



MRG Series

Railway Crossing Swing Gate

Operation, Installation and
 Maintenance Instructions

 Barriers - Pedestrian
 MRG / Railway Gate

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Operation, Installation and Maintenance Instructions

Barriers - Pedestrian MRG / Railway Gate

1.0 Safety **PLEASE READ THIS IMPORTANT INFORMATION FOR SAFETY REASONS**

1.1 General safety notes.

The Magnetic Railway Gate has been designed and built according to the latest state of the art technology and has left the factory in a fully tested condition. Nevertheless, the installation can give rise to risks for persons and objects if it is installed incorrectly. The installation instructions must therefore, be read completely and the safety notes must be observed.

Any liability and warranty is declined by the manufacturer in case of incorrect use and use for purpose other than the intended.

Conversions and modifications to the Railway Gate are not permitted. Only original spare parts and accessories from

1.2 Warning!



This symbol appears in the operating instructions and identifies actions and conditions which can give rise to danger for life and limb of persons. Observe the instructions accurately.

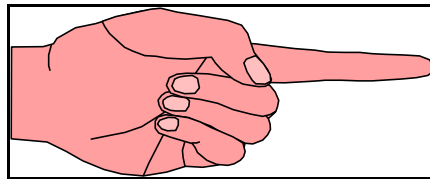
1.3 Caution!

All actions and conditions which can possibly give rise to damage to objects are identified with this symbol in the operating instructions. Observe the instruction accurately.



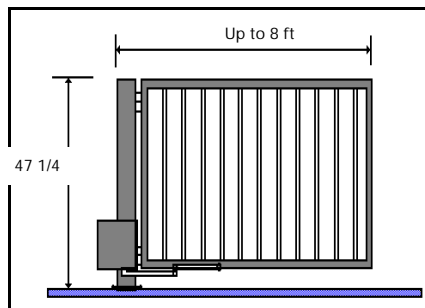
1.1 Note!

Relevant and useful notes for the user are identified with this symbol.



2.0 General Description:

The automatic pedestrian gate system is designed for the control of pedestrian traffic through level and foot crossings.



The general layout for the installation of the gate system is as per Metropolitan Transit Authority Drawing No. A2MS4039. The sequence of operation is as follows:
 1.1 The Gate is normally held open (under power) exposing a walkway across tracks. In this position, it also closes off an emergency exit.



2.2 When a train approaches the crossing, an optional "Sonalert", located in the drive mechanism housing sounds, followed by the closing of the gate under power to prevent access across the tracks by at the same time exposing the emergency exit. The angle of gate travel is approximately 90 degrees and time taken for this movement is between 5-7 seconds.

2.3 After the passage of the train, the Sonalert stops and the gate opens under power, once again exposing the walkway permitting access across the tracks and at the same time closing off the emergency exit. Time taken for this movement is between 5-7 seconds.

2.4 Under power failure conditions, the gate will automatically close against pedestrian traffic under spring tension. However, the Sonalert does not sound.

2.5 The design of the automatic pedestrian gate system is vandal resistant, and all components are of robust construction. The motor and gearbox are protected against intentional damage when the gate is stopped during its opening and being forced against its motion during its operation.

PLEASE NOTE: The Sonalert is an optional extra, and is not provided on our standard gate system. Provision is made for the connection of this device if required.

3.0 Operation

3.1 Motor Operation.

(Refer Drawing No. 858/858-2). The motor fitted is a Magnetic Torque Drive GTA 210-50. Switching between the two-stator coils allows the motor direction to be reversed. Power applied between L1 and L3 will produce a magnetic field in all three coils. One phase is displaced by a 50uF capacitor with a 2.2 ohm 10 watt resistor in series. The magnetic field produced will cause a torque to open the gate. Power to the gate whilst closing is reduced by the inclusion of capacitor/resistor combination into the circuit in series with the WU coil. Power to the gate whilst opening is applied by means of No.1 microswitch contact which will break when the gate is fully open. When the contacts break, the current in the opening coil is reduced by means of a capacitor/resistor combination in series with the VU coil.

3.2 Closed Position:

In the closed position the gate presents a firm resistance against a forced opening. This is achieved by the alignment of the linkages and the reduced motor torque that is preset in the factory.

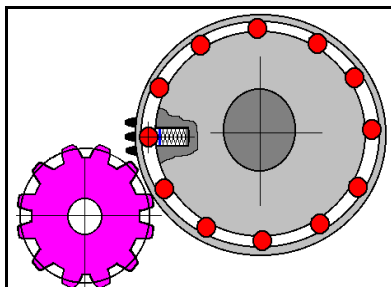
The reduced power is applied at all times when the gate is closed. The motor is stalled and the extra energy is dissipated as heat to the alloy housing of the motor. This is a special feature of the motor.

