User manual

30.12.2003
V1.1

Wind Speed Alarm Unit

6602

Smart Sensing
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INTRODUCTION

6602 is a wind speed alarm unit. It is suitable to be used with any wind sensor with NPN output. It provides 10 V supply for the sensor. There is two independent 250 V 2 A alarm relays, and a watchdog output that gives a pulse at one minute interval.

The unit is equipped with a 8x2 character liquid crystal display for monitoring the operation. The current wind speed is shown in user selectable measurement units, alongside the states of the alarms. The configuration is performed using a PC software with a special programming cable, or using 6790 hand-held programmer.

The alarm unit is mounted in a 35 mm DIN rail and needs 230 VAC supply.

SPECIFICATIONS

Wind sensor input

Wind sensor interface:

Supply:	10 V 20 mA from 6602 or external source
Input:	NPN pulling below 0.8V
Internal pullup:	10 kohm to +5V
Frequency range:	0.06 … 1500 Hz

Processing:

Lowpass filter:	First order, user selectable time constant 1 sec … 10 min
Linearisation:	Up to six points
Gate time:	0.5 s or 128 / f_{in}, whichever smaller

Sensor fault alarm:

No pulse timeout:	1 min … 12 days
Output:	Both of the alarms will activate with no cycling
External reset:	External switch or NPN pulling below 0.8 V, resetting needs high-to-low transition.

Alarms (2 alarms)

Functions:

Type:	Low or high level
Hysteresis:	Freely configurable
Delay (act/inact):	1 s … 1 hour
Cycling:	0.1 s … 15 s on/off

Relays:

Rating:	250 VAC 2 A resistive load
Endurance:	400 000 operations (VDE 0660)
Power off:	Both relays will open.

Display

Type:	8x2 character dot matrix LCD
Backlight:	Yellow LED
Contents:	See chapter Operation
Language:	English or Spanish, user selectable

Watchdog output

Pulse:	Gives ~0.3 s pulse one time per minute

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NPN output:	Internal pull-up 10 kohm to about 6 V, external to 15 V max. Max load 15 mA. Operation not guaranteed.
PNP output:	External supply or internal 9 V supply. Internal pull-down 10 kohm. Max load 15 mA.

Configuration

Connection:	Nokeval POL connector
Parameters:	9600 bps, addr 0
Protocol:	Nokeval SCL-Meku 1
Software:	Mekuwin for Windows 98…XP, needs programming cable POL-RS232.
Hand-held:	Nokeval 6790 programmer

Power supply

Voltage:	230 VAC ±15%
Consumption:	15 mA
Insulation:	Reinforced insulation, no ground connection needed
Pre-fuse:	Not needed

General

Temperature:	-20…+60 °C (LCD may be unusable at extreme temperatures)
Weight:	220 g
Connectors:	2.5 mm^2, not detachable, max 30 insertions.

Regulations

EMC immunity

EN 61326	with sensor lines classified as long distance lines (>30 m)

EMC emissions

EN 61326	class A

Electrical safety

EN 61010	with reinforced insulation

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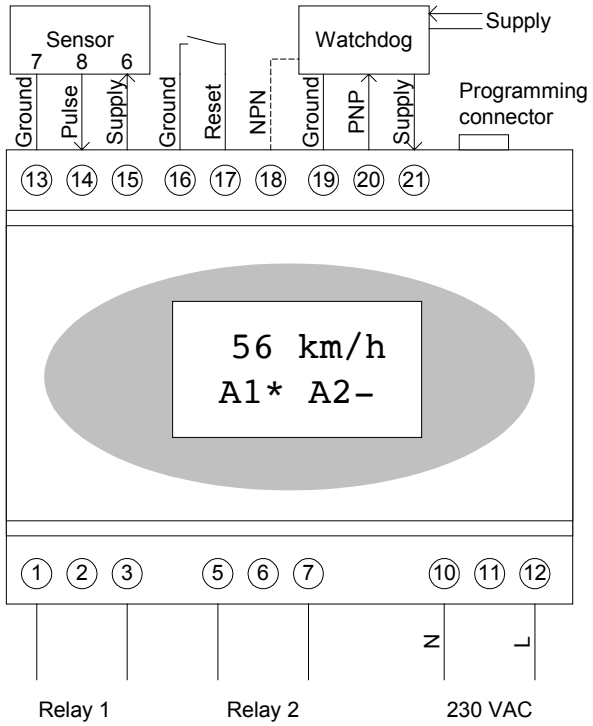
INSTALLING

Connectors



Power supply 230 V is brought to connectors 10 and 12. Ground connection is not needed.

