UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D-53153 Bonn
Germany

Att: CDM Executive Board

DET NORSKE VERITAS
CERTIFICATION AS
International Climate Change Services
Veritasveien 1
NO-1322 Høvik
Norway
Tel: +47-6757 9900
Fax: +47-6757 9911
http://www.dnv.com
NO 945 748 931 MVA

Your ref.:	Our ref.:	Date:
CDM Ref 0751	MLEH/RRama	19 May 2008

Response to requests to review
"Sanquhar and Delta Small Hydro Power Projects" in Sri Lanka (0751)

Dear Members of the CDM Executive Board,

We refer to the issues raised by the requests for review by three Board members regarding our request of issuance for project activity "Sanquhar and Delta Small Hydro Power Projects"(UNFCCC reference number 0751) in Sri Lanka and would like to herewith provide our initial responses to the issues raised.

Comment 1:
The monitoring plan specified cross checking of net electricity export recorded from meter installed by the Ceylon electricity Board (CEB) with the meter reading installed on low voltage side by the Hydro Power Free Lanka (HPFL). The DOE is requested to clarify whether this requirement of the monitoring plan has been met.

DNV Response

As per the registered Project Design Document of the project, the primary recording of the electricity exported to the grid is measured by the bi-directional meter located at the point of supply to the grid. This meter is installed and maintained by the Ceylon Electricity Board (CEB). The measurement is recorded monthly by CEB and, as mentioned in the monitoring plan of the registered PDD, forms the basis for the calculation of the emission reductions.

As part of the regular monitoring of the plant, the project participant has installed a check meter at the low voltage side. The electricity supplied to the grid as per the check meter is monitored and recorded by the project proponent Hydro Power Free Lanka (HPFL). The daily and monthly readings of the check meter were available during verification. The cross checking of the CEB meter readings with the check meter readings is done on a monthly basis by HPFL.

DNV had verified that the monthly electricity generation culled from the monthly CEB invoices (from the meter, installed and maintained by CEB) have been used for the emission reduction calculations. It was also verified by comparison of the monthly meter readings (CEB and check meters) that the CEB readings were on the lower side and hence conservative. The comparison sheet is attached as Annex 1.

We would like to re-confirm that the electricity supplied by the project activity to the grid has been verified from the monthly invoices issued by CEB and cross checked with the monthly readings taken from the check meter installed by the project participant.

Comment 2:
Further clarification is required how the DOE verified the constant values of electricity imported for Sanquhar plant between January 2004 until June 2006 and July 2006 until April 2007.

DNV Response
The main meter readings are recorded on a monthly basis by CEB and provided to the project proponent (both import and export). There was no communication from CEB on the quantity of electricity imported by the project proponent from the grid since 1st December 2003 (date of plant commissioning). HPFL had made several representations to the CEB officials for obtaining the values of the electricity imported from the grid. During October 2007, CEB had provided bulk indication on the quantity of electricity imported by the project since its commissioning. Subsequently the project proponent had requested CEB to provided with the monthly split up on the quantity of electricity imported form the grid (Annex 2) and the same were provided by CEB vide letter attached as Annex 3. The constant values of electricity import indicated by CEB in the month wise split up have been used in the monitoring report.

DNV had verified the communication between the project proponent and CEB on the above. It may also be noted that during verification, the non availability of the import electricity figures had been raised as a CAR and the CAR has been closed after verifying the above mentioned documents.

Comment 3:
The monitoring plan specified a calibration frequency of one year for main electricity meter installed and maintained by CEB and frequency of three years for meter installed by HPFL used for cross checking. Further clarification is required how the DOE verified that this requirement has been met.

DNV Response
The main electricity meter (bi-directional) which forms the basis for emission reduction calculations is installed and maintained by CEB. The calibration of this meter is entirely under the purview of the CEB and is carried out annually at their time of convenience. DNV has verified the calibration certificates of the main meters conducted by CEB.

