained in a steel shell.

The pressure surge, partially dampened by the orifices in the alleviator fluid port, enters the shell, where the remaining kinetic energy is dissipated by compressing the nitrogen gas within the bladder.

OLAER Fawcett Christie Alleviators are totally enclosed and as the only moving part is the bladder, little maintenance is required.

Capabilities

Carbon or Stainless Steel construction. Design pressures up to 34.5 bar. Optional separator materials.

Pressure

Design pressures up to 34.5 bar. Pressure tested and witnessed by independent inspection authority if required.

Approvals

Vessels approved to PED 97/23/EC CE marked, PD5500, ASME VIII Div 1 'U' Coded or design only in accordance with ASME V III Div 1.

Design

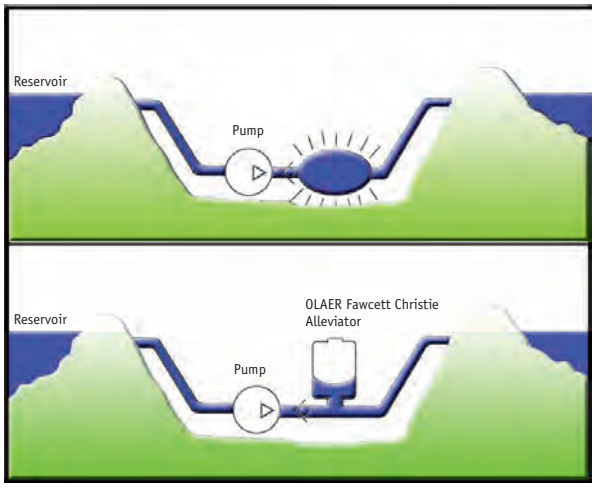
Legs are an optional extra but recommended for units over 227 litres. Where fitted H=600 mm nom (or to suit application). Side bracket options are also available as an alternative to legs.

Fluid end Flange

Optional fluid end flange construction (typically 4", 6" or 8" NB).

Finish

One coat primer paint, special custom paint specification can be quoted.

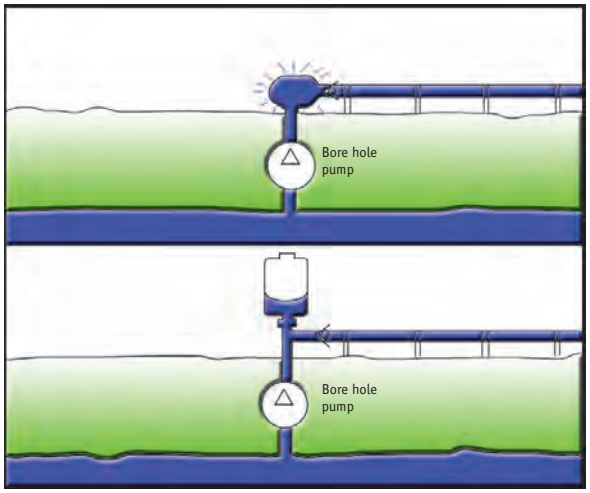


Applications

Pump Shutdown

Upon pump shutdown, the flow of fluid continues along the pipeline creating the possibility of column separation. After stopping, the fluid column will attempt to run back down the pipeline into the check valve causing damaging shock pressures.

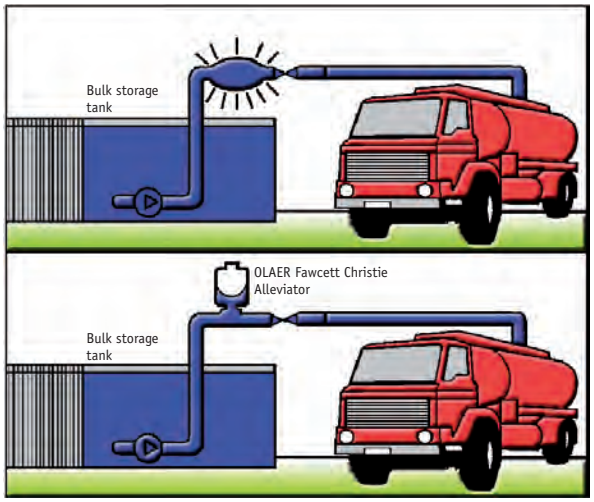
A OLAER Fawcett Christie Alleviator installed in the downstream side of the check valve will, on sensing any decrease in pressure due to column separation, force stored fluid back in.



Pump Start up

On pump start up fluid between the pump and check valve is forced against the valve which is held shut by the pipeline static head condition. Surge pressure greater than the pump shut off thereafter can be generated.

With a OLAER Fawcett Christie Alleviator installed on that leg, the pump discharge is initially accepted and the pressure is allowed to rise gradually allowing time for frictional and static head condition to be overcome.



Valve Closure

As a valve is closed a pressure wave is generated that propagates at the speed of sound along the column of fluid until it reaches the originating pump. The wave is then reflected back to the valve, causing increased line pressure of as much as 100%, resulting in blown out pump seals, weakened pipe fittings and possible burst pipes.

By installing a OLAER Fawcett Christie Alleviator adjacent to the valve, the quick rise in pressure is cushioned by the compression of the gas and flow is controlled, thus stabilising the system.

Large Volume Alleviators

Model numbers

154 - 0 - 0A - S7 - 03 - 4

Gas Volume

098 = 98 litres
154 = 154 litres
227 = 227 litres
286 = 286 litres
460 = 460 litres

Bladder Material

0 = Nitrile Standard
3 = High Aromatic Nitrile
+ = other

Gas end Connections

0A = standard 1/4" BSP gas valve + other international connections available, including permanent charging set connections c/w pressure gauge.

Alleviator Type

S1 = 6" 300lb rf flange oil service
S2 = 8" 300lb rf flange oil service
S3 = 10" 300lb rf flange oil service
S4 = 6" 300lb rf flange internally lined for water service
S5 = 8" 300lb rf flange internally lined for water service
S6 = 10" 300lb rf flange internally lined for water service
S7 = 6" 300lb rf flange all stainless steel vessel
S8 = 8" 300lb rf flange all stainless steel vessel
S9 = 10" 300lb rf flange all stainless steel vessel
+ = many other options available

For further information please contact head office.

Design Pressure

03 = 34.5 bar
02 = 20 bar + others

Design Code

4 = ASME VIII Div 1 'U' Stamped
M = ASME VIII Div 1 Not 'U' Stamped
R = PD5500 cat1
S = PD5500 cat 2

The following details are nominal only and are provided as a guideline

D = 610 mm

Volume	L	Weight (dry)
98	930 mm	175 kg
154	1130 mm	200 kg
227	1400 mm	250 kg
286	1660 mm	310 kg
375	2130 mm	405 kg
460	2600 mm	465 kg

Piston Accumulators

Specification

Capabilities

OLAER Fawcett Christie Piston Accumulators are available in any capacity up to 1350 litres. Capacity is only limited by pressure and available materials. Our standard range is 1 litre up-to and including 150 litres. All units are made to order, and can be custom engineered to suit specific space restrictions.

Pressure

Piston Accumulators are available in any pressure between 5 bar and 2500 bars. The pressure rating is dependant on capacity and/or available materials.

Materials

Our units are available in a variety of materials such as Carbon steel, Stainless steel, Duplex or Super Duplex steels and Aluminium. All come with a choice of material certification options.

Design

Vessels will be in accordance with the PED 97/23/EC for use in Europe and designed to PD5500. Optional 3rd party witness (eg. Lloyds) available. Other design codes can be considered for example ASME VIII Div 1.

Fluid End Connections

To suit customer requirements – e.g. NPT, BSP, Autoclave type or SAE/ASME flanged.

Gas End Connections

To suit customer requirements – e.g. NPT, BSP, Autoclave type or SAE/ASME flanged. Transfer barrier ports, Gas Charging valves (brass and stainless) Gas pressure relief devices e.g. Burst discs and Fuse plugs.

Seals

For low or high temperature applications. Materials typically Nitrile, PTFE, Viton, EPDM and others.

Piston Position Indicators

Carbon Steel Options:

- Tailrod – magnetic operation with visual flapper or magnetic indicator switch.
- Bent tube Indicator - magnetic operation with visual flapper or magnetic indicator switch.
- Tailrod – operating a cam/switch.
- Proximity switch

Stainless Steel Options:

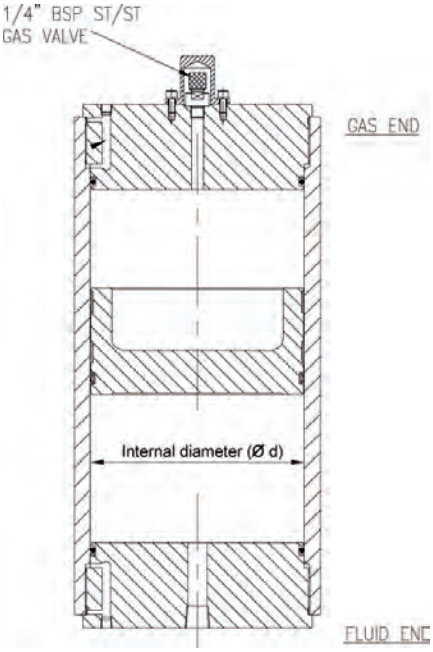
- Piston Magnet - magnetic operation with visual flapper or magnetic indicator switch
- Proximity switches

Internal Diameter (Ø d)												
Design Pressure (PS)	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**280**	**320**	**400**	**501**	**600**
150												■
170										■	■	
200							■					
220										■	■	
240									■			
250							■					
270							■					
275						■						
280							■					
300						■			■			
350					■							
370				■								
390							■					
450						■						
455							■					
490					■							
530			■		■	■						
760			■	■	■		■					
863						■						
950						■	■					
1035								■				
1050			■	■	■	■						
1380						■						
1500			■	■	■	■						
2100			■	■	■							

Carbon Steel Units

Due to our wide range of product sizes we are unable to display every option available therefore the adjacent table displays a selection of our most commonly requested sizes.

For further information please contact a member of our sales team.



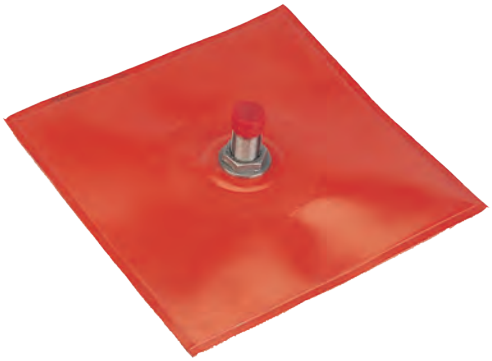
Stainless Steel (17/4 PH)

Internal Diameter (Ø d)												
Design Pressure (PS)	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**280**	**320**	**400**	**501**	**600**
455					■		■					
600				■		■						
690		■										
760			■	■	■	■	■					
863						■						
960						■						
1050	■	■	■	■	■	■						
1380						■						
1500			■	■	■	■						
2100	■	■	■	■	■							

Stainless Steel (AISI 316)

Internal Diameter (Ø d)												
Design Pressure (PS)	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**280**	**320**	**400**	**501**	**600**
150						■						
220				■		■						
230							■					
250		■	■		■	■			■			
320							■					
350						■						
425						■						
455	■	■	■	■	■	■						
550					■							
630			■									
750				■								
760	■	■										

Flexible Separators



Specification

Benefits

Deteriorating hydraulic equipment fluid had been estimated to be responsible for at least 70% of all hydraulic failures. The OLAER Fawcett Christie separator prevents contaminants entering the hydraulic fluid at the tank. If contaminant particles are prevented from entering the fluid tank the result is cleaner fluid and longer fluid life.

This will in turn provide a longer life for the filter elements and system components thus reducing downtime and operating costs.

If no moisture or corrosive gases are allowed to enter the fluid tank the result is:

- reduced oxidation and emulsification of the fluid
- cleaner fluid
- longer fluid life
- reduced corrosion to the inside of the tank and system components.

