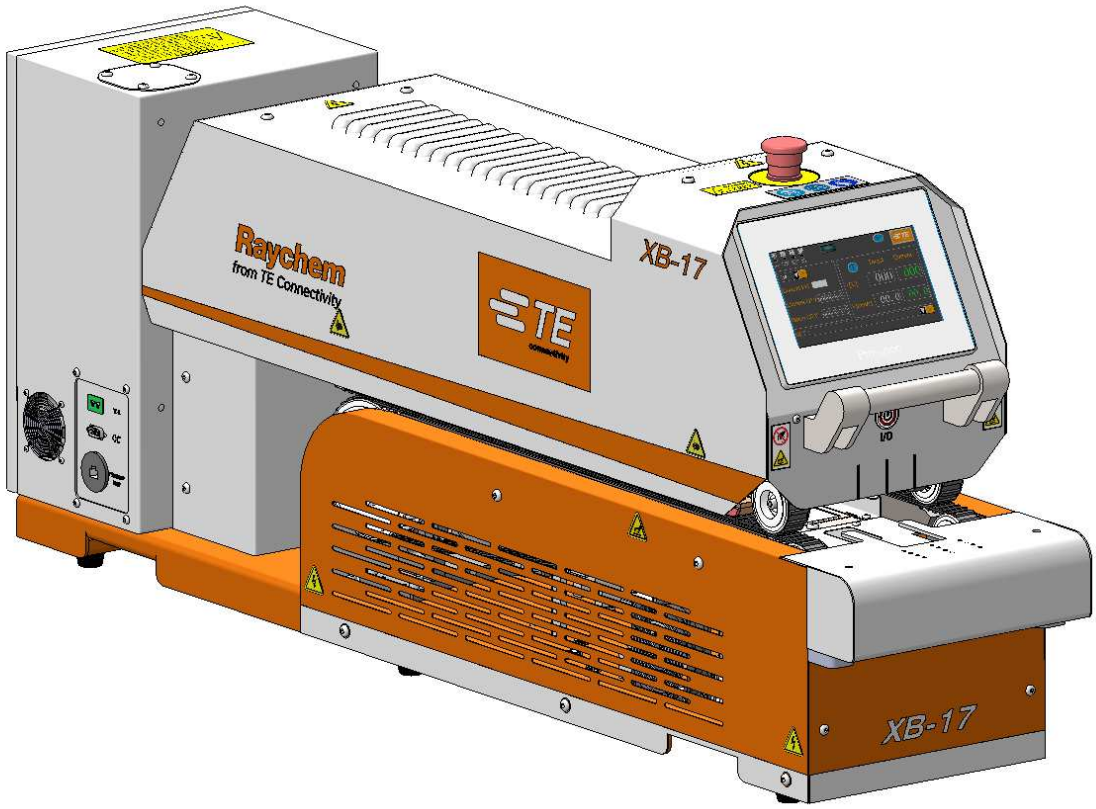

Customer Manual

XB Belt heater

----XB17 / XB19 / XB17C / XB19C

Operating manual No. *409-35023*
Language: *English*
Rev: *C4*

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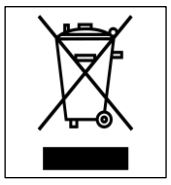
The original operating manual has been written in English.

Any other languages manual, scanning on below QR-code will bring you to te.com, then fill machine part number in search bar to find the machine and manual. (Find the machine part number from nameplate.)

Disposal:



This product must not be disposed of as municipal waste.

Amendment Record

Rev.	Content	Amended By	Date	Change Request No.
Rev. A	*Initial*	*Cham Zhu*	*Dec. 2020*	-
Rev. B	*Modify some description*	*Cham Zhu*	*Apr. 2021*	-
Rev. C	*Modify some description*	*Cham Zhu*	*Mar. 2023*	-
Rev. C1	*Modify some description*	*Cham Zhu*	*May. 2023*	-
Rev. C2	*Transmission Module EC to V2 type*	*Cham Zhu*	*Nov. 2023*	-
Rev. C3	*Modify some description*	*Cham Zhu*	*May. 2023*	-
Rev. C4	*Added Section 8.3.6*	*Bao, Bowen*	*April. 2025*	-

Table of Contents

1 Safety

In common with all electrical equipment, the XB belt heater must be used in accordance with established safe working practices.

Prior to using the equipment, carefully read the Installation and Operation (Section 3 & 4), together with the following safety warnings.

First Aid Instructions

In the event of injury from electrical shock or burns the victim should seek immediate medical assistance from qualified medical personal.

Fire and Shock Hazard

As with all electrical equipment, the XB17 / XB19 Belt heater must be set up and operated properly, according to the procedures detailed in this manual.

Carefully read and observe the instructions and warnings for setup, operation, maintenance, troubleshooting, and repair.

Cotton gloves are recommended for operating the machine and for uploading finished harnesses. Touching hot adhesives, hot splices, or heaters can cause burns. Prior to performing maintenance or repair, always turn OFF the I/O button, allow the machine to cool down, and then turn OFF the MAIN SWITCH and unplug the machine. Opening the electrical cabinet while the machine is powered may cause electrical shock.

Operate the machine with all covers and panels in place. If hands, hair, clothing, or any other foreign objects are caught by the machine's moving parts, you could get injured, and the machine could be damaged.

Always provide adequate ventilation and avoid overheating the product or components during processing. Charring or burning of the tubing or wire insulation will produce fumes that may cause eye, skin, nose, or throat irritation.

1.1 General Warnings

- ***Incorrect use of this machine may cause injury.***
- ***This machine 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 machine unattended during the process cycle.***
- ***Opening the machine cover while the machine is power ON may cause electrical shock. Always press the E-STOP button, turn OFF the Main Switch, and unplug the machine prior to any electrical maintenance or repair.***
- ***In case of excessive smoke, sparks, grinding noises, or any other signs of malfunction, press the emergency stop button, then open the top chamber and remove any assemblies that may be in the heating chamber. Contact maintenance personnel to investigate the cause of the emergency before restarting the machine.***
- ***Failure to follow the manufacturer's instructions may affect the machine 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.***
- ***Due to the machine can reach up to 600°C, do not operate the Equipment near flammable and combustible environment.***
- ***Do not disassemble the equipment without guide or permission from TE.***
- ***Ensure adequate ventilation around the cooling fan intake and output grills a minimum of 75mm clear space, when the equipment is in use.***

1.2 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.

- ***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. (20A)***
- ***Terminal customer should apply the power with overvoltage and undervoltage protection.***

1.3 Safety Label

Read the Customer Manual before operation.

Eye protection must be worn at all times when the tool is in use.

Care must be taken to ensure the warning description is completed understand and follow.

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

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

Special care must be taken when product or calibration probe ejection from the heating chamber.

Do not try to put hands in, it could cause crush.

If hands, hair, clothing, or any other foreign objects are caught by the machine's moving parts, press on emergency button on machine top, and catch and lift the handle to open top chamber to remove anything.

High Voltage. Should take care, avoiding personal injury from electrical hazard.

1.4 Preventing Damage to Machine

To prolong belt life, machine program to not allow setting the belt speed to less than 2.5mm/s. When the belt speed below 2.5mm/s will activate the drive fault alarm and initiate cool down mode.

For normal maintenance and repair, press the I/O button and allow the machine to cool before turning OFF the Main Switch. When the machine cools and the belts and fans stop running, turn OFF the Main Switch and unplug the machine. Do not attempt to bypass turn OFF the Main Switch.

NOTE
XB Belt Heater working temperature is 600 ºC max. Do not set the temperature above 600 ºC.
That will cause heat damage to the components of the machine and shorten the life of the heaters.

Do not cover the fan louvers. Covering the louvers by setting objects on or next to them may cause uneven heating or overheating of components.

An exposed thermocouple wire due to abrasion of the insulation will cause an over temperature condition that can destroy components of the machine and cause inconsistent processing of assemblies. When replacing the covers, ensure that no wires get trapped between the cover and the frame.

Tight belts put excessive side loading on the bearings and can cause premature bearing wear and uneven belt stretch. To adjust the tension in the belts, follow the steps out lined in Section 6.3, Belt Tension Adjustment.

Emergency Stop: In case of excessive smoke, sparks, grinding noises, or any other signs of malfunction, press the emergency stop button. Then open the top chamber and immediately remove any assemblies that may be in the heating chamber. Contact maintenance personnel to investigate the cause of the problem before restarting the machine.

NOTE
Such malfunctions are the only reasons to press the emergency stop button while the belts and fans are still running. DO NOT use this as the normal shutdown procedure because it will defeat the cool-down circuit. And that would reduce the life of Machine.

1.5 Servicing Safety

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 Description

This manual applies to:

- **XB17 Belt heater, STD (TE PN: 2375310-1)**
  ----XB17 Standard machine
- **XB17 Belt heater, 110V (TE PN: 2375310-2)**
  ----XB17 110V heater version
- **XB19 Belt heater, STD (TE PN: 2375320-1)**
  ----XB19 Standard machine
- **XB19 Belt heater, 6” version (TE PN: 2375320-2)**
  ----XB19 wider heater version.
- **XB17C Belt heater (TE PN: 2381120-1)**
  ----XB17 Standard machine with Centering Device
- **XB19C Belt heater (TE PN: 2381130-1)**
  ----XB19 Standard machine with Centering Device

NOTE
Part Number of XB17C (PN: 2381120-1) and XB19C (PN: 2381130-1) is not sellable. Customer can purchase optional Centering Device (PN: 2375330-1) separately and install it onto XB17 or XB19, then convert to XB17C or XB19C.

XB19 Standard version (TE PN: 2375320-1) can be converted to Wide version (TE PN: 2375320-2), with heater width changed up to 150mm and some other reference parts to be replaced. 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.

2.1 General Information

The XB belt heater is a low-maintenance, high-production heater that recovers Raychem heat-shrinkable tubing onto wire harness assemblies or other suitable substrates. End terminations and ring terminals can be processed with customized tooling.

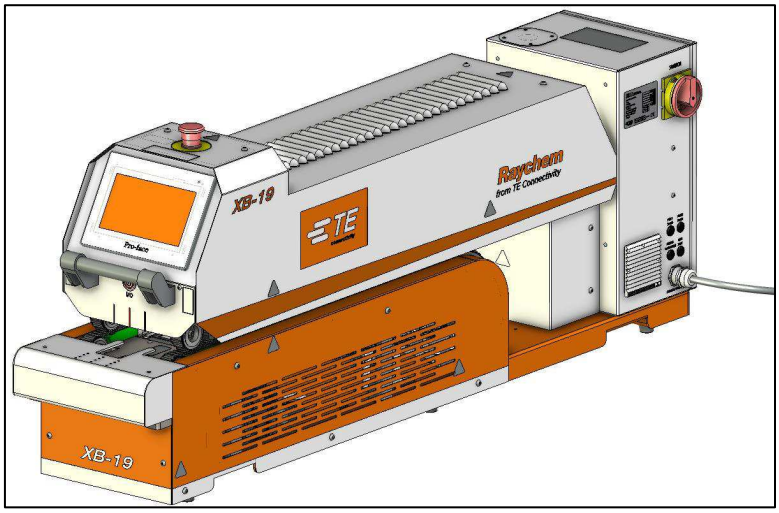


Figure 1: General View

NOTE

Users should independently evaluate the suitability of this equipment for satisfactorily installing tubing to meet their requirements. It is also the users' responsibility to maintain and adjust the equipment, monitor the process, and inspect the installed product to ensure that process requirements are met on an ongoing basis.

Throughout the manual photographs refer to the standard version of the XB19 belt heater. And may not accurately reflect the other version. However, where possible supplemental photographs have been added. If additional information is required contact TE.

On the standard XB belt heater, assemblies are continuously loaded at one end between two sets of double-sided timing belts. These timing belts grip and carry the assemblies through a heating zone, cooling zone, and then deposit them into a collection bin located at the end of the drive belts, where the assemblies can be removed individually or in batches, with virtually no process time delay. Allowing for a few seconds of cool down, the assemblies can be removed almost as quickly as they are fed in. Process speed control and heater temperature set point are both closed loop systems and can be controlled within a wide range of time and temperature combinations as needed for specific applications. See section 4.2 for more detail.

The XB belt heater is a tabletop machine that can run continuously with only interim routine maintenance and cleaning.

For assistance, contact your local TE representative.

To achieve proper machine cooling after use, after the I/O push-button is pressed heaters will power off and the fans and belts continue running for approximately 20 minutes. When 20 minutes time up, the fans and belts stop automatically. This cool down cycle prevents heat damage to the belts, belt guides, and other components.

The XB belt heater has several safety features and self-diagnostic circuitry designed to protect the operator, machine, and product. If any one of the alarms is activated, a warning light located on the front control panel will illuminate, power to the heaters will shut off, and the timing belts will move forward (lockout gate will rise, if optional lockout gate is chosen) preventing feeding assemblies and the unit will enter cool down mode.

Once the fault is cleared, press and hold the I/O button for 5 second to start the device. Heating parameter (timing belt speed & heaters temperature) will resume previous setting. When temperature reach setting range, timing belt will move backward (lockout gate will fail, if lockout gate is chosen), then machine is ready for cycle.

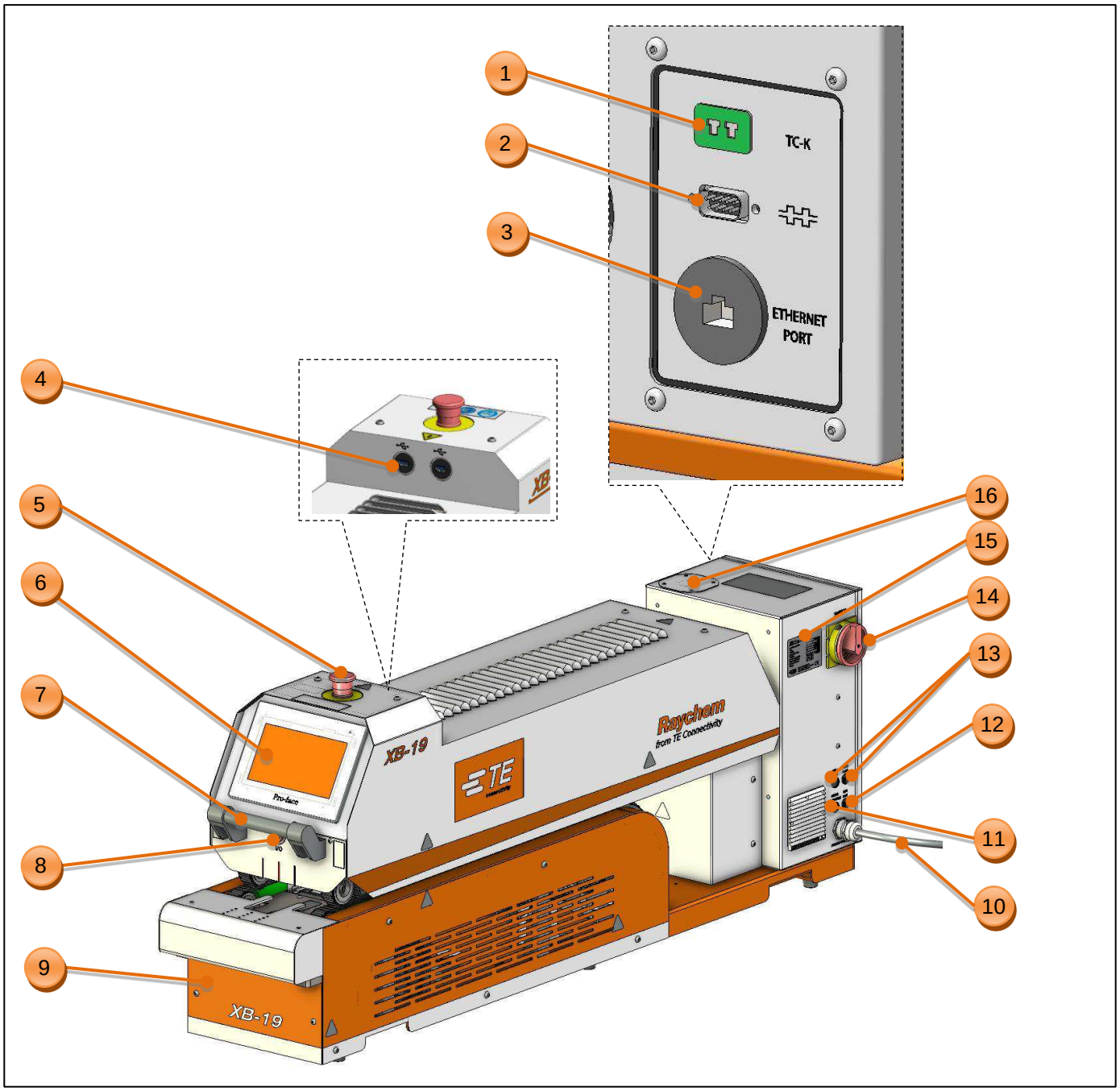


Figure 2: Operation and Interface (XB17 & XB19)

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

2. Remote interface
   (RS 232 connector, originally designed to connect to external device, Refer to section 5.7)

3. Ethernet Port
   (Connect with PC, to upgrade program to PLC and Touch Panel. If no PC available, operator can also upgrade PLC by micro-SD card insert to PLC module in electrical cabinet, upgrade Touch Panel via item 4 USB port.)

4. USB Port
   (XB belt heater have 2X USB port. Allow to upgrade Touch Panel locally vis these 2X USB port, or connect with barcode scanner, or for data collection.)

5. Emergency Stop
   (Cuts power to machine in Emergency)

6. Touch Panel
   (Display machine working information. Can edit machine parameter after login on.)

7. Lift Handle
   (Catch the handle to lift the top chamber to remove splice in Emergency or when doing maintenance.)

8. I/O Button
   (Press and hold for 5 second to activate or inactivate heater power.
   Off--standby, Flash—warm up, Lit—temperature reach set value)

9. CD cover
   (Remove this cover to show the connection interface with Centering Device.)

10. Power Inlet (Power supply)
    - *XB17 2375310-1, 230V AC*
    - *XB17 2375310-2, 115V AC*
    - *XB19 2375320-1, 230V AC*
    - *XB19 2375320-2, 230V AC*

11. Heater Fuse (FS3)
    - *XB17 2375310-1, 1X 230V, 12A anti-surg*
    - *XB17 2375310-2, 1X 115V, 20A anti-surg*
    - *XB19 2375320-1, 1X 230V, 20A anti-surg*
    - *XB19 2375320-2, 1X 230V, 20A anti-surg*

12. Fan Fuse (FS4)
    (24V DC, 2A anti-surge)

13. Main Power Fuse (FS1 & FS2)
    - *XB17 2375310-1, 2X 230V, 15A anti-surg*
    - *XB17 2375310-2, 2X 115V, 20A anti-surg*
    - *XB19 2375320-1, 2X 230V, 20A anti-surg*
    - *XB19 2375320-2, 2X 230V, 20A anti-surg*

14. Main Switch
    (Used to isolate external power)

15. Nameplate

16. Light tower hole
    (A reserved hole to mount optional light tower if need.)

2.2 XB17 / XB19 Specification

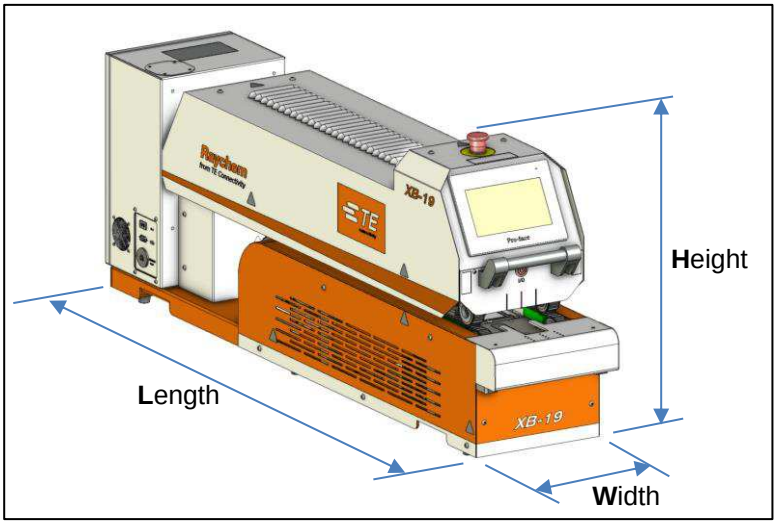


Figure 3: Belt Heater (XB17 & XB19)

Table 1: General Machine Parameters (Machine)

Model Designation	XB-17		XB-19	
	TE PN: 2375310-1 220V version	**TE PN: 2375310-2** 110V version	**TE PN: 2375320-1** 3.75" version	**TE PN: 2375320-2** 6" version
Power supply	230 (+/-10%) V AC 50/60 (+/-1) Hz	115 (+/-10%) V AC 50/60 (+/-1) Hz	230 (+/-10%) V AC 50/60 (+/-1) Hz	230 (+/-10%) V AC 50/60 (+/-1) Hz
Air supply	N/A			
Heater *(upper & lower)*	**W** 100 x **L** 250 (mm) 1000 Watt each	**W** 100 x **L** 250 (mm) 1000 Watt each	**W** 95 x **L** 360 (mm) 1580 Watt each	**W** 150 x **L** 360 (mm) 1660 Watt each
Machine size	**W** 260 x **L**1210 x **H** 510 (mm)		**W** 260 x **L**1340 x **H** 550 (mm)	
Max. Tubing Size	19 Dia x 90 L (mm)		25 Dia x 100 L (mm)	25 Dia x 160 L (mm)
Min cable length *Excluding length to catch by hands*	190 mm		180 mm	235 mm
Working temp	600 °C max			
Ambient operating Environment	Temperature: 5 to 40 °C Relative humidity: 50%~90%			
Belt speed Adjustment	2.5~42 mm/sec; 0.1 mm/sec increment			
Noise	80dB Max (Cyclic, 1m from machine)			
Net Weight	72 KG		77 KG	

2.3 XB17C / XB19C Specification

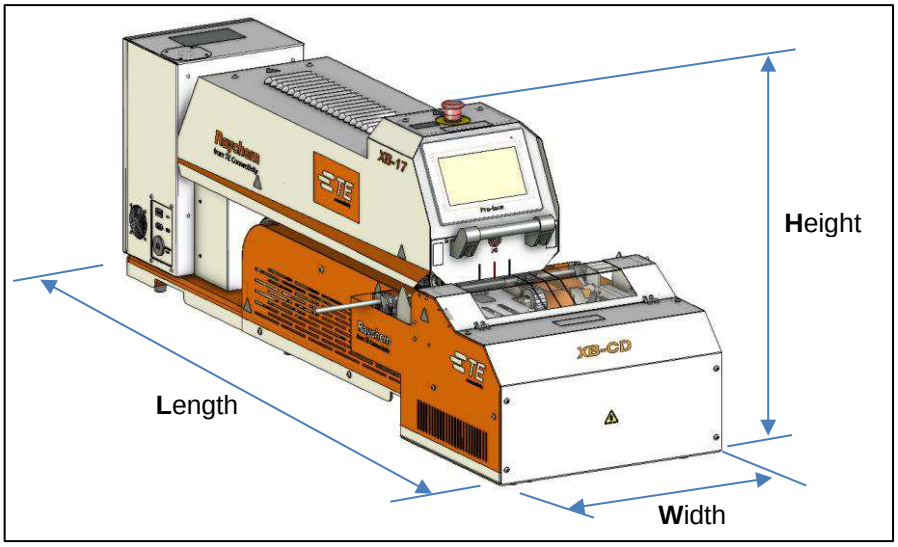


Figure 4: Belt Heater with Centering Device

Table 2: General Machine Parameters (Machine with CD)

Model Designation	**XB-17C**	**XB-19C**
	TE PN: 2381120-1	**TE PN: 2381130-1**
Power supply	230 (+/-10%) V AC 50/60 (+/-1) Hz	
Air supply	4~6 bar	
Heater *(upper & lower)*	**W** 100 x **L** 250 (mm) 1000 Watt each	**W** 95 x **L** 360 (mm) 1580 Watt each
Machine size	**W** 450 x **L** 1570 x **H** 510 (mm)	**W** 450 x **L** 1700 x **H** 550 (mm)
Max. Tubing Size	19 Dia x 90 L (mm)	25 Dia x 100 L (mm)
Min cable length *Excluding length to catch by hands*	450 mm	
Working temp	600 °C max	
Ambient operating Environment	Temperature: 5 to 40 °C Relative humidity: 50%~90%	
Timing Belt speed Adjustment	2.5~42 mm/sec; 0.1 mm/sec increment	
Noise	80dB Max (Cyclic, 1m from machine)	
Net Weight	96 KG	101 KG

3 Installation

3.1 Unpacking, Transport, Handling and Storage

The XB19 Belt Heater has a mass of 86 Kg (XB17 have 81 Kg). When unpacking, transporting, handling, or moving the unit to storage, it is recommended that no less than two persons or a lift truck be used for the process. When storing the unit, it should be placed in a suitable crate, and stored indoors away from any harmful effects of weather or other hazards.

Remove the machine from its shipping container and check for damage. Inspect the shipping container and machine for any evidence of damage during shipment. If you believe there has been damage, contact the shipping agent immediately.

Set the machine on a flat, level surface. Choose a work area with enough room around the machine for loading and unloading wire harnesses. Also allow room for routine maintenance and repair.

Provide adequate ventilation. Allow enough clearance above and around the machine so that the fans can circulate cooling air without obstruction. Do not place anything on the top chamber or cover the fan louvers.

Open TOP CHAMBER and remove packing material between the heaters. Packing material has been placed between the heaters to prevent vibration damage during shipment. Power ON before remove the packing material could get burning.

3.2 Inspection (Power OFF)

At the completion of the unpacking sequence, follow these steps to inspect the machine before making any electrical connections. If you believe damage may have been caused during shipping, contact the shipping agent immediately.

Check the alignment. When the upper heating chamber is closed, the upper belts should be aligned with the lower belts along their entire length with no more than a 6 mm offset. If the belts are not aligned contact your local Raychem representative.

Inspect the heaters for damage. Visually check the heaters for evidence of cracking or chipping of the glass face during shipment. The heaters should be fastened firmly into the baffles.

Ensure that all cover panels are in place and secure. All secure screws are in place.

3.3 Electrical Connections

Improper electrical connections will result in damage to the machine. Ensure that proper electrical connections are made before energizing.

DANGER

Machine is shipped with a 3 meters power cord, without plug. Electrical connections should be carried out only by a qualified electrician.

- *Refer to the electrical schematic in the back of this manual for proper connections. Measure the incoming voltage! Do not assume the rated voltage is nominal.*

3.3.1 220V/240V Input Power (Single phase, 220/240 V AC, 50/60 Hz)

Connect the power cord to the machine using the following connections:

Brown = L (circuit breaker)

Blue = N (circuit breaker)

Green/Yellow = PE (protective earth ground)

XB17 Belt heater, STD (TE PN: 2375310-1)
XB19 Belt heater, STD (TE PN: 2375320-1)
XB19 Belt heater, 6” version (TE PN: 2375320-2)
XB17C Belt heater (TE PN: 2381120-1)
XB19C Belt heater (TE PN: 2381130-1)

3.3.2 115V Input Power (Single phase, 110 V AC, 50/60 Hz)

Connect the power cord to the machine using the following connections:

Brown = L (circuit breaker)

Blue = N (circuit breaker)

Green/Yellow = PE (protective earth ground)

XB17 Belt heater, 110V (TE PN: 2375310-2)

3.4 Air Connections

Air connection is need only when optional Centering Device is available.

Pressure air: 4~6 bar
Outer diameter of pipe: 10mm

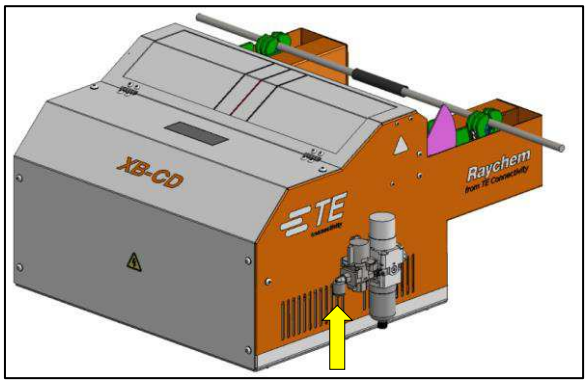


Figure 5: Air connections

3.5 Inspection (Power ON)

At the completion of the power OFF inspection sequence and the electrical connections, follow these steps to complete the set up and inspection of the machine.

Power ON the machine according to section 4.1 Power ON and Warm-up.

