PowderPilot™ 4.x - System Operator Card

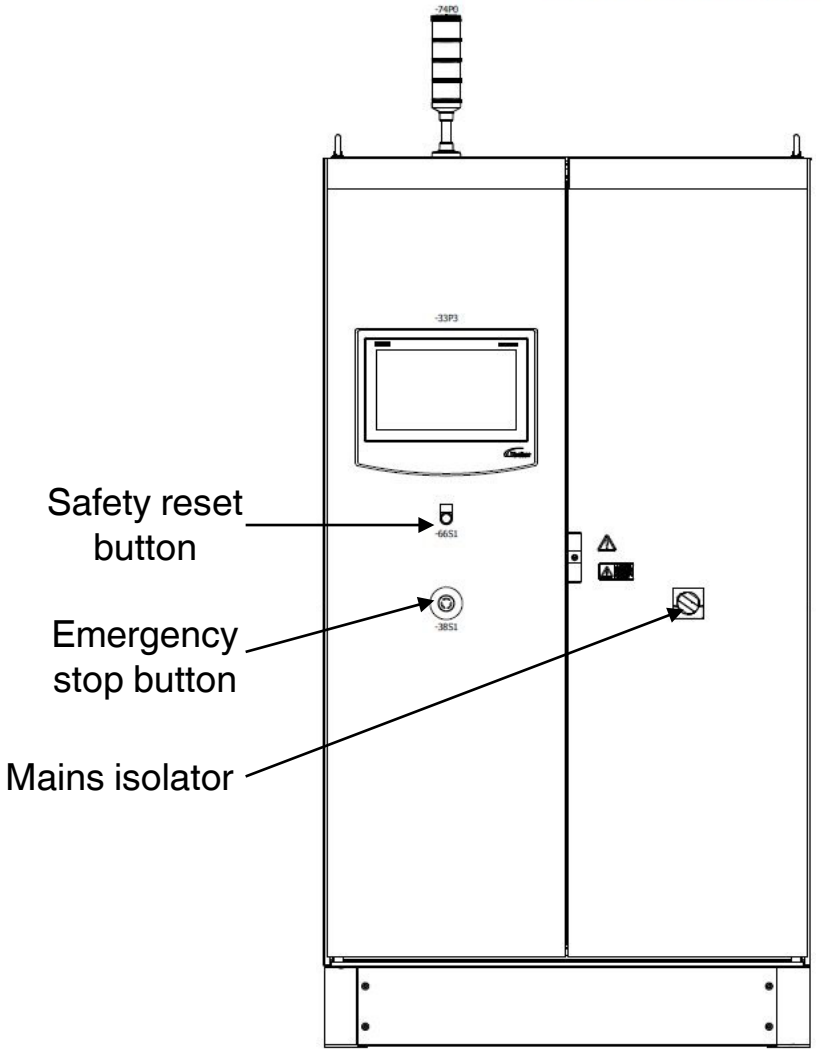
⚠ WARNING: Allow only qualified personnel to operate this equipment.
Follow the safety instructions in this document and all other related documentation.

System Start up

To start up the system:

1. Ensure the area around the booth is clear of personnel. Also ensure that the booth entrance door is open and that the mover safety cage gates are closed.
2. Turn the mains isolator on. Also turn the after filter control panel mains isolator on.
3. Wait for the touch screen to boot up and display the main start screen.
4. Ensure all emergency stop buttons are pulled out.
5. Press the blue safety reset button on Powder Pilot. This will reset the emergency stop system and enable all control circuits.
6. The movers will then proceed to find their zero positions after which they will return to their park positions.

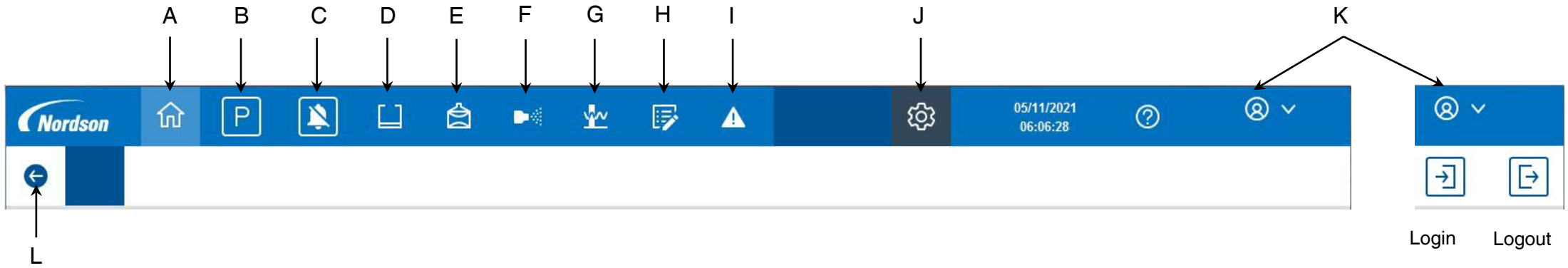
The booth is then ready for operation.



PowderPilot™ 4.x - System Operator Card

Global Navigation & Quick Access Bar

The global navigation bar is as shown below and is located at the top of every user screen.



A – Highlights the current screen accessed

B – Press to park or unpark the movers & spray guns. When parked, the parts will pass through the booth without painting.

C – Press to mute the alarm sounder.

D – Press to display the booth & after filter control screens.

E – Press to display the colour feed centre control screen.

F – Press to display the gun control screens.

G – Press to display the mover control screens.

H – Press to display the gun & mover program edit screens.

I – Press to display the current alarms list.

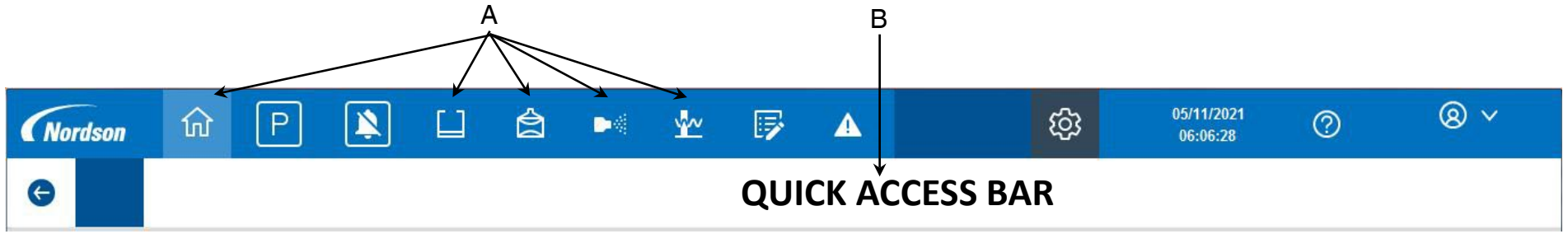
J – Press to enter the system configuration screens.

K – Press to log the current user in or out.

L – Press to move back through previous screens openend.

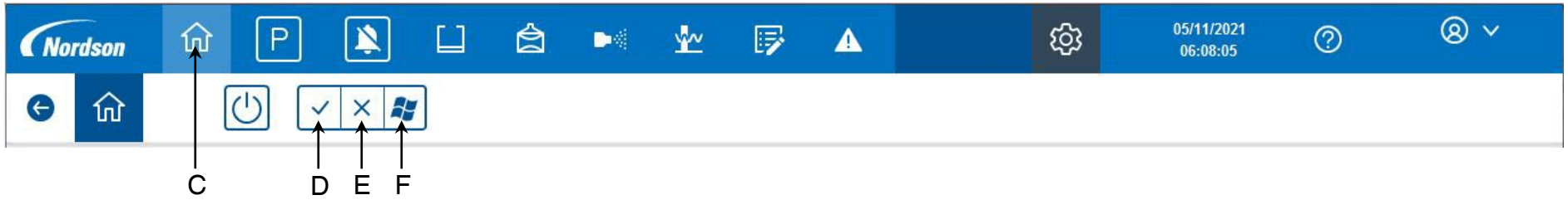
PowderPilot™ 4.x - System Operator Card

Global Navigation & Quick Access Bar



A – Press and release to go directly to that control section's screen. Press and hold for a short time to display commonly used functions relevant to that control section in the quick access bar.

B –The quick access bar is used to display the most commonly used functions from each control section without needing to leave the screen currently in use.



C – Press & hold to display shutdown options.

D – Press to confirm shutdown of the HMI software & Microsoft Windows.

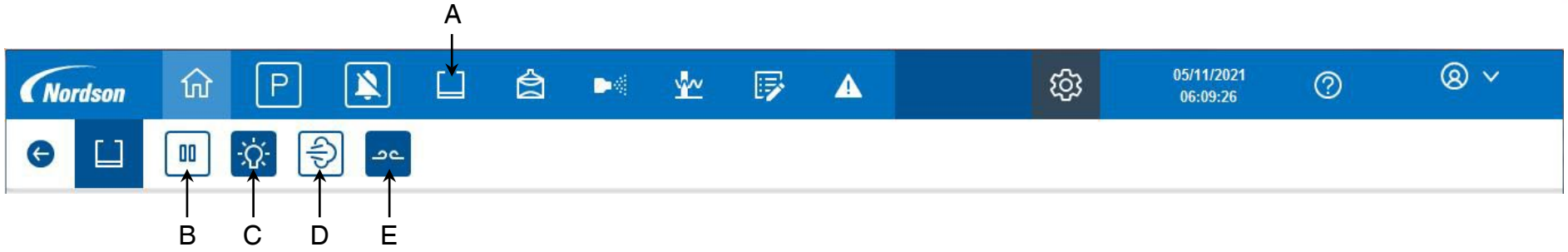
E – Press to cancel the shutdown process.

F – Press to shutdown the HMI & return to the Microsoft Windows desktop.

CAUTION- Always shut down the HMI software and Microsoft Windows before removing power from the control panel to prevent software licence curruption!

PowderPilot™ 4.x - System Operator Card

Global Navigation & Quick Access Bar



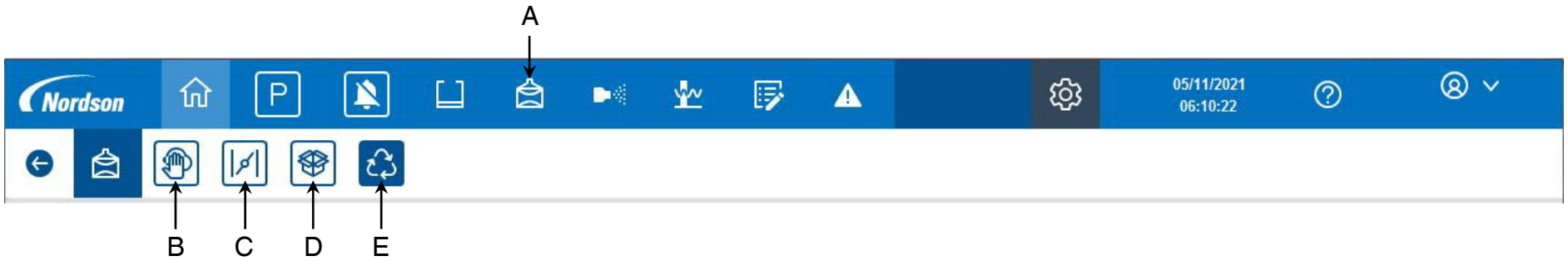
A – Press & hold to display booth control options.

B – Press to auto start or stop the booth.

C – Press to switch the booth lights on or off.

D – Press to perform an external gun blow off sequence.

E – Press to enable or disable the airknife floor cleaning system.



A – Press & hold to display feed centre options.

B – Press to run a colour change sequence.

C – Press to open the feed centre canopy extraction valve. This will increase extraction in the canopy when cleaning it down.

D – Press to enable or disable the box feed virgin pump system.

E – Press to enable or disable the reclaim pump system.

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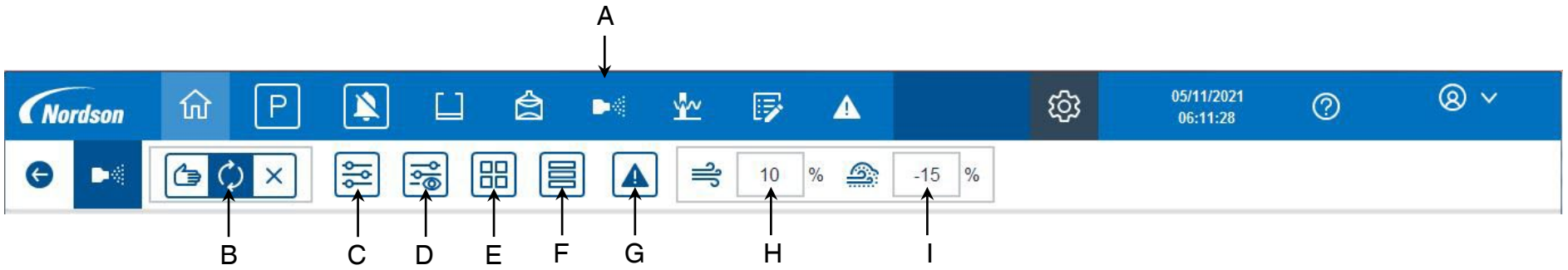
Global Navigation & Quick Access Bar



A – Press & hold to display gun control options.

B – Press to select the required gun trigger mode. These are manual, auto or always off in that order from left to right.

C – Press to display the individual gun setpoint adjustment screen.

D – Press to display the setpoint adjustment screen for all guns at once.

E – Press to display the gun feedback screen for 8 guns at once.

F – Press to display the gun feedback screen for all guns at once.

G – Press to display the gun alarms list.

H – Press to adjust the powder output offset.
Entering a value of 10% for example, will add 10% to all the current powder setpoints. Entering a value of -10% will reduce all current powder setpoints by 10%.

I – Press to adjust the pattern air offset.
Entering a value of 10% for example, will add 10% to all the current pattern air setpoints. Entering a value of -10% will reduce all current pattern air setpoints by 10%.

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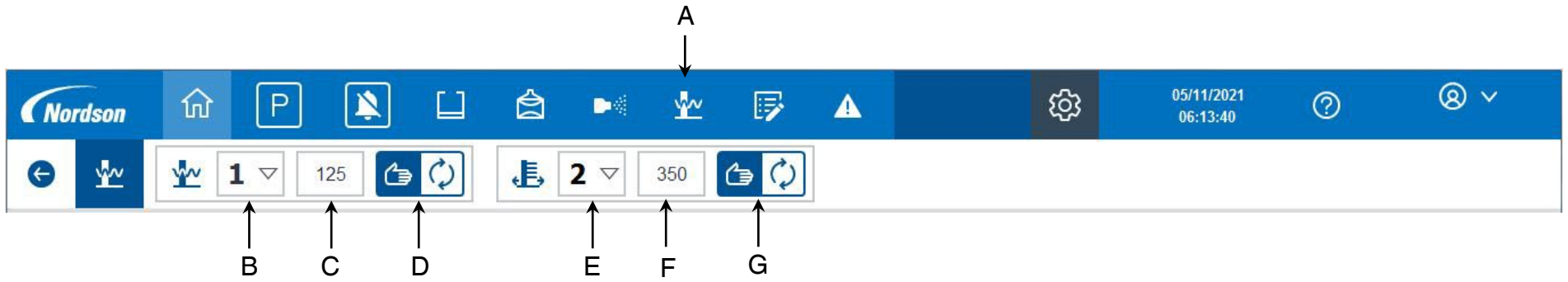
Global Navigation & Quick Access Bar



A – Press & hold to display mover control options.
B – Press to select which reciprocator the following control elements will relate to.
C – Displays the current position of reciprocator 1 or 2 depending on which is selected.
D – Press to set the control mode to auto or manual for the reciprocator currently selected.
This screenshot shows manual mode selected for reciprocator 1.
E – Press to select which Z-axis the following control elements will relate to.
F – Displays the current position of Z-axis 1 or 2 depending on which is selected.
G – Press to set the control mode to auto or manual for the Z-axis currently selected.

This screenshot shows manual mode selected for Z-axis 2.

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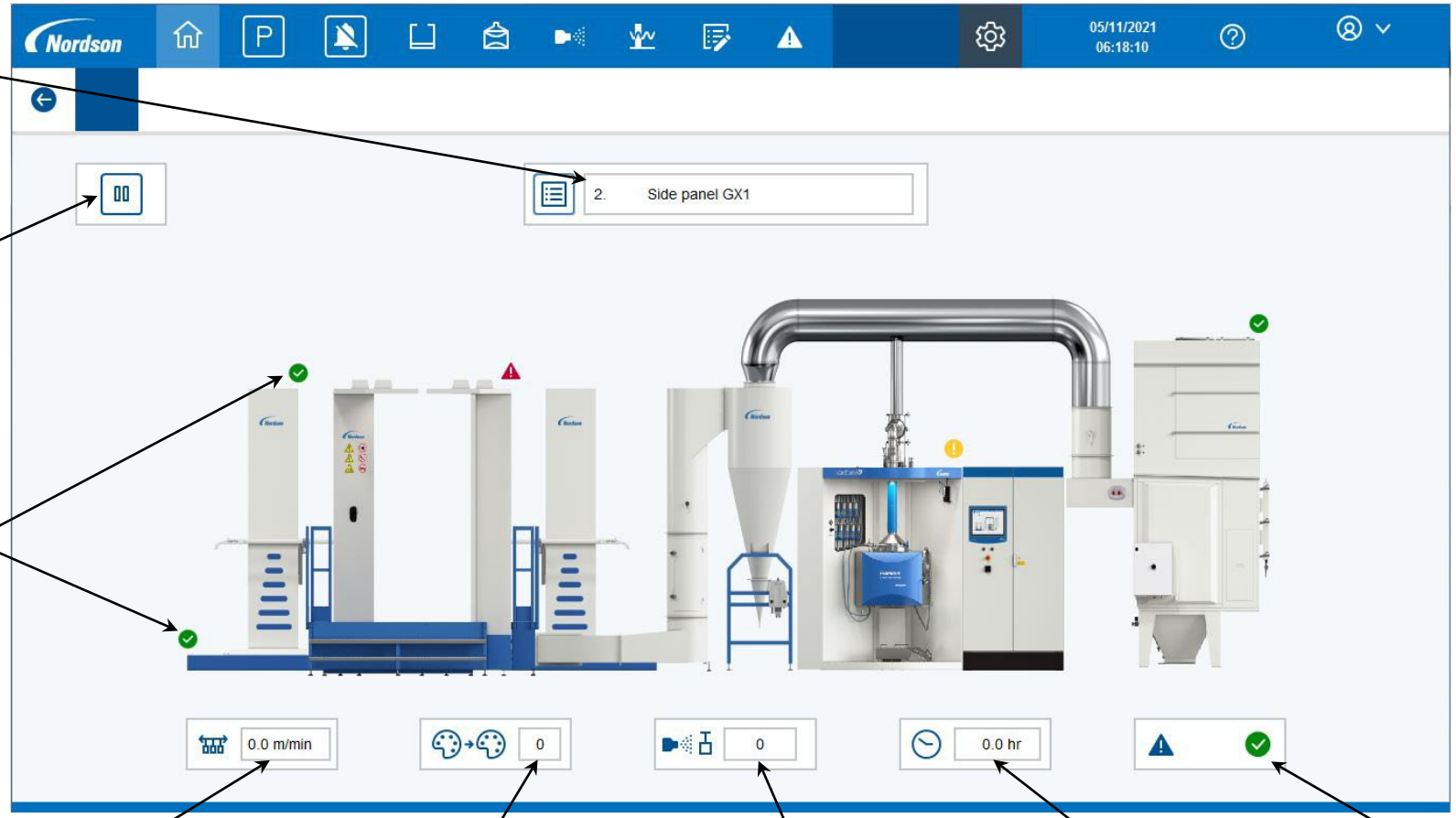
Main Screen

Displays the name & number of the current program running.

