Instructions for WPBFV7 DeviceNet ACM

Fig. 1 Catalog No. WPBFV7

DESCRIPTION

The WPBFV7 is a full voltage non-reversing (FVNR) Advantage Control Module (ACM) designed to be connected to Advantage motor starters and to replace discrete pushbuttons, indicating lights, and external resets. The WPBFV7 is designed to function in conjunction with a DeviceNet network only and provides both local and remote start/stop functions. The module has the ability to monitor communications and turn the Advantage starter off in the case of a DeviceNet power or communication loss. The module will also ignore any power or communication loss when in the Local mode of operation. Once a DeviceNet power or communication loss has occurred, local control can be resumed by pressing the ACM reset pushbutton.

The WPBFV7 is designed to connect between a Model C or later Advantage starter and a WPONIDNA module with a firmware version 4.03 or greater. Earlier version modules may not support all functions of the WPBFV7.

The module can be connected to a DeviceNet system with baud rates of 125, 250, and 500K baud. See WPBFV7 Operation section for additional capabilities.

The WPBFV7 has Run, Off, Overload Alarm, and Trip status indicators in the form of light emitting diodes (LEDs) as follows:

LED	Color	Starter Status
Run	Red Illuminated	On, contactor closed
Off	Green Illuminated	Off, contactor open
OL Alarm	Red (blinking)	Thermal Overload Alarm Condition
Trip	Red Illuminated	Tripped due to Ground Current-Sensing, Phase Loss, or Phase Imbalance
OL Trip*	Red Illuminated	Overload Trip

* Both the OL Alarm and Trip LED's will be illuminated when an Overload Trip condition is present.

RESET BUTTON

The operation of all front panel LED's can be checked at any time by pressing the front panel RESET pushbutton. All LED's will remain lit as long as the RESET button is pressed.

The primary function of the RESET pushbutton is to reset trip conditions caused by overload, phase unbalance, or ground currents.

The RESET button will restore local control once:

1. A DeviceNet power loss has occurred.
2. A DeviceNet communications loss has occurred.
3. A loss or corruption of communications between the WPONIDNA and the ACM has occurred.

DEFINITIONS

ADVANTAGE MOTOR CONTROLLERS - Advantage starters

MODE - Method of control, e.g, local (manual), or remote, or status (ON, OFF)

ACM - Advantage Control Module

FVNR - Full Voltage Non-Reversing

INSTALLATION

CAUTION

DO NOT INSTALL OR PERFORM MAINTENANCE ON THIS DEVICE WHILE EQUIPMENT IS ENERGIZED. DEATH OR SEVERE PERSONAL INJURY CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH INSTALLATION OR MAINTENANCE.

Only qualified persons, as defined in the National Electric Code, who are familiar with the installation, maintenance, and operation of this device and the equipment onto which it is to be installed, as well as applicable local, state, and national regulations and industry standards and accepted practices regarding safety of personnel and equipment safety should be permitted to install, maintain, or operate this device.

These instructions are provided only as a general guide to such qualified persons and are not all-inclusive. They do not cover every application or circumstance which may arise in the installation, maintenance, or operation of this equipment. Users are advised to comply with all local, state, and national regulations and industry standards and accepted practices regarding safety or personnel and equipment safety.

CAUTION

REMOVE ALL POWER FROM INSTALLATION BEFORE ATTEMPTING TO INSTALL OR REMOVE THIS DEVICE. THIS SHOULD INCLUDE L1, L2, AND L3, AS WELL AS THE 3PEC TERMINALS OF ADVANTAGE. ADVANTAGE MODEL"C" AND HIGHER WILL AUTOMATICALLY TURN OFF IN THE EVENT OF A COMMUNICATION FAILURE.

Use Greenlee punch and die set, Greenlee 50600710, or utility tools to create a 2.25 x 3.50 inch opening in sheet metal ranging from .060 to .090 inch in thickness. The mounting holes shown in Figure 2 are not needed for Type 1 enclosures where the snap-in feature provided is sufficient for mounting. For Type 12 enclosures, drill the two .180" diameter holes and use two #8 screw/washer/nut combinations to impress the gasket provided. Read the full load current from the motor nameplate and set the overload protection appropriate for the motor, taking into account the motor service factor (S.F.).

