VYDAS
INTERNATIONAL MARKETING
Specialist Sensors & Instruments for Industry

SPECIAL PURPOSE POWER CELLS

- Fast Response for Machine Tool Monitoring
- Large Capacity for Big Loads
- Direct Current

BY MONITORING HORSEPOWER (WATTS), THE POWER CELL WILL SENSE THE INSTANTANEOUS POWER CHANGE IN A MACHINE OR PROCESS. THIS GIVES VALUABLE INFORMATION ABOUT:

- Mixture Viscosity
- Tool Condition
- Optimum Feed Rate
- Pump or Fan Flow
- Beginning or End of Process
- Obstructions
- Overloads
- Loss of Load

HERE ARE FOUR WAYS TO USE THE POWER INPUT TO A MACHINE OR PROCESS

1. Adjusting Machines and Processes
- Keep feed rates at optimum
- Adjust feed rates as sizes or materials change
- Regulate pressure, force, flow or viscosity
- Compensate for tool wear

2. Signaling Beginning or End of Process
- Tool has touched the workpiece
- Viscosity has reached desired level

3. Detecting Trouble
- Early warning of machine jam-up
- A part is misplaced
- Tool is missed

4. Protecting Machine and Tools
- Sensing overload
- Sensing loss of load
- Detecting dull tools

FAST RESPONSE PH-3A POWER CELL
- Ideal for machine tool applications
- Three phase power

PH-1000 POWER CELL FOR LARGE LOADS
- Up to 1,000 HP
- 1 3/4" windows

Also:
PH-1A for Direct Current
PH-1000DC for Large DC Loads

THE POWER CELL WORKS AS A STAND-ALONE TRANSDUCER. ANALOG OUTPUT IS PROPORTIONAL TO POWER (HORSEPOWER OR WATTS)

The Power Cell is Versatile

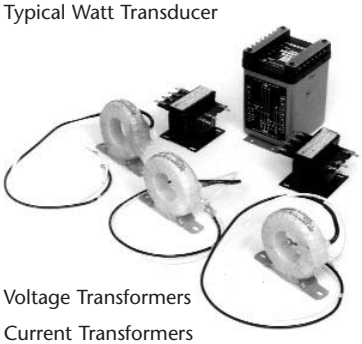
- Works on fixed frequency power
- Works on the output of variable frequency drives

The Power Cell Uses Balanced Hall Effect Sensors

- Sensitive at low and high frequencies
- Fast response
- Linear output
- Independent, precise, machine or process control
- Senses distorted waveforms
- Noise immune
- Accuracy is improved by eliminating the large phase shift errors from the CTs and PCs at low power factors

SIMPLE INSTALLATION

- No current transformers
  Just pass the wires through the windows
- No voltage transformers
  Sample voltage directly
- Capacity easily changed in the field with plug-in voltage and current networks for maximum sensitivity
- Select convenient output: 4-20 MA, 0-10 Volt, 0-5 Volt
- Compact: Minimum panel space required
- Not damaged by overloads

HOOK UP THIS	INSTEAD OF THIS
	Typical Watt Transducer  Voltage Transformers Current Transformers

CHANGING CAPACITY OF THE POWER CELL

The capacity for each of the Hall Sensors is set with 8 pin resistor networks. These voltage and current networks provide a full-scale calibration point. These are easily changed in the field. This lets you match the Power Cell to the load. Cost: $10

In the three phase Power Cell there are:

- Three current networks
- One voltage network
- One function network for the 0-5 Volt and 0-10 Volt outputs
- An additional circuit board for the 4-20 MA and the 0-1 MA outputs

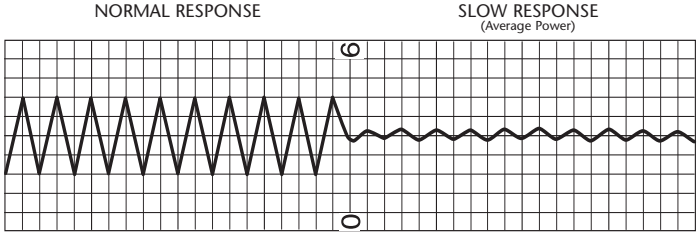
OVERLOAD DAMAGE

The Power Cell is designed so that it is not damaged by overloads. At about 20% above full capacity, the internal circuitry saturates. This prevents damage to attached meters, etc. It also means that the Power Cell can be sized to match the running load without worrying about inrush current.

