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## Operating manual CV-OBHAT BASE UNIT (TE 1-1)

## CV-OBHAT BASE UNIT (TE 1-1899619-1 RAYCHEM CH3712-000)

Customer Manual No. Customer Manual PN: Language: 412-94244\_Rev.B 6-744015-2 en (original)





## Disposal: CV-OBHAT BASE UNIT

This product must not be disposed of as municipal waste.

#### **RoHS: CV-OBHAT BASE UNIT**

RoHS V Compliant

#### **ROHS Information**

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ardous Substances) can be found at the following website:

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## **Amendment Record**

Issue No.	Content	Amended By	Date	Change Request No.
Issue A	Complete Manual	Lipp	June 2013	
Issue A1	Complete Manual	Lipp	October 2013	
Issue B	<i>Complete Manual according to the changes because of EMC compliance</i>	Lipp	October 2014	



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## 1 Introduction

Introduction: About this Manual

This manual contains full information about the CV-OBHAT BASE UNIT and comprises 8 sections:

#### Section 1 - Introduction

This section contains general information regarding the CV-OBHAT BASE UNIT.

### Section 2 - Safety

This section contains important safety information and details of equipment labelling.

#### Section 3 - 4 Installations and Operation

Describes how to unpack, install and operate the equipment and information on how to look after it.

#### Section 5 - Service and Repair

This section contains details of setting the operating parameters, troubleshooting, repair and full maintenance information with details of recommended spares and technical support.

#### Section 5 - Technical Details

This section contains a technical specification and standards compliance information.

Section 7 - Spares

#### Section 8 - Docking post and design

#### Note:

You do not need to read the whole document in order to install and operate the equipment but you should read and understand the whole of this introduction, Section 2 - Safety and Section 3 - 4 Installation and Operation.



## 1.1 General Information

The CV-OBHAT system is a lightweight, portable hot air tool, used to install TE/Tyco/Raychem ES-Cap Stub Splice Sealing products.



The CV-OBHAT tool has been designed for use on-board with minimum board fixtures. Wire support and cap locating fixtures are an integral part of the CV-OBHAT tool hence only a simple board mounting/location post is required on the board. This is provided by the customer (see Section 9 for guidance).

If suitably mounted the CV-OBHAT system can be used off-board.

The CV-OBHAT has a closed loop temperature control system. The hot air pistol and control box are connected by a 6 metre long umbilical that carries power (230V) and air to the heat gun, control leads and a cooling air supply for the cap holding fixture.

The CV-OBHAT system utilises a 'PTMP' function. This function disables the timing of the heat cycle until a pre-set temperature is attained. By this method the effect of ambient temperatures and varying cycle duties can be minimised to ensure high quality, sealed installations are possible.

The CV-OBHAT system utilises a 'DTMP' function .This should be increased if higher productivity is required, for example: un-sealed installations

Loading and unloading product into the CV-OBHAT tool is made simple by the use of a hinged narrow reflector, which also minimises hot air spillage and potential damage to wires during the heating cycle. The tool is designed to have a heating and cooling segment to each installation cycle. The cooling cycle produces cooled product at the end of a cycle, which is easy to handle and mechanically strong.





## 1.2 Controls and Major Components

## Front Panel



### **REAR PANEL**





## 2 Safety

In common with all electrical equipment, The CV-OBHAT system must be used in accordance with established safe working practices.

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

## 2.1 General Warnings



Incorrect use of this equipment may cause injury.

This equipment must be operated and maintained only by fully trained and qualified personnel. Do not leave the equipment unattended during the process cycle.

## 2.2 Electrical Safety



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

Allow the equipment to cool.

Electrical safety checks are described in 6.3. DO NOT CARRY OUT AN INSULATION RESISTANCE CHECK USING A PORTABLE APPLIANCE TEST UNIT AS THIS WILL RESULT IN DAMAGE TO THE EQUIPMENT.

FLASH TESTING - Do NOT Flash Test (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 CV-OBHAT must conform to local standards and regulations.

UK installations must be fitted with a 13A plug conforming to BS1363 (Green/Yellow-Earth; Blue-Neutral; Brown-Line), containing a 5A fuse to BS1362.

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.

