# PRODUCTS


# Operation
# &
# Maintenance

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# 2-Introduction

This equipment was developed to accomplish a traverse displacement in a printer headstock to jet of industrial paint.

When in a production line the products move parallel and in some moment of the operation a stop exists, he is due then to use Swing Arm so that at this time the products are codified. This process eliminates the need to use a headstock printer for each row of products.

All the configuration, operation, maintenance and other topics related to this equipment will be approached in elapsing of this manual that is divided in two parts: Operation and Maintenance. Still containing a series of Appendixes with useful information for both parts.

# 3 Part I: Operation

## 3.1 Navigation and Conventions

The functions of Swing Arms are distributed in menus and parameters.
To locate the parameter or wanted menu: the directional arrows are used upward or down (key yellows) until that the cursor is blinking the left of the line of the parameter or wanted menu.

To access a parameter or menu: after you locate it presses the key ENTER; the cursor that previously was the left of the line passes the being a line under the first type of the value of the parameter or menu.

To alter the value of the parameter: type the value and press the key ENTER to confirm or ESC to cancel the altered value. In case the value of the parameter is among "[", "] " (brackets) their values will be pré-defined, for you alter them presses the directional arrows for left or for right (key yellows).

To return in the previous menu: Press the key ESC while the cursor is blinking to the left side of the line. Remember that is safe when leaving a Menu the position of the last selected parameter.

To visualize a mistake: Whenever it happens a mistake the led of mistake of the panel it will be lit however the mistake will only appear in the screen when the key be pressed F1.

It is stipulated in Swing Arms:

- The parameters finished with "... " (reticences) they are menus.
- The values of the parameters among "[" and "] " (brackets) they are pré-defined.
- The progress movement is always that that, he stands back of the motor and the one of return that, he approaches him.

## 3.2 Main menu

The main Menu appears whenever the equipment is called (he/she sees illustration below) it is also possible to simply access the main Menu starting from any other menu pressing the key ESC until that he appears in the display.

Choice the *WAY OF OPERATION* wanted
[Manual] [Operation] [Programs]


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### 3.2.1 Manners of Operation

Three operation manners exist in Swing Arms: Manual, Operation and Programming. It is possible to access any one of these three manners without interrupting the operation of the arm transporter.

### 3.2.2 Manual

Power down the motor. In that way the motor is free and it can be moved with the hands.

***IMPORTANT**: Entering in this way the equipment will lose the reference.*

### 3.2.3 Execution

He prepares the axes for movement.
Whenever some exists axis without reference the following message he will appear in the display:

Without reference.

Press the key Start for reference

After the reference, in case she has been necessary, Swing Arms will be ready to enter in operation and a similar message the this will appear in the display:

* * * Way of Execution * * *

X=20 Y=10

The values of current position of the axes X and Y are shown in this screen and they are updated in real time. The user can leave the Way of Execution when he wants without interrupting the operation of the Arm transporter.

*IMPORTANT:* The key of "Start" will only work in the Way of Execution

### 3.2.4 Program

It is in this way that all the configuration of the equipment is accomplished. The explanation of each parameter this way is described to proceed:

#### 3.2.4.1 Number of the program for edition...:

He allows to edit any axis file.
Also consult: "File of Axis" in the page 10

#### 3.2.4.2 number of the program of the axis X...:

It edits and it defines which axis File the axis X will execute.
Also consult: "File of Axis" in the page 10

#### 3.2.4.3 Number of the program of the axis Y...:

It edits and it defines which axis File the axis Y will execute.
Also consult: "File of Axis" in the page 10

#### 3.2.4.4 Copy the program number: 00 for 00

He makes possible to accomplish copies of the axis Files.
Also consult: "File of Axis" in the page 10

#### 3.2.4.5 Change of the access level

He allows to alter the current level of access to the user.
To know how to use the functions of password of Swing Arms consults the topic: "Working with passwords" in the page 17.

#### 3.2.4.6 Configuration of the axis X...:

It contains specific information for the axis X, which are described to proceed.

#### 3.2.4.7 Number of the channel X

He informs CPU which the channel (Address) of the plate Acionadora that controls the axis X.

#### 3.2.4.8 Pulse number for turn X

It informs how many pulses should be sent for the step motor for a sign of the sensor of turn to be received.

#### 3.2.4.9 Window of protection of the turn X

It is a tolerance for the parameter: Pulse "number for turn X."

#### 3.2.4.10 Rotation/Rotation of the motor X

He informs which the distance traveled for each turn that the motor gives in his/her own axis.

#### 3.2.4.11 turn X with protection function

If linked, when there is syncronism lack among the pulses sent for the motor and the sensor of turn the movement of the motor will be interrupted.

#### 3.2.4.12 Turn X with correction function

If linked, when there is syncronism lack among the pulses sent for the motor and the sensor of turn the movement of the motor will be corrected.

#### 3.2.4.13 Logic of the external start X

It indicates if it is usually open or usually closed the logic of the external start.

#### 3.2.4.14 Value of the position of the reference

That value is assumed whenever in the reference process it is obtained the sign of course end (FC -)

#### 3.2.4.15 Speed for reference

It indicates the speed during the process of reference of the equipment.

#### 3.2.4.16 Acceleration for reference

It indicates the acceleration during the process of reference of the equipment.

#### 3.2.4.17 Reduction of the current in rest

If it is linked the current of the motor it is reduced when this is not in movement. That reduces the potency consumption.

