



ShrinkSMART



Shrink Fit Machine Operating Manual

Important Cautions & Warnings

The GS Tooling ShrinkSMART is built with the latest technology and it is extremely safe and easy to operate. However, there is still some danger if this device is operated incorrectly and/or by untrained personnel. Pay particular attention to the following cautions and warnings marked with the "Attention" and "Danger" symbols. Failure to follow safe operating practices may cause injuries, death or damage to the device and may VOID your manufacturer's warranties.

Before attempting to use the device, you must read and fully understand this User Guide. Keep this User Guide within easy reach of operating personnel.



Visually inspect the device, power cord and accessory items for any signs of wear or damage before operating the device. Do not use the device if there is any sign of damage or if the device is not performing normally.

Never operate the device without the correct induction heat-focusing stopper in place on the induction head. Do not allow any part of the induction head to contact the tool holder or cutting tool during operation or damage to the device may occur.

The holder and the tool must be clean, free from grease and dry before being fitted to the device.

Tool shank tolerance required: Ø0.118" to 0.196" (Ø3 to 5mm) maximum h5. Tool shank must be carbide or heavy metal (e.g. Densimet) Ø0.236" to Ø 1.259" (Ø6 to Ø32mm) maximum h6. Tool shank can be steel, HSS, carbide or heavy metal. Using h5 for Ø0.236" to Ø1.259" (Ø6 to Ø32mm) provides a safer minimum clamping torque.

Do not wear rings, bracelets or other metallic objects while operating the device. Metallic objects may heat up very quickly when near the induction head during operation.

Use the provided heat-resistant gloves whenever handling tools or tool holders. Never try to handle hot tools or tool holders until the cooling cycle is complete.



If the device is moved from a cold environment to a warm one, wait three hours before operating to prevent build-up of condensation and electronic system errors.

Persons with pacemakers fitted may not operate the device and must maintain a minimum safe distance of 2 meters (6 feet) from the device at all times.



Cutting tools have sharp edges. Handle with caution.

The power cord provided must be plugged into the correct standard, three-phase outlet for your country. Operating the device while it is improperly connected or at the wrong voltage may damage the device and could cause death or injury.



Position the power cord so that it cannot be damaged by fork trucks or other equipment or cause a tripping hazard for personnel.

Do not operate the device in a wet environment where exposure to coolant or spills are likely to occur. Electric shocks or damage to the device may occur.

Never operate the device around flammable materials or fumes. Do not use flammable liquids or aerosols to clean the tool holders. Never expose the device or hot tools to combustible materials.

Never open the device or attempt repairs or you will VOID the manufacturer's warranty. There is dangerous residual voltage inside that may cause death or injury.

Unauthorized modifications or changes to the ShrinkSMART device will VOID your manufacturer's warranty. Do not try and service your device yourself. After-sales technicians can provide any necessary repairs or maintenance. Do not modify or disable the built-in safety features of the device.

Turn off the power switch and disconnect the power cord from the outlet before cleaning, servicing or storing the device.

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Technical features for the water-cooling refrigeration unit 19

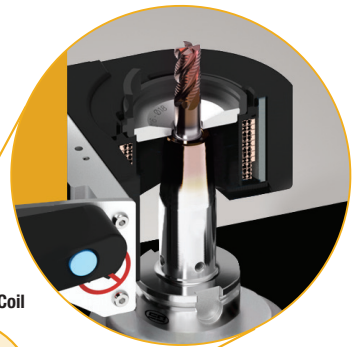
General Overview & Features

Compatible with all popular tooling combinations

Tool types: HSS, Carbide, MST, Magnetic and Non-Magnetic

Diameters from: 0.118" to 1.259" (3mm to 32mm) (1.574" (40mm) possible with the same coil; optional stop disk)

Tapers: CAT/BT/SK40 & 50, HSK63A & 100A, C6 & C10 (with additional adapters available for CAT/BT/SK30, SK25 & 35 & 45, HSK32 & 50 & 80, C3 & C5 & C8 CAPTO)



Column

Enables the shrinking and unshrinking of tool holders with a maximum length of:

15.748" (400mm) with multi-function adapter

17.716" (450mm) with SA50 finned support

20.078" (510mm) with other finned support

Heat Focusing Stop Disks

Magnetic insulator allows the magnetic field to be concentrated on the front part of the tool holder to enable the shrinking and unshrinking of carbide or HSS tools Ø0.118" to Ø1.259" (Ø3 to Ø32mm). Split stop disks are available as accessories for larger head tools.



Storage for Stop Rods
Heat Focusing Stop Disks

SMART Coil

Fast and optimized cycles for shrinking and unshrinking steel, HSS, heavy metal or carbide tools with standard DIN type tool holders.

The ShrinkSMART SMART Coil focuses the heat of the induction unit directly onto the clamping area. It measures the holder thickness and optimizes the power required to heat the holder. It is safe and easy to use with a super fast 2-7 second shrinking cycle.

