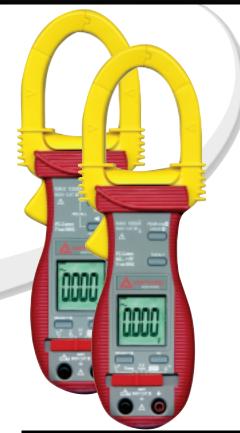
# **AMPROBE**®

### ACD-40PQ & ACD-41PQ 1000A Power Quality Clamp-on with THD Measurement





The ACD-40's provide a simple and effective way to verify if the electrical system is affected by harmonics. Add on troubleshooting capabilities with the ACD-40PQ data logging feature or get complete Power analysis with the ACD-41PQ. Increase measuring efficiency with an optional PC interface kit.

- TRMS sensing
- Measurements: -Total Harmonics Distortion THD, AC/DC Voltage up to 600V, AC Current up to 1000A, Resistance, Frequency, -Temperature
- ACD-41PQ also measures Active (W), Reactive (VAR) and Apparent (VA) Power with dual-display Power Factor readout
- AutoVA Auto Selection of AC Volts, DC Volts or AC Amps (ACD-41PQ)
- Data-logging 5400 points (ACD-40PQ)
- Optional PC interface capability
- Audible continuity
- Auto power off

- Automatic polarity
- Low battery indication
- Peak hold (ADC-41PQ)
- Data hold
- Large, easy to read LCD display with backlight
- Accommodates conductors up to 1.77" (45mm) in diameter
- · Carrying case, test leads,
- batteries (installed), thermocouple and manual included
- Voltage overload protection for all functions up to 600V AC/DC
- Safety CAT III 600V

FEATURES	ACD-40PQ	ACD-41PQ	BASIC ACCURACY	
TRMS Measuremaent	Yes			
AC Current	40.0 / 400.0 / 1000 A		+/-(1.0% Rdg + 5 LSD) @ 50 and 60Hz	
DC Voltage	600.0V		+/-(0.5% Rdg + 5 LSD)	
AC Voltage	600.0V		+/-(0.5% Rdg + 5 LSD) @ 50 / 60 Hz	
Resistance	999.9 Ohms		+/-(1.0% Rdg + 6 LSD)	
Frequency	5.00Hz to 500.0Hz		+/-(0.5% Rdg +4 LSD)	
Active Power (W)		0 to 600.0 kW	+/-(2.0% Rdg + 6 LSD) @ Harmonics Fund to 10th & PF > 0.7	
Reactive Power (VAR)		0 to 600.0 kVAR	+/-(2.0% Rdg + 6 LSD) @ Harmonics Fund to 10th & PF > 0.7	
Apparent Power (VA)		0 to 600.0 kVA	+/-(2.0% Rdg + 6 LSD) @ Harmonics Fund to 10th	
Power Factor		0.10 to 0.99	+/- 3 LSD @ Harmonics Fund to 21th	
THD-R *	0.0% to 99.9%		1.5% of Reading + 6d @ Fund Frequency	
THD-F *		0.0% to 99.9%	1.5% of Reading + 6d @ Fund Frequency	
Temperature	-58 F to 572 F (-50 C to 300 C)		+/-(2.0% Rdg + 6F) +/-(2.0 % Rdg + 3C)	
Hi-Lo Logging	5400 Points			

\*THD-R is defined as: (Total Harmonic RMS / Total RMS) x 100%

#### THD-F is defined as: (Total Harmonic RMS / Fundamental RMS) x 100%





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OPTIONAL ACCESSORIES	PART NUMB	R
PC Interface kit (PC connection cable with	software) RS-232 KIT2	
Line splitter (Energizer)	A47L	
5000A Clamp-on Current Transformer	(50 to 1) CT50-1	
3000A Clamp-on Current Transformer	(50 to 1) CT50-2	
Dual input Thermocouple adapter with	two ther- DKTA-620 an	d
mocouples -50°F to 600°F	two of TPK-56	3
Alligator Clips (For test leads)	VRC-320	
	•	
REPLACEMENT PARTS	PART NUMBER	
(supplied with product)		
Test leads with set of alligator clips	MTL-90B	

(alligator clips are not supplied with product)	MTL-90B
Thermocouple	TPK-59
Carrying case	SV-U
Instruction Manual	www.AMPROBE.com

#### GENERAL SPECIFICATIONS

**Display:** Voltage functions: 6000 counts LCD display(s)

Power, Ohm & Hz functions: 9999 counts LCD display(s)

