kortho

MANUAL

Hot Quick Coder-D

English

bv korthofah

P.O. box: 3040
2220 CA, Katwijk
The Netherlands

Tel:	+31 71 40 60 480
Fax:	+31 71 40 32 807
E-mail:	export@kortho.nl
Internet:	www.kortho.com

Document date:	14/03/2018
Manual:	H215 AE Manual Hot Quick Coder-D Series.doc
Number of pages:	65

The basis for this manual is:

Series:	Hot Quick Coder-D
Models:	HQC-D
Firmware release:	v1.1.021(A)
Original manual language:	English
Production year:	2010

CE

▪ Preface

Welcome to the Hot Quick Coder-D manual.

Read the manual before you start and read it carefully. This will avoid unnecessary problems and loss of performance.

This manual is meant for all personnel who are involved with the Hot Quick Coder-D. The purpose of this manual is to get familiar with the coding unit and control box of the printer.

Keep this manual on a sensible and safe place for future use.

Contact Korthofah BV or your local distributor if you have any questions

Conventions in this manual:

- ▪ The Kortho Hot Quick Coder-D system will be referred to as the printer.
- ▪ Any material the printer is used to print on is called substrate.
- ▪ The Kortho Hotroll, a foam roll which holds the ink (wax-based).
- ▪ Follow the instruction order as indicated when you carry out any of the procedures described.

Instruction format:
1. Instruction. Comment(s).
   a. Sub-instruction. Comment(s).
   b. Sub-instruction. Comment(s).
2. Instruction. Comment(s).

▪ Symbols in this manual

In this manual, the following symbols are used:

WARNING:
This symbol indicates a potentially hazardous situation which, if instructions are not followed, could result in serious injury or death.

CAUTION:
This symbol indicates a potentially hazardous situation which, if instructions are not followed, may result in minor or moderate injury or damage to property.

The statements above are notes for your safety.

Beware:
A notice with useful information for the user in relation to the product. It attends the user to possible problems.

Note:
Gives the user suggestions and helps the work to be carried more rapidly.

▪ Glossary

Bracket: Supports the coding unit and the platen and captures the print force between the print head and the platen.

Continuous packaging   A packaging machine is running without any interruption. The substrate keeps running during a packaging cycle. The printer can print on the moving substrate.

Text holder: Stamps an imprint on the substrate. It slides into the slot of the print head. It holds the rubber clichés and characters that make the actual print.

Hotroll: Plastic core with a foam roll which holds the ink (wax-based). The ink will only be transferred at high temperature (min. 120 °C). This ink is needed to make prints on a substrate.

Foam roll   Part of the Hotroll that contains the ink (wax-based).

Host: A machine or production system that handles the product or substrate and can be connected by an interface to the printer, e.g. a printer alarm to stop the machine.

Intermittent packaging   A packaging machine is stopping and starting at regular or irregular intervals. The substrate runs and stops once during a packaging cycle. The printer can both print while the substrate is running and while it stands still.

Platen: An adjustable metal plate that is placed opposite the print head. The print pressure is build-up between the print head and the platen.

Print: The result of printing an image on a substrate.

Print cycle: The moment from which the printer accepts a print request until the printer is ready to accept a new print request.

Print head: Holds an exchangeable text holder and cause the movement of the text holder between hotroll (taking up ink) and substrate (transfer the ink to the substrate).

Print request: A signal generated by a sensor or host machine. It is a trigger to start a print cycle.

Product: In this manual, the items the printer prints on, e.g. a box, package etc.

Sensor: A product detection device connected to the control box, usually a photocell.

Substrate: This is the material of a product to print on, e.g. cardboard, wood, paper, foil, web etc.

Heating ring: Metal ring that hold the heating elements and temperature sensor. The Hotroll is heated in this ring in order to make the ink liquid, so it can be transferred to the substrate by the text holder.

Preheat unit: Heating unit to preheat a hotroll, so the printer is immediately ready to print after placing a new hotroll.

▪ Table of contents

1 INTRODUCTION

2 TECHNICAL DESCRIPTION

3 PROCESS DESCRIPTION

4 SAFETY

5 INSTALLATION

Appendices

1   INTRODUCTION

1.1   Qualified personnel

Operators are qualified when they have read and understand this manual. A specific preliminary training is not required.

Technicians that carry out repairs and technical maintenance on the printer equipment should have secondary technical education or comparable technical level of knowledge through practical experience.

Installation or servicing of the printer must only performed by qualified personnel of Korthofah BV or a local distributor, which is designated by Korthofah BV. For customer installations authorisation must be obtained from Korthofah BV or a local distributor, which is designated by Korthofah BV.

1.2   Elementary personal protection

WARNING:
Keep your hands away from the text holder, the foam roll, the heating ring and the preheat unit. All these parts are hot. Use the removable text holder handle to exchange text holders.

CAUTION:
Do NOT put your hands between the printer and platen/substrate. The printer stamps with pressure an print on the substrate.

Please read the SAFETY chapter for more information.

1.3   Intended Use

The Hot Quick Coder-D printers are industrial printers and are designed to print directly on substrates.

Normal use means use under normal conditions as described in this manual.

The printer may not be used in areas, which have a fire or explosion hazard.

Korthofah BV accepts no liability for damage resulting from the improper or uninformed use of the equipment or caused by maintenance or other work being carried out improperly. They also accept no liability for the normal wear-and-tear of the printer.

1.4   Specifications

1.4.1   Coding unit

A general impression of the coding unit dimensions is given for the Hot Quick Coder D in Fig. 1.1
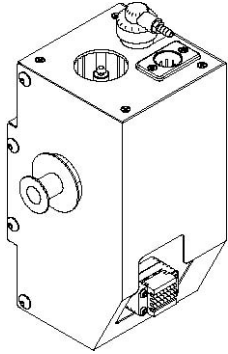
The dimensions of the coding unit without hotrolls are:

Model	H x W x D	Print area
HQC-D	209 x 96.5 x 124 mm	10 x 24 mm

Fig. 1.1   Coding unit HQC-D.

The coding units are driven by compressed air, dry and oil free, with a pressure of 0.4 MPa.

1.4.2   Control box

The dimensions (H x W x D) of the control box are 223 x 296 x 89 mm.

The electrical requirements for the power supply are a voltage of 115 or 230VAC and a frequency between 50 and 60Hz. The total power consumption is the sum of the control box and coding unit consumption. Refer to section 5.1.

All external equipment that is connected to the control box interface must be double insulated to qualify the whole installation as a separated extra-low voltage (SELV, Class II) system.

The control box has a bespoke hardware user interface and host I/O-ports.

The ambient temperature must be between 5 °C and 45 °C, with a relative humidity between 10% and 90% (non condensing).

1.5   Life span

The life span of the equipment is five years, under normal use.

The life span can be negatively influenced by improper/uninformed use of the equipment or improper maintenance, repair or modification. No claims for guarantee or compensation for damages will be accepted in such instances.

1.6   Shock & vibration

The control box should be installed in a low vibration location.

2   TECHNICAL DESCRIPTION

2.1   The printer system
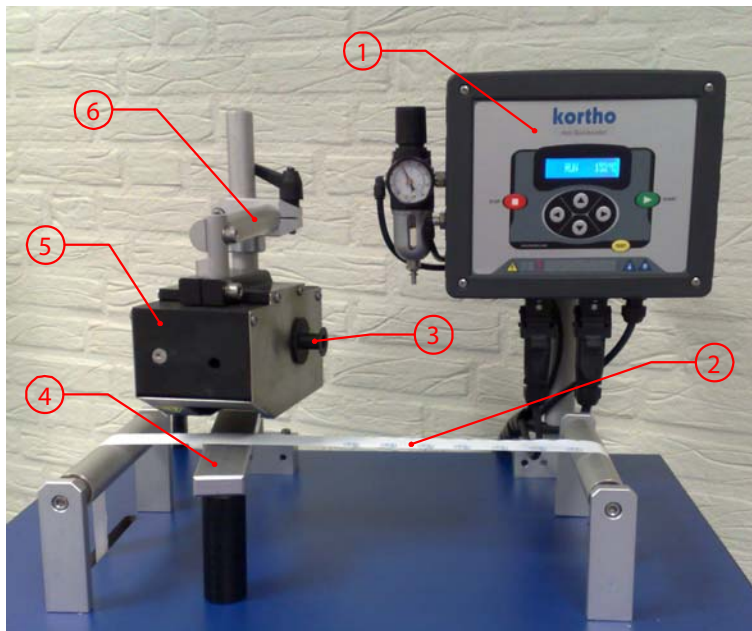
1. Control box
2. Substrate
3. Hotroll
4. Counter pressure plate
5. Coding unit
6. Bracket

Fig. 2.1   The printer system.

The picture Fig. 2.1 shows a typical Hot Quick Coder system. The substrate runs between the coding unit and the platen. The host (e.g. packaging machine that is connected to the control box) triggers the printer to make a print. A print is made when the coding unit stamps with the text holder on the substrate. During the print process the hotroll will be rotated so the ink transfer to the text holder and the usage of the hotroll will be optimal.

The text can be applied to a stationary or a moving product. The maximum permitted product speed is 60 m/min. Approx. 250 impressions per minute can be produced.

2.2   Control box
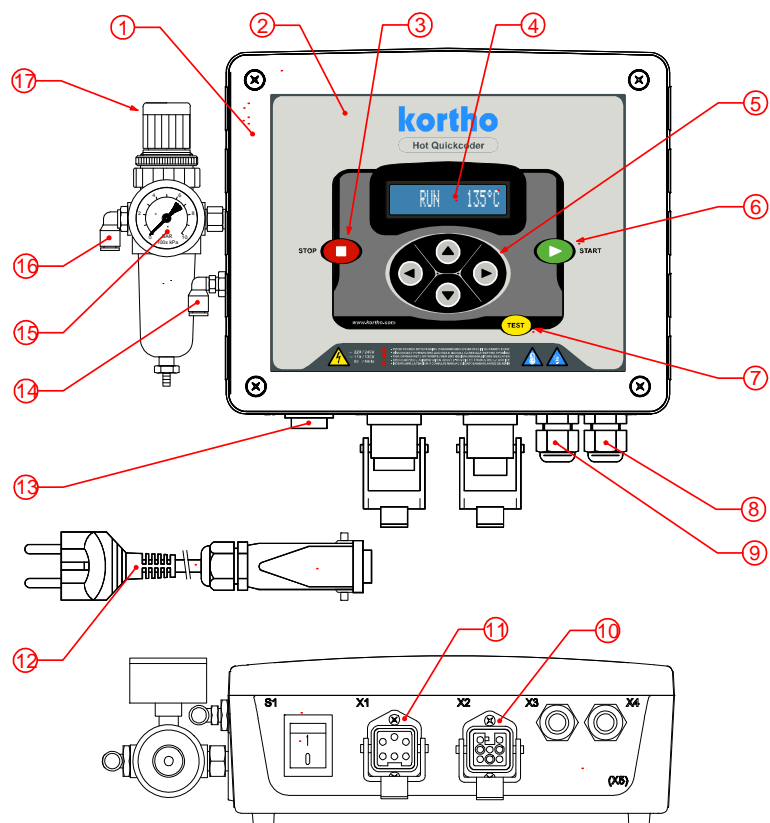
1.   Control box Hot Quick Coder D
2.   Control panel
3.   Stop key
4.   LCD display
5.   Cursor keypad (up, down, left, right)
6.   Start key
7.   Test key
8.   X4 Cable gland
9.   X3 Cable gland
10. X2 Printer connection
11. X1 Supply connection
12. Supply cable + Euro plug
13. Power switch
14. Printer fitting
15. Manometer print pressure
16. Supply pressure fitting
17. Print pressure adjustment

Fig. 2.2   Control box.

