Level Controller

Manual P/N 768 606 A
– English –

NORDSON ENGINEERING • STOCKPORT • UK

CE

Order number
P/N = Order number for Nordson products

Declaration of Conformity
98/37/EC
73/23/EEC

We,

Nordson (U.K.) Limited

of

Ashurst Drive, Cheadle Heath, Stockport, Cheshire, SK3 0RY, United Kingdom

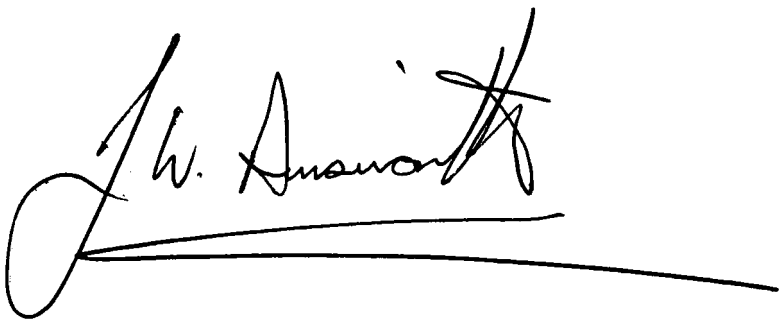
declare that under our sole responsibility for supply/manufacture of the product(s)

Product Name	Level Controller
Model Number(s)	765104
Product Options	None

to which this declaration relates, is in conformity with the following standards and other normative documents

Safety	BS EN 60204–1:1993 “Safety of Machinery – Electrical equipment of machines” EN 60335:Part 1:1988 “Safety of household and similar electrical appliances” BS EN 292:1991 “Safety of machinery – Basic concepts, general principles for design”

following the provisions of 98/37/EC and 73/23/EEC Directives



Jim Ainsworth
General Manager

Nordson (U.K.) Ltd., 22 January 1996

NB ref EN45014 (BS7514)

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Congratulations on the Purchase of Your Nordson Product

Nordson equipment is engineered and manufactured in accordance with strict specifications, using high quality components and state–of–the–art technologies that assure reliable, long–term performance. Your product was thoroughly tested for proper operation prior to shipment.

Before unpacking and installing your new equipment, please read this manual. It is your guide to safe installation, productive operation and effective maintenance. We recommend that you keep the manual available for future reference.

Your Safety is Important to Nordson

Carefully read the *Safety* section. Your product is designed for safe operation when used according to the published instructions. Potential hazards exist when operating instructions are not followed.

Manufacturer of Equipment

Nordson (U.K.) Ltd.
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Cheadle Heath
Stockport
England
SK3 0RY

Telephone: 0044 (0) 161–495–4200
Fax: 0044 (0) 161–428–6716

For a list of local Nordson organisations, see *Nordson International*.

Nordson International

Europe

Country		Phone	Fax
Austria		43-1-707 5521	43-1-707 5517
Benelux		31-13-511-870	31-13-511-3995
Czech Republic		4205-4722 1955	4205-4722 1977
France		33-1-6412 1400	33-1-6412 1401
Denmark		45-43-661 133	45-43-661 123
Germany	*Erkrath*	49-211-92050	49-211-254 658
	Lüneburg	49-4131-8940	49-4131-894 149
Italy		39-02-904 691	39-02-9078 2485
Norway		47-22-656 100	47-22-658 858
Poland		48-22-36 4495	48-22-36 7042
Portugal		351-2-961 9400	351-2-961 9409
Russia		7-812-224 0439	7-812-224 0439
Slovak Republic		4205-4722 1955	4205-4722 1977
Spain		34-96-313 2090	34-96-313 2244
Sweden		46-304-678 500	46-304-678 529
Switzerland		41-61-411 3838	41-61-411 3818
United Kingdom	*Hot Melt*	44-1844-26 4500	44-1844-21 5358
	Finishing	44-161-495 4200	44-161-428 6716
	Nordson U.V.	44-1753-528 151	44-1753-691 351

Distributors in Eastern & Southern Europe

Contact: FDE, Nordson UK	44-161-495 4200	44-161-428 6716

Outside Europe / Hors d'Europe / Fuera de Europa

- For your nearest Nordson office outside Europe, contact the Nordson offices below for detailed information.
- Pour toutes informations sur représentations de Nordson dans votre pays, veuillez contacter l'un de bureaux ci-dessous.
- Para obtener la dirección de la oficina correspondiente, por favor diríjase a unas de las oficinas principales que siguen abajo.