Press to auto start or stop the booth. Each press toggles the state from stopped to running. Stopped is shown here!

These symbols show the current health state of the associated device.



All OK

Indicates an issue but will not stop the ability to produce.

Indicates a problem that will stop the ability to produce.

Current conveyor speed.

Total number of colour changes performed so far today.

No. of parts coated so far today.

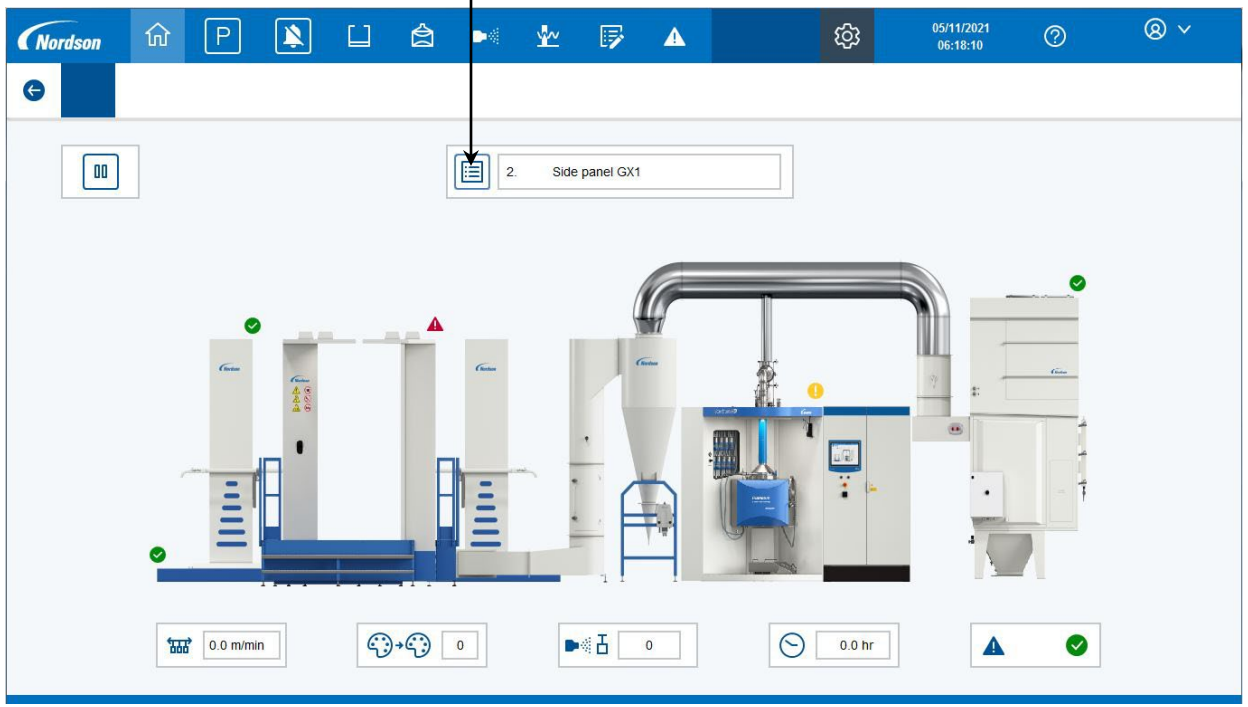
No. of hours actively producing so far today.

Overall system health state.

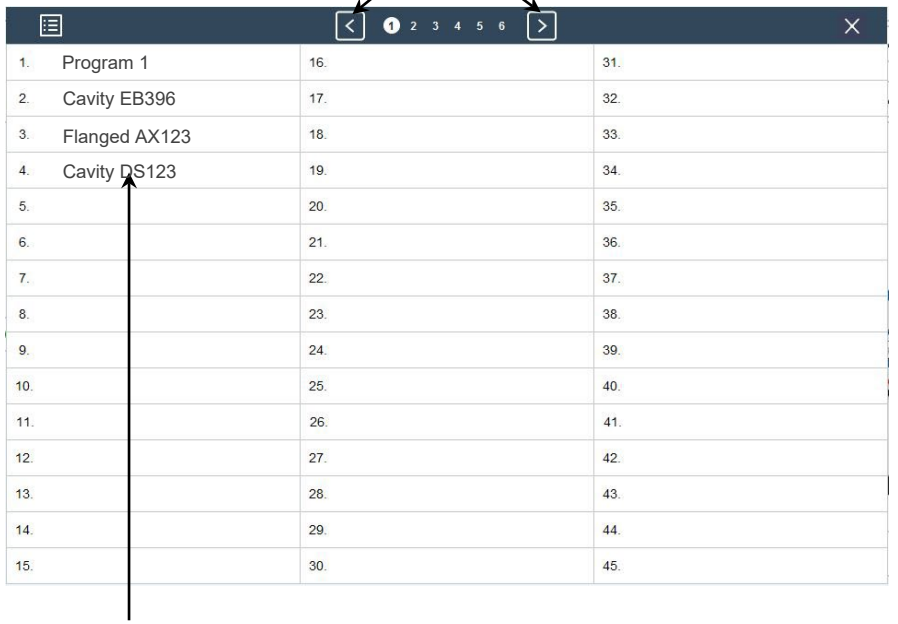
PowderPilot™ 4.x - System Operator Card

Main screen – Program Load

Press the select program button to reveal the selection list as shown opposite.



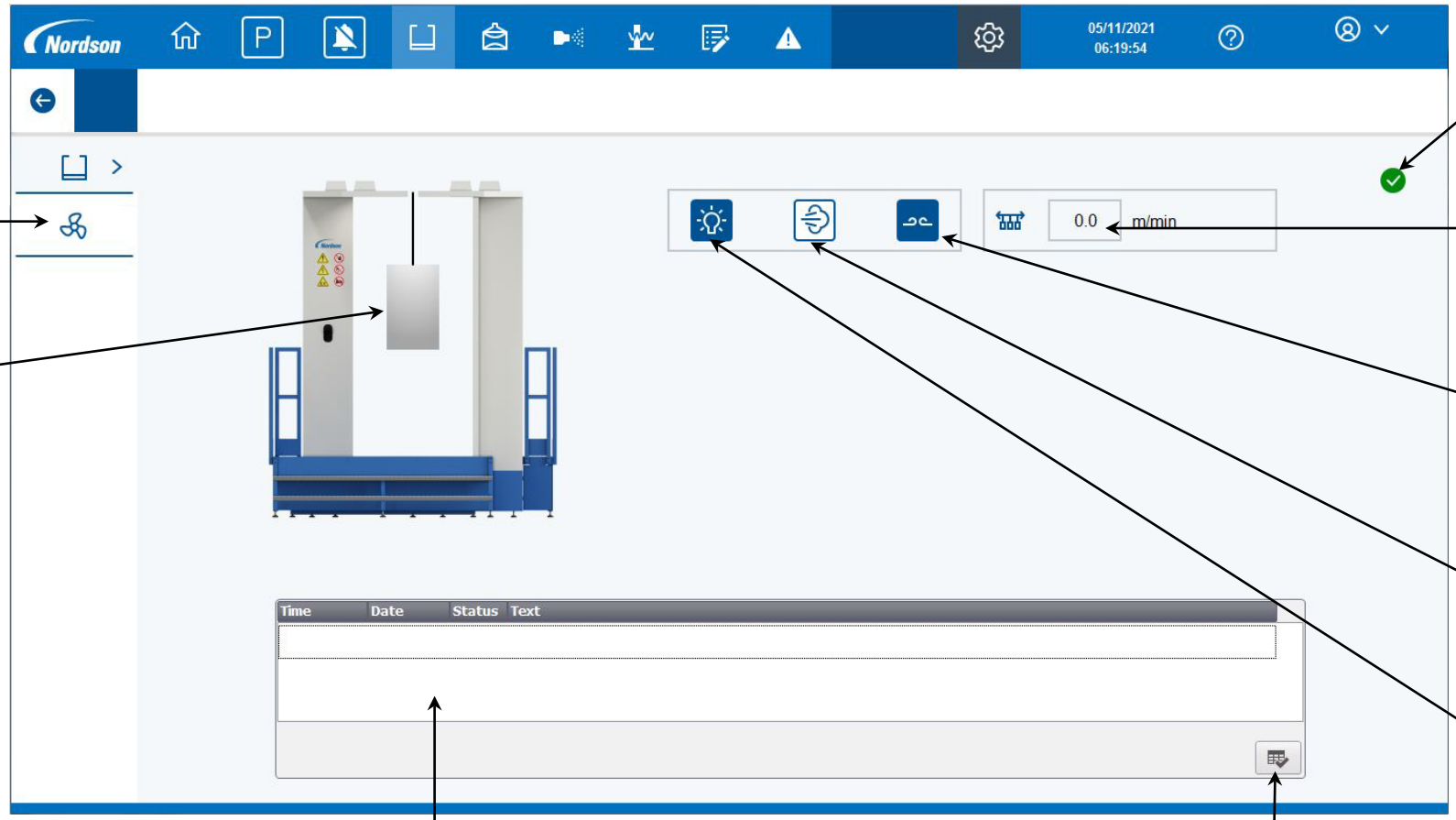
Press to move backwards or forwards through the list of 255 programs available for selection.



Touch the name of the program required. The selection list will disappear again and the new program name will be displayed on the main screen confirming that the program data has been loaded into the system.

PowderPilot™ 4.x - System Operator Card

Booth Control



Press to display the after filter control screen

This icon will appear when the system has detected product within the booth canopy

Current health state of the booth system. See page 9 for symbol details.

Current conveyor speed

Press to switch the airknife floor cleaning system on or off. Press again to toggle the cleaning between on and off. The cleaning system is shown as *on* in this screen shot.

Press to perform an external gun blow off sequence

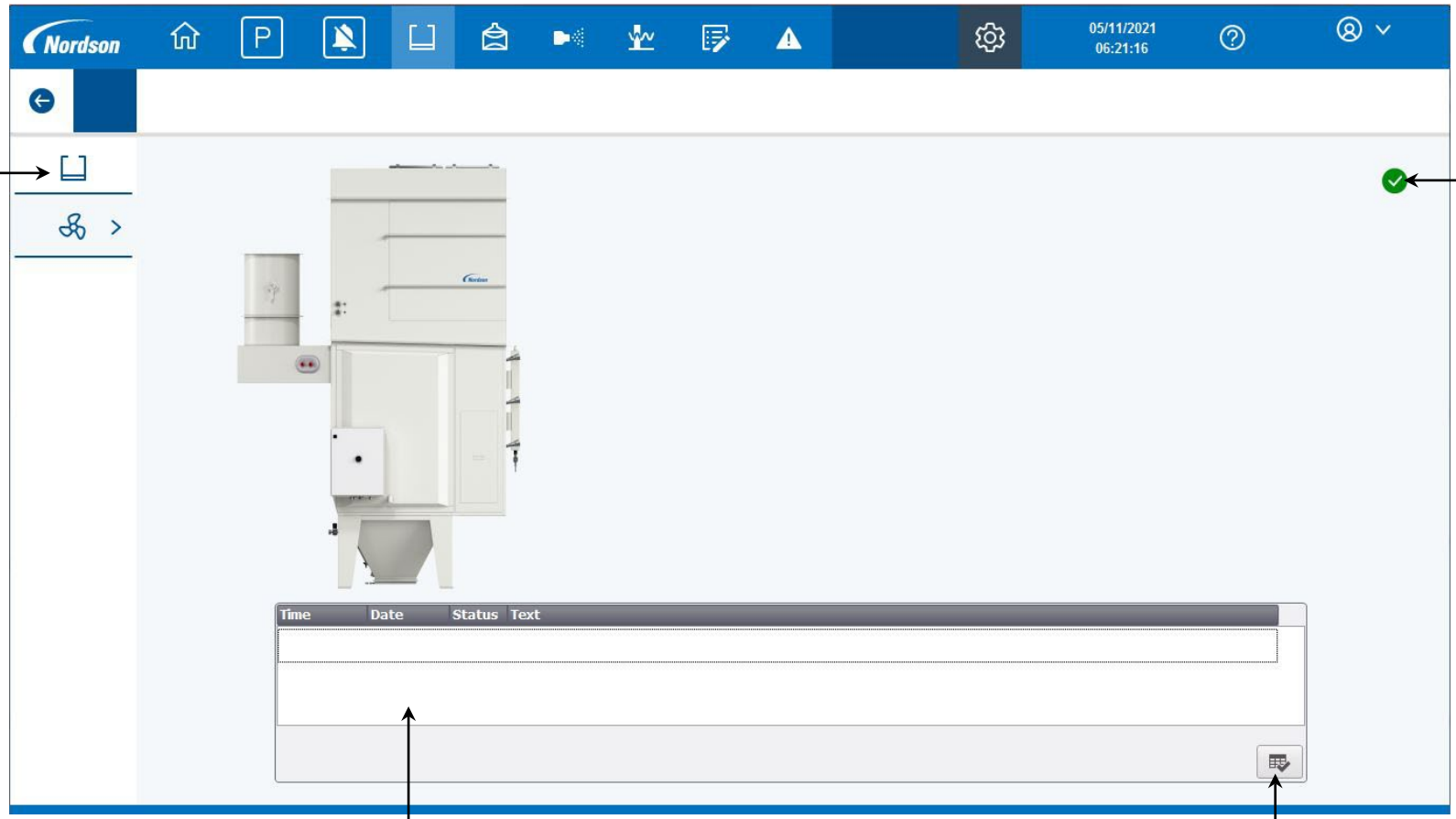
Press to switch the booth lights on or off.
The lights are shown as on in this screen shot.

Displays any current alarms related to the booth

Press to acknowledge any new alarms

PowderPilot™ 4.x - System Operator Card

Afterfilter



Press to display the booth control screen

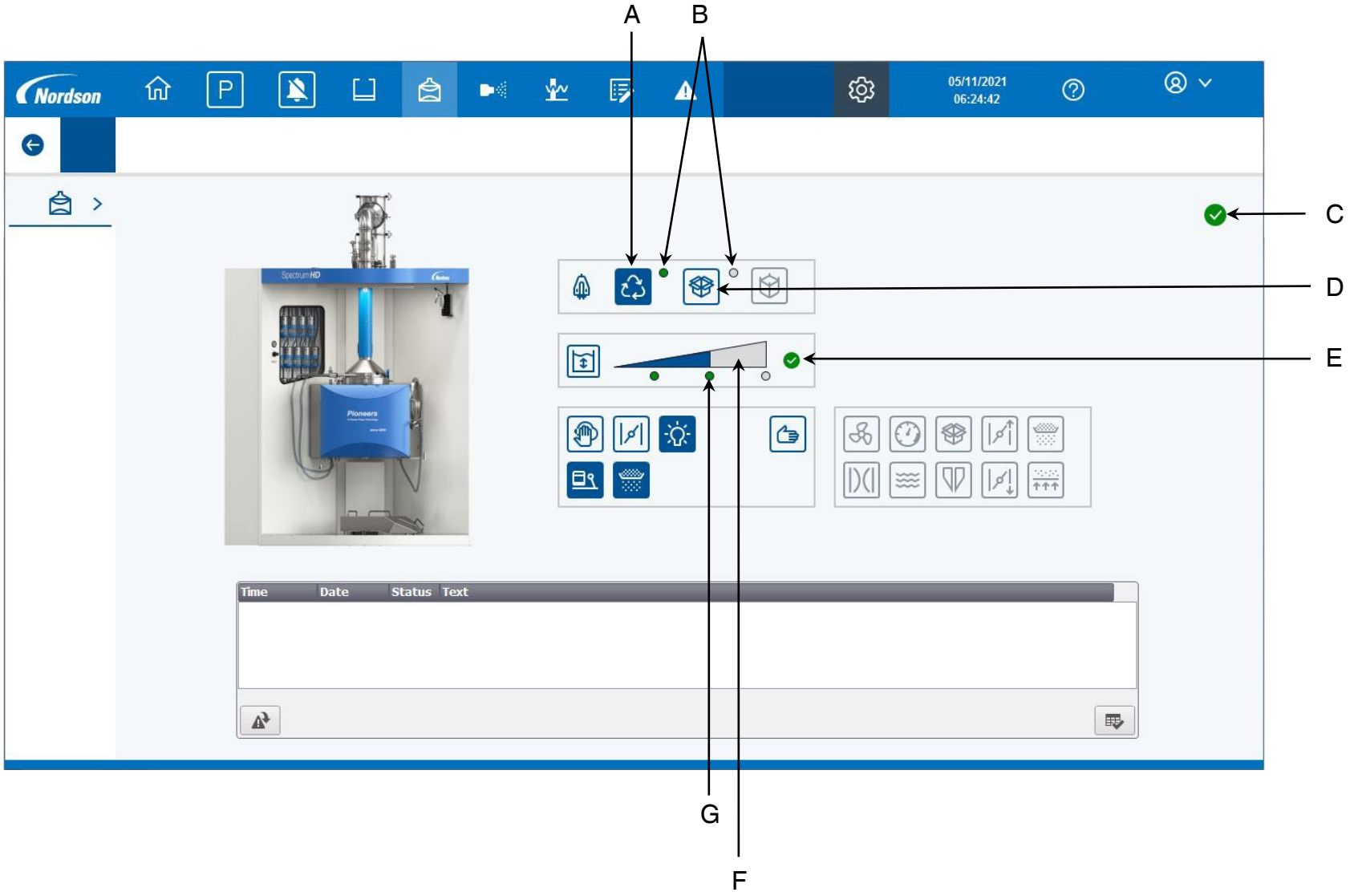
Current health state of the after filter system. See page 9 for symbol details.