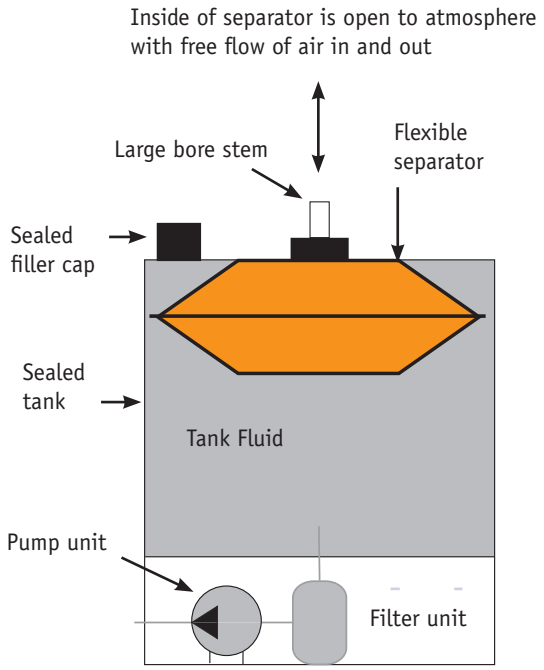
- **Proven in many harsh environments**
- **Available in a wide range of shaped sizes**

Stem

01 = 3/4" BSP Carbon Steel
02 = 7/16" x 20 UNF (Non standard)
03 = 3/4" BSP 316 Stainless Steel

Separator Material

01 = Polyurethane coated thermo plastic sheet reinforced.



Flexible Separators Sizing Chart

Size *(Litres)*	**Type 1** *Square*		**Type 2** *Rectangular Standard*			**Type 3** *Rectangular Long*			**Type 4** *Circular*	
	l	**h**	**l**	**w**	**h**	**l**	**w**	**h**	**d**	**h**
01	240	128	260	190	96	400	140	64	250	134
02	280	153	320	220	115	440	180	89	295	163
03	300	166	360	250	134	540	190	96	330	185
04	320	178	400	280	153	590	240	127	368	210
06	380	217	440	300	166	620	240	127	412	238
08	400	230	480	340	191	590	280	153	440	255
10	420	242	520	360	204	780	280	153	465	270
15	480	280	580	400	229	860	320	178	520	306
18	500	292	620	420	242	900	320	178	540	320
20	520	306	640	440	255	920	340	191	580	344
25	580	331	700	480	267	960	360	204	640	382
30	600	365	720	500	283	1080	380	217	661	480
40	660	395	800	540	318	1160	420	242	706	426
50	700	420	840	580	344	1260	440	255	784	475
60	740	446	900	620	369	1360	460	267	810	490
70	780	471	940	640	382	1460	480	280	850	515

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www.olaerfawcettchristie.co.uk

Flexible Separators

Model numbers

FSC - 0001 - 1 - 01 - 01

Flexible Seperator

Expanded Volume

in litres

Shape

1 = Type 1
2 = Type 2
3 = Type 3
4 = Type 4
* see sizing chart

Stem

01 = 3/4" BSP Carbon Steel
02 = 7/16" x 20 UNF (Non standard)
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Separator Material

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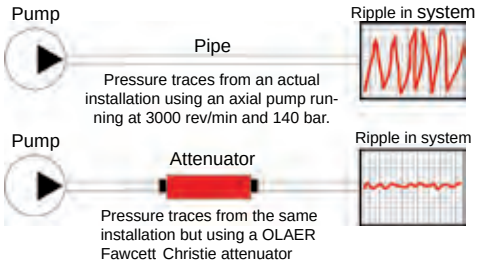
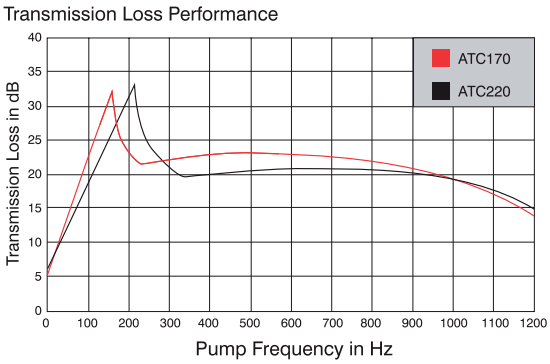
High Frequency Noise Attenuators





Specification

Leakage, damage to instrumentation, instability and noise are often caused by high frequency ripple generated by a hydraulic pump; an attenuator, placed close to the pump will significantly reduce this ripple.

The OLAER Fawcett Christie Noise Attenuator is essentially a "low pass filter" or volume resonator which attenuates transmitted frequencies over a wide band.

OLAER Fawcett Christie Attenuators are manufactured from forged steel with an interconnected inner chamber. Additional sound absorption is achieved if the attenuator is fitted with a flexible hose on both or either side.

Shell

Seamless steel shell necked at both ends. Working pressure 345 bar.

Inner Tube

Designed to accommodate pumping characteristics and size for minimum pressure drop performance.

Finish

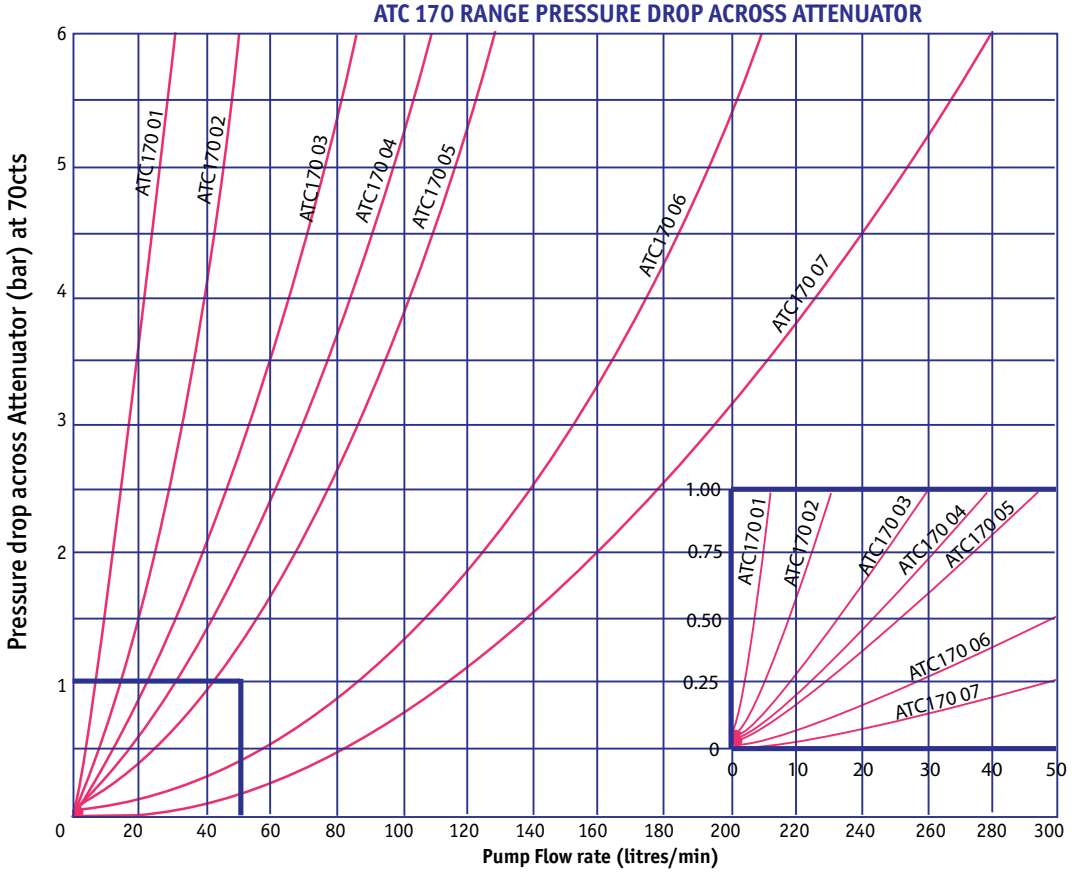
One coat primer paint as standard. Special paints finishes available on request.

Connections

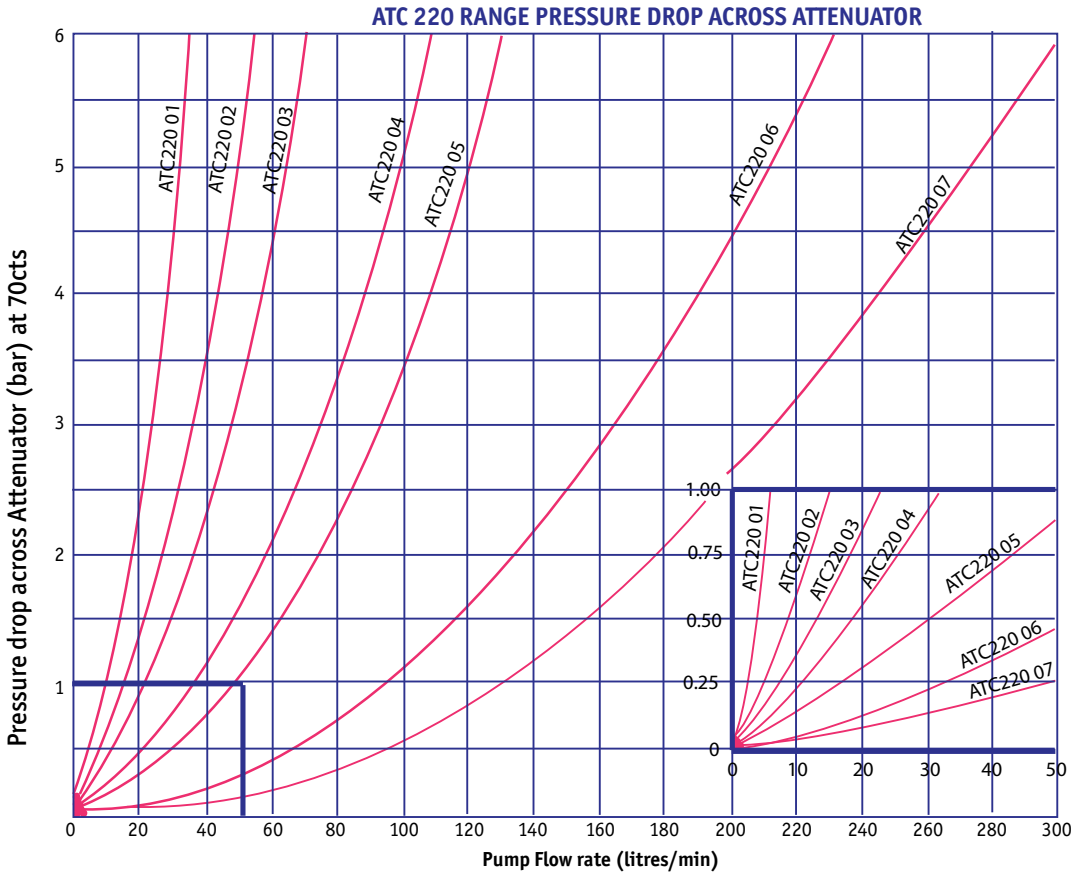
BSP female connections (see chart below). OLAER Fawcett Christie offer an attenuator design service for applications not covered by the standard product range.

Part Number	Model	Min Sys Bore d (mm)	Length d (mm)	Diameter d (mm)	Connection (BSP)	Weight (kg)
60045400100	ATC17001	10	457	88.9	3/4"	5.8
60045500100	ATC17002	13	585	88.9	3/4"	7.3
60045100100	ATC17003	16	592	114.3	1 1/4"	12.0
60044900100	ATC17004	19	592	114.3	1 1/4"	15.0
60045000100	ATC17005	22	744	114.3	1 1/4"	15.0
60044600100	ATC17006	32	744	114.3	1 1/4"	15.0
60045200100	ATC17007	38	744	114.3	1 1/4"	15.0
60045300100	ATC22001	10	381	88.9	3/4"	5.2
60043800100	ATC22002	13	457	88.9	3/4"	5.8
60045600100	ATC22003	16	457	88.9	3/4"	5.8
60045700100	ATC22004	19	585	88.9	3/4"	7.4
60045800100	ATC22005	22	585	88.9	3/4"	7.4
60044700100	ATC22006	32	592	114.3	1 1/4"	12.0
60044500100	ATC22007	38	592	114.3	1 1/4"	12.0

ATC 170 RANGE PRESSURE DROP ACROSS ATTENUATOR



ATC 220 RANGE PRESSURE DROP ACROSS ATTENUATOR



High Frequency Noise Attenuators

Model numbers

ATC - 220 - 01 - 00 - 34

Attenuator Type

Range

170 = 150Hz to 200HZ
220 = 200Hz and above

Size (see sizing chart)

Shell and Fluid port options

00 = Standard

Working Pressure

34 = 345 bar

Accumulator Stations

Specification

Complete flexibility is the keynote to OLAER Fawcett Christie stations. For a customised design to meet your specific needs, contact head office for full specification of alternative major features, e.g: Manifold, accumulator isolation, drain to tank facility, welded fittings etc., and OLAER Fawcett Christie safety blocks.

