



PTS-30

Polymer Thermal Spray

User's Guide



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Safety, Support and Warranty Information

Every effort has been made to ensure that the PTS-30 is easy to use, reliable, and safe. This section will outline general safety considerations and define caution and warning symbols used in this document.

General Safety Considerations

For safe operation, the PTS-30 should be operated only within the limits outlined in the system specifications. Specifically the following classification defines acceptable use for the PTS-30

- Outdoor applications
- Properly ventilated interior space applications to remove combustion gases. Operator must observe all national and international regulations for proper workspace ventilation.
- Ordinary Protection: NOT protected against the harmful ingress of moisture. Do not allow to get wet from rain or other sources.
- Class I Equipment (grounded type)
- Main supply voltage fluctuations are not to exceed $\pm 10\%$ of the nominal supply voltage.
- This equipment is suitable for continuous operation

Warnings and Cautions

Throughout the manual, the following symbols are used to identify warnings and cautions:



“Danger!” indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations. This signal word is not used for property damage hazards unless personal injury risk appropriate to this level is also involved.



“Warning!” indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. This signal word is not used for property damage hazards unless personal injury risk appropriate to this level is also involved.



“Caution!” indicates a potentially hazardous situation which, if not avoided may result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.



The high voltage symbol indicates the possibility of electrical shock



Hot surface – touching this surface could result in burns or discomfort



Flammable – fire could result if improperly used

General remarks

This equipment has been made in accordance with the state-of-the-art and all recognized safety rules. Nevertheless, incorrect operation or misuse may still lead to danger for:

- the life and well-being of the operator or of third parties,
- the equipment and other tangible assets belonging to the owner/operator,
- efficient working with the equipment.

All person involved in any way with starting up, operating, servicing and maintaining the equipment must:

- be suitably qualified
- know about Polymer Thermal Spray equipment and processes
- read and follow exactly the instructions given in this manual.

The instruction manual must be kept at the machine location at all times. In addition to the instruction manual, copies of both the generally applicable and the local accident prevention and environmental protection rules must be kept on hand, and of course observed in practice.

All the safety instructions and danger warnings on the machine itself:

- must be kept in a legible condition
- must not be damaged
- must not be removed
- must not be covered, pasted or painted over

Any malfunctions which might impair machine safety must be eliminated immediately – meaning before the equipment is next switched on.

It's your safety that's at stake!

Utilization for intended purpose only

The PTS system may only be used for the intended purpose of polymer coating creation using Resodyn Engineered Polymeric Systems (Resodyn) approved coating materials.

Utilization for any other purpose, or in any other manner, or with non-Resodyn coating materials, shall be deemed to be not in accordance with the intended purpose. The manufacturer shall not be liable for any damage resulting from such improper use.

Utilization in accordance with the intended purpose also comprises:

- complete reading and following of all the instructions given in this manual
- complete reading and following of all the safety instructions and danger warnings
- performing all stipulated inspection and servicing work.

The PTS system and its heat source must never be used for anything other than preheating substrates to be coated, coating application, and post-heating the coating after deposition.

The machine is designed to be used in industrial and workshop environments. The manufacturer shall not be liable for any damage resulting from use of the machine in residential premises beyond Resodyn approved commercial applications.

Likewise Resodyn will accept no liability for defective or faulty work results.

Ambient conditions

Operation or storage of the PTS system outside the stipulated range is deemed to be not in accordance with the intended use. The manufacturer shall not be liable for any resulting damage.

See Specification Section for stipulated environmental operating and storage ranges.

Obligations of Licensee/operator

The licensee/operator undertakes to ensure that the only persons allowed to work with the machine are persons who:

- are familiar with the basic regulations on workplace safety and accident prevention and who have been instructed in how to operate the machine
- have read and understood the sections on safety rules and the warnings contained in this manual, and have confirmed as much with their signatures
- be trained in such a way that meets with the requirements of the work results

Regular checks must be performed to ensure that personnel are still working in a safety-conscious manner.

Obligations of personnel

Before starting work, all persons to be entrusted with carrying out work with (or on) the machine shall undertake:

- to observe the basic regulations on workplace safety and accident prevention
- to read the sections on safety rules and the warnings contained in this manual, and to sign to confirm that they have understood these and will comply with them

Before leaving the workplace, personnel must ensure that there is no risk of injury or damage being caused during their absence.

Protection for yourself and other persons

When polymer thermal spraying, you are exposed to many different hazards, such as:

- combustion flame heat source
- flying hot polymer particles

- exposed hot equipment and substrate surfaces
- combustion gas fumes
- flying dust debris particles
- increased exposure to noise
- electrical hazards from mains

Anyone working on the vicinity of the polymer thermal spray application process must wear suitable protective clothing with the following characteristics:

- flame-retardant
- isolating and dry
- must cover whole body, be undamaged and in good condition

Protective clothing also includes:

- protecting your eyes and face from heat, and flying debris with an appropriate safety shield or safety glasses
- wearing full cover footwear that will also insulate from heat.
- Protecting your hands by wearing appropriate heat-proof gloves

To lessen your exposure to noise and to protect your hearing against injury, wear ear protection.

Keep other people – especially children – well away from the equipment and the polymer thermal spray application while in progress. If there are still any other persons nearby during operation, you must:

- draw their attention to all the dangers (risk of being burned by hot gasses from applicator or from touching applicator, flying dust debris, flying hot polymer particles, combustion gas fumes, high noise emission levels, possible hazards from electric mains...)
- provide them with suitable protective equipment and/or
- erect suitable protective partitions or curtains.

Hazards from noxious gases and vapors

The fumes given off during polymer thermal spray application contain combustion gas vapors.

Polymer fumes emitted when burned may contain gases and vapors that are harmful to health.

Keep your head away from discharges of polymer fumes and gases.

Do not inhale any fumes or noxious gases that are given off. Extract all fumes and gases away from the workplace using suitable means.

Ensure a sufficient supply of fresh air.

Where insufficient ventilation is available, use a properly rated respirator mask, or one with an independent fresh air supply.

If you are not sure whether your fume-extraction system is sufficiently powerful, compare the measured pollutant emission values with the permitted threshold limit values.

The harmfulness of the polymer thermal spray fumes will depend on e.g. the following components:

- the substrates onto which the coating is being applied
- the chemical composition of the coating being applied
- any other coatings in the immediate vicinity of the coating process
- all cleaning and degreasing agents

For this reason, pay attention to the relevant Materials Safety Data Sheets and the information given by the manufacturer regarding the components listed above.

Keep all flammable vapors (e.g. solvents, fuel gases) well away from the application process.

Hazards from flame heat source

Open flame can cause fires and explosions!

Never perform polymer thermal spray application anywhere near combustible materials.

Combustible materials must be at least 35 feet (11 meters) away from the flame heat source, or else must be covered over with approved coverings.

Have a suitable, approved fire extinguisher at the ready.

Take suitable measures to ensure that there is no risk of injury or fire

Do not perform polymer thermal spray applications in locations that are at risk from fire and/or explosion, or in enclosed tanks, barrels or pipes, unless these have been prepared for the application process in accordance with the relevant national and international standards.

Polymer thermal spray application must NEVER be performed on containers that have had gases, fuels, mineral oils etc. stored in them. Even small traces of these substances left in the containers are a major explosion hazard.

Hazards from electric mains and machine voltage

An electric shock can be fatal. Every electric shock is hazardous to life.

Do not touch any live parts, either inside or outside the machine.

All cables and other leads must be firmly attached, undamaged, properly insulated and adequately dimensioned. Immediately replace any loose connections, scorched, damaged or under dimensioned cables or other leads.

Do not loop any cables or other leads around your body or any part of your body.

Never immerse the applicator in liquid in order to cool it, and never touch the igniter electrode when the power source is ON.

Have the mains and the machine supply leads checked regularly by a qualified electrician to ensure that the ground conductor is functioning properly.

Only operate the machine on a mains power source with a properly functioning ground conductor, and plugged into a grounded outlet socket.

If the machine is operated on a mains power source without a properly functioning ground conductor, and plugged into a power outlet socket without a protective-conductor contact, this counts as gross negligence and the manufacturer shall not be liable for any resulting damage or injury.

Wherever necessary, use suitable measures to ensure that the workpiece is sufficiently grounded.

Switch off any equipment that is not in use.

When working at great heights, wear a safety harness.

Before doing any work on the machine, switch it off and unplug it from the power source.

Put up a clearly legible and easy-to-understand warning sign to stop anyone from inadvertently plugging the machine back into the power source and switching it back on again.

After opening up the machine:

- discharge any components that may be storing an electrical charge
- ensure that all machine components are electrically dead.

If work needs to be performed on any electrically live parts, there must be a second person on hand to immediately switch off the machine at the main switch in an emergency.

EMC precautions

It is the responsibility of the licensee/operator to ensure that no electromagnetic interference is caused to electrical and electronic equipment.

If electromagnetic interference is found to be occurring, the licensee/operator is obliged to take all necessary measures to prevent this interference.

Examine and evaluate any possible electromagnetic problems that may occur on equipment in the vicinity, and the degree of immunity of this equipment, in accordance with national and international regulations:

- safety features
- mains, signal and data-transmission leads
- IT and telecoms equipment
- measurement and calibration devices

- the health of persons in the vicinity, e.g. users of heart pacemakers and hearing aids
- users of heart pacemakers must take medical advice before going anywhere near the equipment

Electromagnetic fields may cause as yet unknown damage to health.

Ancillary measures for preventing EMC problems:

- a) Main power supply:
 - If electromagnetic interference still occurs, despite the fact that the mains connection is in accordance with the regulations, take additional measures (e.g. use a suitable mains filter).
- b) Equipotential bonding
- c) Workpiece grounding:
 - where necessary, run the connection to the ground via suitable capacitors
- c) Shielding, where necessary:
 - Shield other equipment in the vicinity

Particular danger spots

Keep your hands, hair, clothing and tools well away from the combusting, hot gas path, or hot surfaces while the gun is in operation:

- inside the applicator combustion area
- in front of the applicator
- metal heat shielding shrouds
- hot substrate surfaces
- molten plastic surfaces

Do not put your fingers anywhere near the burner igniter electrode.

Covers and side-guards are not to be removed except by an authorized Resodyn service technician, and will be immediately replaced after work has been completed.

The applicator handle assembly is not to be disassembled except by an authorized Resodyn service technician.

Propane gas is flowing when the dead-man safety gas valve is depressed when the hand is gripped and squeezed. For this reason, always hold the torch so that it is pointing away from your body whether it is in operation or not.

Do not touch the workpiece during and after coating application – risk of injury from burning.

Allow the applicator and substrate/coating surface that are used and/or processed at high operating temperatures to cool down before touching or doing any work on them.

Special regulations apply to rooms at risk from fire and/or explosion. Observe all relevant national and international standards.

When hoisting the machines by crane, only use suitable lifting devices:

- Attach the chains and/or ropes to suitable lifting points
- The chains and/or ropes must be at an angle which is as close to the vertical as possible.

