OWNER'S MANUAL
RED LINE *NC 201*
100 kV electrostatic powder spray system

RED LINE INDUSTRIES LIMITED
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INTRODUCTION

Congratulations on your purchase of the **RED LINE *NC 201*** powder coating machine. You have purchased one of the finest and cost-effective 100 kV electrostatic powder coating spray systems.

The **RED LINE *NC 201*** is designed to give you many, many years of uninterrupted trouble-free performance.

It is built tough to give your products uniform high quality powder coats consistently, piece after piece, year after year.

Before using this equipment, please read this Owner's Manual completely. It will save you time, money and unnecessary effort in the future.

We know you will be thoroughly satisfied with your **RED LINE *NC 201***. In case you ever require any assistance or information on this machine at any time, please do not hesitate to contact us directly or your nearest **Authorized RED LINE Sales & Service Center**. It will be our pleasure to be of assistance to you.

For further information on the full range of RED LINE powder coating equipments, systems and complete plants, do write us or contact your nearest Authorized RED LINE Sales & Service Center.

We wish you all success.

With regards,

Himanshu Shah, Director
RED LINE INDUSTRIES LIMITED

CAUTION AND CARE:

First and foremost, it is very important for you, as the user, to understand that although a great deal of attention has been given to various safety factors and considerations, the ultimate responsibility of using and treating this machine responsibly and with care lies with you. This machine generates 100kV (100,000 volts) for electrostatic use. Always treat this machine with the respect it deserves.

ALWAYS …

- ✓ Read this manual completely before starting and every time you need to refer for additional information
- ✓ Wear leather footwear and non-insulating gloves (if any)
- ✓ Ensure that the equipment, the coating booth/cabin and everything within a 3 meter radius of the machine is properly earthed.
- ✓ Use jigs and jig holders which are clean and bare at their contact points wgich are properly earthed to ensure proper dissipation of electrostatic charge build-up.
- ✓ Avoid extended triggering of the gun without powder flow. Powder flow assists in dissipation of charge from near the gun tip.
- ✓ Use only compressed air and a clean dry lint-free cloth, to clean the gun or machine or any parts
- ✓ In case of doubt, contact your local dealer or service centre or us directly

NEVER …

- ☒ Touch the charging electrodes at the tip of the gun with your bare hands when the machine is on. If required to handle the electrodes, always earth the electrodes first to dissipate any electrostatic charge build-up that may have taken place.
- ☒ Inhale the powder that is sprayed. If the powder recovery system is not efficient to suck away all oversprayed powder, either get that handled or at least ensure that an appropriate air-filter is made available for the workers to breath in clean air.
- ☒ Use any kind of solvents to clean any gun or machine parts.

AVOID …

- ☒ Using locally produced replacement parts – this may prove to be cheaper in the short erm but may damage the machine and force higher expenditure later

FIRST START UP

INFRASTRUCTURAL REQUIREMENTS:

Electrical power connection:	100-270 V Ac , 50-60Hz, Single phase with earthing
Pneumatic connection:	Clean & dry compressed air at a pressure between 4kg/cm^2 (56psi) and 7 kg/cm^2 (100psi)

CONNECTIONS FOR START UP:

1. Mount the control panel on the trolley, fastening it in place with the 4 in-built holding bolts underneath.
2. The **AIR DILUTION** tubing (clear) is connected to the top of the powder feed pump
3. The **POWDER** tubing (red) is connected to the rear side of the powder feed pump
4. The **FLUIDIZING** tubing (blue) is connected from the pressure regulator mounted on the trolley stand to the plenum (bottom) chamber of the powder hopper.
5. The powder supply PVC pipe leading to the spray gun is connected to the outlet of the powder feed pump
6. The **GUN CABLE** is plugged into the control panel at the socket marked 'GUN'
7. The power cable is plugged in to your 100-270VAC single phase power outlet. Please ensure that proper earthing is provided through the earth terminal of the plug. If there is any doubt about the efficacy of the earthing available through the power cable, please arrange for a separate earthing through the special earth point provided at the rear of the control panel
8. Connect the compressed air line to the nozzle provided at the rear of the control panel. Connect the output from the 'tee' at the nozzle to the input of the pressure regulator on the trolley stand using the blue PU6 polyurethane tubing provided.
9. Ensure that the power switch is in the '0' position
10. Turn all pressure regulators and the high voltage (HV) control knob counter-clockwise to zero.

