

Installation, Operation and Maintenance Manual.

Installation, operation and trouble shooting information.

Controllers for the Unimaster UMA Dust Collector Range



Throughout this manual statements indicating precautions necessary to avoid equipment failure are referenced in a **Note**. Statements indicating potential hazards that could result in personal injury or property damage are referenced in a **Caution!** box.

This manual is property of the owner. Leave with the unit when set-up and start-up are complete. Donaldson Company reserves the right to change design and specifications without prior notice. Illustrations are for reference only as actual product may vary.

Revision 2 - Valid from Sept 2018

IMPORTANT

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLATION.

**THIS MANUAL SHOULD BE READ IN CONJUNCTION WITH THE RESPECTIVE
PRODUCT MANUAL SUPPLIED WITH THE DUST COLLECTOR.**

EXPLANATION OF SYMBOLS USED

Indicates information on the efficient operation of the controller.



Indicates important information directed towards preventing damage.



Indicates an important safety alert. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

APPLICATION OF DUST CONTROL EQUIPMENT



CAUTION!

Combustible materials such as buffing lint, paper, wood, metal dusts, weld fume, or flammable coolants or solvents represent potential fire and/or explosion hazards. Use special care when selecting, installing and operating all dust, fume or mist collection equipment when such combustible materials may be present in order to protect workers and property from serious injury or damage due to a fire and/ or explosion.

Consult and comply with all national and local codes/regulations related to fire and/ or explosion properties of combustible materials when determining the location and operation of all dust, fume or mist collection equipment.

When combustible materials are present in the environment that the dust collector is being deployed, you must consult an expert in the field of fire extinguishing and/or explosion protection systems for support and guidance on the selection and installation of suitable system.

DO NOT allow sparks, cigarettes or other burning objects to enter the hood or duct of any dust, fume or mist collection equipment as these may initiate a fire or explosion of any combustible materials accumulated in the collector.

Portions of the dust, fume and mist collection equipment, including the clean and dirty air plenums, may be considered as 'confined spaces' under WHS regulations

Recirculation of filtered air in your facility can be a hazard. Consult with your local WHS authority to ensure compliance with all codes regarding recirculating filtered air.

Improper installation or operation of a dust, fume or mist control system may contribute to conditions in the work area or facility that could result in severe personal injury and product or property damage. Regularly check that all dust, fume or mist collection equipment is installed and operated according to national codes and regulations.

The electrical equipment supplied by Donaldson may or may not be suitable for use in a hazardous area. Certain equipment is suitable for use in some types of hazardous areas, and this equipment is provided with certificates of suitability. However the delineation of the hazardous areas is not the responsibility of Donaldson. Thus the suitability of the electrical equipment (provided by Donaldson) to be installed within the hazardous area is also not the responsibility of Donaldson.

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

The controller as described in this manual IS NOT SUITABLE FOR HAZARDOUS AREAS. Please consult your Donaldson representative for special requirements.

This manual contains specific precautionary statements relative to worker safety. Read this manual thoroughly and comply as directed. Instruct all personnel on the safe and proper installation and operation procedures related to this equipment.

Discuss any questions on the application, use or maintenance of this equipment with a Donaldson Representative.

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1. DESCRIPTION

In their standard form, Donaldson's Unimaster dust collectors use a fan to draw dust-laden air from the dust generation points. This air is then filtered by passing it through an array of filter bags. With use, dust accumulates on the outer surface of the bags loading them which reduces the free flow of air through the bags and leads to decreased suction at the dust generation points. To revitalise the filter media, the bags are shaken which dislodges the agglomerated dust particles off the filters and causes them to fall into the dust container under gravity.

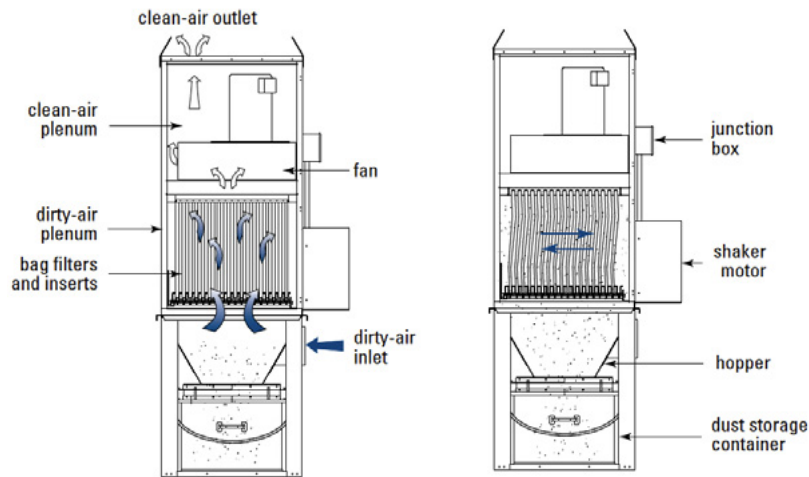


Figure 1: - Standard Unimaster dust collector operation.

Each Unimaster dust collector is supplied with a controller which is designed to operate the fan and/or shaker motor in correct sequence to ensure effective cleaning of the fabric is achieved. The shaker mechanism operates automatically when the fan is turned off.

