POWER METER

UP 6720plus

Introduction

The UP 6720plus Power Meter is microprocessor-based instrument intended for power and energy measurement. Additional functionality option to provide control function as Fault current detection. The UP 6720plus is an Intelligent Electronic Device (IED) and stores these measured values and setting parameters in internal registers for communication. With the features, high accuracy, fully modularized & plug-in design, and compact size, UP 6720plus is very suitable for Electric Utility Substation Automation application.

Features

- ◎ Current input terminal with automatic shorting mechanism
- ◎ Over 90 power and energy parameters
- ◎ Modbus® RTU / DNP3.0 protocol
- ◎ 4-AC current inputs, 5A or 1A (specified when ordering)
- ◎ 4-AC voltage inputs, maximum 300V
- ◎ True RMS conversion
- ◎ 16 bit ADC ,32 sample points per cycle
- ◎ Instant maximum and minimum logger
- ◎ For factory and building automation
- ◎ Maximum demand control applicable
- ◎ Compact physical configuration
- ◎ Waveform capture
- ◎ Error message display(Malfunction or communication interruption)
- ◎ Build in RTC (real time clock)
- ◎ Field programmable PT / CT ratio
- ◎ Accuracy up to 0.15%
- ◎ Low input burden 0.5VA (5A / 120V)
- ◎ 2 communication Port, RS-485 + RS-232
- ◎ Wide power supply range 80~260V AC / DC
- ◎ Memory for all setup and energy data
- ◎ Comprehensive self test diagnostic
- ◎ “User Map” speed up communication (indirect accessing data)
- ◎ Fault current detection (option)
- ◎ 2kV RMS input / output / power isolation
- ◎ LCD display clear and long-life
- ◎ Fully modularized & plug-in type
- ◎ Easy in field maintenance

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Model & Ordering Number

Model : UP 6720plus

Ordering : UP 6720plus — C — 5.0A — H — 1 — N

Version

Current Input
1.0A
5.0A
7.5A

Power
H : AC 80-260V, DC 80-330V
L : DC 24-60V

Option
N : None
A : Fault current detection

Communication Part
1 : RS-485 + RS-232
Y : Special ordering

Specification

Programmable measurements / accuracy / display readouts

Parameter	Digits	Display (Maximum)	Accuracy		Phase 1	Phase 2	Phase 3	Total	Average
			option=N	option=A					
Vx3	4	9.9.9.9. V/KV	0.15% fs	0.25% fs	V1	V2	V3		VE
Ax3	4	9.9.9.9. A/KA	0.15% fs	0.25% fs	A1	A2	A3		AE
Watts	4	9.9.9.9. W/KW/MW/GW	0.25% fs	0.25% fs	W1	W2	W3	W	
Vars	4	9.9.9.9. Var/KVar/MVar/GVar	0.25% fs	0.25% fs	Var1	Var2	Var3	Var	
VA	4	9.9.9.9. VA/KVA/MVA/GVA	0.25% fs	0.5% fs	VA1	VA2	VA3	VAE	
PF	4	1.000	0.25% fs	0.25% fs	PF1	PF2	PF3	PF	
WH	7	9999.9.9.9 WH/KWH/MWH/GWH	0.25% rd/PF *1	0.5% rd/PF *2				WH	
VarH	7	9999.9.9.9 VarH/KVarH/MVarH/GVarH	0.25% rd/PF *1	0.5% rd/PF *2				VarH	
A0	4	9.9.9.9. A/KA	0.5% fs	0.25% fs					
AFx3,AF0	4	9.9.9.9. A/KA	None	1% fs					
Hz	4	70.00	*3	*3					
Angle	4	359.9 DG	*4	*4	DG1	DG2	DG3	DG	

*1 Accuracy performance range for WH/VarH,
PF ≧ 0.5 (-10 to 50℃)
PF = Cosθ for WH ; PF = Sinθ for VarH
Voltage ≧ 60V ; Current ≧ 20% of rating

*2 Accuracy performance range for WH/VarH,
PF ≧ 0.5 (-10 to 50℃)
PF = Cosθ for WH ; PF = Sinθ for VarH
Voltage ≧ 60V ; Current ≧ 10% of rating

*3 0.03% rd or ±20mHz(according to which is smaller)

