Expansion Tank

Expansion tanks within the RAE Secondary Glycol Units are used for 3 purposes; additional volume to allow thermal expansion and contraction, maintaining a positive pressure on the glycol loop, and ensuring adequate net positive suction head (NPSH) for pump operation. The expansion tanks included with the Secondary Glycol Units are a fixed diaphragm type with a non-replaceable diaphragm separating the air charge from the system glycol. RAE supplies expansion tanks pre-charged at 40 psi to ensure that no leaks have developed in the diaphragm. Expansion tanks will not accept any fluid expansion until the system pressure rises above the charge pressure. For this reason, the system pressure should always be greater than the charge pressure of the expansion tank. When installed and correctly charged an expansion tank will create a point of zero pressure change. When a point of zero pressure change is achieved, the suction pressure at the glycol pump will remain constant as the pump cycles on and off and will help ensure consistent, reliable operation. Use the matrices below as a guide to setting up the expansion tank. For roof mounted systems, the matrices represent the minimum expansion tank pressure required to maintain approximately 18 psi in the loop at worst expected case fluid temperatures. 18 psi was determined by adding a minimum loop pressure of 10 psi for adequate air purge to the pump net positive suction head required (NPSHr) of 8 psi. Ground mounted systems have a similar requirement with an additional vertical head loss of 25 feet or approximately 10.8 psi to maintain the minimum loop pressure at the highest point in the loop. The ground mounted matrices therefore maintain a minimum loop pressure at worst expected case fluid temperatures at approximately 29 psi.

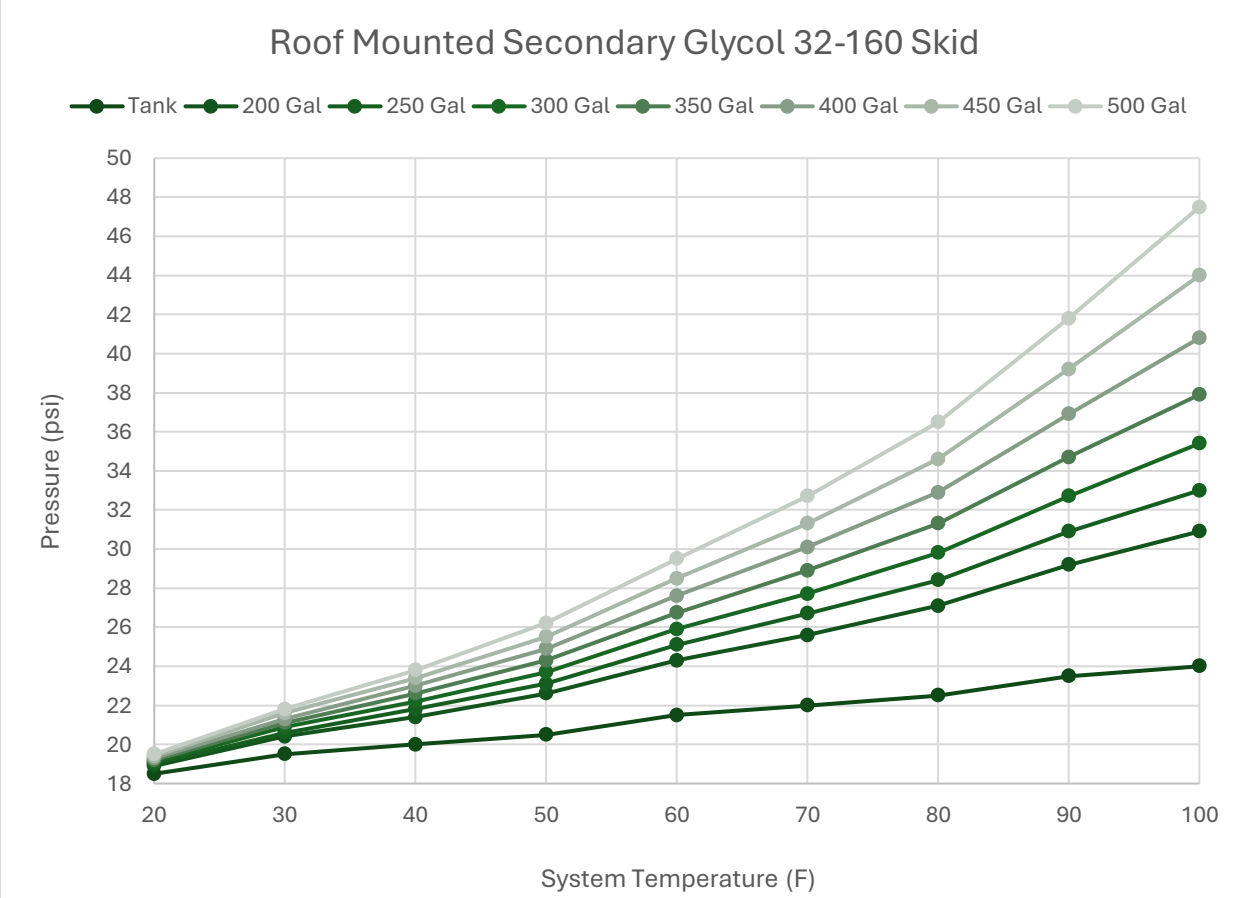
Using the Expansion Tank / System Pressure Charging Matrices

