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# TECHNICAL DOCUMENTATION

for the

# PROGRAMMABLE INTERVAL TIMER

# I 3

## Note for the user

**We should like to make it clear from the outset that these devices are used in many different machines. Because we mainly supply the control to machine manufacturers and like to maintain intensive customer service, we are only too happy for customers to request program adaptations and circuit changes requiered for the different types of machine from us. In this way, is can be ensured that user-friendly operation is provided for the user.**
**If certain features that are important for the user, such as modified operation, or additional functions are integrated into the control, these are described in the Section "Options and Modifications".**

**The functions marked * in the Operating Instructions are optional and not integrated into every control.**

# TABLE OF CONTENTS

1. SYSTEM DESCRIPTION

**The I3 Interval Timing System switches connected machines (tumblers) on and off at programmed intervals for a set time.**

## 1.1 Features

- Up to **99 programs** can be programmed, stored and called up.

The user can store the following data under a program number:

- **Total time**
- **Massage time**
- **Pause time**

* - **Vacuum time**

* - **Aeration time**

- Depending on the software version, the **vacuum, aeration interval** ist activated either
  during the **total time**
  or
  **only during the pause time**

- Another special feature of this timer ist that several consecutive **programs** can be **chained**.

## 1.2 FUNCTION OF THE DISPLAY AND THE KEYBOARD

The display with large high-luminosity display elements informs the user about all important data during the execution phase. All input keys are located on the clearly laid out membrane keypad.

The front panel is subdivided into the following function blocks:

**PROGRAM**


The display field "PROGRAM" is used to locate the requiered program.

**Display field**

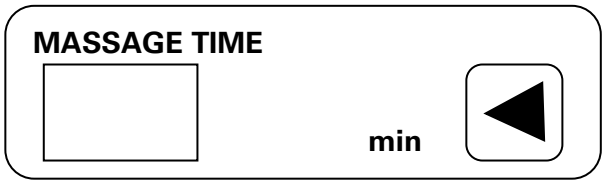
During the **execution phase**, the number of the program currently being executed is displayed.

In **programming mode,** the number of the program whose data are being entered or changed is displayed.

**Key**

If you press the key, the program number on the display is incremented.

**MASSAGE TIME**




This is used to set the massage time. This is the time during which the drum is in motion. Times from **1 minute to 99 minutes** can be set.

**Display field**

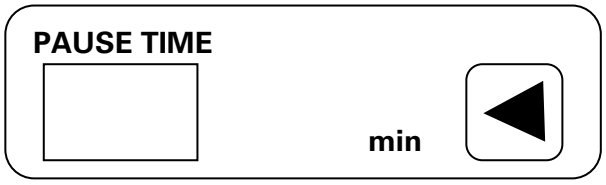
During the **execution phase,** the current massage time to go is displayed. If the pause time is active during execution, this display remains off.

In **programming mode,** the required massage time (setpoint) is displayed.

**Key**

In **programming mode,** the key is used to set the massage time. If you press the key, the time is incremented.

**PAUSE TIME**




This is used to set the pause time. This is the time during which the drum is motionless. Times from **1 minute to 99** minutes can be set.

**Display field**

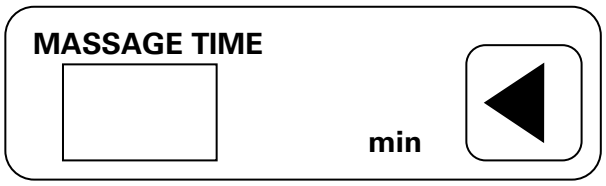
During the **execution phase,** the current pause time to go (actual value) is displayed. If the massage time is active during execution, this display remains off.

In **programming mode,** the required pause time (setpoint) is displayed.

**Key**

In **programming mode,** the key is used to set the pause time. If you press the key, the time is incremented.

*** VACUUM TIME**




There is no separate function field for this function. The vacuum time is set in the function field for massage time.
This is the time during which a connected vacuum pump creates a vacuum in the drum. Times from 1 minute to 99 minutes can be set.

**Display field**

During the execution phase, the vacuum time

In **programming mode,** the required vacuum time (setpoint) is displayed in the massage time display field.

