

Speed Detection Switch

60-200-SC

Monitor user manual

1 Summary

Monitor uses a microprocessor to control the speed monitoring device. Standard sensors and other types of type NPN provides pulse signal flow indicator speed. By a double-pole double-throw relay output.

2 specifications

(1) the input voltage: 120VAC/240VAC (50/60Hz $\pm$ 110%)

Note: monitor in a low voltage state can not be the normal operation of.

(2) output: a.1 DPDT 230V/5A relay, no induction. (230VAC/2A induction)

(NC/NO)

B.0-2VDC and 0-199% corresponding speed. (standard)

The output of the C. 0-20/4-20 mA can choose, can substitute for B (0-2VDC). 800 ohm load range, corresponding to 0-100% or 0-199%. Software selection.

(3): NPN sensor inputs (up to 3KHz) or mechanical contact (external connected capacitor removal of contact bounce)

(4): +12V output (+12VDC, 75mA sensor power supply)

(5) the working temperature: -40 °C-50 °C: electrical equipment

Standard close to the sensor: -25 °C- + 70°C

(6): NEMA4 shell

3 installation

The 3.1 shell is provided with sealing pads, can be installed on a wet or outdoor environment.

The 3.2 power supply wiring

The 3.3 signal wiring

Signal terminal wiring diagram

Note: 1 using NPN type sensor for short circuit power terminal (1) and PNP signal terminals (3).

(1 brown line, 2 is connected with a black line, blue line after the 4, 1 and 3 short circuit)

2 using PNP type sensor signal line access to the PNP signal (3).

Figure 3.3

A 3.4 output terminal

Single channel output

Output channel I

Output channel II

(only two channels of 60-200-2 effective)

Figure 3.4

Warning

Radio frequency interference to monitor noise interference. If close to the radio frequency interference source, you must use the frequency shielding cable.

4 sensor type

Industry standard sensor is of type NPN. NPN (or PNP) type of transistor as a sensor output switch. Type PNP output switch is connected to a high level and low resistance grounding.

Note: the A. sensors with +12VDC, 75mA power supply

B. without PNP type sensor input.

C. internal filter enable signal to microprocessor measurement requirements. Filter for removing noise, but at the same time limit sensor frequency is less than 3000Hz.

Danger

Monitor can not be installed in hazardous areas. Otherwise it must be connected with the approval of the work at special risk region of the sensor.

The 5 signal wiring application example

Monitor (#7) - 0-2VDC speed 0~199%

Alarm inhibit (#9) - external PC or input end of the controller, banned

Alarm status. Only in the " alarm " Cheng Wei d = 2.

Reset (#10) - remote reset input.

6 speed voltage output terminal

Continuous measurement of the rotational speed relative to a reference speed. For example, the current speed and the reference speed, speed voltage output 1V expressed relative to a rotation speed of 100%. If the current speed for the reference speed 90%, output voltage of 0.9V.

Speed voltage output (port 7) can be connected with the display, such as a digital instrument display the current speed. Output voltage of 0~2V (current 1mA). The output is only a reference, a precision of 2%.

7 Design Guide

Warning

Some application problems are likely to occur should be avoided.

For example, may put the design in alarm occurs when cut off its power supply circuit. When power is restored, cannot remember last alarm, equipment with no alarm happened to start.

If the application needs in the alarm state power loss or by the alarm power interruptions, recommended to install the electrical contact device, no manual switching operation cannot be restarted. The design should be considered to start, the instantaneous power failure alarm, reset, or other operating conditions led to unexpected device start. Note: start or reset may cause transient operation of the alarm in the stable power supply before.

The 7.1 setting and adjustment

In the installation and wiring is completed, must be on the device to be programmed. Remove the protective cover is installed in the power supply and the output lines, to ensure that the protective cover is installed.

Warning

The shield is not reliable installation do not provide power.

7.2 programming

7.2.1 factory setting value

When the factory test, the following parameters are programmed in the memory. The operator in the specific application of these parameters can be changed.

- * start delay = 10 seconds
- * the alarm threshold = 40%
- * alarm delay = 10 seconds
- * alarm control = 1
- * start delay control = 1
- * = 1 alarm function
- * current output = 4 (standard)

7.2.2 display

4 digit, 7 light emitting diodes provide three display function. First of all, the user can observe and check program, secondly, can observe the current speed has been relatively programming reference speed percentage. The current speed display range 0~199%. Speed display more than 199% 199%. Third, display an error message.

In a programming mode, the timer off automatically after 65 seconds. Don't take long time to stay in the programming mode. Press any key to activate the display (a programming mode).

The 7.2.3 button

SELECT UP DOWN

Function keys are located in the LED display.

The use of three key (SELECT, UP, DOWN). Touch any one key-press display the current speed percentage (according to remain in the memory of the reference speed calculation).

The " SELECT " button to display the current step parameters stored in the nonvolatile memory and move on to the next step.

