

# Operating instruction for the fully equipped Injector

## IR 56



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User  
Manual  
IR 56

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# 1. Safety instructions

The safety instructions have to be observed during the installation, operation, cleaning and servicing of the Rühle Injector type IR 56.

## 1.1 Safety hints

!!! The operating manual has to be read by the supervising personal before installation, operation, cleaning or servicing. The supervising personal has to make sure, that the operator as well as the persons cleaning and servicing the machine, have read and understood the operating manual.

!!! The operator has to operate the machine as directed and strictly pay attention to all points of the operating manual. The supervisor has to write an instruction for the intended use of the machine.

!!! Before starting up the machine, the operator has to check the functionality of the following safety devices on a day to day basis:

- A. Visual control on all sides of the machine for changes or damage. In case of changes or damage, the machine has to be shut down.
- B. Close injecting area cover - insert inlet and discharge guard plates- start the machine. Open inlet guard plate 20 mm. Should the machine not stop, shut it down immediately.  
- start the machine - open discharge guard plate 20 mm. - should the machine not stop, shut it down immediately.
- C. Close filter chamber door - start the machine - open filter chamber door - should the machine not stop, shut it down immediately.
- D. Lower the lifter - open filter chamber door during the lowering of the lift - should the machine not stop, shut it down immediately.

To shut down the machine, the main switch has to be turned to position "0". Additionally, the main switch has to be secured by a pad lock. The key has to be handed over to the supervisor. The mains plug has to be disconnected from the power outlet.

!!! The supervising personal has to make sure, that the malfunctioning safety devices are repaired by a Rühle technician. It's the supervisors responsibility, that the machine isn't used under any circumstances until the repairs have been carried out.

!!! The cleaning personal has to observe the cleaning instructions.  
The supervisor has to write instructions for a safe cleaning procedure.

!!! The maintenance personal is only allowed to service the machine within the guidelines of "regular maintenance 5.1" unless written permission has been given by the manufacturer to do otherwise. The supervisor has to write instructions for safe maintenance works.

!!! It's not allowed to modify the machine.

!!! The supervisor has to make sure, that the functionality of the safety devices is checked every 2000 working hours but at least once a year by a Rühle service technician.

!!! Only Rühle spare parts and accessories are allowed to be used.

!!! The resale of the machine includes the handing-over of the complete operating manual.

## ***1.2 Safety data sheet***

The product feed and discharge system, the lifter as well as the electronic equipment correspond to the machine guideline 98/37/EG, the Low Voltage guideline 79/23/EWG the EMV guideline 89/336/EWG.

This machine is not fitted with an emergency-STOP device, because there is no risk for the operator and the product. The OFF-sensor on the control panel is within easy reach from the operating area.

### **CE – Conformity declaration**

The fully automatic Injector IR 56 corresponds to the following safety and health requirements:

- a. EU – machine guideline 89 / 37 / EG
- b. prEN 1672-2: 1992 Food machines, safety and hygiene requirements  
Part 2: Hygiene requirements February 1995
- c. EN 60204-1: Electrical equipment of machines  
Part 1: General regulations
- d. Rühle - Documentation
- e. Applied standards A-standards: DIN EN 292 and 1050, B-standards: DIN EN 294,  
349, 811, 954-1, 954-2(draft) and 60204-1

Claus Rühle  
Managing Director

### ***1.3 Risks and accident hazards***

Needle contact with hands !!!

During the curing process and working on the exposed needle beam it's possible that the hands touch the needles as a consequence of carelessness. This can lead to serious injuries.

Therefore always follow this operating instruction and avoid direct contact with the needles as well as the softer blades.

Contact with brine, cleaning agents and disinfectants!!!

When working with liquids always bear in mind, that brine can lead to poisoning in conjunction with open wounds, cleaning agents can be caustic and disinfectants can be health hazards. Therefore always follow the safety guidelines of the suppliers of your additives.

Boxes do fall off lifters!!!

Improper handling of boxes on lifters can lead to the fall of 20 Kg boxes from a height of 1000mm. Therefore always wear safety boots.

Danger of getting caught between machine and lift !!!

Simultaneous activating of the lifter and reaching between lift and machine can lead to minor injuries of the hand(s).

Danger of getting caught on the lift rope pulley !!!

Simultaneous activating of the lifter and reaching on to the rope pulley on the back wall of the machine can lead to minor injuries of the hand(s).

Danger of getting hurt on the needle bar cover !!!

It's possible for the operator to bump his/her head when opening the needle bar cover and suffer minor head injuries as a consequence. Therefore always follow the operating instructions.

### ***1.4 Machine applications***

The Injector IR 56 is only allowed to be used to cure fish or meat in the temperature range of 0°C to 40°C. The pieces to be processed have to be within the measurements of 180 mm maximum height and 300 mm maximum width.