THE RED LINE *NC 201* IS NOW CONNECTED FOR COMMENCING POWDER COATING OPERATIONS

START UP:

1. Fill the powder hopper with as much powder as is required (a minimum of approx. 1 kg may be required in the hopper)
2. Hang the article(s) to be coated in the spray booth, ensuring that they are properly earthed through the jig holder
3. Switch on the mains power supply to the machine from the power outlet
4. Switch on the compressed air supply to the machine
5. Toggle the power switch to the '1' position
6. Set the fluidizing pressure between 0.5 and 2.0 kg/cm2 (depending on the amount of powder in the hopper - the more the powder, the higher this pressure)
7. Point the gun into the booth and press the trigger on the spray gun (the kV meter will now show the minimum electrostatic charge available at the gun nozzle - should be nearabouts 20 kV)
8. With the trigger pressed, adjust the powder regulator to get the powder flow from the gun to the desired flow rate. Adjust the air regulator to get the powder cloud from the spray gun diffused with air to the desired quantity. Often, in case the powder is a little moist or the particles are unusually heavy, you may get powder flow with certain amounts of bursts. Increasing the air dilution in the powder cloud should eliminate this type of powder flow to give you a smooth powder flow.
9. Increase the High Voltage (HV) control to get an electrostatic charging voltage of around 90 to 100kV - normally it is suggested that you always maintain this setting at the highest - 100kV - level as this is the optimum charging voltage for powder coatings
10. Keeping the nozzle of the gun about 10 to 20 cms (4 to 8") from the articles being coated, spray powder in smooth horizontal arm sweeps. Normally one or two passes of the gun over the surface are sufficient to get a uniform powder coat.
11. Depending on the type of article, you may want to adjust the powder cloud size. The control is located at the rear of the gun itself. Pushing the black knob at the end of the center rod towards the gun gives a thin powder cloud (normally suggested for small articles) while pulling the knob out and away from the gun increases the powder cloud size (normally recommended for flat panels, etc.). This is ideal for coating into channels and deep crevices.
12. Releasing the trigger of the gun switches OFF the high voltage generator as well as the powder flow from the gun. When the equipment is not in use, please switch OFF ('0' position) the entire machine to save on compressed air supply through the fluidizing system.

At the end of the shift, it is not required to reduce the air pressure settings to zero or even the high voltage settings to zero. Subsequent start-ups require only that the system is switched on and the gun aimed and triggered.

ROUTINE CLEANING & MAINTENANCE

Always keep your RED LINE ***NC 201*** system clean. Regular cleaning of the powder spray gun, the powder pipe, the powder feed pump and the powder hopper is normally all that is required to ensure that your system always operates at peak performance levels.

At the end of every shift,

1. Dismantle the powder feed pump outlet and, with compressed air jet, clean the insides of the pump and the various parts of the pump outlet
2. Pass compressed air through the powder pipe leading to the gun to remove all powder residues from inside the pipe
3. Pass compressed air through the spray gun via the powder pipe inlet to remove all remnants of powder from inside the spray gun
4. Empty out the powder hopper and thoroughly clean the insides of the hopper and fluidizing plate of all powder using compressed air and a clean cloth

Once a week, dismantle the spray gun and clean it:

1. Unscrew the powder deflector at the tip of the center rod
2. Unscrew and remove the white muzzle-holder
3. Carefully pull out the white muzzle (which houses the central charging electrode) from the gun body
4. With a clean dry cloth, thoroughly clean and wipe the muzzle, the center rod, the powder deflector, center rod and the internal powder passages of the spray gun. Particular attention should be paid to the annular ring contacts in the gun where it connects to the muzzle. This should be kept clean to ensure perfect contact with the muzzle for proper transfer of high voltage to the electrode tips
5. Assemble the gun following the dismantling process in reverse.