Relays are fully independent, and may switch 230 V circuits up to 2 A resistive load. If driving heavier loads, an auxiliary relay is recommended.

Sensor is connected in connectors 13, 14, and 15. +10 VDC supply is provided. Sensor should be of NPN type. This line is protected from overvoltages / currents to a certain limit to allow long sensor wires.

Sensor fault detector may be reset by a switch connected between 17 (signal) and 16 (ground). Up to 30 metres of wire is allowed. A high-to-low transition is needed – a continuously closed switch will not reset.

This unit provides a short pulse each minute to indicate it is alive. This signal is intended to reset an external timer relay that can be used to verify the operation of this alarm unit. The output is of PNP type. External supply can be provided at connector 21, and the PNP output will then use that voltage. Without that, about 9 volts is output at PNP connector. Up to 30 metres of wire is allowed.

Sensor, reset, and watchdog circuitry grounds are connected together internally. It is highly recommended to not to ground the sensor interface at the remote end.

OPERATION

States

After power-up, the alarm unit will go through a sequence to test the external components. After that, it will enter the normal state, displaying the wind speed and controlling the alarms. If no pulses are received from the sensor during a pre-determined time, the sensor fault alarm will activate until manually reset or sensor gives a pulse.

Additionally, every minute a pulse will be sent from the watchdog output.

These states are described below.

Autotest state

When the power supply is applied to this unit, it will go through the following sequence:

1. 1 sec internal stabilisation delay, both relay contacts in no alarm state.
2. Alarm 1 is on for 4 seconds (the actual state of the relay depends on the settings).
3. 0.5 sec pause with both alarms inactive.
4. Alarm 2 is on for 4 seconds.
5. Normal state.

Autotest can be bypassed with the external reset switch. The test can be started whenever using the configuration software: Gen\Test.

```
AUTOTEST
A1* A2-
```

Display: ”AUTOTEST” blinking, states of the alarms shown with *=active and –=inactive.

Normal state

The current windspeed in engineering units is displayed along with a user-configurable unit text.

```
 15 km/h
A1- A2-
```

The states of the alarms are also shown the same way as in autotest mode.

Watchdog output state

Once a minute, a short pulse is output from the watchdog output in order to reset an external safety timer that can be used to monitor the operation of this unit.

```
TEST OK
```

When the pulse is output, the display shows briefly ”TEST OK”.

Sensor fault state

When no pulses are received from the wind sensor for a while, the sensor is suspected to be faulty. The alarm unit will go to sensor fault state and activate both of the alarms continuously until a reset pulse is received from an external reset switch or from the wind sensor. After this, the period will begin from start. The timer can be preventively reset in normal state too, before the unit goes to the fault state.

The display will blink ”FALLO SENSOR” (Spanish) or ”SENSOR FAULT” (English).

```
FALLO
SENSOR
```

No settings fault state

If this unit detects that its settings are not correct, it will enter No settings state and activate both relays. Watchdog pulses are not output.

```
NO
SETTINGS
```

SETTINGS

Using configuration software

Nokeval Mekuwin software can be used to access the settings in the unit. Additionally, a programming cable POL-RS232 or USB-POL is needed between the PC and the alarm unit.

Launch the software, and select your COM port, 9600 baud, address 0 and slot 0. Connect to the unit. The unit must be powered up.

Using hand-held programmer

Nokeval 6790 hand-held programmer is an alternative way to change settings in the unit. Select again 9600 baud, addr 0, slot 0.

About the menu

The settings are divided to four groups (sub-menus) to clarify the structure. These groups are General settings, Input settings, and two Alarm settings. These are described next. Finally the monitoring options are presented.