Displays any current alarms related to the after filter

Press to acknowledge any new alarms

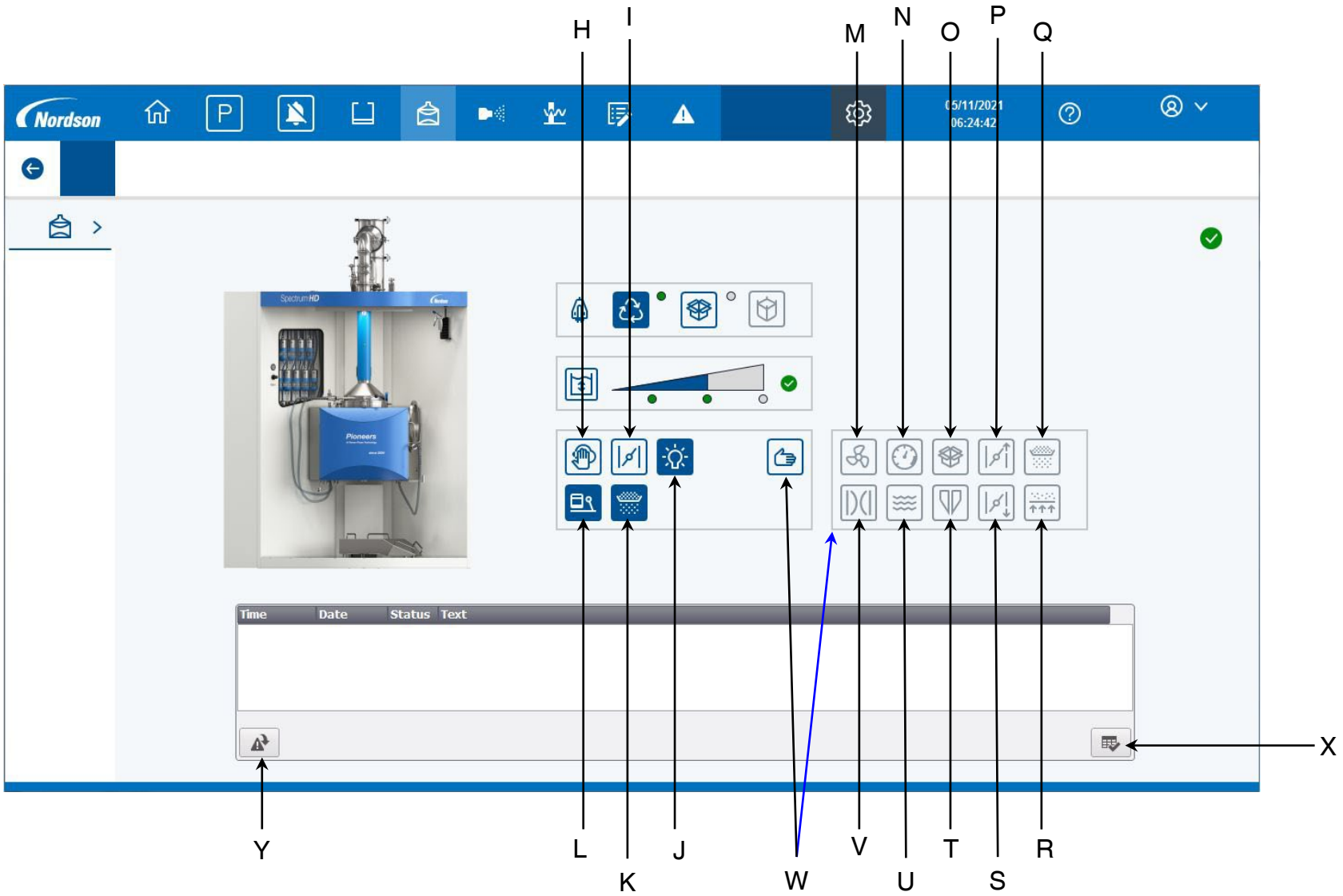
PowderPilot™ 4.x - System Operator Card

Colour Feed Centre



PowderPilot™ 4.x - System Operator Card

Colour Feed Centre - Continued



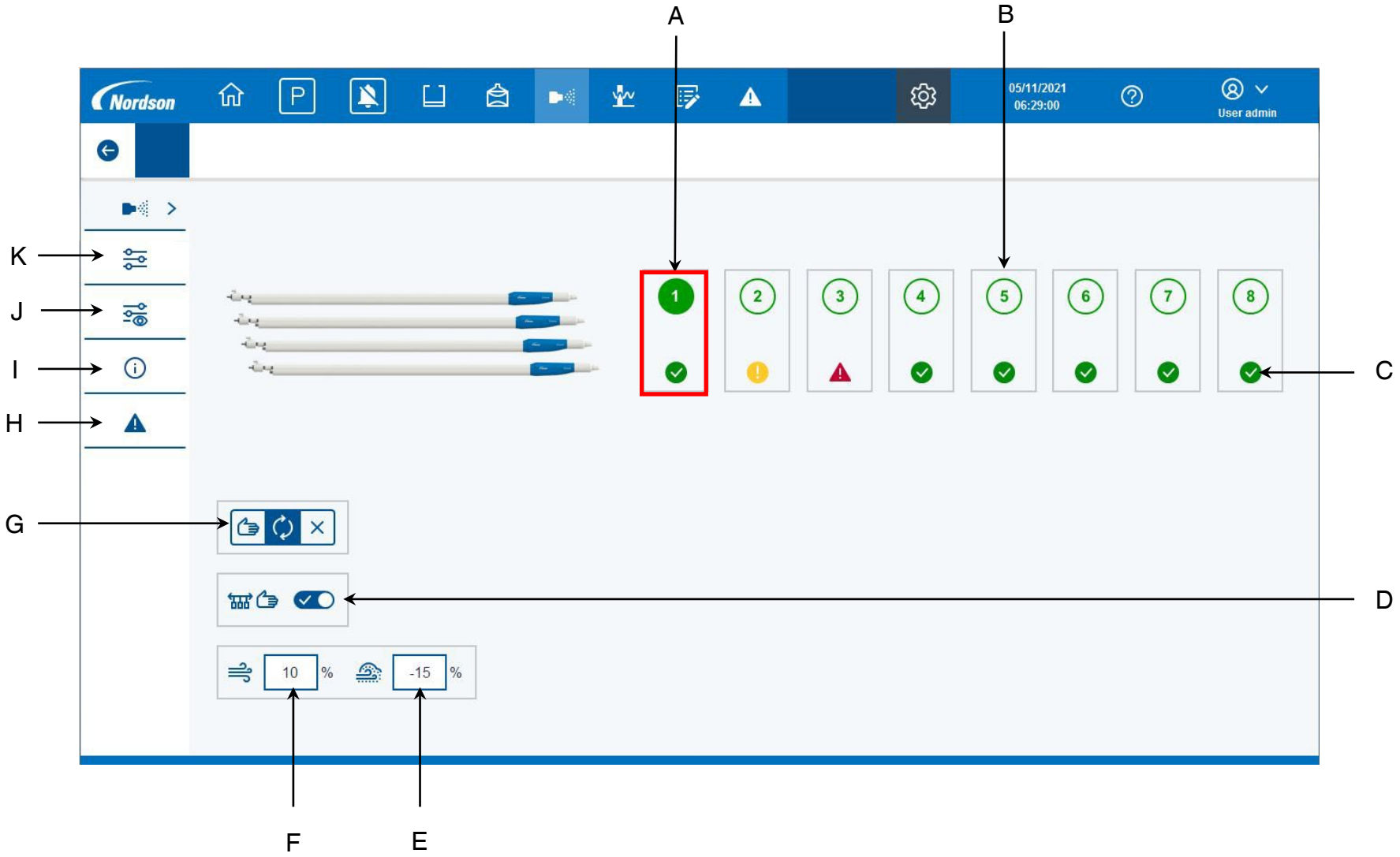
PowderPilot™ 4.x - System Operator Card

Colour Feed Centre - Descriptions

A – Press to enable or disable the cyclone reclaim pump. The pumps are shown as *enabled* in this screen shot.
B – These icons light in green when the relevant pump is actually pumping powder back to the feed centre.
C – Current health state of the feed centre system. See *Main Screen* on page 9 for symbol details.
D – Press to enable or disable the box feed virgin pump. The pump is shown as *disabled* in this screen shot.
E – Current health state of the powder level in the hopper.
F – Current powder level in the hopper indication.
G – These icons light in green when powder is detected on the relevant level probe.
H – Press to perform a colour change. This process is described in detail later on in this operator card.
I – Press to open or close the feed centre canopy extraction valve. This will increase extraction in the canopy when cleaning it down.
J – Press to turn on or off the feed centre lights. The lights are shown as *on* in this screen shot.
K – Press to enable or disable the ultra sonic sieve. The sieve is shown as *enabled* in this screen shot.
L – Press to enable or disable the hopper banger.
The banger strikes the ouside of the hopper on a timed basis to help remove powder from the inside walls of the hopper.
The banger is shown as *enabled* in this screen shot.
M – Afterfilter fan.
N – Main air valve.
O – Box feed virgin pump.
P – Purge duct damper valve.
Q – Ultrasonic sieve.
R – Fluidisation air.
S – Canopy duct damper valve.
T – Cyclone reclaim pump.
U – Box feed table vibrator.
V – Hopper empty valve.
W – Press to enable manual control of individual feed centre devices. Each press of a manual button toggles that device between active and inactive.
X – Press to acknowledge any new alarms.
Y – Displays any current alarms related to the feed centre.

PowderPilot™ 4.x - System Operator Card

Gun Control



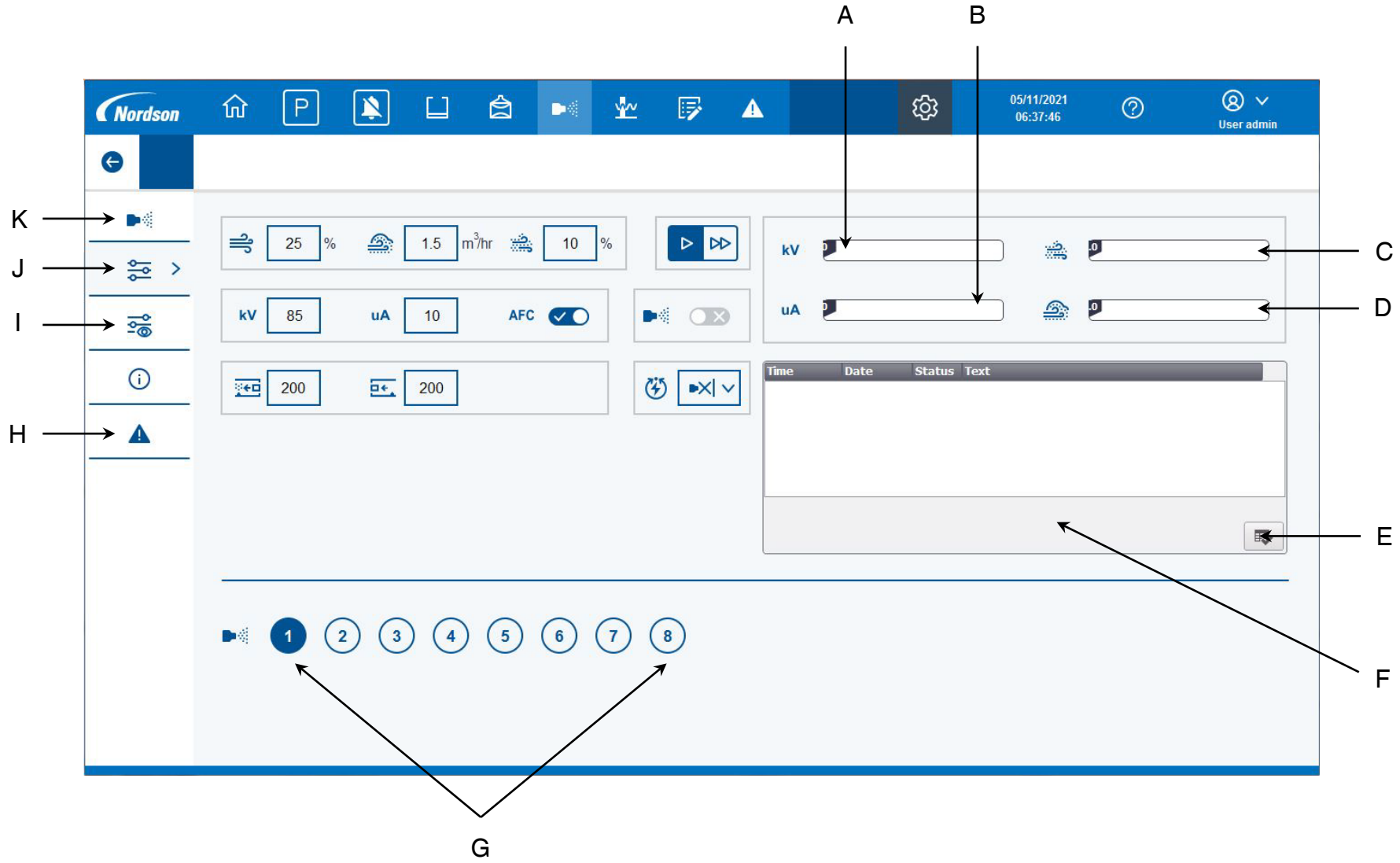
PowderPilot™ 4.x - System Operator Card

Gun Control - Descriptions

A – Press in this area to display the setpoint screen for that gun.
B – Current triggered state for the gun. Gun 1 below is shown as triggered and guns 2-8 as not.
C – Current health state of the individual gun. See page 9 for symbol details.
D – If selected as on, the guns will stop triggering in manual mode when the conveyor stops.
E – Press to adjust the pattern air offset.
Entering a value of 10% for example, will add 10% to all the current pattern air setpoints.
Entering a value of -10% will reduce all current pattern air setpoints by 10%.
F – Press to adjust the powder output offset.
Entering a value of 10% for example, will add 10% to all the current powder setpoints.
Entering a value of -10% will reduce all current powder setpoints by 10%.
G – Press to select the required gun trigger mode. These are manual, auto or always off in that order from left to right.
Auto mode triggers the guns on only when product is in front of them.
Manual mode triggers the guns on all the time.
H – Press to display the gun alarm list screen.
I – Press to display the gun process feedback screen.
J – Press to display all guns setpoint screen.
K – Press to display the single gun setpoint screen.

PowderPilot™ 4.x - System Operator Card

Gun Control – Single gun setpoints



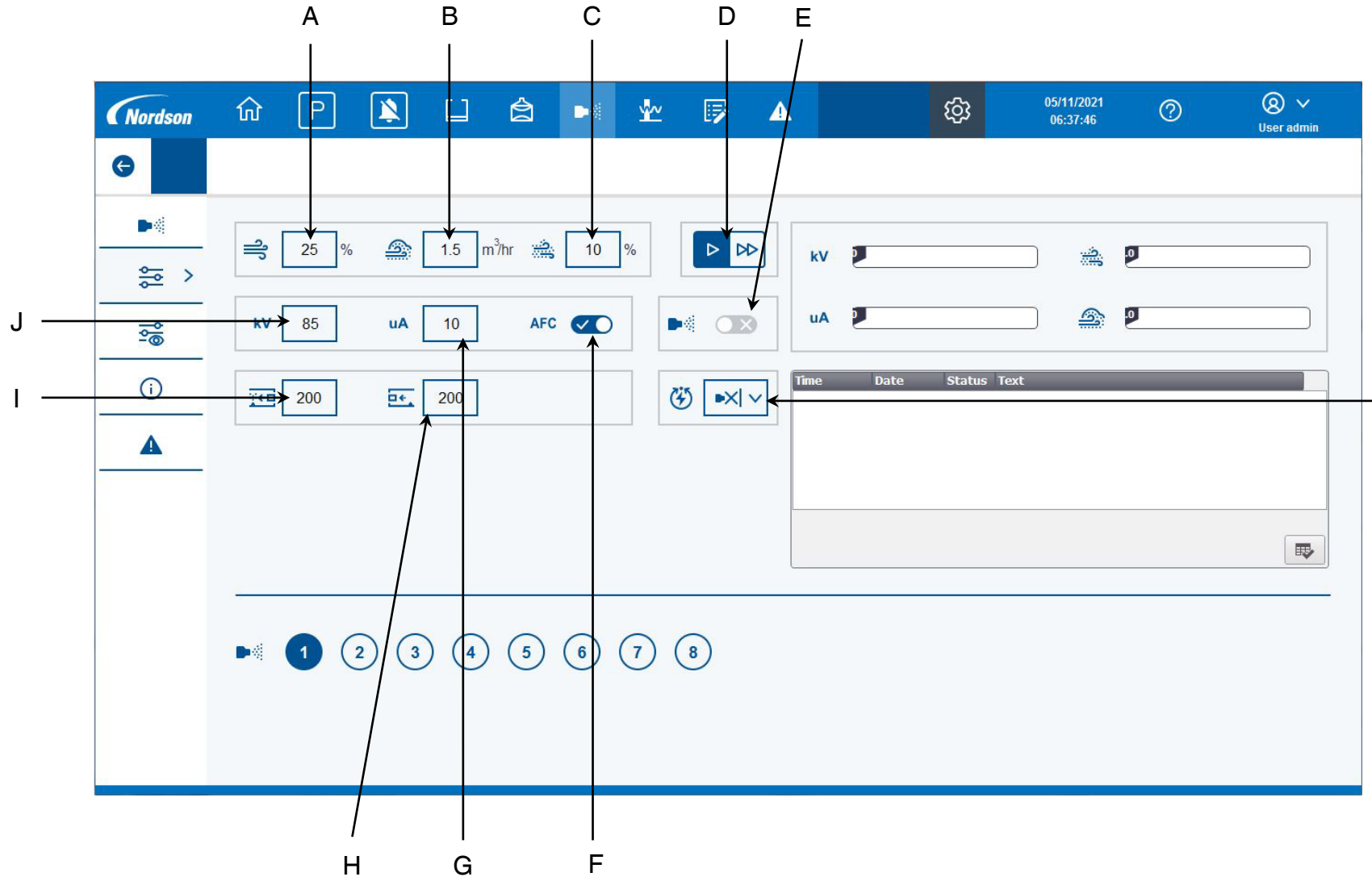
PowderPilot™ 4.x - System Operator Card

Gun Control – Single gun setpoints descriptions

A – KV feedback for the gun selected.
B – uA feedback for the gun selected.
C – Assist air feedback for the gun selected.
D – Pattern air feedback for the gun selected.
E – Press to acknowledge any new alarms.
F – Displays any current alarms for the gun selected.
G – Press the gun that the setpoints above are to be displayed for. Gun 1 is selected in this screenshot.
H – Press to display the gun alarm list screen.
I – Press to display the gun process feedback screen.
J – Press to display the all guns setpoint screen.
K – Press to display the gun overview screen.

