WATT/WH or VAR/VAR HR TRANSDUCERS

WATT/WATTHOUR or VAR/VAR HOUR TRANSDUCER *MODEL* GH & VGH

ACCURATE TO 0.2% OF READING

FEATURES

- Accurate regardless of variations in voltage,current, power factor, or load.
- Available with 1, 2, 2 1/2, or 3 element configurations. Bi-directional Watt and Watthour outputs available. (GH) Bi-directional Var and Var Hour outputs available. (VGH)
- Accuracy maintained over wide temperature range, calibration traceable to **NIST**.

APPLICATIONS

- Integration into energy management systems, or a variety of sub-metering applications.
- Measurement using direct-connection, potential and/or current transformers.

SINGLE PHASE MODELS-INTEGRAL SENSOR (ONE ELEMENT)

INPUTS		F.S. WATTS or VARS	STANDARD GH- OR VGH- OUTPUTS				F.S. COUNTS /HOUR	WH RELAY OPTIONS (ADD SUFFIX)			
VOLTS	AMPS		+1mAdc	+10Vdc	4-20mA	4-12-20mA		"-T"	"-R"	"-H"	"-K"
0 to 150	0 to 1	100	103B	103D	103E	103EM	100	Relay is replaced with 5Vdc, TTL compatible pulse.	A second relay or pulse is provided to allow bi-directional measurement.	Form C (SPDT) solid state relay 0.1A	Form C (SPDT) solid state relay operating in "KYZ" format (50% duty cycle) 0.1A
	0 to 5	500	001B	001D	001E	001EM	500				
	0 to 10	1000	010B	010D	010E	010EM	1000				
	0 to 20	2000	019B	019D	019E	019EM	2000				
0 to 300	0 to 1	200	104B	104D	104E	104EM	200				
	0 to 5	1000	002B	002D	002E	002EM	1000				
	0 to 10	2000	011B	011D	011E	011EM	2000				
	0 to 20	4000	020B	020D	020E	020EM	4000				
0 to 600	0 to 1	500	105B	105D	105E	105EM	500				
	0 to 5	2000	003B	003D	003E	003EM	2000				
	0 to 10	4000	012B	012D	012E	012EM	4000				
	0 to 20	8000	021B	021D	021E	021EM	8000				

Highlighted models, (5A), can be used with current transformers.
To calculate unit scaling when using current or potential transformers, multiply the base unit scaling by the CT or PT ratio.

Example:
GH-001D used with 100:5 CTs.
CT ratio = 100/5 = 20
F.S. Watt input = 500W x 20 = 10,000W (10kW)
(0-10kW input = 0 - 10V output)
WH relay scaling = 1WH/Cnt x 20 = 20WH/cnt.

All std. units require 85-135Vac instrument power, (60 Hz.).
Optional 60Hz self-powered models-Add suffix **"-G"**
Optional 230Vac instrument power - Add suffix **"-22"**
Input voltage ranges limited to:
85-135 for 150V models
200-280 for 300V models
380-550 for 600V models

50 HERTZ MODELS
Self-powered units-Add suffix **"-50"** to part number.
Units requiring external instrument power:
120V, 50Hz-Add suffix "**-51**" to part number.
220V, 50Hz-Add suffix "**-52**" to part number.

Standard Relay is a Form A, SPST

ORDERING INFORMATION
Example: Single-Phase, 120V, 5A Input with +10Vdc Output Proportional to +500 Watts, TTL Pulse Output for Watthours, Each Pulse Proportional to 1.0 Watthour.
GH-001D-T

ORDERING INFORMATION
Example: Single-Phase, 120V, 5A Input with +10Vdc Output Proportional to +500 VAR's, Self-Powered, 1.0 VARhour per Relay Count.
VGH-001DG

CUSTOM WATT HOUR OR VAR HOUR COUNT RATES AVAILABLE - CONSULT FACTORY

THREE PHASE THREE WIRE MODELS-INTEGRAL SENSOR (TWO ELEMENT)

