

DEPRAG

Operating instruction booklet

IRG 1-N Controller



CE

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2. Safety instructions for users

These instructions contain the necessary information for the correct use of the products described. They are for use by technically qualified persons.

Qualified personnel are those persons whose vocational training, experience and internal training and their knowledge of the relevant standards, regulations, accident prevention regulations and plant operating conditions has led the person responsible for operational safety to authorize them to carry out the necessary work, and are able to recognize and avoid potential risks (definition of skilled workers as per IEC 364).

Risk information

The following information serves not only the personal safety of the operating personnel but also the safety of the products described herein and appliances connected to them.

	<p>DANGER ! High-voltage operations. Non-compliance can lead to death, serious injury or damage to property.</p>
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- Always disconnect the supply voltage before assembly or dismantling work, when replacing fuses or altering the structure.
- The relevant Accident Prevention and Safety at Work Regulations must be complied with at all times.
- Before commissioning, make sure that the appliance's nominal voltage conforms to the local mains voltage.
- EMERGENCY SWITCHES must remain operational in all working modes. Unlocking EMERGENCY SWITCHES must not lead to uncontrolled.
- **Electrical connections must be covered at all times!**
- **After assembly, check all protective conductor systems for correct functioning!**

Proper use

The appliance described here is an electrical device for use in feeder equipment or automation plant.

The appliance has been planned for use in oscillation conveyors, in control and automation technology.

This appliance conforms to the relevant Low-Voltage and EMC Guidelines.

3. Application

The IRG 1-N electronic controller is used for stepless controls of inductive loads such as spiral conveyors, linear conveyors and hoppers.

The controller works on the phase control principle, the conveyor output is set by setting the magnet voltage via the setpoint potentiometer integrated in the housing lid. The control curve of the setpoint voltage can be limited by means of two trimming potentiometers (Umin and Umax) on the board so that the complete angle of rotation of the setpoint potentiometer can be used.

The ignition pulses can be moved infinitely within the range of the positive or negative mains voltage half-wave through the setpoint voltage that can be varied with the setpoint potentiometer, whereby the voltage-time area of the output voltage is also set. With oscillation conveyors with 60 Hz oscillation frequency both (positive and negative) mains voltage half-waves are controlled, with oscillation conveyors with 30 Hz oscillation frequency only one mains voltage half-wave is controlled. The changeover between full-wave and half-wave mode is carried out as standard with a slide switch on the board (see Connection Possibilities).

After the working voltage has been switched on the integrated variable soft start is started and guarantees smooth acceleration of the output voltage until it reaches the preset voltage. This eliminates possible switch-on peaks. In addition, the same soft start (coupled with the soft stop via a potentiometer on the board) becomes effective when the output voltage is switched on or off via the controller input and serves to increase or decrease the conveyor output on a time-controlled basis, so that correctly arranged bulk material does not change its position.

The controller input enables the appliance to be switched on or off by another system that makes a switching voltage of 24 V DC available (e.g. a programmable controller). This input has an internal effect on the ignition pulses. If the appliance is to start (switching voltage applied), the ignition pulse are accelerated with the acceleration ramp-up time. If the appliance is to stop (switching voltage not applied), the ignition pulses are slowed down with the ramp-down time.

With two jumpers on the board you can reverse this function. The conveyor starts without external voltage with the ramp-up time, and stops if switching voltage applied without the ramp down time.

Miniature magnets can also be operated safely at the IRG 1-N controller!

4. Warnings



In the case of applications that require the oscillation conveyor to be switched ON and OFF constantly (e.g. dust switching, hopper control system, etc.), the prescribed controller input must be used. If the load circuit is disconnected with a switch or a relay the controller may be damaged.



If the controller is switched on, never insert or remove the plug at the vibration conveyor being operated. This can damage the appliance.