2.3   Coding unit

1. Preheat unit with hotroll
2. Warning sign
3. Print head
4. Text holder
5. Heating ring with hotroll
6. Air supply (to control box)
7. Power supply (to control box)
8. Warning sign
9. Mounting block
10. Location serial number label
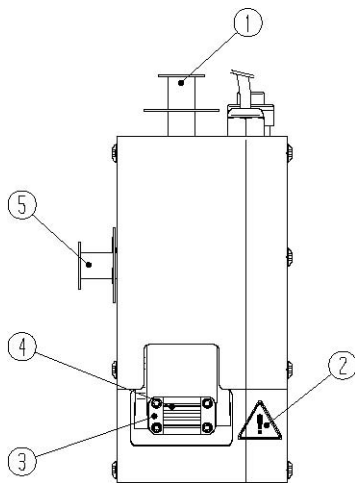
Fig. 2.3   Coding unit HQC-D front view.
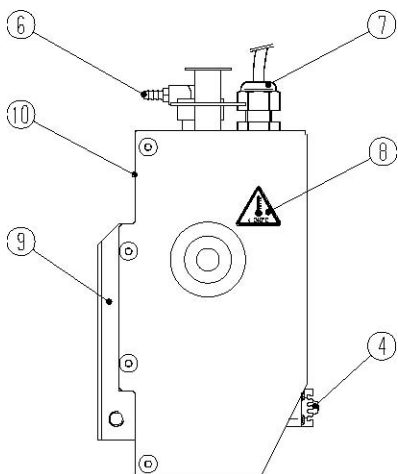
Fig. 2.4   Coding unit HQC-D left view.

2.4 Text holder

The text holder of the HQC-D slides into a text holder slot of the print head.

1. Text holder
2. Removable handle
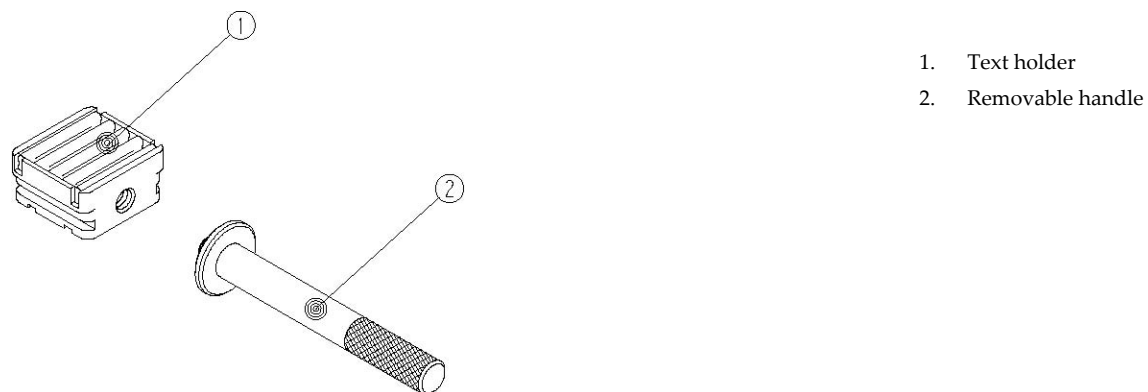
Fig. 2.5 Text holder.

The characters or cliché are made out silicone rubber and on the back they have a special profile which can be pushed into the text holder. The hardness of the silicone rubber is important to get a good print.

2.5 Mounting support

1. Standard bracket
2. Standard platen
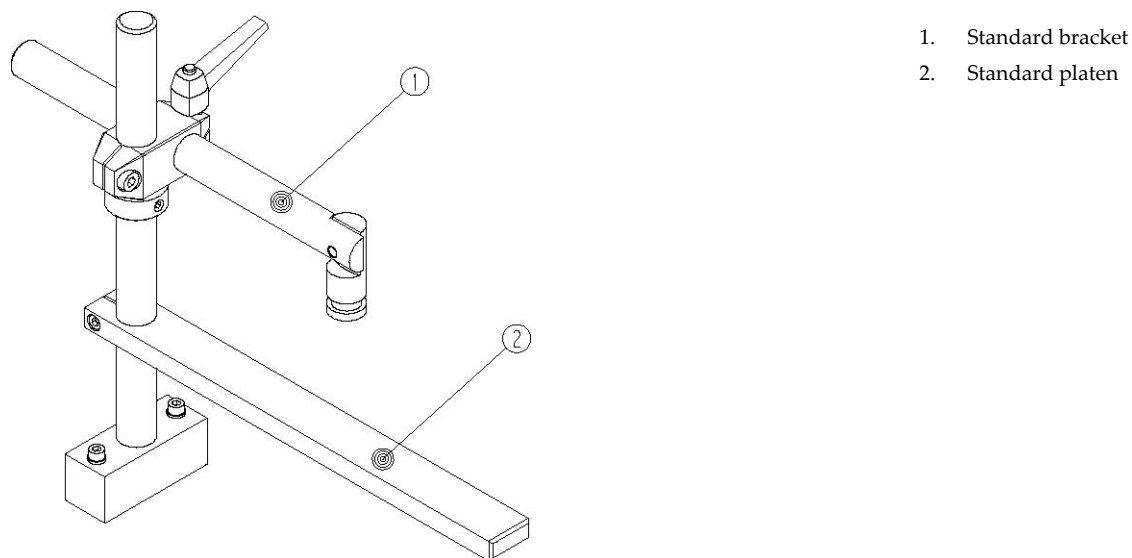
Fig. 2.6 Standard Bracket.

3 PROCESS DESCRIPTION

3.1 The printing process

The purpose of the printer is to print an image on a substrate. This printer uses heat, pressure and time to make a print by transferring ink from a hotroll to the substrate.

The ink is transferred to the substrate when the text holder, which holds the image to be printed, takes the ink from the hotroll and is pressed onto the substrate against the platen. In order to transfer the ink from the hotroll to the text holder the hotroll and the text holder must be hot enough. In general a temperature setting of 135°C gives a good print result.

The operator can set the print parameters; temperature, pressure and time to desired values. These parameters are dependent on the die size, the Hotroll/substrate combination and the environment. Before printing the printer must heat the text holder and the hotroll to a defined temperature.

The print cycle starts with a trigger signal. A host machine, switch or a photocell, which detects the product or special mark on the substrate, must generate this trigger. The printer then stamps the inked text holder on the substrate. When the text holder leaves it's rest position the hotroll will be rotated in order to get a optimal ink transfer and use.

An alarm output is set when a printer error occurs.

3.2 User interface

The user interface consists of two parts, the control panel and the menu structure of operator menus.

3.2.1 Control panel

Fig. 3.1   Control panel.

The cursor keys positioned below the LCD display on the control panel are used to navigate through the control box's screen menus.

Three command keys, STOP, START and TEST are provided.

The STOP key sets the printer in the stop-mode. In stop-mode the printing is stopped and 'STOP' is displayed on the LCD-display.

The START key sets the printer in the run-mode. and 'RUN' is displayed on the LCD-display. The printer accepts now trigger pulses from the host machine, if the alarm is not set.

The TEST key is only enabled in stop-mode. Press this key to make one test print. A test print will only be made if the alarm signal is not set.

3.2.2 Indicator icons

The Indicator icons on the LCD display, are provided to show the status:

I-icon: Indicates that the inhibit input is set. When the inhibit is set the printer will ignore the trigger signal and the test button. (Optional)

T-icon: Indicates that the trigger input is set. In RUN mode the print cycle will start

P-icon: Indicates that the printer is printing and the busy-output is set (power MOSFFET).

H-icon: Indicates that the heating elements are switched on. This icon is flashing until the set temperature is reached.

3.2.3 Menu structure
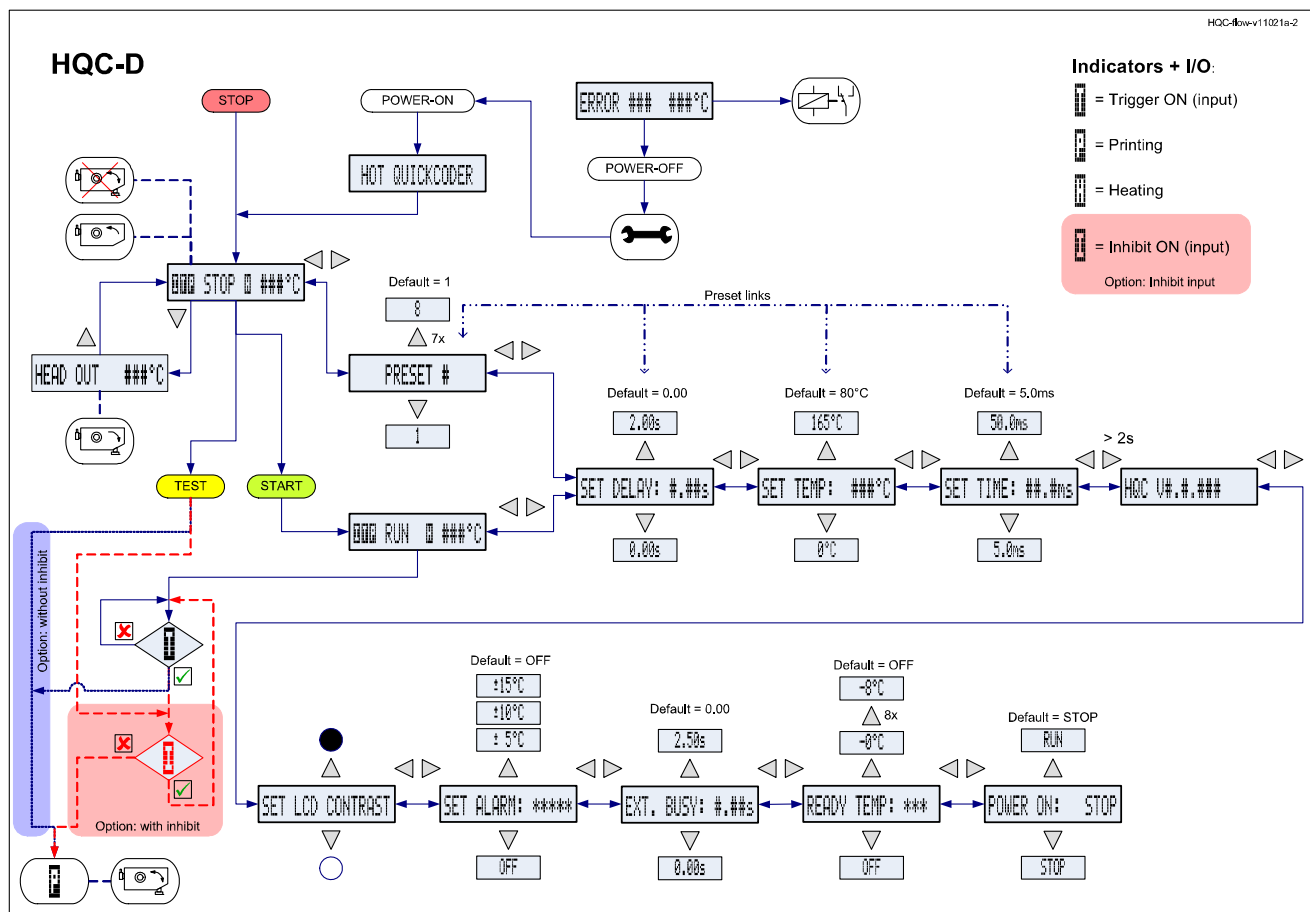
Fig. 3.2   Menu structure

Refer to Appendix E for a full-scale sheet of the basic menu structure.

4   SAFETY

This product is designed to conform to all current directives, and their relevant harmonized standards, of the European Council.

4.1   Relevant directives

CE Machinery Directive (2006/42/EC)

EN 12100-1:2003 EN 12100-1/A1:2009	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN 12100-2 :2003 EN 12100-2/A1:2009	Safety of machinery - Basic concepts, general principles for design - Part 2 : Technical principles.