General settings

Language

Select English or Spanish. Affects LCD messages only.

Contrast

LCD contrast adjustment. Too small value makes the display faint, while too small makes the backgroud too visible. May be adjusted 0-255.

Autotest

Enabling or disabling the autotest state at power-up.

Test

Starts the autotest sequence, like on the power-up.

Input settings

Pts

Number of scaling/linearization points:

- **0**: No scaling. Sensor signal (in Hz) is used as is on the display and alarms.
- **1**: One point scaling. One sensor input (Hz) and one display reading (e.g. km/h or m/s) is set, and the unit calculates the coefficient using these. Zero signal gives always zero reading.
- **2**: Two point scaling. Two input-reading pairs are entered, giving possibility for zero shift.
- **3…6**: Several points scaling/linearization. Several input - reading pairs are entered, and linear interpolation used between these. Outside the points linear extrapolation with two nearest points is used. Sensor inputs must be in ascending order, Mea1<Mea2<Mea3 etc.

Mea1…6

Sensor inputs (Hz), corresponding to readings in Sca settings.

Sca1…6

Scaled readings (km/h). The measurement unit can be any.

Teaching (live calibration)

The current input may be copied to any Mea setting using the Lock operation for that menu item (L button in Mekuwin). Then the corresponding scaled (engineering) value may be entered to the adjacent Sca setting.

Dec

Number of digits to display after the decimal point.

Unit

The unit text to be displayed on the LCD after the scaled reading. Up to four characters may be entered, e.g. m/s or km/h.

Lopass

First order lowpass filter used to slow down variations in the reading. Set the time constant in seconds (2-600). To disable, set to 0.

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Timeout

Sensor fault timeout. If no pulses are received during the period specified with this setting, the unit will go to sensor fault state and activate both alarms. Specify the time in minutes (1-18000). Set to 0 to disable.

The timeout timer can be reset anytime, by an external reset switch or using Free operation on this menu item (F in Mekuwin).

Alarm settings

Type

Type of the alarm:

- **Off**: The alarm is disabled, except in the sensor fault state.
- **Lo**: The alarm is activated when the scaled reading goes below the Level setting, and deactivated when rises above Level+Hyst.
- **Hi**: The alarm is activated when the scaled reading rises above the Level setting, and deactivated when falls below Level-Hyst.
- **LoNc, HiNc**: Same as Lo and Hi except that the relay is pulled and contacts are closed when the alarm is NOT active.

Level

Alarm level, works in conjunction with Hyst.

Hyst

Alarm hysteresis. When an alarm has activated, it won't deactivate until the reading goes back the amount specified in Hyst setting. Always a positive value.

Example: High level alarm at Level=50, Hyst=5. Alarm activates when the reading goes over 50, but deactivates at 45.

Delay

Alarm activation/deactivation delay. The alarm condition must be present the time specified here for the alarm to really activate. The same applies to deactivation. Specify the time in seconds (1-4000). To disable, set to 0.

Cycle, Ton, Toff

Alarm relay cycling. If Cycle is set to Yes, Ton and Toff will become visible in the configuration menu.

When an alarm is active, the relay will be activated for time Ton and deactivated for Toff. The times are entered in seconds (0.1-15).

Monitoring

Monitoring means watching the readings and states of the unit using the confuguration software or the hand-held programmer.

Hz

The current measured input frequency in Hz, no filter applied.

Wind

The scaled (linearized) and lowpass filtered reading in user selected engineering units.

Alarm

The states of the alarms. 0=no alarms active, 1=alarm 1, 2=alarm 2, 3=both of the alarms. Moreover, 4 is added to the value when the watchdog output is active.

By issuing a Lock command for this item, the unit enters I/O test state and this value can be edited to test the relays and the watchdog output. Use free to return the normal operation.

ExtSw

The state of the external reset switch.

Diagnostics

There are three diagnostic messages.

Sensor fault

Given if no pulses are not received from the sensor for the time specified in Timeout setting.

Autotest

The unit is in Autotest state and controls the relays accordingly.

No settings

The unit has detected that its settings are not correct and that they should be re-entered.