**Key**

In **programming mode,** the massage time key is used to set the vacuum time. If you press the key, the time is incremented.

- **AERATION TIME**


There is no separate function field for this function. The aeration time is set in the function field for pause time.
This is the time during which a connected valve is opened to equalize the pressure in the drum. Times from 1 minute to 99 minutes can be set.

**Display field**

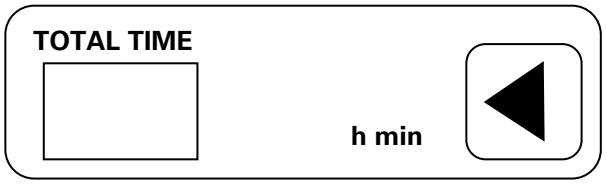
During the **execution phase,** the aeration time (actual value) is not displayed.

In **programming mode,** the required aeration time (setpoint) is displayed in the pause time display field.

**Key**

In **programming mode,** the pause time key is used to set the aeration time. If you press the key, the time is incremented.

**TOTAL TIME**




This field is used to set the execution time. Times between **1 hour and 99 hours or between 1 minute and 99 hours** can be set depending on the software version.

**Display field**

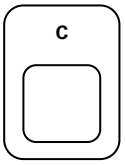
During the **execution phase**, the current time to go is displayed.

In **programming mode**, the requiered execution time is set.

**Key**

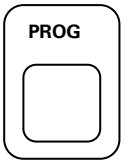
In **programming mode**, the key is used to set the execution time in hours. * or in hours and minutes with certain software versions.

**FUNCTION KEYS**



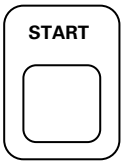

**Correction key „C“**

This key is used during programming to correct values that have been entered incorrectly.



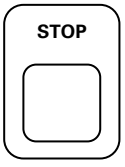

**Programming key „PROG“**

This key is used to select and exit the programming mode.




**„START“ key**

This key is used to start a selected program.




**„STOP“ key**

This key is used to stop or interrupt a running program.

# 2. OPERATING INSTRUCTIONS

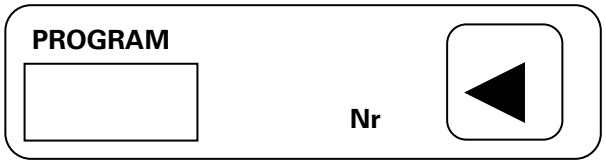
## 2.1 START-UP

The program control is activated when the supply voltage for the connected machine is switched on. Normally the value 0 will be shown in the display fields after a delay of approximately 2 seconds.

## 2.2 PROGRAMMING

**Programs can be programmed and stored under the numbers 01 to 99.**

### 2.2.1 PROGRAMMING PROGRAM NUMBERS 01 TO 49

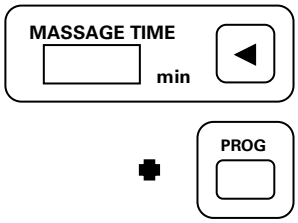



To do this, select the program number that is to be programmed or changed using the „program number“ key.

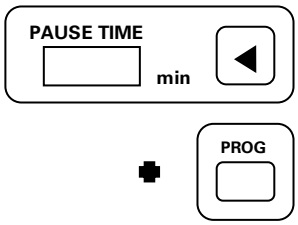
**Note:**

If you habe to correct a value while entering data, you can do this using the „C“ key. Press the „C“ key briefly and then the key of the function block where you want to correct the value. The value 0 appears in the display. You can now enter the new value.

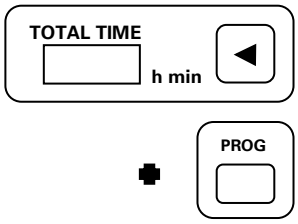
When the decimal point at the units position of the program number lights up, this indicates that values have been entered or changed in that program.