Venting type Unimaster dust collectors are also available without their own fans. These units are typically used in pneumatic conveying systems that provide the necessary static pressure to drive air through the dust collector.

Two types of controllers are available for the Unimaster dust collector range - a standard fan and shaker motor controller and a shaker motor only controller which is used in venting type Unimaster dust collectors.

Table 1 gives a brief overview of the different types of controllers available for the Unimaster dust collector range.

	S-DOL-S	FS-DOL-S	FS-DOL-P	FS-SD-S	FS-SD-P
Description	Shaker motor controller	Fan and shaker motor controller	Fan and shaker motor controller	Fan and shaker motor controller	Fan and shaker motor controller
Type	Venting type	Standard	Standard	Standard	Standard
Configuration	N/A	Standard	PWD	Standard	PWD
Operating temperature range	-10 to 55°C	-10 to 55°C	-10 to 55°C	-10 to 55°C	-10 to 55°C
Enclosure Size	270x180x130	310x310x130	310x310x130	380x282x130	380x282x130
Enclosure Material	Rigid Polycarbonate	Rigid Polycarbonate	Rigid Polycarbonate	Rigid Polycarbonate	Rigid Polycarbonate
Enclosure rating	IP 65	IP 65	IP 65	IP 65	IP65
Cable gland size for mains connection cable	M20	M20 for all models except UMA750K21. M25 for the UMA750K21 model			
Cable gland size for fan connection cable	N/A	M20 for all models except UMA750K21. M25 for the UMA750K21 model			
Cable gland size for shaker motor connection cable	M20	M20	M20	M20	M20
Cable glands rating	IP 65	IP 65	IP 65	IP 65	IP65
Fan starter type	N/A	Direct on line	Direct on line	Star Delta	Star Delta
Shaker motor starter type	Direct on line	Direct on line	Direct on line	Direct on line	Direct on line

Table 1 - Comparison of the different types of controllers for Unimaster dust collector models.

The fan and shaker motor controller is further available in two configurations - the standard fan shaker configuration and another fan-shaker configuration specially designed to meet all requirements of the NSW Public Works Department (PWD) as described in Table 1. The difference in the features of the two fan shaker motor controller configurations is shown in Table 2.

Dust Collector Model	Standard Configuration			PWD Configuration			Metal enclosure
	Fan Starter	Run on Timer	Remote Start-Stop	Fan Starter	Run on Timer	Remote Start-Stop	
UMA 40	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 40 MM	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 70 G1	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 100 G1	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 100 K3	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 150 G1	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 150 K3	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 150 K5	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 150 K7	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 250 G1	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 250 K3	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 250 K5	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 250 K7	DOL	Optional	Optional	DOL	Included	Included	Optional
UMA 250 G8	DOL	Optional	Optional	Star Delta	Included	Included	Optional
UMA 450 K10	DOL	Optional	Optional	Star Delta	Included	Included	Optional
UMA 450 K11	DOL	Optional	Optional	Star Delta	Included	Included	Optional
UMA 750 K15	Star Delta	Optional	Optional	Star Delta	Included	Included	Optional
UMA 750 K18	Star Delta	Optional	Optional	Star Delta	Included	Included	Optional
UMA 750 K21	Star Delta	Optional	Optional	Star Delta	Included	Included	Optional

Table 2 - Comparison of the standard and PWD version combined fan-shaker motor controllers for different Donaldson Unimaster dust collector models.

All controllers are supplied in an IP65 rated rigid polycarbonate enclosure, however a powder coated metal enclosure is available on request.

2. INSTALLATION GUIDE

2.1 MECHANICAL INSTALLATION

The mounting details of the different types of controllers are shown in Figures 2-4.

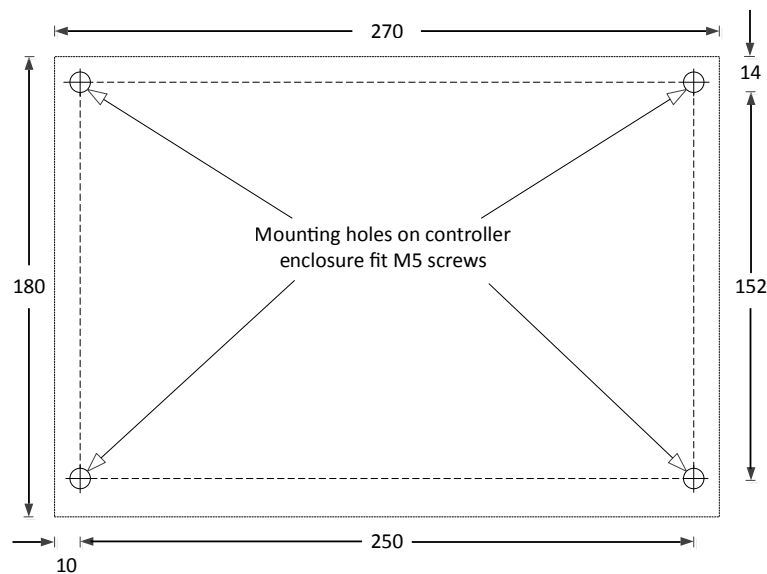


Figure 2 - Mounting details for Controllers for venting type units.

