

USER MANUAL VIBRATION CONTROL RMA - Feeder Controller 105

	RMA-Feeder Controller 105	1
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IMPORTANT NOTES



Electrical danger within the meaning of this documentation or the warning labels on the product itself respectively means that death, serious injury or considerable material damage may occur if the respective measures of precaution are not taken.



Mechanical danger within the meaning of this documentation or the warning labels on the product itself respectively means that death, serious injury or considerable material damage may occur if the respective measures of precaution are not taken.

Disconnecting voltaged parts within the meaning of this documentation means that before maintenance, repair and installation work, the voltage must be switched off and secured against being switched on again.

Qualified Staff

According to this user manual and the labels on the product itself, qualified staff includes those persons, who are familiar with the installation, mounting, initial operation and operation of the device as well as the dangers associated with this and who have the qualifications necessary for their work, such as:

- 1. Training or instruction or authorisation respectively to switch electric circuits and devices on and off, ground and mark them according to the standards of safety engineering.
- 2. Training and instruction according to the standards of safety engineering concerning the care and use of adequate safety equipment.
- 3. First aid training

Intended Use

The RMA-Feeder Controller 105 must only be used for the control of our KÖBRATOR – oscillating rails and for the processing of digital and analog signals.

Warranty

Adherence to the user manual is the pre-condition for a failure-free operation and for the settlement of possible claims under the warranty. Therefore, please study the user manual before you operate the device.

Disposal

Dispose of the RMA-Feeder Controller 105 depending on composition and existing regulations as:

-steel scraps -aluminium -copper -synthetic material -electronic scraps



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1. Safety Instructions



The RMA-FEEDER CONTROLLER 105 controls oscillating mechanical parts (KÖBRATOR), which may be dangerous.

Safety measures and safety devices must correspond with the valid national regulations (e.g. VDE 0100 T410 /VDE 0113 T1 or EN 60204 / VDE 0160 respectively) Necessary safety measure: grounding of the RMA-Feeder Controller 105 Necessary safety device: circuit breaker



If you do not wish to install the device immediately, but instead wish to store it: The storage place must be dry and clean; the storage temperature must be between -25° C and $+85^{\circ}$ C.



Check the device immediately for damaged packaging. Send complaints concerning damages immediately. See to it that damaged products are not operated!



The connection, initial operation, as well as maintenance and repair work must only be executed by qualified expert staff, taking into consideration this manual and all other connection diagrams belonging to the RMA-FEEDER CONTROLLER 105 and the presently valid national /international regulations (safety / accident prevention)



The RMA-Feeder Control 105 is built for 24V DC operation.

We reserve the right to change technical data and constructions beneficial to technical progress.



2. Installation

2.1 Electrical Installation

Please be sure to note the safety instructions in Chapter 1 during the electrical installation!



THE DEVICE MUST BE GROUNDED.

Please be sure to note the safety instructions in Chapter 1 during the electrical installation!

As a connecting line for the KÖBRATOR only the supplied cable must be used. Only one Köbrator may be operated for each magnetic output of the Feeder Controller.

Connect all electric connections according to the connection diagram

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2.2 Connection Diagram (Example)

1	R	MA-FEED	ER-CONTI	ROLLER	2
d 24∨	Type:	I	RMA 105		
Q PE	Pro SPS	grennnumer -Steurung Hr. 1			
Anachtuß	in/Output	Quervervela	Quervervelo	in/Output	Aruschluß
0 24V 0 0V 05 04	0 0.5 0 0.4	POT.GETR.		0 0.9 0 0.8 0 0.7	09 08 07
03 02 01 00	0 0.3 0 0.2 0 0.1 0 0.0		POT.GEB.	Q 0.6	06 24V 0V 11
13 12 11	1.3 1.2 1.1			1.10 1.9 1.8	110 19 18
0 24V 0 0V 17 16 15 14	11.0 ◄ 11.7 11.6 11.5 11.4	POT.GEB.			
ο ΑΙΟ Ο ΟV Ο ΑΙ1 Ο 10V	AN.IN 0 0V AN.IN 1 10V		CAN- MASTER	CAN-OV CAN-RT CAN-H CAN-L	4 3 2 1
0 24V 0 0V	4Q-Au: H1+	sgang 1 M1-	40-A1	usgang 2 M2-	

Achtung OV ist intern verbunden! Keine 100% Potenzialtrennung bei den Eingängen!



