

Operating instructions



IP20 protected panel-mounted units

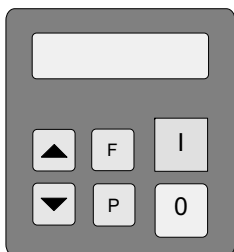
**Features**

Feeder operating frequency is adjustable and independent of mains frequency.  
Constant feed rate ensured by internal compensation, irrespective of mains fluctuations.  
Integrated track control via backlog sensor.  
24 V DC output for operating an air valve (IP 54 version), and amplitude control (sensor required).  
Independent resonant frequency search possible for feeder.  
Enable input (start / stop), status relay (output active / inactive).  
Stand-alone housings (IP 54) or panel-mounted units (IP 20).

**Technical data:**

|                              |                                      |
|------------------------------|--------------------------------------|
| Supply voltage               | 110 / 240 V, +/- 10%, 50/60 Hz       |
| Output                       | 0...100 / 0... 205 V, 16A            |
| Output frequency             | 5...300 Hz, (preset at 35... 140 Hz) |
| Enable input                 | Contacts or 24 V, DC                 |
| Track sensor                 | 24 V, PNP (100 mA)                   |
| Solenoid air valve output    | 24 V, 150 mA                         |
| Status output relay (ON/OFF) | Changeover contact (250 V, 1 A)      |
| Operating temperature        | 0...+45 °C                           |
| Storage temperature          | -10...+80 °C                         |
| Recommended fuse             | 16 A slow-blowing, Type 'D' MCB      |

Display and controls



- Increase value
- Decrease value
- Return
- Programming mode or Enter

Instructions:

Menus are used for changing settings. The different parameters are selected by entering a code.

All adjustments are made by first pressing the P key, followed by selecting the menu code, using the cursor keys.

**Settings**

Pressing the cursor key for a short time causes one digit increase/decrease, holding down for a longer time gives changes in ten-digit steps.  
Changed settings are saved when exiting the menu or automatically if a key is not pressed for 60 seconds.

**Operating displays**

- Enable OFF
- Track full
- Setpoint in %
- Timer running
- Stop using "0" key

## Safety instructions

This description contains the necessary information for the correct application of the product described below. It is intended for use by technically qualified personnel. Qualified personnel are persons who, because of their training, experience and position, as well as their knowledge of appropriate standards, regulations, health and safety requirements and working conditions, are authorised to be responsible for the safety of the equipment, at all times, whilst carrying out their normal duties and are therefore aware of, and can report possible hazards (definition of qualified employees according to IEC 364).



### WARNING!

#### Hazardous voltage!

Failure to observe can kill, cause serious injury or damage.

Isolate from mains before installation or dismantling work, as well as for fuse changes or post installation modifications.

Observe the prescribed accident prevention and safety rules for the specific application.

Before putting into operation, check if the rated voltage for the unit conforms with the local supply voltage.

Emergency stop devices must be provided for all applications. Operation of the emergency stop must inhibit any further uncontrolled operation.

Electrical connections must be covered.

Earth connections must be checked for correct function, after installation.



### Declaration of conformity








We declare that these products conform with the following standards and directives:  
EN 61000-6-4 and EN 61000-6-2 in accordance with directive 89/336/EEC.





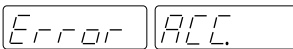
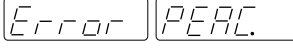
REO ELEKTRONIK AG, D-42657 Solingen

### Specified use

The units described herein are electrical controllers for installation in industrial plants. They are designed for power adjustment on vibratory feed equipment.