OPTIONAL RESPONSE ADJUSTMENT

The Power Cell is designed to have very fast response. In some cases, like agitator and mixer applications, you will probably want to smooth the signal in your controller or computer or use the optional response adjustment on the Power Cell.

An analog load meter (since it has a slow response) also does a nice job of averaging the signal.



FOR THREE PHASE POWER – Fixed or Variable Frequency

PH-3A

Three Phase Power
to 150 HP

PH-1000

Three Phase Power
to 1000 HP

Full Scale Capacity
460 Volt Network

Model	Full Scale
PH-3A-HHG	2 HP
PH-3A-HG	4.5 HP
PH-3A-10	10 HP
PH-3A-15	14 HP
PH-3A-20	21 HP
PH-3A-30	32 HP
PH-3A-40	43 HP
PH-3A-50	53 HP
PH-3A-60	64 HP
PH-3A-70	75 HP
PH-3A-80	85 HP
PH-3A-90	96 HP
PH-3A-100	107 HP
PH-3A-350-140	149 HP
PH-1000-100	102 HP
PH-1000-200	213 HP
PH-1000-300	320 HP
PH-1000-400	427 HP
PH-1000-500	533 HP
PH-1000-600	640 HP
PH-1000-700	747 HP
PH-1000-800	853 HP
PH-1000-900	960 HP
PH-1000-1000	1067 HP

KW=(HP)(.746)

For Voltage Networks Other than 460 Volt Multiply Full Scale HP by:

115 Volt	.25
185 Volt	.4
230 Volt	.5
255 Volt	.55
380 Volt	.83
415 Volt	.9
580 Volt	1.26

For Small Loads
The capacity can be reduced by taking additional "turns" with the wire through each hole for each phase.

Example: A 10 HP unit is reduced to 5 HP by taking two turns through each hole. It is reduced to 3.33 HP with three turns, etc.

Outputs Available
0-1 MA, 4-20 MA, 0-5 Volts, 0-10 Volts
The output is powered by the Power Cell

To Order: Specify Model Number, (Voltage Network if not 460 Volt) and Output

DIRECT CURRENT POWER

Current Network
For PH-1A
10(9.54) Amp, 15(13.34) Amp, 20 Amp,
30 Amp, 40 Amp, 50 Amp, 60 Amp,
70 Amp, 80 Amp, 90 Amp, 100 Amp
Reduce capacity with additional turns

For PH-1A-350
140 Amp

For PH-1000DC
100(95.4) Amp, 200 Amp, 300 Amp,
400 Amp, 500 Amp, 600 Amp,
700 Amp, 800 Amp, 900 Amp, 1000 Amp

Voltage Networks - DC
12 Volt DC, 90 Volt DC, 230 Volt DC,
300 Volt DC, 440 Volt DC, 500 Volt DC, 575 Volt DC

Outputs Available
0-1MA, 4-20 MA, 0-5 Volts, 0-10 Volts
The output is powered by the Power Cell

To Calculate Full Scale for DC
Full Scale Watts = (DC Voltage Network)(Current Network)
Horsepower = Watts/746

To Order: Specify Model Number, DC Voltage Network, Current Network, and Output

Note: *All DC Power Cells are supplied with the Response Adjustment. This insures accurate performance when used on the output of SCR type DC drives.*

PH-1000DC

Direct Current Power
to 1000 Amps DC

PH-1A

Direct Current Power
to 140 Amps DC

SPECIFICATIONS FOR ALL POWER CELLS

FREQUENCY
- DC to 1 KHz

RESPONSE
- 15 Milliseconds (.015 seconds)
- .060 seconds to 1 second with optional response adjustment

ACCURACY/REPEATABILITY
- .5%

IMPEDANCE
- For 10 Volt output: 2K ohm minimum connected impedance
- For 4-20 MA output: 500 ohm maximum connected impedance
- High compliance units available

TEMPERATURE
- 55 C maximum

DIMENSIONS

PH-3A, PH-2A, PH-1A POWER CELLS

Maximum conductor 3/4"
with grommets removed
Mounting: (2) #10 screws,
8 1/2: on center

PH-1000 POWER CELLS

Maximum conductor 1 3/4"
Mounting: (4) 1/4" screws
12 3/4" x 1 1/4" on centers
Weight: 12 pounds

