

# Digital Power Transducer

HC 6610



## Introduction

About the Digital Power Transducer HC 6610  
HC 6610 digital power transducer is a conceptualized and designed to revolutionize the approach to traditional power transducer.

This power transducer is a compact, electronically advanced and programmable device. It is the answer to future generation of electrical transducers' needs and methodology.

### *Environmental Impact & Cost Saving*

The HC 6610 can replace many units of conventional analog or digital instruments, and change over switches (e.g. Amp, Volt, KVA, KW, PF, KWH, KVarH, FQ ... etc.).

This saves the wiring material usage and reduces the cost on traditional transducers' needs.

### *Increase Productivity & Efficiency*

The HC 6610 is specifically designed to meet the world's mostly and widely used ANSI / IEEE / IEC standards and it also fits the DIN rail mounting.

The HC 6610 greatly reduced cabling complexity and time. It is also a standardize hardware and suitable for either 1 phase 2 wires, 1 phase 3 wires, 3 phase 3 wires, or 3 phase 4 wires system.

### *Improved Technical Superiority and Reliability*

The HC 6610 is endowed with excellent technical specifications like overload capabilities, accuracy levels, long terms stability. Those specifications are far exceeding those of conventional instruments.

To meet the future transducer environments, the HC 6610 is equipped with a serial port (RS-485 or RS-232) to allow the connection to an open architecture computerized network. It can run on PC or data acquisition system, and complying the Modbus® protocol. The software provides a simple yet practical solution to energy management in factories or plants, small industries, building services and etc.

### *Parameters Conversion*

This microprocessor-based power transducer provides compatibility with Modicon Modbus® system as a standard feature. The HC 6610 series provides more than 30 power and energy parameters.

## Features

- Over 30 power and energy parameters
- For factory and building automation
- Modbus® RTU
- Maximum 600V
- True RMS conversion
- Field programmable PT / CT ratio
- Accuracy up to 0.15%
- 2 ports : RS485 + RS232
- 4 isolated analog outputs to transducer function
- 4 pulse outputs based on KWH, KVarH
- Memory for all setup and energy data
- Low input burden 0.2VA (5A / 120V)
- Wide Power supply range AC/DC
- Compact physical configuration
- 2KV RMS input / output / power isolation
- Commonly for DIN rail-mounting
- Protective touch-proof terminals and enclosure meeting requirements of VBG4 & VDE 0106 part 100 (Germany)



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## *Factory & Building Automation (FA & BA)*

The HC 6610 was developed for factory and building automation (FA & BA) applications. More of power and energy parameters can easily apply to wide range of AC switch-gear or industrial power distribution system.

## *PLC Modbus® Compatible*

The Modbus® communication protocol allows information and data to be efficiently transferred between HC 6610 and Modicon programmable logic controller (PLC), or other third party Modbus® compatible monitoring and control system. The HC 6610 can also establish a monitoring system just simply adopt IPC-based centralized master display software. The RTU mode Modbus® protocol with default baud rate 9600 bps, 8 data bit.

## *Memory for all setup and energy data*

All of the transducer status setting and energy data are retaining in memory while losing the power. The records include the watt-hour that been measured, the record of maximum demand value, date and time, PT and CT ration, the measured system configuration, the settings and related communication.

## *Field Programmability*

In the site, the HC 6610 is able to set like CT & PT ratio, Modbus® address, communication baud rate, parity etc. The HC 6610 can be programming by rear RS-485 / RS-232 communication port from a PC.

## *Accuracy up to 0.15%*

With a well developed conversion, sampling and software compensation technology that makes HC 6610 successfully meet the accuracy requirements of modern transducer. The accuracy of voltage and current can be up to 0.15%, and other power can be up to 0.25%.

## *Comprehensive System Integration*

The HC 6610 provides the Modbus® (are compatible with the Modicon system as a standard feature for comprehensive system integration). The PLC compatible RS-485 / RS-232 Modbus® communication protocol allows information and data to be efficiently transferred between HC 6610 and Modicon programmable logic controller (PLC) existing RTU Power SCADA system and DCS system, or software backup. We would like you to contact Hsiang Cheng Electric Corp. or our representative sales department for further information.

