PLEASE READ THIS DOCUMENT CAREFULLY PRIOR TO INSTALLATION AND/OR START UP. IT CONTAINS SPECIFIC PRECAUTIONARY STATEMENTS RELATIVE TO WORKER AND EQUIPMENT SAFETY.

THIS DOCUMENT SHOULD BE READ IN CONJUNCTION WITH THE INSTALLATION, OPERATION AND MAINTENANCE MANUAL OF THE DUST COLLECTOR UNIT WHOSE REVERSE JET PULSE CLEANING SYSTEM IT IS TO CONTROL.

**WARNING**

WARNING, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in personal injury and extensive damage.

**NOTICE**

NOTICE is used to address practices not related to personal injury that may result in damage to equipment.

**WARNING**

Regularly check that all equipment is properly selected, sized and operated for the intended use. Discuss any questions relating to the application, use or maintenance of any Donaldson equipment with your Account Manager.

The delineation of hazardous areas within a work area or facility is beyond the responsibility of Donaldson. Consequently, the suitability of electrical equipment provided by Donaldson to be installed within these hazardous areas is also not the responsibility of Donaldson.

Electrical equipment supplied by Donaldson may or may not be suitable for use in a hazardous area. Certain equipment is suitable for use in certain types of hazardous areas and those equipment are provided with certificates of suitability.

In order to protect your interest, Donaldson strongly recommends that you seek professional advice from qualified persons regarding the delineation of hazardous areas and the suitability of Donaldson’s equipment within these areas.

The STi timer in its standard form as described in this manual is NOT suitable for hazardous areas. Please consult your Account Manager for special requirements.

The timer must be installed in compliance with Australian and New Zealand standards. Improper installation may contribute to conditions in the work area or facility that could result in severe personal injury as well as product and/or property damage.
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1. TIMER DESCRIPTION

The Solid state pulse Timer intelligent (STi) is the newest addition to the Donaldson range of timers. This timer gives a versatile range of options for controlling the reverse pulse cleaning jets in continuous duty dust collectors.

The STi timer consists of a master card which is able to pulse up to 10 solenoid valves. If the timer needs to control more than 10 valves, the master card needs to be connected to one or more extension cards using the supplied CAT5 cable. The master card talks to the extension cards through differential signalling using the RS 485 protocol. The addition of each extension card increases the maximum number of valves that can be controlled by 10.

At present, three versions are available within the Donaldson STi timer range:

a. STi timer basic (STi) version. This version fulfills the basic functions of pulsing the diaphragm valves on a dust collector and comes with automatic fault detection features.

b. STi timer with on demand cleaning (STi-ODC) version. This version monitors the pressure difference between the clean and dirty air plenums and uses this information to determine if the filters are clean or dirty. When the differential pressure crosses the preset levels, the timer activates cleaning of the filter media.

c. STi timer with on demand cleaning and tube cleaner (STi-ODC-TC) version. This version augments on demand cleaning with its tube cleaner. The tube cleaner passes a jet of compressed air through the hose connecting it to the dirty air plenum side of the collector to dislodge any product that may accumulate in the tube blocking it. This ensures reliable measurement of differential pressure between the dirty and clean air sides of the collector.

The timer is available in two standard configurations. In the DC configuration these timers drive 24VDC valves where the input to the timer can be between 110-240 VAC or 24VDC. The timers are also available in a legacy AC configuration wherein the timers can drive either 110 VAC or 240 VAC solenoids supplied in older dust collectors, where the input and the output from the timer are the same (e.g. if the timer is intended to drive 240VAC solenoid valves then the power input to the timer should be 240VAC). The timer can be reconfigured to suit special requirements – please contact your Account Manager to discuss your specific requirements.

The standard program design of these timers is such that when only one valve is to be pulsed at any instance (sequential mode), up to 60 valves can be controlled by the timer. When more than one valve is to be pulsed at the same time (parallel mode) there can be up to 4 groups each containing 60 valves. The STi timer can be custom programmed to allow for a higher number of valves to be controlled – please contact your Account Manager to discuss your specific requirements.
<table>
<thead>
<tr>
<th></th>
<th>STi basic version</th>
<th>STi ODC version</th>
<th>STi ODC-TC version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Functional Description</strong></td>
<td>The basic version automatically pulses the valves at regular intervals as long as it is powered up and has not been manually halted either manually or by an interrupt signal.</td>
<td>The ODC version pulses the valves when it detects that the filters have become dirty with the option of faster pulsing when it detects the filters are significantly dirty.</td>
<td>This version operates similar to an ODC version and has additional hardware for cleaning its measurement tubes so that it can accurately detect when the filters become dirty.</td>
</tr>
<tr>
<td><strong>STANDARD ENCLOSURE PROPERTIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycarbonate UV rated enclosure</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Enclosure IP65 rated</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>BASIC FEATURES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alphanumeric digital display</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Maximum number of valves that can be connected to the master card</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Maximum number of valves that can be independently controlled in sequential mode</td>
<td>60 valves</td>
<td>60 valves</td>
<td>60 valves</td>
</tr>
<tr>
<td>Maximum number of valves that can be independently controlled in parallel mode</td>
<td>Maximum 4 blocks, each with up to 60 valves</td>
<td>Maximum 4 blocks, each with up to 60 valves</td>
<td>Maximum 4 blocks, each with up to 60 valves</td>
</tr>
<tr>
<td>Automatic solenoid valve electrical fault detection facility</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Reporting facility available to identify if the system is pulsing or is halted (through General Warnings relay alarm)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Manual (continuous) or automatic (on demand) cleaning facility available</td>
<td>Continuous Only</td>
<td>Both Continuous and On Demand</td>
<td>Both Continuous and On Demand</td>
</tr>
<tr>
<td>Tube cleaning facility</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Standard pulsing sequence available</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Arbitrary pulsing sequence available</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Possible range for pulse duration range</td>
<td>50-990 ms</td>
<td>50-990 ms</td>
<td>50-990 ms</td>
</tr>
<tr>
<td>Possible range for interval between pulses during NORMAL pulsing</td>
<td>1-999 s</td>
<td>1-999 s</td>
<td>1-999 s</td>
</tr>
<tr>
<td>Possible range for interval between pulses during FAST pulsing</td>
<td>N/A</td>
<td>1-99s</td>
<td>1-99s</td>
</tr>
<tr>
<td>Possible range for number of cycles for offline cleaning</td>
<td>0-99 cycles</td>
<td>0-99 cycles</td>
<td>0-99 cycles</td>
</tr>
<tr>
<td>Pressure scale in kPa, in H₂O and mm H₂O available</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Forced pulsing facility when cleaning on demand</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Counter for recording total and session operating hours</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Feature</td>
<td>STi basic version</td>
<td>STi ODC version</td>
<td>STi ODC-TC version</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Counter for recording total as well as number of pulses generated in a session</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Code protection for settings update</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Inputs Available**

<table>
<thead>
<tr>
<th>Feature</th>
<th>STi basic version</th>
<th>STi ODC version</th>
<th>STi ODC-TC version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply requirements</td>
<td>24VDC or 110-240VAC</td>
<td>24VDC or 110-240VAC</td>
<td>24VDC or 110-240VAC</td>
</tr>
<tr>
<td>Sensor input monitoring facility available (interrupts and sensor inputs are on the same terminal)</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No. of sensor inputs that can be monitored</td>
<td>None</td>
<td>2 (either analogue or digital)</td>
<td>2 (either analogue or digital)</td>
</tr>
<tr>
<td>Remote interrupt facility available (interrupts and sensor inputs are on the same terminal)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No. of interrupt switches available</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Outputs Possible**

<table>
<thead>
<tr>
<th>Feature</th>
<th>STi basic version</th>
<th>STi ODC version</th>
<th>STi ODC-TC version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication to Extension Cards via RS 485 bus through CAT5 cable with twisted pair</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Constant 24VDC output available via RS 485 bus</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Relay alarm for system health, triggered off when the timer identifies that the dust collection system is no longer able to operate efficiently</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Relay alarm for warnings, triggered when the timer identifies that there might be something wrong with the dust collection system</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4-20mA current loop for remote monitoring of differential pressure</td>
<td>N/A</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Optional Extras (requires additional hardware)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>STi basic version</th>
<th>STi ODC version</th>
<th>STi ODC-TC version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken bag detection feature</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Compressed air header pressure measurement</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
Figure 1: STi master cards (a) basic version and (b) ODC / ODC-TC version. Note the legacy AC version has different circuitry.
By default, the order in which the timer pulses the valves is consecutive (standard pulse sequence) however it is possible to define an arbitrary pulse sequence during commissioning. Donaldson’s IAF Engineering Department can advise if that is required after reviewing all available facts.

Unless cards are specifically ordered as replacement parts, the timers are generally supplied in a lockable UV stabilised, IP65 rated polycarbonate enclosure, which may or may not have valves fitted directly on to it. Other enclosures (mild steel/fibre glass/stainless steel) may be supplied if specifically requested.

2. INSTALLATION GUIDE

2.1 MECHANICAL INSTALLATION

Each STi timer enclosure (whether housing a master or extension cards) will need to be bolted to either a mounting bracket for mounting to, or be directly bolted onto, a suitable vibration free surface on or near the dust collector.

If the STi timer is supplied with a dust collector, it will be supplied with the necessary mounting brackets. Depending on the dust collector unit, the timer may already be bolted to the dust collector using these brackets, or the brackets may be supplied loose for installation by others as close as possible to the collector on site.

NOTE

Timers ordered as spare parts are not supplied with any mounting brackets. If you need replacement bracket, please advise your Account Manager when you place your order for the timer.

Figure 3 shows the position of the STi timer master enclosure, marked as (A) and the extension enclosure as relevant, marked as (B) for different dust collector models. The figure also shows the location of the pressure taps for the connection of the clean air and dirty air sides marked (C) and (D) respectively.
STi Timer Range

b) Dalamatic Cased Unit Series DLMC

c) Dalamatic Insertable Venting Unit Series DLMV

d) Siloair Unit Series VS

e) Downflo Oval Unit Series DFO

Figure 3: Location of STi timer master and extension card enclosure(s) on different Donaldson dust collectors

f) Powercore Series CPV
Depending on the dust collector unit that the timer has been configured for, it may be supplied with or without solenoid valves fitted on the enclosure. If the timer enclosure if fitted with solenoid valves, it must not be mounted more than 1.5m away from the diaphragm valves on the collector.

NOTE
On the DFO series and the Powercore CPC series units, the master enclosure is normally shipped loose. The master and extension cards are housed in a single enclosure on the Powercore VH series unit. These enclosures should be installed away from the dust collector by others.
2.2 ELECTRICAL INSTALLATION

2.2.1 Connections on the master card

Step 1 Access the input/output terminals on the master card

After opening the STi timer master enclosure door, undo the dome nut on each corner of the face plate to release the face plate and the master card PCB. Pull out the PCB and carefully rotate it inside out to access all the input and output terminals. Figure 4 identifies the different terminals on the STi timer master card.