ACA clamp-on function: 4000 counts LCD display(s) Update Rate: Power function: 1 per second nominal (ACD-41PQ only)

Voltage, ACA clamp-on, Ohm, Hz & Temperature functions: 4 per second nominal ACD-40PQ Hz function: 2 per second nominal. Polarity: Automatic

Low Battery: Below approx. 2.4V Operating Temperature: 0°C to 40°C Relative Humidity: Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C Altitude: Operating below 2000m

Storage Temperature: -20°C to 60°C, < 80% R.H. (with battery removed)

Temperature Coefficient: nominal 0.15 x (specified accuracy)/ °C @ (0oC -18oC or 28°C -40°C), or otherwise specified Sensing: True RMS sensing for all models Safety: Meets IEC61010-2-032 (1994), EN61010-2-032(1995), UL3111-2-032(1999). Measurement Category: III 600 Volts ac & dc Transient protection: 6.5kV (1.2/50µs surge) for all models

Pollution degree: 2

E.M.C.: Meets EN61326(1997, 1998/A1), EN61000-4-2(1995), and EN61000-4-3(1996) In an RF field of 3V/m:

Total Accuracy = Specified Accuracy + 45 digits Performance above 3V/m is not specified **Overload Protections:** 

ACA Clamp-on jaws: AC 1000A RMS continuous + & COM terminals (all functions): 600VDC/VAC RMS

Power Supply: standard 1.5V AAA Size (NEDA 24A or IEC LR03) battery X 2

**Power Consumption:** Voltage, ACA, Hz & Power functions: 10mA typical (ACD-41PQ)

Voltage & ACA functions: 3.5mA typical (ACD-40PQ) Ohm & Temperature functions: 4mA typical APO Timing: Idle for 16 to 17 minutes

APO Consumption: 10µA typical Dimension: L224mm X W78mm X H40mm

Weight: 224 gm approx Jaw opening & Conductor diameter: 45mm max **Special features (ACD-41PQ):** Backlight display; AutoVATM (Auto Selection on ACV, DCV or ACA functions); Power measurement of selectable W, VAR & VA with dual-display Total Power Factor features; Total harmonic distortion THD%-F; PEAK-RMS HOLD;

**Special features (ACD40PQ):** Backlight display; THD%-R Total harmonic distortion-RMS); On screen stand-alone Hi-Lo logging (5400 minutes) at sampling speed of faster than: 20 per second for Voltage & ACA functions 4 per second for Ohm & Temperature functions 2 per second for Hz function

#### ELECTRICAL SPECIFICATIONS

Accuracy is  $\pm$ (% reading digits + number of digits) or otherwise specified, at 23 °C  $\pm$ 5 °C & less than 75% R.H. True RMS (all models) ACV & ACA clamp-on accuracies are specified from 0% to 100% of range or otherwise specified. Maximum Crest Factor is as specified below, and with frequency spectrums, besides fundamentals, fall within the meter specified AC bandwidth for non-sinusoidal waveforms. Fundamentals are specified at 50Hz and 60Hz.

AC Voltage	
RANGE	Accuracy
50Hz / 60Hz	-
600.0V	1.0% + 5d (ACD-40PQ)
	0.5% + 5d (ACD-41PQ)
45Hz ~ 500Hz	
600.0V	1.5% + 5d
500Hz ~ 3.1kHz 9 (ACD-1	
600.0V	2.5% + 5d
DC Voltage	
RANGE	Accuracy
600.0V	0.5% + 5d
NMRR: >50dB @ 50/60Hz CMRR: >120dB @ DC, 50/60 Input Impedance: 2MΩ, 30p DCV AutoVA™ Threshold: 2 ACA & ACV PEAK-rms HOI	pF nominal 2.4VDC nominal (ACD-41PQ)
Response: 65ms to 90%	
Ohms	
RANGE	Accuracy
999.9Ω	1.0% + 6d
Audible Continuity Tester Audible threshold: between Response time: 250µs ACA Current (Clamp-oi	
	•
RANGE	Accuracy <sup>1) 2)</sup>
50Hz / 60Hz	
40.00A, 400.0A, 1000A	1.0% + 5d
45Hz ~500Hz	
	2.0% + 5d
1000A	2.5% + 5d
500Hz ~ 3.1kHz	
<b>500Hz ~ 3.1kHz</b> 40.00A, 400.0A	2.5% + 5d
40.00A, 400.0A	
40.00A, 400.0A 1000A	2.5% + 5d 3.0% + 5d 1AAC (40Hz ~ 500Hz only)