Basic/Double Row Stands

Fabricated frame having substantial vertical and horizontal rolled steel joists with steel plate mounting brackets and feet. Complete with clamping system for securing bottles to frame. Foundation bolt holes are provided, as are integrated lifting points.

The OLAER Fawcett Christie stand range is designed to give safe and accessible mounting for 1 - 14 accumulators in 37 or 54 litre capacities, or 1 - 7 sets of accumulator and back-up bottle.

Drip tray (optional)

Fabricated from steel sheet and mounted on base of stand covering full area of frame. Drain plug/valve fitted as required.

Manifold

Fabricated pipe manifold to suit flow requirements terminating in BSP female or flange to suit customer requirements. Connection is made to the accumulator via socket weld fittings to manifold together with suitable pipe and couplings. Connecting pipe size to each accumulator up to 42m/m O.D. Special drilled manifold blocks can be manufactured to customer's requirements.

Isolating accumulators

For accumulator isolation. Hand operated On/Off type ball shut off valve, up to 11/2 BSP in size, fitted between each accumulator and the manifold.

Isolating station

Hand-operated on/off shut off valve at manifold termination, to suit manifold size.

Pressure indication/test point

Connecting the fluid side of each accumulator to a panel mounted pressure gauge, calibrated in Bar and PSI via 1/4 BSP isolating valve.

Drain indication/test point

Connecting each accumulator fluid port bleed port via suitably sized individual needle valves to common drain outlet, terminating in BSP female (or to suit customer requirements).

Accumulator Size	Number of Units						
37 Litre	1-2	3-4	5-6	7-8	9-10	11-12	13-14
Overall Length L	500	950	1300	1650	2000	2350	2700
Overall Height H	2250	2250	2250	2250	2250	2250	2250
54 Litre	1-2	3-4	5-6	7-8	9-10	11-12	13-14
Overall Length	500	950	1300	1650	2000	2350	2700
Overall Height	2700	2700	2700	2700	2700	2700	2700

Stand Dimensions

Finish

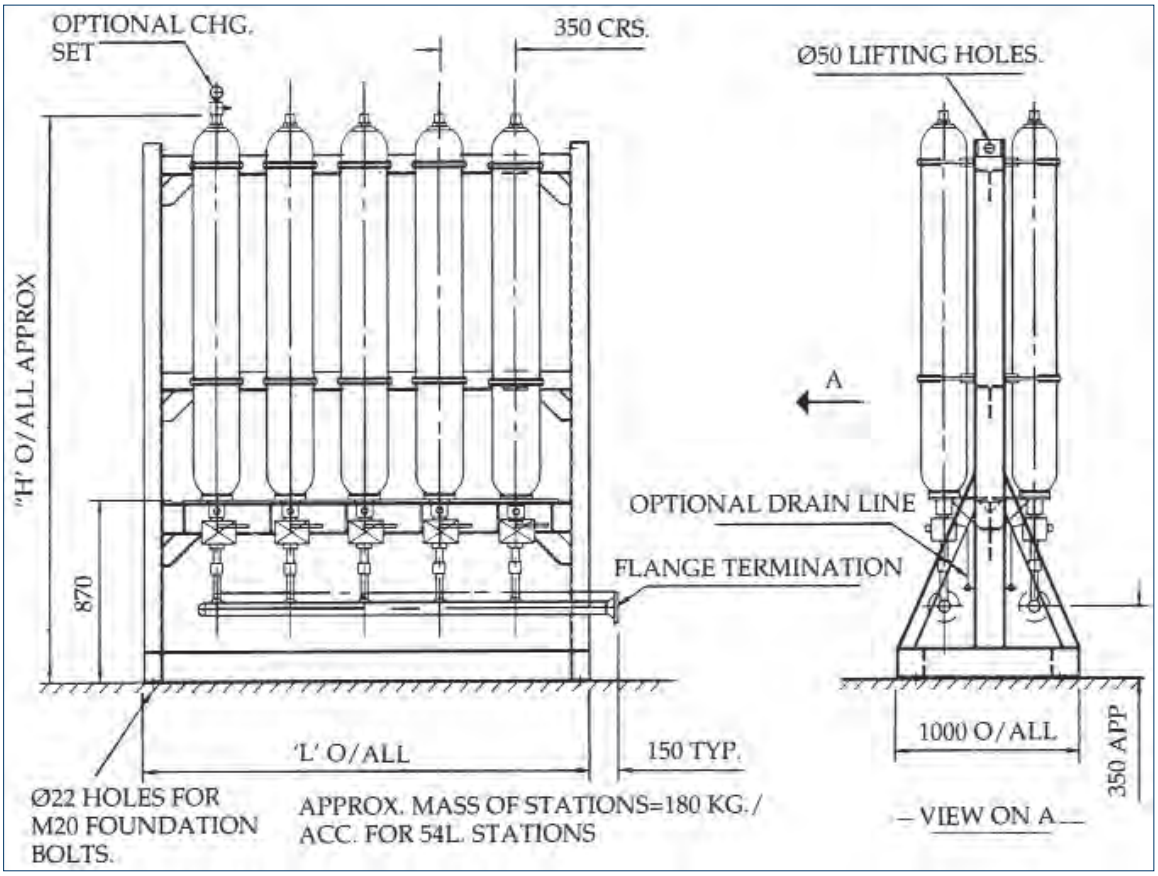
One coat blue machine enamel. (blue) frame/pipework.

Test optional - offshore/subsea specs

Test certificates for accumulators and back-up bottles available upon request.

The manifold and pipework are subjected to a static test, at 1.5 x system working pressure.

Typical stand installation dimensions



Accumulator Selection

Storage application

Data required

1. Maximum working pressure (bar)
2. Minimum allowable working pressure (bar)
3. Volume of stored fluid required (litres)
4. System flow rate
5. System fluid
6. Temperature

Notes

P3 = Maximum reliable system pressure

P2 = Minimum permitted system pressure

P1 = 90% of P2

Volumes delivered based on

P1 V1 = P3 V3 = Isothermal Compression

$P3\ V3^n = P2\ V2^n$ = Adiabatic Expansion where n = 1.4

Storage

The sizing of accumulators applies the law for the expansion and compression of gases which state $PV^n=C$, where 'n' depends on the type, temperature and pressure of the gas being used. When sizing an accumulator using nitrogen gas, n=1.4 is normally taken. The relationship between P1 V1, P2 V2 and P3 V3 is as follows:

P1 V1 = P3 V3 where an isothermal compression of the gas is assumed.

$P3\ V3^n = P2\ V2^n$ where an adiabatic expansion of the gas is assumed.

If you are considering using additional back-up vessels it is essential that:

a) The accumulator to which the back-up bottle(s) is connected is not holding more than four-fifths its own volume of fluid between precharge (P1) and maximum system pressures (P3).

b) Flow rate from accumulator does not exceed gas flow capability through back-up pipe work.

	Accumulator Discharge Volumes (Litres)															
	Standard Bladder Accumulator Sizes										Transfer Barrier with 50 litre Gas Back-up Bottle (BUB) fitted					
P3 / P2	0B	0F	01	03	04	10	20	28	37	54	28+ 1 BUB	37+ 1 BUB	37+ 2 BUB	54+ 1 BUB	54+ 2 BUB	P3/92
1.05	0.005	0.018	0.035	0.08	0.12	0.29	0.57	0.78	1.07	1.49	2.20	2.46	3.87	2.87	4.28	1.05
1.10	0.010	0.035	0.066	0.14	0.22	0.34	1.09	1.49	2.03	2.84	4.18	4.69	7.37	5.49	8.16	1.10
1.15	0.015	0.049	0.094	0.21	0.31	0.78	1.55	2.12	2.90	4.04	5.96	6.73	10.56	7.88	11.73	1.15
1.20	0.019	0.063	0.120	0.26	0.39	0.98	1.97	2.69	3.68	5.13	7.58	8.60		10.06	14.97	1.20
1.25	0.022	0.074	0.143	0.31	0.47	1.17	2.35	3.20	4.39	6.12	9.06	10.20		11.94	17.76	1.25
1.30	0.026	0.086	0.149	0.36	0.54	1.35	2.69	3.68	5.03	7.02		11.91		13.94		1.30
1.35	0.029	0.096	0.183	0.40	0.60	1.50	3.01	4.11	5.62	7.84		13.11		15.35		1.35
1.40	0.032	0.104	0.201	0.44	0.66	1.65	3.29	4.51	6.16	8.60				16.77		1.40
1.45	0.034	0.113	0.217	0.47	0.71	1.78	3.56	4.87	6.65	9.28				18.09		
1.50	0.036	0.121	0.231	0.50	0.76	1.90	3.80	5.20	7.11	9.98				19.33		
1.55	0.038	0.128	0.245	0.53	0.81	2.01	4.03	5.51	7.53	10.50						
1.60	0.041	0.135	0.258	0.56	0.85	2.12	4.23	5.79	7.89	11.04						
1.65	0.042	0.141	0.270	0.59	0.89	2.21	4.43	6.05	8.27	11.54						
1.70	0.044	0.146	0.280	0.61	0.92	2.30	4.60	6.30	8.60	12.01						
1.75	0.046	0.152	0.290	0.63	0.95	2.38	4.77	6.52	8.91	12.44						
1.80	0.047	0.157	0.300	0.65	0.98	2.46	4.92	6.73	9.20	12.84						
1.85	0.048	0.161	0.310	0.67	1.00	2.53	5.06	6.93	9.47	13.21						
1.90	0.049	0.165	0.320	0.69	1.04	2.60	5.20	7.11	9.71	13.56						
1.95	0.051	0.169	0.325	0.71	1.06	2.66	5.32	7.28	9.95	13.88						
2.00	0.052	0.173	0.331	0.72	1.09	2.72	5.44	7.44	10.17	14.19						
2.10	0.054	0.179	0.344	0.75	1.13	2.83	5.65	7.73	10.56	14.74						
2.20	0.056	0.186	0.355	0.77	1.17	2.92	5.84	7.98	10.91	15.23						
2.30	0.057	0.191	0.365	0.80	1.20	3.00	6.00	8.21	11.22	15.66						
2.40	0.059	0.195	0.374	0.82	1.23	3.07	6.18	8.41	11.49	16.04						
2.50	0.060	0.200	0.382	0.83	1.26	3.14	6.28	8.58	11.74	16.38						
2.60	0.061	0.203	0.389	0.85	1.28	3.20	6.39	8.74	11.95	16.68						
2.70	0.062	0.207	0.395	0.86	1.30	3.25	6.50	8.88	12.15	16.95						
2.80	0.063	0.210	0.401	0.87	1.32	3.29	6.59	9.01	12.32	17.19						
2.90	0.064	0.212	0.406	0.88	1.34	3.34	6.67	9.12	12.42	17.41						
3.00	0.065	0.215	0.411	0.89	1.35	3.37	6.75	9.22	12.61	17.60						
3.20	0.066	0.219	0.419	0.91	1.38	3.44	6.88	9.40	12.85	17.94						
3.40	0.067	0.222	0.425	0.92	1.40	3.49	6.98	9.54	13.04	18.20						
3.60	0.068	0.224	0.430	0.94	1.41	3.53	7.06	9.65	13.20	18.42						
3.80	0.069	0.227	0.434	0.95	1.43	3.57	7.13	9.75	13.33	18.60						
4.00	0.070	0.228	0.437	0.96	1.44	3.59	7.18	9.82	13.43	18.74						
4.50	0.075	0.231	0.443	0.97	1.46	3.64	7.28	9.45	13.61	18.98						

- Above volumes in litres discharged between P_3/P_2
- Pressure Ratio P3/P1>5

Above volumes in litres discharged between P3/P2

How to use the chart (Standard Bladder Accumulator selection)

Problem: What size of accumulator will discharge 1.4 litres of liquid between 140 bar and 120 bar.