*4 $0.2^{\circ} \pm \mathrm{SIN}^{-1}(0.02 \times \mathrm{PF})$

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Input
4 - AC Currents (Aa, Ab, Ac, A0)
4 - AC Voltage (Pa, Pb, Pc, Pn for 3-phase input & P1, P2 for separate 1-phase input)
Range
Voltage : 10 - 300 V
Current : 0.01 - 1.2 x CT
Frequency : 40 - 70 Hz

Burden
Voltage < 0.15VA at 300V (or > 1 MΩ)
3 PT continuous, 5 PT 10 sec*1
Current ≤ 0.3VA of rating
2 CT continuous, 25 CT 2 sec, 50 CT 1 sec*1

Display
LCD / 0.4"/ white backlight, black word
top rows of 8 alphanumeric
lower rows of phase & units

Programmability
Communication Baud Rate
1.2K / 2.4K / 4.8K / 9.6K / 19.2K bps
Device address 1 – 254
Communication response delay time
15ms – 200ms ,default 30ms
±WH/QH is 32 Bits, and other measurement parameters are 16 Bits, which are stored in different temporary storage areas. Please refer to the communication location description
Measured Power System
3P4W / 3P3W / 1P3W / 1P2W
50 / 60 Hz main frequency
PT ratio 1.0 - 6000.0
CT ratio 1.0 - 6000.0

Fault Current Detection (Mode 0) option
One Fault-Based-Curve
16 set-point groups (Ip-pu, Mp, Ig-pu, Mg)

Fault Current Detection (Mode 1) option
User definable
4-point Phase time over-current curve
4-point Ground time over-current curve

Waveform Capture
Data Channel : 4 currents, 4 voltages
Sample Rate : 32 points per cycle, length 2 cycle

Maximum / Minimum Logger
20 parameters with time-stamped :
VP1, VP2, VP3, VPE, VPS, VL1, VL2, VL3, VLE, VLS, A1, A2, A3, A0, AE, W, Var, VA, PF, F
Provide automatic storage system for at least one year in the event of a power outage. Contains settings, energy

Communication Port
RS232 (front panel) : Modbus RTU protocol only
RS485 (rear panel) : Modbus RTU/DNP3.0 protocol

Real Time Clock (RTC)
Maximum deviation 2 sec in 24 hours
Time for Year / Month / Day / Hour / Minute / Second

Dielectric Strength
IEC 255-5
2kV AC rms 1 minute between input / output / power
2.5kV AC rms 1 minute between case / input
2kV AC rms 1 minute between case / power

Impulse and Surge
ANSI / IEEE C37.90.1-1989 (3kV) SWC
IEC 61000-4-12 CLASS Ⅲ 2kV Ring Wave
IEC 61000-4-4 CLASS Ⅳ 4kV EFT
IEC 61000-4-5 CLASS Ⅳ 4kV Surge

Stability
Temperature range (-10 to +50℃), maximum 100 ppm/℃

Operating Condition
Temperature range -25 to 60℃
RH 10 to 95% non-condensing

Storage Condition
Temperature range -40 to 80℃
RH 10 to 95% non-condensing

Event logger
200 events with time-stamped
status change of switch input
Failure in self-test
Programming access
Power ON / OFF

Power Supply
LO : DC 24 - 60V ±20% (19.2 – 72VDC)
HI : AC 80 - 260V @ 40 - 70 Hz / DC 80 - 330 V
Dissipation maximum 12 VA for AC and 5W for DC

Dimension
144 x 72 x 210 mm (W x H x D)
CUT OUT : 137 x 68mm

*1 : Overload Withstand

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Fault Current Detection Function option

Fault-Based-Curve

One user programmable Fault-Based-Curve can be stored in the UP 6720plus. This can be used for time over-current detection in the same as IEC, ANSI curves. The custom Fault-Based-Curve has set-points for entering times to fault at the following current levels (I/Ipu) : 1.00 to 1.20 in steps of 0.05 and 1.20 to 6.00 in steps of 0.4, and 6.0 to 20.0 in steps of 2.0. The AIM then converts these points to a continuous curve by linear interpolation between data points.