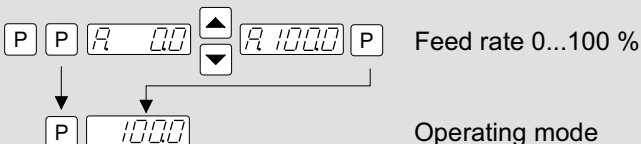
## Installation

|  |  |
|--|--|
|  <b>Check!</b>              | Do supply voltage, operating voltage of the conveyor and controller input voltage match ?<br>Is the controller adequately rated for the rated power of the feeder ?<br>What is the vibrating frequency of the feeder ?   |
|  <b>Fuses</b>              | During switch-on, internal capacitors cause a high inrush current. Especially if several controllers are switched on simultaneously, the external fuse can blow or the circuit breaker can trip. Therefore, we recommend fitting slow-acting fuses or circuit breakers, e.g. with type 'D' characteristic. |
| <b>Connect the unit in accordance with the wiring instructions and ensure that earthing is correct !</b>     |  |
|  <b>Attention!</b>        | New units are factory set (see table with settings).<br>For units with unknown settings, first recall the factory settings using Menu C 210 'FAC'.   |
|  <b>External setpoint</b> | If an external setpoint source is used, select "E.S.P." = I in Menu C003. If a potentiometer is used, select also 'Pot.' = I.<br>To set the minimum vibration level, select E.S.P. = 0, adjust the vibration level with the cursor keys and then set E.S.P. = I.   |
|  <b>Settings</b>          | The specific settings for a system can be saved by selecting 'US.PA.' in Menu C143 (recall settings via Menu C 210 'US.PA').<br>Menu access can be hidden by selecting 'Hd.C.' = I in Menu C117.   |

| Settings                          | Range          | Code settings | Factory code | Menu code | Error messages   |
|-----------------------------------|----------------|---------------|--------------|-----------|--|
| Amplitude (feed rate)             | 0... 100 %     | A.            | 0 %          | 000, 002  |  Overload (output current too high).<br>Possible cause: Feeder too large, frequency too low for installed coils, air gap too large. |
| Maximum output voltage            | 5...100 %      | P             | 90 %.        | 096, 008  |  |
| Vibrating frequency               | 35...140 Hz    | F.            | 100 Hz       | 096, 008  |  Short-circuited output<br>Possible cause: Incorrect wiring, possibly a defective coil.   |
| Soft start ramp up                | 0... 60 sec.   | /.            | 0.1 sec.     | 096       |  |
| Soft stop ramp down               | 0... 60 sec.   | \.            | 0.1 sec.     | 096       |  Input voltage too high<br>Cause: Mains voltage too high or induced voltage from coil   |
| External setpoint                 | 0 / 1          | E.S.P.        | 0            | 003       |  |
| Potentiometer setpoint            | 0 / 1          | POT.          | 0            | 003       |  Sensor timeout has elapsed (material sensor)   |
| Setpoint 0(4)... 20 mA            | 0 / 1          | 0             | 4.20         | 003       |  |
| Coarse / Fine control             | 0 / 1          | 2.SP.         | 0            | 003       |  Sensor fault (only in regulation mode)<br>Accelerometer missing or faulty  |
| Invert enable                     | 0 / 1          | -En.          | 0            | 003       |  |
| Switch on time delay              | 0... 60 sec.   | l.            | 1.0 sec.     | 007, 167  |  Current spike limit<br>Frequency set too low for installed coil or frequency altered too rapidly during setting up                 |
| Switch off time delay             | 0... 60 sec.   | o.            | 1.0 sec.     | 007, 167  |  |
| Invert sensor                     | PNP/PNP invers | -SE.          | PNP          | 007, 167  | Error messages must be cleared in Menu no. C 009 by means of 'Cl.err.'   |
| Activate sensor timeout.....      | 0 / 1          | E.En.         | 0            | 015       |  |
| Sensor timeout delay              | 1... 240 sec.  | E.            | 180 sec.     | 015       | Timeout can be cleared with the 'I' key or by means of enable  |
| Switch off time air valve         | 0...60 sec.    | Ai.           | 4 sec.       | 015       |  |
| Activate control mode             | 0 / 1          | ACC.          | 0            | 008       | Frequently appearing Errors, which are not described in this chapter, should be reported to the manufacturer.  |
| P characteristic                  | 0...100        | P.A.          | 40           | 008       |  |
| I characteristic                  | 0...100        | I.A.          | 100          | 008       |  |
| Automatic frequency control ON    | 0 / 1          | A.F.C.        | 0            | 008       |  |
| Automatic frequency search ON     | 0 / 1          | A.F.S.        |              | 008       |  |
| Display output current            |                | i.            |              | 040       |  |
| Display output frequency          |                | F.            |              | 040       |  |
| Pulse feed                        | 0 / 1          | HOP.          | 0            | 064       |  |
| On time delay (only if HOP = I)   | 0..60 sec.     | H.            | 1.0 sec.     | 064       |  |
| Off time delay (only if HOP = I)  | 0..60 sec.     | h.            | 1.0 sec.     | 064       |  |
| Invert Hopper sensor (not active) | 0 / 1          | -Ho.          | 0            | 064       |  |
| Save user settings                |                | PUSH.         |              | 143       |  |
| Restore factory settings          |                | FAC.          |              | 210       |  |
| Restore user settings             |                | US.PA.        |              | 210       |  |
| Hide programming menus            | 0 / 1          | Hd.C.         | 0            | 117       |  |
| Hide setpoint adjustment          | 0 / 1          | di.S.         | 0            | 137       |  |
| Display software version          |                |               |              | 001       |  |