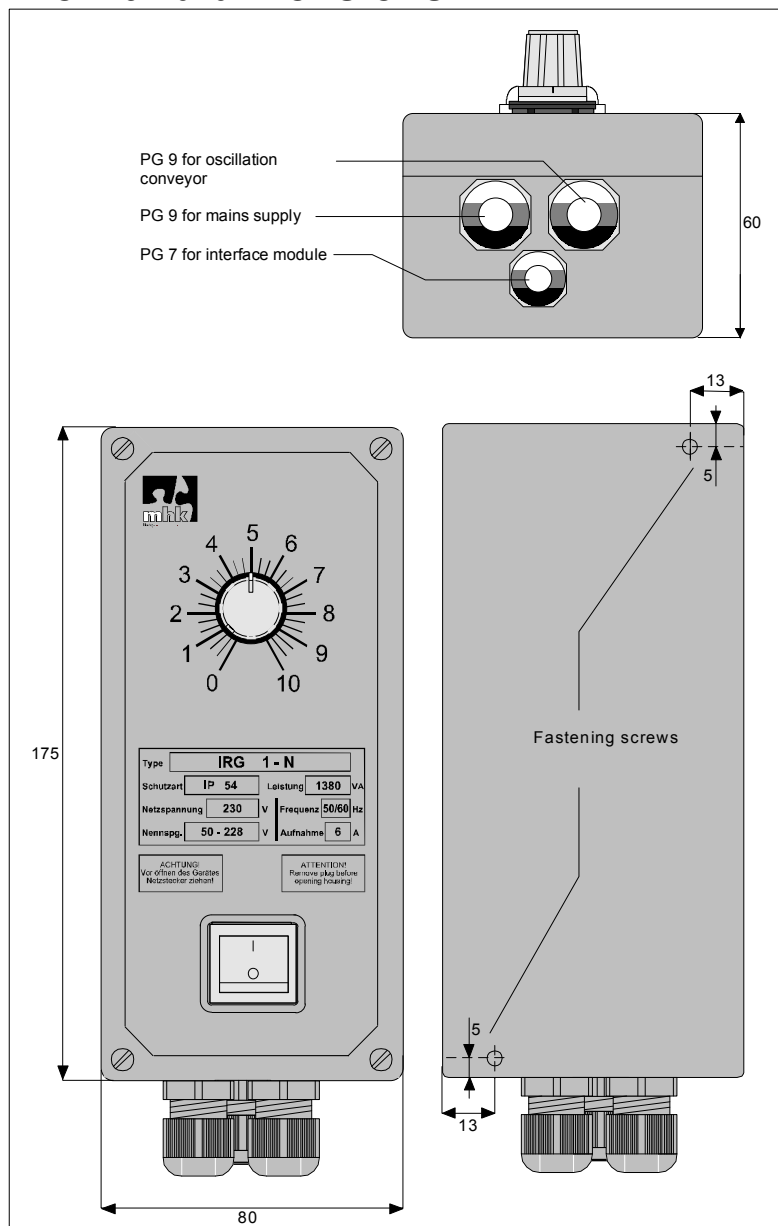
Repair work must be carried out by qualified personnel only. We recommend that repairs are carried out on our premises

5. Installation

There are four holes on the underside for mounting the controller. The holes are separated from the interior of the housing.

- Unscrew the cover fastening screws.
- Remove the cover.
- Insert the fastening screws into the channels and use them to attach the controller to a vibration-free base.