DO NOT USE ANY PETROCHEMICAL SOLVENTS OR OTHER CLEANING AGENTS TO CLEAN THE GUN OR ANY PART OF THE MACHINE AS THIS MIGHT DAMAGE THE GUN OR OTHER COMPONENTS.

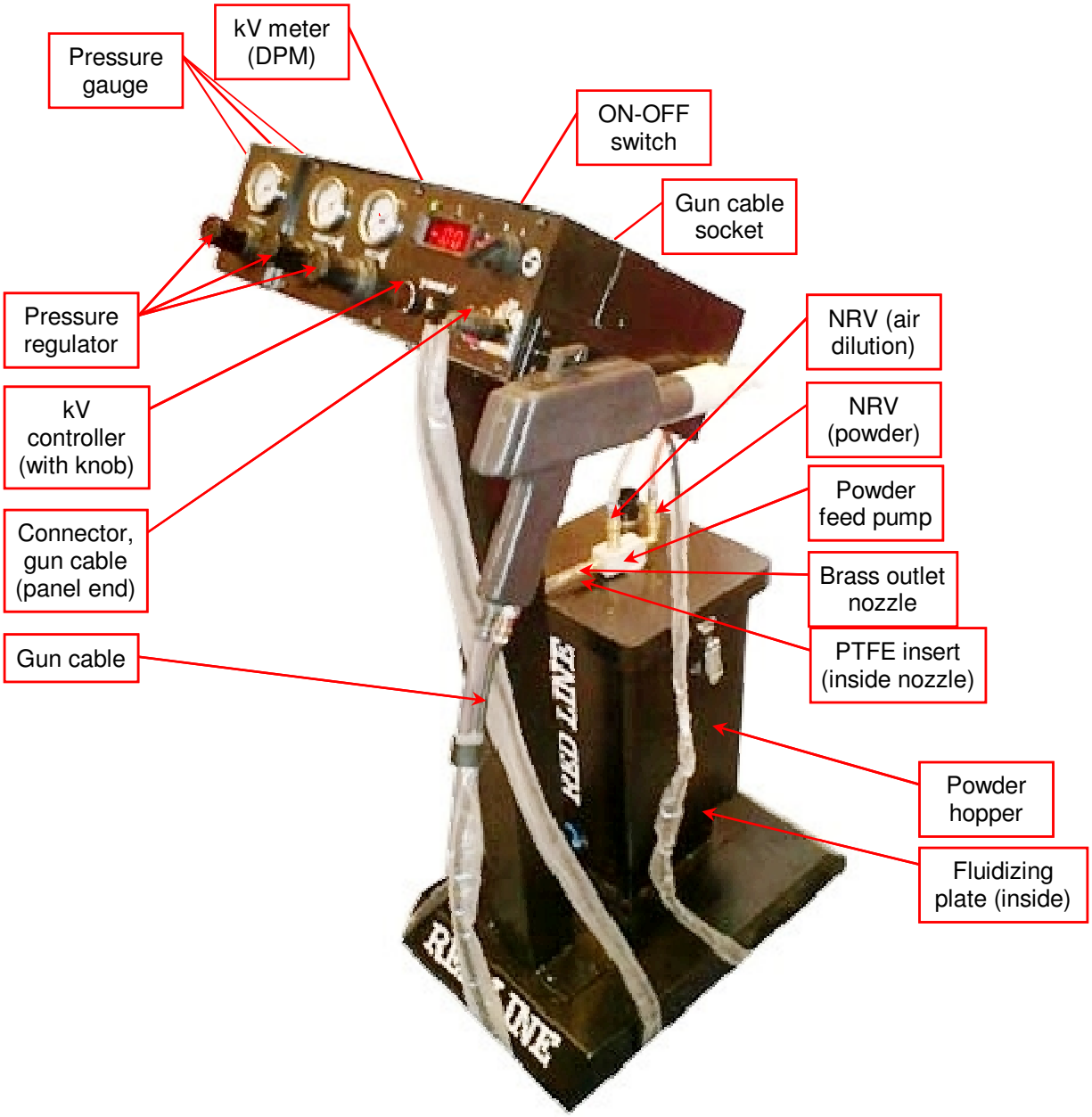
During the weekly cleaning, check for worn out parts. If any such parts need to be replaced, please call for only genuine parts from your nearest RED LINE Service Center. Using locally procured or unauthorized parts may not only affect the performance of the system, but may also damage the delicate parts and components of the machine leading to unnecessary additional heavy expenditures ahead.