Each controller enclosure is drilled with holes for the main power supply cable to enter it, for the cable to connect the shaker motor terminals in the junction box to the relevant terminals in the controller enclosure and for the cable to connect the fan motor terminals in the junction box to the relevant terminals in the controller enclosure. The controller enclosure is supplied fitted with suitable glands to ensure that the IP rating of the glands matches that of the enclosure. The size of the glands is mentioned in Table 1.

Mount the controller independent of the Unimaster dust collector, on a vertical surface, free of vibration.



CAUTION!

The controller must **NOT** be mounted on the side of the dust collector.

The controller is **NOT** suitable for mounting in potentially explosive environments.

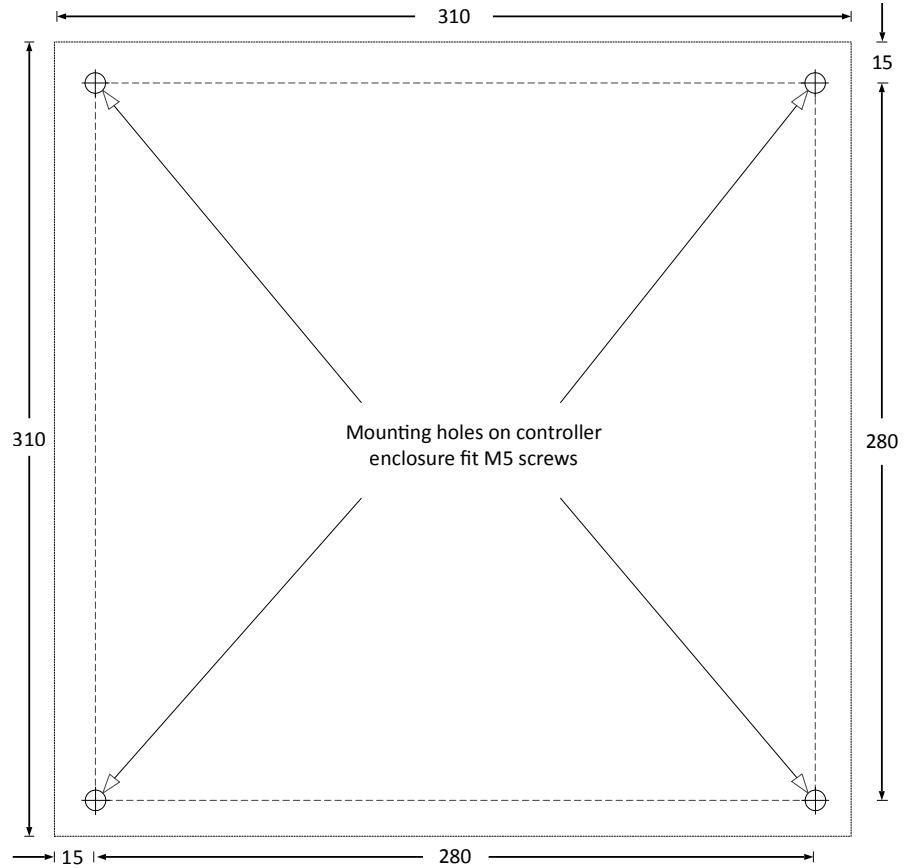


Figure 3 - Mounting details for Controllers with DOL fan starters.