J1 Remote Interrupt/Sensor 1 contacts – digital or analogue
J2 Remote Interrupt/Sensor 2 contacts – digital or analogue
J4 External Power supply, 110-240VAC IN
J7 External Power supply, 24VDC IN
J8 RS 485 Power bus to extension cards, 24VDC OUT
J9 RS 485 Communication bus to extension cards
J11 Voltage free digital input to trigger Offline Cleaning function
J103 Relay contacts for General Warning

J109 Relay contacts for Alarm on Interrupt/Sensor 1 state (not available on basic version)
J111 Relay contacts for Alarm on Interrupt/Sensor 2 state (not available on basic version)
J113 Relay contacts for System Health Alarm
J305 5x Solenoid common contacts
J306 5x Solenoid common contacts + 10 Solenoid active contacts
J501 Remote dP monitoring contacts, 4-20 mA OUT (not available on basic version)

Step 2 Check connection of solenoid valves to STi timer card terminals

The STi enclosure is generally supplied with solenoid valves fitted to it. In this case, the solenoid valves will be wired to the J305 and J306 terminals of the STi master card. The connection of the solenoid valves to these terminals on the STi master card will need to be verified. If a connection is missing, please establish this connection. Each solenoid valve must be connected to a separate active terminal, however multiple solenoid valves can be connected to the same common terminal.

Figure 4: Schematic diagram identifying the different terminals on the STi timer master card 24VDC version.
When the STi enclosure is supplied without solenoid valves fitted onto it, wiring from the terminals on the timer to those on the solenoid valves is to be carried out by others.

**Optional Step 3 Connect the extension cards to the master card**

Depending on the dust collector with which the STi timer is supplied, the master card may be supplied with additional extension cards. These extension cards may be supplied fitted in the same enclosure as the master card, or in separate enclosures.

If a separate enclosure for the extension card is supplied, a 5m industrial grade CAT5 cable is provided with the timer to connect the extension card to the master card through the RS 485 link on the cards (terminal J8 and J9 on the master card). This cable is supplied wired to the master card, and is labelled to identify the different cores of this cable.

If two or more enclosures for the extension cards are supplied, a 1m industrial grade CAT5 cable is provided to link the different extension cards, in addition to the standard 5m cable for linking the first (closest) extension card to the master card. Additional lengths of the CAT5 cable can always be ordered.

The communication connection from the master card to the different extension cards can be daisy chained as shown in Figure 5. Trim the CAT5 cable linking the extension cards to one another as required.

All extension cards can draw power from the master card as long as the total length of CAT5 cable linking the master and the last extension card is less than 20 metres. If the length is more than 20 metres, then extension cards should be connected to their own power supply which is separate to the master card. A suitable heavy duty power cable should be selected in accordance with AS 3000.

**NOTE**

If the power source for the extension cards is not correctly selected, then the valves might not pulse. Most commonly numerous valves will report solenoid faults, and the timer may display the Cumulative Valve Fault error message.

The STi timer monitors the current drawn by the coil of each solenoid valve when it is activated and uses this information to identify any coil faults.

For this feature to function properly, each solenoid valve must be terminated at the active and common terminals of the card that it is connected to, so as to form a complete current loop.

If the solenoids are not wired in this manner, the timer will not be able to detect the current drawn by the coils and will identify that there is an open circuit fault on the coils.
Figure 5: Schematic diagram showing the connection of the RS 485 communication bus from the STi master card to multiple extension cards.
Optional Step 4 Activate Offline Cleaning

Depending on the nature of the product being collected by the dust collector, this product might adhere to the filter elements when the fan is running. In this case, it is beneficial to pulse the filter media 3–5 times after the fan is switched off, to dislodge or remove any product deposited on the filters.

If this feature is used, a separate hole for connecting the dust collector fan to the timer has to be drilled in the STi enclosure. A cable gland matching the size of this drilled hole, and of at least IP65 rating, must be fitted on this hole. The position of the hole should be determined such that there is minimal twisting of the cables inside the STi enclosure.

To activate this feature, the normally-closed (NC) voltage-free auxiliary contact of the dust collector fan must be wired to the terminal J11 of the STi timer, so that it can detect when the fan has been turned off. The cable joining these two terminals should enter the STi enclosure through the hole described in the previous paragraph.

Finally, if power to the timer is lost, the timer recognises that the pulse cleaning system has been de-energised and filters are not being cleaned.

If any of the above conditions are reached, the timer switches the System Health Alarm Relay. If this relay is triggered, an electrical notification can be passed on to the plant control room, so that the operators are immediately made aware of the issue.

Optional Step 5 Activate System Health Alarm Relay Feedback

The STi timer is able to identify if there is a short or an open circuit on the connections to any of the valves that are controlled by it. If the timer detects that more than 30% of the solenoid valves are faulty, it identifies that it will not be able to maintain the differential pressure.

Also, if the differential pressure crosses the Alarm set point, the timer recognises that it has failed to maintain differential pressure within the safe operating range.

If any of the above conditions are reached, the timer switches the System Health Alarm Relay. If this relay is triggered, an electrical notification can be passed on to the plant control room, so that the operators are immediately made aware of the issue.

To deactivate offline cleaning, make sure to bridge the two contacts of J11.

Optional Step 6 Activate General Warnings Relay Feedback

To activate this feature, the input from the plant control room must be wired to the normally closed (NC) contact of terminal J111 of the STi timer master card. The relay contacts are rated up to 1A 30VDC or 0.5A 125VAC.

It might be necessary to drill a hole for the cable to enter the STi enclosure. If a hole is drilled on the enclosure, a cable gland matching the size of this drilled hole, and of at least IP65 rating, must be fitted on this hole. The position of the hole should be determined such that there is minimal twisting of the cables inside the STi enclosure.

The Offline Cleaning feature should not be used in the dust collector units fitted with a soft explosion relief membrane. Pulsing of valves in the absence of the static head generated by the fan can seriously damage these explosion membranes.

To deactivate offline cleaning, make sure to bridge the two contacts of J11.

Table 2: System Health Relay Alarm Trigger Map (Relay ON = System Functioning Properly)

<table>
<thead>
<tr>
<th>Alarm type</th>
<th>Relay On</th>
<th>Relay Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Valve Failure</td>
<td>Valves functioning OK</td>
<td>Multiple valves failed</td>
</tr>
<tr>
<td>Auto dP management Failure</td>
<td>dP below alarm set point</td>
<td>dP over alarm set point</td>
</tr>
<tr>
<td>Power</td>
<td>Power connected</td>
<td>Power disconnected</td>
</tr>
</tbody>
</table>

To activate this feature, the input from the plant control room must be wired to the normally closed (NC) contact of terminal J111 of the STi timer master card. The relay contacts are rated up to 1A 30VDC or 0.5A 125VAC.

It might be necessary to drill a hole for the cable to enter the STi enclosure. If a hole is drilled on the enclosure, a cable gland matching the size of this drilled hole, and of at least IP65 rating, must be fitted on this hole. The position of the hole should be determined such that there is minimal twisting of the cables inside the STi enclosure.

To activate this feature, the input from the plant control room must be wired to the normally closed (NC) contact of terminal J111 of the STi timer master card. The relay contacts are rated up to 1A 30VDC or 0.5A 125VAC.

It might be necessary to drill a hole for the cable to enter the STi enclosure. If a hole is drilled on the enclosure, a cable gland matching the size of this drilled hole, and of at least IP65 rating, must be fitted on this hole. The position of the hole should be determined such that there is minimal twisting of the cables inside the STi enclosure.

To deactivate offline cleaning, make sure to bridge the two contacts of J11.

Optional Step 6 Activate General Warnings Relay Feedback

The STi timer identifies if a short or an open circuit is detected in any of the valves controlled by it. If an open or a short circuit is detected on any of the valves is detected, the timer triggers this relay.

The STi timer also monitors if the number of extension cards that it should be connected to it (defined by its settings which are automatically assessed during POST) are actually connected to it. If it detects that at any time during operation the number of actual extension cards does not match the number that it should be controlling (indicating a communication fault), it triggers this relay.
If the pulsing of the valves has been paused either manually at the timer or using the remote interrupt feature, the timer triggers this relay.

The STi timer and the valves need to be serviced at regular intervals to ensure that they are functioning optimally. The STi timer has counters that keep track of the number of hours that the STi timer has been used and the number of pulses generated by the valves. The timer triggers this relay when the counters have exceeded their preset values.

Table 3: General Relay Warnings Trigger Map (Relay ON = Something may require operator attention)

<table>
<thead>
<tr>
<th>Warning type</th>
<th>Relay On</th>
<th>Relay Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Error</td>
<td>Unable to communicate with all extension cards</td>
<td>Able to communicate with all extension cards</td>
</tr>
<tr>
<td>Individual Valve Fault</td>
<td>SC/OC detected on any valve</td>
<td>No valve faults</td>
</tr>
<tr>
<td>Pulsing Notification</td>
<td>Pulsing paused manually or by interrupt signal</td>
<td>Pulsing not paused manually or by interrupt signal</td>
</tr>
<tr>
<td>Service needed</td>
<td>Counters crossed threshold</td>
<td>Counters below threshold</td>
</tr>
</tbody>
</table>

Optional Step 7 Activate Remote Interrupt Function

It is possible to remote interrupt (temporarily pause) the pulsing of the solenoid valves by passing a digital signal to the input terminals 1-D or 2-D and G of J1 or J2. When the interrupt signal is active, the pulsing of the valves is temporarily paused.

To deactivate the remote interrupt feature, make sure to bridge the input contacts (preferably 1-D and 2-D) with the ground contact (G) placed between J1 and J2.

It might be necessary to drill a hole for the cable to enter the STi enclosure. If a hole is drilled, a cable gland matching the size of this drilled hole, and of at least IP65 rating, must be fitted on this hole. The position of the hole should be determined such that there is minimal twisting of the cables inside the STi enclosure.

NOTE

If the remote interrupt function is to be activated, the input terminal must be selected as an interrupt terminal during software setup.

On the ODC and the ODC-TC versions, the relays (either J109 or J111) will be triggered when an interrupt signal is active. This is in addition to the General Warnings Relay (J103).

Optional Step 8 Activate External Sensor Monitoring and Coupled Relay Alarm

(Not available in the basic version)

The STi timer is able to monitor the readings of the external sensors connected to the input terminals J1 or J2. The timer triggers independent relays if either of the inputs to these terminals crosses the threshold values set in the STi software, which can be used as an alarm to monitor that the dust collection system is working satisfactorily.

To deactivate the monitoring of external sensors, make sure to bridge the input contacts (preferably 1-D and 2-D) with the ground contact (G) placed between J1 and J2.

The relay contacts are rated up to 1A 30VDC or 0.5A 125VAC.
Table 4: External Sensor Monitor Relays Trigger Map  
(OFF = Sensor within range)

<table>
<thead>
<tr>
<th>Alarm type</th>
<th>Relay On</th>
<th>Relay Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor readout</td>
<td>At/beyond threshold cross over</td>
<td>Before threshold cross over</td>
</tr>
</tbody>
</table>

It might be necessary to drill a hole for the cable to enter the STi enclosure. If a hole is drilled, a cable gland matching the size of this drilled hole, and of at least IP65 rating, must be fitted on this hole. The position of the hole should be determined such that there is minimal twisting of the cables inside the STi enclosure.

NOTE
If the sensor monitoring function is to be activated, the input terminal must be selected as an alarm terminal during software setup.

Table 5: Terminals for sensor and feedback alarm connection

<table>
<thead>
<tr>
<th>Connect to Input Terminal</th>
<th>Feedback alarm relay terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor Input 1</td>
<td>J1-A if analogue, or J1-D if digital and G</td>
</tr>
<tr>
<td>Sensor Input 2</td>
<td>J2-A if analogue, or J2-D if digital and G</td>
</tr>
</tbody>
</table>

Optional Step 9 Activate Remote Differential Pressure Reporting
(Not available on the basic version)

Differential pressure across the dirty and clean air sides of the dust collector can be monitored remotely by an external device (commonly a PLC, DCS or a SCADA system) via terminal J501. To activate this feature, replace the existing terminal link with the external device, forming a 4-20mA current loop.