***IMPORTANT:*** In applications where the axis is installed in the vertical position is necessary that this parameter is turned off.

#### 3.2.4.18 Start for the keyboard and external X

If turned off the equipment won't leave when receiving sign of external start or of the keyboard but yes when receiving sign of start of another axis.

#### 3.2.4.19 Configuration of the axis Y...:

See: "Configuration of the axis X...: " in the page 7
For equipments of a single axis this parameter should stay: [Incapacitated].

#### 3.2.4.20 Configuration of the equipment...

The parameters of this menu are described to proceed.

#### 3.2.4.21 Change the password of this level

He allows the password of the level of current access to be changed.
To know how to use the functions of password of Swing Arms consults the topic: "Working with passwords" in the page 17.

#### 3.2.4.22 Software CPU Version

It informs the version of the software of the plate CPU.

#### 3.2.4.23 Software CPU Checksum

It informs the checksum of the software of the CPU card.

#### 3.2.4.24 Routines of tests and verification...

This menu contains routines that allow the visualization of the positions of memory of the control Box's internal plates. Their parameters are described to proceed.

#### 3.2.4.25 Verify the parameter 00h of the plate micrX

He reads of the memory of the Card Acionadora X the content of the requested position.

#### 3.2.4.26 Modify the parameter 00h of the plate micrX

It alters in the memory of the plate Acionadora X the content of the suitable position.

#### 3.2.4.27 Verify the parameter 00h of the plate micrY

He reads of the memory of the plate Acionadora Y the content of the requested position.

#### 3.2.4.28 Modify the parameter 00h of the plate micrY

It alters in the memory of the plate Acionadora Y the content of the suitable position.

#### 3.2.4.29 Verify memory of CPU, Endereço=0000h

He makes a dump of memory in a specific position of the plate CPU.

#### 3.2.4.30 Verify memory X, Endereço=0000h

He makes a dump of memory in a specific position of the plate Acionadora X.

#### 3.2.4.31 Verify memory Y, Endereço=0000h

He makes a dump of memory in a specific position of the plate Acionadora Y.

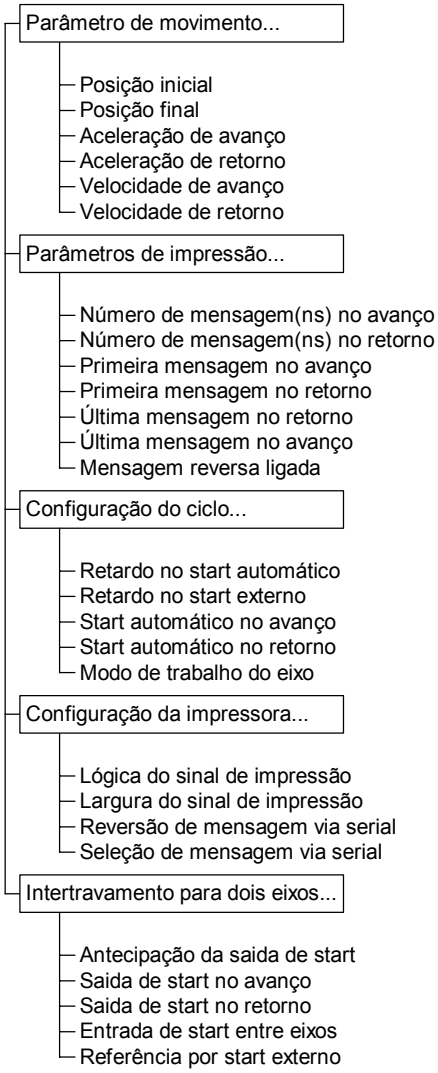
## 3.3 File of Axis

An axis file contains the necessary parameters for the movement and operation of a single axis. Swing Arms possesses available memory to store up to 100 axis files.

When the equipment is in operation parameters as speed, acceleration, impression positions, retards among others are read of an axis file.

The structure of an axis file is according to display the illustration below:

Organograma: Estrutura de um Arquivo de Eixo



### 3.3.1 Parameters of a File of Axis

In an axis File the parameters for progress and return are independent. It is important also to remind that the progress movement is that that stands back of the motor and return that he approaches him.

#### 3.3.1.1 Initial position

It is the closer rest position of the motor.

#### 3.3.1.2 Final position

It is the rest position more moved away to the motor.

#### 3.3.1.3 Progress acceleration

It determines the acceleration and slowing down of the equipment during the progress.

#### 3.3.1.4 Return acceleration

It determines the acceleration and slowing down of the equipment during the return.

#### 3.3.1.5 Progress speed

It is the speed to be reached during the progress movement.
If there is impression in that movement sense it should be taken into account the speed of impression of the printer.

#### 3.3.1.6 Return speed

It is the speed to be reached during the return movement.
If there is impression in that movement sense it should be taken into account the speed of impression of the printer.

#### 3.3.1.7 Number of messages in the progress

It is the number of impressions that you/they will be accomplished during the progress movement
If this parameter goes zero there won't be impressions.

#### 3.3.1.8 Number of messages in the return

It is the number of impressions that you will be accomplished during the return movement.
If this parameter goes zero there won't be impressions.

#### 3.3.1.9 First message in the progress

It defines the position of the first message during the progress movement.
In case it happens some impression during the acceleration, in other words, while the speed is not constant, there will be deformation of the message.
Consult the topic: "Printing Out of the Ramp of Acceleration."