Do not attach any chains and/or ropes to the stainless steel handles or plastic handles.

Danger of flammable gas escaping unnoticed, when using an adapter for the propane gas connection. Seal the adapter thread for the gas connector using Teflon tape if removed and reassembled. Seal all propane supply hose connections with Teflon tape before assembly.

Propane gas cylinders contain pressurized gas and may explode if they are damaged. As propane gas cylinders are an integral part of the polymer thermal spray system, they also must be treated with great care.

Protect propane gas cylinders from excessive heat, mechanical impact, open flames, sparks and arcs.

Mount the propane gas cylinders in the vertical position and fasten them in such a way that they cannot fall or be knocked over.

Keep propane gas cylinders well away from any welding circuits and any other electrical circuits.

Never hang the applicator on the propane gas cylinder.

Use a suitable propane gas regulator on the cylinder to supply propane to the equipment system at all times.

When opening the valve of a propane gas cylinder, always turn your face away from the outlet nozzle.

Close the propane gas cylinder valve when no polymer thermal spraying is being carried out.

Observe the manufacture's instructions and all relevant national and international rules applying to propane gas cylinders and accessories.

Safety precautions at the installation site and during transportation

A machine that topples over can easily kill someone! For this reason, always place the machine on an even, firm floor surface in such a way that it stands firmly:

- An angle of inclination of up to 10° is permissible.

Special regulations apply to rooms at risk from fire and/or explosion. Observe all national and international regulations.

By means of internal instructions and checks, ensure that the workplace and the surrounding area are always kept clean and tidy.

The equipment system must only be installed and operated in accordance with the protection type stated in the specification and/or listed on the specifications plate.

When transporting the equipment system, please ensure that the valid national and regional guidelines and accident protection regulation are followed. This applies in particular to guidelines in respect of dangers during transportation and carriage.

After each use and before transportation, completely bleed off any residual propane pressure contained within the application equipment system.

Before commissioning and after transportation, a visual check for damage must be carried out. Any damage must be repaired by Resodyn-trained service personnel before commissioning and/or additional use.

Safety precautions in normal operation

Only operate the machine if all of its protective features are fully functional. If any of the protective features are not fully functional, this endangers:

- the life and well-being of the operator or other persons
- the equipment and other tangible assets belonging to the licensee/operator
- efficient working with the equipment

Any safety features that are not fully functional must be made right before you switch on the machine.

Never evade, disable, or remove any safety features and never put safety features out of order.

Before switching on the machine, ensure that nobody can be endangered by your doing so:

- At least once a week, check the machine for any damage that may be visible from the outside, and check that the safety features all function correctly.
- Always fasten the propane gas cylinder firmly
- Only use clean, dry, oil free compressed air supply to equipment system
- Compressed air supply contaminated with excessive oil could cause an explosive flame during operation of the applicator. Oil in the air supply will cause damage to the equipment system and will foul the burner plate causing the system to run poorly.

Preventive and corrective maintenance

With parts sourced from other suppliers, there is no certainty that these parts will have been designed and manufactured to cope with the stresses and safety requirements that

will be made on them. Use only original spares and wearing parts. (This applies to standard parts.)

Do not make any alterations, installations or modifications to the machine without express written permission from the manufacturer first.

Replace immediately any components that are not in perfect condition.

Order spare parts using the exact designation and relevant part numbers as shown in the spare parts list. Please also quote the serial number of your equipment system.

Safety inspection

The licensee/operator is obliged to have a safety inspection performed on the machine at least once every 12 months.

Resodyn also recommends the same 12-month interval for regular calibration of operating systems. Calibration should be performed any time a change in operation performance is detected by the operator.

A safety inspection, by a Resodyn trained technician is prescribed:

- after any alterations
- after any modifications or installations of additional components
- following repairs, care and maintenance
- at least every twelve months

Observe the relevant national and international standards and directives in connection with the safety inspection.





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Product Safety Marking Symbols

The following safety marking symbols are used on the product to identify potential dangerous hazard which could result in injury:

	<i>Caution, Refer to Manual</i>		<i>Caution, Risk of Electrical Shock</i>
	<i>Flammable</i>		<i>Earth Ground</i>

	Protective Conductor Terminal		
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Important Safety Notes

	<i>Operators must read this user guide thoroughly prior to use. Failure to do so may cause serious bodily harm and equipment damage.</i>
	<i>Do not use this equipment in areas where there is a risk of fire or explosion.</i>
	<i>Do not point the applicator in a direction that may ignite clothing such as nylon or similar materials. Keep flammable debris away from work area to prevent fires.</i>
	<i>Always store the propane bottle upright. Never use bottle on its side. Inspect propane cylinder for damage. Refer to cylinder manufacturer for guidelines. Close the gas bottle valve when not in use for extended periods.</i>
	<i>Always use in ventilated area. Propane is heavier than air and will settle into low areas without proper ventilation. Allow time for area to ventilate if gas odor is present.</i>
	<i>Inspect all gas hoses daily for signs of damage. (Not limited to cracks, splits, damaged connectors, etc.) . Spray with soap and water solution to check for leaks in gas system. If any damage is present replace the hose immediately.</i>
	<i>Do not store applicator in cart until completely cooled. Continue air flow through applicator until all applicator surfaces reach ambient temperature.</i>

Troubleshooting and Warranty Service

The PTS-30 system should only be operated when it is in good working condition. If the system shows any signs of visible damage or fails to operate as outlined in this manual, the system should not be operated.

For operational errors and troubleshooting, see Chapter 6.

If necessary, contact your Resodyn customer service representative for additional technical support.

Resodyn Customer Service:

Customer Service Resodyn, Engineered Polymeric Systems Phone: (406) 497-5288 e-mail: pts@resodyn.com
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Warranty service will be provided by Resodyn under the terms of your licensing agreement. User will be required to perform standard and routine maintenance to ensure the equipment is in proper working order at all times. Damage to the PTS-30 caused by improper maintenance, improper handling and care, or resulting from improper use is not covered under the warranty terms of the license agreement. The cost for repairs necessary due to user caused damage will be the responsibility of the licensee.

Chapter 1: Introduction

This user's guide describes the PTS-30 thermal spray system and explains its operation. This chapter provides an overview of the PTS-30 and contains general information important to its proper use.

Product Overview

The PTS-30 is a propane fueled polymer thermal spray system which includes an applicator and cart connected by an umbilical. The applicator and the cart are illustrated in Figure 1 Below.

Applicator



Cart with Applicator



FIGURE 1: PTS-30 Applicator and Cart

The PTS-30 is comprised of:

1. An applicator – which mixes propane, combustion air, and fluidized polymer powder to create a polymer “melt in flight” coating.
2. A control cart – which contains the applicator controls, the powder hopper, feed pump, and a storage box for the applicator and umbilical.
3. An umbilical – which carries propane, air, fluidized powder, and electrical control wires between the cart and the applicator.

Applicator Features:

1. One or two hand operable – with repositionable second hand grip.
2. Propane trigger / dead man on-off valve.
3. Latching feed switch feed switch to provide continuous powder feed.
4. Continuous spark electronic ignition system.
5. Replaceable primary air intake filter element.

Cart Features:

1. Compact cart with propane, air, and electrical controls in a self-contained cabinet.
2. Quick disconnects and shutoff valves for air and propane.
3. Convenient storage box for the applicator and umbilical.
4. Large casters - fixed front casters and swivel rear casters with brakes.
5. Handles for easy maneuvering and lifting.
6. Generous 25lb or 50lb stainless steel hopper with fluidizing membrane and vibrator.
7. Powder pump with purge switch.

Installation

For best results, the PTS-30 should be installed on a stable ridged surface capable of supporting 200 pounds. The PTS-30 should be set in place and the caster brakes engaged in the locked position.

The PTS-30 can be operated indoors with proper ventilation. During exterior use the PTS-30 should not be exposed to rain or water.



The propane combustion process for the PTS-30 generates potentially hazardous exhaust gasses including: CO₂, Carbon monoxide, and other gasses due to partial combustion of propane. For indoor operation, always work in a well-ventilated area to prevent the accumulation of exhaust gasses.

Specifications

Applicator Output Power	
Heat Capacity	7 – 30 kW
Heated Air Temperature	200°C – 650°C / 392°F – 1202°F
Polymer Melt Capacity	0.5 – 3.0 gm/sec
Typical Particle Size	50 – 500 um
Particle Specific Gravity	0.8 – 1.7
Applicator Features	
Applicator Weight	9.5 lbs
Hand Grips	2 hand Grips – Second Grip is Repositionable
Polymer Feed Control	Latching trigger on handle
Gas Control	Mechanical valve / dead man switch
Igniter	Continuous spark electronic ignition
Feed indicator	LED to indicate feed is latched on
Infrared Thermal Sensor	Mounted on Auxiliary Handle
Cart Features	
Hopper Capacity	25lb or 50lb max
Hopper Vibrator	3300 rpm 1G vibrator – switched
Handles	Front and Back Handles
Casters	Fixed Front – Pivoting Rear with Brakes
Umbilical	
Length	23' from cart
Lines	Propane, Compressed Air, Feed Tube, Electrical
Sheathing	Nylon Mesh
System Specifications	
Propane Fuel	4 – 7lb/hr
Propane Connection	Flame Engineering HK-7 1/4" Quick Disconnect
Compressed air	40 – 100 psi clean dry oil-free air – 30 SCFM
Air Connection	1/2" Industrial Quick Disconnect
Electrical Power input	115V/60Hz – 5 Amp
Main Fuse	5A 1-1/4" X 1/4"
System Weight	< 200lb
Cart Size (H x L x D)	37" X 48" x 24"
Operating Modes	
Flame On	System on – Flame Burning
Application	Flame on + Powder Feed on
Purge	Flame on or off + Blow Off Air On
Propane/Dead Man Switch Off	Air On, Propane Off
Environmental	
Operating Temperature	0 to 48°C / 32 to 120°F
Storage Temperature	-25°C to +54°C / -13°F to 130°F
Use Environment	Indoor and Outdoor Use
Altitude	Up to 2000 m / 6561 ft