Contact Nordson		Phone	Fax
Africa / Middle East			
FDE, Nordson UK		44-161-495 4200	44-161-428 6716
Asia / Australia / Latin America			
Pacific South Division, USA		1-440-988-9411	1-440-985-3710
Japan			
Japan		81-3-5762 2700	81-3-5762 2701
North America			
Canada		1-905-475 6730	1-905-475 8821
USA	*Hot Melt*	1-770-497 3400	1-770-497 3500
	Finishing	1-440-988 9411	1-440-985 1417

Section 1

Safety

Section 1
Safety

1. Introduction

Read and follow these safety instructions. Task and equipment specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

2. Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

3. Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

4. Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

5. Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual electrostatic spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

6. Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment in the spray area. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one mega−ohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

7. Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

8. Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Section 2

Description

Section 2
Description

1. Intended Use

The Nordson Level Controller is designed to integrate into a powder recycling system to control the addition of powder from a virgin supply to the powder hopper.

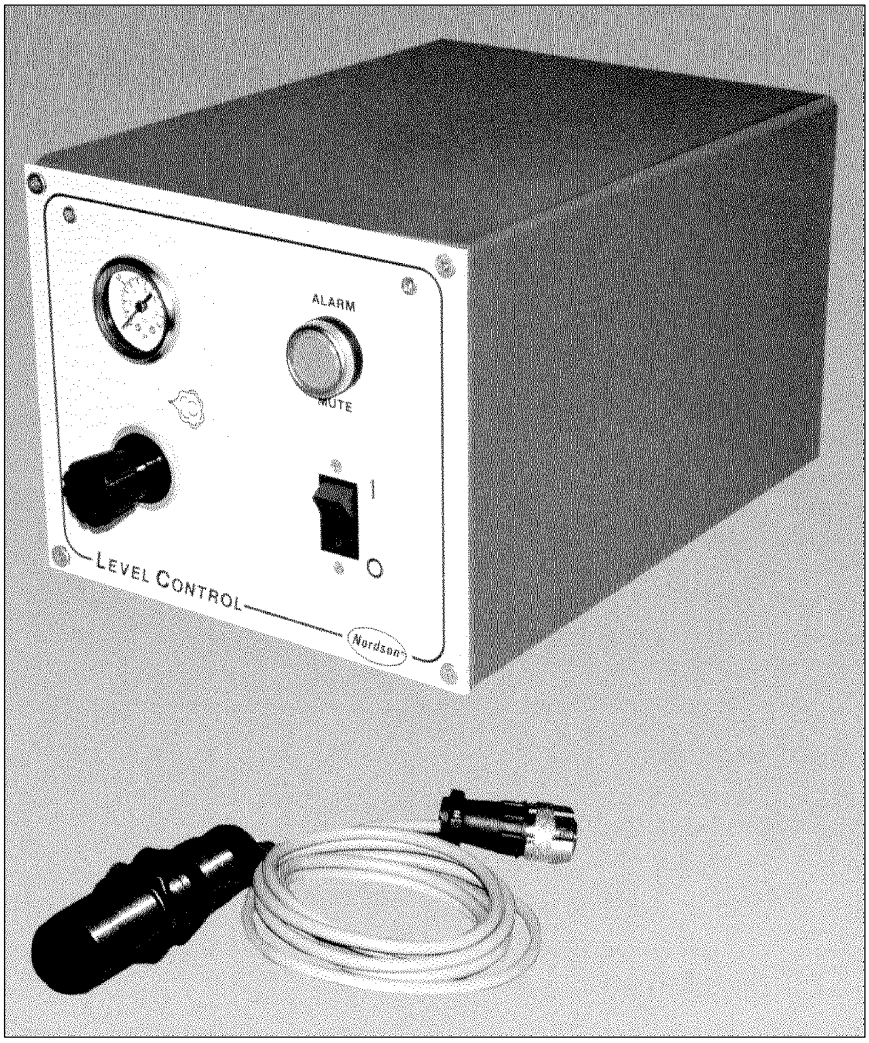


Fig. 2-1

2. Features

The Nordson Level controller automatically monitors and controls the feed of virgin material to powder coating systems. It eliminates the need for manual powder filling of the hopper, minimising spillage and dust hazards.

By maintaining a constant level of powder in the hopper, this provides a constant gun output and film thickness.

The unit is primarily designed for use with the Nordson feed from the box system, it has an electric supply for a vibrator, a regulated air supply for the Nordson transfer pump and comes complete with a simple to mount sensor for fitting to the side of the powder hopper.

Internal to the unit are connections for a remote annunciator, started when the powder level in the hopper has not been restored before a preset time has expired. A mute control on the front panel allows the operator to silence the alarm, while an integral illumination of the switch provides indication that the powder level has not been restored in the hopper.

The Level controller may be installed in both new and retrofit systems. It is supplied in a Nordson Versa Style casing which may be removed to fit the controller into Nordson 19” rack units.

Section 3

Installation

Section 3