## 2.2.1 Electrical Safety continued

The equipment input supply has double pole fusing (Line & Neutral) and must be connected to an earthed power supply. The power supply must be protected by30mA residual current device.Use only specified fuse types ans ratings A remote emergency stop button is supplied on a 6-metre extension lead. Pressing the E stop cuts all electrical power within the control box and to the hot air gun.

Positioning of the E Stop button should be as near as possible to the hot air gun and the lead should be routed to prevent any accidental damage.



## 2.3 Personal Safety

2.3.1 Eyes



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

## 2.3.2 Clothing



Care must be taken to ensure hair or loose clothing does not come into contact with the reflector/heat gun.

### 2.3.3 Fire Hazard



Parts of the tool will be hot during use. Special care must be taken to avoid heating materials other than the pieces being worked on. Do not operate the tool near combustible liquids or gases.

### 2.3.4 Hot air and Surfaces



Care must be taken not to touch any exposed hot metallic surfaces on the tool reflector or nozzle.

Always close the reflector during an installation cycle to prevent hot air from being spilt over the operator or other delicate components.

Always allow the cooling cycle of the process to be completed before removing the product from the reflector.



## 2.3.5 Falling and trip hazards



The CV-OBHAT control box is designed to be mounted above or below the working area of the harness board.

It is important that the box be securely positioned.

The umbilical must be securely fixed to a solid fixture close to the control box such that any pulling of the umbilical does not result in falling of the control box or electrical disconnection.

It is intended that the hot air pistol be supported by a balance system (customer supplied) to enable easy and safe movement.

The leads for mains air supply and electrical supply should be as short as possible and routed to prevent any trip or entanglement hazards.

The umbilical must be supported and routed to prevent any mechanical damage due to crushing, entrapment or pulling.

## 2.4 General

CV-OBHAT tool must only be used for products recommended by Tyco Electronics.

Follow recommendations in product safety data sheets at all times.

## 3 Installation and set-up

## 3.1 Unpacking

Remove the CV-OBHAT SYTEM from its packing. If there is any sign of damage, return the equipment to TE/Tyco Electronics in its original container.

Note:

The Serial Number on machine must correspond with the Serial Number on the packaging.

## 3.2 Safety



Cv-obaht –System must be installed in accordance with established safe working practices. Incorrect use can cause injury.

Installation requirements must conform to local regulations.

## 3.3 Location



The CV-OBHAT is designed to be installed and operated in industrial environments. However it should not be used near explosive or flammable materials or in a location where it would be subject to moisture.

The control box has an IP20 rating i.e. Protected from solid objects up to 12mm (e.g. fingers), with no protection against liquids.

The control box should be located on a level firm surface and should be mounted to prevent pulling or knocking of the unit off its support.

The umbilical should be fixed to a firm support, next to the control unit.

Mains electrical and air leads should be routed to prevent damage or entanglement.

The CV-OBHAT tool should be used in areas with good lighting and adequate ventilation.

The main ON/OFF switch is on rear panel of control box and free access should be maintained.

The **E Stop button** must be located as close as possible to the area on the board where the pistol is being used



## 3.4 Electrical Connections



The CV-OBAHT is designed for operation from a 230V 50Hz mains supply and is supplied with a 2 meter power with an IEC connector. UK installations must be fitted with a 13A plug conforming to BS1363 (Green/Yellow-Earth; Blue-Neutral; Brown-Line), containing a 5A fuse to BS1362.

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

The mains supply to the equipment must be protected by 30mA residual current device.

## 3.5 Air connections

#### The CV-OBHAT tool should be connected to an unrestricted clean filtered air supply.

The supply must be capable of delivering 4 bars at the CV-OBHAT pressure regulator (gun not running). The measured air pressure at this point should not drop below ~3.5 bar whilst the gun is running.





## 3.6 Umbilical connections



### UMBLICAL CONNECTIONS: Ensure all connections are correctly made.

## Connections to be made are:

- 1. Heater
- 2. Heat gun cooling
- 3. Thermocouple
- 4. Stub Splice cooling
- 5. Control
- 6. Emergency stop
- 7. Board locking (plugged as this feature is not normally used)
- 8. Mains in IEC lead.
- 9. Auxiliary "0" volts output (n/c and n/o). Can be used to connect to external device.
- 10. Filter PCB







### CV-OBHAT BASE UNIT CH3712-000

## 3.7 General

Board mounting fixture (not supplied) should be mounted on the board such that the wire splice and sealing product can be easily positioned in the CV-OBHAT reflector. (Small adjustments to the pistol / board angle can be made). Advice on mounting fixture design can be obtained from TE/Tyco technical Service. This must be similar to drawing in section 9, with <u>no sharp</u> edges, and manufactured using hardened anodised Aluminium.