CEB main electricity meter calibration of the Delta plant for the year 2006 was performed on 4 April 2006 and evidence for this was provided to DNV. The calibration for the year 2007 was due on 03 April 2007 at the time of the verification (19 and 20 2007). A CAR was raised during verification and the project participant provided evidences for the communication with CEB requesting for the calibration of the meter. The meter was calibrated by CEB during October 2007 only. CEB calibration certificate indicates that calibrations of meters are under the purview of CEB and are calibrated at their time of convenience. Based on the calibration carried out during October 2007 the CAR was closed.

Similarly for Sanquar plant, the calibration of the main meter for the year 2006 was due in December 2006 and the project participant has sent many reminders to CEB and the CEB

calibrated the meter only during March 2007. The calibration certificates for the main meters are attached as Annex 4 and the communications sent by the Project participant to CEB has been attached as Annex 5.

The main meter installed by CEB is of 0.5 accuracy class and the check meter installed by the project proponent is of class 1. The cross checking of the CEB meter readings with the readings from the meter installed by HPFL is done on monthly basis. The technical details of the check meter installed by the project participant are attached as Annex 6 as part of this response and the accuracy class of the meter installed by CEB can be verified from the calibration meters provided as Annex 4.

As rightly stated by the members of the Executive Board, the check meter installed by the project proponent needs to be calibrated once in three years. However, this is not affirmatively stated in the monitoring plan of the registered PDD and only states as "Steps are being taken to calibrate the meter every three years."

In addition to the un-affirmative statement in the PDD, the other logical reasons for DNV not insisting on the calibration of the meter installed by HPHL are as follows:

1. Readings from the main meter forms the basis for the emission reduction calculations, and the reading of the check meter have no bearing on the emission reductions.
2. The accuracy of the meter installed by HPFL is of class 1 which is comparatively less accurate when compared with the accuracy of the meter installed by CEB which is of Class 0.5.

We sincerely hope that the Board find our elaboration on the above satisfactory.

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS

Ramesh Ramachandran
Project Manager

Michael Lehmann
Technical Director
Climate Change Services

Annex 1

Monthly reading - CEB METER and HPFL METER (LV side)

		Sanquhar		Delta	
Year	**Month**	**CEB Meter**	**Our Meter**	**CEB Meter**	**Our Meter**
2004	jan	34 380	32 118	Not in Operation	
	feb	17 460	18 215		
	Mar	32 440	32 440		
	Apr	249 200	259 333		
	May	418 120	427 868		
	Jun	769 120	760 253		
	Jul	416 320	418 021		
	Aug	211 060	221 540		
	Sep	235 560	234 250		
	Oct	635 960	592 382		
	Nov	508 240	568 914		
	Dec	420 240	427 283		
	Total	**3 948 100**	**3 992 617**		
2005	jan	201 320	193 928	Not in Operation	
	feb	138 460	144 790		
	Mar	65 320	62 195		
	Apr	117 780	129 585		
	May	276 200	272 096		
	Jun	204 860	208 288		
	Jul	322 880	312 097		
	Aug	170 540	172 917		
	Sep	415 820	415 820		
	Oct	549 380	554 627		
	Nov	849 560	827 476		
	Dec	571 060	601 720		
	Total	**3 883 180**	**3 895 539**		
2006	jan	335 120	333 449	Not In Opeation	
	feb	148 440	140 662		
	Mar	236 820	233 985		
	Apr	266 180	278 318	130 880	130880
	May	312 700	302 754	168 080	168080
	Jun	409 740	417 477	-	0
	Jul	554 300	569 429	34	34
	Aug	374 160	371 901	-	0
	Sep	41 340	46 387	1 325	1325
	Oct	306 000	328 593	535	535
	Nov	388 440	362 743	337 609	339630
	Dec	433 400	452 965	270 753	302338
	Total	**3 806 640**	**3 838 663**	**909 216**	**942 822**
2007	jan	246 100	249873	368 264	348741
	feb	91 520	88854	94 560	79969
	Mar	47 440	46150	27 593	29054
	Apr	17 820	20126	-	0
	Total	**402 880**	**405 003**	**490 417**	**457 764**
	Total	**12 040 800**	**12 131 822**	**1 399 633**	**1 400 586**
		Difference	**0,8%**	**Difference**	**0,1%**

Annex 2

Project Office:
3/1 Police Park Terrace,
Colombo 05
Sri Lanka

Phone: 011 2598678
Phone: 011 2504353
Fax: 00 94 11 2592 137
Email: sanjaya.prasad@unilink.lk

HYDRO POWER FREE LANKA (PVT.) LTD.