Installation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Transport

Transport the unit so as to avoid damage. Do not throw the unit. Use suitable packaging materials and sturdy cartons. See *Specifications* section for dimensions and weight.

Protect the unit from exposure to humidity, dust and vibrations.

2. Unpacking

Carefully unpack the unit to avoid damaging it. Check for damage caused during transport.

Save packing materials for possible later use. Otherwise recycle or dispose of properly according to local regulations.

3. Removing

Switch off the mains supply, then disconnect all electrical connections from the unit.

4. Storage

Pack the unit in suitable packing materials and sturdy cartons. Protect from humidity, dust and large temperature fluctuations (condensation).

5. Disposal

Dispose of properly according to local regulations.

6. Setting up the Unit

WARNING: Allow only qualified personnel to perform the installation. Observe safety instructions.

1. Connect the air supply to the 1/4” fitting on rear of unit.

NOTE: The air must be clean and dry at 100 psi maximum, filtered to 5μ or 2 °C dewpoint, oil free. The air pressure must not exceed 6.9 bar / 0.69 MPa /100 psi.

2. Connect the air supply from the output 1/4” BSP fitting on the controller to the transfer pump.

3. If using in conjunction with an Easy-Feed Powder Transfer System, connect this to the terminals (Live - 2, Earth - 5B, Neutral - 7B) indicated on the circuit schematic located at the back of this Manual.

4. If using an external annunciator, connect this to the terminals (Live - 11, Earth - 12, Neutral - 7A) indicated on the circuit schematic located at the back of this Manual.

5. Connect a suitable earth to the connection point on the outside of the cabinet provided.

6. The level probe requires an M30 clearance hole for mounting. The probe should be located approximately half-way between the maximum and minimum desired levels in the hopper. Ideally the minimum amount of powder should be held in the hopper allowing for consumption by the system whilst changing and emptying virgin feed container.

7. Connect the level probe to the controller.

8. Connect the controller to a suitable electrical supply.

9. Turn on the external supplies.

10. Turn the air supply regulator for no air flow.

11. Ensure the hopper is empty of powder.

12. Turn on the ”Supply On/Off” switch.

13. The sensor will activate the level controller, although the air supply has been turned off.

6. Setting up the Unit (contd.)

14. Adjust the sensitivity of the sensor using a small screwdriver.

NOTE: The total movement of the controls are 270°, any excessive force will cause damage.

