

4 TO 20 MA LOOP POWER BUDGET CALCULATOR

Project: PT 1101 loop

Calc no: CALC LP 001 Rev: 0

Yellow cells: enter data. Grey cells: calculated automatically. Free template from instrumentationblog.in

Loop data

Supply voltage (V DC)	24	Transmitter minimum voltage (V)	10.5
Maximum loop current (mA)	22	Receiver / AI input resistance (Ω)	250
Barrier or isolator resistance (Ω)	0	Other series resistance (Ω)	0
Cable length, one way (m)	800	Conductor size (mm ²)	1.5
Conductor temperature (°C)	40		

Result

Conductor resistance at 20 °C (Ω /km)	12.10	Loop cable resistance, both cores (Ω)	20.9
Total loop resistance (Ω)	270.9	Voltage at transmitter at max current (V)	18.04
Margin above minimum (V)	7.54	Loop power check	OK
Maximum allowed loop resistance (Ω)	614	Maximum cable length, one way (m)	13,931
HART resistance ($\geq 230 \Omega$)	OK		

Use the maximum current the transmitter can drive (alarm or saturation current, typically 21 to 23 mA) and the minimum supply voltage, including tolerance and any drop in the power supply distribution.

Prepared by	Checked by
Name:	Name:
Signature:	Signature:
Date:	Date: