SKIPALA
průmyslová automatizace

USER MANUAL FOR THE CONTROLLER DIGR-1202/E

Version: v 1.5
July 2025

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1. Technical data

Rated supply voltage U_{nap}	110–230 VAC, 50/60 Hz
Maximum load power	1,400 W for U_{nap} of 230 VAC
	700 W for U_{nap} of 110 VAC
Intrinsic power dissipation	10 W
Output voltage	5–100% U_{nap} with 0.5% steps
Output frequency	100 Hz, 50 Hz, 33 Hz for 50 Hz network
	120 Hz, 60 Hz, 40 Hz for 60 Hz network
2× digital input	24 VDC PNP
2× digital output	24 VDC max. 120 mA
1× analogue/digital input	0–10 VDC / 24 VDC PNP
Auxiliary output voltage (SELV)	24 VDC max. 180 mA
	10 VDC max. 10 mA
Interference suppression	class A (EN 55011 ed. 4)
Maximum output cable length	3 m
Internal fuse value	T 6.3 A
Protection	IP54
Weight	1.2 kg

2. Environmental conditions

The environmental conditions for which the equipment is designed.

Space	internal
Altitude	up to 2,000 m.a.s.l.
Ambient temperature	10–40 °C
Relative humidity	5–80%
Mains supply voltage fluctuation	±10%
Overvoltage category	II (ČSN 33 2000-4-443 ed. 3)
Degree of environmental pollution	AE4 (ČSN 33 2000-5-51 ed. 3)

3. Description

This product is not a stand-alone functional unit and requires professional assembly.

The DIGR-1202/E controller is a triac based controller designed to control vibratory feeders driven by an electromagnetic coil. Two basic variables are regulated:

- Output voltage amplitude: in the range of 5-100 %
- Output voltage frequency: in steps to a fixed value of:
  100 Hz, 50 Hz, 33 Hz (for 50 Hz network)
  120 Hz, 60 Hz, 40 Hz (for 60 Hz network)

The operation of the controller is defined by parameters that are set by the user from the control panel with text display. The controller can be controlled from the control panel or by external analogue and digital signals.
The controller includes a safely isolated 24 VDC / 4 W SELV supply for powering peripheral devices such as sensors and air valves, and an auxiliary 10 VDC supply for powering the analogue input.
In addition to controlling the vibration intensity, the controller can also handle many logic functions.
In particular:

- stopping when the output bin is full
- monitoring empty bin
- checking jammed parts in the bin
- controlling parts replenishment from the preloader
- switching between two preset amplitude levels using a digital signal
- controlling pneumatic separator
- controlling the ejector of incorrectly oriented pieces
- controlling air supply
- possibility to combine multiple controllers in a cascade, for example to control the linear feeder-circular feeder-preloader assembly

The controller has IP54 protection and can be mounted outside the switchboard. The small size and efficient user functions create the prerequisites for the deployment of these controllers, working both independently and with a master control system, in most vibratory feeder applications. On our website www.skipala.cz you can find application sheets with examples of controller wiring and settings.
If necessary, the manufacturer can make minor software modifications according to the user's requirements.