Mr.Senanayake,
Chief Accountant.
Ceylon Electricity Board,
Kandy.

15/11/2007

Dear Sir,

Invoice for Energy Consumption at Sanquhar Mini Hydro plant – Atabage
Account Number 2270102045

With reference to our phone discussion please send me the detail monthly analysis report regarding our Electricity Consumption at Sanquhar Mini Hydro Plant.

Please fax me a copy for above mentioned for following number 0112 592137

We apprcciate your co-operation in this regard.

Thanking you,

Hydro Power Free Lanka (Pvt) Ltd.

Sanjaya Prasad
Accountant

Annex 3

Accountant Revenue,
Ceylon Electricity Board,
P.O.Box 140,
Lamagaraya RD,
Kandy.

Att : MR. Sanjay Prasad 0112595

Hydro Power Free Lanka (Pvt) LTD,
Sanquhar Mini Hydro Power Station,
Pahala Atabage,
Gampola.

Dear Sir/Madam,

Electricity Supply To Sanquhar Mini Hydro Power Station,Pahala Atabage, Gampola.

The above electricity supply has been assigned the Heavy Supply Account No. **2270102045** and electricity charges from **Dec 2003 to July 2007** amounting to Rs. **1405582.00** is now payable by you as detailed below.

Year	Month	No.of Units K.W.H.	No.of Units KVA	Fixed Charge	Amount Payable
2003	Dec	1520	41	800.00	27,992.00
2004	Jan	1520	41	800.00	27,992.00
	Feb	1520	41	800.00	27,992.00
	Mar	1520	41	800.00	27,992.00
	Aug	1520	41	800.00	27,992.00
	Sep	1520	41	800.00	27,992.00
	Oct	1520	41	800.00	27,992.00
	Nov	1520	41	800.00	27,992.00
	Dec	1520	41	800.00	27,992.00
2005	Jan	1520	41	800.00	27,992.00
	Feb	1520	41	800.00	27,992.00
	Mar	1520	41	800.00	27,992.00
	Apr	1520	41	800.00	27,992.00
	May	1520	41	800.00	27,992.00
	Jun	1520	41	800.00	27,992.00
	Jul	1520	41	800.00	27,992.00
	Aug	1520	41	800.00	27,992.00
	Sep	1520	41	800.00	27,992.00
	Oct	1520	41	800.00	27,992.00
	Nov	1520	41	800.00	27,992.00
	Dec	1520	41	800.00	27,992.00
2006	Jan	1520	41	800.00	27,992.00
	Feb	1520	41	3,000.00	30,192.00
	Mar	1520	41	3,000.00	30,192.00
	Apr	1520	41	3,000.00	30,192.00
	May	1520	41	3,000.00	30,192.00
	Jun	1520	41	3,000.00	30,192.00
	Jul	1540	41	3,000.00	30,334.00
	Aug	1540	41	3,000.00	30,334.00
	Sep	1640	41	3,000.00	34,368.80
	Oct	1540	41	3,000.00	34,368.80
	Nov	1540	41	3,000.00	34,368.80
	Dec	1640	41	3,000.00	34,368.80
2007	Jan	1540	41	3,000.00	34,368.80
	Feb	1540	41	3,000.00	31,874.00
	Mar	1540	41	3,000.00	31,874.00
	Apr	1540	41	3,000.00	31,874.00
	May	1640	41	3,000.00	32,684.00
	Jun	1320	151	3,000.00	74,092.00
	Jul	1200	198	3,000.00	91,920.00
Total		**66680**	**2071**		**1,405,582.00**

The Total sum Of Rs.**1405582.00** had been added to your first bill which should be for the month of **October 2007.**

You are hereby requested to indicate the Accont No: **2270102045** in all future correspondence regarding this electricity supply with us.Remittances sent in settlement of all bills must accompany the relevant bills wherever possible.