### 3.3.1.10 Last message in the progress

It defines the position of the last message during the progress movement.
In case it happens some impression during the acceleration, in other words, while the speed is not constant, there will be deformation of the message.
Consult the topic: "Printing Out of the Ramp of Acceleration."

### First 3.3.1.11 Message in the return

It defines the position of the first message during the return movement.
In case it happens some impression during the acceleration of Swing Arms, in other words, while the speed is not constant; there will be deformation in the message.
Consult the topic: "Printing Out of the Ramp of Acceleration."

### Last 3.3.1.12 Message in the return

It defines the position of the last message during the return movement.
In case it happens some impression during the acceleration of Swing Arms, in other words, while the speed is not constant; there will be deformation in the message.
Consult the topic: "Printing Out of the Ramp of Acceleration."

### 3.3.1.13 Linked reverse message

It indicates when Swing Arms should send the reversion sign for printer, if in the progress movement or of return.

### 3.3.1.14 Retard in the automatic start

He indicates how long Swing Arms should await to simulate a start sign.
Also see: Automatic "Start in the progress" below.

### 3.3.1.15 Retard in the external start

He indicates how long the equipment should await to begin the movement after receiving the sign of external start.
This parameter can be used to establish a synchronism between the production line and the sign of start external correspondent for Swing Arms.

### 3.3.1.16 Automatic Start in the progress

If it is linked Swing Arms it will move forward automatically after the return movement.

### 3.3.1.17 Automatic Start in the return

If it is linked Swing Arms it will return automatically after the progress movement.

#### 3.3.1.18 Way of work of the axis

When in way "Step-to-step", the parameters:
· Number of messages in the progress
· Number of messages in the return
They not pass more to indicate the number of messages but the number and of stops of the axis. And the word "mensagem(ns) " in the striped parameters above he will have the "stop(s sense) ".

#### 3.3.1.19 Logic of the impression sign

The impression sign is indicated will be usually open or usually closed.

#### 3.3.1.20 Width of the impression sign

He defines which will be the width of the pulse of the impression sign.

#### 3.3.1.21 Message reversion saw serial

It enables the message reversion through the serial door.

#### 3.3.1.22 Message selection saw serial

It enables the message selection through the serial door.

#### 3.3.1.23 Anticipation of the start exit

He allows to advance the start exit sent for another axis.
Also see the parameters: Start "exit in the progress" and start "Exit in the return " below.

#### 3.3.1.24 Start exit in the progress

If linked, when the axis reaches the final position (I move of progress) the same will send a start sign for the other axis.
Also see: "Anticipation of the start" exit above.

#### 3.3.1.25 Start exit in the return

If linked, when the axis reaches the initial position (I move of return) the same will send a start sign for the other axis.
Also see: "Anticipation of the start" exit above.

#### 3.3.1.26 Start entrance among axes

This parameter depopulates the axis to receive start of another axis.

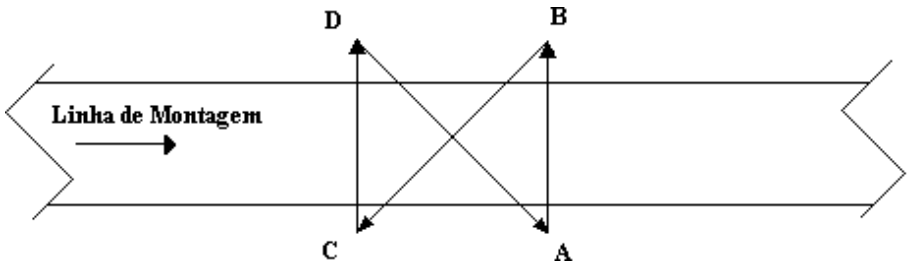
#### 3.3.1.27 Reference for external start

When linked it allows the sign of external start to begin the process of reference of the equipment.

### 3.4 Types of Cycle

Several types exist (configurations) of cycle that you can be executed with Swing Arms, however the more used are: In X, Rectangular, In U and Step-to-step. To follow this a description of each one of them, reminding that the parameter "Way of work of the axes" will be "[Continuous] " so much for the axis X and Y to not to be if there are some contrary indication and the parameter "Start for the keyboard and external" it should be "[Turned off] " for the axis Y.

#### 3.4.1 Cycle in X



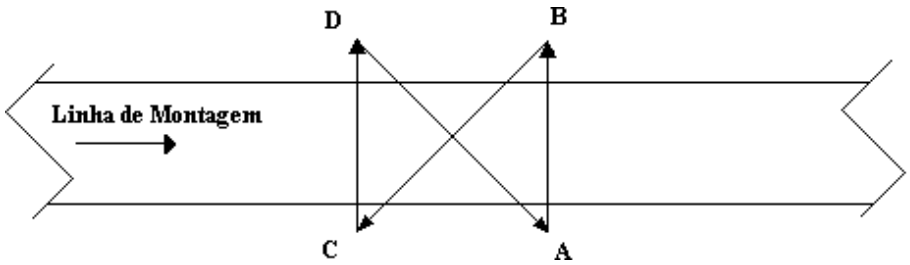

When receiving the start sign Swing Arms it travels the path AB printing, BC without printing, CD printing and OF THE without printing to when in THE the cycle is interrupted and Swing Arms awaits another start sign again.

This configuration can be used in lines with double step, in other words, stop of two products to each cycle.