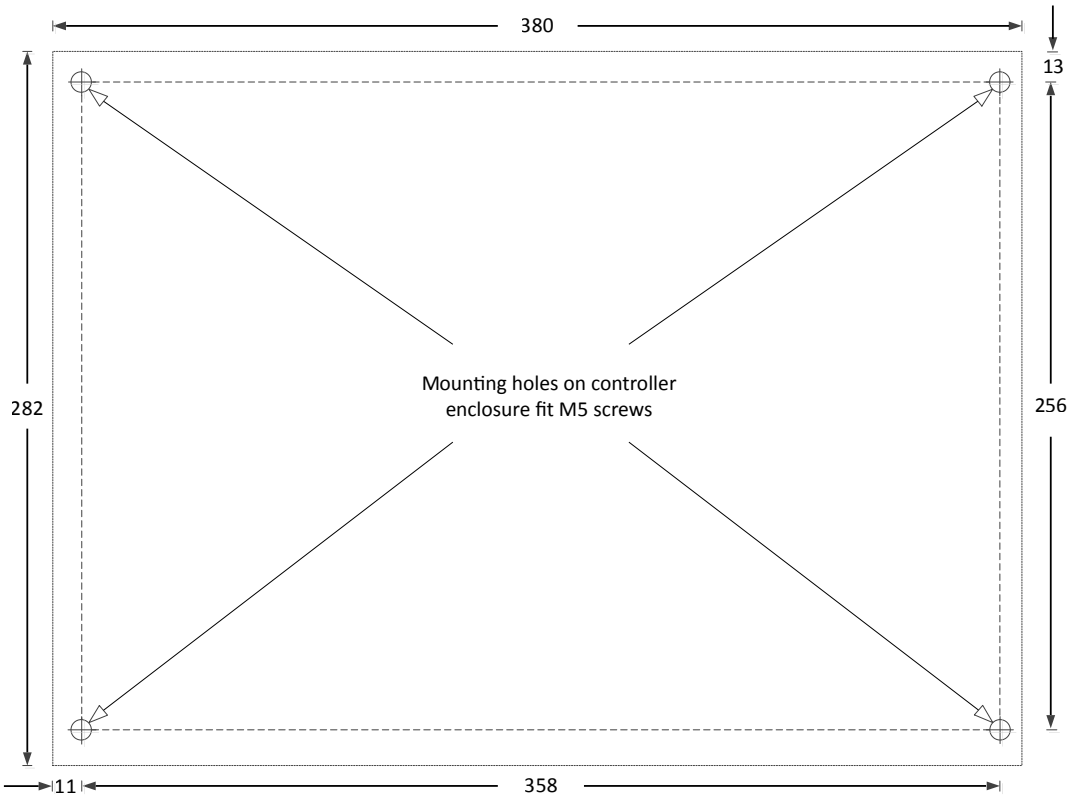


Figure 4 - Mounting details for Controllers with Star Delta fan starters.

2.2 ELECTRICAL INSTALLATION

The controllers come preassembled with the user required only to connect the mains power supply to the controller at the required terminals and wire the fan and the shaker to their control terminals.

The link between the controller and the mains power supply should be through a switch-fuse unit (preferably “on-load” type). Table 3 shows the full load currents drawn by the different Unimasters dust collectors. A suitable high rupture capacity type fuse of the rating shown in Table 3 should be chosen to electrically isolate and protect the dust collector.

Dust Collector Model	Fan Motor				Shaker Motor				Recommended fuse rating
	Motor Size (kW)	Full load current* (Amp)	Factory set thermal overload + (Amp)	Thermal Overload Range (Amp)	Motor Size (kW)	Full load current* (Amp)	Factory set thermal overload + (Amp)	Thermal Overload Range (Amp)	
UMA 40	0.55	1.3	1.4	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	6
UMA 40 MM	1.10	2.4	2.5	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 70 G1	0.75	1.7	1.8	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 100 G1	0.75	1.7	1.8	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 100 K3	1.50	3.1	3.2	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 150 G1	0.75	1.7	1.8	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 150 K3	1.50	3.1	3.2	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 150 K5	2.20	4.4	4.5	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	16
UMA 150 K7	3.00	5.8	6.0	3 to 12	0.18	0.8	0.9	0.34 to 1.4	16
UMA 250 G1	0.75	1.7	1.8	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 250 K3	1.50	3.1	3.2	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	10
UMA 250 K5	2.20	4.4	4.5	1.25 to 5	0.18	0.8	0.9	0.34 to 1.4	16
UMA 250 K7	3.00	5.8	6.0	3 to 12	0.18	0.8	0.9	0.34 to 1.4	16
UMA 250 G8	5.50	9.9	10.0	3 to 12	0.18	0.8	0.9	0.34 to 1.4	25
UMA 450 K10	5.50	9.9	10.0	3 to 12	0.18	0.8	0.9	0.34 to 1.4	25
UMA 450 K11	7.50	13.2	13.5	4.5 to 18	0.18	0.8	0.9	0.34 to 1.4	40
UMA 750 K15	11.0	19.2	11.6	4.5 to 18	0.55	1.8	1.8	1.25 to 5	25
UMA 750 K18	15.0	26.1	15.6	4.5 to 18	0.55	1.8	1.8	1.25 to 5	40
UMA 750 K21	18.5	31.6	18.5	16 to 24	0.55	1.8	1.8	1.25 to 5	50

Table 3 - Full load current drawn, Thermal Overload and Fuse rating for different Unimaster dust collector models.

* There is variation of 5-10% in the full load current drawn between motor brands. The value specified in Table 3 represents an average value for a motor running at 415VAC / 3 ph / 50 Hz.

+ The thermal overload setting and fuse rating specified in Table 3 has been calculated assuming a standard power supply. This will need to be adjusted to suit site conditions during unit commissioning.

Once the switch fuse on the mains supply line has been installed, wire the mains to the controller through the gland on the enclosure.

If the fan starter is a DOL type, then wire the fan (U, V, W) terminals in the junction box to the fan control terminals in the controller. If the fan starter is a Star Delta type, then wire the fan (U1, V1, W1, U2, V2, W2) terminals in the junction box to the fan control terminals in the controller. Pass these cables through the gland installed on the enclosure for them.

The wire the shaker motor (U, V, W) terminals in the junction box to the shaker control terminals in the controller. Pass these cables through the gland installed on the enclosure for them.



CAUTION!