Units Rate : K.W.H. Rs. 8.1
K.V.A. Rs. 400.00

Yours faithfully,

.....

Accountant Revenue.

Copy to : E.E Nwalapitiya - f.i. pl

ASSISTANT REVENUE (Central Province)
C.E.B. City Board,
P.O. Box 140,
KANDY.

Annex 4

(12) Latest Meter Testing ... CEB(EPT)

இலங்கை மின்சார சபை

CEYLON ELECTRICITY BOARD

(Established by act of Parliament No.17 of 1969)

Meter Testing Laboratory
Region- 03
Ceylon Electricity Board
Kolonnawa

நேரடித் தொலை பேசி Telephone :							
பிரதம பொறியியலாளர் Chief Engineer	2331613	அலுவலகம் Office	2547175	தொலை நகல் Fax	2547175	மின் அஞ்சல் e-mail	eeprocev@ceb

My No. EE /MTL/KO/MI.Hy/NA-5

Your No.

IX:M(EP)/MHP/Inspection

Date 2005/12/26

Are Electrical Engineer
Nav alapitiya

HV Meter Testing Report – Sanguar Mini Hydro Power Station (1.6 mw)

(1) **Data :-**

P.P.M.- (Export/Import) Meter

Mal :-	Landis & GYR
S:N :-	81394334
CT atio:-	50/5A
VT atio:-	33000/110 V
Met r Constant:-	10000 imp/kwh/Kvar
Acc racy Class: -	0.5
Mul iplying Factor :-	02

Rea lings

Export: - 317097 kwh
Export: - 89.1 KVA
Import: - 1984 Kwh

(Import) :- (CEB -→ Mini Hydro P/S)
(Export) : - (Mini Hydro P/S -→ CEB)

(a) **Data** :-

CT/VT Unit

CT ratio:- 100/200/5A (Presently connected ratio is 100/5A)
VT ratio:- 33000/110V

(II **Test Results:- At Meter Testing on 24/10/2005**

(I) or Export / Import Meter:- V(r) = 110 V V(y) = 110 V V(b) = 110 V
I(r) = 1.49A I (b) = 1.47A COs Ø = 0.92

Exp ort /Import Meter (P.P.M.)

(C) ercentage error:- (0.64%)

(II) Present Condition & Recommendation

Meter is accurate.

Tested by : .....
E/S(Meter Lab)-R3

200 / 12 /26
Offi e of the CEB
M.T Kolonnawa.

CC: DGM (SAB) - f.i.p.I
DGM (C&C) - f.i.p.I
DGM (E.P) - f.i.p.I

.....
Electrical Engineer
Meter Lab – Kolonnawa.
Electrical Engineer
Meter Testing Lab (Region 3)
Ceylon Electricity Board
Kolonnawa.

Depu ... Engineer
...
...
...
C ... watha.

Energy Meter Testing
Meter Laboratory – Kiribathgoda
Region-02

M/s: **H dro Power Free Lanka (Pvt) Ltd**

Develo er : M/s Hydro Power Free Lanka (Pvt) Ltd — Tested Date: 2007.03.01
Projec : Sanquhar Mini Hydro Power Project - 1.6MW

Meter ata			**PPM(Import/Export)**	**PPM(Parallel Meter)**
Sr No.			81394334	9200207
Make			L&G	Changsha-China
CT Ra o			50/5	100/5
PT Ra o			33,000/110	33,000/110
Meter onstant			10,000 Imp/kWh/kVArh	5000Imp/kWh
Accur y Class			0.5S	1.0
Scale ictor			10	1
Multi ication Factor			2	1
Readi gs				
Cumu tive	Import	kWh	602664	38760
	Export	kWh	3033	660
MD	Import	kVA	21.9	691.2
	Export	kVA	N/A	
Perce tage Error			**+0.31%**	**+0.18%**