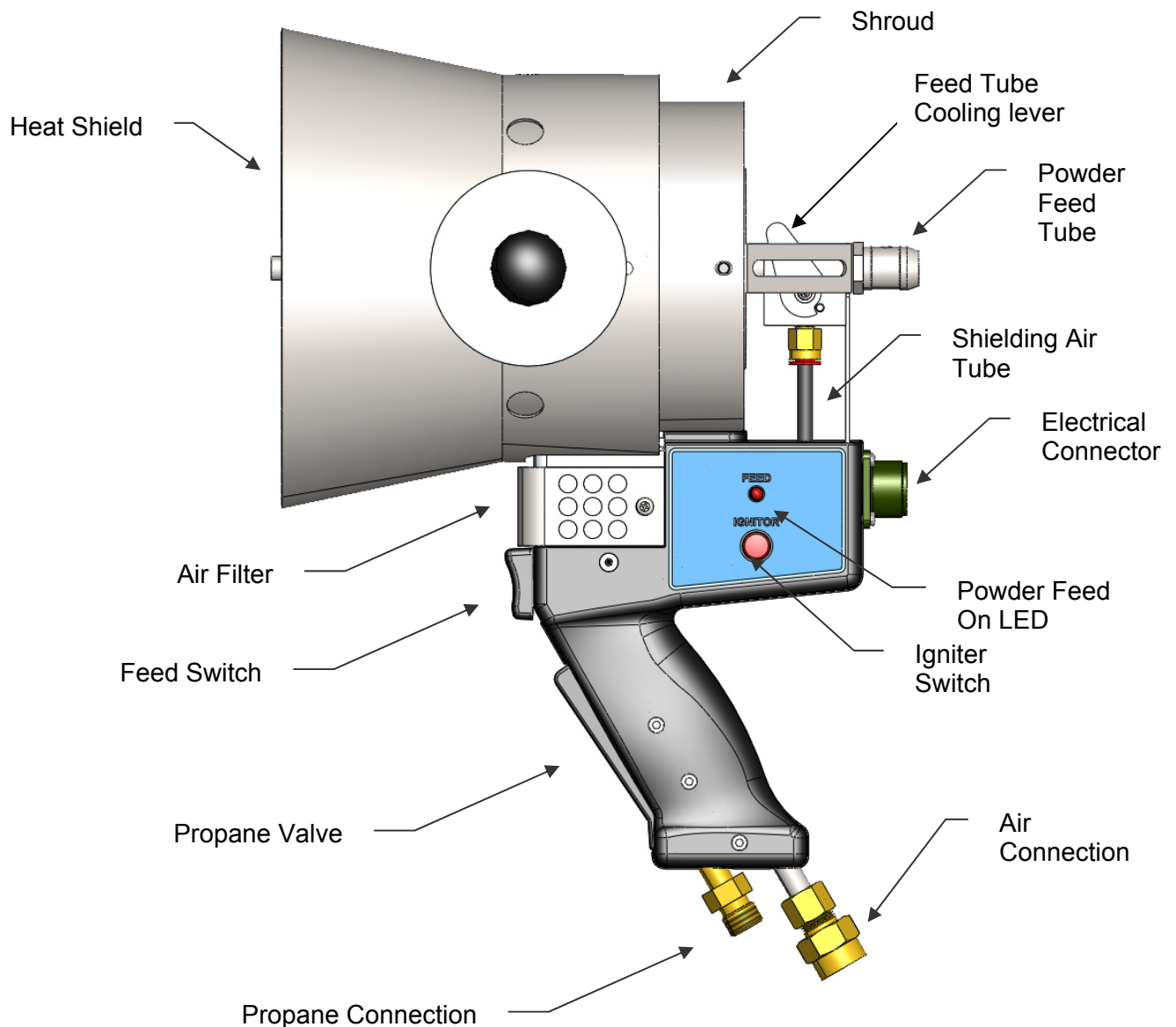
Chapter 2: System Overview

This chapter gives a brief overview of the main components of the PTS-30.

The Applicator

The applicator is illustrated in Figure 2 below. The component names in this figure will be used throughout this manual.

Figure 2: Applicator



The front view of the applicator in Figure 3 shows the burner plate, the diverter, and the igniter electrode. The Side handle is also identified. The side handle can be re-positioned to the top or left side. The right side view shows the location of the Fine-tune burner air adjustment lever and the Feed Tube cooling air adjustment lever.

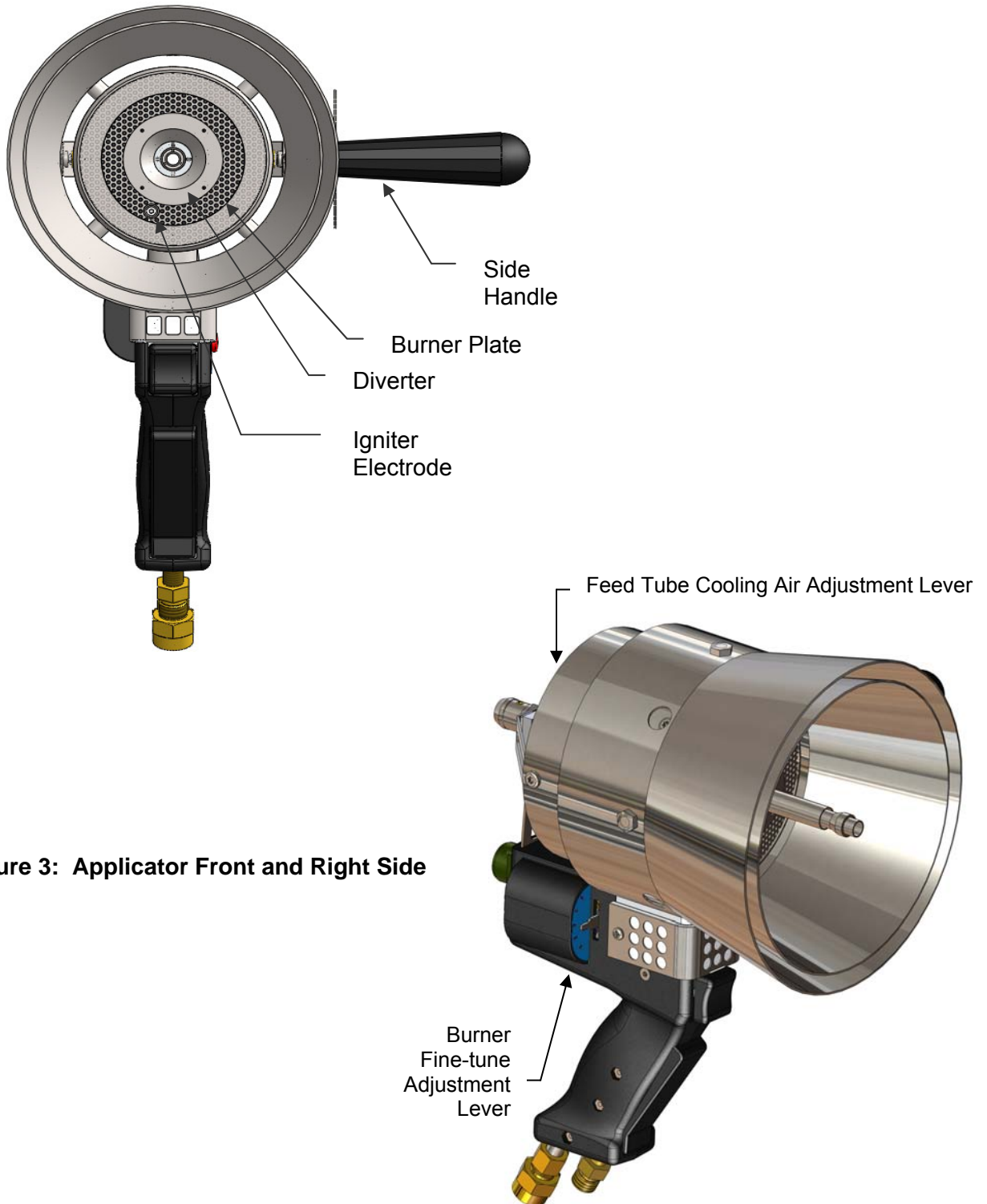


Figure 3: Applicator Front and Right Side

Auxiliary Handle

The applicator can be equipped with an auxiliary handle (Figure 4) with an Infrared (IR) temperature sensor. This optional handle assembly can be used to verify the temperature of the substrate surface being heated during the coating process.

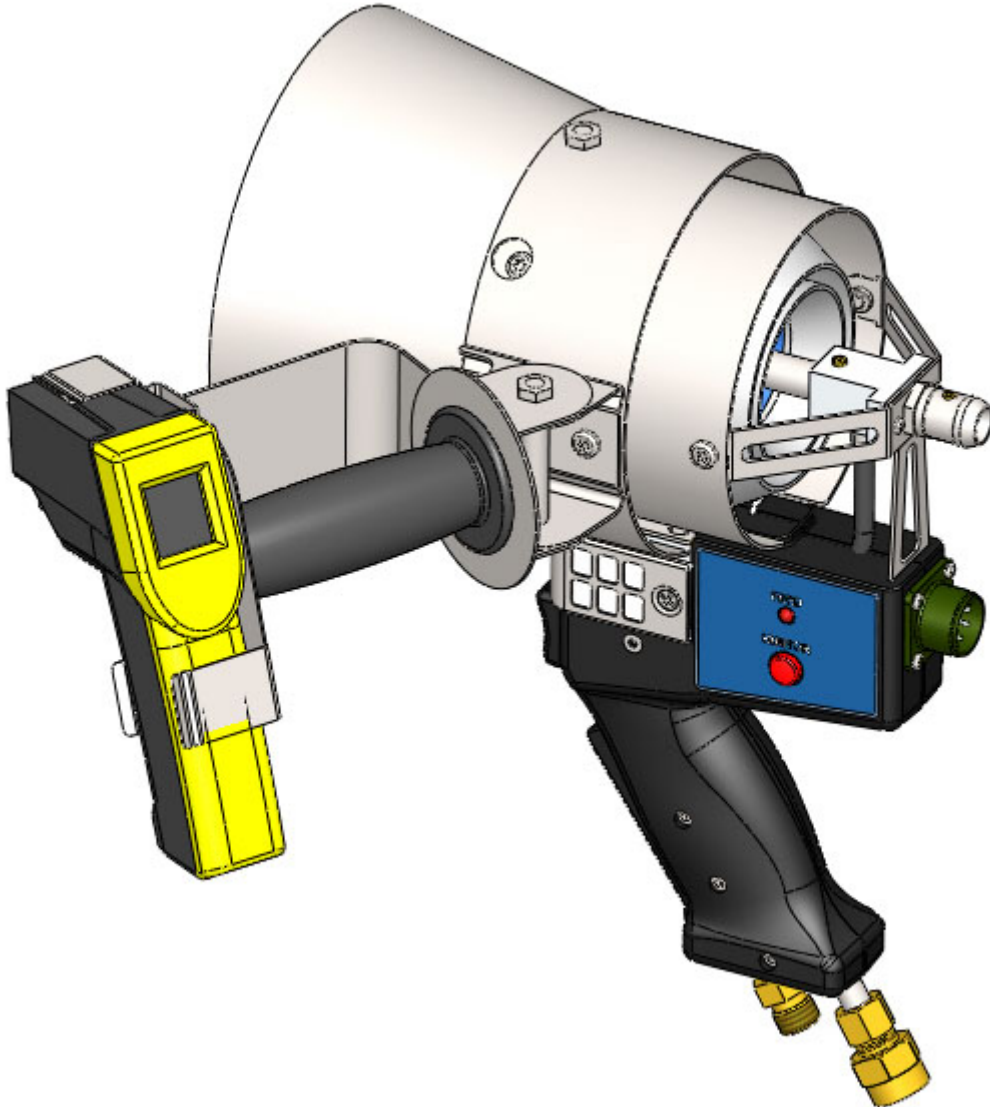


Figure 4: Auxiliary Handle

The Cart

The cart components are identified in Figure 5 below. The cart contains a control box, a storage box (behind the control box), and a powder hopper mounted on a vibrating base. The cart is designed to be easily moved and positioned using the front and rear stainless steel handles. Pneumatic casters are supplied for easy movement. The front casters are fixed. The rear casters are on swivel mounts for steering the cart, and have brakes so that the cart can be securely locked.



