



TECHNICAL MANUAL

Operating and Maintenance Instructions for

V5000

CONVEYOR DEGAUSSER

V5000 CONVEYOR BULK TAPE DEGAUSSER

OPERATING MANUAL

PRODUCTION STANDARD

DOCUMENT NO. M/000055

WARNING TO AVOID ELECTRIC SHOCK HAZARDS, THE COVER SHOULD ONLY BE REMOVED BY AUTHORISED PERSONNEL

CAUTION IT IS RECOMMENDED THAT MAGNETIC STORAGE MEDIA IS KEPT AT LEAST **2** METRES FROM THE DEGAUSSER

IMPORTANT THE POWER ON/OFF SWITCH USED ON THIS EQUIPMENT IS NOT AN ISOLATING SWITCH. IT IS RECOMMENDED THAT THIS EQUIPMENT SHOULD BE OPERATED FROM A SEPARATE SWITCHED ISOLATOR.

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This document refers to V5000 degausser
Part No ZZ 005 017

1. SPECIFICATION

ERASURE	-70db on 1000 oersted tape
TAPE FORMATS	VHS & U-matic, plus DAT, audio cassettes and reels up to 10 1/2" diameter with tape widths 1/4", 1/2" and 1".
BELT SPEED	2 inches per second
THROUGHPUT	200 cassettes / hour typical
DUTY CYCLE	50% (depending on ambient temperature)
WINDOW OPENING	280mm X 42mm
OPERATING VOLTAGE	Optional 220 / 240 V (+5% - 10%) 50Hz

NOTE

Voltages outside the above tolerances may result in permanent damage to the equipment.

CURRENT	20 amps typical 240 V 50 Hz 24 amps typical 220 V 50 Hz
PROTECTION	Fuse rating: 2 amp Circuit Breaker main power: 25 amp
MOUNTING	Free standing table top
DIMENSIONS	Height: 19 1/4" (489mm) Width: 31 1/2" (800mm) Depth: 27 1/2" (699mm)
WEIGHT	80 Kg

2. INTRODUCTION TO THE V5000 CONVEYOR DEGAUSSER

The Verity Systems V5000 degausser has been designed as a high energy multi purpose magnetic eraser capable of erasing media up to 1000 oersted coercivity.

The wide conveyor belt will accept media up to 280mm in width with a typical throughput of up to 200 cassettes per hour. For the computer operator there is a special version that will accept 10.5" data reels complete with self loading collar.

During the design stage of the V5000 particular consideration was given to user efficiency; to maximise the duty cycle the V5000 is controlled by an optical sensor unit, fitted as standard to 50Hz units.

The optical sensor detects when media is placed on the belt and automatically switches from standby to the degaussing mode and will switch back to stand by after six seconds if no further media is placed on the belt.

Additional features include constant monitoring of coil performance with a visual Indication on the front control panel, plus temperature sensors to monitor the degaussing coils and control the high pressure cooling fans. In the unlikely event of a fault occurring, over current protection is achieved using a fuse for the control of circuitry and a resettable circuit breaker for the degaussing coils. Last, but not least, the V5000 is of rugged mechanical construction using high quality material throughout to ensure years of reliable use.

3. INSTALLATION

3.1 Unpacking

Remove the four transit bolts from the pallet.

Unpack the degausser carefully and inspect it for signs of physical damage. If damage is apparent, a claim should be filed with the carrier.

3.2 Power Wiring

Power connection is made to the V5000 via the heavy duty flying cable at the rear of the unit. The power circuit to the degausser should be rated in accordance with the national and local electrical codes. The V5000 operates from specific supplies. Check for compatibility.

Caution

A good electrical ground must be connected top the degausser. The unit must be connected to the correct power supply. Failure to do so may result in permanent damage.

3.3 Voltage Settings

When the unit is unpacked the voltage at which the unit is set will be seen on a label on the current meter.

To change the voltage setting see Fig. 1. Remove the cover, as described in section 8.1. The bus bars and transformer will be found at the front of the unit.

