APPLICATION TOOLING

FOR RAYCHEM HEAT SHRINK PRODUCTS

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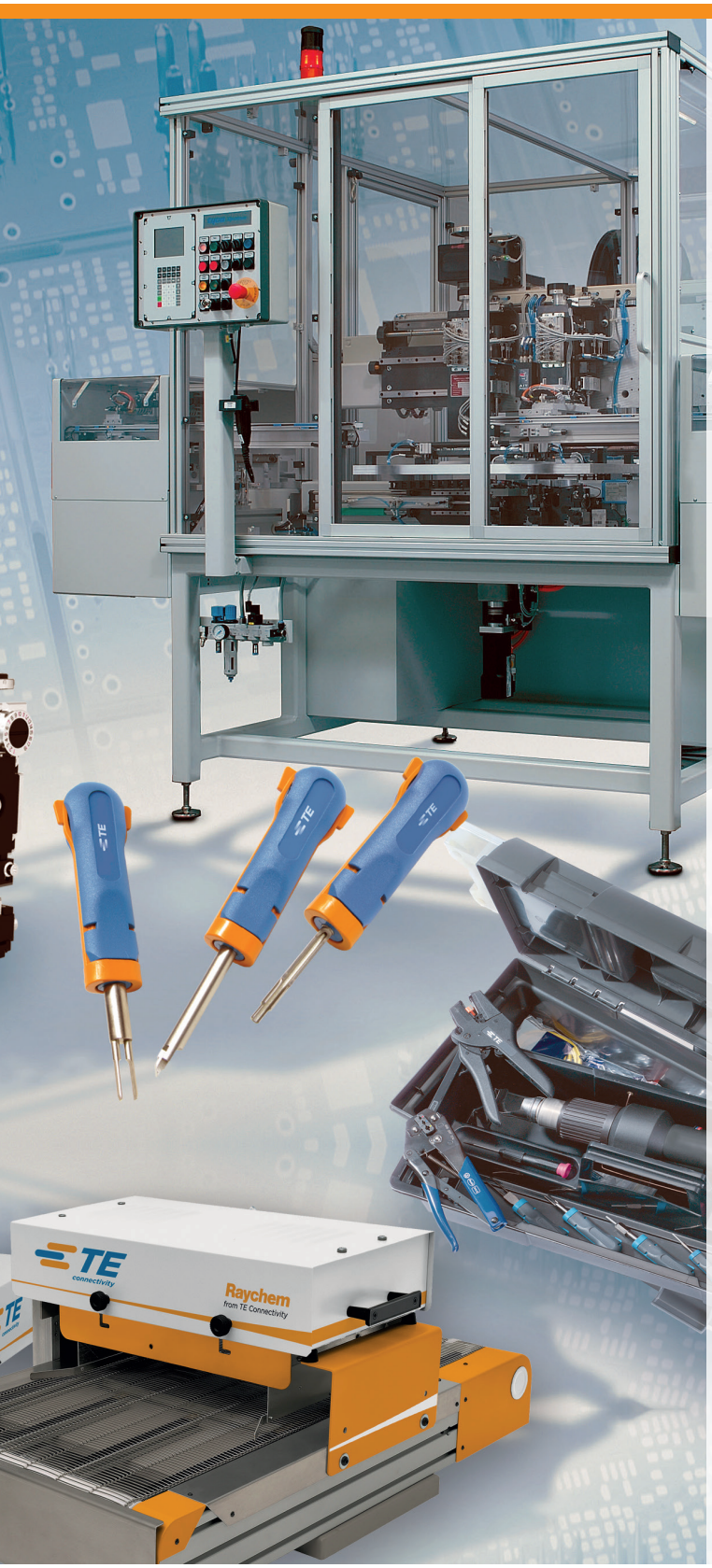
Application Tooling and Equipment Portfolio

- Applicators
- Crimp Machines and Equipment
- Electrical Test Equipment
- FFC-FPC Equipment
- Hand Tools
- IDC Machines
- Lead Makers
- Magnet Wire Equipment
- MOST* Equipment
- Pin Insertion and Press-Fit Machines
- SOLARLOK Equipment
- Tooling for Raychem Heat Shrink Products
- Wire Preparation Equipment
- Installation, Inspection and Service

*MOST is a trademark of SMSC Europe GmbH



Premium-Quality Manufacturing of Heat Shrink Protection Products

TE Connectivity is with its Raychem application equipment one of the world leaders in developing, supplying and manufacturing high quality, technologically advanced installation machines for heat shrink protection products.