Tempera	ture	
RANGE		Accuracy <sup>1)</sup>
-50°C ~ 3	300°C	2.0% + 3°C
-58°F ~ 5	572°F	2.0% + 6°F
-20°C ~ -5	(or 6°F) to specifie 0°C (or @ -4°F ~ ermocouple range	ed accuracy @ -58°F) & accuracy not included
Frequen	су	
RANGE		Accuracy
5.00Hz ~	· 500.0Hz	0.5%+4d
600V rang	ge: > 400A e: > 30V ? <sup>1)</sup> <b>(ACD-40PQ</b>	only)
RANGE	Harminic Order	Accuracy <sup>2)</sup>
0.0%	Fundamental	1.5% of Reading + 6d
~99.9%	2nd ~ 3rd	5.0% of Reading + 6d
	4th ~ 10th	2.5% of Reading + 6d
	11th ~ 51st	2.0% of Reading + 6d
		Total Harmonic

THD%-F <sup>1)</sup> (ACD-41PQ only)					
RANGE	Harminic Order	Accuracy <sup>3)</sup>			
0.0% ~99.9%	Fundamental	1.5% of Reading + 6d			
	2nd ~ 3rd	5.0% of Reading + 6d			
	4th ~ 10th	2.5% of Reading + 6d			
	17th ~ 46th	3.0% of Reading + 6d			
	47th ~ 51st	4.5% of Reading + 6d			
<sup>1)</sup> THD-F is defined as: (Total Harmonic RMS / Fundamental RMS) x 100% <sup>2)</sup> Range for Dual Display mode: 0% ~ 99% <sup>3)</sup> Specified accuracy @ ACA fundamental > 5A ; ACV fundamental > 50V					

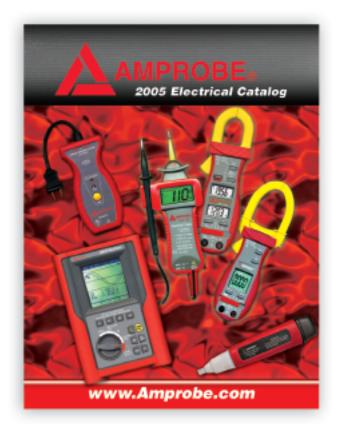
Total Power Factor (PF)			
RANGE	Accuracy <sup>1)</sup>		
0.10 ~ 0.99	F ~ 21st	22nd ~ 51st	
		5d	
<ul> <li><sup>1)</sup>Specified accuracy @ ACA fundamental</li> <li>&gt; 2A ; ACV fundamental &gt; 50V</li> </ul>			

Power					
RANGE		Accuracy <sup>1) 2)</sup>			
0 ~ 600.0kVA	F ~ 10th	11th ~ 46th	47th ~ 51st		
@ PF = 0.99 ~ 0.1	2.0%+6d	3.5%+6d	5.5%+6d		
RANGE	Accuracy 1) 3)				
0 ~ 600.0kW / kVAR	F ~ 10th	11th ~ 25th	26th ~ 46th	47th ~ 51st	
				i	

@ PF = 0.99 ~ 0.70	2.0%+6d	3.5%+6d	4.5%+6d		
@ PF = 0.70 ~ 0.50	3.0%+6d			10%+6d	
@ PF = 0.50 ~ 0.30					
@ PF = 0.30 ~ 0.20	10%+6d			15%+6d	
<ul> <li><sup>1</sup>Specified accuracy is for ACA clamp measurement at the center of jaws. When the conductor is not positioned at the jaw center, position errors introduced are: Add 1% to specified accuracy for ACA measurements made WITHIN jaw marking lines (away from jaw opening) Accuracy is not specified for ACA measurement made BEYOND jaw marking lines (toward jaws opening)</li> <li><sup>a</sup> Add 1% to specified accuracy @ ACA fundamental &lt; 5A or ACV fundamental &lt; 90V. Accuracy is not specified @ ACA fundamental &lt; 1A or ACV fundamental &lt; 30V</li> <li><sup>a</sup> Add 1% to specified accuracy @ ACA fundamental &lt; 5A or ACV fundamental &lt; 90V. Accuracy is not specified accuracy @ ACA fundamental &lt; 5A or ACV fundamental &lt; 90V.</li> </ul>					
A-lags <sup>1)</sup> Indication:					

"A-lags" LCD annunciator turns on to indicate an inductive circuit, or Current A lags Voltage V (i.e., phase-shift angle£c is "+").  $^{9}$ A-lags Indication is specified at 50/60Hz fundamental without harmonics, and at ACV > 90V, ACA > 9A, & PF < 0.95





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