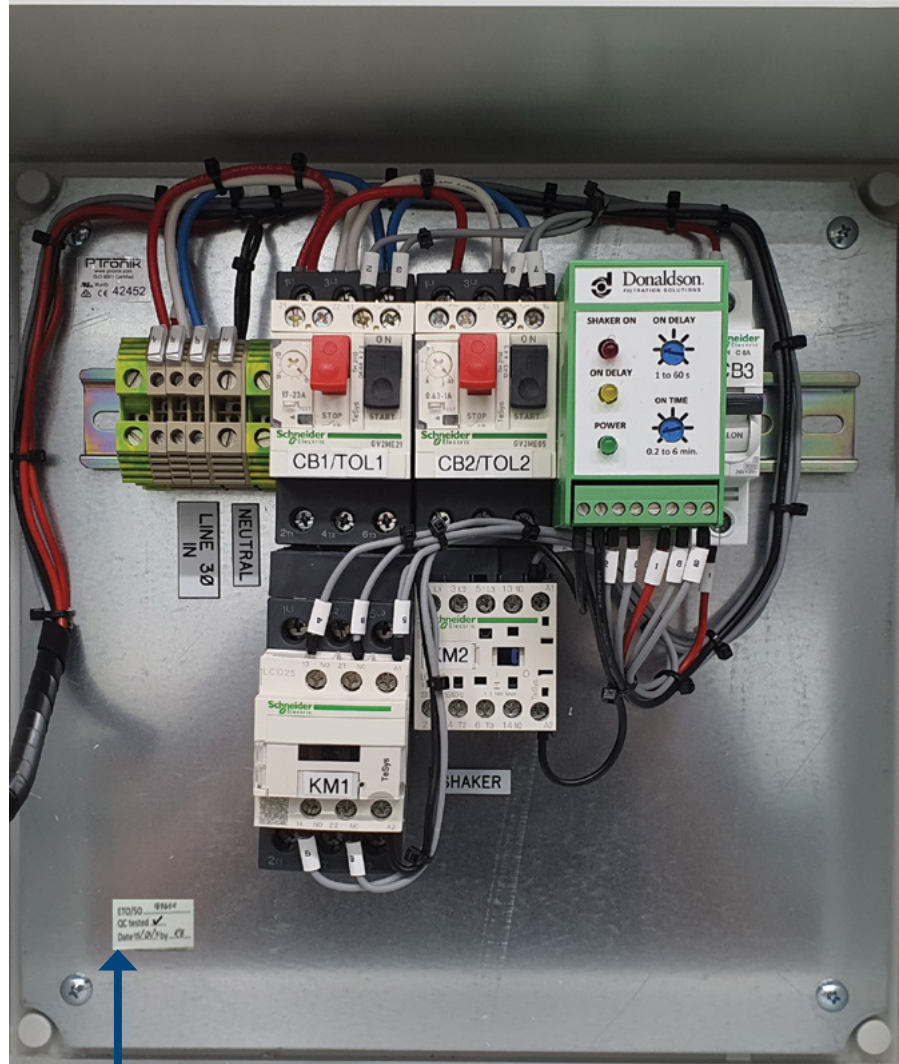
THE CONTROLLERS ARE DESIGNED TO OPERATE WITH THE CONNECTION OF AN ELECTRICAL NEUTRAL. DONALDSON RECOMMENDS THAT THIS CONNECTION IS ESTABLISHED BEFORE THE DUST COLLECTOR UNIT IS OPERATED.

The controller comes pre-configured with the settings identified in the paragraph below, so there is no need to alter the settings on the timer. However if it is necessary, it is possible to change the fan off/shaker on delay (time delay between when the fan is switched off and when the shaker is turned on), the cleaning cycle duration (the time duration for which the shaker motor will be operated) and the fan run on time (the time duration for which the fan will run; after this time, the fan will automatically shutdown) by rotating the angular potentiometer knobs on the shaker timer and run on timer respectively to the desired positions.

The factory default settings for the controllers for the Unimaster dust collectors are:

- Fan off-shaker on delay: 100 seconds
- Cleaning cycle duration: 35 seconds
- Fan run on time (where installed): 60 minutes

TO COMPLY WITH AUSTRALIAN AND NEW ZEALAND STANDARDS, THE ENCLOSURE MUST BE LOCKED BY INSTALLING A PADLOCK THROUGH THE HOLE IDENTIFIED ON FIGURE 7. THE SIZE OF THE HOLE IS 6MM.



