



Technical Data Sheet

Alpha 40D



Alpha 40D is a compact multifunction instrument which specially designed for Active, Reactive and Apparent Energy Measurement including per phase THD, Power and other parameters.

Special Features

- True RMS Measurement
- Energy as Electricity Metering Equipment (AC)
- Onsite Programmable
- Low Back Depth
- Phase Reversal Indication
- LCD Display with Back-lit
- RS-485, Limit or Pulse Output

Application

Alpha 40D measures important electrical parameters like Active / Reactive / Apparent energy , power. The instrument has optional output as two pulse output for energy measurement. it is also applicable to
Energy billing, Electrical load monitoring , Sub-metering Genset, Test Benches and Laboratories

Product Features

True RMS measurement	Measures distorted waveform up to 15th Harmonic.	User Configurable Features	User can select any five or ten measurement screens which be shown on display. Also backlit be programmed to switched on or off
Dual Source Energy Measurement as per IEC 62053	Independent Energy counter for Generator and Utility. Generator sense signal (10 to 60VDC/20 to 300VAC) Active energy (kWh), Reactive energy (kVarh), Apparent energy (kVAh) measurement. Accuracy as per IEC 62053-21,IEC62053-23.		LCD Display with Backlit: LCD shows 3 Parameters at a glance.
THD Measurement	The instrument measures THD per phase voltage & current up to 15th Harmonic.		Parameter Screen recall In case of power failure, the instrument memorizes the last displayed screen.
Onsite programmable	Onsite Programmable System Configuration 3PH4W / 3PH3W / 1PH2W. Onsite Programmable CT ratios and PT ratios		Run Hour, ON Hour, Number of Interruptions Run Hour records the number of hours load is connected. ON Hour is the period for which the auxiliary supply is ON. Number of Interruptions indicates the number of times the Auxiliary Supply was interrupted.
Direct remote access (Optional)	Remote configuration of the Instrument via MODBUS. Remote access of measured parameters. Programmable baud rates up to 38.4kbps.		Onsite selection of Auto scroll / Fixed Screen User can set the display in auto scrolling mode or fixed screen mode locally via front panel keys by entering into Programming mode or remotely via MODBUS (RS-485)
Limit (Alarm) or Pulse Relay Output (Optional)	Potential free, very fast acting relay contact. Configurable as pulse output which can be used to drive an external counter for energy measurement. Configurable as limit (alarm) switch.		Enclosure Protection for dust and water Conforms to IP 50 (front face) as per IEC60529
Low back depth	The instrument has very low back depth (behind the panel) of less than 35 mm.		Compliance to International Safety standards Compliance to International Safety standard IEC 61010-1- 2010
			EMC Compatibility Compliance to International standard IEC 61326

Technical Specifications

Accuracy

Reference Conditions (As per IEC 62053 - 21)	23°C +/- 2°C
Active Energy	Class 0.5 as per IEC 62053 - 21
Reactive Energy	Class 1 as per IEC 62053 - 23
Apparent Energy	Class 1
Active Power	±0.5% of nominal value at cos Φ = 1
Re-Active Power	±1.0% of nominal value at sin Φ = 1
Apparent Power	±0.5% of nominal value
Power Factor/Phase Angle	±3°
Voltage	±0.5% of nominal value
Current	±0.5% of nominal value
Frequency	± 0.2% of mid frequency
THD (Voltage / Current)	± 2.0%

NOTE: Variation due to influence Quantity is 100% of class index for all other parameters except Energy.