Note

Degausser Current Consumption

The degaussing coils are powered as part of a tuned resonant circuit. This allows quite high circulating currents to be generated within the degaussing coils, with minimal current consumption from the mains voltage supply. However, this technique requires that the waveform of the supply voltage contains minimal harmonic distortion. A distorted waveform will result in an increase in current consumption. In extreme cases excessive current will trip the circuit breaker, making it necessary to use a mains filter to remove the distortion and reduce the current consumption.

The typical current consumption figures provided in this manual are when powered from a supply with minimal distortion. Any increase in current consumption due to a distorted waveform will have minimal effect on the degausser performance, however, excessive current consumption should be avoided for obvious reasons. In the event of unexplained high currents, please consult your supplier.

4. METHOD OF OPERATION

The V5000 degausser has been carefully engineered for convenience and simplicity of operation. The unit has a number of unique features which are outlined below.

4.1. Power switch

The power switch is of the rocker type and is the only control. When the power switch is on, the unit will be in the standby mode, identified by the illuminated standby indicator.

The media to be erased is fed into the degausser at the right end and exits at the left end.

4.2. Method of operation (Optical Control)

Connect the equipment to a suitable supply.

To operate the degausser switch the unit into the standby mode using the black rocker switch, the 'standby' indicator will illuminate.

To automatically energise the degausser and start the conveyor belt, place the product on the right hand end of the conveyor belt. With the 'erase' indicator illuminated and the standby indicator extinguished further tapes required to be erased may be placed on the conveyor belt.

The degausser performance is constantly monitored and is indicated via the meter on the control panel. The meter needle should remain in the green area whilst in the 'erase' mode, indicating correct operation.

For optimum erasure of media up to 900 oersted it is recommended that the media is passed through the degausser twice in specific relative positions (see diagram below).

For optimum erasure of certain 1500 oersted media it is recommended that the media is passed through the degausser 4 times in specific relative positions (see diagram below).