PowderPilot™ 4.x - System Operator Card

Gun Control – Single gun setpoints - Continued



Press the arrow to set the select charge mode from the drop down list.
The options are as follows:

- Mode off
- Recoat
- Special powders
- Deep cavities
- User programmable

PowderPilot™ 4.x - System Operator Card

Gun Control – Single gun setpoints descriptions - Continued

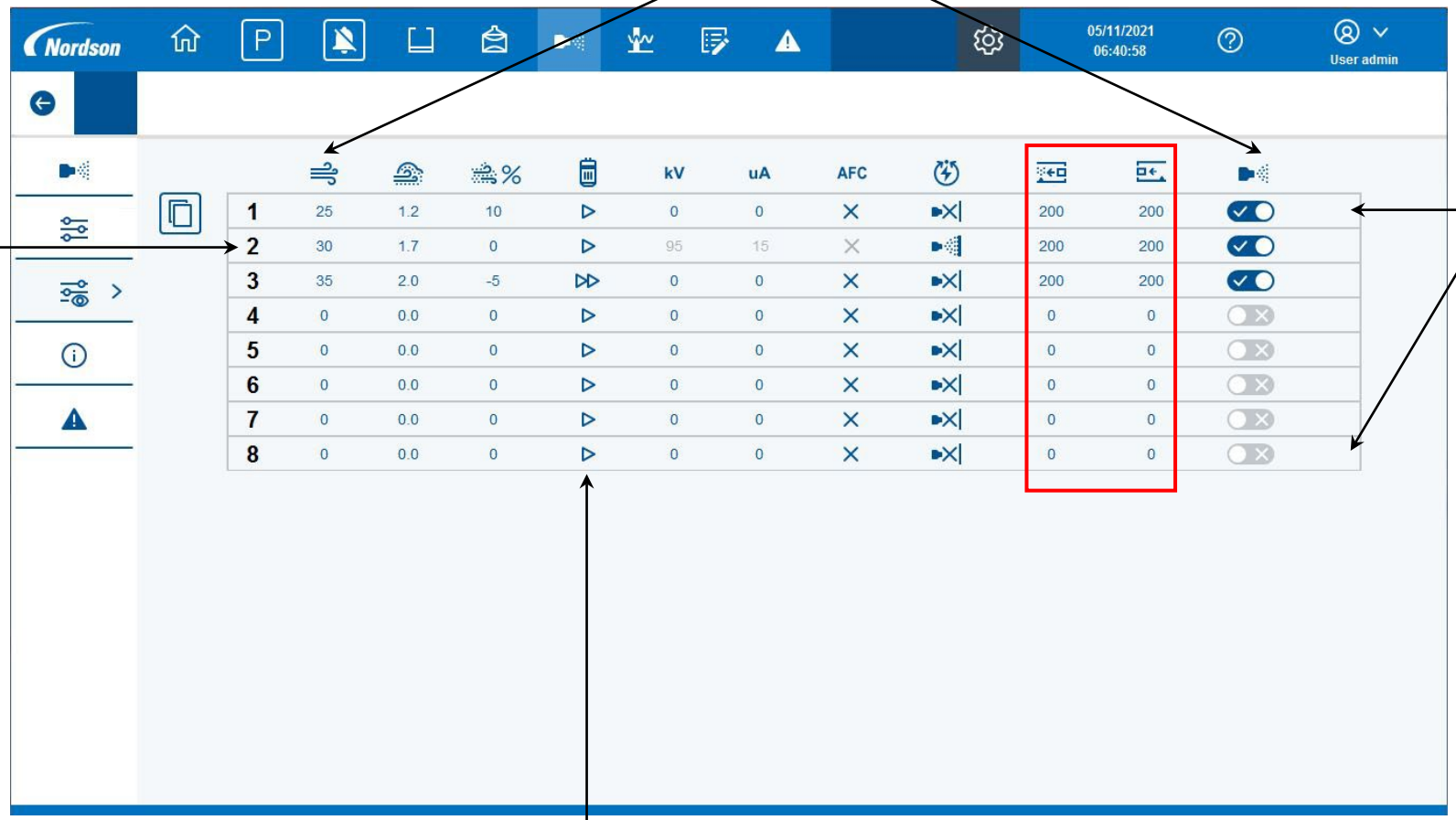
A – Touch to adjust the amount of powder.
B – Touch to adjust the flow of pattern air.
C – Touch to adjust the assist air compensation value.
D – Pump in standard or fast mode. Standard mode is selected in this screenshot.
E – Trigger enable or disabled for the gun selected.
F – Press to set AFC mode on or off.
G – Touch to set the uA.
H – Touch to adjust the after spray dimension. See next page for details.
I – Touch to adjust the before spray dimension. See next page for details.
J – Touch to adjust the KV.

PowderPilot™ 4.x - System Operator Card

Gun Control – All gun setpoints

This screen allows the overview and adjustment of all the setpoints at the same time.

Setpoints as described on the previous page



Gun number.
All setpoints for that gun are in one row

Touch any icon or value in the table to make a change

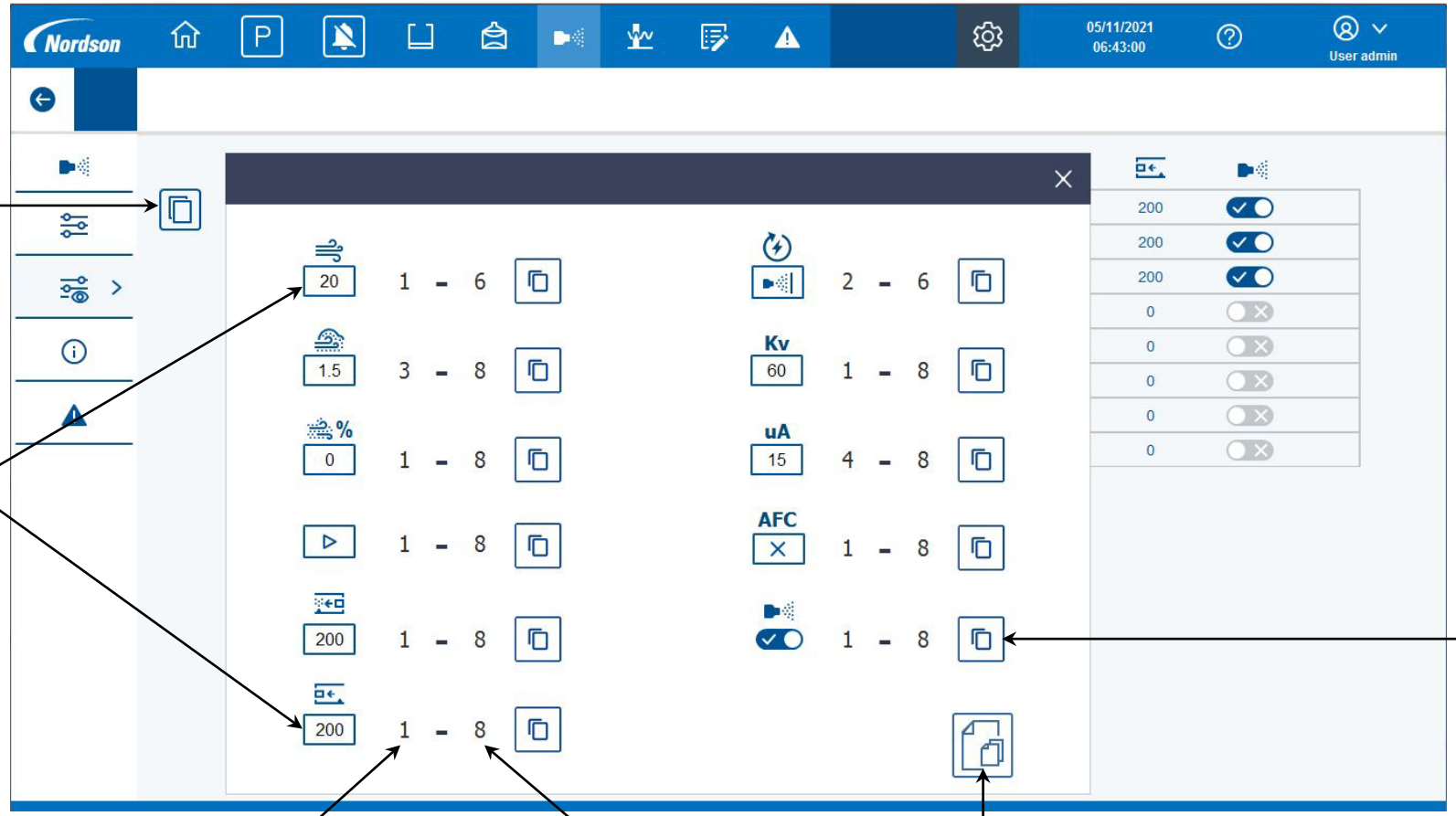
NOTE – The columns highlighted in red set the before spray & after spray dimensions for each gun. The before spray dimension sets how many millimetres before the part reaches the gun that it will turn on in automatic mode.

The after spray dimension sets how many millimetres after the part has passed the gun before it will turn off.

This column sets the pump mode as standard or fast. Pump 3 is set to fast mode in this screenshot.

PowderPilot™ 4.x - System Operator Card

Gun Control – All gun setpoints - Continued



Press to display the group setting pop up window as shown. This is used to send setpoints to multiple guns at the same time.

Setpoint to send to multiple guns

Press to copy that single setpoint to its range of guns

Starting gun of the range to copy the setpoint to

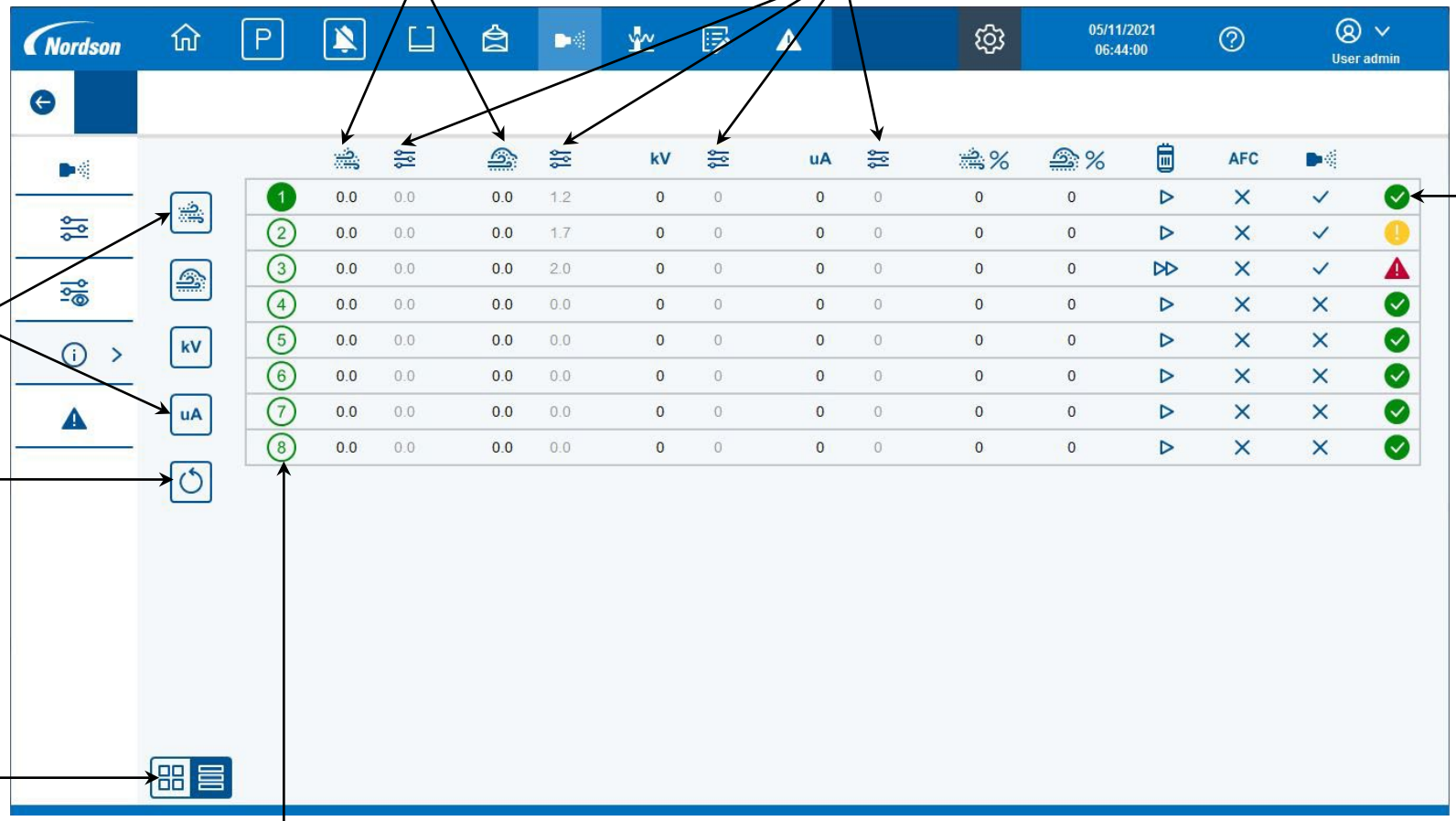
Ending gun of the range to copy the setpoint to

Press to copy all setpoints at the same time

PowderPilot™ 4.x - System Operator Card

Gun Control – All gun feedback

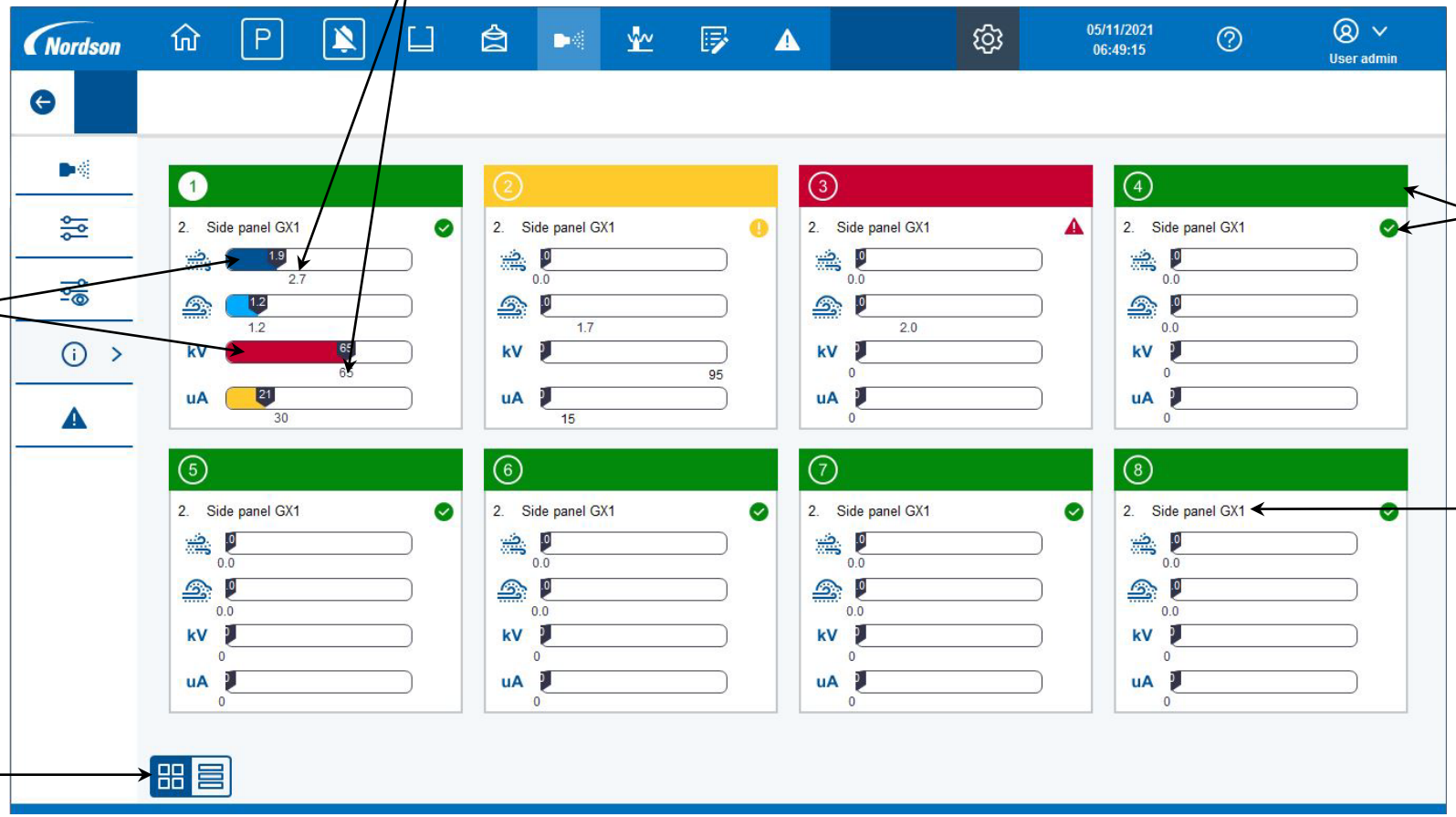
This screen displays the process feedback values for all guns at once.



PowderPilot™ 4.x - System Operator Card

Gun Control – 8 gun feedback

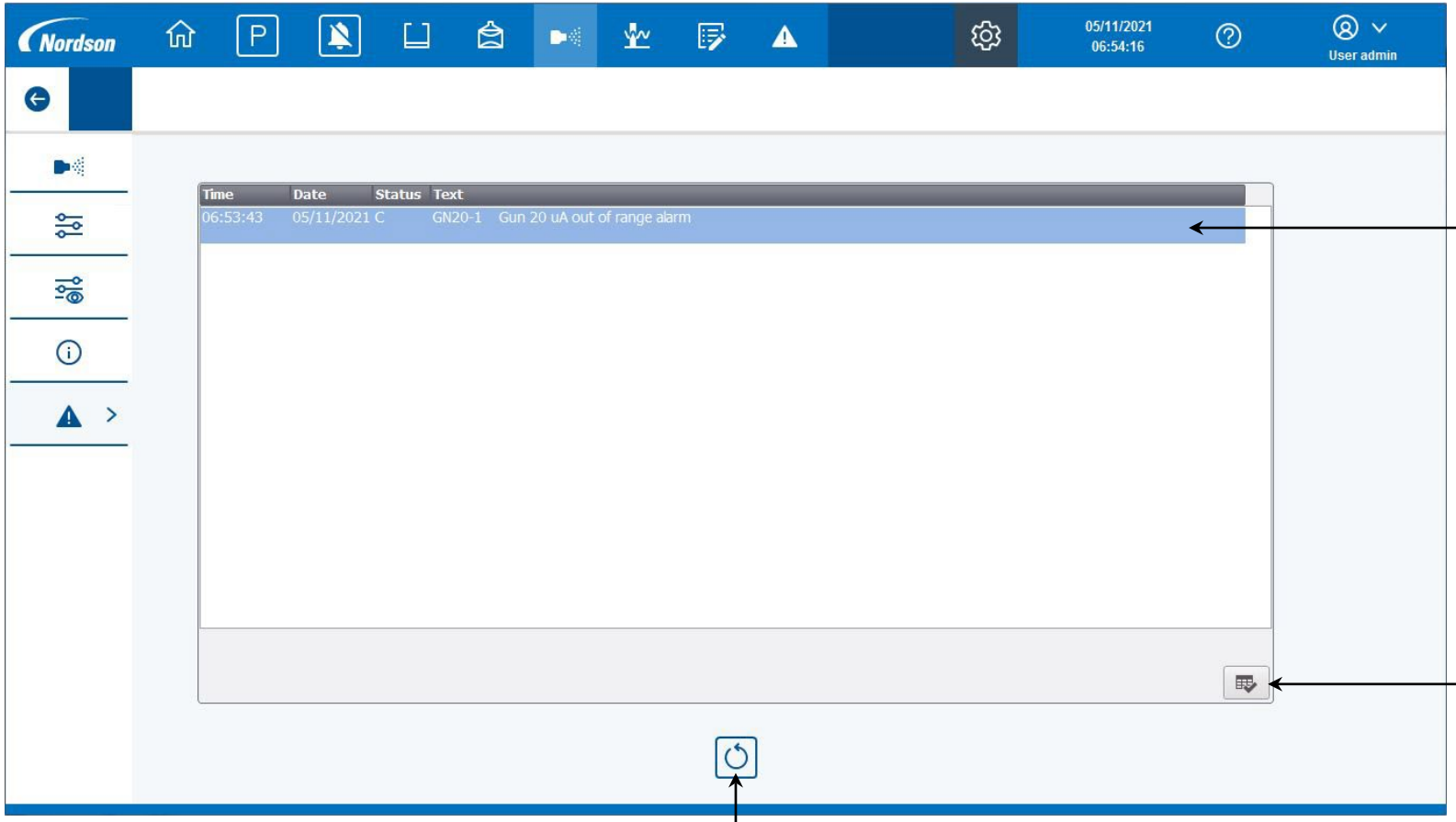
This screen displays the process feedback values for a group of 8 guns at a time.