## Model & Ordering Number

**Model : HC 6610**

**Order : HC 6610 - B - 5.0A - H - 1 - A**

Version

Current Input

1.0A

5.0A

Power

H : AC 80-260V, DC 80-330V

L : DC 20-60V

Option

N : No option

A : Pulse output \* 4

B : Analog output \* 4

C : Analog output \* 2 + Pulse output \* 2

Y : Special ordering

Communication Port

1 : RS-485 + RS-232

Y : Special Ordering

## Specification

### Measured power parameters

Parameters	Accuracy	Phase1	Phase2	Phase3	Phase0	Total
VP x 3	0.15% fs	VP1	VP2	VP3		VPE
VL x 3	0.15% fs	VL1	VL2	VL3		VLE
A x 4	0.15% fs	A1	A2	A3	A0	
Watts	0.25% fs	W1	W2	W3	(0.5% fs)	W
Vars	0.25% fs	Var1	Var2	Var3		Var
VA	0.25% fs	VA1	VA2	VA3		VA
PF	0.25% fs	PF1	PF2	PF3		PF
WH	0.8% rd					WH
VarH	0.8% rd					VarH
Hz	0.03% rd					
Watt demand	0.25% fs					
Phase Rotation						

**■ Stability**

Temperature range (-25 to 55°C)

Maximum 100 ppm /°C

**■ Note**

- ⊙ VP1 / VP2 / VP3 / VPE, phase to neutral voltage
- ⊙ VL1 / VL2 / VL3 / VLE, line to line voltage
- ⊙ A1 / A2 / A3 / AE, phase current
- ⊙ VPE / VLE / AE, 3 phase averaged
- ⊙ AO, neutral current
- ⊙ PF1 / PF2 / PF3, coincident to conversion element
- ⊙ WH / VarH accuracy vs limited input range  
Voltage  $\geq$  50V  
Current  $\geq$  10% of rating  
PF  $\geq$  0.5

***Main AC power input*****■ Phase and wires**

- ⊙ 3 phase 4 wires      ⊙ 3 phase 3 wires
- ⊙ single phase 3 wires      ⊙ single phase 2 wires

**■ Range**

- ⊙ Voltage : 10-600V
- ⊙ Current : Suitable for CT secondary rating (optional)  
Maximum 6A for 5A rating  
Maximum 1.2A for 1A rating
- ⊙ Power maximum 6500 ( W / Var / VA )
- ⊙ Frequency : 47-63 Hz

**■ Burden**

- ⊙ Voltage < 0.4VA at 600V / phase
- ⊙ Current rating < 0.2VA / phase

**■ Overload capability**

- ⊙ Current ( 5A )  
2 x rated continuous      10 x rated 30 seconds  
25 x rated 2 seconds      50 x rated 1 second

**⊙ Voltage**

750V continuous 1000V 10 seconds  
1200V 3 seconds

**■ Communication port**

RS485 / RS232 : MODBUS RTU protocol

**■ User programming**

- ⊙ Communication to baud rate and address  
Baud 1.2K / 2.4K / 4.8K / 9.6K / 19.2K bits
- ⊙ Measuring system to 3 phase 3 wires / 3 phase 4 wires / single phase 3 wires / single phase 2 wires  
PT ratio 1.0 - 5000.0  
CT ratio 1.0 - 5000.0

**■ Dielectric strength**

IEC 255-5  
2KV ACrms 1 minute between input/output/power

**■ Impulse and surge test**

ANSI/IEEE C37.90.1-1989 (3KV) SWC test  
IEC 255-22-1 class III SWC test  
IEC 255-22-4 class IV (IEC 801-4) SWC test  
IEC 255-5 1.2x50 ms (5KV) impulse test

**■ Stability**

Temperature range (-25 to 55°C)  
Maximum 100 ppm /°C  
Long term stability : 0.15% drift max. per year

