Customer Manual

RBK-X1 / RBK-X1C Heat Shrink Machine

Operating manual no. *409-35022*
Language: *English*
Rev: *D2*

The original operating manual has been written in English.

Disposal: RBK processor (RBK-X1 & RBK-X1C)

This product must not be disposed of as municipal waste.

Amendment Record

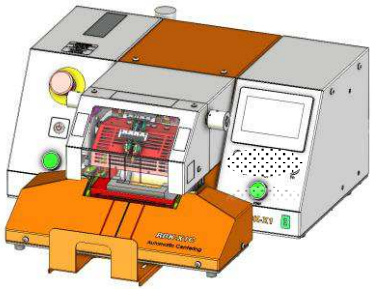
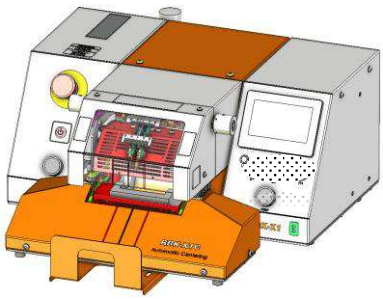
Revision	Content	Amended by	Date	Change Request
B	*Involve X1 and X1C, CE version, and NON-CE version*	*Cham Zhu*	*Jun. 2021*	
C	*New add air-cooling version processor*	*Cham Zhu*	*Dec. 2022*	
D	*Update PLC assembly, start button, and emergency stop button*	*Cham Zhu*	*May 2023*	
D1	*Updated Power Cord & Transformer tabulation*	*Cham Zhu*	*Dec 2023*	
D2	*Updated Auto Centering Indicator in Section 3.1, Updated To trigger Auto Centering function: in Section 4.2.8, Updated PLC ASSY in Section 4.3.2*	*Cham Zhu*	*Mar 2024*	

Table of Contents

1 Introduction

This manual applies to RBK-X1 and RBK-X1C processor:
(In this manual RBK processor will stand for both RBK-X1 and RBK-X1C):

Table 1: General View

Picture	TE PN	CE	Air-cooling	Centering Device
	**2234800-1** --------- *RBK-X1 STD*	✗	✗	✗
	1-2234800-3 --------- *RBK-X1, W/ air-cooling*	✗	✓	✗
	**2234800-2** --------- *RBK-X1 CE STD*	✓	✗	✗
	1-2234800-4 --------- *RBK-X1 CE, W/ air-cooling*	✓	✓	✗
	**2376800-1** --------- *RBK-X1C STD*	✗	✗	✓
	1-2376800-3 --------- *RBK-X1C, W/ air-cooling*	✗	✓	✓
	**2376800-2** --------- *RBK-X1C CE STD*	✓	✗	✓
	1-2376800-4 --------- *RBK-X1C CE, W/ air-cooling*	✓	✓	✓

NOTE
Customer can purchase optional Centering Device 2369600-1 to upgrade processor from RBK-X1 to RBK-X1C. Refer to Instruction Sheet 408-35126. This is a semi-permanent conversion, not a daily free adjustment. This conversion is a chargeable service by TE FE team, not recommended to do by customer personnel.

1.1 General Information

The RBK processor is semi-automatic units using an infrared process to heat shrink tubes like… *(allows using the machine for ALL tubes in range, TE and non-TE)* onto ultrasonically welded or crimped splices.

The equipment is designed to operate in conjunction with ultrasonic welders, positioned adjacent to the welding head.

The heat chamber takes ILS and QSZH products from size 1 to 3A and has electrically heated quartz glass elements which provide the heat source, up to 550°C. Operation of the chamber is prevented until its temperature is within 10°C (editable) of the set operating temperature.

Activated by two start buttons, the heating chamber moves forward, enclosing the joint area. It remains in place for the set timed period, and then returns to the rear rest position, automatically ejecting the wire assembly with the RBK-ILS splice sealing product installed.

In the event of a power failure the heating chamber is retracted to the rear rest position.

The RS232 interface, allows Time, Temperature and Product size to be transferred from a remote machine (e.g. ultrasonic welding equipment) or control computer.

Ten pre-set memory buttons can be programmed for local storage of Time, Temperature and Product size. These can be selected individually or selected in a set sequence by the operator.

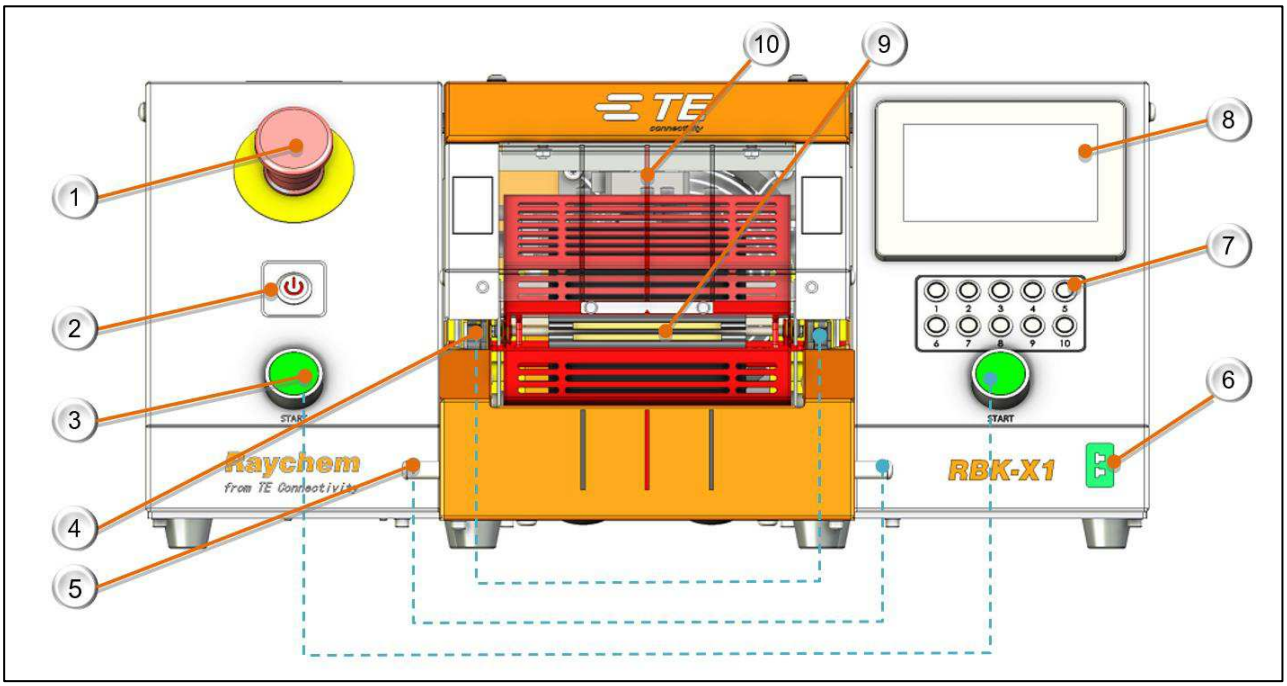
CAUTION
500°C is the maximum recommended set temperature. Set the temperature close to or exceed upper limit 550°C, could cause reduction to heater life.

1.2 Front Panel

(Controls and Major Components)

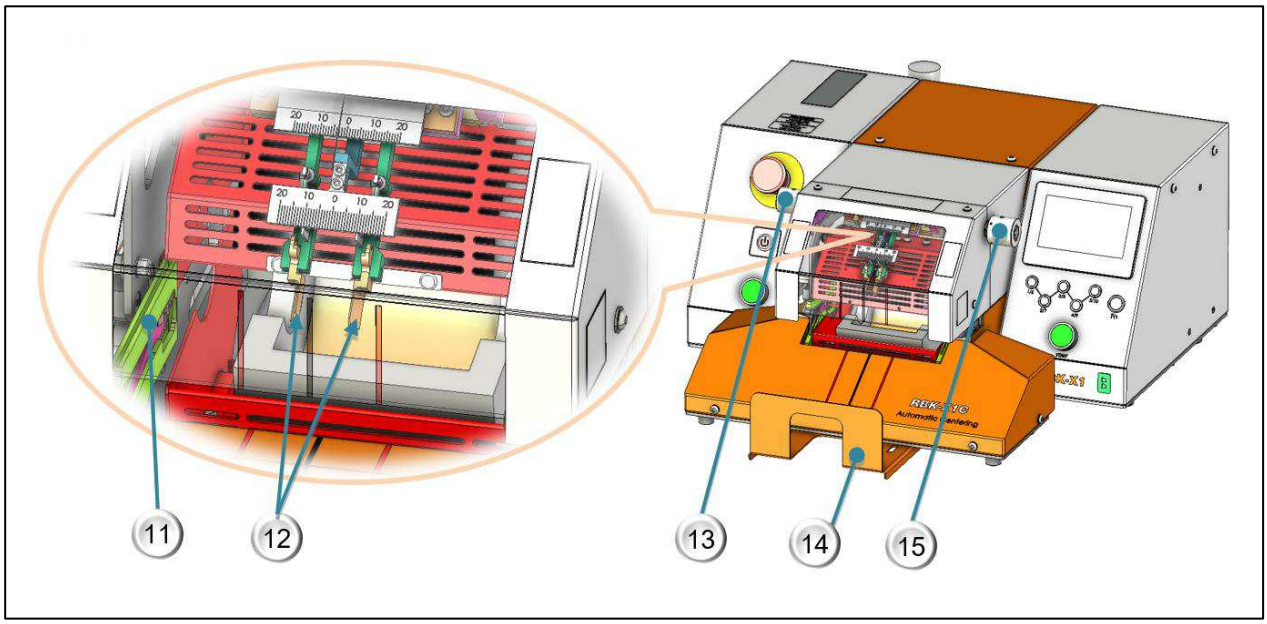
RBK-X1

Figure 1: Front Panel



RBK-X1C

Figure 2: Front Panel



NOTE
In Figure 1, Item 1~10, apply for both RBK-X1 & RBK-X1C and in Figure 2 Item 11~15, apply only for RBK-X1C.

1. Emergency Stop
   (Cuts power to processor)

2. I/O Switch
   (Switch to heater. Off--standby, Flash—warm up, Lit—temperature reach set value)

3. Cycle Start Push buttons
   (Press and hold both buttons simultaneously 0.5s to start cycle process.
   Interrupt Cycle----see section 3.6 item4, when switch ON this function, to press both start button during cycle would interrupt the cycle. Heater would back to home position at once.)

   NOTE
   CE version processor use white start button. NON-CE version processor use green start button.

4. Grippers
   (Hold cable splice in heating chamber)

5. Dual Release
   (Allow removal of splice by hand)

6. Calibration Socket
   (Connect to the UHI temperature probe, to access auto-calibration process.)

7. Process button
   (See Figure 3, 10 button version can press the 10 process buttons to input signal directly. 5+Fn button version, without Fn pressed, operation can input 1~5 directly, then input 6~10 with Fn button pressed. NOTE: Fn button will illuminate when pressed.)

8. Touch screen
   (Display processor working information. Can edit processor parameter after login on. See section 3)

9. Heater Chamber
   (Heat shrinks product over splice)

10. Centering Mark
    (Designed to centering tube visually)

11. Centering Plate
    (In centering cycle, this centering plate will push tube to center. See section 4.2.8 Auto Centering operation.)

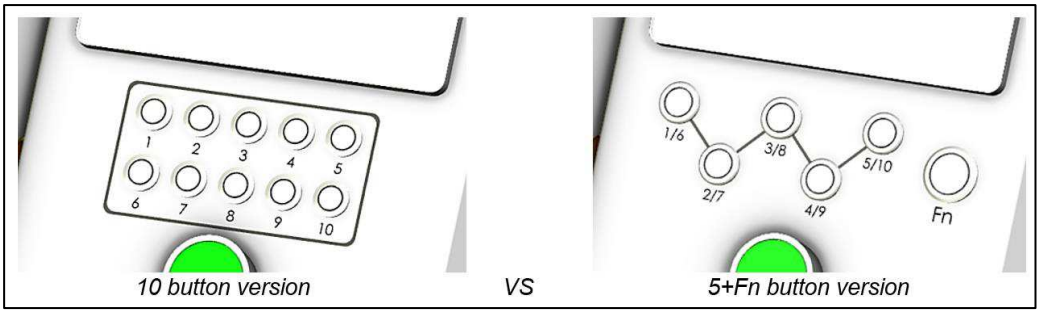
12. Detection Plate
    (See section 4.2.8 Auto Centering operation)

13. Offset knob
    (Pull left knob and rotate, to adjust the 2X detection plates to left or right. Range: "+/-10mm")

14. Collection Bin
    (Adjust this plate's extend length by loosen the 2X mounting screws on the bottom.)

15. Distance knob
    (Pull right knob and rotate, to adjust the distance between 2X detection plate. Range: "5~20mm")

Figure 3: Process button

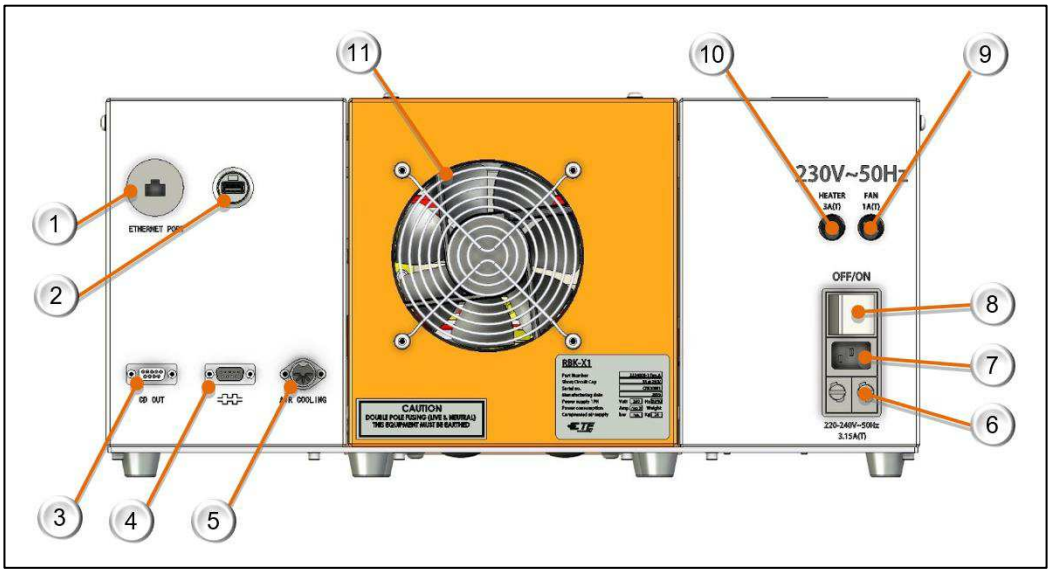


10 button version VS *5+Fn button version*

1.3 Rear Panel

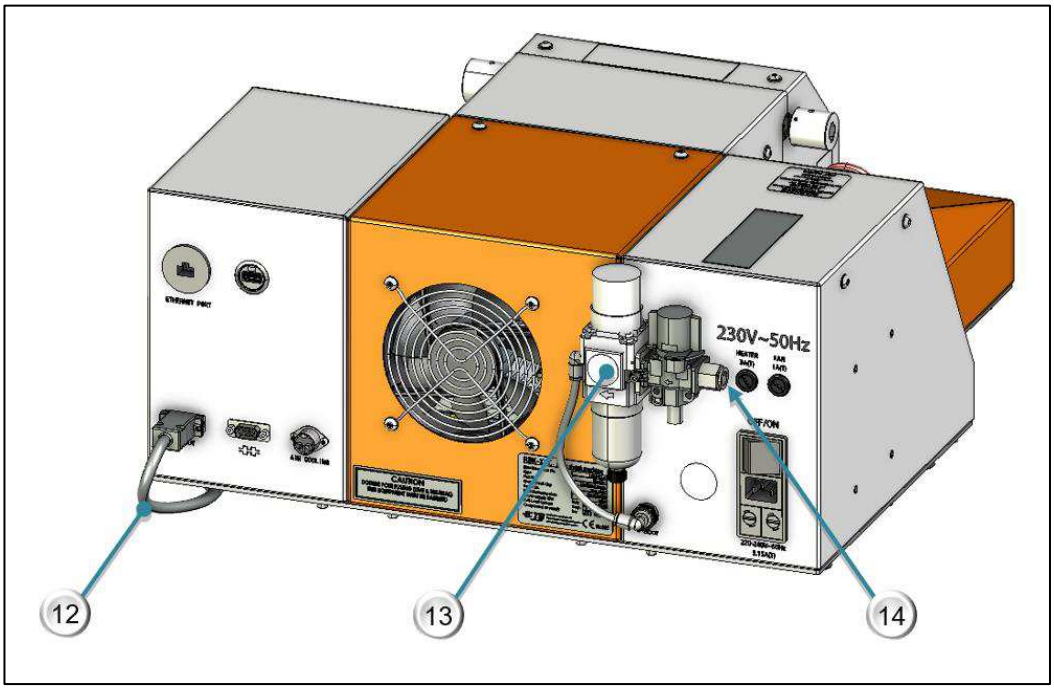
RBK-X1

Figure 4: Rear Panel



RBK-X1C

Figure 5: Rear Panel



NOTE
In Figure 4, Item 1~11, apply for both RBK-X1 & RBK-X1C and in Figure 5 Item 12~13, apply only for RBK-X1C.

1. Ethernet Port.
   (Access to upgrade program to PLC and touch screen)
2. USB port.
   (USB connection hole. Communicate with HMI, like barcode scanning and data collection)
3. CD port.
   (Connect to centering device via CD cable, item 12.)
4. RS 232 Connector.
   (Connect to Ultrasonic welding machine via RS232 connection cable. Refer to section 4.6.5)
5. Air-cooling Socket.
   (Connect to air-cooling fixture, refer to section 4.6.3)
6. Main Power Fuse.
   (2 X 230V, 3.15A anti-surge, fuse size Ø5 X 20 mm)
7. Power Input Socket.
   (230V, 50/60Hz)
8. Main Power Switch.
   (Used to turn ON/OFF to RBK processor)
9. Fan Fuse.
   (230V AC, 1A anti-surge, fuse size Ø5 X 20 mm)
10. Heater Fuse.
    (230V AC, 3A anti-surge, fuse size Ø5 X 20 mm)
11. Cooling Fan.
    (Operates when heater temperature above 190°C.)
12. CD Cable
    (*Communication cable, RBK processor connect with Centering Device)*
13. Air supply kit.
    (F.R.L, apply compress air for centering device, or air-cooling nozzle.)
14. Air inlet.
    (Pressure air: 4~6 bar. Outer diameter of pipe: 10mm)

CAUTION
Do not use the Mains Power Switch or E-stop button as normal procedure to turn off the processor, as this will cause a significant reduction to the life of the heater element. Turn off the Heater using the I/O Switch. The temperature will drop and cooling will continue, once below 190º C, the fan will turn off and the processor will access to the stand-by mode. The power can now be switched off using the Main Power Switch.

EMC Protection for connecting external devices to the RBK processor.
Connecting any external device to the following outputs below a ferrite core must be clamped to every connection used. The ferrite clamp must contain one loop.
Connection for below 4 items requiring ferrite clamp WITH ONE LOOP.

1. *CD port*
2. *RS232 connector*
3. *Air-cooling socket*
4. *Power input socket*

1 x ferrite core to every connection on the interfaces "one loop" as shown...

2 Safety

In common with all electrical equipment, the RBK processor must be used in accordance with established safe working practices.

Prior to using the equipment, carefully read the Installation and Operating instructions (Section 4), together with the following safety warnings.

2.1 General Warnings

CAUTION
Incorrect use of this equipment may cause injury.

This equipment must be operated and maintained only by fully trained and qualified personnel. Operation should be according to this manual, to avoid getting hurt.

Do not leave the equipment unattended during the process cycle.

Jamming of the operating mechanism may prevent the auto retraction of the heater chamber. In this event the RBK processor heaters will switch off automatically. Follow "Heater Carriage Jammed 4.2.10 and the Emergency Heater Chamber Release" on 4.2.11.

Failure to follow the manufacturer's instructions may affect the equipment warranty.

Do not use the equipment for cooking food or heating products other than those recommended by TE Connectivity, especially avoid those products may release hazardous gas after heating.

Do not use the equipment for cooking food or heating products other than those recommended by TE Connectivity, especially avoid those products may release hazardous gas after heating.

Due to the processor can reach up to 600°C, do not operate the Equipment near flammable and combustible environment.

Ensure adequate ventilation around the cooling fan intake and output grills a minimum of 75mm clear space when the equipment is in use.

Do not disassemble the equipment without guide or permission from TE.

2.2 Electrical Safety

The equipment is connected to an AC mains electricity supply. Before undertaking any maintenance or repair, always turn off the equipment and ensure it is isolated from the AC supply.

Allow the equipment to cool.

DO NOT CARRY OUT AN INSULATION RESISTANCE CHECK USING A PORTABLE APPLIANCE TEST UNIT AS THIS WILL RESULT IN DAMAGE TO THE EQUIPMENT.

High voltage TESTING - Do NOT do the Test without the authorization of TE (protection circuits fitted to this equipment may be damaged...)

INSULATION RESISTANCE TESTING - Do NOT exceed 250V DC (protection circuits fitted to this equipment may be damaged).

Power connections for the Processor must conform to local standards and regulations.

Potentially hazardous voltages will be exposed if the equipment's panels are removed while it is powered-up. Do not use the equipment unless all external panels are securely in place.

The equipment input supply has double pole fusing (Line & Neutral) and must be connected to an earthed power supply.

Use only specified fuse types and ratings.

Terminal customer should install overcurrent protective device. (3A)

Terminal customer should apply the power with overvoltage and undervoltage protection.

2.3 Personal Safety

2.3.1 Eyes

Eye protection must be always worn when the tool is in use.

2.3.2 Clothing

Care must be taken to ensure hair or loose clothing does not come into contact with the Processor.

2.3.3 Fire Hazard

Parts of the tool will be hot during use. Special care must be taken to avoid heating materials other than the pieces being worked on.

2.3.4 Hot Surfaces

It is recommended that protective clothing and gloves are used when operating this tool

Do not touch the Processors heating chamber - during use, it will become extremely hot.

Special care must be taken when handling finished wiring assemblies immediately after ejection from the heating chamber.
Special care must be taken when handling the calibration UHI probe immediately after ejection from the heating chamber.

2.3.5 Damage

Do not try to put hands into the safety guard, it could cause crush and cut.

2.3.6 Servicing

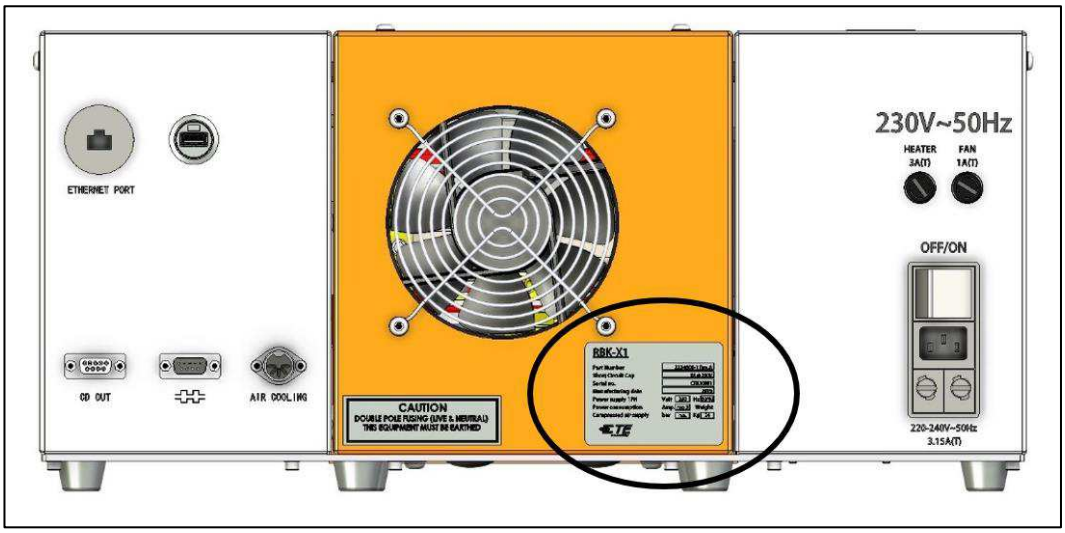
When carrying out repairs, always follow the instructions contained in this manual or contact TE Connectivity for further advice. A record should be kept of the maintenance and servicing of the equipment.

Do not use substitute components, use only TE Connectivity approved parts. If the mains (utility) power supply cord is damaged it must be replaced only by a special cord or assembly available from the supplier or its agent.

2.4 Warnings and Labels

The RBK processor carries a label (shown below) which displays the product part number (PCN), product description, electrical rating information.

Figure 6



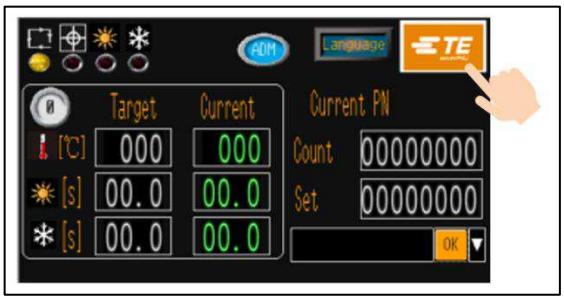
The following conventions are used in the manual.