EXTERNAL TRANSFORMER
(provided with each POWER CELL)

Mounting: (2) #10 screws
2" on center

HOW POWER IS MEASURED AND CALCULATED

Three Phase Power

P = (E)(I)(Cos)(1.73)
P = Power (Watts)
I = Current in each phase (Amps)
E = Voltage phase to phase (Volts)
Cos = Power Factor (Ranges from 0-1)
1.73 = Multiplication factor for three phases = 3
1 HP = 746 Watts

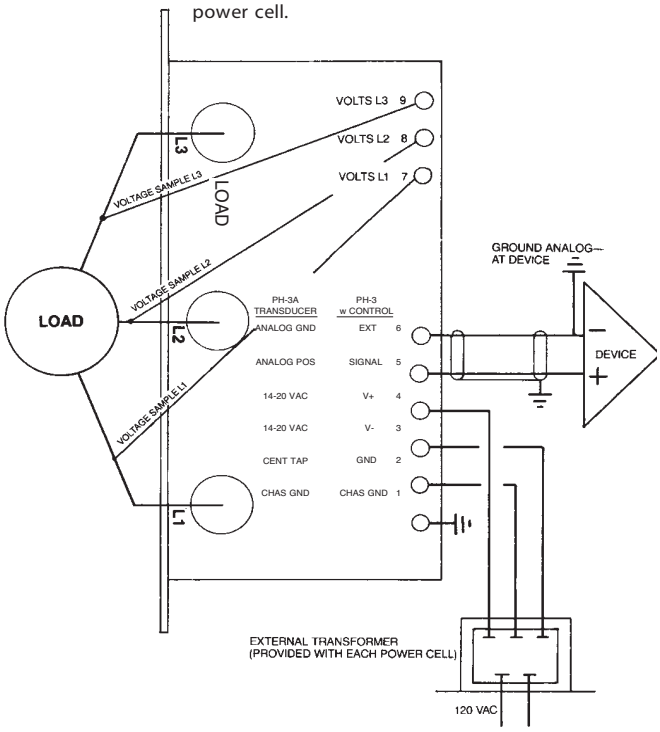
HALL EFFECT DEVICES

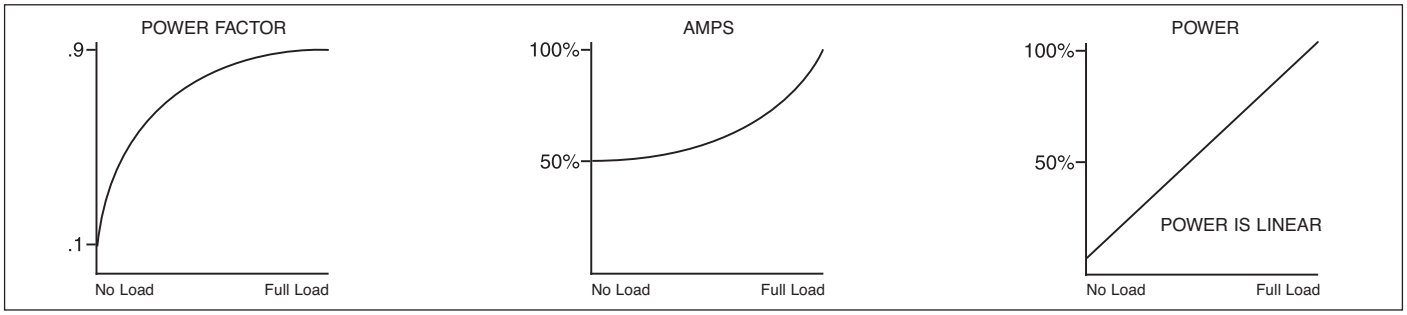
Balanced Hall Effect sensors are used to measure power with odd shapes and frequencies (like on a Variable Frequency Drive). A Hall Effect sensor has these two characteristics:

1. It senses a magnetic field which is proportional to the current flowing through the conductor (I).
2. The Hall Effect semiconductor can multiply two signals. Each Hall Effect Sensor is powered by the signal that comes from the voltage sample for that phase (E). The Hall device multiplies these voltage and current signals.

This is a vector multiplication which also calculates- the lag of the current (Cos = Power Factor). The resulting output is then proportional to power (Volts x Amps x Power Factor).

Terminals MUST face load.
Terminal 6 MUST be grounded.
The output is powered by the power cell.





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