Components

- Compact Control Units
- Frequency Control Units
- Module Technology
RNA Components for Feed Technology

RNA Services
Almost 2000 complete feed systems per annum are delivered by RNA. Because of our vast experience in feed technology, all the components are extensively tested under practical conditions and are extremely reliable and robust. New knowledge is constantly being acquired and utilised in the further development of all the components to achieve product improvements.

We can supply you with a complete range of efficient drives and control systems, together with accessories of recognised high quality and functionality, even for tasks with special performance requirements.

Best possible service, immediate delivery and high availability, as well as product versions for the pharmaceutical and food industries, with licences based on UL and CSA standards, complete our product range.

All our products are thoroughly tested before delivery to guarantee their fault free use.

Last but not least our employees stand behind all our products. The yardstick for all our work is the satisfaction of our customers. We know that continuous, business success can only be achieved through the best quality by meeting all the requirements imposed by a particular task.

We look forward to talking to you!
RNA Control Boxes

RNA supplies optimum control concepts. These range from low cost units to the self-calibrating high-tech unit with microprocessor control. Intelligent processing of peripheral sensors, tailored to the requirements of feed technology allow communication with hierarchy control systems. Moreover, the control units are available under a CE and CSA/UL licence.

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We reserve the right to carry out technical modifications. All dimensions are shown in millimetres.

Further product catalogues from the RNA component supply range

Colouring of the product catalogues:
- Step Feeders
- Bunkers
- Vibratory Feeders
- Conveyors
- Linear Feeders
The controller best suited for any application can be determined on the basis of the selection matrix.

<table>
<thead>
<tr>
<th>Vibratory feeder</th>
<th>ESG 1000</th>
<th>ESG 2000</th>
<th>ESK 2000</th>
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<th>ESG 1000</th>
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<th>ESK 2000</th>
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<th>Linear feeder</th>
<th>ESG 1000</th>
<th>ESG 2000</th>
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<th>Hopper</th>
<th>ESG 1000</th>
<th>ESG 2000</th>
<th>ESK 2000</th>
<th>ESK 2001</th>
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<td>Series BV</td>
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<td>Series BVL</td>
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</table>

- Actuation of vibratory and linear feeder
- Actuation of vibratory feeder and vibratory hopper
- Filling level monitor
- LC-N 24V
- PNP switching sensors
- Indicator lamp

X in conjunction with sensor
<table>
<thead>
<tr>
<th>ESR 2000</th>
<th>ESR 25</th>
<th>ESR 28</th>
<th>ESM 906</th>
<th>ESM 910</th>
<th>EGM 92</th>
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<tr>
<td>110 V</td>
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Sensor amplifier with time delay

in conjunction with sensors

ESC 06 (warning lamp)
Compact Controllers
Series ESG 1000

Controller for the operation of a vibratory or linear feeder

Application

Equipment

- A power output for vibratory or linear feeder
- Internal switching to 230V or 110V mains voltage
- Output power adjustable by potentiometer mounted on front panel
- Manual adjustment of the transient and decay responses by changing the time constants
- External actuation 24 VDC/potential-free contact
- Plug-in connection for RNA vibratory and linear feeders
- Two-pole main switch
- CE, EMV and CSA/UL tested

Setting Parameters

- Adjustable soft start time of drive
- Output voltage U min / Umax
- Mains voltage range 230 / 110 volts
Compact Controllers
Series ESG 2000

Application

Controller for the operation of a vibratory or linear feeder

Equipment

- A power output for vibratory or linear feeder
- Automatic switching to 230V or 110V mains voltage
- Membrane keyboard for setting and varying the working values in the setting menus.
- Simple menu guide for varying the setting parameters
- Manual adjustment of the transient and decay responses by changing the time constants
- External actuation 24 VDC
- Two optocouplers for status messages and further links
- Messages from the controller:
  - Operational = Controller switched on
  - Active = Controller running
- Possibility of connecting external devices, e.g. solenoid valve
- Plug-in connection for RNA vibratory and linear feeder
- Two-pole mains switch
- CE, EMV and CSA/UL tested