The pistol should be supported by a balance device (not supplied) set to allow easy and safe movement of the CV-OBHAT pistol around the board. It is important that any suspension device is free from sharp edges or other features that could damage the umbilical. The umbilical carries 230V electrical supply and this protection must therefore be adequate in all foreseen conditions.

It is recommended that the pistol balance device be used on an over-head rail fitted with a limit switch to stop the line should the pistol still be fixed onto the board – if boards are of moving type.



## 4 Operation

Safety



Before any operation is carried out using the CV-OBHAT tool ensure that Section 2 'Safety' has been read and understood.

The CV-OBHAT must be used in accordance with safe working practices.



Wear safety glasses and gloves at all times.

#### Initial switch on

- 1. Check all electrical and air leads for signs of damage or wear.
- 2. Check umbilical for signs of damage or wear
- 3. Check all connections are good
- 4. Connect electrical supply power lead
- 5. Connect to mains air supply
- 6. Check that the emergency release button is connected and released
- 7. Check pressure indicated on CV-OBHAT tool whilst static is set to 4 bar
- 8. Switch the rear panel Mains Isolator switch ON
- 9. Software version will be displayed in Display 1 and CVOB will be displayed in **Display 2 of the control panel. FIG 1 Page 18**
- 10. If display fails to appear in control panel check electrical and air connections and air pressure.



## 4.1 Selecting Processor Parameters

The processor parameters are entered from the Process Time Display Panel shown below in Fig 1  $\,$ 

Two displays present the parameter information. The lower display indicates the parameter name and the upper indicates its value. Access is by using the four selection keys described below:

Button	Description	Function
↓ ↓	Function & Enter	Both keys are used to enter parameter adjustment mode.
$\bigcirc$	Function Select	The select key selects the parameter digit for adjust- ment.
	Increment Selection	Steps up through the parameter menu. Increases the value of the digit to be changed.

Decrease Selection	Steps down through the parameter menu. Decreases the value of the digit to be changed.
Enter Selection	Stores the adjusted parameter value. Holding for 3 seconds exits adjustment mode.

Table i: Selection Button Function ContinuedPassword control - entry and adjustment

Action	Кеу	Display
1. Hold the Function Select and Enter	↓ ↓	$\frac{0  0  0  0}{P  W  D} ?$



Password Selection: a period of twenty five seconds elapses with no function key activated then the display will revert to the normal operating mode. Entry of an incorrect password will revert to the normal operating mode before access to the parameter mode is given, the selected password must be entered. The CV-OBHAT has a default Password 0000... Note: Record any changed password. In the event of the password being lost the Password: can be reset to the default settings, by applying power to the CV-OBHAT with the Select and Enter buttons pressed. However this will result in the loss of previously entered parameters.

Action		Кеу	Upper and lower displays
1.	Press the Function Select and Enter Keys Simultaneously.	+	$\frac{0  0  0  0}{P  W  D} ?$
2.	Press the Select key to select the first digit.		0 0 0 0 P W D ?
3.	Set the first digit by selecting the Up or Down key for the first number of the password.		0 0 0 2 P W D ?
4.	Press the Select key to step to the next digit.		0 0 0 2 P W D ?
5.	Repeat the procedure to set each digit of the password.		$\frac{3 7 9 2}{P W D ?}$
6.	Confirm the selected Password by pressing the Enter key. The first parameter is now displayed.		off REMT
7.	To change the password the parameters must be scrolled to the password select and the numbers Re-entered as above (See Table vi).		$\frac{0 \ 0 \ 0 \ 0}{P \ W \ D} =$
8.	Adjustment of each parameter is carried out selection.	using the same key functions	as for password



## 4.2 Setting installation parameters

#### For ease of setting the use of numbers as shown Ref Fig 1





#### Example using Numbers changing password.

The control panel settings are Password controlled. The unit has default '0000' password set when delivered.

To access password press keys 1 and 4 simultaneously on the control panel to display: **Fig1** 

0000	
PWD?	

Use key 3 to scroll through the displays until the password display is again visible.