PowderPilot™ 4.x - System Operator Card

Gun Control – Gun alarm list

This screen displays alarms associated with any of the guns



Displays any current alarms associated with the guns.

Press to acknowledge any new alarms.

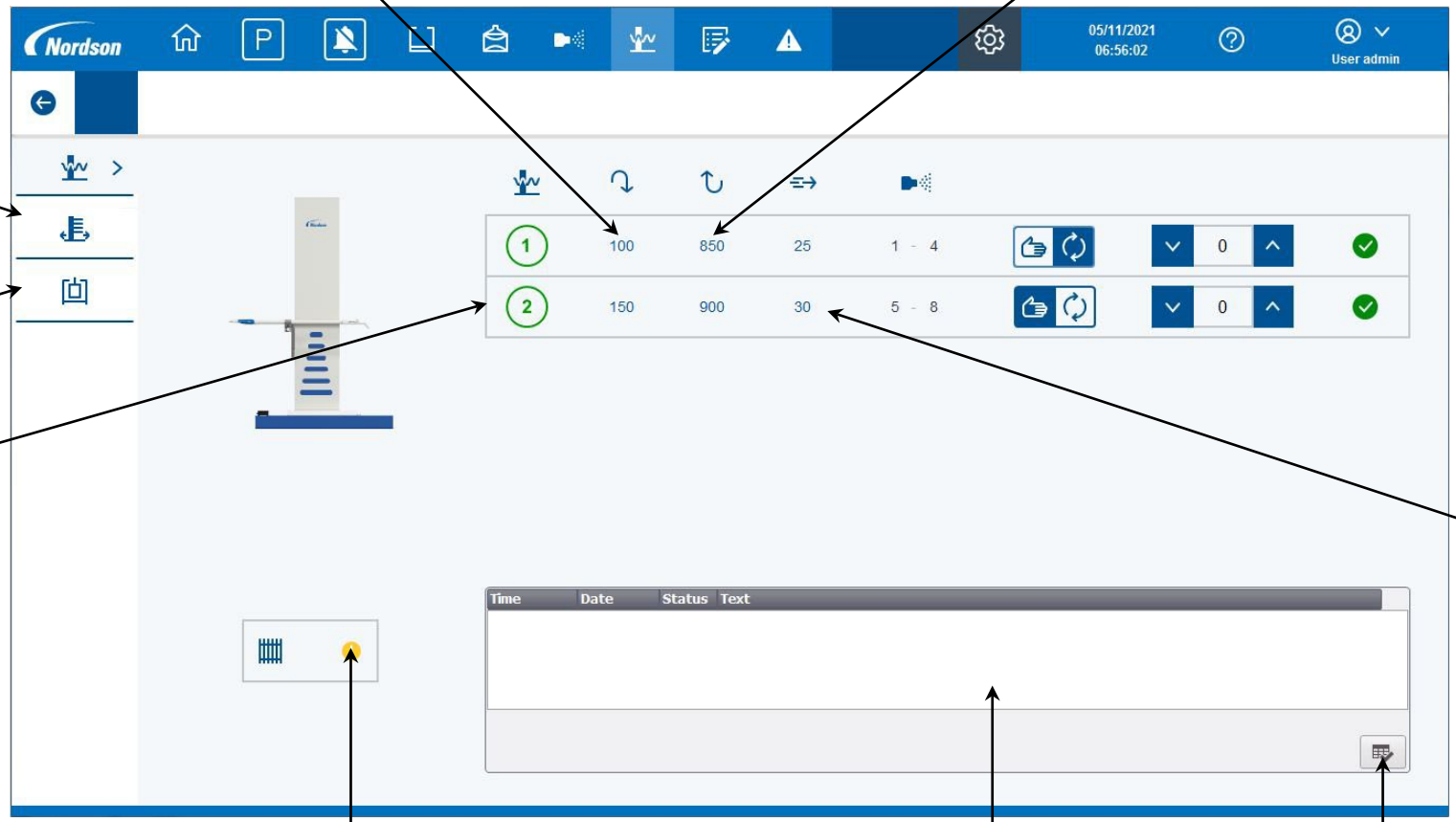
Press to reset any gun control card faults.

PowderPilot™ 4.x - System Operator Card

Reciprocator Setpoints

Touch to set the top turn around point in mm.
This is the distance down from the top of the booth gun slot.

Touch to set the bottom turn around point in mm.
This is the distance down from the top of the booth gun slot.



Press to display the Z-axis setpoints screen.

Press to display part ID status screen.

Reciprocator number and status.

1 Reciprocator stopped.

1 Reciprocator running.

1 Reciprocator stopped in its park position.

Touch to adjust the reciprocator speed of travel in metres / minute.

Displays the current state of the safety cage doors. Green shows closed. Yellow shows open.

Displays any current alarms associated with the reciprocators.

Press to acknowledge any new alarms.

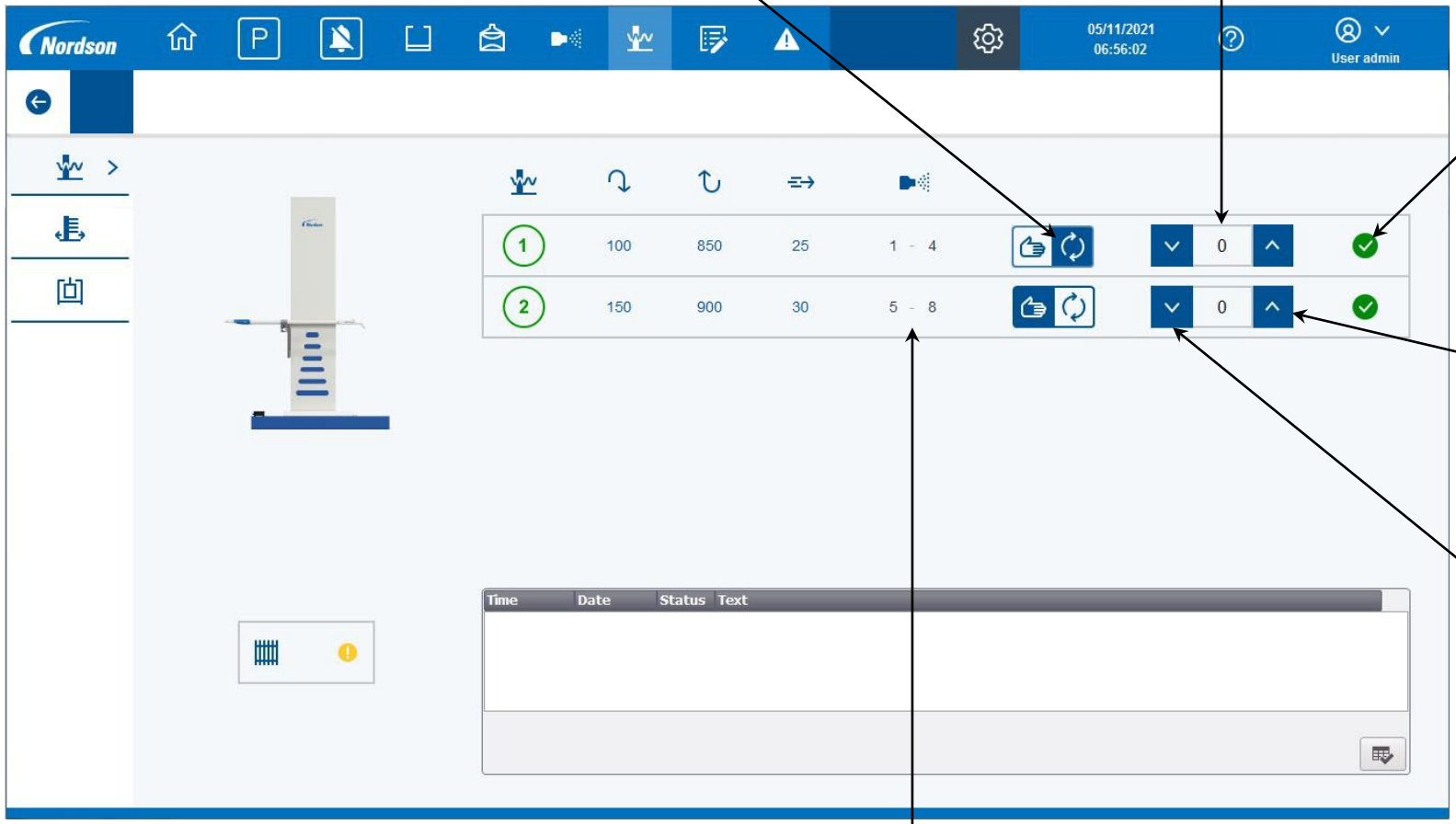
PowderPilot™ 4.x - System Operator Card

Reciprocator Setpoints – Continued

NOTE- When the reciprocator is set to automatic mode and unparked, it will continuously travel between the top and bottom turn around points at the set speed. When set to manual mode, it will only move whilst the up or down button is being pressed.

Press to toggle operation mode between automatic & manual. This icon currently indicates automatic mode.

Current reciprocator position in mm. This is with reference to the top of the booth gun slot.



Current health state of the reciprocator.
See page 9 for symbol details.

When set to manual mode, press this button to move the reciprocator up. Release the button to stop movement.
The button will turn yellow when the carriage has reached the upper end of travel position.

When set to manual mode, press this button to move the reciprocator down. Release the button to stop movement.
The button will turn yellow when the carriage has reached the lower end of travel position.

Displays the gun range located on each reciprocator.

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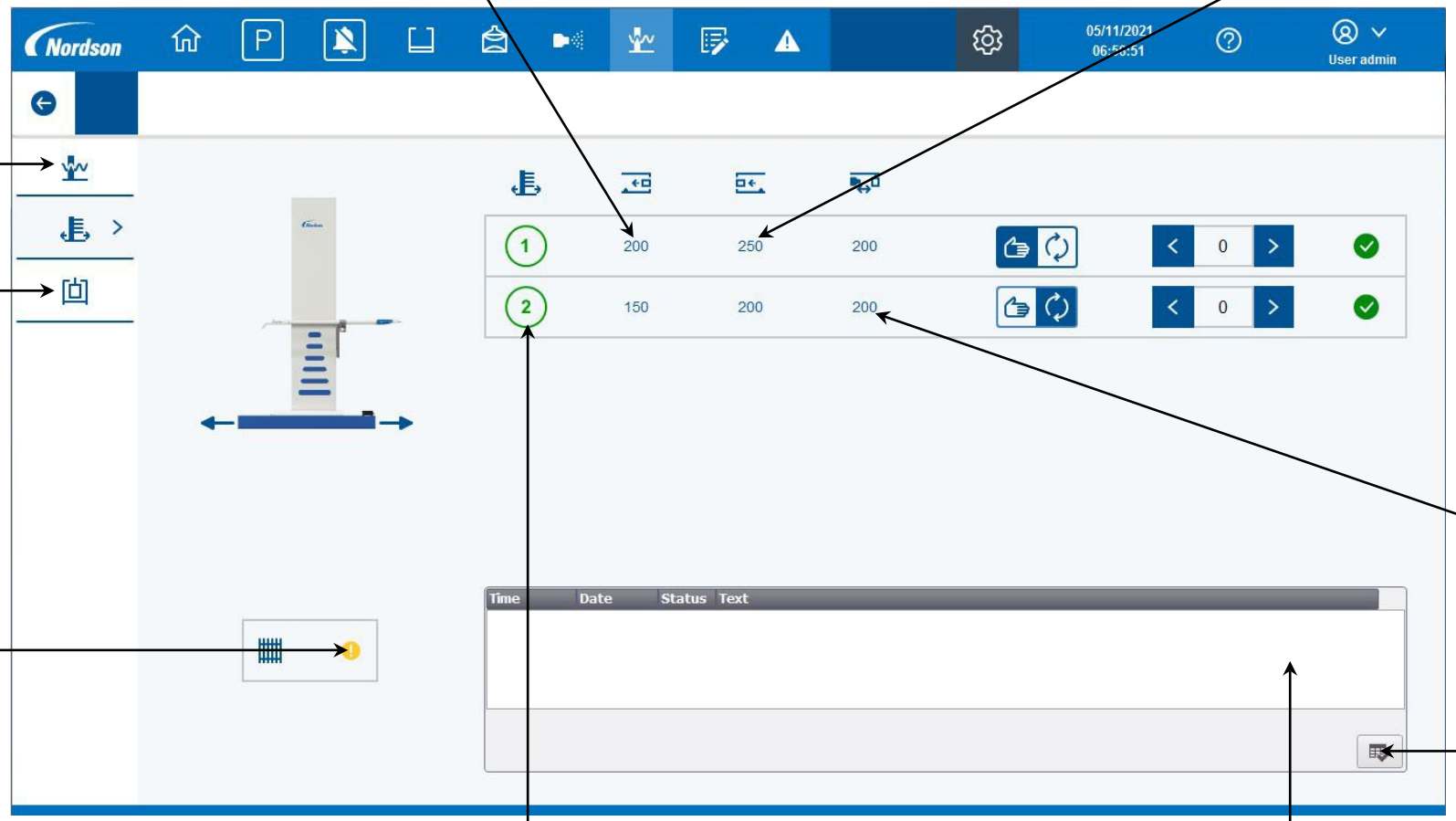
Z-axis Setpoints

Touch to set the pre-move distance in mm.
This sets how many mm before the part arrives at the Z-axis, that it should move out to its correct gun to part distance.

Touch to set the post-move distance in mm.
This sets how many mm after the part has passed the Z-axis, that it should move back in again.



Press to display the reciprocator setpoints screen.

Press to display part ID status screen.

Displays current state of the safety cage doors.
Green shows closed.
Yellow shows open.

Touch to adjust the gun to part distance in mm. This is the distance from the work piece to the gun nozzle that the Z-axis must maintain.

Press to acknowledge any new alarms.

1 Z-axis stopped.

1 Z-axis running.

1 Z-axis stopped in its park position.

Z-axis number and status.

Displays any current alarms associated with the Z-axis.

PowderPilot™ 4.x - System Operator Card

Z-axis Setpoints – Continued

NOTE- When the Z-axis is set to automatic mode and unparked, it will continuously adjust to keep the gun nozzle the correct gun to part distance.
When set to manual mode, it will only move whilst the in or out button is being pressed.

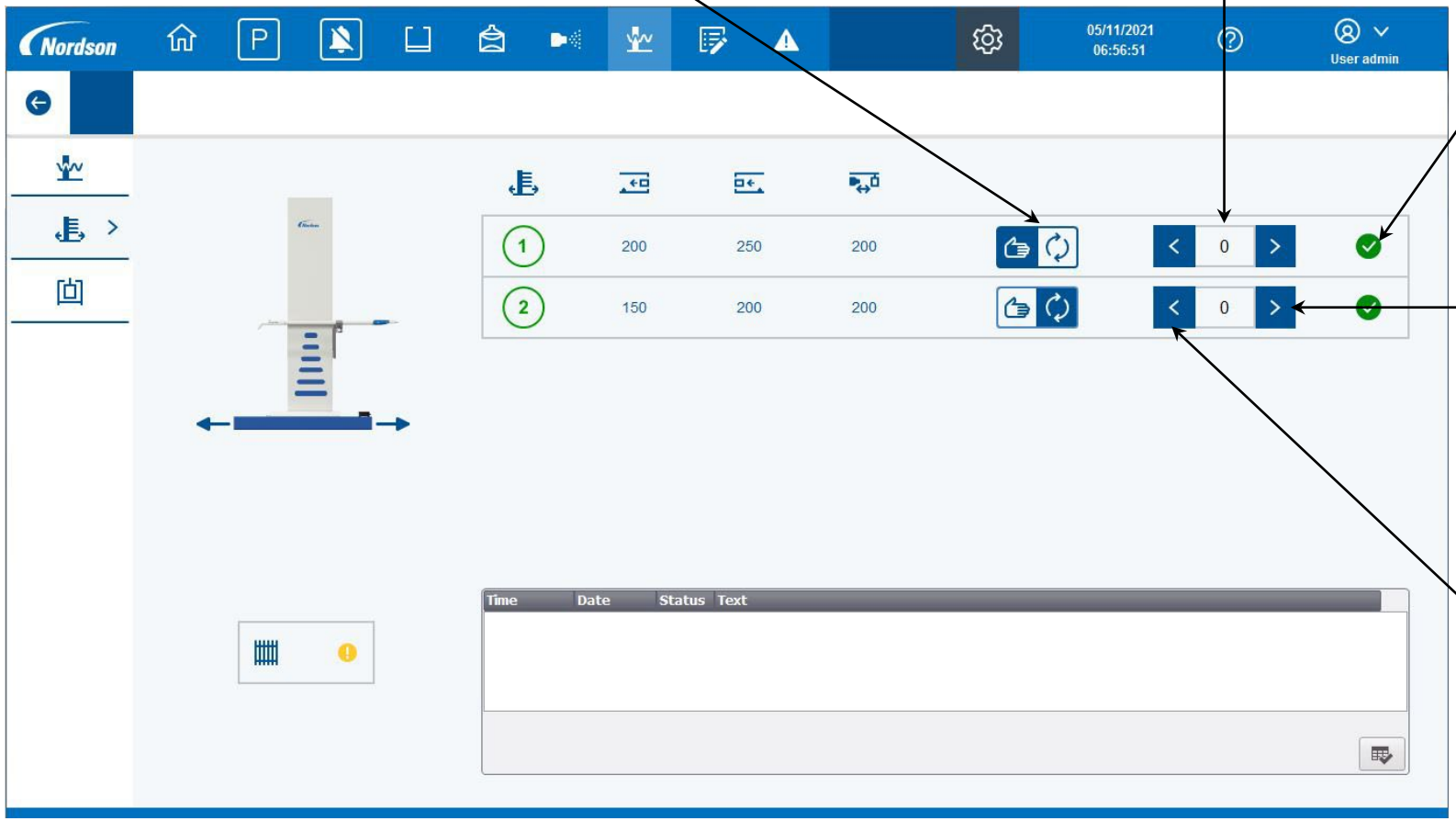
Press to toggle operation mode between automatic & manual. This icon currently indicates manual mode.

Current Z-axis position in mm. This is with reference to the centre line of the booth.

Current health state of the Z-axis.
See page 9 for symbol details.