Designed for general industry use and developed specifically in close collaboration with customers these products provide a perfect solution for your tough engineering problems. This equipment provides the optimal heating temperatures, performance, and control features for high production efficiency.

Easy-to-use products provide cost effective, proven solutions in a wide range of automotive applications from sealing and protecting electrical splices to providing mechanical protection for fluid management systems in harsh environments.

For over 50 years, customers have recognized the global capabilities of Raychem branded products. Combining these advanced products with superior technical support and global sales and service organizations, our world wide customers count on TE Connectivity to supply the knowledge and products they require to solve specific problems, which can effectively enhance the overall performance of their customers' systems.

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APPLICATION TOOLING
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AD-3050 Seal Test Equipment

Sealing Evaluation – Various Products

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)

Ordering Information

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

Accessories

- Recommended spares
  Set of 8 Seals**
  AD-3050-SEAL-8-KIT
  PCN: 299155-000
- Clamp assembly including seals
  AD-3050-SEAL-CLAMP-ASSY
  PCN: 168927-000
- Sealing tape
  EPDM foam, 6 x 9 mm, with acrylic adhesive backing

** Full set of seals

As the equipment is designed to use readily available pneumatic components, these are listed on the parts list which is included with the equipment.

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

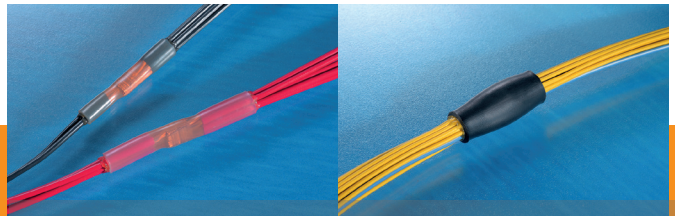
Different combinations of in-line, end-/stub-splices and various ringterminal applications can be pressure tested in any of the combination of fixtures (8 in total).

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 Connectivity 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 OEM (Original Equipment Manufacturer) 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 down 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 these equipments is described in TE Connectivity 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



APPLICATION SAMPLES

APPLICATION TOOLING
FOR RAYCHEM HEAT SHRINK PRODUCTS

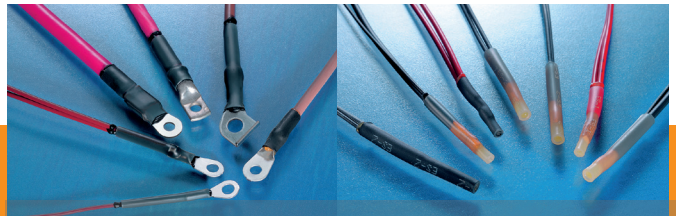
RBK ILS Processor MKIII

Installation of Splice Sealing Products
Ultrasonic Welder

Product Features

- Long life heating elements
- Installation times, temperatures, and product size information (individual selection)
- Sequenced installations
- Operator key lock/password protection levels
- Automatic heater retraction on mains failure (updated safety feature)
- Automatic calibration (single cycle)
- RS232 interface allows time, temperature and product sizes for the next installation to be transferred from a remote machine (e.g. an ultrasonic welding tool)
- Big mechanical protection-cover (removable) in front of the feeding-/working-area
- Pre-installed connection for an optional air-cooling-device
- Second D-SUB-9-connector with a signal output “0” volt (n/c and n/o) where the machine can be connected to a server, local PC or customer intranet
- Machine hours and installation cycle counters
- Software upgradeable to support special applications
- Integrated SW-safety-features to provide high of safeness during processing
- Compliant with latest CE and RoHs requirements

APPLICATION SAMPLES



Technical Data

- Electrical supply: 220 – 240 V, 50 Hz
- Power consumption: 1.7 A (max.)
- Operating temperature: 500 °C recommended
- Machine cycle times for splice sealing products used on typical range of automotive splices:
  6 to 20 sec. depending on wire size and the number or wires used
- Total system noise: <80 dB
- Dimensions: 390 x 365 x 225 mm (15.4 x 14.4 x 8.9 in)
- Weight: 18 kg