Figure 5: Cart - Front View

The main inputs to the cart are 115V / 5A AC Power, propane (using a quick disconnect connector) and compressed air (using a quick disconnect connector).

The cart is attached to the applicator using a supplied umbilical cable (not shown) which has four main lines for connecting the cart to the applicator:

1. Electrical connection (6 pin Connector)
2. Powder Feed (5/8" Conductive Feed Tube)
3. Compressed air (1/2" ID Tube)
4. Propane (1/4" ID Propane Tube)

Storage Compartment

Figure 6 shows the rear storage box and access doors. There is a top door and a rear flip down panel. The Applicator and umbilical can be stored in the storage box with both access doors closed. When operating the system, the umbilical remains attached to the back of the control box (inside the storage box), so either the top door or the rear fold down panel is open during operation.

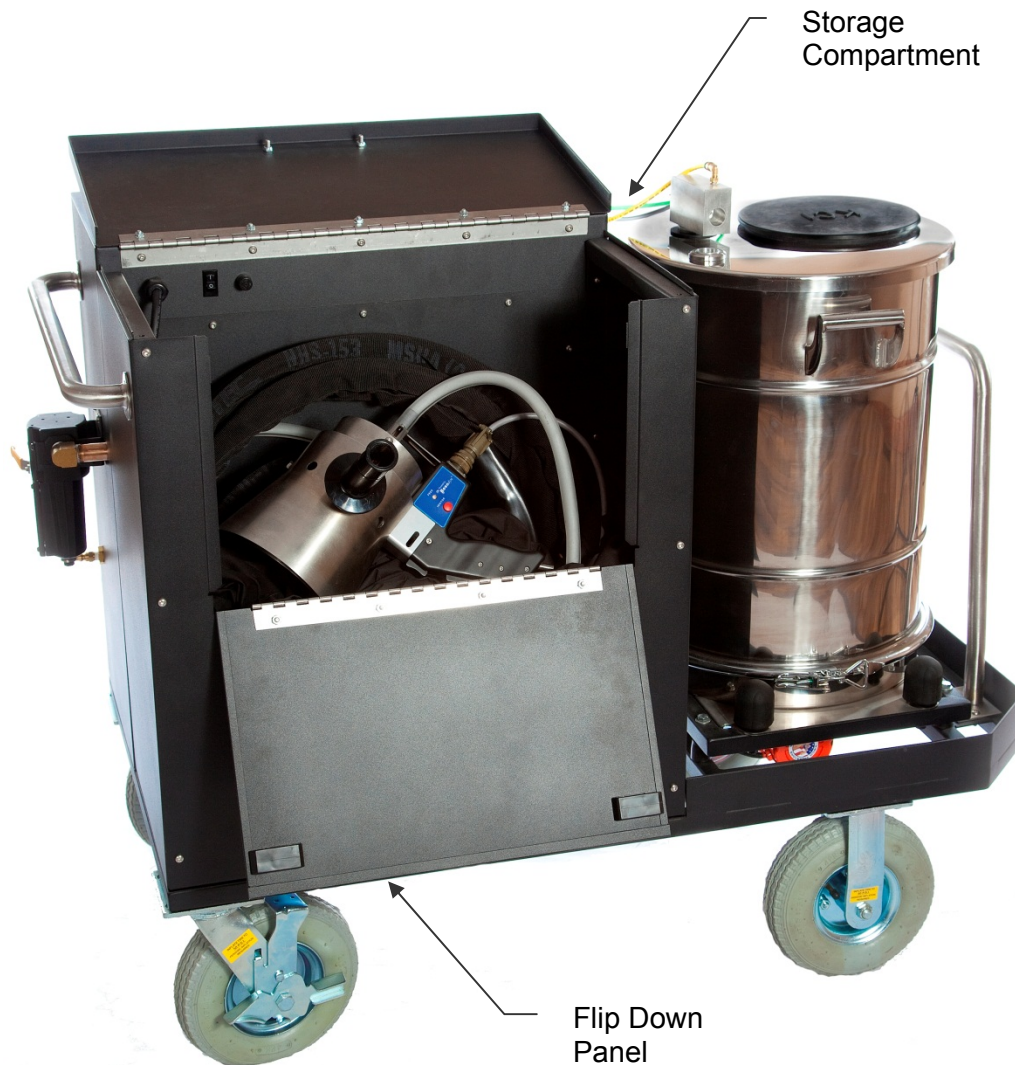


Figure 6: Storage Box

Propane / Compressed Air Input

The propane and compressed air inputs to the cart attach using quick disconnects on the side of the cart. Shut-off ball valves can be used to turn the compressed air and propane to the cart on and off. The air and propane inputs are identified in Figure 7.

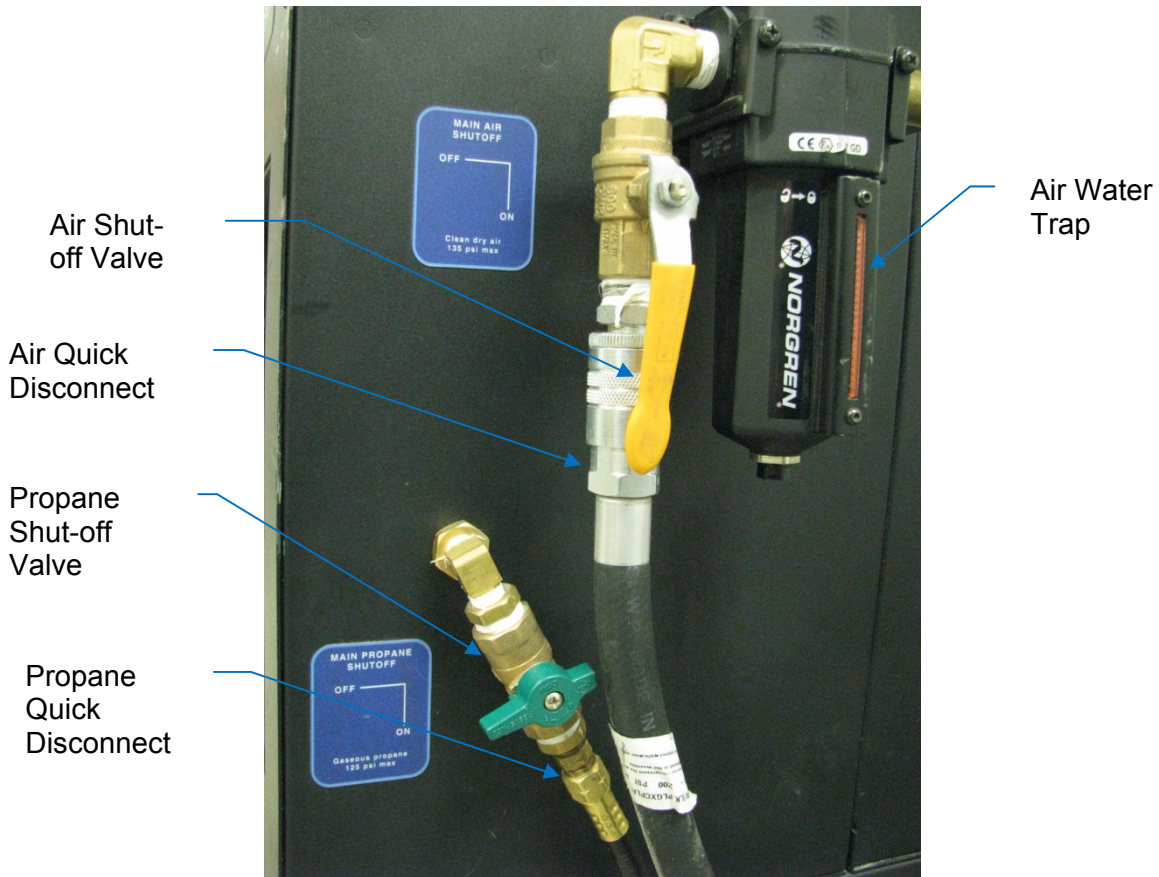


Figure 7: Air / Propane Inputs



When connecting propane to the cart using the quick disconnect, check to be sure that the connection is secure and free of leaks. If a leak is suspected, immediately disconnect the propane from the cart. Use a soap bubble solution for check for suspected leaks. Replace any leaking components prior to using the equipment.

In humid environments, the air water trap may fill with water. The trap comes standard with an automatic drain. Make provisions for the automatic drain if using equipment indoors or on finished surfaces. Some compressed air supplies have oil, rust and other contaminants in the air which could stain or contaminate surfaces below the filter trap. The large volume, in-line air and oil filters supplied with each unit must be used at all times to ensure that clean, dry, and oil free air is supplied to the unit during operation.



Only clean, dry, oil free air can be used with the PTS-30 system. Failure to use clean air can cause damage to the PTS-30 system and will void the warranty.

Powder Hopper

The powder hopper is attached to a stainless steel base plate. The hopper assembly can be completely removed from the cart by four mounting knobs. The powder pump is installed on the lid with a pick-up tube which extends down near the bottom of the hopper barrel. The powder fill insert can be used to check the level of powder and to assure good fluidization of the powder. The powder pump and pick-up tube are supplied with the hopper. For proper powder feed performance, a custom venturi may be required. Refer to the material technical bulletin for specific guidelines on powder pump venturi and pressure settings. The hopper assembly is illustrated in Figure 8.

