

MANUAL
CMA-79



WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

CONAIR MARTIN

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1. Introduction

This manual is for CONAIR MARTIN'S 79 granulators, where

A = Screw feed (Auger)



This manual **must** be studied carefully before installing and using the equipment, in order to prevent personal injury and damage to the machinery.



Always take great care when the knives are within reach, since they are very sharp and can cause personal injury.

CONAIR MARTIN granulators are built for granulation of injection moulded, blow moulded or extruded plastic waste where the granulator's size and performance corresponds to the type of waste. For any other products or materials, approval must be obtained from the dealer or head-office in order for the conditions of the guarantee to remain valid.

The different types of granulator are designed so that maintenance and cleaning can be carried out quickly and simply, both during routine maintenance as well as when changing colour or material.

All servicing work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing the granulator. Chapter 7, which contains servicing instructions, is intended for service engineers. Other chapters contain instructions for the daily operator.

Delivered with the granulator are a manual, tool kit and touch-up paint.

Any modifications, changes, or rebuilding of the granulator must be approved by CONAIR MARTIN in order to avoid personal injury and damage to machinery and to ensure that the documentation remains correct.

If you have any questions, please contact your local dealer or our head-office.

2. Technical specifications

2.1 Dimensions

See chapter 10, Layout.

2.2 Data

Serial Number _____

Motor power _____

Capacity _____

Voltage _____

Screw inlet port _____

Fixed knives _____

Screen _____

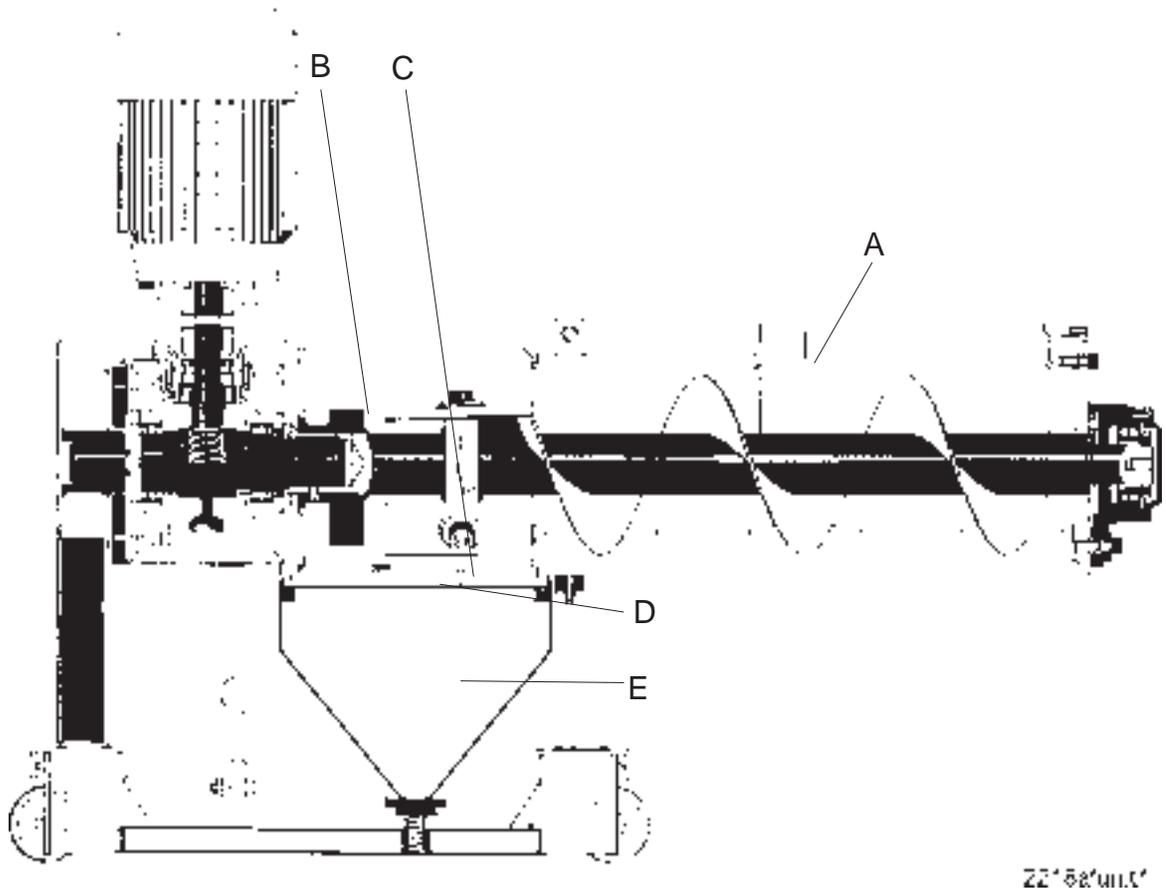
Weight _____

3. Functional description

3.1 Overview

The 79 granulator is designed for grinding different types of plastic waste.

The granulator is controlled from an electrical cabinet with a start/stop function and an emergency stop button.



The material is fed into the hopper (A) and is pushed towards the rotor. The rotor's knives (B) grind the material against the fixed knives (C) in the cutter housing. Both the fixed and rotating knives can be changed or re-sharpened when necessary. The sharpening is carried out in a special fixture outside of the granulator.

Under the rotor is a screen (D) through which the granulate passes before it comes down into the granule bin. The screen is available with various hole sizes depending on the required degree of coarseness of the granulate.

The granulated material is then collected in the granule bin (E). On the standard model, the operator must take out the granule bin to empty it. As an option, the granulator can be fitted with a suction blower which sucks the granulate out of the granule bin.

The granule bin, screen and screenbox are designed so that they can be easily released when cleaning.

3.2 Safety system

Since there are rotating knives inside the granulator, there is a built-in safety system to prevent personal injury.

Emergency stop: The equipment is fitted with an emergency stop switch on the control panel. The emergency stop is activated by pushing the button. It is reset by turning the button in the direction of the arrow (anti-clockwise).

Safety switches: The safety system includes 2 safety switches. The switches are located as follows:

- 1 by the hopper
- 1 by the screenbox

The system is designed so that when the screenbox is pulled out a safety switch is actuated which cuts off the power so that the rotor and screw stop before the screenbox can be opened.