Determine the quantity and appropriate length of interconnect cables needed to connect the ACM to the Advantage starter. See Table I.

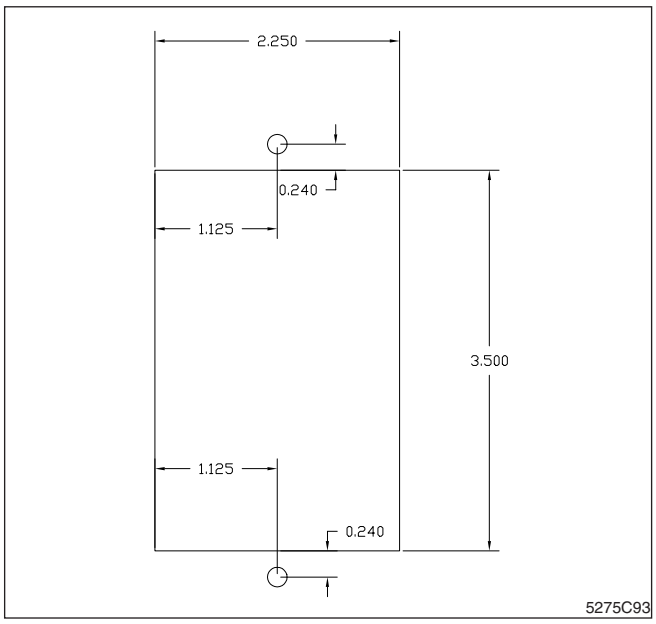

Fig. 2 Panel Cutout Dimensions (dimensions in inches)

Insert the straight end of the interconnect cable into the connector labeled "ADVANTAGE STARTER" on the back of the ACM. Be sure to line up the blank position in the cable connector with the missing pin on the ACM internal connector. Take the right angle end of the interconnect cable and insert it into the front 5 pins in the device cable connector receptacle on the side of the Advantage motor controller. Be sure to line up the blank position in the cable connector with the mssing pin in the device connector receptacle.

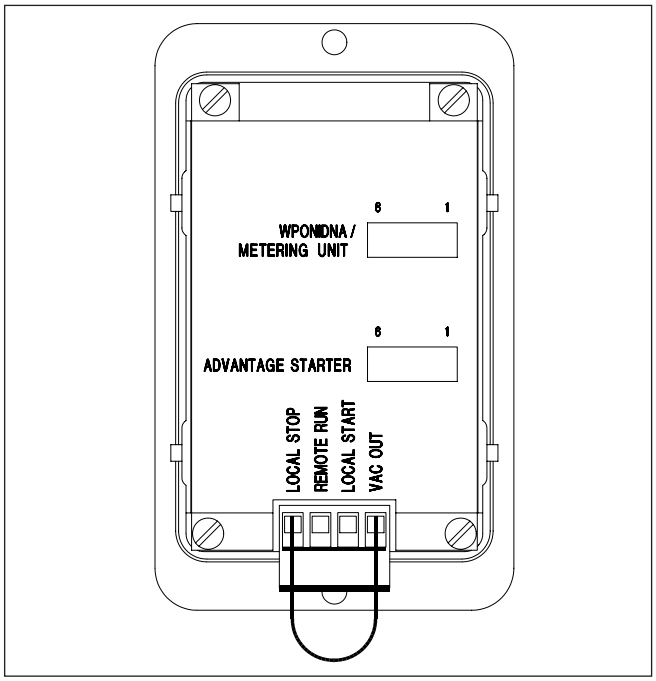

Fig. 3 Rear View of an ACM

Expect the shock mounted printed circuit board inside the device to give under the pressure of insertion. If remote inputs are used, wire the units per the provided figures. Connect the WPONIDNA to the open connection on the back of the ACM labeled, "WPONIDNA/METERING UNIT". See Figure 3.