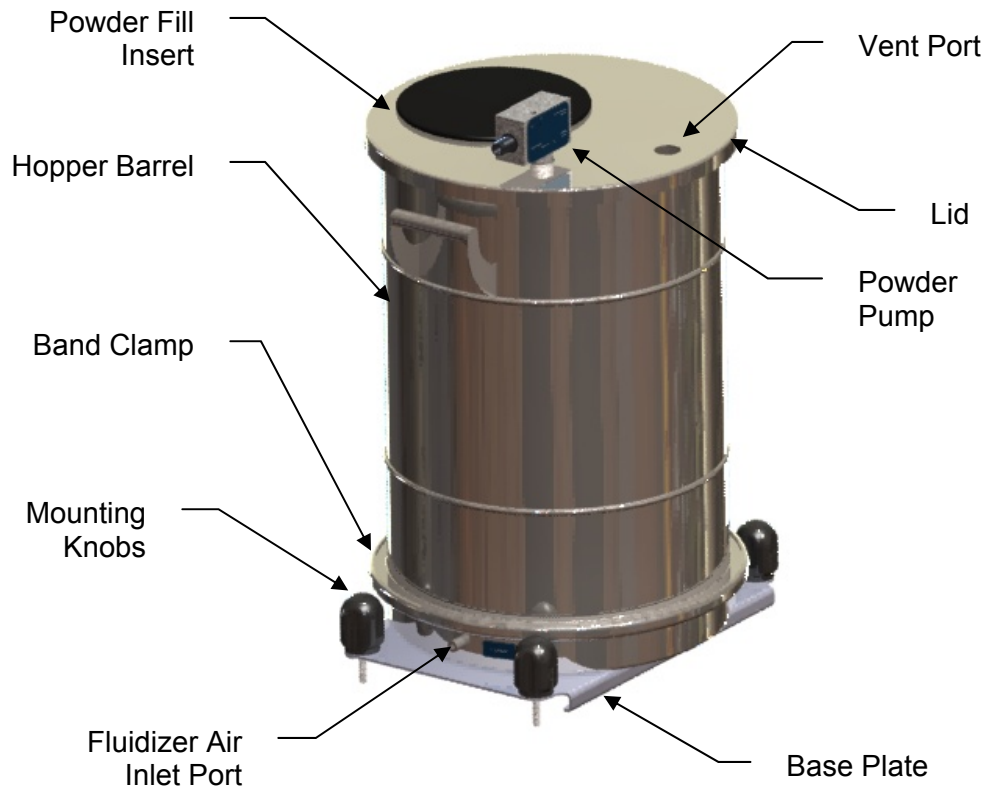


Figure 8: Powder Hopper

The powder hopper utilizes a porous polymer membrane which is held in place with the band clamp at the lower end of the barrel. These polymer membranes can become

clogged after a great deal of use. The membranes may also be damaged from scraping with hard implements to clean or remove powder. Use only soft brushes and shop type vacuums to clean powder residue from hoppers. Replacement membranes may be purchased from Resodyn.

Control Panel - User Interface

The control panel is used for adjusting the settings for the applicator and for the powder feed system. Figure 9 illustrates the controls and indicator on the control box user interface. The user interface is arranged in two sections. The left section is used to control the powder feed. The right section is used to control the applicator combustion settings. The correct operation of these controls will be further discussed in Chapter 3.

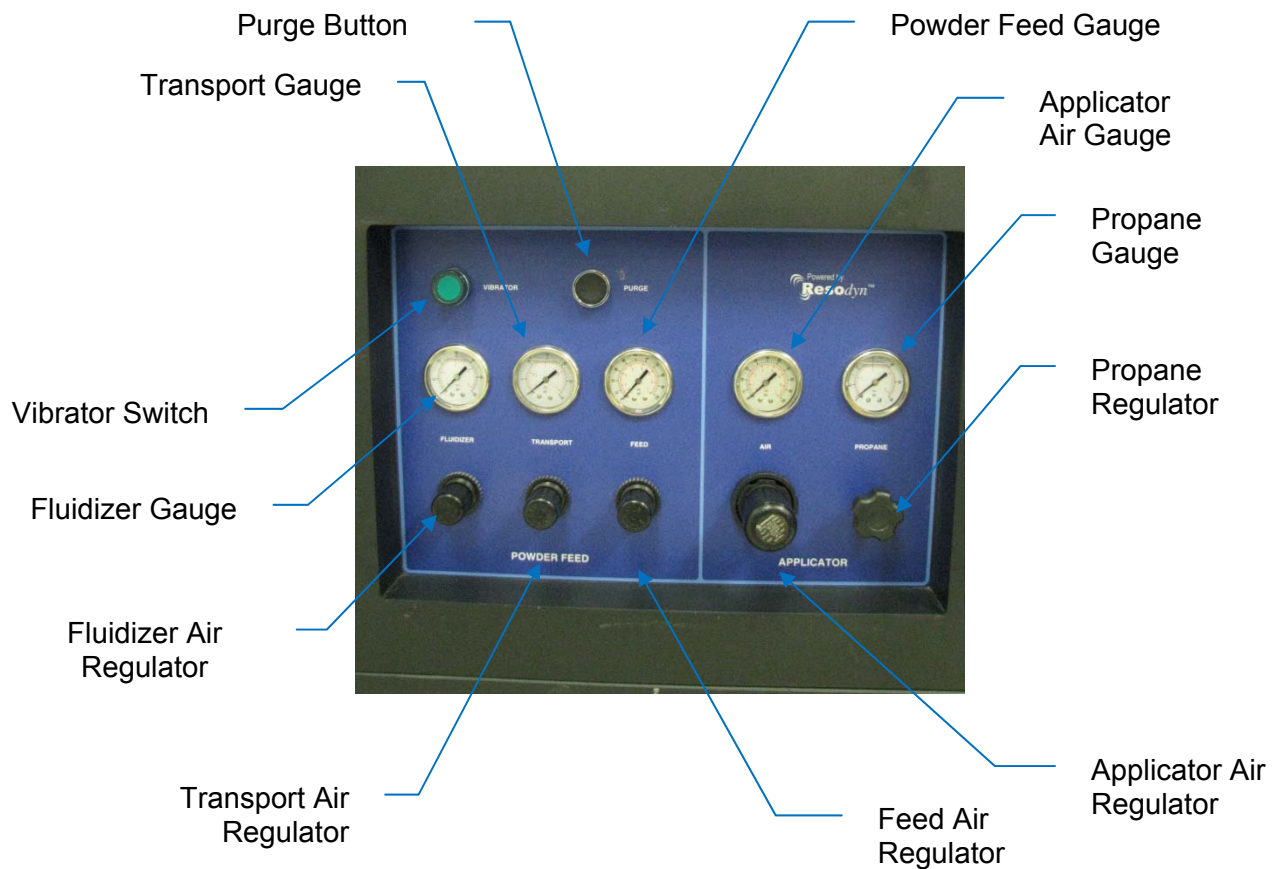


Figure 9: Control Box - User Interface

Control Box - Back Panel

The control box back panel includes the AC power input cord and the umbilical connections to the control box. Figure 10 illustrates the location of these interfaces.

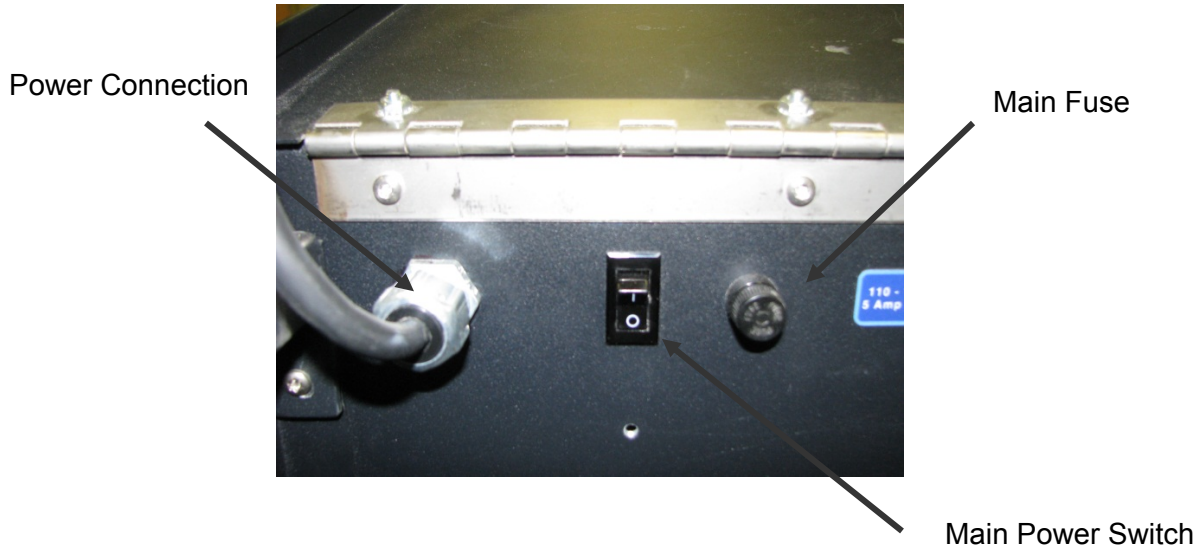


Figure 10: Control Box - Back Panel

The main power switch turns on and off all AC power to the cart and applicator. A fuse holder is mounted near the power switch. This holder accepts a 5A 1-1/4" X 1/4" Fuse. The three connections located at the base of the back panel (see Figure 11) are for the umbilical electrical, propane and compressed air. These bulkhead connections allow for removal of the umbilical; however, for normal operation of the PTS-30 the umbilical can remain attached to these connections.

Chapter 3: Operation

This chapter describes the correct operation of the PTS-30 system.



The PTS-30 should only be operated by properly trained and qualified personnel. Improper use or operation of this equipment could result in serious injury or death to the operator. Read and understand this users guide before attempting to operate the PTS-30.

Initial Set-up

Connecting the Umbilical to the Cart.

The power, propane, and air connections to the umbilical connect to the control box. Access to these connections is through the storage compartment top and flip down doors on the back of the cart with the connections located at the bottom of the storage compartment. See Figure 11

The 6 pin electrical connector can be hand threaded on the bulkhead. The Propane connection must be tightened with two opposing wrenches.

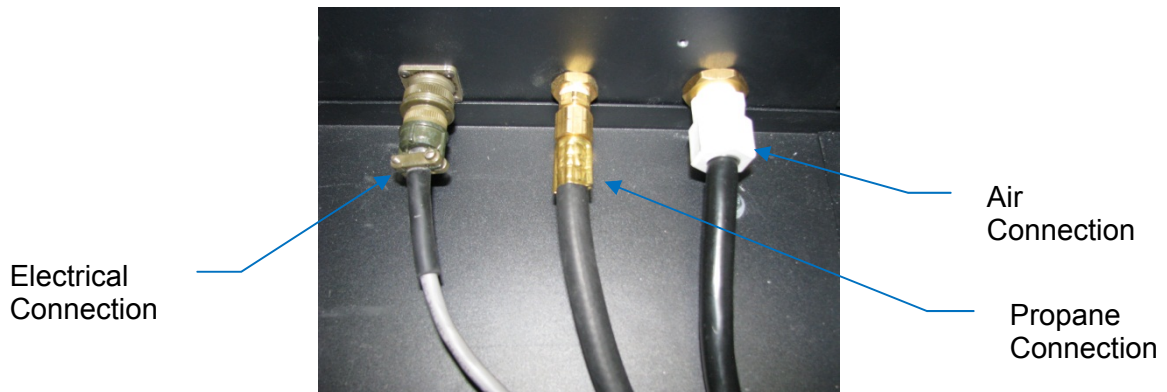


Figure 11: Control Box - Back Panel Lower Right



Assure that the propane connection is secure and not leaking. Check the joint with bubble solution to be sure that no propane is leaking from this connection. Operating with a leaking fitting could cause a fire or explosion.

The air connection is a push to connect fitting. Simply push the 1/2" OD tubing into the connection. To release this connection, push in on the plastic collar on the bulkhead and pull the tube out.