Setting Parameters

- Actuation of vibratory or linear feeder
  - Vibration amplitude
  - External control
  - Signal direction of external control
  - Soft start time and soft stop time
- Storage of programmed settings
- Blocking of settings against unauthorised entries
- Status display (control of vibration frequency)
- Resetting to RNA works setting
Compact controllers
Series ESK 2000

Application
Controller for the operation of a vibratory or linear feeder and connection of two sensors for monitoring and controlling the material flow

Equipment
- A power output for vibratory or linear feeder
- Automatic switching to 230V or 110V mains voltage
- Membrane keyboard for setting and varying the working values in the setting menus.
- Simple menu guide for varying the setting parameters
- Manual adjustment of the transient and decay responses by changing the time constants
- External actuation 24 VDC
- Two relay outputs and two optocouplers for status messages and further links
- Messages from the controller:
  - Operational = Controller switched on
  - Active = Controller running
- Possibility of connecting external devices, e.g. solenoid valve
- Connection of a maximum of 2 sensors whose function and switching behaviour are programmable. (Supply voltage 24V DC 10 mA).
- Plug-in connection for RNA vibratory and linear feeder, sensors and communication
- Two-pole mains switch
- CE, EMV and CSA/UL tested

Setting Parameters
- Actuation of vibratory or linear feeder
  - Vibration amplitude
  - External control
  - Signal direction of external control
  - Soft start time and soft stop time
- Storage of programmed settings
- Setting of sensor input 1 and sensor input 2
  - Input, reversing signal on and off
  - Time until switching and off time
- Selection of sensor links (up to 7 possibilities)
- Setting the cycle monitors (monitoring of sensors 1 and/or 2)
- Blocking of settings against unauthorised entries
- Status display (control of vibration frequency)
- Permanently programmed application examples
- Performance target with external voltage
- Resetting to RNA works setting
Application
Controller for the operation of two vibratory and/or linear feeders and connection of two sensors for monitoring and controlling the material flow

Equipment
- Two power outputs
- Automatic switching to 230V or 110V mains voltage
- Membrane keyboard for setting and varying the working values in the setting menus.
- Simple menu guide for varying the setting parameters
- Manual adjustment of the transient and decay responses by changing the time constants
- External actuation 24 VDC
- Two relay outputs and two optocouplers for status messages and further links
- Messages from the controller:
  - Operational = Controller switched on
  - Active = Controller running
- Possibility of connecting external devices, e.g. solenoid valve
- Connection of a maximum of 2 sensors whose function and switching behaviour are programmable. (Supply voltage 24V DC 10 mA).
- Plug-in connection for RNA vibratory and linear feeder, sensors and communication
- Two-pole mains switch
- CE, EMV and CSA/UL tested

Setting Parameters
- Actuation of vibratory or linear feeder may be selected separately
  - Vibration amplitude
  - External control
  - Signal direction of external control
  - Soft start time and soft stop time
- Storage of programmed settings
- Setting of sensor input 1 and sensor input 2
  - Invert input of signal direction
  - Time until switching and off time
- Selecting the sensor linkages (up to 7 possibilities)
- Selecting the cycle monitors (monitoring of sensors 1 and/or 2)
- Blocking of settings against unauthorised entries
- Status display (control of vibration frequency)
- Permanently programmed application examples
- Performance target with external voltage
- Resetting to RNA works setting
Frequency Controllers
Series ESR 2000

Application
Controller for the operation of a vibratory or linear feeder and connection of two sensors for monitoring and controlling the material flow and manually adjustable vibration frequency. (for example using interchangeable bowls with various weights)

Equipment
- A power output for vibratory or linear feeder
- Oscillation frequency is adjustable, i.e. fine mechanical tunings (fitting springs) are not necessary
- Automatic switching to 230V or 110V mains voltage
- Membrane keyboard for setting and varying the working values in the setting menus.
- Simple menu guide for varying the setting parameters
- Manual adjustment of the transient and decay responses by changing the time constants
- External actuation 24 VDC
- Two relay outputs and two optocouplers for status messages and further links
- Messages from the controller:
  - Operational = Controller switched on
  - Active = Controller running
- Possibility of connecting external devices, e.g. solenoid valve
- Connection of a maximum of 2 sensors whose function and switching behaviour are programmable. (Supply voltage 24V DC 10 mA).
- Plug-in connection for RNA vibratory and linear feeder, sensors and communication
- Self-protective (max. current monitoring)
- Two-pole mains switch
- CE and EMV tested