Similarly, for the hopper, a safety switch is actuated by a loop being pulled out of the switch and breaking the electric circuit when the locking clamp is pressed down and the inlet funnel or protective cover is released.

4. Safety regulations

4.1 Overview

CONAIR MARTIN granulators are built for granulation of injection moulded, blow moulded or extruded plastic waste, which must not exceed the granulator's size and performance as described in chapter 2.

The granulator is equipped with safety switches to prevent the front door and the hopper from being opened during operation. The following safety measures should always be observed when handling the granulator:



- **WARNING! High Voltage! The electrical installation work must only be carried out by authorised personnel!**



- **Always switch off the power supply using the main circuit-breaker (on top of the electrical cabinet) before opening the granulator. WARNING! High voltage remains on the incoming phase's connection block and up to the main circuit-breaker!**



- **Never put any part of your body into any openings on the granulator unless the main circuit-breaker is in the "OFF" (=0) position.**



- **Always be careful when the knives are in reach since they are very sharp. When the rotor has to be rotated manually, this must be done with the greatest care!**



- **Be careful when the hopper and screenbox are opened and closed so that no part of your body gets caught.**
- **The granulator cannot be started until the screenbox and the hopper are locked.**



= **WARNING! High Voltage!**

This sign is placed on the electrical cabinet's door and any connection boxes.



= **WARNING! Risk of being cut or caught in the machinery!**

This sign is placed as necessary next to dangerous parts, for example the hopper and screenbox.

As long as the instructions in this manual are followed carefully, there should be no other dangers.

5. Installation



All instructions must be carried out in the order described, to prevent personal injury or damage to machinery.



Always take great care when handling the knives since they are very sharp and can cause personal injury.

The granulator should be connected to the mains supply by an authorised electrician.

5.1 Pre-start checks

- Before the granulator is installed, the rust preventive should be carefully cleaned from the parts which are not painted or rustproof.
- Check the knife clearance and tightening torque on the attachment bolts for the knives.

5.1.1 Two hours after first start

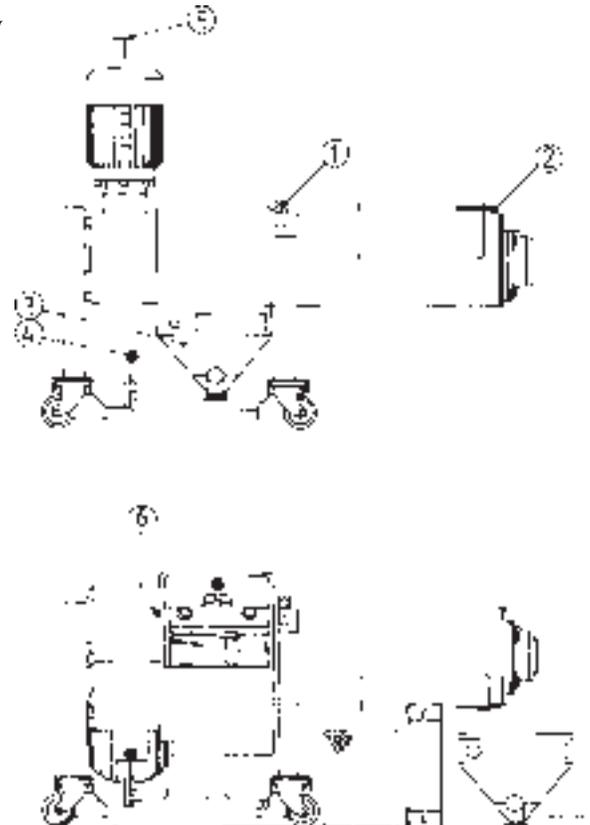
Check the knife clearance again and tightening torque of the attachment screws for knives; check the attachment screws for both the fixed and rotating knives.

5.2 Opening and closing the hopper and screenbox

Screenbox:

The screenbox is held in place by a spring-loaded hoisting mechanism, which is manoeuvred using the bar (4). Release the screenbox by moving the bar until it is horizontal.

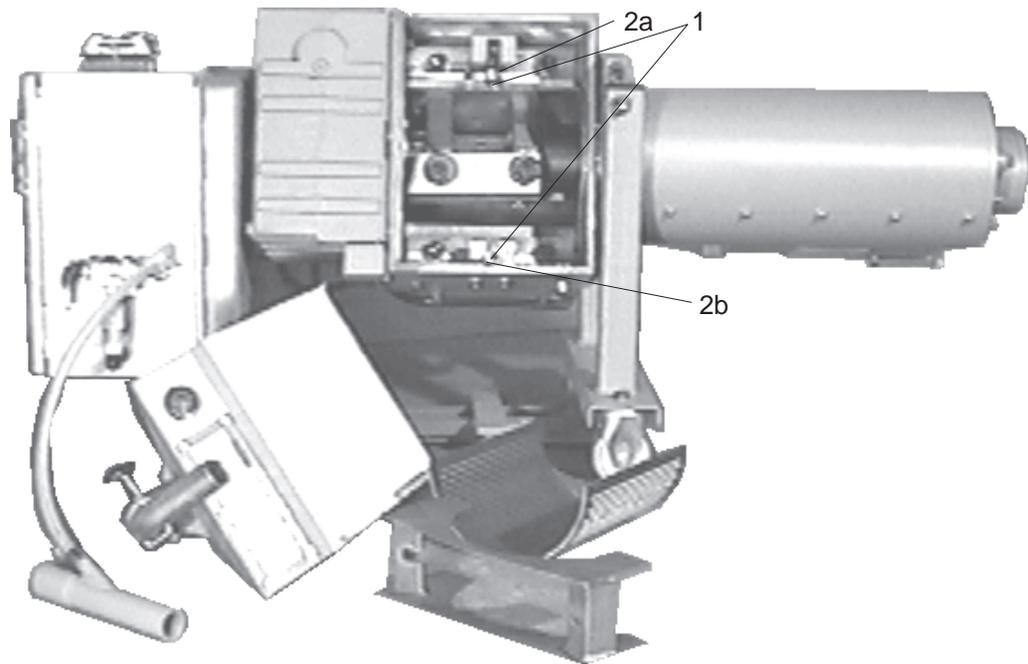
1. Pull out the granule bin (3). A safety switch on the back of the granulator is then activated, which breaks the current to prevent the machine from being started with the screenbox open.
2. Loosen the socket-head nut at the top of the clamping ring (1). Turn the granulator, by using the motor as a lever, to the position shown in the figure opposite. Simultaneously put your weight against the motor so that the granulator does not turn freely and damage the blower motor.