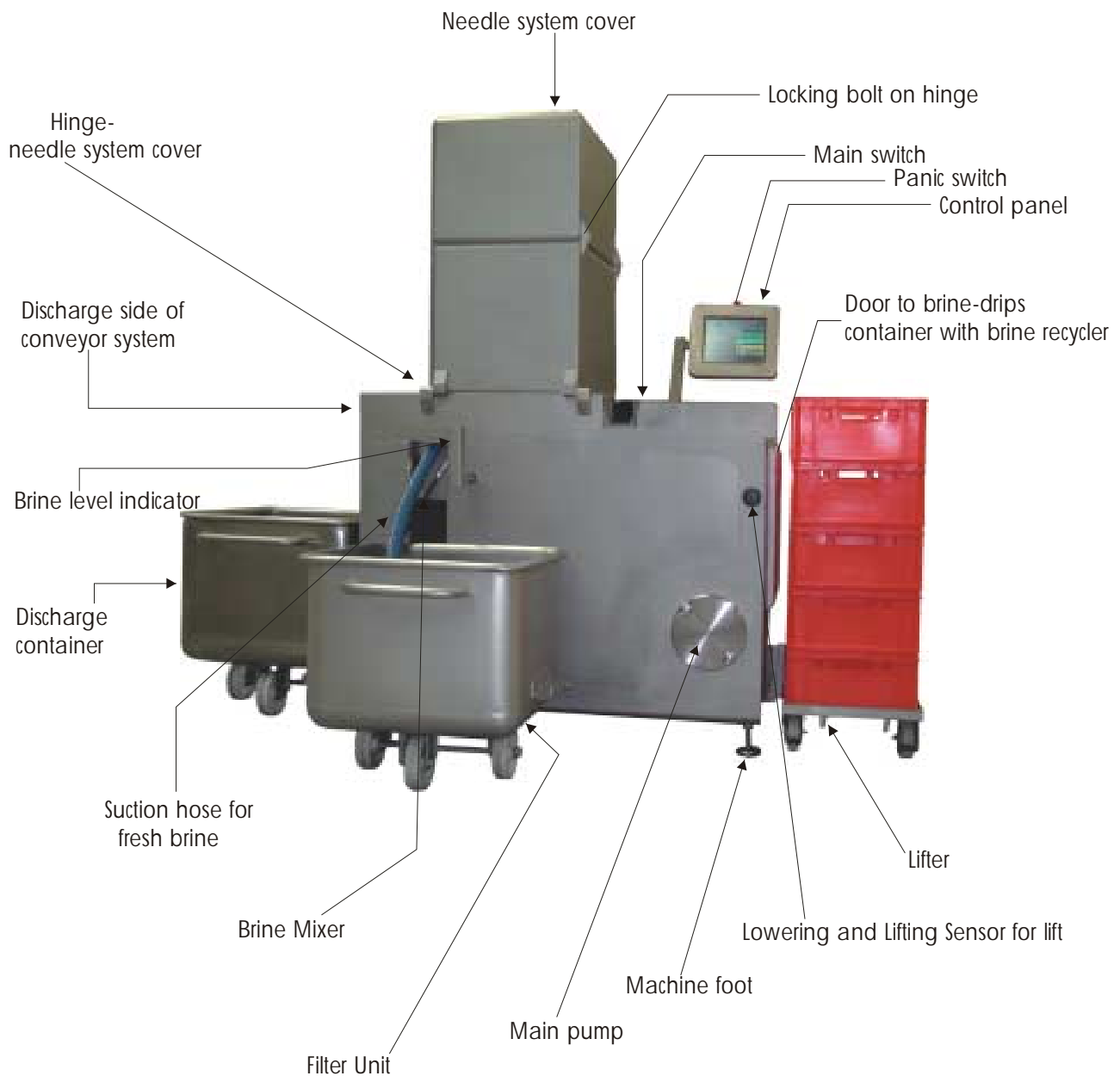
Only process products which are represented by an application program in the control panel, stored by a Ruehle technician. The ambient temperature has to be between 0°C and 40°C.

## 2. Installation instruction

Installation as well as commissioning of the machine is only allowed to be carried out in presence of a Ruehle service technician.

Damages occurring due to acting contrary to this instruction are not covered by Ruehle GmbH Lebensmitteltechnik.

Transport of the machine has to be carried out according to this operating instruction.



## ***2.1 Positioning of machine***

For the transport and delivery of the machine a fork lift with a minimum lifting or transport capacity of 800 Kg has to be used.

For the safe transport the machine is fitted with reinforcements on the underside, so that a fork lift can lift the machine from underneath.

The fork lift has to be driven as close to the machine as possible from the operating side. After lifting the machine it has to be transported as close to the floor as possible.



During the **installation and transport of the machine** see to it that the floor can withstand a load of 400 Kg/m<sup>2</sup>. The machine has to be positioned in such a way, that a passable safety path of one meter in width is all around the machine.

Before lowering the machine on to the floor make sure, that no object or person is underneath the machine. Now put the machine down on the floor.

Adjust the four screwed machine feet with the help of a spirit level, so that the machine is positioned horizontally in the operating side - back side direction. The discharge side has to be 3° higher than the feed side. This is done so that the liquid can drain off the machine.

Now secure the machine feet by turning the counternut all the way to the underside of the machine.



The machine has to be positioned in such a way, that there is an unrestricted ceiling height of at least 2,50 m, so that the protective covers can be opened and closed.