The output from terminal J501 is scaled with the differential pressure read across the dirty and clean air sides of the dust collector, to the range of 4-20 mA.

NOTE
The 4-20 mA current loop has been designed to interface with an external device with an input impedance of 1000. If the input impedance of the external device is greater, then the range of the current supplied to the external device will be scaled down.

NOTICE
No voltage should be applied across terminal J501. Applying a voltage across this terminal will cause irreparable damage to the electronic circuitry of the timer.

Optional Step 10 Check power supply connection to the tube cleaner
(Only available on the ODC-TC versions)

In the ODC-TC version, the STi enclosure comes fitted with a tube cleaner on its back panel. This tube cleaner needs to be connected to the terminal J3 on the STi master card.

As a standard, the STi timer is generally supplied with this connection already established. However it is recommended that the connection of the tube cleaner to the STi master card be verified before the timer is switched on. If the connection has come undone or is missing, please establish this connection.

Step 11 Connect power supply to the STi timer master card

The STi enclosure is supplied with a M12 hole fitted with a IP65 rated cable gland for the power supply cable to enter the enclosure. Use this cable gland to pass the power supply cable into the STi enclosure.

If the STi timer master box is to run on AC power, connect the power supply cables to terminal J4. The terminal can accept between 110 and 240 volt AC supply.

If the timer card is to run on DC power, connect the power supply cables to terminal J7. The voltage of this power supply should be regulated at 24 volt DC supply.
2.2.2 Connections on the extension card(s)

Each STi extension card contains 2 RS 485 bus contacts, 10 solenoid active contacts, 2 solenoid common contacts and 8 DIP switches as shown in Figure 6.

Step 1: Connect the card to the master and/or other extension cards

The STi extension cards need to be connected to the master either directly (when it is the closest extension card) or through another extension card in a daisy chained manner as shown in Figure 5. For connecting the communications bus, connect the supplied CAT5 cable (already connected to the master or another extension card) to the A and B terminals of one of the RS 485 bus contacts on either side of the card.

If the extension card is drawing its power supply from the master card, connect the two remaining wires of the CAT5 cable to the 0V and +ve contacts of the RS 485 power bus on the extension card.

If the extension card is independently powered, it might be necessary to suitably insulate the connection leads of the remaining wires of the CAT5 cable. Connect the negative and the positive cables from the independent power source to the 0V and +ve contacts of the RS 485 power bus. The 0V common must be connected to the external power supply 0V line.

The STi extension enclosure is supplied with two holes fitted with IP65 rated cable glands for the RS 485 bus cables to enter and leave the enclosure. Use these holes to pass the cables in and out of the enclosure. If there is no cable leaving the enclosure, then make sure to plug the hole that is not used.

Figure 6: A standard STi timer extension card (24VDC) together with its schematic identifying the different terminals.
Step 2 Configure DIP switches

There are a set of 8 DIP switches on the bottom left corner of each extension card. These DIP switches control how the extension card sends and receives information to and from the STi timer master card, allowing the master to maintain effective control over the solenoid valves connected to extension card.

Sequential Mode

Unused switches

ON (1)

OFF (0)

Bank selection switches

Parallel Mode

Block selection switches

ON (1)

OFF (0)

Unused switches

Bank selection switches

Figure 7: Configuration of the DIP switches on the STi timer extension card

Switches 1 to 3 give each extension card a unique binary local address so that it can be individually identified by the master card. Addresses from 000 to 101 are possible in a standard unit.

Switches 6 to 8 are unused in the standard units, and do not impact extension card configuration.

In Sequential Mode

In Sequential Mode only one valve activates at a time. Switches 4 and 5 are normally unused in Sequential Mode. If any of these are set to the ON position, the configuration automatically switches to Parallel Mode.

In Parallel Mode

In Parallel Mode multiple valves are activated at once. All cards with the same local address form a bank that pulses together.

Switches 4 and 5 select the order in which the extension cards send return messages back to the master card (the block).

Example DIP switch configuration in sequential mode

Example 1 – DIP switch settings for extension cards connected to a master with valves fitted. Valves pulse sequentially.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Actual Valve No.</th>
<th>Software Valve No.</th>
<th>Valve Block</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Card</td>
<td>Valves 1-10</td>
<td>Valves 1-10</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Extension Card 1</td>
<td>Valves 11-20</td>
<td>Valves 11-20</td>
<td>N/A</td>
<td>000 00 001</td>
</tr>
<tr>
<td>Extension Card 2</td>
<td>Valves 21-30</td>
<td>Valves 21-30</td>
<td>N/A</td>
<td>000 00 010</td>
</tr>
<tr>
<td>Extension Card 3</td>
<td>Valves 31-40</td>
<td>Valves 31-40</td>
<td>N/A</td>
<td>000 00 011</td>
</tr>
<tr>
<td>Extension Card 4</td>
<td>Valves 41-50</td>
<td>Valves 41-50</td>
<td>N/A</td>
<td>000 00 100</td>
</tr>
<tr>
<td>Extension Card 5</td>
<td>Valves 51-60</td>
<td>Valves 51-60</td>
<td>N/A</td>
<td>000 00 101</td>
</tr>
</tbody>
</table>
Figure 8: DIP switch configuration for Example 1

Example 2 – DIP switch settings for extension cards connected to a master with no valves fitted. Valves pulse sequentially.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Actual Valve No.</th>
<th>Software Valve No.</th>
<th>Valve Block</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Card</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Extension Card 1</td>
<td>Valves 1-10</td>
<td>Valves 1-10</td>
<td>N/A</td>
<td>000 00 000</td>
</tr>
<tr>
<td>Extension Card 2</td>
<td>Valves 11-20</td>
<td>Valves 11-20</td>
<td>N/A</td>
<td>000 00 001</td>
</tr>
<tr>
<td>Extension Card 3</td>
<td>Valves 21-30</td>
<td>Valves 21-30</td>
<td>N/A</td>
<td>000 00 010</td>
</tr>
<tr>
<td>Extension Card 4</td>
<td>Valves 31-40</td>
<td>Valves 31-40</td>
<td>N/A</td>
<td>000 00 011</td>
</tr>
<tr>
<td>Extension Card 5</td>
<td>Valves 41-50</td>
<td>Valves 41-50</td>
<td>N/A</td>
<td>000 00 100</td>
</tr>
<tr>
<td>Extension Card 6</td>
<td>Valves 51-60</td>
<td>Valves 51-60</td>
<td>N/A</td>
<td>000 00 101</td>
</tr>
</tbody>
</table>

Figure 9: DIP switch configuration for Example 2

Example DIP switch configuration in parallel mode

Example 3 – DIP switch settings for extension cards connected to a master with valves fitted. Valves connected to the master and extension cards 1 to 3 pulse together as part of block 1.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Actual Valve No.</th>
<th>Software Valve No.</th>
<th>Valve Block</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Card</td>
<td>Valves 1-10</td>
<td>Valves 1-10</td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>Extension Card 1</td>
<td>Valves 11-20</td>
<td>Valves 1-10</td>
<td>2</td>
<td>000 01 000</td>
</tr>
<tr>
<td>Extension Card 2</td>
<td>Valves 21-30</td>
<td>Valves 1-10</td>
<td>3</td>
<td>000 10 000</td>
</tr>
<tr>
<td>Extension Card 3</td>
<td>Valves 31-40</td>
<td>Valves 1-10</td>
<td>4</td>
<td>000 11 000</td>
</tr>
</tbody>
</table>
Example 4 – DIP switch settings for extension cards connected to a master with no valves fitted. Valves connected to extension cards 1 to 4 pulse together.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Actual Valve No.</th>
<th>Software Valve No.</th>
<th>Valve Block</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Card</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Extension Card 1</td>
<td>Valves 1-10</td>
<td>Valves 1-10</td>
<td>1</td>
<td>000 00 000</td>
</tr>
<tr>
<td>Extension Card 2</td>
<td>Valves 11-20</td>
<td>Valves 1-10</td>
<td>2</td>
<td>000 01 000</td>
</tr>
<tr>
<td>Extension Card 3</td>
<td>Valves 21-30</td>
<td>Valves 1-10</td>
<td>3</td>
<td>000 10 000</td>
</tr>
<tr>
<td>Extension Card 4</td>
<td>Valves 31-40</td>
<td>Valves 1-10</td>
<td>4</td>
<td>000 11 000</td>
</tr>
</tbody>
</table>

Example 5 – DIP switch settings for extension cards connected to a master with valves fitted. Valves connected to the master and extension cards 1 and 2 pulse together, and valves on extension cards 3 to 5 pulse together.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Actual Valve No.</th>
<th>Software Valve No.</th>
<th>Valve Block</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Card</td>
<td>Valves 1-10</td>
<td>Valves 1-10</td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>Extension Card 1</td>
<td>Valves 11-20</td>
<td>Valves 1-10</td>
<td>2</td>
<td>000 01 000</td>
</tr>
<tr>
<td>Extension Card 2</td>
<td>Valves 21-30</td>
<td>Valves 1-10</td>
<td>3</td>
<td>000 10 000</td>
</tr>
<tr>
<td>Extension Card 3</td>
<td>Valves 31-40</td>
<td>Valves 11-20</td>
<td>1</td>
<td>000 00 001</td>
</tr>
<tr>
<td>Extension Card 4</td>
<td>Valves 41-50</td>
<td>Valves 11-20</td>
<td>2</td>
<td>000 01 001</td>
</tr>
<tr>
<td>Extension Card 5</td>
<td>Valves 51-60</td>
<td>Valves 11-20</td>
<td>3</td>
<td>000 10 001</td>
</tr>
</tbody>
</table>
**Figure 12: DIP switch configuration for Example 5**

Example 6 – DIP switch settings for extension cards connected to a master with no valves fitted. Valves connected to extension cards 1 to 3 pulse together, and valves on extension cards 4 to 6 pulse together.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Actual Valve No.</th>
<th>Software Valve No.</th>
<th>Valve Block</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Card</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Extension Card 1</td>
<td>Valves 1-10</td>
<td>Valves 1-10</td>
<td>1</td>
<td>000 00 000</td>
</tr>
<tr>
<td>Extension Card 2</td>
<td>Valves 11-20</td>
<td>Valves 1-10</td>
<td>2</td>
<td>000 01 000</td>
</tr>
<tr>
<td>Extension Card 3</td>
<td>Valves 21-30</td>
<td>Valves 1-10</td>
<td>3</td>
<td>000 10 000</td>
</tr>
<tr>
<td>Extension Card 4</td>
<td>Valves 31-40</td>
<td>Valves 11-20</td>
<td>1</td>
<td>000 00 001</td>
</tr>
<tr>
<td>Extension Card 5</td>
<td>Valves 41-50</td>
<td>Valves 11-20</td>
<td>2</td>
<td>000 01 001</td>
</tr>
<tr>
<td>Extension Card 6</td>
<td>Valves 51-60</td>
<td>Valves 11-20</td>
<td>3</td>
<td>000 10 001</td>
</tr>
</tbody>
</table>

**Figure 13: DIP switch configuration for Example 6**
COMPRESSED AIR MANIFOLDS ON DUST COLLECTOR
EACH FITTED WITH 8 DIAPHRAGM VALVES

PULSE SEQUENCING ALGORITHM SET IN ARBITRARY MODE WITH NO. OF VALVES SET AT 24.