TROUBLE SHOOTING

FAULT:	REMEDY:
ELECTROSTATIC:	
The spray gun is charging the powder, but the powder adhesion to the article is poor, taking more time to coat	**EARTHING IS IMPROPER:** Check that the article (through the jig-holder) and the gun panel (from the rear) are correctly and properly earthed
When the trigger is pressed, there is no powder flow and the kV meter also does not indicate any charging voltage	**FUSE BLOWN:** Check fuse F2 and replace with a 5x20mm 1.5amp fuse
During coating, the system switches OFF and the red warning light comes on	This is a safety-designed electronic cutout which has taken place due to an electrostatic current overload. Reset the system (switch off and switch on again) and start work. In case of repeated tripping, call your Authorized Service Center
When switched ON ('1' position), the system does not switch ON (green light remains off) and there is no fluidizing taking place	**NO MAINS SUPPLY:** Check the availability of the mains supply through the power plug and cable fuse blown: Check fuse F1 and replace with 5x20mm 500mA (0.5amp) fuse

POWDER FLOW:	
Everything appears normal, including high voltage except there is no powder flow	a: no compressed air Check inlet compressed air (minimum 4kg/cm2) available at the input to the machine b: powder insufficient: Ensure there is sufficient powder in the hopper. If not, add c: Pressures set at zero: Check and suitably adjust the various air pressure settings d: solenoid #1 not operating: If all three pressure gauges read zero even for non-zero settings, solenoid valve #1 (towards the rear of the panel) in the panel may not be functioning. Test and replace if necessary e: solenoid valve #2 not operating: If only powder and air pressure gauges show zero, solenoid valve #2 may not be functioning. Test and replace if necessary solenoid valves can be tested by disconnecting them from the system and giving them individually a 24 VAC supply (secondary of the power transformer) and compressed air to see if they are working f: powder feed pump blocked: Dismantle and check the powder feed pump for blockages at the outlet. Clean and resume work
Powder flow is erratic and often comes is fits and bursts	a: powder insufficient Add more powder in the hopper b: fluidizing insufficient: Increase the fluidizing pressure c: air dilution insufficient: Increase the air-dilution pressure d: powder feed pump partially clogged: thoroughly clean the powder feed pump

COATING FINISH:	
Craters in films	a: improper pretreatment (residual oil on surface) check the quality of pretreatment - chemical salts or grease/oil may be left behind b: powders from different manufacturers have been mixed and they may not be compatible - use powders of only one company
Pin-hole on the film	Powders may be excessively moist. Change the powder with fresh powder of a recent batch
Bubbles in film	Rust or water was not cleaned off before powder coating. Pretreatment needs to be looked iinto.
Orange peel effect is excessive	a: Curing heating process is too slow Have your oven checked out. The heat soruce (heaters) may not be good enough or adequate in quantity b: Coating too thin c: Powders of different brands have been mixed and they are not compatible. Use powders of only one brand at a time
Film is discolored (yellowed)	Overburning/overcuring has taken place in the oven Cure your powder coatings as per curing schedule provided by the powder manufacturer
Deviation in color	Improper air flows in oven creating varying temperature inside the oven. Have your oven checked out by a qualified oven manufacturer