Product Range/Sizes

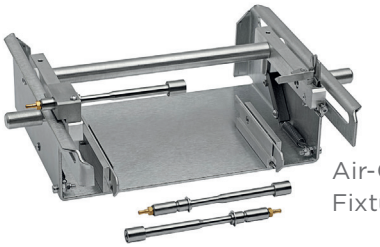
- QSZH 125 products/Sizes 1 to 3 A
- RBK ILS-125 products/Sizes 1 to 3 A
- RBK ILS-85 products/Sizes 6/1 to 12/3
- For other Raychem products
  (e.g. RBK VWS, RBK ESS ...)
  contact TE Application Tooling

Ordering Information

- Equipment RBK-Proc-Mk3-Processor
  PCN: 529535-1

Accessories

- Air cool connection box – RBK-ILS-Proc-Air-Cool-Kit,
  PCN: 1-529533-7
- Stub splice fixture – RBK-ILS-Proc-Stub-Sp-Fix,
  PCN: 981721-000
- 8 mm ring terminal fixture –
  RBK-ILS-Proc-Term-fix-08 mm
  PCN: 049857-000



Air-Cooled-Stub-Splice-Fixture-981721-000

The RBK ILS processor MKIII is a semiautomatic unit designed specifically to install splice sealing products onto ultrasonically welded or crimped splice joints used in automotive harnesses.

The tool can operate in several modes:

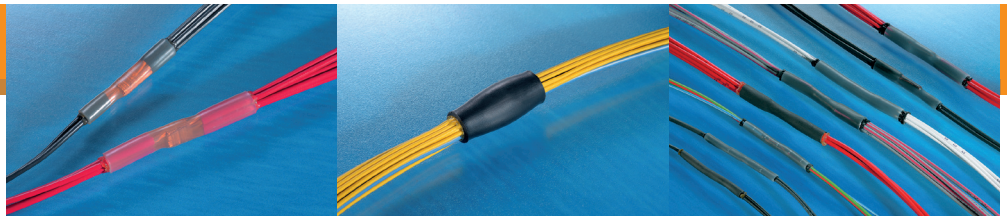
- Stand-alone – operator sets time and temperature
- Sequenced – preset times and temperatures can be sequenced automatically (and can also be randomly selected from sequence stored)
- Automatic communication with upstream ultrasonic welder can allow time and temperature to be automatically set without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

In this way the operator is able to efficiently load both machines and so minimise “dead time”. Installing Raychem 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 thus 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.



APPLICATION TOOLING
FOR RAYCHEM HEAT SHRINK PRODUCTS

Model 19 Belt Heater
Continuous Process 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 unauthorised adjustment
  - Lock-out gate prevents loading of product if the element temperature is tool 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 20 A, 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 metres (5.9 in)/minute
- Processor dimensions (W x L x H): 530 x 1350 x 450 mm (20.9 x 53.2 x 17.7 in)
- Shipping dimensions (W x L x H): 660 x 1470 x 580 mm (26.0 x 57.9 x 22.8 in)
- 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 the latest generation of versatile process heaters 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 ideally suited to installing Raychem tubing products onto both ring terminals and FASTON terminals as well as automotive splices and other suitable applications where the workpiece and substrate are suitable for processing.

The system is suitable for continuous running with minimum maintenance and downtime.

The system provides good 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 unauthorised changing of parameters.

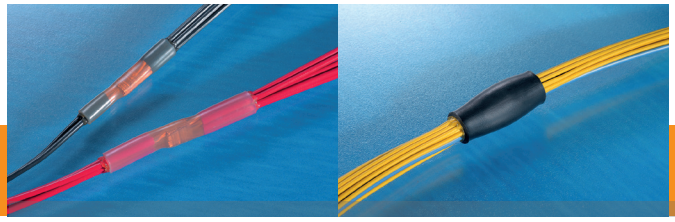
The standard tool CLTEQ-M19-BELT-HTR, PCN: 714529-000* will handle tubing up to 25 mm diameter and 102 mm long. Tubing up to 178 mm long can be handled with the use of the wide heating element tool CLTEQM19-BELT-HTR-6IN, PCN: 075131-000*.

The narrow heating element tool CLTEQ-M19-BELTHEATER-SS, PCN: D43037-000* will handle soldersleeve 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 selfdiagnostic 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 230 V 20 A 50/60 Hz supply.