EMC Directive (2004/108/EC)

|	
EN 55022 :2006 EN 55022/A1:2007	Information Technology Equipment - Radio disturbance characteristics Limits and methods of measurement.
EN 55024 :1998 EN 55024/A1:2001 EN 55024/A2:2003	Information Technology Equipment - Immunity characteristics Limits and methods of measurement.
EN 61000-3-2:2006	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)
EN 61000-3-3:1995 EN 61000-3-3/A1:2001 EN 61000-3-3/A2:2005	Electromagnetic compatibility (EMC) - Part 3-3: Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current 16 A per phase and not subject to conditional connection.

Low Voltage Directive (2006/95/EC)

EN 60950-1:2006 EN 60950-1/A1:2009	Information technology equipment - Safety -- Part 1: General requirements

4.2   Power supply

$\sim$ 220 / 240V
$\sim$ 110 / 130V
  50 / 60Hz
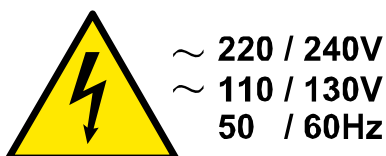
Fig. 4.1   Voltage warning

For safe operation, the power cable to the control box must be connected to a properly grounded single-phase supply of the appropriate voltage. The power supply must comply with the power supply information that is written on the serial-number label (located on the back of the control box).

Verify that no significant potential difference exists between the single-phase ground supply of the printer and the frame ground of the host machine.

> **Note:**
> All external equipment that is connected to the control box interface must be double insulated to qualify the whole installation as a separated extra-low voltage (SELV, Class II) system.

The wire colour code for the supply cable is: BROWN for Line (L)
                                                   BLUE for Neutral (N)
                                                   GREEN/YELLOW for Protective Earth (PE)

When installing or servicing the equipment ensure that the host machine is stopped.

4.3   Precautions before power-up

Check at every printer power-up if all these connections are secured:

1.   The mains power plug. (X1).

2.   The printer cable. (X2).

3.   The cable/conduit (X3/X4) between the control box and the coding unit.

4.4   Precautions when opening the control box

- VOOR OPENEN NETSPANNING ONDERBREKEN EN HANDLEIDING RAADPLEGEN
- DISCONNECT POWERCORD AND READ MANUAL CAREFULLY BEFORE OPENING
- VOR OFFNEN NETZ UNTERBRECHEN UND BEDIENUNGSANLEITUNG BEACHTEN
- DEBRANCHER L'ALIMENTATION AVANT D'OUVRIR ET CONSULTER LA NOTICE
- INTERRUMPA LA TENSION Y CONSULTE MANUAL CUIDADOSAMENTE ANTES DE ABRIR

Fig. 4.2   Attention label for opening the control box

The control box has an attention label (Fig. 4.2) to alert the user to read the manual before opening the control box.

WARNING:

•   <u>ALWAYS</u> disconnect the power to the printer before removing any connectors or covers:

•   Switch the printer off.

•   Remove the plug from the mains power supply.

•   <u>DO NOT</u> operates the printer when any cover is removed.

•   <u>DO NOT LEAVE</u> tools, screws or other parts inside the control box when re-assembling the equipment.

4.5   Anti-static precautions

The printed circuit boards are static sensitive devices, which can be damaged if they are touched without the necessary electrostatic discharge (ESD) precautions being taken. The ESD precautions involve the use of a grounded wrist strap and/or conductive work mat.

During installation, servicing and handling of the printed circuit boards , the printed circuit boards must be protected from electrostatic discharges.

4.6 Coding unit caution labels

This section describes the caution labels used on or near the coding unit.
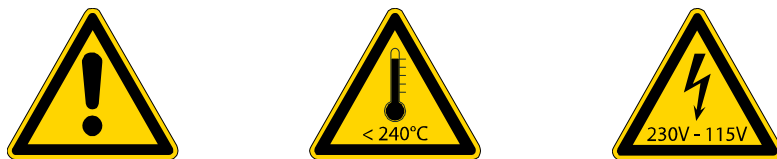
Fig. 4.3   Caution labels, general and hot parts risk.

CAUTION:
Keep body parts away from the moving parts of the coding unit to avoid crush injuries when the printer is operational.

The text holder will stamp on the platen with pressure, this can squeeze body parts with high degree of force.

CAUTION:
Keep body parts away from the text holder, the foam roll of the hotroll, the heating ring and the preheat unit to avoid burn injuries when the printer is powered up.

The heating ring is heated by an heating element, which can deliver a temperature up to 240°C (464°F).

WARNING:
The heating elements of the coding unit are powered by 230V or 115V.

5 INSTALLATION

5.1 Requirements

Provided by the customer:

- Power: 115 or 230VAC, 50-60Hz (refer to Fig. 5.1 for total power consumption).

- A trigger-signal output of the host machine (print).

- Sufficient space for installation and operation.

- Compressed air, dry and oil free, with a pressure of 0.4 MPa.

Optional:

- A stop-signal input of the host machine (printer alarm).

- Printer inhibit-signal output of the host machine (stop printer).

- A busy-signal input of the host machine (printer busy).

Name	Type	VA (max.).
Control box	HQC-D	10
Coding unit	HQC-D	100

Fig. 5.1 Power consumption / type.

The total power consumption is the sum of the control box and the coding unit power consumption.

i

Note:
Refer to Appendix D, 'Connections', 'Electrical diagram, Control box I/O' for the connection options.

5.2 Printer adaptation for 115VAC operation

The printer is standard fitted with fuses and heating element for 230VAC operation. Adaptation to 115VAC operation requires the exchange of fuses (control box) and heating element (coding unit). Refer to Fig. 5.2 for the fuse values and Fig. 5.3 for the heating elements/units

SW1	F1	F2	F3	F4
230VAC	1AT	1,6AT	300mAT	500mAT
115 VAC	2AT	3,15AT	500mAT	500mAT

Fig. 5.2   Control box, fuse values.

Refer to Appendix D Connections, Power–I/O board for the location of the fuses

SW1	Heating element		Part no. for heating unit
	Qty	Power	
230VAC	1x	150 W	814574
115VAC	1x	100 W	814672

Fig. 5.3   Coding unit, heating elements.

Refer to Appendix C Part lists & illustrations for the location of the heating element and sensor.
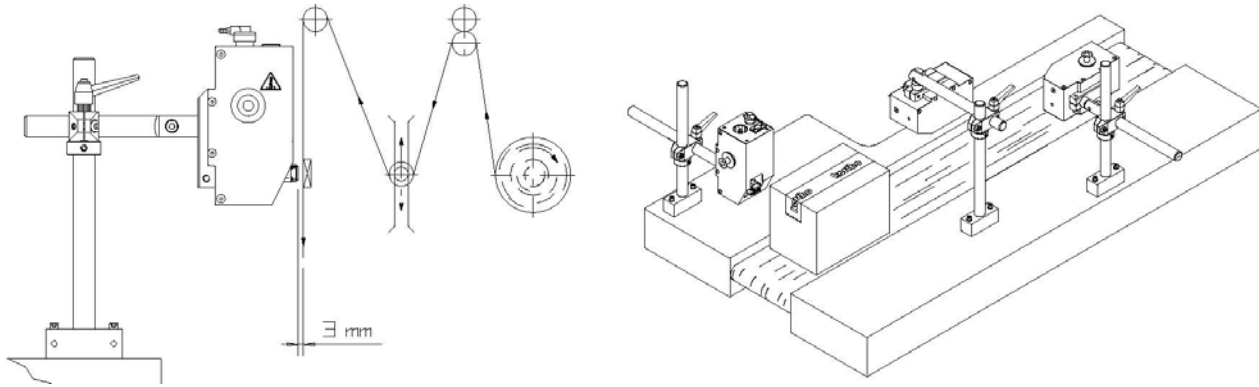
5.3 Mounting the coding unit

Fig. 5.4   Positioning of the coding unit.

Assuming you have available the (standard) mounting support:

1. Find a suitable location on the host machine for mounting the coding unit.

2. Make sure this location does not prevent people doing their job and that this location is accessible for maintenance.

3. Mount the coding unit mounting support on the host machine.

4. Mount a platen if necessary (some products do not need a platen because they are firm enough to make a print on without it).

5. Position the coding unit and tighten the cross coupling. In the printhead out position there should be 3 mm between the surface of the text holder and the substrate, see Fig. 5.4.

5.3.1   Intermittent packaging

On intermittent packaging machines the substrate stops and starts at (ir)regular intervals. Although the printer can make a print on the moving substrate it is preferable to trigger the printer on these machines in the interval that the substrate is stopped.

The print position can be moved with the substrate adjustment roller, Fig. 5.4 figure to the left, or by moving the printer to the desired position.

When using an adjustment roller, be aware that the substrate contains an amount of prints/packages between the print area and the seal area. So a substrate adjustment takes effect after a certain amount of prints.

The package length must be smaller than twice the rack and pinion length of substrate adjustment roller package length. The print area can only then be positioned anywhere between the top and bottom of the package.

5.3.2   Continuous packaging

On continuous packaging machines the substrate never stops and starts while packaging. The printer is triggered on these machines by the packaging cycle or by a sensor that detects a mark on the substrate.

The print position can be moved with the substrate adjustment roller, Fig. 5.4 figure, or by moving the printer to the desired position.

When using an adjustment roller, be aware that the substrate contains an amount of prints/packages between the print area and the seal area. So a substrate adjustment takes effect after a certain amount of prints.

The package length must be smaller than twice the rack and pinion length of substrate adjustment roller package length. The print area can only then be positioned anywhere between the top and bottom of the package.

5.4   Mounting the control box

Find a secure location, which is easily accessible for operators, to mount the control box. Refer to Appendix B, 'Control box HQC-D' for the dimensions of the mounting holes.

Fix it on a position near the coding unit bracket and guide the cables so that the coding unit can rotate and move back and forth within the dimensions of the bracket. Connect the coding unit cable to the X2 connector of the control box and use the connector lock to lock it.

Use the electrical diagram, Appendix D 'Electrical diagram, Control box I/O', to determine which interface option suits best with the host machine. Open the control box to gain access to the terminal blocks. Put an interface cable through one of the cable glands and connect the wires to the proper input or output. In case of a sensor driven trigger use the other cable gland for the sensor cable.

5.5   Initial setup

5.5.1   Prepare the text holder

The text holder has a printing area of 10 x 20 mm or 10 x 24 mm. The printing area has a specially shaped profile. The text characters and clichés have the same profile on the reverse. The text characters and clichés are applied to the text holder with a simple printing movement.

Fig. 5.5   Text holder and removable handle.
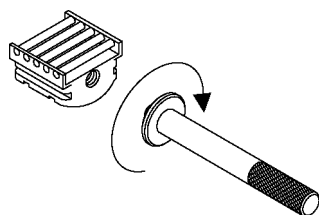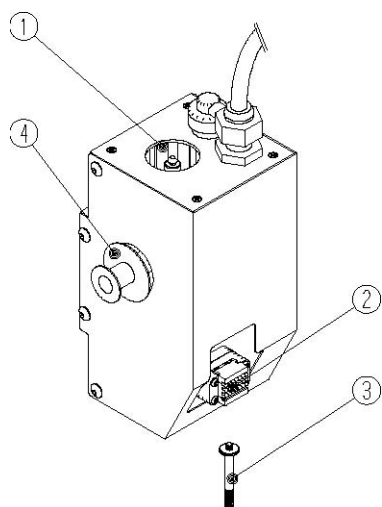
The 'blank space' in the text characters on the same "line" should be completely filled with space characters. This in order to fix the text position.

5.5.2   Placing a text holder

1.   Preheat unit
2.   Heating ring and Hotroll
3.   Text holder in text holder slot
4.   Removable handle

Fig. 5.6   Coding unit.

1.   Check by visual inspection for damage of the printer.

2. Check if all of the relevant cables are connected.

3. Switch on the control box. The program boots while the printer type is displayed.

Fig. 5.7   Firmware for Printer type message.

4. After 3 seconds the Stop mode menu appears.

Fig. 5.8   STOP MODE menu.