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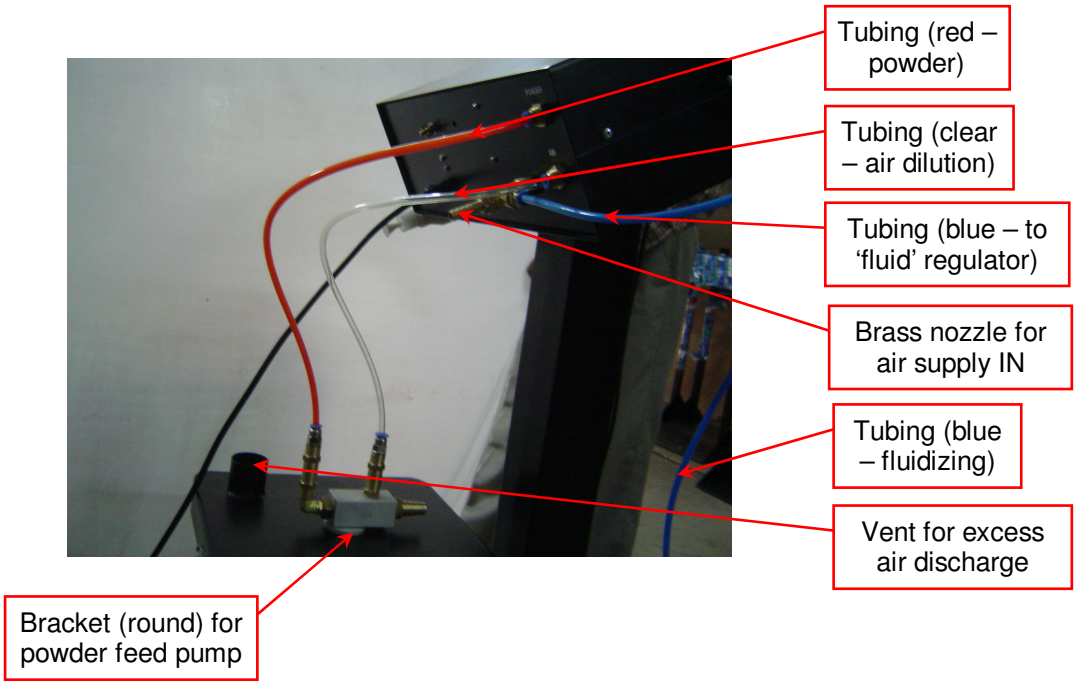