Fig. 1 – description of controls

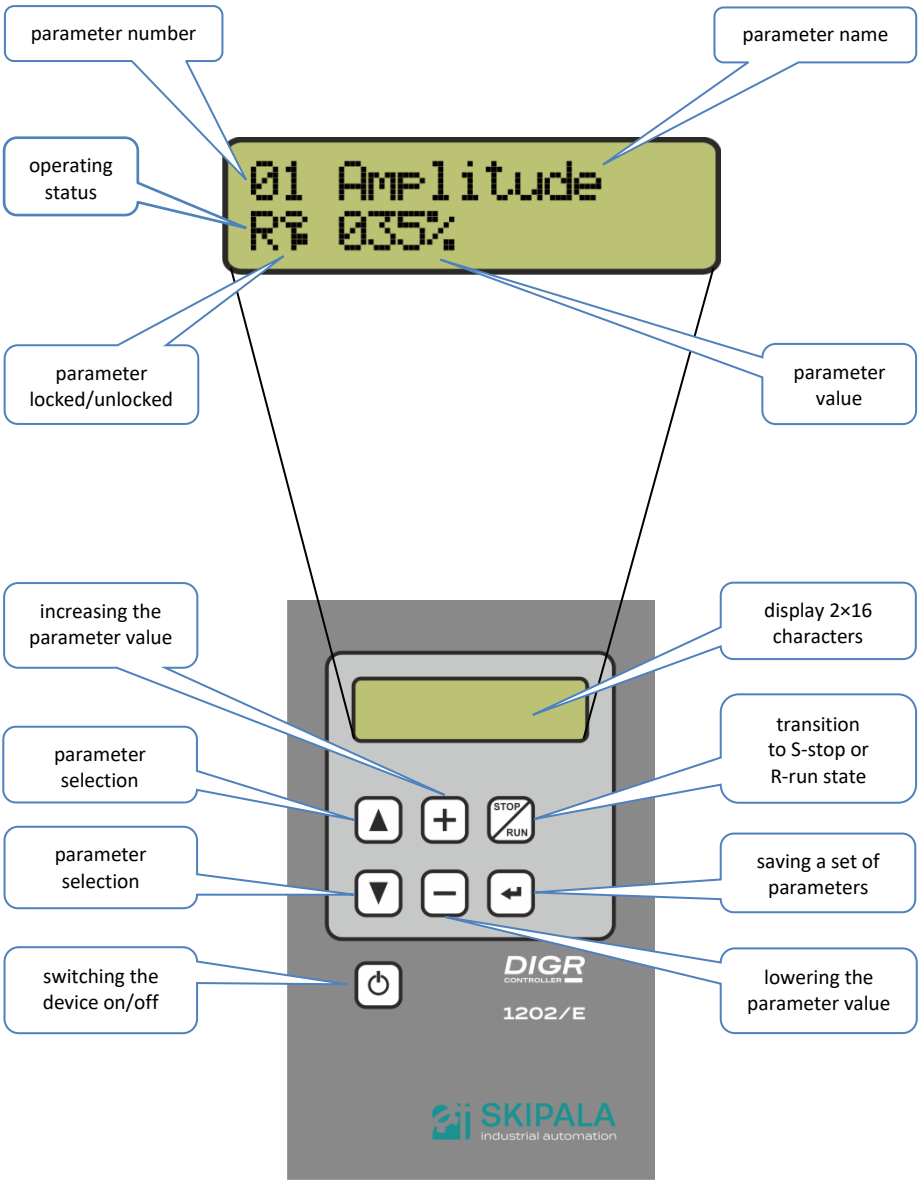


Fig. 2 – basic dimensions

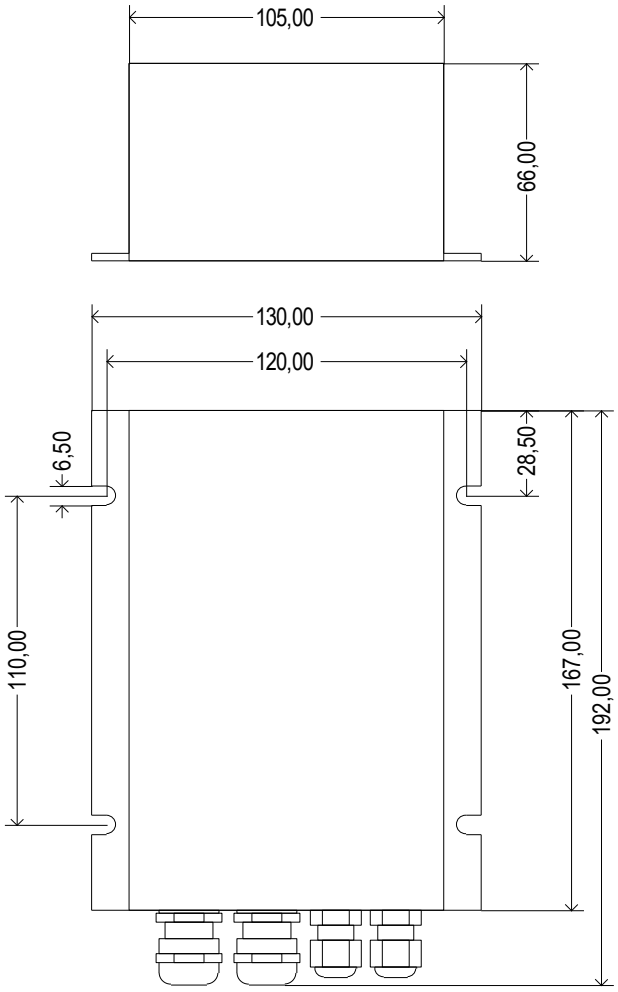
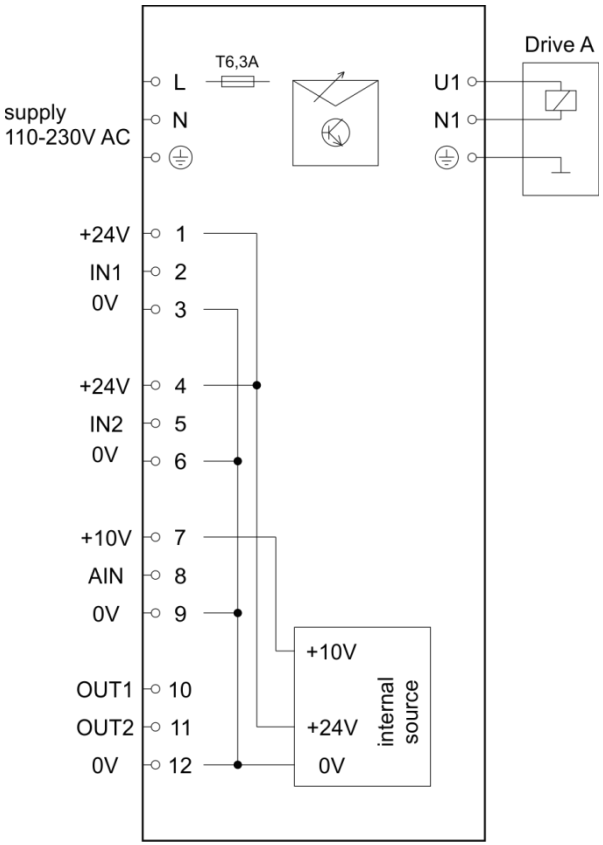


Fig. 3 – connection of the external parts of the controller



4. Installation

The connection of the external electrical parts of the controller may only be carried out by a person with the appropriate electrical qualifications. The cover can only be removed when the controller is safely disconnected from the mains.
Use in a manner not specified by the manufacturer is prohibited!

4.1. Mechanical assembly

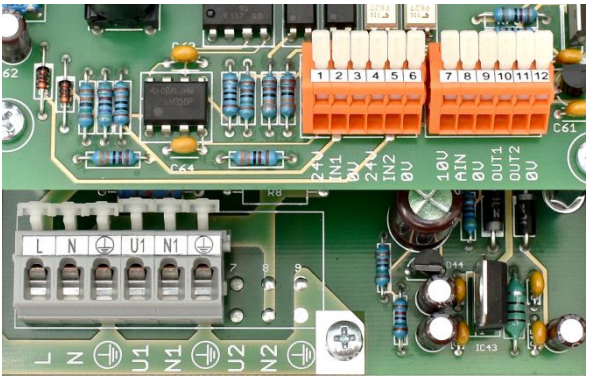
The controller can be installed in a vertical position with the outlets facing downwards or in a horizontal position. It must be fixed to a mechanically rigid part of the equipment, without direct vibration.
Drill 4 holes in the base plate to which the controller is to be attached with a 4.2 mm drill bit and cut the M5 threads. The spacing of the holes can be seen in Fig. 2.
Fasten the controller with 4 M5×8 screws with washers.
Unscrew the four M3 screws securing the controller cover and remove it (Fig. 4).

Fig. 4 – removing the cover

For better access to the terminal block, we recommend removing the part with the outlets (Fig. 5).

Fig. 5 – disassembly of the part with outlets

Fig. 6 – connection terminals



After connecting the external electrical parts of the controller to the terminal block (Fig. 6), reassemble the outlet part and the top cover.