5. Push the down arrow, the printer will make a print stroke and the print head will stay in his "out" position.
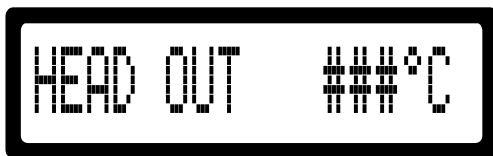
Fig. 5.9   HEAD OUT screen.

4. Screw the handle in the text holder.

5. Place the text holder in the text holder slot.

6. Remove the handle from the text holder.

7. Push the up arrow. The text holder slot will return to his home position and the controle unit will show the STOP MODE menu.

⚠ **CAUTION:**
Not removing the handle form the text holder before returning the print head to his home position can damage the coding unit.

5.5.3   Placing a hotroll

1. Check by visual inspection for damage of the printer.

2. Check if all of the relevant cables are connected.

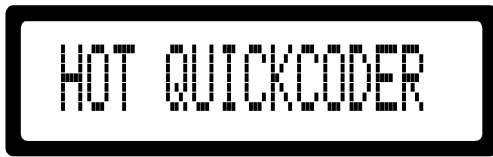**3.** Switch on the control box. The program boots while the printer type is displayed.

Fig. 5.10   Firmware for Printer type message.

4. After 3 seconds the Stop mode menu appears.

```
STOP     25°C
```

Fig. 5.11   STOP MODE menu.

**6.** Push the down arrow, the printer will make a print stroke and the print head will stay in his "out" position.

```
HEAD OUT   ###°C
```
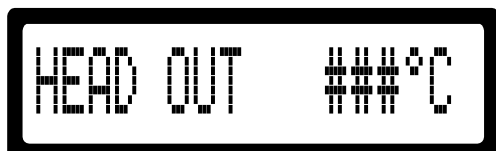
Fig. 5.12   HEAD OUT screen.

5. If present remove the used hotroll from the heating ring.

8. Place the new hotroll in the heating ring, make sure it clicks.

9. Push the up arrow. The text holder slot will return to his home position and the control unit will show the STOP MODE menu.

⚠️ **CAUTION:**
Placing or removing a hotroll in the heating ring while the print head is in his home position can damage the printer.

Placing a hotroll into the preheat unit can be done without any additional actions.

i **Note:**
By placing a new hotroll into the preheat unit one can make sure that the print process can continue immediately after placing a new hotroll from that preheat unit. Place a new roll into the preheat unit in order to make sure that the proces can be repeated the next cycle.

6   OPERATION

This part describes the functions and procedures for operating the printer.

⚠️ **CAUTION:**
Failure to observe the requisite heating up time of minimum 15 minutes leads to irriversable damage to the text characters/clichés, the hotroll and the coding unit.

6.1   Powering up

1.   Check by visual inspection for damage of the printer.

2.   Check if all of the relevant cables are connected.

3.   Set the air pressure to 0.4MPa, with the air regulator on the side of the control box.

4.   Switch the control box on. The program boots while the printer type is displayed.

Fig. 6.1   Firmware for Printer type message.

5.   After 3 seconds the Stop mode menu appears.

Fig. 6.2   STOP MODE menu.

6.   Make sure a hotroll is placed in the heating ring, refer to section 5.5.2. Placing a text holder.

7.   Make sure a text holder is place in the print head, refer to section 5.5.3 Placing a hotroll.

8.   Wait at least 15 minutes to heat up the hotroll and print head.

9.   Proceed with step 14, if the parameters does not have to change.

10. Press the RIGHT ARROW to browse through the parameters and alter the desired parameter. Refer to section 6.3, 'Parameter / message screens' and Appendix F, 'Quick reference'. When setting up the printer set the temperature to 135°C to start with.

     The parameter browse sequence is:
     PRESET, SET DELAY, SET TEMP, SET TIME,
     FIRMWARE message, SET LCD CONTRAST, SET ALARM, EXT.BUSY, READY TEMP, POWER ON.

11. Press the STOP key to return to the STOP MODE menu.

12. Press the TEST key to make a test print.

13. Check the print quality and change the SET TIME and/or SET TEMP parameter if necessary (step 10).

ℹ️ **Note:**
The print pressure is also important for the print quality.

ℹ️ **Note:**
If the print does not result in a completely even image, the position of the coding unit probably needs to be re-adjusted.

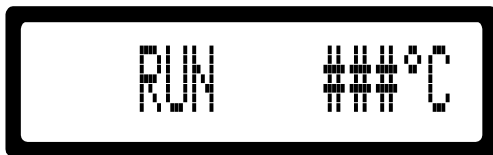14. Press the START key to enter the RUN MODE menu.

Fig. 6.3   RUN MODE menu.

15. Press the RIGHT ARROW to browse through the parameters and alter the desired parameter while in run mode. Refer to section 6.3, 'Parameter / message screens' and Appendix F, 'Quick reference'.

The parameter browse sequence is:
SET DELAY, SET TEMP, SET TIME,
FIRMWARE message, SET LCD CONTRAST, SET ALARM, EXT.BUSY, READY TEMP, POWER ON.

16. Press the STOP key to stop printing and enter the STOP MODE menu.

⚠️ **CAUTION:**
When the temperature is set too high, it can reduce the life time of the hotroll.

⚠️ **CAUTION:**
When the air pressure is set too high, it can reduce the service life of the coding unit.

ℹ️ **Note:**
If the printer is stopped for a longer time and/or switched off it is advisable to remove the text holder. This in order to prevent that the hotroll cools down while the text holder is pressing it together. While removing the text holder the hotroll will stay in his original shape due to which the ink transfer will be optimal.

6.2   Printer mode

6.2.1   Stop mode

This menu is accessible from any screen (except error) by pressing the STOP key.

Fig. 6.4 STOP MODE MENU, with all possible indicator icons.

In this mode the trigger signal will be ignored, but a TEST key press will make a test print. The current temperature is represented by ### °C
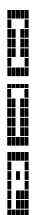
Press button:
RIGHT ARROW   to shift to the PRESET LIST.
TEST   to make a test print.
START   to enter the RUN MODE MENU, the printer is now standby.

In this mode the following indicator icons can be displayed:

I-icon: Indicates that the inhibit input is set (The printer ignores in this mode the TEST key)(Optional).

T-icon: Indicates that the trigger input is set (in this mode the trigger signal will be ignored).

P-icon: Indicates that the printer is printing (in this mode only by pressing the TEST key).

H-icon: Indicates that the heating elements are switched on. This icon is flashing until the set temperature is reached.

Press the RIGHT ARROW to browse through the parameters and alter the desired parameter while in run mode. Refer to section 6.3, 'Parameter / message screens' and Appendix F, 'Quick reference'.

6.2.2 Run mode

This menu is only accessible from the STOP MODE menu by pressing the START key.

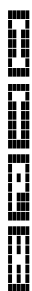Fig. 6.5 RUN MODE MENU, with all possible indicator icons.

In this mode the TEST key will be ignored. The current temperature is represented by ### °C.

Press button:
RIGHT ARROW   to shift to the SET DELAY parameter.
STOP   to return to the STOP MODE MENU and stop printing.

In this mode the following indicator icons can be displayed:

I-icon: Indicates that the inhibit input is set (The printer ignores in this mode the trigger signal) (Optional).

T-icon: Indicates that the trigger input is set (in this mode only by a trigger signal).

P-icon: Indicates that the printer is printing (in this mode the TEST key will be ignored).

H-icon: Indicates that the heating elements are switched on. This icon is flashing until the set temperature is reached.

Press the RIGHT ARROW to browse through the parameters and alter the desired parameter while in run mode. Refer to section 6.3, 'Parameter / message screens' and Appendix F, 'Quick reference'.

6.3 Parameter / message screens

6.3.1 Preset list

This list is only accessible from the STOP MODE menu.

Fig. 6.6 PRESET LIST, the active preset is displayed.

The printer can store 8 different presets. A preset is a collection of predefined parameter values; SET DELAY, SET TEMP and SET TIME. The parameter values of the active preset can be altered by changing the desired parameter.

The current preset list is represented by #.

Press button:

UP ARROW	to increase the PRESET LIST number.
DOWN ARROW	to decrease the PRESET LIST number.
LEFT ARROW	to shift to the STOP MODE MENU.
RIGHT ARROW	to shift to the SET DELAY parameter.
STOP	to return to the STOP MODE MENU.

6.3.2   Set delay

This parameter is only accessible from the RUN MODE menu or the PRESET list.

Fig. 6.7 SET DELAY parameter.

The SET DELAY parameter delays the print after a trigger signal is received. The delay has a range from 0.00 to 2.00 seconds. The current parameter value is represented by #.##s. This parameter can be stored as a preset value, refer to subsection 6.3.1 Preset list.

Press button:

UP ARROW	to increase the parameter value.
DOWN ARROW	to decrease the parameter value.
LEFT ARROW	to shift to the PRESET LIST (stop mode) or the RUN MODE MENU (run mode).
RIGHT ARROW	to shift to the SET TEMP parameter.
STOP	to return to the STOP MODE MENU and stop printing.

6.3.3   Set temp

This parameter is only accessible from the SET DELAY parameter.

Fig. 6.8 SET TEMP parameter.

The SET TEMP parameter is the desired temperature of the heating ring. The temperature has a range from 0 to 165°C. The current parameter value is represented by ### °C. This parameter can be stored as a preset value, refer to subsection 6.3.1 Preset list.

Press button:

UP ARROW	to increase the parameter value.
DOWN ARROW	to decrease the parameter value.
LEFT ARROW	to shift to the SET DELAY parameter.
RIGHT ARROW	to shift to the SET TIME parameter.
STOP	to return to the STOP MODE MENU and stop printing.

6.3.4 Set time

This parameter is only accessible from the SET TEMP parameter.

Fig. 6.9 SET TIME parameter.

The SET TIME parameter is the desired print time. The print time has a range from 5.0 to 50.0 milli-seconds. The current parameter value is represented by #.##s. This parameter can be stored as a preset value, refer to subsection 6.3.1 Preset list.

Press button:

UP ARROW	to increase the parameter value.
DOWN ARROW	to decrease the parameter value.
LEFT ARROW	to shift to the SET TEMP parameter.
RIGHT ARROW	longer than two seconds to shift to the FIRMWARE VERSION message.
STOP	to return to the STOP MODE MENU and stop printing.

6.3.5 Firmware message

This parameter is only accessible from the SET TIME parameter (press the RIGHT ARROW longer than two seconds).
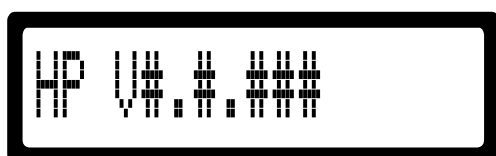

Fig. 6.10   FIRMWARE VERSION message.

The FIRMWARE VERSION message shows the printer type and current firmware version. The current version is represented by V#.#.###.

Press button:

LEFT ARROW	to shift to the SET TIME parameter.
RIGHT ARROW	to shift to the SET LCD CONTRAST menu.
STOP	to return to the STOP MODE MENU and stop printing.

6.3.6 Set LCD contrast

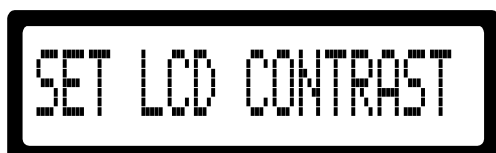This parameter is only accessible from the FIRMWARE message.

Fig. 6.11   SET LCD CONTRAST menu.

In the SET LCD CONTRAST menu the LCD contrast can be changed.

Press button:

UP ARROW	to darken the LCD contrast, keep pressed until the desired contrast is set.
DOWN ARROW	to lighten the LCD contrast, keep pressed until the desired contrast is set
LEFT ARROW	to shift to the FIRMWARE VERSION message.
RIGHT ARROW	to shift to the SET ALARM parameter.
STOP	to return to the STOP MODE MENU and stop printing.