1) P3/P2 = $\frac{140}{120}$ = 1.17

2) Find the value of P3/P2 which is equal to or next lowest to 1.17. In this case the value is 1.15.

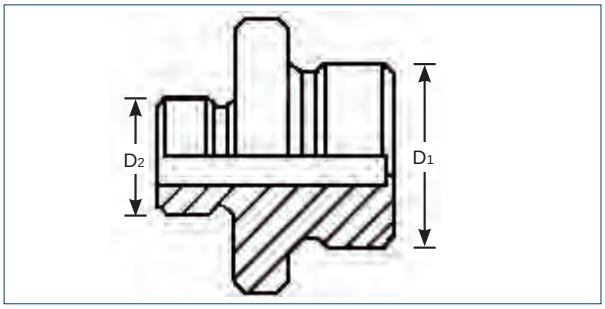
3) Select the accumulator reference equal to or next greater to 1.4 litres from the values located in the row 1.15 i.e. 1.55. Project upwards and read off the accumulator reference i.e. 20.

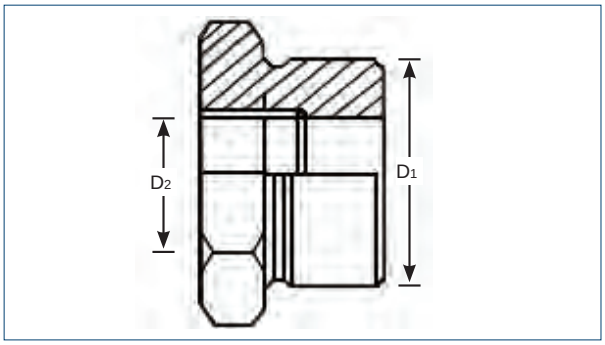
How to use the chart (Transfer Barrier selection)

1) Use this chart the same way as above but limiting volume discharged to that shown, so that V1 - V3 does not exceed 0.80 of actual accumulator shell volume. The corresponding pressure ratio is seen under the P3/P2 column.

2) See datasheet for dimension details of Transfer Barrier Accumulators and Back-up Bottles.

Adaptors & Bonded Seals





Specification

Capabilities

A range of adaptors which enables the accumulator fluid port and/or safety block to be connected onto standard bore pipelines simply and effectively is available. Required bonded seals are shown in the tables and should be ordered separately.

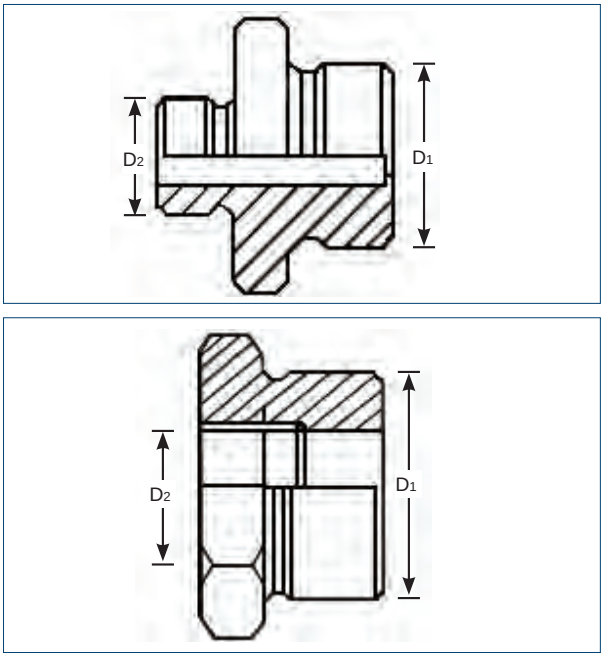
Male/Female Adaptor (BSP/NPT)

Part Number	D1	D2
50420- ***	G 2	1/4" NPT
50218- ***	G 2	3/8" NPT
50069- ***	G 2	1/2" NPT
50070- ***	G 2	3/4" NPT
50071- ***	G 2	1" NPT
50072- ***	G 2	1 1/4" NPT
50073- ***	G 2	1 1/2" NPT
51112- ***	G1½	1/4" NPT
51113- ***	G1½	3/8" NPT
51114- ***	G1½	1/2" NPT
50301- ***	G1½	3/4" NPT
51115- ***	G1½	1" NPT
50276- ***	G1½	1 1/4" NPT
51116- ***	G1¼	1/4" NPT
50804- ***	G1¼	3/8" NPT
50066- ***	G1¼	1/2" NPT
50067- ***	G1¼	3/4" NPT
50068- ***	G1¼	1" NPT
50101- ***	G 1	1/4" NPT
50225- ***	G 1	3/8" NPT
50064- ***	G 1	1/2" NPT
50065- ***	G 1	3/4" NPT
51021- ***	G¾	1/4" NPT
50274- ***	G¾	3/8" NPT
50287- ***	G¾	1/2" NPT
51117- ***	G½	1/4" NPT
51118- ***	G½	3/8" NPT
51119- ***	G 3/8	1/4" NPT

*** = *V10 (Carbon Steel)*
*** = *006 (Stainless Seet*

Male/Female Adaptor (BSP/NPT)

Part Number	D_1	D_2
51021- ***	G¾ M	1/4" NPT F
50274- ***	G¾ M	3/8" NPT F
50287- ***	G¾ M	1/2" NPT F
51116- ***	G1¼ M	1/4" NPT F
50804- ***	G1¼ M	3/8" NPT F
50066- ***	G1¼ M	1/2" NPT F
50067- ***	G1¼ M	3/4" NPT F
50068- ***	G1¼ M	1" NPT F
50420- ***	G 2 M	1/4" NPT F
50218- ***	G 2 M	3/8" NPT F
50069- ***	G 2 M	1/2" NPT F
50070- ***	G 2 M	3/4" NPT F
50071- ***	G 2 M	1" NPT F
50072- ***	G 2 M	1 1/4" NPT F
50073- ***	G 2 M	1 1/2" NPT



Male/Male Adaptor (BSP/BSP)

Part Number	D_1	D_2
50304-***	G1¼"M	G1"M
50716-***	G1¾"M	G½"M
50715-***	G1"M	G½"M
50713-***	G1¼"M	G½"M
50053-***	G1¾"M	G¾"M
50714-***	G1"M	G¾"M
50712-***	G1¼"M	G¾"M
50711-***	G2"M	G¾"M
50054-***	G1"M	G1"M
50055-***	G1¼"M	G1¼"M
50056-***	G2"M	G2"M
52012-***	G2"M	G1¼"M
50454-***	G2"M	G½"M

*** = *V10 (Carbon Steel)*
*** = *006 (Stainless Steel)*

Male/Female Adaptor (BSP/BSP)

Part Number	D_1	D_2
50036-***	G1 1/4"M	G1/4"F
50037-***	G1 1/4"M	G3/8"F
50038-***	G1 1/4"M	G1/2"F
50039-***	G1 1/4"M	G5/8"F
50040-***	G1 1/4"M	G3/4"F
50033-***	G2"M	G1/4"F
50015-***	G2"M	G3/8"F
50042-***	G2"M	G1/2"F
50043-***	G2"M	G3/4"F
50044-***	G2"M	G1"F
50045-***	G2"M	G1 1/4"F
50046-***	G2"M	G1 1/2"F

*** = *V10 (Carbon Steel)*
*** = *006 (Stainless Steel)*

Bonded seals

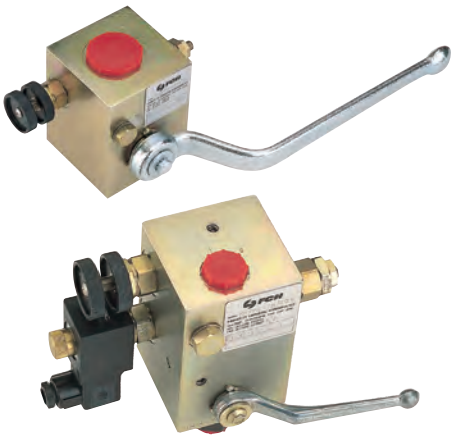
Part Number	Description
40501-***	G1/4"
40502-***	G3/8"
40503-***	G1/2"
40505-***	G3/4"
40507-***	G1"
40508-***	G1 1/4"
40509-***	G1 1/2"
40511-***	G2"

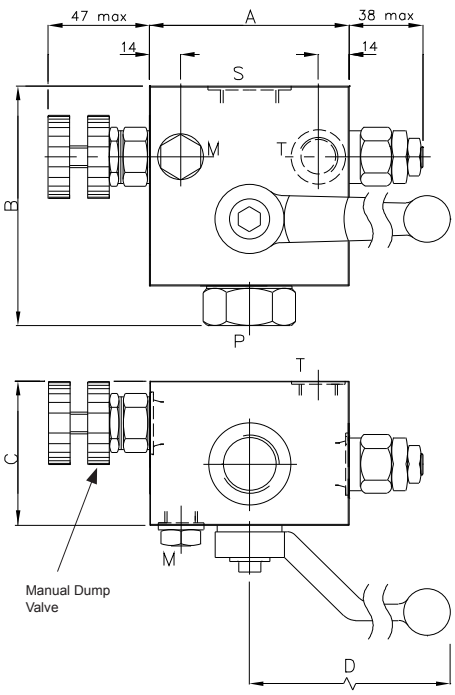
*** = *A97 (Carbon steel/ Nitrile)*
*** = *A98 (Stainless steel/ Nitrile)*
Note: 'G' is equivalent to BSP

Other adaptor variations available please contact us for futher details.

Safety Blocks

Carbon & Stainless Steel





Why use a safety block?

Accident prevention authorities recommend the fitting of a pressure relief valve to gas loaded hydraulic accumulators. The OLAER Fawcett Christie range of carbon steel safety blocks include features to make the installation, operation and maintenance of gas loaded hydraulic accumulators convenient and safe.

Carbon Steel (345 Bar)

Pressure

Maximum working pressure: 345 bar

Materials

Carbon steel. All blocks are fully tested.

Seals

Nitrile fitted as standard. Viton and other options also available.

Connections

- Pressure gauge connection (M port).
- Wide range of adaptors for accumulator connection.
- All G threads (BSP) to BS2779 1986. Performance data available.

Other

- Pressure relief valve for the protection of accumulator.
- Manual dump to tank valve as standard.
- Optional additional electomagnetic dump to tank valve.

Port sizes

Port Sizes					Dimensions mm - for standard (01) safety block			
Size	S port Accum.	P port process	T port tank	M port gauge	A	B	C	D handle length
ECA12	G 1/2	G 1/2"	G 1/4"	G 1/4"	76	93	60	115
ECA20	G 3/4"	G 3/4"	G 3/8"	G 1/4"	90	108	70	160
ECA32	G1 1/4"	G1 1/4"	G 3/8"	G 1/4"	90	131	90	300

For dimensions of (02) safety block with additional solenoid valve contact the sales office.

Safety Block - Carbon Steel

Model numbers

ECA12 - 01 - L - N

Model Type & Size

Dump to tank valve (type)

01 = Mechanical
02 = Mechanical & Electrical

Seal Material

L = Nitrile
V = Flurocarbon

Special Requirements

N = None
A = 110v AC
G = 24v DC
B = 220v AC

Stainless Steel Safety Block

Materials

316 Stainless steel. All blocks are fully tested.

Seals

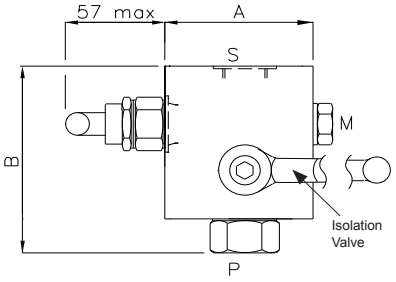
Nitrile fitted as standard. Viton and other options also available.

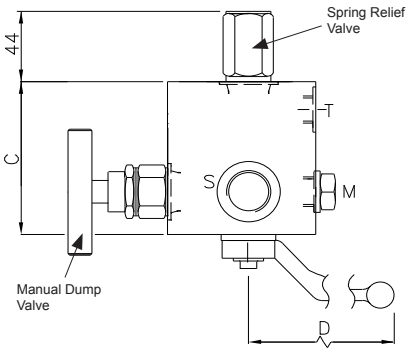
Connections

- Pressure gauge connection (M port).
- Wide range of adaptors for accumulator connection.
- All G threads (BSP) to BS2779 1986.
- For 760 bar only - All NPT to ANSI/ASME B.1.20.1 1983
- Performance data available.