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



APPLICATION SAMPLES

Ordering Information

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

APPLICATION TOOLING
FOR RAYCHEM HEAT SHRINK PRODUCTS

Model 105 Tunnel Oven

for Heat Shrinkable Tubing, Thermal Processing and Curing

Product Features

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

Ordering Information

- Model 105 Tunnel Oven
  CLTEQ-M105-TUNNEL-OVEN,
  PCN: 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 thumbwheel
- 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 (39 x 27 x 16.5 in)
- Control box dimensions (L x W x H):
  51.5 x 21.0 x 17.8 cm (20.25 x 8.25 x 7.0 in)
- Control box weight: 7.7 kg (17 lbs)
- Shipping dimensions (L x W x H):
  134.6 x 116.8 x 63.5 cm (53 x 46 x 25 in)
- 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.

The Model 105 tunnel oven 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 Model 105 tunnel oven has two upper heating chamber height positions, 54 mm (2.11 in) and 98 mm (3.86 in). The position is adjusted by removing the pivot pins and relocating them in the bearing stands.

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

Controlled Heating Zone

The Model 105 tunnel oven has two stamped foil heating elements that are manufactured to a strict wattage specification. Consistent temperatures (ambient to 500 °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

Conveyor Speed Control

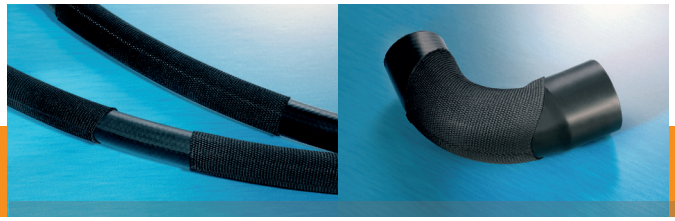
The conveyor speed is precisely set by a 3-digit drive controller and DC drive motor ensure constant conveyor speed at any potentiometer setting from 100 to 999 (0.2 to 5.0 ft) per minute, for precise heating of assemblies.

Minimal Skill Requirements

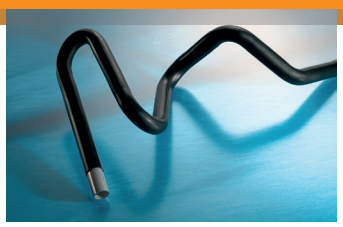
The open loading area of the entry section of the Model 105 tunnel oven requires that the operator simply place an assembly on the mesh conveyor belt within the effective width of the heat zone and collect it at the opposite end.

Versatility

The processor is designed to process a broad range of heat shrinkable products up to 76.2 mm (3 in) 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.



APPLICATION SAMPLES



APPLICATION TOOLING
FOR RAYCHEM HEAT SHRINK PRODUCTS

Model 17 Belt Heater

Conveyor Style Tabletop Belt Heater

Product Features

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

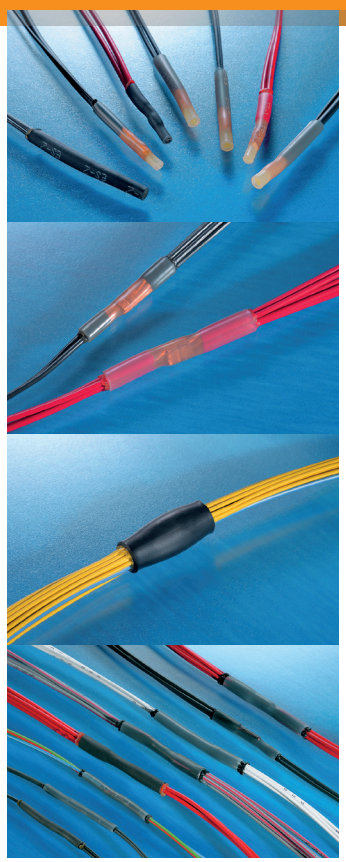
Technical Data

- Electrical supply: 120 VAC, 1∅, 50/60 Hz, 20 A (PN 2280355-3); 220 VAC, 1∅, 208-240 VAC, 15 A (PN 2280355-1)
- Heating Elements: 2 ea. 1000 watt stamped foil infrared with quartz face
- Drive System: DC gear motor with closed loop motor controller, 3-digit thumbwheel
- 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]

Easy Operation

Introducing the Model 17 Belt Heater from TE Connectivity. The reliable, safer and faster alternative to heat guns for heat shrink wire processing applications. The Model 17 Belt Heater 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.

APPLICATION SAMPLES



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 650º 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 only has to center the assembly then the tubing and slide it into the belts. The belts grip and carry the assembly through the heating and cooling zone, depositing them 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.