Under power failure conditions, closing of the gate is achieved by the alignment of the linkages under spring tension – a fail-safe feature!

If the initial resistance is overcome, the gate can be forced to open further. When the gate is released, it is then driven closed under reduced torque from the motor and the spring. No mechanical or electrical damage is done to the motor-gate assembly as the motor is stall proof. Where a high impact of force is imparted on the gate, the indexed coupling device will operate preventing mechanical damage to the motor gearbox assembly and also maintaining the relativity between the cam setting and the drive arm.

3.3 During Opening:

When the power phase change occurs, the motor reverses and drives the gate open. During the opening cycle, full torque is applied until the micro-switch is made, the torque is reduced and the motor is stalled against the return spring torsion and the gate is held in this position. The spring is now fully charged. If the gate is stopped anywhere during its opening cycle, the motor stalls. The motor-gearbox is protected from high impact forces of the gate by the indexed



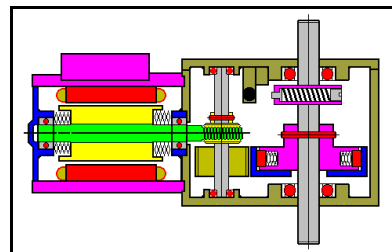
2.4 At the Opening Position: The gate is held in the open position by the motor stalled on reduced power at all times. If the gate has been forced to close, after an initial travel of approximately 5 degrees, a firm resistance

is encountered due to full power being applied to the motor via the cam setting. Further impact forcing of the gate will operate the indexed coupling device thus protecting the motor gearbox assembly and the relative cam with the drive arm. On release of the gate it will be driven to the open position on full power, then held in the open position by reduced power.

4.0 Design Criteria.

4.1 Motor:

Torque Motor MAGNETIC Model GTA 210-27 is stall and condensation proof with in-built thermo overload (100 deg. C.) 110v 50Hz, 280 Watt, 100 Nm, 2.6 Amp. (Normal Operation) Duty: Up to 30 operation/hour. Motor shaft is mounted on heavy duty maintenance free bearings and heavy duty Belleville springs to absorb shock loads.



4.2 Gearbox:

Double output shaft with 3 adjustable limit switches with 1 x N.O. and 1 x N.C. contact (potential free). Speed of output shaft 5rpm. Angle of rotation is 190 degrees. The gearbox contains 2 built in spring loaded end stops. The built in coupling device protects the gears when the output shaft is intentionally forced or vandalised. A heavy adjustable spring mechanism is attached to the gearbox to close the gate through 175 degrees if power to the motor is interrupted.

4.3 Gate

Gate, linkages, drive housing and posts are of robust construction to resist intentional damage by vandals. The gate hinges are designed for low maintenance with greased bushes and stainless steel pins. Couplings for the lever arms are of the low maintenance self aligning type.

4.4 Drive Housing

A detachable mounting plate carries the motor-gearbox assembly, control equipment, Sonalert and the return spring assembly. A lockable weather proof housing slides vertically onto the mounting plate and can be locked with a "7P" long



4.5 Electrical:

110v AC, 50Hz power supply is required for the drive and the audible alarm, Sonalert "Mallory" type SC 110P. 25 No. Klippon Rail Mounted Terminal Blocks Type SAK10, Cat. No. 1100.2 are provided for wiring connections and terminations. The rail is attached to the detachable mounting plate.

4.6 Finishing:

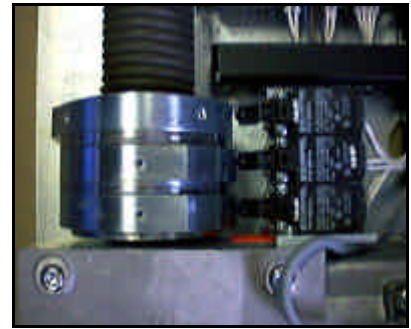
The entire fabricated gate assembly is hot dipped galvanised.

