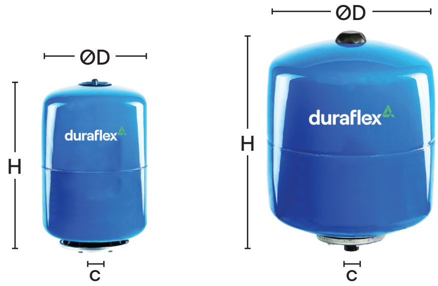
Duraflex Joule

BLADDER TYPE

10, 16, 25 Bar Rated

The Duraflex Joule series are designed for heating, chilled and condenser closed circuit applications

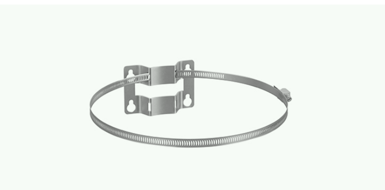
- Suitable for glycol mixture up to 50%
- Replaceable EPDM Bladder
- Pressure gauge fitted (100L and above)
- Electrostatic powder coat finish
- Factory pre-pressurised gas chamber (nitrogen)
- Max operating temperature -10°C / 70°C
- Wall mount bracket available (8-25L)



8-19L 24-35L

8-35L

Model	Volume (lt)	Ø D mm	H mm	c mm	Weight kg	Pre-Charge P. (bar)
			10 Bar			
DJ008-10	8	220	296	1" M	2.9	2
DJ012-10	12	220	410	1" M	3.5	2
DJ019-10	19	280	434	1" M	4.5	2
DJ024-10	24	280	484	1" M	4.9	2
DJ035-10	35	354	465	1" M	6.0	2
			16 Bar			
DJ019-16	19	280	420	1" M	7.5	2
DJ024-16	24	280	484	1" M	7.7	2
			25 Bar			
DJ019-25	19	280	426	1" M	11	2
DJ024-25	24	280	476	1" M	13	2
DJ035-25	35	354	451	1" M	17	2



Wall-hung Bracket

- For vessels 8 - 25 litres
- Holder with multiple connections

Product No.
DWB825

FlowQuip Piped Equipment Specialties

BLADDER TYPE

50L

80-140L

200-500L

750-1000L

50-1000L

Model	Volume (lt)	Ø D mm	H mm	c mm	h mm	Weight kg	Pre-Charge P. (bar)
10 Bar							
DJ050-10	50	410	650	1" M	130	9.2	2
DJ080-10	80	480	791	1" M	170	15	4
DJ100-10	100	480	899	1" M	170	17	4
DJ140-10	140	480	1137	1" M	170	24	4
DJ200-10	200	634	1008	1¼" M	150	36	4
DJ300-10	300	634	1296	1¼" M	150	45	4
DJ400-10	400	740	1427	1¼" M	185	65	4
DJ500-10	500	740	1563	1¼" M	185	70	4
DJ750-10	750	848	1736	2" F	185	122	4
DJ1000-10	1000	848	2187	2" F	185	156	4
16 Bar							
DJ050-16	50	410	650	1" M	125	15	2
DJ080-16	80	480	791	1" M	160	22	4
DJ100-16	100	480	899	1" M	160	25	4
DJ140-16	140	480	1137	1" M	160	31	4
DJ200-16	200	634	1008	1¼" M	145	56	4
DJ300-16	300	634	1296	1¼" M	145	71	4
DJ400-16	400	740	1427	1¼" M	180	154	4
DJ500-16	500	740	1563	1¼" M	180	166	4
DJ750-16	750	800	1981	2" F	180	223	4
DJ1000-16	1000	800	2500	2" F	180	285	4
25 Bar							
DJ050-25	50	410	600	3"	140	28	4
DJ080-25	80	450	615	3"	160	39	4
DJ100-25	100	450	949	3"	160	43	5
DJ140-25	140	500	1104	3"	160	56	5
DJ200-25	200	600	1015	1¼" M	140	115	5
DJ300-25	300	640	1305	1¼" M	140	127	5
DJ500-25	500	750	1498	1¼" M	185	172	5
DJ750-25	750	750	1945	2" F	175	300	5
DJ1000-25	1000	800	2498	2" F	210	330	5

Expansion Tank Sizing, Commissioning & Maintenance

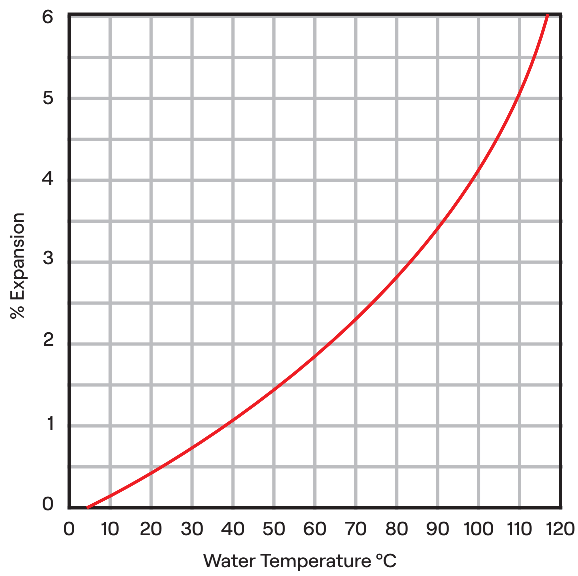
Sizing an Expansion Tank

Careful calculation of the expansion tank size is critical to the correct functioning of the system.