Other

- Pressure relief valve for the protection of accumulator.
- Manual dump to tank valve as standard.





345 bar

Port sizes

Port Sizes					Dimensions mm - for standard (01) safety block			
Size	S port Accum.	P port process	T port tank	M port gauge	A	B	C	D handle length
ECSA12	G 1/2"	G 1/2"	G 1/4"	G 1/4"	65	94	76	115
ECSA20	G 3/4"	G 3/4"	G 3/8"	G 1/4"	70	108	90	160
ECSA32	G1 1/4"	G1 1/4"	G 3/8"	G 1/4"	90	131	105	300

690 bar

Port sizes

Port Sizes					Dimensions mm - for standard (01) safety block			
Size	S port Accum.	P port process	T port tank	M port gauge	A	B	C	D handle length
ECSA12	1/2	1/2	1/4"	1/4"	70	94	85	115

- All NPT to ANSI/ASME B.1.20.1 1983
- All G threads (BSP) to BS2779 1986

Safety Block - Stainless Steel

Model numbers (345 bar)

ECSA12 - 01 - L - N

Model Type & Size

Dump to tank valve (type)

01 = Mechanical

Seal Material

L = Nitrile
V = Flurocarbon

Special Requirements

N = None

Safety Block - Stainless Steel

Model numbers (690 bar)

ECSA12 - 01 - L - N - 2

Model Type & Size

Dump to tank valve (type)

01 = Mechanical

Seal Material

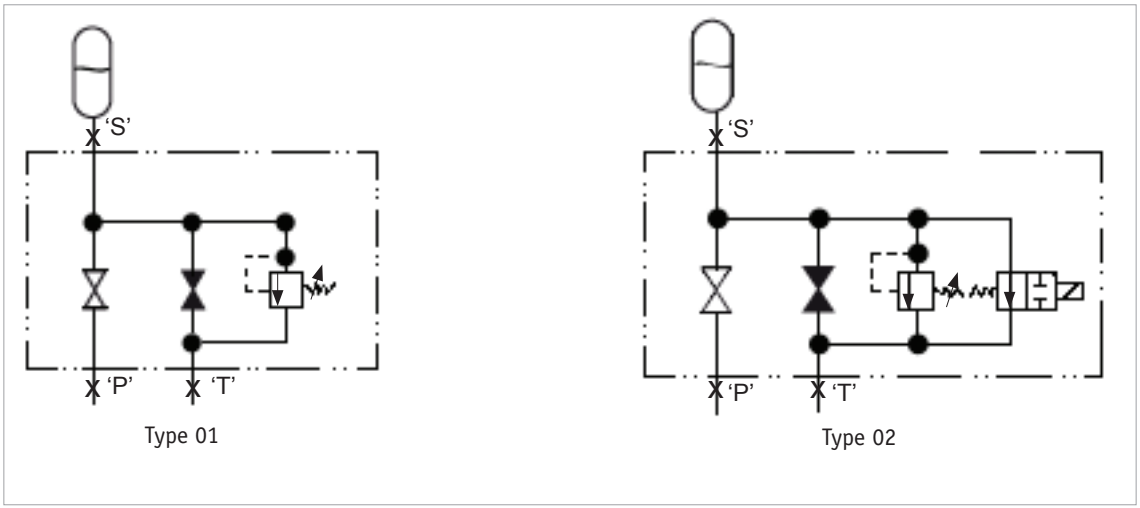
L = Nitrile
V = Flurocarbon

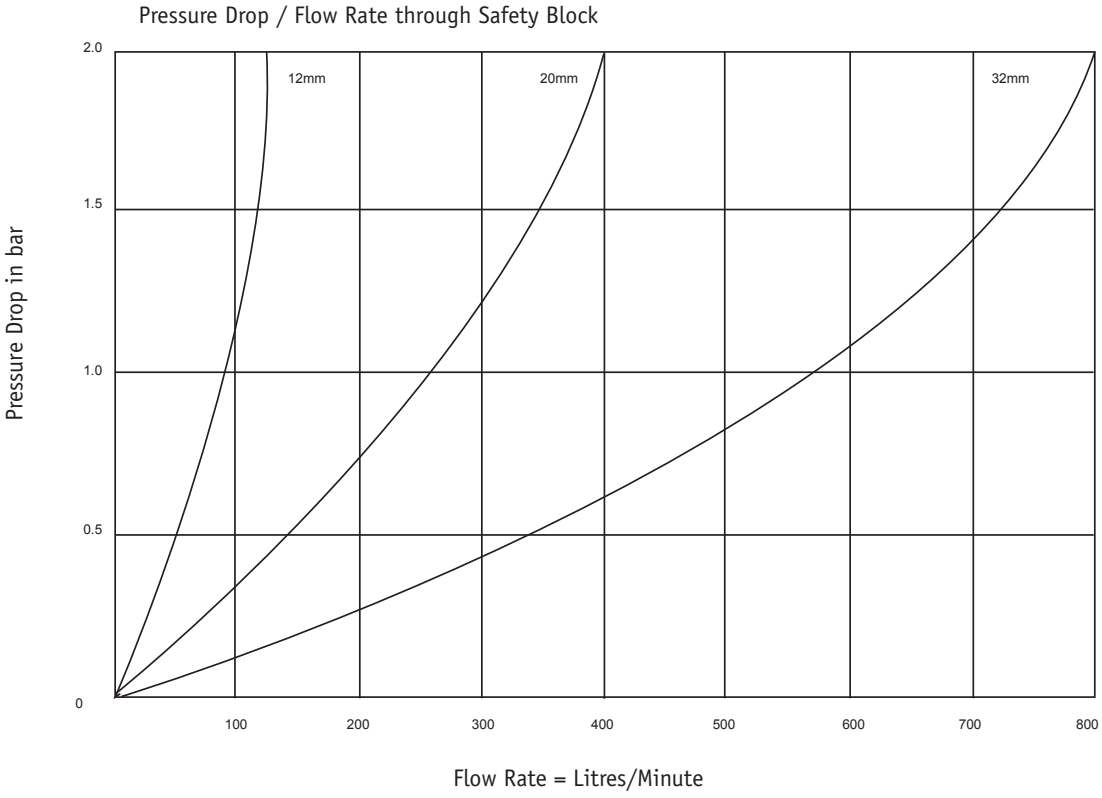
Special Requirements

N = None

2 = BSP 3= NPT

Pressure curves for ECA/ECSA safety blocks





Permanent Charging Sets

Specification

Permanent Charging Set

The permanent charging set comprises of:

- Carbon Seel Body (available in stainless steel)
- Hose Connections
- Pressure Gauge

Its maximim working pressure is 400 bar.

Part Number	Pressure Range	Guage Part No
10570-01	0 - 10 bar	45056 - 099
10570-02	0 - 25 bar	45080 - 099
10570-03	0 - 60 bar	45081 - 099
10570-04	0 - 160 bar	45082 - 099
10570-05	0 - 250 bar	45853 - 099
10570-06	0 - 400 bar	45021 - 099

Stainless steel part number : 10578 - **

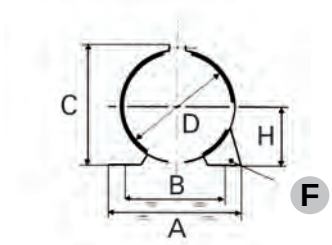
Euro Clamps & Brackets

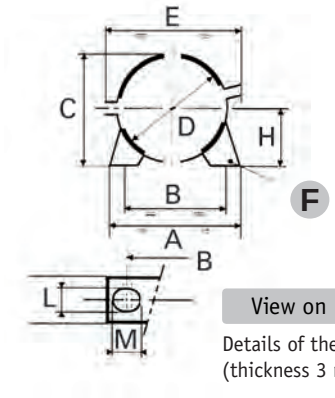
Specifications

Clamps

- Carbon steel construction protected to resist corrosion
- European standard dimensions for ease of interchageability.
- Rubber insert provided to reduce mechanical virbration and to compensate for shell manufacturing tolerances.
- Supplied without foot mounting bolts.

Shape A B*





View on F

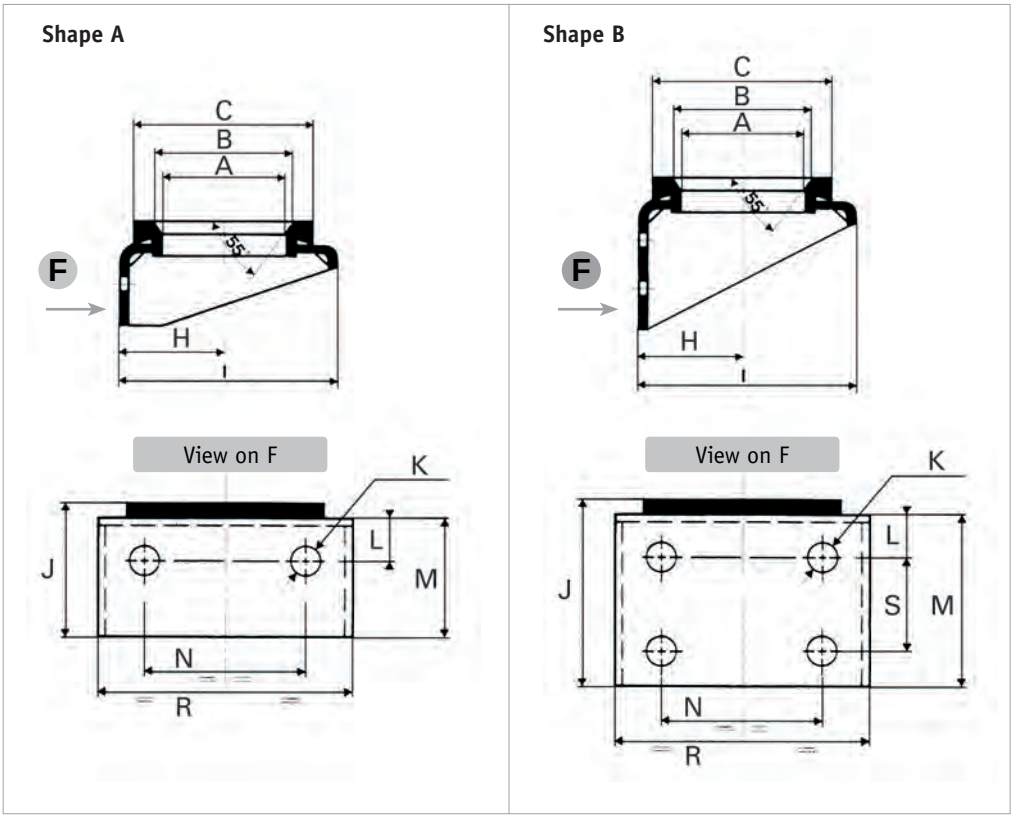
Details of the legs (thickness 3 mm)

Dimensions clamps

Part Number	Model Number	Shape	Dimensions								
			Dia 'D'	H	A	B	C	E	K	L	M
201492-03625	A 56	A	56	36	134	97	92	-	30	9	14
201497-04725	B 90	B	90	53	134	97	127	-	30	9	14
200570-03625	B 114*	B	114	76	138	100	159	-	30	9	14
201270-03625*	B 121	B	121	73	138	100	164	-	30	9	14
201267-03625*	C 168	C	168	92	188	148	181	230	40	9	14
202310-03625*	D 226	D	226	123	270	216	241	290	40	15	21

* Recommended in case of strong vibrations and also for steel works applications

Brackets



Dimensions brackets

Part Number	Model Number	Shape	Dimensions												
			A	B	C	H	I	J	K	L	M	N	R	S	Weight
201519-03620	CE 89	A	89	101	125	73	140	75	13	25	60	75	130	-	0.8
201187-03620	CE 108	A	108	120	150	92	175	95	17	25	80	160	210	-	1.5
201090-03620	CE 159	B	159	170	200	123	235	115	17	25	100	200	260	40	2.5

Clamps & Brackets

Specification

Clamps

Designed to allow quick and easy installation of accumulators, the clamps and bracket assemblies are available to fit accumulator capacities shown below.

