WAGNER

DSP *Digital Single Phase*

Motor Protector / Power Monitor

Installation and Operation Instructions

OVERVIEW:

The DSP-1 Line Voltage Monitor provides continuous monitoring of the power and control signals used to operate any single phase load. Protected devices can include motors, pumps, fans, compressors and other devices.

The DSP-1 protects these devices by keeping a constant watch over the supplied voltage, and when the voltage goes outside of a voltage and tolerance that you select, the DSP-1 opens its control relay.

The time required to respond to the out-of-tolerance conditions is user adjustable and may be set to short times for sensitive devices or longer times to help eliminate nuisance tripping.

When the DSP-1's relay opens, the delay timer starts. This timer keeps track of the time since the output was turned off and prevents the protected equipment from restarting too soon. The delay is also user adjustable. It is particularly useful for the protection of compressors, where an attempted rapid restart can cause a stalled condition and motor burnout.

INSTALLATION:

Installation of the DSP-1 is simple and straight forward.

DISCONNECT ALL POWER BEFORE STARTING THE INSTALLATION OF THE DSP-1

MOUNTING:

Select a cool, dry location for the mounting of the DSP-1. Keep in mind that the front of the unit has the operator controls and the digital display. The front of the DSP-1 should be clear of obstructions and allow easy access to the control buttons. A suitable location may be in the control enclosure, near the motor starter or compressor contactor.

The DSP-1 should be mounted on a metal surface with two #8 sheet metal screws.

WIRING:

If the voltage being monitored is tapped from a high current source, branch circuit protection (fuse or circuit breaker) as described in the National Electric Code should be provided. Since the current drawn by the DSP-1 is a fraction of an Amp, the branch protection can be selected for the wire type used. Typically, a fuse rated at 1 Amp will provide the required protection.

PINOUT DESCRIPTION

L1 & L2

Connect the voltage being monitored to the DSP-1's L1 and L2 terminals. This voltage will also power the DSP-1 and should come from a source such as the line side of the contactor being controlled.

NC, NO and COM

These terminals connect to the relay output. The relay closes when the line voltage is within the selected tolerance, the control voltage is on and the delay timer has expired. Typically you would connect the COM and NO terminals in series with the control circuit, motor starter or contactor coil.

C1, C2 and C3

Connect a control voltage to C1 and C2. The DSP-1 responds to voltage between 18 and 250 Volts and draws only a fraction of an Amp. To allow the use of a 24 Volt thermostat an internal anticipator load is provided by connecting C2 to C3. Be sure to only connect C3 for 24 Volt or lower operation.

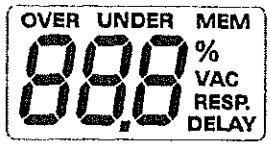
SETUP

After completing the installation, Apply power to the system. The DSP-1's display will show the incoming line voltage. The OVER or UNDER indicators may also be visible depending on the factory versus your incoming line voltage.

Pressing the SELECT button will sequence the display through the following parameters:

VOLTAGE SET POINT
TOLERANCE SET POINT
RESPONSE TIME
DELAY TIME
(BACK TO THE LINE VOLTAGE DISPLAY)

The DSP-1's
LCD DISPLAY



If you press SELECT and do not change a parameter by pressing the up or down arrow keys, the DSP-1 automatically returns to displaying the line voltage in 7 seconds.

To set the desired voltage range press the SELECT button once. The VAC indicator will flash, (indicating that you are in the set voltage mode). Press the up or down arrows to change the setting to the voltage range that you desire. You may press and hold the up or down keys to accelerate the setting of any parameter.

SETUP CONTINUED

To set the desired line voltage tolerance (in percent) press the SELECT button a second time. The % indicator will flash (indicating that you are in the set tolerance mode).
Press the up or down arrows to change the setting to the tolerance range that you desire.

To set the desired delay time (in seconds) press the SELECT button a third time. The DELAY indicator will flash (indicating that you are in the set delay time mode).
Press the up or down arrows to change the setting to the response time that you desire.

To set the desired response time (in seconds and tenths of seconds) press the SELECT button a fourth time. The RESP indicator will flash (indicating that you are in the set response time mode).
Press the up or down arrows to change the setting to the response time that you desire.

The new settings are saved in permanent memory when the display returns to displaying the line voltage. The new settings may be verified by pressing the select button to sequence through the various parameters.

OPERATIONAL CHARACTERISTICS

When presented with a voltage of 70 volts or lower, the DSP1 displays "Lo", the output relay is turned off, the delay timer is started and the response timer is disabled. Only when the voltage returns to normal and the delay time has elapsed is the relay allowed to energize.

When the DSP1 is presented with a voltage higher than 324 volts the display will indicate OVER 325 and the control LED will go out. The display will flash over 325 until the voltage returns to 324 volts or less. Note: Any voltage over 324 volts is treated as an overvoltage condition regardless of the voltage or tolerance settings.

To prevent tripping on a 1 volt change, the DSP1 automatically calculates cut-out and cut-in voltages for both overvoltage and undervoltage. The cut-out voltage is always based on the user voltage and tolerance settings, while the cut-in voltage is 3% closer to the nominal voltage setting. This quality is sometimes referred to as hysterisis.

You may test the display by pressing the UP & DOWN keys at the same time. Press SELECT to continue normal operation.

OPERATION WITHOUT A CONNECTION TO THE CONTROL INPUT

To enable operation of the DSP-1 without control voltage connected to the input, a special sequence of key presses is required.

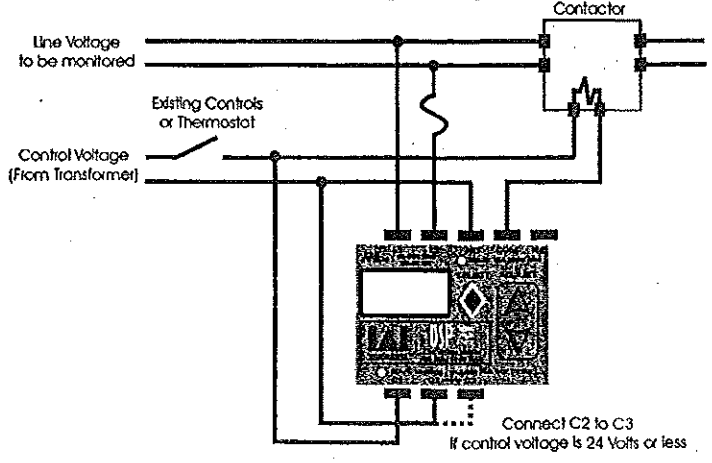
To turn on the control bypass press and hold the UP arrow key then also press the SELECT key. The control LED will begin to blink twice. This double blink is the indication that the control input is bypassed.

To turn off the control bypass simply press and hold the DOWN key then also press the SELECT key. The control LED will stop blinking or just blink once if a control voltage is present.

SPECIFICATIONS

✓ Operating Voltage:	90 to 300 Volts
✓ Voltmeter Range:	70 to 325 Volts
✓ Tolerance Limits:	6 to 18%
✓ Hysterisis	3% of selected operating voltage
✓ Response Timer:	0.1 to 10 seconds
✓ Delay Timer:	1 to 720 seconds
✓ Output Relay:	10 Amps, 250 VAC resistive, single-pole/double-throw
✓ Control Input:	18 to 250 VAC with anticipator load for 24 volt thermostats

Typical Wiring Diagram



Factory Settings:

208 volts
12% tolerance
2 second response
30 second delay

WAGNER MANUFACTURING
A Division of DiversiTech

Product of DiversiTech Corp.
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Assembled in China
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