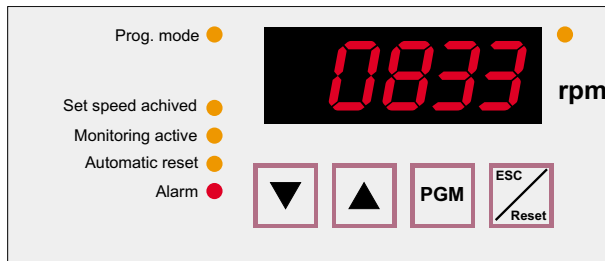


Speed monitor

MN-1000

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USE

MN-1000 is designed to monitor the rotation and speed of fans, axles, stoker screws, motors, etc.

MN-1000 can be used with different types of sensors, for example, passive sensors type Micatrone MGN-10 or Namur sensors type MGN-10N.

FUNCTION

MN-1000 monitors the speed in two ways:

- When the speed exceeds the set operating speed, the "Safety circuit" relay switches and the "Operating speed reached" LED comes on. If the speed then drops below the operating speed less the connection difference, the "Safety circuit" relay releases and the "Operating speed reached" LED goes out.
- When a 230 VAC operating signal is connected to terminal 3, the time delay "Blocking of Alarm during start up" starts. When the time delay has elapsed, monitoring is activated and the "Monitoring active" LED comes on. Should the speed after the start up time not exceed the set operating speed the alarm relay trips. Should the speed during operations drop below the operating speed less the connection difference, the alarm relay trips. The alarm relay can be reset manually or automatically.

The operating speed can be set within two ranges, either 0.1...999.9 rpm or 1...9999 rpm.

DESIGN

MN-1000 is designed with three interconnected circuit boards, I/O board, measurement board and the display board. 4-digit indicator with character for negative values and 6 LEDs for status indication. Readable and programmable from the outside. ABS plastic case equipped with four threaded holes for cable glands.

INSTALLATION

MN-1000 is mounted via 4 screws, max Ø4 mm. The location of the holes is shown back of the enclosure. Do not place the unit on a warm surface. Connect power supply according to the electrical connection. Check that the controller is marked with the correct power supply voltage. If using cable glands without a nut on the inside, glands with grommet must be used to avoid damage to the threads on the enclosure. Remember to remove the transparent protective cover from the front panel after finished installation.

IMPULSE SENSOR INSTALLATION

See the separate installation instruction for each sensor.

- Inductive type MGN-10 (passive)
for speed: 200 ... 5000 rpm
- Inductive type MGN-10N (Namur)
for speed: 0 ... 20000 rpm

SENSOR TYPE AND SPEED RANGE

Connected impulse sensor type and preferred speed range must be set with a DIL-switch inside MN-1000 before operation.

Namur type and 1 .. 9999 rpm is the factory default setting.

1. Remove the cover.
2. On the midmost circuit card is a 2-way miniature switch (DIL-switch) in the lower right-hand corner.
3. Select the connected impulse sensor type
4. Select the preferred speed range.
5. Refit the cover.

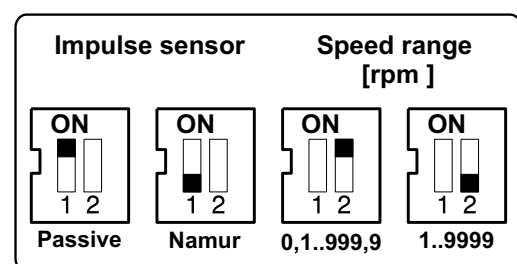


fig 1

Settings of impulse sensor and speed range

PROGRAMMING

Hold down the **PGM** key for 3 seconds and the display will switch from the actual value to the first parameter P00 in the list of parameters. The list of parameters includes three parameters, the first, P00, can not be changed.

Browse through the list of parameters by pressing the **▲▼** keys and this will display P00, P01, P02 and P03.

Pressing the **PGM** key for the parameter in question shows the set value.

