International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 12
April 2018

"Calculate the Total Running Time of Machine"

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Abstract

When and where you should use one, some unusual applications that could benefit by an hour meter, and how you can get the most mileage from this oft-time overlooked component. Hour meter record running time of machine in hour but it not calculate total running life of machine and it is not useful for any kind of machine for example it is not used in AC. As we know it is a subject of tool design and we can have a grasp on the subject while learning it theoretically and practically both so we design a machine tool which calculate the 'total running time of machine'.

Introduction

The manufacturer develops and designs engine dashboards for a variety of equipment and vehicles used for rugged operations, including tractors, backhoes, and industrial equipment. These dashboards require components that can withstand harsh environmental factors, including dust, dirt, extreme temperatures, and intense, frequent vibration. A critical component of a dashboard is the hour meter. Similar to how an odometer tracks mileage, an hour meter monitors elapsed engine operations. It acts as an elapsed time measurement device to determine maintenance work, track service intervals, determine resale value, and measure performance against warranty.

When the manufacturer ran into difficulties with an unreliable hour meter it needed to act fast and intelligently. The manufacturer's old hour meter often failed to perform under harsh environmental conditions and was unable to provide accurate runtime measurements. This heightened the potential for engine failure and potentially contributed to warranty issues. To remedy this problem, the manufacturer chose to replace its unreliable equipment with the Honeywell Hobbs Quartz Plus Hour Meter. "We provide instrumentation to keep users tuned in to how their equipment is operating, so any sort of interruption to that process is extremely detrimental for our customers," the manufacturer said. "When our customers experienced hour meter failures, we needed a reliable replacement applicable to many engines, including those used in high cost-of- failure operations. The hour meter fit the bill." The hour meter system offered the manufacturer an enhanced level of reliability and durability.

Literature Review

John S. Fielden; Electronic kilowatt-hour [1]: In a kilowatt-hour meter for measuring electrical energy consumption from an alternating electrical supply, a microprocessor includes a clock signal generator which is synchronized in phase with the incoming supply frequency. Pulse sampling means controlled by the clock generator sample the incoming voltage and current waveforms at a preselected time instant or instants in each cycle and the sampled data is utilized in the microprocessor to determine energy consumption.

James R. Hurley, Clyde Gilker; Solid state watt-hour meter [2]: A watt-hour meter is disclosed which includes: a microprocessor coupled to a solid-state Hall-Effect sensor; an

electrically alterable ROM coupled to the microprocessor; a power supply; a power outage timing means using the discharge characteristic of a capacitor; apparatus for supplying a 60 Hz clock signal to the microprocessor; a readout device coupled to the microprocessor to provide an indication of the power consumed; an output on the microprocessor for controlling a circuit breaker; and a switch for overriding the microprocessor controlled circuit breaker. The microprocessor and the electrically alterable ROM are connected and programmed: to sense the time of day as determined from an initial time of day and setting the 60 Hz clock signal; to sense and compute the power used by the consumer; to automatically open the circuit breaker when power demand on the electric power source is high and/or the cost per kilowatt hour is high; to automatically close the circuit breaker when the power demand on the source of electric power is low and/or the cost per kilowatt power is low; and to allow a consumer to override the microprocessor's control of the circuit breaker.

Austin G. Boldridge, Jr.; Removably attachable watt-hour meter monitor device [3]: Affixed to or positioned opposite the glass housing of a watt-hour meter which has a rotating disc with an indicator mark on its periphery is a device for indicating the rate of rotation of the disc. The device has two spherical lenses disposed generally in the plane of the disc along a line which is generally perpendicular to a radius of the disc and preferably symmetrically positioned on opposite sides of the radius. A first fibre optical cable couples visible light from an incandescent source to the first spherical lens to focus light on the periphery of the disc and a second fibre optical cable couples visible light collected by the second spherical lens focused on the periphery of the disc to a photo resistor.

Gordon R. Burns, Javier Adame, John T. Voisine, John P. Junker, Jeff Kotowski, Richard D. Davis; Watt-hour meter with digital per-phase power factor compensation [5] : A watt-hour meter employs a power factor compensation technique that inserts a delay into the digitized current or voltage sample stream. An exemplary embodiment of the present invention includes an electronic watt-hour meter comprising a voltage sensor, a current sensor, a conversion circuit, and a processing circuit: The voltage sensor generates a voltage measurement signal responsive to a voltage provided to a load. Similarly, the current sensor generates a current measurement signal responsive to a current provided to a load. The conversion circuit further comprises: a first converter connected to the voltage sensor for generating sampled voltage data stream based on said voltage measurement signal; a second converter connected to the current sensor for generating a sampled current data stream based on said current measurement signal, and a phase correction circuit. The phase correction circuit is connected to one of the first and second converters and inserts a delay into one of the sampled voltage data stream or the sampled current data stream. The processing circuit is operably connected to the first and second converters, and receives information indicative of the sampled voltage data stream and sampled current data stream subject to any delay inserted by the phase correction circuit. The processing circuit then generates power consumption data from the sampled voltage data and sampled current data.

Jerry M. Kennon; Watt-hour meter with fiber optics tamper detector [6]: A watt-hour meter tamper detector characterized by a fiber optic link that extends between a microprocessor of a load management terminal and mounting means for maintaining a watt-hour meter cover intact, and which fiber optic link signals an attempted opening of the mounting ring to the microprocessor when the fiber optic link is severed.

SUMMARY

There are many applications that could potentially benefit from using an hour meter. Consider a motor home with a standby generator. While the motor home may have several thousand miles on it and be several years old, depending upon the owner's habits, the generator used to produce electricity for lights and air conditioning may only see a few hours of use per year. Knowing age as well as running time is key for maintenance as well as resale.

CONCLUSION

The hour meter system main benefit is that it helps you better maintain your equipment by eliminating the guesswork. Equipment that is maintained at manufacturer's recommended intervals generally lasts longer, runs better, and is worth more than poorly maintained equipment. The hour meter system offered the manufacturer an enhanced level of reliability and durability. The meter is completely sealed from dirt and moisture, and its design makes it ideal for demanding equipment that requires careful time monitoring and measurement to ensure adequate engine performance. The hour meter system secures the life time warranty and resale value of products.

References:

[1] John S. Fielden; "Electronic kilowatt-hour meter", Aug 17, 1982, US4345311A

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[3] Austin G. Boldridge, Jr.; "Removably attachable watt-hour meter monitor device", May 20, 1980, US4204115A

[4] Alexander McEachern, William A. Moncrief; "Harmonic-adjusted watt-hour meter", May 29, 1994, US5298854A

[5] Gordon R. Burns, Javier Adame, John T. Voisine, John P. Junker, Jeff Kotowski, Richard D. Davis; "Watt-hour meter with digital per-phase power factor compensation", Aug 23, 2002 US6377037B1

[6] Jerry M. Kennon; "Watt-hour meter with fiber optics tamper detector", Feb 18, 1986, US4571691A

[7] Warren T.Martin, William james Watson, Gregory A. Grisham, Michael K. Anderson, Randal K. Bond ; "Watt-hour meter with communication on diagnostic error detection".