Donaldson Serial No. & QC Details

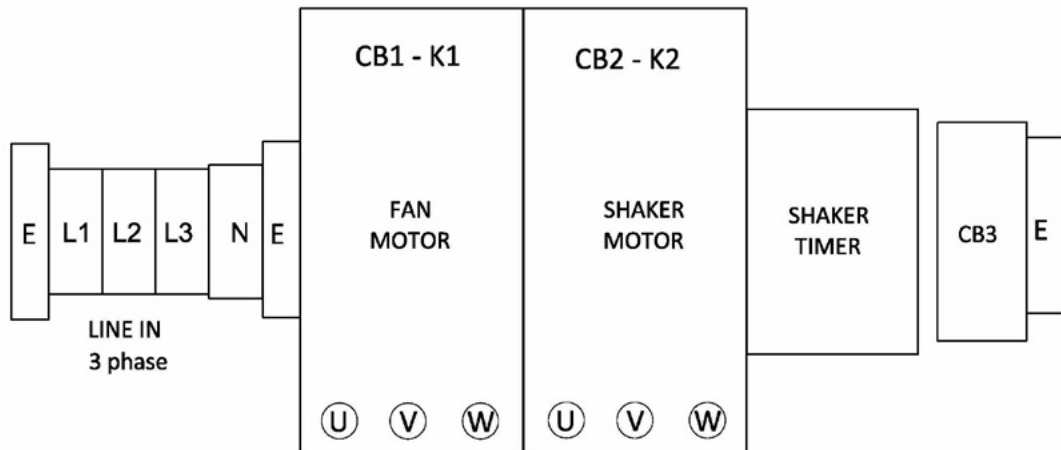
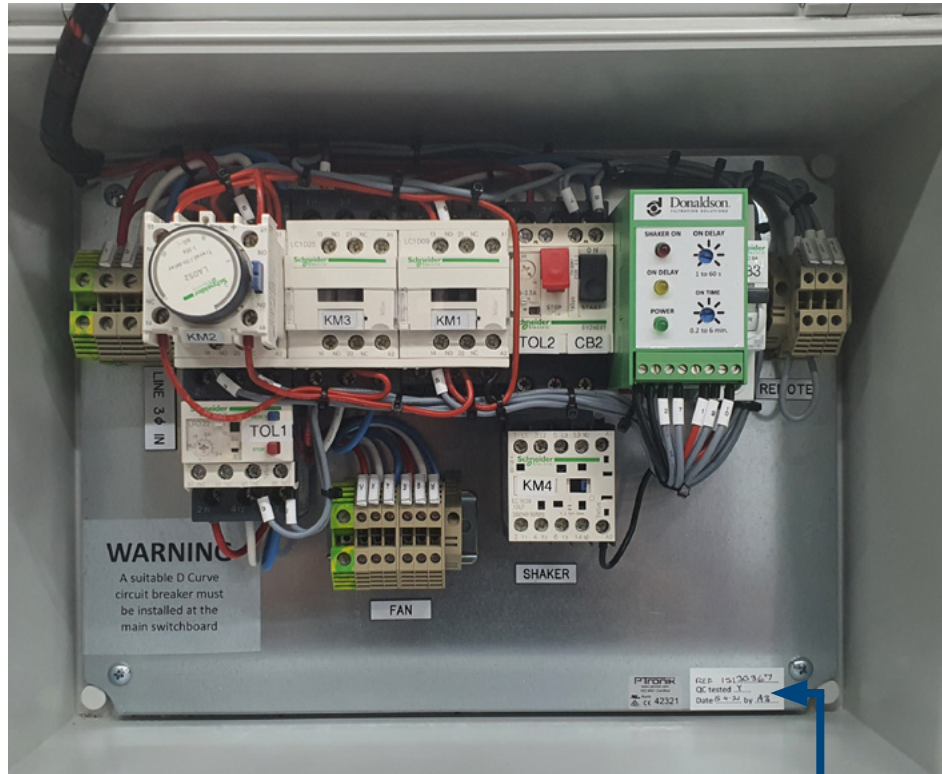


Figure 5 - Panel layout of the controllers with a DOL fan starter.

Finally connect the remote start/stop if required. If this is not required, do not remove the bridge connection between the common and stop terminals in the panel.



Donaldson Serial No. & QC Details

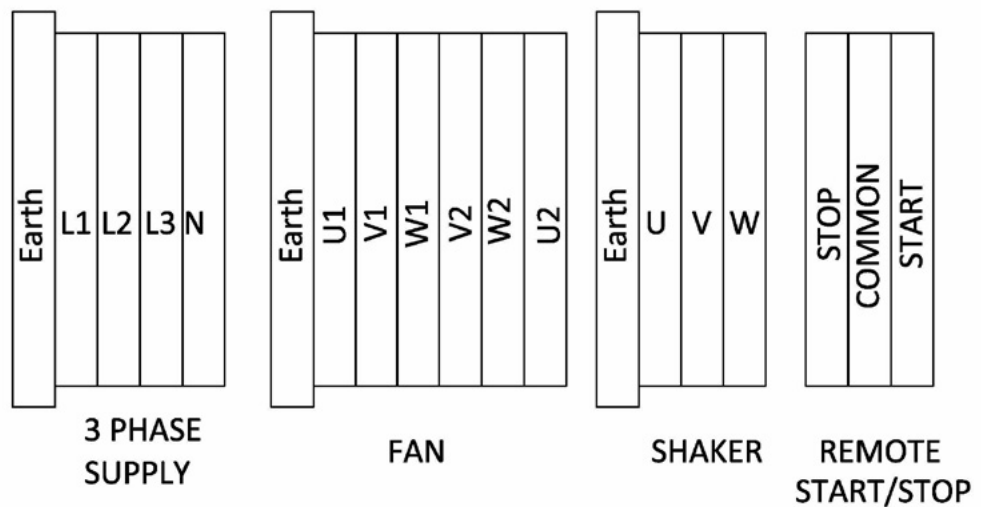


Figure 6 - Panel layout of the controllers with a Star Delta fan starter.