In order to utilize one of the matrices below you must know 4 things:

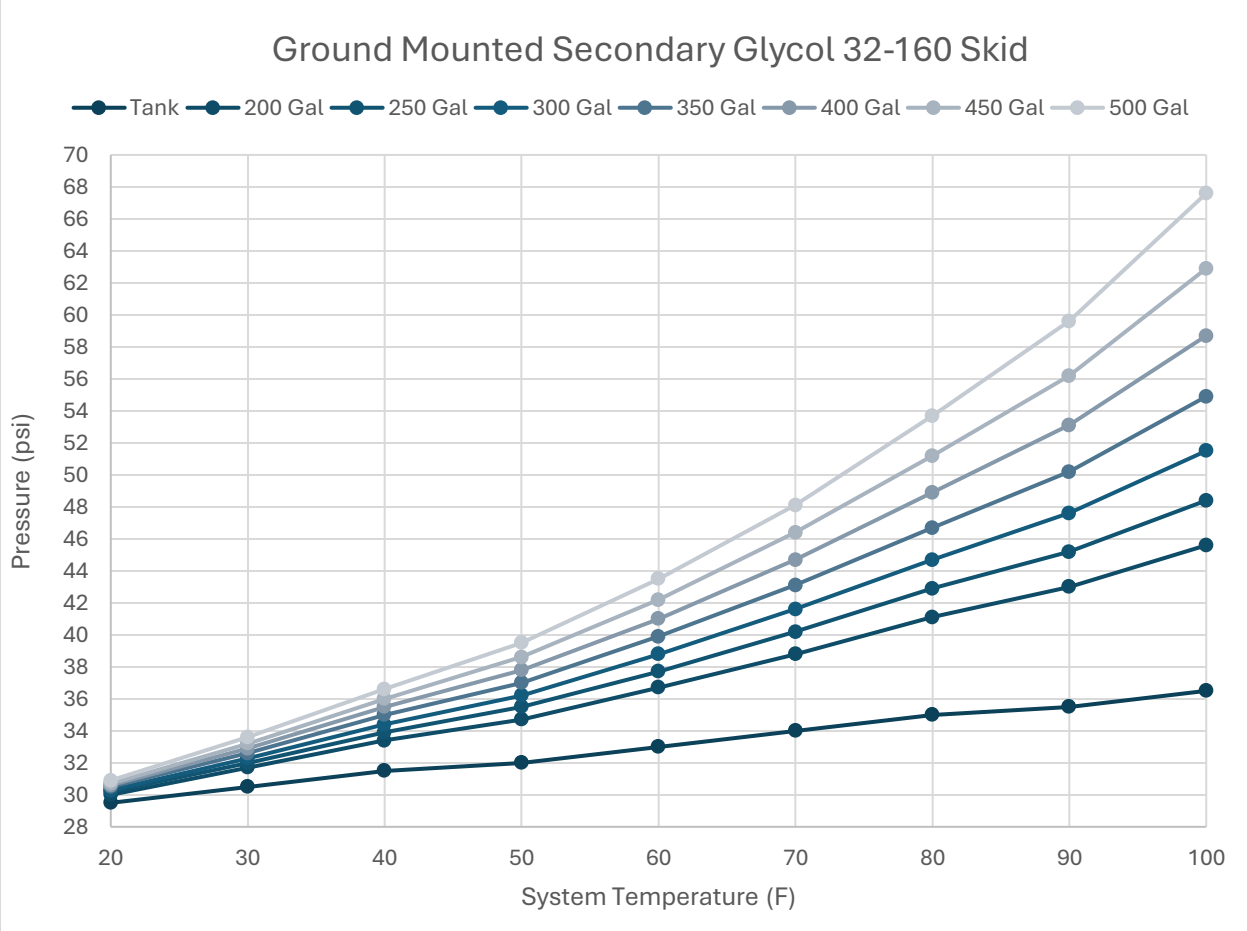
1. Roof or Ground mounted Secondary Glycol Unit
2. Secondary Glycol Unit model (32-160 or 20-95)
3. Current loop temperature of the glycol system
4. Volume of the glycol loop