**■ Operating condition**

Temperature range -25 to +60°C  
RH 20-95% non-condensed

**■ Storage condition**

Temperature range -25 to +70°C  
RH 20-95% non-condensed

**■ Power supply**

- ⊙ AC 80-260V, @40-70 Hz, DC 80-330V  
DC 20-60V
- ⊙ Dissipation max. 8VA for AC and 4.5W for DC

# Digital Power Transducer

HC 6610

## ■ Dimension

134.8 x 70.3 x 149.5 mm DIN Rail-mounting

## ■ Pulse output (PO) ..... option

- ⊙ 4 pulse outputs photo-isolated (maximum)
- ⊙ Configurable Parameter, WH / VarH  
Unit, +1WH / +1QH
- ⊙ Pulse width / 50% duty cycle

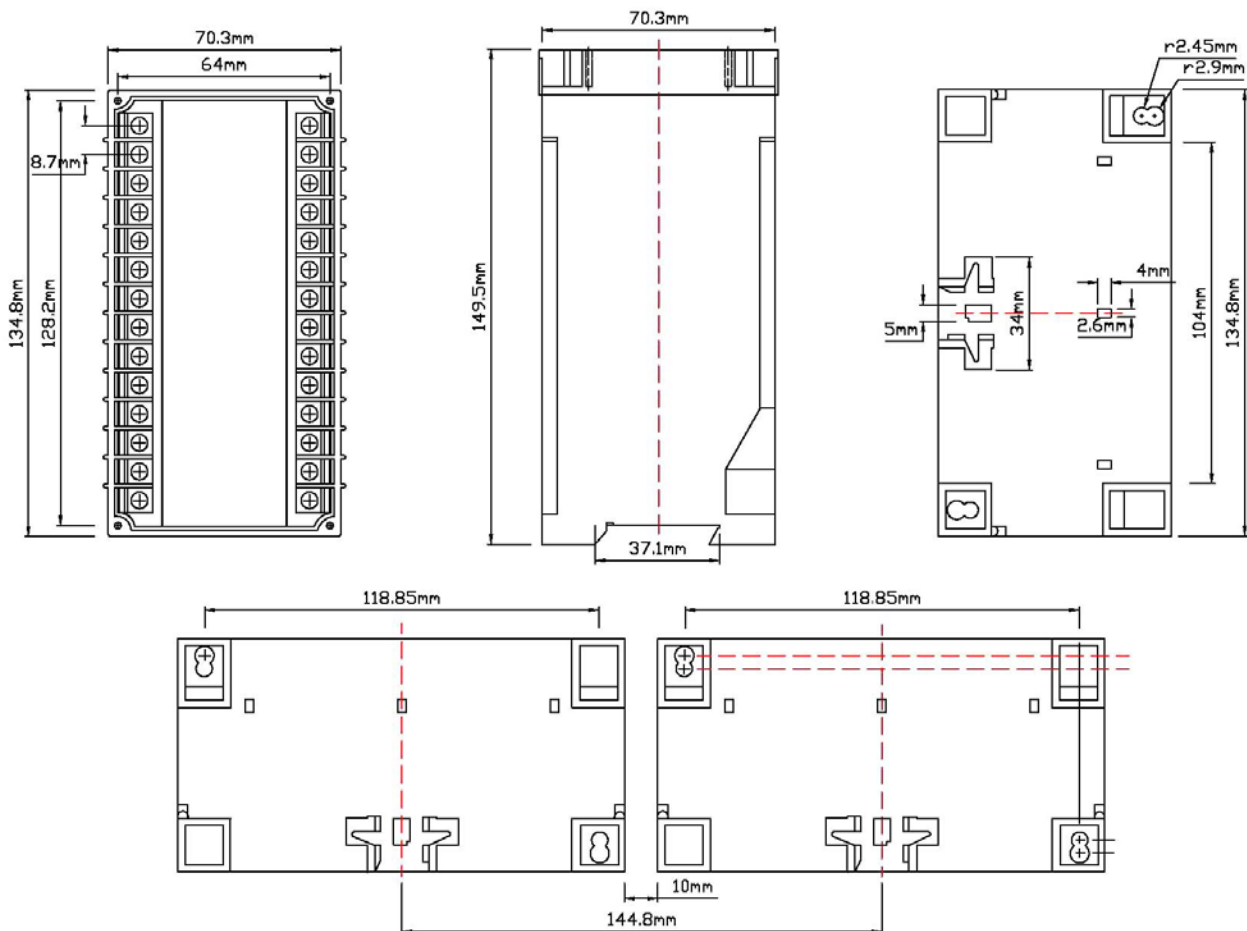
## ■ Analog output (AO) ..... option

- ⊙ 0.5% fs accuracy
- ⊙ 4 isolated analog outputs (maximum)
- ⊙ Standard output  