5.1 Overview and dimensions



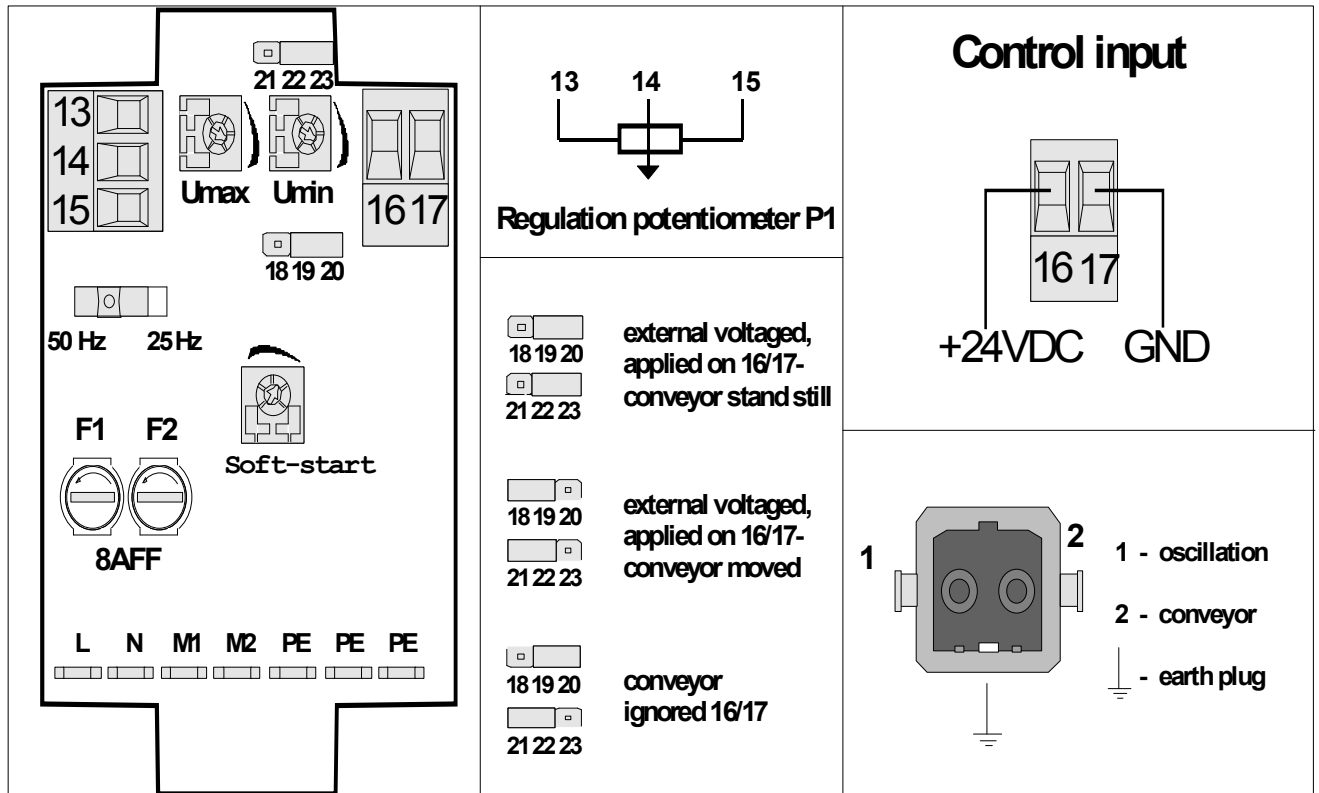
5.2 Technical data

Type	IRG 1-N	
Working voltage	230V AC / +-10%	
Working frequency	60 Hz	50 Hz
Oscillation frequency	30 Hz/60 Hz	25 Hz/50 Hz
Output voltage	50 - 228 V AC	
Output current	0,025 - 6 A AC	
Type of protection	IP 54 (except setpoint potentiometer)	
Fuses	2 x 8 A FF very fast-acting	
Ambient temperature	0 .. 50°C	
Setpoint potentiometer P1	10 Kohm (terminals 13,14,15)	
Mains connector	2m cable with integral earthing pin plug	
Connector to oscillation conveyor	2m cable with integral earthing pin plug	
Dimensions (l x b x h) ca.	175 x 80 x 55 mm	

Features:

Oscillation frequency	Reversible
Control input (Optocoupler input)	+24 V DC external voltage (If controller input with active jumper 18-19/21-22 and external voltage applied, oscillation conveyor moves. If external voltage not applied, oscillation conveyor at standstill. If controller input with active jumper 19-20/22-23 and external voltage applied, oscillation conveyor at standstill. If external voltage not applied oscillation conveyor moves.)
Soft start / Soft stop t1	ca. 0,3 - 2 Sec. variable
	DIN EN 50 081 Part 1 Residential, commercial, trade and light industry, industry. DIN EN 50 082 Part 2 Industry VDE 0160
Standards complied with	

5.3 Connection possibilities



Jumpers may only be inserted for the respective application, otherwise this may lead to a malfunction of or damage to the p.c.b.