Find the matrix associated with the model and configuration that you wish to charge, then find the current loop temperature of your system in the first column. The expansion tank setting is given for increments of 10 degrees Fahrenheit for the glycol temperature. Remove air pressure from the expansion tank until this number is reached. Next, locate the column with your approximate system volume and find the pressure value that corresponds with your glycol loop temperature. This indicates the minimum pressure that the system should be charged to in order to ensure proper expansion tank function.

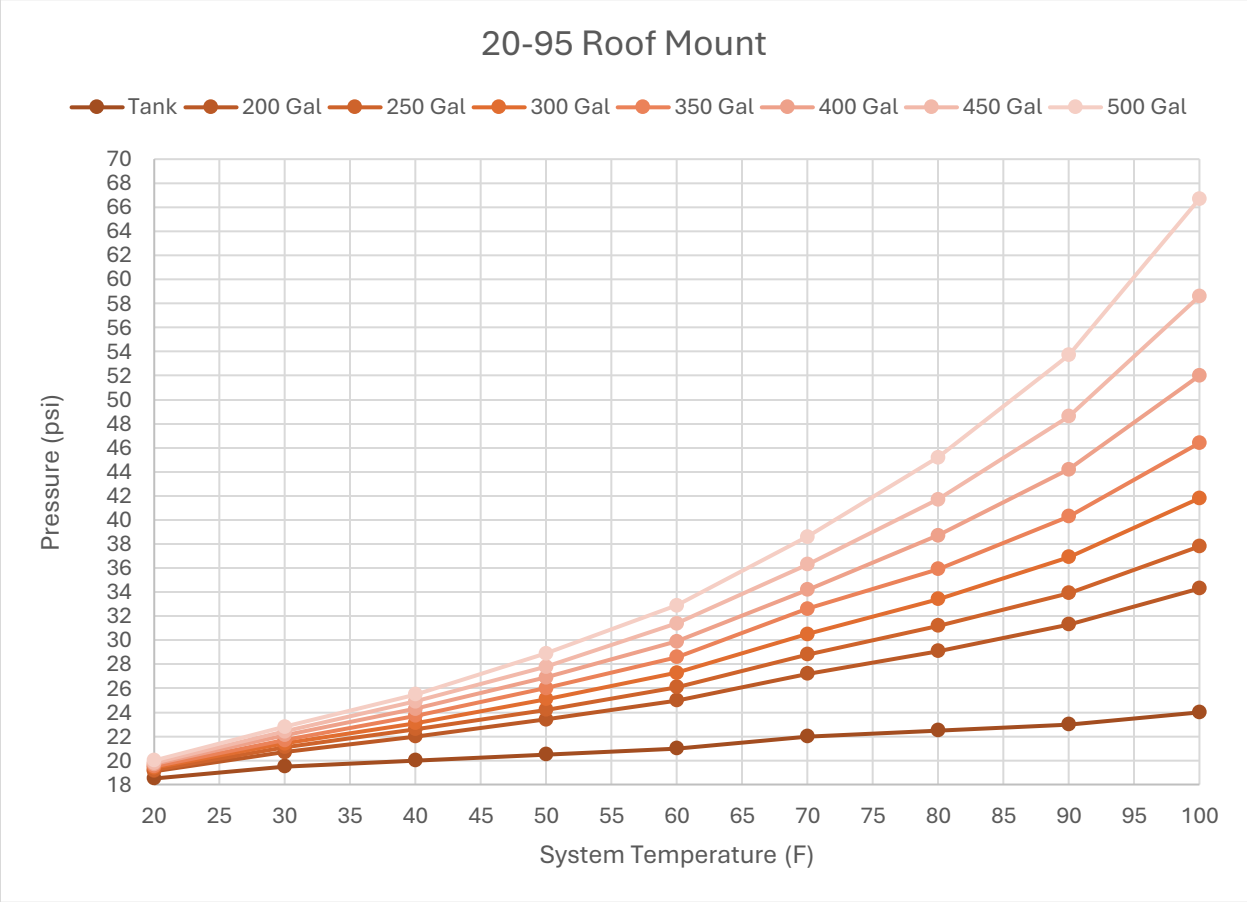
32-160 Roof Mounted								
Fill Temp	Exp Tank (psi)	System pressure at varied system volumes (psi)						
		200 Gal	250 Gal	300 Gal	350 Gal	400 Gal	450 Gal	500 Gal
20	18.5	18.9	19	19.1	19.2	19.3	19.4	19.5
30	19.5	20.4	20.6	20.9	21.1	21.3	21.6	21.8
40	20	21.4	21.8	22.2	22.6	23	23.4	23.8
50	20.5	22.6	23.1	23.7	24.3	24.9	25.5	26.2
60	21.5	24.3	25.1	25.9	26.73	27.6	28.5	29.5
70	22	25.6	26.7	27.7	28.9	30.1	31.3	32.7
80	22.5	27.1	28.4	29.8	31.3	32.9	34.6	36.5
90	23.5	29.2	30.9	32.7	34.7	36.9	39.2	41.8
100	24	30.9	33	35.4	37.9	40.8	44	47.5