The powder feed tube connects to the hose fitting on the power feed pump. Push the powder feed tube onto the barb fitting. A hose clamp may be used to secure the hose onto the fitting.

It is possible to remove the barb fitting from the powder pump housing. The operator may find it more convenient to leave the hose attached to the barb and remove the barb assembly from the housing when disconnecting the umbilical from the powder pump.

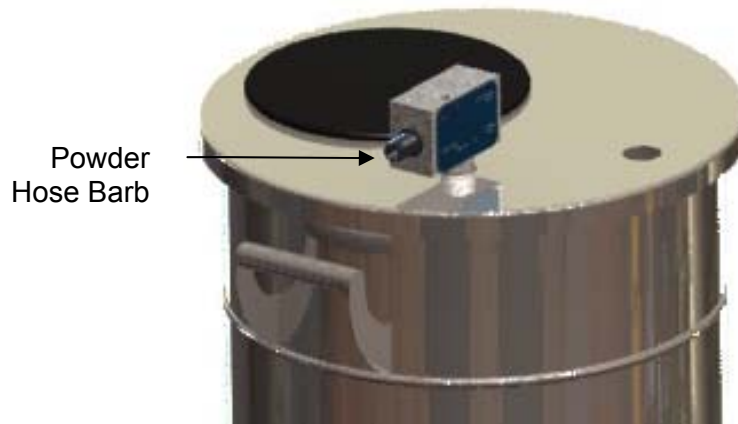


Figure 12: Powder Hopper Lid

Connecting the Umbilical to the Applicator

Connect the umbilical to the applicator as shown in the figure to the right.

The powder feed tube is pressed onto the back of the applicator feed tube.

The electrical connection is hand threaded onto the bulkhead fitting on the applicator.

Note: It is advisable to ensure the powder feed hose and electrical cable is longer than necessary to form a semi-loop when connected. This loop reduces stress on these connections.

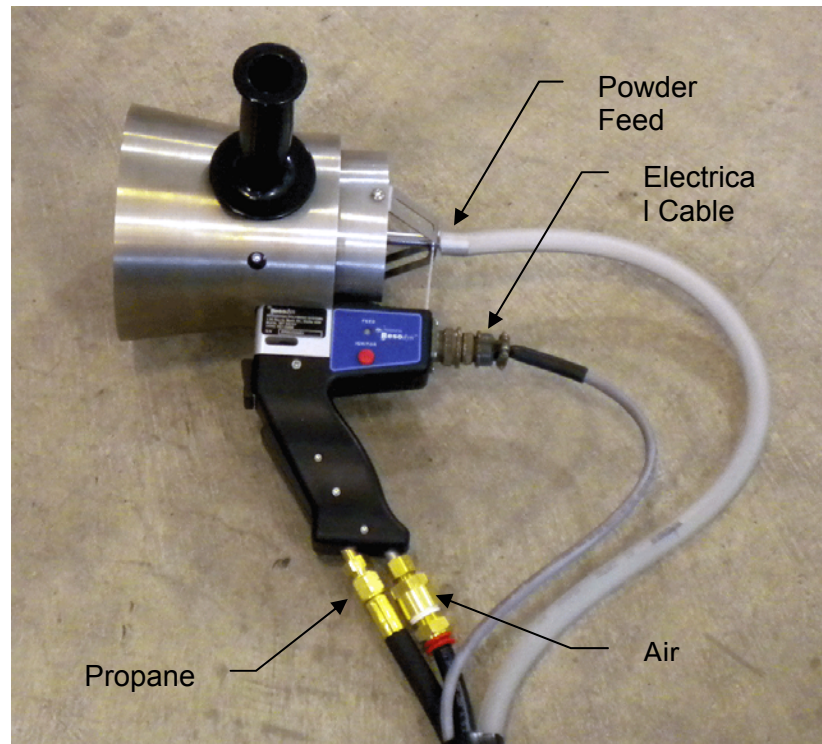


Figure 13: Applicator Connections

Additionally, in order for the powder feed tube to work properly it is important to have generous bends and no kinks. Any abrupt bends in the feed tube can cause problems with powder feed.

The Propane line is attached to the applicator using the 9/16-18 LH gas ferrule on the hose.



Assure that there is a secure leak free connection between the propane hose and applicator. The hose ferrule is a left hand thread, so threading the hose onto the applicator can loosen the tube inside the applicator. Be certain to secure the nut on the applicator tube with an opposing wrench while tightening the ferrule on the hose. Check the joint after attaching and assure there are no leaks. If there is any propane smell, do not use the applicator until the propane connections have been verified.

The air fitting is a push to connect fitting. Press the 1/2" OD tube into the fitting. To release the air hose, push in on the red collar and pull out on the hose.

Connecting the Cart to External Air, Propane and Power

The electrical connection for the cart is made using an L5-20P (120V / 20 Amp) power plug. This plug is attached to a short pigtail which is located in the storage box. Turn off the main power rocker switch before connecting the power cord.

The compressed air and propane connections are located on the side of the box. Prior to connecting air and propane, close the ball valves (turn the handles so they are at a right angle to the valve bodies. Refer to Figure 7 for the compressed air and propane input locations.

Connect the air using a 1/2" quick disconnect fitting.

Connect the gas using a Flame Engineering HK-7 1/4" quick disconnect fitting.



The propane Flame Engineering HK-7 quick disconnect fittings are designed specifically for use with propane. Do not use any other fitting that has not been specifically designed for this application.

Once the propane quick disconnect is attached, verify that the connection is secure and leak free. If there is any propane odor or an audible leak, do not use the system. Check the leak with bubble solution and repair all leaks before using the system.



Assure that the propane fitting is secure and leak free. Check the leak with bubble solution and repair all leaks before using the system. Propane leaks can result in fire.

Prepare the Powder Hopper

The powder hopper utilizes a porous membrane that will fluidize the powder in the hopper and a vibrator below the hopper which assists with the fluidization. For best results the hopper should be 1/4 to 1/2 full when the fluidizer air pressure is off.

Fill the hopper with powder to the desired level either thru the powder fill insert or by removing the hopper lid (see Figure 8).

Operating the Control Cart

Turn on the main power switch

Turn on the main power rocker switch (see Figure 10).



Do not point the applicator directly at your face when testing the igniter. Residual propane may flash and cause burns.

Before propane and air valves are opened, test the igniter. Press the igniter button on the left side of the applicator and listen for electrical arcing from the igniter. During visual inspection of the igniter, do not point the applicator directly at your face. Always look from an angle with the applicator pointed in a safe direction. The igniter will arc from the electrode to the burner face. See Figure 3.

Open the main air shut off ball valve.

When this valve is opened, you may hear air flowing thru the applicator or the hopper. (See Figure 7) Use this valve to stop air flow to the cart between uses. Using the regulator to shut off air will disrupt flame settings and require adjustment at every startup.

The control cart is equipped with a Low Air Pressure Warning Buzzer. When the system supply air pressure drops below a safe usable level an intermittent buzzer will sound to indicate the fault. Take corrective action to correct the low supply air pressure condition before use of system continues.

Open the Main Propane shut off valve.

When this valve is opened, (see figure 6) propane will flow into the control box regulator. Check the propane pressure regulator gauge to see that propane pressure is present.



Propane leaks can result in a fire hazard. When the main propane valve is opened, if there are any audible leaks or any smell of propane gas, close the propane valve. Do not use the system until the source of the propane leak has been identified and repaired.

The propane regulator is a non-relieving regulator. This type of regulator will not reduce downstream pressure if no gas is flowing down stream of the regulator. To correctly set pressure it is necessary to open the gas valve by briefly pressing the propane gas valve on the applicator (see Figure 2).

Turn the regulator knob counterclockwise to reduce the propane gas pressure. Adjust the gas pressure to the desired setting.

Adjust the Hopper to correctly fluidize the powder

Hopper fluidizer settings will vary with each different powder to be applied. Always switch on the vibrator using the green vibrator switch on the control box prior to setting the fluidizer air pressure, as this will assist with lifting and fluidizing the powder inside the hopper. See Figure 9. To adjust the hopper fluidizer, turn up the fluidizer pressure regulator while observing the hopper content thru the hopper fill insert hole and slowly increase fluidizer pressure until the powder in the hopper raises and begins to have a slight boiling appearance.

Powder Feed Settings

Powder feed rate is set using the transport and feed regulators. See Figure 9.

Correct powder feed rate is dependent on the powder formulation and on the correct deposition rates for your application.

For specific feed rate settings refer to the appropriate ResoCoat™ technical data sheet or contact your Resodyn representative for assistance with your particular application.

For the powder pumps supplied with the PTS-30, the maximum powder flow rate is approximately 3 gm/sec (≈23 lbs/hr).

To achieve steady uniform flow, the transport air is typically set at around 5 psi. Low transport air pressure generally helps create maximum feed rate and steady (non-pulsating) flow rate.

The transport pressure should always be set at 3 psi or greater. The transport air continues to flow thru the feed line whether the feed is turned on or off. This transport air has two benefits when the feed is off: 1. Transport air carries out any remaining powder in the tube. 2. Transport air assists with cooling the feed tube in the applicator to prevent powder from sticking and clogging the feed tube.

Powder Line Purge

The powder purge actuator button is located on the control panel. This button can be depressed to momentarily generate a pressurized burst of air thru the feed line to clear out any powder remaining in the line. The purge pressure is controlled by the feed pressure regulator setting.

Setting the Applicator Air and Propane Pressure

Setting the propane pressure and air pressure is critical to creating the flameless heat required to achieve the best results with the PTS-30.



Operators should never operate this equipment without completely reading and understanding this section of the manual.

Proper propane and air settings will depend upon the specific coating application. Refer to the application sheet for your application or contact your Resodyn representative for guidance on your specific application.

The PTS-30 can be operated at power levels from 7 – 30 kW by adjusting the propane pressure and the applicator air pressure. Each PTS-30 system has been carefully factory characterized to determine the propane pressure and applicator air pressure settings which produce the optimum flame. The optimum operating points can be found on an operating point guide attached to the underside of the storage box lid. A sample power setting chart is provided in Table 2. For optimum results, use the guide on the storage box lid.

Table 2: Power Level Chart - SAMPLE ONLY

Power Level	Power kW	Air Pressure	Propane Pressure
1	10	20 PSI	17 PSI
2	15	20 PSI	22 PSI
3	20	30 PSI	30 PSI
4	25	30 PSI	32 PSI
5	30	30 PSI	35 PSI



Using propane and air settings different from those provided on the cart label can result in poor applicator performance, incomplete combustion, or damage to the applicator.

For initial setup, it is recommended to start at power level 2.

Using the storage box settings guide set the propane pressure.



Make final propane adjustments with the applicator ignited and the flame on to prevent releasing unburned propane into the work area.

Adjust the applicator air pressure to correspond with the correct power level setting on the settings guide. See Figure 8 for location.