3. OPERATION

Press the Green button on the enclosure cover to activate the fan. The unit is ready for operation as soon as the fan has been activated.

To turn off the unit, press the Red button on the enclosure cover. This deactivates the fan, and after the fan off/shaker on delay the shaker motor is activated to shake the filter bags for the cleaning cycle duration.

If it is necessary to shut down the unit in case of an emergency, press the emergency stop button on the enclosure cover. This will immediately cut power to the dust collector control wiring and stop both the fan and shaker motors.



Figure 7 - Enclosure cover panel. The figure shows the cover panel for a PWD configuration controller. The standard configuration controller is shown on the cover page of the manual.

4. TROUBLESHOOTING

Observation	Potential Causes	Remedial Action
Partial loss of suction	Fan motor speed low	Check power supply and fan motor connection. For star delta starters, check that motor is connected to Delta.
	Filter blocked	Filter not cleaned regularly enough - initiate cleaning sequence by pressing the stop button. Cleaning mechanism does not work properly. Check the operation of the cleaning mechanism. Filter was cleaned when the fan was still in motion. The Filter bags need to be removed and cleaned by hand. To prevent from happening again reset the fan off-shaker on delay to the factory setting.
	Incorrect fan rotation	Check electrical connections. Transpose two of the three phases if necessary to reverse the fan rotation direction.
	Explosion relief panel breached	Check if explosion relief panel has been breached. Replace panel if breached.
	Filter bags have worn out	Check filter bags and replace them in they are worn.
	Total loss of suction	Fan motor stopped
Filter blocked		Filter not cleaned regularly enough - initiate cleaning sequence by pressing the stop button. Cleaning mechanism does not work properly. Check the operation of the cleaning mechanism. Filter was cleaned when the fan was still in motion. The Filter bags need to be removed and cleaned by hand. To prevent from happening again reset the fan off-shaker on delay to the factory setting.
Manifold or duct connection to the dust collector is blocked		Check ductwork and inlet manifold thoroughly and clean/clear blockages.
Explosion relief panel breached		Check if explosion relief panel has been breached. Replace panel if breached.
Unit trips after normal operation for a while	Thermal overload of fan occurring	Increase fan thermal overload setting but keep within the setting range identified in Table 3. Note that the thermal overload unit will need to be reset by pressing the reset button next to the setting dial before the fan can be restarted.



NOTE

To enable Donaldson to best assist you with a spare parts or service enquiry, please quote the controller serial number and details identified on the Donaldson Quality Control sticker when you contact us. These details can be found at the bottom empty spaces inside the controller enclosure. Please refer to Figures 5 and 6 shown on Pages 12 and 13 of this manual which show the location where this information can be found in the different controllers.

5. APPENDIX - CONTROLLER WIRING DIAGRAMS

The wiring diagram for the controllers with DOL and Star Delta starters are shown in Figure 8 and Figure 9 respectively.