4.2. Connecting the power part

The controller is equipped with a movable supply cable terminated with a 2P+PE fork. Make the connection by inserting the plug into a standard 230 VAC socket, which is protected with a circuit breaker with a maximum rated current of 16 A with B characteristic. The fork serves as a disconnecting means and must be placed in a suitable, easily accessible location near the controller.

If the controller is integrated into the wiring of a master control unit, such as machinery, the connection is made with a 3×1.5 mm^2 flexible cable that is protected with a circuit breaker with a maximum rated current of 16 A with B characteristic. This installation shall be equipped with a disconnecting means for disconnecting all live conductors.

Connect the feeder coil to terminals U1, N1 and the protective terminal (Fig. 6).

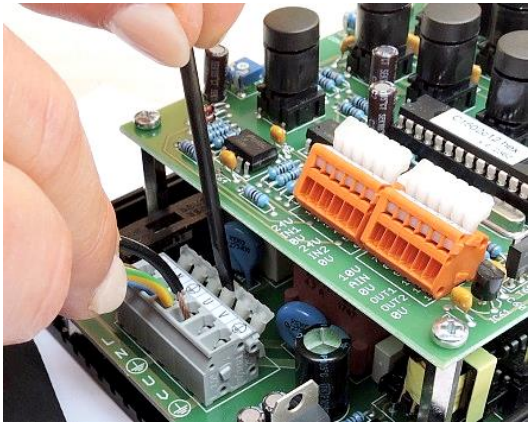
If several controllers are connected to the device, it is advisable to connect these controllers to different phase conductors or to ensure their switching on gradually, because of the current peaks during switching on.

The screwless clamps can be opened with a 3 mm flat head screwdriver (Fig. 7).

With regard to electromagnetic compatibility, observe a maximum output cable length of 3 m.

Cable diameter	8–10 mm
Wire cross section	0.75–1.50 mm^2
Stripped wire end length	6 mm

Fig. 7 – connection of wires



4.3. Connecting the control part

Connect sensors, valves, digital and analogue signals according to the requirements of the specific application (Fig. 3). Use PNP type sensors (output signal is switched to +24 V).

Cable diameter	3.0–6.5 mm
Wire cross section	0.08–0.50 mm^2
Stripped wire end length	6 mm

<u>Tip for you:</u> on our website www.skipala.cz you will find application sheets with examples of controller wiring and settings.

5. Operating status

The operating status is shown on the display as the first character of the bottom line (Fig. 1). The controller can be in one of four states:

a) ⚡ the controller is energized, all activity is shut down.

b) S the controller is switched on, in the S-stop state. The output power voltage is off, the feeder is at standstill. It is possible to view, edit and save parameters to memory.

c) R the controller is switched on, in the R-run state. The output power voltage is on, the feeder vibrates. It is possible to view and edit parameters.

d) W the controller is switched on, in the W-wait state. The output power voltage is off, the feeder is at standstill. The controller waits for a signal from the sensors or from the master control system. It is possible to view and edit parameters.

6. Switching on

The controller can be switched on in two ways:

a) With the button – switching on is done by pressing the ⏻ button. Switching off is done by pressing the button again. This method of switching is suitable when the controller operates independently, without any connection to another master control system.

Attention! The internal circuits of the controller are still energized and therefore switching off with the button cannot be considered a safe disconnection from the mains!

b) Automatically – switching on is done automatically when the power supply is connected. To do this, you must set parameter A36 to "Automatic". This method of switching is suitable if the controller is

incorporated into the wiring of a master control unit that is equipped with a disconnecting means.

After switching on, the controller is ready for operation. Depending on the setting of the digital input functions (parameters A19, A21), it is in the R-run or W-wait state. Pressing the button causes the controller to enter the S-stop state. By pressing the button again, the controller goes from the S-stop state to the R-run or W-wait state.

7. Parameters

The controller contains a set of parameters marked A10-A41.
Use the and buttons to find the desired parameter. If it is not locked (key symbol), the parameter value can be changed using the or button. The locked parameters must be unlocked by entering the password in parameter A41. Saving is only possible in the S-stop state. Saving is carried out by pressing the button. The whole set of parameters is stored in memory at once.