See in the table below the values of the necessary parameters for this cycle type:

| Axis | Parameter | Value |
|---|---|---|
| X | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [ON] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [OFF] |
| Y | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [ OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [OFF] |

### 3.4.2 Rectangular cycle



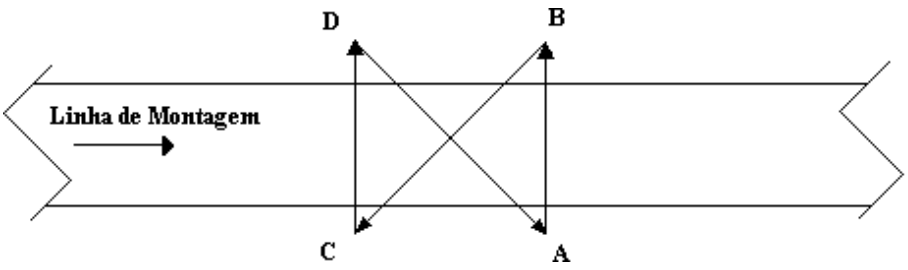

When receiving the start sign Swing Arms it travels the path AB printing, BC without printing, CD printing reversamente and of the without printing and when the point is reached her the Cycle is concluded and the equipment starts to await another start sign.

This configuration can be used in lines that allow reversion of the impressions and work in double step.

See in the table below the values of the necessary parameters for this cycle type:

| Axis | Parameter | Value |
|---|---|---|
| X | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [ON] |
| Y | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [OFF] |

### 3.4.3 Cycle in U



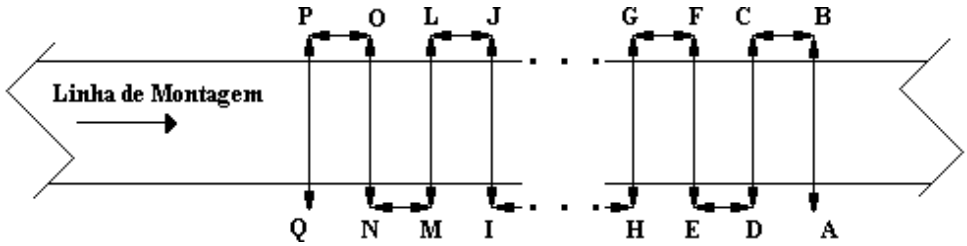

When receiving start sign Swing Arms it travels the path AB printing, BC without printing and CD printing reversamente. The point D will be the stop point to that another start is sent and Swing Arms accomplishes the same course, however, in the opposite sense.

This configuration can be used in lines that allow reversion of the impressions and work in double step.

See in the table below the values of the necessary parameters for this cycle type:

| Axis | Parameter | Value |
|---|---|---|
| X | start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [OFF] |
| Y | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [ON] |

### 3.4.4 Cycle Step-to-step




When receiving the start sign Swing Arms it travels the path AB printing, BC not printing, CD printing reversamente, OF not printing, EF printing and so forth until that it arrives to the point Q where the equipment enters in rest. After other start sign the same course is accomplished; however in the opposite sense.

*IMPORTANT*: So that this configuration type works correctly is necessary that the axis Y (parallel the line) it is configured to work in the way 'Step-to-step'. he/she Sees: "Way of work of the axis" in the page 13.

See in the table below the values of the necessary parameters for this cycle type:

| Axis | Parameter | Value |
|---|---|---|
| X | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [ON] |
| Y | Start Entrance among axes | [ON] |
| | Automatic Start in the return | [OFF] |
| | Automatic Start in the progress | [OFF] |
| | Start exit in the progress | [ON] |
| | Start exit in the return | [ON] |

## 3.5 Working with passwords

Swing Arms possesses four access levels, each one with his respective limitation:

Protected ·
In that level it is not allowed to alter any parameter of Swing Arrms.

· Operation
They will only be available basic parameters to the operation of the equipment.

· Maitenence
They will be available the parameters of the level 'Operation' and other parameters regarding maintenance of the equipment.

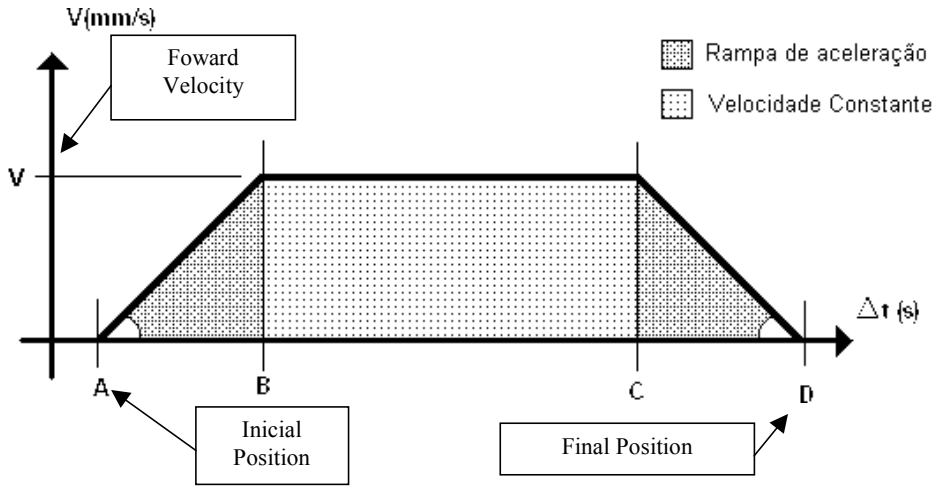
· Supervision
All of the parameters will be available.