4.7 Assembly, Testing and Inspection:

The gate system is fully assembled by Magnetic Automation and if required, tested by an inspecting representative of "The Met". The test procedure is as follows:

1. Set up gate on fundation.
2. Check and adjust gate for closed position via linkages, ensuring the drive arm is against external end stop. Tighten all nuts in linkages after adjustments.
3. Check gate for free movement between open and closed position.
4. Apply 110v AC, 50Hz power to the system and check that the gate will open and close from the fully open to the fully closed position. This test is performed with the Spring disconnected.
5. Disconnect the power and tension spring to close gate at approx. 150 mm from closed position. This is an important adjustment to ensure that the spring will return the gate to the closed position under power failure condition.
6. Check and tighten all screws and nuts if necessary.
7. Check the overall finish and quality and remove any galvanising imperfections if necessary, paying special attention to the hinges.
8. Apply 110v AC, 50Hz power to the system and check the opening and closing operations. The relative position of the drive arm is adjusted via the parallel locking bush on the gearbox output shaft. The set screws of the bush are first loosened before the arm can be adjusted.

In the the open position the gate can be adjusted via the microswitch cam. To adjust the cam, loosen the two grub screws prior to turning the cam. Re-tighten both grub screws after adjustments.



9. Set operation of gate to close position. Measure force required to overcome alignment of linkages at the top corner of gate. Minimum force required is 300Nm. Adjust lever angle to the required 300Nm. (Power on)
10. Check the correct operation of the indexed coupling by means of forcing the gate against its travel direction. The coupling produces a clicking noise when activated. Afterwards, the gate must return to its pre-set position as an automatic reset.
11. Check the power reduction at the open position.
12. Check the correct operation of the Sonalert. (If applicable)
13. Check the following readings during the normal operation of the gate.

Operation	Terminals	Readings (VAC)
		110
Closed	12-13	20
Closed	12-14	40
Open	12-13	33
Open	12-14	15.5

14. Check the opening and closing times for the gate. Time taken should be between 5-7 seconds for each operation.

15. Check the condition of wiring and terminations.

16. Install the drive housing cover and check to ease of sliding and also check the alignment of the holes for the padlock.

5.0 Installation:

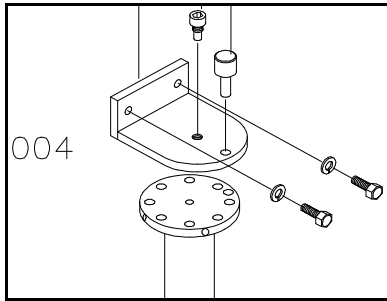
Depending on site conditions, the following installation procedure should be used as a general guide.

1. Set up gate on suitable concrete foundation. To guarantee a safe footing for the gate under loading, a foundation of the following size must be produced: Foundation depth: min 800mm. Foundation cross-section: 400 x 400mm. Reinforcement mesh for the foundation must be used.

2. Check for plumb and levels.

3. Check the geometry of the gate in relation to the openings. The gate can be adjusted for an operating travel of 90 degrees +/- 10 degrees via the microswitch cam.

4. Check gate for satisfactory spring only return from the fully open position and also from approximately 10 degrees short of the fully closed position. If the second test is unsatisfactory, increase the spring tension by a notch.



After spring adjustment, ensure that when power is applied, the gate is not hunting between the full and reduced power settings at the fully open position. If hunting occurs, reduce the spring tension by a notch.

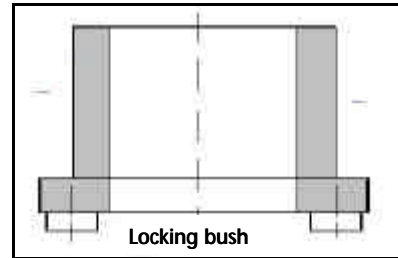
5. Apply power to the gate and check for the normal operation of the gate.

6.0 ADJUSTMENTS.



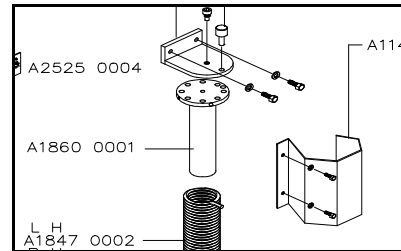
6.1 Parallel Locking Bush:

The bush is preset in the Magnetic Factory. If the relativity between the output shaft of the gearbox and the operating arm needs to be altered, the adjustment can be made by first loosening the setscrews located on the flange of the parallel locking bush. On completion of the adjustment, the setscrews must be tightened otherwise the safety of the level crossing is not guaranteed.