A10 Amplitude

The controller regulates the output voltage amplitude in the range of 5–100% with 0.5% steps. The effective value of the output voltage depends on the supply voltage. The setting range is limited by the value of A17 Amplitude MAX and A18 Amplitude MIN. If the amplitude is set using an analogue signal (parameter A23), the amplitude cannot be set by parameter A10.

A11 Frequency

The principle of changing the frequency of vibration consists in skipping a certain number of half waves of the sinusoid of the regulated voltage. The change does not happen smoothly, but in steps. The parameter value can be used to set the frequencies:
100 Hz, 50 Hz, 33 Hz for 50 Hz power supply
120 Hz, 60 Hz, 40 Hz for 60 Hz power supply

A12 Delay ON

The description is given together with the description of parameter A13.

A13 Delay OFF

Parameters A12 and A13 set the delay in switching off or switching on the feeder, which is triggered by the signal on the IN1 or IN2 input. The range of setting the value is 0-25 s. The delay setting is only meaningful if at least one sensor is connected to the controller to monitor the filling of the feeder output bin. Otherwise, we recommend to set it to 0 s.

Tip for you: Let's assume that the output conveyor is full and the controller is in the W-wait state. The parts are gradually removed from the bin and their movement causes a short interruption of the signal from the filling sensor. The ON delay (parameter A12) must be longer than the signal interruption. Then this interruption will be ignored and the controller will switch into the R-run state only after the bin is actually emptied. A similar situation occurs when filling the bin. The individual parts pass around the sensor and generate short impulses. The OFF delay (parameter A13) must be longer than these impulses. They will then be ignored and the controller will switch to the W-wait state until the bin is actually full.

A14 Ramp up/dwn

This parameter is used to adjust the value of the amplitude during the Start and Run of the feeder so that the feeder starts and stops smoothly. The range of setting the value is 0-6 s. The time applies for the 0% to 100% ramp up and 100% to 0% ramp down.

A15 Batch ON

The description is given together with the description of parameter A16.

A16 Batch pause

In some cases, it is desirable to operate the feeder with interruptions, in batches. Parameter A15 specifies the time for which the batch is fed, parameter A16 specifies the pause time between batches.

Tip for you: The vibratory feeder serves as a preloader, which, based on a filling sensor signal, feeds parts to the hopper of another circular feeder. The preloader only feeds one batch, waits, then evaluates the filling sensor status and feeds another batch if needed. The parts in the hopper have time to spread out evenly during the pause. This ensures that the hopper is not overfilled.

A17 Ampl. MAX

Amplitude Maximum limit. The description is given together with the description of parameter A18.

A18 Ampl. MIN

Amplitude Minimum limit. These parameters can be used to limit the amplitude value setting in parameter A10.

Tip for you: The operator is able to correct the value within the permitted range without affecting the correct operation of the feeder.

A19 Input IN1

Configuration of IN1 digital input.

a) **Not connected** – the input is not used or is only monitored.

b) **Start** – bringing +24 V signal is required for the feeder to be switched on. If the other conditions are met (according to the configuration of the other inputs), the feeder is in the R-run state after the signal is applied. Otherwise, the feeder is in the W-wait state. The transition from W to R and vice versa happens instantaneously, parameters A12, A13 have no effect.
Tip for you: Use this setting in the case of control from the master PLC control system.

c) **Maximum stock** – a sensor is connected to the input to monitor the stock of parts in the bin that is filled by the feeder. When the bin is full, the sensor detects the part for longer than the time set by parameter A13, the feeder stops and switches to the W-wait state. After the bin is emptied, the sensor is not active for longer than the time set by parameter A12, the feeder switches to the R-run state again. If the second input is configured as Minimum stock, the feeder will switch on according to the status of this sensor (see below).
Tip for you: By appropriate setting of parameters A12, A13 we achieve such a state, that monitoring of the bin status is possible with only one sensor.

d) **Minimum stock** – this setting is only relevant if the second input is defined as Maximum stock. A sensor is connected to the input to monitor the minimum stock of parts in the bin, which is filled by the feeder. The feeder enters the R-run state after the minimum stock sensor has not been active for the time specified by parameter A12. The feeder switches to the W-wait state if both stock sensors are active for the time specified by parameter A13.

e) **Ejector** – the input controls the ejector together with the digital output OUT1, OUT2 (parameter A24).