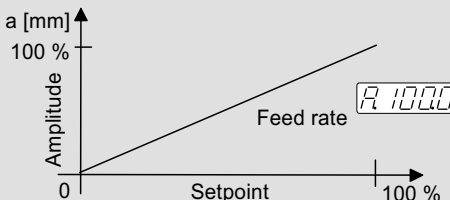
No code number is required to change the feed rate: pressing the P key twice will call the setpoint display.

### Code 000 Feed rate set point



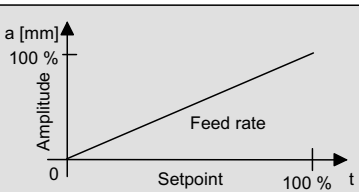
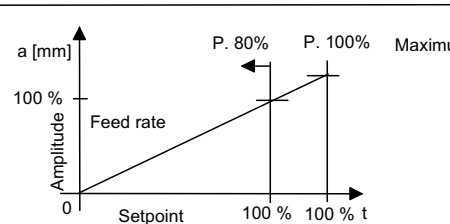
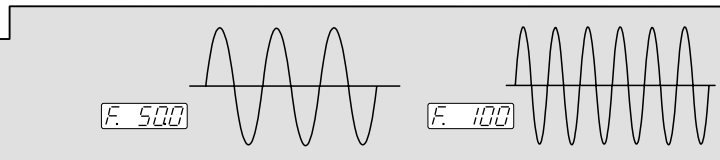
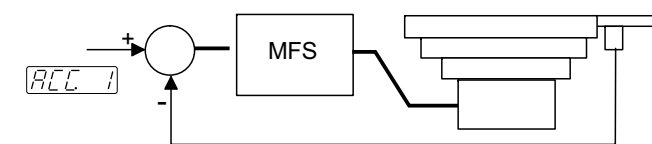
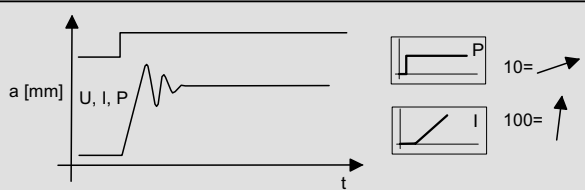
Feed rate 0...100 %