(I/Ipu)	Fault Time Tfbc (ms)	(I/Ipu)	Fault Time Tfbc (ms)	(I/Ipu)	Fault Time Tfbc (ms)
1.00	0-65535	2.80	0-65535	6.00	0-65535
1.05	0-65535	3.20	0-65535	8.00	0-65535
1.10	0-65535	3.60	0-65535	10.0	0-65535
1.15	0-65535	4.00	0-65535	12.0	0-65535
1.20	0-65535	4.40	0-65535	14.0	0-65535
1.60	0-65535	4.80	0-65535	16.0	0-65535
2.00	0-65535	5.20	0-65535	18.0	0-65535
2.40	0-65535	5.60	0-65535	20.0	0-65535

Fault-Alarm-Curve

The required Fault-Alarm-Curve is established by programming a Pickup Current and a Curve Multiplier. The Pickup Current is the threshold current at which the fault detection starts timing, range from 0.05 to 20.00 CT. The Curve Multiplier allows shifting of the programmed base curve in the vertical time direction, range from 0.00 to 100.00. The formula is :

T = M * Tfbc (at I/Ipu)

Where

T = Fault Alarm Time (ms) M = Curve Multiplier

Tfbc = Fault Base Time (ms) at I/Ipu

I = Input Current Ipu = Pickup Current

Set-point Group

In UP 6720plus, the set-points (Ip-pu, Mp) are used for all three phase time over-current detection, and the set-points (Ig-pu, Mg) are used for ground time over-current detection only. Sixteen user programmable set-point groups (Ip-pu, Mp, Ig-pu, Mg) (G_00 to G_15) can be stored in UP 6720plus. (In other word, there are 16 phase fault-alarm-curves and 16 ground fault-alarm-curves.) Via communications, host can select the active set-point group remotely, and the active group no, the active Ip-pu, the active Mp, the active Ig-pu, and the active Mg value can be read-back.