32-160 Ground Mounted								
Fill Temp	Exp Tank (psi)	System pressure at varied system volumes (psi)						
		200 Gal	250 Gal	300 Gal	350 Gal	400 Gal	450 Gal	500 Gal
20	29.5	30	30.2	30.3	30.5	30.6	30.7	30.9
30	30.5	31.7	32	32.3	32.6	32.9	33.2	33.6
40	31.5	33.4	33.9	34.4	35	35.5	36	36.6
50	32	34.7	35.5	36.2	37	37.8	38.6	39.5
60	33	36.7	37.7	38.8	39.9	41	42.2	43.5
70	34	38.8	40.2	41.6	43.1	44.7	46.4	48.1
80	35	41.1	42.9	44.7	46.7	48.9	51.2	53.7
90	35.5	43	45.2	47.6	50.2	53.1	56.2	59.6
100	36.5	45.6	48.4	51.5	54.9	58.7	62.9	67.6



	20-95 Roof Mounted							
Fill Temp	Exp Tank (psi)	System pressure at varied system volumes (psi)						
		200 Gal	250 Gal	300 Gal	350 Gal	400 Gal	450 Gal	500 Gal
20	18.5	19.1	19.2	19.4	19.5	19.7	19.8	20
30	19.5	20.7	21.1	21.4	21.7	22.1	22.4	22.8
40	20	22	22.6	23.1	23.7	24.3	24.9	25.5
50	20.5	23.4	24.2	25.1	26	26.9	27.8	28.9
60	21	25	26.1	27.3	28.6	29.9	31.4	32.9
70	22	27.2	28.8	30.5	32.6	34.2	36.3	38.6
80	22.5	29.1	31.2	33.4	35.9	38.7	41.7	45.2
90	23	31.3	33.9	36.9	40.3	44.2	48.6	53.7
100	24	34.3	37.8	41.8	46.4	52	58.6	66.7



	20-95 Ground Mounted							
Fill Temp	Exp Tank (psi)	System pressure at varied system volumes (psi)						
		200 Gal	250 Gal	300 Gal	350 Gal	400 Gal	450 Gal	500 Gal
20	29.5	30.3	30.4	30.6	30.8	31	31.2	31.4
30	30.5	32.1	32.6	33	33.5	33.9	34.4	34.9
40	31.5	34.2	34.9	35.7	36.4	37.2	38	38.9
50	32	35.9	37	38.1	39.2	40.5	41.7	43.1
60	33	38.3	39.8	41.4	43.1	44.9	46.8	48.9
70	34	40.9	43	45.2	47.6	50.2	53	56.1
80	34.5	43.3	46	49	52.2	55.9	59.9	64.5
90	35.5	46.5	50	54	58.5	63.7	69.6	76.4
100	36.5	50.1	54.7	60	66.2	73.5	82.3	92.9