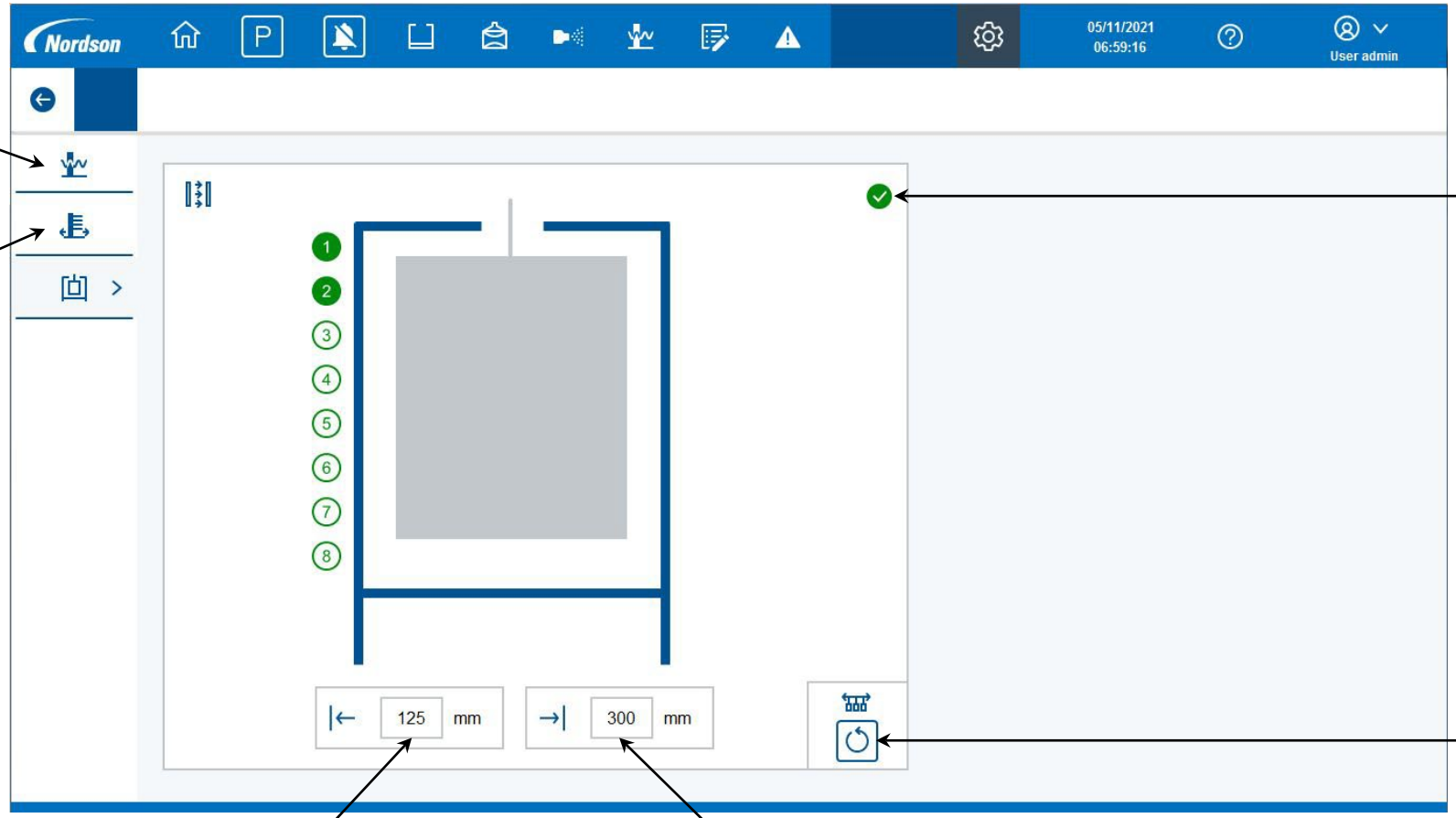
When set to manual mode, press this button to move the Z-axis in. Release the button to stop movement.
The button will turn yellow when the carriage has reached the inner end of travel position.

When set to manual mode, press this button to move the Z-axis out. Release the button to stop movement.
The button will turn yellow when the carriage has reached the outer end of travel position.



PowderPilot™ 4.x - System Operator Card

Beam Array Status



Press to display the reciprocator setpoint screen.

Press to display the Z-axis setpoint screen.

Current health state of the beam array system. See page 9 for symbol details.

Press to reset the part tracking memory.

Displays the left hand width dimension of the part currently in the beam array stand.

Displays the right hand width dimension of the part currently in the beam array stand.

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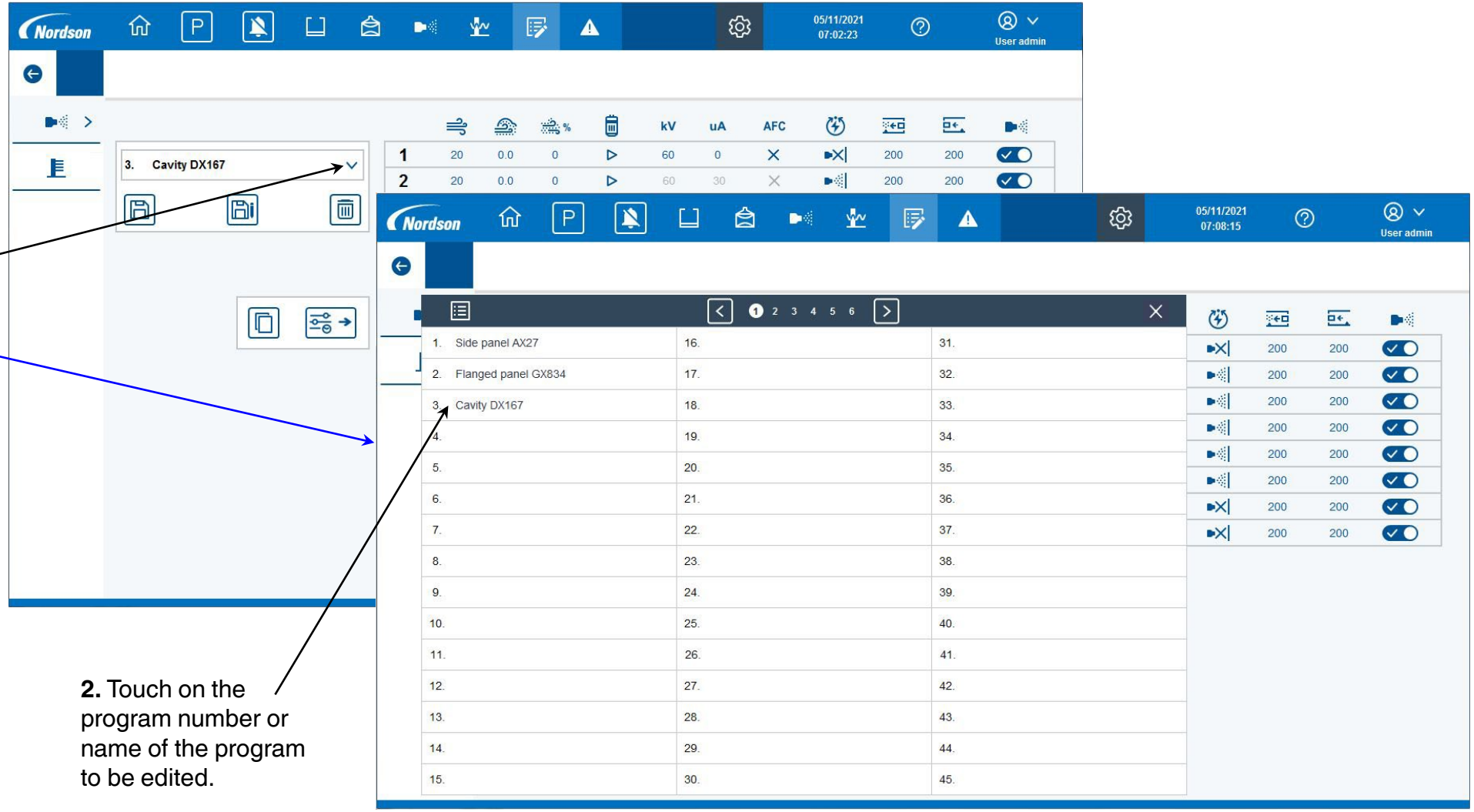
Program Edit

The system has 255 programs available for use. To edit one of those program's data, follow these steps:

1. Press this drop down arrow to display a program selection list as shown here.



2. Touch on the program number or name of the program to be edited.

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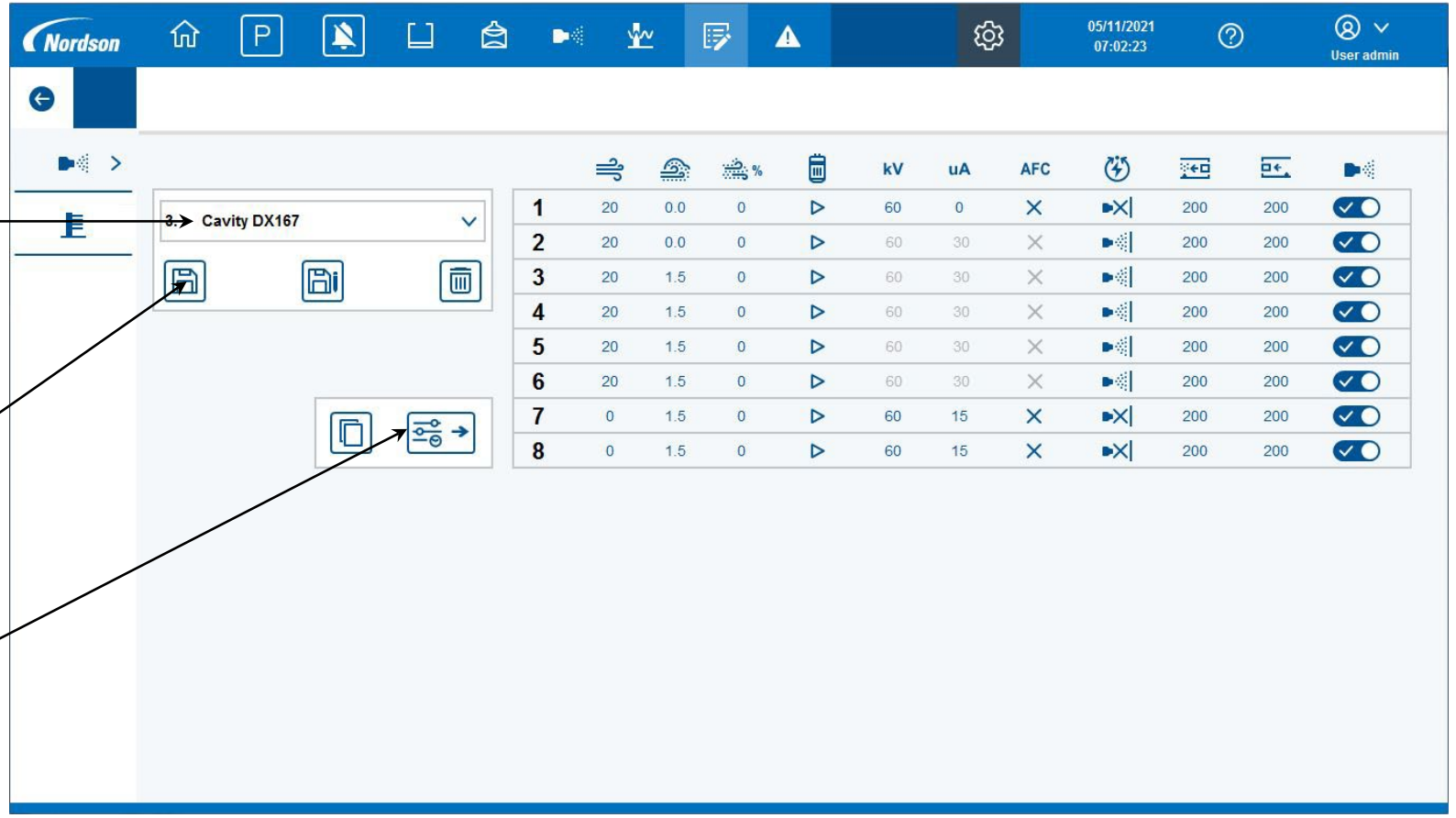
Program Edit – Continued

The system has 255 programs available for use. To edit one of those program‘s data, follow these steps:

3. The data previously stored in this program will now be displayed. Touch any value on this screen to adjust it. This includes the program name. Touch the name area and enter the program name required.

4. Press the save button to store the changes.

3a. Alternatively, press this button to copy the current settings being used by the guns into the program edit table.



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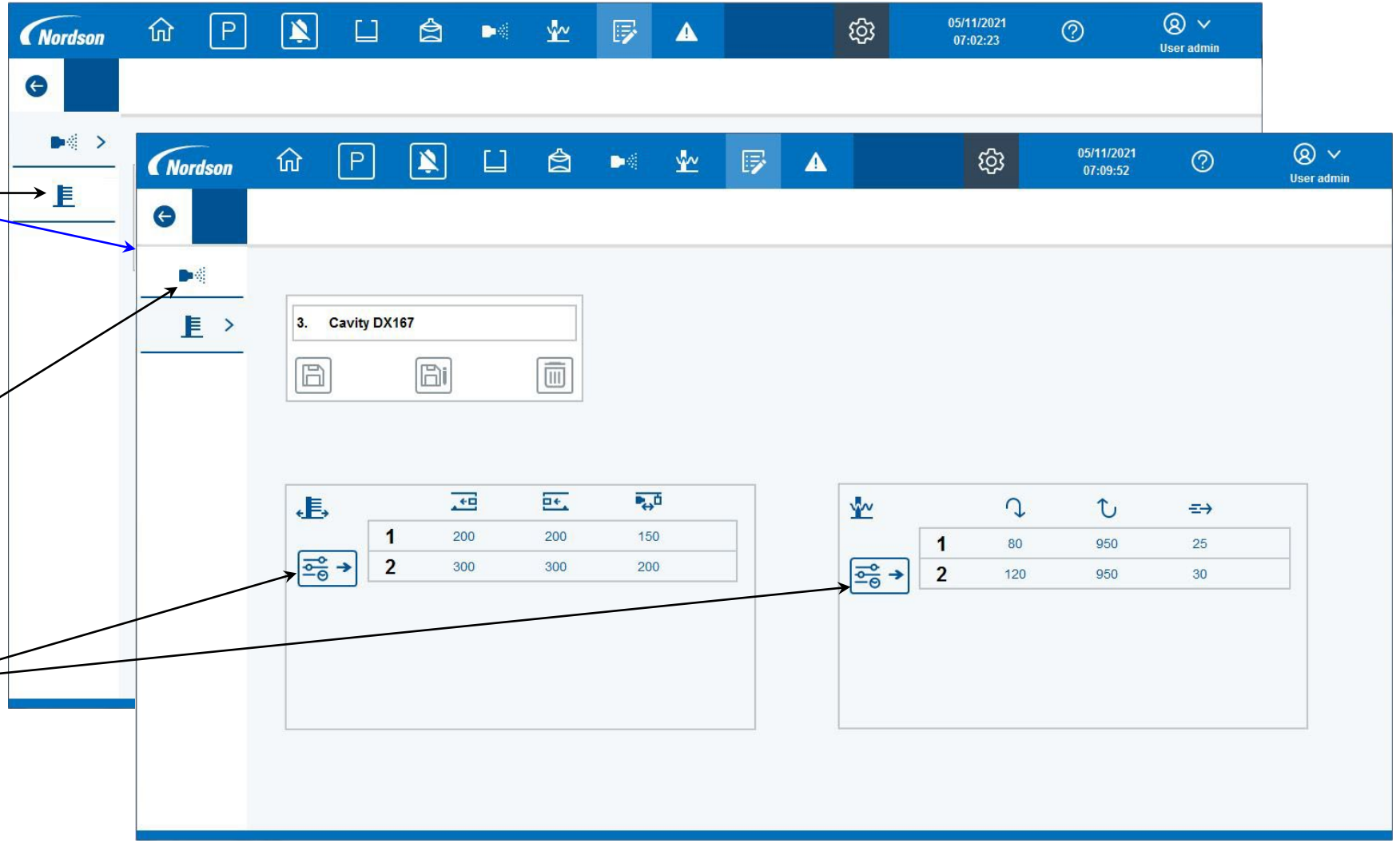
Program Edit – Continued

The system has 255 programs available for use. To edit one of those program's data, follow these steps:

Press this button to adjust any settings within the program related to the movers

Press this button to return to the gun settings.

Press this button to copy the current settings being used by the Z-axis or reciprocators into the program edit table.



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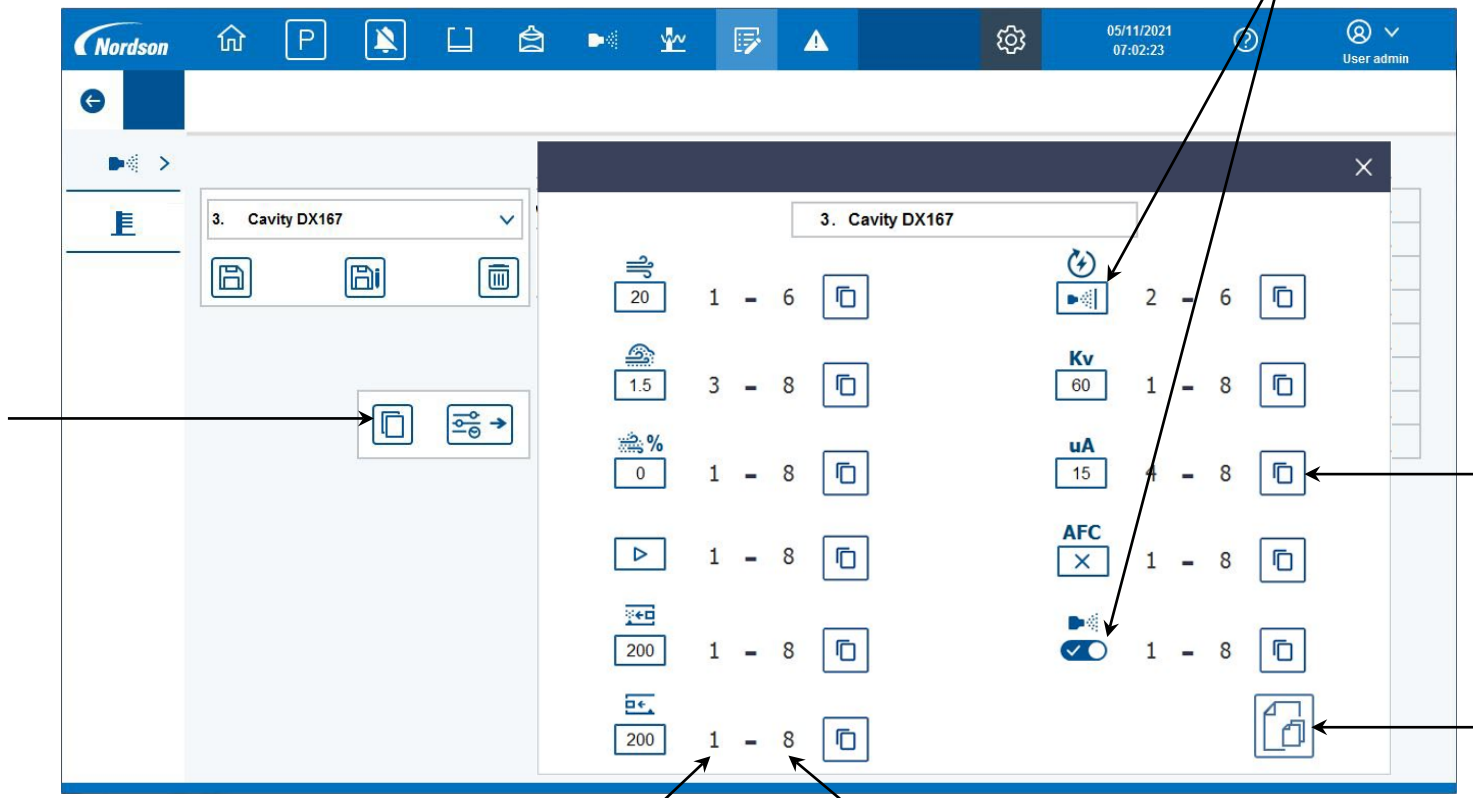
Program Edit - Group setting

The system has 255 programs available for use.