Whenever if he wants to alter the current level for a superior level it will be necessary to enter with the access password; otherwise, when he wants to move for an inferior level to the current any password will be requested. For instance, if being in the level 'Maintenance' we want to pass for 'Supervision' the access password will be requested, however if we pass for 'Operation' it won't be necessary to type the password.

*IMPORTANT:* The production password for all of the levels is: "123."

To alter the level of current access: choose the option 'it Changes of the access level' that, he is located in the Way 'Programming.'
To alter the password: choose the option to "Change the password of this level" that is in the menu "Configuration of the equipment... " that, he is located in the Way 'Programming.'

## 3.6 Printing Out of the Ramp of Acceleration.




The graph above represents the progress movement accomplished by the Arm transporter, and:

A => "Initial Position"
B => End of the ramp of acceleration
C => I Begin of the ramp of deceleration or slowing down
D => "final Position"
V => progress" "Speed

So that there is not distortion of the message is important that the impressions happen out of the ramps of acceleration. This period, ideal for impression, happens during the points B and C where the speed V is constant (he sees the graph of the illustration above).

If we know the necessary space for Swing Arms to accelerate and slow down is enough to avoid that the impressions happen in this period. For us to know this space used her formulates to proceed:

$$\Delta s = \frac{V^2}{2a}$$

Where:

+s = traveled space
v = speed
a = acceleration

### 3.6.1.1 Example:

See the graph of the previous illustration and suppose the following parameters for the equipment:

Initial position = 10mm
Final position = 410mm
Progress speed (V) = 400 mm/s
Progress acceleration (the) = 4000 mm/s²

We can calculate the necessary space for the ramp of acceleration (+s) and consequently the space where the speed is constant (x) this way:

$$\Delta s = \frac{400^2}{2 \times 4000} \Rightarrow \Delta s = \frac{160000}{8000} \Rightarrow \Delta s = 20mm$$

$$PosiçãoInicial + \Delta s \leq X \leq PosiçãoFinal - \Delta s$$

$$10 + 20 \leq X \leq 410 - 20$$

$$30 \leq X \leq 390$$

$$X \geq 30mm$$

$$X \leq 390mm$$

In other words, starting from the "initial Position" (in the graph the point A), it will be necessary 20mm so that the speed becomes constant (point B), and after some time again will be necessary to travel 20mm (point C) before we arrive the "final Position" (point D).

Then among the positions 30mm and 390mm it can be accomplished impressions without there is distortion of the same ones.

# Part 4 - II: Maintenance

## 4.1 The Parts of Swing Arms.

Swing Arms is basically divided in two parts: Control box and Arm transporter.

*IMPORTANT:* Never connect the cable of the motor while the equipment be called.

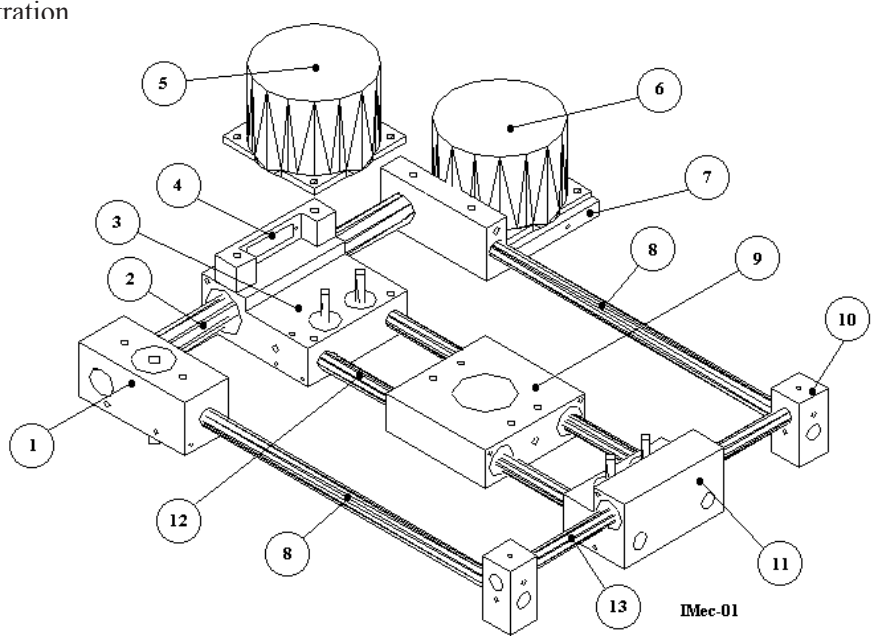
### 4.1.1 Arm Transporter

Made in laminated aluminum with braces in VND.

Electrically each axis of the Arm transporter possesses: a step motor; a sensor one optic of course end (FC -) that, he is close to the motor and a sensor one optic of turn (FC+ or Zero index) installed close, or in the own pulley of the motor.

The sensor of turn has the function of protecting and/or to correct the positioning of the cursor, while the sensor of course end will be indicating the position of absolute zero of his respective axis.

See the description of the mechanical pieces of the Arm transporter below in the illustration




Item Description

1 Mancal axis X
2 Guide axis X ø20mm
3 Cursor axis X
4 Support of the connector of the axis Y
5 Motor axis Y
6 Motor axis X
7 Flange of the motor
8 Espaçador
9 Cursor axis Y
10 Support of the axes XY
11 Mancal axis Y
12 Guide axis Y ø12mm
13 Guide axis X ø12mm

### 4.1.2 Box of Control

It is where the information are processed, accomplished to entrances and output and the control of the movements.