omversorau

3. Technical Data

3.1 Electric power supply

Input voltage Nominal value admissible range

Drawing of current from 24 V

3.2 Digital-Inputs

Number Input voltage Nominal value admissible range Fan-in current at HIGH - level Propagation delay time ^tLOW - HIGH ^tHIGH - LOW Input voltage LOW - level HIGH - level Mechanical driving point impedance



voltage-connected

10 % residual ripple

4

24 V - 30 ... + 30 V

6.1 mA

24 V DC +/- 25 % incl.

 \leq 0.6 A

3.5 ms 2.8 ms

\leq	5	٧	/	
		-	•	,

\geq	1	5	۷
-	-		~

3.9 kΩ

Actuator supply

Pin:	Inputs
1	10
2	1
3	12
4	13
5	0 V
6	+ 24V_A





3 Functional Inputs	voltage-connected
Number Standard Inputs Incremental supply input Timer- / counter inputs Input voltage	4, usable as 4 1 4
Nominal value admissible range	24 V - 30 + 30 V
Fan-in current at HIGH - level	5.2 mA
Input frequency at duty cycle 0.5	(25 kHz
Propagation delay time Standard inputs ^t LOW - HIGH ^t HIGH - LOW	15 μs 15 μs
Input voltage LOW - level HIGH - level	∫ 5 V ∫ 15 V
Selector shaft ULOW - HIGH UHIGH - LOW Mechanical driving point impedance	13.1 V 9.5 V 4.6 kΩ
Input signals VRZ	2-Phase-square moved by 90° 1 reset pulse 4 - fold

24 V DC, +/-25 %, 150 mA

Pin:	Dig. In	FunIn	VRZ
1	4	IN 0	CH-A
2	15	IN 1	CH-B
3	16	IN 2	CH-0
4	17	IN 3	
5	GND		
6	+ 24 V		



3.3 F



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3.4 Digital-Outputs

Number On-load voltage Vin Nominal value admissible range Output voltage HIGH - level LOW - level Fan-out current Parallel connection of outputs

Short circuit-proof Sampling frequency ohmic load inductive load Lamp load simultaneity factor

voltage-separated

6

24 V 18 ... 30 V

min. Vin-0,2 V max. 2 μ A \cdot RL max. 500 mA possible, max. 4 outputs with Itotal = 2 A yes, thermal overload protection

100 Hz 2 Hz (induction-dependent) max. 6 W 100 %



Pin:	Outputs
1	Q 0
2	Q 1
3	Q 2
4	Q 3
5	Q 4
6	Q 5





WARNING:

Voltage negative feed at the outputs can lead to the destruction of the output drivers.

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3.5 Digital-Inputs

Number	4
Input voltage	
Nominal value	2
admissible range	-
Fan-in current at	
HIGH - level	6
Propagation delay time	
^t LOW - HIGH	3
thigh - I OW	2
Input voltage	
LOW - level	<
HIGH - level	≥
Mechanical driving point impedance	3
Actuator supply	
Nominal value	2
admissible range	1

voltage-connected

4
24 V - 30 + 30 V
6.1 mA
3.5 ms 2.8 ms
≤ 5 V ≥ 15 V 3.9 kΩ

24 V 18 ... 30V

3 0 	
╡═╌┥ ╡╶╌┥ ┥╢╌┥ ┝╶╢╌┥	
0VI	
	_)

Pin:	Inputs
1	18
2	19
3	I 10
4	11
5	0 V
6	+ 24 V





3.6 Digital-Outputs

Number On-load voltage Vin Nominal value admissible range Output voltage HIGH - level LOW - level Fan-out current parallel connection of outputs

Short circuit-proof Sampling frequency ohmic load inductive load Lamp load Simultaneity factor

voltage-separated to the system and to 4Q-output transformers

4 (1 group à 4) 24 V

24 V 18 ... 30 V

min. Vin-0.2 V max. 2 μ A \cdot RL max. 500 mA possible, max. 4 outputs with Itotal = 2 A yes, thermal overload protection

100 Hz 2 Hz (induction-dependant) max. 6 W 100 %



Pin:	Outputs
1	Q 6
2	Q 7
3	Q 8
4	Q 9

Pin:	Outputs
5	0 V
6	+ 24 V





3.7 4Q-Output transformer

Number Voltage supply on-load voltage Vin nominal value admissible range Monitoring of voltage undervoltage overvoltage Drawing of current from 24 V per output Output voltage (ohmic load)

min. voltage Fan-out current constant current pulse current 1 second Short circuit-proof Sampling frequency outputs

voltage-separated to the system and to Digital IO's

2

24 V 18 ... 30 V yes 3.5 V ... 7 V 33 V ... 43 V

on-load current + 0.02A

typ. voltage Vin - (0.125 Ohm * $I_{\text{load}})$ Vin - (0.300 Ohm * $I_{\text{load}})$

min. 2.5 A typ. 4.4A yes, thermal overload protection per PWM approx. 0.5 ... 600 Hz for magnetic valve, vibration



Pin:	4Q Output (2 channels)
1	M2-
2	M2+
3	M1-
4	M1+
5	0V (4Q)
6	+24V (4Q)



WARNING:

Voltage negative feed at the outputs can lead to the destruction of the output drivers.