Setpoint to send to multiple guns.

Press this button to display the group setting pop up window as shown. This is used to send setpoints to multiple guns in the program at the same time.



Press to copy that single setpoint to its range of guns.

Press to copy all setpoints at the same time.

Starting gun of the range to copy the setpoint to.

Ending gun of the range to copy the setpoint to.

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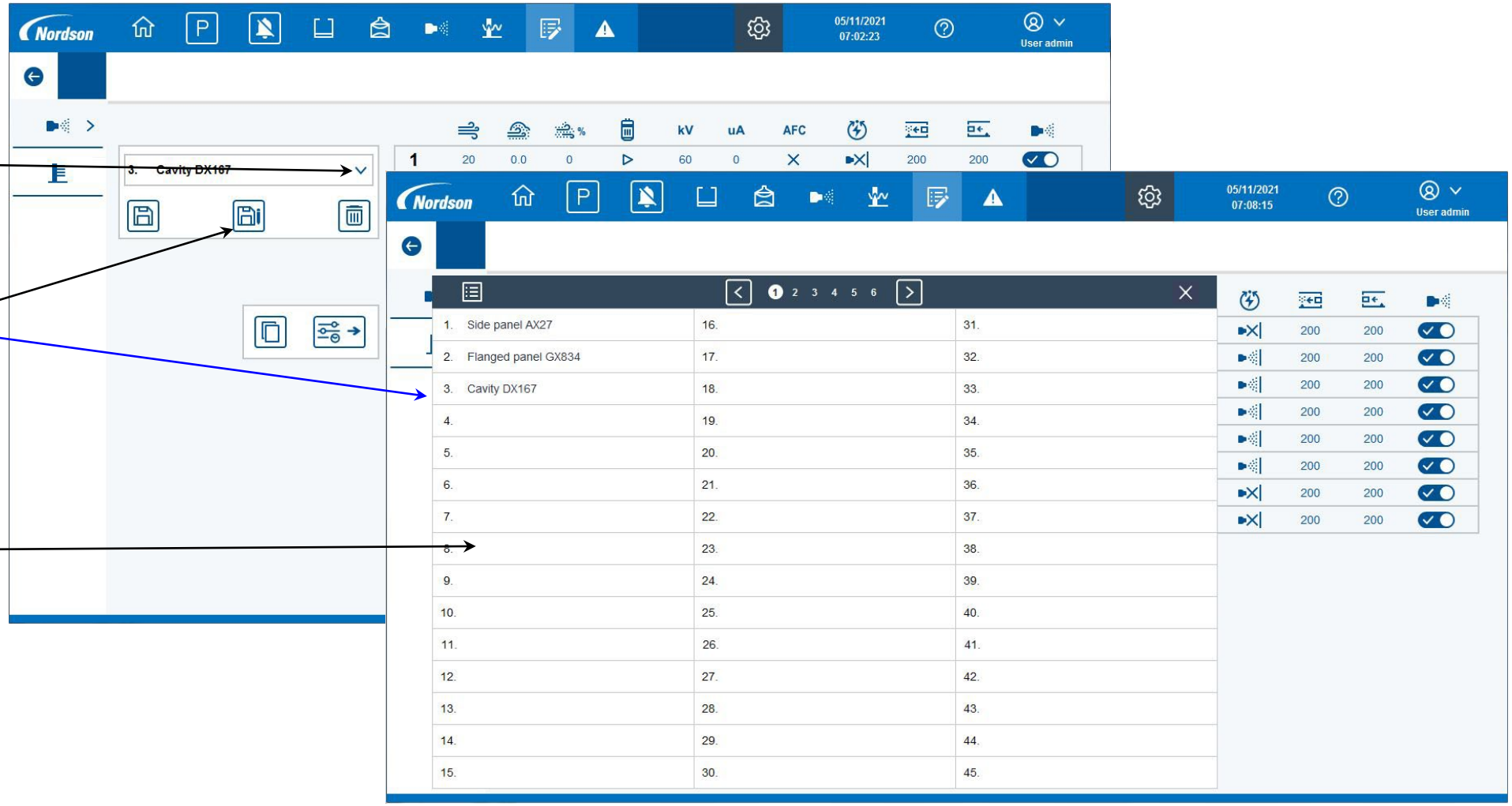
Program Control – Save as another program

The system has 255 programs available for use.
To save the data from one program into a different program follow these steps:

1. Load the program to be copied as described on page 29.

2. Press the Save as button to display the program selection window.

3. Touch the program number to copy into. All data including the program name will be copied into the new program location



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Program Delete

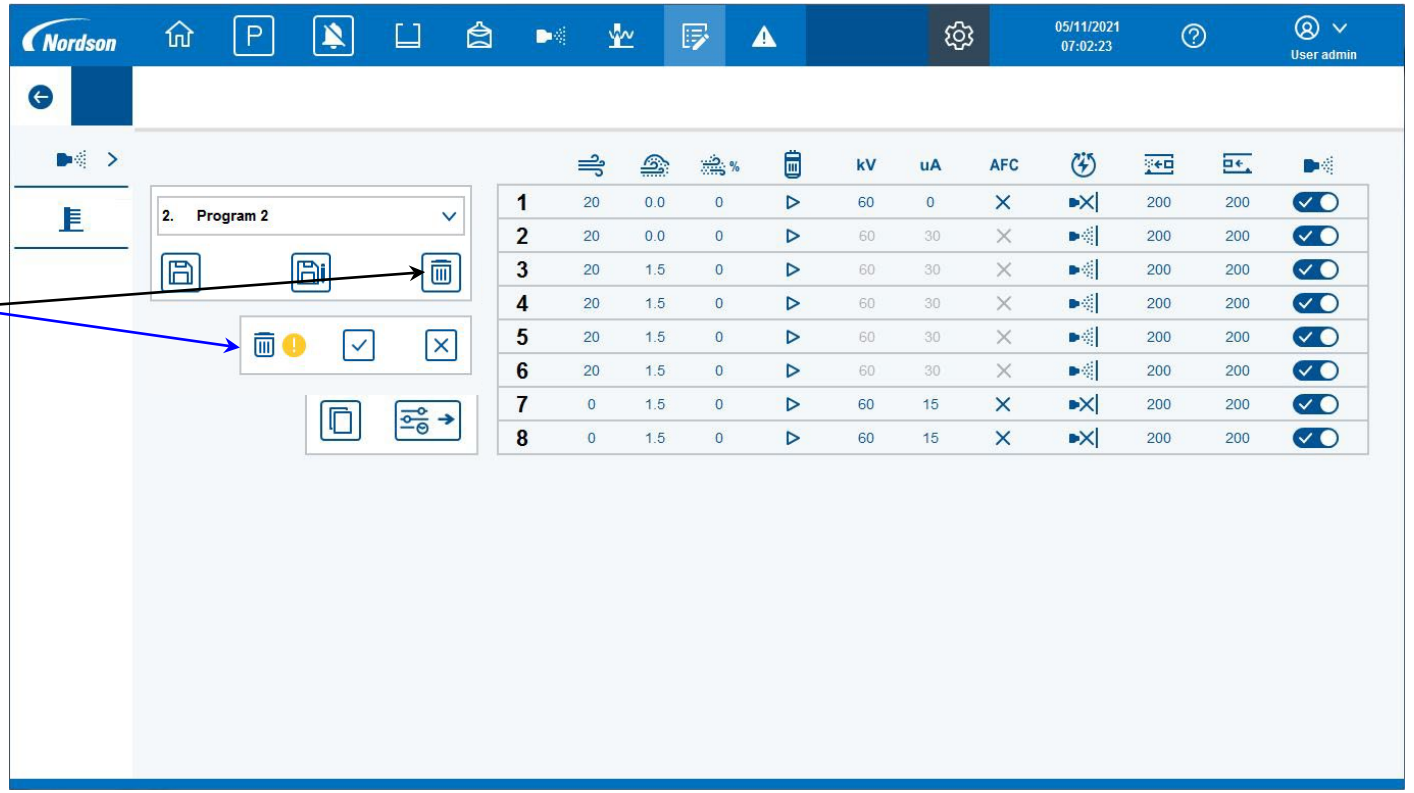
The system has 255 programs available for use.
To delete one of these program‘s data, follow these steps:

1. Select the program to delete as shown on page 29.

2. Press the delete button. A confirmation window will appear.

3. Press the ☒ button to cancel the delete process.

Press the ☑ button to delete the program data.



When the delete process is complete, the name window will be empty, and all table entries will show zero.

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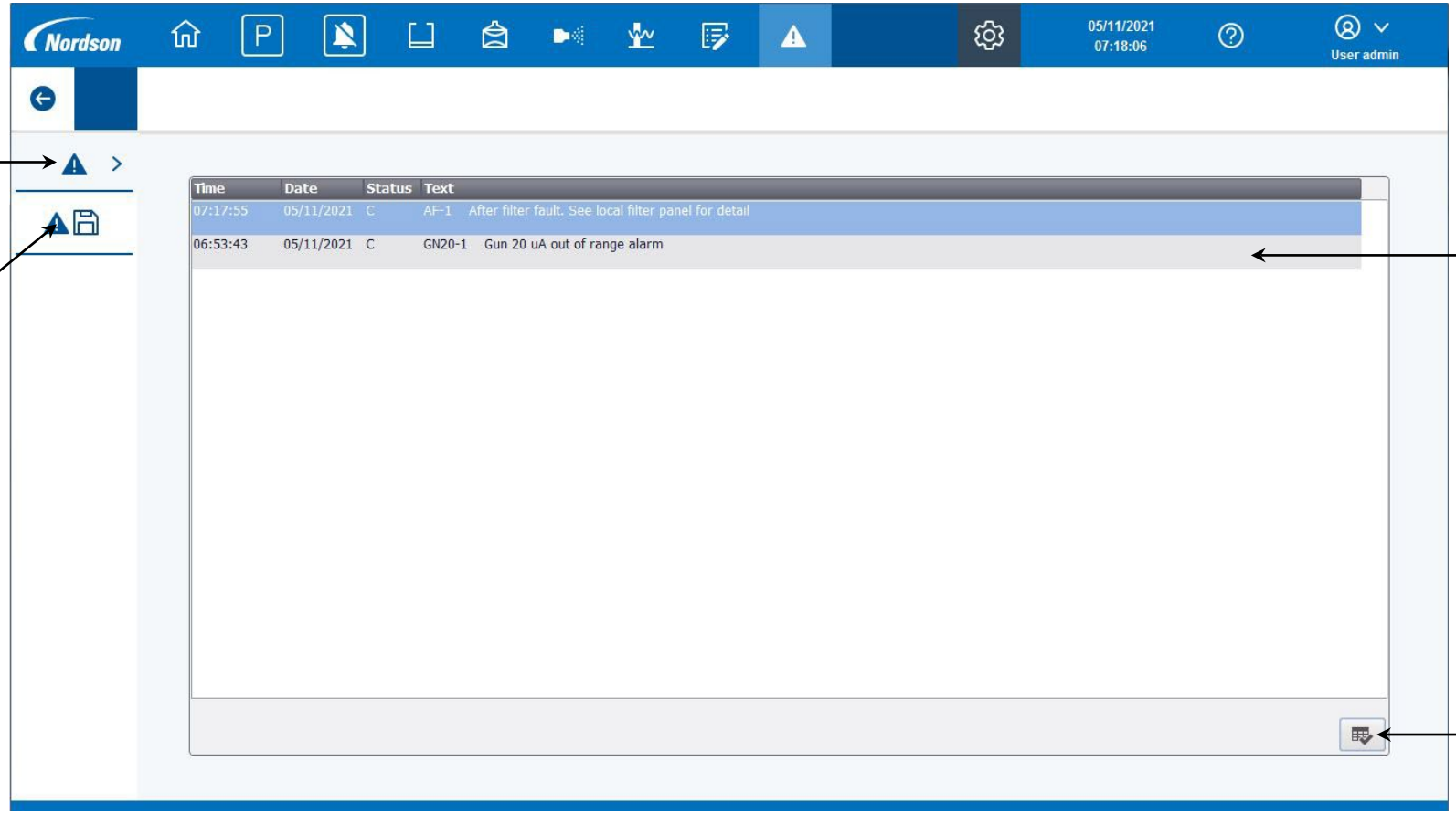
System Alarm List

This screen displays all system alarms.



Press to display current active alarms.

Press to display historical alarms.

Displays any current or historical alarms.

Press to acknowledge any new alarms.

PowderPilot™ 4.x - System Operator Card

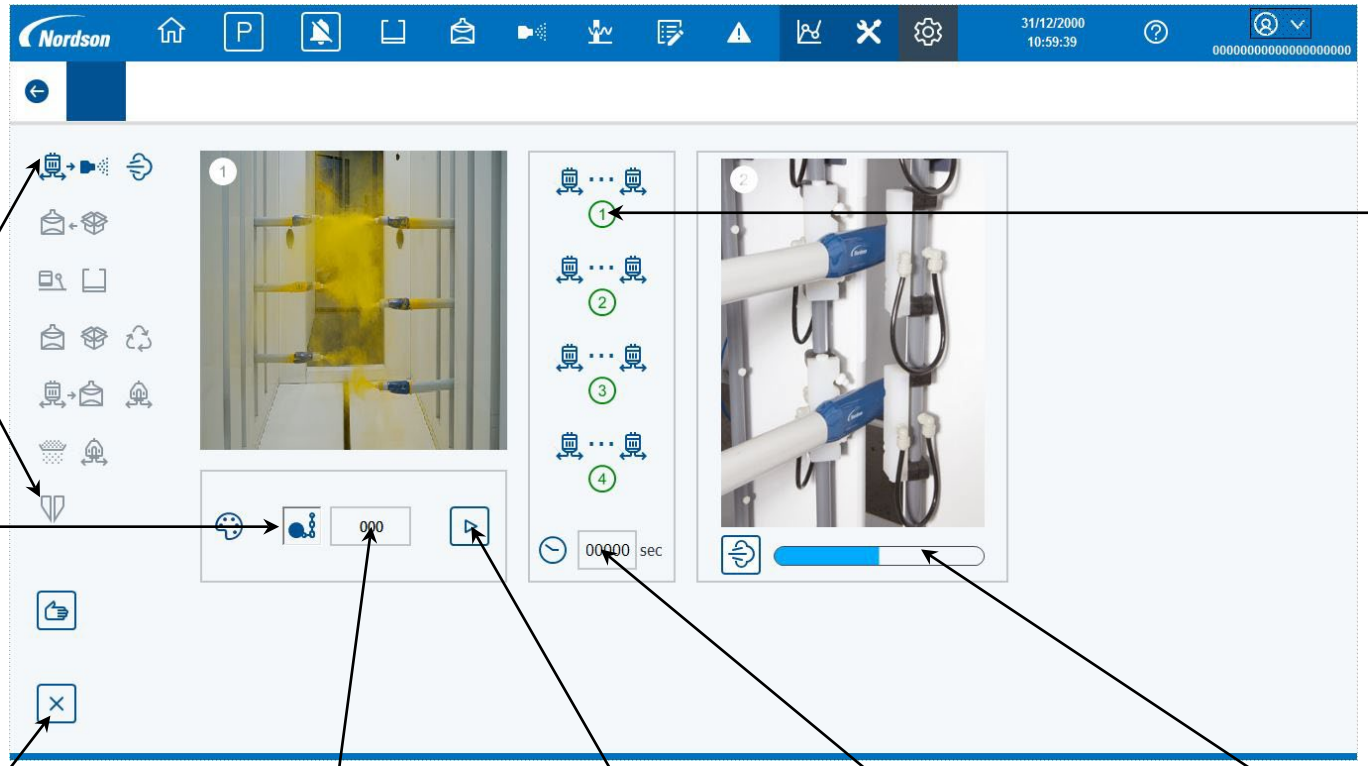
Colour Change Sequence

Press this button on the feed centre control screen to perform a colour change.

PowderPilot™ 4.x - System Operator Card

Colour Change Sequence – Continued

Step 1 - This step purges the powder hoses clean and also cleans the outside of the guns using external gun blowoff nozzles. The 1st step in purging the powder hoses is to send a low pressure air stream down each powder hose to remove the majority of the powder in the hose. Then high pressure pulses of air are used to thoroughly clean the hose.



Current cleaning step indication

Press to toggle the clean type required between easy and hard powders.

The system performs an easy powder purge with less purge pulses.

The system performs a hard powder purge with more purge pulses.

Press to abort the colour change sequence

Displays the number of purge pulses that will be performed.

Press to start the purge.

Displays the time remaining until purge is complete.

External gun clean progress bar.

Indicates which group of 8 pumps are currently being purged.

To clean the outside of the guns, the Z-axis takes the guns fully into the booth, the external gun blow off nozzles are activated and the guns are retracted out of the booth again at slow speed.

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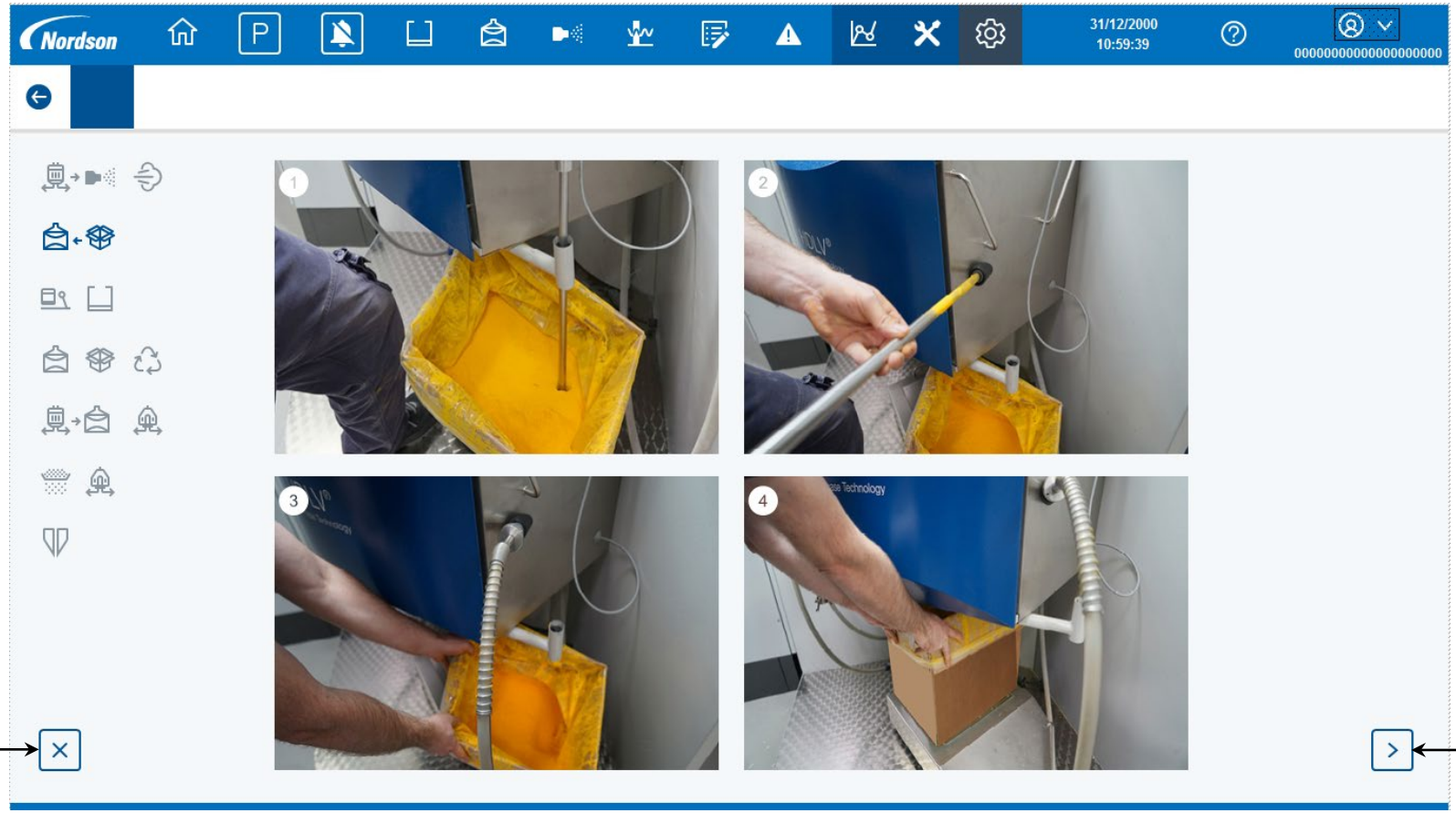
Colour Change Sequence – Continued

Step 2 - This step requires the suction lance to be taken out of the virgin box and placed into its purge location.
The box then needs to be placed directly under the hopper ready for emptying back into the box in the next step as detailed in the pictures.
This screen is automatically displayed when the powder hose purge has completed.