The set value is changed by pressing **PGM** after which the left-hand digit starts to flash. Use the **▲▼** keys to change digit and when the required digit is shown, press the **PGM** key. The next digit to the right will then start to flash and can be changed. Continue along the entire row to the right and press the **PGM** key. The unit responds by flashing the required value three times to acknowledge programming has been successful.

Negative values are entered by pressing the **▼**-key repeatedly when programming the left most digit displayed until the digit turns over from positive to negative numbers. Remaining digits are then programmed as described above until the entire parameter value is entered.

Ongoing programming can be cancelled before the last digit is completed by pressing the **ESC** key.

After programming a value you can return to the list of parameters by pressing the **ESC** key.

Par. no:	Parameter list	Range	Preset
P00	Program version	XXX	
P01	Operating speed	0,1...999,9	-
P01	Operating speed	1...9999	1000 rpm
P02	Hysteresis	0,1...99,9	-
P02	Hysteresis	1...999	200 rpm
P03	Alarm delay during start-up	0...3600	180 sec.

The "Programming" LED lights during programming. Indication of the actual value is restored by pressing the **ESC** key, after which the "Programming" LED goes out and the Pa LED comes on. If the unit is left in "Programming" mode and no key is pressed for 5 minutes, MN-1000 automatically returns to pressure display mode.

Selection of the speed range.

There are two ranges available to set the operating speed (P01), one for low speeds 0.1...999.9 rpm and one for higher speeds 1...9999 rpm. The selection is made using the DIL-switch, which also changes the range for the connection difference at the same time.

Display

The operating speed is shown using 4 digits and with the low range set so it indicates from 000.1 rpm to 999.9 rpm.

When the high range is set the display is from 0001 to 9999. When the speed exceeds 9999 rpm, the speed is shown in thousands of rpm with 2 decimals, i.e. from 10.00 (10,000) to 20.00 (20,000) rpm.

It is not possible to program a speed greater than 9999 rpm. However, speeds up to 20,000 rpm are shown on the display.

Safety circuit

When the speed exceeds the operating speed the relay contact "Safety circuit" switches so the connection between terminals 4 and 5 makes and the connection between terminals 5 and 6 breaks. At the same time the "Operating speed reached" LED comes on. If the speed then drops to the operating speed (P01) less the connection difference (P02) the "Safety circuit" relay contact releases so the connection between terminals 4 and 5 breaks and the connection between terminals 5 and 6 makes.

Monitoring active - Alarm relay.

The alarm relay normally makes the connection between terminals 7 and 8. When 230 VAC is connected to terminal 3, the time delay (P03) "Alarm delay during start up" starts. Once the time delay has elapsed monitoring is activated and as an acknowledgement of this the "Monitoring active" LED comes on.

If the speed, after start up, does not exceed the operating speed (P01) the alarm relay trips so that the connection between terminals 7 and 8 breaks and the connection between terminals 8 and 9 makes. If the speed, during operations, drops below the operating speed (P01) less the connection difference (P02) the alarm relay trips so that the connection between terminals 7 and 8 breaks and the connection between terminals 8 and 9 makes.

Resetting

The alarm can be reset as soon as the speed exceeds the programmed operating speed (P01) or by deactivating the monitoring = disconnect signal from terminal 3.

An alarm can be reset in two different ways.

- Manual resetting
Press the ESC/RESET key or via a temporary make contact between terminals 13 and 14 for more than 2 seconds. The "Automatic resetting" LED flashes.
- Automatic resetting
Connect terminals 13 and 14 electrically via an external make contact or fit a jumper. The "Automatic resetting" LED comes on.

Power failure

Should a power failure occur during an alarm state, the alarm remains active when the power supply returns.

