

The L/R or inductance to resistance ratio of a cable is defined as follows:

$$\frac{L}{R} \text{ ratio} = \frac{\text{Inductance per unit length (}\mu\text{H)}}{\text{Loop resistance per unit length (}\Omega\text{)}}$$

with the loop resistance being the sum of the resistances of both conductors to the load. Normally twice the cable length.

Australian standard AS2381.7 Appendix A defines intrinsically safe systems. In them, associated electrical equipment is connected to the intrinsically safe electrical equipment in the hazardous area by cables. As these cables have both capacitance and inductance, they can store energy and hence maximum capacitance, inductance and inductance to resistance ratio need to be specified and known. The total cable capacitance and either the total lumped cable inductance or the L/R ratio must be less than those shown in the certificate or installation diagram.

The L/R ratio is dependent on conductor spacing within the pair and conductor size, both of which are fixed at the design stage. Typical values of instrumentation cables are 13 for the B50 range and 31 for the B51 range

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Diagrams of cables are illustrative only and are not necessarily to scale.

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