Operating mode



### Feed rate setting

|   |   |   |
|---|---|---|
| <h3>Code 003 Function settings</h3>   | <p>Display: </p> <p>0...+10 V: </p> <p>0(4)...20mA: </p> <p>Potentiometer: </p> | <p>Internal using keys in touch panel<br/>External setpoint<br/>0...+10 V,<br/>0(4)...20 mA<br/>Potentiometer 10 K<math>\Omega</math></p> |
| <p>0 = Setpoint using display<br/>I = external setpoint 0...+10 V ON</p> <p>0 = external setpoint 0...+10 V<br/>I = external setpoint 4...20 mA</p> <p>0 = 0...10 V/ 0(4)...20 mA<br/>I = Potentiometer</p> | <p>Track control / backlog</p>  | <p>Track control or Coarse / fine control with two feed rates</p>   |
| <p>0 = Track control via backlog sensor<br/>I = Coarse/fine control with second setpoint</p> <p>0 = Enable<br/>I = Invert enable</p>  | <p>Coarse / fine control</p>  | <p>+24 V signal or closed contact will enable the output.<br/>+24 V signal or closed contact will inhibit the output.</p>                 |
| <p>Operating mode</p>   |   |   |
| <h3>Code 096 / 020 Feeder</h3>  | <p>Maximum</p> <p>P. 80% P. 100%</p>  | <p>Limiting the maximum feed rate</p> <p>The set point will still display 0... 100 %, even though it is limited internally.</p>           |
| <p>Feed rate 0...100 %</p> <p>Maximum limit 100...5 %</p>   |   | <p>The frequency setting depends on the feeder type.<br/><b>Important!</b><br/>The wrong frequency setting can damage the coil.</p>       |
| <p>Vibrating frequency [Hz]</p> <p>Soft start time 0...5 sec.</p> <p>Soft stop time 0...5 sec.</p>  | <p>Feed rate</p>  | <p>Time ramp for starting and stopping the feeder.</p>  |
| <p>Operating mode</p>   |   |   |

| Code 008 Control mode   |  |  |   |  |
|---|--|--|---|--|
| P <input type="text" value="C. 000"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="C. 008"/> P<br>P <input type="text" value="R. 00"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="R. 100"/> P<br>P <input type="text" value="P. 1000"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="P. 900"/> P<br>P <input type="text" value="F. 500"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="F. 480"/> P<br>P <input type="text" value="ACC 0"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="ACC 1"/> P<br>P <input type="text" value="PR 10"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="PR 10"/> P<br>P <input type="text" value="IR 10"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="IR 10"/> P<br>P <input type="text" value="RFC 0"/> <input type="button" value="▲"/> <input type="button" value="▼"/> <input type="text" value="P"/> P<br>P <input type="text" value="RFS"/> <input type="button" value="▲"/><br>P <input type="text" value="1000"/> P Operating mode | Feed rate 0...100 %<br>Maximum limit 100...5 %<br>Vibrating frequency [Hz]<br>Switch to control mode<br>0 = Regulation (without sensor)<br>1 = Control (with sensor)<br>Proportional characteristic (gain)<br>Integral characteristic (damping)<br>Automatic frequency control<br>0 = Off 1 = On<br>Start frequency search |      | Limiting of output voltage or feed rate, e.g. to prevent hammering. The displayed setpoint range remains at 0...100%.<br>Frequency setting depends upon the feeder type.<br>Activates the control mode to ensure a constant vibration amplitude, even with large load variations. The control mode requires an acceleration sensor.<br>Influences the regulation behaviour: Lineout time and vibration behaviour (pumping) of feeder.<br>Automatic frequency change in case of resonance.<br>Start automatic frequency search | Maximum feed rate<br>Vibrating frequency<br>Control mode<br>Control parameters |
|   | P <input type="text" value="RFC 0"/> f = fixed      P <input type="text" value="RFC 1"/> f = f resonant<br>▲ key will start automatic frequency search   |  |   |  |

Amplitude-controlled operation requires an acceleration sensor mounted to the feeder, e.g. SW11. Ensure that sensor is mounted rigidly (no self-oscillation), and that feeder is standing firmly.