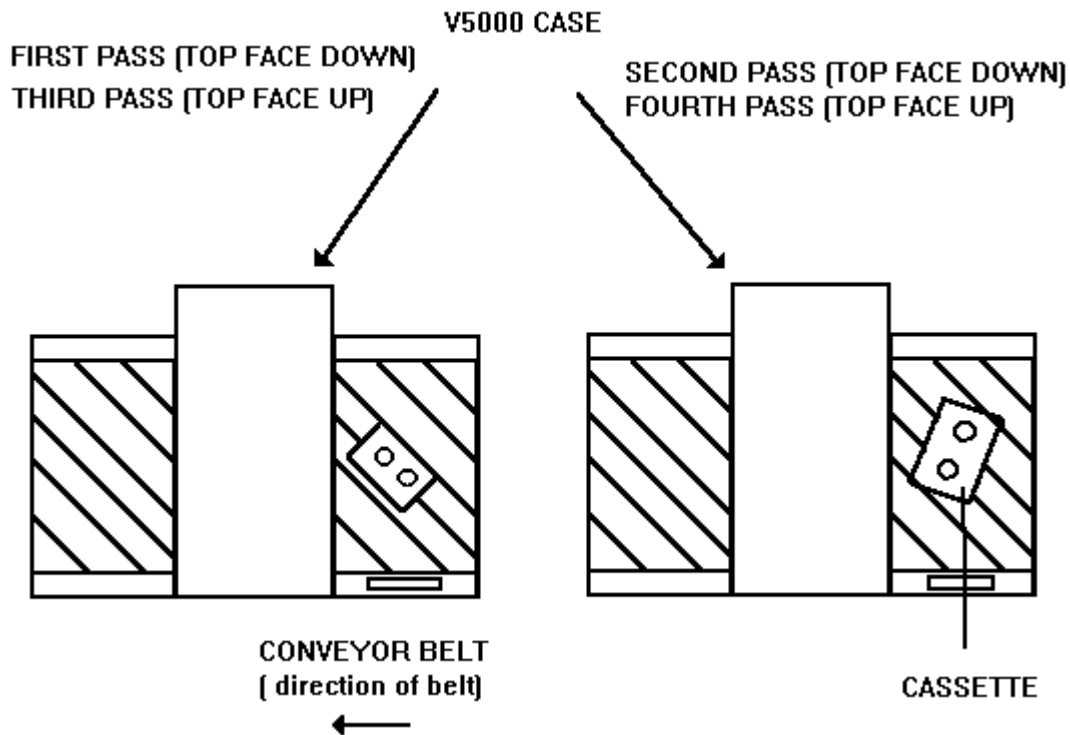


Figure 2 - Cassette position during erasing

The relative position for the second pass amounts to basically rotating the media through 90 degrees. It should be noted that reels of tape should also be rotated through 90 degrees.

During prolonged continuous operation the unit will eventually overheat. At this stage a red warning indicator on the front panel will illuminate before returning to the standby mode when cooled. Approximately 20 minutes should be allowed before attempting any further erasures.

Assuming the unit has not returned to the 'standby' mode due to extended operation the degausser will return automatically to the 'standby' mode after a fixed time delay, from detecting the last product to be erased.

4.3. Method of Operation (Manual Control)

Units without optical control have the standby and erase indicators replaced with push button switches. The switches provide direct control over the degausser, however, the erase function is disabled if the degauss coils overheat. Apart from the manual control, the other aspects of the erase procedure are identical to that in 4.2.

Note

It is recommended that the degausser be left in the standby mode until the cooling fans have switched off.

5. SAFETY RECOMMENDATIONS

It is recommended that people with any form of heart pace-makers or implants etc. avoid close proximity to any equipment of this type without appropriate medical advice.

6. INDICATORS/FEATURES

6.1. Panel Indicators

The following indicators are included on the V5000 degausser:

Indicators	Mode
Red warning light on the mains switch:	Power on
Yellow standby light:	Unit in standby mode
Red warning light:	Overheat
Green warning light:	Unit in erase mode
Field meter:	Erase field strength

6.2. Thermostatically controlled cooling fan

The high pressure cooling fans are controlled by a thermostatic switch mounted on the degaussing coil. The sensor switches the fan on at a coil temperature of 70 degrees centigrade ± 5 degrees centigrade. The fan, once running, will continue after the degaussing coils are switched off. This is to allow the coils to cool sufficiently.

6.3. Overtemperature Sensors

Each of the degaussing coils is monitored for excessive operating temperatures. In such an event the degausser will be automatically switched off until the coils have cooled sufficiently. The V5000 is specified for intermittent operation and if continuous operation is attempted the sensors will be activated after approximately 20 minutes depending on the ambient air temperature.

6.4 Over Current Protection

Incorporated in the degausser are two types of over-current protection namely a fuse for the control circuitry including the conveyor motor and a resettable thermal circuit breaker for the degaussing coils.

Caution

Repeated tripping of the circuit breaker indicates an internal problem. Do not continue to attempt to turn the machine on under such conditions. A catastrophic failure may result.

6.5. Key Switch

The security key switch, when fitted, inhibits the operation of the degausser by removing power to the control electronics but still allowing the mains on/off switch to illuminate when applicable. The key is removable in both the 'on' and 'off' positions.

6.6. Automatic Operation (Standard on 50Hz Units)

In order to maximise the actual 'media erase' time the degauss coils are controlled by a product sense circuit. The media is detected as it is placed on the conveyor belt and the degauss coils are energised. The coils are then energised for a fixed period after the detection of the product.

7.0 MAINTENANCE / SERVICING

7.1 Cooling System

The cooling system utilises high pressure fans in order to maximise correct operating periods under extended use. The fans are of the ac brushless type with a life expectancy in excess of 16,000 hours and do not require routine servicing.

7.2 Conveyor Belt Drive System

The drive motor is of dc type and drives the conveyor belt via a gear box. The drive system has a long life expectancy and does not require routine servicing.

7.3 Conveyor Belt Cleaning

CAUTION It is recommended that the degausser is disconnected from the mains supply before attempting to clean the belt.