Input Voltage

Nominal input voltage (AC RMS)	Phase -Neutral 63.5 VL-N 133 VL-N 239.6 VL-N	Line-Line 110 VL-L 230 VL-L 415 VL-L
System PT primary values	100 VLL to 1200 kVLL programmable on site.	
Max continuous input voltage	120% of nominal value	

Input Current

Nominal input current	1A/5A AC RMS
System CT primary values	From 1A to 9999A
Max continuous input current	120% of nominal value
Overload Indication	"-OL" >121% of nominal value (for voltage and current)

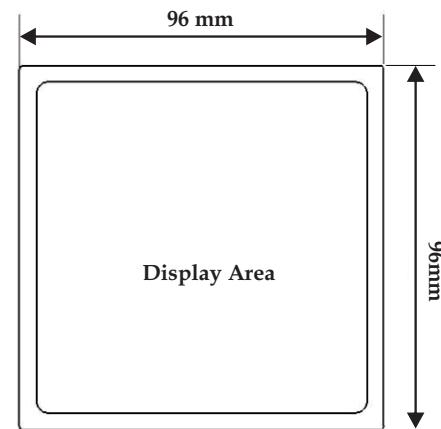
Auxiliary Supply

External Aux	60 V - 300V AC-DC (± 5% approx)
Aux supply frequency	45 to 65 Hz range
Nominal Value	230 V AC/DC Hz for AC Aux 50/60

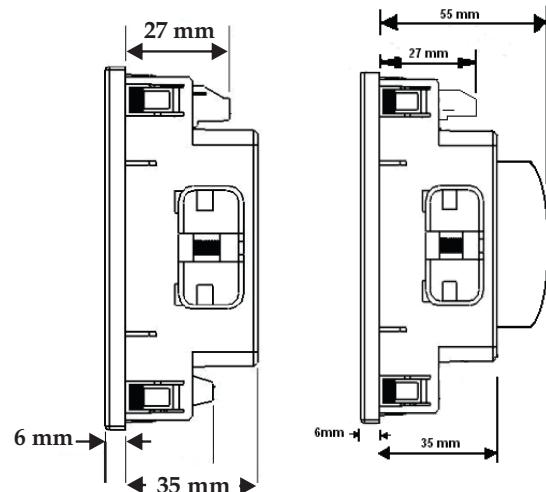
Environmental

Operating temperature	-20° to +70°C
Storage temperature	-30° to +80°C
Relative humidity	0... 95% RH (non condensing) Minimum 3 minute
Shock (As per IEC60068-2-27)	Half sine wave, Peak acceleration 30gn(300m/s^2), duration 18ms.
Vibration	10... 150...10 Hz, 0.15mm amplitude
Number of sweep cycles	10 per axis.
Enclosure	IP 50 (front face only)

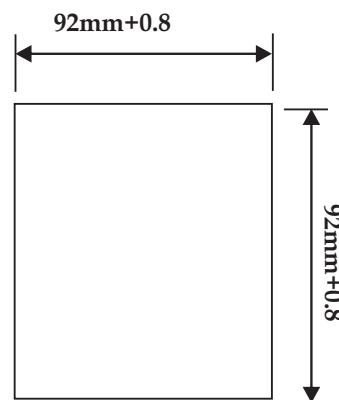
Dimension Details



Front View



Side View



Panel Cutout

Technical Specifications

Operating Measuring Ranges

Current (Energy Measurement) (As per IEC 62053 - 21)	Starting current : 2mA for 1A & 10mA for Range : 20mA to 1.2A for 1A 100mA to 6A for 5A
Voltage	50... 120% of nominal value
Power Factor	0.5 Lag ... 1... 0.8 Lead
Frequency	50Hz / 60Hz
Total Harmonic distortion	0....50%

Applicable Standards

EMC	IEC 61326 -1 :2005
Immunity	IEC 61000-4-3. 10V/m min - Level 3 industrial Low level
Safety	IEC 61010-1-2010,Permanently connected use
IP for water & dust	IEC 60529
Pollution degree	2
Installation category	III
Isolation Protective Class	2
High Voltage Test Input + Aux Vs Surface Input Vs Remaining Circuit	4kV RMS,50Hz,1min 2kV RMS,50Hz,1min

Overload Withstand

Voltage	2 x Nominal value for 1 second, repeated 10 times at 10 second intervals
Current	20 x Imax for 0.5sec

Display update rate

Response time to step input	1 sec approx.
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Interfaces

Impulse Led	For Energy Calibration at front
Relay (Optional)	240VAC,5A(Configured as Limit or Pulse output)
ModBus(Optional)	RS-485,max. 1200m Baud rate : 4.8k,9.6k,19.2k,38.4k bps.

