

## 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 D<sup>2</sup>PAK



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 pF.**
- 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, D<sup>2</sup>PAK 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 <sup>*1</sup> (mVp-p)	Droop (%/ms)	LF (-3dB) (Hz)	Peak di/dt (kA/μs)	HF (-3dB) Bandwidth <sup>*2</sup> (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 $\Omega$  oscilloscope).  
±2V pk, Sensitivity is half the nominal value into 50 $\Omega$ .

## 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.**

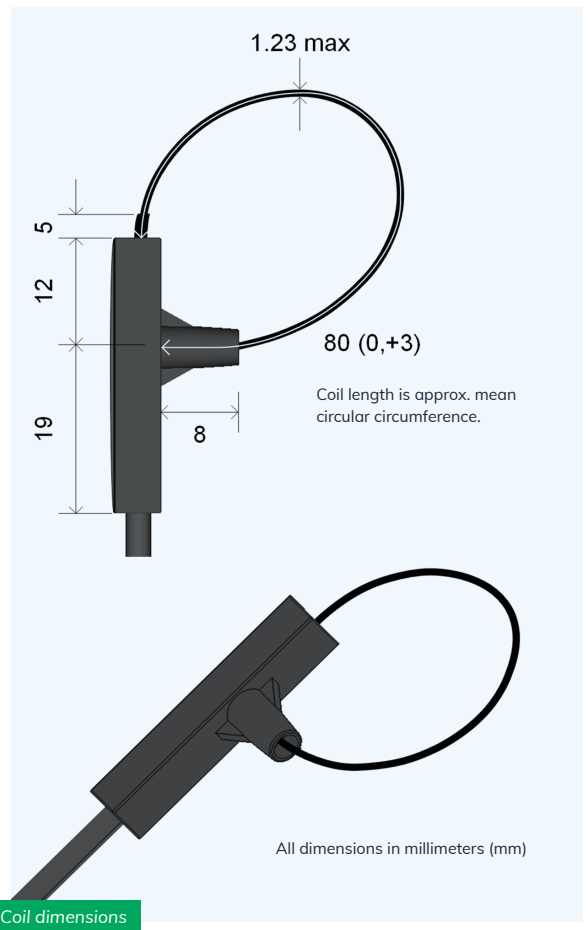
## Coil length

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.

# PEN1

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