In order to obtain correct erasure of the media it should be ensured that while passing through the degausser the media is held stationary on the conveyor belt. To this end a belt with a 'sticky' surface is used. However, after extensive use, the belt may become contaminated and allow the media to move whilst being erased. It is therefore recommended that the belt should be cleaned using a mild detergent to ensure correct operation. (A household type spray cleaner is suitable.)

Spray the visible part of the belt with the cleaner and wipe off. Move the belt on and repeat the process until the complete belt is clean.

CAUTION Only spray the cleaner onto the belt surface, do not soak.

7.4 Conveyor Belt Tensioning and Tracking

Belt adjustment is not a routine activity, however in the following rare cases it may be required:

- a. Belt ceases to move.
- b. Belt moves intermittently

In both examples of mistracking above a gap is usually seen between one edge of the belt and the product guiding area of the cover.

The above conditions must not persist, otherwise permanent damage to the belt and drive mechanism may occur.

For further instructions on belt tensioning see Section 8.9.

7.5 Lamp Replacement

To prevent shock hazard, switch off the mains power before replacing lamps. Illuminated lenses on the indicators pull off for lamp replacement. Only one type of lamp (28v) is used.

7.6 Fuse Replacement

The equipment is protected by a fuse and a circuit breaker which are located at the rear of the unit.

Note

Electrically isolate the degausser before replacing fuse.

The fuse holder contains a 1 amp antisurge fuse. To replace it rotate the cap in an anti-clockwise direction and remove cap and fuse. Renew the fuse and replace the cap into the holder and tighten in a clockwise direction. To reset the circuit breaker simply press the button until it latches in.

7.7. Optical Product Sense

The optical sensing electronics have been preset prior to leaving the factory and should not require adjustment, the exception being after long service to compensate for normal component wear.

8.0. SERVICE PROCEDURES

The V5000 has been engineered to allow components to be replaced quickly and efficiently. However, there are inevitably one or two items requiring detailed instructions to assist in their efficient replacement or adjustment should they become faulty. These items are:

- a. Conveyor drive motor
- b. Magnet box
- c. Conveyor belt
- d. Fan
- e. Solid state relay
- f. Product sense unit

Apart from these items the remaining components may be readily replaced. However the following notes should be adhered to:

Notes

1. Locking compound should be used on screws and nuts during reassembly.
2. Thermal conductive grease should be used when fitting the bridge q rectifier D1 or the solid state relay RL1.

8.1. Cover Removal (**CAUTION - LIVE MAINS VOLTAGE IS EXPOSED WITH MAIN COVER REMOVED**)

1. Disconnect the degausser from the mains power supply.
2. Remove the 9 screws securing the cover to the base of the unit and lift off the cover vertically, taking care not to damage the wires leading to the controls and indicators, lay the cover down by the side of the unit.
3. Should it be necessary to completely remove the cover disconnect the wires from the field meter and mains on / off switch (making note of wire positions).

Unplug the warning light and keyswitch connector block.

8.2. Conveyor Drive Motor Replacement

1. Remove the cover.
2. Disconnect red and blue drive motor wires from the terminal block.
3. Slacken the two bolts securing the lower right hand conveyor belt roller and reduce the belt tension.
4. Remove the geared belt roller and move the belt to give access to the drive motor gear.
5. Apply heat to the brass gear on the drive motor. (By the use of a hot air gun) break the locking compound and pull off the brass gear.
6. Remove the three screws securing the motor/gear box, remove motor/gear box. Note the position of any spacing washers.
7. Fit the new motor/gear box, and tighten screws.
8. Fit the brass gear on motor shaft using locking compound Loctite 601 allow to set. The brass gear should be positioned on the motor/gearbox shaft for correct engagement with the roller gear.
9. Re-fit the drive roller, tighten bolts.
10. Re-tension the conveyor belt and check the tracking.

Note *Do not overtighten the belt. Tension is only required to take up any slack in the belt.*

8.3. Upper Magnet Box Removal

1. Remove the cover.
2. Remove fan assembly wires.
3. Remove the four coil connecting wires from the terminal block making note of their position.
4. Remove the two spade connectors from the coil temperature sensor.
5. Remove the earth strap.
6. Remove the four nuts securing the magnet box to the rubber vibration mountings and lift off the magnet box.
7. To fit the magnet box reverse the above procedure.