Neutral connection is required

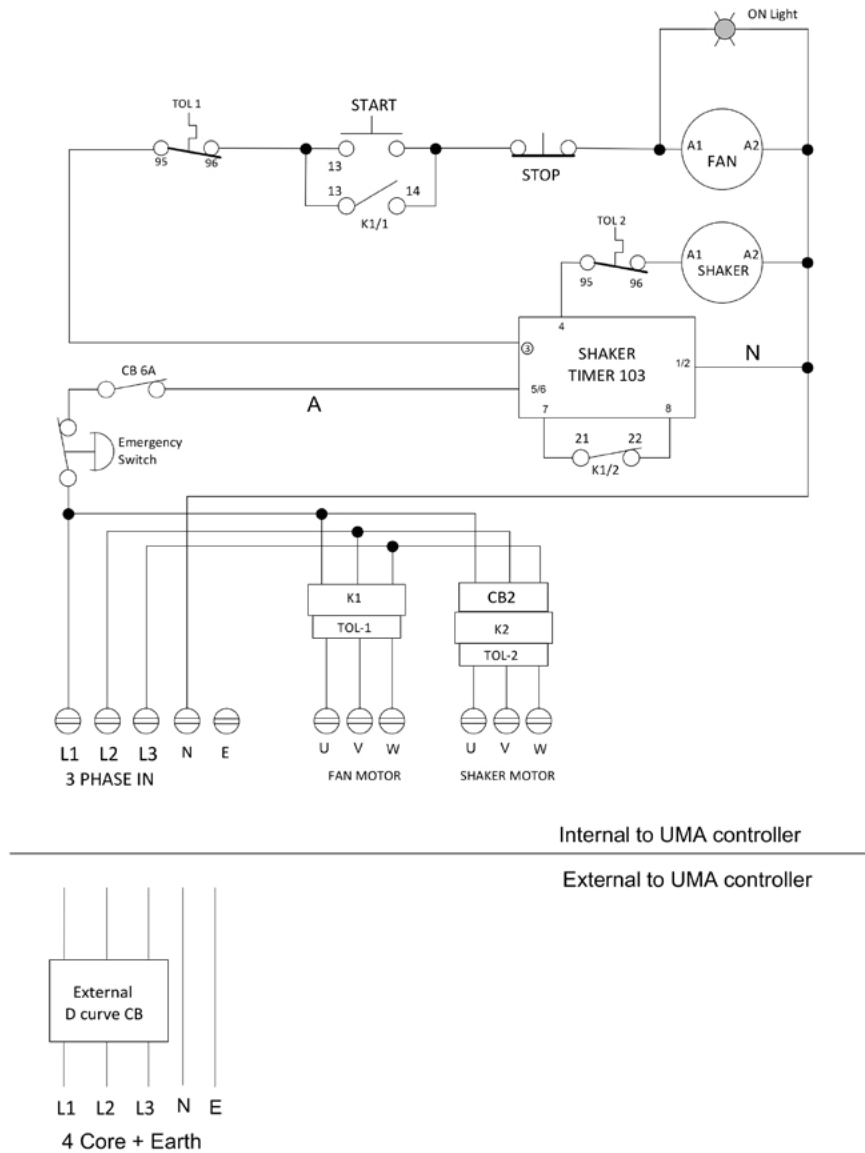


Figure 8 - Wiring diagram of a standard controller with a DOL fan starter.

Neutral connection is required

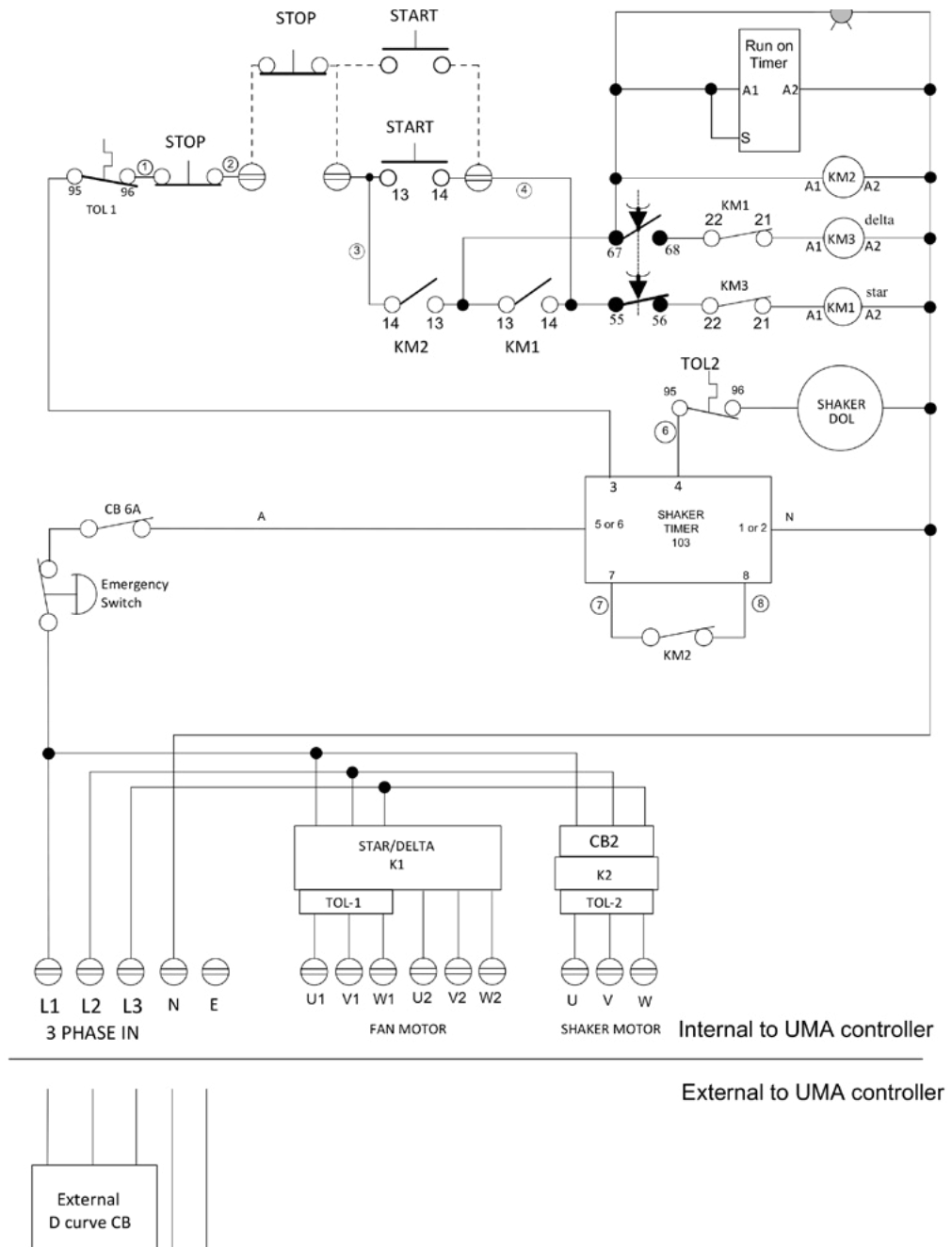


Figure 9 - Wiring diagram of a UMA controller with a Star Delta fan starter with 240VAC remote start stop terminals and a fan run on timer.

6. CONTACT DETAILS

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