In touch panel, select the preset heating parameter which stored in touch panel (see Figure 12, item 2 process number), to check if machine will change the temperature and belt speed accordingly.

NOTE

Using the emergency stop or Main Switch as the normally shut down procedure defeats the automatic cool down circuit and will cause heat damage to the machine.

4 Operation

4.1 Power ON and Warm-up

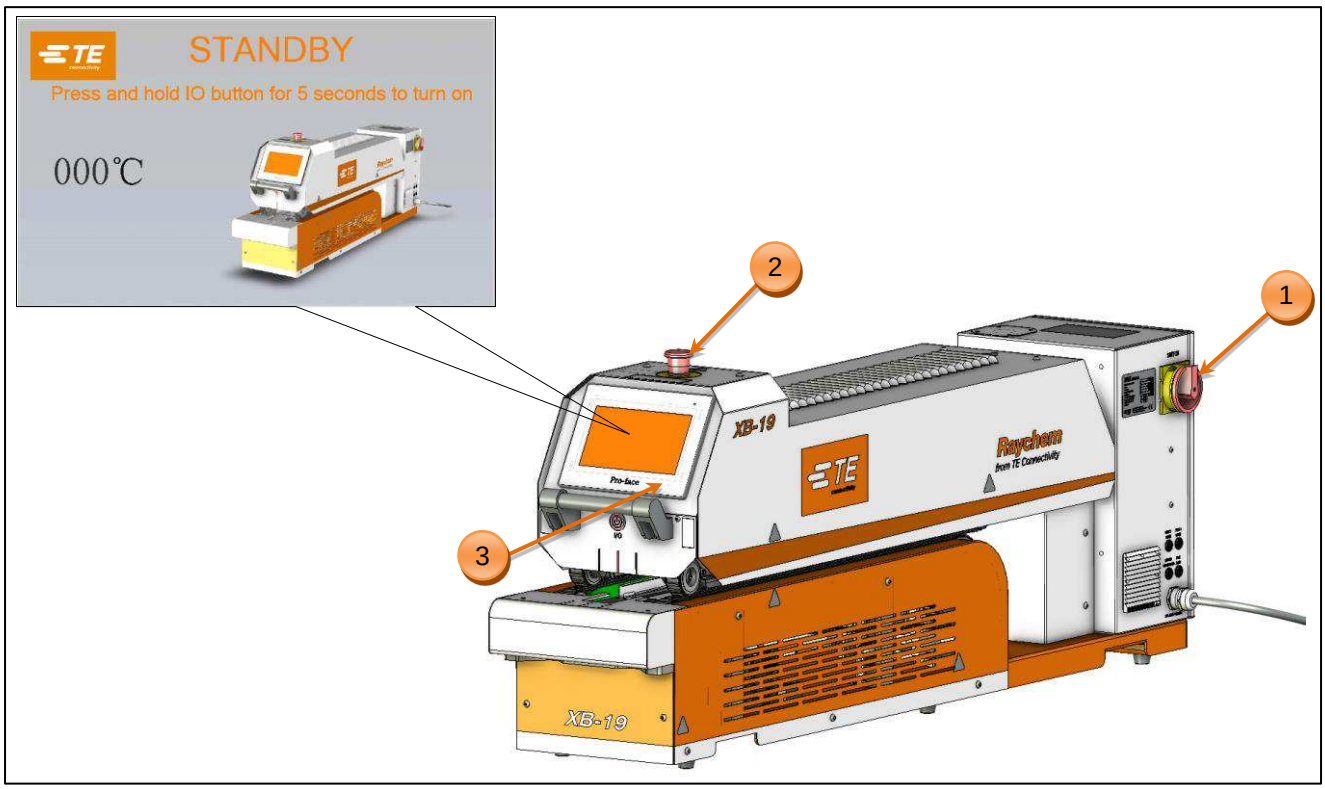


Figure 6: Power ON

Verify that the machine is connected to the appropriate power source. Refer to section 3.3 Electrical Connections, about how to connect to appropriate power source.

Power ON:

1. Turn on the Main Switch
2. Rotate E-stop button clockwise to release E-stop button.
    - *Touch panel will entry standby mode. See the top left picture in Figure 6.*

3. Press the I/O button for 5 second.
   - *Machine will turn ON power to heater.*
   - *I/O button start to flash.*
   - *Touch panel entry main interface.*
   - *In touch panel the heater actual temperature starts to rise from ambient.*
   - *Timing belt start to move forward (lockout gate rise).*
4. When temperature reach 200°C, machine cooling fans will start working.
5. When temperature reach preset temperature range, machine is ready for production.
   - *Heater indicator on main interface will show green.*
   - *I/O button lit.*
   - *Timing belt change to move backward (lockout gate fall).*

NOTE
When the heaters have reached the set temperature, wait approximately 5 minutes for the heater temperature to stabilize before production.

4.2 Loading and Unloading

At the completion of the power ON and warm-up sequence, follow these steps to process wire assemblies. These instructions are for processing center splices. For other applications contact your local Raychem representative.

4.2.1 Loading to XB Belt Heater

1. Select the suitable process number according to the tube type.
2. Prepare the wire assembly. Slide a piece of Raychem heat-shrink tubing over the assembly, next to the splice to be sealed.

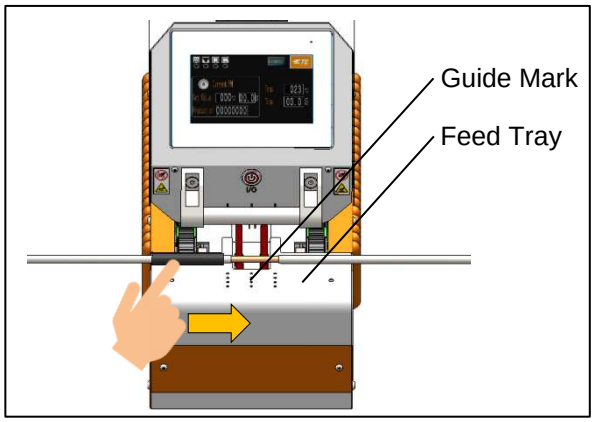


Figure 7: Centering the Splice & Tube

3. Center the nugget on the feed tray. Use the center guide mark to align the nugget of the splice.

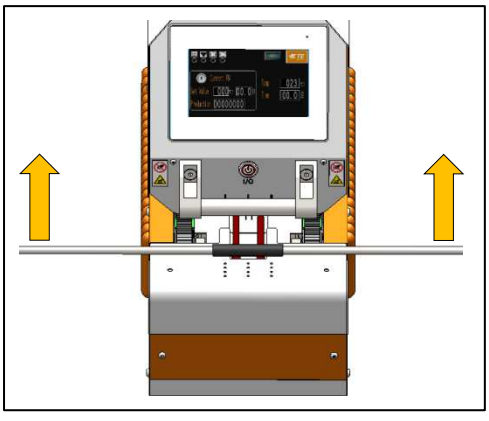


Figure 8: Feed into heating chamber

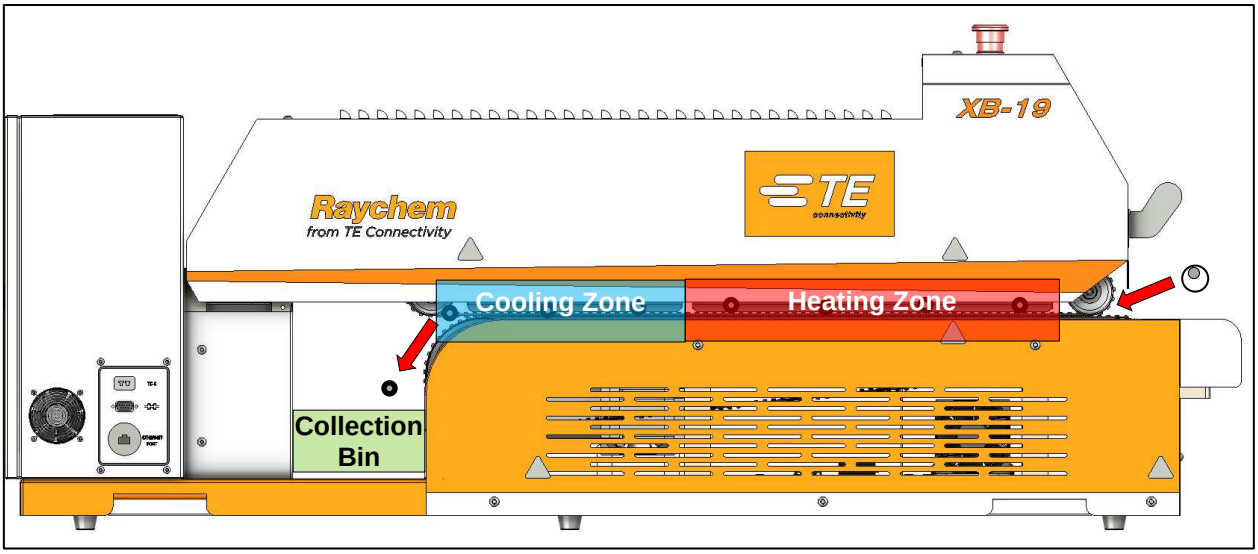


Figure 9: Machine Workflow

4. Center the tubing over the nugget, using the outboard alignment marks on the feed tray.

NOTE
For significantly unbalanced splices, offsetting the tubing toward the larger side is helpful to prevent 'milk-off' of the tubing.

5. Slide the assembly into the belts. The timing belts grip the assembly and pull it into the heating chamber, going through heating zone, cooling zone, and then deposit the finished assembly into the collection bin.

NOTE
For significantly unbalanced splices, offsetting the tubing toward the larger side is helpful to prevent 'milk-off' of the tubing.

NOTE
Allow the assemblies to cool for a few seconds after they fall to the collection bin.

4.2.2 Loading to XB Belt Heater with optional Centering Device

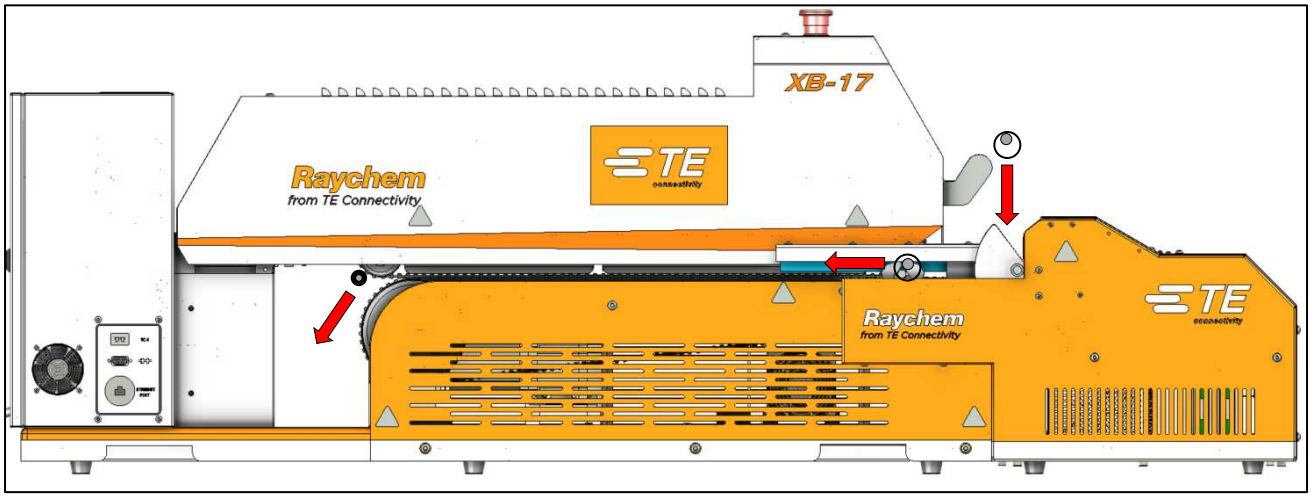


Figure 10: Machine with CD Workflow

1. Select the suitable process number according to the tube type.
2. If need, adjust the detection probes distance, or offset for Centering Device detection unit.
3. Prepare the wire assembly. Slide a piece of Raychem heat-shrink tubing over the assembly, next to the splice to be sealed.
4. Carry both end of cable and push cable down, allow splice contact with both detection probes. When splice contact with both detection probes successfully, clamping cylinders will clamp on both ends of cable automatically, then feed to machine heating chamber automatically.
5. When clamping cylinder back to home position, Centering Device is ready for next cycle.

NOTE
*Be careful when feed cable into Centering Device. When detection probes contact with splice successfully, clamping cylinders will clamp on both ends of cable automatically**. Keep hands out of Centering Device to avoid crushing.***

4.3 Power OFF and cool down

At the end of the work shift, press the I/O button for 5 second. This will shut off power to the heaters. The belts and the fans will continue to run for 20 minutes, until a cool safe temperature has been reached, at which time all power will shut off automatically.

Power OFF:

1. Checking on timing belt, no wire assembly remain on timing belt.
2. Press and hold the I/O button for 5 seconds.
   - *Machine will entry cooling down process. It will take about 20 minutes to cool down.*
   - *Heater will power off.*
   - *Timing belt moving forward (lock out gate rise)*
3. When temperature fall below 200°C, machine cooling fans and timing belt will stop. Touch panel will show the machine is in standby mode.
4. Turn OFF Main Switch.

Figure 11: Shutdown Interface

NOTE
Do not use the Main Switch or Emergency stop for the normal shutdown procedure. This defeats the automatic cool down cycle and will cause heat damage to the machine.

5 Software (HMI)

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

5.1 Main Interface

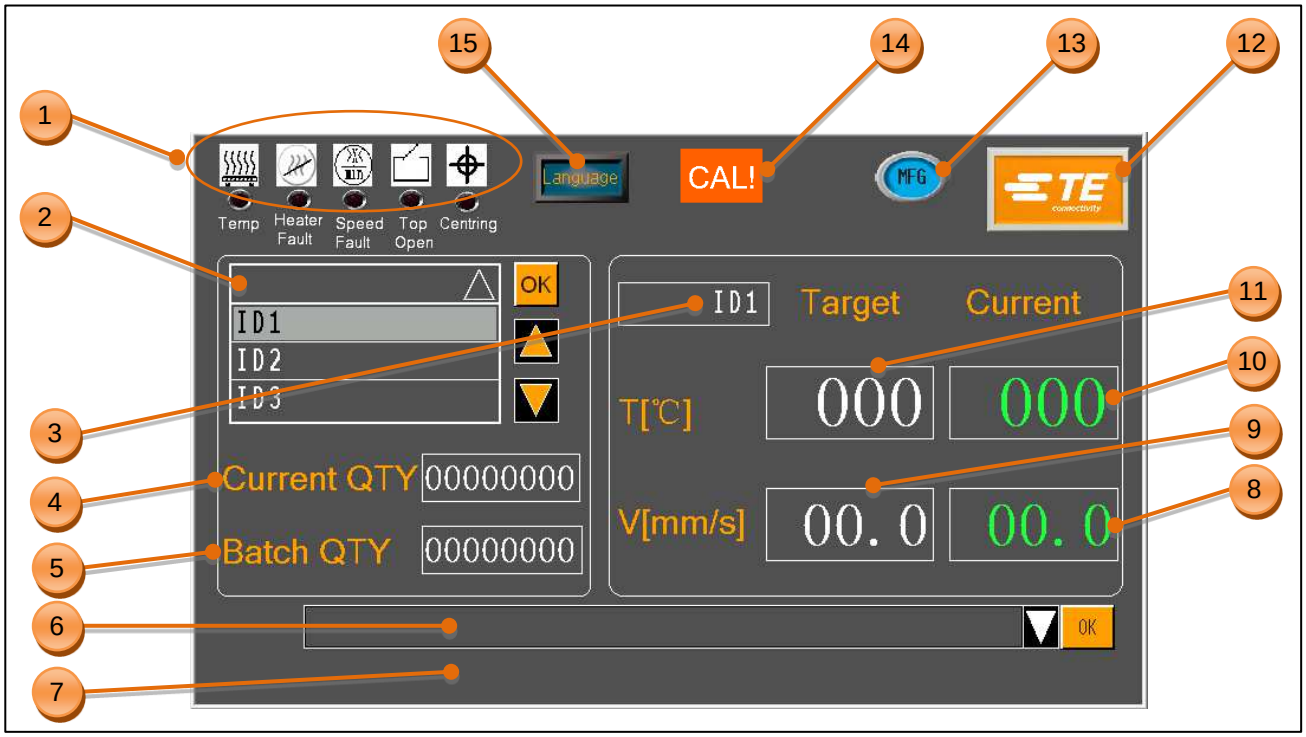


Figure 12: Main Interface

1. Status Indicators
   (5 indicators on the touch panel indicate the status of the machine. These indicators include equipment status indicators and many alarm condition indicators.)

   -  TEMP**:** Indicator to show heater status.
     Yellow, when warming up.
     Red, when temperature exceeds the set value by 20 ºC.
     Green, when reach preset temperature range.
   -  HEATER FAULT**:** Indicator illuminate only when Heating failure.
   -  SPEED FAULT**:** Indicator illuminate when motor position out of tolerance, or speed error.
   -  TOP OPEN**:** Indicator illuminate when top chamber open.
   -  Centering**:** This icon will show only when Centering Device is activated. Section 8.3.4 Centering Device.

2. Process No.
   Operator can select the process number from this column, with help of up and low arrow to flip over, then click on OK to load heat parameter (PN / temperature / belt speed) stored in the selected process number to machine. Operator can also click on blank area, then we can get a quick input windows, input key words and search the process number.
   Refer to section 5.3 Heat parameter, about how to new add or edit the heat parameter stored in the 10 process numbers.

3. Current PN
   Description for operator, on identifying the product or process No. Operator can edit as product name or PN. See section 5.3 Heat parameter, about how to edit it.

4. Current QTY
   It shows the real-time production quantity. Operator can reset the value in Production Setting page manually. In case the Batch QTY was activated, this value will reset automatically when Current QTY meet Batch QTY.

5. Batch QTY
   It shows the target production quantity. Operator can preset this value in Production Setting page before production. When Current QTY meet this value, in the Maintenance will pop up message to remind operator. Operators need to close this window to clean the message. Default value is 0, which means it will turn OFF the reminder.

6. Setting Item
   Access to advanced setting page. Login on by click on TE logo, the Setting Item column will show. Click on the column to find the dropdown list, to select the different setting item. Refer to section 5.2 Login On)

7. Error message area
   In case of error appear, error message will roll in this area continuously until operator solve the problem. For example, if operator open the top chamber, an error message will roll until operator close the top chamber. Try to wait second for error message to run through the window after problem was solved.

8. Current speed
   Real-time speed for the timing belt.

9. Target speed
   Target timing belt speed value stored in the selected process No.

10. Current Temp
    Real-time temperature of heater.

11. Target Temp
    Target temperature value stored in the selected process No.

12. Login button
    TE logo, click on this button to login on.

13. Current ID
    When operator login on, this icon will show the current login ID.

14. Cal reminding
    Machines have default count down for calibration requirement. When this message appeared, try to operate calibration as soon as possible. So as to make sure machine operate at good heating capacity.

15. Language button
    It will show the current language. Click on this icon to select other language.

5.2 Login On

Access to advanced page, to review more detail on machine status or try to edit machine parameter (like heat parameter), it will require operator to login on. Follow below steps to login on:

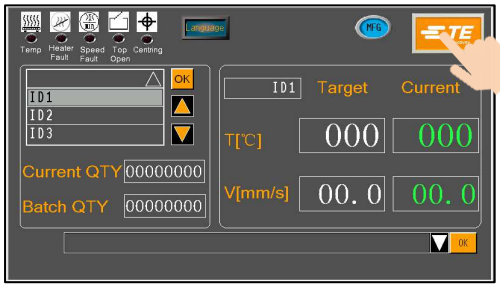


Figure 13

When power ON to machine, you would see the main interface like the picture left. Press on the TE logo from the main interface to login on. 3 level authority to log on:

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

(Password can be edit by higher authority.)

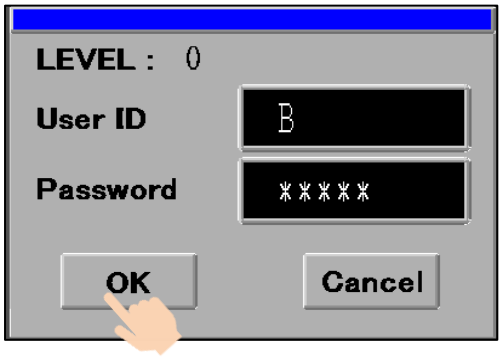


Figure 14

After TE logo is click, a window pops up like picture left. Input 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.

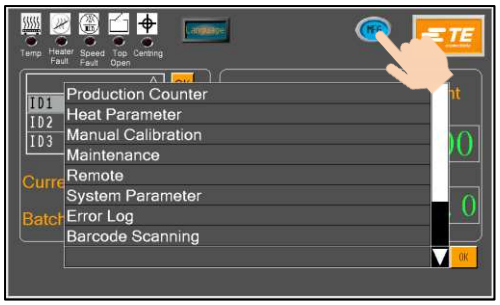


Figure 15

You would find the main interface already have 2 changes:

1. 

ID icon is showing you access as engineer.

2. On the bottom appear a column. Click on it, would appear a drop-down list.

3. In this drop-down list, you can choose the setting item, like show on below table.

Table 3: Setting item

Access right for setting item	No Log on	OPR	EGR	MFG
Production Counter	-	✓	✓	✓
Auto Calibration	✓	✓	✓	✓
Heat parameter	-	-	✓	✓
Manual Calibration	-	-	✓	✓
Maintenance	-	-	✓	✓
Remote	-	✓	✓	✓
System Parameter	-	-	-	✓
Error Log	-	-	✓	✓
Barcode Scanning	-	-	✓	✓
Data collection-Local	-	-	✓	✓
Data collection-Barcode	-	-	✓	✓
Centering Manual	-	-	✓	✓

5.3 Heat parameter

Originally machine was programmed to store 10 process numbers (ID1, ID2…ID10 default, up to ID1000 max), each process number will store heat parameter (Product name / Temperature / Speed). Customer can new-add or edit process number in this page if need.

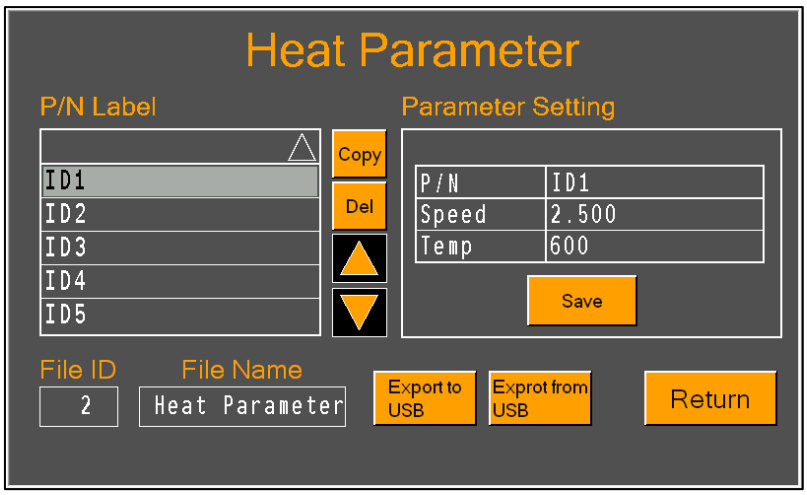


Figure 16: Heating parameter page

Edit exist process number: (take ID1 for example)

1. Click on ID1 from the ***P/N Label* table** on page left. Then we can see the heat parameter (Part number / Speed / Temperature) stored in ID1, will show on the *Parameter Setting* table.
2. Click on the value to be edit in ***Parameter Setting*** table, to input the new value.
3. Click on Press on the ***SAVE*** button, to upload new parameter to ID1.

New add process number:

1. Click on ID1 (or any other process number) from the *P/N Label* table on page left. Then we can see the heat parameter (Part number / Speed / Temperature) stored in ID1, will show on the ***Parameter Setting*** table.
2. Click on ***COPY*** button to copy heat parameter from ID1 to get ID1~1, then edit the new value ID1~1.

New add or edit in bulk:

1. Plug a USB flash into the machine USB port.
2. Click on ***EXPORT TO USB*** button. Then unplug the USB.
3. Find the file from USB via PC, refer to the file name show in 

. Open the file and try to new add or edit refer to exist parameter.
4. Plug the USB back to machine USB port and click on ***EXPORT FROM USB***.

NOTE
Choose USB flash disk no more than 32G, as fat32 format.

5.4 Production Counter

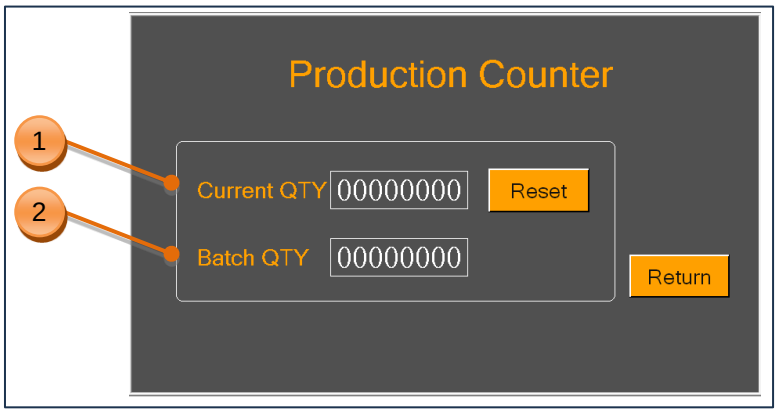


Figure 17: Production Counter page

1. Real-time production quantity counter.

   *The number here will +1 automatically after each product run through the heating chamber and drop down to collection bin. Operator can press and hold the **RESET** button for 5S, to clean the counter value.*

2. Operator can preset the production target (quantity) here.

   - *If you input the value, when machine complete the setting batch quantity, on the main interface will pop up a tip "Complete!", to remind the operator current batch production is completed. (See below capture, operator need to clean this message manually by clicking on close button). The Batch QTY will continuously start the next batch count automatically.*

- *If you input value "0", no "Complete!" message will pop up.*

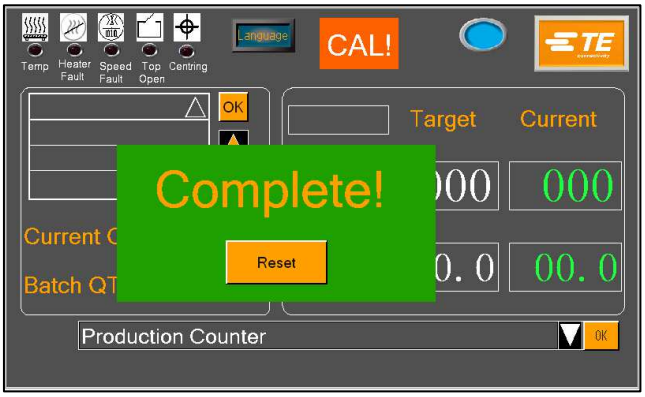


Figure 18: Production Counter (complete!)

5.5 Maintenance

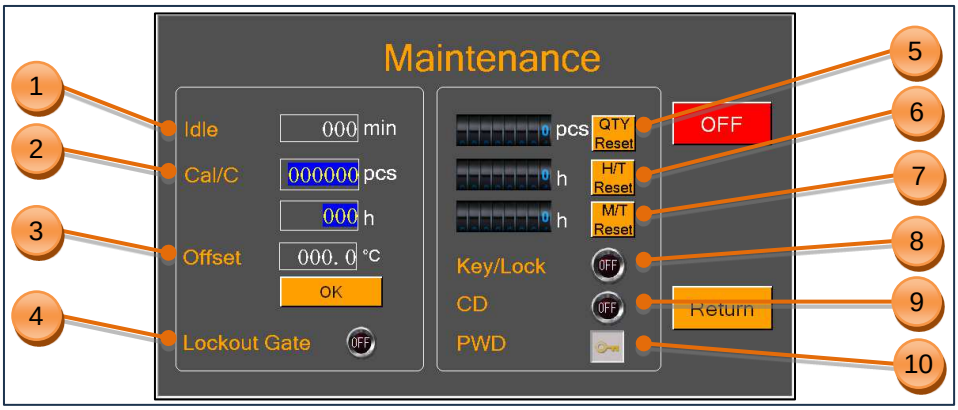
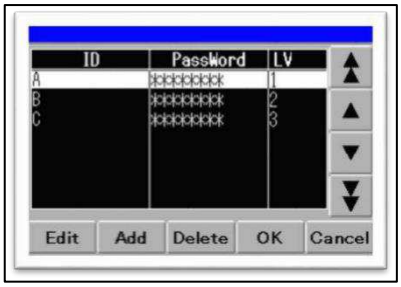


Figure 19: Maintenance page

1. Time to standby, the machine will entry standby mode automatically if no action or no new product was feed. *Default value: 60 mins, turn OFF this function by input value "0".*
2. Machine Calibration Counter, by cycle (pc) or by Hour.
   Default value: 75000 pcs / 350 Hours.
3. Temperature Compensate; Enter the value and click OK to Write.
4. Switch ON, to activate optional Lockout gate when Lockout gate is installed. Meanwhile timing belt reverse function will be inactivated.
5. Machine cycle counter, designed to indicate production QTY after leave factory.
6. Heater timer, which is designed to indicate the hours the heater operates. It is necessary to reset this counter when replaced the heater.
7. Motor timer, which is designed to indicate the hours the motor operates. It is necessary to reset this counter when replaced motor.
8. Key lock.
   OFF, machine allow operator to shift heating parameter by click on process dropdown list in Main Interface.
   ON, machine won't response when operator click on process dropdown list.
9. Centering Device Switch, to activate Centering Device when optional Centering Device is installed. Switch OFF when optional Centering Device is not available.
10. Change password. Higher level authority can change lower-level authority log on password.