8.4. Lower Magnet Box Removal

1. Repeat steps 8.3.1. to 8.3.6.
2. Remove the four coil connecting wires from the terminal block, making note of their positions.
3. Remove the four spade connectors from the coil temperature sensors. Cut any cable ties and pull back the cables.
4. Remove the earth strap.
5. Remove the two brass extension and the two plain nuts securing the magnet box to the rubber vibration mountings.
6. Slacken off the two screws securing the bottom right hand roller and slacken off the conveyor belt.
7. Lift up the conveyor belt and slide out the magnet box through conveyor belt.
8. If a new magnet box is to be fitted, remove the rubber vibration mountings and product guides and fit to the new magnet box.
9. To refit the magnet box reverse the above procedure.

8.5. Conveyor Belt Replacement

The unit is supplied from the factory with an endless belt. Replacements are supplied with a join as this is much easier and simpler to fit.

1. Remove the cover.
2. Slacken the lower right hand roller and release the belt tension.
3. If there is an endless belt fitted to the unit this must be cut with a sharp knife or scissors but care should be taken not to let the belt slide off the unit.
4. Using a strong tape attach the end of the new jointed belt to the end of the old belt where it is cut, then gradually feed the new belt through the unit by pulling on the old belt.
5. When the two ends of the new belt are adjacent, thread in the joint pin until its ends are protruding from either side of the belt and the pin is centrally located on the joint.
6. The belt should now be adjusted as described in Section 8.9.

8.7. Fan Assembly Removal

1. Remove the cover.
2. Disconnect the fan power leads from the terminal block.
3. Remove the four nuts and screws securing the fan motor assembly to the magnet box end plate. Break the silastic seal and remove the fan.
4. The replacement fan assembly is fitted in reverse order.

Note Use sealant type EA 100 007 around the mating faces of the fan assembly when re-fitting.

8.8. Solid State Relay (SSR) replacement

1. Remove the cover.
2. Remove the right hand bottom conveyor belt roller.
3. Remove the lower fan assembly.
4. Remove the cables from SSR. noting their positions.
5. Remove the SSR securing nuts and screws and remove the SSR.
6. Replacement of SSR is the reversal of the above procedure.

Note Use thermal grease type EA 100 002 under the replacement SSR.

8.8. Setting/checking procedure for product sense unit

1. Disconnect the degausser from the mains supply.
2. Remove the nine off screws securing the degausser cover and lift off the cover. The cover lifts off forward and will sit alongside the degausser with the indicators and ON/OFF switch still connected.
3. The optical product sense pcb is located on the far side of the conveyor belt adjacent to the mains i/p lead.
4. Fig. 3 shows the pcb component layout and the monitor points used to set the potentiometers RV1 and RV2.
5. Connect the degausser to the mains supply and switch the degausser ON. Using an oscilloscope monitor test point (1) see Fig 3, and check the waveform displayed with that on Fig 3.

Note There is no adjustment provided for this waveform.

6. If the waveform is correct monitor test point (2), see Fig 3 and check the waveform displayed with that on Fig 3.

Note During this check the sensor (item 20 on Fig 3) must be shielded from any extraneous light. With the conveyor belt moving the waveform may show signs of instability due to light from the emitter being reflected off the conveyor belt. Adjust if necessary RV1 to obtain the correct waveform.

7. The 'time out' delay, ie the delay before switching off the degausser coils after having detected the product may be adjusted using RV2.
8. Having set RV1 and RV2 replace the degausser cover checking that the light sensors line up through the holes in the cover and check for correct operation.

8.9. Conveyor belt tensioning

As the belt stretches from general wear and tear retracking may be required, ie to set the conveyor rollers so that the conveyor belt runs over the centre of the rollers without excessive loading or damage to the edge of the belt. Tracking of the belt is achieved by adjusting the lower right hand roller. The roller is secured by bolts in slots in the degausser chassis and by moving one end of the roller, either slackening or tightening the correct running position of the belt may be achieved. It is recommended that the degausser is allowed to run for a few minutes to ensure that correct tracking has been achieved.