The required **massage time** is entered using the „PROG“ and the „MASSAGE TIME“ keys. **Hold the „PROG“ key down and press the „MASSAGE TIME“ key.**

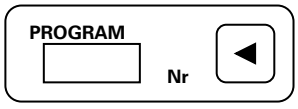



The required **pause time** is entered using the „PROG“ and the „PAUSE TIME“ keys. **Hold the „PROG“ key down and press the „TOTAL TIME“ key.**

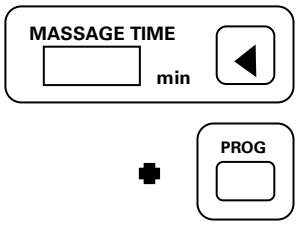



The required **total time** is entered using the „PROG“ and the „TOTAL TIME“ keys. **Hold the „PROG“ key down and press the „TOTAL TIME“ key.**

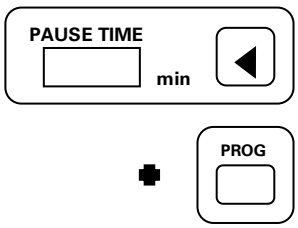
*** On units with vacuum control**, the values for vacuum and aeration time must also be entered. This is done as follows.




**Press the program number key briefly.**
Once the key has been pressed, the „program number“ concerned is still shown in the program number display. The display fields „massage time“ and „pause time“ normally show 0, unless values have already been programmed under this number.




The function field „massage time“ is now used to enter the **vacuum time**.
**To enter the time hold the „PROG“ key down and press the „MASSAGE TIME“ key.**




The function field „massage time“ is now used to enter the **aeration time**.
To enter the time **hold the „PROG“ key down and press the „PAUSE TIME“ key.**

### 2.2.2 PROGRAMMING PROGRAM NUMBERS 50 TO 99

Using these program numbers it is possible to chain up to ten programs. This has the advantage that several programs can be executed one after the other. The following program numbers can be chained:

| | |
|---|---|
| Program numbers | 50 to 59 |
| Program numbers | 60 to 69 |
| Program numbers | 70 to 79 |
| Program numbers | 80 to 89 |
| Program numbers | 90 to 99 |

**Each program number is programmed as described in Section 2.2.1.**

But please **heed the following points:**

- **The program numbers must be adjacent**
  e.g. program number 52,53,54

- **Several program blocks can be chained in one program number block.**
  e.g. in program number block 80 to 89
  Program 80, 81
  Program 83, 84, 85
  Program 87, 88, 89

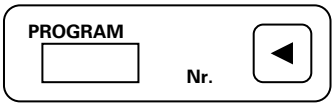
- **A chained program must be terminated by writing the value 0000 into the total time of the next program number.**
  e.g. program numbers 70, 71, 72, 73 are chained if the value 0000 is stored in the total value of the following program number – i.e. program number 74.
  No terminating program number is required if the last program number is also the last program number of the block.
  e.g. program numbers 77, 78, 79 – the program number 79 can be used for a program. 0000 does not have to be stored in the total time of program number 79.

### 2.2.3 PROGRAMMING PROGRAM NUMBER 00

If the program number is 00, data entry is possible without pressing the PROG key. This is used to test programs.

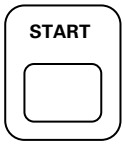
Note:
The values entered only remain stored until the machine is switched off or another program is executed.

## 2.3 STARTING / STOPPING THE PROGRAM




To do this, **select** the **number of the program** you want to start by pressing the **„program number"** key.

### 2.3.1 STARTING THE PROGRAM

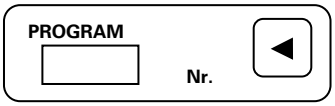



Press the „START" key to start the program.
The decimal point in the display field „Total time" starts to blink at one-second intervals.

During the execution phase, the time currently being executed is displayed.

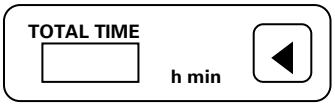
* On certain versions of the unit it is possible to have the program start after a certain time.

### * STARTING THE PROGRAM WITH LEAD TIME

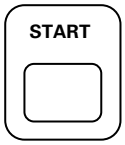



To do this, **select** the **number of the program** you want to start by pressing the **„program number"** key.

Set the required lead time in the display field „total time" using the „total time" key.