Setting Parameters
- Actuation of vibratory or linear feeder
  - Vibration amplitude
  - External control
  - Signal direction of external control
  - Soft start time and soft stop time
  - Frequency manually adjustable
- Storage of programmed settings (5 memory places)
- Setting of sensor input 1 and sensor input 2
  - Invert input of signal direction
  - Time until switching and off time
- Selection of the sensor links (up to 7 possibilities)
- Setting the cycle monitors (monitoring of sensors 1 and/or 2)
- Blocking of settings against unauthorised entries
- Status display (control of vibration frequency)
- Permanently programmed application examples
- Performance target with external voltage
- Resetting to RNA works setting
Application

Controller for the operation of a vibratory or linear feeder and connection of one sensor for monitoring and controlling the material flow and automatic adjustment of the exciter frequency (vibration frequency) of the vibratory drive and equalisation of the load-independent vibration response.

Equipment

- Automatic adjustment of the vibration frequency after calibration, i.e. fine mechanical tunings (fitting springs) are not necessary
- Switching to 230V or 110V mains voltage1)
- Membrane keyboard for setting and varying the working values in the setting menus.
- Simple menu guide for varying the setting parameters
- Manual adjustment of the transient and decay responses by changing the time constants
- External actuation 24 VDC (in conjunction with ESC06 board) (not included in the scope of supply)
- Three optocouplers for status messages and further linkages (in conjunction with ESC06 board) (not included in the scope of supply)
- Messages from the controller:
  - Operational = Controller switched on
  - Active = Controller running
  - Alarm = Controller stopped
- Possibility of connecting external devices, e.g. solenoid valve (only in connection with ESC06 and EBX)
- Connection of a maximum of 1 sensor whose function is programmable. (Supply voltage 24V DC 10 mA).
- Plug-in connection for RNA vibratory bowl and linear feeder, sensors and communication
- Self-protecting (max. current monitoring)
- Two-pole main switch
- CE and EMV tested

Setting Parameters

- Automatic calibration (the controller “learns” the typical characteristics of the vibratory feeder)
- Actuation of vibratory or linear feeder
  - Vibration amplitude
  - External control
  - Signal direction of external control
  - Soft start time and soft stop time
- Storage of programmed settings
- Setting of sensor input 1
  - Input, reversing signal direction
- Status display (calibration and operation values)
- Resetting to RNA works setting

1) Note: When converting the mains voltage to 110V the output voltage of the controller remains 200V! For this reason vibratory and linear feeders must always be used in 200V.
**Modules**

**Series ESM 906 and 910**

- Controller for operating a vibratory or linear feeder
- A power output for vibratory or linear feeder
- Output power with potentiometer or analogue voltage 0 to 10V DC, adjustable
- External actuation, 24 VDC
- CE and EMV tested
- Status message for ready and active
- Output voltage $U_{\text{min}} / U_{\text{max}}$
- Mains voltage 230V or 110V
- Control by potential-free contact or 24 V DC

### Application

Controller for operating a vibratory or linear feeder

### Equipment

- A power output for vibratory or linear feeder
- Output power with potentiometer or analogue voltage 0 to 10V DC, adjustable
- External actuation, 24 VDC
- CE and EMV tested
- Status message for ready and active

### Setting Parameters

- Output voltage $U_{\text{min}} / U_{\text{max}}$
- Mains voltage 230V or 110V
- Control by potential-free contact or 24 V DC
Sensor Amplifier
Series EGM 92

**Application**

Sensor amplifier for a sensor with separately adjustable switching times for material flow or rather filling level in the vibratory feeder or hopper.