When click on icon, it will pop up the window left. You can change the password in this window. (This window shown, is log on as MFG.)

Figure 20

5.6 Calibration (Temperature)

To ensure the same type XB Belt Heater are operating at the same heating element temperature and to ensure reliable results when using the Raychem recommended installation conditions, the machine should be calibrated using the following procedure.

The Belt Heater must be calibrated every time one of the following occurs:

- Heater is changed.
- Temperature controller is changed.
- Motor is changed.
- Motor driver is changed.
- First time installation, or environment is changed.
- “Cal!” message pop up in Main Interface. See 0
- Whenever the heating performance is not good as usual.

Calibration setting:

- Heater Temperature: 600 ºC
- Timing Belt Speed: 10.2mm/s
- Probe target Temp: 130 ºC ± 5°C for XB17, 150 ºC ± 5°C for XB19.

5.6.1 Auto Calibration

Calibration Tool:

- UHI 250A probe. (TE PN: 7-1192190-9, ORDER-NO: 288869-000)
- Extension Cable. (TE PN: 9-2375314-6)

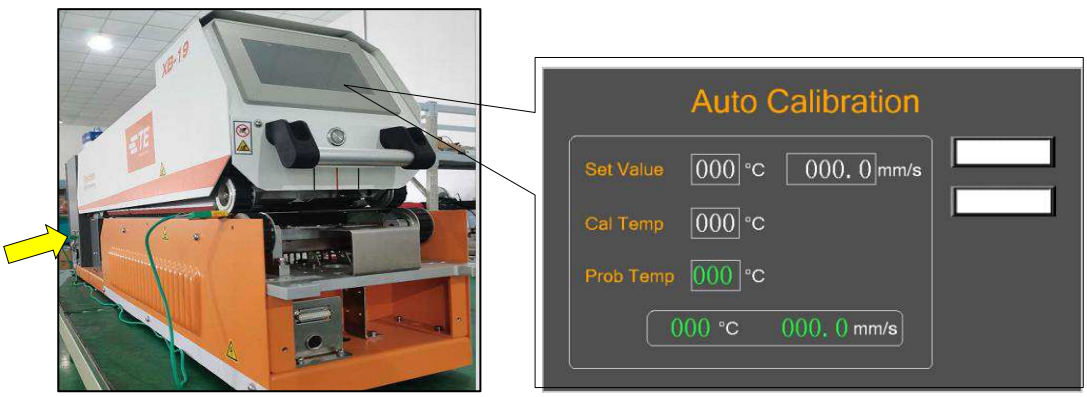
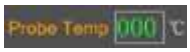
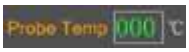


Figure 21: Auto Calibration

Automatic Calibration Procedure

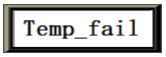
1. Connect the UHI probe to the calibration socket in left side of electrical cabinet.
   - Touch panel will entry Auto Calibration page automatically. Refer to Figure 21
   - The heating parameter stored in “Set Value”, will upload and change machine’s temperature and belt speed.
   - 

When these 2 values turn green. Allow a further 15 minutes for heater temperature to stabilize.
2. 

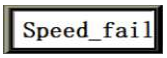
When this value turns green (23+/-3 ºC) timing belt will move forward. Operator can feed the UHI probe into heating chamber centrally.
   - UHI probe will enter from the entrance.
   - 

This value which is showing probe’s real-time temperature, start to rise.
   - 

This value will show the probe’s peak temperature when calibration finished.
3. When the UHI probe go through the heating chamber, it will be drop down to collection bin. DO NOT UNPLUG THE UHI PROBE AT THIS STAGE. Allow 15 seconds for machine to calculate and adjust OFFSET automatically after UHI is ejected. At the same time of temperature calibration, UHI probe is also used for speed detection. When calibration finished, 2 blanks on page right will show the calibration result.
   - 

Calibration success. Offset value was updated automatically
   - 

Calibration Fail. Need to redo calibration
   - 

Belt Speed is correct.
   - 

Belt Speed is wrong, stepper motor fail, need to replace motor.

5.6.2 Manual Calibration

Calibration tool:

- UHI 250A probe. (TE PN: 7-1192190-9, ORDER-NO: 288869-000)
- Extension Cable. (TE PN: 9-2375314-6)
- Thermometer. (TE PN: 9-2375314-7)

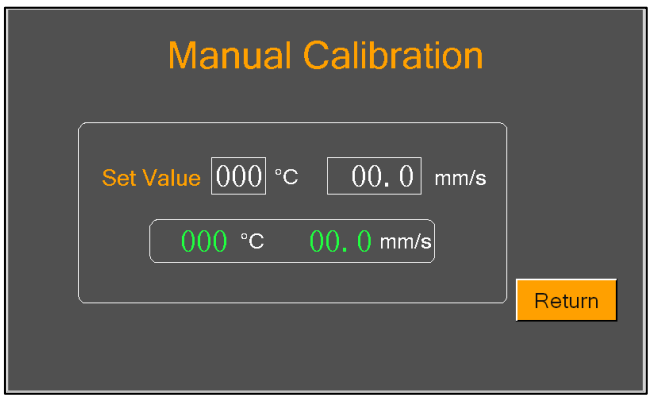


Figure 22: Manual Calibration

Manual Calibration Procedure

1. Login on to Manual Calibration page.
   - 

heating parameter in “Set Value” will upload and change machine’s temperature and belt speed.
   - 

When these 2 values turn green. Allow a further 15 minutes for heater temperature to stabilize.
2. Connect UHI probe to thermometer. Read the real-time temperature of UHI probe from thermometer, make sure its temperature was cooled to 23+/-3 ºC before feed to heating chamber.
3. Carry out 3 times’ calibration, then record each UHI probe peak temperature from thermometer.
4. Calculate Adjust offset value, then 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 (XB17=130 ºC, XB19=150 ºC)

   Example 1 (For XB19)

   If the average probe peak temperature is 170°C, old offset is “-15”, target temp is 150 ºC.

   New offset = “–15” + (170 – 150) x 2 = ”25”

   Example 2 (For XB17)

   If the average probe peak temperature is 110°C, old offset is “-15”, target temp is 130 ºC.

   New offset = “–15” + (110 – 130) x 2 = ”–55”

NOTE
After new offset is input, it is necessary to wait 15 minutes for temperature to stabilize before production.

5.7 Remote Mode

The remote mode allows the XB Belt Heater to be controlled by external devices such as an industrial Computer or Ultrasonic Welding equipment, via connecting the RS232 communication interface with external device. (The TE heat shrink processing machine was tested and proved functional with the major ultrasonic welding machine available in the markets, consult with TE for any communication difficulty occurs.)

Figure 23: *Remote Interface (RS232 connector)*

NOTE
Customers need to prepare the communication cable (DB9, female to female) by themselves. See below wiring map for this cable connection. Or purchase it from TE. (Section 8.3.7).

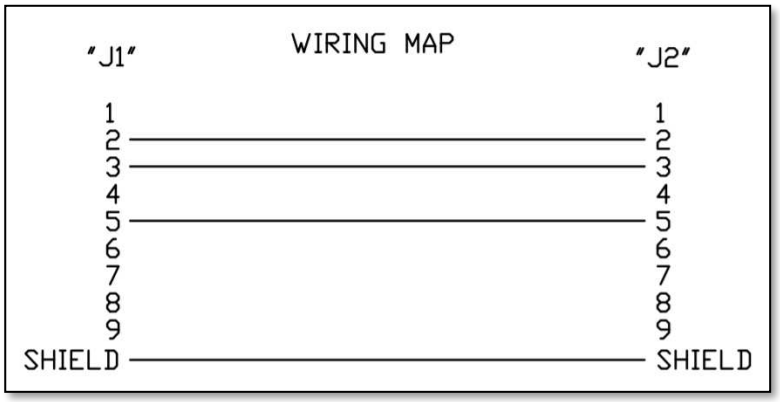


Figure 24: *Wiring Map for RS232 communication interface*

5.7.1 Remote operation Procedure

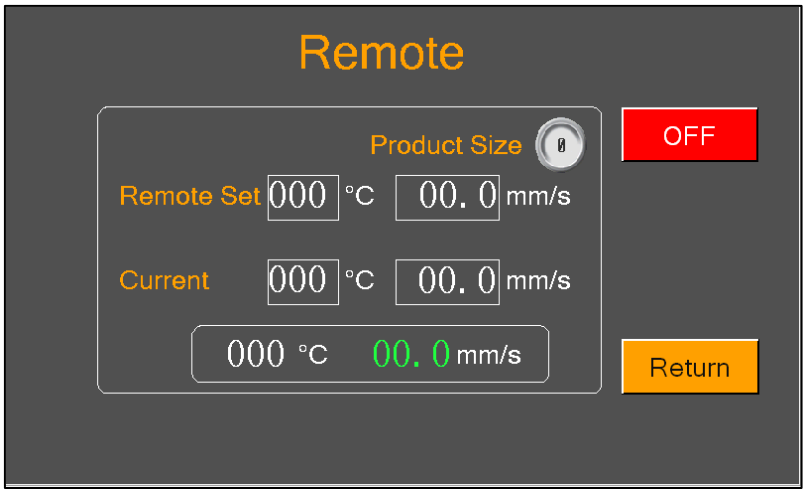


Figure 25: Remote operation Procedure

1. Connect XB Belt Heater with external device via the RS232 communication interface, like Ultrasonic Welding equipment.
2. Switch ***OFF*** to ***ON***, allow the machine to communicate with external device.
3. 

These values are showing the parameter (Product Size / Temperature / Speed) transferred from external devices.
4. 

These values are showing the parameter which machine is going to carry out.
5. 

These fluctuant values are showing the real-time parameter for machine.
6. When XB Belt Heater connect with external device. You can confirm if connection is working correctly by checking the value on “Current” and “Remote Set” is comply with the parameter in external device.
7. Switch ***ON*** to ***OFF***, to shut off the communication with external device.
8. Click on ***RETURN*** button, to back to main interface.

5.7.2 RS232 Data Format

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 XB Belt Heater recognizes the following fourteen bytes information packet structure.

BYTE 1	Start of Header (SOH) (always ASCII 01h)
BYTE 2	10'mm/s of speed (ASCII 30h to 39h (1 to 9))
BYTE 3	1mm/s of speed (ASCII 30h to 39h (1 to 9))
BYTE 4	Always a decimal point (ASCII 2Eh)
BYTE 5	0.1mm/s of speed (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 XB Belt Heater 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 XB Belt Heater 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:

- The checksum Byte compares.
- 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 XB Belt Heater 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).

5.8 System Parameter

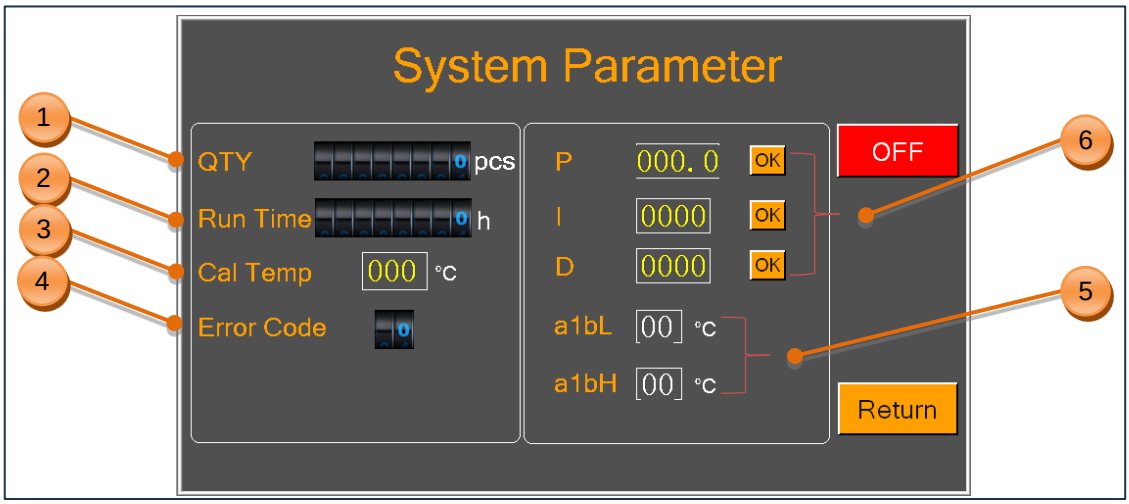


Figure 26: System Parameter

1. Machine cycle counter. This value cannot be reset. It will record the total cycle after machine leave TE factory.
2. Machine timer. This value cannot be reset. It will record the total operating hours after machine leave TE factory.
3. Calibration Temp, Probe target temperature after ran through heating chamber.
4. Error Code for temperature controller. Detail information can find on manual of OMRON E5CC.
5. a1bL 00 °C Lower alarm temperature, default value 10°C.
   a1bH 00 °C Higher alarm temperature, default value 10°C.
   Upper and lower limit for the temperature. When real-time temperature reached this range, heater light will show green, timing belt will change to move backward. Ready for production.
6. PID control. These parameters have to be carefully adjusted together and are factory set.

   P 000. 0 OK Proportional 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 0000 OK Integral. 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 0000 OK Derivative. 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.

5.9 Barcode Scanning

Machine can work with barcode scanner. When scanner read the barcode, machine can record the parameter to external USB storage, also machine can load the heating parameter program in the barcode, then the machine can change heating parameter automatically.

NOTE
Wireless Barcode Scanner (Optional, TE PN 9-2375314-9).

5.9.1 Barcode Scanning mode

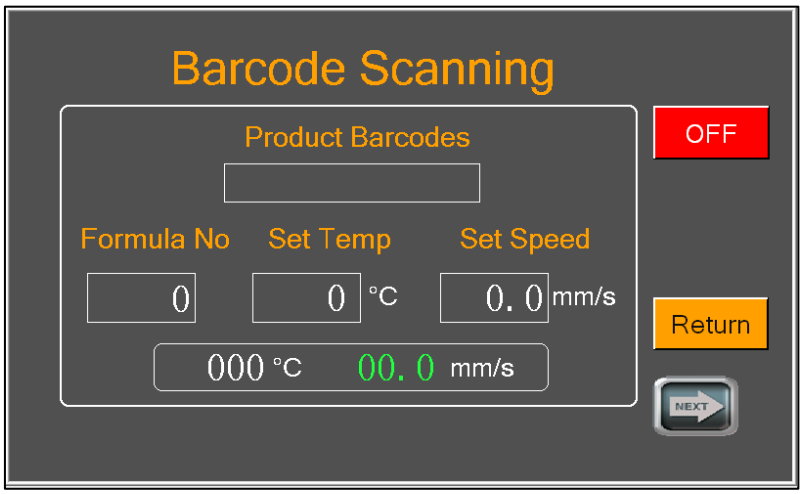
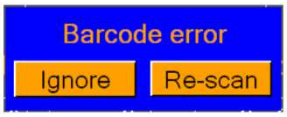


Figure 27: Barcode Scanning mode

1. Connect Barcode Scanner with machine, via USB port (Figure 2).
2. Access to “Code Reading” page by login on as engineer (authority “C”)
3. Click on the “OFF” button to switch to “ON”, to activate Barcode scanning function.
    - If scan barcode successfully, parameter will upload to update the parameter in the page.
    - If fail, touch panel will pop up message “Barcode error”.



Click on “Ignore”, will ignore this error and remains last barcode.
Click on “Re-scan”, allow to re-scan the barcode again.
Or entry “Manual Code Input” page, to input code number manually.

4. Switch “ON” to “OFF” and click on ***RETURN*** button, to quit Barcode Scanning mode, page will jump to Main interface.
5. Click on “Next” button, will allow to edit or preset Code settings. Customers need to preset the Code setting before operating in Barcode Scanning mode.

5.9.2 Code setting

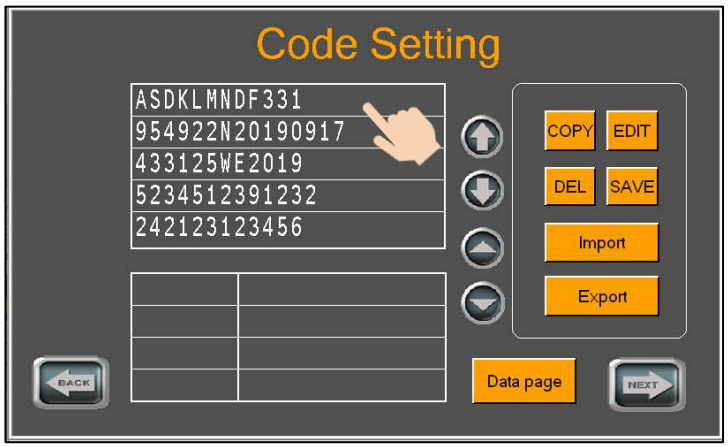


Figure 28: Code Setting

There are two ways to write barcode data：

1. Edit one by one, in the touch panel interface：
   - Modify: Select the barcode from top table in “Code settings” page, the bottom table will show the exist parameter stored in this selected code. Click on “EDIT”.
   - New add: Select any barcode in top table and click on “COPY” button, the barcode data will copy to new code, and then modify the new code.
2. Import barcode data external USB disk.
   a. Insert a USB disk into the USB port, and click on “Export” button on HMI to download the existing data from the touch panel to the USB disk;
   b. Unplug and check on USB disk via PC, will found it generated a folder Recipe.
   Try write new barcode by editing the excel file 00001_Recipe Group1 in folder Recipe, refer to the original parameter and save.
   c. Insert the USB disk back to machine USB port and click on “Import” button to upload barcode data to the touch panel.

5.9.3 Manual code input reading

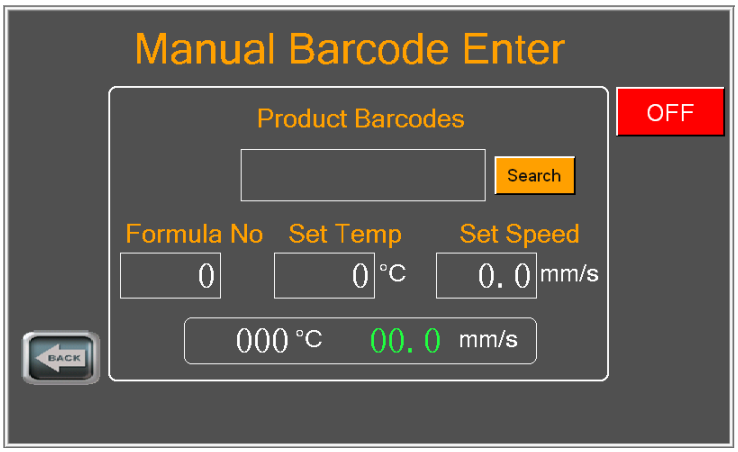


Figure 29: Manual Code Input

In this page, you can input the barcode number manually in the blank and search the data. Switch the “OFF” button to “ON”, to allow editing. And Switch to “OFF” when finished.

5.10 Error Log

Figure 30: Error Log

Equipment failures will be recorded and saved on this page for future reference.

In this page top right is showing the current revision for PLC and HMI program.

5.11 Data Collection

Machine can collect production data in HMI automatically and allow to export to external USB disk manually.

NOTE
Customers need to prepare USB flash by themselves. No more than 32G, as fat32 format.

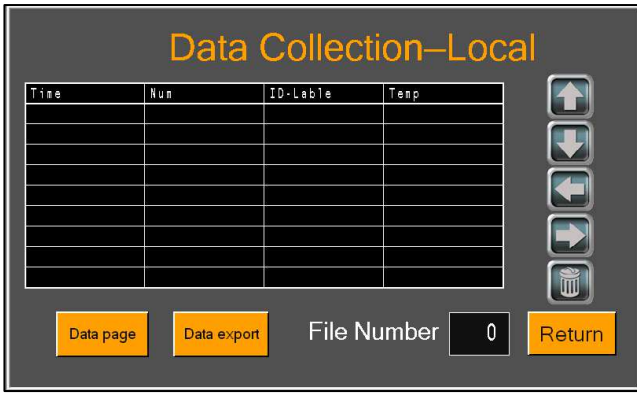


Figure 31: Data Collection - Local

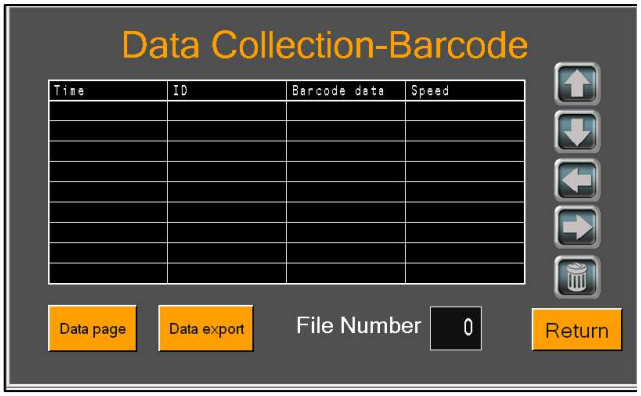


Figure 32: Data Collection - Barcode

5.11.1 Data Collection - Local

Operation without barcode scanning, machine can only record the 10X process parameters stored in machine. Access to “Data Collection-Local” page to review the production information on touch panel. Or operator can download the production information to external USB disk.

- Click and input “File Number” to name the document name to export.
- Click on “Data export” button to export the production information to USB disk.
- Click on “Data page” button, to review and double check on the export document in USB disk.
- Click on “Return” button will access to Main Interface.

5.11.2 Data Collection - Barcode

Operation with barcode scanning, machine can record those information recognized from barcode. Access to “Data Collection-Barcode” page to review the production information on touch panel. Or operator can download the production information to external USB disk.

- Click and input “File Number” to name the document name to export.
- Click on “Data export” button to export the production information to USB disk.
- Click on “Data page” button, to review and double check on the export document in USB disk.
- Click on “Return” button will access to Main Interface.

5.12 Centering Manual

I/O page for Centering Device operation. In this page, engineer can also control the Centering Device to move step by step.

T/P ---- *Tube Pusher, consists of left push plate and right push plate which designed to push tube to center.*

Probe Up/Down ---- *Detection Unit Up/Down. Detection Unit consists of left detection probe and right detection probe. It will move to up (detection position), move to down (home position) getting out the way of T/P centering.*

Clamp ---- *Clamping Cylinder, they were designed to clamp both ends of cable assembly.*

Feed ---- *Feeding mechanism, clamping cylinder will carry splice move to machine entrance.*

Splice in position ---- *Indicator will illuminate when both detection probes contact with splice successfully.*

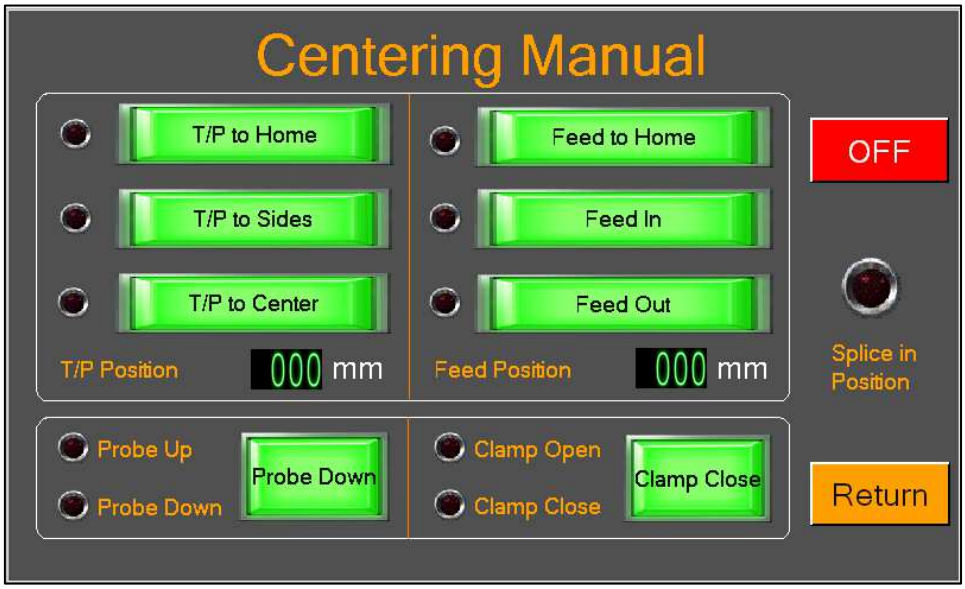


Figure 33: Centering Manual

6 Maintenance

The XB Belt Heater is a very low maintenance machine; however, a few minutes of maintenance each week will ensure its reliability and long service life. The following are guidelines for daily, weekly, and monthly maintenance procedures that will keep the XB Belt Heater in optimum working condition. Don't wait until the machine has a problem to give it some attention.

DANGER

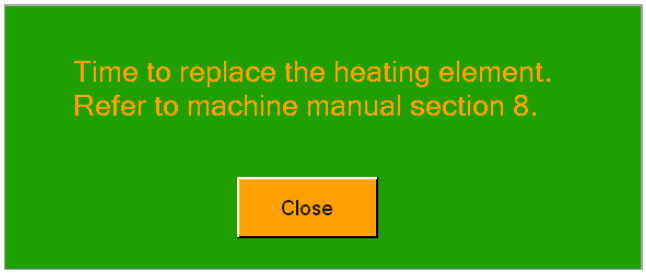
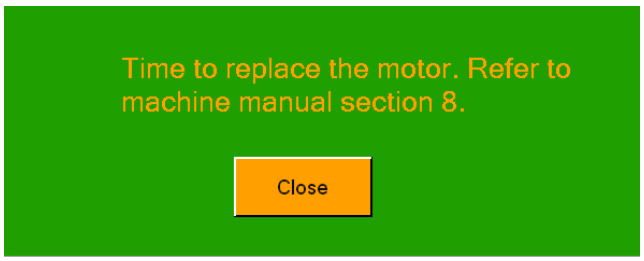
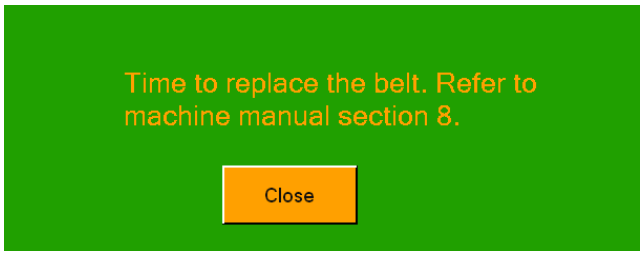
These procedures should be performed only by qualified maintenance. personnel. To minimize the risks of burns, electrical shock, or other injuries, all safety precautions must be observed.

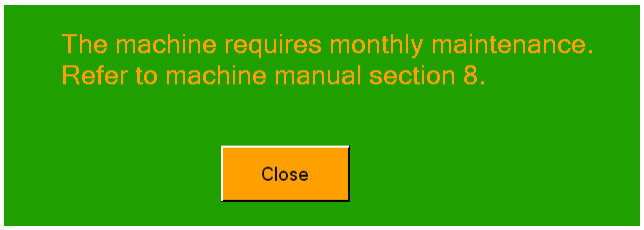
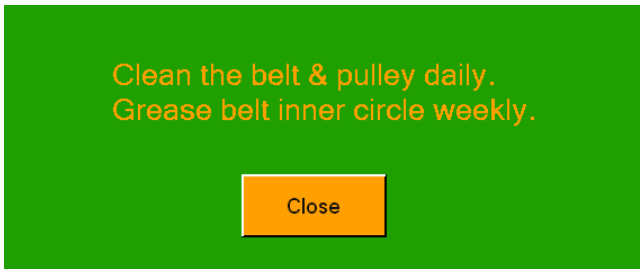
The heaters remain hot after the belts and fans stop moving. To avoid any burns or injury during maintenance, wait an additional 15 minutes after the normal cool down cycle is complete before beginning.