Contd.

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3. Loosen the two collar nuts (1) which retain the screen holder.



4. Lower the link screws (2a, 2b) against the screen and lift out the screen holder.
5. Lower the link screws against the inside (as for 2b) of the cutter housing and lift out the screen for cleaning or changing the knives.

Hopper:

1. Release the protective cover or inlet funnel by pushing down the locking clamp (2) and pulling the funnel axially over the locking clamp. The safety switch's locking clamp is released, which cuts off the current to the screw motor and prevents the granulator from being operated with the hopper open.

5.3 Electrical connection



The granulator should be connected up by an authorised electrician.

Connect the granulator to the mains supply. See Electrical scheme, chapter 9, connecting (Q1).

All connected electric motors have been set up with the intended rotation direction by setting up the internal electrical connection for clockwise rotating field.

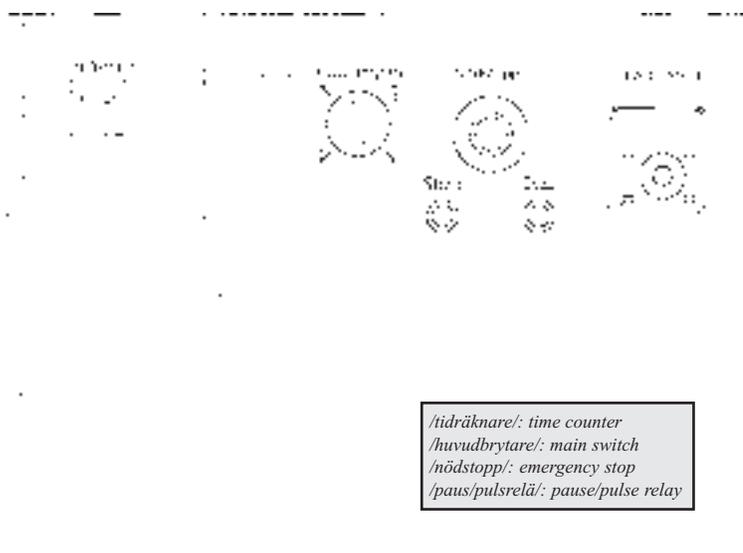
- Using a phase-sequence indicator, check that the incoming phases are connected to the granulator so that the intended, clockwise rotating field is maintained.

6. Operation and daily maintenance

6.1 Starting and stopping

The start and stop functions are controlled by a push-button on the electrical cabinet.

NOTE: The granulator should not be stopped until it has finished grinding all the material in the hopper and cutter housing. Any remaining material can slow down the rotor when it is re-started which can overload the motor and trigger the overload protector.



6.2 Inspection

There should **not** be any material in the granulator when the inspection is to be carried out.

6.2.1 Daily inspection

- **Emergency stop.** Check the emergency stop function by starting the granulator and then stopping it using the emergency stop button. The emergency stop is reset by turning the emergency stop button in the direction of the arrow. The machine can then be re-started by pressing “START”.

6.2.2 Weekly inspection

- **Cables.** Inspect all cabling in the machine to see that there is no wear or other damage. For reasons of personal protection, damaged parts should be replaced immediately.
- **Safety switches.** There are 2 safety switches, 1 for the locking clamp by the screw feed, and 1 for the screenbox:

Screenbox: Check the safety switch by loosening the granule bin as described in chapter 5.2. It should not be possible to start the granulator until the hoisting mechanism's bar has been set in a vertical position after the granule bin has been put into place.

Hopper: Open the hopper as described in chapter 5.2, but close and lock the granule bin. Check the safety switch to the hopper by starting the granulator. It should not be possible to start the granulator until the hopper is closed and the locking clamp is back in position.

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6.3 Cleaning



NOTE: Set the main circuit-breaker to position "0" when cleaning the granulator. Empty the granulator of all material before re-starting.



Always take great care when handling the knives since they are very sharp and can cause personal injury.

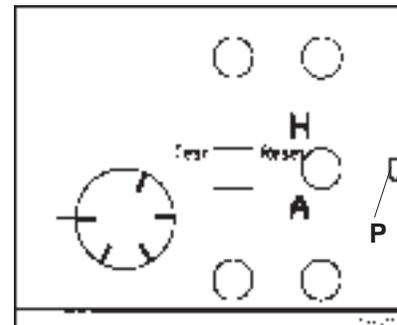
1. Open the hopper and screenbox as described in chapter 5.2.
2. Clean the hopper, screen and granule bin.
3. Clean the cutter-housing and inside the stand.
4. Be sure to clean the groove (6) between the gear and cutter housing and remove any material which may get into the gear.
5. Replace all parts in reverse order.

Note: Steps 2 - 5 should be carried out every time the machine is cleaned, or at least once every 300 hours.

6.4 Trouble-shooting

6.4.1 If the granulator does not start

- Check that the safety switches' break loops are completely pushed in.
- Check that the emergency stop is not activated. It can be reset by turning the button in the direction of the arrow.
- The bimetal relay F1 in the electrical cabinet, according to the diagram opposite, is released if you press stop or overload the granulator. This is indicated by the small green rectangular pin (P), which sticks up above the surface of the bimetal relay. When you reset by pressing the "Reset" button, the pin (P) is pushed back in so that it is level with the surface of the bimetal relay.



7. Servicing

All servicing work should be carried out by a qualified service engineer and in the order described, to prevent personal injury or damage to machinery.

7.1 Changing the knives

When changing the knives, also check for any wear to the screen. For safety reasons, this should be replaced when the holes in the screen become drop-shaped.



Always take great care when handling the knives since they are very sharp and can cause personal injury. Use protective gloves!

7.1.1 Changing the fixed and rotating knives

For safety reasons, damaged screws *must* be replaced.

- Open the granulator as described in chapter 5.2.