A20 Sensor 1 Type

Defining the type of sensor connected to the IN1 input.

a) **Switching NO** the sensor output is 24 V when the part being fed is present.

b) **Disconnecting NC** the sensor output is 24 V when the part being fed is not present.

A21 Input IN2

Configuration of IN2 digital input. The setting is the same as for parameter A19 Input IN1.

A22 Sensor 2 Type

Defining the type of sensor connected to the IN2 input. The setting is the same as for parameter A20 Sensor type 1.

A23 Analog AIN

AIN input configuration. It can be configured as analogue 0–10 V or digital 0/24 V.

a) **Not connected** – input is not used.
b) **Amplitude** – the 0–10 V analogue signal adjusts the amplitude magnitude in the range of 15-100% in 0.5% steps. The setting range can be limited by the value of parameters A17, A18. The set value is displayed in parameter A10.
c) **JOG-min** – the digital signal at the input causes the amplitude to switch to the minimum value set by parameter A18.
Tip for you: Use this setting if you need to reduce the feeder speed during operation. For example, when filling material onto the scale as you approach the desired weight.
d) **Start** – bringing the digital signal is a condition for the feeder to be switched on (depending on the configuration of inputs IN1, IN2).
e) **Stop** – bringing the digital signal causes the feeder to stop.

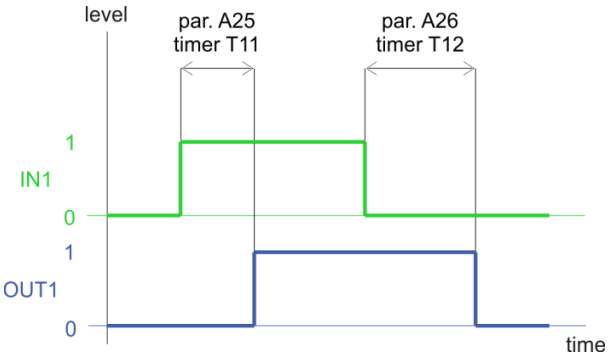
A24 Output OUT1

Configuration of digital output OUT1.
Tip for you: For example, a pneumatic valve can be connected to the digital output to control air nozzles, turnouts or ejectors. It can also be used as a signal for a master PLC control system, a signal beacon or a signal when connecting multiple controllers in a cascade.

a) **Not connected** – output is not used.
b) **Drive in running state** – the output is switched whenever the drive is in the R-run state.
c) **Air** – the output controls the air supply valve to the feeder. The valve is switched on before the feeder is switched on. The advance time is set by parameter A25 (Timer T11). When the feeder is switched off, the air is switched off with a delay set by parameter A26 (Timer T12).
d) **Ejector E1** – the operation is shown in Fig. 8. A valve controlling the ejector is connected to the outlet. This refers to a device that removes misaligned or excess parts from the feeder path.

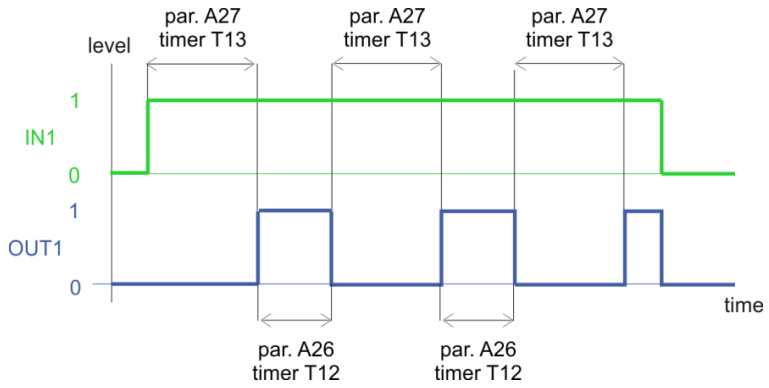
One of the inputs, e.g. IN1, must be set for the ejector function (parameter A19). This input receives a signal from a sensor that detects the parts. Parameter A25 (Timer T11) sets the delay so that the ejector does not react to short impulses from the sensor. Parameter A26 (Timer T12) influences the time of the ejection. The ejector is in operation only when the controller is in the R-run state.

