IMPORTANT-SEE POST-SPRAY FLUSH PROCEDURES & ALSO MAINTENANCE PROCEDURES ON LAST PAGE!

IMPORTANT-READ & FOLLOW THESE INSTRUCTIONS

INSTALLATION, MAINTENANCE & OPERATING INSTRUCTIONS FOR DULTMEIER SALES ANTI-ICE/DE-ICE PICK-UP SPRAYING SYSTEMS:
DU 1A203 SERIES WITH DCS 400 RATE CONTROL SYSTEM
& SINGLE LANE BOOM

I. General Installation of Spraying System in Truck:

A. Always ensure the **tank is completely empty** before loading or unloading the system from the truck. The frame is not designed to support liquid weight when being lifted with cables or forklifts.

B. **DO NOT rely on straps or other tie-downs to secure the skid frame to the truck bed. Instead, securely mount the skid frame to the truck frame underneath the truck's bed using proper bolts** (use 1/2" dia. or larger stainless bolts with nylock nuts; minimum of 4 each).

II. Mounting the DCS400 Controller Console and Cable Hookups:

A. Mount the DCS 400 Console to a secure support inside the truck cab.

B. Install the 31' console cable from the other rear port on the back of the DCS400 console and then connect 10' long flow control cable to 31' cable. Then connect leads at end of 10' flow cable to the flow meter, control valve and boom on-off valve (See Pg. 7 of the DCS 400 Installation & Service Manual). The other connector leads on the10' flow cable will not be needed-simply tie off securely (Note: coil up any excess cable length, tie, and secure inside cab; when routing cables, ensure they avoid hot or sharp areas under the truck).

C. Install the Speed Sensor cable from the rear of the truck's speedometer panel to the speed sensor connection port on the back of the DCS400 console (See Pg. 7 of the DCS 400 Installation & Service Manual; Also, see Speed Calibration procedure below).

D. Turn the DCS 400 Console's Power Switch Off and route the red and white power leads to a 12V battery. Important: See Pgs. 7 & 8 of the DCS 400 Installation & Service Manual.

E. Now, turn the DCS400 Power Switch On. Then, check the Boom On-Off valve by turning on the Master Boom Switch (far right side of Console) and also turning on the Center Boom Switch. This should open the Boom On-Off Valve (Note: Both the Master Boom Switch and the Center BoomSwitch must be on for the valve to open). You can also check the Control Valve by turning the rotary dial rate switch (near center of Console) to "M" (stands for Manual Control) and then moving the "Increase/Decrease" Switch (located just left of the rotary dial rate switch). This should open and close the Control Valve (Note: the rotary dial rate switch must be in the "M" position).

III. Initial Programming of the DCS 400 Controller:

The following are Suggested Settings for the Raven DCS400 Controller on DU 1A203 Series Sprayers for De-ice/Anti-Ice Spray Systems; Keep in Cab.

A. See Pgs. 14 & 15 of the DCS 400 Installation & Service Manual for the entry steps to program the controller. Then start by programming the following settings into the Controller:

US, SP1, C-SD (Use the CE button and the Enter buttons-See Pg. 15).
Note: Use SP2 if your truck's transmission is of the electronic type; Use SP1 if it is of the mechanical type.

Note: Above 3 Settings are for US (English Units, for the truck's Speedometer, and for the Spray System's Electric Control Valve. Once you program them, they should normally not be changed (to change them, hold down the "CE" button while turning on the Power switch at the same time). See Pg. 15 of the DCS 400 Installation & Service Manual for additional details if needing to make changes to these values.

B. Now program the following (be sure to watch the decimal point when programming these items):

Width Cal = 12.0 (This is the Lane Width in feet).
B-L = 0 (This is the Boom width left side in inches).
B-C = 144 (This is the Boom width center section in inches).
B-R = 0 (This is the Boom width right side in inches).

Note: Use the arrow keys on the left side of the controller to toggle between Width, B-L, B-C & B-R (watch the left screen to see which rate you are programming; then toggle up/down to the next item and program it).

C. Now program the following (be sure to watch the decimal point when programming these items):

Speed Cal = 600 (Initial Calibration; Changes Will be Req'd-See Below)
Meter Cal = 680-720 (Should match the Number on the Meter's Tag).
Valve Cal = 2123 (for the Electric Control Valve).

D. Now program the following (be sure to watch the decimal point when programming these items). These are the Rate Cal Settings (you may change these periodically; these are always entered in GALS PER LANE-MILE). Program up to six different rates. Listed Below are Some POSSIBLE Anti-cing/De-icing Rate Settings (IN GALS PER LANE-MILE; ALWAYS determine actual Rate Settings with your Product Suppliers and Chief of Snow Control):

Rate 1 = 20, Rate 2 = 30, Rate 3 = 40, Rate 4 = 50, Rate 5 = 60, Rate 6 = 70

Note: Use the arrow keys on the left side of the controller to toggle between the six rate settings (watch the left screen to see which rate you are programming; then toggle up/down to the next rate and program it).

E. Now program the "Blast" Feature: The following are some POSSIBLE Blast Cal Settings (This is in GALS PER MINUTE (GPM); NOT GALS PER LANE-MILE; use for Bridge Decks, etc; Always determine actual Blast Settings with your Chief of Snow Control):

B-R = 35 (This is the Blast Rate in GALS PER MINUTE).
B-S = 20 or 30 (This is the Blast Time in Seconds).