Disassembling the rotating knives (G):

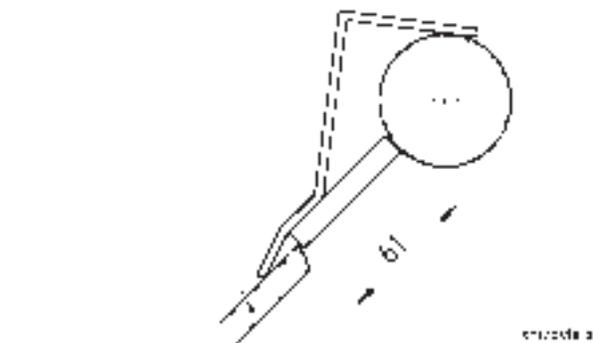
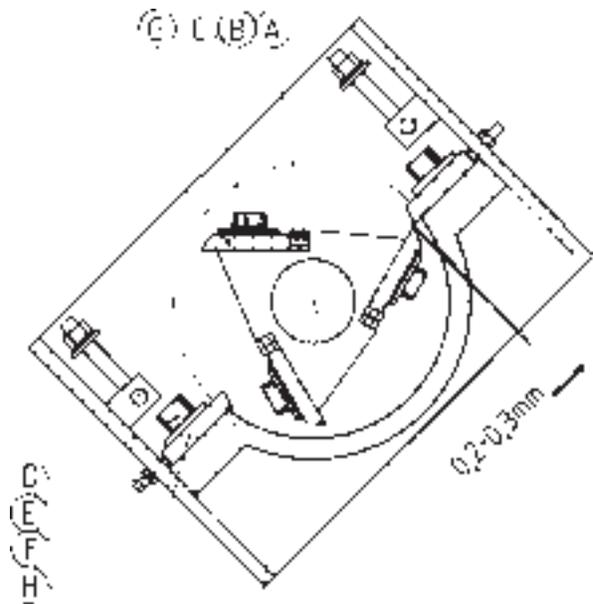
1. Remove the fastening screws (C) and washers.

Disassembling the fixed knives (H):

1. Remove the screws (D) and washers.

Assembling the lower fixed knife:

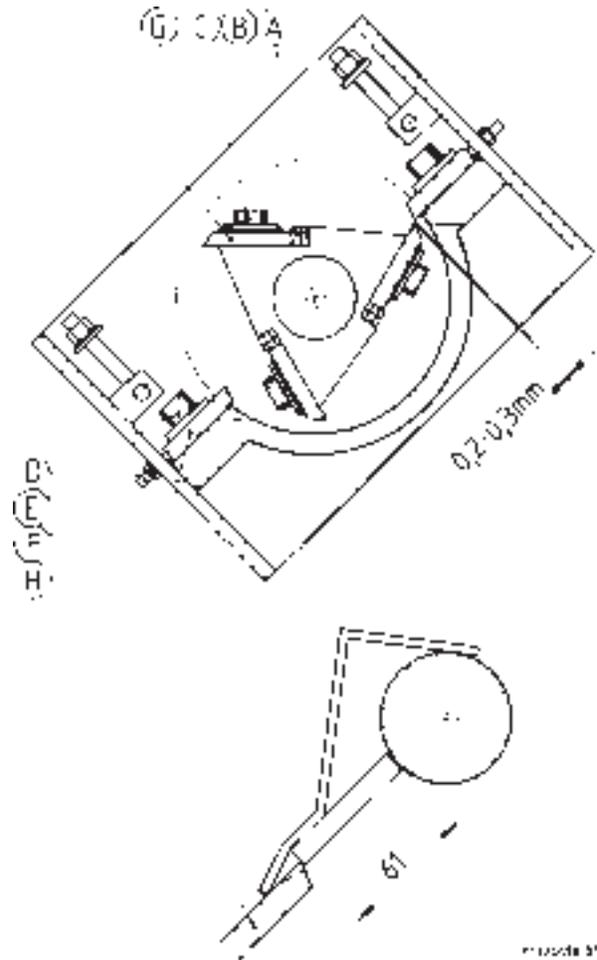
1. Check that the knives and the grooves where the knives are to be placed are free from plastic waste, grease, etc.
2. Place the lower fixed knife in position and gently tighten the screws (D) with washers.
3. Position the fixture for adjusting the lower fixed knife and push the knife's edge against it.
4. Tighten the screws (D) so that the knife does not move and release the fixture.
5. Tighten the screws (D) using a torque of 220 Nm.



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Assembling the rotating knives

1. Clean the cutter's knife location and place a rotating knife there.
2. Screw in the fastening screws (C) with washers and gently tighten the screws. **NOTE:** Check that the washers do not bear against the fixed knives.
3. Adjust the knife using the setting screws (B) until the correct amount of play, 0.20 - 0.30 mm, is obtained between the fixed and rotating knife. Using the feeler gauge included in the tool kit, check the amount of play.
4. When the correct amount of play has been obtained, tighten the screws (C) using a torque of 220 Nm.
5. Set the other rotating knives in place in the same way. To turn the cutter easily, use the socket-head screw in the motor shaft.



Assembling the upper fixed knife

6. Push the upper fixed knife into its groove.
7. Turn the cutter so that the rotating knife's cutting edge is directly in front of the upper fixed knife's cutting edge.
8. Adjust the fixed knife using the setting screws (F) until the correct amount of play, 0.20 - 0.30 mm, is obtained.
9. Tighten the screws (E), 5 pcs, along the upper long side, and the two that were loosened on one short side.
10. To ensure that the knife's setting on the cutter does not change, turn the setting screws (B) back 1/6 turn and hold in this position while tightening the locking nuts (A). Then tighten the locking nuts (E) on the setting screws for the fixed knives.
13. Using a feeler gauge, check the distance between the fixed and rotating knives. The distance should not fall below 0.20 mm.

7.2 Sharpening the knives



Always take great care when sharpening the knives since they are very sharp and can cause personal injury.

7.2.1 Overview

NOTE: Use the services of a skilled person when re-sharpening the knives and only sharpen the edges marked with the special sign! (see diagram under 7.2.2 and 7.2.3)

The knives must be sharpened so that the correct grinding angles are obtained, otherwise the granulator will not operate effectively with lightly cutting knives.

During sharpening, the knife must be cooled the whole time with plenty of water and must definitely not burn or start blueing on the edge since this means that the knife lacks durability and stability. If this occurs, the knife cannot be repaired by further grinding down or grinding away of the blued or burnt colour. The tempered knife may have deep deformations with possible cracking as a consequence.

