

# APPLICATION TOOLING

FOR RAYCHEM HEAT SHRINK PRODUCTS  
FROM TE CONNECTIVITY

# Quality Tooling for Raychem Heat Shrink Products

## RBK-X1 Processor



### Technical Data

- Electrical supply: 220 - 240V, 50/60 Hz
- Power consumption: 3A (max.)
- Operating temperature: 200 - 600°C
- Machine cycle time: 6 to 20 sec.
- Total system noise: <80 dB
- Dimensions: 419 x 500 x 218 mm
- Weight: 24 kg

### Product Range/Sizes

- Tubing diameter: Up to 19 mm (max)
- Tubing length: Up to 70 mm (max)

### Machine Ordering Information

Description	PN
RBK-X1	2234800-1
RBK-X1 (CE approved)	2234800-2
RBK-X1 w/welding machine interface	2234800-3
RBK-X1 w/welding machine interface (CE approved)	2234800-4
RBK-X1 w/connectivity package	2234800-5
RBK-X1 w/ connectivity package (CE approved)	2234800-6

### Accessories Ordering information

Description	PN
Ultrasonic welding machine interface (field/factory upgrade)	2234989-1*
Connectivity package	2369599-1**
Barcode scanner (including necessary software)	2367220-1***
110V-220V AC transformer with US AC cord	2234986-1

MES (custom only)

\* Applying un-compliant ultrasonic welder may be charged separately

\*\*Providing production data, data export capability, barcode scanning software and welding machine interface

\*\*\*In case of customer provided barcode scanner, only connectivity package PN 2369599-1 is needed.

### Calibration Solutions Ordering Information

- Temperature calibration probe **PN: 288869-000**
- Connection cable **PN: 952687-000**

### Fixture Solutions

- Multiple wire fixture **PN: 2234710-1†**
- Stub fixture **PN: 2234801-1**
- Stub splice fixture **PN: 981721-000**
- Air cool connection box (applied with stub splice fixture PN 981721-000) **PN: 1-529533-7**

† Custom tooling will be quoted separately

### Production Data Solutions Ordering Information

- Basic data collection type I: Software product, to enable RBK-X1 to export to the directory of customer defined PC or networked drive (+ Pro Studio EX) **PN: 2367222-1 ††**
- Basic data collection type II software product, to enable RBK-X1 to store production data locally in machine and export to external storage device (USB port) **PN: 2367223-1 ††**

†† Special requirement of data collection will be quoted separately

### Product Features

The RBK-X1 processor is a semi-automatic unit designed specifically for sealing wire bundles, splice terminals and ring terminals. The RBK-X1 features long life heating elements, operator key lock/password protection levels and individual selections for installation times, temperature and product size information.

The RBK-X1 offers a highly reliable PLC control, a short machine depth to accommodate a larger front working area, low profile and sequence processing.

### The tool can operate in several modes:

- Stand-alone - operator sets time and temperature
- Sequenced - preset times and temperatures can be sequenced automatically (and can also be randomly selected from sequence stored)
- Communication with upstream ultrasonic welder can allow time and temperature to be automatically set without operator intervention

### RBK-X1 Operation:

The operator is able to efficiently load both machines and minimize “dead time”. Installing splice sealing products immediately after welding gives reduced installation time and early possible mechanical protection for the welded joint.

The operator positions the splice sealing product centrally over the splice joint and then locates the assembly into the gripper mechanism. Pushing the two start buttons initiates the machine cycle, bringing the heating chamber into place over the joint area. The heating chamber remains in place for the set period and then returns to the rest position. The wire assembly is automatically ejected, with the splice sealing product installed and the joint area sealed, insulated and strain relieved.