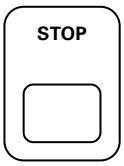

If you press the „total time" key, the two display fields „massage time" and „pause time" are unlit. The program number display remains visible and you can now set the required lead time in the display field „total time".
Depending on the software version, times between **1 hour and 99 hours or 1 minute and 99 minutes** can be entered.



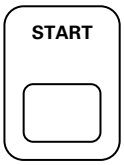

Press the „START" key to start the program.
Once the lead time has elapsed, the actual execution cycle of the set program number is started.

Lead times are not stored and must therefore be entered before every program start.

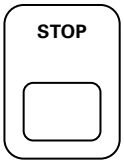
### 2.3.2 STOPPING THE PROGRAM




You can stop a program before the end with the „STOP“ key. After you have pressed the key, the displays start to blink.




You can restart the program from the point where it was interrupted with the „START“ key.




If you want to stop the program altogether, you can do this with the STOP""key.

**Caution !**
**During programs with vacuum control there might still be an underpressure in the drum!**

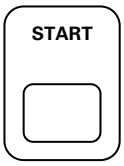
## 2.4 OPERATION AFTER FAILURE OF THE POWER SUPPLY

The program control is equipped with a protective circuit. The values are also saved if the unit has failed during program execution as the result of a power failure (including program number 0).

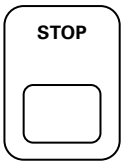
After voltage recovery, the function of the program control depends on the position of the slide switch on the rear of the housing.

In **switch position "1"** ...

After a power failure all values in the displays start blinking.




If you want the program to be executed without change, press the „START“ key.




If you want the program to be stopped press the "„STOP" key.

In **switch position "2"** ...

The program control automatically continues to execute the working cycle after power recovery.

**Caution!**

**With the functions „automatic start after power recovery“ and * “execution with lead time“ the machine is switched on automatically.**

**In both cases, the relevant regulations of the VDE and the Statutory Industrial Accident Insurance Institution or equivalent national institutions must be observed!**

# 3. TECHNICAL DATA

## 3.1 SUPPLY VOLTAGE

The units can be supplied in different versions with different operating voltages.

**Caution!**

**Before connecting the control, compare the supply voltage for the unit with the rating plate! The rating plate is located on the rear of the unit.**

The unit is equipped with an electronic voltage-monitoring function. When the unit is switched on the circuit checks the magnitude of the operating voltage. If it is 10% higher than that stated on the rating plate the unit cannot be switched on.

**Electrical connection values:**

| | |
|---|---|
| **Voltage:** | **24V AC +/-10%**<br>or<br>**220V AC +/-10%** |
| **Power consumption:** | **max. 10VA** |
| **Frequency:** | **49,5Hz to 60,5Hz** |

The operating voltage is connected at the 3-way connector of the unit.

## 3.2 AMBIENT CONDITIONS

**Temperature:**

| | |
|---|---|
| Operation: | -10 to +45 C |
| Storage: | -25 to +70 C |

**Relative air humidity:**

| | |
|---|---|
| Operation: | 10% to 80% without condensation |
| Storage: | 5% to 85% without condensation |

**Shock resistance:**

| | |
|---|---|
| Operation: | up to 0.5 G within 1 ms |
| Storage: | up to 1.0 G within 1 ms |

**Vibration resistance:**

| | |
|---|---|
| Operation: | up to 0,25 G at max. 55 Hz |
| Storage: | up to 0,5 G at max. 55 Hz |

**Weight:** 1,5 kg

## 3.3 HOUSING AND DIMENSIONS

The unit is supplied as a complete unit in a mounting housing ready for connection.

| | |
|---|---|
| **Housing material:** | Acc. To DIN 4370 out of heat-resistant Noryl SE 1 |
| **Colour:** | Black |
| **Mounting:** | Using screw clamps |
| **Dimensions:** | Length: 144 mm<br>Width: 144 mm<br>Depth: 85 mm |

## 3.4 MOUNTING NOTES

When mounting the program control there are some important points to observe. We therefore request you to read this section through before performing any mounting work and to observe the points stated in it.