NOTE

Do not use solvents for cleaning. Solvents are unnecessary and may damage some components of the machine.

6.1 Maintenance Reminder

	Set reminder time in system parameters (default to 0, off) When the heater reaches the set reminder time, a reminder message will pop up on the main page. After following the prompts for replacement, click close to clear the reminder and it will appear again when the next heater run time reaches the reminder time
	Set reminder time in system parameters (default to 0, off) When the motor running time reaches the set reminder time, a reminder message will pop up on the main page. After following the prompts for replacement, click close to clear the reminder and it will appear again when the next motor running time reaches the reminder time
	Set reminder time in system parameters (default to 0, off) When the belt usage time reaches the set reminder time, a reminder message will pop up on the main page. After following the prompts for replacement, click close to clear the reminder and it will appear again when the next belt usage time reaches the reminder time

	Set reminder time in system parameters (default to 240h) When the machine reaches the set reminder time, a reminder message will pop up on the main page. After following the prompts for replacement, click close to clear the reminder and it will appear again when the next machine running time reaches the reminder time
	When the belt has been in use for one week, a reminder message will pop up on the main page. Click Close to temporarily turn off the reminder, but it will pop up again after 4 hours. After following the prompts for maintenance, enter the maintenance page and long press Reset to clear the "Main Reminder" to 0. The reminder will be eliminated and will reappear when the next belt usage time reaches 1 week

6.2 Daily Maintenance

Before the daily production begins, while the machine is cool, take a few minutes to perform the following steps.

- **Clean and inspect the belts and pulleys.** Using a dull soft tool (wood or brass dowel), remove any adhesive or foreign matter from the belts and pulley grooves. Ensure that the belts are seat ed properly in the timing grooves and the grooves are clean. Adhesive buildup in the timing grooves may cause the belts to ‘walk’ off the pulleys.
- **Clean and inspect the heaters.** Using a soft scraping tool, soft wire brush, or wet cloth, clean any adhesive or foreign matter from the quartz face of the heating elements. Ensure that the heaters are securely fastened in place.
- Calibration is need.
- As the machine warms up for normal operation, check the general condition of the machine. Ensure that all the fans are operating.
- Listen for any grinding or clicking noises. The belts should be running smoothly without a jerky motion.
- All covers must be securely in place. Make any repairs or adjustments necessary to return the unit to proper working order.

6.3 Weekly Maintenance

In addition to the daily procedures, perform the following procedures every week or after 40 to 50 hours of operation.

- **Check the belts for alignment.** Make sure the belts are seated properly in the timing pulleys, and that the pulley grooves are clean. Make sure the pulleys are in alignment and securely in place. With the top chamber closed, make sure the top belts mesh with the bottom belts.
- **Check the belts for tension.** With the top chamber open, measure the free-play distance at the center of each belt. The distance between the belt and foam pad, or guide, should be between 19mm (0 .75 in).

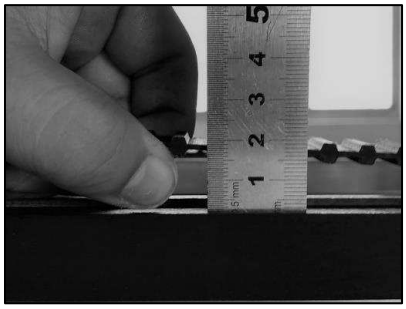


Figure 34: Checking Belt Tension with a Ruler

NOTE
Belts that are too tight will prematurely wear the bearings and belts.

- **Verify that the upper floating rails contact the upper belts.** With the top chamber close, inspect the position of the upper rails. If they do not touch the belts along the entire length of the rail, adjust the spring-loaded bolts on either end of the rails. If the rails do not contact with the belts, smaller harness may not be gripped sufficiently and tubing will tend to drop and touch heater, or harness will move when it go through the heating chamber.

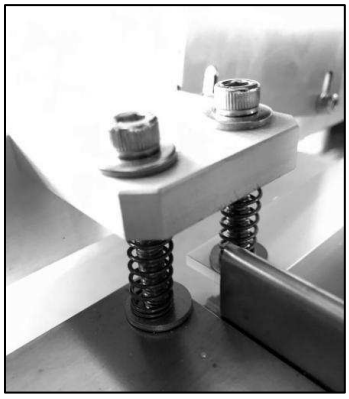


Figure 35: Rail Springs

- General condition check. As the machine warms up for normal operation, check its general condition. Ensure that all the fans are operating and listen for any grinding or clicking noises. The belts should be rotating smoothly without a jerky motion. All guards and covers must be securely in place. Make any repairs or adjustments necessary to return the unit to proper working order.
- Silicone the belts. With the belts turning, spray silicone (not solvent or oil) over the entire length of the belts. This will increase the life of the belts significantly. Grease the belts for inner circle weekly with silicone will increase the life of the belts. (Recommended silicone: Molykote DC111, or any other High Temperature Greases is acceptable)

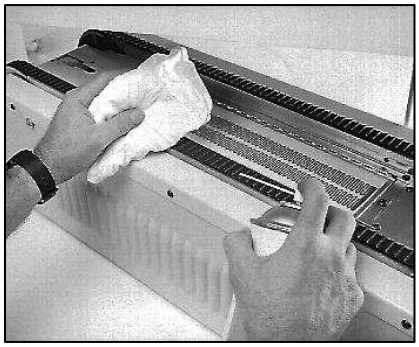


Figure 36: Spraying Silicone over the belts

6.4 Monthly Maintenance

Don’t wait for the machine to break down before giving it some attention. Take a few minutes each month to perform the following procedures. This should ensure a long and reliable service life with minimal downtime for repairs.

- Clean the inside of machine of dirt, dust, or any foreign material. Open each side panel and (with an air hose, vacuum, or damp cloth) clean out any dirt, dust, wires, tubing, adhesive, or anything else that has been trapped inside the machine.
- Inspect the belts. If the belts are worn and fibers are peeling off, replace the belts.

  Grease the belts for inside track weekly with silicone will increase the life of the belts. (Recommended silicone: Molykote DC111)

Figure 37: Motor Brushes

- Check and tighten the bolts for those movement components. Like pulley, pulley mounting block, gears in transmission module.

7 Troubleshooting

NOTE
If the machine is still inoperative after following the troubleshooting and repair procedures in this manual, contact your local TE representative.

DANGER
Some troubleshooting procedures require the machine's power to be ON. To minimize the risk of burns, electric shock, or other injuries, these procedures should be performed only by a qualified maintenance person, and all safety precautions must be observed.

Wear protective gloves to prevent possible burns or electric shock. The heaters remain hot after the belts and fans stop moving. To avoid any burns or injury during troubleshooting, before you begin wait an additional 15 minutes after the normal cool down cycle is complete.

7.1 Alarm Message

Alarm Message	Possible Cause	Corrective Action
Standby time is up!	The time that operator doesn't operate the machine is longer than the standby time, the machine is in standby mode automatically	Reboot device
Emergency Stop!	Emergency stop button be pushed	Release the emergency stop button
Temp controller comm error!	The communication cable between PLC and temp controller is damaged	Check the communication cable between PLC and temp controller
	The PLC communication port is damaged	Check the PLC communication port
	The temp controller error	Check the temp controller
Temperature error!	Actual temperature is higher than 810°C(XB19)/730°C(XB17)	Check the temp sensor
		Check the temp controller
Heating failure	After 90s, actual temperature is lower than 180°C when set temperature is higher than 200°C	Check solid-state relay
		Check Master control relay
		Replace the master control relay.
Temperature error! check heating circuit!	Actual Temperature is higher than set temperature 10°C or lower than set temperature 10°C	Check the connect between temperature controller and PLC
Upper heating chamber open	The upper heating chamber was artificially open.	Close the upper heating chamber and restart the equipment
	The upper heating chamber detects sensor damage	Check and replace the sensor

Alarm Message	Possible Cause	Corrective Action
Upper heating chamber overheat	The temperature of the upper heating chamber is too high, which causes the overheating sensor to work	Check and cool down
	Overheat sensor damage	Check and replace the overheating sensor
Motor fault	Belt motor driver alarm	Check connections between the motor driver and the motor.
		Check the driver and replace as necessary.
Clamp open alarm	Clamp open sensor not detect	Check the clamp open sensor
Clamp close alarm	Clamp close sensor not detect	Check the clamp close sensor
T/P Motor Alarm	T/P motor driver alarm	Check connections between the motor driver and the motor.
		Check the driver and replace as necessary.
Feed Motor Alarm	Feed motor driver alarm	Check connections between the motor driver and the motor.
		Check the driver and replace as necessary.
T/P to Side Fail	T/P motor side sensor not detect	Check the side sensor
T/P to Center Fail	T/P motor center sensor not detect	Check the center sensor
Tube Missing	Tube sensor not detect	Check the tube sensor
		check the tube is missing or not
Probe Up Alarm	Probe up sensor not detect	Check the probe up sensor
Probe Down Alarm	Probe down sensor not detect	Check the probe down sensor
CD Door Open	Door opened	Close the CD door

7.2 Troubleshooting Guide

Problem	Possible Cause	Corrective Action
No power in the machine.	Main power source is not connected.	Connect the power source.
	Emergency stop button is depressed.	Turn and release the emergency stop button.
	Main Switch is OFF.	Turn ON the Main Switch.
	Main Switch is defective	Replace the Main Switch.
	I/O push-button has not been pressed.	Press the I/O push-button.
	I/O button failure	Replace the I/O button
	Fuse FU1/FU2 is blown.	Replace the fuse.
Power to the machine drops as soon as the ON push button is released, without entering cool-down mode.	Fuse FU4 is blown.	Replace the fuse.
	Cooling fan relay is defective.	Replace the fan control relay
	Cooling fan is defective.	Replace the cooling fan.
Heaters will not reach set point.	Heater failed (see Section 7.2).	Replace as necessary (see Section 8.2.3).
	Thermocouple or thermocouple lead wire is faulty between controller and heater (see Section 7.4.1).	Repair as necessary.
	Thermocouple in upper heater is faulty (see Section 7.4.1).	Replace the upper heater (see Section 8.2.2).
	Solid-state relay is defective (see Section 7.4).	Replace the solid-state relay.
	Temperature controller is defective.	Replace as necessary.
	Temperature controller is not programmed correctly.	Reset the parameters
Temperature control varies.	Thermocouple wire is faulty.	Repair the thermocouple wire or replace the upper heater (see Section 8.2.3).
	Temperature controller is not programmed correctly	Reset the internal parameters
	Excessive air movement around machine.	Check for external fans or air conditioning that may be blowing excessive air at the machine.
No power to heaters.	I/O button was not activated.	Press I/O button for 5S to activate it.

Problem	Possible Cause	Corrective Action
	Solid-state relay is defective (see Section 7.4).	Replace the solid-state relay.
	Master control relay is defective (see Section 7.6).	Replace the master control relay.
	Temperature controller set point is too low.	Increase the set point as necessary.
	The heating fuse blew	Check the heater and replace the fuse
	Temperature controller is defective.	Replace the controller.
	Electrical connections are faulty.	Ensure the integrity of the connections.
Heaters will not shut off.	Temperature controller is defective.	Replace the controller.
	Solid-state relay is defective (see Section 7.4).	Replace the solid-state relay.
Fans don't operate.	A fan is defective.	Replace the defective fan.
	Fan fuse is blown.	Replace the fuse. (FU4)
	DC power supply failure.	Replace the DC power supply/drive fault detector board.
	Low-voltage transformer failure.	Replace the low-voltage transformer.
	Faulty electrical connections to fans.	Ensure the integrity of the connections.
Belts don't move.	Set screws and keys are loose or missing on the drive pulleys.	Align pulleys and tighten set screws.
	Electrical connections are faulty.	Check connections between the motor driver and the motor.
	Motor driver is defective (see Section 7.5).	Check the driver and replace as necessary.
	Motor fail (see Section 7.5).	Replace motor as necessary.
No variable speed control.	Motor driver failure.	Replace the driver (see Section 8.2.5).
	CPU speed control failure.	Replace as CPU
Belts walking off pulleys.	Belts are too loose.	Adjust tension (see Section 6.3).

Problem	Possible Cause	Corrective Action
	Upper rails are not adjusted properly.	Adjust position of rails (see Section 6.3).
	Pulley grooves are dirty.	Clean the pulleys
	Assemblies are dragging behind the splice location.	Adjust the position of the assemblies (toward middle of machine).
No grip on wire assemblies being processed.	Floating rails are not adjusted properly.	Adjust pressure on rails (see Section 6.3).
Count Error	Parts Sensor Failure	check the out sensor and replace as necessary.

7.3 Heater Test

If a heater has failed, the touch panel will indicate that heating failed. The temperature controller will cease to display the element temperature. The following procedure will determine which heater has failed.

- When the machine is cool, turn OFF the Main Switch and unplug the power cord.
- Remove the top and side panels
- Measure the heater resistance at terminal blocks T5 and T8, located near each element

NOTE
If the resistance of both heaters is acceptable and a heater fault continues to occur, the problem is likely one of the heater power relays KA1.

7.4 Temperature Control Circuit Test

The temperature circuit consists of the temp controller, thermocouple over temperature switch, and cool down timer circuit. The following procedure describes the test for each circuit.

7.4.1 Thermocouple Check

NOTE
The upper heater and the thermocouple are assembled as a single unit. If a damaged wire or insulation cannot be repaired, the upper heater must be replaced.

Figure 38: Temperature Controller

When the machine is cool, turn OFF the Main Switch and unplug the power cord.

- Open the electrical cabinet.
- Disconnect either thermocouple lead from the rear of the temperature controller and measure the resistance across thermocouple wires. If the resistance is infinity, the wire is broken. If tracing the length of the wire does not reveal the break, it may be inside the upper heater. Continue with the following steps.
- Remove the top sheet metal cover.
- Disconnect the miniature thermocouple plug and measure the resistance from the male end connected to the heater. If the resistance is greater than 2Ω, replace the upper heater. If the resistance is less than 2Ω, the fault lies in the extension wire between the plug and the temperature controller.

7.4.2 Over temperature Circuit Test

A normally closed resettable thermal switch, located in the upper heating chamber, senses when there is an over temperature condition. Should an over temperature condition occur, the touch panel will show the heating chamber to overheat, the timing belt moving forward (lockout gate will rise), and power to the heaters will be shut off.

When the machine is cool, turn OFF the Main Switch and then turn it back ON.

Press the I/O button. If the machine immediately illuminates the over temperature indicator light and goes into cool down mode even though the machine is cool, the over temperature switch (TSW1) is defective and must be replaced.

NOTE
The over temperature switch (TSW1) can be checked directly by measuring the resistance across the terminals of the switch. The resistance should be 0 Ω. If the resistance is infinity, replace the switch.

- Remove the top sheet metal cover.

Figure 39: Overtemperature Switch (TSW1)

- Remove the bracket (with the over temperature switch attached) from the top of the upper heating element shield.
- If the switch is closed (alarm is OFF), apply heat to the switch with a heat gun. The switch should then open (over temperature light illuminates) at a temperature of approximately 200 ºC. If the switch does not open, replace it.

7.5 Solid -State Relay Test

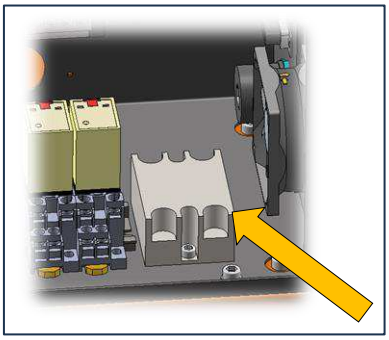


Figure 40: Solid State Relay

DANGER

Only a qualified electrician should perform this test with machine power on and should wear electrical insulating gloves and follow all electrical safety precautions when performing the test.

NOTE

The first part of this test is performed while the temperature controller is supplying full power to the heaters. The second part of the test is performed with the temperature controller supplying no power to the heaters.

- After the machine has cooled down, open the electrical cabinet cover and remove the Plexiglas cover on the solid-state relay.
- Press the I/O button.
- Set the temperature control to 600 ºC.
- Measure the input voltage across terminals #3 and #4 of the solid-state relay.
- When full power is on to the heaters, the voltage measured should be approximately 24 Vdc. If no voltage is present, check the output of the temperature controller and the electrical connections between the temperature controller and the relay.
- Measure the output voltage across terminals #1 and #2. If there is power to the heaters, the voltage measured should be approximately 0 Vac. If the voltage present is significant (>3 Vac), the solid-state relay has an open circuit; replace the relay. If the relay is not open and still fails to heat up, check the heater power relays.
- Lower the set point of the temperature controller to 20 ºC. This part of the procedure is performed with no power supplied to the heaters.
- Measure the input voltage across terminals #3 and #4. The voltage should be approximately 0 Vdc. If significant voltage is present, the temperature controller is defective.
- Measure the output voltage across terminals #1 and #2. The voltage measured should be the line voltage (200 to 260 Vac). If no voltage is present, the solid-state relay is shorted.

7.6 Drive Circuit Test

The drive circuit consists of the Closed-loop stepper motor, motor driver, and PLC and all interconnections.

DANGER

This test is performed with the machine power on. Wear electrical insulating gloves and follow all electrical safety precautions when performing this procedure.

7.6.1 PLC drive Test

- Open the electrical cabinet cover to gain access to the PLC.
- Measure the input DC voltage across terminals L+ and M, wires #5 and #104. The voltage measured should be direct current 24V DC. If it is not, check the line on the controller board.
- When XB Belt Heater is in working, its PLC pulse output terminal Q0.0 and Q0.2 will emit pulse in reverse according to the operation, the status display lamp will be lit, and its feet #34, #36, and #104 will output 24V DC, to drive the stepper motor.

Figure 41: PLC module

- If the Q0.0/Q0.2 indicator is flashing but no voltage output, then the PLC is at fault.

7.6.2 Stepper motor driver

- Open the electrical cabinet cover to gain access to the stepper motor driver.
- Measure the input DC voltage across terminals V+ and V-, wires (21) and (104). The voltage measured should be 24 V DC. If it is not, check the line on the controller board.
- Check whether the dial code of the motor driver is correct. See circuit diagram P6 for the specific setting.
- Check the wiring of the motor. If the wiring is damaged, the motor may not run or be in the wrong direction.
- There are two indicator lights on the stepper motor driver. According to their state, the cause of motor failure can be determined:

When 1 green and 1 red flash alternately, it indicates phase overcurrent;

When 1 green and 2 red flash alternately, the motor phase is open;

When 1 green and 4 red flash alternately, it indicates low power supply;

When 1 green and 5 red flash alternately, it indicates that there is other fault (for example: out-of-tolerance position).

When the above protection function starts, the motor shaft loses the self-locking force. To restore normal operation, the above faults need to be confirmed to be eliminated. Then the power is restarted, the power indicator is always on green, the motor shaft is locked, and the driver is restored to normal.

Figure 42: Stepper motor driver

7.6.3 Motor Resistance

- Disconnect power to the machine.
- Disconnect either wire from A + and A - /B+ and B- on the motor driver board to measure the resistance to the motor between wires # 53 and #52. The resistance should be approximately 10.3Ω. If the resistance is significantly higher or lower, replace the motor.

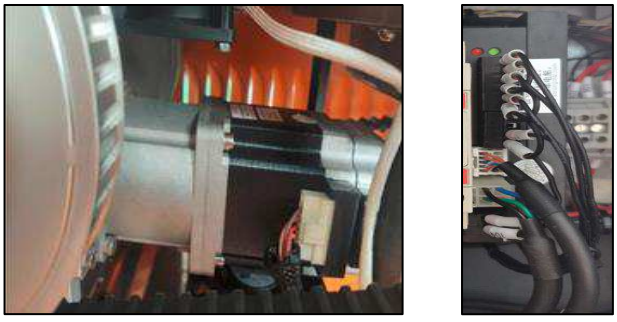


Figure 43: Stepper motor and driver

7.7 Safety Relay Test

Figure 44: Safety Relay (KS1)

- Open the electrical cabinet to gain access to the Safety Relay.
- Turn on the air switch, make sure the emergency stop button is not pressed;
- The relay should activate, apply power to the drive circuit.
- Measure the voltage on the coil of the relay on terminals #5 (A1) and #104 (A2); The voltage should be approximately 24 V DC. If there is voltage, but the relay is not active, the relay is defective.
- The safety relay apply power to the stepper motor, cooling fan, heating control circuit and power to the middle mechanism, check these components as required
- Under normal working condition, the indicator light of K1, K2, K3 and K4 will be on.

NOTE
Please test the actual circuit according to the circuit diagram.

7.8 DC Power Supply / Drive Fault Detector Circuit Test

Figure 45: DC Power Supply

DC power supply provides power supply for the whole machine (except heating elements).

- Measure the voltage on the coil of the relay on terminals #4 (L) and #103 (N);
- The voltage should be approximately 220V AC. If there is voltage, but the relay is not active, the relay is defective.
- Measure the voltage on the coil of the relay on terminals #5 (+V) and #104 (-V); The voltage should be approximately 24V DC. If there is not voltage, the relay is defective.
- With the machine cool and the Main Switch OFF, remove the back cover of the collection bin. The power supply is located above the power transformer. Remove the fuses on the PCB and check it for continuity. If the resistance is infinity, replace the fuses.

NOTE
XB17 has two input power supply specifications of 115V/230V. For different voltages, the power supply needs to be switched by dial code switch, as shown in Figure 46.

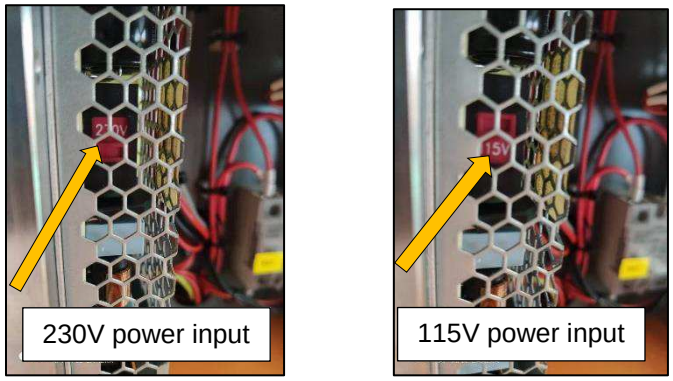


Figure 46: DC Power Supply (230V/115V switch)

7.9 Optical Parts Counter

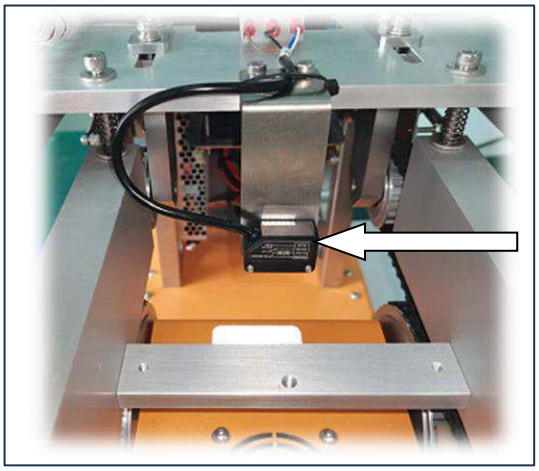


Figure 47: Photo Sensor (1PHTSENS)

Through the photoelectric sensor detection, the signal will be transmitted to the PLC, by the PLC to complete the counting function.

- Use the object to pass under the photoelectric sensor. If the indicator light above the sensor changes, check its connection line with the PLC. If the indicator light doesn't change, the fault lies in the reflector or photo sensor.

- Inspect the reflector. If it is dirty, clean it using a damp soft cloth. If it is damaged, replace the reflector （TE PN: 5-2375314-4）.
- Place a piece of white paper under the photo sensor (over the reflector). A red-light beam should be visible. If it is not, replace the photo sensor.
- Sensor was assembled to locate in center as default, also it has additional mounting hole on left or right side. Customer can adjust it to sides if need. The reflector which attached on bottom of heat channel, should also be adjusted accordingly.

8 Components and Repair

Follow the guidelines in Sections 8.1 through 8.4 for replacing the major components of the machine.

NOTE
If the machine is still inoperative after following all troubleshooting and repair procedures, please contact your local TE representative.

DANGER

These procedures should be performed only by a qualified maintenance person. To minimize the risks of burns, electrical shock, or other injuries, all safety precautions must be observed.

To prevent electric shock, perform this work with power OFF. First turn off the Main Switch. Then unplug the power cord.

The heaters remain hot after the belts and fans stop moving. To avoid any burns or injury during maintenance, wait an additional 15 minutes after the normal cool down cycle is complete before beginning.

Do not attempt to bypass the Main Switch.

Do not attempt to bypass the emergency stop switch.

NOTE
When reassembling panels, be sure no wires are pinched between the outer panels and the inner frame, or an electrical short or blown fuse could result.

To avoid machine damage, replace fuses only with new fuses of the original amperage, voltage, and type. For recommended values, see outside panel of electric electrical cabinet, Specifications, or the fuse labels.

To rotate the belts, or to check the voltages for heater output, you may reconnect the machine. Disconnect it again before resuming repair work.

8.1 Electrical cabinet

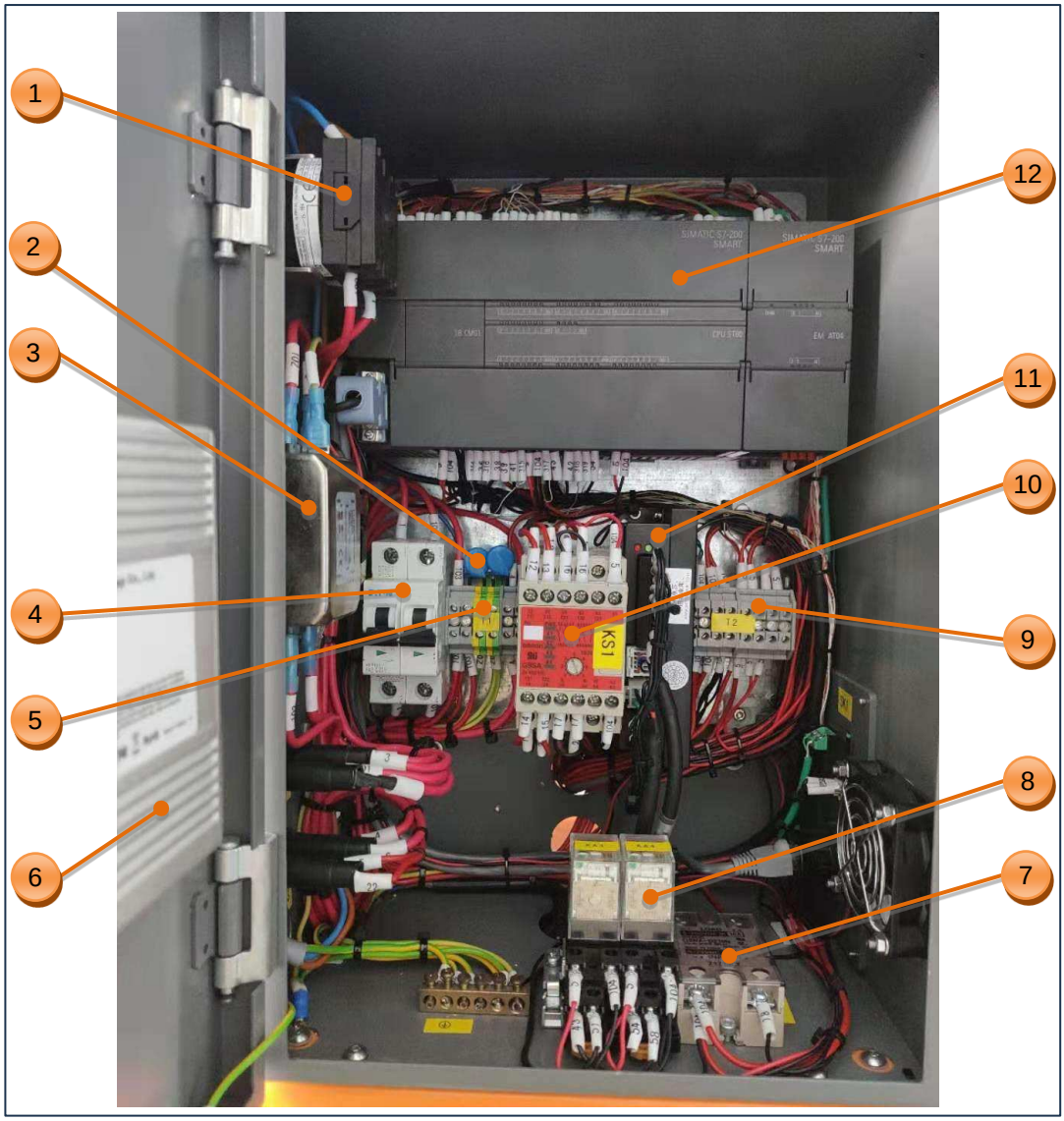


Figure 48: Electrical cabinet

1. Main Switch QS1
   Isolating the external power supply
2. Piezoresistor
   Improve power supply quality
3. Filter FL
   Filter particular frequency current
4. Power switch QF1
   Protect the machine from an electrical overload
5. Terminal block T1
   Connect the wires
6. HUB
   Exchange the signal from PLC, HMI and external device
7. Fan Relay KA2
   Control the cooling fans
8. Electrical Relay KA3 & KA4
   Control the circuit
9. Terminal block T2
   Connect the wires
10. Safety relay KS1
    Control the safety action of machine, like E-stop
11. Stepper motor driver MD1
    Control the motor
12. PLC
    Main controller of the machine

8.2 Key components replacement

8.2.1 Belt Replacement

Figure 49: Drive belts

- When the machine is cool, turn OFF the Main Switch and unplug the power cord
- Remove all of the covers upper panel (for access to upper belts for replacement), both side panels, and lower front panel (for access to lower belts for replacement).
- Loosen the two tensioning screws located on the end of the front bearing stand.
- Remove the two screws on the rear of the belt guides to remove the lower belts.
- Remove the belts.
- Clean the pulley grooves. Use a wire-bristled brush to remove any dirt or adhesive buildup in the timing grooves.
- Check that the set screws are in place and secure in the drive pulleys and that the pulleys are aligned properly with the belt guides.
- Ensure that the bearings are secured to the bearing stands. They are secured with a bolt and nut though the stands.
- Inspect the foam pads and belt guides at this time. Replace as necessary.
- Install new belts by reversing the previous procedure (Steps 1-9)

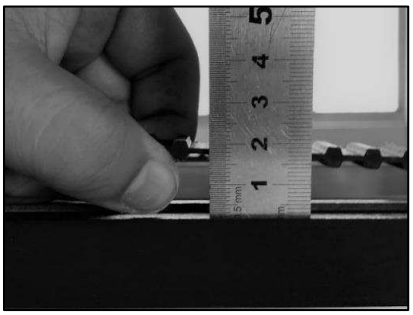


Figure 50: Measuring the Belt Tension

- Tension the belts by gripping the bearing stand and pulling forward. While keeping tension on the stand and belts, tighten the two locking, screws on the corresponding bearing stand.
- Replace and tighten the screws on the rear of the belt guides after replacing the lower belts.
- Measure the belt play by gripping the belt in the center and lightly pulling the belt away from the foam pad or belt guide. There should be a 17 mm (0.75 in) gap between the center of the belt and the foam pad or guide.