****Ref Test Data & Results**

Note : Import: Power Plant → CEB
Export: CEB → Power Plant

CT/P Unit Data — CT Ratio: 100/5; PT Ratio: 33,000/110

Test ata & Results

V_r	:107	V_y	:108	V_b	:107
I_r	:0.204	I_b	:0.155	Power Factor	:0.908

Percentage Error **
Main Meter **+0.31%**
Parallel Meter **+0.18%**

Pres t Condition & Recommendation: Meters are OK. Export MD register not available in the main meter

Test by:
Nam : Gunasiri Nonpehewa
Desi ation : Electrical Superintendent

Electrical Engineer
Meter Testing Laboratory

Elec ical Engineer
Mete Laboratory - Kiribathgoda
Ceyl n Electricity Board

Date: 29th March, 2007

Copy : DGM(Com&Corp)-R2
: DGM(Central)
: DGM(Energy Purchases)
: AE, Nawalapitiya

SITE TEST REPORT
LOSS REDUCTION UNIT
COMMERCIAL & CORPORATE BRANCH
REGION 03

Electrica Engineer: N` Eliya.

HV Met r Testing Report :- **No: UVA/N`E/TA/MH/2007/339**

Delta Mi i Hydro Power Station. (1.2 MW)

(1) D ta:-

PPM (Export/Import) Meter

M ake:-	GENIUS
S No:-	205017607
M eter Ratio (CT):-	100/5A
M eter Ratio (VT):-	33000/ 110V
M eter Constant:-	01 kWh per pulses
A ccuracy Class:-	01
M ultiplying Factor:-	01

R eadings

Import:-
Cu:- 2706769 kWh
R_1:- 2360611 kWh
R_2:- 346160 kWh
MD:- 1294.966 kVA

Export:-
Cu:- 8458 kWh
MD:- 15.515 KVA

mport):- Mini Hydro P/S → CEB
xport):- CEB → Mini Hydro P/S

CT/VT Unit

(a) T Ratio :- 100/5A
(b) T Ratio :- 33000/110V

(II) **est Results:-** **At Meter Testing on – 03/10/2007**

(a) or PP Meter:- V(r) = 110V V(y) = 110V V(b) = 110V
I(r) = 1.05A I(b) = 1.07A COS Ø = 0.85

(b) ercentage Error:- P.P.M
(-)0.32%

(III) **Present Condition & Recommendation**

* Meter is O.K.

Office f the D.G.M.(C&C – R.3)
C.E.B., Colombo 2.
09th Oc ober, 2007

Copie to:- DGM (UVA)
DGM (E.P.T)
Acct. Rev (UVA)

Tested by: .....
E/S Office (Comm. & Corp. – R.3)

.....
Electrical Engineer (Loss Reduction – R.3)

...) Area Electrical Engineer - Nuwara-eliya

F / Meter Testing Report – Delta Minji Hydro Power (1.2 MW) No: 254

Ref. your request dated: 2006-04-04
By letter No: DGM(EPT)/MHP/1150

( ) Data:- **PPM-(Export/Import) Meter**
Make:- Genius
S.No:- 205017607
CT Ratio:- 100/5A
VT Ratio:- 33000/110V
Meter Constant:- 01 pulses/kWh
Multiplying Factor:- 01

Initial Reading.

Readings:-

Import: Cu:- 3620 kWh
R1:- 3619 kWh
R2:- 1.79 kWh
MD:- 0 KVA

Export: Cu:- 243 kWh
MD:- 0 KVA

ELECTRICAL ENGINEER
Ceylon Electricity Board,
NUWARA - ELIYA.

(Import):- (Mini Hydro P/S → CEB)
(Export):- (CEB → Mini Hydro P/S)

CT/VT Unit
CT Ratio:- 100/5A
VT Ratio:- 33000/110V

II) **Test Results:- At Meter Testing on 10/04/2006**

(a) For Import/ Export Meter:- V® = 110V V(y) = 109V V(b) = 109V
I® = 0.16A I(y) = I(b) = 0.19A
Cos 0 = 0.99

(b) Percentage error:-

kWh	kvarh	KVA
+0.40%	-0.70%	Accurate

III) **Present Condition & Recommendation**

Meter is accurate.