The control box is constituted for:

- · Power Suplies of Motor
- · Power Suplies of CPU
- · Internal Cables
- · CPU card
- · Driver(s) Card(s)

(Obs.: The number of cards Acionadora this related to the number of axes to be controlled in the Arm transporter).

#### 4.1.2.1 Power

Both sources are toggle and they possess circuits that detect the tension of the net automatically between 110V and 220V.

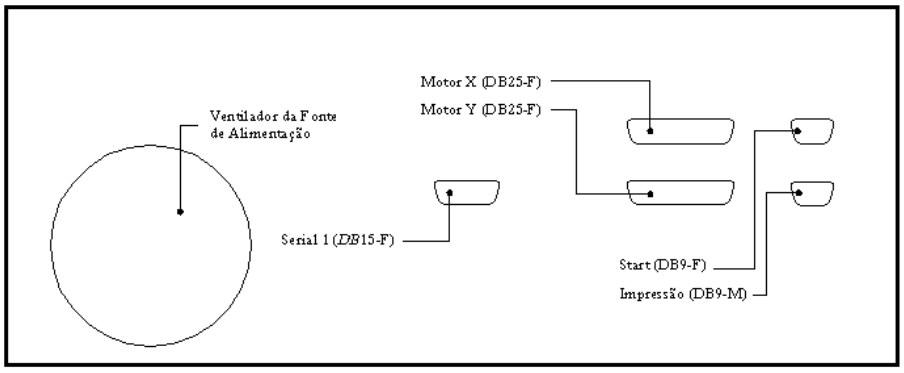
#### 4.1.2.2 Internal cables

The internal cables are responsible for taking the signs of the internal plates outside of the control Box.

The illustration to proceed describes the control Box's connectors.

For a detailed description of each one of the control Box's internal cables consults: "Appendix A: Internal cables.

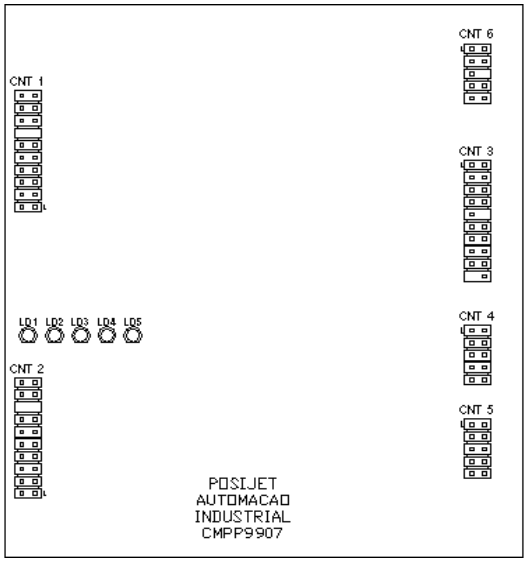
Vista Frontal da Caixa de Controle



### 4.1.2.3 Driver Motor Card

It is a microcontroled card responsible for the control of the step motor and of all the other external signs of entrance and exit. This plate communicates with the plate CPU through a serial communication RS-232. (Serial 2)

See in the illustration to follow the description of the connectors of the plate Acionadora:




| Conector | Descrição |
|---|---|
| CNT 1 | Start |
| CNT 2 | Impressão |
| CNT 3 | Motor |
| CNT 4 | Serial 1 |
| CNT 5 | Serial 2 |
| CNT 6 | Alimentação |

| LED | Descrição |
|---|---|
| LD1 | +5V |
| LD2 | +24V |
| LD3 | Pistão |
| LD4 | PA |
| LD5 | Erro |
| OBS: Os Leds 3,4 e 5 podem apresentar outras funções em razão da aplicação. | |

### 4.1.2.4 CPU Board

Responsible for the control of the display and keyboard. He also works as a data-base, all the programming is stored in her, and, only correspondent for the plate Acionadora in the moment of the execution.

The plates CPU and Acionadora are interlinked through a serial communication RS-232. (Serial 2)

### 4.2 Characteristics

Mechanical characteristics:
· Dimensões of the control Box:
L=340mm C=240mm H=175mm Peso=5kg
· Dimensões of the Arm transporter:
L=51mm C=102mm H=curso+190 Peso=8kg (p / 550mm)

Electric characteristics:
Feeding 110V or 220V AC with Earth. (Automatic keying)
Consumption 250Watts

Characteristics of the entrance signs and exit:
· Serial Communication
Entrances and exits pattern RS-232 +12V and -12V no isolated.
· Too much entrances and exits
NPN 20mA isolated for fotoacoplador
Except entrance of external "Start" that can be NPN/PNP

# Tabela de **Cabos Internos**

(Padrão para CMPP9907)

| *Impressão* (CNT2) | | |
|---|---|---|
| **Flat-20** | **DB9-M** | **Descrição** |
| 2 | 2 | 0Vcc |
| 3 | 7 | Taco |
| 4 | 6 | Print Go |
| 6 | 4 | Inv-Men |

| *Start* (CNT1) | | |
|---|---|---|
| **Flat-20** | **DB9-F** | **Descrição** |
| 1-10 | 1 | +24V |
| 2-3 | 2 | Gnd |
| 4 | 4 | Pist. |
| 5 | 6 | Start |

| *Serial 1* (CNT4) | | |
|---|---|---|
| **Flat-10** | **x** | **Descrição** |
| 3 | x | Rx |
| 4 | x | Rts |
| 5 | x | Tx |
| 6 | x | Cts |
| 9 | x | Gnd |

| *Alimentação* (CNT6) | | |
|---|---|---|
| **Flat-10** | **x** | **Descrição** |
| 1-2 | x | +5V |
| 3-4-7-8 | x | Gnd |
| 9-10 | x | Vcc (38V) |

x ⇨ Indeterminado.