Enter the desired 4-digit password code (using key 1 to select relevant digit and key 2 or 3 to adjust) and press key 4 to enter and store.

(The controller will automatically return to the standby mode after a short period of time. Alternatively, if key 4 is pressed and held, the controller will also return to standby mode).

The next time the control menu is accessed the new set password will need to be entered (and key 4 pressed) before access to the control functions is allowed.

#### Setting heat time

For advice on all installation parameters contact TE/Tyco Technical Service. Press keys 1 and 4 simultaneously and adjust and enter password if required Scroll through menu

(using keys 2 & 3) until display reads as follows: The heating time (s) digits can now be selected by key 1 and adjusted by keys 2 and 3.

15.0
CT 1

When the desired heat time has been selected, store the value by pressing key 4. (The controller will automatically return to the standby mode after a short period of time. Alternatively, if key 4 is pressed and held, the controller will also return to standby mode).

Factory setting 15 seconds



Enter the control menu as described above until display is:

The cooling time can now be adjusted as above.

It is strongly recommended that the cooling time be maintained at 30 seconds. If insufficient cooling time is selected the PTMP function may not function correctly, resulting in erratic temperature control and poor installed product quality.

Factory setting 30 seconds.

#### Set temperature adjustment

Enter and scroll through the control menu until the display is:

It is recommended that the set temperature is left at 250°C for use with ES Caps sizes 1 and 2. For setting for other sizes contact local Technical Service.

Factory setting 250℃

#### Setting PTMP temperature

The PTMP value is the temperature at which the heating cycle timing starts. By correct use of the PTMP function varying ambient temperatures and duty cycles can be accommodated by the CV-OBHAT system whilst maintaining consistent and reliable product installations. It is recommended that the PTMP value is set at 100°C

Enter and scroll through the control menu until the display is: Temperature can now be adjusted and entered as before.

Factory setting 100℃

#### Setting DTMP temperature

The DTMP value is the maximum value at which the next heating cycle can be initiated. This enables the duty cycle of the tool to be increased, as PTMP need not be achieved to start the next cycle. The accuracy and temperature control of the tool will be slightly compromised and it is therefore recommended that the DTMP and PTMP are set at the same value to ensure sealed installations. DTMP should be increased if higher productivity is required, for example: un-sealed installations

Enter and scroll through the control menu until the display is: Temperature can now be adjusted and entered as before.

Factory setting 100℃





250 °C

ST 1



TE	APPLICATION TOOLING
connectivity	



#### Setting the board locking time

The CV-OBHAT controller is capable of pneumatically controlling a board locking device. (Where board locking is not utilized it is recommended that a blanking plug is used to shut off the board locking outlet on the rear panel of the controller. The 'end of cycle' buzzer sounds at the end of the board-locking period (i.e. signalling when the tool can be removed), which can be set independently to the cooling time. If indication of the completed cycle is required the board locking time and cooling time must be set to the same value. It is strongly recommended that the installed product is not removed from the tool until the cooling cycle is complete.

Enter and scroll through the control menu until the display is:

Time (s) can now be adjusted and entered as before.

Factory setting 30.0 seconds

## 30.0 LOCK

10.0

WARM

0000

#### ALARM function WARM

The CV-OBHAT system has an adjustable WARM alarm. This function is used to ensure the pistol/control is performing correctly. It is a set time within which the pistol must reach the PTMP setting. If the system fails to reach the PTMP setting within the WARM time the system will switch off and abort the installation.

Enter and scroll through the control menu until the display is:

Time can now be adjusted and entered as before.

Factory setting 10 seconds

## 4.3 Adjustable parameters and software menu sequence

The following list describes the adjustable parameters, the menu sequence and the recommended values for the stub splice variant (= Factory settings).

#### It is NOT recommended that the values change from those listed below, without discussing with Tyco Technical Services.

PWD? And other parameters can be adjusted as required. CT 1 value (heat cycle time) may need to be adjusted according to local conditions and verified with trial sample installations.