### Manual adjustment of vibrating frequency

Frequency adjustments must be made with a low setpoint (e.g. 30 %), because at the resonant frequency, large oscillations (coil hammer) can occur with relatively low output voltages. To determine resonant frequency, an analog true-rms current meter (e.g. moving-iron instrument) must be connected in the output circuit. Resonant frequency is found when a minimum output current produces maximum vibration amplitude.

### Automatic frequency search (only with controlled operation)

\* Adjust setpoint to zero.

\* Activate control mode (Menu C 008, set Parameter ACC = 1).

\* After starting the frequency search (Menu C 008, select Parameter 'A.F.S.', and start with the arrow key), the optimum vibration frequency of the feeder will be determined.

When the resonant frequency has been found, the controller switches back to normal operation.

### Note:

If coil hammer occurs during the frequency search, Parameter 'P.' in Menu C008 must be reduced.

Code C 007 / C 167 Track control / Backlog sensor

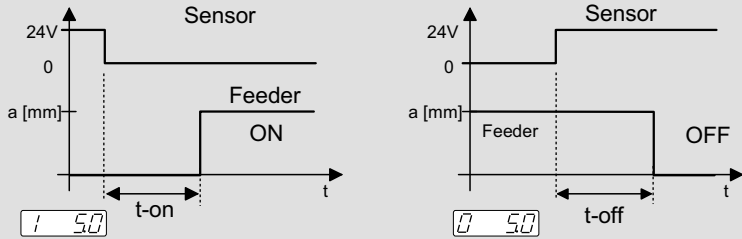
P C. 000 C. 167 P

P 1. 00 1. 50 P Switch on time delay  
0...60 sec.

P 0. 00 0. 50 P Switch off time delay  
0...60 sec.

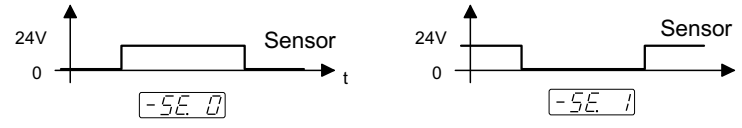
P -SE. 0 -SE. 1 P Invert sensor function  
I = inverted

P 1000 Operating mode



Adjustment of the ON and OFF delays

Time delays



Invert sensor input

Sensor

Code 015 Special functions

P C. 000 C. 015 P

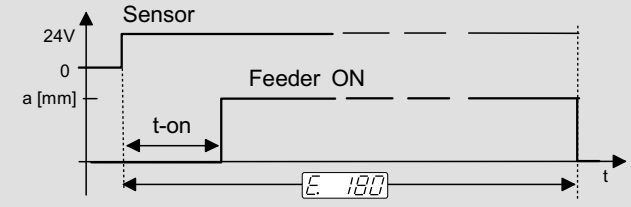
P EE.n. 0 EE.n. 1 P 0 = Feeder doesn't switch off during timeout  
1 = Feeder switches off during timeout

E. 40 E. 1800 P E. = Sensor timeout [sec]

P Ri. 0 Ri. 10 P Run-on-time for air valve output

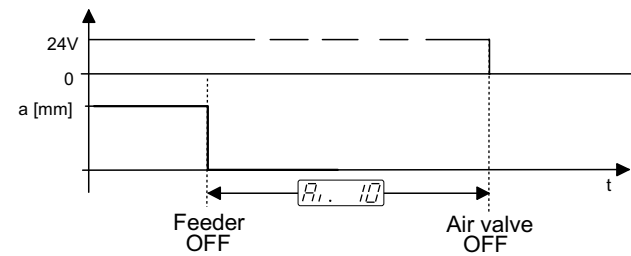
P 1000 Operating mode

EE.n. 0 inactive  
EE.n. 1 active



Sensor control active. If no components are detected during the timeout period, the feeder switches off.

Sensor control



Setting the run-on-time for the air valve output.

