Alan Heffernan VFD Panel for PM1340GT Lathe
Interfacing with a Jacobs Control System

Background:

I wanted a wall mounted panel to house the Hitachi VFD and power up all systems for my PM1340GT lathe.   It needed a door mounted primary disconnect switch to power all up with one action. It was to be located at the tailstock end of the lathe so it was easily assessable and out of the line of fire.

I decided I wanted a nonmetallic box that was easier to cut openings in and that would also provide the aesthetics I was after. There are several options out there for boxes but I landed on this Hoffman solution. I bought the box from Zoro and learned not to window shop on their website. Their photos are generic from the manufacturers and do not necessarily show the product specifics properly. Lookup specific manufacturers' descriptions and photos on their websites to make sure you know what you are getting.

The particular box I bought is very robust and sturdy. It is compression molded fiberglass construction with a very high content of glass fiber. It is quite dense, heavy but strong.
I installed a window in the door of this box. If you want a window, Hoffman and others make boxes with clear doors and/or windows. In the end, my approach gave me what I wanted. I want to see the VFD, primary breaker, and the status for the supplementary cooling fan. I want to know what frequency of output the VFD is delivering at any given adjustment and I want to know if the supplemental cooling is running or not. In addition I want to be alerted if the primary fuses are blown via their LED indicators on the holders.

The box is fed from the primary panel in the shop from a dedicated 30 amp 220v breaker with four wire connection. All power is then fused in the box through the 30 quick acting J fuses. The VFD is fed directly from the primary fuse block and 220v power is provided to the Jacobs Control System via a 220v breaker in the panel. There is also a 110v breaker in the panel for support systems such as a DRO. Therefore all power to the lathe and its systems is switched by the primary switch mounted on the door.

The compression molded fiberglass box is a bit abrasive to cutting tools. For example, it ate three Bosch jig saw blades cutting the window opening I installed.   It did not seem to damage hole saws. One should wear a dust mask, long sleeves, gloves, and cut on it outside while minimizing exposure to the significant amount of fine/microscopic glass fiber/shards that are produced when cutting and drilling on this box.

<u>Parts List</u>:

1. VFD - Hitachi WJ200-015SF - Quality Machine Tools
2. Panel - Hoffmann 14" x 12" x 8" deep, Mfr #: A14128CHSCFG, Zoro #: G8750585 - Zoro panel
3. Panel interior mounting plate - Hoffman, Zoro #: G8759204, Mfr #: A14P12 - Zoro mtg. plate
4. Polycarbonate for window - McMaster Carr
5. Cable glands - assortment purchased via Amazon.
6. Primary switch – Socomec door mounted – Automation Direct
   a. 22003003-UL Socomec SIRCO M Series disconnect switch, non-fusible, 3-pole
   b. 14070532 Socomec shaft, 320 mm (12.6 inch) length, 5 x 5 mm shaft size
   c. 14841111Socomec handle, round, S0 type, red/yellow, external front
   d. 22943005 Socomec terminal shroud, 3-pole, line or load mount
7. Resistor - 50 ohm - via ebay and/or other sources
8. Din rail - Automation Direct
9. Primary breaker - Allen Bradley Mdl. #1492-FB2J30-L Fuse Holder, 2 Pole, 30 Amp ebay link
10. Fuses for primary breaker - Ferraz A4J30 Trap Current Limiting 600V 30 Amp (30A) Fast Acting UL Class J Fuse ebay link
11. 220V breaker - FAZ-C3-2 Eaton miniature 3 amp 2-pole breaker, DIN rail mount - Automation Direct
12. 110V breaker - FAZ-C15-1-NA-SP Eaton miniature 15 amp breaker – Automation Direct
13. Cooling fan - 24 volt 120 mm brushless ball bearing - Amazon fan
14. Thermostat for fan - 011419-00 Stego setpoint thermostat, adjustable, normally open – Automation Direct
15. Indicator light for fan - 24 volt LED indicator, blue - Amazon indicators
16. Fan suction filter - 120 mm filter with grill - Amazon - filter
17. Exhaust port - 120 mm mesh grill - Amazon   grill

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