NOTE
Belts that are too tight will prematurely wear the bearings and stretch the belts.

Replace the upper timing belt with optional thin cable belt (Section 8.3.7), will allow the machine can carry thin cable. Assemble this thin cable belt, with big tooth towards outside track.

Ensure that the upper backing rails are touching the upper belts. If they do not touch the belts, they may not securely grip smaller assemblies being processed.

Adjust the rails by using the spring -loaded screws at the end of the rails.

8.2.2 Heater Replacement

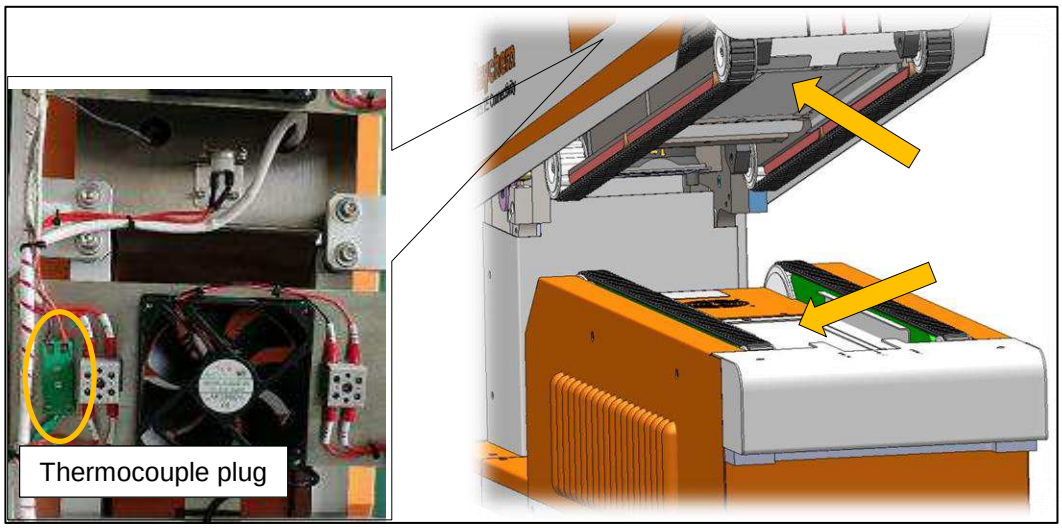


Figure 51: Heater

The machine has two heaters, one upper and one lower. The temperature is controlled through a K-type thermocouple embedded in the upper element. See section 2.1 specification, for the heaters spec.

For XB19 standard machine, allow to shift the heater to wider size heater, and the distance between left and right belt can be adjust wider accordingly. For assistance, contact your local TE representative.

- Remove the two mounting screws securing the heaters to the baffles.
- Remove top cover and disconnect the power leads by loosening the screws on the terminal block.
- Disconnect the thermocouple mini plug (Left picture in Figure 51) when replacing the upper heater.
- Remove the heater.
- Install a new heater by reversing the procedure.

NOTE
Calibration is need after heater replacement.

8.2.3 Motor driver Replacement

Figure 52: Motor driver

- Switch the Main Switch to OFF position and unplug the power cord.
- Open the electrical cabinet cover.
- Remove the motor driver cover standoffs.
- Remove all wires from the controller. Note the position of the wires before removal.
- Remove the mounting screws from the controller.
- Set the dial switch above the new drive.
- Install a new controller by reversing the above procedure.

8.2.4 Idler Pulley and Bearing Replacement

The bullets come already pressed into the sealed needle bearings. They are replaced as a set, pulley and bearing.

- Remove the nut that secures the bolt to the bearing into the stand.
- Remove the pulley and bearing assembly from the stand and replace the entire unit. Do not try to separate the bearing from the pulley. The bearing is pressed into the pulley hub and is replaced as one unit.

8.2.5 Drive Pulley Replacement

- Remove the side covers.
- Mark the position of the pulley on the shaft. The pulley must be reinstalled in exactly the same position on the shaft as the old pulley.
- Loosen the 2 sets of screws in the pulley.
- Slide the pulley off the shaft, ensuring that the key is not lost.
- Slide the new pulley onto the shaft and locate it in the exact same position as the old pulley.
- Install the key and tighten the set screw.

8.2.6 PLC or HMI replacement

ONLY WHEN PLC or HMI was replaced, it would require to do additional setting to below items.

To enter the current interface, you need the password with the highest authority (please contact the local field service engineer to obtain the password).

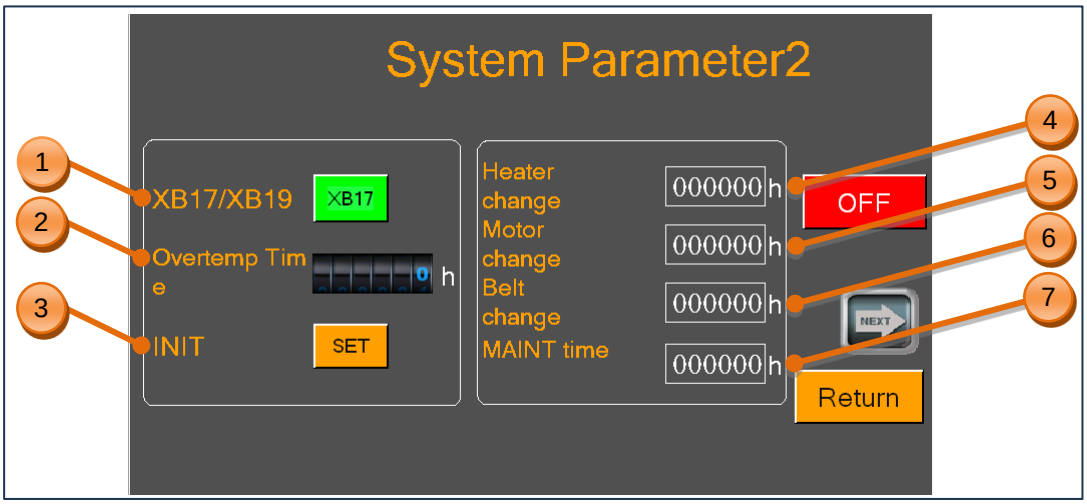


Figure 53: System Parameter 2

1. XB17/XB19
   Refer to nameplate to select the right model of machine.

2. Overtemp Time
   Time when the temperature of the heater exceeds 550 ℃

3. INIT
   Initial all the parameters.

4. Heater change
   Time of heater replacement.

5. Motor change
   Time of motor replacement.

6. Belt change
   Time of belt replacement.

7. MAINT time
   Time of maintenance.

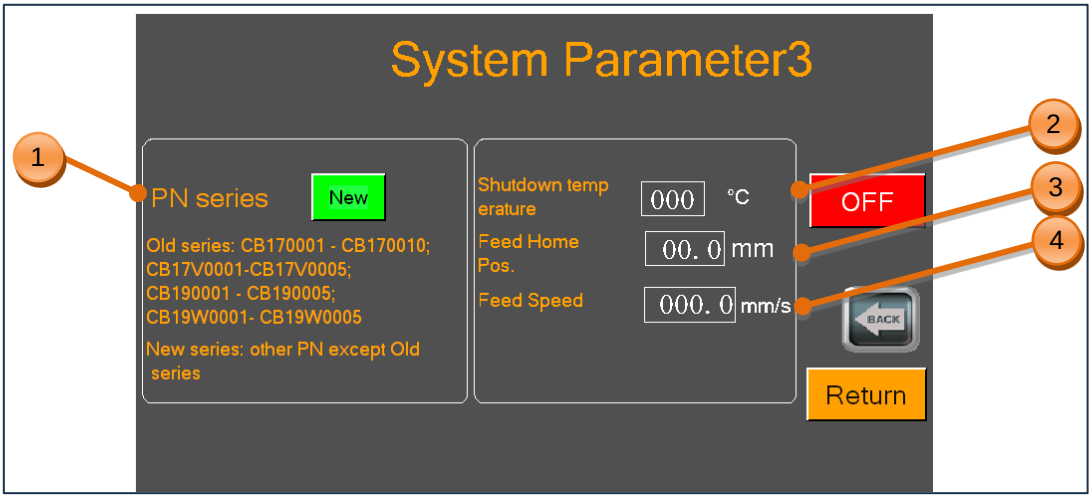


Figure 54: System Parameter 3

1. PN series
   Select new or old according to the prompts below.

2. Shutdown temperature
   Below this temperature, machine will shut OFF automatically, default value is 200℃.

3. Feed Home Pos
   Set the initial feeding position of the Centering Device according to the actual materials.

4. Feed speed
   Set the feeding speed of the Centering Device according to the actual materials.

8.3 Optional Accessories

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

8.3.1 Custom tooling (PN TBD)

In case of special product, like stub splice, ring terminal, it would need custom tool to process in XB Belt Heater.

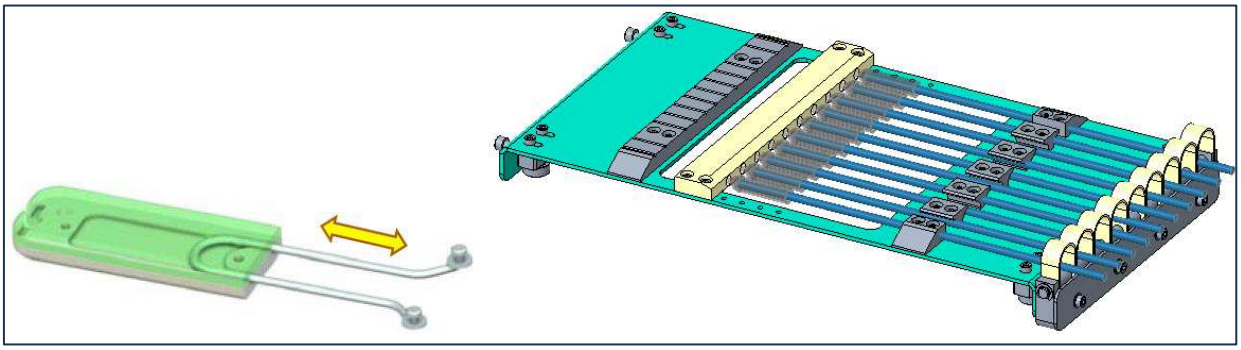


Figure 55: Custom tooling

8.3.2 Floorstand (TE PN: 2375329-1)

Figure 56: Floorstand

Figure 57: Floorstand with Belt heater and Centering Device

8.3.3 Calibration tool

Calibration tool:

- UHI 250A probe. (TE PN: 7-1192190-9, ORDER-NO: 288869-000)
- Extension Cable. (TE PN: 9-2375314-6)
- Thermometer. (TE PN: 9-2375314-7)

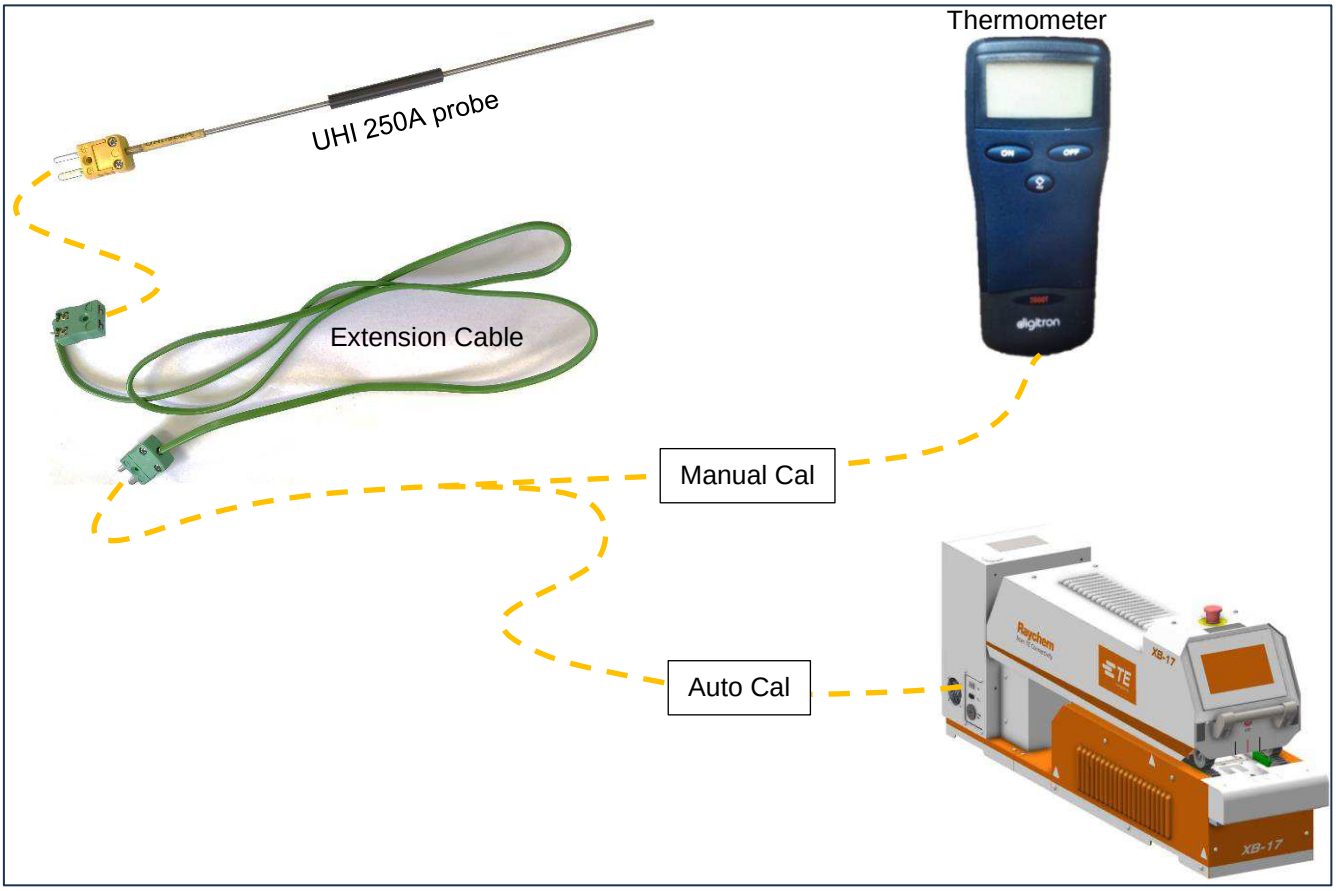


Figure 58: Calibration tool

8.3.4 Centering Device (TE PN: 2375330-1)

The Centering Device is an optional device that can be adopted to the XB Belt Heater in front. The Centering Device ensures the correct position of the heat shrink tube and the wire splice before feeding into heating chamber. See section 4.2.2, about how to operate machine with Centering Device.

Capacity: Max Tube length 110mm, Min cable length 450mm (excluding length to be caught by hands).

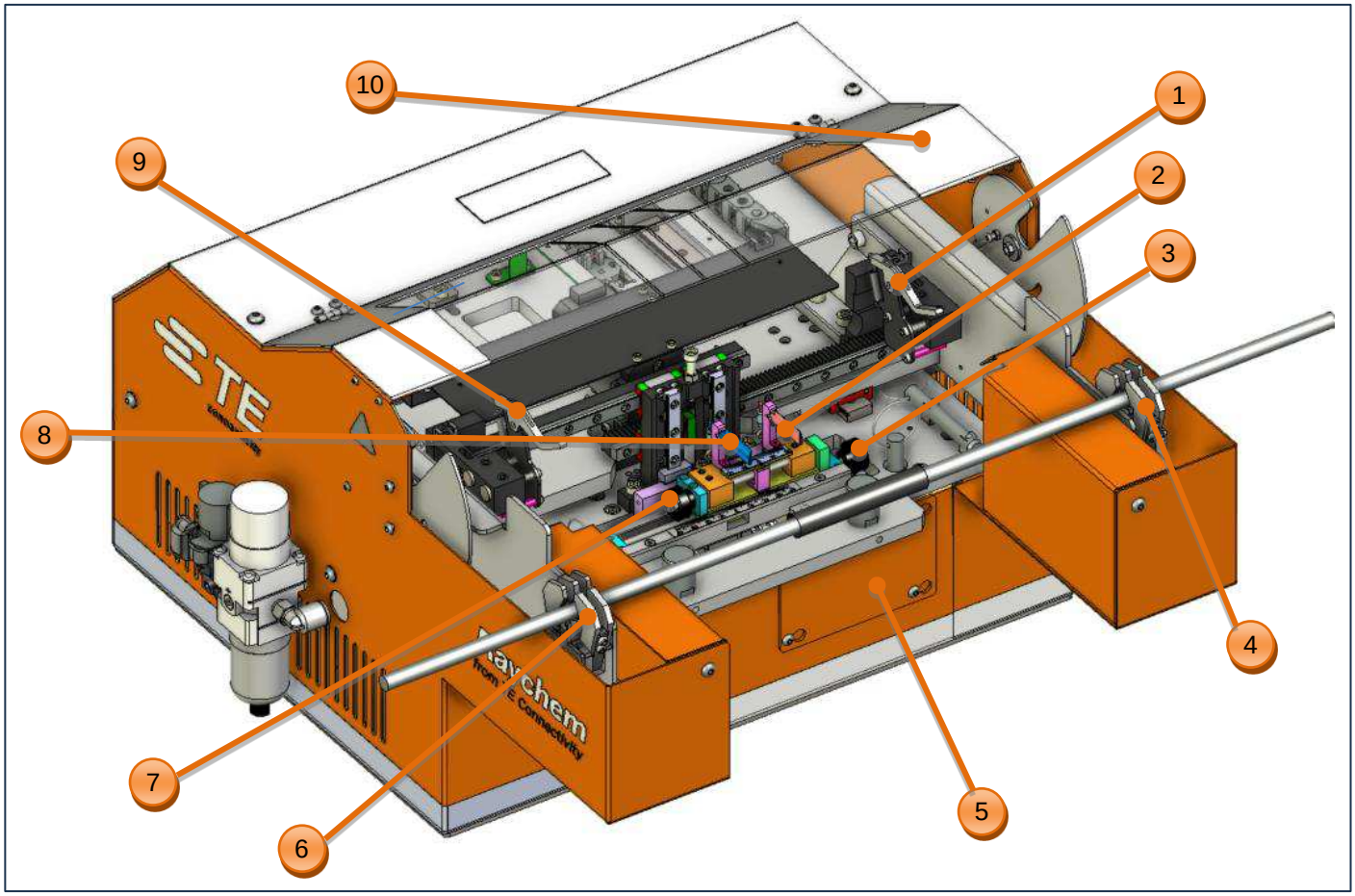


Figure 59:Centering Device

1. Left Tube Pusher
2. Left detection probe
3. Offset adjusting Knob
4. Left clamping cylinder
5. Interface cover
6. Right clamping cylinder
7. Probes space adjusting knob
8. Right Detection probe
9. Right Tube Pusher
10. CD door

Installation:

- Remove the CD cover and Feed tray from the front of machine.
- Connect the Centering Device communication cable and power cord with machine CD interface.
- Refer to Figure 61, assemble CD onto machine front and fix it by 2X alignment pins.
- Refer to Figure 62 install the CD safety guard onto top chamber and fix it by 6X set screws.
- Connect the air supply.

- Activated Centering Device by switching on “CD switch” in HMI maintenance page.
- Then operator can see the detection unit moving up to detection position, and centering plate trying to find the original position. In touch panel, it appears the Centering icon on page top.
- Then Centering Device is ready for production.

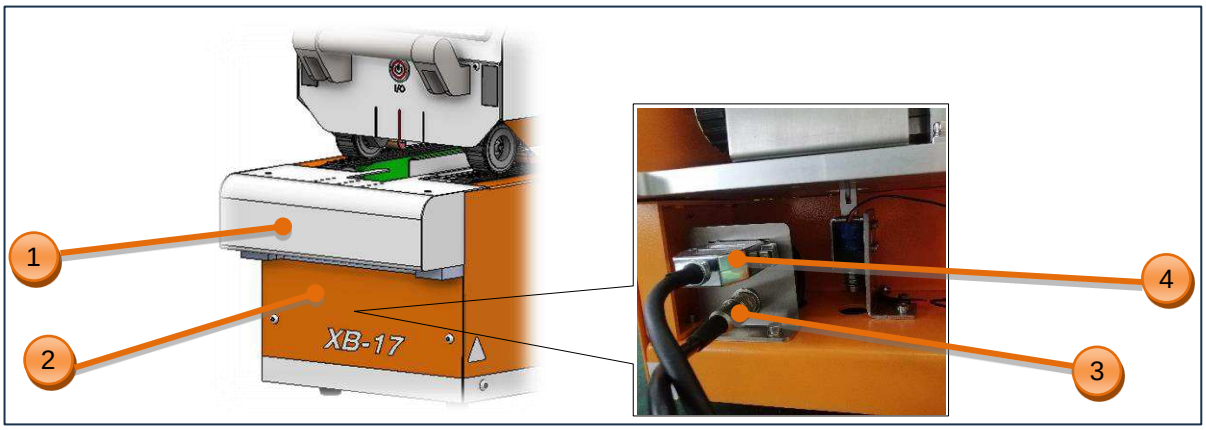


Figure 60: Machine CD interface

1. Feed tray
2. CD cover
3. Power cord
4. Communication cable

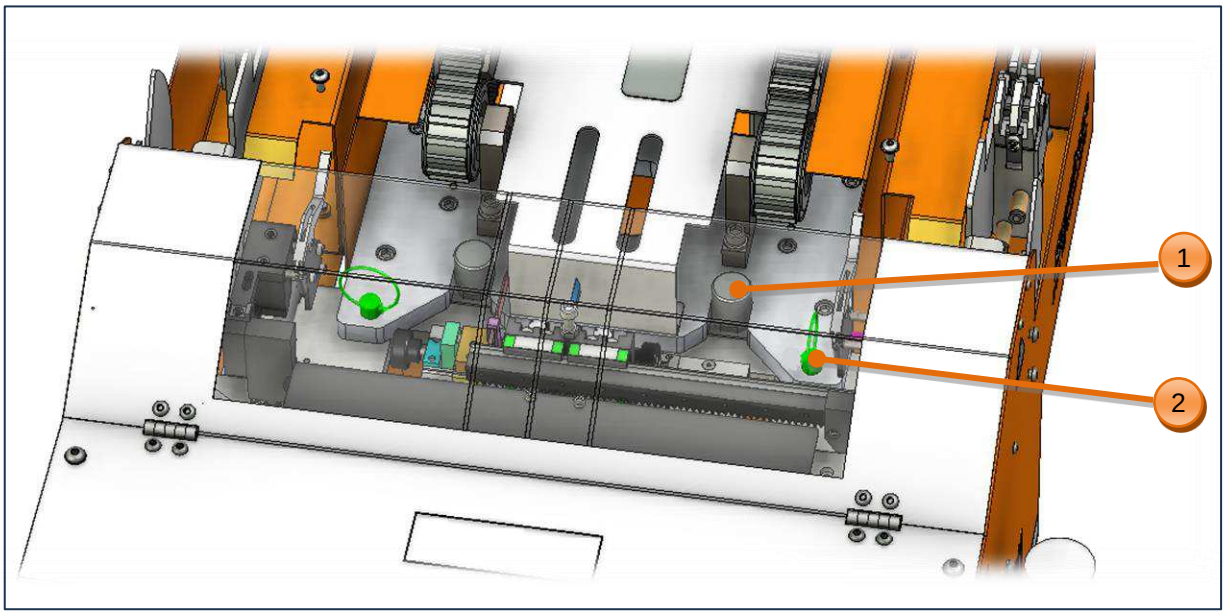


Figure 61: CD connect interface

1. 2X guide rods
2. 2X Alignment Pins

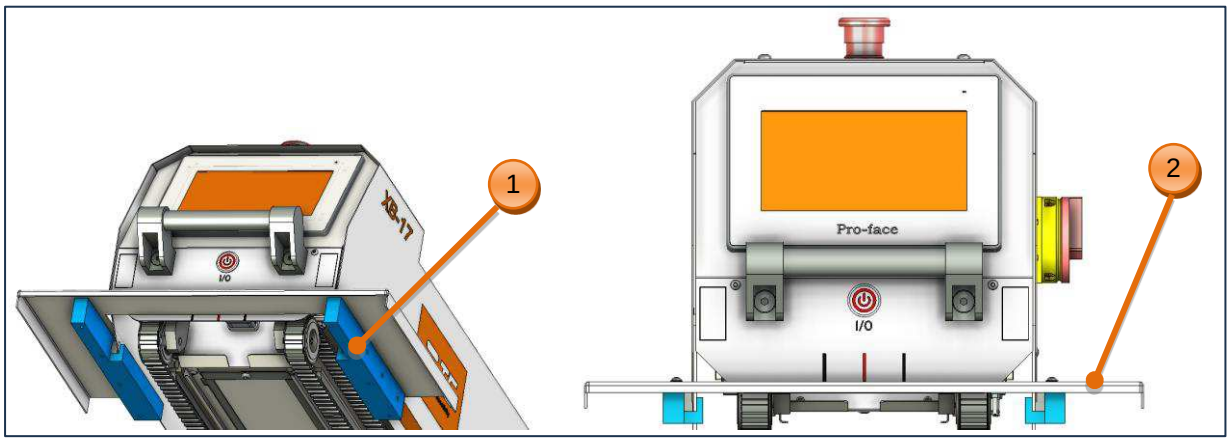


Figure 62: CD safety guard

1. Set screw
2. CD safety guard

8.3.5 Lockout gate (TE PN: 2375311-6)

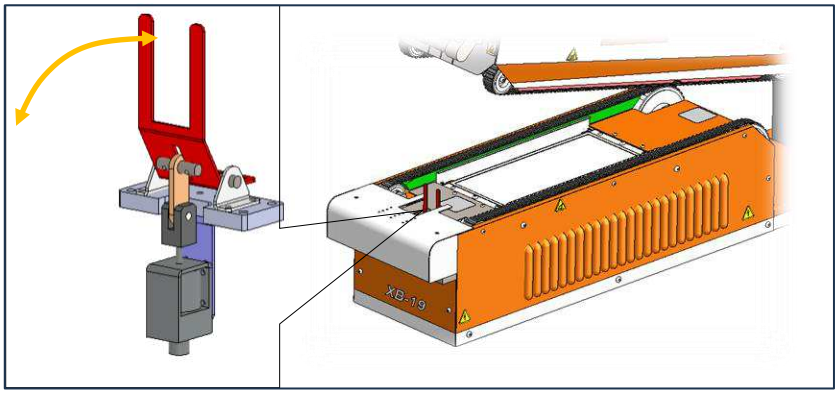
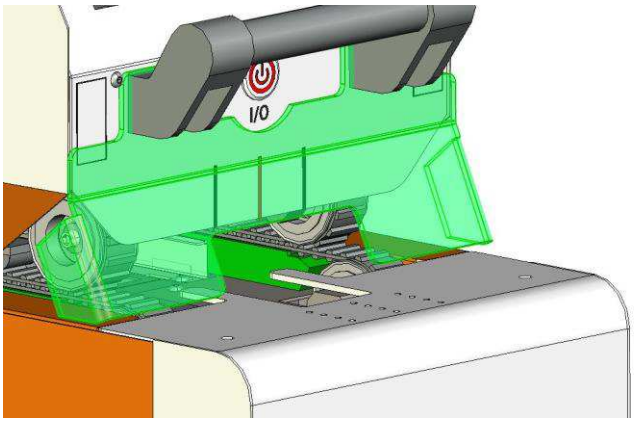


Figure 63: Lockout Gate

Optional mechanism, with same function as Reverse. Lockout gate will rise when beyond preset temperature range, preventing feeding new product. Standard Machine already have timing belt reverse function. Operators need to shift lockout gate or reverse accordingly in HMI maintenance page when trying to activate Lockout Gate. See section 5.5, item 4.