OLAER Fawcett Chrisite accumulator clamps are fabricated from stainless steel, brackets from carbon steel and come complete with rubber cushion mouldings. Each assembly is supplied with mounting bolts.

Nitrile rubber mouldings fitted to the supports give rigid mounting to the accumulator and eliminate any vibration and noise.

Diagram A

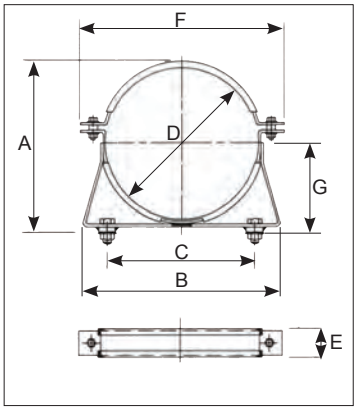


Diagram B

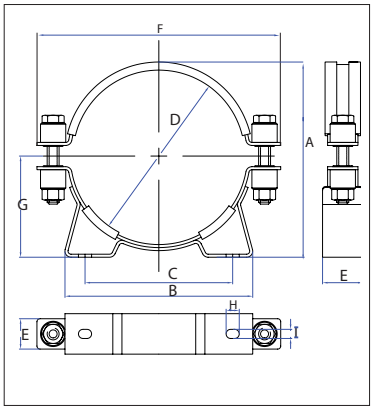
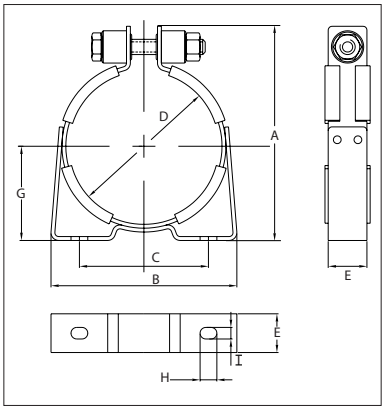


Diagram C

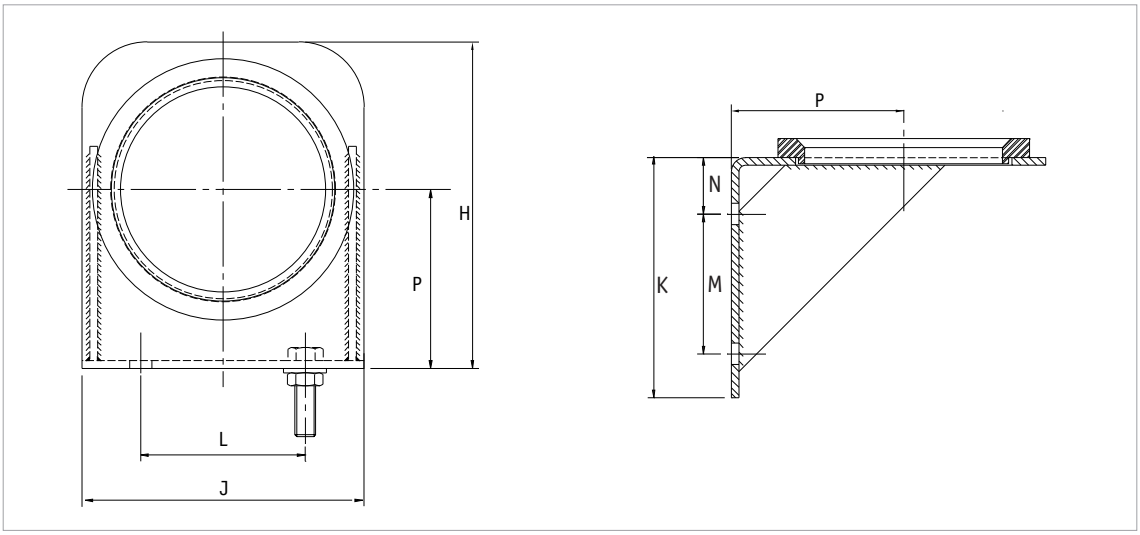


Model Number	Diagram	Accumulator Capacity (L)	Dimensions									Mounting Bolts	Mass (kg)
			A	B	C	D	E	F	G (ref)	H	I		
10957	C	0.6	143	127	90	96	30	-	60	13	9	M8 x 30	0.59
10981*	C	1 - 3	137	144	100	111-116	30	-	73	13	9	M8 x 80	0.75
10982*	B	4 - 9	190	186	146	170	30	244	100	13	9	M8 x 80	1.25
10983*	B	10 - 54	250	267	211	218-228	40	306	129	21	15	M12x80	1.50
11060	A	12 - 54 HP200	270	280	220	256-261	40	345	140	10.5	10.5	M10 x 50	2.00

* Recently superseded. Previous part details:

Model Number	Diagram	Accumulator Capacity (L)	Dimensions							Mounting Bolts	Mass (kg)
			A	B	C	D	E	F	G (ref)		
10958 superseded by 10981	C	1 - 3	140	165	120	112-114	34	165	72	M10 x 30	0.71
10959 superseded by 10982	B	4 - 9	200	190	148	165-168	34	250	100	M10 x 30	0.91
10960 superseded by 10983	B	10 - 54	263	295	195	220-230	40	295	134	M10 x 45	1.50

Brackets



Brackets are manufactured from carbon steel

Support bracket assembly (c/w cushion ring)

Mounting bolts - M16 X 70

Spare cushion rings

4 to 9L part number: 48472-A00

10 to 54L part number: 48473-A00

Model Number	Accumulator Capacity (L)	Dimensions							Mass
		H	J	K	L	M	N	P	
10962	4 - 9	185	165	150	85	85	40	102	2.5 kg
10961	10 - 54	250	216	191	108	111	45	130	6kg
11061	12 - 54	250	240	191	108	111	45	140	7kg

Euro Precharging Kits

Decription

The precharge tester and pressurizer are used for the charging of bladder, piston and membrane accumulators with nitrogen, and for testing or changing the pre-charge pressure. The instrument is suitable for OLAER Fawcett Christie accumulators with ⅝“ and ⅞“ stem valves, Schrader valves or screw plugs.It is screwed onto the gas valve of the accumulator and connected with the charging hose to a standard nitrogen cylinder . If only the pre-charge pressure needs to be checked, the connection of the charging hose is not necessary.

Each unit comprises of:

-Tester and pressurizer with manometer, return valve on the charging hose connection, built-in release valve, valve spindle for opening the gas valve or screwplug

- Charging hose, length 2,5 m
- Connections for the accumulator:
  - ♦ 7/8” - 14 UNF
  - ♦ 5/8” - 18 UNF
  - ♦ 0.302” - 32 UNF
  - ♦ M28 x 1.5
  - ♦ 1/4” BSP
- Plastic protective case

Maximum permitted operating pressure: depending on manometer, **max. 400 bar!** Tighten Allen screw on membrane accumulator with 20 Nm torque.

Euro Precharing Kits

Handling and Precharging Procedure

PREPARATION

Before any pre-charge checks and/or nitrogen pressurizing, the hydraulic fluid of the accumulator must be discharged.

Accumulator with gas valve:

- Turn star knob (no. 1) anti-clockwise till stop.
- Remove the protective and/or seating cap of the gas valve.
- Attach pressurizer with adapter no. B or C (+ connector no. D for Schrader valves) to the gas valve.

Move the manometer into a convenient position for reading and tighten spigot nut (no. 2) with hand.

- Check that the bleed valve is closed (turn star knob no. 3 clockwise).

Accumulator with screw valve:

- Turn star knob (no. 1) anti-clockwise till stop.
- Remove plastic cover of screw valve.
- Loosen screw valve with Allen screw width A/F 6.
- Attach pressurizer without adapter to the screw valve. Move the manometer into a convenient position for reading and tighten the spigot nut (no. 2) by hand.
- Check that the bleed valve is closed (turn star knob no. 3 clockwise).

CHECKING THE PRE-CHARGE PRESSURE

- Turn star knob (no.1) clockwise respectively anti-clockwise.
- The gas valve or Allen screw opens and pre-charge pressure will register on the manometer.

REDUCING THE PRE-CHARGE PRESSURE

- Turn star knob (no.3) of the bleed valve slowly anti-clockwise to exhaust the pre-charge pressure.

PRESSURIZNG / RAISING THE PRE-CHARGE PRESSURE

- Attach charging hose to return valve (no.4) and to nitrogen bottle.
- Open the stop valve on the nitrogen cylinder carefully. Let the nitrogen flow slowly in the accumulator, till the desired pre-charge pressure is reached.
- Close the stop valve on the nitrogen cylinder. After 5-10 minutes (temperature compensation), check the pre-charge pressure again and correct, if necessary.

REMOVING

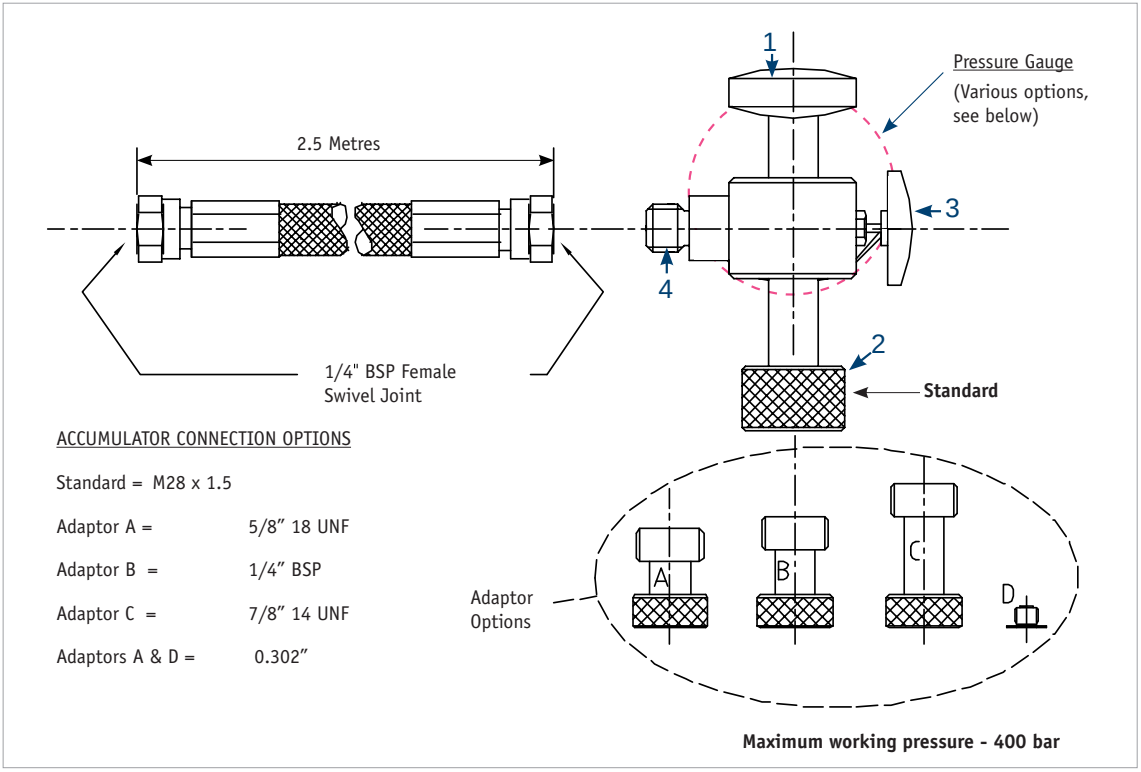
- Turn star knob (no.1) back.
- Turn star knob (no.3) anti-clockwise to exhaust the pressurizer and charging hose.
- Remove the pressurizer.
- Tighten screw valve with Allen screw width A/F 6.
- Test the gas valve for leaks using a leak detection spray.
- Replace the protective and/or seating cap with hand.

Caution:

- NEVER use oxygen to prefill the accumulator.