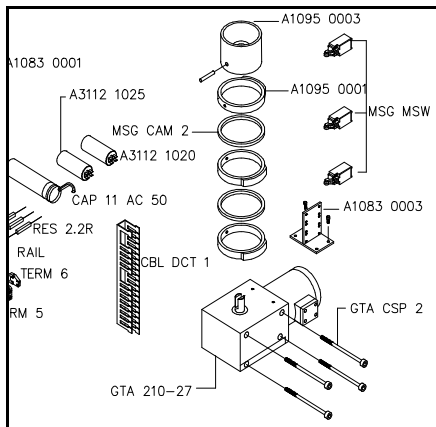
6.2 Return Spring:

The spring tension is initially preset in the factory. Care must be taken when adjusting the spring tension. A cylindrical punch needs to be inserted into one of the holes on the tension adjusting flange and the pressure of the spring is taken off the knurled knob locating pin. The locating pin can then be removed and the adjusting flange can be revolved either way for the appropriate adjustment. It is recommended that all adjustments be made in one notch step only. The locating pin can then be replaced to complete the



6.3 Microswitch Cam:

If there is a need to adjust the preset No. 1 cam for altering the fully open position of the gate, the two locking grub screws must be loosened off initially. The cam is then rotated and the gate positioned to the new location. Both locking grub screws must be tightened on completion of the adjustment. This adjustment is carried out with power connected to the



Twelve Monthly Intervals

Remove both stainless steel pins from hinges, clean and apply new grease and re-install. The retaining roll pins must be re-installed.

The following services should be carried out by MAGNETIC Automation.

1. Check all bearings in motor gearbox assembly for wear or damage. Replace if necessary.
2. Check gear free play.
3. Check torque in indexed coupling (min 150Nm).
4. Clean gearbox and apply new grease (type Blasolube).
5. Replace gate return spring.

9.0 Warranty.

Under the pre-condition that the operating and service conditions are complied with and no inadmissible interventions have been made to the equipment and the equipment has no mechanical damage, a warranty of 2 years after commissioning or maximum 3 years after delivery, applied on all mechanical and electrical components.

10. Technical Support.

Should a fault which cannot be rectified occur during the warranty period, please contact our after sales and service department.

6.4 Linkages.



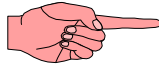
The linkages can be adjusted by loosening the two lock nuts on the connecting rod. The bolt in the forkhead needs to be removed. Adjustments can be made by turning the forkhead. It is most important to tighten the locknuts and the main bolt on the lever arm otherwise the safety of the level crossing is not guaranteed.



7.0 Routine Maintenance

Six Monthly Intervals.

1. Check operation of gate system and adjust return spring if gate is not closing completely without power.
2. Check geometry of the installation. Adjust micro switch cams if necessary.
3. Check and tighten all nuts and bolts



8.0 Service Life

The Magnetic torque motor GTRA 210-60 is designed for approximately three million opening/closing cycles. In the event of different service life requirements, the customer must perform his own tests.

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10.1 MRG 223L Railway Pedestrian Gate L/H complete

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY PER ASSEMBLY
1	MRG A12740002	Gate drive mechanism L/H	1
2	MRG A23100051	Gate Frame Leaf RAW	1
3	MRG A17510223	Gate Post, Main Support Pillar	1
4	MRG A22900223	Frame, Gate Drive Mechanism Mount	1
5	MRG A18270223	Safety Guard Rail Complete	1
6	MRG A21350051	Cover, Gate Drive Mechanism ZP PDR	1
7	MRG A23240001	Handle, Cover Assembly Gare Mech.	2
8	MRG A21350053	Cover, Anti-intrusion	1
9	MRG A23350003	Hinge, Female	2
10	MRG A30480001	15/16 Steel Ball, Gate Hinge	2
11	MRG A25990205	Pivot Lug Mount	1
12	MRG A274500051	Plate, Pivot Connect ZP	1
13	MRG A21320001	Con Rod, Articulated Lever Assembly	1
14	MRG A35430001	Parallel Locking Bush 25mm	1
15	MRG A35320001	Lever Extension & Clevis	1
16	MRG A25500051	Primary Lever Arm	1
17	MRG A27400051	Locating Pin, Lever Arm S/Steel	1
18	RDE A37930020	Rod End 20mm RH	1
19	NST A36660120	M20 Half Nut ZP	1
20	SSH A38322045	M20 x 45 Hex Set Screw	1
21	CLP A31240020	Circlip 20mm External	1
22	SBS A38341025	M10 x 25 Button Head Socket Screw ZP	16 each
23	SBS A38341016	M10 x 16 Button Head Socket Screw ZP	12 each
24	WFT A39770010	M10 Flat Washer ZP	13 each
25	MSG A39790010	M10 Spring Washer ZP	31 each
26	NST A36660010	M10 Full Nut ZP	2 each
27	SSH A38321230	M12 x 30 Hex Set Screw ZP	8 each
28	SSH A38321245	M12 x 45 Hex Set Screw ZP	1
29	WFT A39770012	M12 Flat Washer ZP	9 each
30	WSG A39790012	M12 Spring Washer Zp, Light Duty	9 each
31	NST A36660012	M12 Full Nut ZP	1
32	SCP A38330855	M8 x 55 Cap Screw ZP	2 each