## 2.2 Connection of the machine

Before connecting the machine to the mains, make sure that the power outlet is dimensioned according to the machine datas. The Injector IR 56 is standard equipped with a connected load of 400 V / 50 Hz / 16 A / 7,5 KW.

These values can vary, so take the values of the data plate, positioned at the back of the Injector, before finally connecting the machine.

After an electrician has fitted a suitable plug to the power lead, the machine can be supplied with power by connecting the lead to the power point.

Turn the main switch from „0“ to „1“ to turn the machine on.



Should it not be possible to start the machine at the control panel, the direction of rotation has to be changed by an electrician by changing over the two black leads inside the power plug.

Now connect a freshwater hose to the connector on the back side of the machine. Use a hose suitable for drinking water with an internal diameter of at least NW 20 as well as a quick lock coupling of the same size. The water temperature shouldn't be higher than 30°C, the water pressure should not exceed 4 bar and the water should be of drinking quality.





## ***2.3 Commissioning of the machine***

The operating manual has to be read and understood before commissioning the machine. This is followed by cleaning and disinfecting of the machine according to the cleaning instructions. During the cleaning process, all accessories have to be checked for visible damage - a possible cause of the transport. The same applies to the entire machine, especially the safety devices.

Pull the red switch on top of the control panel upward. Select „Service Program“ and „Intensive Cleaning“. Now clean and disinfect the entire machine according to the cleaning instruction. Completely clean the in- and outside of the machine.

The Ruehle technician now has to register the internal height of the brine container in the menu „Operating Instruction“ -> „Service“ -> „Operating Hours/Calibration“ -> „Calibration“ in order to be able to calculate the correct brine level of the 150 litre container and the 200 litre container respectively. To do this, pull the level sensor out of the machine and position the desired container under it. At the control panel select now the container size and confirm your choice by pressing the key with the green symbol.



After returning to the main menu by using the control panel, you can now start a test run. Select the desired curing program and make sure that all safety devices are locked.

## **3. Operating instruction**

### ***3.1 Switching on the machine***

To start the machine.....

....the main switch has to be turned to position „1“

....the curing area has to be closed and the inlet and discharge guide plate must be in locked position

....the filter chamber and the main motor must be closed and locked.

Now the machine can be started according to the menu on the control panel.

### 3.2 Process control

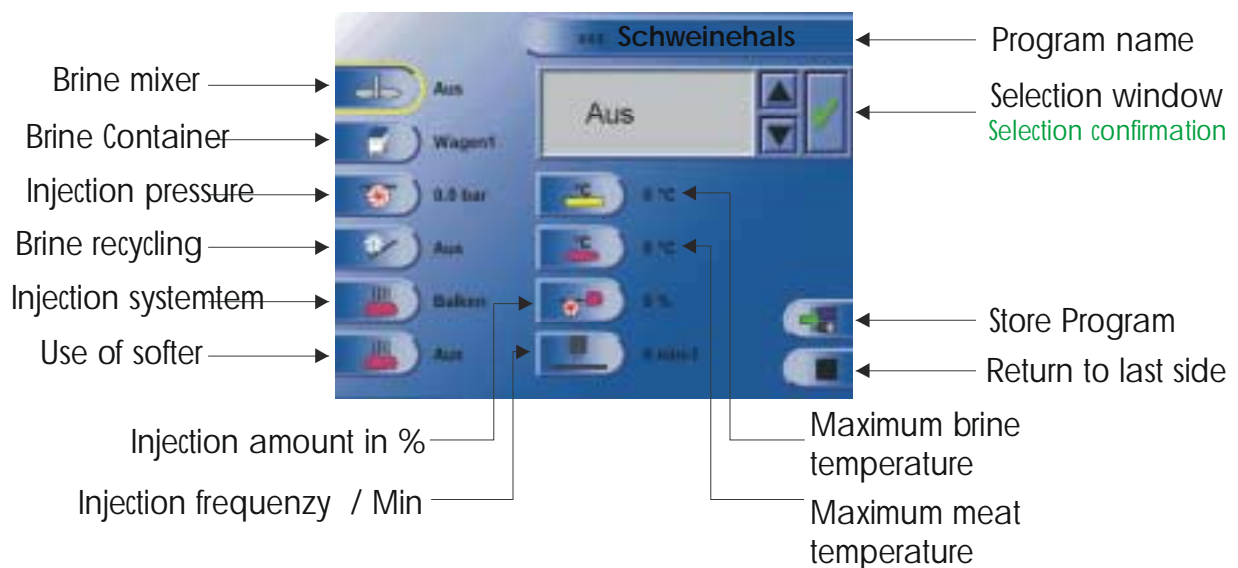
The Ruehle technician will optimize the programs to customer specifications during the commissioning of the machine.

All possible user programs are pre-programmed in principle. Should the need arise to change the product name, injection pressure as well as the injection amount in %, we recommend not to change the other program parameters.

For the every day operation it's not necessary to have programming knowledge, because all the programs are already stored and the menu control leaves hardly any room for operation errors, which could damage the machine. The supervisor has to be informed about error messages.