APPLICATION 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 prevents 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 (43 x 25 x 20 in)
- Dimensions (L x H x D) – 613148-000 / 167309-000 / 289588-000: 1100 x 900 x 500 mm (43 x 35 x 20 in)
- Base plate dimensions (L x D) – 289588-000 / 167309-000: 1040 x 450 mm (41 x 18 in)
- Base plate dimensions (L x D) – 613148-000: 1040 x 397 mm (41 x 16 in)
- 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

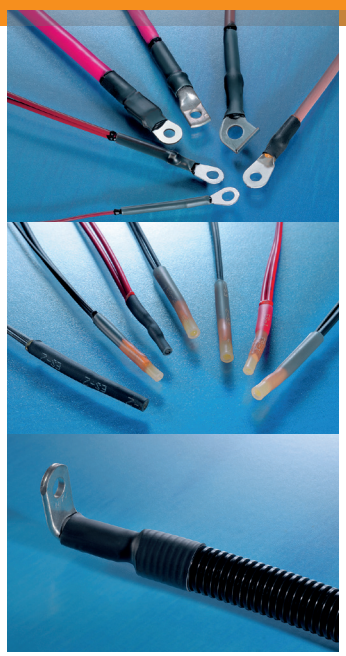
- IR-1891-230V-Shuttle-Retn
  PCN: 528018-1

Acessories

IR-1891-Heater-Return-Kit
PCN: 184947-000 (for use on PCN 167309-000 serial nos 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.

APPLICATION SAMPLES



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 moveable 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, ensures 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 whilst the heating cycle is taking place.

The IR-1891 shuttle is provided with closed loop temperature control and in addition 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 of the infrared medium wave length type and consist of a coiled resistance wire contained in quartz glass tubes. The closed loop temperature control uses similar elements but having integral thermocouple sensors.

Let's Connect

To learn more about our Heat Shrink Equipment, or to learn more about our comprehensive bundle of tooling solutions, please visit us at www.tooling.te.com.

TE Technical Support Center

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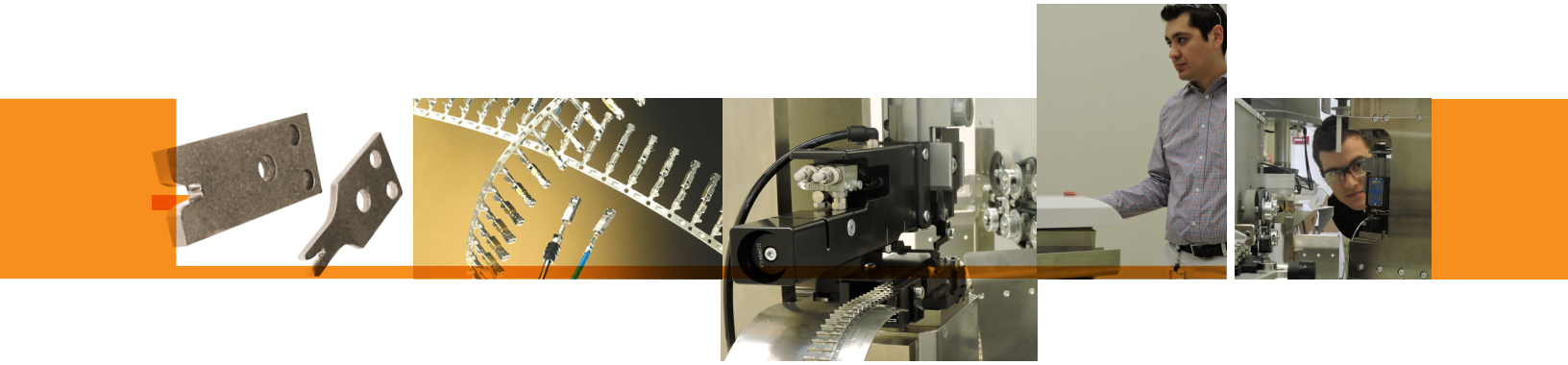

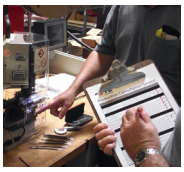

Waste Not. Want Not.

