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INSTRUCTION MANUAL

Programming of Semikonti Spray Plant

Type	Semikonti Spray Plant
No.	PTA33-0102.01
Year	2009

1 Introduction

This text is intended as a user guide / handbook for the semikonti spray section and this will be used as a supplement to the on site training and education of the spray operators of the semikonti spray section. After finalizing the training session and by using this text as a handbook, the operator should be able to:

- Change an existing program.
- Generate a new spray program.
- Copy a spray program from one plant to the other.

Some general safety instructions will be described to avoid mechanically or personal injuries.
A general introduction of the FANUC R2000iA/165 industrial robot will be presented, this includes some general specifications and typical industrial applications of the robot, as well as an introduction on how to operate the robot.
The typical spray program will described and the typically used programming features and functions will be explained. Furthermore how to program the Hennecke foam machine (foam recipe and metering package) and robot, to generate a new spray program will be described. Finally some typical errors and how to rectify the errors will be described

This text will not go into details of the foam machine and foam trolleys, this will only deal with the programming and preparation of receipts.

For further details about any subject regarding, the Hennecke foam machine (HK135) or FANUC robot, not treated in this text, please see the Hennecke documentation DVD or the FANUC documentation for further information.

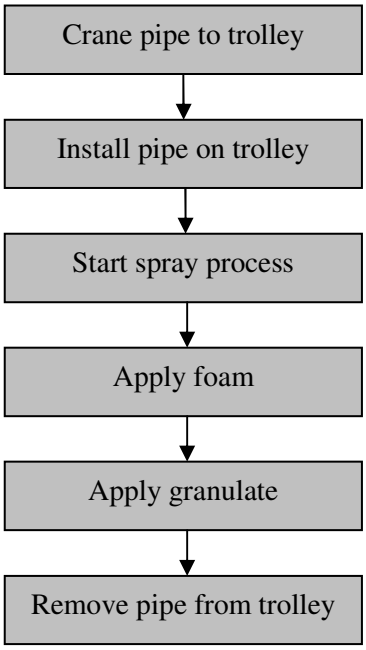
2 Function Description

The Semikonti spray plant consist of different machine parts build together:

- 2 no. HK135 Hennecke Foam Machines
- 2 no. Industrial Robots (FANUC R2000iA/165)
- 2 no. Foam Trolleys
- Spray booth
- Safety Fence
- 2 no. PE granulate supply

The foam machines are installed separately in the tankfarm, the robots are installed in the spray booth in the semikonti production area, the foam trolleys are installed on rails prepared to drive past the robots in the spray cabin, the safety fence is connected to the spray cabin to seal of the moving machinery and the wet part of the spray process, the PE granulate supply is installed on top of the spray cabin.

The operations in the spray process can be illustrated as following:



3 Safety

Due to the machinery is potentially dangerous if not handled correct. This section describes the safety issues that shall be obeyed and respected when operating machinery of the semikonti spray section to prevent damage or personal injuries.

Table 3-1: Safety precautions Semikonti spray section.

The operator shall at all time while operating the semikonti spray section, wear proper working clothes, safety shoes and safety goggles in good condition. To avoid any potentially dangerous situations make sure to keep area of the semikonti spray section tidy and clean, both on the inside of the safety fence as well as on the outside see Figure 3-1.

When operating the semikonti spray section the operator or any other personnel must under no circumstance enter the spray cabin or the safety fence, and all safety doors to the spray cabin and safety fence shall be properly closed see Figure 3-1. During programming of the robot it can be necessary to enter the spray cabin while operating the robot, therefore the operator shall take further precautions, and it will be described in a later section how to do this on a safe and responsible way.

Before operating / programming the robot, the operator shall attend an internal training course to learn about the safety precautions and functions of the robot.

Please notice the spray booth is classified as an ATEX zone 0, which means that during operation the atmosphere inside the spray booth is potentially explosive. This is why it is most important not to install any electrical or other ignition source inside the spray cabin unless the equipment is categorized 1G According to 94/9/EC.

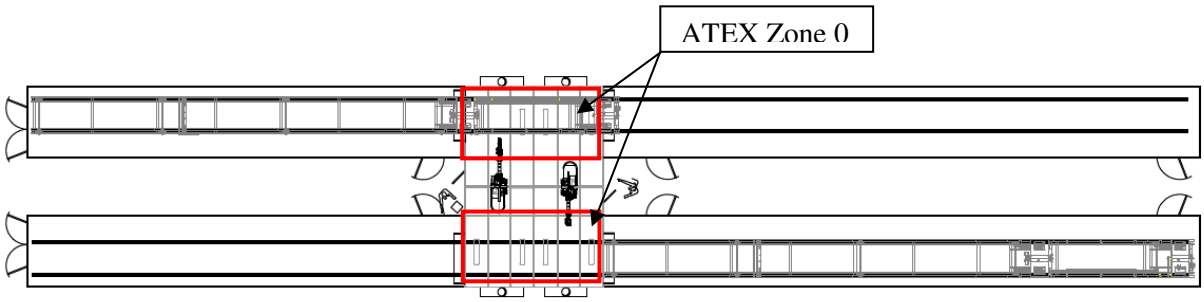


Figure 3-1: Layout of the semikonti spray section.

When one spray line is activated in auto mode and the trolley has started transportation, and the other trolley is in start position, it is possible to enter the safety fence of the other spray line but, if the trolley is not in starting position while opening the fence the opposite line will abort the auto sequence immediately. This is to prevent any possible physical interaction with the robots while running an auto sequence.

3.1 Emergency Stop

In case of any accidents or failure, the semikonti spray plant is covered by emergency buttons distributed on the safety fence, spray cabin and on the HK135 control panels in front of the spray cabin. If any of the above mentioned emergency buttons are pressed both the trolley and robot stops.

The robot controller and the teach pendant are also equipped with emergency buttons, see Figure 3-2 but activating one of these buttons will only cause the robot to stop, this will not bring the spray trolley or foam machine to stop.

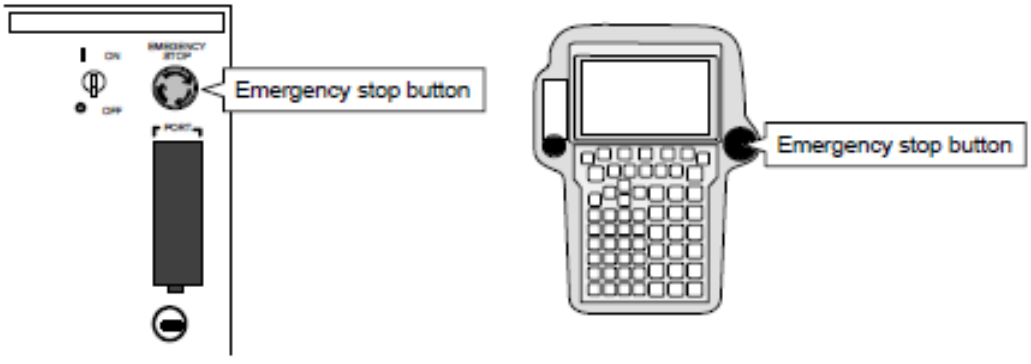


Figure 3-2: Emergency buttons on the front of the robot controller and teach pendant.