#### 3.3.1 Curing programs

Your machine possesses a large number of programs. They are based on our vast experience with each product. That's why you never should move to far away from the existing parameters when changing a program and only alter the parameters which really have to be changed. In case of a completely new product beeing injected, use an existing program as basis for the new one. All programs are optimized to customers specifications during the commissioning of the machine by a Ruehle technology adviser.



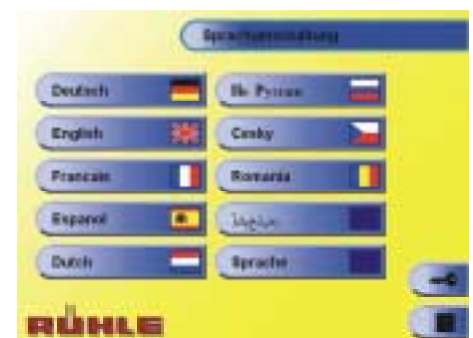
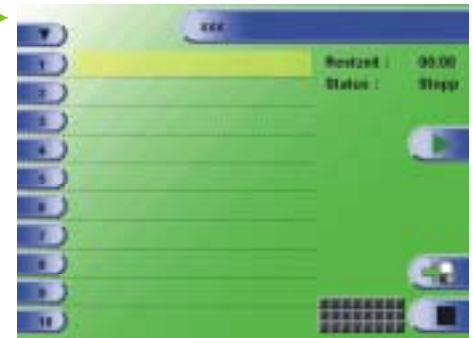
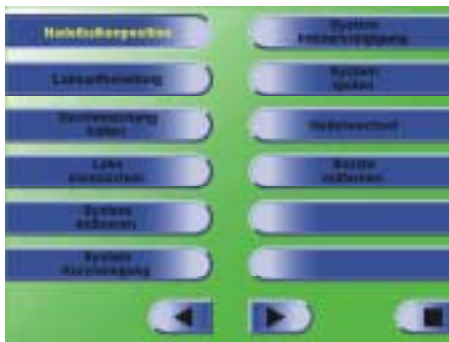
To adjust a program parameter you have to:

- Chose the machine function
- Chose the function in the selection window with the help of the arrows and confirm.
- Chose a new machine function or store the program.

### 3.3.2 Operating the control







### 3.4 Injection system

The injection system has two possibilities of injecting liquid into meat.

- a. Central controlled injection: As soon as the product reaches the needle system, all the needles will contain liquid - a central valve opens.
- b. Single needle control: Only the needles getting into contact with the product will contain liquid - each needle uses its own valve mechanism.

Both injection systems possess a bone cut-off, so that excessive injection concentrations are avoided. This guarantees a uniform injection result.

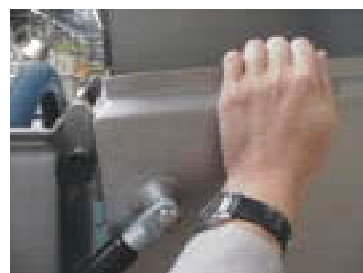
Curing with the single needle control is more accurate and saves on brine consumption compared to the central controlled injection. The latter has advantages with very high injection amounts (over 60%) as well as with very viscous brine.

#### 3.4.1 Protective devices

The protection separates the injection area from the surroundings in order to avoid external influences like interference by the operator as well as contamination.

The machine is not allowed to operate without the closed cover. That's why, prior to opening the cover, the machine has to be put in a position which corresponds to works being carried out with an open cover. ( see service programs).

- a. Take off the discharge guard plate at the rear of the machine.
- b. Swing the protective cover by 180° over the top of the needle system in the direction of the inlet side, until the cover is secured by the locking pin.
- c. Standing on the operating side, pull the protective cover by swinging it 120° away from the machine. Use one hand to pull and the other hand to support the cover.  
Caution: the hood could contact the head of the operator and cause injuries.



- d. To close the protective cover, repeat steps c to a in reverse order.  
The locking pin has to be pulled towards the operating side.



The protective cover is equipped with two shock absorbers which act as a lifting aid covering weights above 20 Kg.

### 3.4.2 Changing needles

Changing a needle becomes necessary when, during the daily visual inspection it is discovered, that one or several needles are blocked, bent, broken or blunt. Needles with such deficiencies have to be exchanged with new ones. Blocked needles can be cleaned, mechanically worn needles however should not be used again, not even after they have been repaired.

Caution: Direct handling of needles requires the wearing of protective gloves against cuts and stabs. Taking off the complete needle system requires to wear an apron and safety boots against cuts and stabs in addition to the protective gloves.

- a. In the menu „Service Program“ select „Needle Change“ and wait for the program to finish.

- b. Open the protective cover according to 3.4.1.



- c. Take the brine hose at the front of the needle system by unlocking the two holding brackets through pulling the spring bolts and folding them onto the needle system. Now you can pull the hose away from the needle system.



- d. Apply the sickle tip of the multi-functional tool to the holding recess of the triangular sheet metal on top of the needle system. With the left hand now pull the tool-lever downward. With the right hand swing the rubber limit-stop holder below the triangular sheet metal to the right. Caution: When decreasing the pressure on the tool lever the fingers could get jammed. Now you can decrease the pressure on the lever and remove it.