Information to prevent personal injury from electrical hazard.

Information to prevent damage to the equipment.

3 Software

The software serves as the processor's central control unit. With this you can set the procedures for product processing. The software is operated via a touch screen.



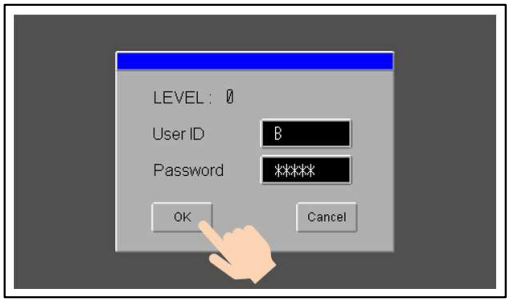
When power on to heater, you would see the main interface like this picture.

Press on the TE logo from the main interface to log on.

3 level authority to log on:

- "OPR" ---- user ID: "A", password: "0000"
- "EGR" ---- user ID: "B", password: "12345"
- "MFG" ---- user ID: "C", (TE kept)

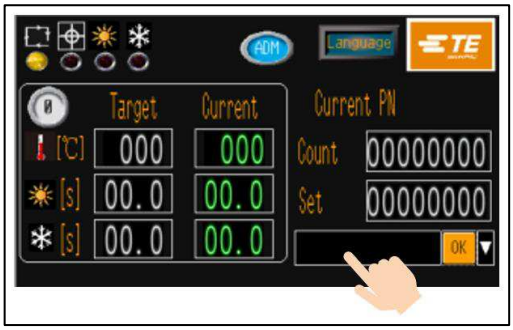
(Password can be edit by higher authority. See section 3.5, item 9)



Input user ID and password in this window.

For example, we are trying to log on as Engineer, then we should input "B" in user ID column, and input "12345" in Password column.

Then click on "OK" button.



Then you would find the main interface already have 2 changes:

- 

ID icon is showing you accessed as engineer.
- On the bottom right appear a column. Click on it, would appear a drop-down list.

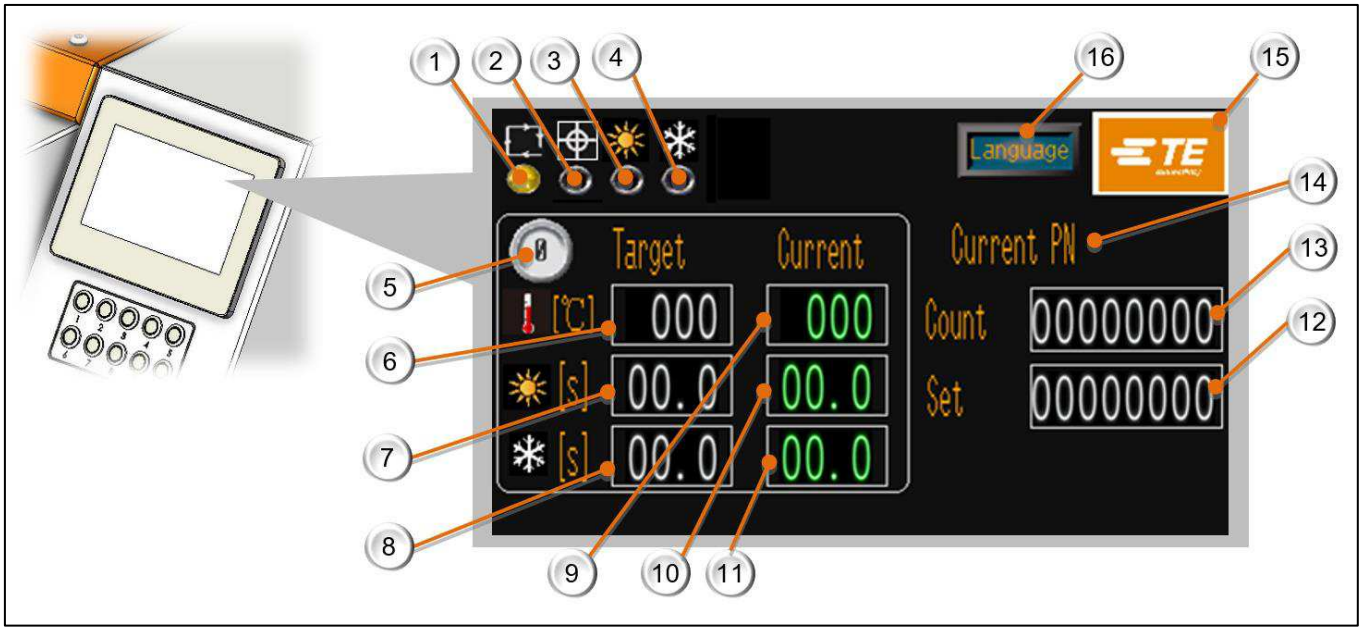
In this drop-down list, you can choose the setting item, like shown on Table 2. Then click on OK button to access.

Table 2

Access right for setting item	No log on	OPR (A)	EGR (B)	MFG (C)
Main Interface (Single production)	✓	✓	✓	✓
Sequence production		✓	✓	✓
Production setting		✓	✓	✓
Auto Cal.	✓	✓	✓	✓
Heat parameter			✓	✓
Sequence setting			✓	✓
Maintenance			✓	✓
Manual Cal.			✓	✓
Remote		✓	✓	✓
Error Log			✓	✓
System Parameter				✓
Circle Test				✓
I/O & Manual				✓
Centering Manual				✓
Bar code scanning			✓	✓

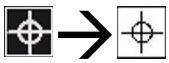
3.1 Main interface

Figure 7: Touch Screen (main interface)



This picture above (see Figure 7) is showing the main interface. In this page, operator can process single production.

1. Processor Status Indicator
   (Illuminated amber when processor not ready for production.
   Illuminated green when processor for production.)
2. Auto Centering Indicator

   (Click on the centering icon above this indicator to activate the Auto Centering function. 

   Illuminate green during Auto Centering cycle.
   Illuminate red when Centering device error.
   ONLY RBK-X1C processor can activate this function.)
3. Heating cycle Indicator
   (Illuminated green during heating cycle.)
4. Cooling cycle Indicator
   (Illuminated green during cooling cycle.)
5. Current process
   (Display current selected process button number. 10X pre-set process number available.)
6. Target Temperature
   *(Display target heating **Temperature** stored in the current selected process button. Upper limit 550°C.)*
7. Target heating cycle time
   *(Display target heating cycle **time** stored in the current selected process button. Upper limit 99.9S)*
8. Target cooling cycle time
   *(Display target cooling cycle **time** stored in the current selected process button. Upper limit 99.9S.)*
9. Current Temperature
   *(Display the real **Temperature** of current cycle.)*
10. Current heating cycle time
    (Display countdown for heating cycle time.)

11. Current cooling cycle time
    (Display countdown for cooling cycle time. Value will show 0 when cooling function inactivated.)

12. Target production volume
    (It will pop up reminder when production volume reach target value. See section 3.5 production setting.)

13. Production Counter
    (This value will add 1 when an entire cycle completed. See section 3.5 production setting)

14. Current PN
    (Identify the process button, we used to fill it by product's size or PN.)

15. Login on button
    (Click on TE logo, to get LOGIN ON interface. Login on to read more info or modify processor parameter. See section 3 about how to login on.)

16. Language shift button
    (Click on this icon to access to below windows, then select the machine HMI operation language.)

3.2 Heat parameter

In this interface, operator can pre-set or edit heat parameters (product description / Temperature / Heating cycle time / Cooling cycle time) stored in the 10X quick process buttons.

Figure 8

To edit the parameter stored in quick process button (for example):

1. *Switch button* **OFF** *to* **ON** *from top left, allow the operator to edit the parameter.*
2. *Press on the processor quick process button , then you would find the original parameter stored in will show on* **CURRENT PN** *and* **SET VALUE.**
3. *Click on the 3 values on* **SET VALUE***, to input the new value. (Temperature / Heating cycle time / Cooling cycle time).*
4. *Click on blank area under* **PN SET** *to edit the* **CURRENT PN** *description for process button .*
5. *Press on the quick process button for 5 seconds, to upload new parameter to quick process button. You would find the values shown in* **CURRENT** *would change to same with* **SET VALUE***. New parameter was successfully modified.*
6. *Switch* **ON** *to* **OFF***, to exit editing.*
7. *Click on , to back to main interface.*

NOTE

- ***The 3 values shown in CURRENT, identify heating parameter (Temperature / Heating cycle time / Cooling cycle time) which processor is carrying out.***
- ***Pls access to Maintenance interface, turn ON the A/C button before you tried to modify the cooling cycle time.***

3.3 Sequence production

In this interface, processor entry the Sequence production mode.

Figure 9

To operate processor as sequence 1# (for example):

1.  *Click on this icon to have drop down list, to select the Sequence 1#.*
2.  *It would show the selected button, which originally stored in sequence 1# (3→2→1→3→5). The green light will indicate the current process will run. From the beginning, the green light will indicate the first process "3".*
3. *Press and hold on both start button to start the sequence.*  *start to count down to 0 for heating cycle and cooling cycle. Cooling cycle will come after heating cycle automatically if cooling function was activated.*
4. *After finished the process 3, the green light will jump to the next process 2.*
5. *When we completed the last process 5, the green light will jump to the first process 3. We already completed the sequence cycle, the counter*  *will show number "1". Processor is ready to continue the next sequence cycle for sequence 1#.*
6. *If necessary, press on the green* **SEQUENCE** *button to interrupt sequence. Then this button will show red, no matter how many times you press on both start button, it will stay on current process. Currently you also can press the left or right arrow to shift the current process. Unless you turn this SEQUENCE button back, it will continue the sequence.*

NOTE

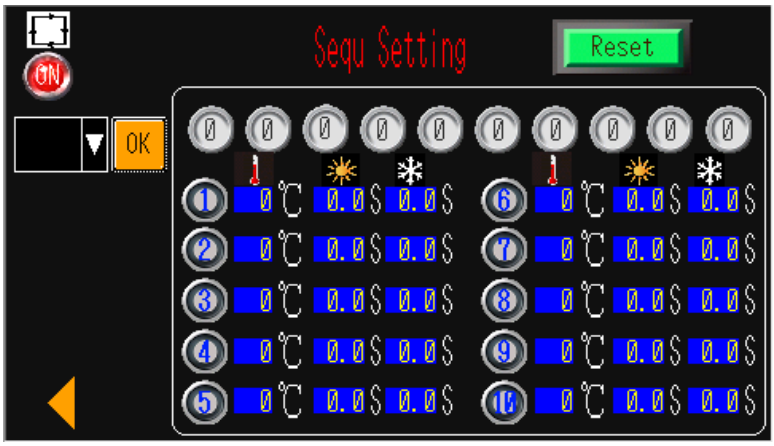
-  ***is showing the real temperature / countdown heating cycle / countdown cooling cycle for current process.***
-  ***is designed to reset sequence production counter, with press and hold for 5 seconds.***

3.4 Sequence Setting

In this interface, operator can pre-set or edit parameter stored in each Sequence.

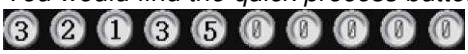
NOTE: Currently, processor can store up to 15X sequences. Each sequence contains up to 10X processes.

Figure 10



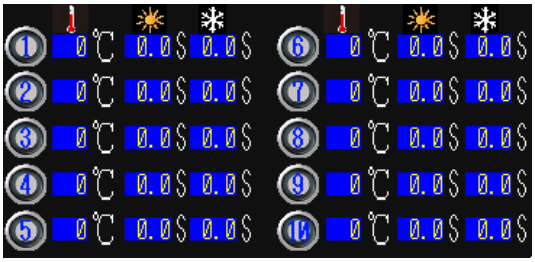
To edit the parameter stored in Sequence 1# (for example):

1. *Switch OFF to ON, allow the operator to edit the parameter.*
2. *Click on the drop-down list to select the Sequence 1#.*
3. *Click on the green* **RESET** *button.*
4. *Press on the processor quick process buttons according to the sequence you would like to set. (3→2→1→3→5, for example)*
5. *You would find the quick process button you selected will show on*



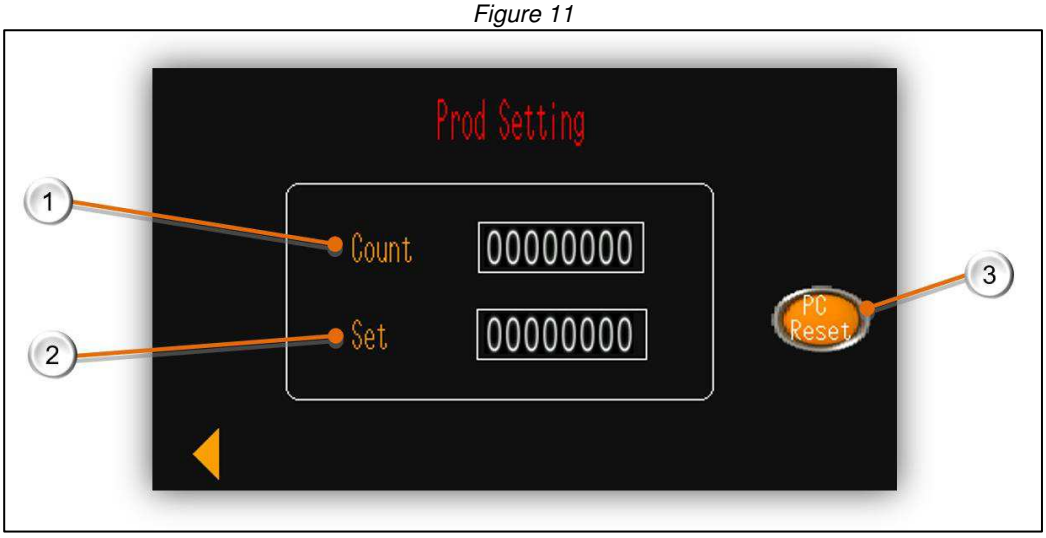
6. *Turn it back to button RESET, parameter will store in the sequence 1#*
7. *Switch* **ON** *to* **OFF**, *exist editing.*
8. *Click on*  *, to back to main interface.*

NOTE
The parameter (Temperature & Heating cycle time & Cooling cycle time) stored in 10X quick process button can review from below area. It would help for editing Sequence. To edit heating parameter for each quick process button, refer to section 3.2 Heat Parameter



3.5 Production Setting

Figure 11



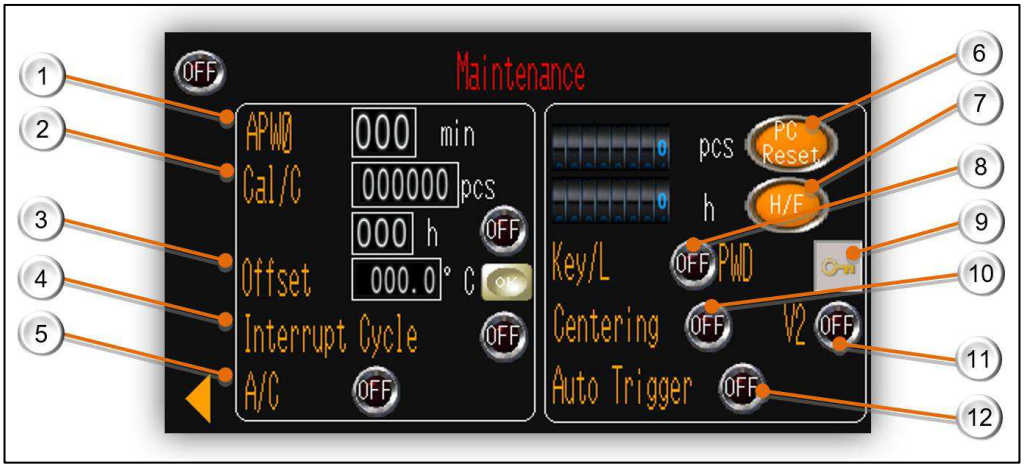
1. Count, production counter.
   (The number here will +1 automatically after each cycle is completed. The counter won't count the cycle which was interrupted.)

2. Set, target production volume
   - ***If you input the value except 0**, when the **COUNT** value met **SET** value, main interface will pop up a tip "complete" to remind the operator production is completed (see below capture). Currently the processor cannot operate unless you reset by click and hold for 5 seconds on the orange* **PC RESET** *button.*
   - ***If you input the value 0**, you can turn OFF the reminder.*

3. Reset button
   *Click and hold this button for 5 seconds, then **COUNT** value will be reset to 0.*

3.6 Maintenance

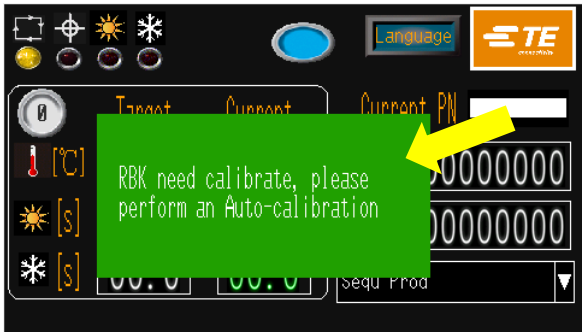
Figure 12



1. Standby Time
   Default value: 60 mins. The processor will automatically entry standby mode if no action in 60min.
   Input value "0", will turn OFF this function.

2. Processor Calibration Counter
   Count down by cycle (default value: 75000 pcs) or by Hour (default value: 350 Hours). No matter which value met, calibration reminder will show on touch panel.
   And there is a mandatory reminder OFF/ON button behind.

Mandatory reminder OFF
----Operator can ignore and keep on cycle



Mandatory reminder ON
----Processor cannot work before Auto-call

To extinguish the flashing indications, Auto-calibration must be carried out. Section 3.7

3. Offset value
   It can be changed automatically after AUTO CALIBRATION. Or input value and click on OK button to change offset manually.

4. Interrupt Cycle (Normally OFF)
   When switch ON, pressing on both start button during cycle would interrupt the current cycle, and heater chamber will go back to home position.

5. Air-cooling switch
   When processor connect with external cooling device, like RBK fixture 2234786-2 (section 4.6.3), or processor with integrated air-cooling nozzle, we can activate air-cooling function by turn ON this switch. Processor will start cooling cycle when heating cycle completed automatically. Operator can edit cooling cycle time in section 3.2.

6. Processor cycle counter
   Designed to indicate the processor operation cycle after leave factory. ***It is required to reset this counter by pressing and holding this button for 5 seconds when replaced the motor.***

7. Heating element timer
   Designed to indicate the hours the heating element operate. ***It is required to reset this counter by pressing and holding this button for 5 seconds when replaced the heating element.***

8. Key lock switch
   Switch OFF, operator can select other process by press on the 10X quick process button.
   Switch ON, processor won't response when operator press on the 10X quick process button.

9. Change password.
   Click on this icon to edit the password. High level authority can change the password for low level authority.

10. Centering Device switch (Normally OFF)
    When switch ON, Centering Device is activated. Then press on both start button to make processor entry Centering production mode.
    ONLY RBK-X1C can activate this function. RBK-X1 will pop up error when activate this function.

11. V2 switch
    When turn OFF, RBK processor can communicate with V1 Ultrasonic welding machine (For example, Schunk, Telsonic or Branson Emerson). When turn ON, RBK processor can communicate with V2 Ultrasonic welding machine (For example, Schunk, Branson Emerson)
    NOTE: RBK processor was programed protocol according to Schunk ultrasonic welding machine. If any other brand welder, refer to section 3.9.2 to reprogram.

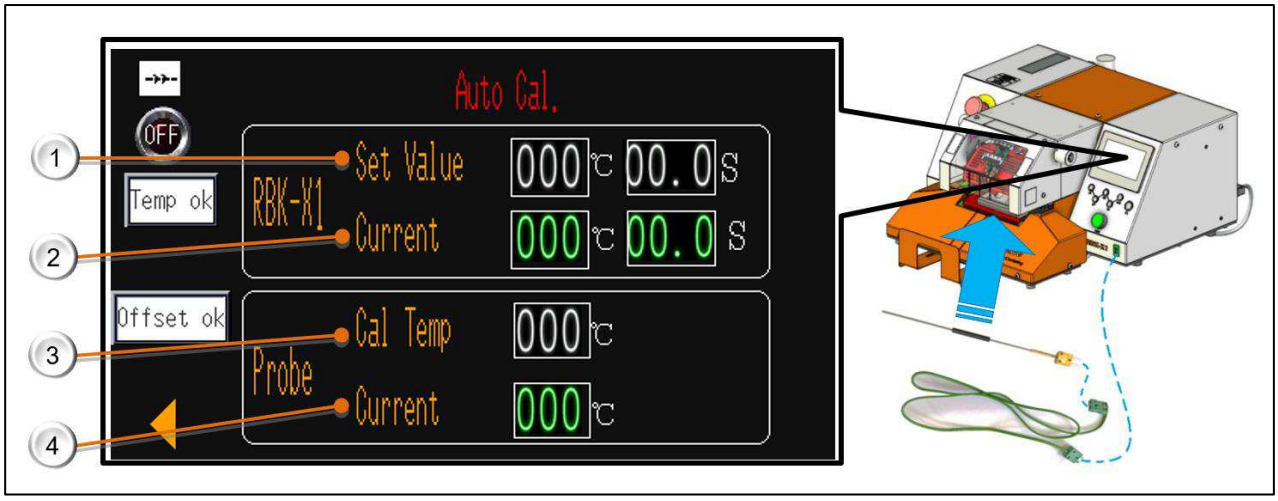
12. Auto Trigger
    Turn on this button while Centering Device activated, cycle can be triggered automatically, without pressing on both start button.

DANGER
Without keep both hand on start button to trigger a cycle, operator could have chance to put hands into processor, that may cause crushing.

3.7 Auto Calibration

Refer to section 4.6.1 to prepare calibration tool.

Figure 13



1. RBK-X1 "Set Value"
   RBK processor calibration temperature and cycle time. Factory setting: 500℃ @ 15S.
2. RBK-X1 "Current"
   RBK processor real temperature and cycle time. (When calibration cycle start, cycle time will count down from 15S to 0S.)
3. Probe "Cal Temp"
   Probe calibration value, which used to calculate RBK processor new offset value.
   - *It would show **PROBE INSTANTANEOUS TEMPERATURE,** the moment when calibration cycle complete.*
     ----X1 calibration type, ONLY for NON-CE version machine. Factory default setting.
   - *It would show **PROBE PEAK TEMPERATURE** after calibration cycle completed.*
     ---- MK3 calibration type, ONLY for CE version machine. Factory default setting.
4. Probe "Current"
   Probe real temperature. It is required to cooling the probe to 23°C± 3°C before calibration cycle start.

Automatic Calibration Procedure

1. Connect the UHI probe to the green Auto-Cal socket, see section 1.2, item 6.
   a. *Touch screen entry Auto-Calibration interface automatically.*
   b. *Processor will automatically adjust cycle heating parameter to 500ºC@15S. Allow another 5 minutes for processor to stabilize when **RBK-X1 Current value** reach 500ºC.*
2. Place the UHI probe centrally into the Processor jaws.
3. Trigger calibration cycle by pressing both start button.
   *(Auto calibration cycle can be triggered ONLY WHEN UHI probe within 23+/-3 ºC. See Figure 13 item4, **Probe Current** value will change to green from red when temperature within 23+/-3 ºC.)*
   a. *Timer display counts down from the (15s). UHI temperature will rise.*
   b. *If after 5 seconds the Processor does not detect a 108C UHI. Increase of 5ºC the cycle will be aborted. i.e. If probe is not inside heater during cycle.*
4. Once the cycle is completed the UHI will be ejected.
5. DO NOT UNPLUG THE UHI PROBE WHEN IT WAS EJECTED. Before removing UHI from socket, allow 15 seconds for processor to calculate and adjust OFFSET automatically.

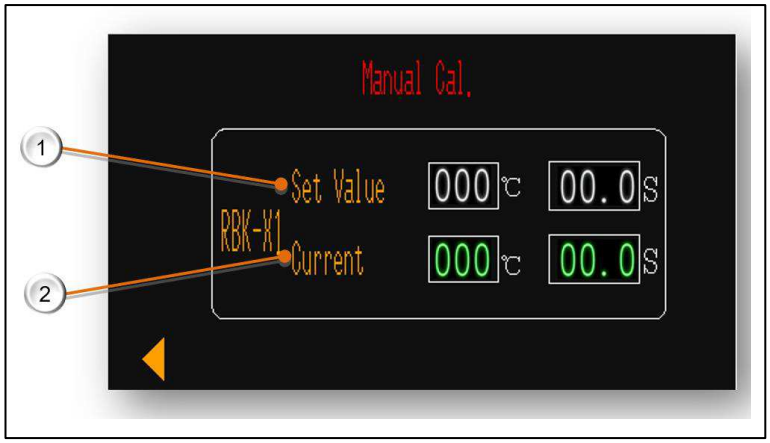
NOTE

- ***Processor can perform auto-CAL at any time, however when the processor indicated "Cal" in the Touch Screen, or replacement on heating element.***
- ***Do not repeat auto-calibration within 15 mins. Repeating this procedure within this time may cause a large offset value to be obtained.***
- ***If calibration succeed, it will pop up a reminder "Temp OK" & "Offset OK" on display left.***

3.8 Manual Calibration

Refer to section 4.6.1 to prepare calibration tool.