INPUTS		F.S. WATTS or VARS	STANDARD GH- OR VGH- OUTPUTS				F.S. COUNT PER HR	WH RELAY OPTIONS (ADD SUFFIX)			
VOLTS	AMPS		+1mAdc	+10Vdc	4-20mA	4-12-20mA		"-T"	"-R"	"-H"	"-K"
0 to 150	0 to 1	200	120B	120D	120E	120EM	200	Relay is replaced with 5Vdc, TTL compatible pulse.	A second relay or pulse is provided to allow bi-directional measurement.	Form C (SPDT) solid state relay 0.1A	Form C (SPDT) solid state relay operating in "KYZ" format (50% duty cycle) 0.1A
	0 to 5	1000	004B	004D	004E	004EM	1000				
	0 to 10	2000	013B	013D	013E	013EM	2000				
	0 to 20	4000	022B	022D	022E	022EM	4000				
0 to 300	0 to 1	400	121B	121D	121E	121EM	400				
	0 to 5	2000	005B	005D	005E	005EM	2000				
	0 to 10	4000	014B	014D	014E	014EM	4000				
	0 to 20	8000	023B	023D	023E	023EM	8000				
0 to 600	0 to 1	800	122B	122D	122E	122EM	800				
	0 to 5	4000	006B	006D	006E	006EM	4000				
	0 to 10	8000	015B	015D	015E	015EM	8000				
	0 to 20	16000	024B	024D	024E	024EM	1600				

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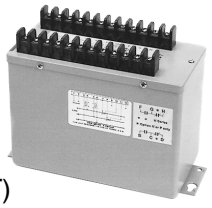
WATT/WH or VAR/VAR HR TRANSDUCERS

WATT/WATTHOUR or VAR/VAR HOUR TRANSDUCER *MODEL* GH & VGH

ACCURATE TO 0.2% OF READING



THREE PHASE FOUR WIRE MODELS-INTEGRAL SENSOR (THREE ELEMENT)

INPUTS		F.S. WATTS or VARS	STANDARD GH- OR VGH- OUTPUTS				F.S. COUNT PER HR	WH RELAY OPTIONS (ADD SUFFIX)			
VOLTS	AC AMPS		±1mAdc	±10Vdc	4-20mA	4-12-20mA		"-T"	"-R"	"-H"	"-K"
0 to 150 L-N	0 to 1	300	125B	125D	125E	125EM	300	Relay is replaced with 5Vdc, TTL compatible pulse.	A second relay or pulse is provided to allow bi-directional measurement.	Form C (SPDT) solid state relay 0.1A	Form C (SPDT) solid state relay operating in "KYZ" format (50% duty cycle) 0.1A
	0 to 5	1500	007B	007D	007E	007EM	1500				
	0 to 5	1500	7.5B	7.5D	7.5E	7.5EM	1500				
	0 to 10	3000	016B	016D	016E	016EM	3000				
	0 to 20	6000	025B	025D	025E	025EM	6000				
0 to 300 L-N	0 to 1	600	126B	126D	126E	126EM	600				
	0 to 5	3000	008B	008D	008E	008EM	3000				
	0 to 5	3000	8.5B	8.5D	8.5E	8.5EM	3000				
	0 to 10	6000	017B	017D	017E	017EM	6000				
	0 to 20	12000	026B	026D	026E	026EM	12000				

PART NUMBERS 7.5 AND 8.5 DENOTE 2 1/2 ELEMENT UNITS. Standard Relay is a Form A, SPST

Highlighted models, (5A), can be used with current transformers. To calculate unit scaling when using current or potential transformers, multiply the base unit scaling by the CT or PT ratio.

Example:
GH-001D used with 100:5 CTs.
CT ratio = 100/5 = 20
F.S. Watt input = 500W x 20 = 10,000W (10kW)
(0-10kW input = 0 - 10V output)
WH relay scaling = 1WH/Cnt x 20 = 20WH/cnt.
All std. units require 85-135Vac instrument power, (60 Hz.).
Optional 60Hz self-powered models-Add suffix "**-G**"
Optional 230Vac instrument power - Add suffix "**-22**"
Input voltage ranges limited to:
85-135 for 150V models
200-280 for 300V models
380-550 for 600V models

ORDERING INFORMATION

Example: Three-Phase, Four Wire 120V, 5A Input with ± 10Vdc Output Proportional to ± 1500 Vars, TTL Pulse Output for Var Hours, each Pulse Proportional to 1.0 Var Hour.
VGH-007D-T

50 HERTZ MODELS
Self-powered units-Add suffix "**-50**" to part number.
Units requiring external instrument power:
120V, 50Hz-Add suffix "**-51**" to part number.
220V, 50Hz-Add suffix "**-52**" to part number.