а	Password protection. Restricts unauthorized access to settings	PWD?
h	Remote control function. This feature is unavailable on this tool and	OFF
U	therefore must always be set to OFF	REMT
с	WARM alarm function. Tool performance check.	10.0
	Recommended setting 10 seconds.	WARM
d	Temperature from which heat cycle time starts.	100℃
	Recommended setting 100°C	PTMP
е	Temperature below which next heat cycle can begin	100℃
	For sealed applications recommended setting 100°C	DTMP



- f Cool time. This time period must be long enough for pistol to cool Below PTMP and allow product to cool sufficiently for handling. Note: If cooling below PTMP is not achieved, at end of cool time, the system will prevent start of the next cycle.
- g Sequencing function. This feature can be switched ON/OFF. It can be set to sequence; six pre-sets are available.
- h Offset feature. This can be used for calibration, to allow for variation in pistol performance.
- i Alarm band Low. The low and high alarm bands are used as system performance checks.
- j Alarm band High.
- k Proportional setting. The PID values have been set to give the Maximum performance from the system. It is recommended that these values are not changed.
- I Integral setting
- m Derivative setting
- n Heat cycle time. This time starts counting down provided the pistol temp is above PTMP.
   It may be necessary to adjust for optimum sealing conditions.
   Contact Tyco Technical Services for advice if.
- o Set temperature. This is the target temperature for the pistol. Note this temperature may not be achieved during an installation.
- Product identification code. This feature is not available on this tool.
   Displays m, n and o are repeated 15 times (pre-set functions).
   Only the first set is available on this tool.
- q Display brightness control
- r Board locking time. It is strongly recommended that LOCK and COOL be set to the same value. I.e. 30 seconds.
- s Stub splice fixture cooling time. It is recommended that this value be set to its highest value. After the set time (from end of heat cycle) the fixture cooling air will switch off. If insufficient cooling is allowed product can adhere to the fixture.



OFF	
SEQU	

+00
OFST
UF51

100℃	
albL	

300℃
albH

020	
PROP	

01	
INTE	

02	
DERT	

15.0	
CT 1>6	

250℃	
ST 1>6	



5	
BRTN	
	_

30.0	
LOCK	

99.9	
SSPL	



- t This function is not available on this tool and therefore must be set to 0
- u This function is not available on this tool and therefore must be set to 0
- v Password setting.

+00
CalT



PWD=		

## 4.4 Defining Operating Modes (Local Operating Mode)

**Process Selection Buttons (6).** 



The 6 process selection key parameters are assigned and stored in memory using the Parameter settings outlined previously in pages 19 to 23. Each process may be selected and used repeatedly.



Parameter Settings for Local Operation

#### Sequenced Mode

Process selection keys are enabled. After each process the current selection is advanced to the next, up to the selected number. The sequence is then restarted at Nº1.

SEQU	1 to 6
------	--------

Parameter Settings for Sequenced Operation



#### Selecting and Operating the Sequenced Mode.

Before selecting the number of process keys to be used (for example 5), each selected key must first have parameters set as per page 18 to 22 and stored in the memory.

#### Note:

Setting SEQU selects the number of keys required starting with 1 and finishing with the required number e.g. 5.

Action	Кеу	Display
1. Hold the Function Select and Enter	✓ +	$\frac{0  0  0  0}{P  W  D} ?$
2. Enter Password and step through to Set Sequence mode.		off SEQU
<ol> <li>Use the Function Select key to step from 'off' to the № of keys to be included in the Sequence e.g. 5.</li> </ol>		$\frac{5}{\text{S E Q U}}$
<ol> <li>Store this change into memory. The display will revert to normal. The first 5 process selection keys will be lit, with key N <sup>o</sup> 1 flashing. The Yellow Sequence LED is lit.</li> </ol>		



## 4.5 Product Installations

#### **Product loading**

- 1. Select the correct size ES Cap for the wire splice configuration to be sealed. See Product Installation Guide. (PIP-021)
- 2. Push wire splice into cap (ensure wire splice quality conforms to the recommendations in PIP-021).
- 3. Open reflector using handle provided (care should be taken not to touch any hot metal surfaces with bare hands).
- 4. Holding the wire splice and cap push small end of cap firmly into the Stub Splice Cooling Fixture and clip wires into silicone wire grippers on the opposite side of the reflector.
- 5. Check that the assembly is firmly positioned centrally within the reflector
- 6. Close reflector.

Note - It is recommended that, prior to production, trial assemblies are checked for sealing integrity as per PIP-021. If necessary, the installation time can be adjusted accordingly to ensure sealing (Section 4.2).