# Quality Tooling for Raychem Heat Shrink Products

## Model 17 Belt Heater



### Technical Data

- Electrical supply: (**PN 2280355-3, 2280355-4**) 120 VAC, 1Ø, 50/60 Hz, 20A; (**PN 2280355-1**) 220 VAC, 1Ø, 208-240 VAC, 15A
- Heating elements: 2 ea. 1000 watt stamped foil infrared with quartz face
- Drive system: DC gear motor with closed loop motor controller, 3-digit thumb-wheel
- Air flow (cooling): 2 - 100 CFM fans in the upper heater housing
- Conveyor belt system: Double sided timing belts; two on each side of the processor - pitch 9.5 mm [0.375 in]
- Belt speed: Up to 243 cm / min [8 ft / min]
- Processor dimensions: 48 cm [19 in] W x 109 cm [43 in] L x 37 cm [14.5 in] H
- Processor weight: 41 Kg [90 lbs]
- Shipping dimensions: 61 cm [24 in] W x 122 cm [48 in] L x 56 cm [23 in] H
- Shipping weight: 68 Kg [150 lbs]
- Tubing diameter (max): Up to 19 mm [0.75 in]
- Tubing length (max): Up to 90 mm [3.5 in]

### Product Features

- Closed-loop time and temperature control
- Continuous controlled process
- Adaptable for different applications
- Bench-top design
- Heater operation and over temperature alarm lights

2280355-1\*  
2280355-3\*\*  
2280355-4\*\*

\*CE Approved

\*\*Not available in EMEA

### Easy Operation

Introducing the Model 17 Belt Heater from TE. The reliable, safer and faster alternative to heat guns for heat shrink wire processing applications. The Model 17 is our smallest (tabletop) conveyor style processor which provides a controlled process for a wide variety of heat shrinkable tubing products. Double-sided timing belts on the top and bottom of the processing chamber draw the assemblies through a thermally controlled infrared heat zone and through a fan-cooled zone before depositing them safely into an unloading bin.

### Controlled Heating Zone

The Model 17 processor has two stamped foil heating elements that are manufactured to a strict wattage specification. Consistent temperatures (ambient to 650° C) are controlled by a thermocouple embedded into the upper heating element connected to a closed-loop temperature controller. An alarm light illuminates whenever the actual heating element temperature varies from the set point temperature.

### Speed Control

The belt speed is selected using a 3-digit thumb wheel via a closed-loop motor controller and DC gear motor. There are clearly marked guides for aligning the assembly as well as the tubing or device being processed. The operator centers the assembly, then the tubing and slides it into the belts. The belts grip and carry the assembly through the heating and cooling zone, depositing it into the unloading bin. Labor costs are reduced significantly because once an operator loads an assembly, that operator can begin preparing another assembly. The throughput rate is usually limited by the rate at which the operator can load assemblies into the processor.

### Versatile Design

The processor is designed to process a broad range of heat-shrinkable products up to 19 mm [0.75 in] in diameter and 90 mm [3.5 in] in length. The infrared energy source is well-suited to efficient processing of either single-wall or adhesive-lined tubing. Heat output can be controlled to accommodate a wide variety of products and substrates.

# Quality Tooling for Raychem Heat Shrink Products

## Model 19 Belt Heater



### Product Features

- Process Control
  - Closed-loop temperature control
  - Closed-loop belt speed control
  - Max/min element temperature alarm bands
  - Lock-out on temperature belt speed controls to prevent unauthorized adjustment
  - Lock-out gate prevents loading of product if the element temperature is too low and if any of the alarms activate
- Diagnostic
  - Heater failure alarm
  - Drive circuit fault alarm
- Safety
  - Emergency stop switch
  - Cool down circuit

### Technical Data

- Electrical supply: 230 VAC 20A, 50/60 Hz single phase
- Heater power: 3160 W / 3320 W / 1760 W depending on tool version
- Element temperature (max): 500 °C
- Conveyor belts: Timing belts, 9.5 mm (0.37 in) pitch
- Belt speed (max): 1.5 meters (5.9 in)/minute
- Processor dimensions (W x L x H): 530 x 1350 x 450 mm
- Shipping dimensions (W x L x H): 660 x 1470 x 580 mm
- Shipping weight: 86 kg

### Product Range

- Tubing diameter (max) 25 mm  
178 mm wide heating element tool  
50 mm narrow heating element tool
- Workpiece length (min) 240 mm
- Tubing diameter (max) 25 mm

The Model 19 belt heater is a continuous-running process heater suitable for installing a wide range of heat shrinkable products.

Two pairs of timing belts grip the individual workpieces and carry them through an infrared heating zone. The workpieces then pass through a cooling zone before finally being deposited into a collection bin.

The system is suited for a wide variety of workpieces and substrates including Raychem tubing products for ring and FASTON terminals.

The system provides excellent process control with both the motor speed and heating elements having closed-loop control. Other controls provide a high level of process security and prevent unauthorized changing of parameters.