Tested by:.....
E.S.(Office) C&C – R.3

.....
Electrical Engineer(Loss Reduction – R.3)

Office of the D.G.M.(C&C – R.3)
C.E.B., Colombo 2.
8th May, 2006.

Copies to:- DGM(Uva) - f.i.pl.
DGM(EP) - f.i.pl.
Acct.Rev.(Uva) –f.i.pl.

Deputy General Manager
(Energy Purchase-Transmission)
CEYLON ELECTRICITY BOARD
[illegible] A. Gardiner Mawatha,
Colombo-02.

Annex 5

Project Office:
3/1 Police Park Terrace,
Colombo 05
Sri Lanka

Phone: 011 2598678
Phone: 011 2504353
Fax 00 94 11 2592 137
Email: sanjaya.prasad@unilink.lk

HYDRO POWER FREE LANKA (PVT.) LTD.

S.Diddeniya,
Chief Engineer,
Energy Purchasing Division,
Ceylon Electricity Board,
Sir Chittampalam A Gardner Mawatha,
Colombo 02.

15th October 2006

Dear Madam,

Sanquhar Mini Hydro Project -: Meter Calibration for year 2006

Please be kind enough to conduct a meter calibration test at our Sanquhar Mini Hydro Plant at Atabage, Gampola.

Please do the arrangement as soon as possible.

Thanking you

Yours Sincerely,
For Hydro Power Free Lanka (Pvt) Ltd

Hydro Power Free Lanka (Pvt) Ltd.

.....

Sanjaya Prasad

Project Office:
3/1 Police Park Terrace,
Colombo 05
Sri Lanka

Phone: 011 2598678
Phone: 011 2504353
Fax: 00 94 11 2592 137
Email: sanjaya.prasad@unilink.lk

HYDRO POWER FREE LANKA (PVT.) LTD.

S.Diddeniya,
Chief Engineer,
Energy Purchasing Division,
Ceylon Electricity Board,
Sir Chittampalam A Gardner Mawatha,
Colombo 02.

13th December 2006

Dear Madam,

Sanquhar Mini Hydro Project -: Meter Calibration for year 2006

We have not received any response regarding above mentioned subject where our earlier communication dated 15th October 2006.

Please consider this as extremely urgent and important and take necessary actions to carry out meter calibration test at our Sanquhar Mini Hydro Plant.

Thanking you

Yours Sincerely,
For Hydro Power Free Lanka (Pvt) Ltd

Hydro Power Free Lanka (Pvt) Ltd.

Accounts

Sanjaya Prasad

Project Office: 4/35, 2nd Lane,
Thalakotuwa Gardens,
Colombo 05,
Sri Lanka.

Phone: 011 4 516 903
Phone: 011 4 516 904
Fax: 00 94 11 2 514 006
Email: hpfl@sltnet.lk

HYDRO POWER FREE LANKA (PVT) LTD.

S.Diddeniya,
Chief Engineer,
Energy Purchasing Division,
Ceylon Electricity Board,
Sir Chittampalam A Gardner Mawatha,
Colombo 02.

29th January 2007

Dear Madam,

Sanquhar Mini Hydro Project -: Meter Calibration
Invoice for Electricity Consumption

With reference to the above mentioned subject and subsequent phone discussion we would like to request from you,

a.) To carry out Meter calibration at Sanquhar site. Please send us the quotation for carry out this task so that we can make the payment and complete the above mentioned as soon as possible.
b.) Since the commissioning of our Sanquhar plant on 01/12/2003 we have not received the invoice for monthly electricity consumption at Sanquhar Site. Please provide us the invoice so that we can arrange the payment.
c.) And please give us a copy of invoice for the Delta plant also for the Electricity consumption.