The "UP" button - corresponding step parameter value plus 1.

The "DOWN" button - corresponding step parameter value minus 1

7.2.4 into the way of programming

Can use two methods to start programming mode.

Holding down the " SELET" button for 5 seconds, measuring the current speed as the new reference speed input. If the button 5 seconds before the release, 60-22H-1 terminated without changing any parameters measurement.

The same hold down the "UP " and " DOWN" button for 2 seconds, skip measurement reference speed stage directly into the programming mode. This method will retain the original reference speed.

Note: in the programming mode alarm cannot be reset.

7.2.5 startup delay (" A ")

Programming is the first step user selection device starts to reach normal operating speed time. The last set of parameter values first show (first programming displayed for 10 seconds). The use of " UP " and " DOWN " button in 0~99 seconds to changing values of parameters.

Warning

0 delay time will cancel the start-up delay, it may be in the start-up of the equipment will generate alarm.

7.2.6 alarm threshold (" B ")

Users choose a normal speed (100%) by 0~160% as alarm threshold. Can choose the overspeed alarm or a low speed alarm. For example,

The last set of 40% (low speed alarm), the parameter values by 1% step size is in the range of 0~160 regulation. Parameter 0 can make the shielding alarm

function and prohibit the operation of the alarm. The choice of parameter values (percentage) of more than 100% sets of overspeed alarm.

For example, measuring the reference speed of 100RPM, programming alarm threshold value is 80%, the actual alarm threshold for 80RPM.

7.2.7 alarm delay (" C ")

User selection in measuring speed across the alarm threshold to the alarm relay (alarm status) time (seconds)

The function of preventing irregular rotational speed pulse input error alarm operation, if the alarm delay period to detect normal speed to cancel the alarm condition.

In 1~65 seconds range alarm delay time. The default value of 10 seconds. Alarm delay can be thought of as a " window ", when the pulse cycle over the operator selected alarm delay " window" when, in the alarm delay after the alarm will be activated. See Section 5.2 speed (RPM) and alarm delay time example.

7.2.8 alarm control (" F ")

In the event of a power interruption automatic reset.

Warning

Alarm control method will influence the safety of the operator.

Alarm output through the output relay to cut off power supply. Power loss is always output alarm state. If the power supply is suddenly back, back into the delay to the start state.

Warning

PRIOR ALARM CONDITIONS WILL NOT BE RETAINED.

Don't keep alarm priority state

Don't cut off the power supply to achieve power on reset function. To provide an external port is connected with a relay or switch to realize the remote reset function.

Note: interruption of power supply or using a remote reset will cause the device to enter the start state. Reset will produce instantaneous alarm state until the relay.

Power on reset and remote reset always efficient. The default value is "F" = 1, pointed out the way of reduction is allowed.

Select "F" = 2 can prohibit the alarm state, together with the power and remote reset. "INHIBIT" port provides the function. '

When "INHIBIT" port connected to a signal common "COMMON", the output relay attracting (alarm). When "INHIBIT" port and signal public terminal is disconnected, equipment as electric as start, including start delay.

Note: "INHIBIT" must maintain a low level of 160 mS, to ensure that the device is detected by the "INHIBIT" signal.

7.2.9 start-up delay control (" G ")

Can be in the absence of the sensor signals, which may be in the absence of pulse when the judge for a low speed alarm, causing unnecessary alarm state. Select "G" = 2 to avoid this confusion. "G" value = 2 instructions in the reset after waiting for the detected pulse signal, detects a pulse signal into the delay to the start of operation.

Select "E" = 1 instructions in the reset after directly into the delay to the start of operation.

7.2.10 alarm function (" H ")

Can use two methods to cancel the operation of an alarm, first of all, in the programming steps to select the "H" = 1, forced locking alarm until the remote reset, power is interrupted, "INHIBIT" function to cancel the alarm state.

If you select "H" = 2, increase the clearance of alarm function, when the detected in normal speed to cancel the alarm state.

Warning

Ensure that the design and installation of complete according to "lock" the application mode of operation, not a "unlocked" structure.

After installation, the necessary testing to ensure that the selected need to clear the alarm method.

The 7.3 current output

Monitor has a selectable 0-20/4-20mA current output alternative to the standard 0-2VDC output. The components in a factory calibration. The user only needs to select the correct settings in programming.

" J " = 14 ~ 20 and 0 ~ 100% mA

" J " = 24 ~ 20 and 0 ~ 199% mA

" J " = 30 ~ 20 and 0 ~ 100% mA

" J " = 40 ~ 20 and 0 ~ 199% mA

The 7.4 mode of operation (" = ")

In a programming steps (" output ") by the "SELECT" button to end programming mode. Automatic recording of changes in the parameters stored in the nonvolatile memory and into operation mode. The digital display to display the current speed percentage, the symbol " = " is displayed in the left.

The 8 principle

Embedded microprocessor and non-volatile memory. When electrically activated automatically mount programming information.