Note: Use the arrow keys on the left side of the controller to toggle between the Blast Rate & the Blast Seconds settings (watch the left screen to see which item you are programming; then toggle up/down to the next rate and program it).

Important Note: Check the Settings you've programmed above periodically to be sure they haven't been accidentally changed by someone (Controller memory will retain them indefinitely even when Power switch is shut off).

F. You can also program the Volume/Tank button, but this must be done after the tank is filled and before the spray run.

G. You can also program the Time button and its Power Down Delay Feature-See Pg. 19 of the DCS 400 Installation & Service Manual.

H. Read about the Data-Lock Feature, Alarm Feature, Etc. on Pgs. 18-20 of the DCS 400 Installation & Service Manual. It is recommended that "Display Smoothing" be On to eliminate eye strain on the operator.

IV. Adjusting the Initial Speed Cal Setting (This is an essential step and must be done to ensure Spray System accuracy):

A. See Pg. 10 of the DCS 400 Installation & Service Manual and follow the steps and formula there to adjust your initial Speed Cal Setting to an accurate value. Repeat the process two or three times to ensure your final Speed Cal Setting is accurate.

V. Initial Self-Test (This is also an important step and must be done to ensure Spray System is working properly. The Self-Test Mode allows you to see the system spray just as if you were driving since you are giving it a simulated speed):

A. See Pg. 18 of the DCS 400 Installation & Service Manual. Note: Enter a Speed which you will normally drive at when spraying. To do this, press the Self-Test button, then press the Enter button, then enter the Speed who want to simulate, then press the Enter button again. You can check your entry by pressing the Self-Test button.

B. Be sure the spray tank has been filled full of water. Also be sure the hand valve on the suction side of the pump (between tank suction port and pump) is open. Close the hand valve which feeds the hose reel and also close the "by-pass" (throttling valve)-this will deliver maximum flow to the boom.

C. Be sure the pump engine is full of oil and gas. Then start the pump engine and let it warm up for a few minutes.

D. Turn the Power Switch on the Controller to "On". Then turn the Master Boom Switch to "On" and the Center Boom Switch to "On" also (these Switches are located on the upper right side of the Controller). Then Press the Self-Test Button and be sure its red light comes on. Then incrementally turn the rotary dial rate switch (round dial near top center of the Controller) from 1 to 6 with about 15-20 seconds pauses. The spray rate (in GALS PER LANE-MILE) should be shown in the left screen and should move up to match each of your pre-programmed rate settings (1-6). Spray volume should also be increasing out of the boom as you move up from rates 1-6.

E. Once you've completed a successful Self-Test (and properly adjusted the Speed Cal Setting as outlined in IV above), you are now ready to conduct spray runs on the road.

Note: The DCS 400 Controller will automatically move to and then maintain your pre-programmed rate settings (IN GALS PER LANE-MILE) regardless of speed changes (this is called ground speed orientation).

IMPORTANT: POST-SPRAY RUN FLUSHING PROCEDURES:

A. First, Flush the entire system plumbing and pump thoroughly with water when spraying work is completed to remove salts and other corrosive liquids (after each spray run).

Otherwise, in a short period, salts can crystallize into solids causing clogging of valves, nozzles, etc. **(Note: If you are using a non-corrosive liquid, you may skip steps A-C here and simply keep the system fully charged with liquid-as long as the liquid will not "gum" up or crystallize in cold weather; otherwise, proceed with A-C here).**

B. Second, Drain the entire system plumbing & pump thoroughly to remove all flusing water:

1. Drain the pump; unscrew drain plug at bottom of pump to drain.
2. Remove strainer cap to drain strainer, suction & discharge plumbing (open the "Drain-Fill" Valve, Boom On-Off Valve, valve feeding to hose reel and hose end gun when doing this to let air in and to be sure all suction & discharge plumbing including the boom itself are fully drained out).
3. Re-install strainer cap and close all valves.

C. Third, Fill the entire system plumbing & pump thoroughly with either RV anti-freeze (full-strength) or 50% Anti-freeze/50%Water to eliminate corrosion & prevent freezing (this last step is very important; without liquid in the pump and plumbing, air will cause corrosion to take place).

D. Fourth, Flush the truck bed and the skid frame with a low pressure hose to remove corrosive liquids. DO NOT use a high-pressure hose nor spray water directly on the pump engine, electric valves or wire connections during flushing operations.

IMPORTANT MAINTENANCE PROCEDURES:

A. Perform pump engine maintenance (oil changes, air filter cleaning, etc.) in accordance with engine manufacturer's maintenance instructions (engine service manual should be shipped with system; call if additional copies are needed).

B. Ensure system has been properly flushed and charged with non-corrosive liquid as outlined above before storing for the next spray run and for off-season storage.

Congratulations on your purchase of your new Dultmeier Sales 1A203 Series Liquid De-icing System. Your complete satisfaction is our goal. **Please take time before starting to carefully read through the attached Installation, Operating & Maintenance Instructions, especially, the "Post-Spray Run" procedures.** Please contact us any time with questions as you set up and operate your new system for the first time.

Each truck make, model & year can require different speedometer sensor cables. We have tried to send the correct speedometer sensor cable for your truck, but oftentimes a cable change is necessary. If you determine that the speedometer sensor cable included with your new liquid de-icing system is not correct for your particular truck, then please phone or fax our engineering department with the make, model and year of your particular truck. We will then send you the correct speedometer cable. We thank you for your assistance and patience in this matter. Our phone is 800-228-9666 (Omaha) and our fax is 402-333-5546.

Sincerely,
Dultmeier Sales