Press to abort the colour change sequence.

Press to acknowledge these actions have been completed.

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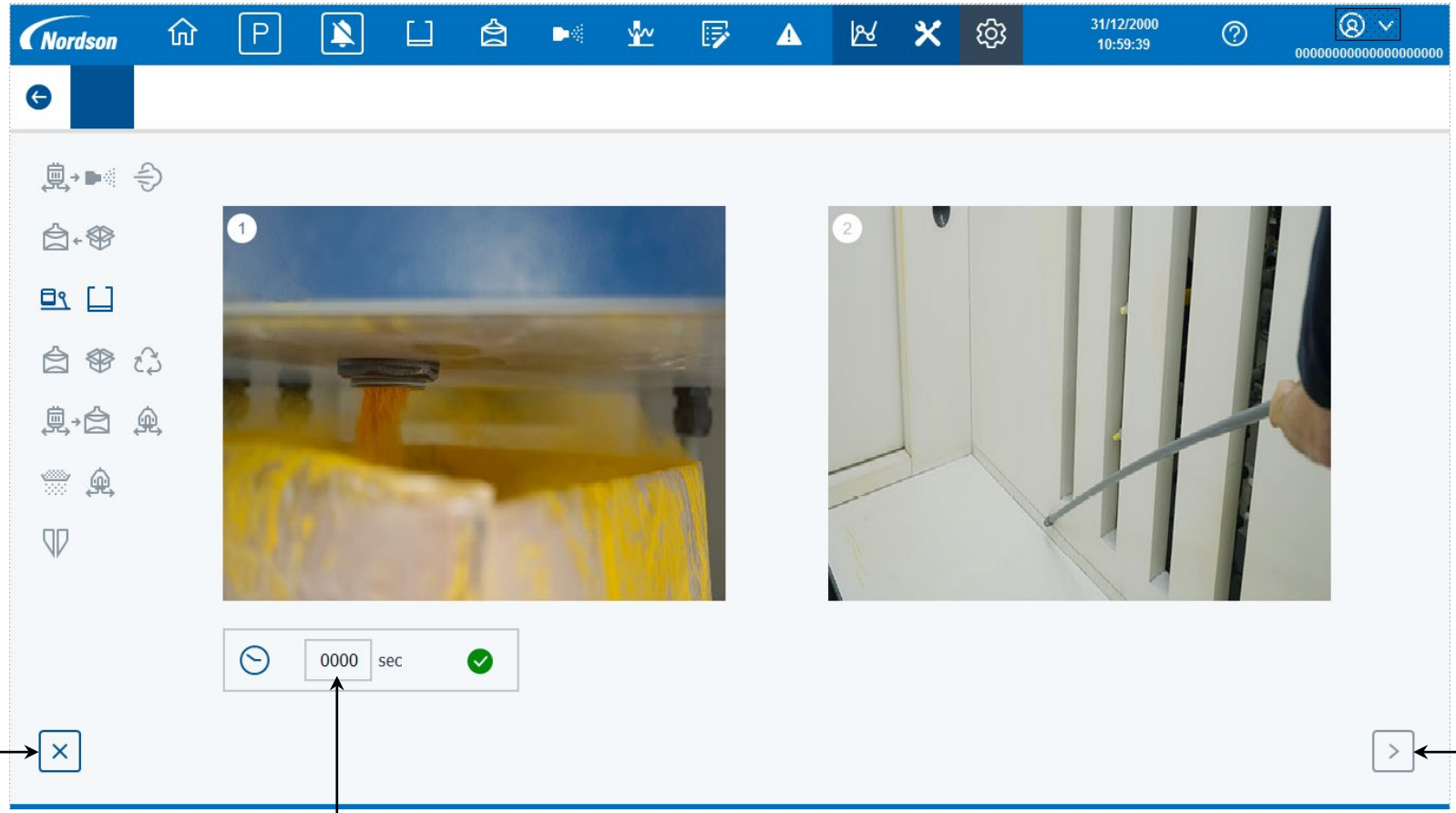
Colour Change Sequence – Continued

Step 3 - This step empties the powder in the hopper back into the powder box. The booth canopy then needs to be cleaned down.



Press to abort the colour change sequence.

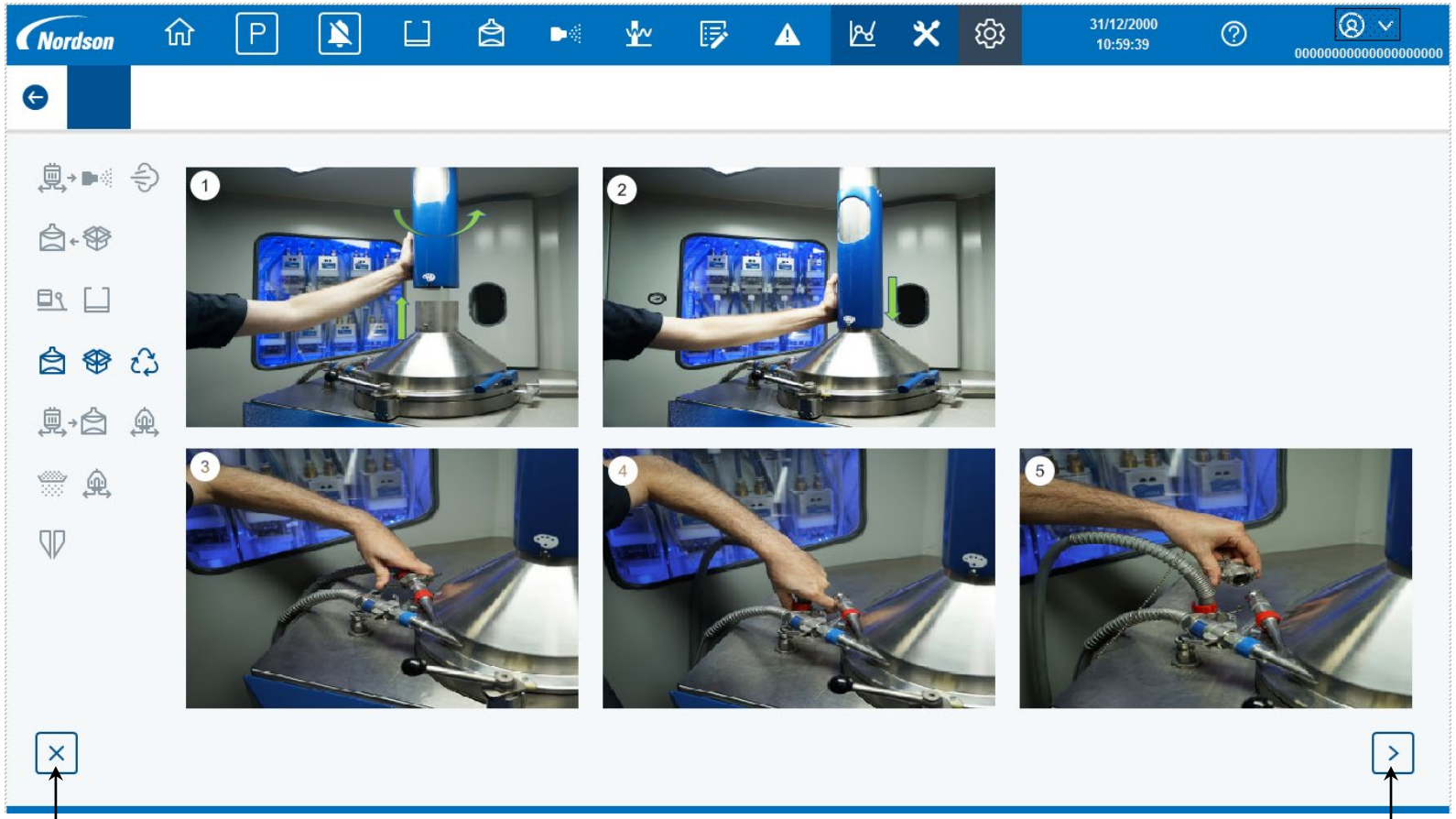
Displays the remaining time the hopper must empty for before the aknowledge button is enabled to allow the next step to be performed.

Press to acknowledge these actions have been completed.
This button only becomes active after the remaining hopper empty time reaches zero.

PowderPilot™ 4.x - System Operator Card

Colour Change Sequence – Continued

Step 4 - This step requires the vent tube to be rotated to the hopper purge position and the virgin / reclaim pump delivery hoses to be placed in their respective purge positions as detailed in the pictures.



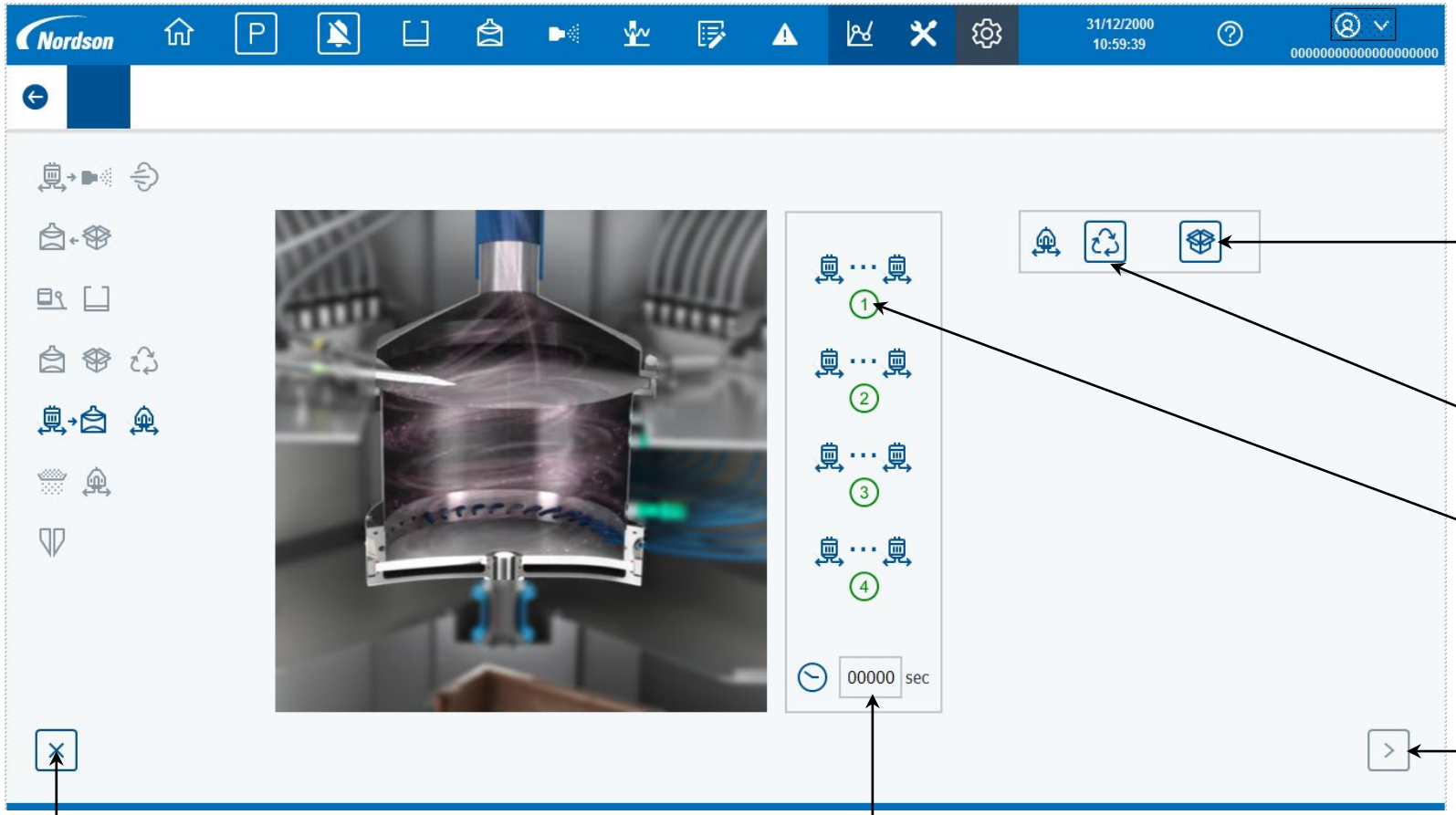
Press to abort the colour change sequence.

Press to acknowledge these actions have been completed.

PowderPilot™ 4.x - System Operator Card

Colour Change Sequence – Continued

Step 5 - This step purges the powder suction hoses clean. The 1st step in purging the suction hoses is to send a low pressure air stream down each powder hose to remove the majority of the powder in the hose. Then high pressure pulses of air are used to thoroughly clean the hose.



Press to enable purging of the box feed virgin pump.

Press to enable purging of the cyclone reclaim pump.

Indicates which group of 8 pumps are currently purging.

Press to acknowledge the operator is ready to move onto the next step. This button only becomes active after the powder suction hose purge is complete.

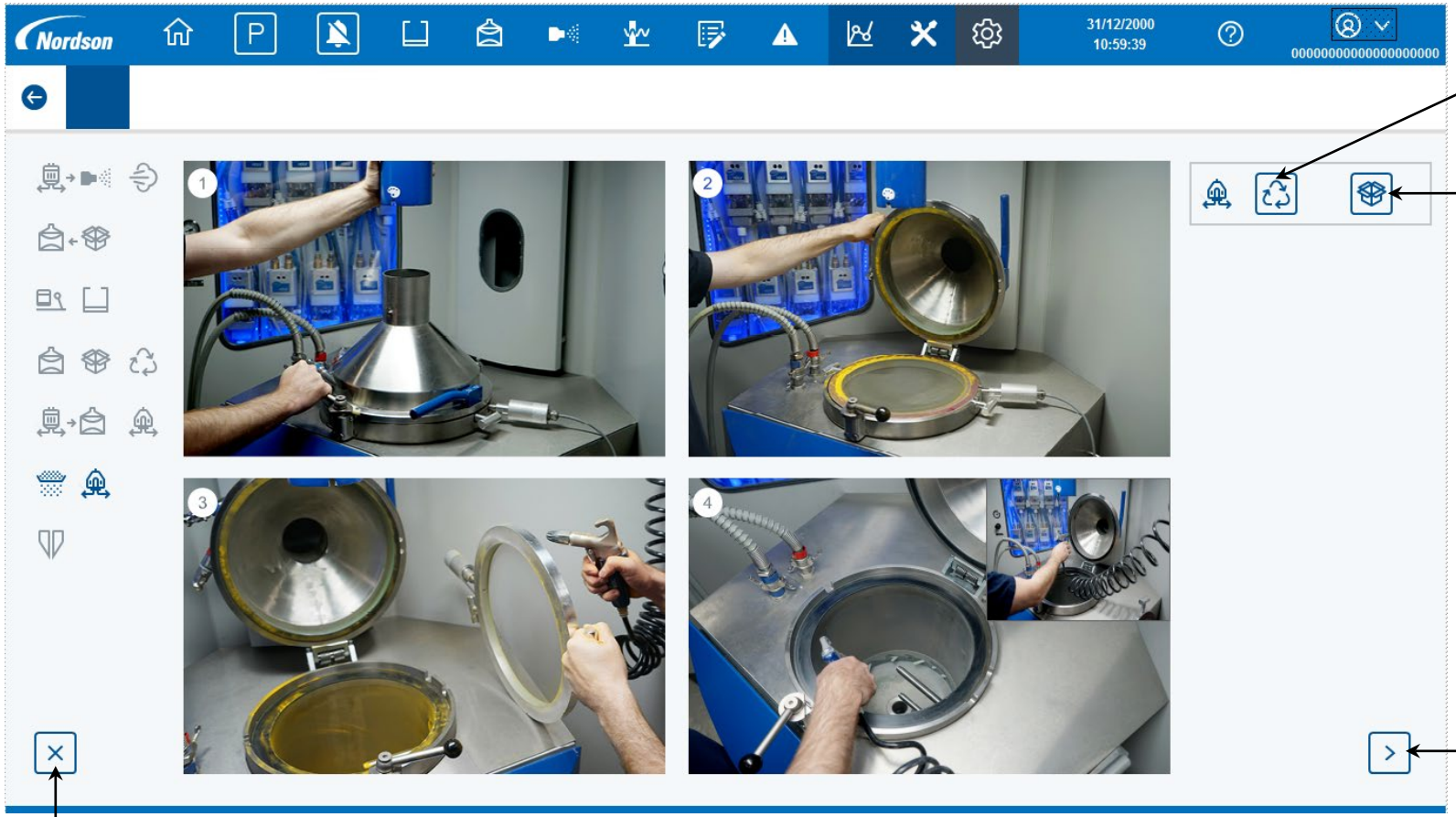
Press to abort the colour change sequence.

Displays the time remaining until purge is complete.

PowderPilot™ 4.x - System Operator Card

Colour Change Sequence – Continued

Step 6 - This step requires the inside of the hoper and the ultrasonic sieve screen to be cleaned by the operator.
This is done by opening the hopper lid and blowing the hopper clean with a manual air gun as detailed in the pictures.



Press to enable purging of the cyclone reclaim pump.

Press to enable purging of the box feed virgin pump.

Press to acknowledge the operator is ready to move onto the next step.

Press to abort the colour change sequence.

PowderPilot™ 4.x - System Operator Card

Colour Change Sequence – Continued

Step 7 - This step requires the inside of the cyclone to be cleaned by the operator.
This is done by opening the cyclone doors and collection hopper and blowing clean with the manual air lance as detailed in the pictures.