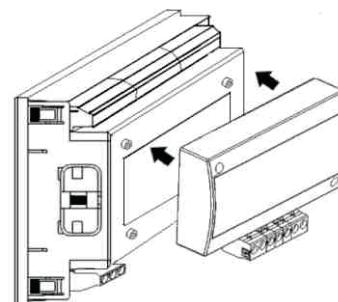
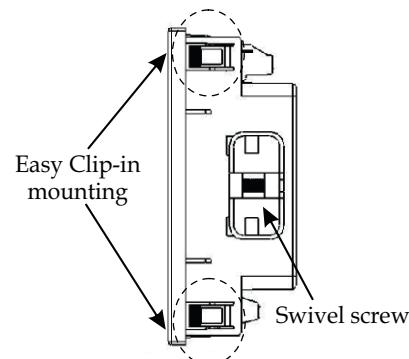
VA Burden

Nominal input voltage burden	< 0.3 VA approx. per phase
Nominal input current burden	< 0.3 VA approx. per phase
Auxiliary Supply burden With addon card Without addon card	< 6 VA approx. < 4 VA approx.

Generator Sense

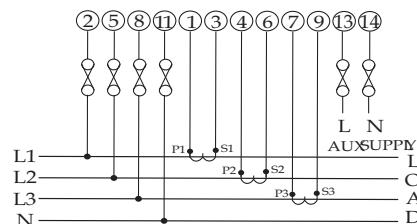
AC voltage	20... 300 VAC
DC voltage	10... 60 VDC

Installation

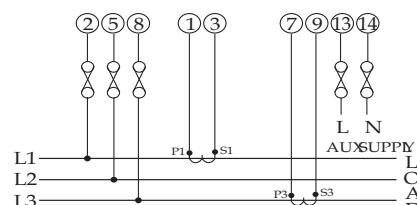


Optional Modbus/Pulse output pluggable module.