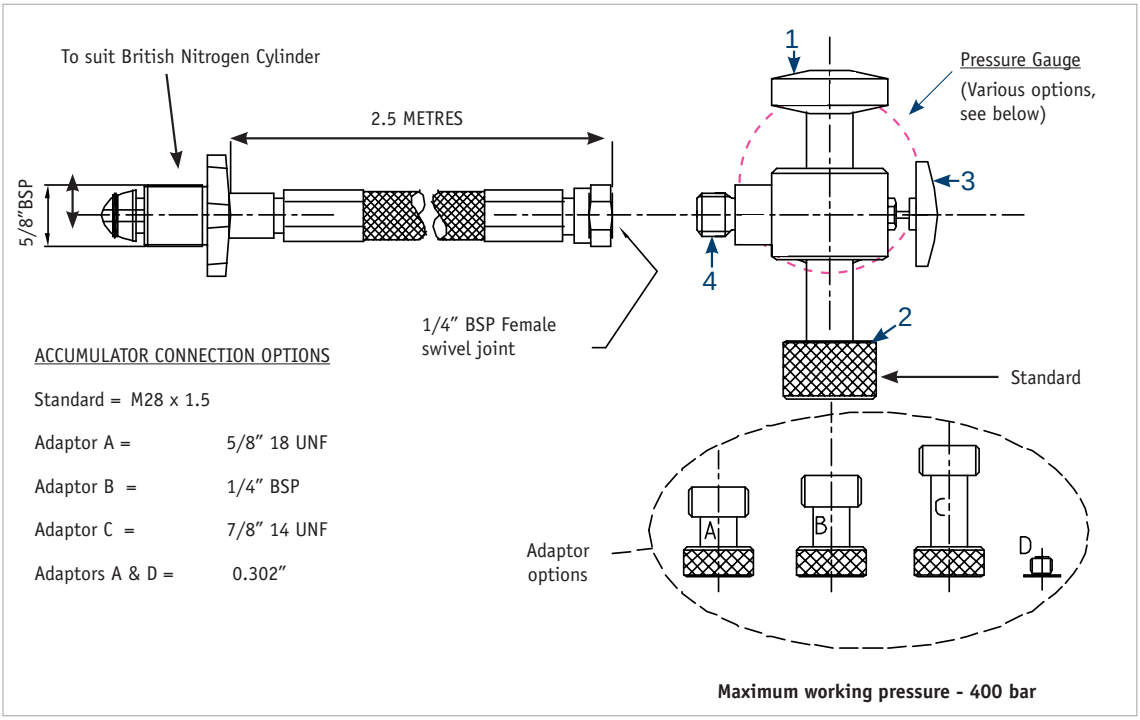
Where the nitrogen cylinder pressure is higher than the permitted accumulator working pressure, a pressure-reducing valve must be used in between!

Drawing for Euro Precharge Kit - 10598 - ** (1/4 BSP)



Assembly Part Number				Component Part	
10598-01	10598-02	10598-03	10598-04	Charging Kit Assembly	Part No.
1	1	1	1	Olaer charging set	202139-00803
1	1	1	1	Charging hose	50096 - 099
1				Pressure gauge 0 - 25 bar	45083 - 099
1			1	Pressure gauge 0 - 250 bar	45086 - 099
	1		1	Pressure gauge 0 - 60 bar	45084 - 099
	1			Pressure gauge 0 - 400 bar	45087 - 099
		1		Pressure gauge 0 - 10 bar	45117 - 099
		1		Pressure gauge 0 - 160 bar	45085 - 099

Drawing for Euro Precharge Kit - 10597 - ** (British Nitrogen Cylinder)



Assembly Part Number						Component Part	
10597-01	10597-02	10597-03	10597-04	10597-05	10597-06	Charging Kit Assembly	Part No.
1	1	1	1	1	1	Olaer charging set	202139-00803
1	1	1	1	1	1	Charging hose	11774
1				1		Pressure gauge 0 - 25 bar	45083 - 099
1			1		1	Pressure gauge 0 - 250 bar	45086 - 099
	1		1			Pressure gauge 0 - 60 bar	45084 - 099
	1					Pressure gauge 0 - 400 bar	45087 - 099
		1				Pressure gauge 0 - 10 bar	45117 - 099
		1		1	1	Pressure gauge 0 - 160 bar	45085 - 099

Charging Kit with hose burst valve

Specification

A microbore hose with hose burst valve has been incorporated within the kit to prevent injury occurring as a result of hose whip. Hose whip can occur due to the sudden release of energy. When a hose fails it could cause serious harm to personnel in the vicinity.

Benefits

Each kit comes with a Microbore Hose which is offers greater flexibility and is easier to use than a standard hose. Other key benefits of the Microbore hose design are:

- Reduced flow rate to minimize the possibility of a bursting bladder during precharging.
- Detachable gas bottle adaptor that can be changed without replacing whole assembly.
- Olaer specially designed flow restriction hose burst valve that prevents hose whip and potential injury in the case of hose failure.
- The hose burst valve will close if the nitrogen supply is too high or if the supply valve was opened too fast.
- After closing the nitrogen supply valve there will be a short delay before the safety valve automatically opens again.

Other benefits of this kit include:

- The charging body can be used as a stand alone device which permits precharge checking.
- **Maximum working pressure: 350 bar.**
- A wide selection of gauges are available for inclusion in this kit.
- Each kit contains 3 different charging adaptors which will accommodate the majority of European bladder and piston accumulators.
- Spare seals included.
- All parts in the kit are contained within a foam filled damage resistant, polypropylene case.

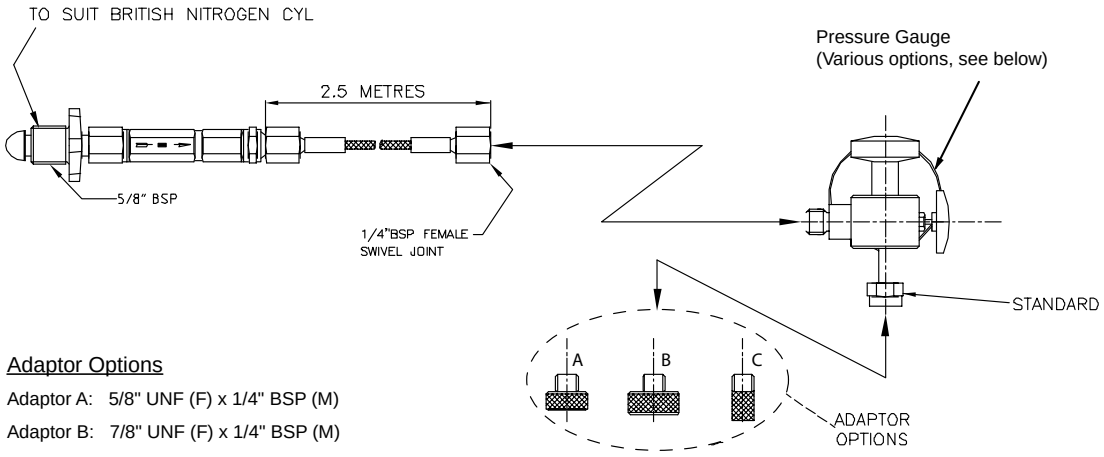
Contents

Each Charging Kit contains:

1. Hose burst valve
2. Microbore hose
3. Safety pattern pressure gauges
4. Charging adaptors
5. Spare seals
6. Charging set body
7. Protective Case (Not labelled, see picture above)

Assembly Part Number						Component Part	
10607-01	10607-02	10607-03	10607-04	10607-05	10607-06	Charging Kit Assembly	Part No.
1	1	1	1	1	1	Olaer charging set	10608
1	1	1	1	1	1	Charging hose assembly	10609
1				1		Pressure gauge 0 - 25 bar	45083-099
1			1		1	Pressure gauge 0 - 250 bar	45086-099
	1		1			Pressure gauge 0 - 60 bar	45084-099
	1					Pressure gauge 0 - 400 bar	45087-099
		1				Pressure gauge 0 - 10 bar	45117-099
		1		1	1	Pressure gauge 0 - 160 bar	45085-099

Drawing for Charging Kit with Host Burst Valve - 10607-**



Adaptor Options

Adaptor A: 5/8" UNF (F) x 1/4" BSP (M)

Adaptor B: 7/8" UNF (F) x 1/4" BSP (M)

Adaptor C: 0.302" X 32 TPI (F) x 1/4" BSP (M)

Maximum working pressure - 350 bar

Olaer Hose Burst Valve

Nitrogen Precharging

Precharging

USE ONLY oxygen-free DRY NITROGEN GAS.

1. All accumulators are supplied without precharge unless a precharge pressure is specified when ordering. Prior to applying hydraulic pressure to the system all accumulators must be precharged with nitrogen.
2. Check details of accumulator on label and shell for maximum working pressure. The maximum hydraulic system pressure must not exceed the MWP of the accumulator.
3. Always use a nitrogen pressure regulator valve when the accumulator shell pressure rating is lower than gas pressure in nitrogen cylinder.
4. Precharge pressures vary with operating conditions. CONSULT OLAER Fawcett Christie if no precharge has been previously recommended. For a guide the following values can be used; - Storage application: 90% of minimum allowable system pressure, Shock application: 90% of flow pressure at accumulator position, Pulsation application: 70% of mean pumping pressure, NB. Allowing precharge to fall below 20% of maximum system pressure in a bladder accumulator may cause premature failure of the bladder. Excessive precharge pressures in relation to minimum system pressure may cause failures of the bladder and/or poppet valve and in piston accumulators, may cause excessive stresses due to the piston frequently contacting the end cap.
5. Ensure that moving parts such as bladders and pistons are adequately lubricated with system fluid before commencing precharging. This is especially important where the system fluid is of low viscosity e.g. water based.

CONSULT OLAER Fawcett Christie FOR FURTHER INFORMATION.

Precharging Procedure

The following procedures should be adopted for safe precharging of accumulators.

For accumulators having a working pressure less than the nitrogen source refer to fig.2.

For accumulators having a working pressure equal to or greater than the nitrogen source refer to fig.3. see note 4.

For accumulators fitted with a permanent charging set refer to fig.4.

Procedure 1. Using a Nitrogen Pressure Regulatoe Valve (NPRV) fig.2

- Remove protective cap (1) if fitted and sealing cap (2).
- Attach NPRV (3) to nitrogen cylinder (4). Ensure centre spindle (10) is fully unwound.
- Attach charging set (5) to accumulator gas valve assembly (6) and connect charging hose (7) between NPRV (3) and charging set connection.
- Back off handle (8) anti-clockwise until loose, check gas bleed valve (9) on charging set is closed and screw handwheel (10) clockwise to open gas valve. **Do not screw knob down tight.**
- Open nitrogen cylinder valve by turning key (11), cylinder pressure will register on right-hand gauge (12). This pressure should be checked against the required precharge pressure.
- Turn handle (8) clockwise until outlet pressure on left-hand gauge (13) registers 10% higher than required precharge pressure. When pressure on the charging set and outlet gauges are equal, close nitrogen cylinder valve.
- Turn handwheel (10) anti-clockwise to seal gas valve.
- Crack bleed valve (9) to exhaust gas from charging hose and remove hose from charging set and replace hose connection sealing cap.
- Close bleed valve, turn handwheel (10) clockwise to open gas valve. **Do not screw knob down tight**. Crack bleed valve (9) to vent down to required precharge pressure. Close bleed valve.
- Turn handwheel (10) anti-clockwise to reseal gas valve, crack bleed valve and remove charging set from accumulator.
- Test gas valve for leaks using a leak detection spray or a soapy water solution.
- Replace sealing cap (2), tighten with pliers, and protective cap (1) if fitted.

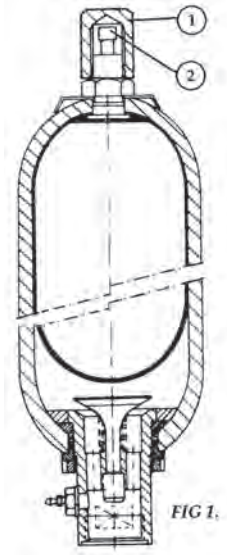


FIG 1.

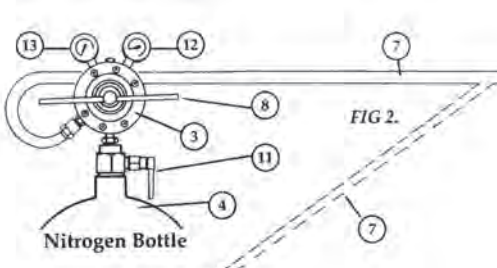


FIG 2.