8.3.6 Protective Cover (TE PN: 2409590-1)



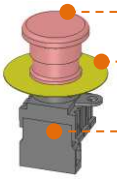
Optional enhanced protection, which can better protect the operator's hands after installation.

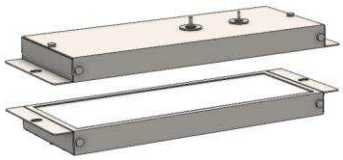
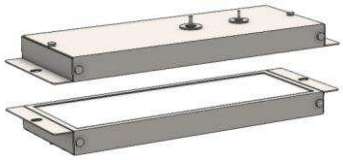
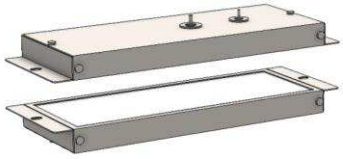
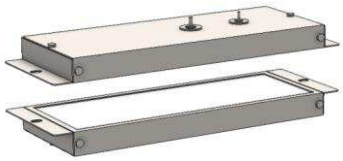
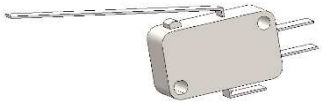
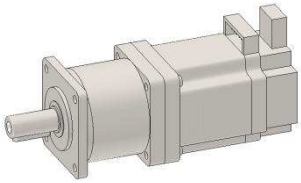
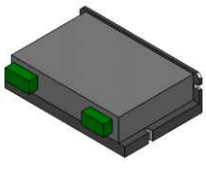
8.3.7 Other accessories

9-2375314-9	***Barcode Scanner, wireless***
9-2375314-8	***Light Tower***
2-2375314-0	***Upper timing belt, thin cable, XB17***
2375324-2	***Upper timing belt, thin cable, XB19***
2234787-1	***RS232 connection cable, ultrasonic***
2234787-2	***RS232 connection cable, ultrasonic, with adapter (NON-CE)***
2234787-3	***RS232 connection cable, ultrasonic, with adapter (CE)***

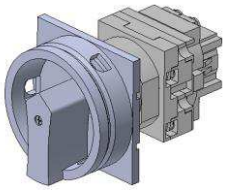
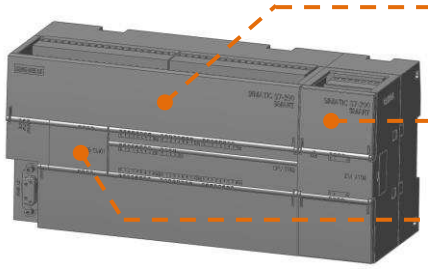
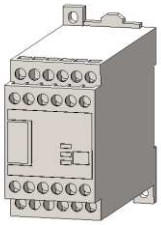
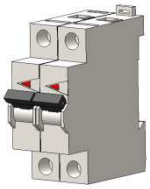
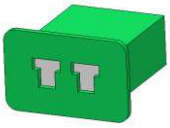
NOTE
Ultrasonic RS232 connection cable 2234787-1 cannot used on XB17C or XB19C directly. Without connecting with an adapter, it has risk cause short cut issue to Centering Device.

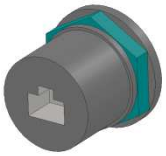
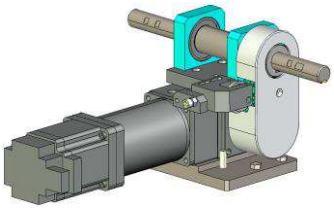
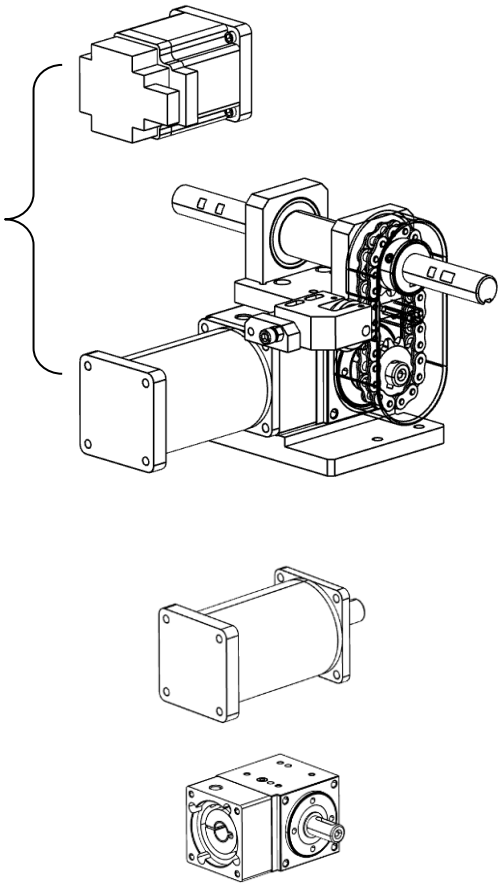
8.4 Spare Parts

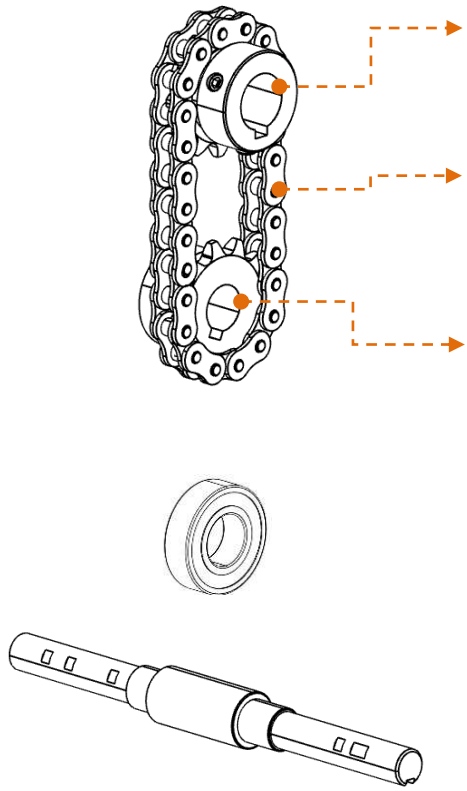
Description	Picture	Part No	Note
I/O button		*1-2375314-5*	*See Figure 2, item 8*
E-stop button		*2234983-1* *2234983-2* *2234983-3*	*See Figure 2, item 5*
Touch panel		*3-2375314-2*	*See Figure 2, item 6*
USB port		*2-2375314-5*	*See Figure 2 item 4*
FAN		*1-2375314-2* *1-2375314-3* *5-2375314-5*	*Top chamber* *BTM chamber* *Cooling zone*
Photoelectric sensor		*4-2375314-2*	*2X in top chamber* *See Figure 47*
Reflector, photoelectric sensor		*5-2375314-4*	*Loc under photoelectric sensor.* *See Figure 47*
Thermostat		*4-2375314-9*	*See Figure 39*

Description	Picture	Part No	Note
XB17 Heater, 220V (Machine 2375310-1)		2375317-3 2375317-4	Upper heater Lower Heater
XB17 Heater, 110V (Machine 2375310-2)		2375317-5 2375317-6	Upper heater Lower Heater
XB19 Heater, STD (Machine 2375320-1)		2375327-3 2375327-4	Upper heater Lower Heater
XB19 Heater, Wider (Machine 2375320-2)		2375327-5 2375327-6	Upper heater Lower Heater
The micro switch		4-2375314-3	Rear side of top chamber
DC Power Supply		4-2375314-1	See Figure 45
Temperature controller		3-2375314-9	See Figure 38
Stepper Motor		6-2375314-7	BTM chamber See Figure 43
Motor driver		7-2375314-5	See Figure 48, item 11

Description	Picture	Part No	Note
Timing Belt, XB17		1-2375314-6 2-2375314-7	upper lower
Timing Belt, XB19		2375324-1 2375324-4	upper lower
Kit, foam pad, XB17		1-2375324-7	Press on upper timing belt
Kit, foam pad, XB19		2-2375324-1	Press on upper timing belt
Belt guide, XB17		3-2375312-3	BTM chamber
Belt guide, XB19		1-2375322-5	BTM chamber
Idler pulley		2-2375314-2	
Drive pulley		6-2375314-1	

Description	Picture	Part No	Note
Main switch		*8-2375314-9*	*See Figure 48, item 1*
PLC ASSY		*8-2375314-3* CPU module, programmed *6-2375314-9* Analog input module *6-2375314-8* Communication module	*See Figure 48, item 12*
HUB		*7-2375314-3*	*See Figure 48, item 6*
Safety relay		*7-2375314-9*	*See Figure 48, item 10*
Miniature circuit breaker		*8-2375314-6*	*See Figure 48, item 4*
Wave filter		*8-2375314-5*	*See Figure 48, item 3*
Thermocouple panel socket		*7-2375314-6*	*See Figure 2, item 1*

Description	Picture	Part No	Note
Ethernet port		7-2375314-2	See Figure 2, item 3
D-sub 9 pin connector		8-2375314-2	See Figure 2, item 2
Compression spring		4-2375314-4	See Figure 35
 Power Unit, ASSY （For XB17&19）		2-2375328-0 Stepper motor 2375325-1 Transmission Module 4-2375328-4 Reducer 4-2375328-2 Reversing gear	BTM chamber

Description	Picture	Part No	Note
		***3-2375328-6*** ***Idler Sprocket*** ***3-2375328-0*** ***Chain*** ***3-2375328-8*** ***Drive Sprocket*** ***1-2375328-4*** ***Bearing*** ***3-2375328-4*** ***Shaft***	

9 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 4.

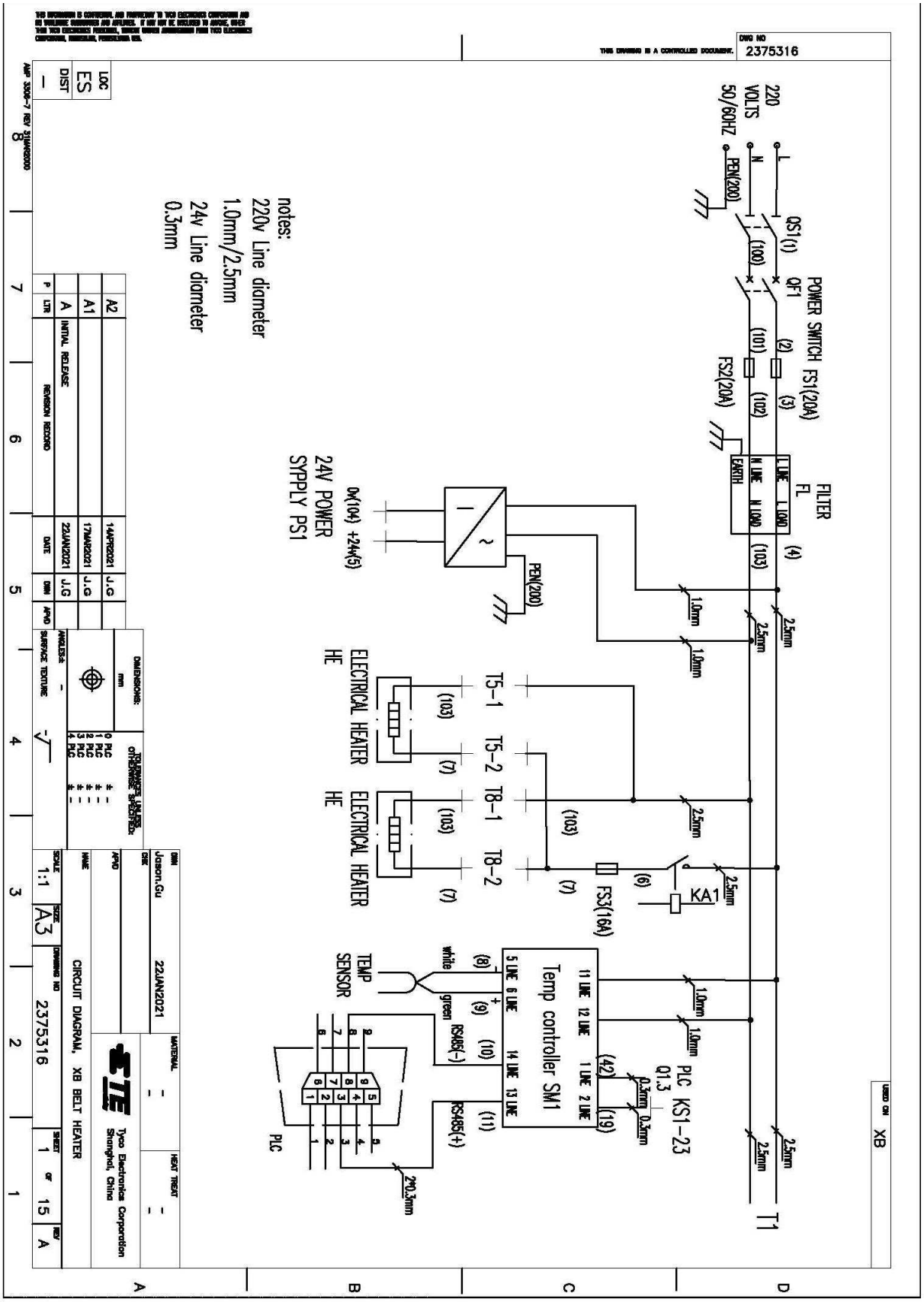
Figure 64: Service and repair

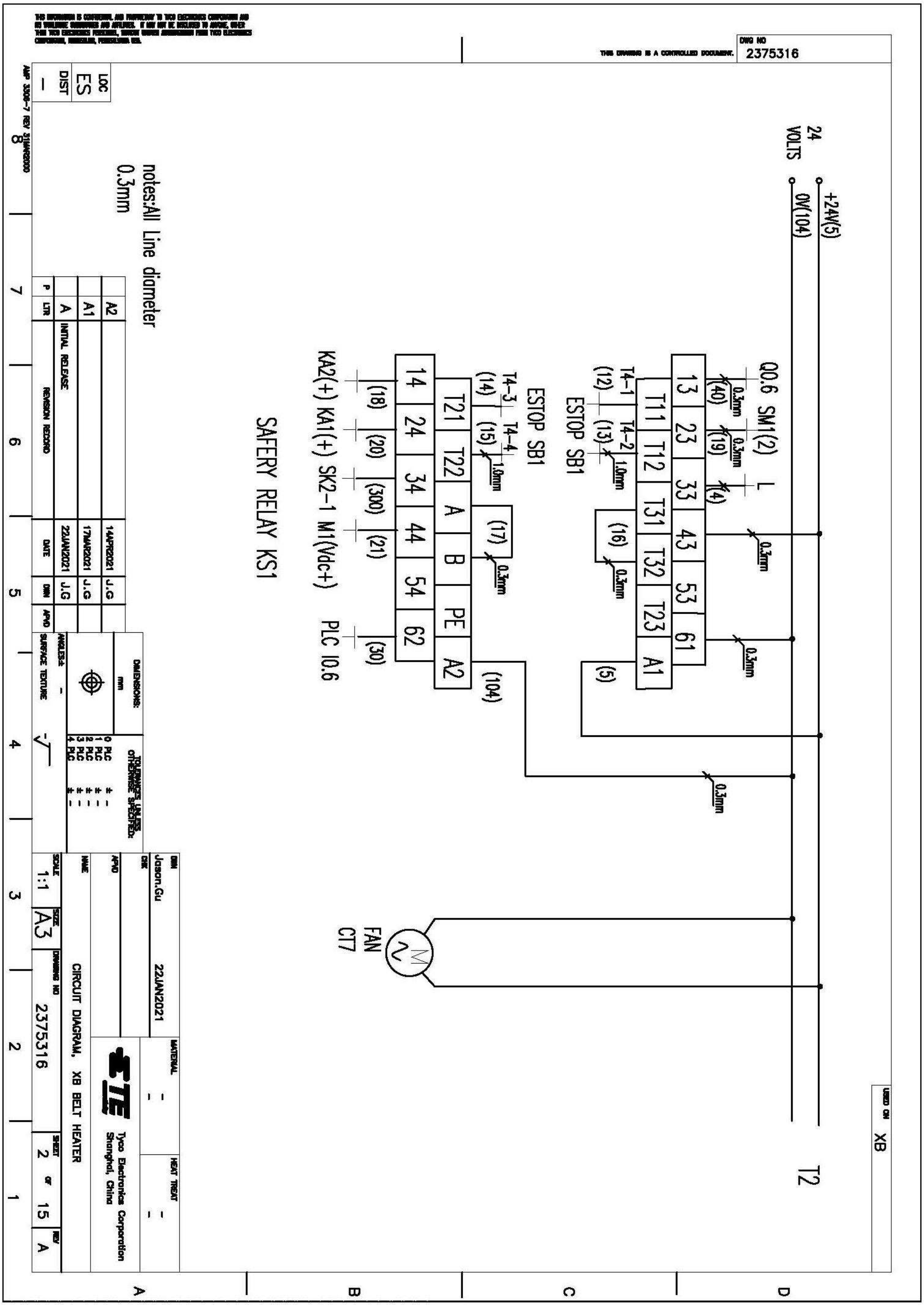
Table 4: Field service e-mail addresses

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

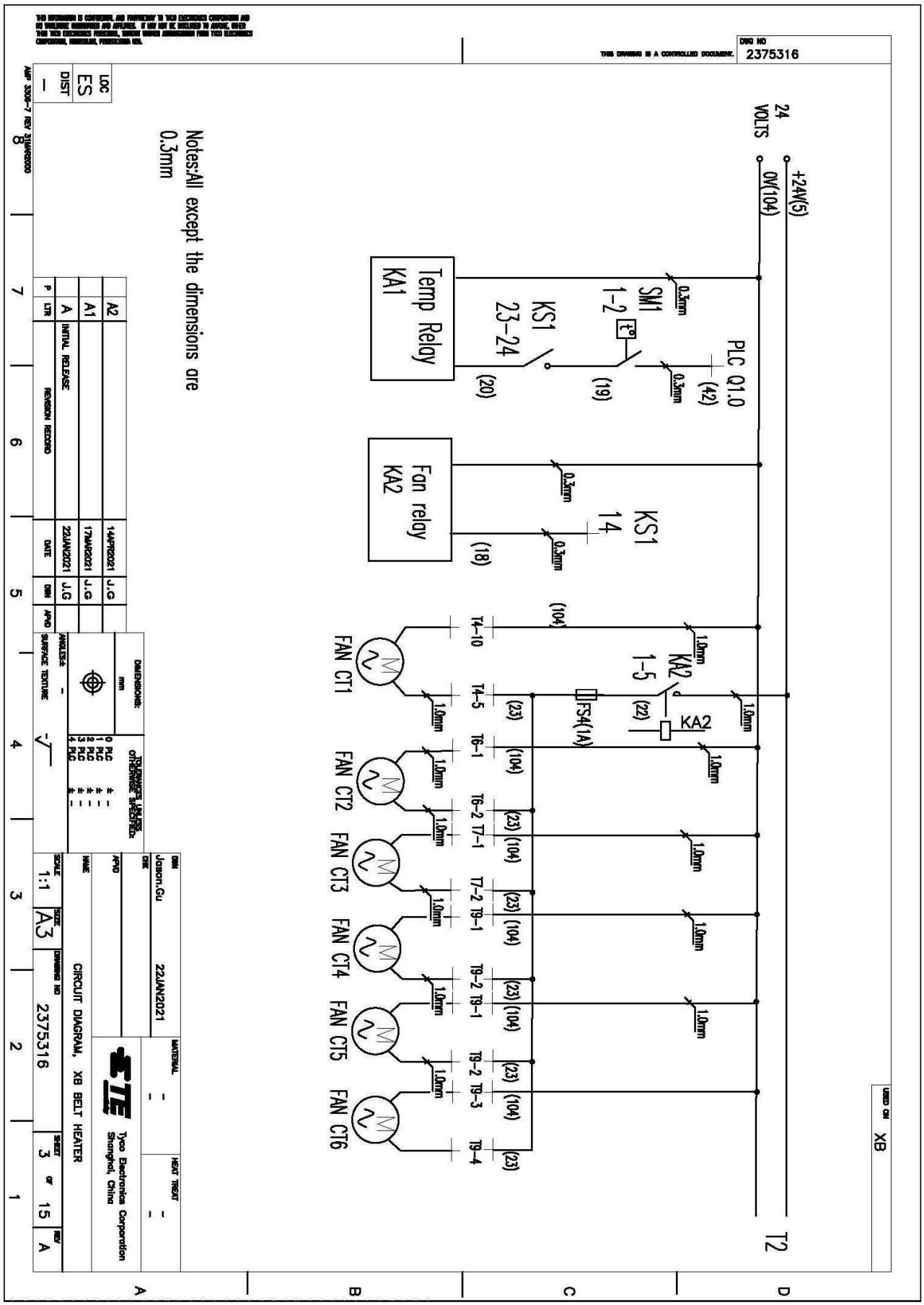
10 Schematic Diagram

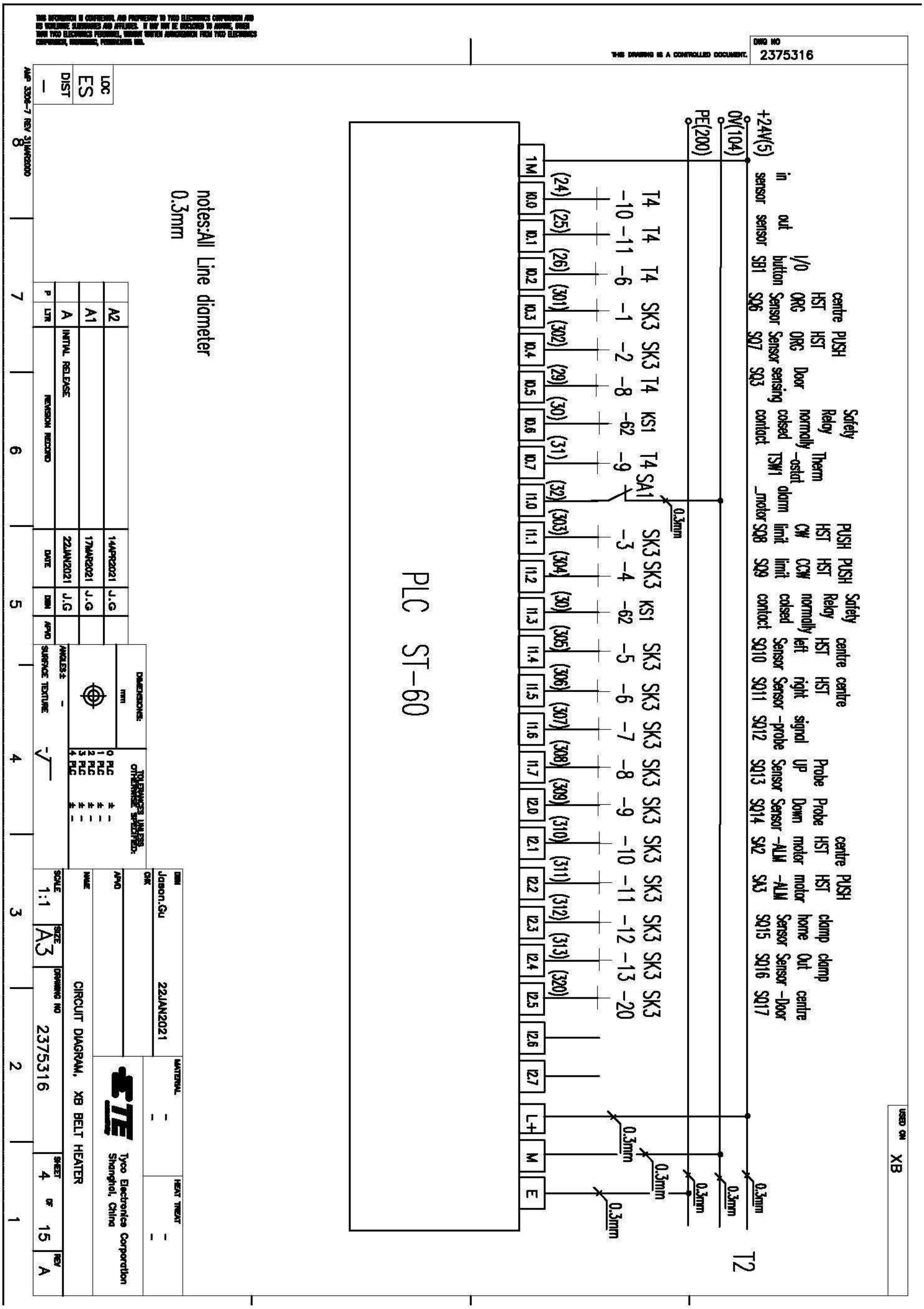
Note: (Belt Heater base machine, sheet 1~10. Centering Device, sheet 11~15)