- e. Is a softer installed it has to be removed according to the instruction below.  
Now the needle system can be removed by sliding it across the runner rods in order to change the needles.



- f. To get the machine ready for operation follow this instruction in reverse order until the protective cover is locked. Make sure that the spring bolts are locked.



### ***3.4.3 Softer installation***

Follow the points a, b, d, of 3.4.2 Changing needles to prepare the machine for the removal or installation of the softer.

#### **Removal:**

While positioned at the discharge side of the machine pull both the locking bolts on the left and right side of the softer and remove the softer across the runner rods.



#### **Installation:**

Hold the softer on the handle bars on the right and left side, put the softer onto the runner rods with the softer blade pointing downward. Push the softer towards the needle system until the snapping noise of the two locking bolts can be heard and the softer can't be moved any more.



To get the machine ready for operation follow the points d, b, a, of 3.4.2 Changing needles until the protective cover is locked. Wear an apron and safety boots against cuts and stabs when changing the softer.

### ***3.4.4 Main pump maintenance***

Intensive cleaning of the machine also includes intensive cleaning of the main pump. The main pump is a stainless steel rotary pump and doesn't need much service. Nevertheless does the pump require inspection and cleaning in order to achieve good hygienic conditions.

Caution: Never open the pump during the sequence of an application - or servicing program.



Open the pump:

Apply the tool lever to the pump lid, which is located on the outer side of the machine. Slide the hole of the lever over the holding knob, located at the top of the pump lid, and approach the holding knob located at the bottom side with the shorter lever part from the left. Now pull the longer lever part towards the left until the lid has loosened. Remove the tool and unscrew the lid by turning it to the left.



Inspecting and cleaning the pump:

Perform a visible check for abrasion and mechanical changes and, if anything in this regard is discovered, shut down the machine immediately, don't allow the last product batch to be used for consumption and inform the supervisor.

To clean the pump proceed according to the cleaning instruction („Rough Cleaning -> Cleaning Agent -> Rinse -> Disinfect“). After the cleaning let the water drip of the pump and wait until it's dry before closing the pump.

Closing the pump:

Put the lid onto the pump while turning it towards the right. After the lid is closed hand-tight, apply the tool lever to the lid. Slide the hole of the lever over the holding knob and approach the holding knob located at the bottom side with the shorter lever part from the right. Now pull the longer lever part towards the right until the lid can't be turned any further with the tool. Now remove the tool.

### ***3.5 The conveyor system***

The conveyor system of the IR 56 is a gear rack forward feed type, which basically is composed of a support plate and a gear rack unit. The gear rack unit lifts the product off the support plate, transports it 80 mm towards the discharge side and puts the product down onto the supporting plate again. For a complete exterior cleaning, the conveyor system has to be completely removed from the machine. The support plate is a safety relevant part. The machine will not start if the plate is not installed properly.

Removing the conveyor system:

- a) Chose „Service Programs“ followed by „exterior Cleaning“ on the control panel. Start the program and wait for it to finish.
- b) Hold on to the handle of the support plate on the feed side of the machine, lift it up and pull it out of the machine.



- c) Hold the gear rack unit by the connecting bolts and remove the gear rack unit from the guide rollers by lifting it upward. Remove the unit now by pulling it out of the machine on it's feed side.



Installation of the conveyor system:

To install the conveyor system, chose point a) first, followed by c) and b) in reverse order. Caution: Take care not to get the fingers jammed when installing the support plate.

### 3.5.1 Feeding

Feeding is done with the operator standing on the long side of the machine, directly facing the control panel.

The product can come onto the conveyor system either by dumping the contents of a box, which is positioned on the lifter, or by manually positioning the product piece by piece onto the conveyor system.

The more accurate and better aligned the product is on the conveyor system the more uniform and accurate the curing result usually is.

The explanation is, that a proper positioning makes sure , that the product doesn't slide across the conveyor, not even during the injection process.

This is even more valid for products with a special geometry:

Nuckle of pork -> large side pointing to the front and upward.

Pigs head -> teeth facing down

Chicken -> breast on the bottom side

Pork belly -> Rind facing down fan shaped.

Caution: never reach into the needle area, this can lead to serious injuries.

### 3.5.2 Product discharge

There has to be a collecting container pushed right up to the machine, so that brine-drips and small pieces fall right into the container.

The machine allows for a container hight of 950mm.

All kinds of containers can be used up to this size as far as they have a minimum width of 350 mm.

According to the high throughput rate it is advisable to use large containers. During the curing process the operator has to check the filling height of the container in regular intervals and change containers when necessary.

Caution: over-charged containers can lead to a pile-up on the conveyor system which will influence the amount of brine injected into the product.



### 3.6 The brine mixing system

A brine mixer with its mixing wheel located inside the suction filter is fitted parallel to the suction hose of the brine supply.

This suction filter is only opened when a service is due, because there are enough openings for cleaning provided.

The brine mixing system can work with two different speeds. The slow speed is useful to keep a well pre-mixed brine on a constant well mixed level. The fast speed can be used to improve the blending level and should be applied with brine, which underwent a rough pre-mix stage.