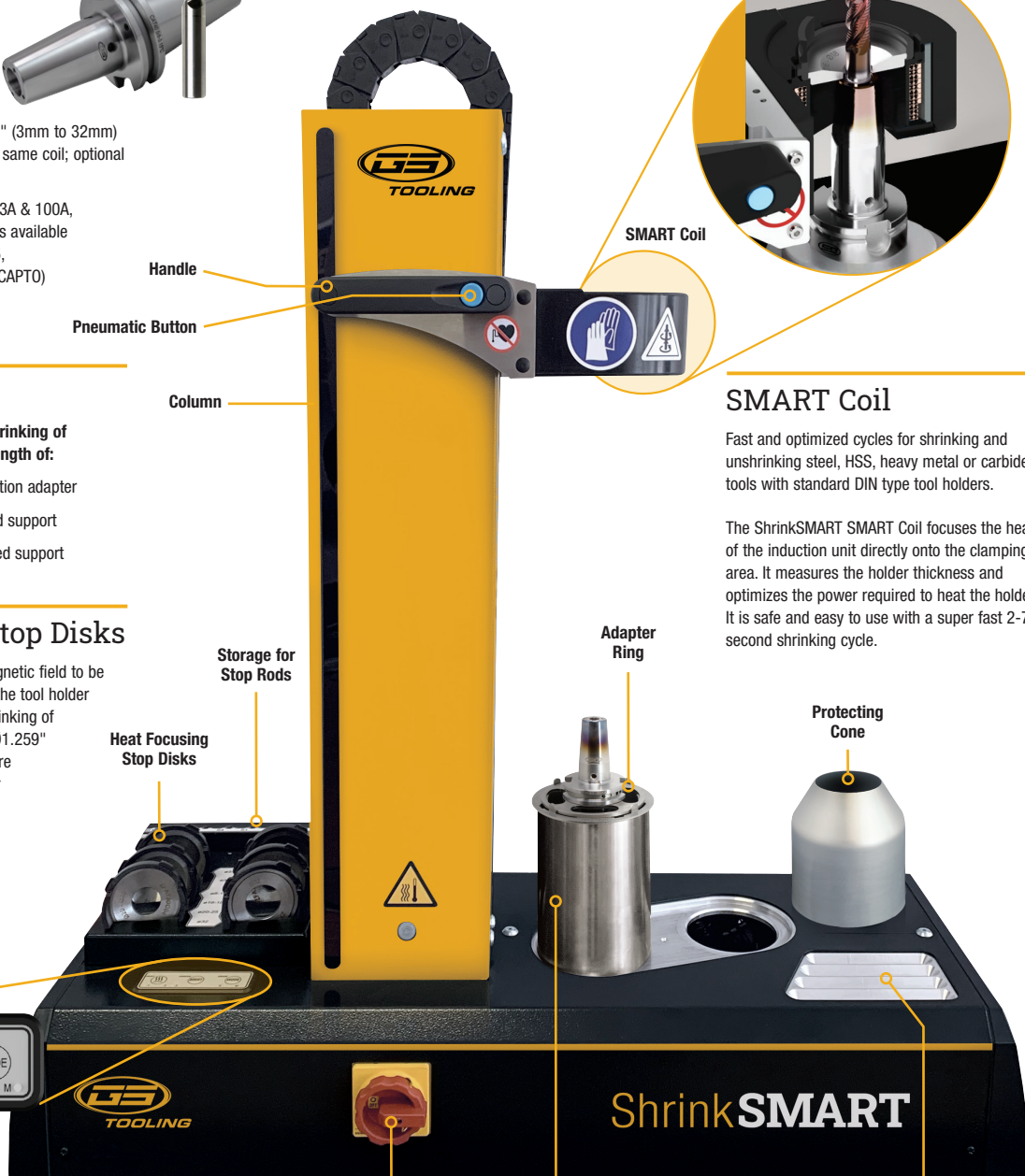
SMART Control Panel



SMART Control Panel & Software

The easy to use SMART Control Panel has three optimized pre-preprogrammed cycles:

1. For DIN 4.5° holders
2. For DIN 3° holders
3. One programmable MODE for specialized tool holders.



ShrinkSMART

Fans

Internal fans automatically engage after heat cycle to cool the holders.

What's In the Box & Specifications

Operating Manual



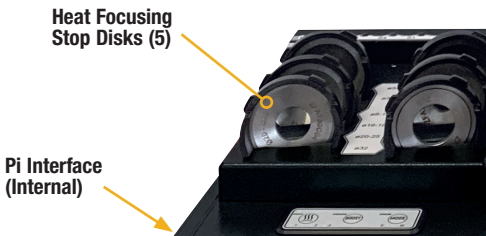
Quick Reference Card

ShrinkSMART
Minimum Shank Clamping Depth

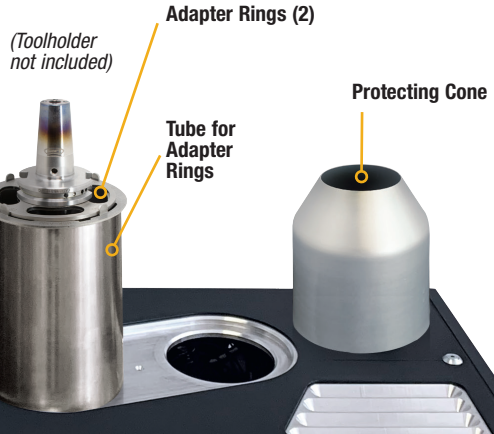
| Shank Diameter | Shank Length | Minimum Clamping Depth | Maximum Clamping Length |
|----------------|--------------|------------------------|-------------------------|
| 3/16" | 2 1/2" | 1/2" | 1 1/2" |
| 1/4" | 3" | 5/8" | 2" |
| 5/16" | 3 1/2" | 3/4" | 2 1/4" |
| 3/8" | 4" | 7/8" | 3" |
| 1/2" | 4 1/2" | 1" | 3 1/2" |
| 5/8" | 5" | 1 1/8" | 4" |
| 3/4" | 5 1/2" | 1 1/4" | 4 1/2" |
| 7/8" | 6" | 1 1/2" | 5" |
| 1" | 6 1/2" | 1 3/4" | 5 1/2" |
| 1 1/8" | 7" | 2" | 6" |

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| | |
|-------------------------------|---|
| Power | Up to 16kW allows the shrinking and unshrinking of tools Ø0.118" to Ø1.259" (Ø3mm to Ø32mm) |
| Voltage | AC 3 x 400V-480V (±10%) + PE/23.8 A/50-60Hz 2.5 meter cable is supplied Air 3-6 bars/duct Ø0.4" (Ø3mm) required |
| Max Tool Length | 16" to 19.25" (406.4mm to 488.95mm) |
| Largest Possible Taper | HSK125A |
| Weight | 102lbs (46.2kg) Approximate |
| Dimensions | 12.5"W x 38"D x 36"H (317mm x 955mm x 920mm) Approximate |



| GS Tooling ShrinkSMART Shrink Fit Machine | | Code No. |
|---|--|----------|
| Included | | |
| 1 | SMART Coil | 541650 |
| 5 | Heat Focusing Stop Disks: 0.118"-0.236" (3mm-6mm), 0.314"-0.551" (8mm-14mm), 0.629"-0.708" (16mm-18mm), 0.787"-0.984" (20mm-25mm), 1.259" (32mm) | |
| 2 | Adapter Rings: CAT40/BT40/SK40/HSK63A/C6 CAPTO CAT50/BT50/SK50/HSK100A/C10 CAPTO | |
| 1 | Tube for Adapter Rings | |
| 1 | Protecting Cone | |
| 1 | Pair of Gloves | |
| 1 | Quick Reference Card: Clamping Depth & MODE Selection | |
| 1 | Operating Manual | |
| 1 | Pi-Interface | |



Parts, Accessories & Upgrade Options

Air-Powered Cooling Unit

Cooling time: from 50 seconds (*Depending on the tool holder shape*)

Weight: 11.5lbs (5.24kg)

Height: 18.38" (467mm)

Connection: W, N+G

Voltage: 1 x 100Vac-277Vac

Frequency: 50/60Hz

Air Required: 3-6 Bars



| Description | Code No. |
|--------------------------|----------|
| Air-Powered Cooling Unit | 541654 |

Air-Cooling Box & Extra Storage for 5 Holders

Cooling time: from 4-5 minutes
(*Depending on the tool holder shape*)

Weight: 23.15lbs (10.5kg)

Height x Width x Depth:
12.48" x 19.68" x 35.8"
(317mm x 500mm x 910mm)

Connection: L1, N+PE

Voltage: 1 x 100Vac-277Vac

Frequency: 50/60Hz



INCLUDED:

2 fans, 5 adapter rings for CAT40/BT40/HSK63A/C6,
5 adapter rings for CAT50/BT50/HSK100A/C10,
2 protecting cones

| Description | Code No. |
|-------------------------------|----------|
| Air-Cooling Box for 5 Holders | 541656 |

Water-Cooling Refrigeration Unit

Cooling time: from 45 seconds
(*Depending on the tool holder shape*)

Extension table: Allow storage of
5 contact bushings and 1 cooling bell

Weight: 88lbs (39.8kg)

**Height x Width x Depth
(Table Extension):**
14.25" x 5.69" x 35.8"
(362mm x 150mm x 910mm)

**Height x Width x Depth
(Refrigeration Unit):**
18.5" x 11.42" x 22.83"
(470mm x 290mm x 580mm)

INCLUDED:
Refrigeration unit, tube support,
2 cooling bells, extension table



| Description | Code No. |
|--|----------|
| Water-cooling refrigeration unit, tube support, 2 cooling bells & extension table | 541688 |

Rotary Table with Shrink Depth Settings

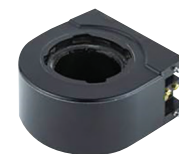
The Rotary Table stops the user from having any contact with hot holders, and allows them to safely switch from the heating position to a cooling position. The Stop Rods allow the user to set the depth of the cutting tool with a wheel that moves the stop rod and your tool into position. Stop Rods also assists in removing broken tools.



| Description | Code No. |
|---|----------|
| Rotary Table Attachment with 8 Stop Rods – 4pc 4.2mm Diameter (Code No. 541714) & 4pc 2.5mm Diameter (Code No. 541715) | 541652 |

SMART Coil

Measures the holder thickness and optimizes power consumption by automatically adjusting kw and heating time for each holder. This increases the life of your tool holders



| Description | Code No. |
|-------------|----------|
| SMART Coil | 541686 |

Parts



Heat Focusing Stop Disk



Split Heat Focusing Stop Disk



Adapter Rings



Protecting Cone



Pair of Gloves



Stop Rods
(Set of 4 pc)



Finned Support Cooling Adapter



Cooling/Contact Bushing



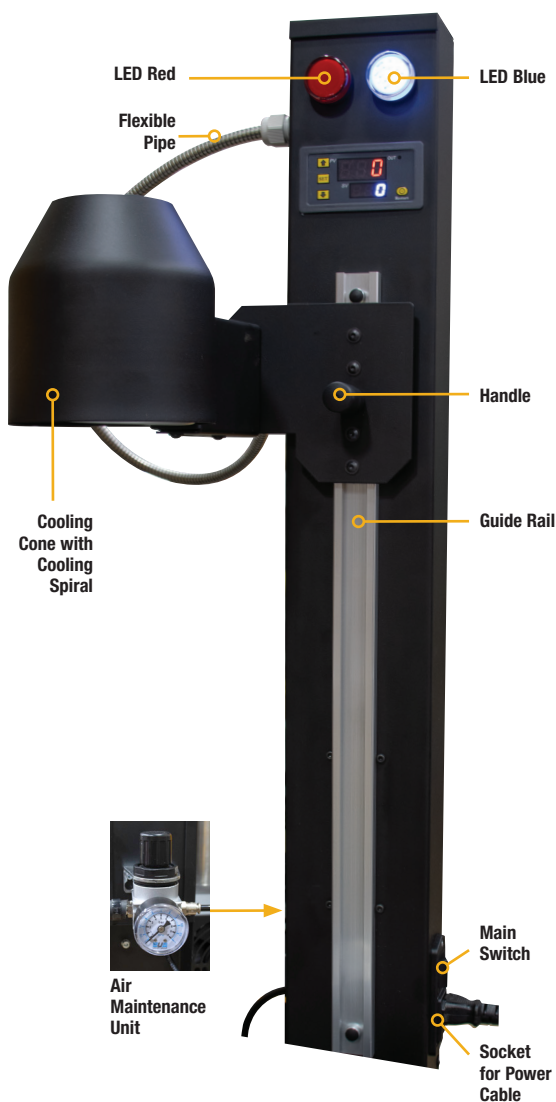
Tube for Adapter Rings



Tube for Adapter Rings with Stop Rod Depth Setter

| Description | Code No. |
|--|--|
| Protecting Cone | 541658 |
| Tube for Adapter Rings | 541660 |
| Tube for Adapter Rings with Stop Rod Depth Setter | 541661 |
| Stop Rods | 4pc 4.2mm Diameter 4pc 2.5mm Diameter |
| Pair of Heat Resistant Gloves (<i>May not look exactly as shown</i>) | 541712 |
| Adapter Rings | CAT40/BT40/SK40/HSK63A/C6/C10 CAPTO CAT50/BT50/SK50/HSK100A BT30/SK30/HSK40A/C4 CAPTO SK25/HSK32A/C3 CAPTO SK35/HSK50A/C5 CAPTO SK45/HSK80A/C8 CAPTO |
| Heat Focusing Stop Disks | 0.118"-0.236" (3mm-6mm) 0.314"-0.551" (8mm-14mm) 0.629"-0.708" (16mm-18mm) 0.787"-0.984" (20mm-25mm) 1.259" (32mm) |
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| Tube for Adapter Rings | 541662 541664 541666 541668 541670 541672 |
| Tube for Adapter Rings with Stop Rod Depth Setter | 541674 541676 541678 541680 541682 541675 541677 541679 541681 541683 541690 541692 541694 541696 541698 |
| Stop Rods | 541714 541715 |
| Pair of Heat Resistant Gloves | 541712 |
| Protecting Cone | 541658 |
| Tube for Adapter Rings | 541660 |
| Tube for Adapter Rings with Stop Rod Depth Setter | 541661 |
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| Stop Rods | 4pc 4.2mm Diameter 4pc 2.5mm Diameter |
| Pair of Heat Resistant Gloves (<i>May not look exactly as shown</i>) | 541712 |
| Adapter Rings | CAT40/BT40/SK40/HSK63A/C6/C10 CAPTO CAT50/BT50/SK50/HSK100A BT30/SK30/HSK40A/C4 CAPTO SK25/HSK32A/C3 CAPTO SK35/HSK50A/C5 CAPTO SK45/HSK80A/C8 CAPTO |
| Heat Focusing Stop Disks | 0.118"-0.236" (3mm-6mm) 0.314"-0.551" (8mm-14mm) 0.629"-0.708" (16mm-18mm) 0.787"-0.984" (20mm-25mm) 1.259" (32mm) |
| Split Heat Focusing Stop Disks | 0.118"-0.236" (3mm-6mm) 0.314"-0.551" (8mm-14mm) 0.629"-0.708" (16mm-18mm) 0.787"-0.984" (20mm-25mm) 1.259" (32mm) |
| Finned Support Cooling Adapters | CAT40/BT40 CAT50/BT50 BT30 HSK63A C6 CAPTO |
| Cooling/Contact Bushings | 1/8" & 3/16" (3/4/5mm) 1/4" & 5/16" (6/8mm) 3/8" & 7/16" & 1/2" (10/12mm) 9/16" & 5/8" (14/16mm) 3/4" (18/20mm) 1" & 1-1/4" (25/32mm) |
| Tube for Adapter Rings | 541662 541664 541666 541668 541670 541672 541674 541676 541678 541680 541682 541675 541677 541679 541681 541683 541690 541692 541694 541696 541698 |
| Tube for Adapter Rings with Stop Rod Depth Setter | 541661 |
| Stop Rods | 4pc 4.2mm Diameter 4pc 2.5mm Diameter |
| Pair of Heat Resistant Gloves (<i>May not look exactly as shown</i>) | 541712 |
| Adapter Rings | CAT40/BT40/SK40/HSK63A/C6/C10 CAPTO CAT50/BT50/SK50/HSK100A BT30/SK30/HSK40A/C4 CAPTO SK25/HSK32A/C3 CAPTO SK35/HSK50A/C5 CAPTO SK45/HSK80A/C8 CAPTO |
| Heat Focusing Stop Disks | 0.118"-0.236" (3mm-6mm) 0.314"-0.551" (8mm-14mm) 0.629"-0.708" (16mm-18mm) 0.787"-0.984" (20mm-25mm) 1.259" (32mm) |
| Split Heat Focusing Stop Disks | 0.118"-0.236" (3mm-6mm) 0.314"-0.551" (8mm-14mm) 0.629"-0.708" (16mm-18mm) 0.787"-0.984" (20mm-25mm) 1.259" (32mm) |
| Finned Support Cooling Adapters | CAT40/BT40 CAT50/BT50 BT30 HSK63A C6 CAPTO |
| Cooling/Contact Bushings | 1/8" & 3/16" (3/4/5mm) 1/4" |