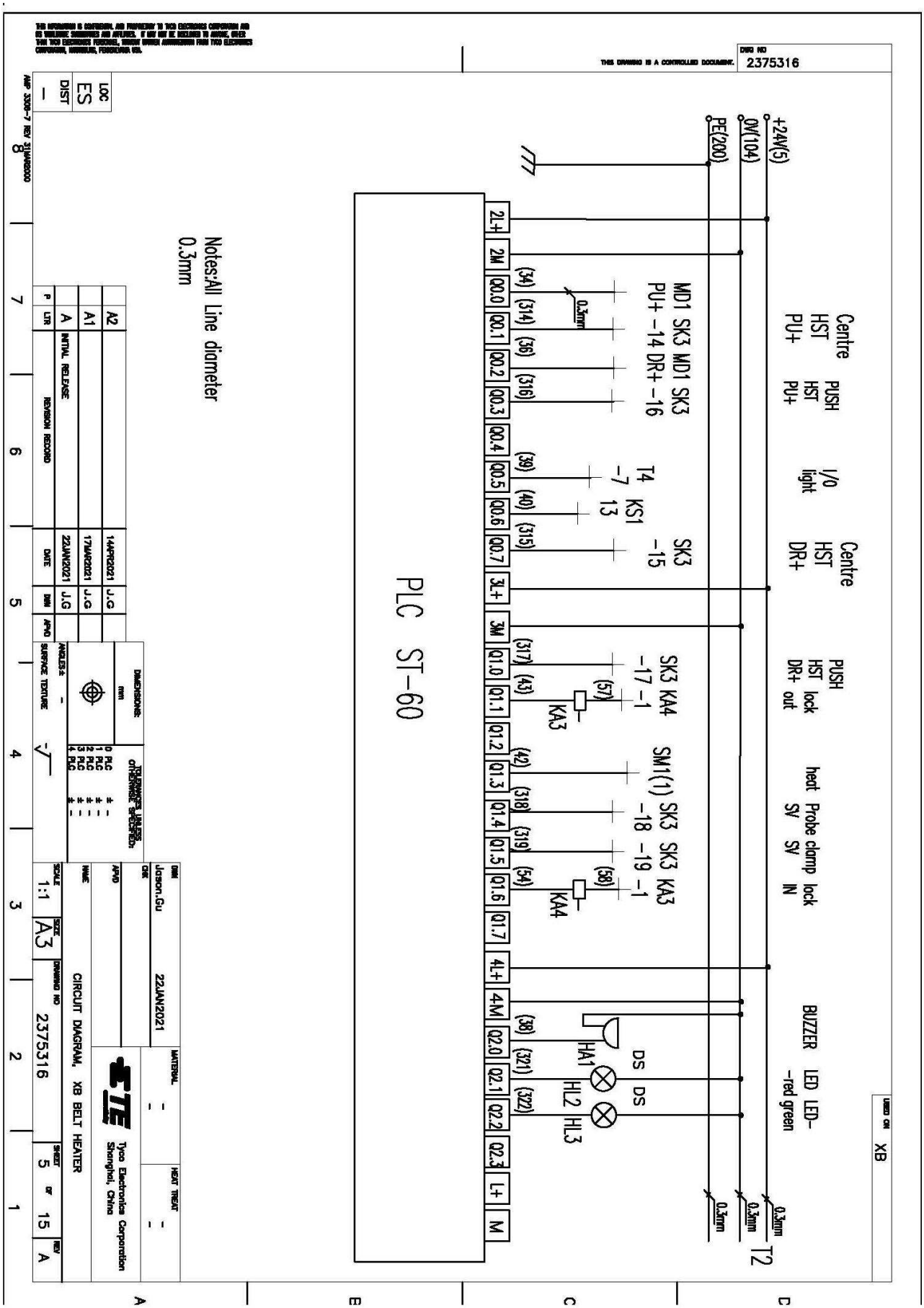


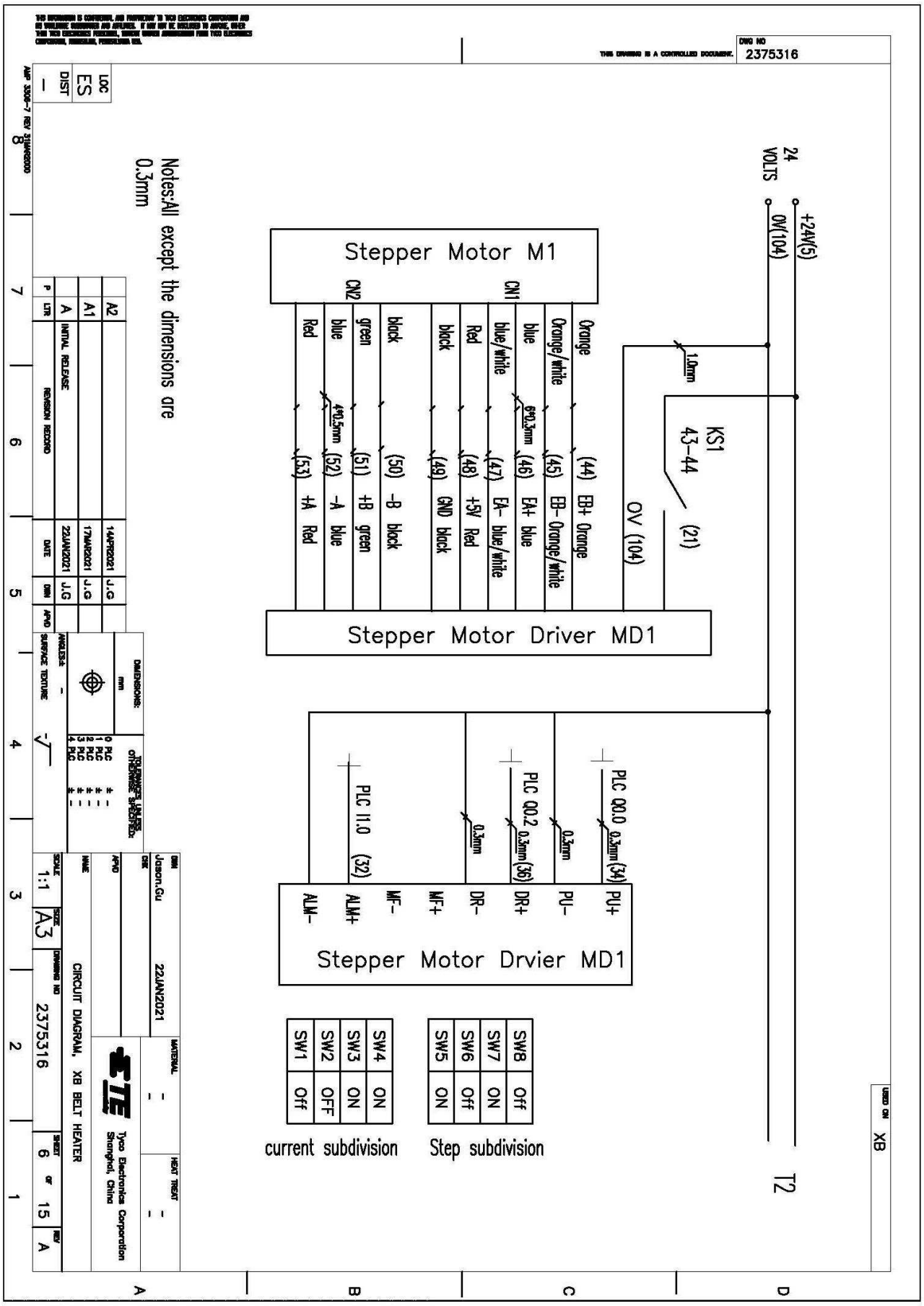


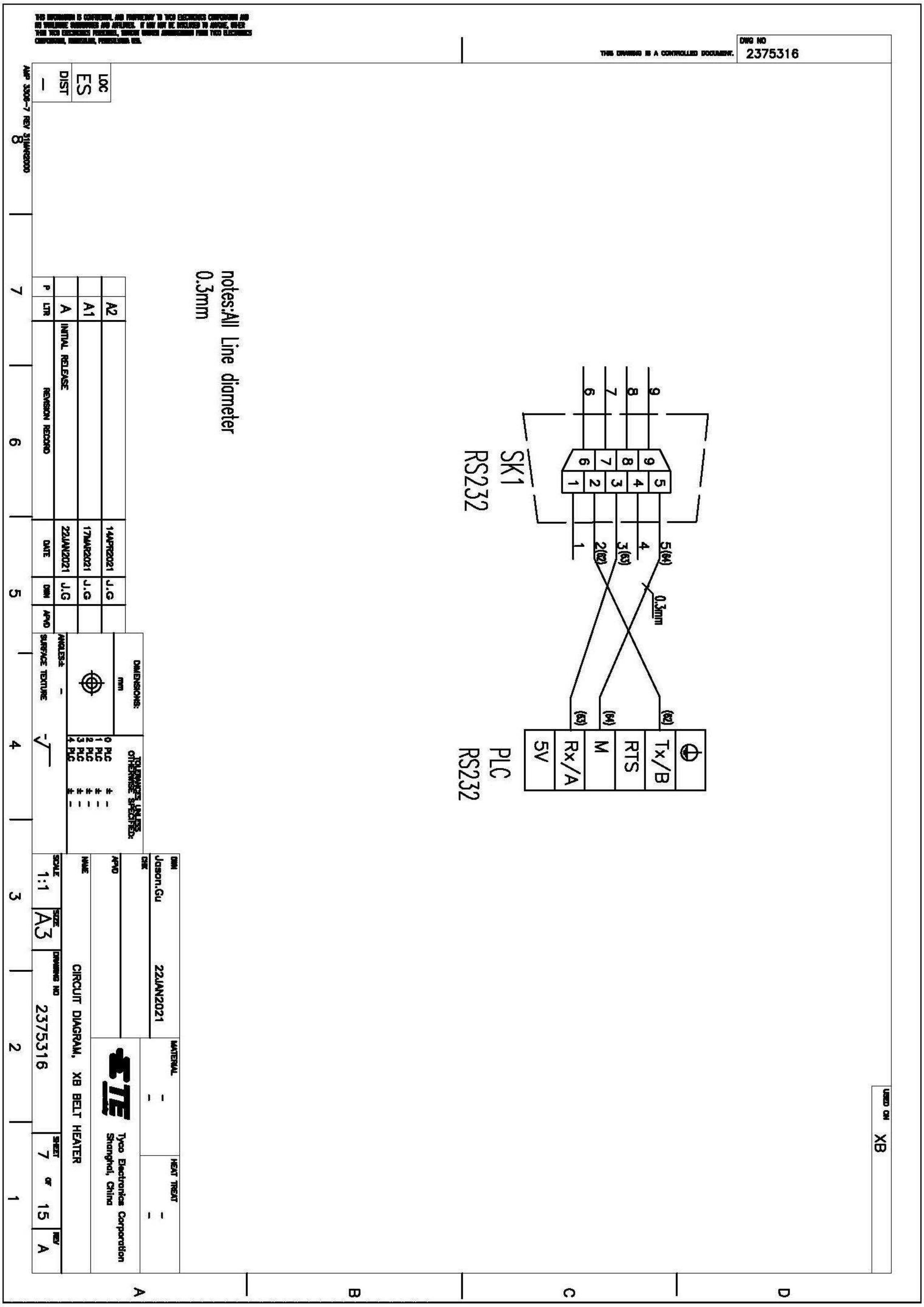
notes:All Line diameter 0.3mm
24 VOLTS
+24V(5)
0V(104)
Q0.6 SM1(2)
L
ESTOP SB1
SAFERY RELAY KS1
KA2(+) KA1(+) SK2-1 M1(Vdc+)
PLC I0.6
FAN
CT7
T2
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation Shanghai, China
Jason.Gu
22JAN2021
2375316
INITIAL RELEASE
A3
1:1

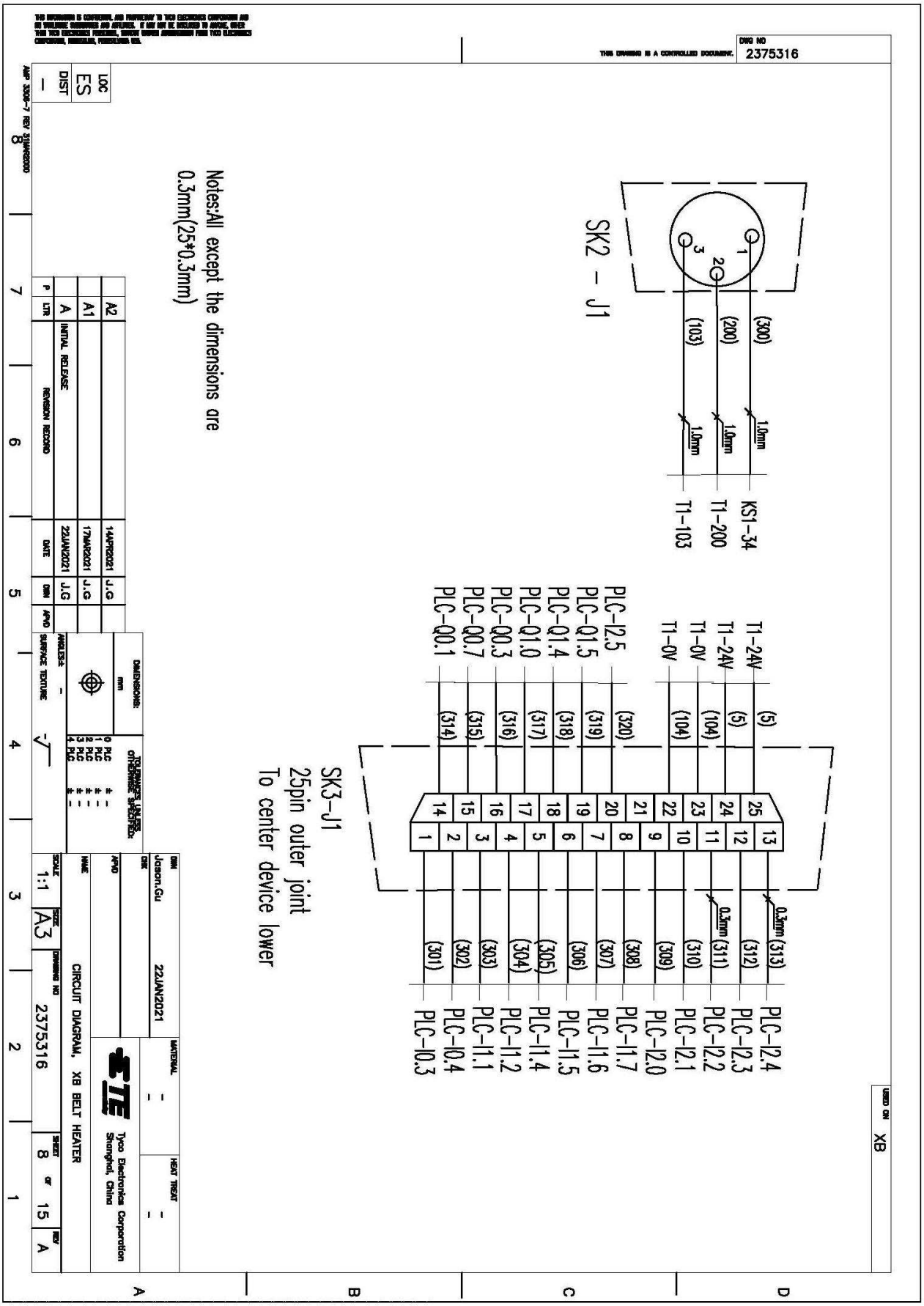

DWG NO
2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
24 VOLTS
+24V(5)
0V(104)
PLC Q1.0
SW1
1-2
KS1
23-24
Temp Relay
KA1
KS1
14
Fan relay
KA2
KA2
1-5
FS4(1A)
T2
FAN CT1
FAN CT2
FAN CT3
FAN CT4
FAN CT5
FAN CT6
Notes:All except the dimensions are
0.3mm
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation
Shanghai, China
2375316
22JAN2021
Jason.Gu

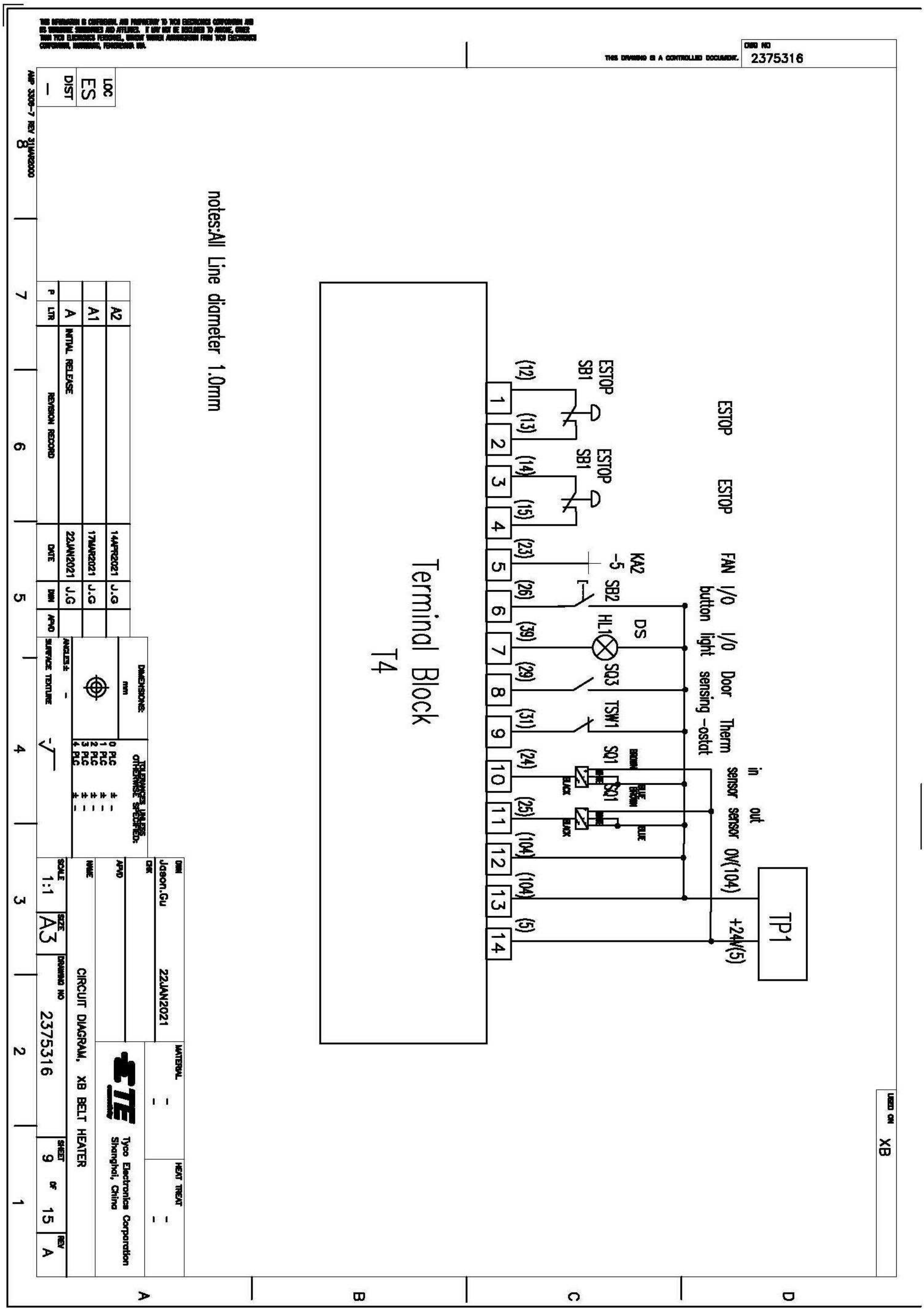

PLC ST-60
notes:All Line diameter 0.3mm
+24V(5)
0V(104)
PE(200)
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation Shanghai, China
2375316
Jason.Gu
22JAN2021
A3
1:1
XB

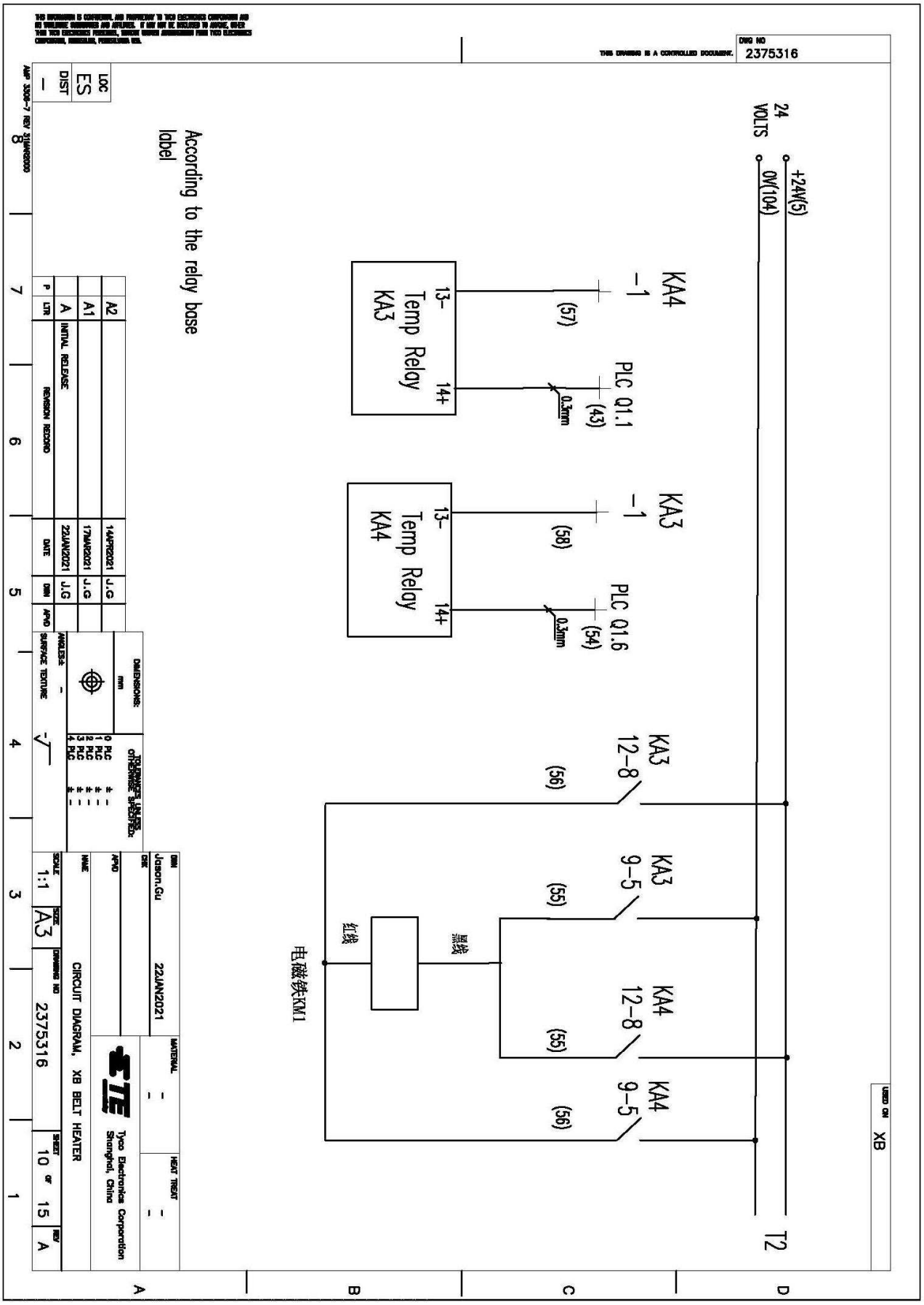

DWG NO
2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
USED ON
XB
+24V(5)
0V(104)
PE(200)
Centre HST PU+
PUSH HST PU+
I/O light
Centre HST DR+
PUSH HST lock DR+ out
heat SV
Probe clamp lock SV
IN
BUZZER
LED
LED- -red green
MD1 SK3 -14
MD1 SK3 DR+ -16
T4 -7
KS1 13
SK3 -15
SK3 KA4 -17 -1
SM1(1) SK3 -18
SK3 -19
KA3 -1
KA3
KA4
HA1
DS
HL2
DS
HL3
0.3mm
T2
PLC ST-60
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
4L+
4M
Q2.0
Q2.1
Q2.2
Q2.3
L+
M
Notes:All Line diameter
0.3mm
REVISION RECORD
LTR
REVISION
DATE
DWN
APVD
A
INITIAL RELEASE
17MAR2021
J.G
A2
A1
14APR2021
22JAN2021
J.G
DIMENSIONS: mm
ANGLES± -
SURFACE TEXTURE √
TOLERANCES UNLESS OTHERWISE SPECIFIED:
0 PLC ± -
1 PLC ± -
2 PLC ± -
3 PLC ± -
4 PLC ± -
DWN Jason.Gu 22JAN2021
CHK
APVD
NAME
MATERIAL -
HEAT TREAT -
Tyco Electronics Corporation Shanghai, China
CIRCUIT DIAGRAM, XB BELT HEATER
SIZE A3
DRAWING NO 2375316
SCALE 1:1
SHEET 5 OF 15
REV A
LOC ES
DIST -
AMP 3309-7 REV 31MAR2000

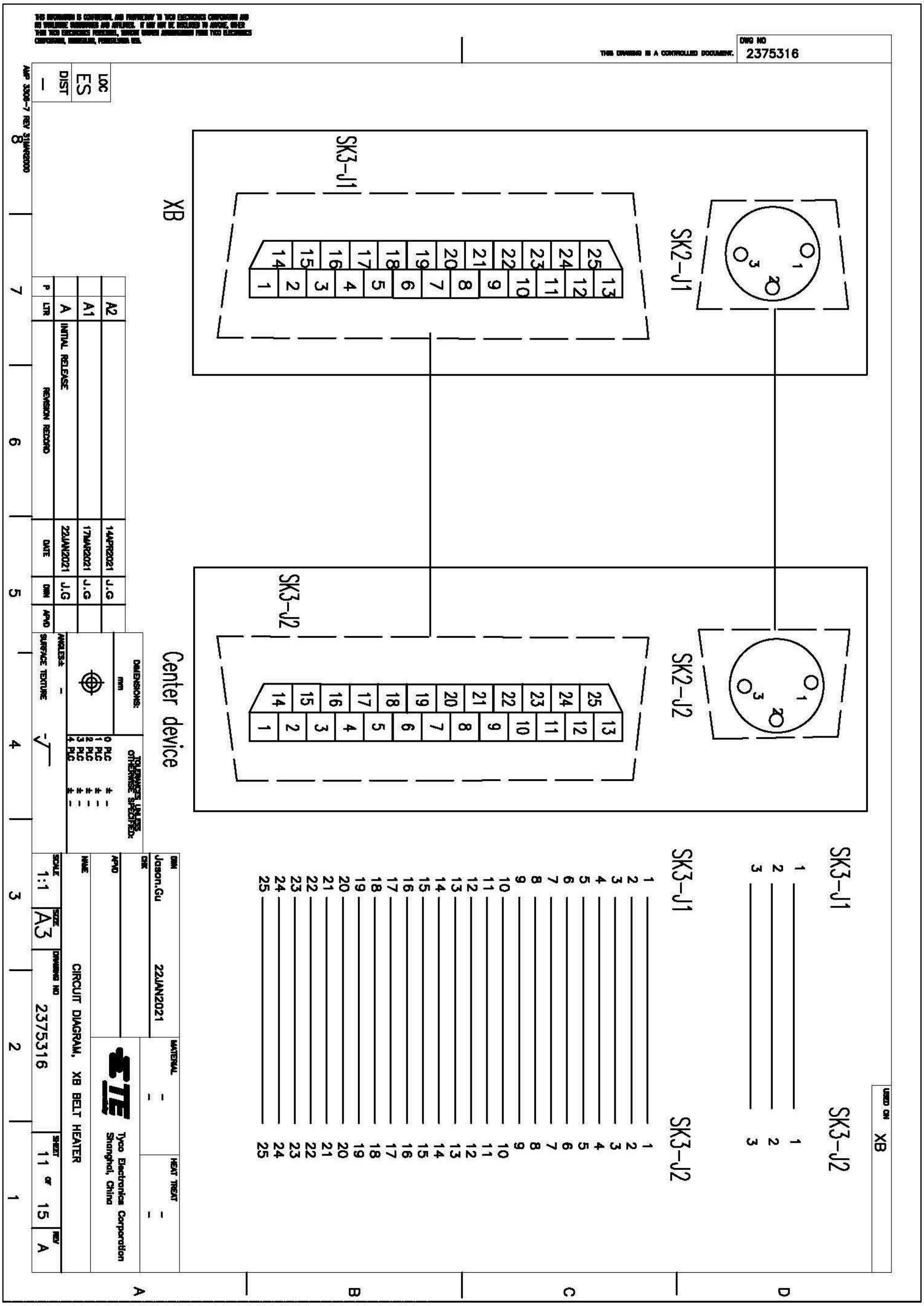

DWG NO
2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
24 VOLTS
0V(104)
+24V(5)
Stepper Motor M1
CN1
CN2
Orange (44) EB+
Orange/white (45) EB-
blue (46) EA+
blue/white (47) EA-
Red (48) +5V
black (49) GND
black (50) -B
green (51) +B
blue (52) -A
Red (53) +A
1.0mm
KS1
43-44
(21)
OV (104)
Stepper Motor Driver MD1
PU+ (34)
PU-
DR+ (36)
DR-
MF+
MF-
ALM+ (32)
ALM-
PLC Q0.0
PLC Q0.2
PLC I1.0
0.3mm
Stepper Motor Drvier MD1
SW8 Off
SW7 ON
SW6 Off
SW5 ON
Step subdivision
SW4 ON
SW3 ON
SW2 OFF
SW1 Off
current subdivision
Notes:All except the dimensions are
0.3mm
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation
Shanghai, China
2375316
A3
1:1
22JAN2021
Jason.Gu
XB