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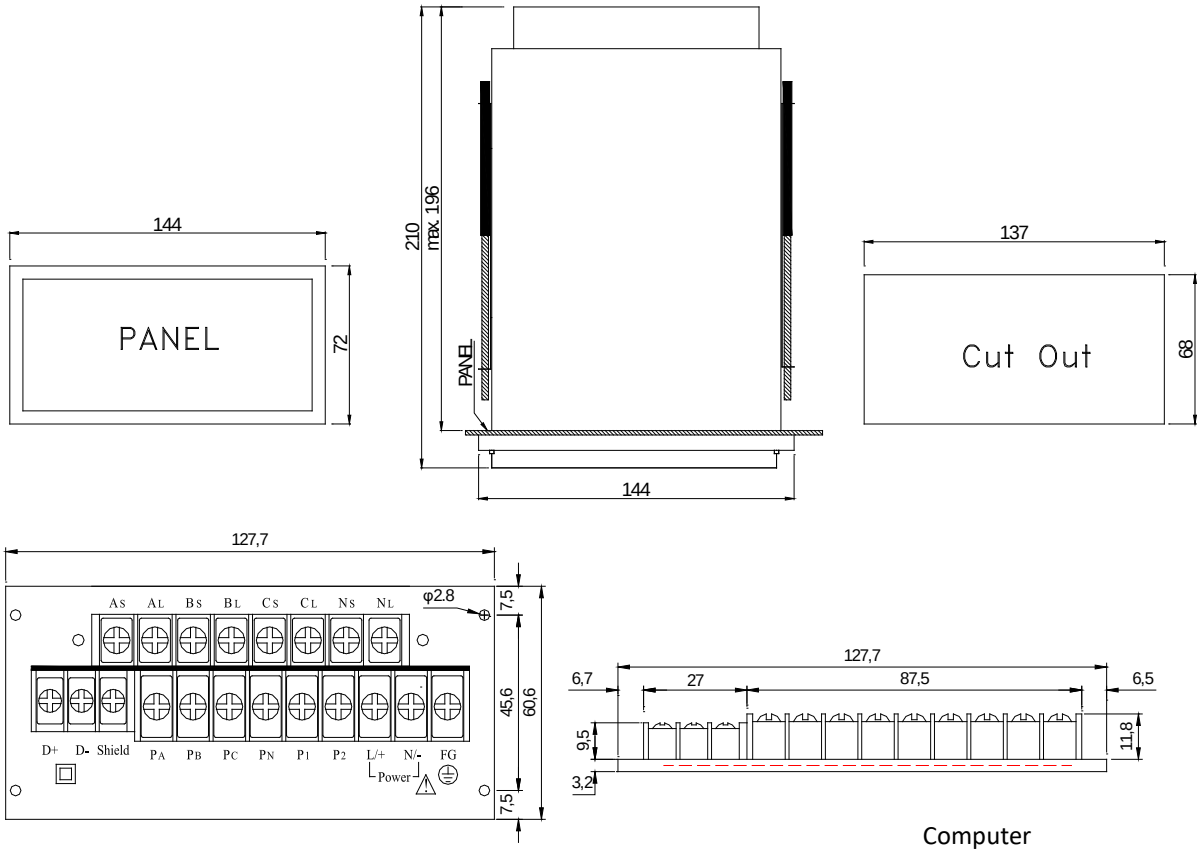
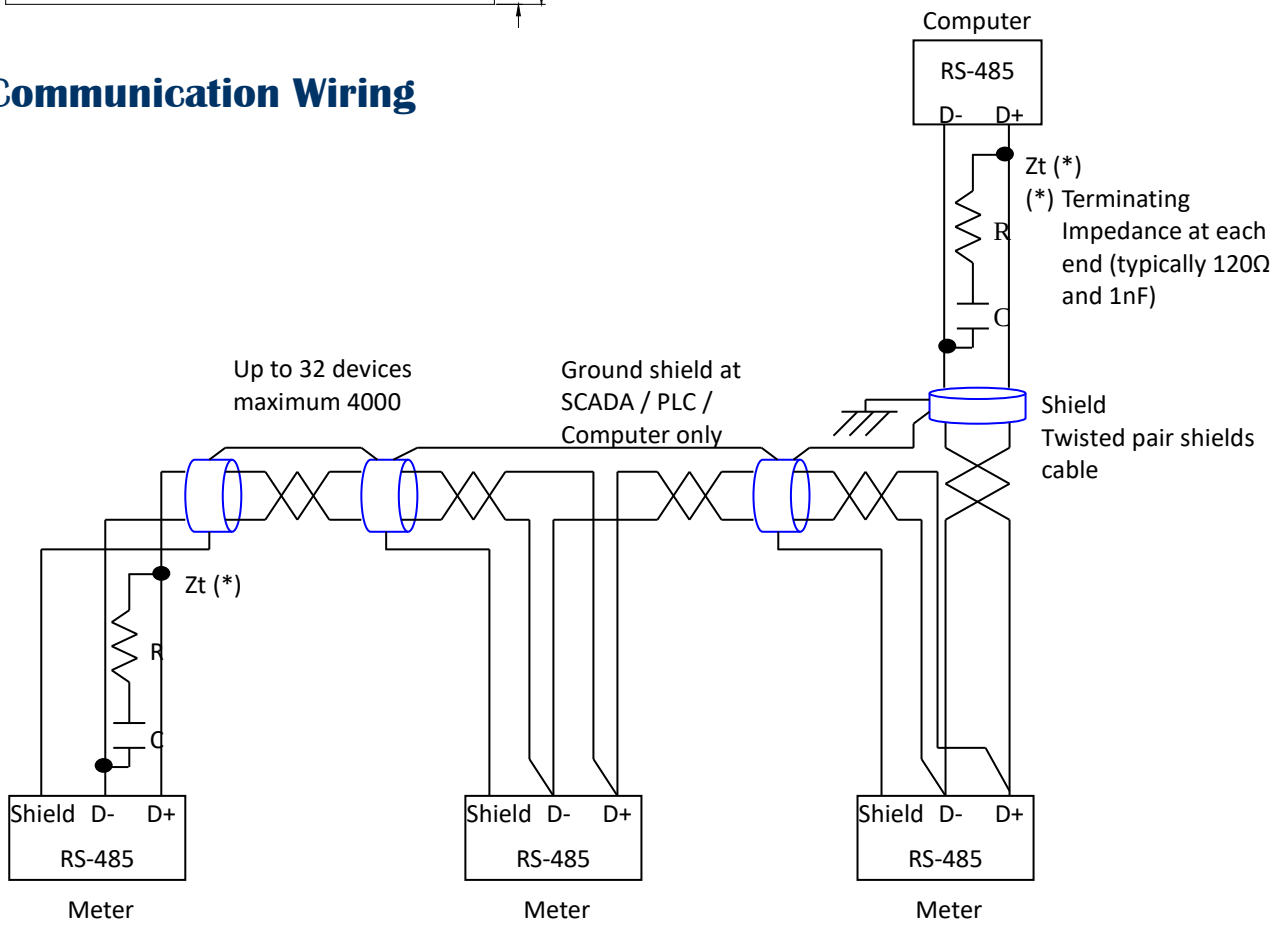
Dimension