Increase the pressure by turning the regulator knobs clockwise. When you open the applicator air regulator, you will hear air flowing thru the applicator. This is normal. This air flow will flush any propane in the applicator and cool the applicator shroud and heat shield.

Igniting the Applicator



Improper ignition of the applicator could cause harm to the operator. Only trained operators who have read this entire manual should attempt to ignite the applicator.



Do not ignite without air flowing through the applicator! Failure to do so will cause dangerous explosive flash to operator and personnel in vicinity.

Before igniting the applicator, always ensure the following:

1. Air pressure is set to the correct setting
2. Propane is set to the correct pressure in correlation to air setting
3. Igniter is correctly working
4. Burner fine-tune lever on right side of handle is in the center position

Ignition Steps

1. Once the above details are verified, ensure the cart propane shut off valve is open.
2. Hold the applicator with your right hand and point the applicator in a safe direction.
3. Squeeze the propane gas valve to fully open and press the igniter switch.

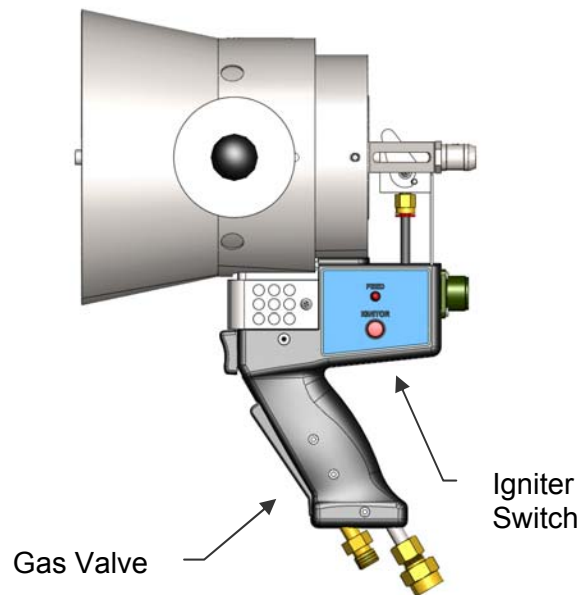


Figure 14: Propane Ignition Controls

If the burner does not ignite within 1 – 2 seconds, release the gas valve and the igniter switch, wait 5 seconds and repeat.

If the applicator does not ignite after three attempts, repeat the above checks and try again.



Never point the applicator at anyone or anything which can be harmed or burned. When the applicator is ignited, extremely hot air exits the shroud and could cause burning.

Adjusting the Flame

Once the applicator is ignited, check the flame by carefully observing the flame in the shroud using a visual side viewing angle. The applicator air pressure, and the Applicator Fine-tune lever are used to adjust the flame for a given propane pressure setting.

Use Table 3 for proper air pressure setting for flame appearance. Refer to Chapter 6: Troubleshooting section for flame adjustment problems or increased applicator noise.

Table 3: Power Level Chart

Air pressure	Flame Appearance
Air Pressure too Low	Flames are yellow or flame tips are extending past the end of the shroud
Air Pressure correct	Flame is fully attached to the burner plate (no voids) and is bright blue. Flame does not extend past the end of the shroud
Air Pressure too High	Flame is light blue and voids are visible on the heater face

The air pressure should be adjusted high enough to generate a full well anchored flame on the heater plated with no flame tips extending beyond the end of the shroud. The PTS-30 Burner Fine-tune Lever is located on the right side of the handle. The Fine Tune Lever adjusts the overall amount of air entering the burner area.

The Fine Tune Lever should be adjusted anytime the Air/Propane Pressure is changed on the cart. For best results move the Fine Tune Lever down until the Applicator makes a loud howling noise, and then slowly adjust the Fine Tune Lever up until the howling noise is no longer present. If a howling noise is not heard, simply observe the flame from a safe angle so there is no risk of getting burned, and move the lever to achieve the best flame appearance per the information in Table 3. This should be the optimum flame pattern setting for the selected air/propane settings.

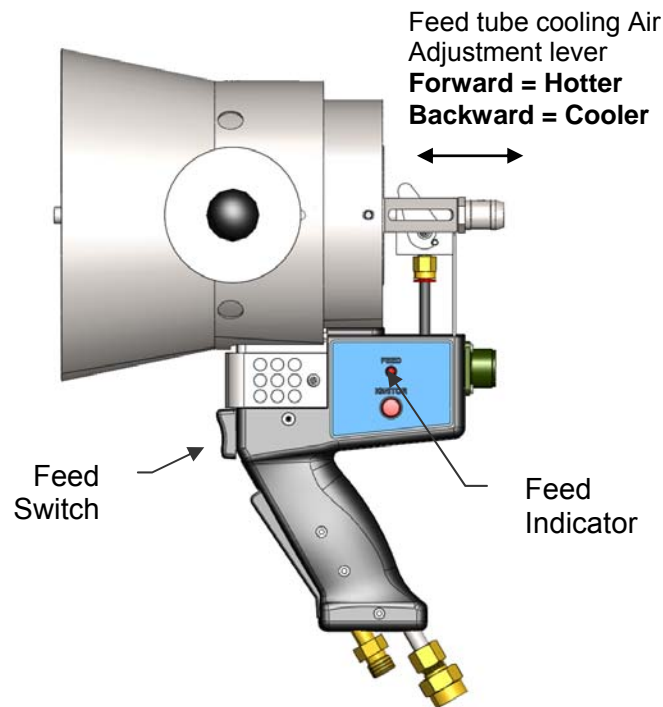


Figure 15: Powder Feed Controls

Turning on the Powder Feed

To turn the powder feed on, depress the feed switch and release it. Once the feed switch has been depressed the feed indicator LED on the handle will illuminate and powder will begin to flow. To turn the feed off, depress the feed switch again and release it.

Note: This is a latching switch. There is no need to keep the feed switch depressed.

The feed tube cooling air adjustment lever located on the left side of the feed tube block controls the amount of air cooling the feed tube. The lever should normally be placed in the full forward position to reduce the amount of air exiting the front of the feed tube heat shroud.

Some spray conditions and powder materials may require additional cooling air. Moving the lever to the full back position will allow more air to exit the front of the feed tube shroud. Caution should be observed, as this will also considerably cool the temperature of the applicator hot air which is required to process the powder on the substrate.

Chapter 4: Applying a finish with The PTS-30

General Starting Parameters

The PTS-30 is capable of applying a wide variety of Resodyn polymer materials on a broad range of substrates with the correct settings. The thermal output of the system can be varied by selecting the different power level settings for operation. The correct power setting will vary depending on the ResoCoat™ material, and the substrate type and thickness onto which the material is being applied. Material and coating damage may result if the specified power level for ResoCoat™ material is exceeded.

Temperature sensitive substrates: Resodyn Engineered Polymeric Systems can customize powders and process parameters to provide an optimized coating with lower thermal input to the substrate. Contact Resodyn for assistance with custom coating formulation for your application.

Application General Guidelines

Creating polymer powder coatings using the PTS-30 system and ResoCoat™ materials can be safely and efficiently accomplished by following the basic process steps outlined in this section, and by observing a few fundamental “rules” of Polymer Thermal Spray coating.

Rule #1: A coating is only as good as the surface to which it is applied.

The surface to be coated must be clean, dry, free of all contaminants, and mechanically sound. Surface preparation should be performed as prescribed in the ResoCoat™ Material Technical Bulletin and/or the applicable job specification. All dust, dirt, debris, loose, or poorly adhered substrate surface material, and contaminants such as oil, grease, or solvents, should be removed by an approved cleaning or preparation method prior to PTS coating application.

Rule #2: Always pre-heat the substrate surface before coating.



Failure to properly pre-heat the surface will result in poor and/or no adhesion of the coating to the substrate.

The surface to be coated must be pre-heated to the temperature specified by the ResoCoat™ material data sheet, and MUST BE VERIFIED by a temperature measuring device prior to beginning each application of material. An Infra-Red temperature sensor can be used to quickly and easily determine the surface temperature during the pre-heat process.

Rule #3: The material feed rate must be adjusted to match the speed of application.

The application speed will be determined by several factors which include; heat absorption rate of the surface being coated, melt and flow properties of the ResoCoat™ material, finished coating thickness, ambient temperature, etc. The ResoCoat™ material technical bulletin will specify an average feed rate that can be used as an initial setting for most applications. Excessive material feed rates can result in a coating formation condition of air entrapment in the applied coating material. This entrapped air will cause reduced flow properties requiring considerably longer post-heat applications, and in extreme cases prevent the material from forming a smooth, continuous film. Insufficient material feed rates will result in reduced application rates, will unnecessarily increase the amount of heat placed into the substrate while attempting to build coating thickness, and may actually damage and degrade the finished coating. A properly adjusted material feed rate will deposit sufficient powdered material to visually form a complete layer of coating; with each subsequent, overlapping pass flowing and joining together to form a smooth finished film. The operator should make adjustments to the material feed rate as required to match the appropriate speed of application.

Rule #4: Allow the retained heat in the deposited coating and substrate to process the coating material.

Ideally, the heat applied by the PTS applicator to the coated surface during material deposition will be sufficient to melt and flow the previously applied material passes into a smooth, fully processed coating. Substrates that have a high heat absorption rate such as thick metals and concrete may require the operator to discontinue material deposition, apply post-heat to the coated surface to fully process the coating, and then resume material deposition at the previous location. Care must be taken not to overheat and damage the coating during post-heating operations. It should be noted that by the time a visual change is observed in the coating surface, more heat than was actually required to process the material has been applied. Post-heat should be applied using a waving, side-to-side motion without dwelling in any one area. Always use a temperature sensor to monitor the heat input to the coating surface. A continuous need to suspend coating deposition and rework areas by applying post-heat may be an indication of improper speed of application and/or feed rate setting. Make adjustments accordingly.

Spraying a Polymer Thermal Spray Coating with the PTS-30

1. Ensure the control cart is connected to the compressed air, propane, and electrical sources and the system power switch is in the ON position. Refer to prior user manual sections to ensure the powder feed pump is properly connected with all system hoses in their correct locations.
2. Remove the powder hopper lid and fill the hopper to approximately half-full capacity with ResoCoat™ powder material. The powder pick-up tube is intentionally designed to not extend completely to the bottom of the hopper. The powder level must be at least two (2) inches above the bottom of the pick-up tube after fluidization to operate. Over filling the hopper will result in poor powder fluidization and will require additional fluidizer air.

3. Refer to the appropriate reference source as listed below and determine all system operating pressures per their individual requirements. Note: To properly set all air pressures, the compressed air source must be connected to the system and the inlet valve must be in the open position with air flowing through the system and exiting from the applicator. To accurately set the propane pressure, the applicator propane valve lever located on the front of the applicator handle must be temporarily depressed to flow propane while adjusting the regulator pressure to ensure a valid set point.