The brine mixing system is automatically controlled in all the user programs and it can be adjusted in the programming mode.

Additionally a service program „Brine Mixing“ can be selected on the control panel in order to use the brine mixing system exclusively.



The suction filter always has to be positioned at the base of the brine container in order to avoid the forming of foam on top of the brine. The brine mixing system cuts-off automatically when the brine level sinks below the top edge of the suction filter.

### 3.7 Brine recycling

Brine recycling means a filter system which separates the brine-drips from coarse contaminations and redirects the brine back to the injection process.

The Curing Centre IR 56 has integrated brine recycling which works inside an integrated brine-drips container. The advantage of this system is, that the brine inside the machine will not flow back to the fresh brine. This guarantees best hygiene conditions.

Basically brine recycling consists of a filter basket and a filter brush. The brush is fixed inside the basket with the help of a clamping lid. During the curing process the filter brush is turned and coupled to the side of the machine so that impurities are transported to the chamber containing the coarse substances. This chamber has to be cleaned after three hours the latest in order to prevent an overflow.

Caution: Never start the machine without the brine recycling system

Disassembly / Assembly

- a) Chose „Service Programs“ followed by „Emptying the machine“ on the control panel.  
Start the program and wait for it to finish.



b) Chose „Service Programs“ followed by „exterior Cleaning“. Start the program and wait for it to finish.

b) Open the door to the brine-drips container on the inlet side of the machine by turning the locking latch to the left and open the door to 90°.

c) Reach underneath the brine recycler and with a jolt pull the complete unit out of the machine. Turn the compacting lid by 100° and pull the filter brush out off the filter basket.

e) For assembly follow b), d) and c) in reverse order.



### 3.8 Feed system

The lifter elevates a pile of boxes of not more than 1.5 m high and a maximum weight of 120 Kg to operating height.

Never exceed these values. A warning sticker on the machine reminds the operator of these limits.

The lifter fork is suitable for nearly all common European box running gears. Other running gears are only allowed to be used with written confirmation By Ruehle.



The boxes are pushed onto the fork until they touch the machine.

a quick push against the sensor elevates the boxes by 100 mm, this is the height of the running gear.



With every further push of the sensor the lifter moves the next box to the upper machine edge until the contents of the last box are processed.

The control sensor can be operated with the knee as well as with the hand.

A push of longer than a second lets the lifter move back to the bottom position.

You can select the box size with which you want to work on the control panel. The following sizes are stored in the control panel: EURO 1 (100 mm high), EURO 2 (200 mm high) and EURO 3 (300 mm high). A Ruehle technician can install a new size if you are working with a different sized box system. Don't use different sized boxes otherwise.



The fork can be swung upward by a 100° when the machine is not in use. This is also the position

Caution: When moving the fork out of its end position it can drop to the floor and cause injuries

### 3.9 Brine feed

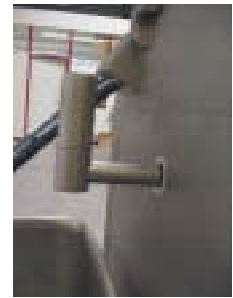
Fresh brine will stay fresh with the Injector IR 56 because sucked in brine doesn't return to the fresh brine container. Fresh brine inside the injection system is injected as soon as possible or it is recycled as brine drips and reused straight away.

When left-over brine has to be removed from the machine it can be filled into a separate container. To do this, take the suction hose out off the fresh brine container and put it into the separate container. Chose „Service Program“ followed by „Empty machine“ on the control panel and start the program. Wait for the program to finish. The emptying process always has to be followed by an interior cleaning cycle in order to avoid bacterial contamination.

Caution: Curing programs can only be started when sufficient fresh brine is in the correct position.

#### ***3.9.1 Container sizes and positions***

It's possible to use all kinds of fresh brine containers up to a height of 750 mm above floor level. Standard sizes are 200 litre and 150 litre standard containers. These two sizes can be selected with Curing Programs on the control panel. Only chose the container type which is provided in the corresponding curing program. Special container sizes can be installed on the control panel during commissioning of the machine.



The fresh brine container has to be positioned in such a way, that the suction hose reaches down to the container base and the level indicator is above the container and works troublefree.

After positioning of the container the suction hose is lowered until the suction filter touches the container base. The level indicator has to be pulled out until it reaches the limit stop.

## 4. Cleaning instruction

The Injector IR 56 is constructed so that the system containing the brine as well as all outside parts coming into contact with foodstuff can be cleaned thoroughly. Regular use of the programs for interior and exterior cleaning guarantee the best hygiene properties. Proper cleaning is not only the condition for good food but also for the durability of the machine. That's why the person responsible for cleaning the Injector has to have read and understood the cleaning instruction and follow it to the point.

