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CUBE & RAIL 350V



- **Standard DIN Formats**
- **Installation Aids 'Right First Time'**
- **Supplied as a Retro-fit Kit with Split CTs**
- **Isolated Pulse Output**
- **True rms measurement to the 30th harmonic Individual harmonics to the 15th via MODBUS**
- **Accuracy better than Class 1**
- **RS485 MODBUS RTU[®] Option**
- **Designed & Made in the UK with a 5 year Warranty**

Rail 350V and **Cube 350V** – a range of meters specifically designed for retro-fit applications. They are supplied complete with specially designed openable current sensors. Easy to fit, and with added measurements to ensure **‘Right First Time’** installation.

Easy to Commission — Right First Time

Wiring: With kW & PF displayed at the touch of a button, installations can be quickly and simply tested – connections confirmed & the load measured.

Pulse Output: With a **Pulse Test** facility, pulses can be generated – without any load present – to test all downstream equipment.

Easy to Use

Complex menu structures are eliminated by limiting the displayed parameters to key values. Links allow the display to be further simplified by disabling the per-phase kW and/or PF readings. All system parameters are however available via MODBUS. With a bold custom LCD display, the Meters can be read from any angle, with the necessary legends simplifying reading. The programmable isolated pulse outputs provide an interface to a data collection system or BEMs.

Multi-Parameter

Displayed	Phases	Additionally available via MODBUS	Phases
Volts, LN & LL	1, 2, 3	Pk Volts LN	1, 2, 3
Amps	1, 2, 3	Pk Amps	1, 2, 3
PF	1, 2, 3 & Σ	Neutral Current	Σ
kW	1, 2, 3 & Σ	kVA & kvar	1, 2, 3 & Σ
kWh & kvarh	Σ	kVAh	Σ
Frequency		kW, kVA & kvar Demand	Σ
Hours Run (on Load)	Σ	Pk kW, kVA & kvar Demand	Σ
True rms measurement of Volts & Amps – and true Power Measurement – to the 30th harmonic at 50Hz.		Amp Demand & Peak	1, 2, 3
		%THD Volts & Amps	1, 2, 3
		V & I Harmonics 2 nd – 15 th	1, 2, 3

Current Ranges

FS Amps	Current Range	CT Type	Max Cable J
50 Amp	250mA — 60 Amp	SCL16	15mm
100 Amp	500mA — 120 Amp	SCL16	15mm
150Amp	1 Amp — 175 Amp	SCT19	19 x 19mm
400 Amp	4 Amp — 450 Amp	SCT32	32 x 32mm

Other current ranges may be available to order.

Easy to Configure

Rail 350 Meters are configured from the front panel to suit installations, with decimal point and legend being automatically set to provide optimum resolution.

Fully Supported

Comprehensive operating instructions - supplied with every Meter – provide full information on installation. These include connection schematics and configuration details for virtually all CT ratios. Full technical support is readily available from your local Distributor or from Technical Sales at ND Metering Solutions.

Universality of Connections

For maximum convenience all these Meters can be powered from the measurement voltage. Where supplies may be subject to unusually wide variations, the Meters may be powered from a separate auxiliary supply. Standard Meters are suitable for both 3 wire and 4 wire 3f unbalanced loads.

Accurate Real World Measurement

A precision measurement system maintains full accuracy up to the 30th harmonic (at 50Hz) in the presence of harmonics and randomly and/or periodically interrupted waveforms - as commonly found on modern electronically controlled loads.

RS485 MODBUS[®] Communications

A high speed internal RS485 MODBUS[®] communications option allows readings to be read remotely and provides the extra information required for system management.

OUTLINE SPECIFICATION

INPUTS	
System Voltage U_n	3 Phase 3 or 4 Wire Unbalanced Load 400/230V. 3 Phase 3 or 4 Wire 110/63V & 208/120V optional. Others to order.
Current I_n	Special to suit CTs. I_n = CT nominal FS Amps
Measurement Range	Voltage 50% to 120% Current 0.5% to 120%
Frequency Range	Fundamental 45 to 65Hz Harmonics Up to 30 th harmonic at 50Hz Individual to the 15 th
Burden	Voltage <0.1VA per phase Current To suit CT used
Overload	Voltage x4 for 1 hour Current As per CT specification
DISPLAY	
Type	Custom, Supertwist, LCD
Data Retention	10 years min. Stores kWh & Meter set-up
Format	8 x 6.66mm high digits with DPs & 3.2mm legends
Scaling	Direct reading. User programmable CT & VT CT Primary programmable from 10A to 25kA VT primary programmable from 11V to 440kV
Legends	Wh, kWh, MWh etc. depending on user settings
AUXILIARY SUPPLY	
Standard	230V 50/60 Hz $\pm 15\%$
Options	110V 50/60 Hz $\pm 15\%$ 24Vdc, 48Vdc or 110Vdc
Load	2VA max.
Overload	x1.2 continuous
ACCURACY	
	All errors ± 1 digit. Accuracies specified equivalent to Meter being used with Class 1 CTs
kWh	Equivalent to Class 1 per EN 62053-21 & BS 8431
Kvarh	Equivalent to Class 2 per EN 62053-23 & BS 8431
kW & kVA	Equivalent to Class 0.25 IEC 60688
kvar	Equivalent to Class 0.5 IEC 60688
Amps & Volts	Equivalent to Class 0.1 IEC 60688 (0.01 I_n – 1.2 I_n or 0.1 U_n – 1.2 U_n)
PF	Equivalent to $\pm 0.2^\circ$ (0.05 I_n – 1.2 I_n and 0.2 U_n – 1.2 U_n)
Neutral Current	Equivalent to Class 0.5 IEC 60688 (0.05 I_n – 1.2 I_n)
PULSE OUTPUTS	
Function	1 Pulse per unit of energy
Scaling	Settable between 1 & 1000 counts of kWh register
Pulse Period	0.1 sec. default; Settable between 0.1 and 20 sec
Rise & Fall Time	< 2.0ms
Type	N/O Volt free contact. Optically isolated BiFET
Contacts	100mA ac/dc max., 100V ac/dc max.
Isolation	2.5kV 50Hz 1 minute
MODBUS [®] Serial Comms Optional	
Bus Type	RS485 2 wire + 0v. 1/2 Duplex, 1/4 unit load
Protocol	MODBUS [®] RTU with 16 bit CRC
Baud Rate	4800, 9600 or 19,2000 User settable
Address	1 – 247 User settable
Latency	Reply within 250ms max.
Command Rate	New command within 5ms of previous one
GENERAL	
Temperature	Operating -10°C to +65°C Storage -25°C to +70°C
Humidity	< 75% non-condensing
MECHANICAL	
	Meter Panel DIN Rail
Environment	IP54 (Option of IP65) IP22 (IP65 in external case)
Enclosure	DIN 43700 96 x 96 DIN 42880 6 Modules
Material	Mables UL94-V-O. Self extinguishing Noryl UL94-V-O. Self extinguishing
Dimensions	96 x 96 mm x 83.5mm 106mm x 90mm x 58mm 72mm behind panel
Weight	~ 250 gms ~ 325 gms
Terminals	Rising Cage. 4mm ² (12 AWG) cable max.
SAFETY	
Conforms to	EN 61010-1 Installation Category III