Air valve output

Code 064 Pulse feed

P C. 000 C. 064 P

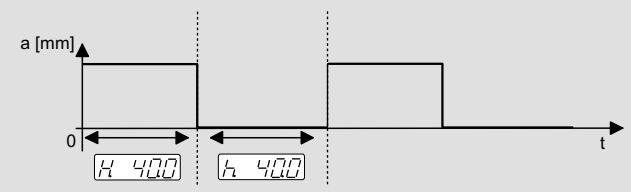
P HOP. 0 HOP. 1 P 0 = Pulse feed Off  
1 = Pulse feed On

P H. 10 H. 500 P Feeder on time

P h. 10 h. 315 P Feeder off time

P -HQ. 0 -HQ. 1 P Sensor invert (not active)

P 1000 Operating mode



On and Off time for Hopper pulse feed

Pulse feed

Code 117 Inhibit access

P C.000 [▲] [▼] C.117 P

P HdC.0 [▲] [▼] HdC.1 P

I = Hidden menus

HdC.1

Parameter menus cannot be accessed, except for the feed rate setpoint

HdC.0

Parameter menus can be accessed

Hide programming menus.

P 1000

Operating mode

Code 137 Inhibit setpoint access

P C.000 [▲] [▼] C.137 P

P d1.5.0 [▲] [▼] d1.5.1 P

0 = Setpoint access ON  
1 = Setpoint access OFF

d1.5.0

Setpoint can be adjusted

d1.5.1

Setpoint cannot be adjusted

Setpoint access

P 1000

Operating mode

Code 143 Save parameter settings

P C.000 [▲] [▼] C.143 P

US1.0 [▲] [▼] US1.3 P

Select parameters 0 to 3

Saves up to 4 different parameters (no. 0 - 3).

Save parameter settings

P PUSH [▲] [▼] SAFE P

Save parameter settings

▲ All previously set parameters are saved.

P 1000

Operating mode

Code 210 Restore parameters

P C.000 [▲] [▼] C.210 P

P FRC [▲] [▼] SAFE P

Restore factory settings

▲ Restore factory settings.

Restore factory settings

US1.0 [▲] [▼] US1.3 P

Select parameters 0 to 3

Saves up to 4 different parameters (no. 0 - 3).

Restore parameter settings previously stored under C143

P USPR [▲] [▼] SAFE P

Restore user settings

▲ Restore settings saved under C143.

P 1000

Operating mode

Service

**Code 127 Enable service menu**

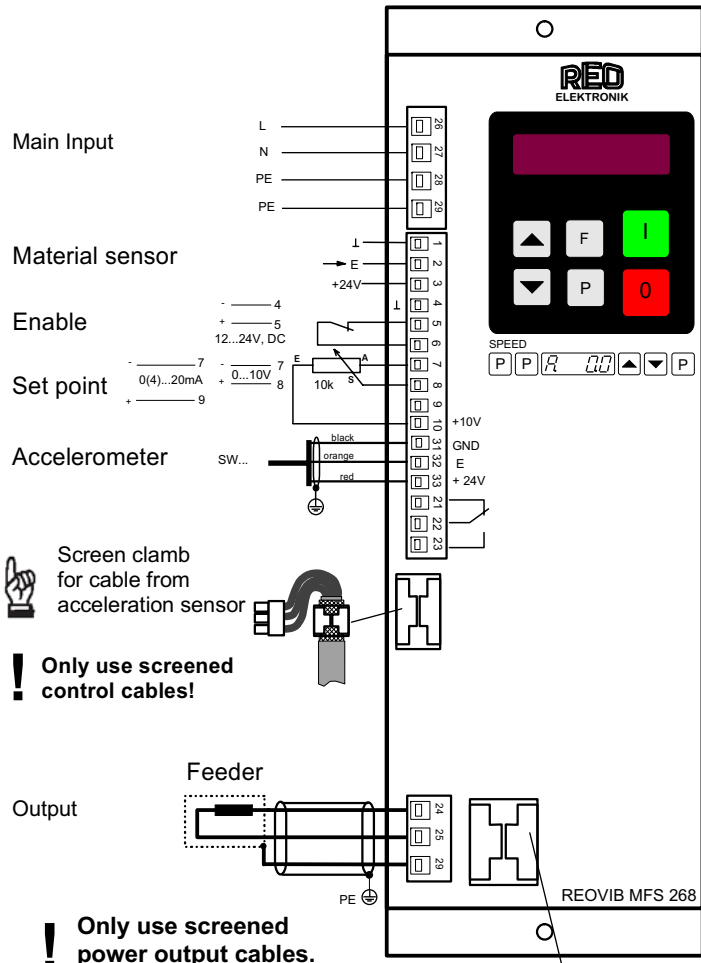
|   |                 |   |                          |                |
|---|-----------------|---|--------------------------|----------------|
| <p>Navigation: P [C. 000] [▲] [C. 127] [▼] [P]</p> <p>Navigation: P [EnS. 0] [▲] [EnS. 1] [▼] [P]</p> <p>Navigation: P [1000] [P]</p> <p>0 = Service mode OFF<br/>1 = Service mode ON</p> <p>Service mode</p> | <p>[EnS. 1]</p> | <p>Enables access to the adjustment of I<sub>max</sub>, F<sub>min</sub> / F<sub>max</sub>, and Output voltage limiting.</p> | <p>Extended settings</p> | <p>Service</p> |
|---|-----------------|---|--------------------------|----------------|