**BANK 1**
CONNECTED TO STi MASTER CARD

01 05
02 06
03 07
04 08

**BANK 2**
CONNECTED TO STi EXTENSION CARD 1

09 13
10 14
11 15
12 16

**BANK 3**
CONNECTED TO STi EXTENSION CARD 2

17 21
18 22
19 23
20 24

DIP Config: 000 00 001
DIP Config: 000 00 010

PULSING ORDER: BANK 1 ➔ BANK 2 ➔ BANK 3

*Figure 14: Valve Numbering Schematic Sequential Mode*
### VALVES PULSE TOGETHER

#### BANK 1
- Connected to STi Master Card
- 01-1 → 05-1
- 02-1 → 06-1
- 03-1 → 07-1
- 04-1 → 08-1
- DIP Setting: 000 00 001

#### BANK 2
- Connected to STi Extension Card 2
- 01-2 → 05-2
- 02-2 → 06-2
- 03-2 → 07-2
- 04-2 → 08-2
- DIP Setting: 000 01 000

#### BANK 3
- Connected to STi Extension Card 2
- 01-3 → 05-3
- 02-3 → 06-3
- 03-3 → 07-3
- 04-3 → 08-3
- DIP Setting: 000 10 000

### BANK 2
- Connected to STi Extension Card 3
- 09-1 → 13-1
- 10-1 → 14-1
- 11-1 → 15-1
- 12-1 → 16-1

### BANK 3
- Connected to STi Extension Card 6
- 17-1 → 21-1
- 18-1 → 22-1
- 19-1 → 23-1
- 20-1 → 24-1

### BANK 4
- Connected to STi Extension Card 3
- 09-2 → 13-2
- 10-2 → 14-2
- 11-2 → 15-2
- 12-2 → 16-2
- DIP Setting: 000 01 001

### BANK 5
- Connected to STi Extension Card 4
- 17-2 → 21-2
- 18-2 → 22-2
- 19-2 → 23-2
- 20-2 → 24-2
- DIP Setting: 000 01 010

### BANK 6
- Connected to STi Extension Card 5
- 09-3 → 13-3
- 10-3 → 14-3
- 11-3 → 15-3
- 12-3 → 16-3
- DIP Setting: 000 10 001

### BANK 7
- Connected to STi Extension Card 6
- 17-3 → 21-3
- 18-3 → 22-3
- 19-3 → 23-3
- 20-3 → 24-3
- DIP Setting: 000 10 010

---

**Figure 15: Valve Numbering Schematic Parallel Mode**
Step 3  Check connection of solenoid valves to the card terminals

The STi extension enclosure is normally supplied with solenoid valves fitted to it. The connection of these solenoid valves to the solenoid valve active and common terminals of the card will need to be verified. If a connection is missing, please establish this connection. Each solenoid valve must be connected to a separate active terminal - however multiple solenoid valves can be connected to the same common terminal.

2.3  PNEUMATIC INSTALLATION

2.3.1  Check connection of solenoid valves to diaphragm valves

When the timer is supplied with a new dust collector, the solenoid valves are connected to the diaphragm valves using 6mm OD black pneumatic hose. During commissioning of the system, check that the hose is securely held in the push fittings on both the diaphragm as well as the solenoid valves.

If required, remove the hose and reinsert into the push fittings at both ends.

2.3.2  Set up on demand cleaning (not required in basic version)

CONNECT THE CLEAN DRY COMPRESSED AIR SUPPLY TO THIS PUSH IN FITTING

FIX HOSE CONNECTED TO THE CLEAN AIR SIDE OF THE DUST COLLECTOR TO THIS PUSH IN FITTING

Figure 16: Push In Fittings affixed on the side of the STi master enclosure

Step 1  Check the hose connections from the bulkhead fittings on the master enclosure to the pressure sensor on the master card.

The STi timer enclosure comes fitted with two bulkhead fittings for connecting it to the pressure taps on the dust collector. On the inside, these fittings are connected to a pressure sensor on the STi timer card using 6mm OD pneumatic hose. This connection should be verified before the STi timer is switched on.

If the hose has come off, remove the hose and secure it at either end while ensuring that the hose is not entangled around the electrical cables.

Step 2  Check the hose fittings on the master enclosure to the pressure taps on the dust collector.

The STi timer enclosure is supplied with 10 metres of pneumatic hose to connect the timer to the pressure tap points on the dust collector, whose locations are identified in Figure 3. Use this hose to connect from the two push fit connectors labelled (C) and (D) to the clean and dirty air plenums of the dust collector.

Additional lengths of pneumatic hose can always be ordered.

2.3.3  Set up tube cleaner (only required in ODC-TC version)

CONNECT THE CLEAN DRY COMPRESSED AIR SUPPLY TO THIS PUSH IN FITTING

FIX HOSE CONNECTED TO THE DIRTY AIR SIDE OF THE DUST COLLECTOR TO THIS PUSH IN FITTING

Step 1  Check the hose connections from the bulkhead fittings on the master enclosure to the tube cleaner and the fitting for connecting the timer to the dirty air plenum of the dust collector.

At one end the tube cleaner is connected the compressed air supply through a bulkhead fitting on the STi master enclosure. On the other side, it is connected to the bulkhead connected to the dirty air plenum of the dust collector. Both these connections are by pneumatic hose.

If the hose has come off from the fittings, remove the hose and secure it at either end while ensuring that the hose is not entangled around the electrical cables.
**NOTICE**

The bulk head and push in fittings as well as the tube cleaner itself is rated to withstand a maximum pressure of 7 bar (approximately 100 psi). Connecting a compressed air supply at a higher pressure than this will cause irreversible damage to the tube cleaner and the entire timer in general.

Any damage due to the connection of a compressed air supply at a higher pressure is not covered under any warranties provided by Donaldson.

**Step 2**  Connect compressed air supply to the tube cleaner.

Supply clean dry compressed air to the push in fitting mounted on the STi master enclosure. This push in fitting is sized for a 6mm OD pneumatic hose.

*Figure 17: P&I drawing showing the compressed air connection to the tube cleaner.*
3. OPERATION AND SITE REPROGRAMMING

The STi Timer generally comes pre-programmed from Donaldson customised with optimal pulse timing settings for the Donaldson dust collector that it is intended to be connected to. After installing the Timer following the instructions in Section 2, switch on the power to the Timer.

The Timer should power up and detect the extension cards connected and the configuration of these extension cards. Once power up self-test and reconfiguration is completed the Timer should be ready to operate and will display the run screen.

From the run screens it is possible to quickly review the Timer settings and identify when the dust collection system will need servicing. Whilst on these screens, it is possible to access screens where contact details of Donaldson Care are displayed.

After reviewing this information, the user can access the programming section of the Timer code by inputting the correct passcode.

Once inside the programming mode, the user can reprogram the different variables governing the pulse timing algorithms. Table 6 and 7 show the factory set values for the different variables.

If the pulse cleaning system is to be interlinked with any external inputs whether sensors or interrupts, this will need to be set up inside the programming section. Donaldson does not program this by default as the selection of the inputs and how they are handled is a site specific item and therefore is best set up as part of unit commissioning.

Inside the programming section it is also possible to enter the test mode. The test mode is normally used for troubleshooting on site if required during system commissioning.

Programming screens are shown in Section 4 which explains navigating through the screens and what information is shown on each screen.

NOTE
If the DIP switches on the extension cards have not been set up according to the guidelines mentioned in Section 2.2.2, the reverse jet pulse cleaning mechanism of the dust collector will not operate as designed.

NOTICE
Changing settings on the STi Timer can impact the efficiency of the reverse pulse jet cleaning system and may result in irreversible damage to the dust collection system. Donaldson DOES NOT recommend changing these settings after the system has been commissioned without consulting Donaldson’s IAF Engineering team.
POWER ON

INITIALISATION
(see Section 4.1)

RUN SCREENS
(see Section 4.2)

REVIEW SETTINGS
(see Section 4.4)

SERVICE INFORMATION
(see Section 4.5)

PROGRAMMING SECTION
ENTRY
(see Section 4.7)

PULSE TIMING
CONFIGURATION
(see Section 4.8)

INPUT HANDLING
AND ALARMS
(see Section 4.9)

ODC CONFIGURATION*
(see Section 4.10)

TUBE CLEANER
CONFIGURATION**
(see Section 4.11)

TEST MODE
(see Section 4.12)

OPERATIONAL RECORDS

TIMER INITIALLISATION
EXTENSION DETECTION
CONFIGURATION DETECTION
AUTOMATIC MODE SET UP

AUTOMATIC STATE*
PULSING STATE
HALTED STATE

TIMING CONFIGURATION
TIMER SETTINGS
ODC SETTINGS*
AUTO PULSE SETTINGS*
TUBE CLEANER SETTINGS**

HOURS TO NEXT SERVICE
PULSES TO NEXT SERVICE
USE PASSCODE “004”

NO. OF VALVES SET UP
PULSE SEQUENCING
PULSE DURATION
INTERVAL BETWEEN PULSES IN NORMAL MODE
OFFLINE CLEANING ACTIVATION AND SET UP

INPUT HANDLED AS INTERRUPT OR ALARM?
INPUT ANALOGUE OR DIGITAL?
ANALOGUE SETPOINT AND TRIGGER SET UP

PRESSURE MEASUREMENT UNIT SELECTION
ESTABLISH ODC SET POINTS
INTERVALS BETWEEN PULSES IN FAST MODE
AUTO PULSE ACTIVATION AND SET UP

TUBE CLEAN DURATION AND SET UP
MANUALLY PULSE ANY VALVE

TOTAL HOURS
HOURS SINCE LAST SERVICE
PULSES SINCE LAST SERVICE

Figure 18: Navigating through the STi firmware

* Not shown in the STi Basic version
** Only shown in STi ODC TC version

DONALDSON CARE
EMAIL/PHONE NUMBERS

PRODUCT SUPPORT
(see Section 4.6)

SERVICE INFORMATION
(see Section 4.5)

PROGRAMMING SECTION
ENTRY
(see Section 4.7)

PULSE TIMING
CONFIGURATION
(see Section 4.8)

INPUT HANDLING
AND ALARMS
(see Section 4.9)

ODC CONFIGURATION*
(see Section 4.10)

TUBE CLEANER
CONFIGURATION**
(see Section 4.11)

TEST MODE
(see Section 4.12)

OPERATIONAL RECORDS

TIMER INITIALLISATION
EXTENSION DETECTION
CONFIGURATION DETECTION
AUTOMATIC MODE SET UP

AUTOMATIC STATE*
PULSING STATE
HALTED STATE

TIMING CONFIGURATION
TIMER SETTINGS
ODC SETTINGS*
AUTO PULSE SETTINGS*
TUBE CLEANER SETTINGS**

HOURS TO NEXT SERVICE
PULSES TO NEXT SERVICE
USE PASSCODE “004”

NO. OF VALVES SET UP
PULSE SEQUENCING
PULSE DURATION
INTERVAL BETWEEN PULSES IN NORMAL MODE
OFFLINE CLEANING ACTIVATION AND SET UP

INPUT HANDLED AS INTERRUPT OR ALARM?
INPUT ANALOGUE OR DIGITAL?
ANALOGUE SETPOINT AND TRIGGER SET UP

PRESSURE MEASUREMENT UNIT SELECTION
ESTABLISH ODC SET POINTS
INTERVALS BETWEEN PULSES IN FAST MODE
AUTO PULSE ACTIVATION AND SET UP

TUBE CLEAN DURATION AND SET UP
MANUALLY PULSE ANY VALVE

TOTAL HOURS
HOURS SINCE LAST SERVICE
PULSES SINCE LAST SERVICE

Figure 18: Navigating through the STi firmware

* Not shown in the STi Basic version
** Only shown in STi ODC TC version
### Table 6: Pulse Timing Configuration for different Donaldson dust collections