Figure 14



1. RBK-X1 “Set”
   RBK processor calibration temperature and cycle time. Factory setting: 500℃ @ 15S.
2. RBK-X1 “Current”
   RBK processor real temperature and cycle time. (When calibration cycle start, cycle time will count down from 15S to 0S.)

Manual Calibration Procedure

1. Access to Manual Calibration page on HMI, allow another 5 minutes for processor to stabilize when **RBK-X1 Current** value reach 500 ºC.
2. Connect UHI probe to a thermometer. Check on thermometer, make sure UHI probe was cooled to 23°C± 3°C, then place the UHI probe centrally into the Processor jaws, and trigger calibration cycle by pressing both start button.
3. Carry out 3 times’ calibration and record every time’s UHI probe peak temperature value from thermometer.
4. Calculate **New offset** and update it to machine “OFFSET” value in Maintenance page manually.

   How to calculate new offset:

   New Offset = Old Offset + (Avg. probe – Target) x 2

   - Old Offset. Read from Maintenance page.
   - Avg. probe = (probe peak temp1 + probe peak temp2 + probe peak temp3) / 3
   - Target: 130 ºC

   For example,

   If the average probe peak temperature is 150°C, old offset is “-15”, target temp is 130 ºC.
   New offset = “–15” + (150 – 130) x 2 = ”25”

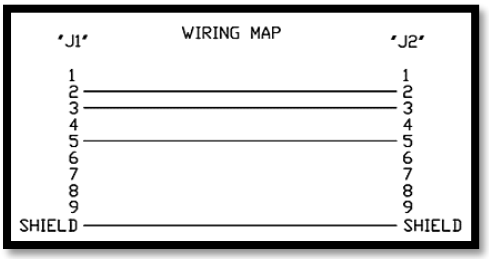
NOTE

- ***After OFFSET has been adjusted correctly it is necessary to wait 15 minutes for temperature to stabilize prior to normal use.***
- ***To remove the ‘Cal’ message on HMI, an auto-CAL is needed to be carried out. If this does not disappear it is necessary to replace the heating element and do auto-CAL.***

3.9 Remote Operation Mode

The remote operation mode allows the processor to be controlled by external devices such as an industrial Computer or Ultrasonic Welding equipment. (The TE heat shrink machine was tested and proved functional with the major ultrasonic welding machine available in the markets, consult with TE for any communication difficulty occurs.)

Remote operation is enabled via the RS232 connector, through an RS232 cable connecting to the external device.



NOTE: Customer need to prepare the RS232 communication cable (DB9, female to female) by themselves. See wiring map for this cable on left. Or purchase it from TE. (Section 4.6.5)

3.9.1 RS232 Communication Protocol

All data is transmitted in ASCII form. The Data format uses 8 data bits, 1 stop bit, no parity at 9600 baud. Full duplex TX/RX exists, RTS/CTS is disabled. The Processor recognizes the following fourteen bytes information packet structure.

Table 3

BYTE 1	***Start of Header (SOH) (always ASCII 01h)***
BYTE 2	***10's of seconds (ASCII 30h to 39h (1 to 9))***
BYTE 3	***1's of seconds (ASCII 30h to 39h (1 to 9))***
BYTE 4	***Always a decimal point (ASCII 2Eh)***
BYTE 5	***0.1's of seconds (ASCII 30h to 39h (1 to 9))***
BYTE 6	***Always a NULL (always ASCII 00h)***
BYTE 7	***Product size code (ASCII numeric – (1 to 3) – see below)***
BYTE 8	***Product size code (ASCII numeric – ('_' or A)– see below)***
BYTE 9	***100's of deg. C***
BYTE 10	***10's of deg. C***
BYTE 11	***1's of deg. C***
BYTE 12	***Checksum high hex nibble (ASCII value 0–9 A–F) F)***
BYTE 13	***Checksum low hex nibble (ASCII value 0–9 A–F)***
BYTE 14	***End of transmission (EOT) (always ASCII 04h)***

The checksum hex (A-F) must be in ASCII lower case.

The Processor will ignore all RS232 data until a SOH character is recognized. On receipt of a SOH, 10 additional characters or an EOT character is sought. For each character received (including the SOH) the longitudinal addition (checksum) is maintained up to and including byte 11. Overflow of the checksum beyond a byte boundary is discarded; This single byte checksum is converted to two ASCII characters and compared with bytes 12 and 13 of the received packet.

The processor responds 100ms after receipt of the above data packet with either a single ACK (acknowledgement) (ASCII 06h) or a NAK (not acknowledgement) (ASCII 15h) character. An ACK response will occur providing the following verifications are met:

a) *The checksum Byte compares.*

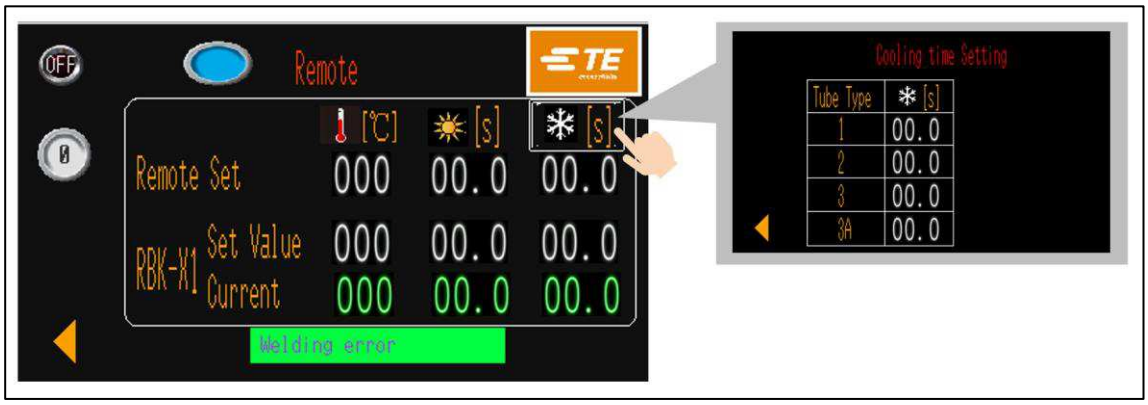
b) *The packet format meets the above defined format. (i.e., The decimal point and null characters occur in the correct positions and the expected numeric values represented by ASCII 30–39 are present).*

Failure to meet these requirements results in the processor responding with a NAK. The only exception unchecked is product size value.

The two ASCII values designated product size are unchecked as part of the receive protocol other than being included in the checksum calculation (i.e. any data received in these positions will not result in NAK response). However, the software will only display product sizes for the following received ASCII characters in these positions: 1_/2_/3_/3A (where _ is an ASCII null (00h)). Any other data received results in a blank product size display.

3.9.2 Remote operation Procedure

Figure 15



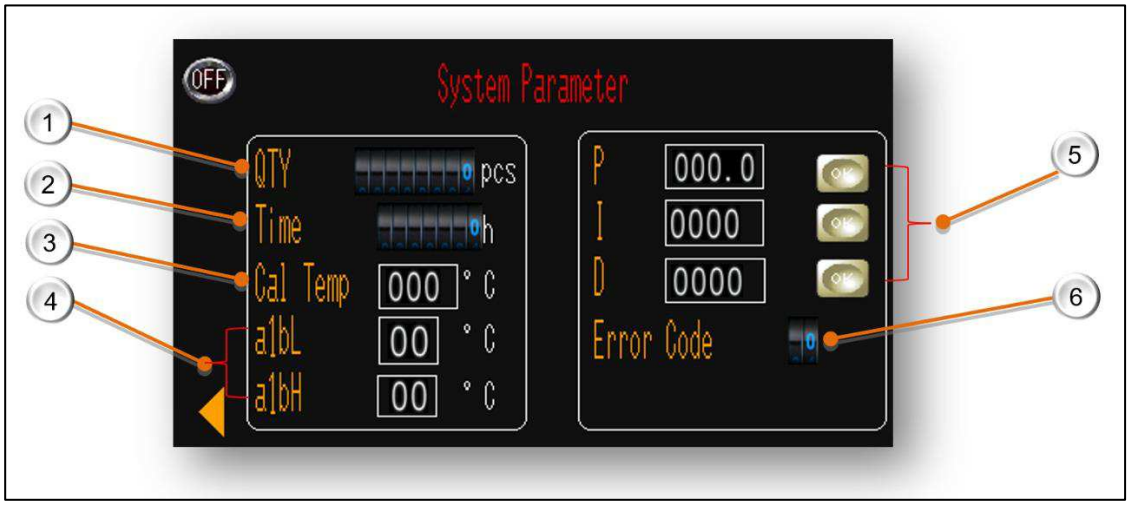
1. *Connect processor with external device via the RS232 communication interface (section 1.3, item 4), like Ultrasonic Welding equipment.*
2. *Access to REMOTE mode from HMI. Switch OFF to ON, allow the processor to communicate with external device. (Restart processor under REMOTE mode, it will allow processor can back to REMOTE mode automatically, unless log OFF by clicking on TE logo and switch ON to OFF on screen top left.)*
3. **REMOTE SET**, *these values are showing the parameter (temperature/heating cycle time/cooling cycle time) transmit from external devices.*
4. **RBK-X1 SET**, *these values are showing the parameter which processor is carrying out.*
5. **RBK-X1 CURRENT**, *these fluctuant values are showing the real time parameter for current process.*
6. *When RBK processor connect with external device. You can confirm if connection is working correctly by checking the value on RBK-X1 SET and REMOTE SET is comply with the parameter in external device.*
7. *Press and hold on both start button, processor will operate basing on RBK-X1 SET value.*
8. *Switch ON to OFF, to shut off the communication with external device.*
9. *Click on left arrow button, back to main interface.*

NOTE

- ***Refer to section 3.6 item 5, about how to de-active air-cooling function. Then cooling time will display 0.***
- ***To edit the air-cooling time, click on the hidden button under SNOW icon, to access to the COOLING TIME SETTING page. Here you can set for 4 type of cooling time, 1_/2_/3_/3A (where _ is an ASCII null (00h)). Besides these 4 types, RBK processor cooling time will show 0, no cooling function available.***

3.10 System Parameter

Figure 16



1. *Processor cycle counter. This value cannot be reset. It will record the total cycle after processor leave TE factory.*

2. *Processor timer. This value cannot be reset. It will record the total operating hours after processor leave TE factory.*

3. *Calibration Temperature. Default value is 130°C.*

4. *Lower alarm temperature, default value 10°C.*

   Higher alarm temperature, default value 10°C.

   Processor Status Indicator (section 3.1, item 1) will illuminate green When processor real temperature under setting temperature +/-10°C, and illuminate amber when beyond.

5. *PID control. These parameters have to be carefully adjusted together and are factory set.*

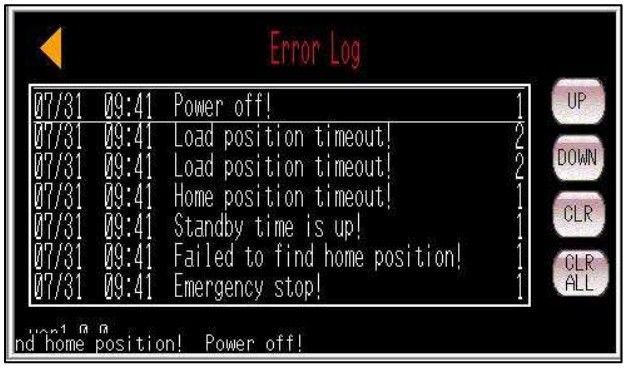
   - ***P**roportional Band, Area around the selected process temperature where the output is at a level other than 100% or 0%. Increasing this parameter increases the width of this band.*

   - ***I**ntegral. Corrects offset between selected process temperature and the proportional band over time. Increasing this parameter increases the time it takes to correct this offset.*

   - ***D**erivative. Shifts the proportional band relative to the actual process temperature, damping the process temperatures tendency to over/under shoot when changing. Increasing this parameter will lengthen the time to change to another process temperature.*

6. *Error Code for temperature controller. Detail information can find on manual of OMRON E5CC.*

3.11 Error Log



This page will show error message on HMI. Other processor issue please find from section 4.3 Troubleshooting

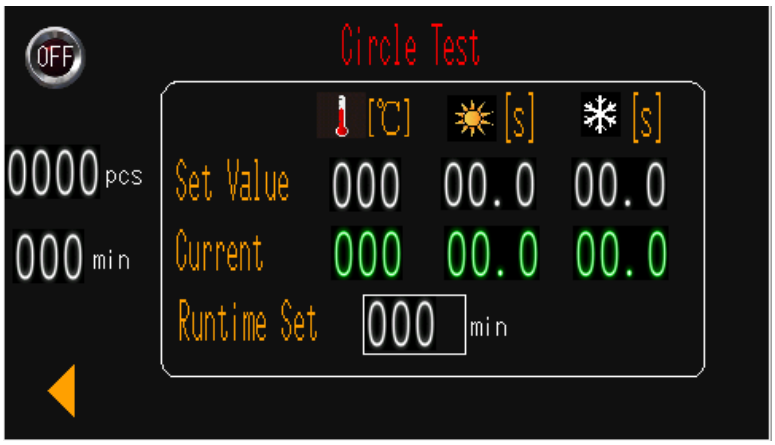
Table 4

Error	Possible Reason	Action
Power off!	The processor isn't powered off in right process 1. Emergency stop button be pushed 2. The power supply is cut	1. Check the emergency stop button was pressed or not 2. Check the power supply of processor
Load position timeout!	1. The heating chamber be jammed 2.The motor error	1. Check the heating chamber be jammed or not 2. Check the motor
Home position timeout!	1. The heating chamber be jammed 2.The motor error	1. Check the heating chamber be jammed or not 2. Check the motor
Standby time is up!	The time that operator doesn't operate the processor is longer than the standby time, the processor is in standby mode automatically	Press the IO button for 5s to power on the processor
Failed to find home position!	When power on the processor the heating chamber isn't on home position, and push two hands buttons, the heating chamber can't back to home position	1. Check home position sensor 2. Check the heating chamber be jammed or not 3. Check the motor
Emergency stop!	Emergency stop button be pushed	Release the emergency stop button
Setting temperature too high!	Setting temperature value is higher than 675℃	Reset the temperature value lower than 675℃
Temperature error!	Actual temperature is higher than 675℃	1. Check the temp sensor 2. Check the temp controller
Temp controller comm error!	1. The communication cable between PLC and temp controller is damaged 2. The PLC communication port is damaged 3. The temp controller error	1. Check the communication cable between PLC and temp controller 2. Check the PLC communication port 3. Check the temp controller
Temperature error! Check heating	Actual Temperature is higher than set temperature 10℃ or lower than set temperature 10℃	Check the connect between temperature controller and PLC
Heating failure	After 90s, actual temperature is lower than 180℃ when set temperature is higher than 200℃	1. Check solid-state relay 2. Check Master control relay 3. Replace the master control relay.
Probe up/down alarm!	1. Probe up/down sensor error 2. Inner connection of CD cable fail	1. Check the sensor 2. Reconnect the cable from top front

T/P to side/center alarm!	1. T/P side/center sensor error. 2. Outer connection of CD cable fail	1. Check the sensor 2. Reconnect the outer CD cable
Push tube failure!	1. Push tube sensor error.	1. Check the sensor
Heater is not at home pos.	Heater is not at home position when machine power on.	1. Push two-hands button to make heater back to home position. 2. Check the home sensor
Home/Load sensor failure	Home/ Load position sensor error	Check home/ load position sensor
L/R- ejection IN/Out fail	1. L/R ejection cylinder sensor error 2. No air in L/R ejection cylinder	1. Check the sensor 2. Check the air supply of cylinder.

3.12 Circle Test

Figure 17



This is a testing interface, allow processor can keep running for 60 min. So as to check if processor can work well.

To start the circle test:

1. *Access to CIRCLE TEST interface from HMI*
2. *Press on both start button to trigger this test.*

   DON'T put hands inside the heating chamber, since processor will keep running until times up.
3. *When time discount from 60 min to 0, test cycle will stop automatically.*
4. *We can check the total testing cycle or time on this interface left.*

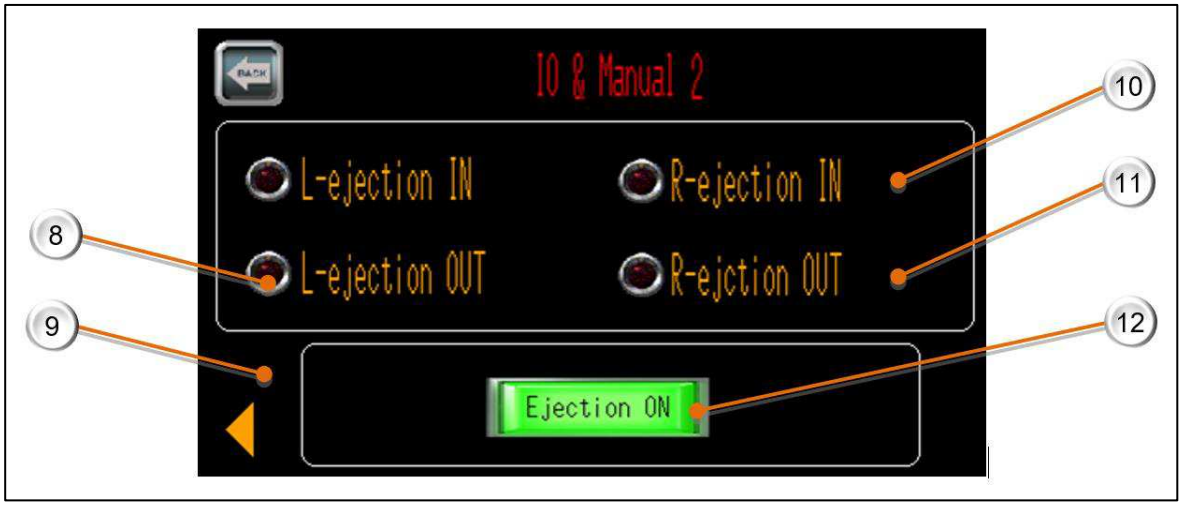
To edit test time:

1. *Switch OFF to ON.*
2. *Edit the test time if need on* RUNTIME SET*, default value 60 min.*
3. *Click on*  *, to back to main interface.*

3.13 I/O & Manual

Figure 18

Figure 19

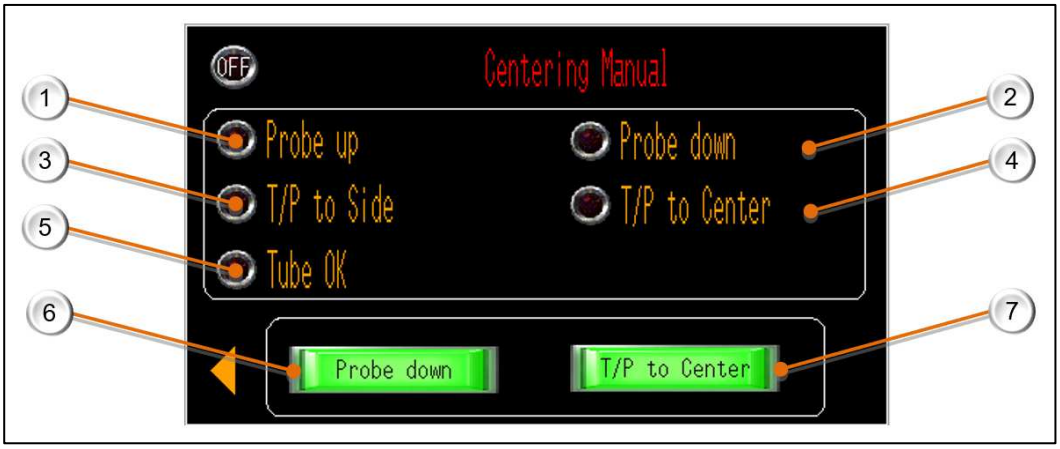


This is an I/O page, help FSE to check processor status or do maintenance.

1. *When pressing on left start button, this icon will illuminate green.*
2. *When pressing on right start button, this icon will illuminate green.*
3. *When press on E-stop button, this icon will illuminate green.*
4. *When heater in load position, this icon will illuminate green.*
5. *When heater in home position, this icon will illuminate green.*
6. *Press on this button, heater will move to forward to load position. Press on this button again, heater will move backward to home position.*
7. *Press on this button, Air-cooling nozzle will start to blow. Press on this button again, nozzle will stop.*
8. *When left ejection blade retracted, this icon will illuminate green.*
9. *When left ejection blade extended out, this icon will illuminate green.*
10. *When right ejection blade retracted, this icon will illuminate green.*
11. *When right ejection blade extended out, this icon will illuminate green.*
12. *Press on this button, will drive both ejection blades in or out.*

3.14 Centering Manual

Figure 20



This is an I/O page when input signal from those action.

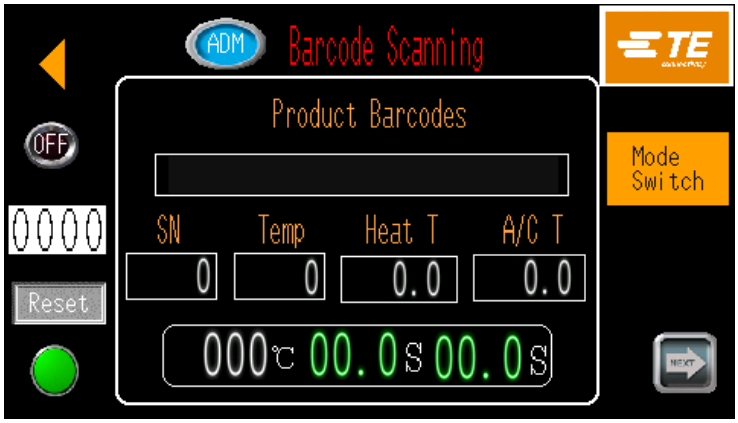
1. *When detection arms swing up, this icon will illuminate green.*
2. *When detection arms swing down, this icon will illuminate green.*
3. *When centering plate in both sides, this icon will illuminate green.*
4. *When centering plate move to center without tube was detected, this icon will illuminate green.*
5. *When centering plate move to center with tube was detected, this icon will illuminate green.*
6. *Press on this button, the detection arms will swing down/ up.*
7. *Press on this button, left and right centering plate will move to center/sides*

3.15 Barcode scanning

Barcode scanning can help processor to get the product's heating parameter (Temperature/time…) by reading the barcode attached on the product, then upload and change current heating parameter to processor accordingly.

(1) *Login on from main interface as User ID "B", select BARCODE SCANNING to access to the interface in right picture shown.*

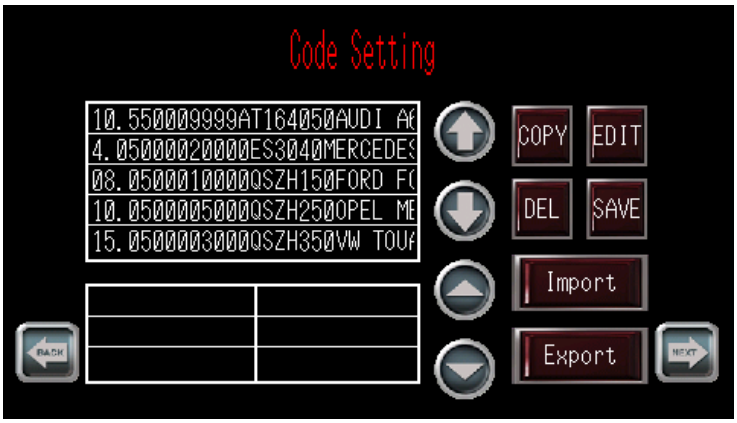
In this page, processor can work with Barcode scanning function.



(2) *Click next page button from Barcode Scanning interface, to access to CODE SETS interface.*

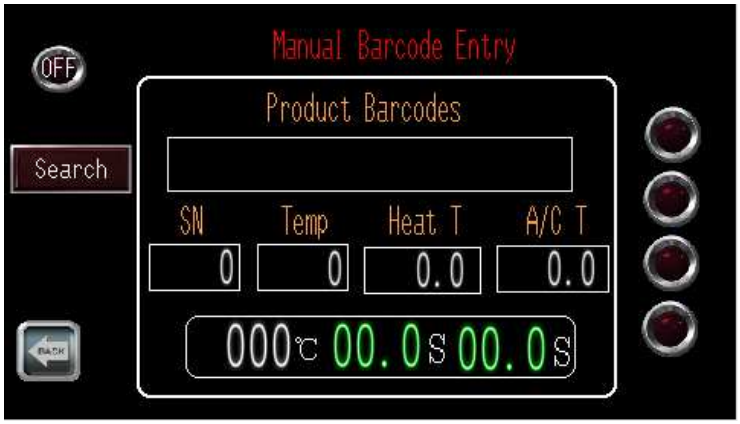
In this page, operator can pre-set or edit barcode parameter.

Note: Operator need to pre-set barcode parameter in this page before using barcode scanning function. Otherwise, processor pop up error message in touch panel.