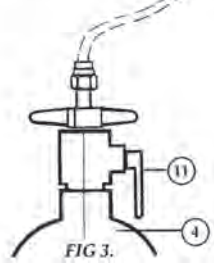


FIG 3.

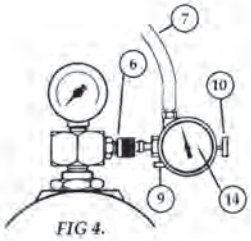


FIG 4.

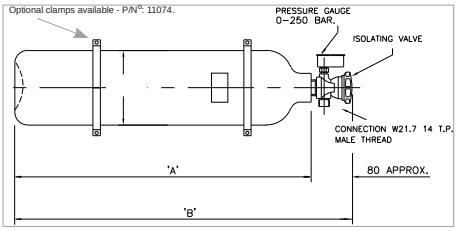
Procedure 2. Nitrogen Pressure Regulator Valve (NPRV) not required fig.2

- Remove protective cap (1) if fitted and sealing cap (2).
- Attach charging set (5) to accumulator gas valve assembly (6). Ensure centre spindle (10) is fully unwound.
- Connect charging hose (7) to nitrogen cylinder (4) using the appropriate adaptor, and attach the free end to the charging set.
- Turn handwheel (10) clockwise to open gas valve. Do not screw knob down tight. Slowly open nitrogen cylinder by turning key (11).
- Allow pressure on the gauge (14) to read slightly in excess of required precharge and then close nitrogen cylinder valve.
- Turn handwheel (10) anti-clockwise to seal gas valve.
- Crack bleed valve (9) to exhaust gas from charging hose and remove hose from charging set and replace hose connection sealing cap.

Procedure 3. Permanent Charging Set fitted fig. 4

Follow steps of Procedures 1 or 2 as appropriate but connect to the permanent charging set as shown in fig.4.

Precharging Kit Complete with Nitrogen Cylinder



Specification

For reliability in service, gas-loaded accumulators should have their nitrogen precharge pressure checked every 6 months.

Our new lightweight portable precharging kit includes all the necessary equipment to keep your systems trouble-free.

Comprising

- 6 or 12 litre Nitrogen bottle complete with carrying strap.
- Hose
- Miscellaneous adaptors
- Regulator
- Gauges

Important Information

1. Use only high purity nitrogen gas.
2. Prior to installation all accumulators must be precharged.
3. Check label for working pressure.
4. Always use a nitrogen regulator when the pressure rating of the accumulator is lower than the gas pressure in the nitrogen cylinder.
5. Precharges very with operating conditions. For a guide the following can be used:

   Storage applications: 90% of mean pumping pressure

   Shock applications: 70% of flow pressure at accumulator position

   N.B. Precharge must never be below 20% of maximum system pressure.
6. Ensure bladder has been lubricated with system fluid before commencing precharging
7. If in doubt check with OLAER Fawcett Christie.

For Nitrogen Bottles 6 & 12 Litres

- Carbon steel construction.
- Design pressures up to 200 Bar.
- Pressure gauge full safety pattern type.
- Designed in accordance with PED 97/23/EC

Nom	Dim A	Dim B	Weight	Part Number
6 Litres	535	615	8.0kg	65396
12 Litres	985	1065	17.5kg	65376

Portable Charging Sets

Specification

Portable Charging Set

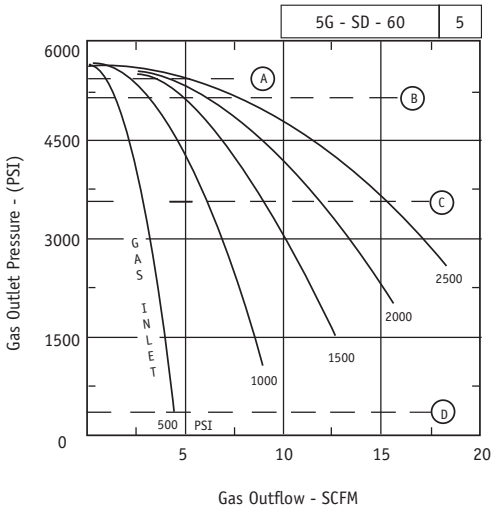
The portable charging set comprises of:

- Stainless steel body
- Bleed valve
- Hose connection
- Pressure gauge

Maximum working pressure 400 bar

Part Number	Pressure Range	Guage Part No
10550-01	0 - 10 bar	45056 - 099
10550-02	0 - 25 bar	45080 - 099
10550-03	0 - 60 bar	45081 - 099
10575-04	0 - 160 bar	45082 - 099
10550-05	0 - 250 bar	45853 - 099
10550-06	0 - 400 bar	45021 - 099

Portable Lightweight Nitrogen Booster



Dashed lines represent approximate air drive consumption.
A = 15 SCFM C = 50 SCFM
B = 20 SCFM D = 75 SCFM

Specification

The OLAER Fawcett Christie portable nitrogen booster has the following features:

- Lightweight
- Robust
- Intrinsically safe
- User friendly
- Versatile
- ATEX approved

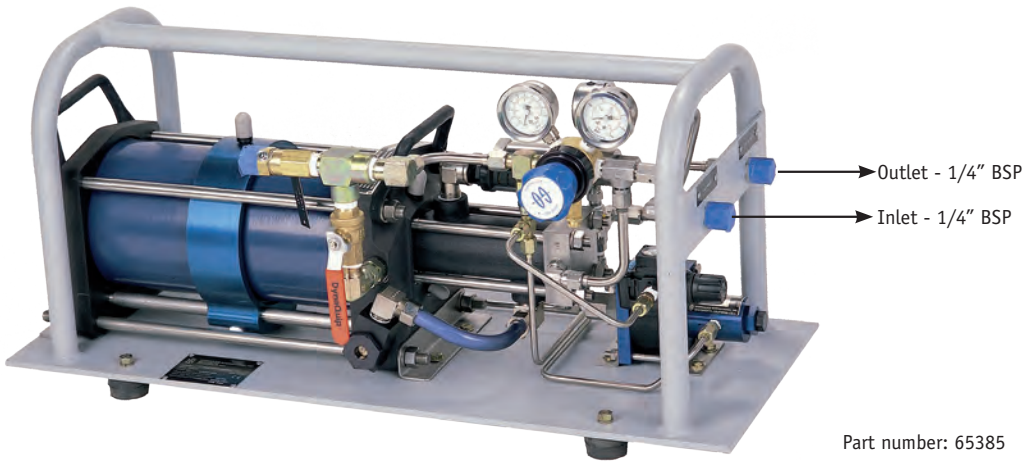
It requires no electricity, only an air supply is needed to drive the booster. It can even be driven by the nitrogen gas i.e. it is selfsupporting.

It can fill accumulators up to 400 bar and nitrogen bottles can be emptied down to approximately 35 bar.

Technical Details

- Gas booster model 65385
- Single acting, double drive section.
- Note: (1) Maximum safe pressure is based on a minimum 4:1 safety factor on the ultimate strength of the hardware exposed to this pressure.
- Approximate practical pressures based on 95 psi drive and 505 efficiency with nitrogen gas.
- Outlet psi 5700 (max)
- Inlet psi 400 (min)
- Performance curves based on an air drive source of approximately 95psi 1/2" ID piping

Safe Pressure		Displacement per cycle Cu.In.	Approx. outlet stall pressure (PSI)	Envelope Dim., Inches	Weight (Kg)
Outlet PSI Max	Inlet PSI Max				
9000	9000	3.1	60 x drive PSI	30(L) x 14(H) x 12(W)	31



Part number: 65385

Nitrogen Pressure Regulator Valves

Typical Nitrogen Pressure Regulator.

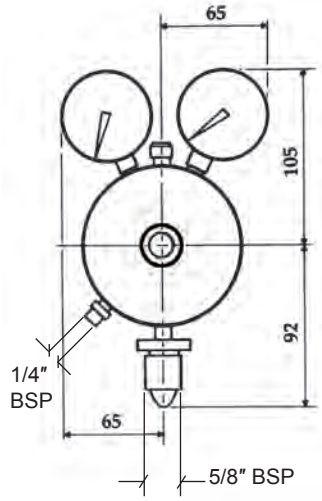
Gauges will vary depending on pressure requirement.

Specification

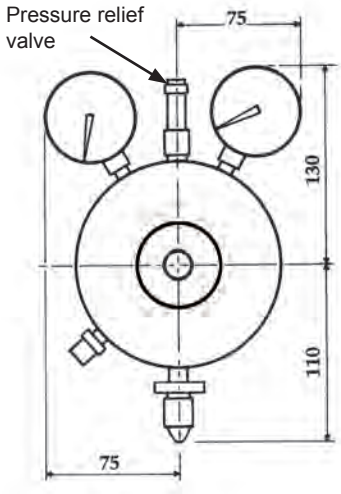
OLAER Fawcett Christie Nitrogen Pressure Regulator Valves have been introduced to assist users of hydraulic accumulators during the operation of nitrogen precharging.

Fitted onto the nitrogen bottle, these valves offer both increased levels of safety and greater convenience, regulating the gas outlet pressure to the required precharge pressure.

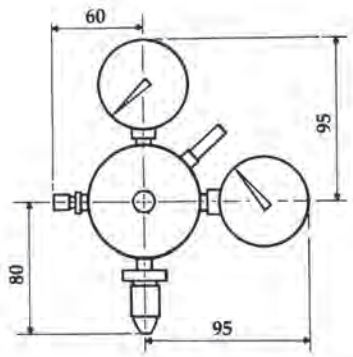
Always use a nitrogen regulator when the pressure rating of the accumulator is lower than the gas pressure in the nitrogen cylinder.



Part Number:	50203-099
Precharged Outlet Pressure:	0 - 10 bar
Inlet Pressure:	230 bar (max.)



Part Number:	50204-099
Precharged Outlet Pressure:	0 - 42 bar
Inlet Pressure:	230 bar (max.)



Part Number:	50205-099
Precharged Outlet Pressure:	0-100 bar
Inlet Pressure:	230 bar (max.)

Part Number:	50206-099
Precharged Outlet Pressure:	0-170 bar
Inlet Pressure:	230 bar (max.)

Universal Charging Set

Specification

Part Number

10503 Composing:

- Carbon steel body
- Hose including fixed nitrogen adaptor (5/8" BSP Male)
- Bleed valve
- Pressure gauge
- Connection: ¼" BSP male coned to suit hose assembly

For assembly WITHOUT hose part numbers become 10500-02, 10500-03 etc.

Part No.	Pressure Range	Gauge Part No.
10503-02	0-25 bar	45083-099
10503-03	0-60 bar	45084-099
10503-04	0-160 bar	45085-099
10503-05	0-250 bar	45086-099
10503-07	0-400 bar	45087-099
10523-10	0-690 bar	45140-099

Optional Extra's

Country	Part Number	Description
UK	50094-099 50096-099 50097-099 55354-099	Nitrogen Cylinder Adaptor ¼" BSP (M) x ⅝" BSP (M) Charging Hose ¼" BSP (F) 345 bar x 2.5m long ¼" both ends Extension Adaptor for Charging Hose 345 bar Charging Hose ¼" BSP (F) 690B x 2.5m long
Accessories	50032-V10 43183 10127 10128 11015 10574-**	Charging Hose Adaptor ¼" BSP (M) x ¼" NPT (F) Charging Set Carrier Box Charging Block Elbow ¼" BSP (M) Charging Block Elbow .302" x 32 TPI (M) Tool Kit Permanent Charging Set 0.16L to 3.0L - see Permanent Charging Set page for correct Gauge Suffix - **

- in Fluid Energy Management

Global perspective

and local entrepreneurial flair

Olaer is a global player specialising in innovative, efficient system solutions for temperature optimisation and energy storage. Olaer develops, manufactures and markets products and systems for a number of different sectors, e.g. the aircraft, engineering, steel and mining industries, as well as for sectors such as oil and gas, contracting and transport, farming and forestry, renewable energy, etc.

All over the world, our products operate in the most diverse environments and applications. One constantly repeated demand in the market is for optimal energy storage and temperature optimisation. We work at a local level with a whole world as our workplace – local entrepreneurial flair and a global perspective go hand in hand.

Our local presence, long experience and a wealth of knowledge combine with our cutting-edge expertise to give you the best possible conditions for making a professional choice.