

MTL3992 HIGH STABILITY POWER SUPPLY

for strain-gauge bridges, etc

The MTL3992 is a galvanically isolated power supply unit designed to provide an accurate and stable voltage suitable for powering bridge circuits in hazardous areas. An integral voltage sensing circuit maintains a constant and stable bridge voltage enabling bridge outputs to be measured directly. A typical use for the unit is powering up to four 350Ω load-cells in hazardous areas as part of a complete weighing system application (which may also include MTL interfaces, transmitters, and indicators).

SPECIFICATION

See also 'Common specification'

Location of strain-gauge bridges

Zone 0, IIC, T4 hazardous area
Division 1 Group A hazardous location

Bridge excitation voltage

7.0V with setting accuracy of 0.03%

Sense line resistance R_S

0.1% error for 200Ω

Stability/drift

<50ppm/°C, ie 0.005%/°C

Output ripple

<20mV at 100kHz

Load and line regulation

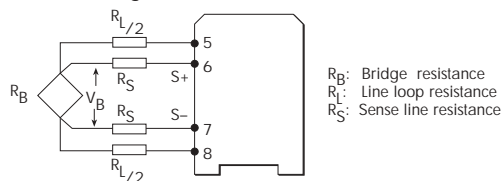
±0.04%

Response times

No load to 350Ω: 100ms
No load to 175Ω: 135ms
No load to 116Ω: 165ms
No load to 87Ω: 185ms
350Ω to no load: 18ms
175Ω to no load: 22ms
116Ω to no load: 28ms
87Ω to no load: 33ms
Measured at $V_{in} = 24V$ dc, line resistance = 7Ω

Line resistance

Varies with bridge resistance as follows:-



For loads $\geq 87\Omega$:

$$R_L = R_B - 72.45$$

For loads from 76Ω to 87Ω:

Load resistance: 86Ω 84Ω 82Ω 80Ω 78Ω 76Ω
Line loop resistance: 12.2Ω 9.6Ω 7.0Ω 4.5Ω 2.2Ω 0Ω

For loads below 76Ω the voltage regulation is not guaranteed

Power supply requirement

Worst case **Typical with four-bridge load and 15Ω line resistance**

155mA at 24V 105mA at 24V
183mA at 20V 127mA at 20V
112mA at 35V 79mA at 35V

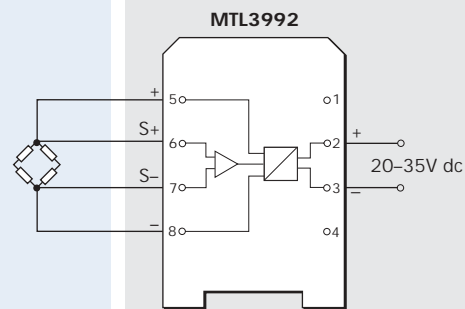
Power dissipation within unit

Typical (with four-bridge load and 15Ω line resistance):
1.9W at V_{in} 24V

Worst case: 3.9W (can occur only when sense wires and load are disconnected)

Hazardous area

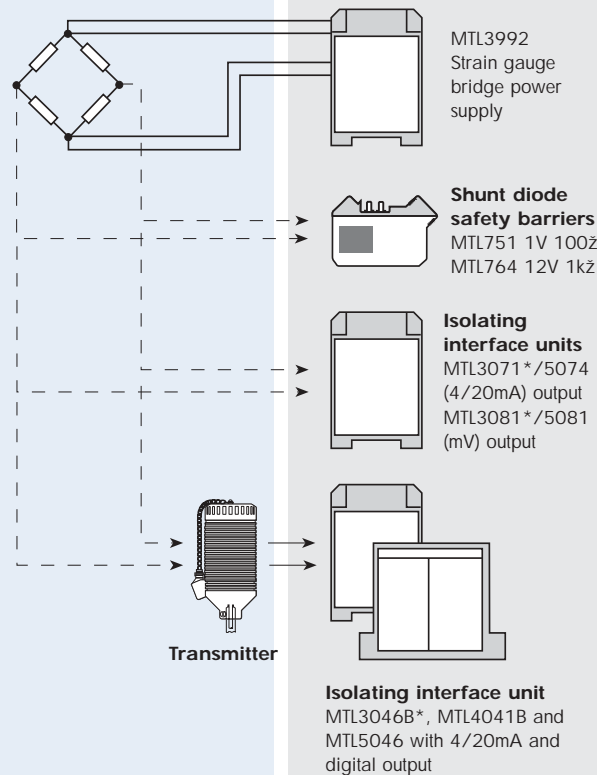
Safe area



STRAIN GAUGE APPLICATIONS

Hazardous area

Safe area



* Not CE marked

Note: 1. The unit should be spaced 5mm apart from other units.

2. If sense terminals 6 and 7 are left unconnected when the MTL3992 is powered, the unit will become very warm. During installation/commissioning, connect terminal 6 to terminal 5 and terminal 7 to terminal 8 to avoid this.

Replaceable fuse

200mA, 5 x 20mm glass to DIN41571 sht.2, semi-time-lag (M)

Safety description

Combined hazardous-area terminals: 17.69V, 65.5Ω, 270mA
This safety description includes the fault energy available from terminals 6 and 7

System certificates and cable parameters are available for applications using MTL3992 with MTL3046, MTL3071, MTL3081, MTL4041B and Zener diode barriers. Please contact MTL for details.



EUROPE (EMEA)
AMERICAS
ASIA PACIFIC
E-mail: enquiry@mtl-inst.com

Tel: +44 (0)1582 723633
Tel: +1 603 926 0090
Tel: +65 487 7887

Fax: +44 (0)1582 422283
Fax: +1 603 926 1899
Fax: +65 487 7997

Web site: www.mtl-inst.com

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