### 4.1 Safety hints

- The cleaning instruction has to be read and understood before cleaning is started. The supervisor has to make sure that the cleaning instruction has been read and understood by the cleaning personal.
- The cleaning personal has to clean the machine as directed and follow the instruction to the point. The supervisor has to write an instruction for the cleaning procedure as directed.
- The cleaning personal to tell the supervisor about defects of the machine immediately.
- The cleaning personal has to use the recommended cleaning agents and disinfectants.
- The cleaning agents and disinfectants have to be made up to solutions according to the manufacturers data sheet. Protective gear has to be worn.
- Preparing the machine for cleaning is part of the machine operation. That's why only a person who has read and understood the operating manual is allowed to undertake the cleaning preparation.

### 4.2 Cleaning agents and disinfectants

The following cleaning agents and disinfectants have to be used:

A. Cleaning agent: Alkaline cleaning: P3-topax 19, P3-topax 66  
Acidal cleaning: P3-topax 56

Disinfectant: P3-topax 99, P3-topax 66

Source of supply: Henkel Hygiene GmbH, Reisholzer Werftstraße 38 - 42  
D - 40589 Düsseldorf, Tel.: 0211 / 9893-706

B. Cleaning agent: Alkaline cleaning: Somplex Fettlöser  
Acidal cleaning: Somplex Schaum Sauer

Disinfectant: P3-topax, P3-topax 91

Source of supply: Diverseylever, Morschheimer Straße 5, D-67292 Kirchheimbolanden

### ***4.3 Cleaning procedure***

Before cleaning the machine the operator has to prepare the machine for the cleaning process and follow the sequence below.

- a. Chose „Service Programs“ followed by „Intensive Cleaning Interior“ on the control panel, remove the fresh brine container and start the program.
- b. Follow the program instructions right to the end of the program.
- c. Chose „Service Programs“ followed by „Cleaning Position“ on the control panel, start the program and wait for it to finish.
- d. Open curing area protective cover.
- e. Remove brine recycling system and dismantle it.
- f. Remove conveyor system.
- g. Open main pump.
- h. Remove softer.
- i. Turn main switch to „0“.
- k. Remove seal of the brine recycling door. Dismantle into main constituents.
- l. Fold feeder fork upward.
- m. Put all removable parts onto a non-skid surface.
- n. Clean filter brush with a dishwasher.
- o. Use drinking water in the temperature range from 50°C to 60°C (depending on the softening point of fat) from a water hose or pressure cleaner to hose down the machine and the dismantled attachments, which have to be in a secured position.  
wear safety goggles when pressure cleaning.
- p. Put the cleaning agent solution into a pressure foam generator at 3 bar, hose the foam onto the machine and attachments and wait for 15 minutes.
- q. Use drinking water in the temperature range from 50°C to 60°C from a water hose or pressure cleaner to hose down the machine and the dismantled attachments, followed by drying with compressed air suitable for food (according to DIN ISO 8573-1)
- r. Perform a visual check of the machine and attachments for cleanliness in order to repeat steps „o - q“ if required.
- s. Fill the disinfectant solution into a pressure cleaner with a power rating of at least 3 bar, spray the solution onto the machine and attachments and wait for 20 minutes.
- t. Use drinking water in the temperature range from 50°C to 60°C from a water hose or pressure cleaner to hose down the machine and the dismantled attachments, followed by



drying with compressed air suitable for food (according to DIN ISO 8573-1)

u. Assemble the machine following the sequence „l --> d“ in reverse order.

v. Select the Service Program „Empty System“ and start the program.

## **5. Technical Service**

All works which have to do with technical service are only allowed to be carried out by Rühle technicians and by persons with a written approval from Rühle. A difference is made between regular maintenance and regular service, so that the approval has to be valid for the respective service.

### ***5.1 Regular maintenance***

Regular maintenance has to be carried out at least once a week. This allows little errors or wear and tear to be detected before a major damage occurs.

Not performing regular maintenance leads to technical consequences and a loss in quality of the product. Irregularities discovered during regular maintenance have to be rectified immediately.

Maintenance plan

- a. Dismantle machine according to the cleaning instruction and check for ease of operation, abrasion of material and any traces of wear and tear.
- b. Check softer blades for wear and tear, damage and fractures of the blades.
- c. Check curing needles for free passage, wear and tear and damage.
- d. Check filter brush for hygiene properties.
- e. Check tightness of needle system.
- f. Perform a spot check of the cured product for germ content.
- g. Check all safety limit switches and safety flaps according to the safety instruction.
- h. Perform a visual check of the complete machine body. Irregularities of the surface have to be rectified immediately.

### ***5.2 Regular technical service***

Regular service has to be carried out every 2000 operating hours or at least once a year, in case that the machine has not been running for 2000 hours.

A message on the display will remind the operator automatically after 2000 operating hours that a service is due and he/she should notify the supervisor immediately.

Following works have to be carried out during the regular service:

- a. Exchanging the needle seals of the needle system.
- b. Exchanging the filter brush of the recycling system
- c. Sharpening the softer blades.
- d. Exchanging the feed hose of the secondary pump.
- e. Grease all lubricating nipples and movable parts inside the engine room.
- f. Check the lifter rope of the lifter.
- g. Check the set of seals of the main pump
- h. Check safety functions.
- i. Read error record of control panel and examine the errors.
- k. Control run with machine open with a curing program.

