

CWTUM-S

A wide-band AC current probe with BNC output to connect to most types of oscilloscope or data acquisition devices.

The CWTUM-S is an even thinner version of the original CWT Ultra-mini probe from PEM. The Rogowski coil cross-section diameter is **just 1.2mm** without compromising operating temperature, high frequency performance or insulation voltage. Such a thin coil provides another solution for measuring current in tight spaces without disrupting the circuit under test.



Coil on a D²PAK



Coil lengths up to 150mm available



Key Features

- Wide operating temperature **-40°C to +125°C**.
- High frequency (-3dB) **30MHz**.
- Loads the circuit under test by only a **few pH**.
- Standard coil length (circumference) of **80mm**.
Longer coil lengths readily available.
- Coil insulation **1.2kV pk**.
- **1.2mm** cross section diameter.
Thinner coils available at lower insulation ratings
- Peak di/dt capabilities up to **100kA/μs**.
- Current ratings from **30A pk** to **30kA pk**.



Applications

- Switching current waveforms in power electronic circuits:
 - MOSFET or IGBT devices as small as TO-220, D²PAK and other SMT power devices.
 - Measuring power losses in semiconductor bond wires in power devices.
 - Monitoring currents in small inductors, capacitors, snubber circuits, etc.
- Measuring small AC currents in the presence of large DC currents (e.g. monitoring capacitor ripple).
- Power converter development and diagnostics.
- Measuring high frequency sinusoidal, pulsed or transient currents in power frequency to rf applications.

Model	Sensitivity (mV/A)	Peak Current (A)	Noise* ¹ (mVp-p)	Droop (%/ms)	LF (-3dB) (Hz)	Peak di/dt (kA/μs)	HF (-3dB) Bandwidth* ² (MHz)
CWTUM-S/015	200	30	20	85	150	2.0	30
CWTUM-S/03	100	60	18	78	100	4.0	30
CWTUM-S/06	50	120	12	70	75	8.0	30
CWTUM-S/1	20	300	10	53	50	20	30
CWTUM-S/3	10	600	12	11	12	40	30
CWTUM-S/6	5.0	1.2k	12	5.5	6.0	80	30
CWTUM-S/15	2.0	3.0k	10	2.8	3.0	100	30
CWTUM-S/30	1.0	6.0k	10	1.5	1.5	100	30
CWTUM-S/60	0.5	12.0k	8.0	1.0	1.0	100	30
CWTUM-S/150	0.2	30.0k	5.0	1.0	1.0	100	30

*1 'Noise' is the internally generated integrator noise, this is predominantly the same frequency as the LF (-3dB) bandwidth.

*2 The HF(-3dB) is specified for a 1m cable and 80mm coil, we can supply longer coils and cables on request.

di/dt ratings

These are 'Absolute maximum di/dt ratings' and values must not be exceeded.

Type	Abs. Max. peak di/dt	Abs. Max. rms di/dt
CWTUM-S	100kA/μs	1.0kA/μs

Output

±6V pk corresponding to 'Peak Current' into $\geq 100\text{k}\Omega$ (recommended e.g. DC1M Ω oscilloscope).

±2V pk, Sensitivity is half the nominal value into 50 Ω .

Accuracy

Calibrated to $\pm 0.2\%$ reading with conductor central in the Rogowski coil loop.

Conductor position in the coil (for a 2mm dia. conductor) typically $\pm 2\%$ reading.

Conductor position in the coil (for a 10mm dia. conductor) typically $\pm 1\%$ reading.

Linearity (with current magnitude) 0.05% reading.

DC offset

±3mV max. at 25°C

Temperature

Coil and cable -40°C to +125°C

Integrator electronics 0°C to +40°C

Coil voltage

1.2kV pk

Safe peak working voltage to earth.

Rating established by a 3kV rms, 50Hz, 60 sec flash test.

Cable length

1m (length of cable from coil to electronics).

Longer cables are available on request.

Coil length

80mm

Longer coils are available on request.

Battery Options

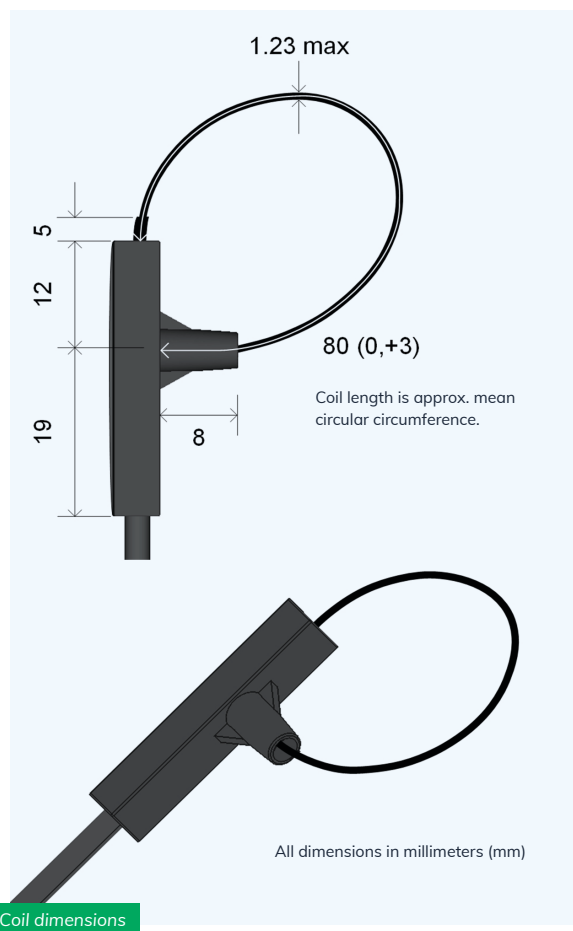
B Alkaline Batteries -- 4 x 1.5V AA alkaline batteries, 25 hour life.

External power adaptor disconnects batteries and powers unit.

R Rechargeable Batteries -- 4 x 1.2V NiMH batteries, 10 hour life.

External power adaptor trickle charges batteries and powers unit

External power adaptor available in **US, EURO, UK & AUS** versions as an optional extra.



1 **2** **3** **4** **5**
CWTUM-S / 015 / R / 1 / 80

Example part codes

CWTUM-S/015/R/1/80

CWT Ultra-mini (S), peak current 30A, Rechargeable batteries, 1m cable, 80mm coil.

CWTUM-S/6/B/1/80

CWT Ultra-mini (S), peak current 1200A, Alkaline batteries, 1m cable, 80mm coil.

Generating the part code

- 1 Model**
- 2 Range**
- 3 Battery Option**
- 4 Cable Length (m)**
- 5 Coil Length (mm)**



Included as standard

- ✓ Carry Case
- ✓ Unit Model
- ✓ Batteries (B or R)
- ✓ 0.5m BNC Output Cable
- ✓ Calibration Certificate

Optional Extras

- + Longer Cable
- + Longer Coil
- + Power Adaptor (UK, EU, US, AU)



More detailed technical notes, dimensioned drawings, CAD files and quotation request for this product are available online.

PENI
Power Electronic Measurements

+44 (0)115 946 9657
info@pemuk.com

Power Electronic Measurements Ltd
Gloucester House
162 Wellington Street
Long Eaton
Nottingham
NG10 4HS
United Kingdom

www.pemuk.com

Rev. 11/24