15. The sensor LED will be showing GREEN, turn the timer fully anti-clockwise to turn off the delay times.

16. With no material around the sensor, rotate the calibration range control clockwise until the LED changes to RED. Slowly rotate the calibration range control clockwise until the LED changes to GREEN. Optimum setting is then usually achieved by rotating the control a further 10°anti-clockwise.

17. The air supply to the powder pump can be turned up to the required level for powder transfer.

18. Adjust the timer control to it's mid-point position.

19. When the powder is detected, the GREEN LED will commence flashing RED, indicating that the material has been sensed and the time delay before stopping the transfer is now operating. When the delay has elapsed, the LED will be RED.

20. As powder is used from the system, the sensor will detect the drop in level, the LED will flash GREEN showing that the time delay before activating the transfer is now operating. When the delay has elapsed, the LED will be GREEN.

21. Steps 18 and 19 are the normal cycle of operation.

22. Adjust the time delay as required for optimum operation, it is better to have the longest possible on/off transfer periods for best operation.

23. Should, during the course of operation, the supply of virgin powder run out and the level in the hopper has not been restored by a pre-set time, the low level alarm will activate. This is an illuminated button on the front panel and, if fitted, an external annunciator. The external annunciator can be muted by pressing the illuminated button, the button will extinguish as soon as there is the correct level of powder in the hopper.

24. The time for activation of the low level alarm is adjusted by means of a timer located inside the controller, it is factory-set to approximately one (1) minute.

Section 4

Operation

Section 4
Operation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Daily operation

1. Turn on the external electric and air supplies.
2. Turn on the Level Controller.
3. Adjust the regulator to give desired transfer rate for the powder.
4. At end of use turn off the Level Controller.
5. If a Low Level warning should occur then mute the annunciator (if fitted) by pressing the front panel button.
6. Determine if the powder has run out or if there is a blockage in the system. Correct by adding more powder or clearing blockage.
7. Alarm will clear when powder level in hopper rises above minimum level.

Section 5

Maintenance

Section 5
Maintenance

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

WARNING: Breathing in certain airborne dusts (including finishing powders) may be hazardous to health. Ask the powder manufacturer for a Material Safety Data Sheet (MSDS) for information. Use appropriate respiratory protection.

1. Daily Maintenance

The Level Controller should be checked periodically for correct operation of all parts, including the Low Level Alarm.

Ensure that the controller is kept clean, with any dust or powder being wiped off with a lint free cloth.

2. Annual Maintenance

The unit should be tested for electrical safety, at intervals of not more than 12 months according to Electricity at Work Regulations 1989 (as revised) or similar for non-UK countries.

Section 6

Troubleshooting

Section 6
Troubleshooting

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Important Hints for Troubleshooting

The following tables provide general information for the troubleshooting of basic problems. Sometimes more detailed information, circuit diagrams or measuring devices are also needed for troubleshooting.

It must be noted that a fault can occur for several reasons. It is advisable to check all possible causes for a given fault. Obvious causes of malfunction such as broken wires, missing fasteners etc., should be noted during visual inspections and corrected immediately.

The Unit does not contain any user serviceable parts, any parts that fail must be replaced by approved parts available from Nordson.

Problem	Possible Cause	Corrective Action
Controller fails to operate	No supply present	Check supply to controller
		Check On/Off switch is on
	On/Off switch trips out	Carry out electrical check on equipment
LEDs on probe do not illuminate	No supply present	Check supply & On/Off switch
Solenoid/Vibrator supply fails to operate	No supply present	Check supply & On/Off switch
	Sensor not operating correctly	Refer to sensor manual
	Solenoid faulty	Check / replace solenoid
No transfer air	Regulator or air supply turned off	Check and correct

Section 7

Parts

Section 7
Parts

1. Introduction

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use the parts list, and the accompanying illustration, to describe and locate parts correctly.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