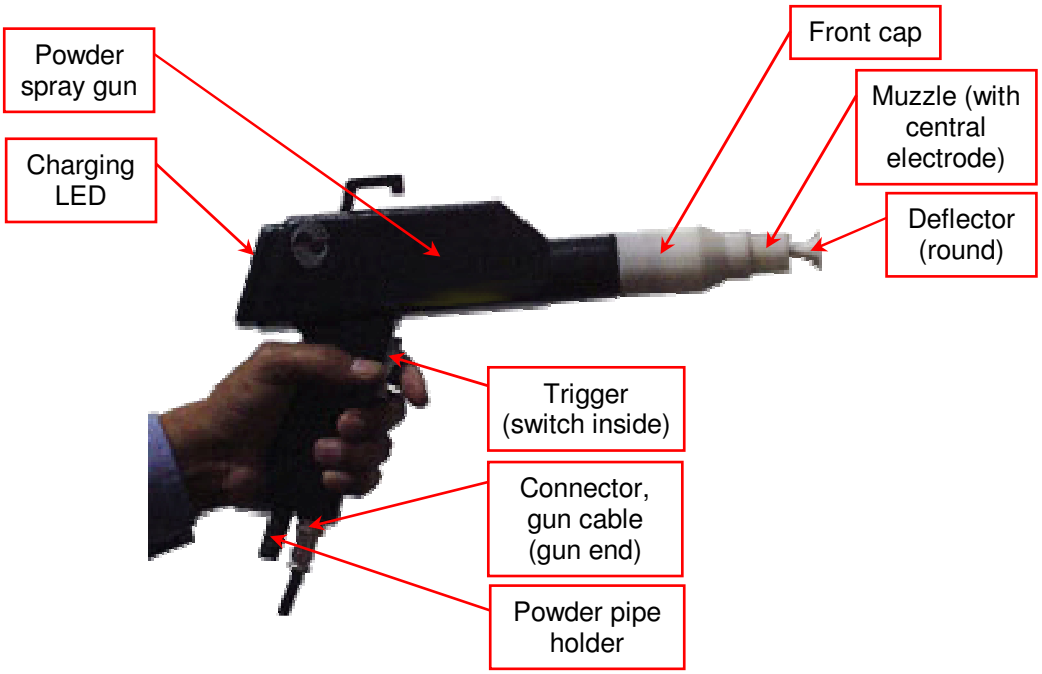

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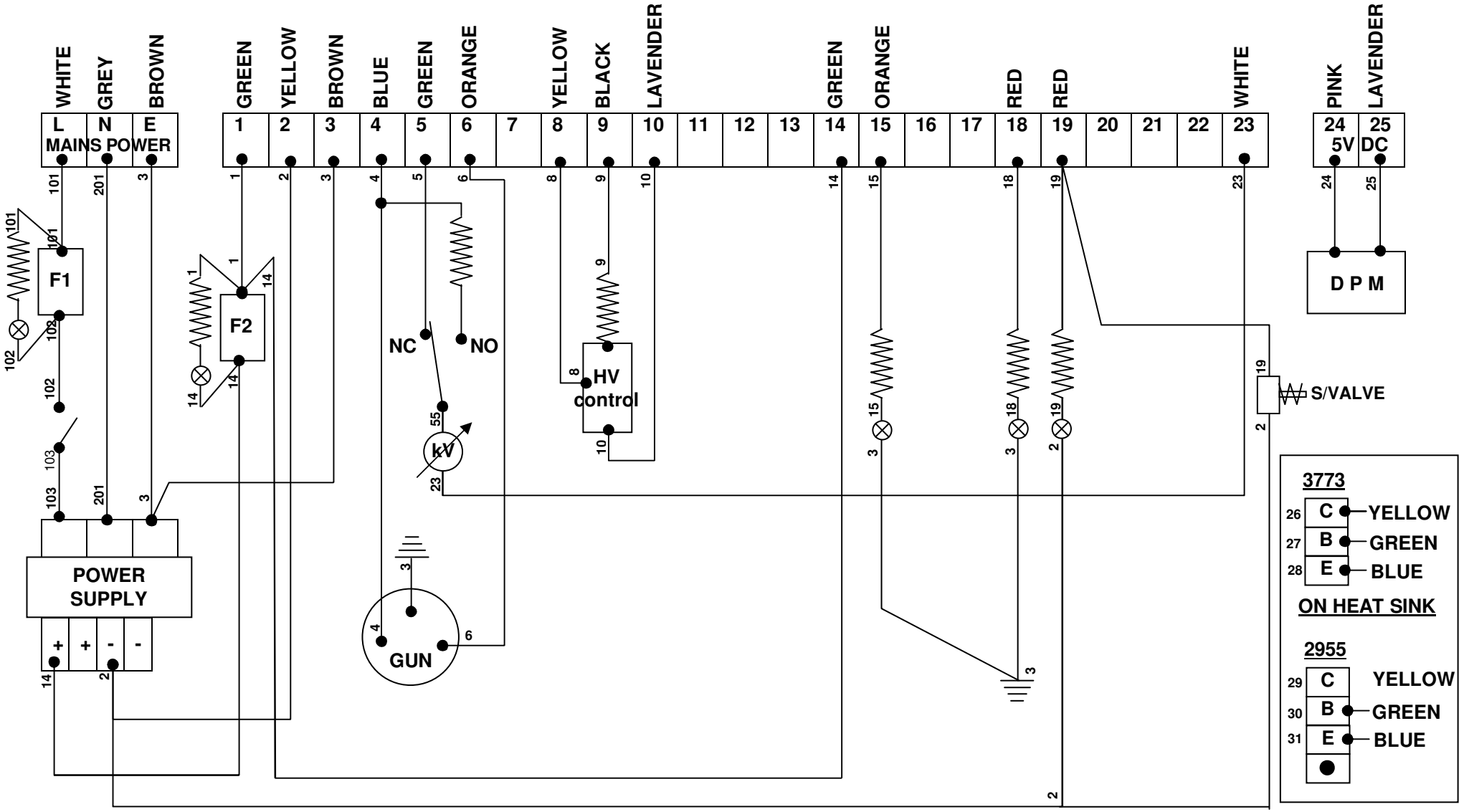