(3) *Click next page button from CODE SETS interface, to access to MANUAL BARCODE ENTRY interface.*

In case of any reading fail on barcode scanning, this page would allow operator to input barcode parameter manually.

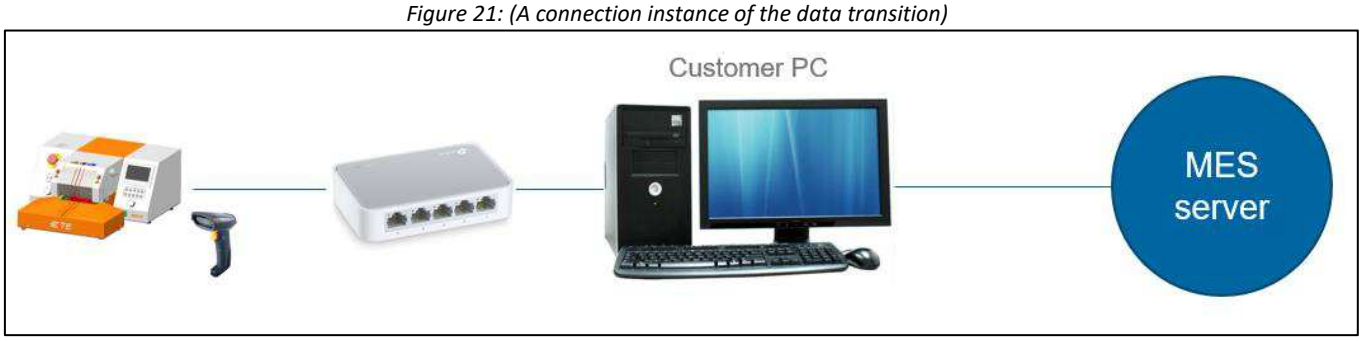


NOTE
More detail on barcode scanning, ask for instruction from TE.

3.16 Data Collection

Data Collection is designed to implement the storage of production data, for example: scan ID, product info, temperature, time, date and so on.
Production data could be stored to USB stick or external PC through using this feature.

Figure 21: (A connection instance of the data transition)



NOTE
Processors have default setting (parameter, doc format, …) on data collection. If any further requirement need contact with TE SALES to customize.
More detail on Data Collection, ask for instruction from TE.

4 Installation and Operation

4.1 Installation

4.1.1 Unpacking

Remove the RBK processor from its packing. If there is any sign of damage, return the equipment to TE in its original container.

Note:
The Serial Number on processor must correspond with the Serial Number on the packaging.

4.1.2 Safety

CAUTION
RBK processor must be installed in accordance with established safe working practices. Incorrect use can cause injury.

Installation requirements must conform to local regulations.

4.1.3 Location

CAUTION
RBK processor is designed to be installed and operated in industrial environments. However it should not be used near explosive or flammable materials or in a location where it would be subject to moisture.

The Processor is a manually operated device and should be sited on a flat level surface, at a height suitable for an operator - a sturdy workbench is ideal.

Take care to ensure that the ventilation fan on the back panel is not obstructed.

4.1.4 Electrical Connections

CAUTION
The Processor is designed for operation from a 230V 50Hz mains supply and is supplied with a 1.5 meters power line.

Power connections for the processor must conform to local standards and regulations.

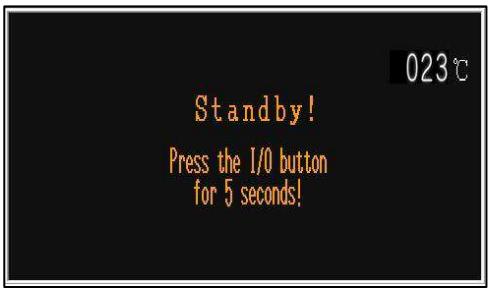
4.1.5 Pneumatic Connections

CAUTION
The Processor is designed for operation from a 4~6 bar compress air.

In RBK-X1C (processor with centering device), make sure air supply is available when using the Processor, no matter activated or inactivated the Centering Device. Cut off the air supply when operating the Processor may cause mechanical jam.

4.2 Operation mode

4.2.1 Stand-by mode

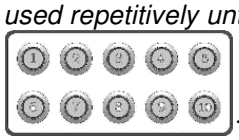


*When turn on the main power switch, the I/O button LED start to flash, processor is in stand-by, no power is connected to the **heater**, **fan** and **motor** circuits. Currently the processor is showing standby interface and ready to power ON by press on I/O button for 5 second.*
Processors allow to set the time to standby automatically, to avoid any accident when operator is leaving. See section 3.6, item 1.

I/O button

4.2.2 Single Process mode (Main Interface) ---- *See section 4.2.7*

The process selection button parameters (time; temperature; product size) have been assigned and stored for each process button. The selected process button number and its stored parameter will be shown on the main interface, and they can be used repetitively until another process button is selected.



10X process quick process buttons.

4.2.3 Sequence Production mode ---- *See section 3.2 & 3.3*

Allow operator to operate the production for different process step by step according to the sequence which preset and stored in processor.
Currently this processor can store 1#~15# sequence. 10 processes for each sequence.

4.2.4 Remote production mode ---- *See section 3.8*

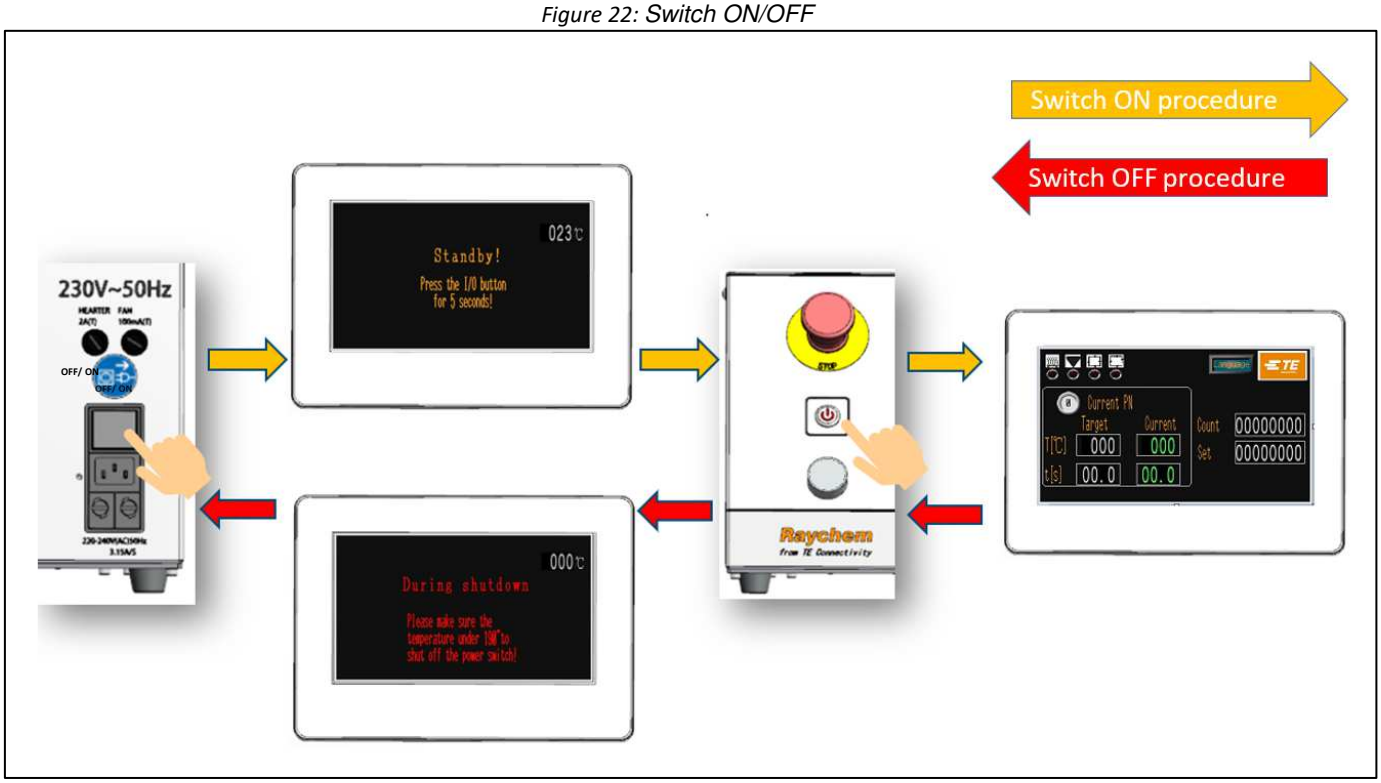
Allow the processor to receive and operate following the heating parameter (product size/temperature/time), which transport from Ultrasonic welding machine through the RS232 Interface socket.

4.2.5 Centering production mode (Main Interface) ---- *See section 4.2.8*

In this mode, processor will help to centering the splice and tube before cycle start.
Also, processor allow to operate under remote mode with centering activated.

4.2.6 Switch ON/OFF to processor

Figure 22: Switch ON/OFF



Switch ON procedure

1. *Connect the power input socket with 230V (+/-10%) AC by power cord.*
2. *Release the Emergency Stop button.*
3. *Switch the Mains Switch to ON from rear panel.*
   Touch screen will power on and show the standby interface.
4. *Switch on the Processor by pressing the I/O button for 5 seconds.*
   a) The I/O LED flash.
   b) Touch screen will show the main interface.
   c) Heater indicator turn amber, and Temperature of heater start to rise.
5. *Check that the correct process button is selected for the task required. The activated button is shown on the main interface.*
6. *When the Heater Indicator turn green, processor is ready to start process.*

Switch OFF procedure

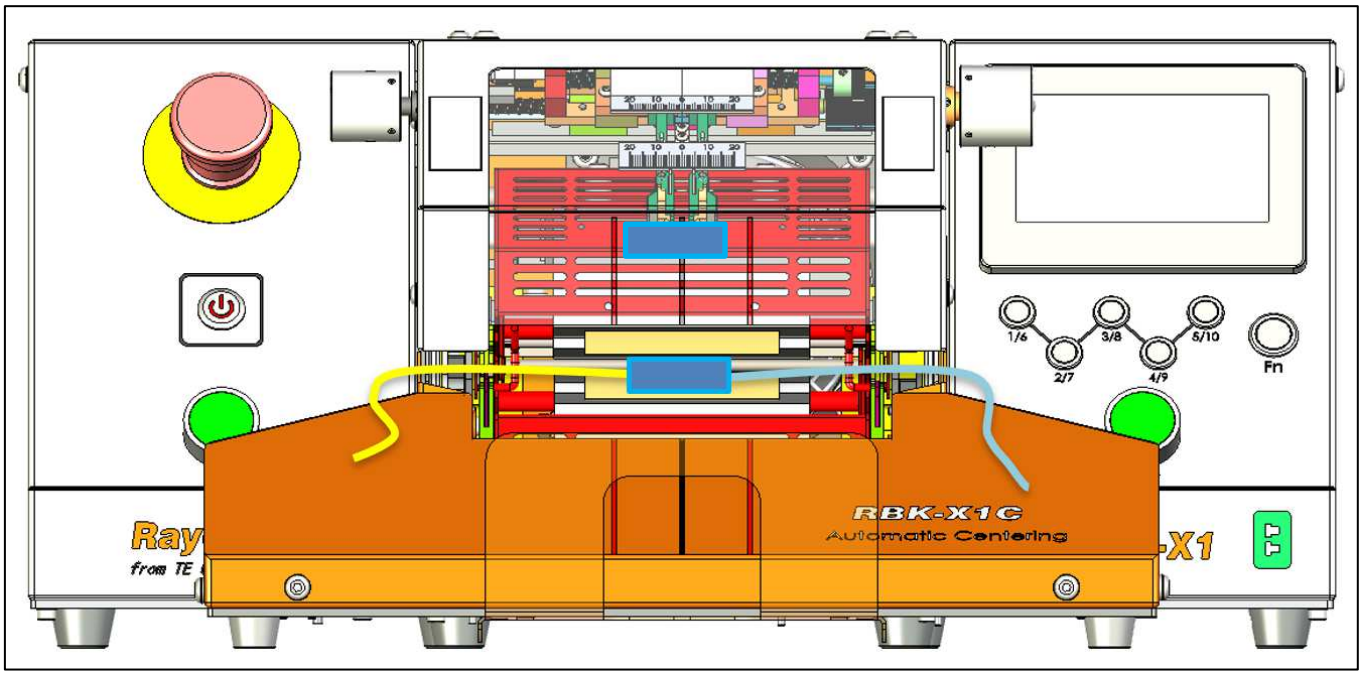
1. *Ensure that the Processor operating cycle is completed, and the cable splice has been removed.*
2. *Switch OFF the Processor by pressing the I/O button for 5 seconds.*
   a) The I/O LED start to flash.
   b) Touch screen will show the shutdown interface.
   c) Temperature of heater start to drop.
   d) cooling fan keep running.
3. *When temperature drop to 190°C, cooling fan stop running.*
4. *Switch the Mains Switch to OFF from rear panel.*

CAUTION
DO NOT use E-stop button or main switch directly as normal Switch OFF process, due to it will reduce Heater life.

4.2.7 Single Process Operation

CAUTION
Denotes a condition that can result in product or equipment damage.

Figure 23: Single process (RBK-X1 & RBK-X1C)



1. *Log on in HMI, switch OFF to the 'Centering' button in Maintenance page, to inactivate Auto Centering function (see section 3.5, item 10).*
2. *Check from main interface, if correct process button has been selected for the cable assembly to be processed. And the heater indicator lit green.*

   Note: This will be selected automatically if the Processor is being controlled remotely.
3. *Select the correct size (ILS. / QSZH) product (Code 1; 2; 3; 3A) and position over splice to be processed.*
4. *Insert the cable splice into the Processor grippers. Align the center of the splice and product ends, with the guide markers on the Perspex shield and Guard.*
5. *Press and hold both START CYCLE buttons 0.5S simultaneously, heater carrier will move forward to load position.*

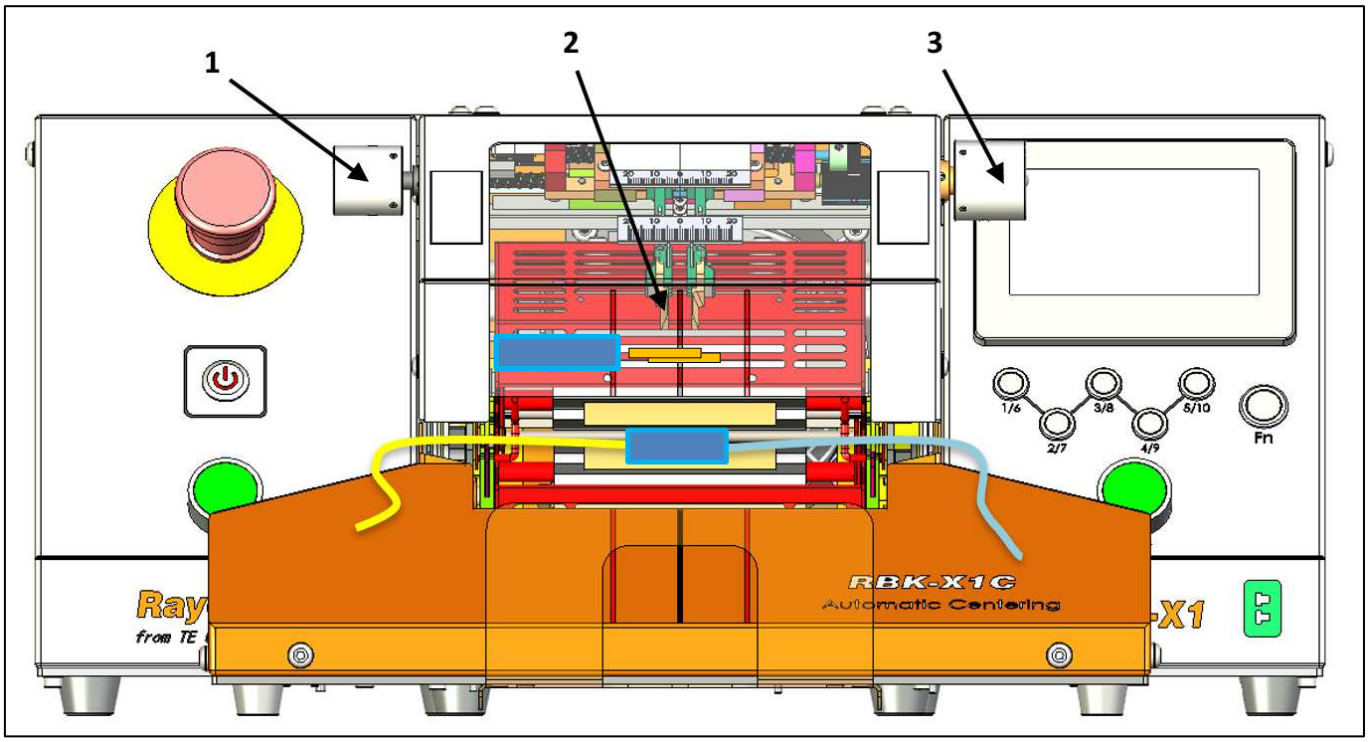
   Note: When cycle start, release hands before heater carrier arrived at loading position will interrupt cycle. Heater carrier will stop at the position when hands release. (Can turn off the interrupt in maintenance page) . Quick press on both START CYCLE button, the heater carrier will back to home position. Ready for new cycle.
6. *Check from main interface that the process Cycle indicator lit green.*
7. *Check that the heating cycle time start to count down.*
8. *When the Timer reaches zero, the heater will move backward to home position. Then cooling cycle will start. If air-cooling function was de-activated, the processed splice will be ejected.*

   Note: TAKE CARE WHEN HANDLING THE EJECTED CABLE SPLICE AS IT WILL BE HOT.
9. *Without selecting another process button, the next cycle will continue the last selected process.*

4.2.8 Auto Centering Operation

CAUTION
Action of the Process Start buttons is inhibited until the heater LED has changed to green.

Figure 24: Auto Centering (RBK-X1C only)



1 Offset Knob
2 Detection plate
3 Splice length Knob

To trigger Auto Centering function:

1. *Log on in HMI, switch ON to the 'Centering' button in Maintenance page, to activate Auto Centering function (see section 3.5, item 10).*
2. *Turn back to main interface, press both start button to drop down the DETECTION PLATE.*
3. *Pull and rotate the right SPLICE LENGTH KNOB to find a suitable distance between 2 detection plates, according to the width of splice, then processor is ready for centering. (New version machine we cancel the Knob, to adjust by Allen-key.)*
4. *If necessary, pull and rotate the left OFFSET KNOB to adjust the splice offset. (New version machine we cancel the Knob, to adjust by Allen-key.)*
   Note: Due to current centering device capacity, splice offset CANNOT lager than 10mm.

Operation procedure:

1. *Push tube to expose the splice (Figure 4-Figure 3), then insert cable with splice contact with both DETECTION PLATE.*
   Note: Due to current centering device capacity, tube CANNOT longer than 60mm.
2. *When detection success, the DETECTION PLATE will swing up, then the CENTERING PLATE will push the tube to the center, and back to both side at once.*
   Note: In case of CENTERING PLATE was stuck when moving to center, remove the cable manually and press on both start button to start a new cycle.

3. *Press on both start buttons simultaneously until the heater carrier move forward to load position.*
   Note: If turn on "Auto Trigger" button in Maintenance page, operator don't need to press both start button to activate heater carrier moving forward, it would automatically move forward when detection success. But we won't recommend operating like this, since heater carrier moving without hands on button, operator may have chance to put hands in heating chamber. That would cause accident.
4. *Check from main interface that the process Cycle indicator lit green. Timer Display start to count down.*
5. *When the Timer reaches zero, the heater will move backward to home position, (For Air-cooling version machine, a cooling cycle will start automatically to cool on product if cooling function was activated), then the processed splice will be ejected. Cycle completed, DETECTION PLATE drops down, ready for next cycle.*

   NOTE
   TAKE CARE WHEN HANDLING THE EJECTED CABLE SPLICE AS IT WILL BE HOT.

6. *Without selecting another process button, the next cycle will continue the last selected process.*

4.2.9 Emergency Stop

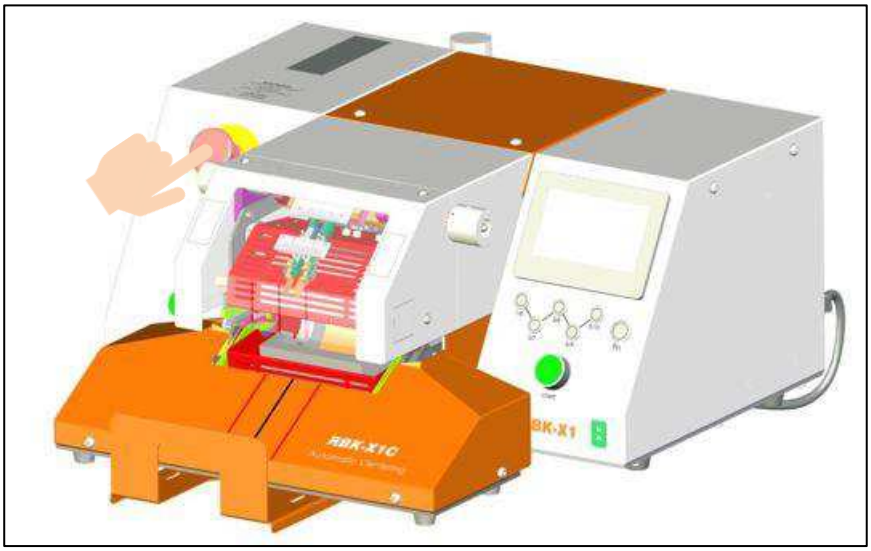
NOTE
This is an EMERGENCY procedure used in the unlikely event of the Heater Chamber remaining closed after the set time sequence.

HAZARDS FROM DAMAGED PRODUCT
Due to the nature of all heating tools, any product which is trapped or inadvertently left in the oven can become damaged or even BURN. This may lead to smoke; hence the processor must be used in a well-ventilated area.

If a fire occurs inside the heater the operator should actuate the processor's Emergency Stop button and then either extinguish the fire by correct use of a CO2 filled fire extinguisher or allow the fire to extinguish naturally. In both cases care should be taken not to inhale any of the fumes which result from the burning wires or splice tubing. If the heater chamber is forward when the E-STOP is activated it will immediately move to the rear and eject the splice being processed. Care should be taken in handling the splice as the splice nugget and surrounding area may be hot. The splice/wires should then be safely disposed of in a metal bin which contains no combustible material.

In the unlikely event the heater chamber does not retract during an emergency stop operation, follow the "Emergency Heater Chamber Release" on section 4.2.11.

Figure 25



1. *To Power OFF the processor in an emergency, push the EMERGENCY STOP button. If the heater chamber is forward when STOP is activated, it will move to the rear and eject the splice being processed. All power to the Processor is then turned OFF.*

2. *To restore the processor to its normal working condition, release the EMERGENCY STOP button by rotating it clockwise.*

3. *Reset the Processor by pressing the I/O button for 5 seconds until the I/O LED illuminates. Once the heater chamber has returned to the selected temperature the Processor is then ready to continue operation.*

4.2.10 Heater Carriage Jammed

CAUTION
Heater Carriage Jams.

Power to the motor and heater will remove automatically.

The RBK processor heaters will switch off automatically if the carriage has not reached the front sensor in 700ms. Power to the drive motor removed.
Heater's cool down and the RBK processor will go into Stand-by mode, exactly as if the operator were preparing to switch the processor off.

The equipment is connected to an AC mains electricity supply. Before undertaking any maintenance or repair, always turn off the equipment and ensure it is isolated from the AC supply.

Clear the jam. Check for signs of damage to Processor. Ref Emergency Heater Chamber Release: section 4.2.11.

To reset the Processor:

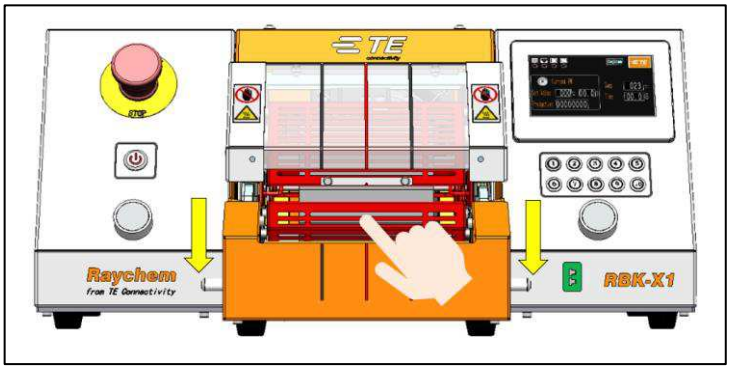
1. *Switch ON the Processor by pressing the I/O switch for 5 seconds.*
2. *Press on both start button.*
3. *This will move the mechanism back and reset the fault condition.*
4. *Processor is now ready to use.*

4.2.11 Emergency Heater Chamber Release

This is an EMERGENCY procedure used in the unlikely event of The Heater Chamber not opening when the Emergency stop is activated. The equipment is connected to an AC mains electricity supply. Before undertaking any maintenance or repair, always turn off the equipment and ensure it is isolated from the AC supply. Allow processor to cool down before starting this procedure!