6.3.7 Set alarm

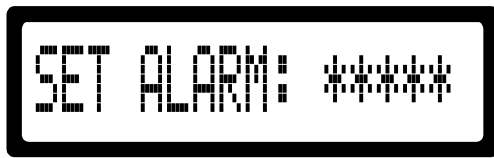This parameter is only accessible from the SET LCD CONTRAST menu.

Fig. 6.12   SET ALARM parameter.

The SET ALARM parameter is the desired temperature alarm setting. The temperature alarm has four possible settings;: OFF, ±5°C, ±10°C or ±15°C. The current parameter value is represented by *****.

The temperature range (±5°C, ±10°C or ±15°C) is related to the SET TEMP parameter. If the actual temperature is outside the current temperature range; the alarm is set, the printer stops printing and an error message (ERROR 004) is displayed.

Press button:
UP ARROW   to browse upwards through the settings.
DOWN ARROW   to browse downwards through the settings.
LEFT ARROW   to shift to the SET LCD CONTRAST menu.
RIGHT ARROW   to shift to the EXT.BUSY parameter.
STOP   to return to the STOP MODE MENU and stop printing.

6.3.8 Extended busy (optional)

This parameter is only accessible from the SET ALARM parameter.

Fig. 6.13   EXT.BUSY parameter.

The EXT.BUSY parameter extends the busy signal, refer to Appendix D Connections, I/O signals. The extended busy time has a range from 0.00 to 2.50 seconds. The current parameter value is represented by #.##s.

Press button:
UP ARROW   to increase the parameter value.
DOWN ARROW   to decrease the parameter value.
LEFT ARROW   to shift to the SET ALARM parameter.
RIGHT ARROW   to shift to the READY TEMP parameter.
STOP   to return to the STOP MODE MENU and stop printing.

6.3.9 Ready temperature

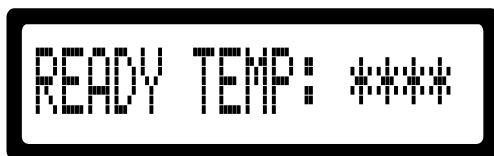This parameter is only accessible from the EXT.BUSY parameter.

Fig. 6.14   READY TEMP parameter.

The READY TEMP parameter controls the busy signal when the control box is powered on. This parameter is related to the SET TEMP parameter, see subsection 6.3.3, and has ten possible settings; OFF, -0°C and -1°C to -8°C in one degree steps.   The current parameter value is represented by ****.

When this parameter is set, the busy signal is set from the moment the control box is powered on until the printer temperature ($T_{pr\,int\,er}$) has reached a value equal or greater than SET TEMP (T_{set}) minus READY TEMP (T_{ready}).

$$T_{pr\,int\,er} \geq T_{set} - T_{ready}$$

The preferred READY TEMP values are OFF and -0°C, the other values are meant for special environments.

While the busy signal is active, the printer ignores trigger signals and will not print. This parameter is usual used with automatically controlled packaging machines. It prevents printing until the printer has reached (nearly) the desired print temperature.

> **i**
>
> **Note:**
> The busy signal status is not displayed when the busy signal is set by the READY TEMP parameter, only the output is set.
>
> (Reminder: The busy signal status is displayed as the P-icon when the printer is printing)

Press button:

UP ARROW	to increase the parameter value.
DOWN ARROW	to decrease the parameter value.
LEFT ARROW	to shift to the EXT.BUSY parameter.
RIGHT ARROW	to shift to the POWER ON parameter.
STOP	to return to the STOP MODE MENU and stop printing.

6.3.10   Power on

This parameter is only accessible from the READY TEMP parameter.
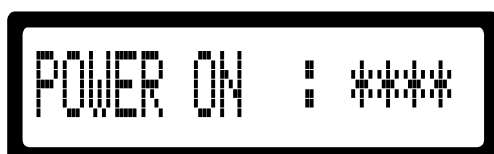

Fig. 6.15   POWER ON parameter.

The POWER ON parameter sets the print mode at which the control box will start after power on. This parameter has two possible settings, STOP and RUN. The current parameter value is represented by ****.

This parameter is usual used with automatically controlled packaging machines.

Press button:

UP ARROW	to toggle the parameter to the RUN value.
DOWN ARROW	to toggle the parameter to the STOP value.
LEFT ARROW	to shift to the READY TEMP parameter.
STOP	to return to the STOP MODE MENU and stop printing.

6.4 User settings

Fill in this table with the values found by setting the printer parameters.
Use the table, as a reference, to set the printer parameters when the memory is reset to the default values.
Keep the table nearby, when calling the helpdesk of your local distributor.

Firmware:	V . .	PRESET			
Parameter	**Range**	**1**	**2**	**3**	**4**
SET DELAY	0.00- 2.00s				
SET TEMP	0 - 165°C				
SET TIME	5.0- 50.0ms				
Parameter	**Range**	**1**	**2**	**3**	**4**
SET DELAY	0.00- 2.00s				
SET TEMP	0 - 165°C				
SET TIME	5.0- 50.0ms				
Parameter	**Range**	**GLOBAL**			
SET ALARM	OFF, ±5°C, ±10°C,±15°C				
EXT.BUSY	0.00- 2.50s				
READY TEMP	OFF, -0°C to -8°C				
POWER ON	STOP, RUN				

Fig. 6.16 Printer parameters.

Fill in this table and keep nearby, when calling the helpdesk of your local distributor.

Manufacterer host machine, type	
Control box, serial number	
Coding unit , serial number	
Production plant	
Production line	
Type of substrate (product)	
Production / print rate	Cycles / min
Ambient temperature (min, max)	°C (min) / °C (max)

Fig. 6.17 Printer environment information.

7 TROUBLESHOOTING

7.1 Error 001
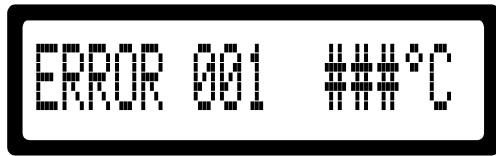
```
ERROR 001  ###°C
```

Fig. 7.1 ERROR 001.

A too high or too low print temperature is detected.

The print temperature must be in between -10 to 200°C.

The actual temperature is displayed, here represented as ###°C

7.2 Error 002
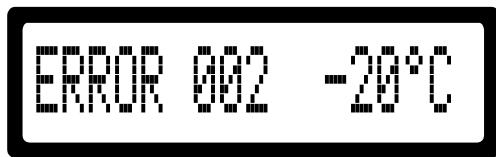
Occurs only in the stop or run mode.

7.2.1 -20°C

```
ERROR 002  -20°C
```

Fig. 7.2 ERROR 002, -20°C.

The temperature sensor circuit is short circuited or the PT1000 sensor is defect.

7.2.2 300°C

```
ERROR 002  300°C
```

Fig. 7.3 ERROR 002, 300°C.

The temperature sensor circuit is open circuited or the PT1000 sensor is not connected or defect.

7.3 Error 003

Occurs only at system boot.
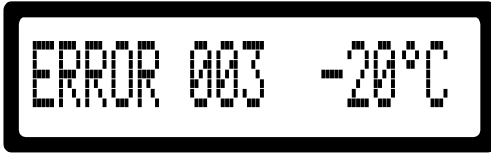
7.3.1 -20°C

Fig. 7.4   ERROR 003, -20°C.

The temperature sensor circuit is short circuited or the PT1000 sensor is defect.

7.3.2 300°C

Fig. 7.5   ERROR 003, 300°C.

The temperature sensor circuit is open circuited, the PT1000 sensor is not connected or defect and if an HQC-AT heating element/coding unit is connected to the control box.

7.4 Error 004

Occurs only if the SET ALARM parameter is set.

Fig. 7.6   ERROR 004.

The temperature alarm is activated.

A too high or too low print temperature deviation from the SET TEMP parameter value (±5°C, ±10°C or ±15°C) has occured.

The actual print temperature is displayed, here represented as ###°C.

7.5   Error 016

```
ERROR 016  ###°C
```

Fig. 7.7   ERROR 016.

The print temperature algorithm does not detect a temperature change while the heating element is switched on.

Perhaps the heating element or PT1000 sensor are not connected or defect, the fuses F1/F2 are blown or the heating circuit is defect.

The actual detected print temperature is displayed, here represented as ###°C.

7.6   LCD screen is not lit

Check the fuses F1, F2, F3 and F4. See Installation chapter.

8   MAINTENANCE

⚠ **WARNING:**
Always disconnect the HQC-D from the mains power supply by removing the mains plug from the control box.

⚠ **WARNING:**
The HQC-D may under no circumstances be cleaned with water.

⚠ **Note:**
Use ethanol to clean the coding unit and the control box. Never use an agressive cleaner, this may damage the plastic parts of the coding unit and the control panel of the control box.

8.1   Quick and regular checks

- The print quality:
    - o Due to the ink consumption the print can faint. In that case replace the hotroll by a new one.
    - o De text can fill up with ink, due to which the print becomes unreadable. Clean the text with ethanol. If the text fills up quickly it is worthwhile trying to reduce the print temperature.
    - o Due to normal use the silicone rubber will wear. Replace the text characters and clichés if necessary.
- The rotation of the hotroll: Check the rotation of the Hotroll during the print process in order to optimize the ink distribution. If the hotroll doesn't rotate check if the transport pin on the print head is still straight.
- The printer: Check the coding unit and the control box for damage. Repair defects immediately.
- Cabling: Check if all of the relevant cables are connected in a proper way. Repair defects immediately.

8.2   Monthly maintenance

- Print quality: See also 8.1 Quick and regular checks, and adjust the position of the coding unit and the print parameters if necessary.
- Movement of the printhead:Check if the print head is ok and can move freely in the way it should. Make adjustments and repair if necessary.

8.3   Yearly maintenance

- Cleaning: Clean the complete printer at least every year. In dirty environments more frequent cleaning can be required.
- System check: Perform a complete system check or call Korthofah or your local distributor to take care of such a system check. Make adjustments and repair if necessary.

9   DISMANTLING & DISPOSAL

9.1   Dismantling

Separate the printer parts in this order:

1. Switch off the printer.
2. Unplug the mains power cable.
3. Disconnect all remaining connections of the control box.
4. Dismount the supports.
5. Separate the supports from the coding unit and the control box.
6. Treat the control box as electronic waste.

9.2   Disposal

9.2.1   Disposal method

The disposal method must be in accordance with national and local regulations at the time of the disposal.

The user is responsible for the disposal of:

1. The printer at the end of its operational life.
2. Packaging
3. Used and wasted hotrolls.

9.2.2   Waste separation

Please deliver the packaging materials to waste recycling companies.

The hotrolls are generally being count as special waste.

Printed circuit boards are RoHS compliant and count as electronic waste.

The remaining waste of the printer contains mainly plastics, anodized aluminium and stainless steel

Please deliver the remaining waste materials also to waste recycling companies.