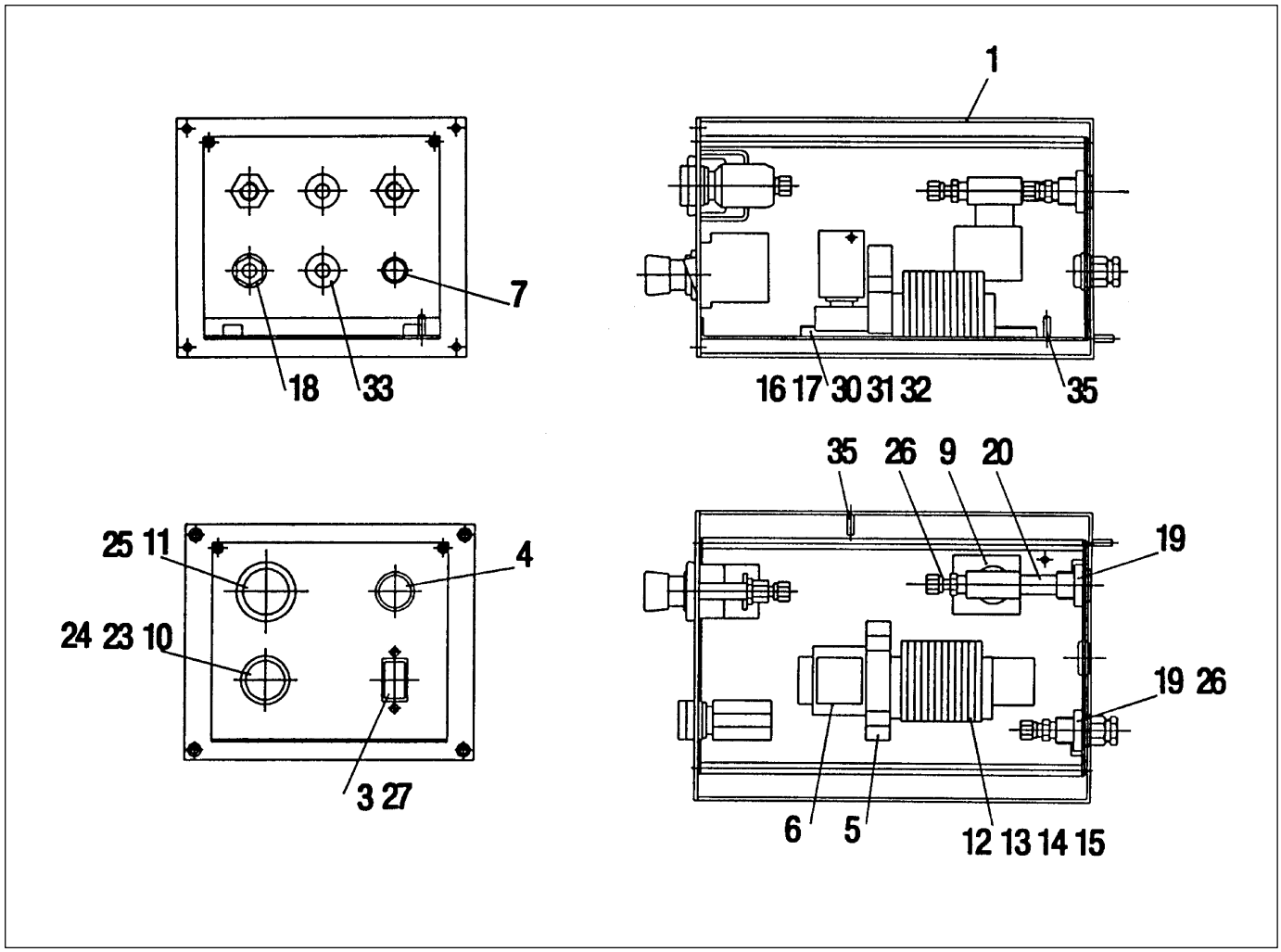
Item	Part	Description	Quantity	Note
—	000 0000	Assembly	1	
1	000 000	• Subassembly	2	A
2	000 000	• • Part	1	