Check the mounting conditions before mounting the unit. If the operating part (switching cubicle) in which the unit is to be mounted is installed immediately on the machine, ensure that **no vibration** or shocks can affect the unit.

The size of the **cut-out** required to mount the unit is **136.5 mm x 136.5 mm**. These dimensions must be observed precisely to ensure that the unit is seated firmly.

**Concave front doors** must be **straightened**.

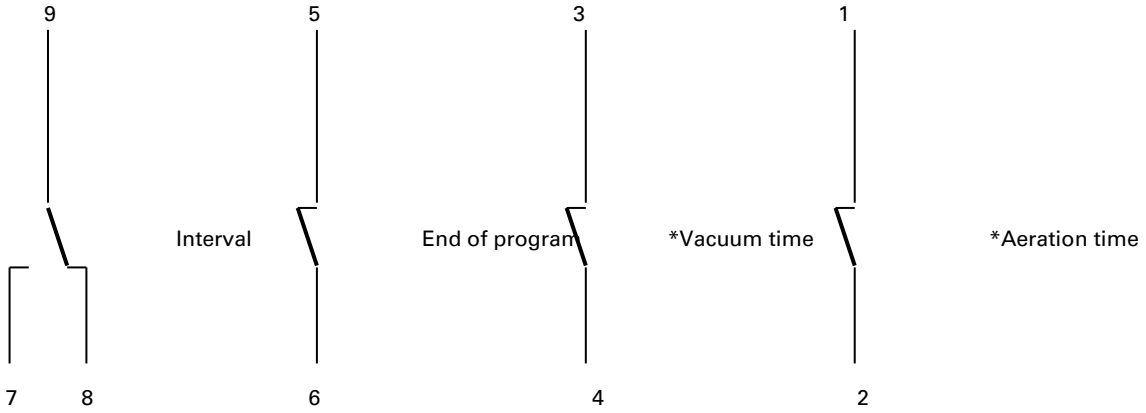
Before mounting the unit insert the **seal** provided **between the front door and the unit**. Fix the unit using fixing clamps.

After mounting, check that the **seal between the unit housing and the front door is good**.

The **ventilation slots** on the left and right side walls and on the bottom of the housing **must not be covered!**

## 3.5 CONNECTION ASSIGNMENT

### 3.5.1 Block diagram




**Drive motor** **End of program** ***Vacuum pump** ***Aeration valve**

### 3.5.2 Outputs

**Isolated relay outputs** (changeover contacts)

**Contact material:** Silver – gold-flashed

**Contact load:**

**Max. switching voltage:** **300V DC / 250V AC**

**Max.switching current:** **1 A**

**Max.switching power:** **200W / 200 VA**

**Note:**

The **standard** version of the unit is equipped with one **interval relay (changeover contact**) and one **end-of-program relay (NO contact).**

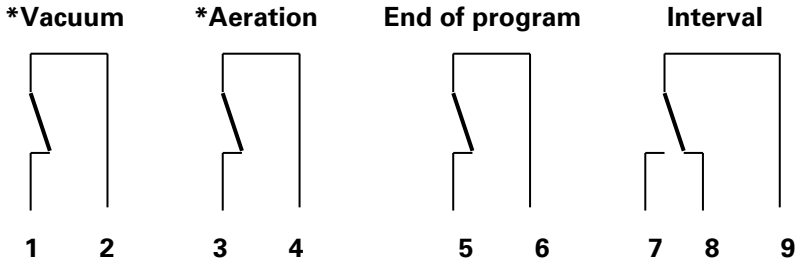
* On the **version with vacuum control**, the unit is also fitted with a **vacuum relay (NO contact)** and an **aeration relay (NO contact).**

Due to the plant-specific differences of individual machine manufacturing companies, there are also a large number of other variations.

A label is stuck over the 9-way terminal block on the rear of the unit in the factory to indicate contact assignments which deviate from the standard.

Any additional or changed functions are indicated in Section "Options and Modifications" where necessary.