Fig. 8 – operation of the E1 ejector



e) **Ejector E2** – the operation is shown in Fig. 9. A valve controlling the ejector is connected to the outlet. This refers to a device that removes misaligned or excess parts from the feeder path.
One of the inputs, e.g. IN1, must be set for the ejector function (parameter A19). This input receives a signal from a sensor that detects the parts. Parameter A25 (Timer T11) suppresses short impulses on input IN1. Parameter A27 (Timer T13) determines the delay between the signal on the input and the switching of the output. Parameter A26 (Timer T12) determines the duration of the output switching.
Tip for you: The E2 ejector can be used, for example, to detect jammed parts. If the parts do not pass under the sensor for the duration of Timer T13 value (parameter A27), the OUT output is activated, to which a valve is connected, which controls the air nozzles that blow the jammed parts out of the feeder path. The ejector is in operation only when the controller is in the R-run state.

Fig. 9 – operation of the E2 ejector



f) **Monitor IN1 ON** – the output monitors the ON state of the IN1 digital input regardless of its configuration. This monitoring only takes place when the drive is in the R-run state. If the signal 24 V is present at the IN1 input for a certain period of time, which is set by parameter A27 (Timer T13), the OUT output will switch on. The signal at the monitored input can be protected against short impulses caused by movement of parts under the sensor. Impulses from state 0 to state 1 are suppressed by setting parameter A25 (Timer T11). Impulses from state 1 to state 0 are suppressed by setting parameter A26 (Timer T12). All impulses that are shorter than the set time will be ignored.

g) *Tip for you: You can use this setting, for example, if you connect a beacon to the output to indicate a shortage of parts in the bin*.

h) **Monitor IN1 OFF** – the output monitors the OFF state of the digital input IN1. The settings and functions are the same as for monitoring the IN1 ON input.

i) **Monitor IN2 ON** – the output monitors the ON state of the digital input IN2. The settings and functions are the same as for monitoring the IN1 ON input.

j) **Monitor IN2 OFF** – the output monitors the OFF state of the digital input IN2. The settings and functions are the same as for monitoring the IN1 ON input.

A25–A27 Timers

Universal timers whose use is determined by the setting of the parameter A24 Output OUT1.

A28 Output OUT2

Configuration of digital output OUT2. The setting is the same as for parameter A24 Output OUT1. The difference is only in the numbering of the timers that are used by the output.

OUT1 T11, T12, T13 (parameters A25, A26, A27)
OUT2 T21, T22, T23 (parameters A29, A30, A31)

A29–A31 Timers

Universal timers whose use is determined by the setting of the parameter A28 Output OUT2.

A32 Frequency source

The frequency of the power supply network can be

a) **50 Hz**
b) **60 Hz**

A33–A35

Reserved for later use.

A36 Switch ON

Determines the behaviour of the controller after supply voltage is applied.

a) **Using the button** – after the supply voltage is applied, the controller is switched off. Switching on is done by pressing the ⏻ button. Switching off is done by pressing the button again.
b) **Automatically** – when the supply voltage is applied, the controller is automatically switched on. This setting does not exclude switching on and off with the use of the button.

A37 Service functions

Designed for service purposes.

a) **Not used** – service functions are not activated.
b) **Random stop** – when testing the feeder, real-life behaviour in operation can be simulated. The feeder is switched off and on at irregular intervals.

A38 Lock/Unlock

Parameters are divided into two groups in terms of their editing: locked and unlocked. Unlocked parameters can always be edited, locked parameters only after entering the password. Parameters A17–A38 are always locked in the group. Parameters A10–A16 can be optionally assigned to one of the groups using parameter A38. First, enter the password using parameter A41. Then using the ⊞ or ⊟ button, set the number of the parameter you want to lock or unlock. Press ↵. The key symbol appears after the parameter number. This means that the selected parameter is locked. Unlocking is done in the same way. By pressing the ↵ button, the key symbol disappears and the parameter is unlocked. Parameter locking will only take effect after the password is invalidated.

A39 Language

Language selection.

a) **English** – it is always available.
b) **Czech** – it is delivered unless another language version is ordered.

Tip for you: As standard, you can order Russian or German version, or another language can be agreed upon.