| *Motor* (CNT3) | | |
|---|---|---|
| **Flat-20** | **DB25-F** | **Descrição** |
| 1-2 | 1-2-14 | A |
| 3-4 | 4-5-17 | B |
| 5-6 | 3-15-16 | A' |
| 7-8 | 6-18-19 | B' |
| 11-12 | 8 | Vcc |
| 13-14 | 9 | 0Vcc |
| 15 | 10 | Ref |
| 16 | 23 | S.C. |
| 17 | 21 | Tum ou FC+ |
| 18 | 22 | FC- |

| *Serial 2* (CNT5) | | |
|---|---|---|
| CPU | Acionadora | |
| **Flat-10** | **Flat-10** | **Descrição** |
| 2 | 3 | Tx/Rx |
| 3 | 5 | Rx/Tx |
| 7 | 9 | 0V |

***Polarização dos Conectores***

| **Cabo** | **Pino(s)** |
|---|---|
| Print | 15-16 |
| Motor | 10-19 |
| Serial 2 | N/c |
| Serial 1 | Nenhum |
| Start | 13-14 |
| Power | 6 |

# Tabela de **Cabos Externos**

(Padrão para CMPP9907)

| *Impressão* | | | |
|---|---|---|---|
| **DB9-F** | **DB9-M** | **Descrição** | **Cor** |
| 2 | x | 0Vcc | Red |
| 4 | x | Inv-Men | Yellow |
| 6 | x | Print Go | Brow |
| 7 | x | Taco | Orange |

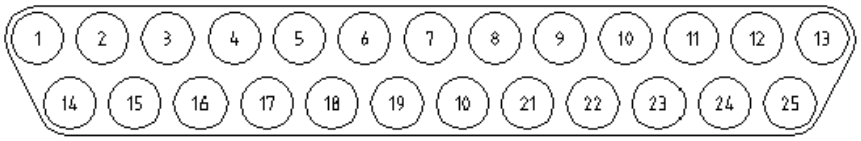
| *Start* | | | |
|---|---|---|---|
| **DB9-M** | **x** | **Descrição** | **Cor** |
| 1 | x | +24 | Red |
| 2 | x | Gnd | Yellow |
| 4 | x | Pist. | Orange |
| 6 | x | Start | Brow |

x ⇨ Indeterminado.

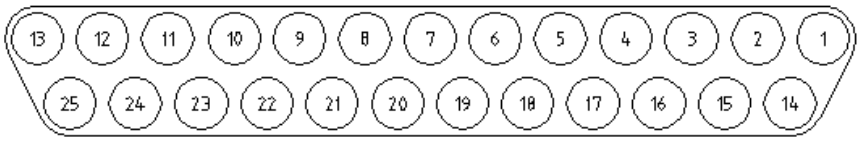
| *Motor* | | | |
|---|---|---|---|
| **DB25-M** | **DB25-F** | **Descrição** | **Quant./Cor** |
| 1 | 1 | A | 2xBlack |
| 2 | 2 | A | 2xViolet |
| 3 | 3 | A/ | White |
| 4 | 4 | B | 2xRed |
| 5 | 5 | B | 2xRed |
| 6 | 6 | B/ | Gray |
| 7 | 7 | - | Orange |
| 8 | 8 | Vcc | 2xOrange |
| 9 | 9 | 0Vcc | 2xGreen |
| 10 | 10 | Ref. | Brow |
| 11 | 11 | - | Green |
| 12 | 12 | Blindagem | Child |
| 13 | 13 | Blindagem | Child |
| 14 | 14 | A | Black |
| 15 | 15 | A/ | 2xWithe |
| 16 | 16 | A/ | Yellow+Violet |
| 17 | 17 | B | Yellow |
| 18 | 18 | B/ | Yellow+Blue |
| 19 | 19 | B/ | 2xBlue |
| 20 | 20 | - | Brow |
| 21 | 21 | FC+/Giro | Brow |
| 22 | 22 | FC- | Brow |
| 23 | 23 | S.C. | Gray |
| 24 | 24 | - | Gray |
| 25 | 25 | Blindagem | Child |