### ***5.3 Errors and error messages***

F01	MfWatchdog	(* Malfunction 1 Watchdog*)
F02	MfRotaryField	(*Malfunction 2 Rotary field wrong*)
F03	MfMUEZ	(* Malfunction 3 Magnetic monitoring unit*)
F04	MfMPump	(* Malfunction 4 Mainpump overload*)
F05	MfBeam	(* Malfunction 5 Beam drive overload*)
F06	MfSPump	(* Malfunction 6 Secondary pump overload*)
F07	MfNeedle1	(* Malfunction 7 Needle control drive 1 right time control*)
F08	MfNeedle2	(* Malfunction 8 Needle control drive 2 left time control*)
F09	MfMixer	(* Malfunction 9 Mixer overload*)
F10	MfBrineRec	(* Malfunction10 Brine recycling overload*)
F11	MfFeed	(* Malfunction 11 Feed drive overload*)
F12	MfMRBValve	(* Malfunction 12 Mixer runback valve time control*)
F13	MfMSupValve	(* Malfunction 13 Mixer supply valve time control*)
F14	MfSSPumpValve	(* Malfunction 14 Secondary pump valve time control*)
F15	MfWaValve	(* Malfunction 15 Water valve time control*)
F16	MfService	(* Malfunction 16 Service hours expired*)
F17	MfPressure	(* Malfunction 17 Wire break pressure sensor*)
F18	MfF1Temp	(* Malfunction 18 Wire break PT100 Meat*)
F19	MfBrTemp	(* Malfunction 19 Wire break PT100 brine*)
F20	MfConduct	(* Malfunction 20 Wire break conductance*)
F21	MfLevFB	(* Malfunction 21 Wire break level fresh brine*)
F22	MfLevRbB	(* Malfunction 22 Wire break level runback brine*)
F23	MfLPSensSS	(* Malfunction 23 Wire break low pressure sensor suction side*)
F24	MfFiltBI	(* Malfunction 24 Filter blocked*)
F25	MfBrush	(* Malfunction 25 Brush holder drive time control*)
F26	MfFeRoPuLS	(* Malfunction 26 Feed rope pulley limit switch*)

F27	MfCharge	(* Malfunction 27 Running time charging exceeded*)
F28	MfEmStop	(* Malfunction 28 Emergency Stop was pushed*)
F29	MfWater	(* Malfunction 29 Water connection missing or shut*)
F30	MfBeamIni	(* Malfunction 30 Beam initiator defect or signal missing*)
F31	MfReserve	(*No Malfunction*)
F32	MfBlinker	(*SPS to PC watch dog*)

#### Other Errors

Error	Solutions
Varying injection amounts	Injection pressure too low? Product with varying bone and fat content? Discharge side blocked? Product can slide across conveyor?
Control panel works, machine doesn't run.	Safety switch open (Emergency Stop) Panic switch on the control panel pulled?
Discharge side of conveyor system blocked.	Discharge container too high? Product higher than 200 mm? Product positioned too high?
feed system will not start.	„Emergency Stop“, because not all safety limit switches are closed?
Emergency Stop – machine doesn't react on commands.	Needle system cover not closed? Discharge guard plate (flap) not closed? Brine drips door not closed? Support plate of conveyor system not installed properly?
Machine performance not satisfactory.	Selection of correct program? Conveyor system not 100% filled? Other time frames (besides curing time) too high?
Level indicator of fresh brine doesn't coincide with brine amount.	Level sensor not directly positioned above fresh brine? Brine has too much foam? Level sensor not pulled out far enough?

Should an error occur which is not listed above or should it not be possible to rectify the error with the help of the solutions, then the Rühle service will help - just call:

Phone: +49 7748 523 0.

## 6. Technical documentation

### Technical data

Current: Three-phase current  
Voltage: 400 V AC  
Control Voltage: 24 V DC  
Current: 16 A  
Power input: 7,5 KW

Should these datas not confirm with the datas on the type plate, then use the values of the type plate. For safety reasons check the datas with the manufacturer and get written confirmation.

One type plate is positioned under the main switch on the back side of the machine. The second type plate is on the inside of the service door, which is housing the control panel.

Compressed air suitable for food according to DIN ISO 8573-1  
Oil: Class 1 / Particle: Class 1 / Water: Class 4

Power plug: CEE-plug 32 A, 5 - poles  
Working place noise level under 65 dBa



### 6.1 Circuit diagrams

The circuit diagrams of the IR 56 are supplied together with the machine. These diagrams are kept inside the switch box in order to have them handy for the technician. In case of reselling the machine, the circuit diagrams have to be handed over as well.

### 6.2 Spare parts list

Service on the Injector IR 56 is only allowed to be carried out by Rühle service technicians and authorised persons. These persons have all the necessary information as well as list of spare parts necessary for your machine.

Damage to parts is usually not caused by the parts themselves - that's why a fault diagnosis has to be carried out. For this reason there are no spare parts listed here, because non-qualified repairs can do more harm than good.

In case of damage to the machine or the need for spare parts, call +49 7748 - 523 - 0, quote the machine type and the machine serial number and we will help you right away to find the fault and send you the correct spare parts.

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