The following instructions apply only if you are using CONAIR MARTIN'S sharpening fixture SF 79. The sharpening fixture is intended for use in a surface grinding machine and should be fixed on a magnetic board.

7.2.2 Sharpening the fixed and rotating knives

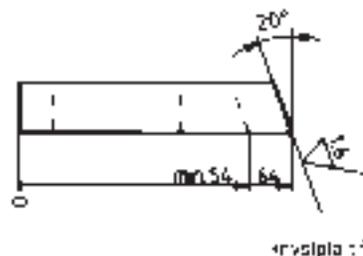
Fixed knives:

NOTE: Only the surfaces marked with the special sign should be sharpened. The specified measurements apply when sharpening the knives.

- The fixed knives are fastened as shown in the figure opposite (A) and the relief angle, 20° , is sharpened.



- The knives can be sharpened only as much as is shown in the figure opposite. After that, they are worn out and should be replaced by new ones in order for the granulation to be effective.

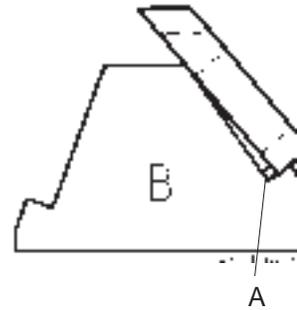


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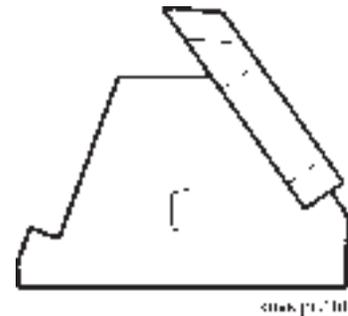
Rotating knives:

NOTE: All rotating knives should be sharpened equally so that the cutter does not become unbalanced.

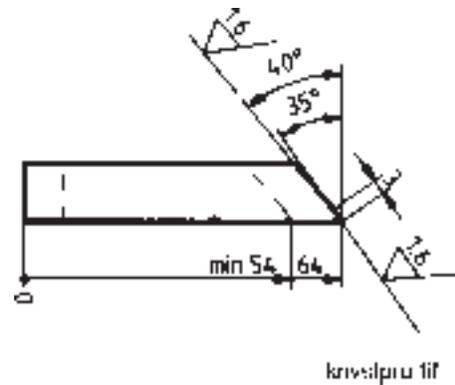
- The rotating knife is fastened with the stirrup (A) under the lower part of the knife, as shown in the adjacent figure, right part. Ball washers should be used when tightening. In this position the secondary relief angle, 40° , is sharpened.



- Loosen the screws and remove the stirrup (A), fasten the knife again. In this position the primary relief angle, 35° , is sharpened.



- The knives can be sharpened only as much as is shown in the adjacent figure. After that, they are worn out and should be replaced by new ones in order for the granulation to be effective.



7.3 Disassembling/assembling the screw

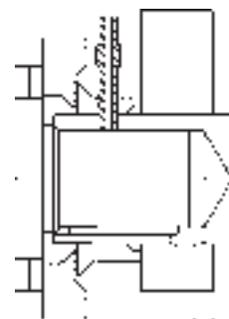
7.3.1 Disassembling

- Release the cover on the bearing housing.
- Straighten the locking lug on the folding washer and loosen the KM-nut on the clamping ring.
- Tap the KM-nut so that the clamping ring releases from the shaft.
- Lift away the end cover and place an extractor (1) there.
- Screw in the screw (2), which should reach at least 15 mm in the thread in the granulator screw.
- Alternately tighten the lifting screws (3) so that the whole time the extractor is parallel with the end of the cutter housing. To reduce the pulling force, pressure oil can be used as described below.



Disassembling the screw using pressure oil

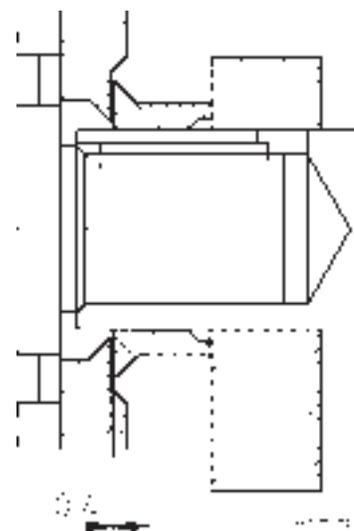
In the screw shaft close to the worm gear unit there is a plugged hole for connecting to a pressure-oil pump, for example a separate pump to a hydraulic jack. In this way, oil is pumped into the shrinkage fit via an oil duct, which means that considerably less force is required to pull the screw from the gear.



7.3.2 Assembling

Before assembling the screw, the shaft and hole should be dry and clean. The shaft is sprayed with Molykote anti-slipping lacquer.

- Place two 0.2 mm feeler gauges together between the seal-ring and the cutter housing so that the distance between these is 0.4 mm.
- Heat the screw shaft to 225 °C and place it on the gear shaft.
- Cool the screw shaft with cutting fluid until it has cooled down to under 100 °C.
- Release the feeler gauge and fit the end cover.
- The ball bearing is locked in the middle of the bearing housing in axially in such a way that the bearing can take up the axial change as a consequence of the generation of heat in the granulator.
- The bearing is locked on the clamping ring by a KM-nut, which is locked with the folding washer.



7.4 Lubrication

The bearing is delivered filled with grease and, under normal running conditions, needs to be lubricated after 10,000 hours or every other year with grease of type Castrol Spheerol APS-2 or similar quality.

When delivered, the gears are filled with an oil which is especially intended for worm gear units. The oil is synthetic and **must not** be mixed with mineral oils. Normally it should not need to be replaced. With this oil the gears can be used in an ambient temperature between -30 °C to +30 °C.

OIL:

Shell Tivela WA

BP Energol SGR 150

Mobil Glygoyle 22

Castrol Alpha SN 6

Nynäs NP 797

Texaco Synlube SAE 90

QUANTITY:

Worm gear unit 2.2 kW = 1.1 l.

Worm gear unit 3.0 kW = 1.8 l.