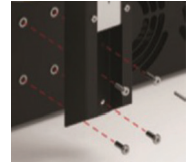
Air-Powered Cooling Unit – Installation & Usage



Air Maintenance Unit

Mount the Air-Powered Cooling Unit

- 1 Place unit against the ShrinkSMART and line up the screw holes. Tighten the 4 screws to secure powered cooling unit.
- 2 Connect the local compressed air pipe to the air maintenance unit.
- 3 Connect the power cable to the air-powered cooling unit and the local power supply socket.
- 4 Switch on the air-powered cooling unit.



After switching on the device, air cooling starts automatically and stops automatically after the end of the programmed cooling time.

The display shows the current remaining cooling time in seconds.

Default cooling time is 210 seconds.

When cooling starts, the red LED lights up and after cooling stops, the blue LED lights up.

The cooling time can be restarted with the Restart button.

The default cooling time can be modified.



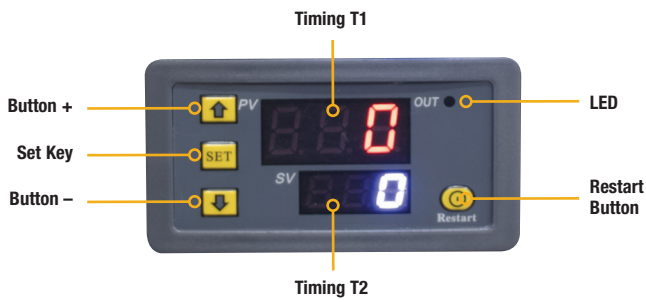
Specifications

| | |
|-----------------------------|--------------------------------------|
| Model | Time Delay Relay |
| Timing Range | 0-999s (Default 210s) |
| Power Supply Voltage | 1 x 100 Vac-277 Vac, 50-60Hz |
| LED Display | Red & Blue Dual Display |
| Panel Size | 3.11 x 1.02 x 1.69" (79 x 26 x 43mm) |

Instructions – Air-Powered Cooling Unit

- 1 Turn on power switch.
- 2 Unit will default to 210 seconds.
- 3 To alter the default cooling time - Press SET key once to enter time setting mode, the red LED will flash. Press the ▲ key to increase or ▼ key to decrease the setting time (T1).
- 4 After setting the timing you must wait 6 seconds for the setting to be saved automatically.

Digital Time Delay Relay



To set up a cooling cycle

- 1 After setting the cooling time (T1), short press the SET key again (if you are already within the T1 time setting, otherwise you will need to short press the SET key twice within 6 sec), the red LED will flash. The pause time setting (T2) can now be set by using the arrow keys (▲ ▼). When done you can press the SET key to save the settings or wait the 6 seconds to have it save automatically.
- 2 Long press the SET key to enter parameter setting mode. There are two sets of parameters, P0 and P1. Short press the SET key to switch between the two sets. P0 is used to set the timing metric (seconds, minutes, hours). It's recommended to stay in seconds. P1 is used to set the cycle timing (alternating between T1 cooling time and T2 pause)
- 3 When in the desired parameter set use the arrow keys (▲ ▼) to set the second parameter (see chart below).

| | |
|------|--|
| P0-0 | T1 Timing mode is second. |
| P1-1 | Standard single cooling time (T1) then finished. |
| P1-5 | Cyclical cooling (T1, T2, T1, T2, ...) |



After finishing the heating cycle, move the multi-function adapter with the tool holder to the cooling position.



Move down the cooling spiral with the protecting-cone to the appropriate cooling position and start the cooling with the restart button.

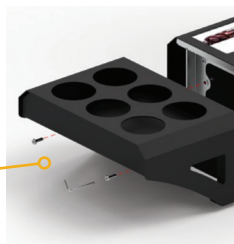
Water-Cooling Refrigeration Unit – Installation & Usage



1 Mount the extension table

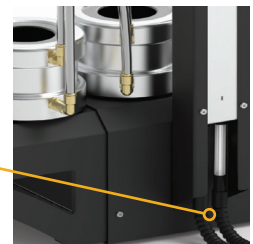
Delivered with the water-cooling option.

Tighten the 2 screws.



3 Connect the tubes

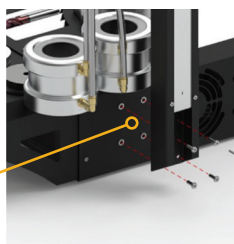
Connect the 2 tubes of the water-cooling system to the connectors of the column.



2 Mount the column for the water-cooling tubes

Delivered with the water-cooling option.

Tighten the 4 screws.



4 Fill the cooler

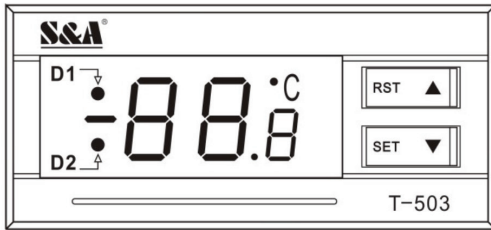
Remove the cover on the top of the cooler. Fill in the tank with pure water until the indicator shows you that the tank is full.