WIRING DIAGRAM INSIDE CONTROL PANEL

MODEL: ***NC201***

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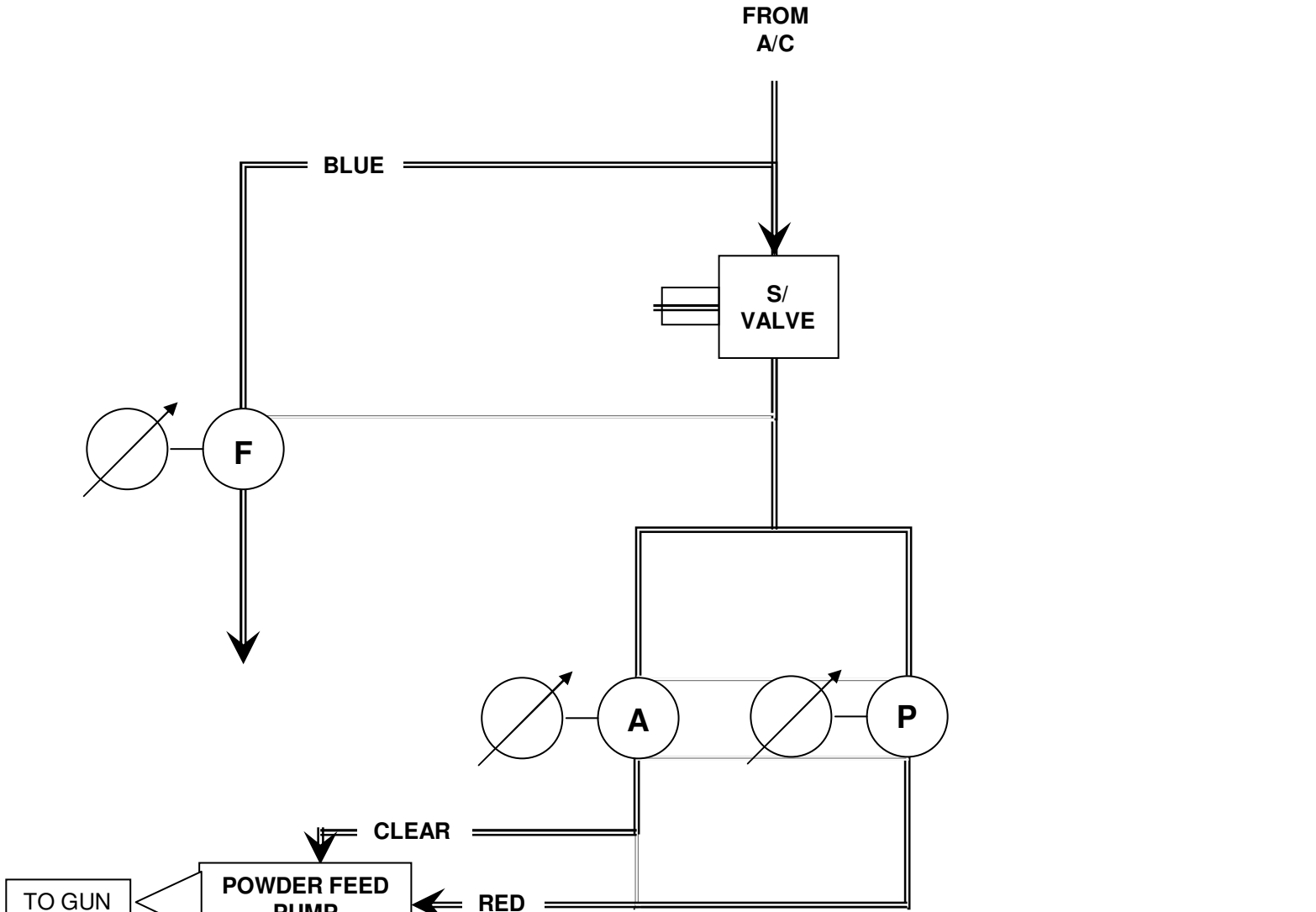