CUSTOM WATT HOUR OR VAR HOUR COUNT RATES AVAILABLE - CONSULT FACTORY

SPECIFICATIONS

INPUT

Voltage ..... See Tables
Current ..... See Tables
Frequency Range ..... GH ..... 58-62Hz .... VGH 60Hz
Optional 50Hz ..... GH ..... 48-52Hz .... VGH 50Hz
Power Factor ..... Any
Burden
Voltage 0.1VA/phase
Current 0.28VA/phase
Overload
Voltage (cont.) ..... 150V Range 175V
300V Range 350V
600V Range 600V
Current (cont.) ..... 5A Range ..... 2 X F.S.
10A Range ..... 2 X F.S.
20A Range ..... F.S.
Transient ..... All Ranges
50A ..... 10 sec./hr.
250A ..... 1 sec./hr.
Dielectric Test....(Input/Output/Case) ..... 1800Vac (RMS)
Surge ..... Withstands IEEE SWC test

OUTPUT

VGH ..... + = Lagging/ - = Leading
ACCURACY ..... ± 0.2% Rdg. ..... ± 0.05% F.S.
Includes combined effects of voltage, current, load and power factor
Relay ..... Form A (SPST, N.O.) 120Vac, 0.5A
Contact closure duration ..... 200 milliseconds
Option T ..... Pulse ..... 5V TTL Compatible Pulse
Pulse duration ..... 200 milliseconds
Option H ..... Form C (SPDT) 120Vac, 0.1A
Contact closure duration ..... 200 milliseconds
Option K ..... Form C (KYZ) 120Vac, 0.1A
Contact closure duration ..... 50% duty cycle
Analog Output Ripple ..... < 0.5% F.S.
Output Loading (Ohms)
±1mA 0-10K
±10Vdc ..... 2K min.
4-20mA 0-500
Response Time....(99%) ..... <400 milliseconds
Field Adjustable Cal. ..... ± 2% min.
Temperature Effect....(-20°C to +60°C) ..... +0.005%/°C
Operating Humidity ..... 0-95% non-condensing
Instrument Power (std.) 95-135Vac, 60Hz, 7.5VA
"**-22**" Option ..... 230Vac, 50/60Hz, ±10%

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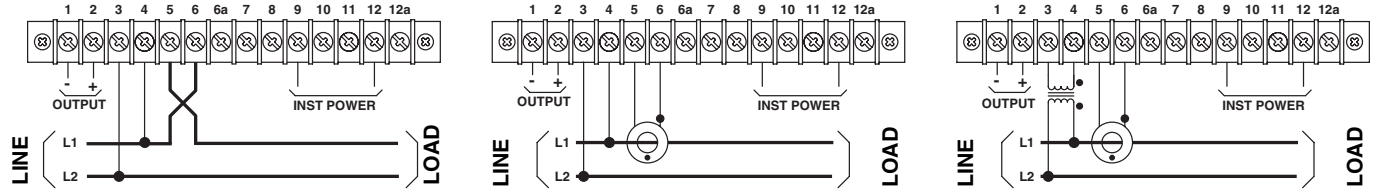
WATT/WH or VAR/VAR HR TRANSDUCERS

CONNECTION DIAGRAMS — *MODEL* GH & VGH

SINGLE PHASE CONNECTIONS (ONE ELEMENT)

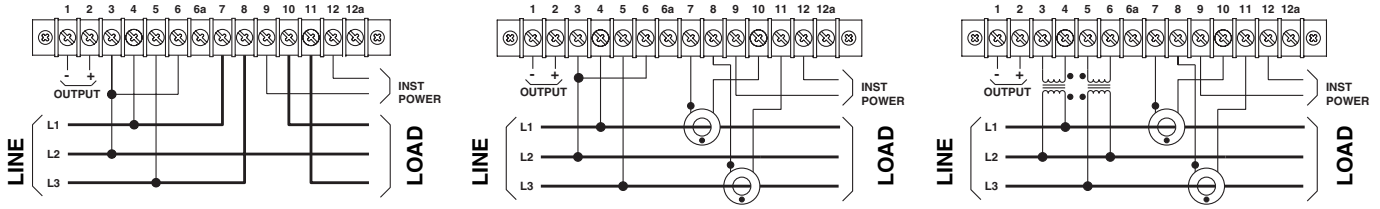


DIRECT CONNECTION

USING ONLY CURRENT TRANSFORMERS

USING CURRENT & POTENTIAL TRANSFORMERS

THREE-PHASE,THREE-WIRE CONNECTIONS (TWO ELEMENT)