3.8 Analog-Inputs voltage connected

Number of channels Input quantity AD-transformation

Approximation

Max. Input range

Mechanical driving point impedance

Offset malfunction (0-point)

Connecting line

For type -10 is valid: Offset malfunction (0-point) 2 0 ... 10 V via ADC to CPU transformation principle successive

Resolution 10 Bit transformation duration 20 μs

voltage range +/- 20 V

voltage range 136 k Ω

voltage range $\leq \pm -100 \text{ mV}$ amplification malfunction $\leq \pm -1.0 \%$ shielded length max. 50 m

voltage range $\leq \pm -100 \text{ mV}$



Pin:	Analog-Input
1	AI 0
2	GND
3	AI 1
4	+ 10V





WARNING:

Voltage negative feed at the outputs can lead to the destruction of the output drivers.



voltage-separated

3.9 CAN

Output differential voltage Input differential voltage recessive dominant Input-Offset voltage (to CAN GND)	min. + 1.5 V - 1 V + 1 V	max. + 3 V + 0.4 V + 5 V +/- 6 V
Input differential resistance Transmission rate up to 15 m cable length up to 50 m cable length up to 150 m cable length up to 350 m cable length Number participants Connecting line up to 100 m up to 350 m	20 kΩ max. 1 MBit max. 500 kBit max. 250 kBit max. 125 kBit max. 64 shielded, twisted 0.25 mm ² 0.5 mm ²	100 kΩ
	Pin:CAN1CANL2CANH3RT40V-CA	N

Terminals: by connection of RT via a bridge to CANH at the ends of the CAN-network.

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3.10 RS232

Output voltage Input voltage Fan-out current Input resistance Transmission rate Connecting line up to 9600 Bd up to 57600 Bd





3.11 RS485

Output differential voltage Input differential voltage Input offset voltage (to GND) Fan-out driver current ($U_{diff} = +/- 1,5 V$) Transmission rate Connecting line at 0.14 mm² at 0.25 mm²

voltage-connected

min. typ. max. +/- 3 V +/- 8 V +/- 15 V +/- 3 V +/- 8 V +/- 30 V +/- 10 mA 3 kΩ $5 k\Omega$ 7 kΩ 1200 ... 57600 Bd shielded, min. 0.14 mm² max. 15 m max. 3 m

Pin:	RS 232
1	Service-Pin
2	RXD
3	TXD
5	GND

voltage-connected

min.	max.
+/- 1.5 V	+/- 5 V
+/- 0.5 V	+/- 5 V
	- 6 V/+ 6 V

+/- 55 mA

1200 ... 57600 Bd shielded max. 300 m max. 600 m



Terminal: by connection of Rt via bridges of 6-7 and 8-9 and the end of the RS 485 network.

<u>NOTE:</u>

R

All Service-Pins are intended for use by the factory and must not be connected by the user.

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4. Displays and Control Keys

4.1 Automatic Operation

The automatic operation is a mode of operation during which all movements, functions of the machine are executed by the control.

By pressing the key * **AUTO - MAN** * you can switch between * **Automatik** * (autmatic) and * **Einrichten** * (setup).

In the automatic operation, the message * *Automatik vorgewählt* * (automatic preset) appears in the display.

All current malfunctions and messages appear on the display.

With the * F * keys shown in the display again different functions can be executed, e.g. starting the automatic operation, stopping the automatic operation. You can receive further information from the display.

4.2 Setup Operation

The setup operation is a mode of operation during which all movements, functions of the machine can be executed selectively by hand.

By pressing the key * **AUTO - MAN** * you can switch between * **Automatik** * (autmatic) and * **Einrichten** * (setup).

In the setup menu, the sub-menus **FUNKTIONEN** (functions) will appear for the start of individual functions and the sub-menu **SERVICE* *. They are selected with the * \downarrow * and * \uparrow * keys.

With the * **ENTER** * key the selected sub-menu is invoked.