Appendix A   Specifications

Control box HQC-D

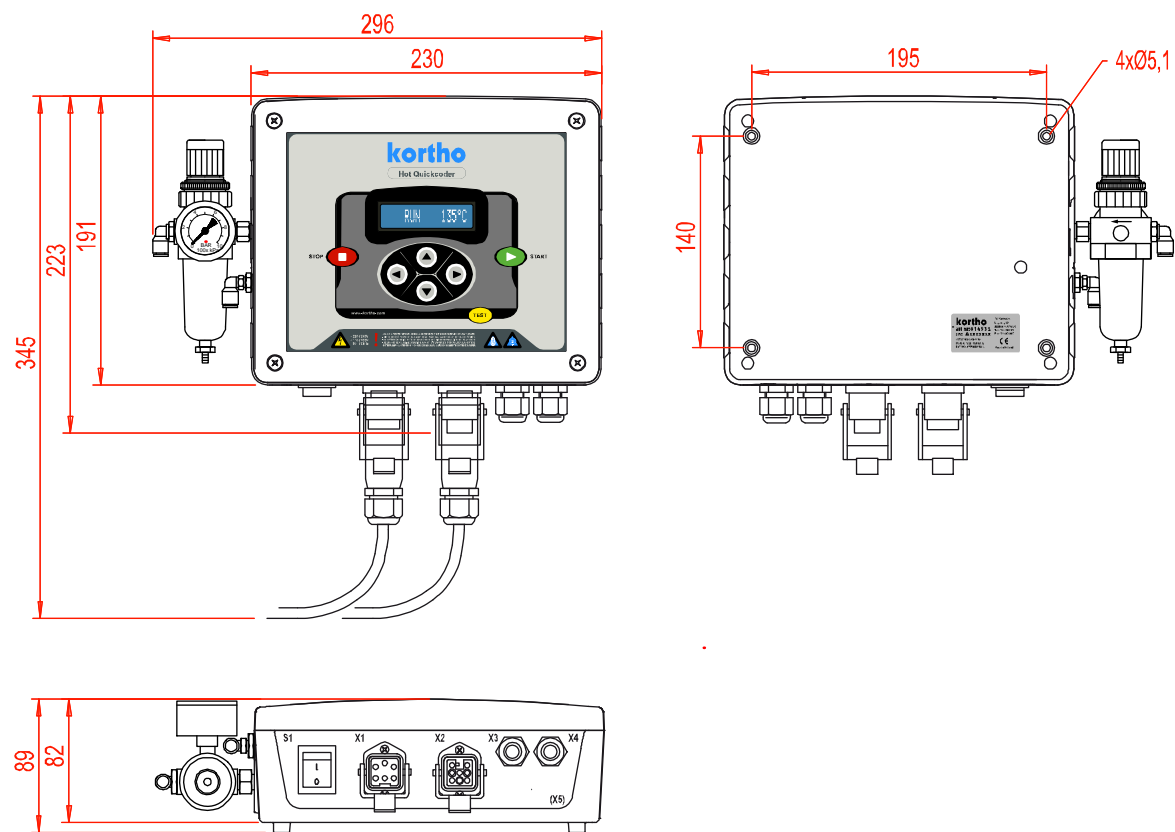| Control box HQC-D			
Specification		**units**	**HQC-D**
Weight		[kg]	2,3
Dimensions	Heigth	[mm]	345
(with cable connectors and cable)	Width	[mm]	296
	Depth	[mm]	89
Main supply cable length		[m]	2.5
Supply AC voltage (50/60 Hz)		[V]	115 / 230
Power consumption		[W]	10

Coding unit HQC-D

| **Specification**		**units**	**HQC-D**
Weight		[kg]	2
Dimensions including	Heigth	[mm]	255
hotrolls and cable	Width	[mm]	163
	Depth	[mm]	124
Supply/Control cable length		[m]	2,5
Print area	(maximum)	[mm]	12x24
Print rate, with full area	(maximum)	[n/min]	300
Print head temperature range		[°C]	0-165
Compressed air, supply pressure range		[MPa]	0,4
consumption at 0.4 Mpa		[l/print]	0,04
Supply AC voltage (50/60 Hz)		[V]	115 / 230
Power consumption		[W]	100 / 150
Noise level		[dB]	82

Appendix B　　　Dimensions

Control box HQC-D

Coding unit HQC-D

Bracket coding unit HQC-D
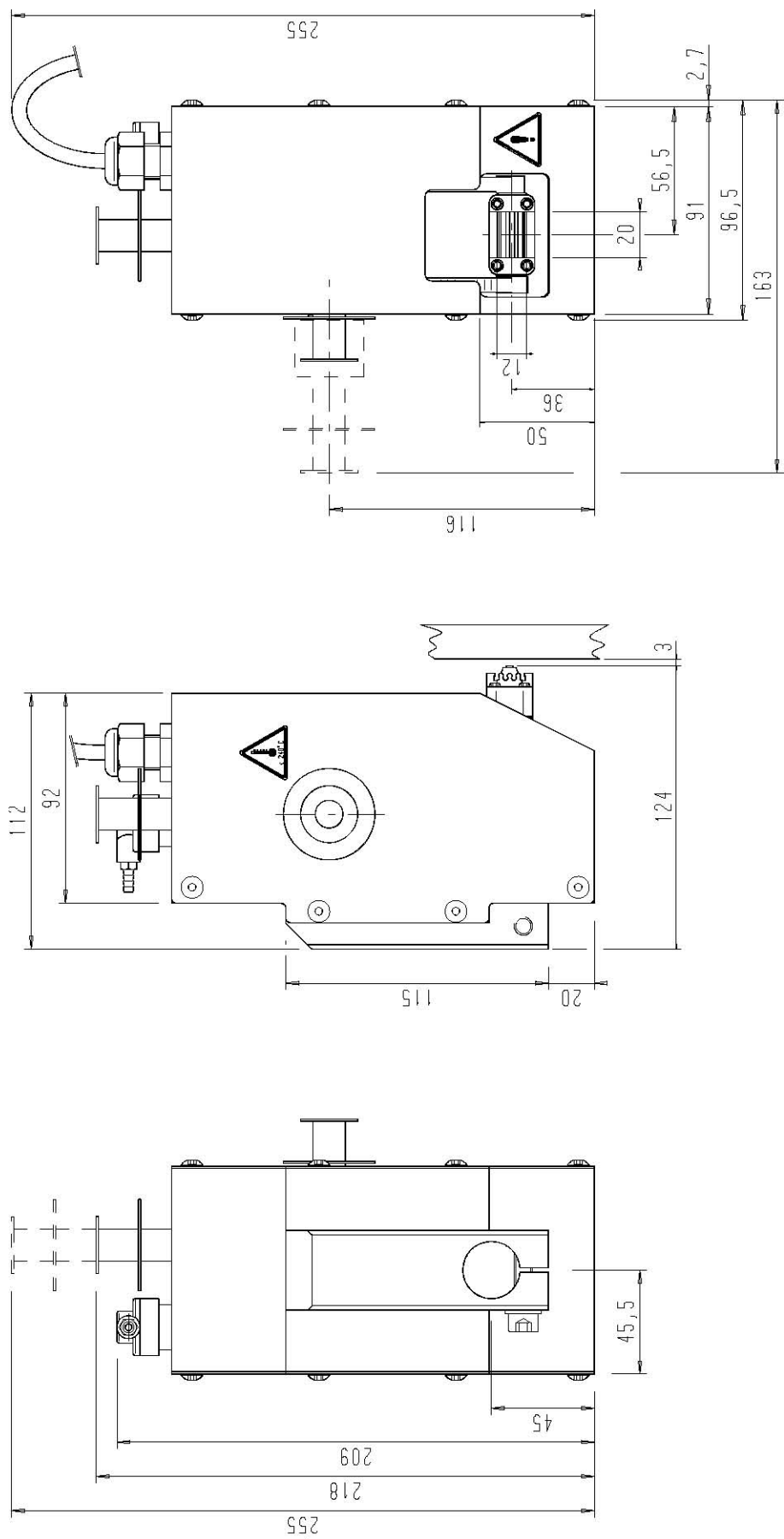
Appendix C Part lists & illustrations

Control Box HQC-D

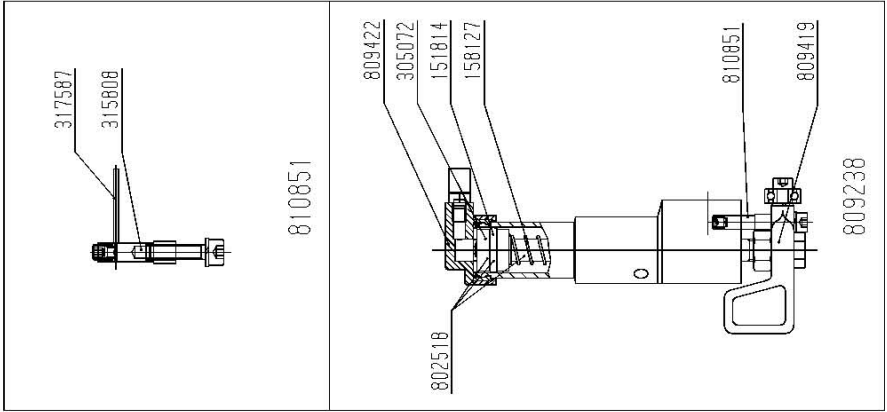| CONTROL BOX HQC-D					
Part no.:	814532				
Line	Part no.	Description	Line	Part no.	Description
1	150007	STICKER DIM: 44X25MM	16	321704	TOP CONTROLBOX HP/HQC/KWP
2	152765	FILTER-REDUCTION UNIT 1/8 INCH	17	321732	BOTTOM CONTROLBOX HQC
3	152819	REDUCING COUPLING 1/8XM5	18	321758	COUPLING 1/8"
4	152877	HOSE NIPPLE M5X4MM	19	810682	POWER CORD HQC/HP
5	156517	PRESSURE GAUGE 0-10 BAR 1/8 IN	20	814418	POWER PCB HQC-D
6	158632	COUPLING NUT PG 9	21	814504	PCB FRONTPLATE BOX-D
7	160481	ROUND HEAD COUNTERSUNK SCREW 3X8 ST.	22	814771	CHASSISPART CONTROLBOX HQC-D
8	160564	3/2 MAGNETIC VALVE 1/8-1,5-24VDC	23	814825	CHASSISPART MAINS VOLTAGE. HQC-D
9	161557	KNEE JOINT 6X1/8"	24	814838	CORD BLUE HQC/HP
10	164974	PANEL CONTROL BOX HQC/HP	25	814841	CORD BLACK HQC/HP
11	165002	NAME PLATE CONTROLBOX HQC	26	814867	EARTH WIRE PCB HQC/HP-D
12	165098	COUPLING UNIT HOSE d=6,4	27	814879	CONTROLCABLE PCB HQC/HP-D
13	165101	SWITCH CONTROLBOX HQC/HP-D	28		
14	165139	KNEE JOINT 6XM5	29		
15	165142	DIMINISHING COUPLING 1/8X1/8K	30		