TABLE I - INTERCONNECT CABLES	
Catalog Number	**Description**
WACM1	1 Foot Interconnect Cable
WACM3	3 Foot Interconnect Cable
WACM6	6 Foot Interconnect Cable
WACM10	10 Foot Interconnect Cable

Before installing the WPBFV7, please review the following application limitations. DO NOT install the WPBFV7 if one or more of these conditions exist.

1. Do not install in locations where the temperature at the unit will fall outside the range of 0 to 40°C. Cooling equipment such as a fan should be used to lower the temperature if the 40°C limit is exceeded. Heating equipment should be provided if the 0°C limit is exceeded.
2. Do not install where the relative humidity will exceed 95%, or where condensation will form due to rapid temperature changes. A heater should be provided to prevent the formation of condensation.
3. Do not install where dust, salt, or iron particles are present.
4. Do not install where the unit may be subject to direct impact.

CAUTION

NEVER PLUG THE WPBFV7 CABLE INTO THE ADVANTAGE HOST OR WPONIDNA HOST WHILE THE HOST IS POWERED.

DO NOT CONNECT ANY EXTERNAL 120VAC SOURCE TO THE REMOTE INPUT TERMINAL LABELED "VAC OUT" ON THE BACK OF AN ACM. SEE FIGURE 3. DO NOT CONNECT ANY EXTERNAL LOADS (PILOT LIGHTS, RELAYS, ETC.) TO THE TERMINAL LABELED "VAC OUT".

THIS TERMINAL IS TO BE USED ONLY FOR THE WIRING OF THE REMOTE CONTROL DEVICES PER FIGURE 4.

EMERGENCY STOP

The optional EMERGENCY STOP pushbutton shown in the Figure 4 provides a faster stop (by approximately 1/10 of a second) by bypassing the distributed opening sequence provided when the normal STOP pushbutton is operated. The built-in distributed opening sequence insures that each set of contacts associated with a phase takes it share of the wear associated with opening the circuit first and the ease of opening last. This provides uniform wear on all contacts and provides longer life for a given set of contacts, i.e., all three phases wear at the same rate.

OPERATIONAL CHECK

When an ACM is first powered up, the top two rows of LED's (RUN, OFF, ALARM, and TRIP) will blink, while the ACM is establishing communications with the Advantage motor controller. If after approximately two seconds the LED's do not stop blinking, there is a communication problem between the ACM and the Advantage motor controller. After communication is established, the ACM will then display the status of the Advantage motor controller. In addition, the ACM will default to the mode of operation it was in before power was removed (LOCAL, OFF, or REMOTE). In order to tell which mode of operation the ACM is in, observe the LED's in the upper left-hand corners of the LOCAL/OFF/REMOTE membrane pushbuttons. The ACM can only be in one mode at a time. The status of the starter can be monitored by observing the top two rows of LED's on the ACM.

WPBFV7 OPERATION

The Type WPBFV7 ACM can be used to monitor the operational status of Advantage starters and provide control via contact closure from a remote device or by DeviceNet communications.

Remote Mode (Remote LED Illuminated)

In order to control the Advantage with the DeviceNet system or the REMOTE RUN terminal input, the ACM must first be put in the REMOTE mode. Control is allowed by DeviceNet and the REMOTE RUN terminal input simultaneously. If the ACM is in either the OFF or the LOCAL mode, control over the DeviceNet network will not be allowed. Monitoring is available in all modes.

Local Mode (Local LED Illuminated)

In order to control the unit with either the START/STOP front panel pushbuttons or the LOCAL/START/STOP terminal inputs, the ACM must first be placed in the LOCAL mode. Control from the front panel buttons or inputs are both allowed at the same time.