The standard tool CLTEQ-M19-BELT-HTR, **PN: 714529-000\*** will handle tubing up to 25 mm diameter and 102 mm long. Tubing up to 178 mm long can be handled with the use of the wide heating element tool CLTEQM19-BELT-HTR-6IN, **PN: 075131-000\***.

The narrow heating element tool CLTEQ-M19-BELTHEATER-SS, **PN: D43037-000\*** will handle solder-sleeve devices up to 10 mm diameter and 45 mm long, or short length tubing (less than 50 mm), where applications require a narrow heat width.

The system is provided with self-diagnostic circuits to alert the operator or abort the process if either a component fails or an 'un-safe' condition occurs.

The processor is designed to operate from a 230V 20A 50/60 Hz supply.

\*If in doubt, contact TE Application Tooling for advice on machine selection.

### Ordering Information

- Standard tool CLTEQ-M19-BELT-HTR  
**PN: 714529-000**
- Wide heating element tool  
CLTEQ-M19-BELT-HTR-6IN,  
**PN: 075131-000**
- Narrow heating element tool  
CLTEQ-M19-BELTHEATER-SS,  
**PN: D43037-0000**

# Quality Tooling for Raychem Heat Shrink Products

## Model 105 Tunnel Oven



### Product Features

- Closed-loop speed and temperature control
- Continuous controlled process
- Adaptable for different applications
- Heater operation and over-temperature alarm lights
- CE approved

### Ordering Information

- Model 105 Tunnel Oven CLTEQ-M105-TUNNEL-OVEN,  
**PN: 955018-000** (Custom variations available upon request)

### Technical Data

- Electrical supply: 210 - 240 VAC, 20 A, 50/60 Hz
- Heating elements: (2) 1500 W infrared stamped foil with black quartz face, one top and bottom
- Drive system: DC gear motor with closed loop motor controller, 3-digit thumb-wheel
- Air flow (cooling): 4 - 100 CFM fans, 2 - for upper heater housing, 2 - for product cooling
- Operating temperature: Set point (heater surface) ambient to 500°C; throughput = 50 to 200 °C
- Conveyor belt system: Wire mesh 70% open
- Belt speed: 6.1 - 152 cm (0.2 - 5.0 ft) per minute
- Processor dimensions (L x W x H): 99 x 68.5 x 41.7 mm
- Control box dimensions (L x W x H): 51.5 x 21.0 x 17.8 cm
- Control box weight: 7.7 kg (17 lbs)
- Shipping dimensions (L x W x H): 134.6 x 116.8 x 63.5 cm
- Shipping weight: 146 kg (320 lbs)
- Tubing diameter (max): Up to 76.2 mm (3.0 in)
- Tubing length (max): 356 mm (14 in) perpendicular to belt travel, unlimited length parallel to belt travel

### Applications

The Model 105 tunnel oven is a reliable and versatile process heater which provides a controlled process for a wide variety of heat shrinkable products.

It is designed as an integrated modular unit. Assemblies are placed on the entry section of a mesh conveyor belt, transported through the heating chamber, across a bank of cooling fans then discharged from the rear of the conveyor.

The upper chamber is cantilevered to permit processing of assemblies that require only a portion of the assembly to pass through the heat zone, and is equipped with adjustable heat shields to maximize the oven heating efficiency for various applications.

### Controlled Heating Zone

Two stamped foil heating elements provide consistent temperatures (ambient to 500° C) and are controlled by a thermocouple embedded into the upper heating element connected to a closed-loop temperature controller.

An alarm light illuminates whenever the actual heating element temperature varies from the set point temperature.

### Conveyor Speed Control

The conveyor speed is precisely set by a 3-digit drive controller. The DC drive motor provides constant conveyor speed at any potentiometer setting from 100 to 999 (0.2 to 5.0 ft) per minute, for precise heating of assemblies.

### Minimal Skill Requirements

The open loading area of the entry section requires that the operator simply place an assembly on the mesh conveyor belt within the effective width of the heat zone and collect it at the opposite end.

### Versatility

The processor is designed to process a broad range of heat shrinkable products up to 76.2 mm in diameter and infinite length. The infrared energy source is well suited to efficient processing of either single-wall or adhesive-lined tubing. Heat output and drive speed can be controlled to accommodate a wide variety of products and substrates such as HFT 5000, AP-2000, QSZH 125 and other Raychem tubing products.

