Applying Kirchoff’s current law at the emitter nodes of the RHS circuit:

\[ I = \frac{v_A - v_{BE} - v_1}{R} + i_G \quad \text{and} \quad I = \frac{v_B - v_{BE} - v_2}{R} - i_G \]

(the small input resistors can be neglected, since the base currents are only \(~\text{nA}\)). Subtracting

\[ 0 = (v_B - v_A) - (v_2 - v_1) - 2Ri_G \]

Meanwhile through \( R_G \)

\[ i_G = \left( \frac{v_A - v_{BE}}{R} \right) - \left( \frac{v_B - v_{BE}}{R} \right) \]

Substituting

\[ 0 = (v_B - v_A) - (v_2 - v_1) - \frac{2R}{R_G} (v_A - v_B) \]

Hence

\[ (v_2 - v_1) = \left[ 1 + \frac{2R}{R_G} \right] (v_B - v_A) \]

i.e. the gain formula is the same as for the generic instrumentation amp on the LHS however the voltages at the external gain resistor \( R_G \) (pins 1 and 8 of the AD620 device) sit at \( v_{BE} \) below the input voltages instead of being equal to them.