According to the programming selection, in the device power on or reset, waiting for the pulse signal or automatic start delay.

Start delay prevents the speed does not reach the stable error. In the start-up delay period, any speed over will start the alarm time delay process.

Continuous detection of speed pulse rate (frequency) and to compare the alarm threshold and in the programming stage determines the alarm delay time. When the pulse rate deviation alarm threshold, start alarm delay process.

Alarm delay during programming to determine determined experimentally and must be used. Alarm delay is a special type of filter, and only constant speed deviation can generate alarm. Alarm delay time can be seen as a " window ", when the pulse interval (seconds) exceeds the alarm delay time " window ", will generate an alarm. This means selecting the minimum alarm delay " window " must be integrated into revolutions per minute (PRM) and the use of the sensor of each pulse number. Section 5.2 provides further information. Once the establishment of alarm, alarm continued to power on reset or receiving remote reset signal or the " INHIBIT " control line at least 160mS low level. " INHIBIT " must be prohibited in programming control alarm set. Also in programming setting detected in normal speed when the automatic removal of alarm.

12VDC, 75mA power supply sensor

NPN or mechanical contact signal input. Contact closure will produce electronic noise must be external capacitor filter.

9 rpm and minimum alarm delay time

Introduced earlier alarm delay time " window " concept, there will be a detailed description of.

By selecting the alarm delay time, you set up a second unit time window. If the input monitor for two consecutive pulse interval time exceeds the alarm delay " window " of the time, alarm relay will release.

Basic operation monitoring system

The A. axis drive system

B. non contact (near) system

C. Non-contacting (proximity) systems

D. Examples of the above systems follow with 20 RPM and 100 RPM used for 100 percent reference speed

In the above example, the set point is low, need a wide range of alarm delay " window ", because the input pulse stream continuous pulse interval on the increase. In case of a low set point application needs a second alarm delay, must use every turn can produce more pulse sensor.

Calculation of other speed (RPM) range allows for minimum delay time, use the following formula.

A. $\text{Hz} = \text{RPM} \times \text{PPR} / 60$

PPR = sensor each pulse number

RPM = the alarm set rpm

B. $\text{pulse cycle} = (1/\text{Hz}) + 1 (\text{seconds})$

Minimum delay time = (C. + ROUNDED NEAREST WHOLE pulse cycle

Warning

To avoid a rotational speed pulse interval time and alarm delay time " window " is the same. USE AN ALARM DELAY TIME THAT IS ONE OR TWO ALARM DELAY SECONDS LONGER.

10 fault detection

Containing error detection system. If the operator attempts to use the device does not support parameter programming, device error code according to remind the operator

Error. Some hardware fault state can also generate error codes. If the device operates in a mode of operation, press any key to activate the display error messages.

Error code definition:

Err1 = cannot measure. Loss of signal or too slow.

Err2 = calculate the alarm speed too slow. Very low reference speed and low alarm threshold calculation results require the device for pulse for more than 5 seconds (limit). For example, the sensor generates 10 pulse per revolution, connecting shaft speed 3 RPM, every 2 seconds to produce a pulse. In programming this low speed measurement. But when the alarm threshold selection for speed by 20%, because the calculation results of low-speed signal for more than 5 seconds. Generate Err2 error.

Err3 = calculate the alarm speed too fast. Similar to Err2, if the reference speed and overspeed alarm threshold determined by the frequency of more than 3000HZ, will produce error status.

Err4 = signal high frequency. The frequency of the input signal exceeds 3000HZ. May choose the wrong sensor or noise.

11 troubleshooting

Closed in normal operation. Touch a button to activate only in the display to display the error message. The programming can also display an error message.

Monitor set (single channel)

The description of the steps

A start delay range for 1-99 seconds, in seconds

B alarm set point 0-160%, to 1% for indexing

C alarm delay range for 1-99 seconds, in seconds

D alarm control 1= for normal operation

2= alarm block

E start-up delay control 1= power on

2= + output pulse power supply

F alarm function 1= locking (manual reset)

2= indicator (reset)

G

H

J 1= 4-20mA 0-100% current output

2=4-20mA 0-199%

3=0-20mA 0-100%

4=0-20mA 0-199%

In run mode display speed ratio

Monitor set (dual)

The description of the steps

A start delay range for 1-99 seconds, in seconds

B alarm set point (channel 1) in 1% 0-160%, for indexing

C alarm delay (channel 1) is in the range of 1-99 seconds, in seconds

D alarm set point (channel 2) in 1% 0-160%, for indexing

E alarm delay (channel 2) is in the range of 1-99 seconds, in seconds

F alarm control 1= for normal operation

2= alarm block

G start-up delay control 1= power on

2= + output pulse power supply

H alarm function 1= locking (manual reset)

2= indicator (reset)

J 1= 4-20mA 0-100% current output

2=4-20mA 0-199%

3=0-20mA 0-100%

4=0-20mA 0-199%

In run mode display speed ratio