# Quality Tooling for Raychem Heat Shrink Products

## IR-1891 Shuttle Machine



Twin workstation heater for multiple installation of short length tubing products

### Product Features

- Automatic cycle start once heater is manually positioned over product, which gives improved process control (recommended for adhesive lined heat shrinkable tubing e.g. sealing applications)
- Automatic heating head retraction at end of cycle helps prevent damage to components
- Multiple product fixture assemblies give increased process rates
- Cooling fan above each fixture assembly maintains holding fixture at an acceptable temperature
- CE approved

### Technical Data

- Electrical supply: 230 V single phase
- Power consumption: 1600 W
- Operating temperature: 500 °C max.
- Process rate: 1200/hour maximum depending on application and operator
- Heating times: 3 to 20 sec. depending on application
- System noise: < 70 dB
- Dimensions – 508636-000 (L x H x D): 1100 x 650 x 500 mm
- Dimensions (L x H x D) – 613148-000 / 167309-000 / 289588-000: 1100 x 900 x 500 mm
- Base plate dimensions (L x D) – 289588-000 / 167309-000: 1040 x 450 mm
- Base plate dimensions (L x D) – 613148-000: 1040 x 397 mm
- Product range: Wide range of Raychem tubing products such as all dual wall tubings, single wall tubings and ES-Caps [maximum diameter 20 mm (0.8 in) and maximum length 60 mm (2.0 in)]

### Ordering Information

- IR-1891-230V-Shuttle-Retrn **PN: 528018-1**

### Accessories

IR-1891-Heater-Return-Kit **PN: 184947-000** (for use on **PN: 167309-000** serial numbers 400 and above)  
A range of tooling fixtures designed for previous applications is available. Please contact TE Application Tooling for details.

IR-1891 shuttle machine also available as an extra cooling and fixation version. Ordering information upon request.

The IR-1891 is suitable for the installation of a range of Raychem heat shrinkable tubing products onto a variety of small components, e.g. ring terminals, FASTON terminals and small connectors. The machine is provided with two workstations and a movable heating head.

Each workstation is provided with supports for tooling fixtures which can be specified and ordered separately. These support the workpieces and locate the tubing products. The operator loads the workpieces into the fixtures at one of the workstations, confirms that the tubing product is correctly positioned and then slides the heat head into position before initiating the heating cycle. The operator then continues with loading/unloading the other workstation while the heating cycle is taking place.

The IR-1891 shuttle is provided with closed loop temperature control and the heat head is “locked” into position by use of an electromagnet during the heating cycle.

Once the other workstation has been loaded and the first installation is complete, the heat head is moved into position over the product and the next heating cycle initiated. Heating times vary typically from 3 to 30 seconds depending on the size and type of tubing product. Process rates up to 1200 pieces/hour can be achieved depending on the heating time and the time taken by the operator to load/unload the workpieces. The installation temperature/power can be varied according to product type/size and required cycle times.

The heating elements, which are continuously energized, are infrared medium wave length and consist of a coiled resistance wire contained in quartz glass tubes. The closed loop temperature control uses similar elements but has integral thermocouple sensors.

# Quality Tooling for Raychem Heat Shrink Products

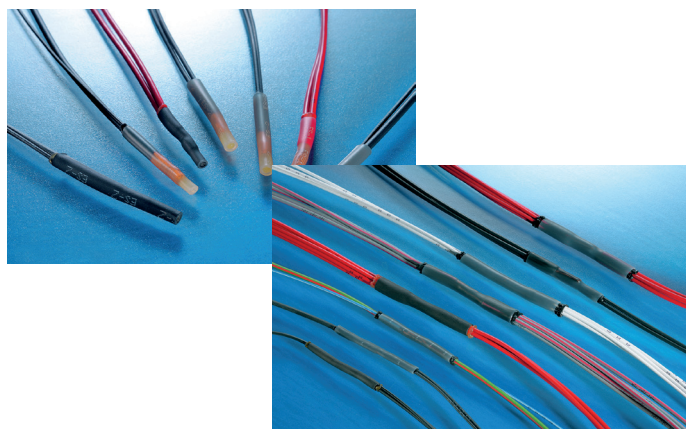
## CV-Obhat 1600 W Stub-System



The CV-Obhat system is a lightweight, portable hot air tool, used to install Raychem ES cap stub splice sealing products and RBK ILS, QSZH, RBK VWS in-line splice sealing products.