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

2. Level Controller Parts



Item	Part	Description	Quantity
-	765104	Controller, level	1
N/S	769126	• Crimp, flat pin, 0.5-1.5MM2.RD	17
N/S	769403	• Washer, spring, M3, BZP	4
N/S	768606	• Manual, level controller, Versa	1
N/S	769128	• Crimp, receptacle 0.25”, IN.,.5-1.5	5
N/S	769601	• Screw, M3x8, posi pan HD, chrome	4
N/S	769130	• Crimp, spade, 0.5-1.5MM2, 4BA/M3.5	17
N/S	765119	• Box, packing, level controller	1
1	765114	• Fab., level control, Versa style	1
N/S	768900	• Sensor, prox, multi-voltage, relay	1
3	765122	• Circuit breaker, 5A, 240VAC	1
4a	765125	• Lamp block, 240VAC, 130VAC lamp	1
4b	765126	• Lamp, 130V, BA9S	1
4c	765124	• Contact block, N/O	1
4	765123	• Actuator, blue, illuminated	1
5	765129	• Timer, multivolt, .25-640M, DLY On	1
6	765128	• Relay, base, 8 pin	1
6a	765127	• Relay, 240VAC, DPCO, 8 pin	1
7	769012	• Connector, 8-way insert socket	1
7a	769018	• Contact, socket	8
7b	769015	• Connector, chassis mount shell	1
9	768404	• Solenoid valve, 2/2,1/4BSP, 240 VAC	1
10	768003	• Regulator, air	1
11	768001	• Gauge, 0-10 bar, panel mounted	1
12	769043	• Terminal, 2.5 mm, symetric	9
13	769044	• Terminal, 4 mm, earth symetric	2
14	769046	• Terminal, end cover	1
15	769047	• Terminal, end stop	2
16	769042	• Rail, din, symetrical, TS35-0.5M LG	1
17	769041	• Jumper, 2.5 mm	1
18	769132	• Gland, cable, 4-7MM OD,M20 thread	3
19	768202	• Fitting, bulkhead, 1/4BSPF-1/4BSPF	2
20	768116	• Nipple, barrell, 1/4BSP	1
N/S	768251	• Tubing, poly, 6MM OD, blue,/MTR	2
N/S	769107	• Cable, 3183Y, 3 core, 0,75MM2, BK,/MT	15
23	768211	• Fitting, elbow, 1/4BSPM-6MM(PI)	2
24	768207	• Fitting, elbow, 1/8BSPM-6MM(PI)	1
25	768230	• Fitting, stud, 1/8BSPF-6MM(PI)	1
26	768234	• Fitting, stud, 1/4BSPM-6MM(PI)	2
27	769602	• Screw, M3x8, SLT CSK HD, BZP	2
30	769621	• Screw, M5x10, SLT PAN HD, BZP	2
31	769422	• Washer, plain, M5, BZP	4
32	769421	• Nut, M5, nyloc, BZP	2
33	769136	• Grommet, blanking, 20 mm hole	2
35	769139	• Terminal, blade, 0.25 IN. TO M5	3

3. Sensor Extension Cables

Item	Part	Description	Quantity
	768915	Extension cable 5 mtr	1
	768916	Extension cable 10 mtr	1
	769016	• Connector, in-line coupler	1
	769012	• Connector, 8-way, insert, socket	1
	769018	• Contact, socket	5
	769014	• Connector, cable shell	1
	769013	• Connector, 8-way, insert, pin	1
	769017	• Contact, pin	5

Section 8

Specifications

Section 8
Specifications

1. Electrical

Voltage (Volts)	220 - 240
Frequency (Hz)	50
Current (A) (with no external connections)	0.2 A

2. Mechanical

Height (mm)	176
Width (mm)	216
Depth (mm)	360 (requires min 75 mm extra clearance at rear for incoming hoses/cables)
Weight (kg) (boxed)	8.2

3. Noise

Less than 70 dB(A) measured at a distance of 1 m from the surface of the unit and at a height of 1.6 m.