TECHNICAL DATA

Power voltage: 230 VAC
±10 % 50/60 Hz

Power consumption: 7.5 VA

Connecting set point 2: 230 VAC
(Same phase as term. 1)

Ambient temperature: 0...55 °C

Speed range settings 0,1 ... 999,9 rpm
1 ... 9999 rpm

Display range settings: 0,1 ... 999,9 rpm
1 ... 9999 rpm
(The display shows the speed up to 20 000 rpm, when speed exceeds 9999 rpm the speed is shown in decimal form 10,00 ... 20,00 (20,00 = 20000 rpm))

Measurement error: ≤ ±5 %

Number of set limits: 1 pc.

Hysteresis: 0,1 ... 99,9 rpm
1 ... 999 rpm

Output Relays: 2 pcs.

Max load on relays: 230 VAC, 2 A cos φ = 1

Alarm delay during start up: 0 ... 3600 seconds

Inductive impulse sensors: MGN-10
(Passive 200.. 5000 rpm)
MGN-10N
(Namur 0 .. 20 000 rpm)

Electrical terminals:
- Supply voltage: Max. 2x1,5 mm² wire
- Relays: Max. 2x1,5 mm² wire
- Impulse sensor: Max. 2x0.75 mm² wire

Cable entries: 2 pcs M16 + 2 pcs M20

Degree of protection: IP 65

Dimensions [HxWxD]: 120x200x57 mm

Weight: 0,75 kg

ELECTRICAL CONNECTION:

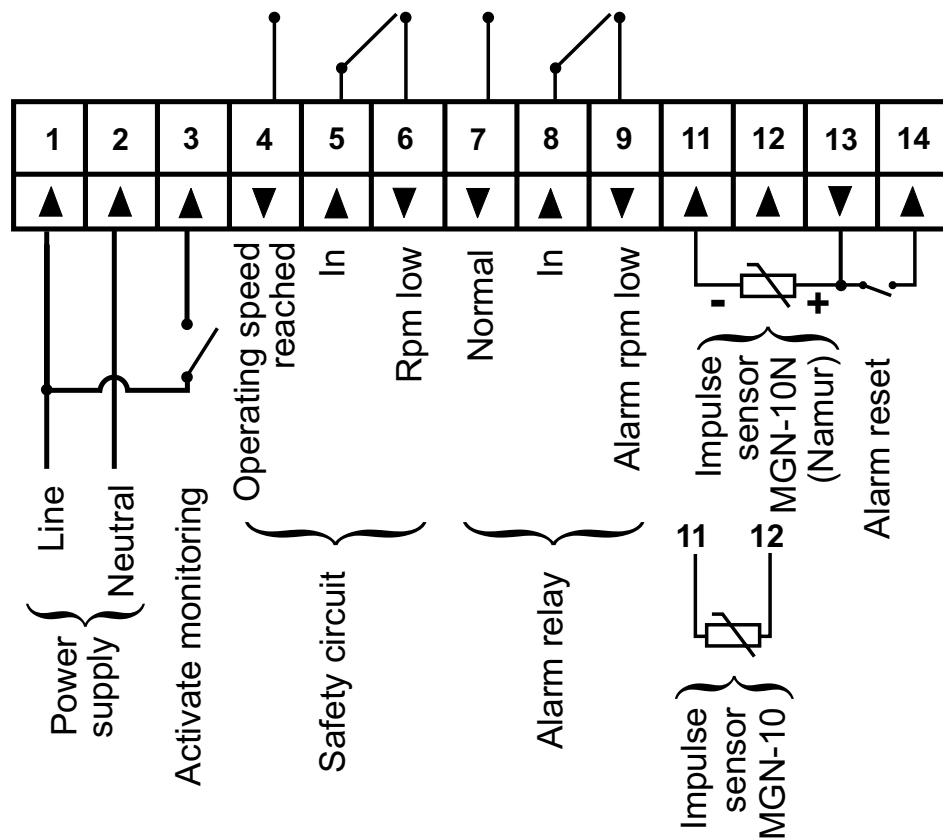


fig 2

Relay switches are drawn in power less condition, this equals the alarm position.
Cable marking on sensor type MGN-10N; unless otherwise noted: Blue = minus, Braun = plus.

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