

ML100.200 - The Perfect Solution when Changing from AC to DC Controls

Those who have been involved in control systems design for a good number of years can remember when DC power was no where to be found in a control panel. Most of the AC controls operated on 120VAC which was provided by a control power transformer (CPT) converting primarily 480VAC to 120VAC. As power demands have increased throughout the world, certain problems have been encountered in the control panel due to AC power surges and brown outs. These fluctuations on the extreme high or low side can cause a control power transformer to produce unwanted voltages on the secondary side, effecting the operation of the applications. Safety measures have also been increased by many agencies for the protection of personnel and equipment. These changes make AC controls not as straight forward to install as in years past because of the need of additional protective devices. Because of these AC power and safety issues, many design engineers are switching to DC components in the control panel. DC power supplies can offer better output regulation over a wider AC input range than a transformer can. Certain questions are raised when contemplating the change from AC to DC controls: If all the controls in a panel operate on DC does it make sense that you would still need a transformer to energize only the power supply? What if a panel is retrofitted in the field and all the controls are converted to DC? Would you leave the oversized transformer in the panel just to run the power supply? Would a

smaller transformer be purchased and the larger one removed? PULS has come up with the perfect solution for when low DC power is required and the transformer can be eliminated.

ML100.200

The PULS ML100.200 is a simple and cost effective approach to convert the AC voltage of a typical 3-phase system into a regulated DC voltage. The ML100.200 only requires two



PULS ML100.200

legs of the three wire system making it ideal for when a control power transformer is changed out for a power supply. The ML100.200 is rated for 4.2A @ 24VDC (100W), has robust overload capabilities and has many advantages over a transformer.

Connecting 2 Wires Instead of 3
3-phase devices typically require that all three phases be connected to the unit in order to work properly. In some cases, there are devices that

will operate on only single phase of a 3-phase system, but sometimes concerns are raised about the 3-phase power being unbalanced. This may be true when considering power circuits. However, if you compare the energy consumption of a control circuit versus a power circuit, the control circuit uses far less energy. The imbalance you might see in a power circuit is minimized when a control device such as a power supply is utilizing only two of the three wires. A power supply being connected to only two wires of a 3-phase system is no different than when a control power transformer is connected in the same manner. Connecting to only two wires can have many advantages. The power rating of the ML100.200 allows for a very compact design requiring far less space in a panel as compared to a transformer. The ML100.200 can utilize the same two wires that the transformer was connected to, making



Typical 100VA Control Power Transformer

The PULS Advantage

Issue 6



Basic Connection Diagram - Fuses may be Required

ML100.200	switched-mode power supply	Transformer power supply*)
Installation type	DIN-rail	Flange
Weight	360g	4500g
Size	73x75x103mm	110x172x161mm
Volume	34.4 cu in	185.9 cu in
Input	320-552Vac	360-440Vac
Efficiency	90%	63%
Power dissipation	11W	58W
Mains bridging	typ. 20ms	typ. 3ms

*) Typical model of a European manufacturer

Advantages of Switched-Mode Power Supply

the change to DC even easier.

Other Benefits

The ML100.200 has a wide range input allowing for global main voltages of 380, 400 and 480VAC without the need of changing a jumper or supplying different units as occurs with transformers. A neutral wire is not required for the operation of the ML100.200. This helps in global applications when machine builder standards such as EN 60204-1 restricts the usage of a neutral wire. The ML100.200 has amazingly high efficiency, up to 90% and full output power can be achieved between -10°C and +60°C. The spring clamp terminals makes wiring especially easy and they stand up and hold strong to tough vibrations that might be encountered. This is true if the ML100.200 is used to power sensors along a conveyor line where the power supply enclosure is attached directly to the conveyor rail. If any of those sensors or any other devices

require a NEC Class 2 power supply, PULS has that covered as well. The ML90.200 has all the features and benefits as the ML100.200 but the unit is rated for 3.75A @ 24VDC and the overload is modified to stay under the 100W max rating for NEC Class 2 approval. The ML100.200 is very compact and weighs only 360 grams, making it substantially lighter than a transformer. The input stage is very rugged and has a high immunity to transients, power surges and low electromagnetic emissions making usage in nearly all environments possible.

Potential Savings

In addition to reasons already mentioned in this article, the ML100.200 power supply can potentially save money in other areas. A smaller enclosure might be able to be used because of the small footprint of the unit. The ML100.200 is very light so transportation costs can be reduced. With the high efficiency and

low losses, additional cooling for the enclosure may not be needed, saving on equipment and labor. The spring clamp terminals can save up to 75% wiring time as compared to screw terminals. The DIN-rail mounting makes installation a snap with no tools required. The ML100.200 or the ML90.200 have many features and benefits packaged in a small space and is just a sample of the innovative products from PULS. Utilizing high quality components allow for a very high MTBF with a long service life. Not just another power supply but ingenuity at work!