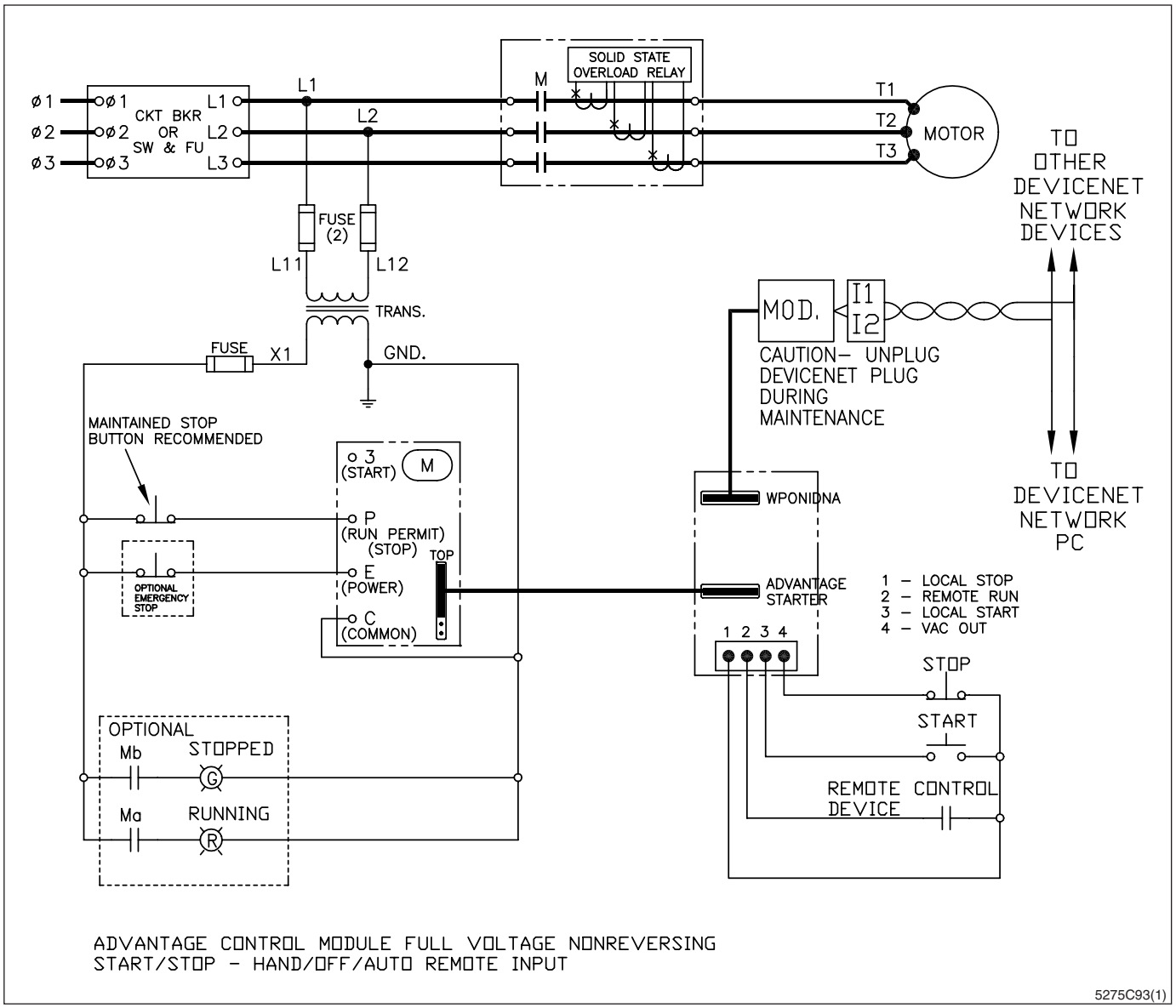

Fig. 4 Type WPBFV7 Connection Diagram

Off Mode (Off LED Illuminated)

In order to prevent control from any input, the ACM must be placed in the OFF mode by pressing the front panel OFF pushbutton. The starter contacts will drop out. Control is now prohibited.