8. Spare parts list

8.1 Overview

Only use spare parts from CONAIR MARTIN when replacing machine parts. Orders should go to the representative in the country where the machine was purchased.

When ordering, the following should be specified:

- machine designation, as specified on the machine plate
- serial number, as specified on the machine plate
- article number, as specified in the spare parts list
- quantity, as specified in this spare parts list.

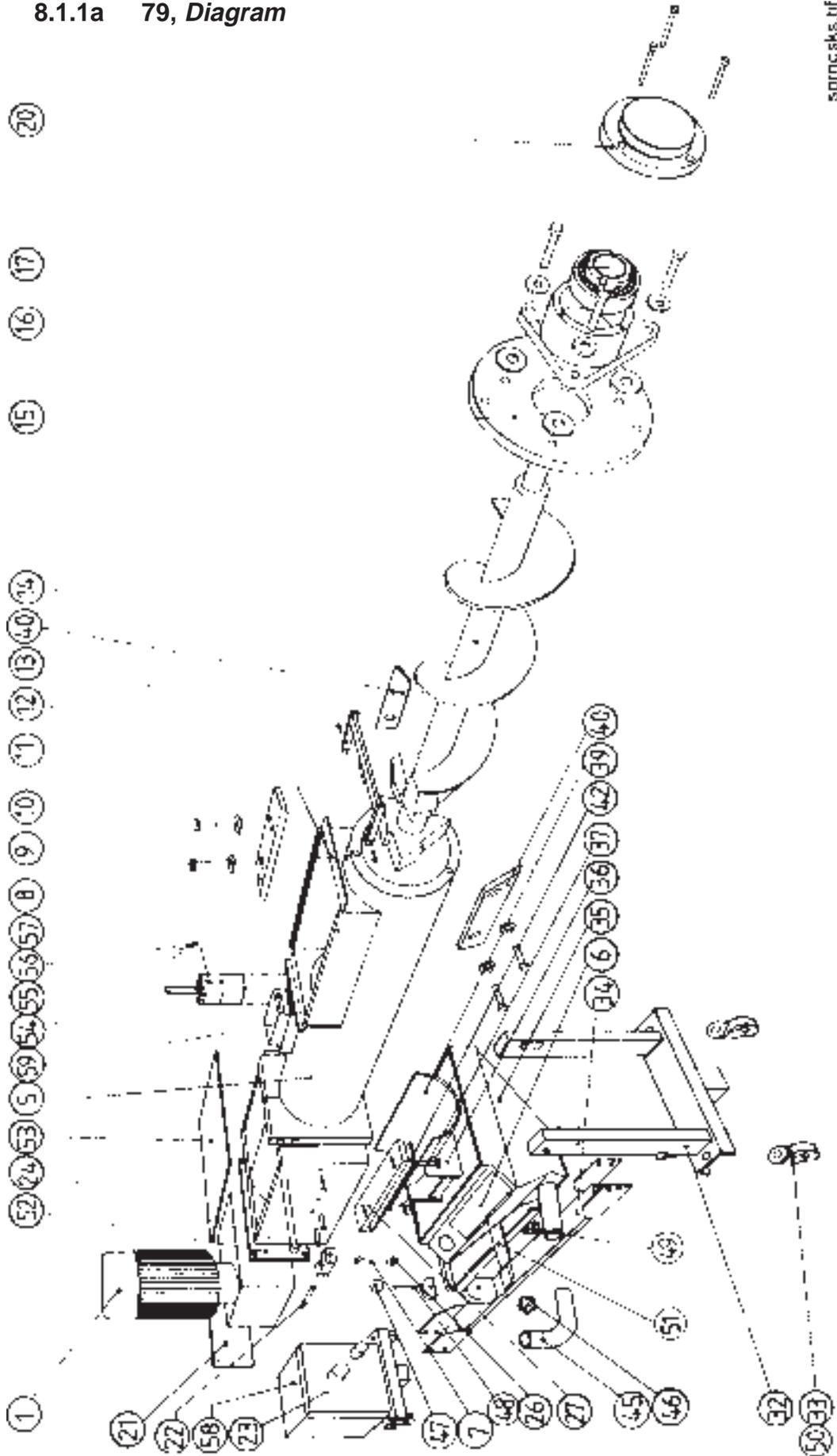
Each module illustrates a particular part of the granulator.

The granulator is divided into the following modules:

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8.1.1a 79, Diagram



springaks.tif

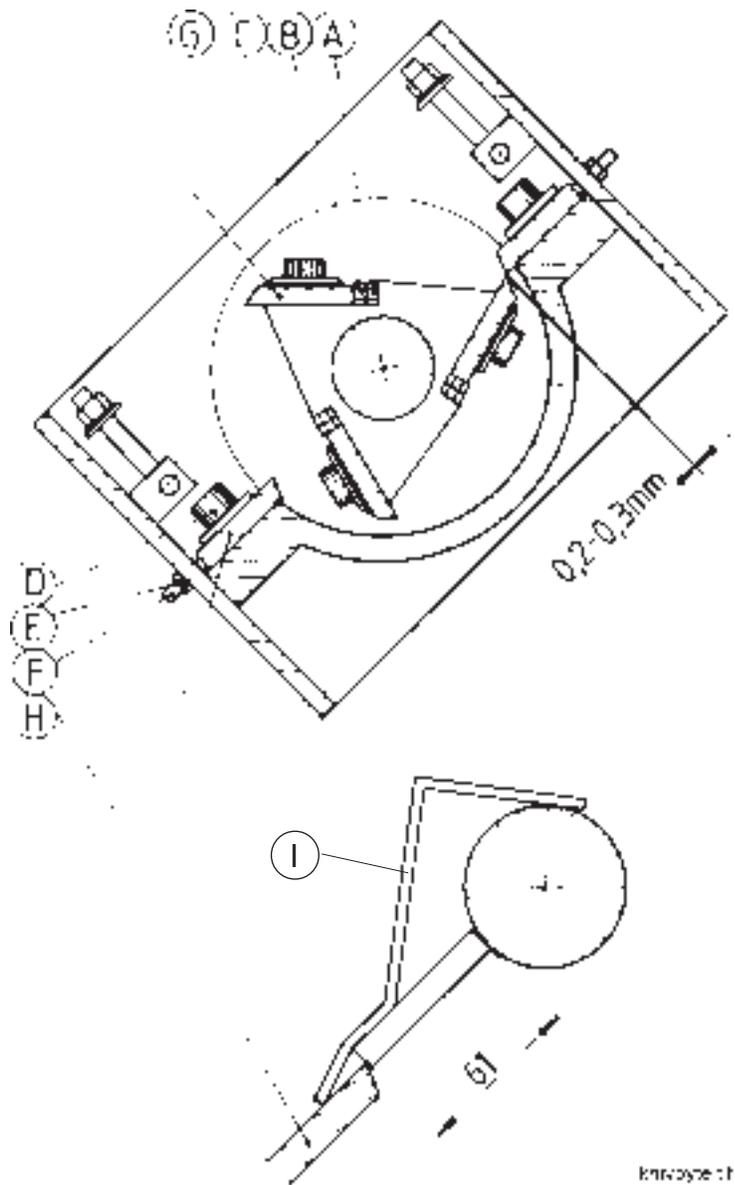
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8.1.1b 79, Table