Tap water: $7.5 < \text{pH} < 9$ / 7°C (44.6°F)
 $< \text{TH} < 15^\circ\text{C}$ (59°F)

Note: change the water approx. every 6 months.



Temperature Controller Panel



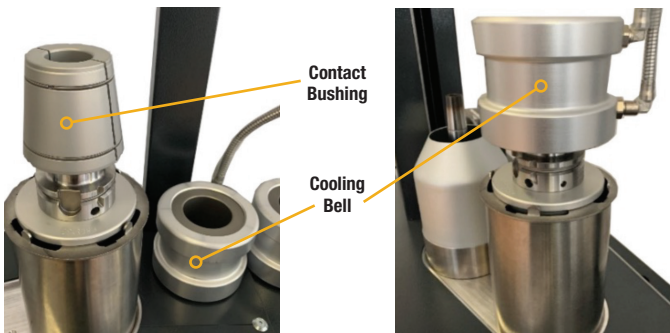
- 1 Indicators **D1**, **D2** (as shown) of thermostat working state:
 - D1 ON:** thermostat works in intelligent control MODE;
 - D1 OFF:** thermostat works in temperature control MODE;
 - D1 FLASHES:** thermostat works in parameters setting MODE or displays value of room temperature;
 - D2 ON:** chiller works in refrigerating state;
 - D2 OFF:** chiller works in the insulation working state;
 - D2 FLASHES:** chiller works in the energy-saving state;
- 2 Press ▼ button will show the room temperature, 6 seconds later to display the restore defaults. (Meanwhile, D1 is flashing, displaying room temperature.)
- 3 ▲▼ keys are for adjusting the display status of the controller, parameters selection and adjustment.
- 4 **RST key:** enter key.
- 5 **SET key:** function setting key.



Never turn on the power without having filled the cooler first. After first use, it might be necessary to add more water to the tank (check the level). Afterwards, a regular check of the water level and quality is recommended.

Use

Install the corresponding contact bushing for the cooling bells (Ø and holder type-depending) onto the top of the holder, and slip over the cooling bell.



Water Temperature Setting



Press SET button (SET) to enter into the user-defined state. Meanwhile, D1 flashes to indicate that the controller is in parameters setup status.

Under intelligent MODE, the control panel displays the temperature difference value between water and air (F1).

Under constant temperature MODE the control panel displays the set temperature value (F0).

At this moment, press ▲▼ key to change settings. After modifying the value, press the ENTER button (RST) to save and exit, then new parameters take effect, or press SET key (SET) to exit without saving parameters. If there is no more action within 20 seconds, it will automatically exit modifying status without saving parameters.



If you see noticeable condensation it is recommended that you set the water temperature higher.

Water Cooler Maintenance

| | Frequency | Observation |
|-------------------|-----------|---|
| Water Level Check | 1 Month | |
| Water Tank Check | 6 Months | Tap water: 7.5 < pH < 9 / 7°C (44.6°F) < TH < 15°C (59°F) |
| Radiator Cleaning | 2 Months | Do not use an air blower |

The tank must only be filled up with pure water (tap water, please refer to recommendations in the table above) and any other product is forbidden (distilled water, demineralized water, glycol etc.).

If the water cooler will be idle for a long period, the device must be stored in an area at an ambient temperature to avoid any risk of frost.

Repairs to the refrigeration unit must only be carried out by qualified heating and cooling expert.

The water cooler must not run with an empty tank.

Taking Delivery

The device you have received has been controlled and tested at our factory according to ISO9001 specifications. If the equipment is being stored or transported

under unacceptable conditions it may be permanently damaged. In this case the manufacturer will exclude all warranty claims and obligations.

Unpacking must be carried out carefully to avoid any damage.

Working Environment of the Device

The ShrinkSMART device needs to be positioned in a dry and clean working area on a stable and rigid surface that is resistant to hot tool holders (+/-100°C (212°F)).

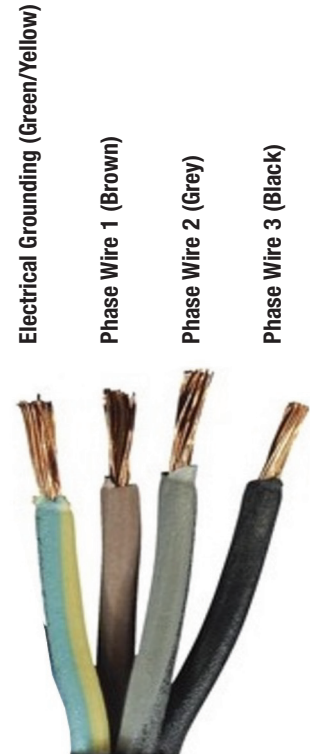
CONNECTIONS:

Power supply

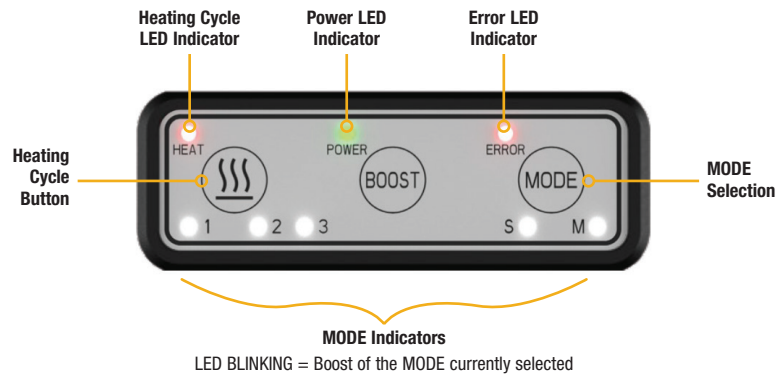
Take care to use the correct power supply
AC 3 x 400-480 V + PE / 20 A / 50 - 60 Hz

Air supply

3 to 6 bar (43 to 87 psi)/pipe external
Ø0.393" (Ø10mm) (pipe not supplied)



ShrinkSMART Keypad & Display



Starting your ShrinkSMART Machine

- 1 Switch the main switch to ON.
- 2 The POWER button will turn green.
- 3 After 10 seconds, the MODE 1 LED is activated and shows that the device is ready to be operated.



Warnings



Always wear protective gloves while handling Shrink Fit holders, tools, accessories and spare parts.



Electrical hazard when dismantling module parts.



Persons with medical implants are not permitted to use or work with this device. Persons with a pacemaker must refer to the guidelines for their pacemaker established on the basis of: NF EN 60601-1-2 (September 2017)



Do not use hydraulic tool holders on this device as there is a risk of explosion and third-degree burns. Please notify and provided training to operators who may use this device.