1. Remove the cover and place it down alongside the degausser.
2. Reconnect power to the degausser.
3. Run the degausser and identify where the conveyor belt is running.
4. Slacken one of the fixing screws securing the lower right hand roller and move the end of the roller to position the belt running centrally between the belt guides over the lower magnet box.
5. Tighten the roller belt and run the degausser to check the operation of the belt.
6. Disconnect the degausser from the power supply.
7. Replace the cover.

9. BASIC FAULT FINDING TABLE 1

Note

The table includes possible faults of optional extras. Disregard sections that are not applicable to a particular unit.

Function	Symptom	Possible Fault	Location
Power Lamp	Fails to illuminate	Loss of mains supply Blown bulb Faulty switch	User source Control panel Control panel
Standby Indicator	Fails to illuminate	Key switched in off position F1 Fuse Blown Faulty bulb Faulty connector SK1 Faulty optical control pcb Faulty dc power supply	Front panel Rear panel Control panel In line connector from the control panel Far right hand side Rear right hand side of degausser
Standby Indicator	Fails to illuminate -	Faulty optical control pcb	Far right hand side of Degausser remains degausser in erase mode
Erase Indicator	Fails to illuminate but degauss coils energise and conveyor belt	Faulty bulb Faulty connection SK1 from the control running Faulty optical control pcb	Control panel In line connector panel Far right hand side of degausser

Function	Symptom	Possible Fault	Location
Cooling fans	Fail/s to operate	Faulty fan motor/s on the rear of the	Fans are mounted magnet assemblies
		Faulty degaussing coil Temperature sensor SW2	Lower magnet assembly
Conveyor Belt	Fails to run but erase indicator illuminated	Conveyor motor faulty degausser	Front left hand side of
		Optical control	Far right hand side of degausser

Function	Symptom	Possible Fault	Location
Conveyor Belt	Fails to run -	Faulty coil sensor SW 4 or 5	Both upper and lower coils not energised
Coil assemblies		Degaussing coils overheating due to faulty fan or operating in high ambient temperature	Relocate to reduce ambient temperature
Optical	Fails to operate product sense	Faulty or out of adjustment of degausser pcb	Far right hand side
		Faulty sensor emitter	Rear right hand side of degausser
Field Meter	Fails to operate	Tripped circuit between CB1	At the rear of the degausser adjacent to the input power cable
		Faulty relay RL1	Mounted on the rear chassis member under lower fan
		Faulty optical control pcb of degausser	Far right hand side
		Faulty meter	Control panel
Circuit breaker CB1	Repeatedly trips	Badly distorted mains supply waveform	User source
		Faulty coil/s	Centre of the degausser
		Faulty tuning capacitors	At each end of the degausser under the conveyor belt
Fuse FS1	Repeatedly blows	Faulty dc power supply side of degausser	Front right hand
		Faulty conveyor motor	Front left hand side of degausser

Note

Degausser Current Consumption

The degaussing coils are powered as part of a tuned resonant circuit. This allows quite high circulating currents to be generated within the degaussing coils, with minimal current consumption from the mains voltage supply. However, this technique requires that the waveform of the supply voltage contains minimal harmonic distortion. A distorted waveform will result in an increase in current consumption.

The typical current consumption figures provided in this manual are when powered from a supply with minimal distortion. Any increase in current consumption due to a distorted waveform will have minimal effect on the degausser performance, however, excessive current consumption should be avoided for obvious reasons. In the event of unexplained high currents, please consult your supplier.

TABLE 2 CURRENT MONITOR POINTS

The following table contains typical current values to be measured at specific points in the equipment.