**Equipment**

- two potential-free replaceable contacts
- mains connection 230V / 50-60Hz
- signals: ready for operation, sensor signal, output signal

**Setting Parameters**

- two separately adjustable times
Plug Connections
Compact Controllers
Housing Technology

What >>
Connection
- Vibratory and/or linear feeder
- Sensor connection
1 sensor
2 sensors
- Communication
1 sensor
system (e.g. SPS)
- Communication
2 sensors
system (e.g. SPS)

<< With
Housing plug
7-pin plug
5-pin plug
Sensor adapter
Y-Socket
2x
+ 4-pin plug
7-pin plug

Compact controller
Housing technology Series ESR
ESR 2000
EXS 25/28
X51
X52
X53
X54
Y-Socket
With additional ESC06 board only

Compact controller
Housing technology Series ESK
ESK 2000
EXS 2001
X51
X52
X53
X54
Y-Socket

Compact controller
Housing technology Series ESG
ESG 2000
EXS 2000
EXS 1000
X51
X52
X53
X54
Y-Socket

Rhein-Nadel Automation GmbH • Control Boxes
### Type

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<tbody>
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<td>230 V AC, 50/60 Hz, +20 %/-15 %</td>
<td>230 V AC, 50/60 Hz, +20 %/-15 %</td>
<td>230 V AC, 50/60 Hz, +20 %/-15 %</td>
</tr>
<tr>
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<td>110 V AC, 50/60 Hz, +10 %/-10 %</td>
<td>110 V AC, 50/60 Hz, +10 %/-10 %</td>
<td>110 V AC, 50/60 Hz, +10 %/-10 %</td>
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<td><strong>Output voltage</strong></td>
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<td>0 ... 208 V eff / 230 V AC</td>
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<td>0 ... 98 V eff / 110 V AC</td>
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<tr>
<td></td>
<td>20 ... 105 V eff / 110 V AC</td>
<td>0 ... 98 V eff / 110 V AC</td>
<td>0 ... 98 V eff / 110 V AC</td>
<td>0 ... 98 V eff / 110 V AC</td>
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<td><strong>Operating mode</strong></td>
<td>Phase shift</td>
<td>Phase shift</td>
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<td><strong>Load current max. channel 1+2</strong></td>
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<td>–</td>
<td>–</td>
<td>10 Aeff / 4 Aeff</td>
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<td><strong>Load current max.</strong></td>
<td>6 Aeff</td>
<td>10 Aeff</td>
<td>10 Aeff</td>
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<td><strong>Load current min.</strong></td>
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<td><strong>Internal fuse</strong></td>
<td>Fine-wire fuse 5x20, 6,3 A träge</td>
<td>F 1 = 10 A</td>
<td>F 1 = 10 A</td>
<td>F 1 = 10 A / F 2 = 4 A</td>
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<tr>
<td><strong>Soft start/stop time</strong></td>
<td>soft start adjustable + switched off</td>
<td>0 ... 5 sec. may be selected separately</td>
<td>0 ... 5 sec. may be selected separately</td>
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<td><strong>Sensor inputs</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2</td>
</tr>
<tr>
<td><strong>Release input</strong></td>
<td>Contact or 24 V DC</td>
<td>24 V DC (10-24 V DC)</td>
<td>24 V DC (10-24 V DC)</td>
<td>24 V DC (10-24 V DC)</td>
</tr>
<tr>
<td><strong>Sensor supply</strong></td>
<td>–</td>
<td>–</td>
<td>24 V DC, max. 60 mA (Per sensor input)</td>
<td>24 V DC, max. 60 mA (Per sensor input)</td>
</tr>
<tr>
<td><strong>Sensor delay AN</strong></td>
<td>–</td>
<td>–</td>
<td>0 ... 60 sec.</td>
<td>0 ... 60 sec.</td>
</tr>
<tr>
<td><strong>Sensor delay AB</strong></td>
<td>–</td>
<td>–</td>
<td>0 ... 60 sec.</td>
<td>0 ... 60 sec.</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>–</td>
<td>–</td>
<td>2 Optocoupler</td>
<td>2 Optocoupler</td>
</tr>
<tr>
<td><strong>Status output (optocoupler)</strong></td>
<td>–</td>
<td>–</td>
<td>max. 30 V DC 10 mA</td>
<td>max. 30 V DC 10 mA</td>
</tr>
<tr>
<td><strong>Relay contacts</strong></td>
<td>–</td>
<td>–</td>
<td>max. 6 A 250 V AC</td>
<td>max. 6 A 250 V AC</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>0 ... 50 °C</td>
<td>0 ... 50 °C</td>
<td>0 ... 50 °C</td>
<td>0 ... 50 °C</td>
</tr>
<tr>
<td><strong>Protective system</strong></td>
<td>IP 54</td>
<td>IP 54</td>
<td>IP 54</td>
<td>IP 54</td>
</tr>
<tr>
<td><strong>Dimensions W x H x D</strong></td>
<td>80 x 190 x 140</td>
<td>192 x 180 x 132</td>
<td>192 x 180 x 132</td>
<td>192 x 180 x 132</td>
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</tbody>
</table>
## Technical Data