TE Application Tooling has a broad network of field service engineers who cover almost all countries worldwide. The engineers have the knowledge to help you on a professional level with your equipment and may be able to improve the manufacturing efficiency. In addition to installation and repair service, we can assist with equipment selection, training, troubleshooting, service contracts and spare parts.

www.te.com/en/products/application-tooling/global-field-services.html

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RNF-100-2-BK-BSP RNF-100-2-CL-BSP RNF-100-3-BK-SP RNF-100-4-BK-SP RNF-100-3/64-BK-SP DA46743 RNF-100-1/16-BK-SP-CS5004 RNF-100-1/16-WH-SP-CS5004 RNF-100-1/2-BK-STKCS5004 RNF1001/2RBKSTK RNF1001/4BKSPCS5004 RNF1001/4WHSPCS5004 RNF1001/8BKSPCS5004 RNF1001/8CLSPCS7312 RNF1001/8WHSPCS5004 RNF-100-1-BK-STKCS5004 RNF-100-3/16-BK-SP-CS5004 RNF-100-3/16-CL-SP-CS7312 RNF-100-3/16-WHSPCS5004 RNF-100-3/32-WHSPCS5004 RNF1003/4RBKSTK RNF1003/8BKSPCS5004 RNF-100-3-BK-STKCS5004 RNF-100-5/8-BK-SP RNF-100-1/4-BK-STK-CS5004 RNF-100-2-BK-STK-CS7250 RNF-100-3/32-BK-SP-CS7807 RNF-100-1-1/2-BKSTKCS5004 RNF-100-3/32-0-SP RNF-100-3/8-X-STK RNF-100-3/8-0-SP RNF-100-1/4-0-SP RNF-100-3/8-2-SP RNF-100-3/32-X-SP RNF-100-1/16-4-SP RNF-100-1-X-SP RNF-100-1-X-STK RNF-100-1-1/2-9-STK RNF-100-1/16-X-SP RNF-100-1/16-9-SP RNF-100-1/2-2-STK RNF-100-1/2-6-STK RNF-100-1/2-9-SP RNF-100-1/2-9-STK RNF-100-2-0-STK RNF-100-3-0-STK RNF-100-3/16-6-STK RNF-100-3/4-4-SP RNF-100-1/8-2-SP RNF-100-2-0-SP RNF-100-1/4-4-STK RNF-100-3/32-9-SP RNF-100-1-1/2-BU-SP RNF-100-3-WH-STK RNF-100-3/16-YO-SP-CS6162 RNF-100-3/4-BK-SP-CS5004 RNF-100-1/16-BN-SP-CS5004 RNF-100-1/16-CL-SP-CS5868 RNF-100-1/8-GN-SP-CS7554 RNF-100-3/16-BU-SP-CS5004 RNF-100-1-RD-STK RNF-100-1-GN-STK RNF-100-3-BK-STK-CS7224 RNF-100-1/2-VT-SP RNF-100-3/8-WH-SP-CS5074 RNF-100-1/2R-BK-STK RNF-100-3/16-WH-SP-CS5551 RNF-100-1/2-GN-STK RNF-100-1/2-BK-STK-CS7387 RNF-100-1/8-GN-STK RNF-100-1/2-WH-SP-CS7554 RNF-100-3/32-CL-SP-CS5868 RNF-100-3/4-YO-SP RNF-100-1/2-BK-STK-CS7224 RNF-100-3/16-BK-SP-CS7807 RNF-100-1/4-RD-SP-CS5529 RNF-100-1/8-BK-SP-CS7807 RNF-100-1-YO-STK-CS7465 RNF-100-2-GN-SP RNF-100-1-RD-SP RNF-100-1/8-CL-STK-CS6162 RNF-100-4-YO-SP RNF-100-1/8-VT-STK RNF-100-3/16-RD-STK RNF-100-1/2-RD-SP-CS5529 RNF-100-2-WH-STK-CS5529 RNF-100-3/64-WH-STKCS7156 RNF-100-1/4-RD-STK-CS7675 RNF-100-3-YO-SP RNF-100-1-1/4-WH-SP RNF-100-1-1/4-GN-SP RNF-100-1/4-WH-SP-CS7465 RNF-100-4-BU-SP RNF-100-1/8-RD-SP-CS5529 RNF-100-3/8-BN-SP RNF-100-1/16-GN-SP RNF-100-1/4-CL-STK-CS6162 RNF-100-1-BK-SP-CS7387 RNF-100-3/64-BKSTK-CS6162 RNF-100-3/4-WH-STK-CS5592