Communication Wiring



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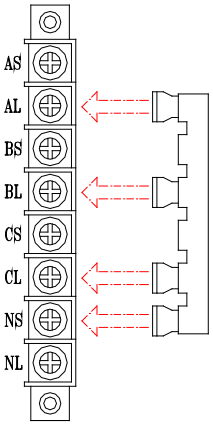
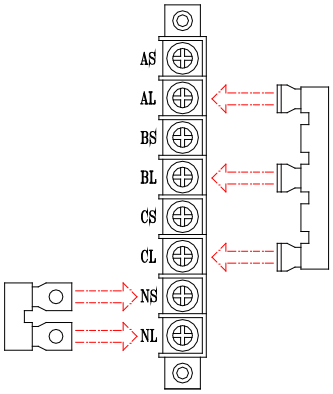
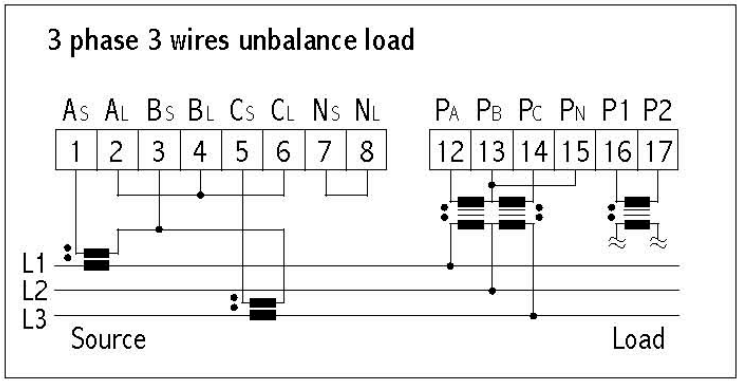
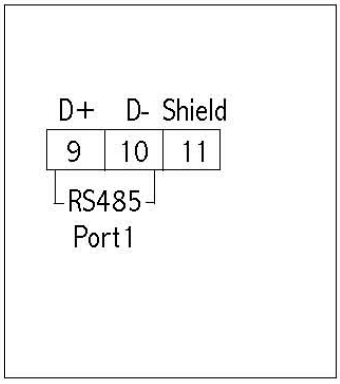
Wiring

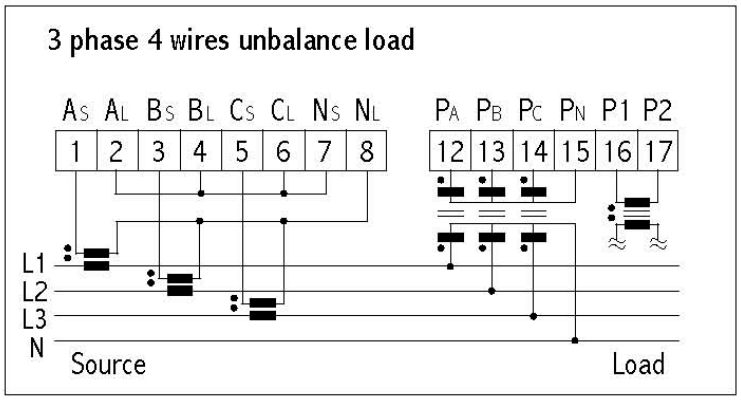
3 phase 4 wires

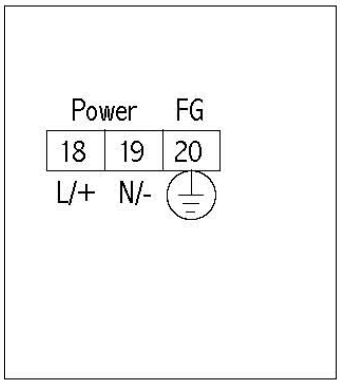












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