PNEUMATIC CONNECTIONS
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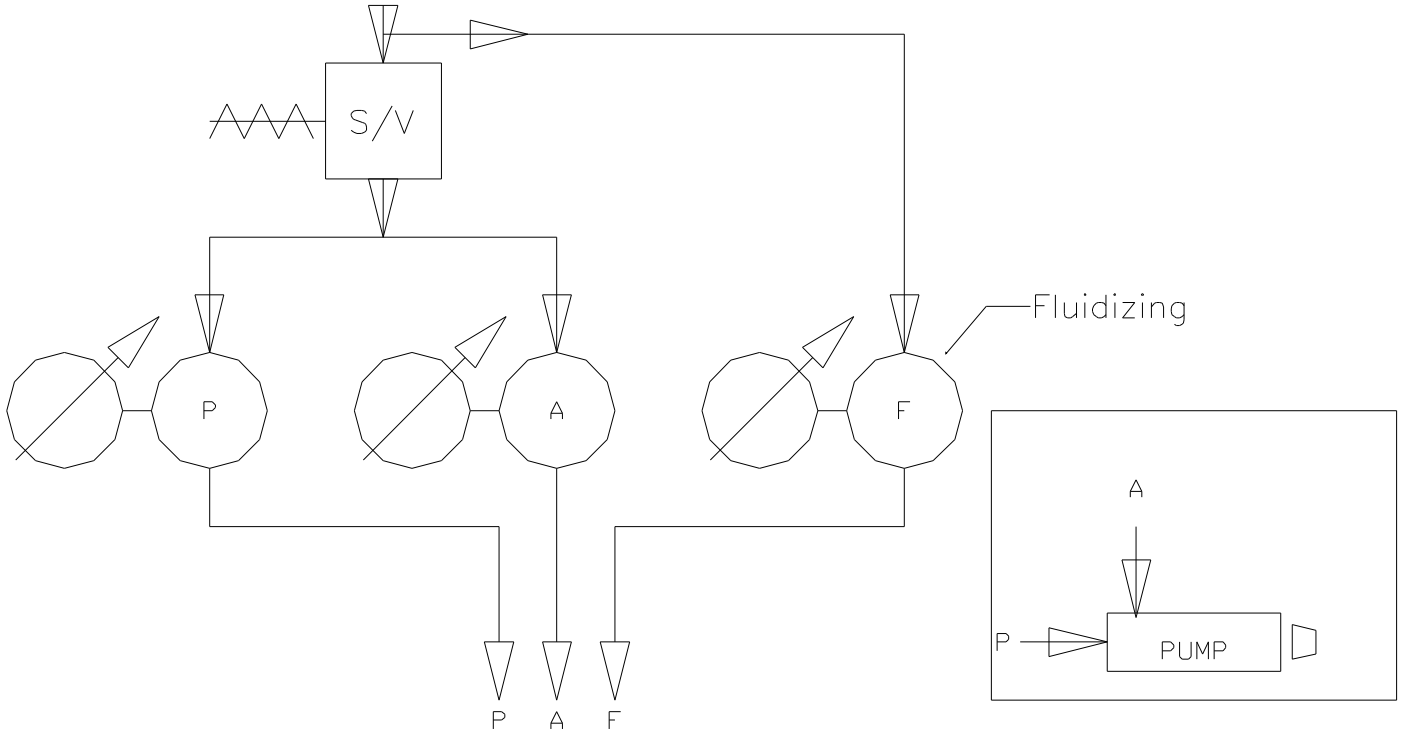

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