The values given are in amperes and may differ slightly from those actually measured due to component tolerance plus effects due to operating temperature

**Current Monitor Test Points
(refer to circuit diagram)**

Model Voltage/Frequency	1	2	3	4	5
220v 50Hz setting	20	1.3	0.1	18.6	58
240v 50Hz setting	18	1.4	0.1	16.5	60

10. RECOMMENDED SPARES LIST

Part No.	Description	Qty	Designation
RS 100 018	Solid State Relay	1	RL1
FF 100 022	Fuse 2 Amp	10	FS1
SD 100 010	Bridge Rectifier	1	D1
OI 100 011	28v Bulb	10	I2 - I4

V5000 DEGAUSSER 50Hz (Std)

PARTS LIST

Part No.	Description	Qty	Designation
CA 100 001	Cable Gland 20mm	1	
CC 100 002	Capacitor 200µf	8	C1-C8
CC 100 035	Capacitor 2200µf	1	C9
CC 200 005	Capacitor clip	1	
CG 200 001	Terminal block	10	TB2 and 3
CG 200 002	End cover	2	TB2 and 3
CG 200 003	Jump bar	1	TB2 and 3
CG 200 004	Terminal Rail	1	
CM 100 024	Terminal block	1	TB1
CM 100 025	Terminal block 20A 12 way	1	
CM 100 500	Cable shell	1	SK1
CM 100 501	Chassis shell	1	PL1
CM 100 502	Pin	10	PL1
CM 100 503	Sockets	10	SK1
FF 100 022	Fuse 2A	1	FS1
FF 200 006	Fuse holder	1	
FM 100 001	Guard 120mm	6	
FM 100 040	Motor/gearbox 24v	1	M1
FM 100 041	Fan	2	F1 and F2
HS 100 124	Modified vibro mount	4	
MP 000 527	Spur gear conveyor	1	
MP 000 631	Base bracket	9	
MP 000 772	Vibration pad	20	
MP 002 620	Case	1	
MP 001 008	Case base	1	
MP 001 009	Chassis member	2	
MP 001 011	Roller bracket	4	
XX 001 773	Driven roller assembly	3	
XX 001 774	Drive roller assembly	1	
MP 001 015	Belt	1	
MP 001 016	Foot	4	
MP 001 020	Cassette guide	1	
MP 001 021	Magnet housing upper	1	
MP 001 024	Bottom bracket (front)	1	
MP 001 026	Top bracket	3	
MP 001 027	Side plate (front)	3	
MP 001 081	Magnet housing lower	1	
MP 001 103	Air deflector	2	
MP 001 104	Air dam	2	
MP 001 106	Rubber foot mount	4	
MP 001 110	Support post	4	
MP 001 115	Label - control panel	1	

Part No.	Description	Qty	Designation
MP 001 292	Emitter adjust bracket	1	
MP 001 318	Emitter plate	1	
MP 001 319	Sensor plate	1	
MP 001 123	Mains Supply Bracket	1	
MP 001 390	Bump Stop	2	
OI 100 011	Bulb	3	I2, I3, I4
OI 100 101	Emitter inf.red	1	D2
XX 001 886	Meter	1	I1
RS 100 003	Relay	1	RL1
SD 100 010	Bridge rectifier	1	D1
SP 100 005	Temp sensor 120 deg	2	SW4 and SW5
SW 100 013	Thermal switch	1	SW2
SW 100 040	Indicator	3	I2, I3, I4
SW 100 042	Diffuser	3	I2, I3, I4
SW 100 043	Lens red	1	I3
SW 100 044	Lens yellow	1	I4
SW 100 045	Lens green	1	I2
SW 100 070	Key switch	1	SW3
SW 100 046	Rocket switch illum	1	SW1
TX 100 015	Transformer	1	TX1
XX 001 029	Magnet housing cover	2	
XX 001 302	Pcb assembly optic control	1	Pcb1
MP 002 100	Label 'Verity Systems'	1	
MP 002 105	Label 'V5000'	1	
SW 100 050	Circuit Breaker 25A	1	CB1
XX 001 295	Coil/Stack Assy RH	1	L2
XX 001 481	Coil/Stack Assy LH	1	L1
MP 002 624	Cassette Guide (Front)	1	
XX 002 623	Modified Vibro Mount (Upper)	4	