5.4 Setting instructions

Quick setting:

- Bring the external control potentiometer P1 (connected at terminals 13, 14, 15) to working position by turning.
- Bring the trimming potentiometer Umin to the middle position by turning.
- Bring the trimming potentiometer Umax to the zero stop by turning to the left. Then turn to the right until the working speed has been reached.

Range setting:

- Bring the external control potentiometer P1 (connected at terminals 13, 14, 15) to the end position by turning to the right.
- Bring the trimming potentiometer Umin to the zero position by turning to the left.
- Bring the trimming potentiometer Umax to the end position by turning to the right. Now turn to the left until the max. required voltage is reached (e.g. 200 V AC).
- Bring the control potentiometer P1 to the zero position by turning to the left.
- Now set the trimming potentiometer Umin to the max. required lower voltage range (e.g. 65V AC) by turning to the right
- As the two trimming potentiometers influence each other reciprocally, further readjustment of the two potentiometers is necessary.

5.5 Starting

1. Before connecting the IRG 1-N controller measure the working voltage and frequency of the oscillation conveyor you want to operate with the controller and compare the values with the controller's technical data. The output current of 6A should not be exceeded.
2. Set the slide switch on the board in accordance with the working frequency of the oscillation conveyor:

Full-wave operations 50/60 Hz (slide switch left)
Half-wave operations 25/30 Hz (slide switch right)
3. Check the jumpers on the board for the type of switching and set.
4. Connect the vibration conveyor with the earthed connector.
5. Set the setpoint potentiometer to zero.
6. Switch the controller on.
7. Use the Umin and Umax potentiometers to set the required control range. (See Setting instructions, page 7.)

6. Operating instructions

1. Before switching on, check that the controller is correctly connected to the oscillation conveyor.
2. Switch the controller on with the mains switch.
3. If required, set the setpoint potentiometer until the vibrations conveyor reaches the required output.

7. Repair

Replacing the fuse

1. Always pull the plug out before opening the controller.
2. Unscrew the housing cover screws.
3. Replace the defective fuse with an 8 A FF fuse.
4. Close the housing again.

8. Troubleshooting

Appliance not working

- Check the mains voltage, check the fuses and replace if necessary.
- Is the controller input set correctly, are the jumpers correct?

Conveyor not working

- Check whether the right oscillation frequency has been set, where necessary alter the setting.
- Check the mains frequency (50/60 Hz). The oscillation frequency and the mains voltage must conform to one another.
- Umax trimmer setting too low, set Umax.

Conveyor vibrates too much, magnet knocking (noises)

- Incorrect oscillation frequency setting. CAUTION! Magnet may have been destroyed by overheating, or mechanically damaged by knocking against something.
- Umax trimmer setting too high, reset Umax if necessary.

Magnet heats up

- Incorrect mains voltage for magnet, check.
- Incorrect oscillation frequency set, reset if necessary.

Control input not working

- Polarity reversal of control voltage, check
- Correct jumper for control input, check

9. Declaration of conformity

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hereby declares in its sole responsibility that the product

control appliance for oscillation conveyor systems

with the type designation

IRG 1-N (incl. derivatives)

to which this Declaration refers conforms to the following standards :

Special basic standard for emitted interference :
Residential areas,
business and trade areas and light industry

DIN EN 50 081 Part 1

Product standard for high frequency interference :
Limit-value class B

EN 55 011 for ISM appliances

Special basic standard for interference immunity :
Industrial areas

DIN EN 50 082 Part 2

Product standard for interference immunity :

**EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5**


Inductive loads of the measuring structure : 25mA und 4A (Hahn magnets WS 9,10,11)

The above company has the following technical documentation available for inspection :

- statutory operating instructions
- circuit diagrams, manufacturing instructions, test record
- description of the measures for guaranteeing conformity

Issued on : 14/10/2003

Name of authorized person:


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