Shrink Fit Tool Holder & Cutting Tools

The GS Tooling ShrinkSMART makes it easy and safe to perform Shrink Fit tool changes without causing damage to the tool holder or cutting tool, as long as the device is correctly installed and the operating procedures are followed.

ShrinkSMART is designed to work best with all types of standard Shrink Fit tool holders and efficiently with tools made from steel, HSS, heavy metal or carbide.

Tool shank diameter tolerance is critical. Tool shank tolerance required:

- $\varnothing 0.118''$ to $\varnothing 0.196''$ ($\varnothing 3$ to $\varnothing 5\text{mm}$) maximum h5, tool shank must be carbide or heavy metal (e.g. Densimet).
- $\varnothing 0.236''$ to $\varnothing 1.259''$ ($\varnothing 6$ to $\varnothing 32\text{mm}$) maximum h6, tool shank can be steel, HSS, carbide or heavy metal.
- Using h5 for $\varnothing 0.236''$ to $\varnothing 1.259''$ ($\varnothing 6$ to $\varnothing 32\text{mm}$) provides a safer minimum clamping torque.

Make sure the minimum shrinking depth LSC shown in the Product pages for each holder is respected when fitting the tool shank into the holder.

Make sure that the tool holders and the tools are clean, free from grease and dry before being fitted in the device.

Shrinking Depths to be Respected

We recommend the following shrinking depth in order to guarantee the minimum transmittable torque and lifetime of the tool.

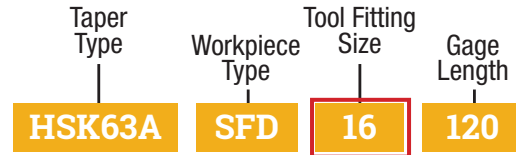
EXAMPLE FOR A TYPE SFD DIN 4.5° TOOL HOLDER:

The **Internal Diameter** (tool-fitting size) is indicated in the tool holder specification.

The shrinking depth (depending on the position of the stop end screw) must be set to the noted **Shank Clamping Length** as a minimum.

In this case, the chart indicates the Shank Clamping Length as 39 = 1-1/2"

Designation:



Minimum Shank Clamping Depth

| Inch | | Metric | |
|-------------------|-----------------------|-------------------|-----------------------|
| Internal Diameter | Shank Clamping Length | Internal Diameter | Shank Clamping Length |
| 1/8" | 1/2" | 3 | 13 |
| - | - | 4 | 15 |
| 3/16" | 3/4" | 5 | 18 |
| 1/4" | 7/8" | 6 | 26 |
| 5/16" | 1-3/16" | 8 | 30 |
| 3/8" | 1-1/4" | 10 | 32 |
| 1/2" | 1-3/8" | 12 | 34 |
| - | - | 14 | 34 |
| 5/8" | 1-1/2" | 16 | 39 |
| 3/4" | 1-5/8" | 18 | 39 |
| 7/8" | 1-5/8" | 20 | 42 |
| 1" | 1-7/8" | 25 | 47 |
| 1-1/4" | 2" | 32 | 52 |

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Heating Mode Selection

| Workpiece Type | DIN Type | Designation | Mode |
|---------------------|-----------------------|---------------------------------|------|
| | DIN 4.5° | SFD | 1 |
| | DIN 4.5° | SFD...-L1 | 1 |
| | MQL DIN 4.5° | SFD...M SFD...M1 SFD...M2 | 1 |
| | Short | Short | 1 |
| | DIN 4.5° Reinforce | SFR | 2 |
| | DIN 3° Slim | SFS | 2 |
| | Cylinder | Power Program | 3 |
| Custom Tool Holders | Special Program | Special Program | S |

Immediately move the inductor up after each heating cycle.

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ShrinkSMART Shrinking Process

- 1 Place the position ring and the adapter ring corresponding to the type of tool holder on the Tube for Adapter Rings.



- 2 Select the corresponding heating MODE to use depending on the type of tool holder according to the MODE card (Shown on the previous page)



- 3 Place the Tube for Adapter Rings with position ring and adapter ring on the base plate hole.

Place the tool holder on the adapter ring.

The Tube for Adapter Rings with the positioning ring and positioning adapter can be used, than a finned support.



- 4 Take the Heat Focusing Stop Disk corresponding to your tool shank diameter and place it in the SMART Coil.

Secure the Stop Disk by turning it a quarter turn into the SMART Coil.



- 5 Move the SMART Coil housing downwards on the holder by pressing the button on the handle. The stop disc should make contact with holder. Check to center.



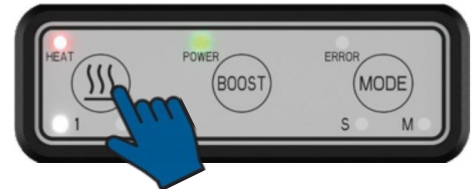
- 6 Push the MODE button until you reach the corresponding MODE shown earlier in the table.



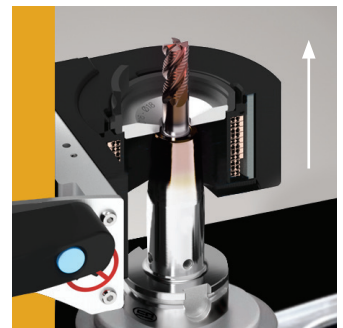
- 7 Put the protective gloves on and take hold of the cutting tool.



- 8 Push the HEATING cycle button once and wait for the heating cycle LED to go off.



- 9 Quickly move the SMART Coil housing upwards.



- 10 Quickly place the tool inside the tool holder and wait for the tool to be correctly clamped.



- 11 Move the cooling tube together with the tool holder to the other hole on the base plate.



Without a water-cooling system, place the air cooling cone over the tool holder.



With a water-cooling system, place the contact busing and the cooling bell on the tool holder.

ShrinkSMART Shrink Release

The unshrinking process is the same as the shrinking process.

Audible Feedback

During operation, the device power source generates an audible feedback tone that changes frequency depending on the tool holder size and temperature. It is not unusual to hear the pitch change as the tool holder temperature increases. Do not be alarmed if you hear this tone, as it is normal.

BOOST MODE

The BOOST function was made to avoid issues when:

- The cutter tool falls outside the H5/H6 tolerance band
- There is dirt between tool holder and the tool
- Light overheating of the tool holder
- Competitors shrink and release tool holders with same shape as our standard shape, but with different tolerance on bore

Before using the Boost function, please ensure that your tool holder is not already hot (<math><30^{\circ}\text{C}</math> (122°F))

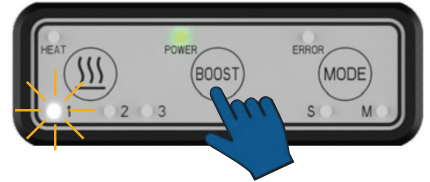
Sowa Tool and Machining Co. Ltd. is not responsible for the misuse of the BOOST function.