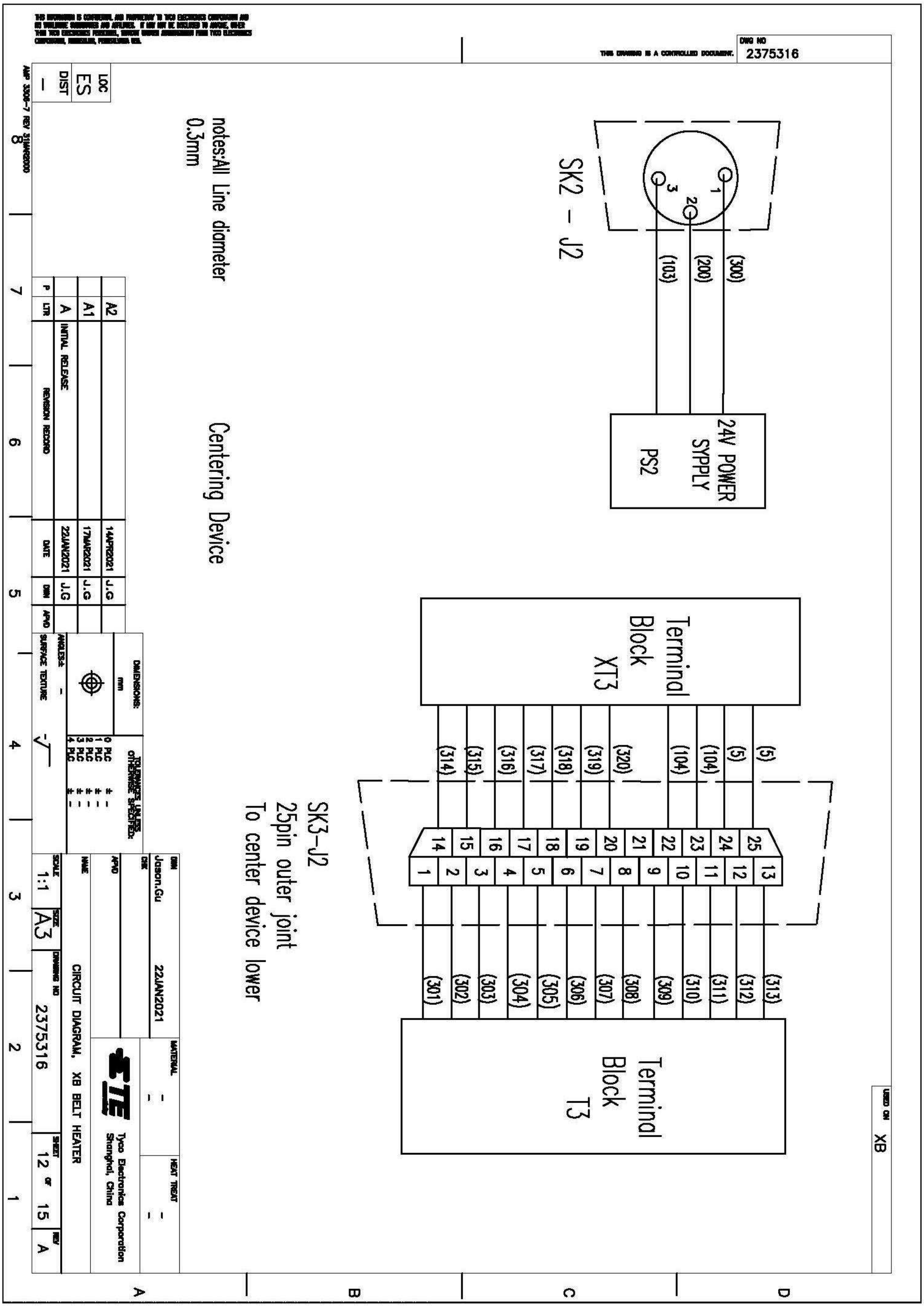

DWG NO 2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
LOC ES
DIST –
SK1
RS232
PLC
RS232
Tx/B
RTS
M
Rx/A
5V
0.3mm
notes:All Line diameter
0.3mm
A INITIAL RELEASE 22JAN2021 J.G
A1 17MAR2021 J.G
A2 14APR2021 J.G
DIMENSIONS: mm
DWN Jason.Gu 22JAN2021
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation
Shanghai, China
SCALE 1:1
SIZE A3
DRAWING NO 2375316
SHEET 7 OF 15
REV A
USED ON XB

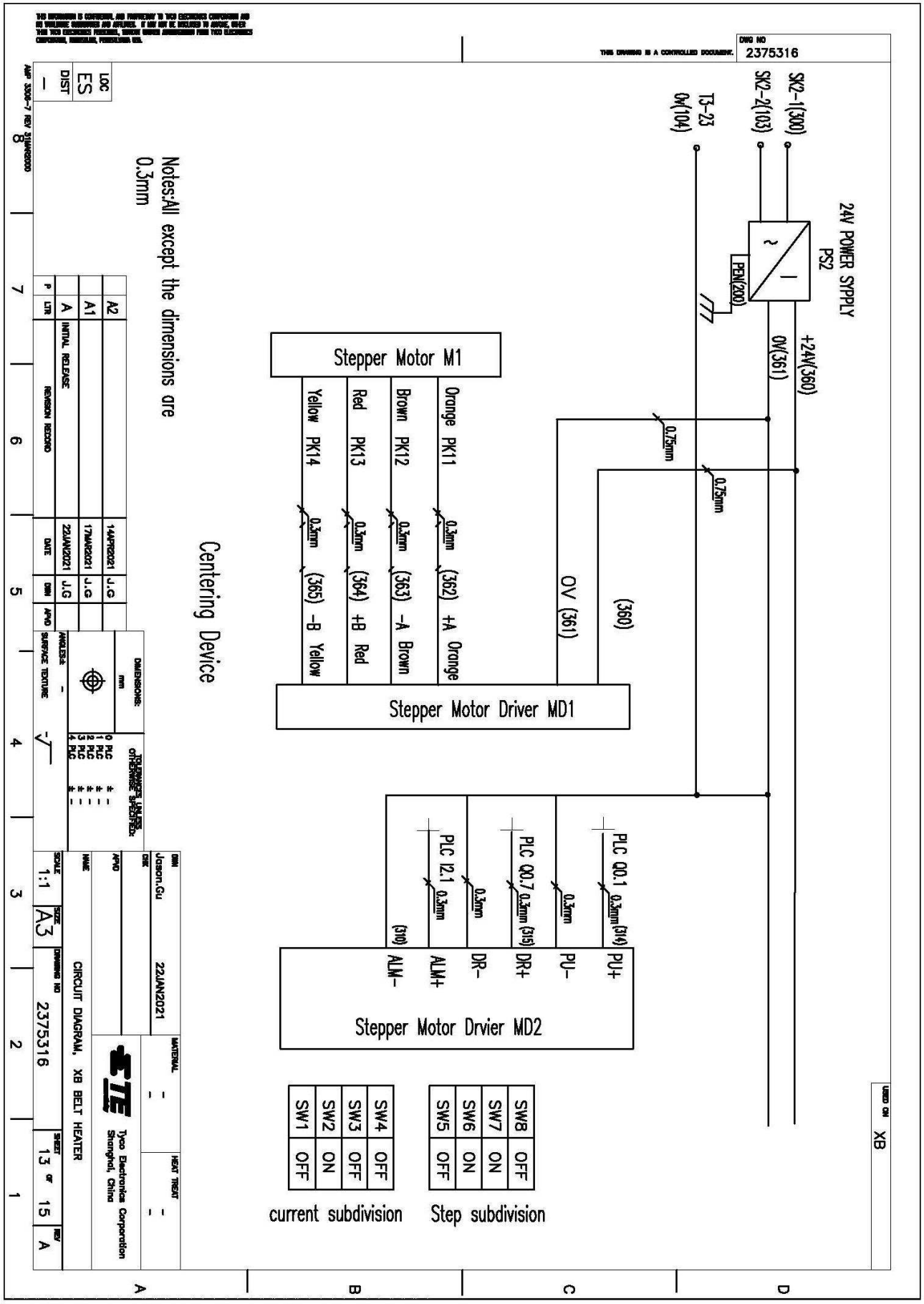

DWG NO
2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
SK2 - J1
(300)
(200)
(103)
1.0mm
KS1-34
T1-200
T1-103
SK3-J1
25pin outer joint
To center device lower
T1-24V
T1-24V
T1-0V
T1-0V
PLC-I2.5
PLC-Q1.5
PLC-Q1.4
PLC-Q1.0
PLC-Q0.3
PLC-Q0.7
PLC-Q0.1
(5)
(104)
(320)
(319)
(318)
(317)
(316)
(315)
(314)
0.3mm (313)
(312)
0.3mm (311)
(310)
(309)
(308)
(307)
(306)
(305)
(304)
(303)
(302)
(301)
PLC-I2.4
PLC-I2.3
PLC-I2.2
PLC-I2.1
PLC-I2.0
PLC-I1.7
PLC-I1.6
PLC-I1.5
PLC-I1.4
PLC-I1.2
PLC-I1.1
PLC-I0.4
PLC-I0.3
Notes:All except the dimensions are
0.3mm(25*0.3mm)
REVISION RECORD
LTR A
INITIAL RELEASE
DATE 22JAN2021
DWN J.G
APVD
DIMENSIONS: mm
TOLERANCES UNLESS OTHERWISE SPECIFIED:
ANGLES± -
SURFACE TEXTURE √
DWN Jolson.Gu 22JAN2021
CHK
APVD
NAME
CIRCUIT DIAGRAM, XB BELT HEATER
MATERIAL -
HEAT TREAT -
SCALE 1:1
SIZE A3
DRAWING NO 2375316
SHEET 8 OF 15
REV A
USED ON XB
Tyco Electronics Corporation
Shanghai, China

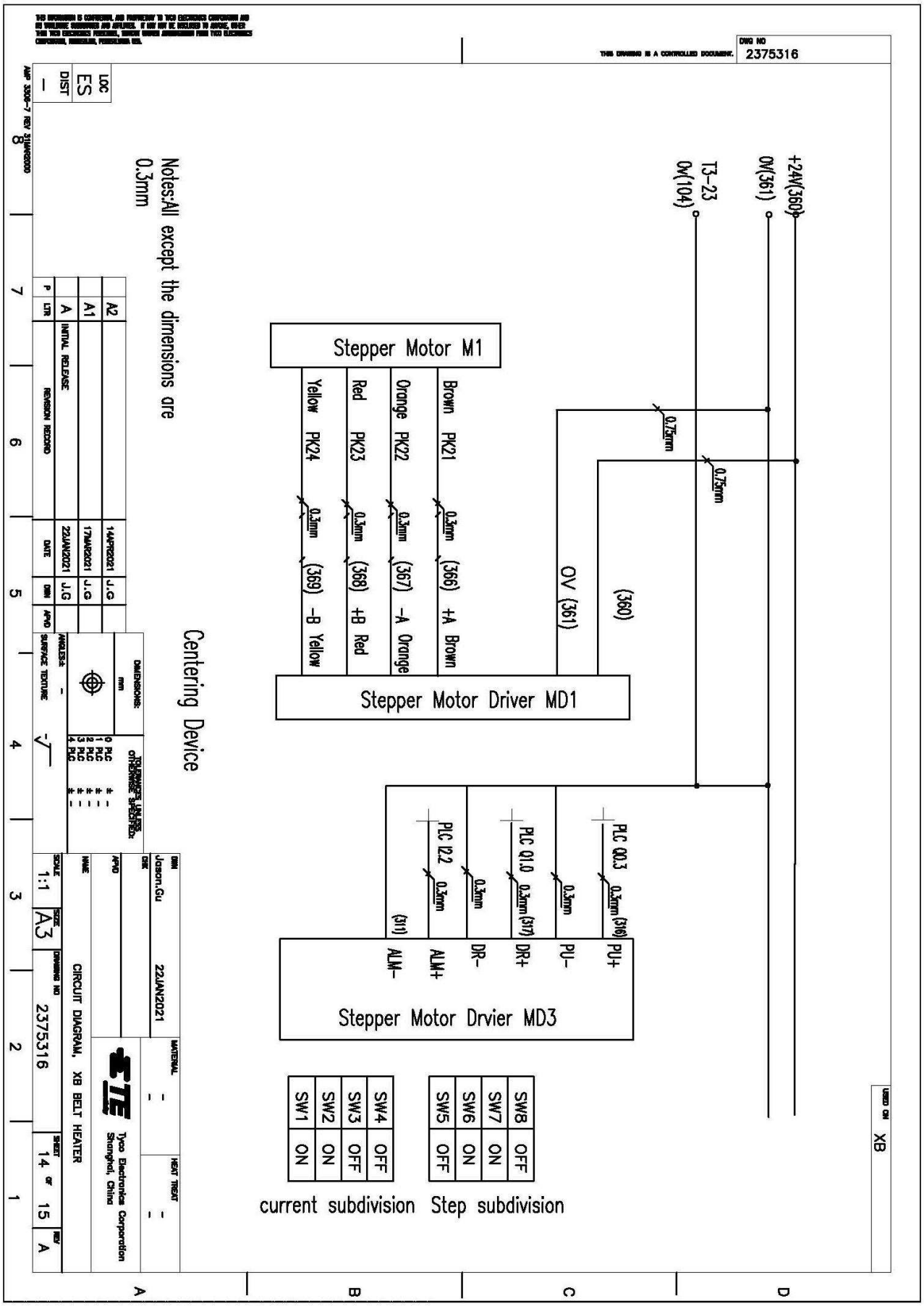

notes:All Line diameter 1.0mm
Terminal Block
T4
ESTOP
SB1
ESTOP
FAN I/O
button
I/O
light
Door
sensing
Therm
-ostat
in
sensor
out
sensor
0V(104)
+24V(5)
TP1
KA2
-5
SB2
DS
HL1
SQ3
TSW1
SQ1
(12)
(13)
(14)
(15)
(23)
(26)
(39)
(29)
(31)
(24)
(25)
(104)
(104)
(5)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
THIS DRAWING IS A CONTROLLED DOCUMENT.
2375316
LOC
ES
DIST
A2
A1
A
LTR
INITIAL RELEASE
REVISION RECORD
14APR2021
17MAR2021
22JAN2021
DATE
J.G
J.G
J.G
DWN
APVD
DIMENSIONS:
mm
Jason.Gu
22JAN2021
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation
Shanghai, China
SCALE
1:1
SIZE
A3
DRAWING NO
2375316
SHEET
9
OF
15
REV
A
USED ON
XB
A
B
C
D
1
2
3
4
5
6
7
8

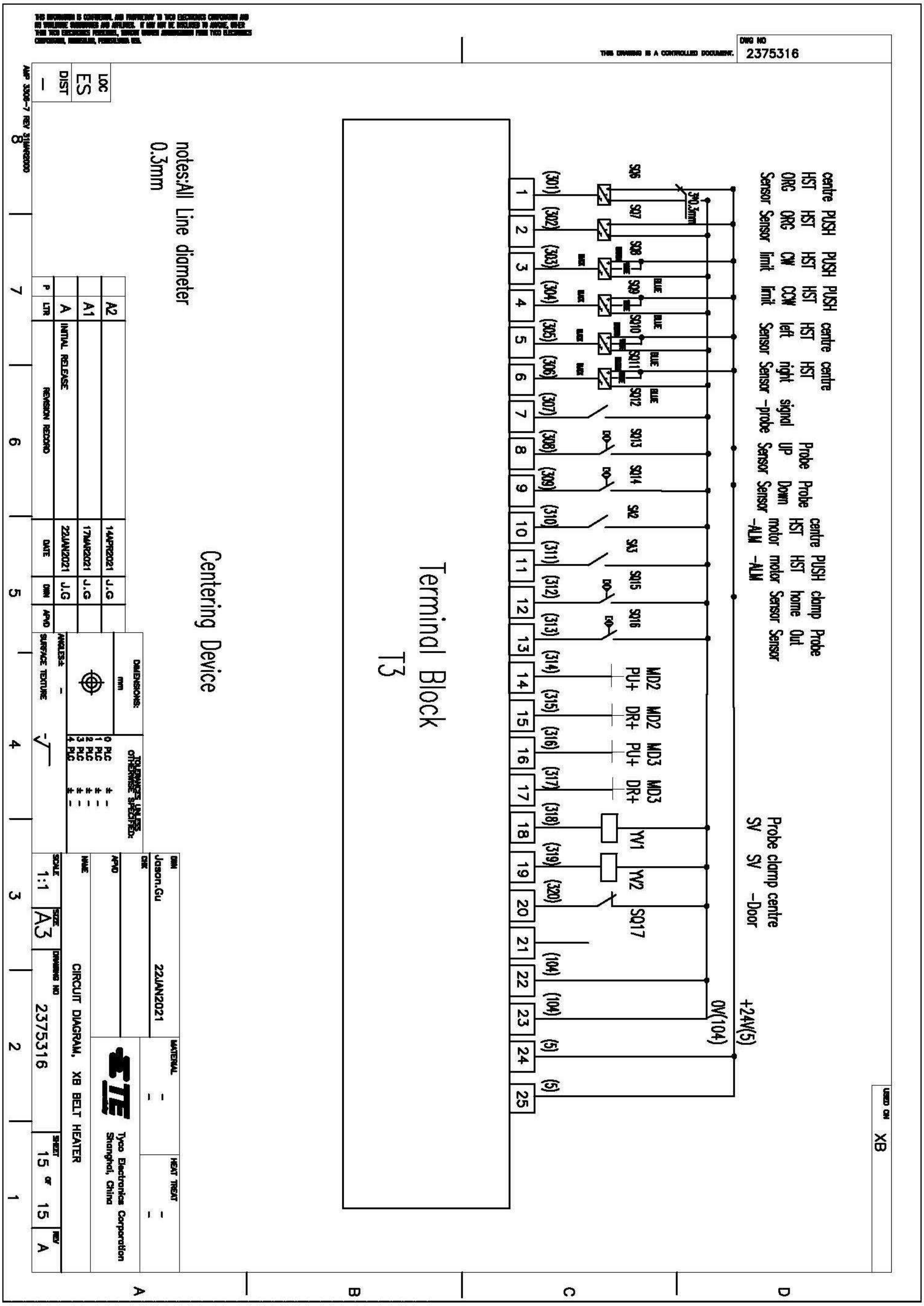

DWG NO
2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
24 VOLTS
0V(104)
+24V(5)
KA4 -1
13- Temp Relay KA3 14+
(57)
PLC Q1.1
(43)
0.3mm
KA3 -1
13- Temp Relay KA4 14+
(58)
PLC Q1.6
(54)
0.3mm
KA3 12-8
KA3 9-5
KA4 12-8
KA4 9-5
(56)
(55)
(55)
(56)
黑线
红线
电磁铁KM1
T2
USED ON
XB
According to the relay base label
REVISION RECORD
A INITIAL RELEASE 22JAN2021 J.G
A2
A1
14APR2021 J.G
17MAR2021 J.G
DIMENSIONS: mm
ANGLES± -
SURFACE TEXTURE √
DRN Jason.Gu 22JAN2021
CHK
APVD
NAME
CIRCUIT DIAGRAM, XB BELT HEATER
SCALE 1:1
SIZE A3
DRAWING NO 2375316
SHEET 10 OF 15
REV A
MATERIAL -
HEAT TREAT -
Tyco Electronics Corporation Shanghai, China
LOC ES
DIST -
AMP 3306-7 REV 31MAY2000


2375316
XB
SK3-J1
SK2-J1
Center device
SK3-J2
SK2-J2
SK3-J1
SK3-J2
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation Shanghai, China
Jason.Gu
22JAN2021
A3
1:1
INITIAL RELEASE
22JAN2021
17MAR2021
14APR2021
J.G


DWG NO 2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
SK2 – J2
(300)
(200)
(103)
24V POWER SYPPLY
PS2
Terminal Block XT3
(5)
(5)
(104)
(104)
(320)
(319)
(318)
(317)
(316)
(315)
(314)
SK3–J2
25pin outer joint
To center device lower
(301)
(302)
(303)
(304)
(305)
(306)
(307)
(308)
(309)
(310)
(311)
(312)
(313)
Terminal Block T3
notes:All Line diameter 0.3mm
Centering Device
LOC ES
DIST –
A INITIAL RELEASE 22JAN2021 J.G
A1 17MAR2021 J.G
A2 14APR2021 J.G
REVISION RECORD
DIMENSIONS: mm
DWN Jason.Gu 22JAN2021
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation Shanghai, China
SCALE 1:1
SIZE A3
DRAWING NO 2375316
SHEET 12 OF 15
REV A
USED ON XB

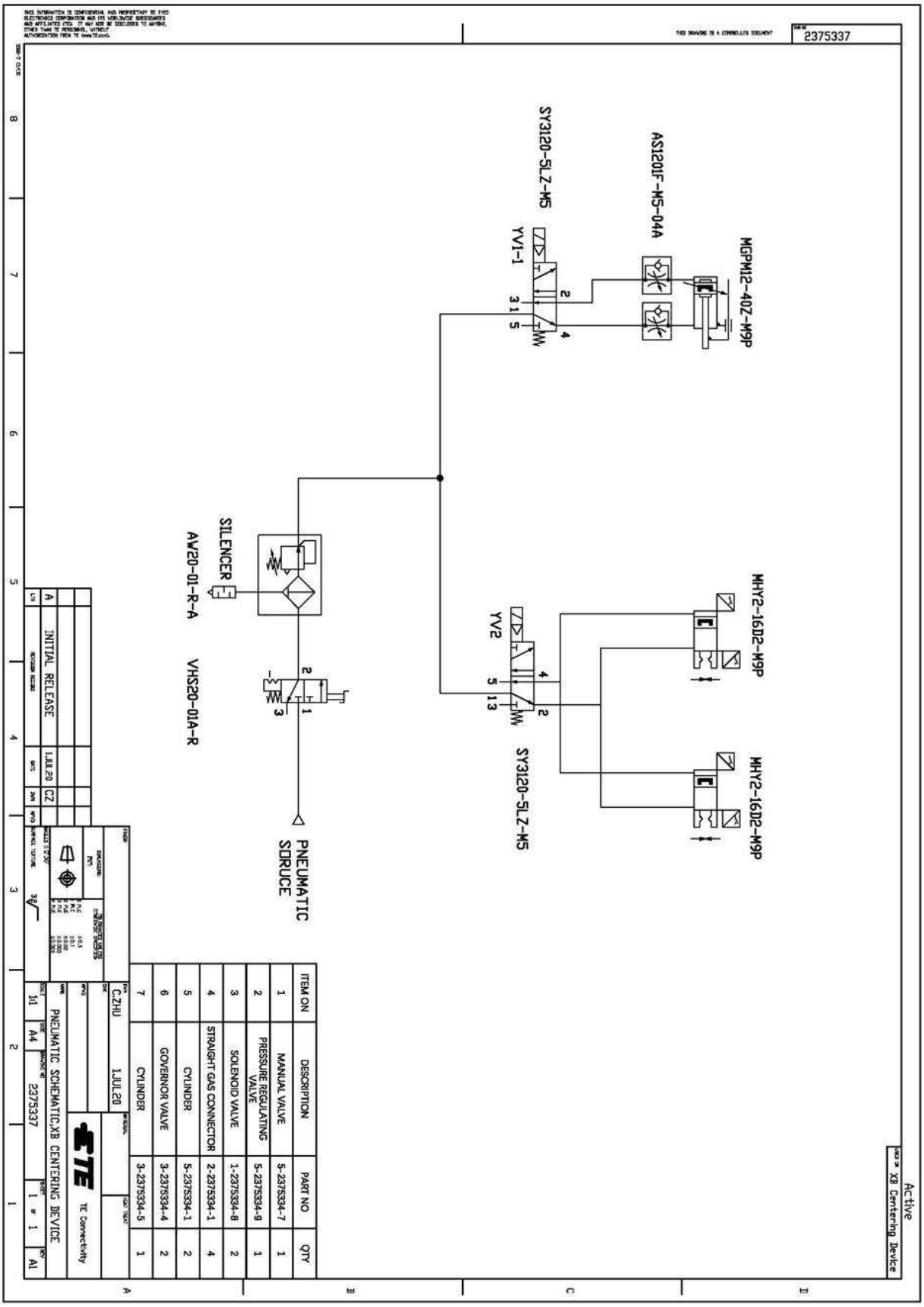

DWG NO
2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
24V POWER SYPPLY
PS2
SK2-1(300)
SK2-2(103)
T3-23
0V(104)
PEN(200)
+24V(360)
0V(361)
0.75mm
Stepper Motor M1
Orange PK11 0.3mm (362) +A Orange
Brown PK12 0.3mm (363) -A Brown
Red PK13 0.3mm (364) +B Red
Yellow PK14 0.3mm (365) -B Yellow
OV (361)
(360)
Stepper Motor Driver MD1
PLC Q0.1 0.3mm (314) PU+
PLC Q0.7 0.3mm (315) DR+
PLC I2.1 0.3mm (310) ALM+
PU-
DR-
ALM-
Stepper Motor Drvier MD2
SW1 SW2 SW3 SW4
OFF ON OFF OFF
current subdivision
SW5 SW6 SW7 SW8
OFF ON ON OFF
Step subdivision
Notes:All except the dimensions are 0.3mm
Centering Device
CIRCUIT DIAGRAM, XB BELT HEATER
DRAWING NO 2375316
SIZE A3
SCALE 1:1
SHEET 13 OF 15
REV A
Tyco Electronics Corporation Shanghai, China
USED ON XB


DWG NO 2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
+24V(360)
0V(361)
T3-23 0v(104)
Stepper Motor M1
Brown PK21 0.3mm (366) +A Brown
Orange PK22 0.3mm (367) -A Orange
Red PK23 0.3mm (368) +B Red
Yellow PK24 0.3mm (369) -B Yellow
0.75mm
0.75mm
OV (361)
(360)
Stepper Motor Driver MD1
PLC Q0.3 0.3mm (316) PU+
PLC Q1.0 0.3mm (317) DR+
PLC I2.2 0.3mm (311) ALM-
0.3mm PU-
0.3mm DR-
0.3mm ALM+
Stepper Motor Drvier MD3
SW1 ON SW2 ON SW3 OFF SW4 OFF
current subdivision
SW5 OFF SW6 ON SW7 ON SW8 OFF
Step subdivision
Notes:All except the dimensions are 0.3mm
Centering Device
USED ON XB
DRN Jason.Gu 22JAN2021
APVD
MATERIAL -
HEAT TREAT -
SCALE 1:1
SIZE A3
DRAWING NO 2375316
SHEET 14 OF 15
REV A
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation Shanghai, China
REVISION RECORD
A INITIAL RELEASE 14APR2021 J.G 22JAN2021 J.G
DIMENSIONS: mm
ANGLES± -
SURFACE TEXTURE √
UNLESS OTHERWISE SPECIFIED: 0 PLC ± 1 PLC ± 2 PLC ± 3 PLC ± 4 PLC ±
AMP 3306-7 REV 31MAR2009
LOC ES DIST —



Terminal Block T3
Centering Device
notes:All Line diameter 0.3mm
centre PUSH HST ORG Sensor
PUSH HST ORG Sensor
PUSH HST CW limit
PUSH HST CCW limit
centre HST left Sensor
centre HST right Sensor
signal -probe
Probe UP Sensor
Probe Down Sensor
centre HST motor -ALM
PUSH HST motor -ALM
clamp home Sensor
Probe Out Sensor
SQ6
SQ7
SQ8
SQ9
SQ10
SQ11
SQ12
SQ13
SQ14
SK2
SK3
SQ15
SQ16
MD2 PU+
MD2 DR+
MD3 PU+
MD3 DR+
YV1
YV2
SQ17
Probe SV
clamp SV
centre -Door
+24V(5)
0V(104)
BLUE
DWG NO 2375316
THIS DRAWING IS A CONTROLLED DOCUMENT.
LOC ES
DIST —
A2 14APR2021 J.G
A1 17MAR2021 J.G
A INITIAL RELEASE 22JAN2021 J.G
REVISION RECORD
DIMENSIONS: mm
DWN Jason.Gu 22JAN2021
CIRCUIT DIAGRAM, XB BELT HEATER
Tyco Electronics Corporation Shanghai, China
SCALE 1:1
SIZE A3
DRAWING NO 2375316
SHEET 15 OF 15
REV A
USED ON XB

11 Pneumatic Diagram (Centering Device)



12 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

XB17, XB19, XB17C, XB19C

Name, type or model

2375310-1, 2375310-2, 2375320-1, 2375320-2, 2381120-1, 2381130-1

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 Annex I (EN ISO 12100:2010, EN 60204-1:2018)*
- *EMC Directive 2014/30/EU (EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019)*

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

11/16/2020

Middletown Pa. 17057 USA Robert Jakus, Quality Manager, Product Safety Compliance Officer

Place and date of issue — Name, position and signature

EN