In the sub-menu **FUNKTION** the individual functions, movements of the machine can be selected with the $* \downarrow *$ and $* \uparrow *$ keys and can be invoked with the $* \leftarrow *$ und $* \rightarrow *$ keys shown in the display. Movements leading to collision are blocked.

The sub-menu * **SERVICE** * is only accessible for authorized maintenance personnel and therefore protected by a password. In this menu, the individual times can be changed or the language switched. With a separate password, the frequency for the vibration range can be set.

With the * **ESC** * key, the individual menus can be left again.

4.3 Deletion of Malfunctions

The malfunction is defined in the display if its existence makes it impossible for the set mode of operation to be executed.

By pressing the * **RESET** * key, the malfunction is deleted.



4.4 Setting of the Vibration

By pressing the * **VIBRATION** * key, the display shows the function * **Einstellen der Vibration** * (setting of the vibration). By pressing the * **VIBRATION** * key again, the function can be left.

In the menu * **VIBRATION** * the performance of the vibration range can be changed with the $* \downarrow *$ und $* \uparrow *$ keys. When leaving the menu, the thus set performance is not secured against a voltage loss.

(Saving of performance settings see Chapter 4.6)

4.5 Status – Display of the I-Os

By pressing the * *Info* * key, the display shows the stated special function. By pressing the * *Info* * key again, the special function can be left.

In the special menu * *INFO* *, the status of the input and output bytes is shown. By pressing the * \downarrow * and * 1* keys, you can switch between the **Byte 0** and the **Byte 1**. However, this function is intended for the control of the inputs and outputs of the Feeder Controllers .

4.6 Saving the Frequency or the Performance Settings Respectively.

In order to secure the frequency or the performance respectively against a voltage loss, the value must be saved by pressing the * \leftarrow * , * \rightarrow * and * **ENTER** * keys at the same time. However, make sure that the * **ENTER** * key is pressed last..

Therefore your set values are overwritten !!!



4.7 Set up values of Pneumasort times

Deutsch	Englisch	Schwedisch	Französisch	Meaning
Ruheschaltung Pneu	Pneu off when empty	Viloläge pneu	position repos Pneu	Off position Pneumasort: Pneumasort switches off when all switches are idle time x
Teilemangel	parts deficiency	delbrist	manque pièces	Part deficiency time X for no parts in the funnel
NIV Bunker min	lev storage belt min	niv lagring min	remplissage mini	Level storage belt not reached switch in funnel is idle time X
NIV Bunker max	lev storage belt max	niv lagring max	remplissage maxi	Level storage belt exceeded: switch in funnel is busy time X
NIV Sortier. min	lev track max	niv band min	rail de triage mini	Level sorting rail not reached: switch on vibrating rail is idle time X
NIV Sortier. max	lev track max	niv band max	rail de triage maxi	Level sorting rail exceeded: switch on vibrating rail is busy time X
TKE Sort 1 min	pk end of track min	slut band 1 min	rail de triage 1 mini	Parts control end of sorting rail not reached: switch at the end of the vibrating rail is idle time X
TKE Sort 1 max	pk end of track max	slut band 1 max	rail de triage 1 maxi	Parts control end of sorting rail exceeded: switch at the end of the vibrating rail is busy time X



5. Troubleshooting

The chapter Troubleshooting covers only the componentry RMA-Feeder Controller 105 in connection with a KÖBRATOR.

Achtung

Troubleshooting only by qualified staff!

Troubleshooting only by qualified staff!

BE SURE to disconnect the voltage of the RMA-Feeder Controller 105 before opening the cover.





5.1 Error list

Malfunction	Cause	Solution
There is supply voltage, but there is no display	Microprocessor not described	Software-download only by qualified staff. Upon request you can receive this download-file from the service technicians in our company in the automatisation department.
The output MAGNET is selected, however, no vibration can be determined in the KÖBRATOR	KÖBRATOR is jammed mechanically or Distance between yoke and magnet in the KÖBRATOR has changed	Turn off device and determine whether KÖBRATOR is jammed Please contact the service technicians in our company in the manufacturing department "Elektro" in order to find out the set interval between the yoke and the magnet.
The output MAGNET is selected, however, no vibration can be determined in the KÖBRATOR	Electric connection between KÖBRATOR and RMA 105 is interrupted or Magnet in the KÖBRATOR defect	Control plug-in connection on the back of the KÖBRATOR. Determine resistance of the magnet in the KÖBRATOR, possibly replace magnet. (Please consult the KÖBRATOR maintenance manual and spare parts list for the resistor of the magnet)

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