1. *Push bottom heater cover to rear of processor until heater opens (See below picture).*
2. *Push down on GRIPPER RELEASE stubs and remove splice.*

Figure 26: Manual movement of bottom heater



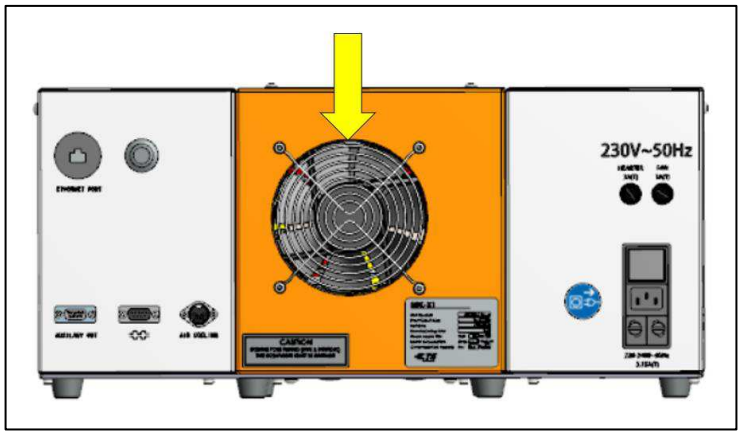
CAUTION
FRONT OF THE PROCESSOR CAN BE HOT TO THE TOUCH

4.2.12 Routine Maintenance

The RBK processor requires only the minimum of maintenance. However, the following checks must be carried out on a weekly basis:

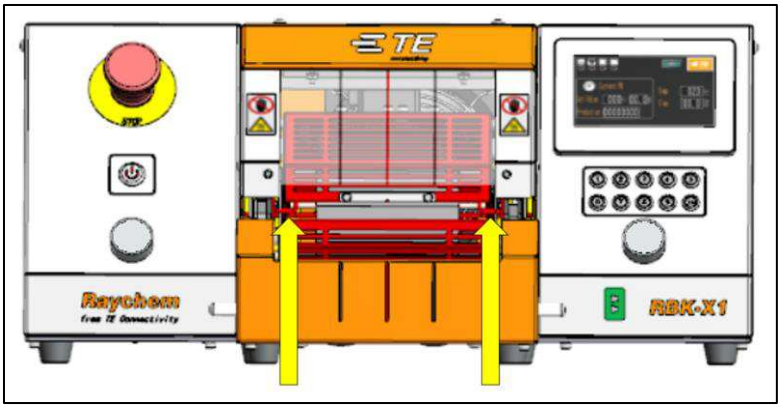
1. ***Check the cooling fan is operating correctly and air is flowing through the rear vent panel. If necessary, clean the dust inside the machine by air gun.***

Figure 27



2. ***Remove front cover. Check for correct clearance (a minimum of 75mm clear space) and obstructions.***

Figure 28



3. ***Wire Grippers. Check visually for correct operation and signs of wear.***
4. ***Manual Release. Check that manual release levers operate freely.***
5. ***Clean the tube hot melt left on the heating element and loading position.***

4.3 Troubleshooting

THE TASKS IN THIS SECTION SHOULD ONLY BE CARRIED OUT BY A SUITABLY QUALIFIED TECHNICIAN. BEFORE STARTING ANY REPAIRS, THE PROCESSOR MUST BE DISCONNECTED FROM THE MAINS SUPPLY. AFTER COMPLETION, THE APPROPRIATE SAFETY CHECKS MUST BE MADE.

If a fault appeared, the following tables would help in identifying the fault.

4.3.1 Preliminary Checks

Before investigating a fault condition check:

1. *MAINS ISOLATION switch is in ON position.*
2. *EMERGENCY STOP switch is in OUT position.*
3. *All fuses are OK.*
4. *Power supply is ON.*

4.3.2 Troubleshooting Table

Besides those error log described in section 3.10, other problem see below table.

Table 5

Problem	Possible Cause	Verification	Solution
All LED's OFF	***No power.***	***Unplug mains power cable. Check mains supply present.***	***Restore power supply.***
	Mains Switch not in the 'ON' position and/or the Emergency Stop switch pressed...	***stand-by LED is illuminated when the Mains Switch and the emergency stop are in the correct position.***	***Set switches to correct position.***
	Mains input fuses failed	***Remove and check.***	***Replace if necessary.***
HMI still on standby interface.	***I/O switch not pressed.***	***Check the I/O LED illuminated***	***Press I/O switch for 5S to start the processor.***
Cycle cannot start when press on both start button.	***Actual temperature beyond set temperature band.***	***Check that the Heater LED is Green.***	***Wait until temperature reach set temperature band.***
	Processor was under Auto Centering mode	***Check from main interface, if the Auto Centering Indicator was shown. (Section 1.3, item 5)***	***Ref to section 4.2.8, how to work under Auto Centering Mode.***
	One cycle start button disconnected.		***Replace button if necessary.***

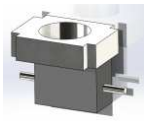
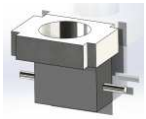
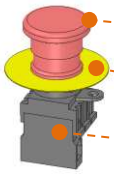
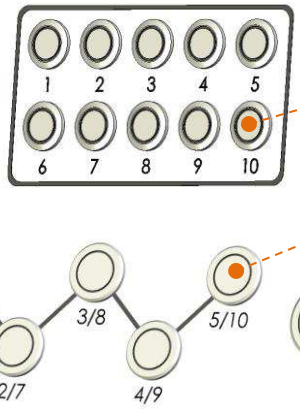
Problem	Possible Cause	Verification	Solution
Heater chamber fails to move when start buttons pressed.	*Heater not in rear position.*	*Check heater chamber position. Check for obstruction.*	*Remove obstruction. Press cycle start buttons to return heater to the rear position.*
	'Home' sensor failed or stuck OFF.	*Check sensor gap and position. Sensor should be illuminated. Check wiring and connections.*	*Adjust sensor position or replace if required.*
	'Load' sensor failed or stuck ON.	*Check sensor gap and position. Sensor should be illuminated. Check wiring and connections.*	*Adjust sensor position or replace if required.*
	Safety Relay error	*when the start buttons are pressed, check contact "43" is connected to "44" from circuit.*	*Replace the safety relay*
		when the start buttons are pressed, check there is 24V power supply between A1 & A2	*Replace the safety relay*
	Motor Failure	*Check power to motor (24V dc) when start buttons are operated.*	*Replace motor. Rectify wiring fault.*
	Mechanical Jam.	*See section 4.2.10*	

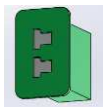
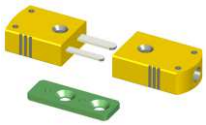
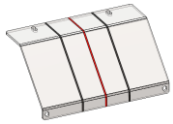
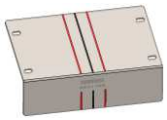
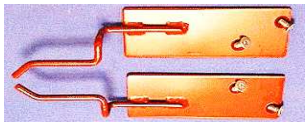
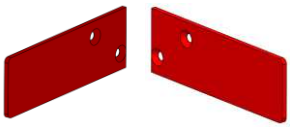
Problem	Possible Cause	Verification	Solution
Heating chamber moves forward and returns immediately to the Home position.	*'Load' proximity sensor permanently 'OFF' or defective. May be positioned incorrectly.*	*Check that the 'Load' sensor internal LED is illuminated.*	*Adjusting sensor position. Replace sensor if necessary.*
		Pressing the cycle buttons will reset the sensor control but will move the chamber to the Home position if not correct.	
Processor overheats. Covers and guards are warmer than normal.	*Switch off procedure not being observed.*	*Switch off at I/O switch Fan will continue to run until 190℃ and then switch off. Blue stand-by led will be lit.*	*Ensure correct switching procedures are carried out.*
	Cooling fan failure	*Check fan function.*	*Replace fan.*
No action when shift on quick process buttons.	*Keypad Lock Mode 'Key/L' selected on.*	*Check in parameter for Key/L settings.*	*Reset Key/L to OFF*
RS232 Communication does not function.	*'REMT' not on.*	*Check parameters.*	*Set 'REMT' to ON.*
	RS232 cable not connected to welder or Processor.	*Check interconnecting cable.*	*Reconnect...*
	External device setting error	*Check data format comply with RBK-X1C (refer to section 3.8.2) by port testing software.*	*Make sure transfer data between RBK-X1C and external device on data format*
Centering device does not act.	*Auto Centering function was not activated.*	*Check on touch panel if the auto centering icon was shown*	*Log on to maintenance interface to activate Auto Centering. Refer to section 3.5, item 10.*
	Connection on 2X detection plate fail	*Check connection of the 2X detection plate.*	*Reconnect or replace component if necessary.*
Centering plate got stuck	*Reed plate in the Centering plate got stuck*	*Press on the Reed plate to check if it moved smoothly*	*Clean dust, or replace spring if necessary.*
Tube got stuck with splice when centering	*Splice joint stop the movement of centering tube*	*Tube was not in center when heating chamber move forward.*	*Press E-stop button, Remove the splice and restart processor for a new circle.*

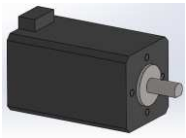
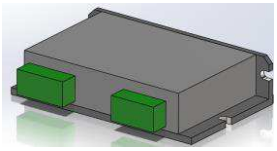
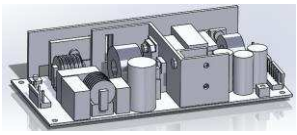
4.4 Recommended Spare Parts

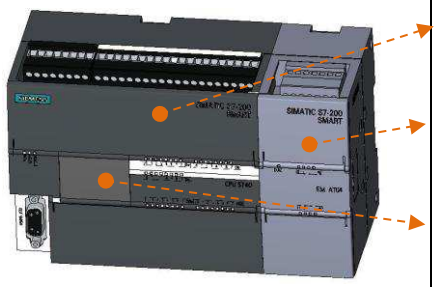
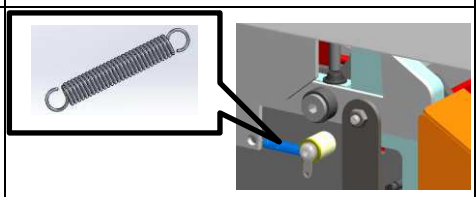
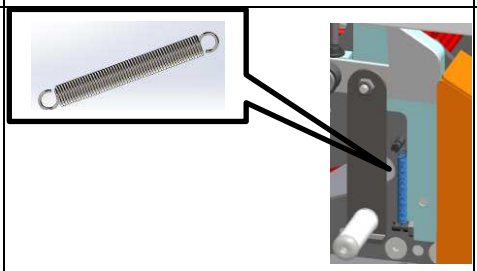
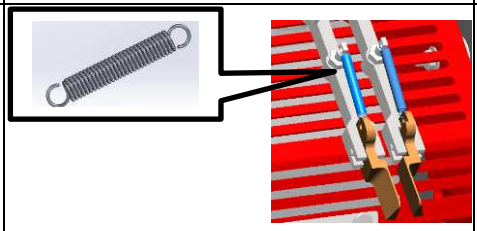
Refer to section 4.5.2 Gaining Access, how to remove the cover to replace below spare parts. Mostly all RBK processor can share same spare parts, except those items specify in note column.

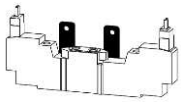
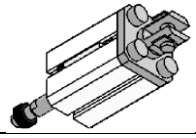
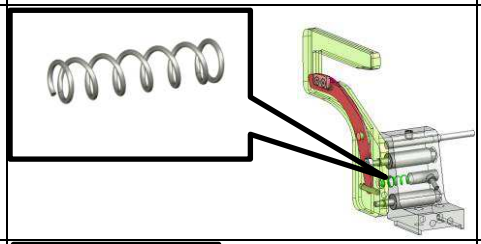
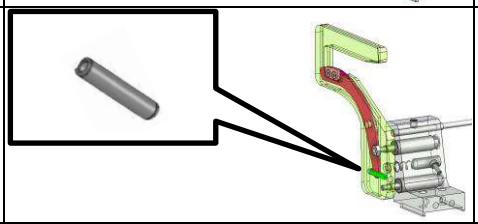
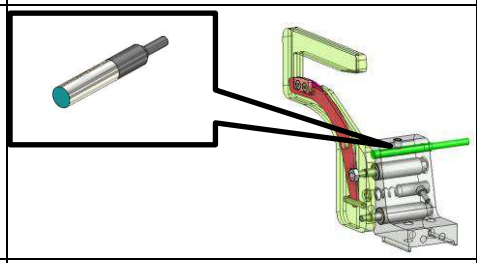
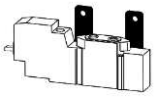
Table 6

Description	Picture	Part No	Note
Start button *(NON-CE)*		***2234980-1***	*Use on NON-CE version*
Contact, Start button *(NON-CE)*		***2234984-1***	*Use on NON-CE version*
Start button *(CE)*		***2234980-2***	*Use on CE version*
Contact, Start button *(CE)*		***2234984-2***	*Use on CE version*
Emergency Stop Button		***2234983-1*** ***2234983-2*** ***2234983-3***	*Refer to section 1.2, item 1*
Touch Screen		***2234977-1***	*Refer to section 1.2, item 8*
I/O button		***2234982-1***	*Refer to section 1.2, item 2*
Processor button		***2234981-1*** ***1-2234981-1*** ***1-2234981-2***	*Refer to section 1.2, item 7. This PN stand for only 1 button.*

Description	Picture	Part No	Note
Calibration socket, "K" type		***2234973-1***	*Refer to section 1.2, item 6*
Kit, thermocouple connector		***2391335-1***	*All RBK processor*
Connection cable, CD		***2369601-4***	*Use on RBK-X1C* *Refer to section 1.4, item 12*
Air supply kit		***2369601-3***	*Use on RBK-X1C* *or A/C version*
View Window, X1		***2234897-1***	*Use on RBK-X1*
View Window, X1C		***2369602-1***	*Use on RBK-X1C*
Ejector blade, Left ***Ejector blade, Right***		***2234840-1*** ***2234840-2***	*Use on RBK-X1*
Ejector blade, Left ***Ejector blade, Right***		***2-2369603-2*** ***2-2369603-3***	*Use on RBK-X1C*
Heating Element Assembly *(including upper and lower heater, thermocouple is part of lower heater.)*		***2234991-1*** ***2234991-2***	*Standard version* *Optional wide version*
Thermocouple		***2234990-1***	*All RBK processor*

Description	Picture	Part No	Note
Wire kit, drag chain, X1 *(NON-CE)* ***Wire kit, drag chain, X1*** *(CE)*		***2408011-1*** ***2408011-2***	*Use on NON-CE version* *Use on CE version*
Cooling Fan (220V) ***Cooling Fan (24V)***		***2234963-1*** ***2234963-2***	*Use on NON-CE version* *Use on CE version*
Stepper Motor		***2234883-1***	*Locate in Top Rear cover*
Motor Driver		***2234972-1***	*Locate in Left cover*
24V Power supplier		***2234970-1***	*Locate in Left cover*
Solid State Relay (AC) ***Solid State Relay (DC)***		***2234969-1*** ***2234969-2***	
Two-hand safety control module		***2234967-2***	*Use on CE version*
Proximity Sensor, home/load *(NON-CE)* ***Proximity Sensor, home/load*** *(CE)*		***2234988-1*** ***2234988-2***	*Use on NON-CE version* *Use on CE version*
Switch, NON-CE ***Switch, CE***		***2234985-1*** ***2234985-2***	*Use on NON-CE version* *Use on CE version*

Description	Picture	Part No	Note
PLC ASSY		***2234964-1/-2*** *CPU module, programmed* ***2234966-1*** *Analog input module* ***2234965-1*** *Communication module*	***2234964-1*** *Only used on 2234800-1, -2, -11 2376800-1, -2* ***2234964-2*** *Only used on 2234800-13, -14 2376800-13, -14* *Locate in Right cover*
Safety Relay		***2234967-1***	*Locate in Right cover*
Temperature controller		***2234968-1***	*Locate in Left Cover*
Storage Battery		***2234971-1***	*Locate in Left Cover* *Each processor would need 2X*
Reset Spring, Latch Assembly		***2234868-1***	*All RBK processor*
Reset Spring, Pinch Block		***2234869-1***	*All RBK processor*
Reset Spring, Detection plate		***5-2369604-8***	*Use on RBK-X1C*
Detection Plate, Left ***Detection Plate, Right***		***3-2369602-1*** ***6-2369602-5***	*Use on RBK-X1C*

Description	Picture	Part No	Note
Valve, centering plate		6-2369604-9	Use on RBK-X1C Locate in top middle cover
Cylinder, Detection plate		6-2369604-7	Use on RBK-X1C Locate in top middle cover
Cylinder, Centering plate		4-2369604-5	Use on RBK-X1C Locate in CD cover
Cylinder sensor, Centering plate		2-2369604-4	Use on RBK-X1C Locate in CD cover
Rail ASSY, Centering plate		5-2369604-5	Use on RBK-X1C Locate in CD cover
Timing belt, Centering plate		9-2369604-9	Use on RBK-X1C Locate in CD cover
Compressed Spring, CD trigger		4-2369604-3	Use on RBK-X1C
Compressed Spring, Centering plate		4-2369604-2	Use on RBK-X1C
LED		3-2369604-5	Use on RBK-X1C Locate in CD cover
Sensor, CD trigger		2-2369604-5	Use on RBK-X1C
Valve, detection plate		4-2369604-9	Use on RBK-X1C Locate in CD cover

4.5 Repair

THE TASKS IN THIS SECTION SHOULD ONLY BE CARRIED OUT BY A SUITABLY QUALIFIED TECHNICIAN. THE PROCESSOR MUST BE ALLOWED TO COOL AND BE DISCONNECTED FROM THE MAINS SUPPLY BEFORE CARRYING OUT ANY REPAIR OR REPLACEMENT.

THE PROCESSOR HAS A CAPACITOR AS PART OF THE AUTO-RETRACT FEATURE. NORMAL PRECAUTIONS REGARDING DISSIPATION OF STORED ENERGY MUST BE TAKEN PRIOR TO ANY SERVICE OR REPAIR.

AFTER COMPLETION OF A REPAIR OR REPLACEMENT, THE APPROPRIATE SAFETY CHECKS MUST BE MADE. REFER TO section 2.2 "Electrical Safety".

4.5.1 Circuit Protection Devices

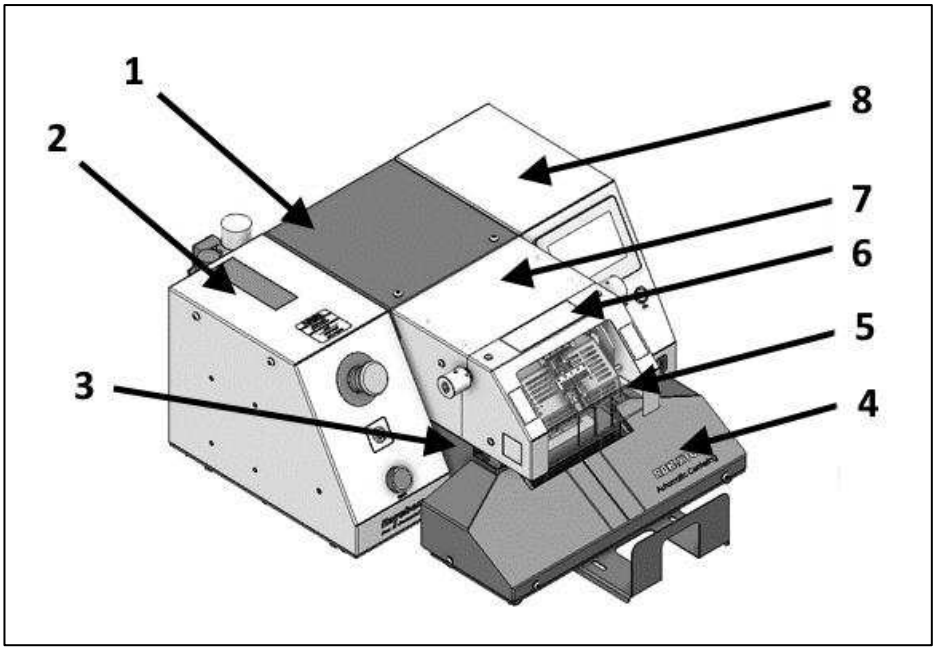
The Processor is protected by four external fuses fitted at the back of the unit. See section 1.3 for detail.

Figure 29

4.5.2 Gaining Access

To gain access to the internal components, the side and top covers must be removed. Use the correct size Key.

Figure 30



1	Top Rear cover	**5**	R-side guard
2	Left cover	**6**	Top front cover
3	L-side guard	**7**	Top middle cover
4	CD cover	**8**	Right cover

Figure 31: Top Front Cover Securing Screws (4X)

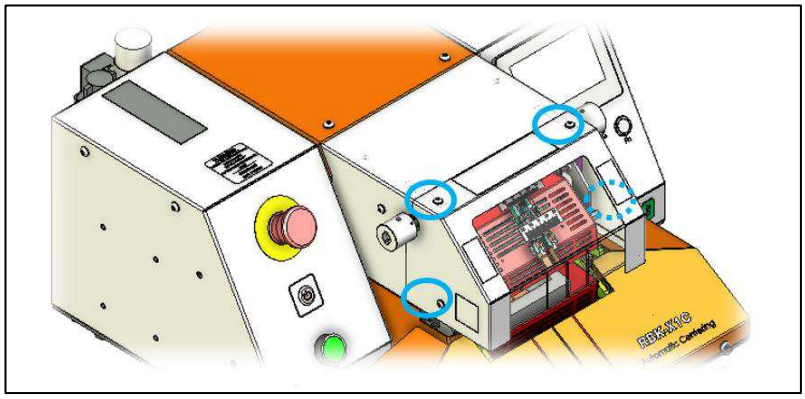


Figure 32: Top Middle Cover Securing Screws (2X)

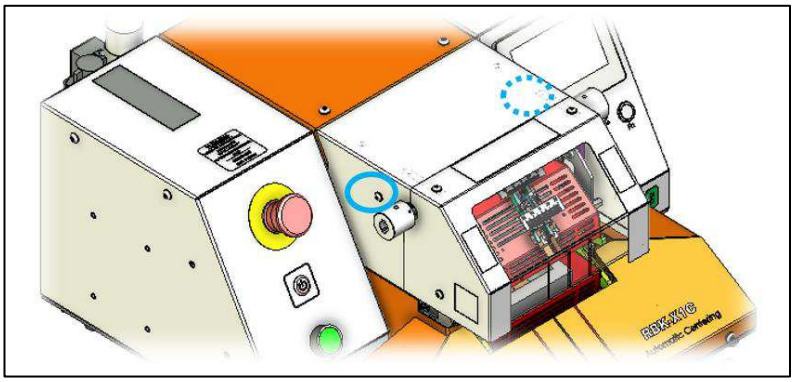
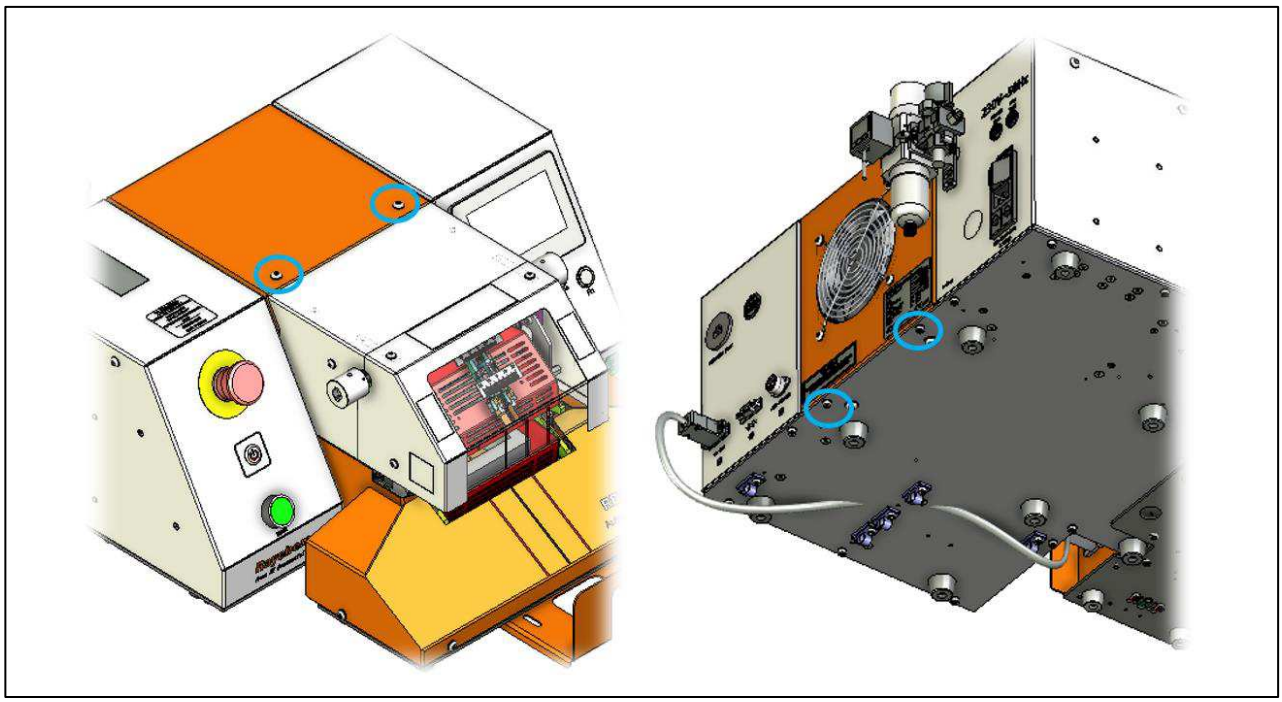
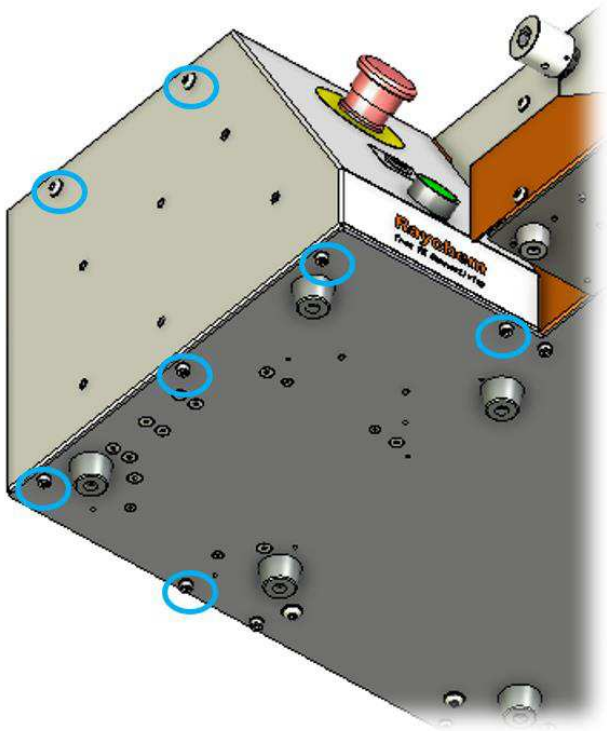
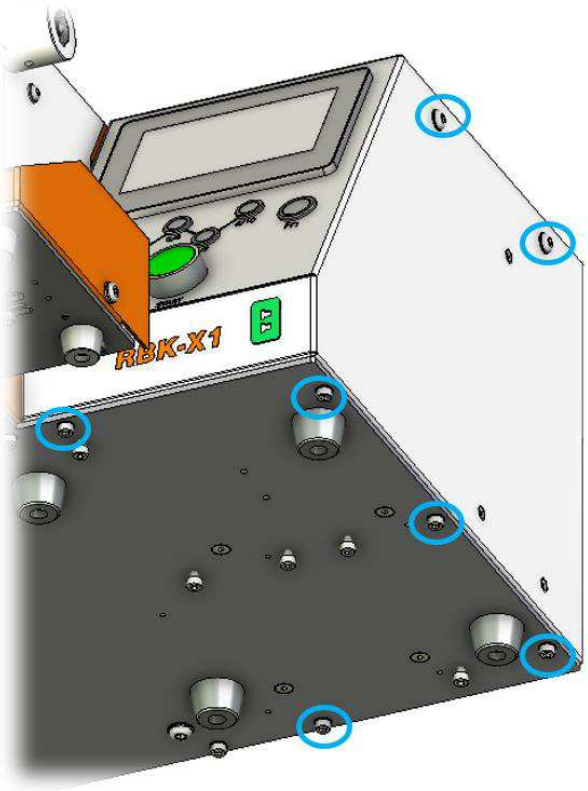


Figure 33: Top Rear Cover Securing Screws (4X)





Left Cover Securing Screws (7X)



Right Cover Securing Screws (7X)

Figure 34: L-side guard (2X) and R-side guard (2X) securing screws.