The BOOST function is only for one cycle.

- 1 Push the MODE button until you reach the corresponding MODE shown earlier in the table.



- 2 Push the BOOST button once and the LED of the selected MODE will blink.



- 3 You are ready to start the heating cycle. Follow the same instructions from step 9 of the shrinking process.

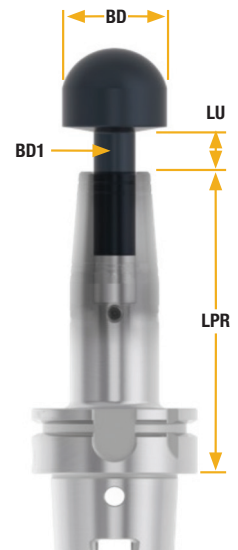
The BOOST function can be configured in the web interface. The default BOOST function increases the heating time by 20%.

ShrinkSMART Shrinking of Special Tools

For special tools, e.g. tools with a front end that is larger than the shank (mushroom tool), split heat focusing stop discs are available. The use of split heat focusing stop disc requires clearance between the tool head and the front face of the tool holder. To successfully shrink/release special tools, it is necessary to observe the following conditions:

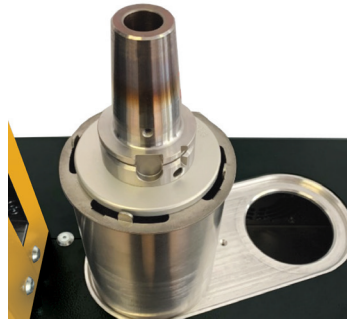
- Maximal diameter of the cutter **BD** is 3 x **BD1**
- \varnothing **BD** maximum = \varnothing 63 mm (\varnothing 2.48") (maximum bore \varnothing of induction unit)
- **LPR** dimension = 70 mm (2.76") minimum due to the inductor housing dimension)
- **LU** dimension changes depending on the tool shank diameter **BD1**

| Tool Shank \varnothing : | 0.12" (3mm) | 0.16" (4mm) | 0.2" (5mm) | 0.25" (6mm) | 0.31" (8mm) | 0.4" (10mm) | 0.47" (12mm) | 0.55" (14mm) | 0.63" (16mm) | 0.71" (18mm) | 0.79" (20mm) | 1" (25mm) | 1.26" (32mm) |
|----------------------------|-------------|---------------|-------------|---------------|---------------|-------------|--------------|----------------|--------------|----------------|--------------|-------------|--------------|
| LU Dimension: | 0.24" (6mm) | 0.24" (6.5mm) | 0.27" (7mm) | 0.27" (7.5mm) | 0.27" (7.5mm) | 0.35" (9mm) | 0.39" (10mm) | 0.43" (11.5mm) | 0.39" (10mm) | 0.27" (11.5mm) | 0.47" (12mm) | 0.35" (9mm) | 0.35" (9mm) |



ShrinkSMART Shrinking of Special Tools

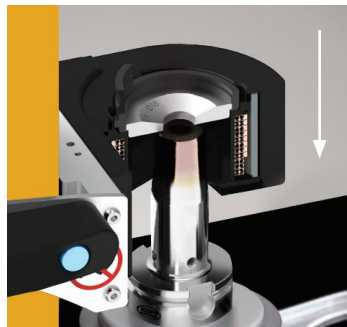
- 1 Place the tool holder in the finned support, or into the adapter ring on the Tube for Adapter Rings.



- 2 Insert the Split Heat Focusing Stop Disk that matches the tool shank \varnothing (See table on previous page) into the location diameter in the SMART Coil housing. (Secure the Disk by turning it a quarter turn into the SMART Coil)



- 3 Move the SMART Coil housing downwards on the holder by pressing the button on the handle. The Split Heat Focusing Stop Disk must be in contact with the top of the tool holder.



5 Split Heat Focusing Stop Disks covering a tool shank diameter of $\varnothing 0.118''-1.259''$ (3-32mm) are available as accessories with the following capacities: $\varnothing 0.118''-0.236''$ ($\varnothing 3-6\text{mm}$), $\varnothing 0.314''-0.551''$ ($\varnothing 8-14\text{mm}$), $\varnothing 0.629''-0.708''$ ($\varnothing 16-18\text{mm}$), $\varnothing 0.787''-0.984''$ ($\varnothing 20-25\text{mm}$), $\varnothing 1.259''$ ($\varnothing 32\text{mm}$).

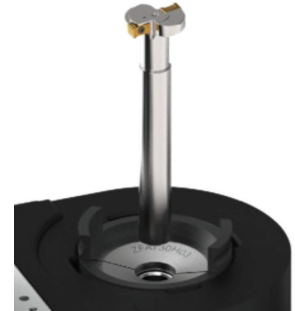
- 4 Push the MODE button until you reach the corresponding MODE shown earlier in the table.



- 5 Push the Heating Cycle button once and wait for the heating cycle LED to go off.



- 6 Place the tool in the tool holder.



- 7 After shrinking, move the SMART Coil housing slightly upwards and remove the Split Heat Focusing Stop Disk.

CAUTION – TOOL MAY BE HOT



- 8 Move the SMART Coil housing upwards to allow the tool holder to be removed.



Note

The overall height of the SMART Coil housing limits the « LPR » dimension to a minimum of 2.76" (70 mm). Any less than this and it will not be possible to lower the SMART Coil housing sufficiently to gain access to the split stop disc assembly.

ShrinkSMART Shrink Release of Special Tools

1 Place the tool holder in the finned support, or into the adapter ring on the Tube for Adapter Rings.



2 Move the SMART Coil housing below the front face of the tool holder and fit the appropriate split stop disc assembly around the shank of the cutting tool. The Heat Focusing Stop Disc must be in contact with the top of the tool holder.