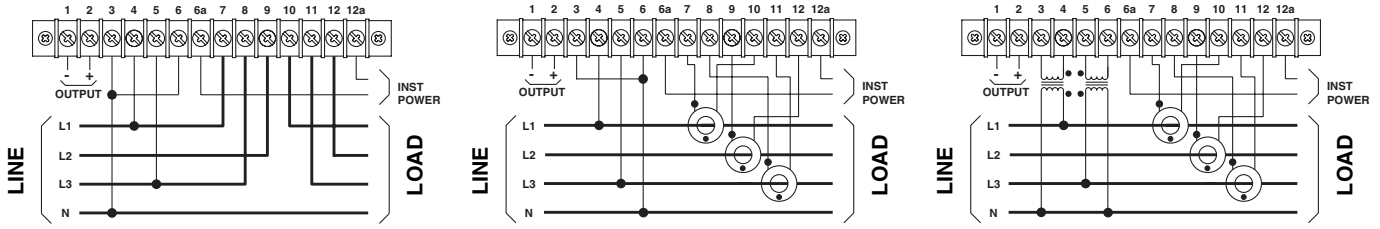


DIRECT CONNECTION

USING ONLY CURRENT TRANSFORMERS

USING CURRENT & POTENTIAL TRANSFORMERS

THREE-PHASE,FOUR-WIRE CONNECTIONS (2 1/2 ELEMENT)

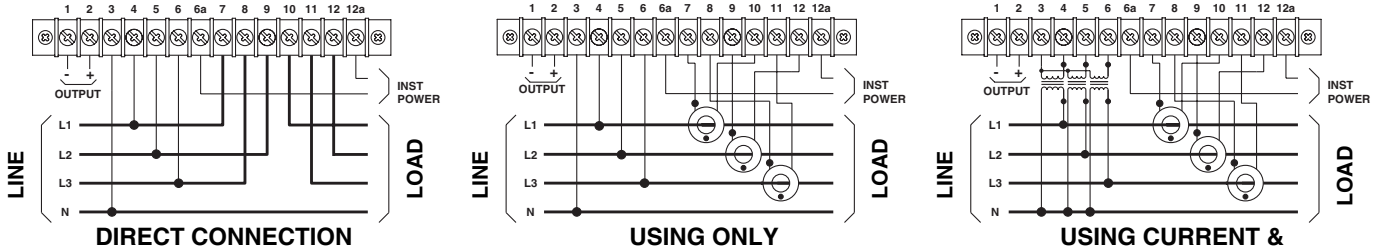


DIRECT CONNECTION

USING ONLY CURRENT TRANSFORMERS

USING CURRENT & POTENTIAL TRANSFORMERS

THREE-PHASE,FOUR-WIRE CONNECTIONS (THREE ELEMENT)

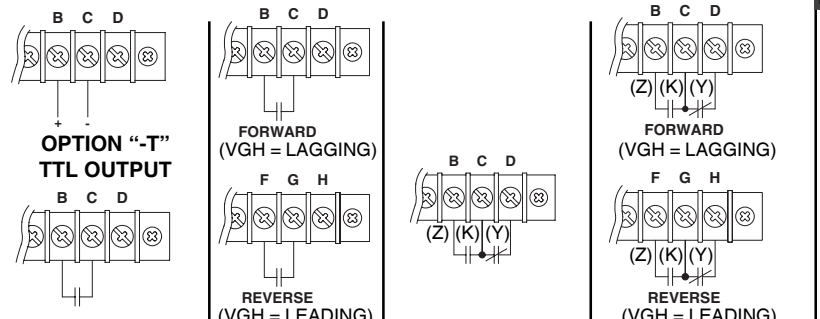


DIRECT CONNECTION

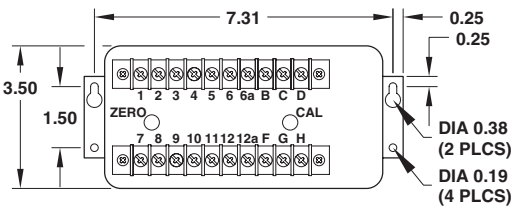
USING ONLY CURRENT TRANSFORMERS

USING CURRENT & POTENTIAL TRANSFORMERS

WATTHOUR OR VARHOUR OUTPUT CONNECTIONS



CASE DIMENSIONS



CASE HEIGHT 5.88"
1PH 2W 2.9 LBS
3PH 3W 3.3 LBS
3PH 4W 3.8 LBS

All Dimensions In Inches

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