<table>
<thead>
<tr>
<th>Dust Collector Model</th>
<th>No. of valves being controlled, refer Figure 35</th>
<th>Pulse sequencing algorithm, refer Figure 36</th>
<th>Pulse duration, refer Figure 39</th>
<th>Interval between pulsing during normal pulsing, refer Figure 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalamatic units DU 7, DU 10, DU 14 and DU 20</td>
<td>05</td>
<td>Standard</td>
<td>100 ms</td>
<td>25 sec</td>
</tr>
<tr>
<td>Dalamatic units DU 30 and DU 45</td>
<td>10</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Cased Series DLMC, 1 bank units (1/2/15 to 1/8/15)</td>
<td>10</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Cased Series DLMC, 2 bank units (2/2/15 to 2/8/15)</td>
<td>20</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Cased Series DLMC, 3 bank units (3/2/15 to 3/8/15)</td>
<td>30</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Cased Series DLMC, 4 bank units (4/2/15 to 4/8/15)</td>
<td>40</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Insertable units, DLMV 4/7, DLMV 6/10, DLMV 8/7, DLMV 8/15, DLMV 9/15 and DLMV 12/10</td>
<td>03</td>
<td>Standard</td>
<td>100 ms</td>
<td>25 sec</td>
</tr>
<tr>
<td>Dalamatic Insertable units, DLMV 7/7, DLMV 10/10, DLMV 13/12, DLMV 14/7 and DLMV 15/15</td>
<td>05</td>
<td>Standard</td>
<td>100 ms</td>
<td>25 sec</td>
</tr>
<tr>
<td>Dalamatic Insertable units DLMV 20/10, DLMV 25/12 and DLMV 30/15</td>
<td>05</td>
<td>Standard</td>
<td>060 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Insertable units DLMV 21/7 and DLMV 30/10</td>
<td>10</td>
<td>Standard</td>
<td>060 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Dalamatic Insertable units DLMV 45/15, DLMV 60/15 and DLMV 80/20</td>
<td>10</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Siloair units, VS 10, VS 14, VS 15 and VS 21</td>
<td>02</td>
<td>Standard</td>
<td>200 ms</td>
<td>12 sec</td>
</tr>
<tr>
<td>Siloair units, VS 20 and VS 28</td>
<td>03</td>
<td>Standard</td>
<td>200 ms</td>
<td>12 sec</td>
</tr>
<tr>
<td>Torit, Series TD</td>
<td>03</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>DownFlo Oval units DFO 2-4 and DFO 2-8</td>
<td>04</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>DownFlo Oval unit DFO 3-12</td>
<td>06</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>DownFlo Oval unit DFO 3-24</td>
<td>12</td>
<td>Arbitrary</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>DownFlo Oval unit DFO 3-36</td>
<td>18</td>
<td>Arbitrary</td>
<td>100 ms</td>
<td>7 sec</td>
</tr>
<tr>
<td>DownFlo Oval unit DFO 4-16</td>
<td>08</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>DownFlo Oval unit DFO 4-32</td>
<td>16</td>
<td>Arbitrary</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>DownFlo Oval unit DFO 4-48</td>
<td>24</td>
<td>Arbitrary</td>
<td>100 ms</td>
<td>7 sec</td>
</tr>
</tbody>
</table>
**If the dust collector model is not listed above, please contact Donaldson IAF Engineering.**

**When to use an Arbitrary pulsing sequence**

In systems comprising of more than one card, the timer assumes that 10 valves are connected to each card other than the last card. This might not be the case. In this case, it is necessary to use an arbitrary pulsing sequence for the following benefits:

- Attempting to pulse non-existing valves unnecessarily increases the total during of the cleaning cycle which reduces the efficiency of the reverse jet cleaning system.

- Each non-existent valve that the timer attempts to pulse is registered as having a fault (because a valve that does not exist does not pulse). This is unnecessarily indicated on the timer screen and the general warnings/system health relays. This has the potential of confusing operators when a real fault on an EXISTING valve is detected as the operators may think that it is one of the valves that are non-existent.

### STi Timer Range

<table>
<thead>
<tr>
<th>Dust Collector Model</th>
<th>No. of valves being controlled, refer Figure 35</th>
<th>Pulse sequencing algorithm, refer Figure 36</th>
<th>Pulse duration, refer Figure 39</th>
<th>Interval between pulsing during normal pulsing, refer Figure 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powercore units CPV 1 and CPV 3</td>
<td>03</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore unit CPV 2</td>
<td>02</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore units CPV 4 and CPC 4</td>
<td>04</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore units CPC 6 and CPV 6</td>
<td>06</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore units CPC 8 and CPV 8</td>
<td>08</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore units CPC 12 and CPV 12</td>
<td>12</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore units CPC 16, CPC 24, CPC 32 and CPC 48</td>
<td>08</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore unit TG 4</td>
<td>04</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore unit TG 6</td>
<td>06</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore unit TG 8</td>
<td>08</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore unit TG 12</td>
<td>12</td>
<td>Standard</td>
<td>100 ms</td>
<td>10 sec</td>
</tr>
<tr>
<td>Powercore units, VH 1-4 and VH 2-8</td>
<td>04</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Powercore units, VH 1-6, VH 2-12 and VH 3-18</td>
<td>06</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
<tr>
<td>Powercore units, VH 2-16 and VH 3-24</td>
<td>08</td>
<td>Standard</td>
<td>100 ms</td>
<td>15 sec</td>
</tr>
</tbody>
</table>
Table 7: Recommended On Demand Cleaning settings for different dust collector models

<table>
<thead>
<tr>
<th>Collector Type</th>
<th>Dust Collector Range</th>
<th>ODC Low Set Point, refer Figure 52</th>
<th>ODC High Point, refer Figure 53</th>
<th>ODC High-high Set Point, refer Figure 54</th>
<th>ODC Alarm Set Point, refer Figure 55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag Collector</td>
<td>Dalamatic DU</td>
<td>90 mmWG 3.54 inWG 0.88 kPa</td>
<td>110 mmWG 4.33 inWG 1.08 kPa</td>
<td>130 mmWG 5.12 inWG 1.28 kPa</td>
<td>180 mmWG 7.08 inWG 1.77 kPa</td>
</tr>
<tr>
<td></td>
<td>Dalamatic DLMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dalamatic DLMV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartridge Collector</td>
<td>Siloair VS series</td>
<td>50 mmWG 1.97 inWG 0.49 kPa</td>
<td>75 mmWG 2.95 inWG 0.74 kPa</td>
<td>90 mmWG 3.54 inWG 0.88 kPa</td>
<td>180 mmWG 7.08 inWG 1.77 kPa</td>
</tr>
<tr>
<td></td>
<td>TD series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFO series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powercore Collector</td>
<td>CP series</td>
<td>50 mmWG 1.97 inWG 0.49 kPa</td>
<td>75 mmWG 2.95 inWG 0.74 kPa</td>
<td>90 mmWG 3.54 inWG 0.88 kPa</td>
<td>180 mmWG 7.08 inWG 1.77 kPa</td>
</tr>
<tr>
<td></td>
<td>TG series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>VH series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. PROGRAMMING THE TIMER

4.1 TIMER INITIALISATION

Immediately after power is turned on to the STi timer, it initiates self diagnostics. During this period, the timer broadcasts messages to all extension cards over the RS485 communication channel. Based on the responses it receives, the timer automatically configures the pulsing mode to suit.

Start Up screen

Upon power connection to the timer, it displays the Start Up screen.

![Start Up screen](image)

**STi ODC-TC version**

**Firmware1.3.0**

**rcon reg: 111000**

![Connected cards 1 Reading cards...](image)

**Figure 19: Start Up screen**

NOTE

The Start Up screen reads ODC-TC in the ODC-TC version, ODC in the ODC version and basic in the basic version.

Extension detection screen

After timer start up, the timer initiates pinging for detecting any extension cards that are connected to it. During this period, it displays the extension detection screen.

![Connected cards 1 Reading cards...](image)

**Figure 20: Extension detection screen**

After the detection is completed, the timer reports:

- Number of extension cards detected
- Whether the cards are set to pulse in sequential or parallel mode
- In sequential mode, the total number of cards with valves connected
- In parallel mode, the number of blocks and the number of cards in each block
- Whether the configuration detected is valid or invalid.
For a configuration to be detected as valid, no two extension cards should have the same DIP switch configuration.

In sequential mode, a configuration will be determined as valid if all cards are set up with subsequent local addresses.

In parallel mode, a configuration will be determined as valid if:

- For each block that is detected, the total number of cards is the same.
- In each block, the cards are set up with subsequent local addresses.

### Configuration confirmation screen

After detection is complete, the timer shows the configuration it has detected so that the user can confirm that this is matches the dust collector that the timer is set to control.

Whilst in sequential mode, only one block of cards is displayed and in parallel mode, cards are grouped in four blocks.

### Figure 22: Configuration confirmation screen in (a) sequential mode, and (b) parallel mode

In this screen M identifies the Master card, o identifies that an extension card was detected with the corresponding local and block selection configuration, - identifies that no extension card was detected with the corresponding DIP switch configuration.

### 4.2 TIMER RUN SCREENS

Timer operation is possible in three states:

a. Automatic State. The valves pulse only when the differential pressure across the dirty and clean air sides of the dust collector have crossed a certain value, which normally indicates that the filter media has become dirty.

b. Pulsing State. The valves pulse at regular intervals irrespective of the differential pressure across the dirty and clean air sides of the dust collector. Compressed air consumption can be significantly larger than in the Automatic State. This state should be used either during testing or when a fault with the differential pressure measurement apparatus has been detected.

c. Halted State. The valves do not pulse at all; the pulsing of the valves has been deactivated.

In any of these states, the timer generally displays the resting run screens. Whilst on the resting screens if any push button is pressed, the timer brings up the corresponding active run screen. If there is no activity for 30 sec the timer returns to the resting run screen.
NOTE
The Automatic State is not available in the basic version.
In the ODC or ODC-TC versions, upon the first start up the timer will initialise the Resting Run screen in Automatic State, whilst in the basic version, the timer initialise the Resting Run screen in Pulsing State. Upon start up on all subsequent occasions the timer will initialise the last screen shown before shut down.

Run screens in Automatic State

(a)  LOW  A1  AUTO
     Valve 05  OC04
     Pulse in 12 s
     dP = 1.09 inWG

(b)  HIGH  A1  A2  AUTO
     Valve 02
     Pulse in 14 s  CVF
     A/M  CONF

Figure 23: (a) Resting, and (b) Active run screens in Automatic mode

In Automatic State, the Run screens display the following information:

- Whether the instantaneous differential pressure is above the alarm set point (ALARM), or above the High-high set point (FAST), or above the high set point (HIGH), or below the high set point (LOW).
- The timer is operating in automatic (AUTO) state.
- The valve number that is going to be pulsed next.
- The time duration in seconds after which the valve is going to be pulsed.

If individual valve failure is detected when a solenoid valve is pulsed, a notification identifying the valve will be displayed on the run screens. This notification is displayed as a SC (short circuit) or OC (open circuit) followed by the valve number, refer to Figures 14 and 15.

If an interrupt signal on either of input terminal J1 or J2, the timer transitions through to Halted State and displays an interrupt notification INT on the screen.

If an alarm signal is detected on either of the input terminals J1 or J2, a corresponding message (A1 or A2) is displayed on the run screen.

If more than 30% of the valves are reported faulty, a cumulative valve failure (CVF) warning notification is shown on the run screens.

If any of the counters exceed their threshold values the timer will display the Service Required (SVC) notification. If both the CVF and SVC notifications are displayed, the CVF notification takes precedence over the SVC notification.