Thanking you

Yours Sincerely,
For Hydro Power Free Lanka (Pvt) Ltd

Hydro Power Free Lanka (Pvt) Ltd.

.....
Accountant

Sanjaya Prasad

Project Office: 4/35, 2nd Lane,
Thalakotuwa Gardens,
Colombo 05,
Sri Lanka.

Phone: 011 4 516 903
Phone: 011 4 516 904
Fax: 00 94 11 2 514 006
Email: hpfl@sltnet.lk

HYDRO POWER FREE LANKA (PVT) LTD.

Electrical Engineer
Meter Lab,
Ceylon Electricity Board,
Kandy Road,
Kiribathgoda.

06th February 2007

Dear Sir,

ESTIMATED COST FOR THE TESTING HT METER EQUIPMENT
Ref No -: DGM(EPT)/MHP/0180

With reference to the above mentioned subject we like to test our HT meter at above mentioned site.

Please provide us the estimated cost so that we can proceed with the testing.

Thanking you

Yours Sincerely,
For Hydro Power Free Lanka (Pvt) Ltd

Sanjaya Prasad

Annex 6

SCATTERGOOD & JOHNSON LTD

ELECTRICAL ENGINEERING AND FLUID CONTROL DISTRIBUTORS

ISOQAR QUALITY ASSURED FIRM ISO 9001 — UKAS QUALITY MANAGEMENT 026

Certificate number 734 / 95

Socomec

Diris A40/41
Multifunction Energy Meters

0-690V Multiple Output

* Panel Mounting 96 x 96 mm
* Accuracy IEC 1036 Class1
* IP54
* Plug in option modules (4 max)
* Back lit, self fitting LCD Display
* 60mm deep without options
* 80mm deep with options
* 110 - 440 VAC / 120 - 350 VDC auxiliary supply
* 1A / 5A Secondary CT
* Direct Access Information Keys

Base Units

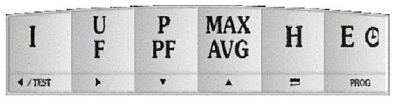
Part Number	Description	Input Voltage	Price
48250A40	Diris A 40 Base unit	110-400V AC / 120-350V DC Auxiliary Supply	£201.82
48251A40		12-48V DC Auxiliary Supply	£263.48
48250A41	Diris A41 Base Unit	110-400V AC / 120-350V DC Auxiliary Supply	£498.93
48251A41		12-48V DC Auxiliary Supply	£571.81

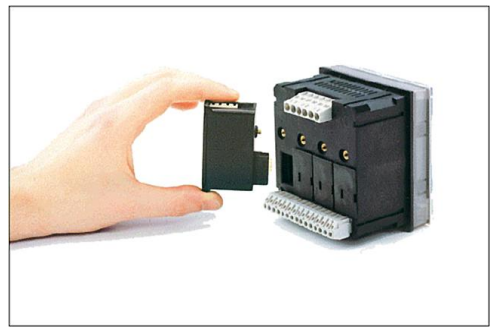
Optional Output Modules

Part Number	Description	Price
48250090	Pulse Output Module KWh/KVARh/KVAh with two programmable pulse outputs	£80.73
48250091	Pulse Output Module and Harmonics	£185.00
48250092	Communication Module 2 or 3 Wire RS485 + JBUS/MODBUS Protocol	£140.15
48250093	Analogue Output Module 2 Configurable 0/4 - 20mA analogue outputs	£106.51
48250094	2 Input/2 Output Module 2 Inputs for Pulse Metering / 2 Outputs for Alarm or Command	£162.58
48250096	Communication Module Profibus DP	£224.23

6 Direct Access Keys to Read:

I	Current
U/F	Voltage and Frequency
P/PF	Powers and Power factor
Max/Avg	Average and Maximum Values
H	Spectral Harmonics
Š / E	Energy Metering & Hours Run





PLUG AND DISPLAY

Optional plug-in modules (metering, harmonics, communication, analogue, alarms or control/com enable additional functions to be added to the ba unit enabling performance vs cost to be optimise while providing onsite flexibility for the end user.

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