**Standard assignment of the 9-way terminal block without and with * vacuum control**




**3.5.3 Rear view**

# 4. GENERAL INFORMATION

## 4.1 MAINTENANCE

**Note:** **The membrane keyboard consists of a high-quality, non-reflective polyester membrane. If the membrane is damaged by improper use, the unit must be sent for repair.**

### 4.1.1 Cleaning

The only preventive maintenance required is to clean the membrane keyboard.
**Before you do this, disconnect the system from the mains power supply to ensure that you cannot start the machine unintentionally.**
You can now clean the front membrane using a mild cleaning agent. Make sure that no liquid enters the unit.

**Caution!** **Do not use coarse cloth or volatile solvents such as alcohol or paint thinners.**

### 4.1.2 Battery back-up

High quality memory components with an integrated lithium battery are used in production. The manufacturer of these components guarantees continuous data storage for at least 10 years.

To prevent loss of data, we recommend sending the unit in for inspection after an operating time of approx. 8 years.

## 4.2 WARRANTY CONDITIONS

Every unit undergoes a stringent quality test before leaving production. Nearly all early failures are detected in intermittent operation. However, it is possible that a component might fail only after a long period of operation. In accordance with the General Conditions of Supply for Products and Services of the German Electrical Industry, we grant a **12 month** warranty on condition that the unit is not modified in any way. In repairs of all types we make every effort not to change or delete the programs entered by the user but we do not guarantee this. The **user must** therefore **check that the programs are correct before starting up the unit. Faults due to improper installation or mounting are not covered by the warranty!**

## 4.3 REPAIR AND COMPONENT REPLACEMENT SERVICE

For warranty claims, repair and component replacement service, we recommend our in-house facilities. We provide first-hand service with short delivery times. If you have a claim, attach a note to the housing of the unit with a brief description of the fault. Then add your name and telephone number and we will be able to deal with your claim quickly. We recommend use of the original packaging when sending units be post, rail or road.

## 4.4 TRANSPORT DAMAGE

It is advisable to inspect the unit for mechanical damage and loose parts inside immediately after unpacking it. If transport damage is found, inform the carrier immediately. In case of doubt, ask the supplier.

## 4.5 SAFETY INFORMATION

**Please read the information in the instructions and mounting notes carefully before starting up the unit. This information is important for the installation, operation and maintenance of the unit.**

**Keep the operating instructions in a safe place for possible subsequent owners.**
**The manufacturer accepts no liability if the following instructions are not observed.**

| | |
|---|---|
| **Packaging** | Dispose of the packaging material in a proper manner. |
| **Use** | **Only use the unit for its specified purpose.** |
| **Mounting** | **Observe the installation instructions** - see the description Section 3.3. If the unit has to be remounted after repair or inspection, make sure that the seal between the housing of the unit and the front door of the switchgear cubicle is good. **Worn or porous rubber seals must be replaced.** |
| **Electrical connection** | **The electrical connection conditions and specifications must match those on the rating plate.**<br>**Electrical connection, start-up, possible measurements during repair and fuse replacement must only be performed by a trained electrician who is aware of the dangers involved.**<br>**Caution!**<br>**Before opening and closing the housing, the unit must be disconnected from all voltage sources.** |
| **Unit fuse** | **Before replacing or checking the fuse element, disconnect the unit from the mains power.**<br>**Do not on any account use fuse elements with a higher current rating than that specified!** |
| **Ventilation slots** | To avoid heat accumulation in the unit, ensure that the ventilation slots in the right-hand and left-hand side walls and in the bottom of the housing are never covered. |
| **Humidity** | All the printed circuit boards in the unit are covered with protective paint in the factory. This affords them better protection from humidity than conventional boards.<br>However, despite this preventive measure, we strongly advise you not to allow liquid of any kind to enter the housing through the ventilation slots of the unit. |
| **Used units** | Units taken out of service must be rendered unusable immediately .... |
| **Disposal** | and disposed of in the proper manner. |

**Subject to changes due to technical advance without prior notice.**

**This description is for information only and is not binding unless expressly confirmed by us in writing.**
**We reserve the right to change the specification, version, price and delivery time of the product described at any time.**

**Our contribution to the protection of the environment - we use recycled paper.**

# 5. Options and Modifications

## View of display