In addition to this information, the Resting Run screen displays the instantaneous differential pressure across the clean and dirty air sides of the dust collectors.

At the Active Run screen in Automatic State, pressing A/M causes the timer to transition to the Pulsing State; the timer brings up the Active Run screen in Pulsing State. Pressing CONF causes the timer to show the saved configuration that it is operating on.

Run screens in Pulsing Mode

(a)  HIGH  PULSE
     Valve 12  OC24-2
     Pulse in 6 s
     dP = 106 mmWG

(b)  FAST  PULSE
     Valve 06
     Pulse in 5 s  SVC
     A/M  P/H  CONF

Figure 24: (a) Resting, and (b) Active run screens in Pulsing State
In Pulsing State, the Run screens display the following information:

- The timer is operating in the pulsing (PULSE) mode
- The valve number that is going to be pulsed next.
- The time duration in seconds after which the valve is going to be pulsed.

As with the Run screens in Automatic State, if individual valve failure is detected when a solenoid valve is pulsed, a notification identifying the valve will be displayed on the run screens. If an alarm or interrupt input has been activated or not, a notification identifying the input is displayed on the run screens. Also, if cumulative valve failure or service required is detected a notification will be shown on the run screens.

Whilst on the Active Run screen in Pulsing State, pressing A/M causes the timer to transition to the Automatic State; the timer brings up the Active Run screen in Automatic State (this option is not available in the basic version). Pressing P/H causes the timer to transition to the Halted State; the timer brings up the Active Run screen in Halted State. Pressing CONF causes the timer to show the saved configuration that it is operating on.

4.3 TEMPORARILY STOP CLEANING OF FILTER MEDIA

Run screens in Halted State

NOTE

In the ODC or ODC-TC version, the Resting Run screen displays the instantaneous differential pressure across the clean and dirty air sides of the dust collectors. The range of the instantaneous differential pressure is displayed on both the Active and Resting Run screens. This information is not available in the basic version.

As with the Run screens in Automatic State, if individual valve failure is detected when a solenoid valve is pulsed, a notification identifying the valve will be displayed on the run screens. If an alarm or interrupt input has been activated or not, a notification identifying the input is displayed on the run screens. Also, if cumulative valve failure or service required is detected a notification will be shown on the run screens.

Whilst on the Active Run screen in Pulsing State, pressing A/M causes the timer to transition to the Automatic State; the timer brings up the Active Run screen in Automatic State (this option is not available in the basic version). Pressing P/H causes the timer to transition to the Halted State; the timer brings up the Active Run screen in Halted State. Pressing CONF causes the timer to show the saved configuration that it is operating on.

Figure 25: (a) Resting, and (b) Active run screens in Halted State

In Halted State, the Run screens display the following information:

- The timer is operating in the halted (HALT) state
- Whether an interrupt or an alarm input has been triggered.
- Whether cumulative valve failure or service required has been detected.

NOTE

In the ODC or ODC-TC version, the Resting Run screen displays the instantaneous differential pressure across the clean and dirty air sides of the dust collectors. The range of the instantaneous differential pressure is displayed on both the Active and Resting Run screens. This information is not available in the basic version.

NOTE

If the cleaning of filter media is stopped by passing an interrupt signal to the timer, the timer will automatically switch to the halted mode. When the interrupt signal is stopped, the timer will return to the mode that it was operating in before the interrupt signal was activated.

NOTE

In the ODC or ODC-TC version, the Resting Run screen displays the instantaneous differential pressure across the clean and dirty air sides of the dust collectors. The range of the instantaneous differential pressure is displayed on both the Active and Resting Run screens. This information is not available in the basic version.

Whilst on the Active Run screen in Pulsing State, pressing A/M causes the timer to transition to the Automatic State; the timer brings up the Active Run screen in Automatic State (this option is not available in the basic version). Pressing P/H causes the timer to transition to the Pulsing State; the timer brings up the Active Run screen in Pulsing State. Pressing CONF causes the timer to show the saved configuration that it is operating on.
4.4 REVIEW SETTINGS

Timer Configuration screen

(a) STi Firmware 1.3.0
Config = Sequential
2 Cards in total
NEXT HELP

(b) ODCTC Firmware 1.3.0
Config = Parallel
2 Blocks 1 Card/Blk
NEXT HELP

Figure 26: Timer configuration screen in (a) sequential and (b) parallel mode

The Timer Configuration screen identifies the following information:

- The firmware version that the timer is running.
- Whether the valves are set to be pulsed in parallel or in sequentially.
- The number of extension cards that the timer is configured to control.

NOTE
Screen reads STi for basic version, ODC in ODC version and ODCTC in ODC-TC version.

Pressing NEXT causes the timer to show timing settings. Press HELP to view contact details of Donaldson Care.

Timing Settings Quick Summary screen

Figure 27: Timing Settings Quick Summary screen

The Timing Settings Quick Summary screen identifies the following information:

- The number of valves that are being controlled by the timer.
- The order in which these valves are being pulsed, whether one after another starting from valve 1 (STD) or in a user-defined arbitrary order (ARB).
- The duration of each pulse in milliseconds (DUR)
- The interval between two subsequent pulses in standard pulsing mode (INT1)
- The interval between two subsequent pulses in fast pulsing mode (INT2). Not shown in basic version.
- The number of cleaning cycles to be activated for offline cleaning, once the fan has switched off (OffCyc). Not shown if Offline Cleaning is activated.

Pressing NEXT causes the timer to show on demand cleaning settings. Press HELP to view contact details of Donaldson Care.

ODC Settings Quick Summary screen

(not shown in basic version)

Figure 28: ODC Settings Quick Summary screen

The ODC Configuration Quick Summary screen identifies the following information:

- The Low Set Point (on demand cleaning stops when dP falls below this value)
- The High Set Point (on demand cleaning starts when dP crosses this value)
- The High-High Set Point (fast pulsing activated when dP crosses this value)
- The Alarm Set Point (dP alarm activated when dP crosses this value)
- Pressure unit: inches water gauge (inWG), mm water gauge (mmWG) or kPa.

Pressing NEXT causes the timer to show auto pulse settings. Press HELP to view contact details of Donaldson Care.
**Auto Pulse Settings Display screen**
(not shown in basic version)

![Auto Pulse Settings Display screen](image)

*Figure 29: Auto Pulse Settings Display screen*

The Auto Pulse Settings Display screen shows the maximum interval between two pulses generated by the timer.

Pressing NEXT causes the timer to show tube cleaner settings. Press HELP to view contact details of Donaldson Care.

---

**TC Settings Quick Summary screen**
(only shown in ODC-TC version)

![TC Settings Quick Summary screen](image)

*Figure 30: TC Settings Quick Summary screen*

The Tube Cleaner Configuration Summary screen identifies the following information:

- The interval between two successive tube cleaner activations
- The duration of activation of the tube cleaner.

Pressing NEXT causes the timer to show tube cleaner settings. Press HELP to view contact details of Donaldson Care.

---

**4.5 VIEW SERVICE INFORMATION**

**Service Information screen**

![Service Information screen](image)

*Figure 31: Service Information screen*

The Service Information screen identifies the number of hours and the number of pulses remaining till the timer is due for a service.

Pressing NEXT brings up the passcode check screen. Press HELP to view contact details of Donaldson Care.

---

**4.6 REQUEST PRODUCT SUPPORT**

**Donaldson Care screen**

The Donaldson Care screen shows the toll free numbers in Australia and New Zealand. The screen showing the Australian details is shown first. Pressing any of the push buttons brings up the screen showing the New Zealand details. Pressing any of the push buttons while the New Zealand details are shown returns the timer to the run screens.

(a) DONALDSON CARE
AU Tel    1800 345 837
email     service@donaldson.com

(b) DONALDSON CARE
NZ Tel    0800 743 387
email     iafnz@donaldson.com

*Figure 32: Donaldson Care screen showing contact information in (a) Australia, and (b) New Zealand*
Customers outside Australia or New Zealand should send an email to the Australian email address. A support request should identify the card serial number, the firmware version the card is running and the details listed on the quality control sticker.

4.7 ACCESS TIMER SETTINGS

Passcode Check screen

PASSCODE REQUIRED
Enter CODE 000
DOWN CHECK UP

*Figure 34: Service Information screen*

Pressing UP or DOWN increments or decrements the passcode; the correct passcode is 004. When the CHECK push button is pressed, the timer checks if the code entered is correct or not.

If the incorrect passcode is entered, the timer returns to the resting run screens. If the correct passcode is entered, the timer brings up the Enter Pulse Timing Configuration screen.

4.8 CONFIGURE PULSE TIMING

Enter Pulse Timing Configuration screen

*Figure 35: Enter Pulse Timing Configuration screen*

The STi timer is supplied preconfigured to suit the dust collector whose cleaning system it is intended to control. Donaldson DOES NOT recommend that these settings are changed as this may cause irreversible damage to your dust collection system.

Changing these settings without prior authorisation from Donaldson’s IAF Engineering team will VOID all warranties offered by Donaldson.
Pressing EXIT returns the timer to the resting run screens. Pressing SELECT brings up the Pulse Sequencing Algorithm Selection screen. Pressing NEXT brings up the Enter Input Handling and Alarms Configuration screen.

**Number of Valves Selection screen**

![Figure 36: Number of valves selection screen](image)

Pressing UP or DOWN increments or decrements the number of valves being controlled by the timer. Pressing SET saves the value to the timer and the timer brings up the Pulse Sequencing Algorithm Selection screen.

**Pulse Sequencing Algorithm Selection screen**

![Figure 37: Pulse sequencing algorithm selection screen](image)

Pressing CHANGE toggles the pulse sequencing algorithm from Standard to Arbitrary and vice versa. Pressing SET saves this value to the timer.

If NO is selected the timer brings up the Pulse Duration Selection screen. Otherwise the timer brings up the Arbitrary Valve Sequence Setup screen.

**Arbitrary Valve Sequence Setup screen**

![Figure 39: Arbitrary valve sequence setup screen](image)

The sequence position represents the order in which the valve is pulsed, and can range between zero and the total number of valves.

Pressing UP or DOWN increases or decreases the valve number that occupies the particular position in the pulsing sequence. Pressing SET saves this value to the timer. The process repeats itself till the position of all the valves has been set.

Once the position of all the valves has been saved, the timer brings up the Pulse Duration Selection screen.

**Pulse Duration Selection screen**

![Figure 40: Pulse duration selection screen](image)

NOTE

If it is intended that a valve is not pulsed, it should be excluded from the pulsing sequence.
Pressing UP or DOWN increments or decrements the pulse duration. Pressing SET saves the value to the timer and the timer brings up the Interval between pulses in Normal mode selection screen.

**Interval between pulses in Normal mode selection screen**

![Interval between pulses in Normal mode selection screen](image)

**Figure 41: Interval between pulses in normal mode selection screen**

Pressing UP or DOWN increments or decrements the interval between pulses in normal mode. Pressing SET saves the value to the timer and the timer brings up the Interval between pulses in Fast mode selection screen.

**Interval between pulses in Fast mode selection screen**

(not shown in basic version)

![Interval between pulses in Fast mode selection screen](image)

**Figure 42: Interval between pulses in Fast mode selection screen**

Pressing UP or DOWN increments or decrements the interval between pulses in normal mode. Pressing SET saves the value to the timer and the timer brings up the Offline Cleaning Activation screen.

**Offline Cleaning Activation screen**

![Offline Cleaning Activation screen](image)

**Figure 43: Offline Cleaning Activation screen**

Pressing CHANGE toggles the selection from Activated to Deactivated and vice versa. Pressing SET saves the selection to the timer.