0-20mA<sub>dc</sub>, 4-20mA<sub>dc</sub> / load < 500Ω
- ⊙ Option output  
0-1mA<sub>dc</sub>, 0-5mA<sub>dc</sub>, 0-10mA<sub>dc</sub>, 0-1V<sub>dc</sub>,  
0-5V<sub>dc</sub>, 0-10V<sub>dc</sub>, 1-5V<sub>dc</sub>, 2-10V<sub>dc</sub>
- ⊙ Configurable Measured parameters  
Input range, unipolar / bipolar

Ex1. Input setting voltage are 100 or  $100\sqrt{3}$  (57) V  
and 110 or  $110 / \sqrt{3}$  V, output : 4-20mA

Ex2. Input setting current can be set for 1 or 5A,  
output : 4-20mA

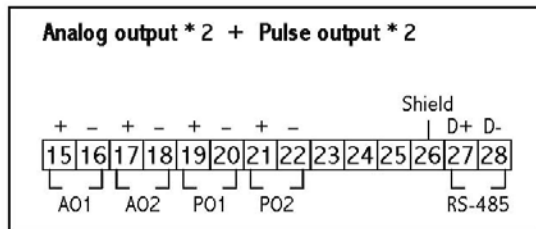
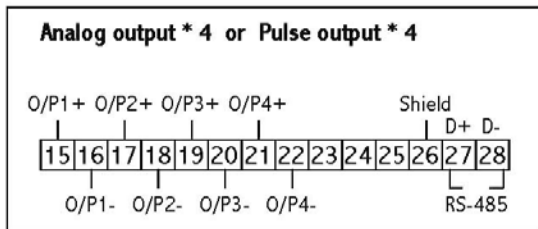
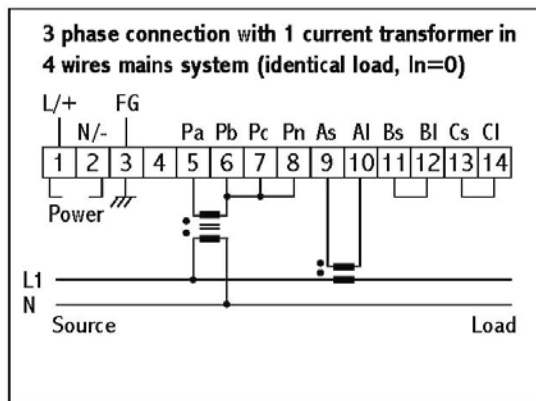
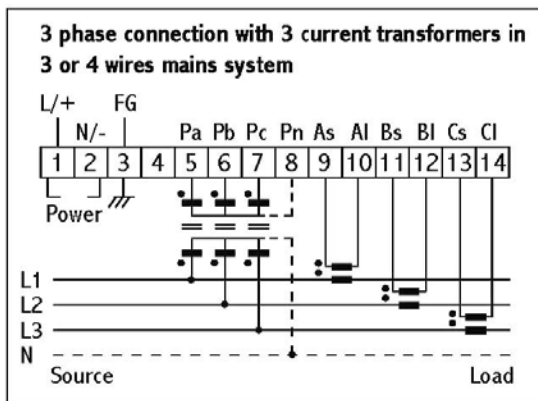
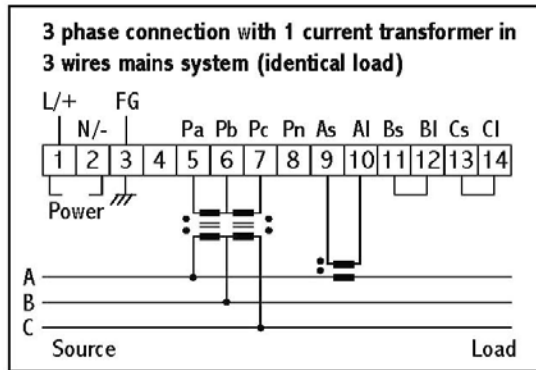
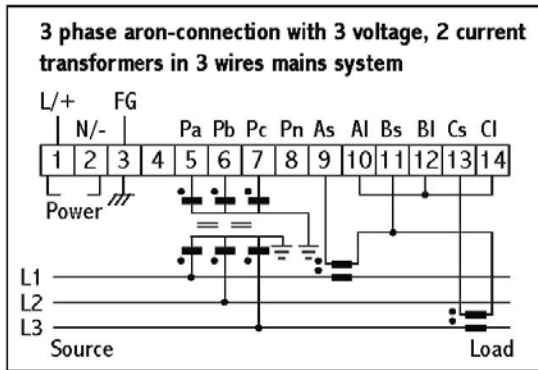
## Dimension