814532
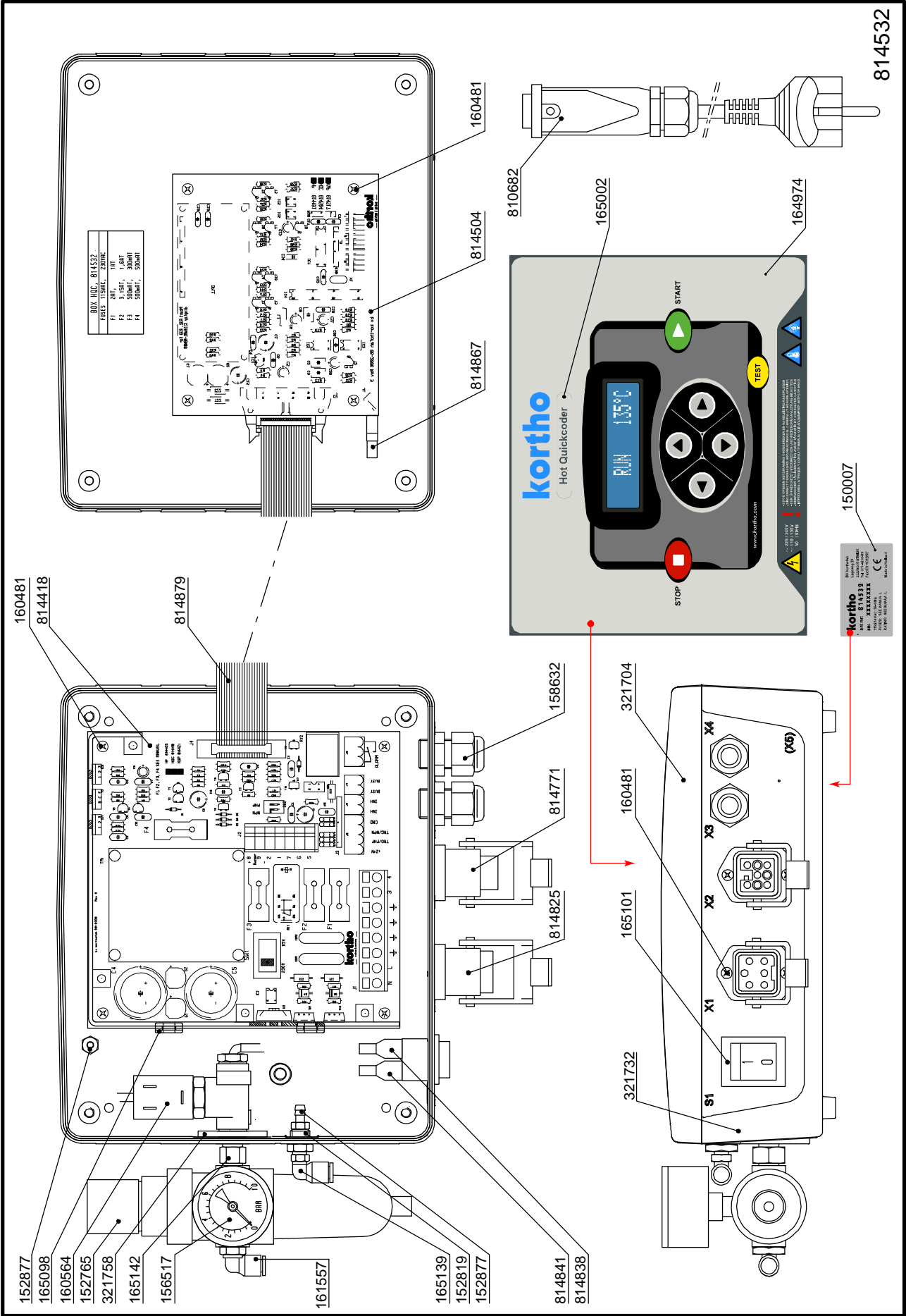
Coding unit HQC-D

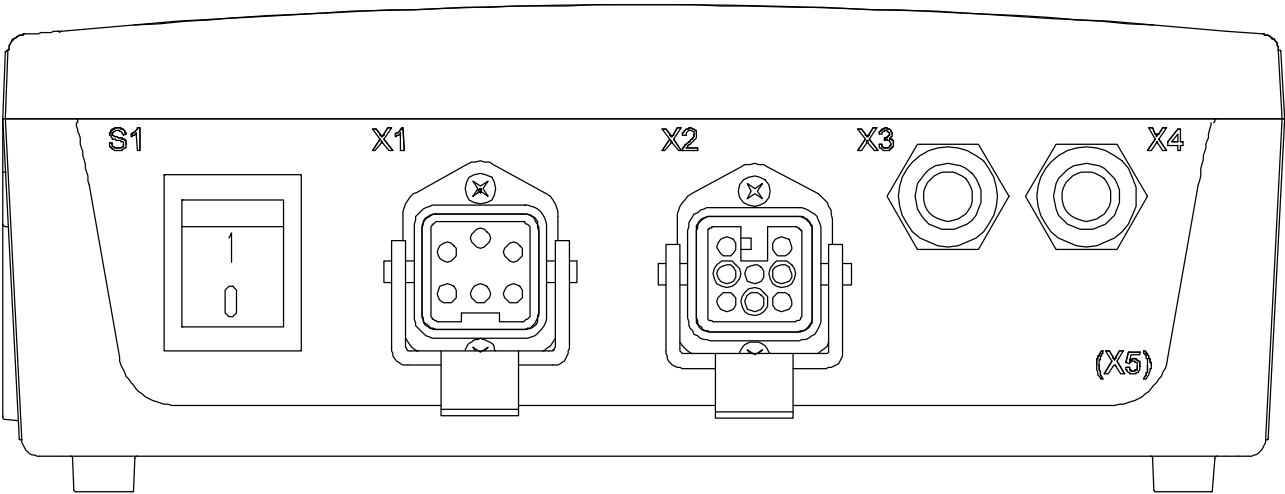| CONTROL UNIT HQC-D					
Part no.:	**814561**				
Line	Part no.	Description	Line	Part no.	Description
1	118087	BALL BEARING 13/4X5	19	802518	PISTON ROD WITH PISTON QC
2	126572	COMPR.SPRING, LO=16,5; DM=4,0	20	802801	GUIDE BRACKET QC
3	151814	GASKETRING PISTON 16X9X2,1MM	21	802941	PLUG WITH BALL BEARING QC
4	153268	MTR. AIR TUBE 6/4-BLACK	22	803399	FORK QC
5	158127	COMPR.SPRING QC-M	23	809238	AIRCYLINDER COMPLETE HQC
6	304777	SPINDLE LONG	24	809254	HOUSING HQC
7	304789	SPINDLE SHORT	25	809295	HEATING RING HQC
8	304818	SCREW PRINTING HEAD	26	809419	DRIVING BLOCK HQC
9	304999	SPRING PRINTING HEAD	27	809422	CYLINDER BOTTOM HQC
10	305072	PISTON ROD QC	28	809842	TEXTPLATE HOLDER HQC
11	315614	BUFFER GEAR RACK	29	809855	PRINTING ASSY W/0 TEXTPL. HQC
12	315795	SHAFT HEATING UNIT HQC	30	810851	SPRING + HOLDER HQC
13	315808	SPRING HOLDER HQC	31	814574	HEATING UNIT HQC-D 230V
14	315935	BUFFER HOLDER HQC	32	814994	HEATING UNIT HQC-D 115V
15	316454	CAM HOLDER HQC	33		
16	316651	COVER CAP HQC	34		
17	316972	DISTANCE BUSH HEATING RING HQC	35		
18	317587	SPRING HQC	36		
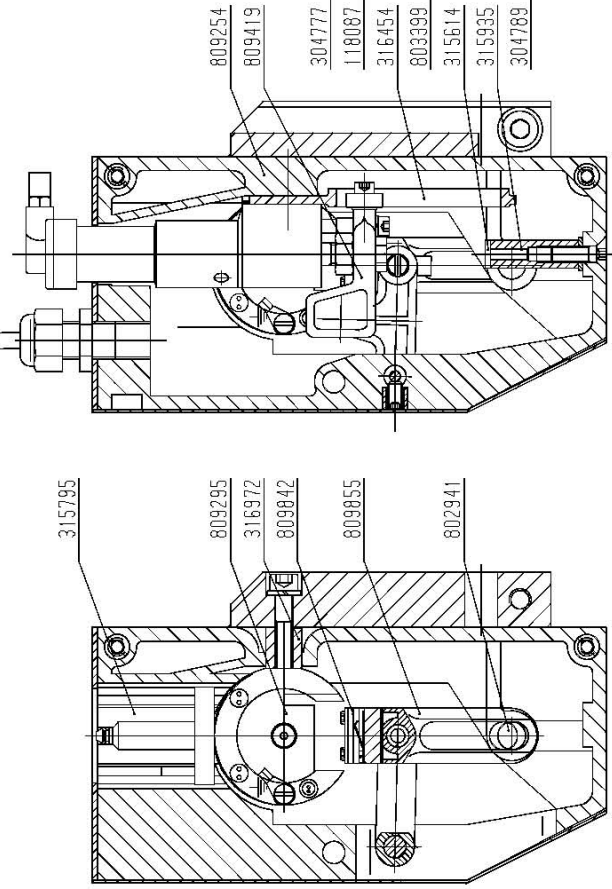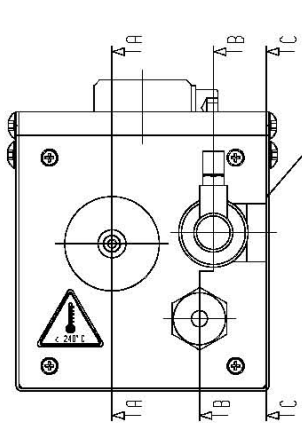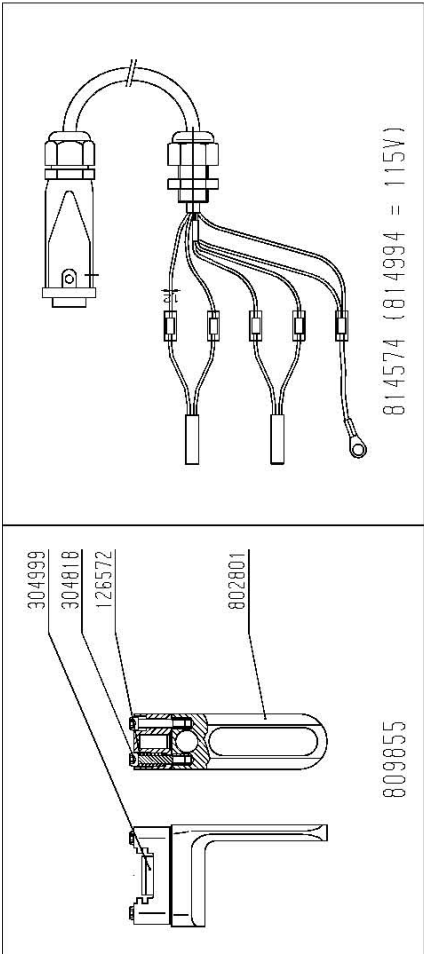
Appendix D   Connections

Control Box Connectors


| Item	Description	Type
S1	Power switch	Rocker switch
X1	Mains supply	5-ways, chassis plug
X2	Coding unit	8-ways, chassis socket
X3	Cable gland (input)	PG9 gland
X4	Cable gland (output)	PG9 gland
X5	Cable gland (Optional)	

Fuses

814418, HQC-D, PCB Powersupply board		
Fuse ID	**115 VAC**	**230 VAC**
F1	2AT	1 AT
F2	3.15 AT	1.6 AT
F3	500m AT	300m AT
F4	500m AT	500m AT