### Module Technology, Panel Mounting

<table>
<thead>
<tr>
<th></th>
<th>ESR 2000</th>
<th>ESR 25/5A*</th>
<th>ESR 28/8A</th>
<th>ESM 906</th>
<th>ESM 910</th>
<th>EGM 92</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V AC, 50/60 Hz, Upgradable to</td>
<td>230 V AC 50/60 Hz</td>
<td>230 V AC 50/60 Hz</td>
<td>230 V AC 50/60 Hz</td>
<td>230 V AC, 50/60 Hz</td>
<td>230 V AC, 50/60 Hz</td>
<td>230 V AC, 50/60 Hz</td>
</tr>
<tr>
<td>110 V AC 50/60 Hz</td>
<td>110 V AC 50/60 Hz</td>
<td>110 V AC 50/60 Hz</td>
<td>110 V AC, 50/60 Hz</td>
<td>110 V AC, 50/60 Hz</td>
<td>110 V AC, 50/60 Hz</td>
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</tr>
<tr>
<td>230 V AC, 50/60 Hz</td>
<td>230 V AC 50/60 Hz</td>
<td>230 V AC 50/60 Hz</td>
<td>230 V AC, 50/60 Hz</td>
<td>230 V AC, 50/60 Hz</td>
<td>230 V AC, 50/60 Hz</td>
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<tr>
<td>Frequency reversal PWM</td>
<td>Frequency reversal PWM</td>
<td>Frequency reversal PWM</td>
<td>Phase shift</td>
<td>Phase shift</td>
<td>–</td>
<td>–</td>
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<tr>
<td>6 Aeff</td>
<td>5.5 Aeff</td>
<td>8.5 Aeff</td>
<td>6 Aeff</td>
<td>10 Aeff</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>80 mA</td>
<td>60 mA</td>
<td>60 mA</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>F 1 = 10 A</td>
<td>Mains fuse: 5x20 mm, 4 A Delay action, 12 13 72</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>0 ... 10 V DC</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0 ... 10 V or Poti 10 / k Ω</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>24 V DC (10-24 V DC)</td>
<td>Can be supplemented with additional print</td>
<td>–</td>
<td>–</td>
<td>potential-free contact / 12 ... 24 V DC, Ri 10 k Ω</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>0 ... 60 sec.</td>
<td>Sensor signal delay: 0,000 up to 10 sec.</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0 ... 60 sec.</td>
<td>–</td>
</tr>
<tr>
<td>2 Relay / 2 Optocoupler</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2/0 PTO Coupler</td>
<td>–</td>
<td>Relay contact 2 x potential-free replaceable contact</td>
</tr>
<tr>
<td>max. 6 A 250 V AC</td>
<td>max. 6 A 250 V AC</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>max. 6 A 250 V AC</td>
</tr>
<tr>
<td>0 ... 50 °C</td>
<td>0 ... 40 °C</td>
<td>0 ... 40 °C</td>
<td>0 ... 45 °C</td>
<td>0 ... 45 °C</td>
<td>0 ... 50 °C</td>
<td>–</td>
</tr>
<tr>
<td>IP 54</td>
<td>IP 54</td>
<td>IP 54</td>
<td>IP 20</td>
<td>IP 20</td>
<td>IP 30</td>
<td>–</td>
</tr>
<tr>
<td>192 x 180 x 132</td>
<td>140 x 220 x 160</td>
<td>140 x 220 x 160</td>
<td>104 x 177 x 112</td>
<td>150 x 74 x 109</td>
<td>55 x 75 x 110</td>
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</tbody>
</table>

* Also available with reduced output currents 0.6 A and 1.8 A, for adaptation to small vibratory drives.