### Product Features

- Capable of producing sealed stub and in-line splices on-board
- Wire support and cap holding fixtures integral part of pistol
- Small footprint on harness board
- Lightweight pistol connected to controller with 6m umbilical
- Audible signal at end of installation cycle
- Control system incorporating audible and visual process safety alarms
- Programmable heat cycle start temperature
- Optional board locking capability
- CE approved



### Technical Data

- Electrical supply: 220/240 V/50 Hz single phase
- Current max. load: 7A
- Compressed air supply: 400 kPa/4 bar minimum
- 6-different programmable pre-sets
- Programmable heat cycle timer: 0-99.9 sec.
- Programmable cool cycle timer: 0 - 99.9 sec. from end of heat cycle
- Programmable cap cooling fixture timer: 0- 99.9 sec. from end of heat cycle
- Programmable board locking timer: 0 - 99.9 sec. from end of heat cycle (board locking on during heat cycle)
- Operating temperature: Recommended 500 °C
- Dimensions: 380x300x180mm (15.0x11.8x7.1 in) control box
- Weight: 15 kg- complete system (Control box + pistol + umbilical)
- Umbilical length: 6m
- Product range: Raychem ES caps, RBK ILS tubes, RBK VWS tubes, WSZH tubes

### Ordering Information

- Stub-Splice Variant:  
CV-OBHAT base unit: CH3712-000  
CV-OBHAT-COOL-FIXASSY: 775072-000  
CV-OBHAT-SIL-ARM-GRIP:CH3711-000  
Alternatively  
CV-OBHAT-MECH-GRIPPER:C58553-000
- Inline-Splice Variant:  
CV-OBHAT base unit: CH3712-000  
2xCV-OBHAT-SIL-ARM-GRIP: CH3711-000  
Alternatively  
2 x CV-OBHAT-MECH-GRIPPER: C58553-000

# AD-3050 Seal Test Equipment



## Ordering Information

- AD-3050-SEAL-TEST-EQ-NC **PN: C82893-000**
- Version with integrated timer:  
AD-3050-SEAL-TEST-EQ-NC-TIMER **PN: 528024-1**  
(Timer retrofit kit available)

## Product Features

- Fast determination of sealing integrity
- Multiple test fixtures
- Easy load and release of test samples
- Connector seal test port
- Timer adjustable from 8 - 120 seconds (only with integrated AD-3050 Seal Test Equipment timer version)

## Technical Data

- Pneumatic supply:  
600 kPa / 6 bar maximum, filtered supply  
200 kPa / 2 bar test pressure maximum  
(Test pressure typically 50 kPa / 0.5 bar)
- Machine cycle times for seal testing: Typically 1 min.
- Total system noise: Negligible noise from air test
- Dimensions: 550 x 350 x 215 mm (21.7 x 13.8 x 8.5 in)  
(excludes packing case)
- Weight: 4 kg (excludes packing case)

The AD-3050 seal test equipment is a manually operated pneumatic device, intended for use as a convenient “in process” sampling technique for checking sealed splices.

Different combinations of in-line, end-/stub-splices and various ring terminal applications can be pressure tested in any of the combination of fixtures (8 in total).

There is also a facility to allow leak testing of various connectors. The tool is also intended for use as a quick and easy sampling technique for the preliminary selection of installation conditions where Raychem splice protection products are used.

TE has seen good correlation between results obtained with the AD-3050 seal test and those obtained through water immersion testing. However testing in accordance with the Original Equipment Manufacturer (OEM) specification is the only way of confirming that the OEM specification is being met.

The splice products are located in clamps which deliver the test pressure. The product is immersed in water and pressure is delivered through the wire(s) to the sealed area.

The test result is determined visually by looking for bubbles in the area of the sealing product. Connectors can also be pressure tested by adapting the separate supply fixture to any connector type. Use of this equipment is described in TE’s customer manual. This equipment can also check for poke through i.e. where individual wire strands poke through the installed heat shrinkable sleeve, by using any applicable measure instruments.

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