**Code 040 Service**

|  |  |   |   |  |
|--|--|---|---|--|
| <p>Navigation: P [C. 000] [▲] [C. 040] [▼] [P]</p> <p>Navigation: P [I. 385] [P]</p> <p>Navigation: P [I. 1000] [▲] [I. 800] [▼] [P]</p> <p>Navigation: P [F.L. 35] [▲] [F.L. 30] [▼] [P]</p> <p>Navigation: P [F.H. 120] [▲] [F.H. 80] [▼] [P]</p> <p>Navigation: P [F. 505] [P]</p> <p>Navigation: P [PLI. 0] [▲] [PLI. 1] [▼] [P]</p> <p>Navigation: P [1000] [P]</p> <p>Actual value in % (display only) of the nominal coil current</p> <p>Current limit in % of I<sub>max</sub>.</p> <p>Lower frequency limit</p> <p>Upper frequency limit</p> <p>Actual frequency value (display only)</p> <p>Output voltage limiting 100 V<br/>0 = Off, 1 = On</p> <p>Operating mode</p> | <p>[I. 385]</p> <p>Display shows the actual coil current in % of the nominal current (I<sub>nom</sub>).</p> <p>Conversion</p> $\frac{\text{Display} \times I_{nom}}{100} = \frac{38,5 \times 6}{100} = 2,31 \text{ A}$ <p>Adjustment of the current limit in % of the nominal current (I<sub>nom</sub>).</p> <p>Conversion: e.g. 4,8 A coil:</p> $\frac{I\text{-limit} \times 100}{I_{nom}} = \frac{4,8 \times 100}{6} = 80 \%$ <p>Adjustable frequency range<br/>Parameters 'F.L.' and 'F.H.' in Menu C 040.</p> <p>Effective frequency range<br/>Parameter 'F' in Menus C 008, C 096, and C 020.</p> <p>Display shows the actual vibration frequency.</p> <p>[PLI. 1] When operated with 230 / 240 V mains supply, the output voltage is limited to 100 V.</p> | <p>Monitoring the output current.</p> <p>Adjusting output current limit depending on coil.</p> <p>Setting the limits of the frequency adjustment range accessible for the user.<br/>A narrow adjustment range is preferable for the automatic frequency search function.</p> <p>Monitoring the vibration frequency.</p> | <p>Current limit</p> <p>Frequency range</p> |  |
|--|--|---|---|--|

### Connections REOVIB MFS 268

### Dimensions REOVIB MFS 268



Main Input

Material sensor

Enable

Set point

Accelerometer

Screen clamp for cable from acceleration sensor

**!** Only use screened control cables!

Feeder

Output

**!** Only use screened power output cables.