Power–I/O board

CPU board

Electrical diagram, Control box HQC-D

kortho Hot Quick Coder-D
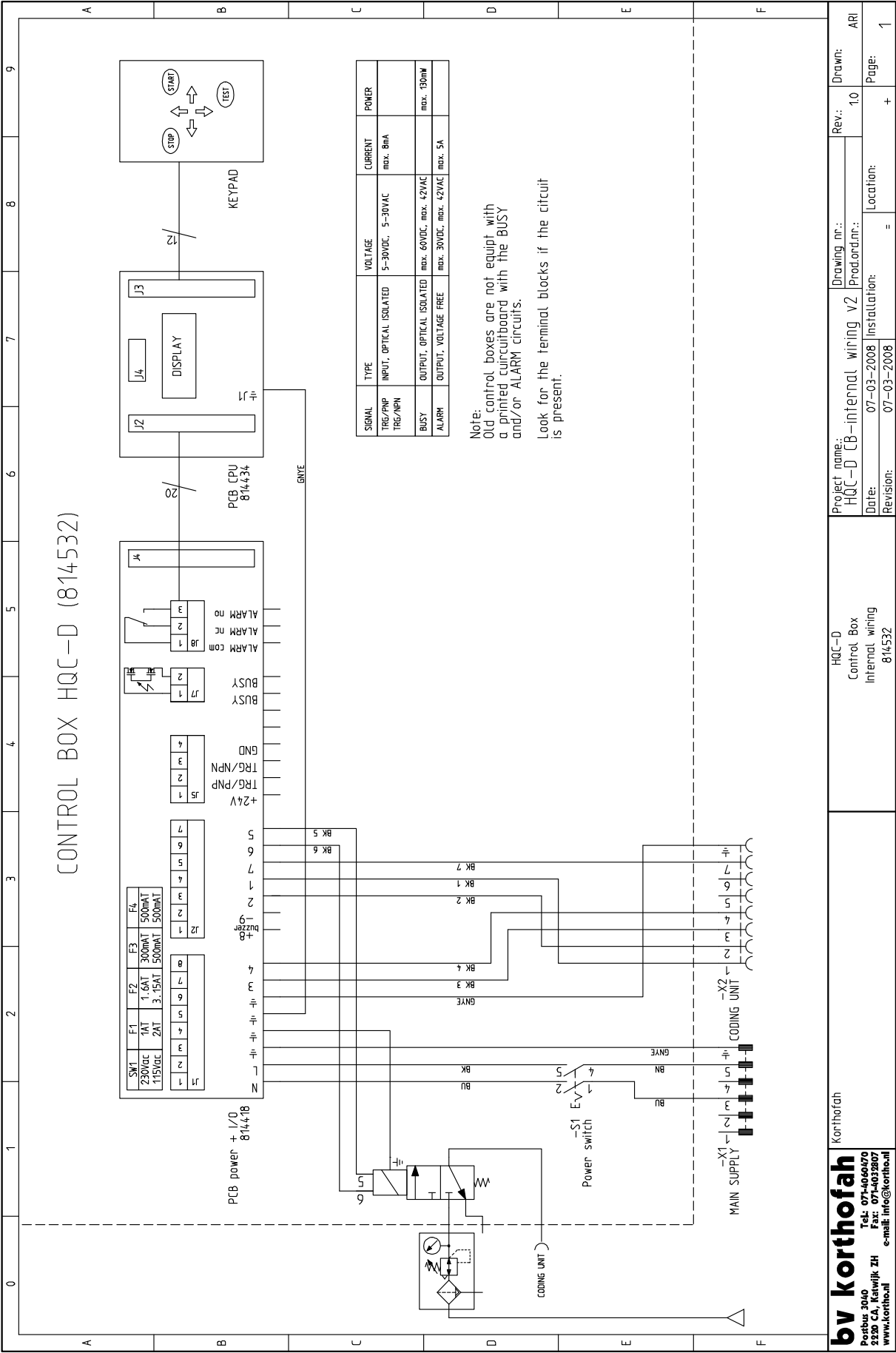
Electrical diagram, Control box I/O
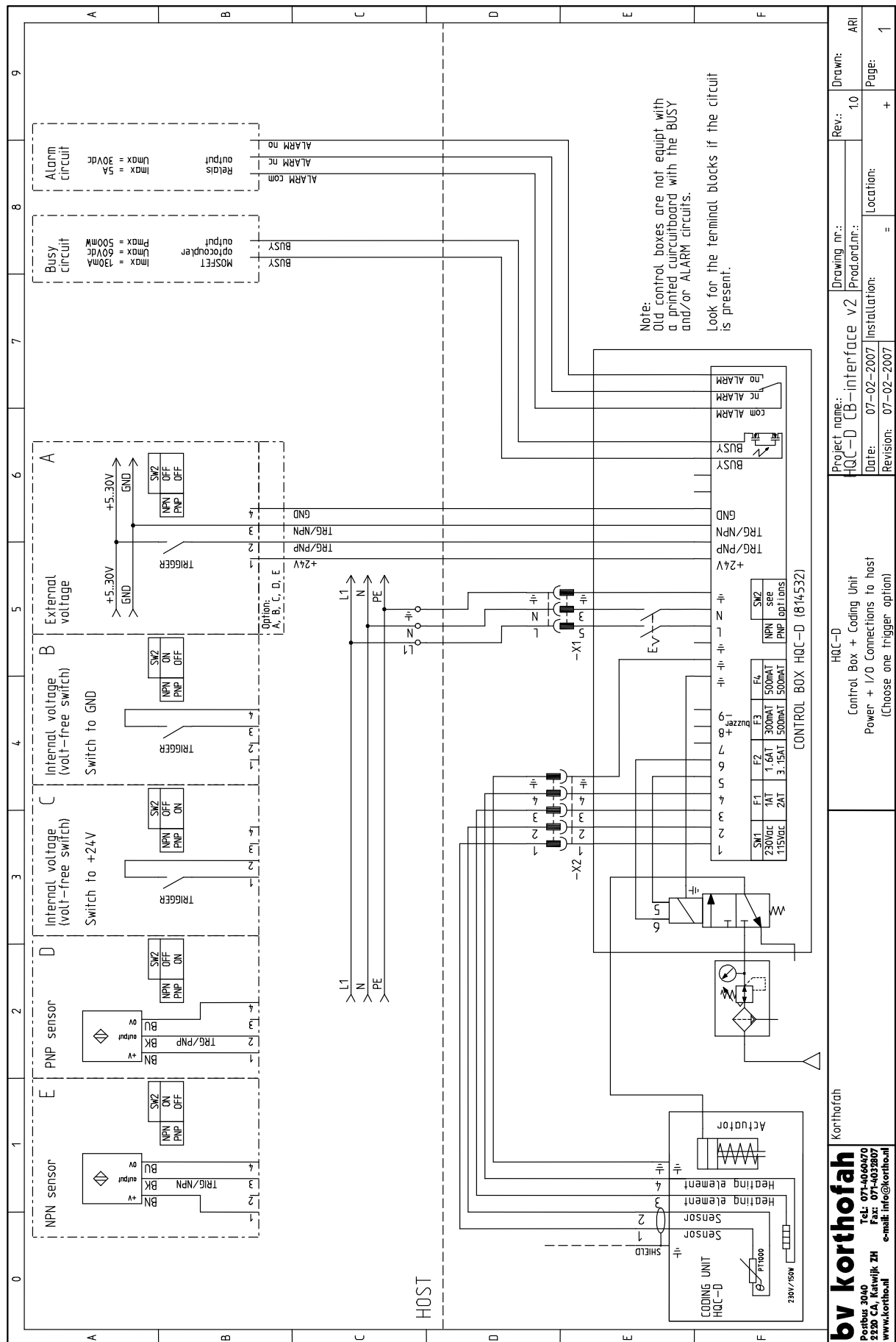
Trigger settings

The trigger settings are set with de dipswitches of SW2 on the power-I/O board.

SW2			
NPN	**PNP**	**Printer accept trigger if:**	**Diagram option**
OFF	OFF	TRG/PNP input is switched to +V and TRG/NPN input is switched to GND	A
OFF	ON	TRG/PNP input is switched to +V	C, D
ON	OFF	TRG/NPN input is switched to GND	B, E
ON	ON	Not used, trigger pulse is blocked	-

I/O signals

Input signals

Trigger: A pulse on this input starts the print cycle, only if the printer is in run mode , not busy and the inhibit signal is not present. The T-icon on the screen indicates that the trigger input is set.

Inhibit: A pulse on this input inhibits the print cycle, either if the printer is in run or stop mode. The I-icon on the screen indicates that the inhibit input is set (optional).

Ouput signals

Busy: This output is active when the printer is printing. The P-icon on the screen indicates that the busy output is set (optional).

Alarm: This output is active when an error has occurred. The message 'Error ###' on the screen indicates that the alarm output is set.

Power-on: If a voltage of +24V is present at the +24V terminal block the printer is switched on.

kortho

EC DECLARATION OF CONFORMITY

(According to Annex II.A of the Machinery Directive 2006/42/EC)

We,   B.V. Korthofah
Lageweg 39
NL 2222 AG Katwijk ZH
The Netherlands

declare under own responsibility that the product

Hot Quickcoder:
Control box HQC-D   (814532)
Coding unit HQC-D   (814561)
(including the mounting supports built by B.V. Korthofah)

to which this declaration relates is in conformity with the following standards or other normative documents

EN 12100-1 (2003) + A1 (2009)
EN 12100-2 (2003) + A1 (2009)
EN 55022 (2006) + A1 (2007)
EN 55024 (1998) + A1 (2001) + A2 (2003)
EN 60950-1 (2006) + A1 (2009)
EN 61000-3-2 (2006)
EN 61000-3-3 (1995) + A1 (2001) + A2 (2005)
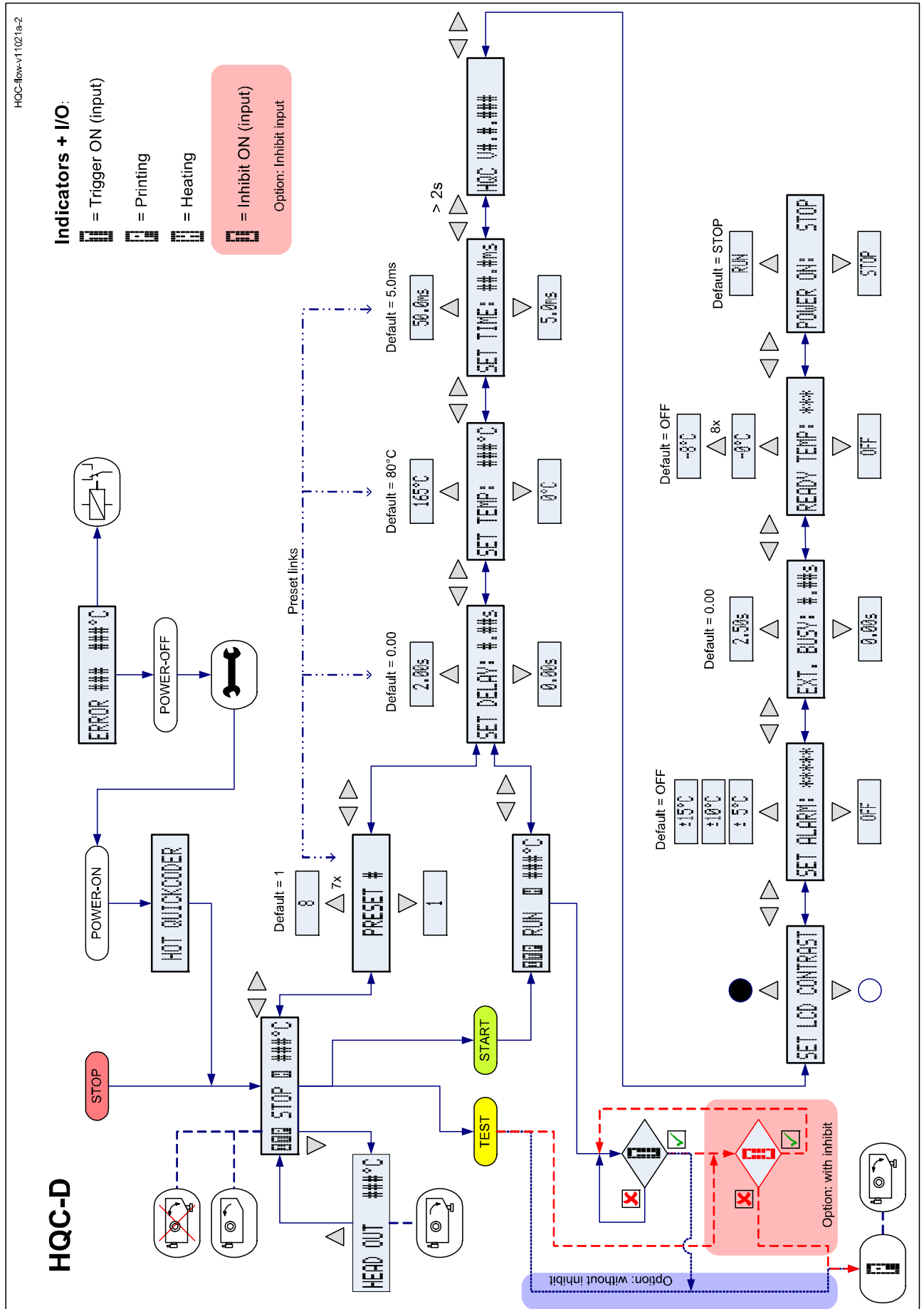
following the provisions of the

Machinery Directive 2006/42/EC
EMC Directive 2004/108/EC
Low Voltage Directive 2006/95/EC

M.P.J.J. de Groot, Director
1 September 2010, Katwijk ZH, The Netherlands

HOT QUICKCODER HQC-D