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## Wiring

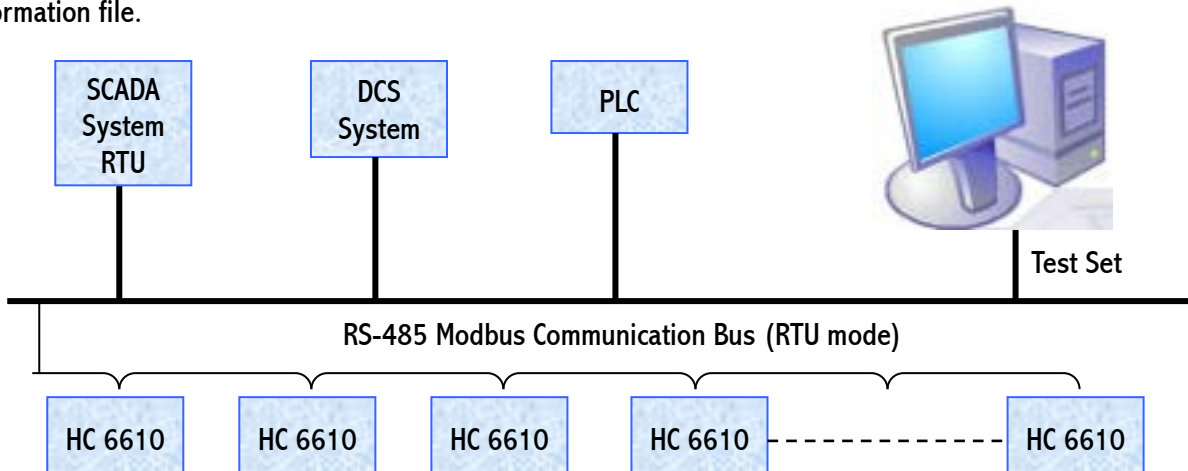


## Applications

The HC 6610 PC tool a utility program that can help user to connect to “HC 6610 Power Transducer” rapidly. The HC 6610 PC Tool is provided along with every HC 6610, which allows easy access to all meter setup information and actual values via a personal computer running Windows 95/98 and one of the PC’s communication ports (COM1 or COM2). The PC Tool is able to do the function as bellows:

- ⊙ Program / Modify setup information
- ⊙ Load / save setup information files from / to disk
- ⊙ Read actual “Basic” value (current / voltage / power / frequency)

The HC 6610 PC Tool can be used as stand-alone without a HC 6610 to create or edit HC 6610 setup information file.



## Communication wiring