System Parameter	Reference Source
Power Level Required for ResoCoat Material	ResoCoat™ Material Technical Bulletin
Applicator - Propane Pressure	Power Level Chart on Cart
Applicator - Air Pressure	Power Level Chart on Cart
Powder Feed – Fluidizer Pressure	ResoCoat™ Material Technical Bulletin
Powder Feed – Transport Pressure	ResoCoat™ Material Technical Bulletin
Powder Feed – Feed Pressure	ResoCoat™ Material Technical Bulletin

Parameter Set-up checklist

For specific instructions on the following steps, refer to Section 4.

1. Set the applicator air pressure.
2. Set the applicator propane pressure.
3. Switch the hopper vibrator on.
4. Set the powder hopper fluidizer pressure.

With the hopper lid removed, observe the powder level rise as the fluidizer air pressure is increased from the zero setting. The powder level will rise up the wall of the hopper as the fluidized air passes through the powder. The proper final adjustment of the fluidizer air pressure will be determined by the operator and will be effected by various factors including hopper fill level and ResoCoat™ material type. Properly fluidized powder will have risen in height up the wall of the hopper, will have a gentle boiling appearance as the air bubbles break the surface, and have a soft cloud feel when your hand is moved down through and around in the powder. Not enough fluidizer air pressure will result in a packed powder which creates an evacuated area around the pick-up tube that does not automatically refill. Excessive fluidizer air pressure can be seen as a hard boiling of the powder's surface and will result in excessive powder being blown from the lid vent with the escaping air.

5. Set the powder feed and powder transport pressure

Adjust the Powder Feed and Powder Transport Pressures together to provide adequate material, with an even flow. With the hopper lid removed, hold the applicator aimed facing downward toward the open top of the hopper to capture material as it flows from the applicator.



Never aim an ignited applicator at the open hopper.

Depress and release the applicator powder feed switch once to activate the powder feed system. Adjust the Powder Feed Pressure to the suggested beginning setting. Adjust the Transport Pressure to the suggesting beginning setting and observe the powder flow through the semi-transparent feed hose connected to the powder feed tube on the back of the applicator. The powder will be observed passing through the hose around the bend into the applicator. The powder flow should be an even, non-surging flow. If the flow is observed to have a heavy surge resulting in a discontinuous flow of powder exiting the powder feed tube from the front of the gun, reduce the transport until a smooth flow has been achieved. As a general rule, excessive transport air pressure will cause heavy surging of the powder flow, while too little transport air pressure may cause the material to “salt out”, which is a condition where the powder begins to fall to the bottom side of the hose interior and not be carried with the air stream to the applicator. Depress and release the powder feed switch to stop the flow of powder.

6. Ignite the Applicator following instructions from the previous sections.

Applying a Coating

Now aim the ignited applicator at a suitable practice (non-flammable) substrate and perform preheat application on a section of the substrate approximately 18 to 24 inches wide and 12-18 high. Whenever possible it is always advisable to begin coating from the Top of the substrate surface and move toward the bottom with each slightly overlaid pass to take advantage of rising process heat. In this way, the area that was previously coated continues to receive heat, which will assist with coating flow-out and smoothing. When preheating slowly move the applicator back and forth over the area until the required substrate preheat temperature is observed with an I.R. thermometer. Always preheat an area slightly larger than the planned coating area.

Begin coating deposition. Depress and release the powder feed switch, and observe that powder begins to flow from the feed tube to begin coating deposition. The skills required to apply a smooth complete PTS coating are very similar to those required when using a paint spray applicator system, with the exception that the powder will remain flowing during the process and is not cycled off and on with each pass.

The coating application should be done in a smooth side to side motion over a width of the 12 to 18 inches in the preheated area. Attempting to coat an area that is too wide will result in excessive cooling of the substrate area that is not continuously receiving

direct heat from the applicator. Move the gun slowly in a sideways motion over the area to be coated noting the build-up rate of the material as it is deposited. As you gain experience you will begin to observe when the traverse speed and material feed rate are working in unison to deposit the correct amount of material that will flow-out into a complete coating layer with each pass.

Hold the gun as steady as possible and move the powder deposition pattern in a straight line to the other side of the preheated area. At the completion of each pass, immediately and smoothly adjust your aim slightly lower and begin moving back in the other direction to accomplish the next deposition pass. Each pass should slightly overlap the previous pass to allow the coating material to commingle and flow together. The amount of overlap should be great enough to provide enough material to form a complete coating with no visible bare spots, and small enough so as not to deposit a needlessly thick coating. Indicators of overlap and traverse speed issues are visible stripes which may indicate thin coating passes with insufficient material to flow-out completely, or ridges forming which could be an indication of an excessive feed rate for the traverse speed or a gun stand-off distance that is too close.

Coatings gain thickness at a very rapid rate, so it is also advisable to measure the thickness of your practice coatings to gain an understanding of coating build rates. Spraying a thin coating is much more difficult than thick coating applications. Practice will assist in acquiring the skill to automatically adjust traverse speed and overlap amount in response to the visual indicators of the process to apply a coating of the desired thickness.

Congratulations! You are now successfully creating Polymer Thermal Spray coatings with the Resodyn PTS systems.

Chapter 5: Care and Maintenance

Care & cleaning



*Allow only qualified personnel to perform maintenance duties.
Follow all safety instructions listed in this manual.*

Daily Cleaning

1. Disconnect the powder feed hose and blow out the powder pump and feed tubing with clean dry air. Blow air into the feed hose from pump end.



Do not use a power drill to clean out powder tube.

2. Clean any powder buildup in applicator powder feed tube. (See Figure 2.) Insert and spin a twist drill bit by hand into powder tube to remove any obstructions. Use a drill size that will just fit inside the tube for proper fit. If tube becomes bent or deformed replace with OEM part.

Periodic Cleaning



Never replace conductive O-rings with non-conductive O-rings. Conductive O-rings provide a path for electrostatic discharge. Failure to comply could result in fire, explosion or personal injury.

1. Disassemble the pump and clean the parts with low pressure air and wipe with lint free cloth. Parts can be cleaned with alcohol only after the O-rings are removed. O-rings may be damaged by solvents.
2. Inspect all feed hoses and replace if damaged.
3. Remove fluidizing plate and blow off with compressed air. Replace gasket and membrane with OEM parts if damaged. Replace the membrane if embedded with powder and fluidization is weak.

Replacement Parts

Below is a list of customer replaceable parts. Contact your sales representative for OEM replacement parts.

PTS-30 Spare Parts List	
Description	Part Number
Applicator	
Powder Feed Tube	200267
Auxiliary Handle	200381
Handle Guard	200316
Temperature Sensor	001290
Air Filter	200547
Burner Screen Pack	910113
Umbilical	910114
Cart	
Filter Assembly (Automatic Drain)	001286
Filter Assembly (Manual Drain)	001285
Filter Trap Service Kit	001287
Main Fuse	001288
Pneumatic Casters - Fixed	001729
Pneumatic Casters - Swivel	001730
Powder Hopper Membrane – 50 lb	001807
Membrane Gasket – 50 lb	001814
Powder Pump	001817
O-Ring Kit	001293
Venturi Kit	001923

Chapter 6: Troubleshooting

Here are some simple solutions to check before contacting your service representative. Use the following chart to resolve operational problems. If the problem persists contact your authorized service center.



Do not attempt to open secured panels or disassemble any component. Attempting to do so will void the warranty. Access to internal compartments in the cart or applicator may cause bodily damage or unsafe operating conditions. Only authorized service professionals are permitted to perform maintenance beyond the scope of this troubleshooting guide.

Description of Problem	Potential Problem	Solution
Applicator will not ignite	Gas not present, crimped hose, applicator propane port blocked	Check bottle valve and pressure. Check propane tubing for proper connections from propane bottle to applicator. Verify propane pressure at cart is set properly to desired power setting. Visually check propane gauge for pressure reading.
	Igniter not working	Check the igniter by following instructions in Section 4 Verify main power switch is in ON position. Remove fuse holder (located next to power switch) and visually check fuse. Verify electrical connections on umbilical are secure Verify that the cart is plugged in to an appropriate power source.
	Propane and Air Settings Incorrect	Refer to the setting guide on the cart storage box lid

Description of Problem	Potential Problem	Solution
Flame Blows out	Fuel Mixture Too Lean	Check for proper Propane/Air setting. Slightly decrease air pressure.
Improper Flame Appearance	Improper Air or Propane Setting Improper Fine Tune lever setting on Applicator	Verify air and propane settings are set to proper power level settings. Adjust Fine Tune lever on Applicator to cause howling noise then slightly adjust in other direction.
	Flame extending past shroud Yellow tips on flame	Increase air pressure for current propane setting then adjust Fine Tune lever on Applicator to cause howling noise then slightly adjust in other direction.
	Flame not even and attached to burner plate	Reduce air pressure for current propane setting, then adjust Fine Tune lever on Applicator to cause howling noise then slightly adjust in other direction.
Applicator Noise	Applicator makes loud howling noise	Make sure the gas valve is fully depressed. Adjust Fine Tune lever on Applicator to cause howling noise then slightly adjust in other direction. Relaxed grip will restrict gas flow and cause howling noise.
No Powder Flow	Low powder level.	Verify powder level in hopper is between ¼ and ½ full.
	Low fluidization or no vibration	Verify powder is fluidizing and the vibrator is on. Powder should have boiling appearance with liquid feel when stirred.
	Incorrect powder feed/transport settings. Clogged powder lines	Verify powder feed settings are set to recommended levels. Disconnect and blow out powder feed lines and pump. Verify applicator powder feed tube is free from obstructions. See daily cleaning procedures for proper maintenance.

Description of Problem	Potential Problem	Solution
	Cart solenoid failure.	Check solenoid function by depressing powder feed switch (with main power on) and listening for solenoid clicking sound in cart. The solenoid actuates on or off each time the trigger is pulled.
No Power	Blown Fuse	Check the fuse located near the main power switch.
	Power Cord	Verify main power cord is seated properly
Hot air is blowing backward through the applicator toward operator	Extremely incorrect power settings	Verify propane and air settings are correct with the operating point guide.
	Applicator is fowled	If the diverter or feed tube were to become fowled with plastic, the applicator air flow will not work correctly. Clean the applicator
	Air amplifiers are damaged	Call Resodyn customer service
Flame has voids or dead spots	Improper air and propane settings	Check settings on the operating point guide
	Filter has become clogged	Inspect the filter on the Applicator handle. Replace if it has become clogged
	Heater burner plate has become fowled	Remove and inspect the burner plate. If it has become fowled, burn off the contamination with a propane torch and blow off the ash. If the burner plate cannot be cleaned – or is otherwise damaged, replace the burner plate.
	Propane tank empty or very low fuel level.	
Feed tube Tip is Fowled	Improper air and propane settings	Check settings on the operating point guide
	Shielding air is not flowing	With the air on, verify that a jet of air is flowing between the feed-tube and shielding tube.

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Description of Problem	Potential Problem	Solution
Heat Shield is Hot	Improper air and propane settings	Check settings on the operating point guide
	Air amplifiers are damaged	Call customer service