## 7 appendix C: Connectors

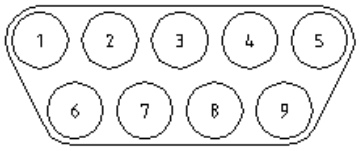
**DB25-Macho**



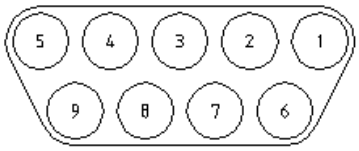

**DB25-Femea**



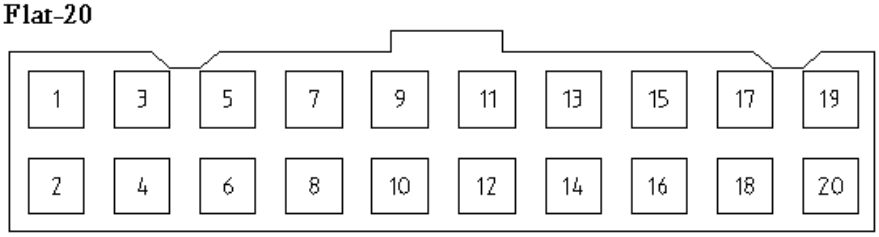

**DB9-Macho**



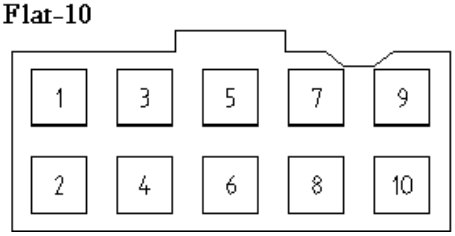

**DB9-Fêmea**




**Flat-20**




**Flat-10**



## 8 appendix D: Error Codes

| Erro | Descrição | |
|---|---|---|
| 4 | Display | |
| 5 | Ram de sistema | |
| 6 | Badram Erro power off | |
| 11 | Battery Low | |
| 12 | Eprom damage | |
| 13 | Lost Memory | |
| 14 | Memory Bad | |
| 35 | Serial gate whit problem | |
| 36 | Timer in | |
| 38 | Framing | |
| 40 | Overrrum | |
| 41 | Checksum | |
| 42 | Comunication Protocol | |
| 44 | Send Time-out | |
| 51 | Serial Start byte | |
| 52 | Invalid Start byte | |
| 53 | Invalid Stop byte | |
| 54 | Invalid Start byte | |
| 55 | Number the bytes received no valid | |
| 56 | Receiver not ACK | |
| 57 | Answer channel not valid | |
| 58 | Answer command not valid | |
| 59 | Invalid Bytes end off block | |
| 60 | Receiver command check-sum | |
| 61 | Menu program | |
| 62 | Menu axis configuration | |
| 63 | Menu axis  X configuration | |
| 64 | Menu axis  Y configuration | |

## 9 Appendix F: Map of the Menus

In this Appendix they are striped all of the menus and parameters of Swing Arms. The items in bold are simple menus, the underlined items are menus that receive parameters and the other items are simple parameters. The objective of this section is simply auxiliary the user to navigate among the parameters of the equipment.

Main menu

Manual

Execution

Programming

Number of the program for edition...:

Movement parameter...
- Initial position
- Final position
- Progress acceleration
- Return acceleration
- Progress speed
- Return speed

Impression parameters...
- Number of messages in the progress
- Number of messages in the return
- First message in the progress
- First message in the return
- Last message in the progress
- Last message in the return
- Linked reverse message

Configuration of the cycle...

- Retard in the automatic start
- Retard in the external start
- Automatic Start in the progress
- Automatic Start in the return
- Way of work of the axis

Configuration of the printer...

- Logic of the impression sign
- Width of the impression sign
- Message reversion saw serial
- Message selection saw serial

Intertravamento for two axes...

Anticipation of the start exit
Healthy of start in the progress
Start exit in the return
Start entrance among axes
Reference for external start

Number of the program of the axis X:

Identical to program "Number for edition"

Number of the program of the axis Y:

Identical to program "Number for edition"

To copy the program number: 00 for 00
He changes of the access level

Configuration of the axis X...

Number of the channel of the axis X
Pulse number for turn X
Window of protection of the turn X
Displacement/Rotation of the motor X
Turn X with protection function
Turn X with correction function
Logic of the external start X
Value of the position of the reference
Speed for reference
Acceleration for reference
Reduction of the current in rest
Start for the keyboard and external X

Configuration of the axis Y...
Number of the channel of the axis Y
Pulse number for turn Y
Window of protection of the turn Y
Desplacement/Rotation of the motor Y
Turn Y with protection function
Turn Y with correction function
Logic of the start expresses Y
Value of the position of the reference
Speed for reference
Acceleration for reference
Reduction of the current in rest
Start for the keyboard and external Y

Configuration of the Equipment...
To change the password of this level
Software CPU version
Software CPU checksum

Routines of tests and verification

To verify parameter 00h of the plate micrX
To modify parameter 00h of the plate micrX
To verify parameter 00h of the plate micrY
To modify parameter 00h of the plate micrY
He verifies memory of CPU, endereço=0000h
He verifies memory X, endereço=0000h
It verifies memory Y, endereço=0000h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# *ET-2003*

# Control Panel

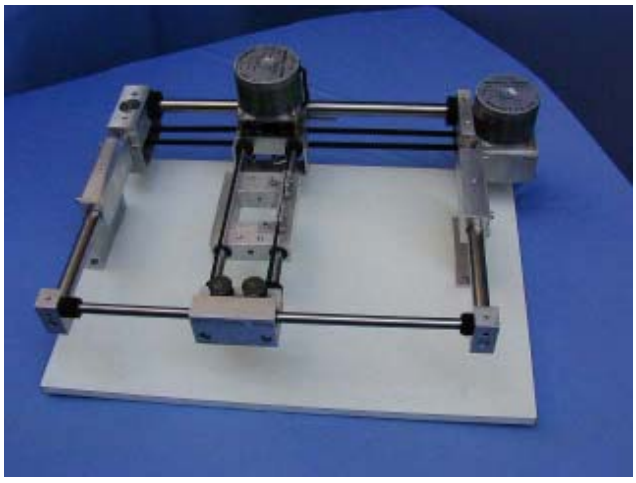

*Figura 2*

Electronics Card

# MOUNTED EQUIPMENT

2 AXES


2 AXES



2 AXES

1 AXES

1 AXES

MINI RUN

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