Expansion Coefficient

Calculate the expansion coefficient for your system by calculating the difference between the cold system water temperature (heating off) and the max working temperature.

°C	Coefficient
0	0.00013
10	0.00025
20	0.00174
30	0.00426
40	0.00782
50	0.01207
60	0.0145
65	0.01704
70	0.0198
75	0.02269
80	0.0258
85	0.02899
90	0.0324
95	0.0396
100	0.04343



Heating System

The expansion tank sizing formula is as follows:
(based on Boyles Law)

$$Vt = \frac{e \times C}{1 - (Pi/Pf)} = \frac{Vu}{1 - (Pi/Pf)}$$

where:

Vu = Total useful volume of tank = Vi - Vf

Vi = Initial volume

Vf = Final volume

e = Expansion coefficient

Pi = Initial charge pressure (absolute) of vessel.
This pressure must not be lower than the hydrostatic pressure at the point where the tank is connected to the system.

Pf = Maximum operating pressure (absolute) of the relief (safety) valve
taking into account any differences in level between the vessel and the safety valve.

C = Total water capacity of the system in litres: boiler, pipework, radiators etc
(as a general approximation, C is between 4 and 8 litres for every kW of boiler output)

Note: Calculations must be done in Absolute Pressure
e.g. 100kPa = 200kPa absolute.

In standard heating systems:

e = 0.04318 (Tmax = 99°C, Tmin = 10°C, Δt = 89°C, C = 0.035)

Cooling System

The vessel sizing formula is as follows:
(based on Boyles Law)

$$Vt = \frac{e \times C}{1 - (Pi/Pf)}$$

In standard cooling systems:

e = 0.011 (Tmax = 50°C, T min =4°C)

Pi = Maximum plant pressure, corresponding to the maximum achievable temperature, equal to the ambient temperature, which is recommended to be fixed at 50°C

Pf = The final working pressure achieved at minimum temperature, using 4°C

Example

C = 500 litres

Pi = 150kPa (250kPa Abs)

Pf = 400kPa (500kPa Abs)

V = 0.04318 x 500 = 43.2 litres

1 - (250/500)

Select the next largest sized tank 50 litres

Calculating Expansion Tank Pre-charge Pressure

Please use the below calculation to correctly determine the expansion tank pre-charge pressure:

Pi = [Hm x 10] + 20kPa

where:

Pi = Initial charge pressure (absolute) of vessel

Hm = System height (metres) above the location of the expansion tank

Installation

1. The expansion tank must be installed on the suction side the system pump and preferably in the coolest part of the system e.g. on return to boiler.
2. Ensure water entering the tank is less than 70°C, to prevent premature diaphragm failure. If water temperature is higher than 70°C, an intermediate tank must be installed between the expansion tank and the system.
3. The expansion tank must be installed with a lockable service valve and drain point. This is to ensure the tank can be serviced properly in the future.
4. The expansion tank must be installed with a pressure relief valve between the tank and the lockable service valve, to protect the tank from overpressure situations.
5. The pressure relief valve rating must be no higher than the safe working pressure of the expansion tank.

Commissioning

Please follow the below 4 step process for commissioning an expansion tank:

1. Disconnect
a. Isolate the expansion tank from the system via the lockable service valve. This is crucial to ensure an accurate pressure reading.
b. Disconnect from the system and drain the tank.

2. Test
a. Calculate the correct expansion tank pre-charge pressure.
b. Test the pre-charge pressure in the expansion tank via the Schrader valve.

3. Charge
a. Charge the expansion tank to the correct (see note on calculating pre-charge pressure) pressure via the Schrader valve, using an air compressor or nitrogen canister.
b. Recheck tank charge to ensure pre-charge pressure is holding. If a leak is found, the Schrader valve or the expansion tank will need replacing.

4. Reconnect
a. Reconnect the expansion tank to the system.
b. Re-pressurise the system and check for leaks.

Maintenance

Please follow the below 5 step process for maintaining an expansion tank:

5. Inspect
a. Perform a visual check of expansion tank to ensure no obvious damage or corrosion is present.
b. To check the integrity of the diaphragm, press down the Schrader valve. If water exits the valve, the diaphragm has ruptured and the expansion tank will need replacing.

6. Disconnect
a. Isolate the expansion tank from the system via the lockable service valve. This is crucial to ensure an accurate pressure reading.
b. Disconnect from the system and drain the tank.

7. Test
a. Calculate the correct expansion tank (see note on calculating pre-charge pressure)
b. Test the pre-charge pressure in the expansion tank via the Schrader valve.

8. Charge
a. Charge the expansion tank to the correct pre-charge pressure via the Schrader valve, using an air compressor or nitrogen canister.
b. Recheck tank charge to ensure pressure is holding. If a leak is found, the Schrader valve or the expansion tank will need replacing.

9. Reconnect
a. Reconnect the expansion tank to the system.
b. Re-pressurise the system and check for leaks.

Piping Diagram

The below diagram illustrates the typical piping configuration and preferred placement for expansion tanks. Locating the expansion tank on the return flow side of the boiler helps ensure the expansion tank is not exposed to hot water temperatures in excess of its specified limits.