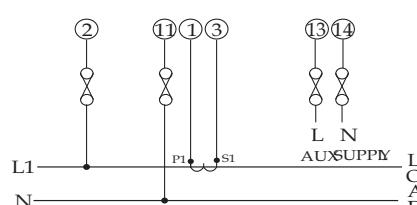
Electrical Connection



3 Phase 4 Wire Unbalanced load



3 Phase 3 Wire Unbalanced load



1 Phase 2 Wire

Electrical Parameters

Sr No	Parameter	3 Phase	4 Wire	3 Phase	3 Wire	1 Phase	2 Wire
1	Utility Active Energy (kWh)	✓		✓		✓	
2	Generator Active Energy (kWh)	✓		✓		✓	
3	Utility Reactive Energy (kVArh)	✓		✓		✓	
4	Generator Reactive Energy (kVArh)	✓		✓		✓	
5	Apparent Energy (kVAh) (Utility & Generator)	✓		✓		✓	
6	System Active Power (kW)	✓		✓		✓	
7	Active Power L1 (kW)	✓		✗		✗	
8	Active Power L2 (kW)	✓		✗		✗	
9	Active Power L3 (kW)	✓		✗		✗	
10	System Re-active Power (kVAr)	✓		✓		✓	
11	Re-active Power L1 (kVAr)	✓		✗		✗	
12	Re-active Power L2 (kVAr)	✓		✗		✗	
13	Re-active Power L3 (kVAr)	✓		✗		✗	
14	System Apparent Power (kVA)	✓		✓		✓	
15	Apparent Power L1 (kVA)	✓		✗		✗	
16	Apparent Power L2 (kVA)	✓		✗		✗	
17	Apparent Power L3 (kVA)	✓		✗		✗	
18	System Power Factor	✓		✓		✓	
19	Power Factor L1	✓		✗		✗	
20	Power Factor L2	✓		✗		✗	
21	Power Factor L3	✓		✗		✗	
22	System Phase Angle	✓		✓		✓	
23	Phase Angle L1	✓		✗		✗	
24	Phase Angle L2	✓		✗		✗	
25	Phase Angle L3	✓		✗		✗	
26	Current Demand(Utility / Generator)	✓		✓		✓	
27	kVA Demand(Utility / Generator)	✓		✓		✓	
28	kW Demand (Utility / Generator)	✓		✓		✓	
29	Max Current Demand(Utility & Generator)	✓		✓		✓	
30	Max kVA Demand(Utility & Generator)	✓		✓		✓	
31	Max kW Demand(Utility & Generator)	✓		✓		✓	
32	Run Hour (Utility & Generator & Total)	✓		✓		✓	
33	On Hour (Utility & Generator & Total)	✓		✓		✓	
34	Number of Interruptions (Utility & Generator)	✓		✓		✓	
35	System Voltage	✓		✓		✓	
36	Voltage L1	✓		✗		✗	
37	Voltage L2	✓		✗		✗	
38	Voltage L3	✓		✗		✗	
39	Voltage L12	✓		✓		✗	
40	Voltage L23	✓		✓		✗	
41	Voltage L31	✓		✓		✗	
42	System Voltage THD	✓		✓		✓	
43	Voltage L1 THD	✓		✓		✗	
44	Voltage L2 THD	✓		✓		✗	
45	Voltage L3 THD	✓		✓		✗	
46	System Current	✓		✓		✓	
47	Current L1	✓		✓		✗	
48	Current L2	✓		✓		✗	
49	Current L3	✓		✓		✗	
50	System Current THD	✓		✓		✓	
51	Current L1 THD	✓		✓		✗	
52	Current L2 THD	✓		✓		✗	

✓ : Available ✗ : Not Available

Electrical Parameters

Sr No	Parameter	3 Phase	4 Wire	3 Phase	3 Wire	1 Phase	2 Wire
53	Current L3 THD	✓		✓		✗	
54	Neutral Current	✓		✗		✗	
55	Frequency	✓		✓		✓	
56	RPM	✓		✓		✓	
57	Phase Reversal Indication	✓		✓		✗	
58	Current Reversal Indication	✓		✓		✓	
59	Phase Absent Indication	✓		✓		✗	
60	Old Utility Active Energy (kWh)	✓		✓		✓	
61	Old Generator Active Energy (kWh)	✓		✓		✓	
62	Old Utility Reactive Energy (kVArh)	✓		✓		✓	
63	Old Generator Reactive Energy (kVArh)	✓		✓		✓	
64	Old Apparent Energy (kVAh) (Utility & Generator)	✓		✓		✓	
65	Old Run Hour (Utility & Generator & Total)	✓		✓		✓	
66	Old On Hour (Utility & Generator & Total)	✓		✓		✓	
67	Old Number of Interruptions (Utility & Generator)	✓		✓		✓	

✓ : Available ✗ : Not Available

Ordering Information

Product Code	AP40-	X	X	X	X	X	X	X	000000
Product Type	Alpha 40D	5							
System Type	3PH 3W/4W		3						
	1 Phase			1					
Input Voltage	63.5VL-N				1				
	133VL-N				2				
	230VL-N				3				
	239.6VL-N				4				
	254VL-N				5				
	110VL-L				6				
	230VL-L				7				
	415VL-L				8				
	440VL-L				9				
Input Current	1/5A				5				
Power Supply	60-300V AC/DC					U			
RS 485 Modbus	With RS 485						R		
	Without RS 485						Z		
Pulse Output	With Pulse Output							P	
	Without Pulse Output							Z	



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