	Pos. Qty.	Part no.	Pos. Qty.	Part no.
1	1	9-10478	34	2-09068
	1	9-10555	35	2-09035
5	1	1-11142	36	2-08754
6	1	3-09043	37	9-40177
7	2	9-50203	39	3-08780
8	1	3-11139	40	3-11140
9	6	9-40165	42	4-10462
10	6	4-08788	45	3-09076
11	1	9-50210	46	9-50353
12	1	3-08774	47	9-50014
13	2	4-10471	48	4-09031
14	1	1-08746	49	9-50238
15	1	2-08734	50	9-50148
16	1	9-60040	51	2-09029
17	1	9-60026	52	3-09069
20	1	4-09023	53	3-23588
21	1	3-09067	54	3-09546
22	2	4-08778	55	4-09547
23	1	16,401	56	9-50245
24	2	4-08744	57	9-91255
26	2	9-40368	58	9-11033
27	2	3-11138	59	9-11002
32	1	2-08759		
33	2	9-50147		

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8.1.2 79, Knives, fixed and rotating



Pos.	Qty.	Part no.
A	6	9-40203
B	6	9-40150
C	6	9-40165
D	4	9-40134
E	4	9-40045
F	4	9-40172
G	1	3-11139
	2	3-11140
H	2	3-11138
I	1	3-08786

9. Electrical scheme

The following components can be included in the standard electrical equipment for granulators in the 79 range.

B1	Level control, capacitive
F1	Over-current relay for granulator motor
F2	Over-current relay for blower motor
F14	Automatic circuit breaker for auxiliary transformer
F15	Glass-tube circuit breaker for auxiliary supply
H1	Pilot light
K1	Auxiliary relay
K2	Main contactor #1
K3	Main contactor #2
K5	Contactora for blower motor
K8	Pause-pulse relay for Air Veyor
K9	Auxiliary relay, level control
P1	Hour counter
Q1	Main circuit-breaker
S1	Emergency stop
S2	Stop button granulator
S3	Start button granulator
S5	Safety switch
S6	Safety switch
S7	Safety switch
T1	Auxiliary transformer
X1	Connection blocks
X2	Adapter for blower
X5	Adapter for level control
YV1	Magnetic valve for Air Veyor
Z1	Time delay when starting granulator

11. Options

11.1 Overview

Only use spare parts from CONAIR MARTIN when replacing machine parts. Orders should go to the representative in the country where the machine was purchased.

When ordering, the following should be specified:

- machine designation, as specified on the machine plate
- serial number, as specified on the machine plate
- article number, as specified in the spare parts list
- quantity, as specified in this spare parts list.

Each module illustrates a particular part of the granulator.

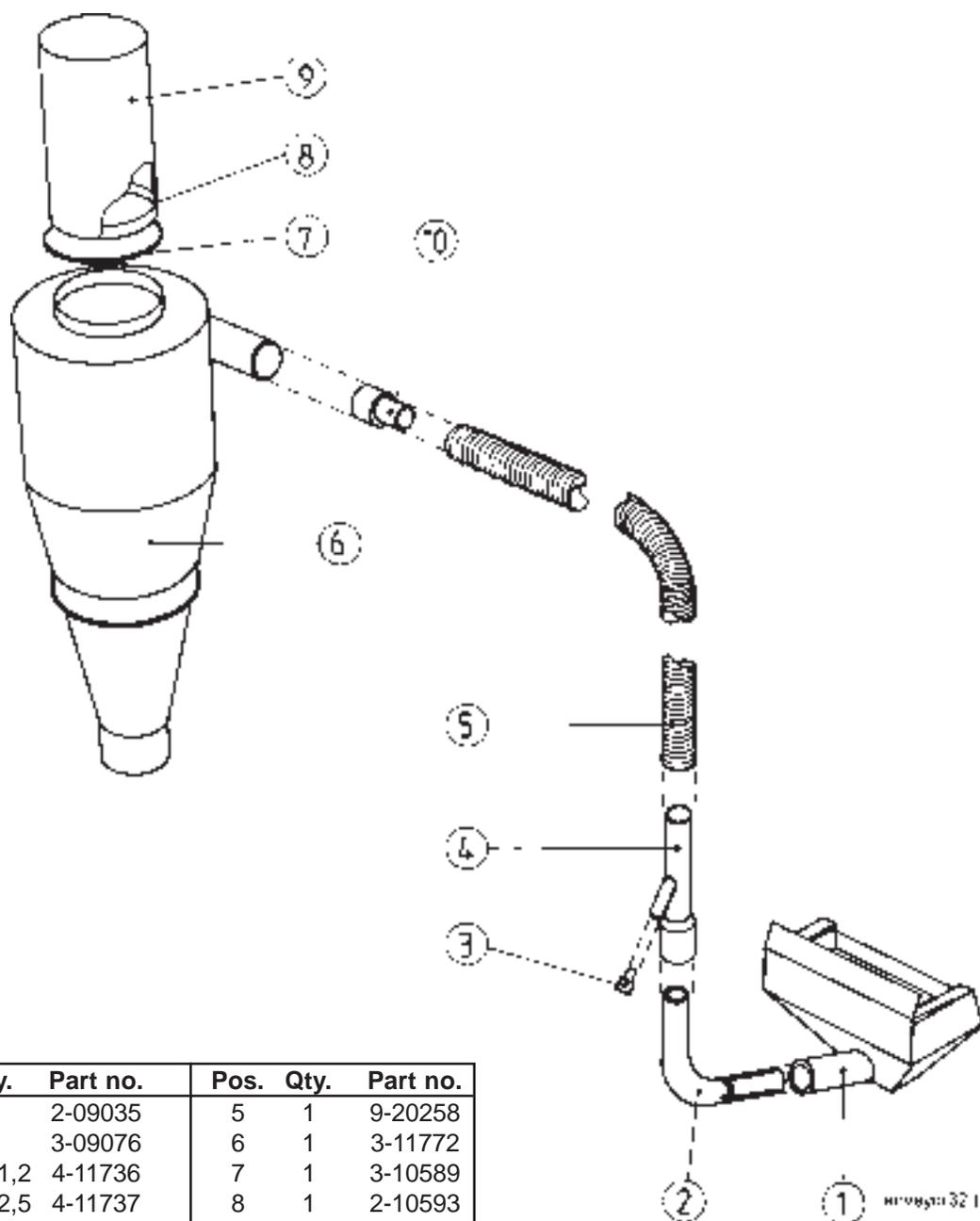
The granulator is divided into the following modules:

The following options are described:

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11.1.1 79, Air-veyor 32



Pos.	Qty.	Part no.	Pos.	Qty.	Part no.
1	1	2-09035	5	1	9-20258
2	1	3-09076	6	1	3-11772
3	1 → 1,2	4-11736	7	1	3-10589
	1 → 2,5	4-11737	8	1	2-10593
	1 → 2,8	4-11738	9	1	9-20480
	1 → 3,4	4-11739	10	1	4-05894
4	1	3-11733			

11.1.2 Pause/pulse relay when emptying with Air-veyor

In those cases when emptying of the granule bin with an air veyor has been chosen, the pause/pulse relay should be cancelled to prevent a glut in the granule bin.

When delivered, the relay is preset as follows:

$$T1 = \text{range } 1 - 10 \text{ m}$$

$$T2 = \text{range } 6 - 60 \text{ s}$$

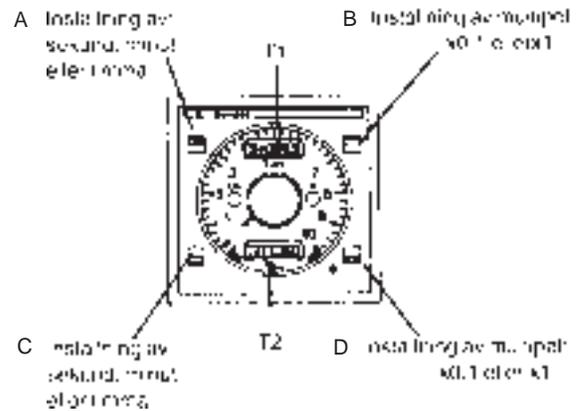
where

Pause time T1 (the time the air veyor is idle) is selected using switches (A) and (B). Then the time is set using the handwheel

$$T_{\text{off}} = T_1.$$

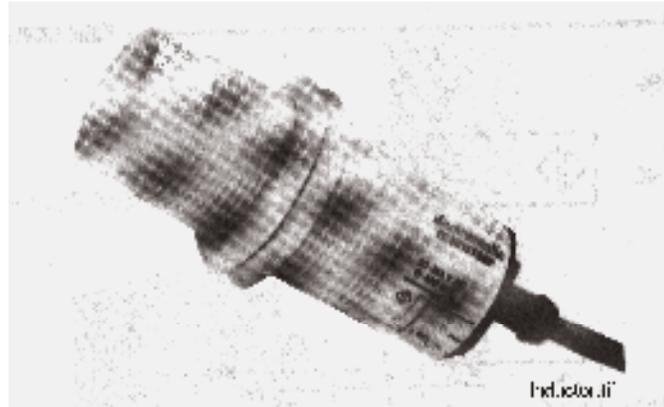
Delay time interval T2 (the time the air veyor is working) is selected using switches (C) and (D). Then the time is set using the handwheel $T_{\text{on}} = T_2$.

TIDSINSTÄLLNING:



- A Setting of: seconds, minutes or hours
- B Setting of multiples: x0.1 or x1
- C Setting of: seconds, minutes or hours
- D Setting of multiples: x0.1 or x1

11.1.3 Level control, capacitive



Pos.	Qty.	Part no.
1	1	9-10527

Setting the sensitivity

- Pull out the granule bin and fill it to the desired level.
- On the back of the capacitive level control there is a trimming screw. Turn this until the LED just lights up.
- Turn the trimming screw back so that the LED just goes out. The sensitivity is then set.
- Empty and replace the granule bin and connect the air-veyor's nozzle.

12. Transporting and storing

12.1 Overview

Handling and transporting of the machinery should be carried out by specially trained personnel.

The machine is packed in weather-proof and partly shock-proof plastic sheeting. It is fixed with straps to a pallet for transportation.

12.1.1 Unpacking and checking

- Check that the machine has not been damaged in transit. Report any damage to the forwarder.
- Do not unpack the machine until it has been moved to its installation location.
- After unpacking, check that the delivery is complete by checking against the delivery note.

12.1.2 Lift and transport to installation location

For information about the machine's weight, refer to chapter 2, Technical data.

For information about the space required, refer to chapter 10, Layout.

The machine can be lifted and handled using a fork-lift truck.

12.1.3 Placing at the installation location

See chapter 5, Installation.

12.2 Storing

Normally, the machine is pre-packed for transport to the installation location where it is to be put into operation immediately. Therefore, it is only protected with rust-preventive oil.

12.2.1 Long-term storage

- The machine should be kept in a storage area with constant temperature and humidity.
- Before storing for a long time, the machine should be given a coating of long-term rust preventive, for example Castrol DWX 160 with durability 24 - 36 months in a suitable storage area.

12.2.3 Preservation

The machine is protected with rust-preventive oil Castrol DWX 22 on all surfaces which are not painted or rust-free.

12.2.4 Durability

The rust protection from the rust-preventive oil Castrol DWX 22 is effective for up to 12 months if the conditions described in 12.2.1 are fulfilled.