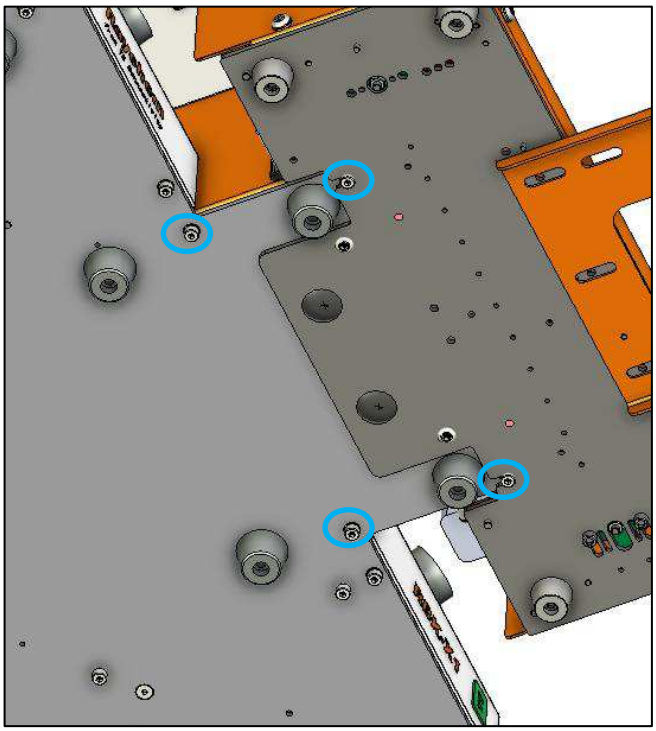
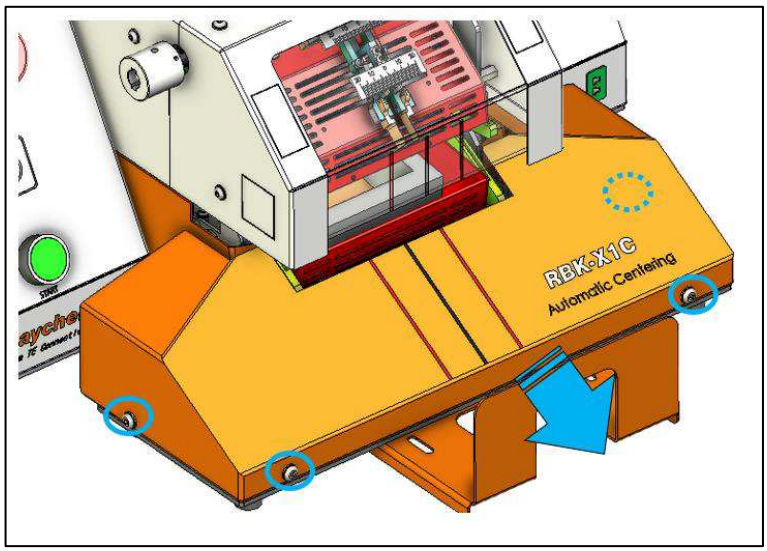


Figure 35: CD cover Securing Screws (4X)



4.5.3 Heater Element Replacement

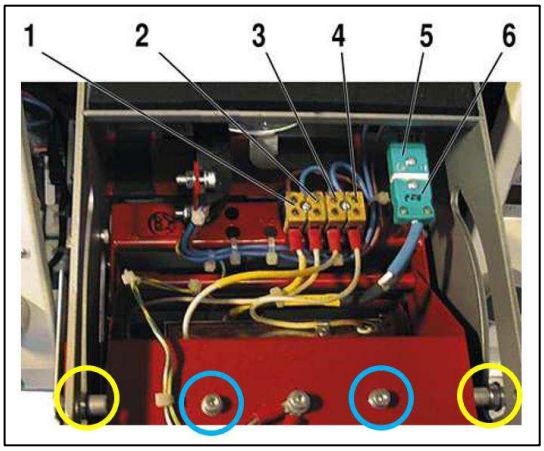
ENSURE THAT MAINS SUPPLY IS DISCONNECTED.

The two heater elements are mounted within a protective cage. Each are removed separately but must be replaced as a set. REMOVE TOP GUARD FIRST.

Replacement procedure

1. *Remove top cover /top guard/front guard/both side guard.*
2. *Disconnect the upper and lower heater electrical connections, unplug the thermocouple plug.*

Figure 36:Electrical Connections for Heating elements.



1 = Bottom Heater 3 = Top Heater 5 = Thermocouple 'K' Type Socket
2 = Bottom Heater 4 = Top Heater 6 = Thermocouple 'K' Type Plug

3. *Remove the 2X upper bearing screws from left and right side. Allow the heating element can be easily removed from cover. (See yellow circle in Figure 36.)*
4. *Remove the 2X upper heater mounting screws on top of red heating element cover, with one hand to hold the heating element avoid falling. (See blue circle in Figure 36.) Upper heating element can be removed.*
5. *Remove the grommets from base plate (See below picture), to gain access to the two lower heater element mounting screws.*

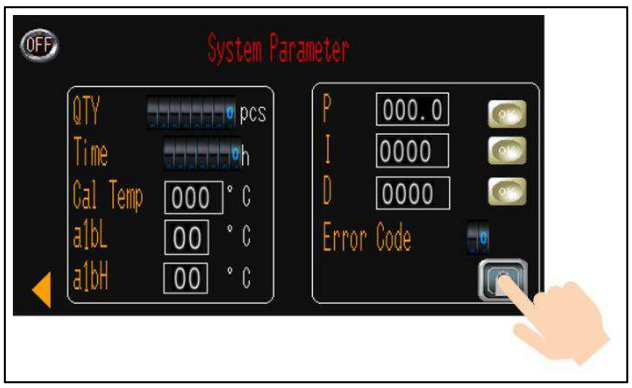
Figure 37

6. *Rotate Disc clockwise to push heater chamber forward to the Load position.*
7. *Remove the 2X lower heater mounting screws using allen key access through the holes which was found in step 5. Now Lower heating element can be removed.*
8. *Replacement is the reverse of the removal procedure.*

NOTE
Ensure wires to thermocouple connector plug are reconnected with the correct polarity. On replacement ensure that the earth lead is connected and cable ties are fitted. Calibration must then be carried out.

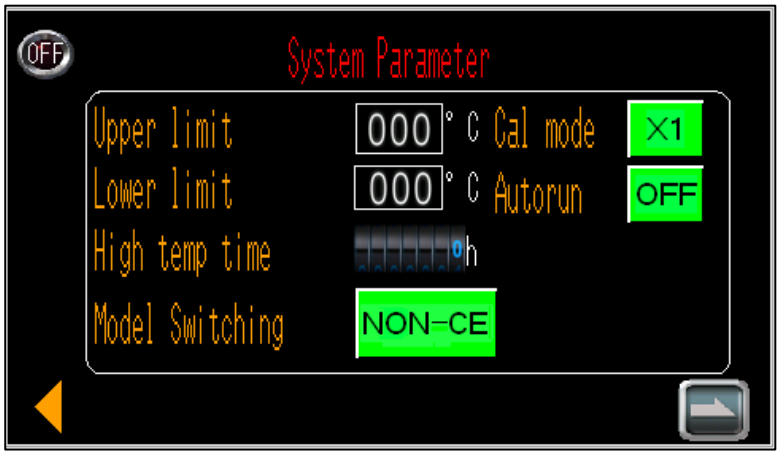
4.5.4 PLC or HMI replacement

CAUTION
It is important to do additional setting on HMI after replacing the new PLC or HMI.



Contact with TE to get the highest authority D, then access to SYSTEM PARAMETER interface, and click on NEXT page icon on bottom right to get the hidden page as below capture. Then set for item 4/5/6.

Figure 38



1. Upper Limit----DON'T edit
   The upper limit of processor operation temperature can be set, default value 550 ℃.

2. Lower Limit----DON'T edit
   The lower limit of processor operation temperature can be set, default value 200 ℃.

3. High temp time----CANNOT be edit
   Timer, recording processor operation time when the temperature exceeds 550 ℃.

4. Model switching
   Select the right type for your processor. Easy way to confirm which type your processor, CE version processor use white start buttons, NON-CE version processor use green start buttons.

   - *It would show **PROBE INSTANTANEOUS TEMPERATURE,** the moment when calibration cycle complete.*

   ----X1 calibration type. Factory default setting.

   - *It would show **PROBE PEAK TEMPERATURE** after calibration cycle completed.*

   ---- MK3 calibration type. Please contact with TE if need to shift to MK3 calibration type.

5. Cal mode
   The calibration mode of the processor, default setting is X1.
   In case of old MK3 user, they can shift it to MK3 calibration mode, to use the same heating parameter.

6. Autorun
   Default setting OFF.
   It is customized Autorun function, ONLY available on customized machine 1-2234800-1.

4.6 OPTIONAL ACCESSORIES

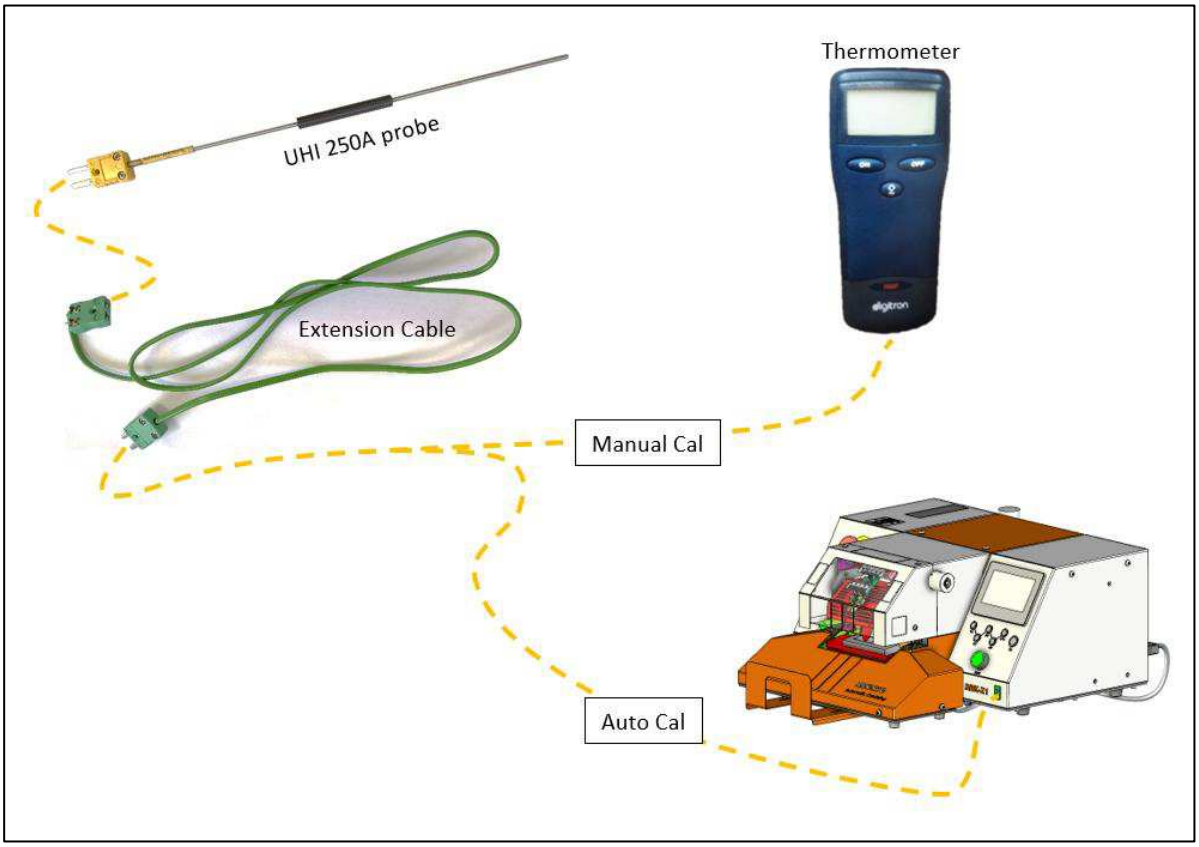
Below option components were not included in standard processor. Customers need to purchase from TE separately IF NEED. **Please consult with product manager for PN on TBD item.**

4.6.1 Calibration tools

Table 7

7-1192190-9	***UHI 250A probe (Order NO: 288869-000)***
9-2375314-6	***Extension cable***
9-2375314-7	***Thermometer***

Figure 39



4.6.2 Power Cord & Transformer

Table 8

2234780-1	***Power Cord, EU (Packed in CE version processor)***	***Processor use in European***
2234780-2	***Power Cord, CN (Packed in NON-CE version processor)***	***Processor use in China***
2234986-1	***Transformer, 110V INPUT/220V OUTPUT***	***Processor use in US/Japan***

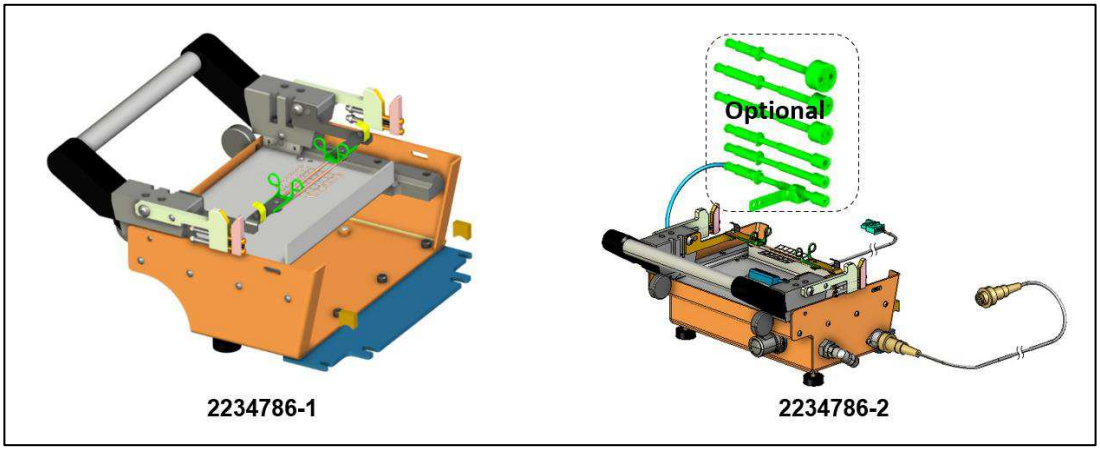
Figure 40

4.6.3 RBK Fixture

Table 9

2234786-1	***RBK fixture***
2234786-2	***RBK fixture, with air-cooling kit***

Figure 41



NOTE
More detail on RBK fixture, refer to Instruction Sheet 408-35188.

4.6.4 Air Cooled Stub splice fixture

Table 10

981721-000	***Air Cooled stub splice fixture (TE PN: 1-1197585-9)***
1-529533-7	***Air-cooling kit (air flow controller)***

Figure 42

4.6.5 Other accessories

Table 11

2234781-1	***Barcode Scanner***
2369598-1	***USB Flash, 16 GB***
2234787-2	***RS232 connection cable, ultrasonic with adapter (NON-CE)***
2234787-3	***RS232 connection cable, ultrasonic, with adapter (CE)***

NOTE
Ultrasonic RS232 connection cable 2234787-1 cannot used on RBK-X1C directly. Without connecting with an adapter, it has risk cause short cut issue to Centering Device.

4.6.6 MES Customized

Table 12

TBD	***hardware***
TBD	***Software***

5 Specification

Table 13

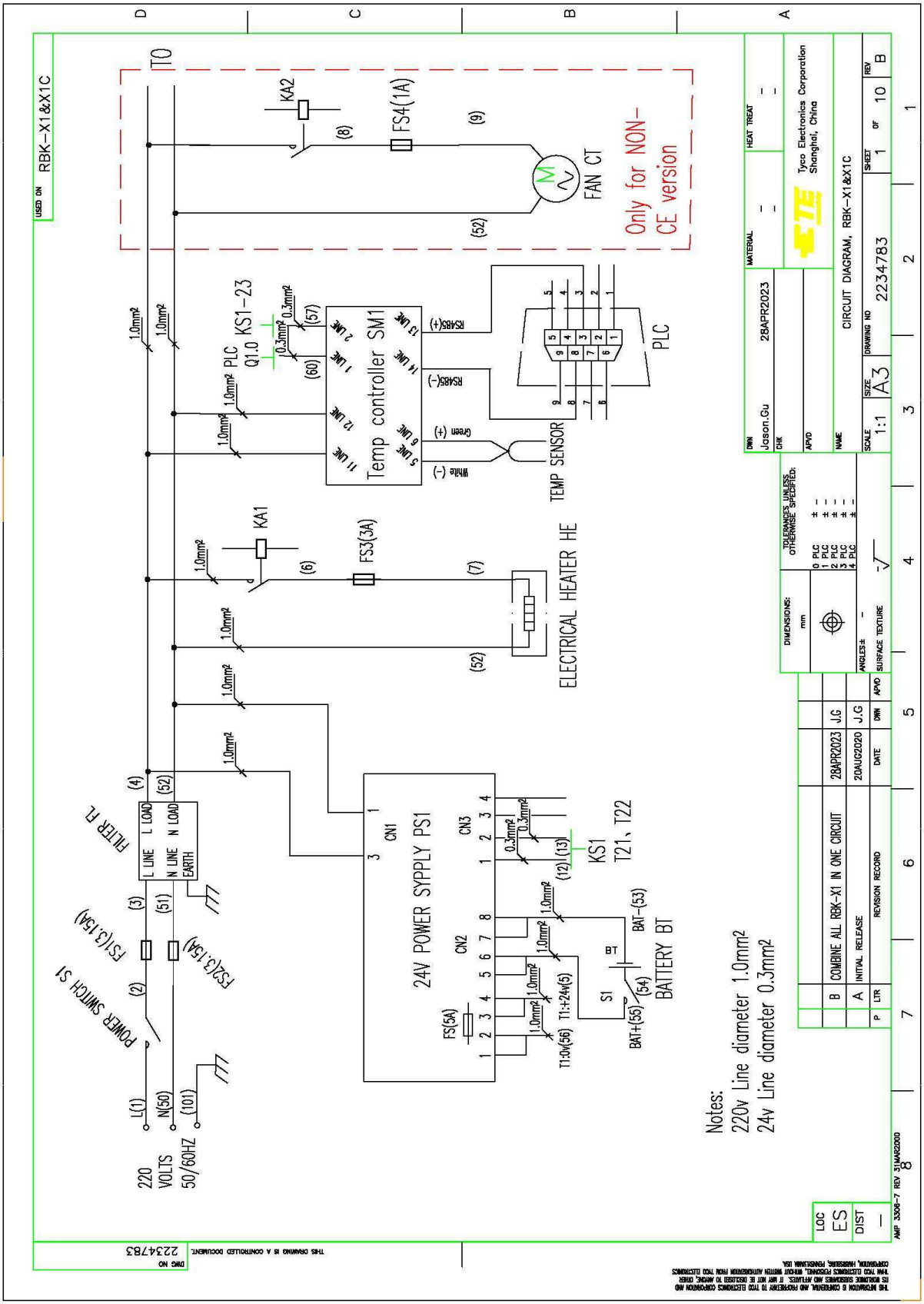
Model Designation	***RBK-X1***	***RBK-X1C***
Electrical Supply	***230V(+/-10%) - 50 Hz(+/-1Hz)*** *(Can connect to 110V via optional transformer 2234986-1)*	
Pressure air Supply	***N/A (4~6 bar, for A/C version)***	***4~6 bar***
Power Consumption	***3 A (Maximum)***	
Operating Temperature Range	***200ºC to 550ºC Maximum*** ***(Acc. ± 1ºC of set temperature)*** ***500ºC Recommended***	
Typical Processor Cycle Times for ILS-125 ***Products used on typical range of automotive splices.*** ***QSZH product installs faster than the ILS-125 Product***	***Range 0.1 to 99.9 seconds*** ***Typically 2-34 seconds, depending on wire size and number of wires used.***	
Mains Fuses	***2 x 230V - 3.15A T (anti-surge) Line and Neutral***	
Product Range	***RBK-ILS-125/QSZH Sizes 1 to 3A RBK-ILS-85 Sizes 6/1 to 12/3*** ***(For other Raychem/TE Products*** ***Discuss with TE Product Management)***	
Dimensions ***(Width x Depth x Height)***	***500 x 420 x 233 mm***	***500 x 607 x 233 mm***
Weight ***(It is FORBIDDEN to move processor by hands all alone, that would get injured)***	***24 kg***	***32 kg***
Noise	***80dB Maximum (Cyclic, 1m from processor)***	
Power Failure Protection	***UPS activated 'Electronic Spring' Technology (Allows Heater Chamber to be retracted automatically)***	
RS232 Interface	***Permits transfer of Time, temperature and Product code from isolated STD. 1KV remote device.***	
Ambient Operating Environment	***Temperature:*** 5 to 40°C ***Relative humidity***: 50%~90%	
Altitude	***<1000m***	
Transportation and storage Temperature	***-25-55°C***	
Transportation	***Transport processor with processor top to up. Avoid shaking.***	

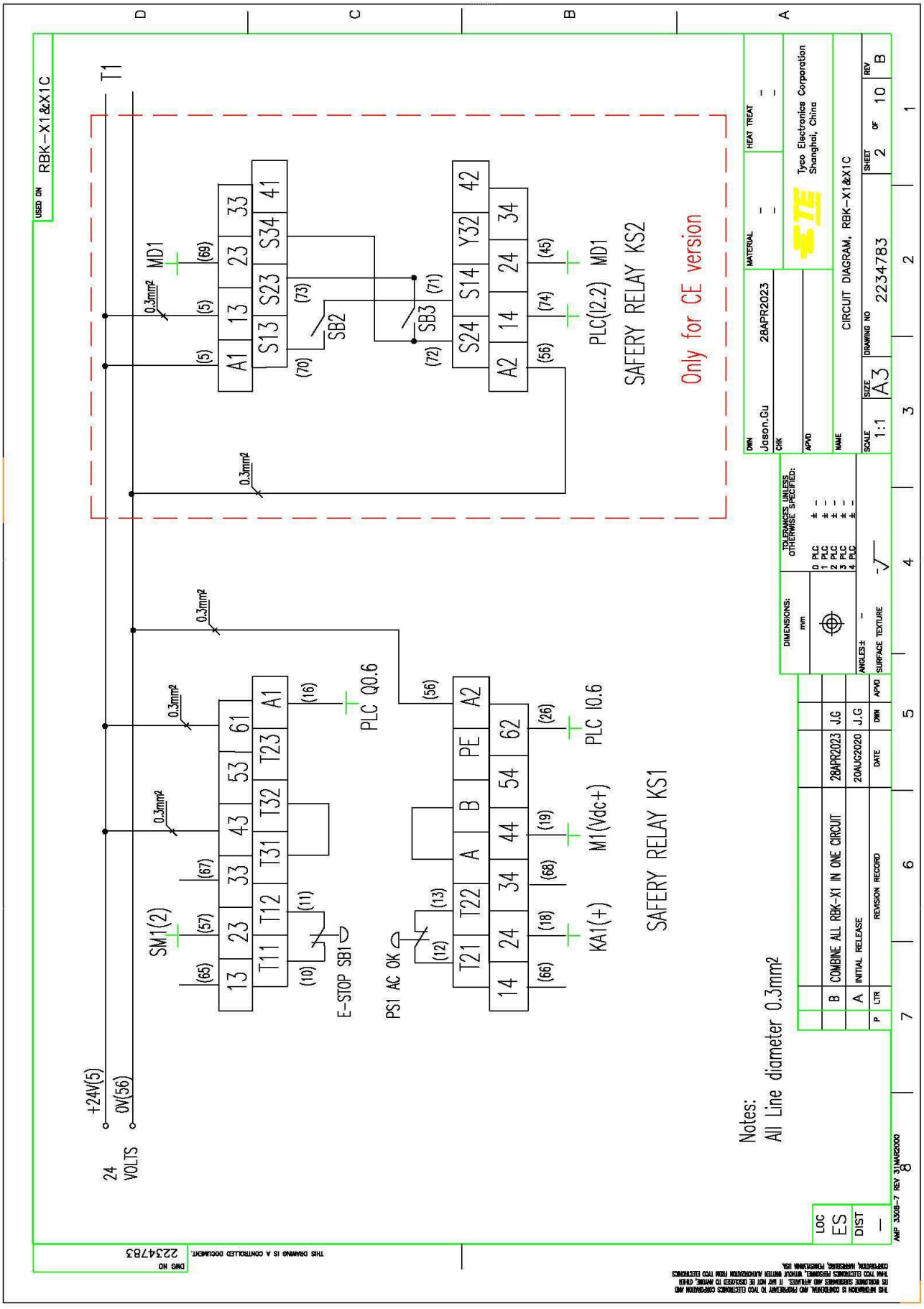
6 Schematic Diagram.