4. Wiring diagram

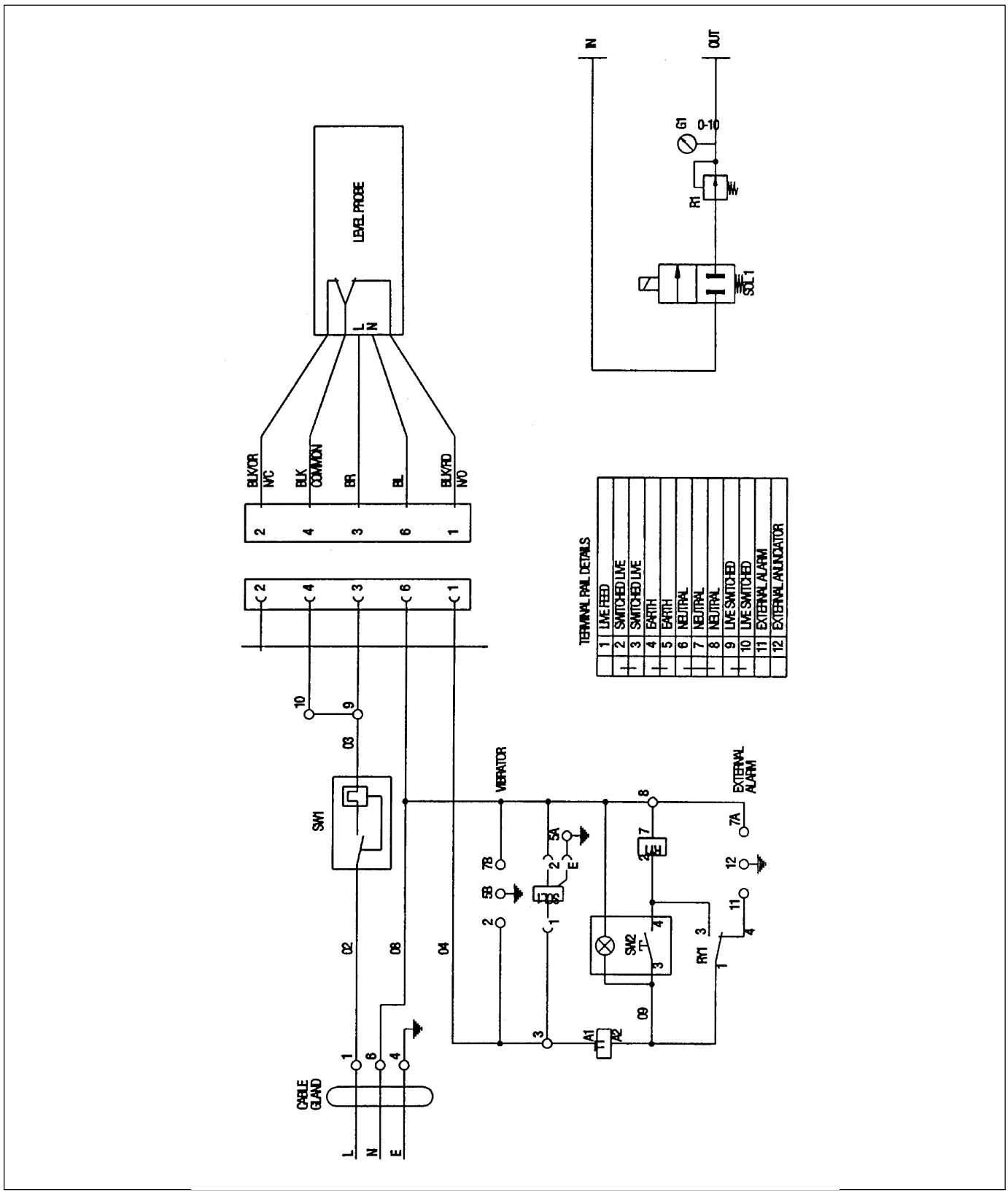


Fig. 8-1