3 Push the MODE button until you reach the corresponding MODE shown earlier in the table.

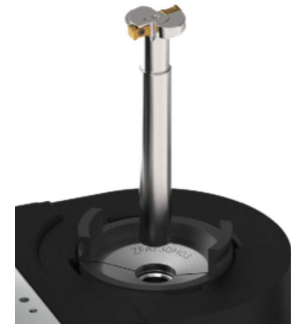


4 Push the Heating Cycle button once and wait for the heating cycle LED to go off.

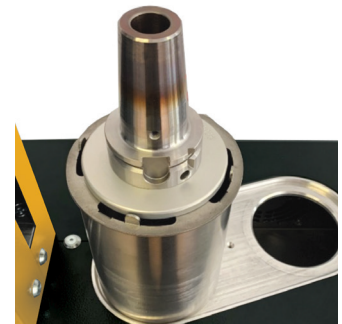


5 Remove the tool from the tool holder.

CAUTION – TOOL MAY BE HOT



6 Move the SMART Coil housing upwards to allow the tool holder to be removed.



ShrinkSMART Shrinking Capability

| Shrink Fit Holder Type | Cylindrical Reinforced | Mold Maker DIN3° | Standard DIN 4.5° | Standard DIN 4.5° Reinforced |
|--|------------------------|------------------|-------------------|------------------------------|
| Average Shrinking Time | 6 sec. | 2.5 sec. | 4 sec. | 6 sec. |
| Minimum Shrinking Ø (Tool Shank) | 0.236" (6mm) | 0.118" (3mm) | 0.236" (6mm) | 0.236" (6mm) |
| Maximum Shrinking Ø (Tool Shank) | 1.259" (32mm) | 0.629" (16mm) | 1.259" (32mm) | 1.259" (32mm) |
| Maximum Ø of tool with front end that is larger than shank | 2.480" (63mm) | | | |
| Average open air cooling time | 25-35 min. | 15-25 min. | 20-30 min. | 25-35 min. |
| Average ventilator streamed air cooling time | 10 min. | 5 min. | 8 min. | 10-15 min. |
| Average water cooling time | 2 min. | 1 min. | 1.5 min. | 2 min. |
| Average air-powered cooling time | 3 min. | 1.5 min. | 2.5 min. | 3.5 min. |

ShrinkSMART – Maintenance Frequency

Daily Maintenance

Inspect and clean your ShrinkSMART machine daily. This will ensure your Shrink Fit holders will continue to perform at their best.

- 1 Check the condition of the SMART Coil.
- 2 Check the condition of the Heat Focusing Stop Disks.



Monthly Maintenance

- 3 Check the water level of the water-cooling unit. (if applicable)
- 4 Check the water temperature. (if applicable)



In the case of significant condensation, it is advisable to slightly increase the water temperature to prevent condensation on the bells and the tool holder.

Twice a Year

The water-cooling unit must be drained off.

- 5 Turn off the general power supply by pressing the switch at the front of the device.
- 6 Remove the sealing cap to drain the water. Replace sealing cap.
- 7 Remove the sealing cap of water tank.
- 8 Fill the tank with pure tap water until the indicated level is reached ($7.5 < \text{pH} < 9$ / $7^\circ\text{C} (44.6^\circ\text{F}) < \text{TH} < 15^\circ\text{C} (59^\circ\text{F})$).
- 9 Close the tank.
- 10 Switch on the general switch at the front of the device.



Wastewater is considered to be polluted and must be treated according to environmental constraints.

ShrinkSMART – Safety Precautions

This shrinking device is only intended for professional use.

Take care to use the correct power supply:
AC 3 x 400-480 V + PE / 20 A / 50 - 60 Hz.

The power supply for the refrigeration unit is: 1x110V+PE/15A/60Hz.
Industrial Chiller US.

The Shrink Fit holder becomes very hot during operation. Touching this spot may cause serious burns. Always wear gloves when handling Shrink Fit holders.

Persons with medical implants are not permitted to use or work with this device. Persons with pacemakers must refer to the guidelines of their pacemaker established on the basis of: NF EN 60601-1-2 (September 2007).

Repairs to the shrinking devices should only be carried out by skilled operators. Please contact Sowa Tool at sales@sowatool.com.

Only trained and authorized persons are permitted to use the shrinking devices.

ShrinkSMART – Recommendations for Use and Maintenance

Always make sure the holder has cooled down prior to shrink grip or shrink release.

The holder and the tool must be clean, free from grease and dry before being fitted to the device. Before starting the shrinking process, please always check if:

- The power supply is sufficient
- The length has been set correctly, with the correct stop rod
- The correct stop disc has been chosen
- Recommended cylindrical tool shank tolerance is h5 or h6 (maximum h5 for Ø0.118" (Ø3mm) to Ø0.196" (Ø5mm), maximum h6 for Ø0.236" (Ø6mm) to Ø1.259" (Ø32mm))
- The tool shank is not damaged

Keep the device and its environment clean to ensure a long service life.

The device can only be used for the purposes defined in this operating manual. Sowa Tool and Machine Co. Ltd. can not be held responsible for casualties caused by any other use.

Maintenance is limited to regular cleaning of the device and accessories with adapted products.

ShrinkSMART – Safety Functions of the Heating Module

The SMART Coil is equipped with a sensor to avoid overheating of the SMART Coil and if the temperature limit is reached the Interface will be not available.

To increase the service life of the holders, the electronics of the device have been programmed to allow only one main heating process, which it automatically cuts off after use. A programmed delay is then activated before the heat cycle function can be repeated.

Appendix – Technical Features for the ShrinkSMART Machine

| | |
|----------------|---|
| Power | 19,800 VA |
| Voltage | AC 3 x 400V-480V (±10%) + PE/23.8 A/50-60Hz 2.5 meter cable is supplied Air 3-6 bars/duct Ø0.4" (Ø3mm) required |
| Weight | 102lbs (46.2kg) |

- 1** Prevent condensation and frost
- 2** Air humidity when the temperature of the device slowly increases to 40°C (104°F) or quickly passes from -20 (-4°F) to +30°C (86°F)
- 3** At a maximum of 6,500 feet (2,000m) above sea level

Appendix – Technical Features for the ShrinkSMART Water-Cooling Refrigeration Unit

| | |
|----------------------------------|----------------------------------|
| Voltage: | AC 1P 110V |
| Frequency: | 60Hz |
| Current: | 3.5-5.6A |
| Tank capacity: | 6L |
| Compressor power: | 0.305kW 0.41HP |
| Machine power: | 0.44/0.46kW |
| Nominal cooling capacity: | 2866Btu/h 0.84kW 722Kcal/h |
| Refrigerant charge: | 280g |

| | |
|--------------------------|---|
| Pump power: | 0.03kW |
| Max. lift: | 10M |
| Max. flow: | 10L/min |
| N.W: | 26Kg |
| G.W.: | 31 Kg |
| Refrigerant: | R-134a |
| Precision: | +/-0.3°C |
| Reducer: | Capillary |
| Inlet and outlet: | 10mm fast connector |
| Dimensions: | 22.84" x 11.4" x 18.5" 580mm x 290mm x 470mm (LxWxH) |



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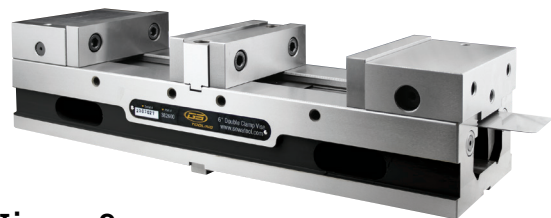
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Sowa Tool & Machine Co. Ltd.

Canadian Headquarters
500 Manitou Drive, Kitchener, ON, N2C 1L3

US Headquarters
101-137 Overhill Drive, Mooresville, NC 28117

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