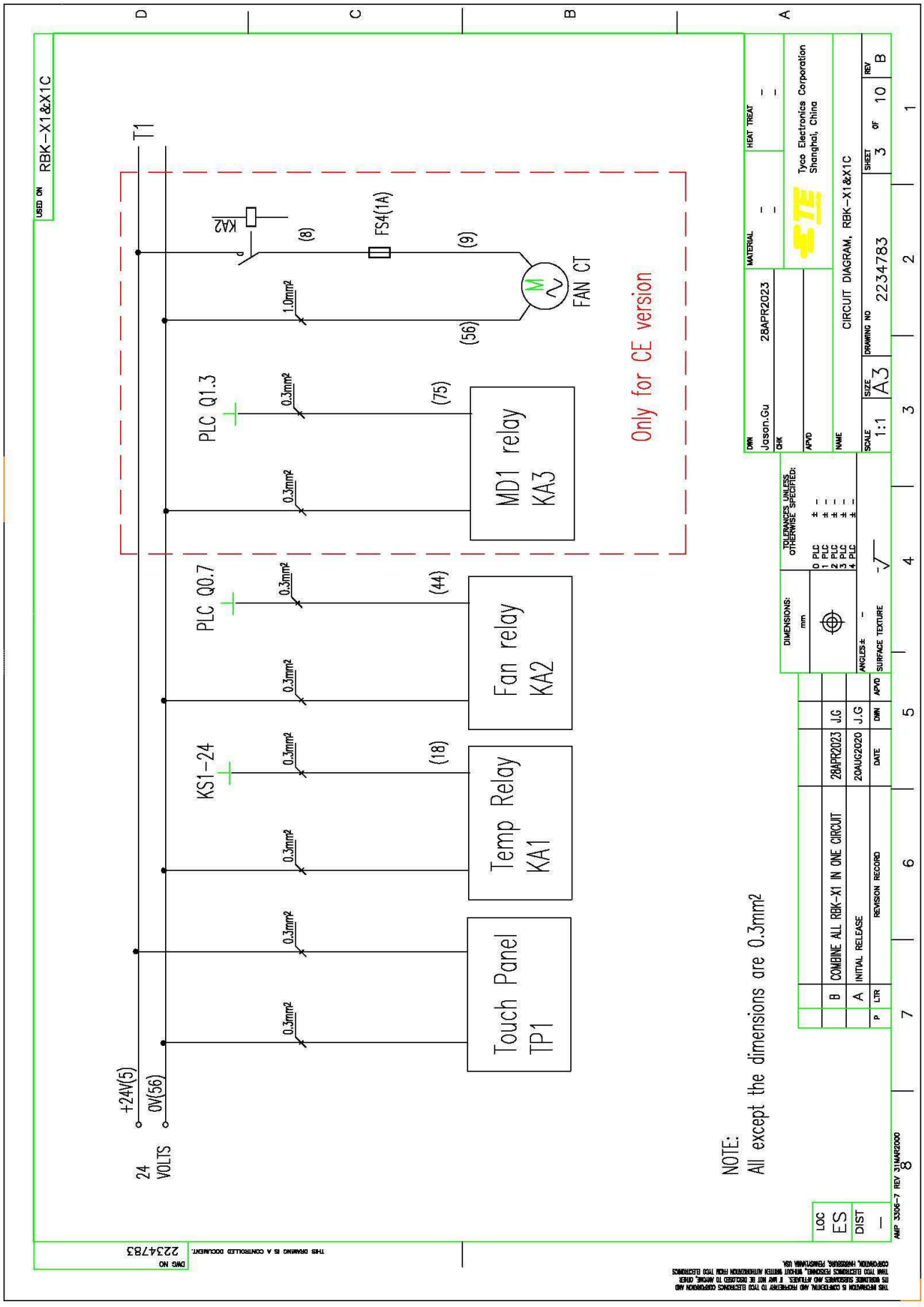
NOTE

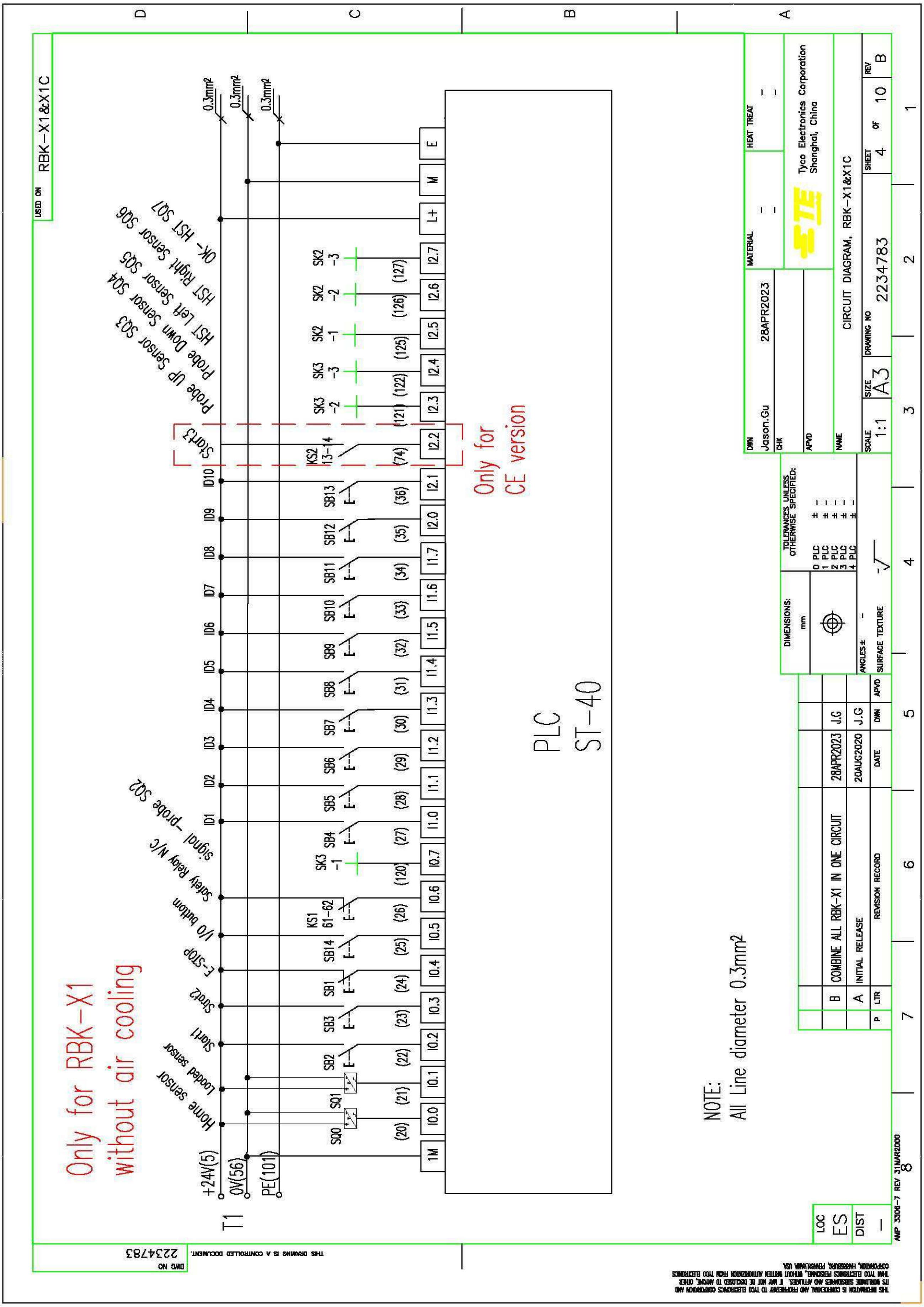
Check on Figure 1, for different kind of version machine. (CE, NON-CE, W/ A/C, W/O A/C, W/ CD, W/O CD)

Figure 43




USED ON RBK-X1&X1C
T1
+24V(5)
0V(56)
24 VOLTS
SM1(2)
E-STOP SB1
PS1 AC OK
SAFERY RELAY KS1
KA1(+)
M1(Vdc+)
PLC Q0.6
PLC I0.6
MD1
SB2
SB3
SAFERY RELAY KS2
PLC(I2.2) MD1
Only for CE version
0.3mm²
Notes:
All Line diameter 0.3mm2
CIRCUIT DIAGRAM, RBK-X1&X1C
Tyco Electronics Corporation
Shanghai, China
DRAWING NO 2234783
SIZE A3
SCALE 1:1
SHEET 2 OF 10
REV B
28APR2023
Jason.Gu
COMBINE ALL RBK-X1 IN ONE CIRCUIT
INITIAL RELEASE
REVISION RECORD
THIS DRAWING IS A CONTROLLED DOCUMENT.
DWG NO 2234783


USED ON
RBK-X1&X1C
T1
KA2
(8)
FS4(1A)
(9)
1.0mm²
(56)
FAN CT
PLC Q1.3
0.3mm²
(75)
MD1 relay
KA3
Only for CE version
PLC Q0.7
(44)
Fan relay
KA2
KS1-24
(18)
Temp Relay
KA1
Touch Panel
TP1
+24V(5)
0V(56)
24
VOLTS
NOTE:
All except the dimensions are 0.3mm2
COMBINE ALL RBK-X1 IN ONE CIRCUIT
INITIAL RELEASE
REVISION RECORD
28APR2023
20AUG2020
CIRCUIT DIAGRAM, RBK-X1&X1C
2234783
Tyco Electronics Corporation
Shanghai, China
28APR2023
Jason.Gu
SIZE A3
SCALE 1:1
SHEET 3 OF 10
REV B


RBK-X1&X1C
USED ON
Only for RBK-X1
without air cooling
Only for
CE version
PLC
ST-40
NOTE:
All Line diameter 0.3mm2
T1
+24V(5)
0V(56)
PE(101)
0.3mm²
Home Sensor
Loaded sensor
Start1
Start2
E-STOP
I/O button
Safety Relay N/C
Signal -Probe SQ2
Probe Up Sensor SQ3
Probe Down Sensor SQ4
HST Left Sensor SQ5
HST Right Sensor SQ6
OK - HST SQ7
Start3
ID1
ID2
ID3
ID4
ID5
ID6
ID7
ID8
ID9
ID10
SQ0
SQ1
SB2
SB3
SB1
SB14
KS1 61-62
SK3 -1
SB4
SB5
SB6
SB7
SB8
SB9
SB10
SB11
SB12
SB13
KS2 13-14
SK3 -2
SK3 -3
SK2 -1
SK2 -2
SK2 -3
1M
I0.0
I0.1
I0.2
I0.3
I0.4
I0.5
I0.6
I0.7
I1.0
I1.1
I1.2
I1.3
I1.4
I1.5
I1.6
I1.7
I2.0
I2.1
I2.2
I2.3
I2.4
I2.5
I2.6
I2.7
L+
M
E
DWN Jason.Gu 28APR2023
CHK
APVD
MATERIAL
HEAT TREAT
Tyco Electronics Corporation Shanghai, China
NAME CIRCUIT DIAGRAM, RBK-X1&X1C
SCALE 1:1
SIZE A3
DRAWING NO 2234783
SHEET 4 OF 10
REV B
DIMENSIONS: mm
TOLERANCES UNLESS OTHERWISE SPECIFIED:
ANGLES ±
SURFACE TEXTURE
B COMBINE ALL RBK-X1 IN ONE CIRCUIT 28APR2023 J.G
A INITIAL RELEASE 20AUG2020 J.G
LTR REVISION RECORD DATE DWN APVD
LOC ES
DIST
AMP 3306-7 REV 31MAR2000
DWG NO 2234783
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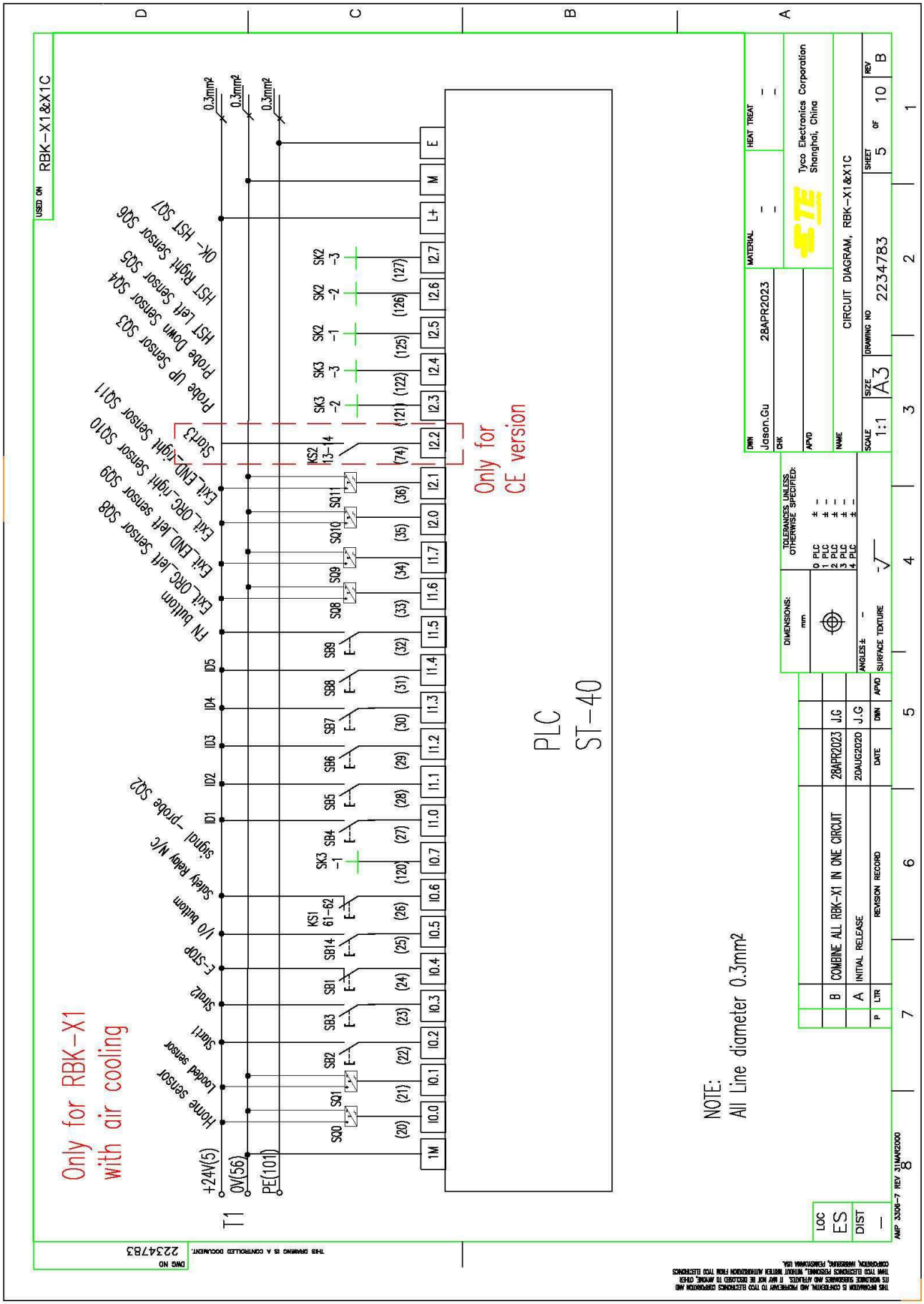
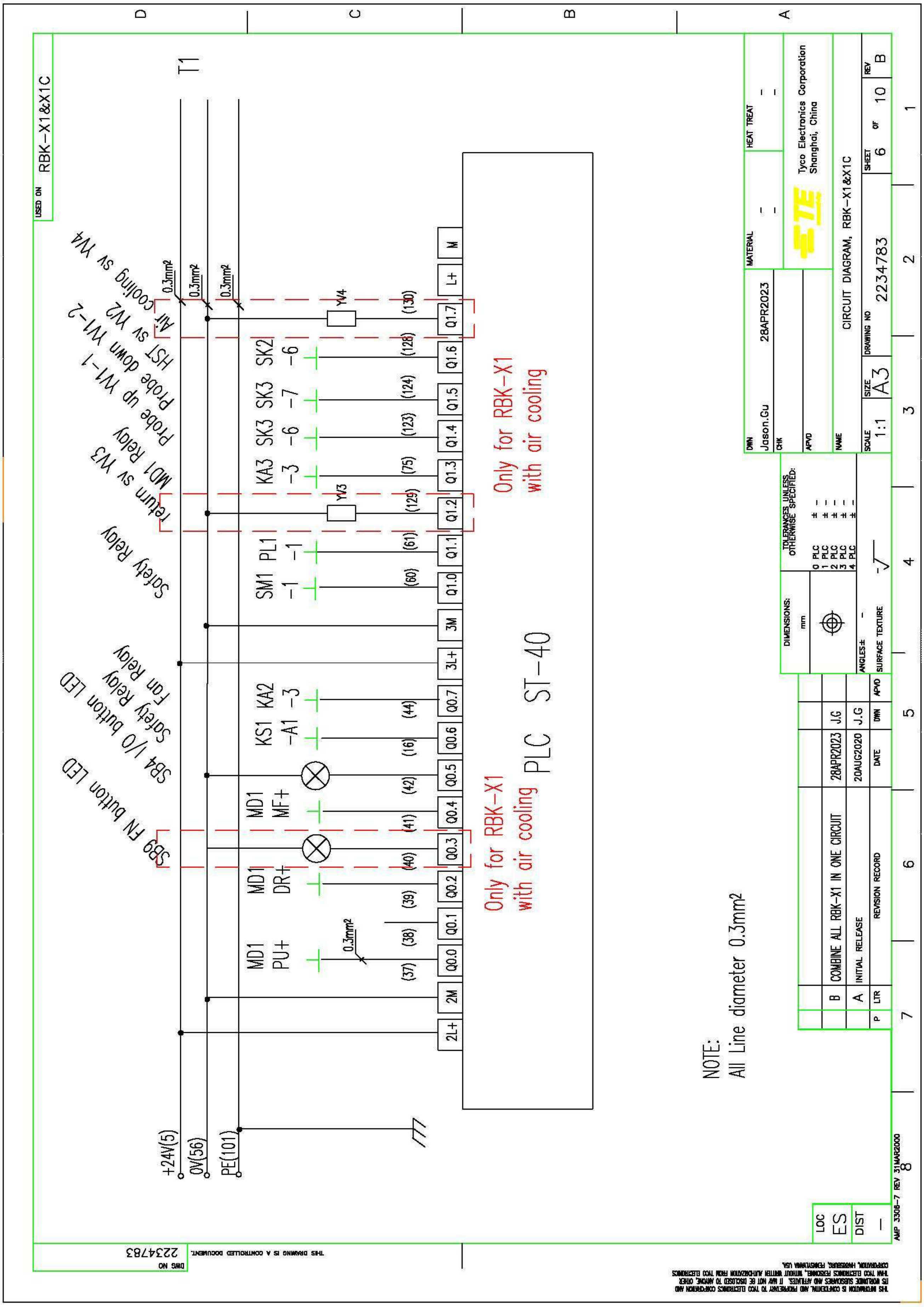
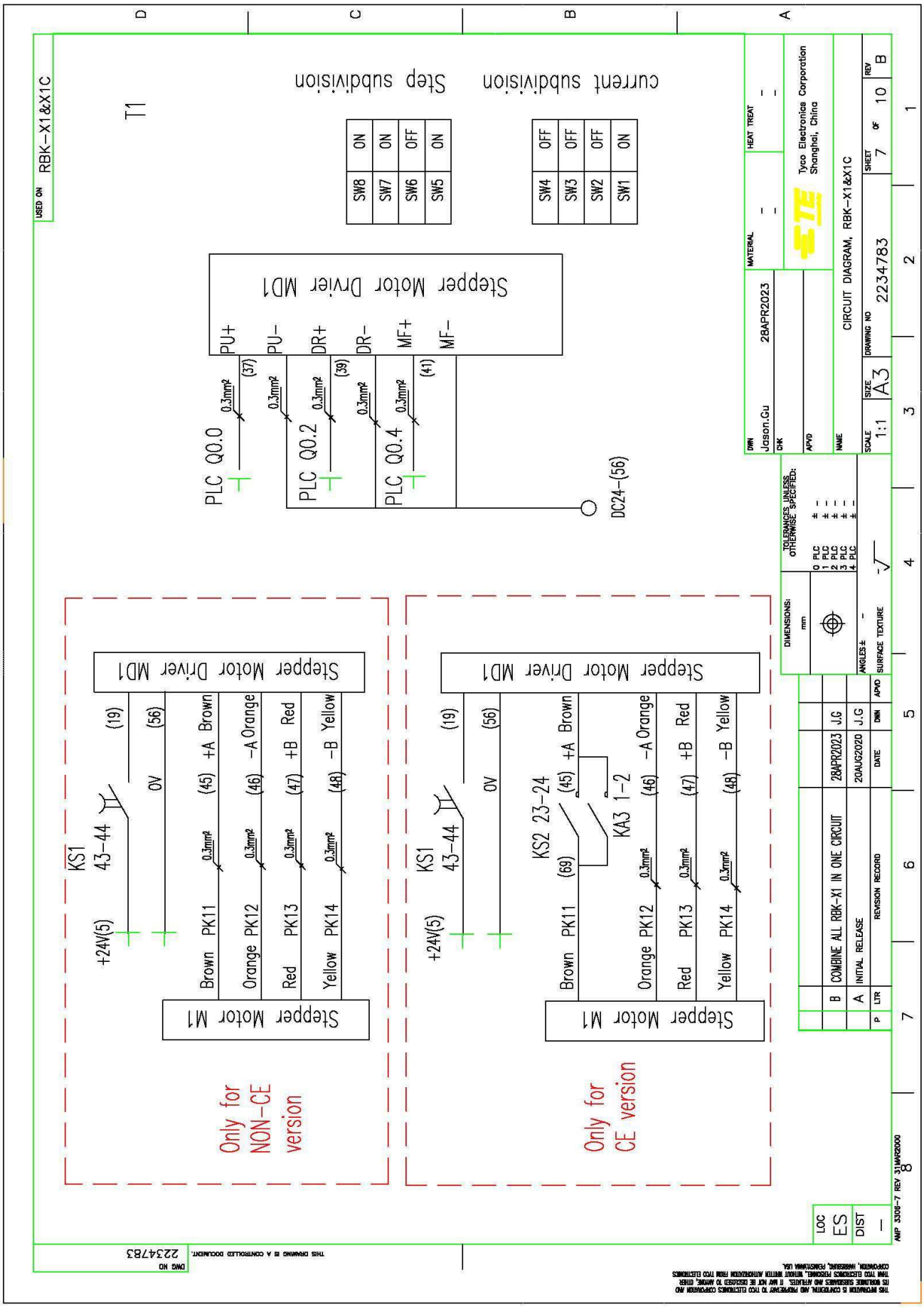
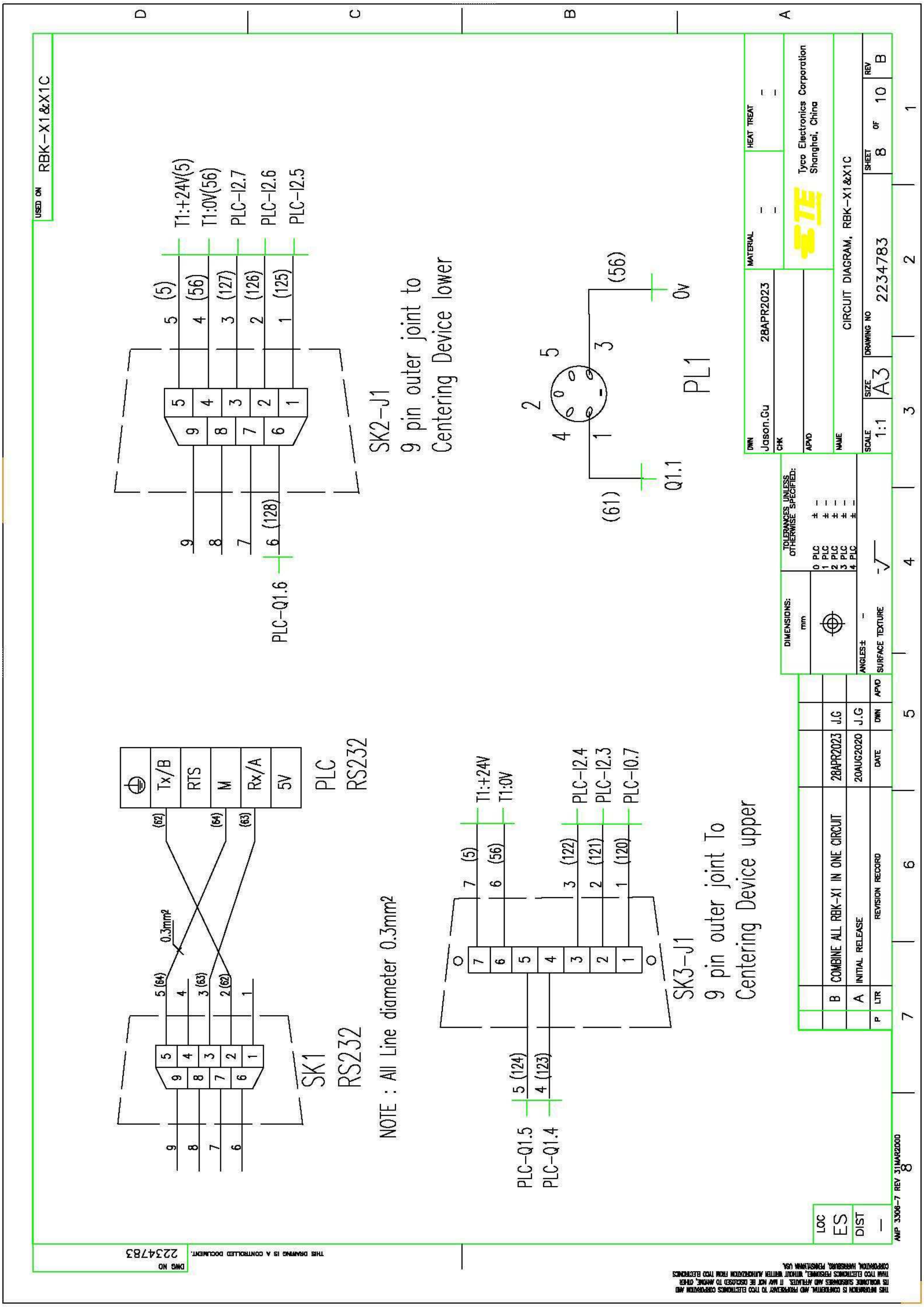
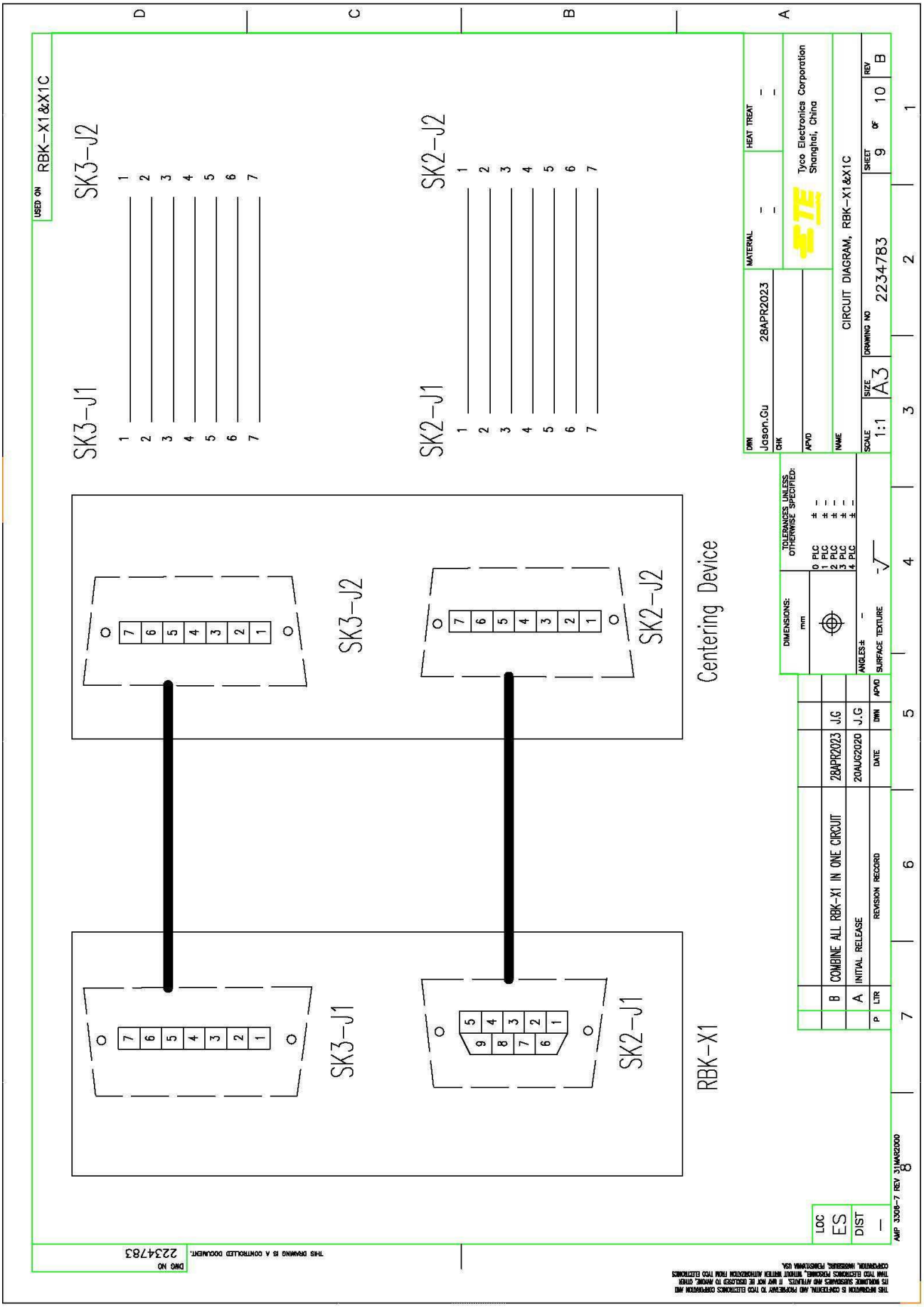