If Deactivated is selected the timer returns to the Enter Pulse Timing Configuration screen. Otherwise the timer brings up the Offline Cleaning Cycles Selection screen.

**Offline Cleaning Cycles selection screen**

![Offline Cleaning Cycles selection screen](image)

**Figure 44: Offline Cleaning Cycles selection screen**

Pressing UP or DOWN increments or decrements the number of offline cleaning cycles to be activated after the fan is turned off.

Donaldson’s recommended number of offline cleaning cycles is between 3 and 5.

Pressing SET saves the value to the timer and the timer returns to the Enter Pulse Timing Configuration screen.
4.9  INPUT HANDLING AND ALARMS SETUP
(NOT SHOWN IN BASIC VERSION)

Enter Input Handling and Alarms Setup screen

Figure 45: Enter Input Handling and Alarms Setup screen
Pressing EXIT returns the timer to the resting run screens. Pressing SELECT brings up the Input Type Selection screen. Pressing NEXT brings up the Enter On Demand Cleaning Setup screen.

Input Type Selection screen

Figure 46: Input Type Selection screen
Pressing TYPE toggles the selection from Interrupt (INT) to Alarm (ALARM) and vice versa. Pressing SET saves the selection to the timer.

If Interrupt is selected, the timer brings up the Interrupt Input Type Selection screen. Otherwise, if this was the first input, the timer returns to the Input Type Selection screen for the second input. If this was the second input, the timer returns to the Enter Pulse Timing Configuration screen.

Interrupt Input Type Selection screen

Figure 47: Interrupt Signal Type Selection screen
Pressing A/D toggles the signal type from Digital to Analogue and vice versa. Pressing SET saves the selection to the timer.

If Analogue is selected, the timer brings up the Analogue Input Setpoint Selection screen. Otherwise, if this was the first input, the timer returns to the Input Type Selection screen for the second input. If this was the second input, the timer returns to the Enter Pulse Timing Configuration screen.

Analogue Input Setpoint Selection screen

Figure 48: Analogue Interrupt Setpoint Selection screen
Pressing UP or DOWN increments or decrements the setpoint at which the interrupt is activated. Pressing SET saves the value to the timer and the timer brings up the Analogue Input Trigger Configuration screen.

Analogue Input Trigger Setup screen

Figure 49: Analogue Interrupt Trigger Setup screen
Pressing TRIGGER toggles the interrupt from Increasing to Decreasing and vice versa. Pressing SET saves the value to the timer.

NOTE
If an Increasing Trigger is selected, the timer activated the interrupt/alarm if the input value rises above the setpoint selected.

If a Decreasing Trigger is selected, the timer activated the interrupt/alarm if the input value falls below the setpoint selected.
If this was the first input, the timer returns to the Input Type Selection screen for the second input. If this was the second input, the timer returns to the Enter Pulse Timing Configuration screen.

### Alarm Configuration screen

![Alarm Configuration screen](image)

Pressing A/D toggles the signal type from Digital to Analogue and vice versa. Pressing W/D toggles the alarm type from Warning Only to Disable Pulsing and vice versa. Pressing SET saves the selections to the timer.

If Analogue is selected, the timer brings up the Analogue Input Setpoint Selection screen. Otherwise, if this was the first input, the timer returns to the Input Type Selection screen for the second input. If this was the second input, the timer returns to the Enter Pulse Timing Configuration screen.

#### 4.10 ODC CONFIGURATION

**NOT SHOWN IN BASIC VERSION**

### Enter On Demand Cleaning Setup screen

![Enter On Demand Cleaning Setup screen](image)

Pressing EXIT returns the timer to the resting run screens. Pressing SELECT brings up the Pressure Measurement Unit Selection screen. Pressing NEXT brings up the Enter Tube Cleaner Setup screen.

### Pressure Measurement Unit Selection screen

![Pressure Measurement Unit Selection screen](image)

Pressing CHANGE cycles the measurement unit between mm water gauge (mmWG), inches water gauge (inWG) and kilopascal (kPa). Pressing SET saves the selection to the timer and the timer brings up the Low Set Point Selection screen.

### Low Set Point Selection screen

![Low Set Point Selection screen](image)

Pressing UP or DOWN increments or decrements the pressure set point at which reverse jet cleaning is stopped. Pressing SET saves the value to the timer and the timer brings up the High Set Point Selection screen.

### High Set Point Selection screen

![High Set Point Selection screen](image)

Pressing UP or DOWN increments or decrements the pressure set point at which reverse jet cleaning is activated. Pressing SET saves the value to the timer and the timer brings up the High-high Set Point Selection screen.
High-high Set Point Selection screen

```
High-high Set Point = 090 mmWG
(Fast Pulsing)  
DOWN   SET   UP
```

Figure 55: High-high Set Point Selection screen

Pressing UP or DOWN increments or decrements the pressure set point at which the reverse jet cleaning system is activated at a faster rate. Pressing SET saves the value to the timer and the timer brings up the Alarm Set Point Selection screen.

Alarm Set Point Selection screen

```
Alarm Set Point = 180 mmWG
(dP Alarm)  
DOWN   SET   UP
```

Figure 56: Alarm Set Point Selection screen

Pressing UP or DOWN increments or decrements the pressure set point at which the differential pressure alarm is activated. Pressing SET saves the value to the timer and the timer brings up the Auto Pulse Duration Selection screen.

Auto Pulse Activation screen

As part of the fault detection algorithms incorporated within the STi codebase, the timer checks that the solenoid coils are functioning properly whenever they are pulsed. If the valves are not pulsed for extended periods in Automatic Mode (i.e. the dP is below the low set point), it is possible that there could be a fault in one of the coils which the timer is not aware of. As a workaround this, the timer automatically pulses the valves of the dust collector one by one at an interval selected under the Auto Pulse settings. The process of pulsing a single valve at a time continues until all valves on the dust collector have been pulsed.

FORCED AUTO PULSING ACTIVATED

```
CHANGE     SET
```

Figure 57: Forced Auto Pulse Activated screen

Pressing CHANGE toggles the selection from ACTIVATED to DEACTIVATED and vice versa. Pressing SET saves the selection to the timer.

If DEACTIVATED is selected the timer returns to the Enter Pulse Timing Configuration screen. Otherwise the timer brings up the Auto Pulse Duration Selection screen.

Auto Pulse Duration Selection screen

```
Interval btwn forced pulses = 10 hrs
(Auto Pulse)  
DOWN   SET   UP
```

Figure 58: Auto Pulse Duration Selection screen

Pressing UP or DOWN increments or decrements the interval between forced pulses generated by the cleaning system. Donaldson's recommended auto pulse duration is 6 hrs. Pressing SET saves the value to the timer and the timer returns to the Enter Pulse Timing Configuration screen.

4.11 TUBE CLEANER SETUP
(ONLY SHOWN IN ODC-TC VERSION)

Enter Tube Cleaner Setup screen

```
TC CONFIGURATION
EXIT   SELECT   NEXT
```

Figure 59: Enter Tube Cleaner Setup screen
Pressing EXIT returns the timer to the resting run screens. Pressing SELECT brings up the Tube Clean Duration Selection screen. Pressing NEXT brings up the Enter Manual Test Mode screen.

**Tube Clean Duration Selection screen**

```
Clean Tube for
  = 03 s
DOWN   SET   UP
```

*Figure 60: Tube Clean Duration Selection screen*

Pressing UP or DOWN increments or decrements the tube clean duration.

Donaldson’s recommended tube clean duration is 3 sec.

Pressing SET saves the value to the timer and the timer brings up the Tube Clean Interval Selection screen.

**Tube Clean Interval Selection screen**

```
Clean Tube every
  = 01 hrs
DOWN   SET   UP
```

*Figure 61: Tube Clean Interval Selection screen*

Pressing UP or DOWN increments or decrements the tube clean interval. Donaldson’s recommended auto pulse interval is 1 hour. Pressing SET saves the value to the timer and the timer returns to the Enter Pulse Timing Configuration screen.

**4.12 MANUALLY TEST VALVE OPERATION**

**Enter Manual Test Mode screen**

```
MANUALLY TEST VALVES

EXIT SELECT NEXT
```

*Figure 62: Enter Manual Test Mode screen*

Pressing EXIT returns the timer to the resting run screens. Pressing SELECT brings up the Test Valve Selection screen. Pressing NEXT brings up the Enter Operational Records screen.

**Test Valve Selection screen**

(a)

```
Valve Number to test
  = 01
DOWN   PULSE   UP
```

(b)

```
Valve Number to test
  = 01-1
DOWN   PULSE   UP
```

*Figure 63: Test Valve Selection screen in (a) Sequential and (b) Parallel pulsing mode*

Pressing UP or DOWN increments or decrements the valve number that is to be tested. In sequential mode, the valve number is directly indicated as shown in (a) above. In parallel mode, the valve number is followed by the block number as shown in (b) – the valve number is cycled through for the first block before proceeding to the second block and so on.

Pressing PULSE causes the timer to attempt to pulse the valve identified in the screen. Once this is done the timer brings up the Test Result screen.

**Test Result screen**

```
Valve Number = 01-1
PULSED!!
DONE REPEAT
```

*Figure 64: Test Result screen*

This screen shows the result of the attempt to pulse the valve identified in the screen. The results should be interpreted as shown in the following table.
Table 8: Solenoid coil test result options

<table>
<thead>
<tr>
<th>Message displayed</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PULSED!!</td>
<td>The current drawn by the solenoid coil is within the range that should be normally drawn</td>
</tr>
<tr>
<td>SHORT CIRCUIT!!</td>
<td>The current drawn by the solenoid coil is above what should be normally drawn</td>
</tr>
<tr>
<td>OPEN CIRCUIT!!</td>
<td>The current drawn by the solenoid coil is below what should be normally drawn</td>
</tr>
</tbody>
</table>

Pressing DONE returns the timer to the Enter Pulse Timing Configuration screen. Pressing REPEAT causes the timer to bring up the Test Valve Selection screen.

4.13 VIEW OPERATIONAL RECORDS

Enter Operational Records screen

The Operational Records screen is displayed for 30 seconds or till any of the push buttons are pressed, after which the timer brings up the Enter Pulse Timing Configuration screen.

5. ALARMS AND WARNING MESSAGES

The STi timer has monitors a range of variables linked to system performance and maintenance, and displays messages to advise operators if any of the in-built warnings or alarms have been triggered. This is in addition to any relays whose state may change as a result of the warning or alarm trigger.

If any of the inbuilt warnings or alarms are triggered, then the timer brings up the corresponding alarm screen as shown below. If none of the push buttons on the timer are pressed, the timer will return to the run screen after 90 seconds. The timer will continue to operate with the backlight flashing to draw attention towards itself.

During the blinking of the screen, if any push button is pressed the timer brings up the list of alarm screens linked to the alarms and warnings that have been activated. The user may progress to the next alarm screen by pressing the NEXT button. At the end of the list of screens, the timer returns to the Run screens.

The following information is identified on the Operational Information Screen is:

- The total number of hours for which the timer has been operational.
- The number of hours that have elapsed since the last service.
- The number of pulses that have been generated since the last service.
Differential pressure activated  
(not shown in basic version)

Once the Differential Pressure Alarm Activated warning message is acknowledged, the timer returns to the run screens. In the run screens a message is shown identifying which input has triggered this alarm.

**NOTE**
If the states of any of the relays has changed as a result of the trigger of an inbuilt warning or alarm these will not switch back to their original state till the event trigger has been resolved.