A40 Information

If you want more information about this product, please visit our website http://www.skipala.cz.

Tip for you: on our website you will find application sheets with examples of controller wiring and settings.

A41 Password

Entering the password will temporarily unlock the locked parameters. The valid password is fixed by the manufacturer as the three-digit number 108 and cannot be changed. Its purpose is only to protect against accidental overwriting of locked parameters. Entering a password is invalidated by changing the password entered or by turning the controller off.

Fig. 10 – parameter table

Parameter Number A	Factory values	Application values Drive A	Application values Drive A
10 Amplitude	30,0 %		
11 Frequency	50,0 Hz		
12 Delay ON	00,0 s		
13 Delay OFF	00,0 s		
14 Ramp up/dwn	02,0 s		
15 Batch ON	00,0 s		
16 Batch pauze	00,0 s		
17 Ampl. MAX	100,0 %		
18 Ampl. MIN	05,0%		
19 Input IN1	not used		
20 Sensor 1 Typ	normal open		
21 Input IN2	not used		
22 Sensor 2 Typ	normal open		
23 Analog AIN	not used		
24 Output OUT1	not used		
25 Timer T11	00,0 s		
26 Timer T12	00,0 s		
27 Timer T13	000 s		
28 Output OUT2	not used		
29 Timer T21	00,0 s		
30 Timer T22	00,0 s		
31 Timer T23	000 s		
32 Frequency source	50 Hz		
36 Switch ON	press button		
37 Service fnc	not used		
38 Lock/unlock	unlock		
39 Language	english		
40 Info	www.skipala.cz		
41 Password	000		

8. Maintenance

The controller does not require any special maintenance. Carry out regular inspections and revisions in accordance with Act No. 250/2021 Coll., CSN 33 1500 and all related standards, within the intervals applicable to the equipment to which the controller is connected.

In the event of a malfunction, any repairs are prohibited. Repairs may only be carried out by the manufacturer or by a company authorised by the manufacturer.

In case of complications with the controller operation, it is possible to perform a RESTART, during which all parameters are factory set. RESTART is performed as follows:

a) disconnect the controller from the mains and wait at least 60 seconds for the capacitors to discharge
b) press and hold the ↵ button
c) connect the controller to the power supply network
d) release the ↵ button

The values of the factory setting parameters are listed in the table (Fig. 10).

9. Disposal

At the end of the service life of the controller, the controller must be handed over to a specialist company or manufacturer for professional disposal.

10. Warranty

The warranty for the product is 12 months from the date of sale.

Serial number:

Vendor: Date of sale:

11. Manufacturer identification

Name of the manufacturer: **Skipala s.r.o.**
VAT: CZ06607551
Manufacturer's registered office: Rybnik 301
560 02 Rybnik
Czech Republic
Contact details: web: www.skipala.cz e-mail: skipala@skipala.cz

EU DECLARATION OF CONFORMITY

pursuant to Act No. 90/2016 Coll. on conformity assessment of specified products when made available on the market, as amended.

Manufacturer: **Skipala s.r.o.**
Rybnik 301, 560 02 Rybnik
Czech Republic
ID: 06607551

Product identification data:
Name: Digital controller for vibratory feeders
Type: **DIGR-1202/E**

Product description:
The product is designed to regulate vibratory feeders driven by an electromagnetic coil.

The manufacturer declares that the above-mentioned product complies with the relevant provisions of the European Union regulations and is safe under the conditions of its intended use.

The basis for issuing the EU Declaration of Conformity is **Certificate No. 1250284** issued by the Electrical Engineering Testing Institute based on compliance with the requirements of the "ETI Certificate" certification scheme .

List of laws, technical and harmonized standards used:
Government Regulation No. 118/2016 Coll. (Directive 2014/35/EU of the European Parliament and of the Council)
Government Regulation No. 117/2016 Coll. (Directive 2014/30/EU of the European Parliament and of the Council)
EN 61010-1 ed. 2:11+A1:19
EN 61326-1 ed. 3:22
EN IEC 61000-6-2 ed. 4:19
EN IEC 61000-6-4 ed. 3:19

The last two digits of the year in which the CE marking was affixed to the product: 25

In Rybnik, July 16, 2025

Karel Skipala
Managing Director