See Figure 4 for control device wiring details. If the terminal input pushbuttons are not connected per Figure 4, a jumper must be connected between terminals VAC OUT and LOCAL STOP (see Figure 3) in order to control the starter from the front panel START/STOP membrane pushbuttons or with the DeviceNet system. As long as an ACM is connected to an Advantage motor controller, control is not allowed via the 3PEC terminals of the starter. The 3PEC terminals can only be used to stop the starter.

DeviceNet Power Loss

The WPBFV7 ACM has the ability to detect the loss of communication between itself and the WPONIDNA due to a loss of DeviceNet power. If this situation occurs, the starter will drop out in less then 2 seconds and the ACM will enter the OFF mode. To gain Local control, the user must first press the RESET pushbutton on the ACM. If the ACM is in Local mode, then a Device Net communciation loss will be ignored.

DeviceNet Communication Loss Detection

The WPBFV7 ACM has the ability to detect a communication loss (i.e., loss of Can High or Can Low) between the DeviceNet master and the WPONIDNA. If this situation occurs, the starter will drop out in less than 2 seconds

and the ACM will enter the OFF mode. The starter status LEDs on the ACM will flash, indicating a communication loss. To gain local control, the user must first press the RESET pushbutton on the ACM. If the ACM is in Local mode, then a DeviceNet communication loss will be ignored.

WPONIDNA/ACM Communication Loss

The WPBFV7 ACM has the ability to detect a communications loss between itself and the WPONIDNA. If communication is lost between the WPONIDNA and the ACM, the starter will drop out in less than 2 seconds and the ACM will enter the off mode. To gain local control, the user must first press the reset pushbutton on the ACM. If the ACM is in Local mode, then a WPONIDNA/ACM communication loss will be ignored.

Recovery from Communications Failure

The WPBFV7 will constantly attempt to restore communcations. Once communication is restored, all ACM functions will be fully operational.

CAUTION

IF THE REMOTE RUN INPUT IS ACTIVE, PRESSING THE FRONT PANEL KEY SEQUENCE "OFF-REMOTE-OFF" OR "OFF-LOCAL-OFF" FASTER THAN 1.5 SECONDS BETWEEN KEY PRESSES MAY RESULT IN THE ACM ENTERING AN INCORRECT MODE ON POWER CYCLE.

TROUBLESHOOTING HINTS

Problem:
Top two rows of LED's continue to alternate blinking when the unit is first powered up.

Cause:

a. Interconnect cable plugged into wrong port on rear of ACM.
b. Bad interconnect cable.
c. Bad ACM or Advantage motor controller.
d. No DeviceNet power.

Solution:

a. Move interconnect cable from port labeled WPONIDNA to port labeled ADVANTAGE STARTER.
b. Replace interconnect cable.
c. Replace defective component.
d. Supply 24VDC to DeviceNet network.

Problem:
Cannot start the Advantage motor controller from front panel membrane pushbuttons or terminal inputs.

Cause:

a. There is no jumper between VAC OUT, and LOCAL STOP.
b. Terminal P is not energized on the Advantage motor controller.
c. If remote inputs are used, they are not wired per Figure 4.

Solution:

a. Add a jumper between VAC OUT, and LOCAL STOP.
b. Energize the P terminal on the Advantage motor controller.
c. Correct the remote input wiring per Figure 4.

ACM SPECIFICATIONS

Input Supply Requirements
120VAC (supplied by the Advantage motor controller)

Maximum Distance from Advantage Motor Controller
10 Feet

Operating Frequency
50 or 60 HZ

Operating Temperature
0 to 40°C

Storage Temperature
-20 to 85°C

Humidity
0 to 95% (non-condensing)

Remote Input Wire Size
#18 - #14 AWG

Maximum Distance Between Remote Pushbuttons and ACM
200 Feet

Terminal Input Control Voltages
ON State: > 30VAC
OFF State: < 10VAC

Cutout Dimensions
2-1/4 x 3-1/2 inches (see Figure 2)
The cutout can be made using a Greenlee rectangular punch #50600710

Enclosure Type
1 or 12 when properly installed

Still Need Help?
Contact Cutler-Hammer Automation
Phone: 1-800-809-2772

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