**Warning Only Type Alarm Activated**  
(not shown in basic version)

Once the Warning only Type Alarm Activated warning message is acknowledged, the timer returns to the run screens. In the run screens a message is shown identifying which input has triggered this alarm.

**Interrupt Activated – pulsing disabled**

**Offline Cleaning Activated**

Once the Offline Cleaning Activated warning message is acknowledged, the timer transitions to the Resting Run screen in Halted Mode.

**Cumulative Valve Failure Detected**  
(when ≥ 30% of valves are reported as failed)

**NOTE**
If the states of any of the relays has changed as a result of the trigger of an inbuilt warning or alarm these will not switch back to their original state till the event trigger has been resolved.
Service Required Notification

(a) SERVICE REQUIRED
PULSES EXCEEDED
PRESS TO ACKNOWLEDGE

(b) SERVICE REQUIRED
HOURS EXCEEDED
PRESS TO ACKNOWLEDGE

(c) SERVICE REQUIRED
PULSES EXCEEDED
HOURS EXCEEDED
PRESS TO ACKNOWLEDGE

Figure 73: Service Required Notification Message (a) pulses exceeded; (b) operation hours exceeded; (c) both exceeded

After any of the service required notification screens shown above are acknowledged by the user, the timer brings up the Genuine Parts Helpline Information screen.

SERVICE REQUIRED
ORDER GENUINE PARTS
service@donaldson.com

Figure 74: Genuine Parts Helpline Information screen
## 6. GENERAL TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Potential Causes</th>
<th>Remedial Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timer does not turn on</td>
<td>Power supply to the timer has been interrupted</td>
<td>Check that the input power supply to the timer is active and at the rated voltage.</td>
</tr>
<tr>
<td></td>
<td>Timer has not been wired correctly</td>
<td>Verify that the cable connection at terminal J4 (if the input power supply is AC) or terminal J7 (if the input power supply to the timer is DC) is secure.</td>
</tr>
<tr>
<td></td>
<td>The timer has been damaged due to internal failure</td>
<td>The timer master card needs to be replaced. Be sure to quote the serial number of the timer and the details from the QC sticker that you have to expedite processing.</td>
</tr>
<tr>
<td>An INVALID configuration error message is displayed after the timer is turned on</td>
<td>The timer is not able to communicate with all the extension cards that it should be controlling based on the saved settings</td>
<td>Review the DIP switch configuration on the extension cards. Ensure that these are set up as illustrated in Section 2.2.2 Step 2. Check the CAT5 cable connecting the extension cards to the master card and in between extension cards is securely fixed to terminals at either end. Check the integrity of the CAT5 cable. Replace cable if necessary. The master and/or extension cards are damaged and needs to be replaced. Be sure to quote the serial number of the timer and the details from the QC sticker that you have to expedite processing.</td>
</tr>
<tr>
<td>Timer pulses valves immediately after turn on but does not pulse valves after a while</td>
<td>The bridge between the contacts of terminals J11 have been removed and no connection has been made to the normally closed auxiliary contacts of the fan</td>
<td>Temporarily disable offline cleaning by changing the setting on the Offline Cleaning Cycles Selection screen shown in Figure 42. Turn off the timer and restart it after waiting for a minimum of 90 sec. If the timer functions properly, ensure that the connection between the auxiliary contacts on the fan and the terminals J11 are secure. If it is not intended to use the Offline Cleaning feature, bridge the contacts of terminal J11.</td>
</tr>
<tr>
<td>Symptom</td>
<td>Potential Causes</td>
<td>Remedial Action</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Valves are not pulsing</td>
<td>Power supply to the timer has been interrupted</td>
<td>Check that the input power supply to the timer is active and at the rated voltage</td>
</tr>
<tr>
<td></td>
<td>Low voltage power supply to the timer</td>
<td>Check the voltage at which power is being supplied to the timer — a low voltage may be able to operate the LED display but will not be sufficient to operate the valves.</td>
</tr>
<tr>
<td></td>
<td>Timer cards have not been wired correctly</td>
<td>Verify that the cable connection at terminal J4 (if the input power supply is AC) or terminal J7 (if the input power supply to the timer is DC) is secure. Check the CAT5 cable connecting the extension cards to the master card is securely fixed to terminals at either end.</td>
</tr>
<tr>
<td></td>
<td>Pulsing has been paused either manually or by an interrupt signal</td>
<td>If it has been paused manually, the timer must be returned to either the Automatic Mode or the Pulsing Mode. If the timer has been paused by an interrupt signal, this signal must be deactivated.</td>
</tr>
<tr>
<td></td>
<td>A disable pulsing type alarm has been triggered</td>
<td>Power down dust collection system and resolve the issue that has triggered the alarm before restarting the dust collection system.</td>
</tr>
<tr>
<td></td>
<td>Timer is in Automatic Mode and the differential pressure is below the high set point</td>
<td>Nothing needs to be done. The timer is functioning properly.</td>
</tr>
<tr>
<td>Pulses are weak</td>
<td>Low voltage power supply to the timer</td>
<td>Check the voltage at which power is being supplied to the timer – a low voltage may be able to operate the LED display but will not be sufficient to open the valves fully.</td>
</tr>
<tr>
<td></td>
<td>Tubing between the solenoid and diaphragm valves has come undone</td>
<td>Check the connection of the pneumatic tubing between the solenoid and diaphragm valves. If the tubing has come undone, please securely fix both ends of the tubing to the fittings on the valves.</td>
</tr>
<tr>
<td></td>
<td>Compressed air is being delivered to the diaphragm valves at lower pressure than what is recommended</td>
<td>Verify that the air compressor is working. Check compressed air supply line for leakages.</td>
</tr>
<tr>
<td>Pulses are erratic</td>
<td>Two or more valves are being pulsed from a single card.</td>
<td>The timer has not been correctly specified. Contact the Donaldson IAF Engineering team to identify the correct timer configuration for the dust collector.</td>
</tr>
</tbody>
</table>
**SPECIFICATION FORM**

**CONTROLLER INCORPORATING FAN STARTER AND/OR REVERSE JET PULSE CLEANING CONTROL**

Mounting brackets are **ONLY** supplied with new dust collectors – if needed, this has to be ordered separately.

### A. CUSTOMER DETAILS

<table>
<thead>
<tr>
<th>Client name *</th>
<th>Billing address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tel/mobile *</td>
<td>Email *</td>
</tr>
</tbody>
</table>

### B. FAN STARTER DETAILS

**B1. Starter type**

- [ ] Direct Online
- [ ] Star Delta
- [ ] Soft Start
- [ ] Variable Speed Drive

**B2. Motor details:**

- [ ] kW*
- [ ] VAC
- [ ] Phase
- [ ] Hz; Current draw = [ ] A at full load

**B3. Other requirements**

- [ ] Isolator switch
- [ ] Circuit breaker
- [ ] E-stop switch

### C. REVERSE JET PULSE CLEANING DETAILS

**C1. Special Features**

- [ ] None
- [ ] On demand cleaning required
- [ ] Tube cleaning required

**C2. Solenoid Valve details**

- [ ] solenoid valves controlled *
- [ ] rated [ ] V *
- [ ] AC
- [ ] DC; [ ] W

**C3. Available power supply**

- [ ] AC
- [ ] DC

### D. SOLENOID MOUNTING INSTRUCTIONS

**D1. Solenoids are mounted on**

- [ ] Controller enclosure
- [ ] Solenoid box
- [ ] Diaphragm valves

**D2. IF solenoids are mounted on the timer, does the master enclosure have them fitted?**

- [ ] Yes
- [ ] No

### E. SPECIAL REQUIREMENTS

**E1. Enclosure Material**

- [ ] Polycarbonate
- [ ] Powder Coated Steel
- [ ] Stainless Steel
- [ ] Fibreglass

**E2. Tick if Controller is mounted in a Hazardous Area**

- [ ] Give all relevant details:

* indicates a field where a response is mandatory

---

**ADDITIONAL INFORMATION**

If you seek a replacement controller for a Donaldson dust collector, please identify the model number of your dust collector and the serial number of your existing controller to ease processing at our end.
GLOSSARY OF TERMS

Standard pulsing algorithm – when valve number 2 is pulsed immediately after valve number 1 and so on.

Arbitrary pulsing algorithm – in this case the valves or set of valves can be pulsed in any order, eg. valve number 5 is pulsed immediately after valve number 3 and so on.

Category 5 (CAT5) cable – a twisted pair cable for carrying low voltage communication signals. A day to day example of CAT5 cables would be the blue LAN (ethernet) cables for computers.

Cumulative valve failure – situation where multiple valves on the collector cleaning system have failed and the system can no longer satisfactorily clean the filter media. On a Donaldson dust collector cumulative valve failure alarms are activated when more than 30% of the valves on the collector have failed.

Dual inline package (DIP) switch – a mechanical electric switch that is packaged with others in a group for use primarily on a printed circuit board along with other electronic components.

Firmware – program code stored in the on board memory of the STi timer to control how the timer functions.

Offline cleaning – cleaning mode in which filters are cleaned when the dust collector fan has been turned off. In this mode, a preset number of cleaning cycles are activated to ensure that dust particles are dislodged from the filter media.

On demand cleaning – cleaning mode in which filters are cleaned only when they are dirty, thereby reducing the compressed air consumption and increasing filter life.

Sequential pulsing mode – when one valve is pulsed at a time.

Parallel pulsing mode – when a set of two or more valves are pulsed at a time.
The Donaldson Torit Warranty

Donaldson warrants to the original purchaser that the major structural components of the goods will be free from defects in materials and workmanship for ten (10) years from the date of shipment, if properly installed, maintained and operated under normal conditions. Donaldson warrants all other Donaldson built components and accessories including Donaldson Airlocks, TBI Fans, TRB Fans, Fume Collector products, Donaldson built electrical control components and Donaldson built Afterfilter housings for twelve (12) months from date of shipment. Donaldson warrants Donaldson built filter elements to be free from defects in materials and workmanship for eighteen (18) months from date of shipment. Donaldson does not warrant against damages due to corrosion, abrasion, normal wear and tear, product modification, or product misapplication. Donaldson also makes no warranty whatsoever as to any goods manufactured or supplied by others including electric motors, fans and control components. After Donaldson has been given adequate opportunity to remedy any defects in material or workmanship, Donaldson retains the sole option to accept return of the goods, with freight paid by the purchaser, and to refund the purchase price for the goods after confirming the goods are returned undamaged and in usable condition. Such a refund will be in the full extent of Donaldson’s liability. Donaldson shall not be liable for any other costs, expenses or damages whether direct, indirect, special, incidental, consequential or otherwise. The terms of this warranty may be modified only by a special warranty document signed by a Director, General Manager or Vice President of Donaldson. Failure to use genuine Donaldson replacement parts may void this warranty. THERE EXIST NO OTHER REPRESENTATIONS, WARRANTIES OR GUARANTEES EXCEPT AS STATED IN THIS PARAGRAPH AND ALL OTHER WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESS OR IMPLIED ARE HEREBY EXPRESSLY EXCLUDED AND DISCLAIMED.

Parts and Service

For genuine Donaldson replacement filters and parts, call the Parts Express Line. For faster service, have unit’s model and serial number, quantity, part number, and description available.

Donaldson Australasia Pty Ltd
PO. Box 153
Wyong, NSW, 2259
dustcollector@donaldson.com

FREE CALL: 1800 345 837
www.donaldsonfilters.com

Donaldson Company, Inc. is the leading designer and manufacturer of dust, mist, and fume collection equipment used to control industrial-air pollutants. Our equipment is designed to help reduce occupational hazards, lengthen machine life, reduce in-plant maintenance requirements, and improve product quality.

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