RBK-X1&X1C
Only for RBK-X1 with air cooling
Only for CE version
PLC
ST-40
T1
+24V(5)
0V(56)
PE(101)
Home sensor
Loaded sensor
Start1
Start2
E-STOP
I/O button
Safety Ready N/C
signal -probe SQ2
FN button
Exit_ORG_left sensor SQ8
Exit_END_left sensor SQ9
Exit_ORG_right sensor SQ10
Exit_END_right sensor SQ11
Start3
Probe Up Sensor SQ3
Probe Down Sensor SQ4
HST left Sensor SQ5
HST Right Sensor SQ6
OK- HST SQ7
0.3mm²
NOTE:
All Line diameter 0.3mm²
COMBINE ALL RBK-X1 IN ONE CIRCUIT
INITIAL RELEASE
REVISION RECORD
CIRCUIT DIAGRAM, RBK-X1&X1C
Tyco Electronics Corporation
Shanghai, China
2234783
28APR2023
2DAUG2020
Jason.Gu

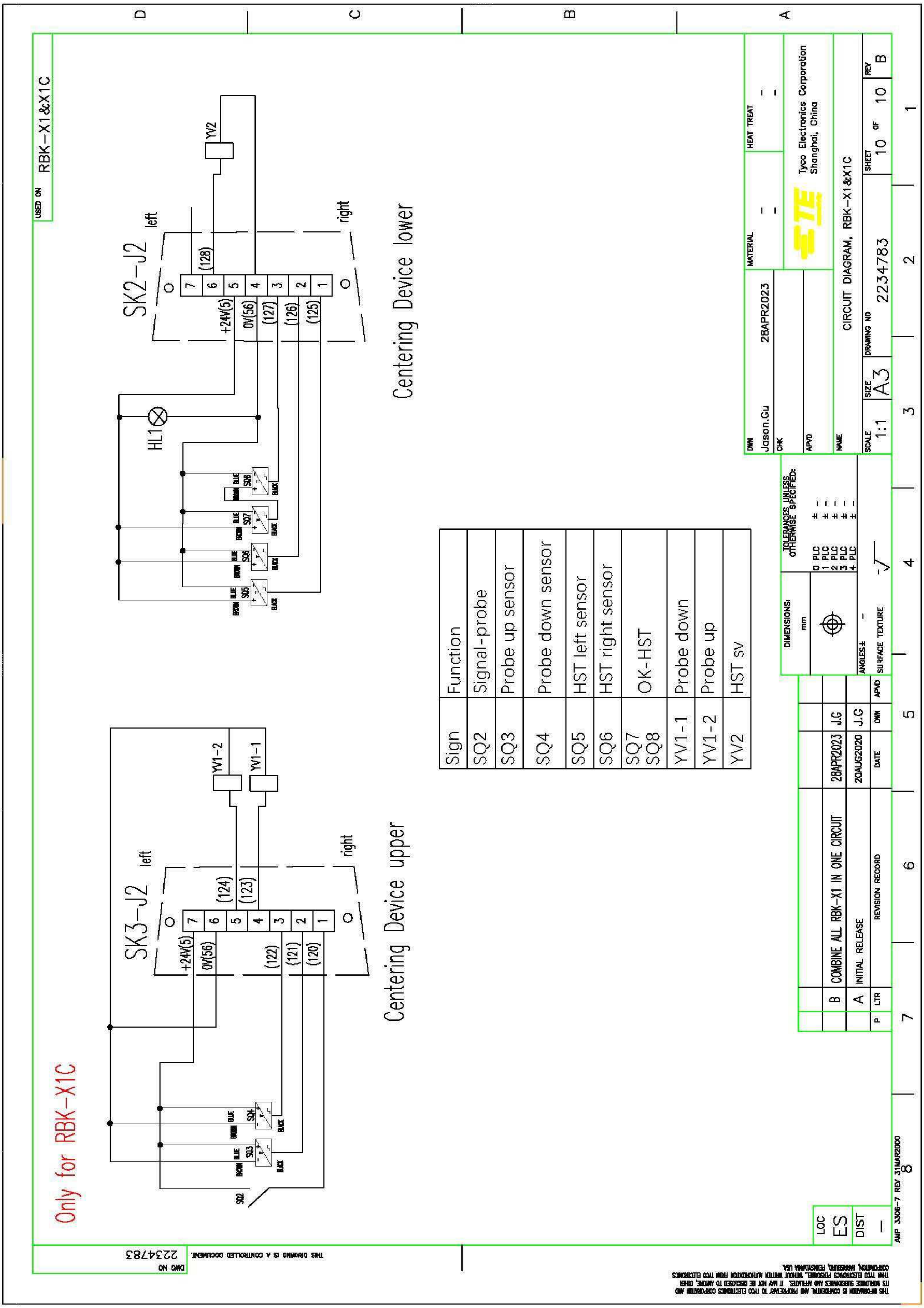

RBK-X1&X1C
T1
+24V(5)
0V(56)
PE(101)
Air cooling sv YV4
HST sv YV2
Probe down YV1-2
Probe up YV1-1
MD1 Relay
return sv YV3
Safety Relay
Fan Relay
Safety Relay
SB4 I/O button LED
SB9 FN button LED
SM1 -1
PL1 -1
KA3 -3
SK3 -6
SK3 -7
SK2 -6
KS1 -A1
KA2 -3
MD1 PU+
MD1 DR+
MD1 MF+
0.3mm²
2L+ 2M Q0.0 Q0.1 Q0.2 Q0.3 Q0.4 Q0.5 Q0.6 Q0.7 3L+ 3M Q1.0 Q1.1 Q1.2 Q1.3 Q1.4 Q1.5 Q1.6 Q1.7 L+ M
PLC ST-40
Only for RBK-X1 with air cooling
NOTE: All Line diameter 0.3mm²
CIRCUIT DIAGRAM, RBK-X1&X1C
Tyco Electronics Corporation Shanghai, China
DWN Jason.Gu 28APR2023
DRAWING NO 2234783
SIZE A3
SCALE 1:1
SHEET 6 OF 10
REV B
B COMBINE ALL RBK-X1 IN ONE CIRCUIT 28APR2023 J.G
A INITIAL RELEASE 20AUG2020 J.G
LOC ES
DIST -
THIS DRAWING IS A CONTROLLED DOCUMENT.


RBK-X1&X1C
T1
current subdivision
Step subdivision
SW1 ON
SW2 OFF
SW3 OFF
SW4 OFF
SW5 ON
SW6 OFF
SW7 ON
SW8 ON
Stepper Motor Driver MD1
PU+
PU-
DR+
DR-
MF+
MF-
PLC Q0.0
PLC Q0.2
PLC Q0.4
DC24-(56)
0.3mm²
(37)
(39)
(41)
Only for NON-CE version
Only for CE version
KS1
43-44
+24V(5)
0V
(19)
(56)
KS2 23-24
KA3 1-2
Brown PK11 (45) +A
Orange PK12 (46) -A
Red PK13 (47) +B
Yellow PK14 (48) -B
Stepper Motor M1
CIRCUIT DIAGRAM, RBK-X1&X1C
Tyco Electronics Corporation
Shanghai, China
DRAWING NO 2234783
SIZE A3
SCALE 1:1
SHEET 7 OF 10
REV B
Jason.Gu
28APR2023
COMBINE ALL RBK-X1 IN ONE CIRCUIT
INITIAL RELEASE
20AUG2020
28APR2023
THIS DRAWING IS A CONTROLLED DOCUMENT.
DWG NO 2234783



RBK-X1&X1C
T1:+24V(5)
T1:0V(56)
PLC-I2.7
PLC-I2.6
PLC-I2.5
PLC-Q1.6
SK2-J1
9 pin outer joint to
Centering Device lower
PL1
Q1.1
0v
PLC
RS232
Tx/B
RTS
M
Rx/A
5V
0.3mm2
SK1
RS232
NOTE : All Line diameter 0.3mm2
T1:+24V
T1:0V
PLC-I2.4
PLC-I2.3
PLC-I0.7
SK3-J1
9 pin outer joint To
Centering Device upper
PLC-Q1.5
PLC-Q1.4
B COMBINE ALL RBK-X1 IN ONE CIRCUIT 28APR2023 J.G
A INITIAL RELEASE 20AUG2020 J.G
Jason.Gu 28APR2023
Tyco Electronics Corporation
Shanghai, China
CIRCUIT DIAGRAM, RBK-X1&X1C
2234783
A3
1:1
SHEET 8 OF 10
REV B
THIS DRAWING IS A CONTROLLED DOCUMENT.
DWG NO 2234783

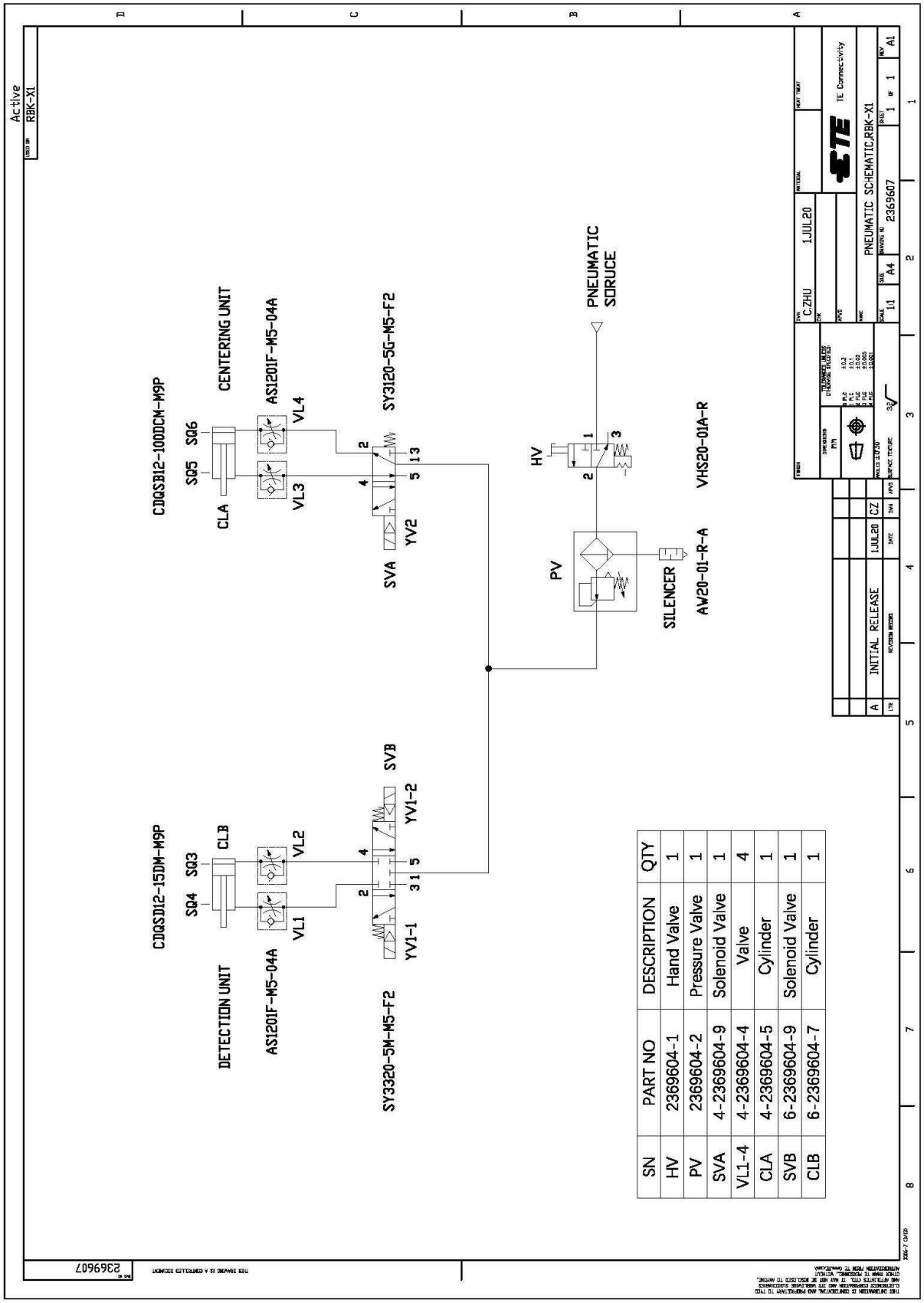

USED ON
RBK-X1&X1C
SK3-J2
SK3-J1
SK2-J2
SK2-J1
Centering Device
RBK-X1
CIRCUIT DIAGRAM, RBK-X1&X1C
Tyco Electronics Corporation
Shanghai, China
DRAWING NO
2234783
SIZE
A3
SCALE
1:1
SHEET
9 OF 10
REV
B
DWN
Jason.Gu
28APR2023
CHK
APVD
MATERIAL
HEAT TREAT
DIMENSIONS:
mm
TOLERANCES UNLESS OTHERWISE SPECIFIED:
0 PLC ± –
1 PLC ± –
2 PLC ± –
3 PLC ± –
4 PLC ±
ANGLES± –
SURFACE TEXTURE
B COMBINE ALL RBK-X1 IN ONE CIRCUIT 28APR2023 J.G
A INITIAL RELEASE 20AUG2020 J.G
P LTR REVISION RECORD DATE DWN APVD
LOC ES
DIST –
AMP 3308-7 REV 31MAR2000
THIS DRAWING IS A CONTROLLED DOCUMENT.
DWG NO 2234783



Sign	Function
SQ2	Signal-probe
SQ3	Probe up sensor
SQ4	Probe down sensor
SQ5	HST left sensor
SQ6	HST right sensor
SQ7 SQ8	OK-HST
YV1-1	Probe down
YV1-2	Probe up
YV2	HST sv

7 Pneumatic Diagram

Apply only on RBK-X1C



SN	PART NO	DESCRIPTION	QTY
HV	2369604-1	Hand Valve	1
PV	2369604-2	Pressure Valve	1
SVA	4-2369604-9	Solenoid Valve	1
VL1-4	4-2369604-4	Valve	4
CLA	4-2369604-5	Cylinder	1
SVB	6-2369604-9	Solenoid Valve	1
CLB	6-2369604-7	Cylinder	1

8 Replacement and repair

Stock and control a complete inventory to prevent lost time when replacement of parts is necessary. Parts other than those listed should be replaced by TE Connectivity to ensure quality and reliability. Order or return parts through your TE representative or go to TE.com and click the **Shop TE Store** link at the top of the page.

For field service, go to the Service and Repair page on the TE website, or send an e-mail to the address for your region in Table 14.

Figure 44: Service and repair

Table 14: Field service e-mail addresses

Region	Address
Asia	Tefe1ap@te.com
EMEA (including India)	Tefe1@te.com
North America	Fieldservicesnortharmerica@te.com
South America	FSE@te.com

9 RoHS information

Information on the presence and location of any substances subject to RoHS (Restriction on Hazardous Substances) can be found at the following website:

http://www.tycoelectronics.com/customersupport/rohssupportcenter/

Click on “Find Compliance Status” and enter equipment part number.

10 Declaration of conformity of CE

DECLARATION OF CONFORMITY

Tyco Electronics (Shanghai) Co., Ltd.
F/G/H Section, 1/F, Building 15, 999 Yinglun Road,
(Shanghai) Pilot Free Trade Zone, China

We declare that the machinery

RBK-X1 CE Heat shrink machine

Name, type or model

2234800-2, 1-2234800-4

Serial number or PN

on the basis of the design and construction of the version issued by us for circulation is in conformity with the essential Health and Safety requirements of the following EC directives. Any modification made to the machinery without our approval shall invalidate this declaration.

- *Machinery Directive 2006/42/EC (EN ISO 12100:2010, EN 60204-1:2018)*
- *EMC Directive 2014/30/EU (EN 55011:2016+A1, EN 61000-6-2:2005)*
- *RoHS 2 Directive 2011/65/EU*

The original English version is legally binding

Name of the authorized Person for documentation:

TE Connectivity Germany GmbH

Address of the authorized Person for documentation:

AMPèrestraße 12-14, D-64625 Bensheim

7/26/2022

Middletown Pa. 17057 USA Jon Hill, Product Safety Compliance Officer

Place and date of issue — Name, position and signature

EN

DECLARATION OF CONFORMITY

Tyco Electronics (Shanghai) Co., Ltd.
F/G/H Section, 1/F, Building 15, 999 Yinglun Road,
(Shanghai) Pilot Free Trade Zone, China

We declare that the machinery

RBK-X1C Heat shrink machine

Name, type or model

2376800-2, 1-2376800-4

Serial number or PN

on the basis of the design and construction of the version issued by us for circulation is in conformity with the essential Health and Safety requirements of the following EC directives. Any modification made to the machinery without our approval shall invalidate this declaration.

- *Machinery Directive 2006/42/EC (EN ISO 12100:2010, EN 60204-1:2018)*
- *EMC Directive 2014/30/EU (EN 55011:2016+A1, EN 61000-6-2:2005)*
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