10.1 MRG 223L Railway Pedestrian Gate L/H complete

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY PER ASSEMBLY
33	WFT A39770008	M8 Flat Washer ZP	4 each
34	WSG A39790008	M8 Spring Washer ZP	8 each
35	SGB A38310610	M6 x 10 Grub Screw ZP	2 each
36	WFT A39770006	M6 Flat Washer	4 each
37	WSG A39790006	M6 Spring Washer ZP	4 each
38	SCK A38290520	M5 x 20 C/S Screw ZP	4 each
39	WFT A39770005	M5 Flat Washer	4 each
40	WSG A39790005	M5 Spring Washer ZP	4 each
41	NST A3666005	M5 Full Nut ZP	4 each
42	RIV A3822002	5/32 Rivet 73 A 5-4	2 each
43	LBL A25250004	Magnetic MEL ID Name Plate, Acrylic	1

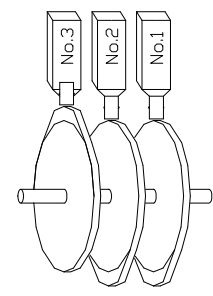
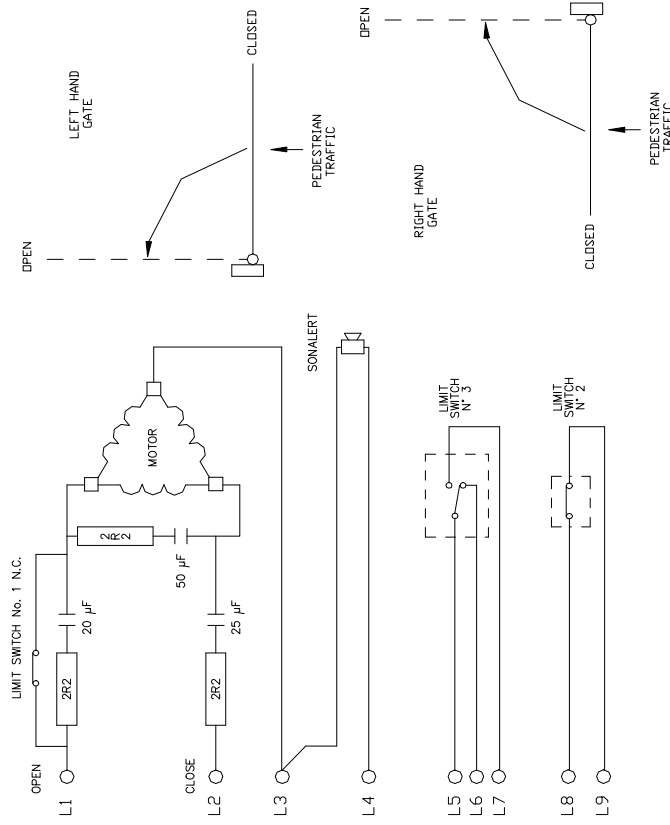
10.2 MRGA12740002 Gate drive mechanism L/H

1	GTA 210-50	Torque Drive 110V C/W 50 uf Cap	1
2	SCP A38330950	M8 x 150mm Cap Screw	4 each
3	GTA A39762008	M8 Spring Washer	4 each
4	MRG A27450052	Plate Gate Drive Mechanism	1
5	MRG A20940051	Padlock Bracket	1
6	MRG A20940052	Sonar Bracket	1
7	MRG A20940053	Limit Switch Bracket	1
8	MRG A35380001	Limit Switch ZIR 236-11Z	3 each
9	MRG A21050051	Cam	3 each
10	MRG A28480081	Cam Spacer	2 each
11	MRG A28400061	Cam Coupling	1
12	MRG A20940054	Retaining Bracket, Spring Assembly	1
13	MRG A28500051	Spring LH	1
14	MRG A28800001	Spring Tensioner	1
15	MRG A20650005	Locating Bolt, Spring Assembly	1
16	MRG A20650006	Retaining Bolt, Spring Assembly	1

10.2 MRG A12740002 Gate drive mechanism L/H

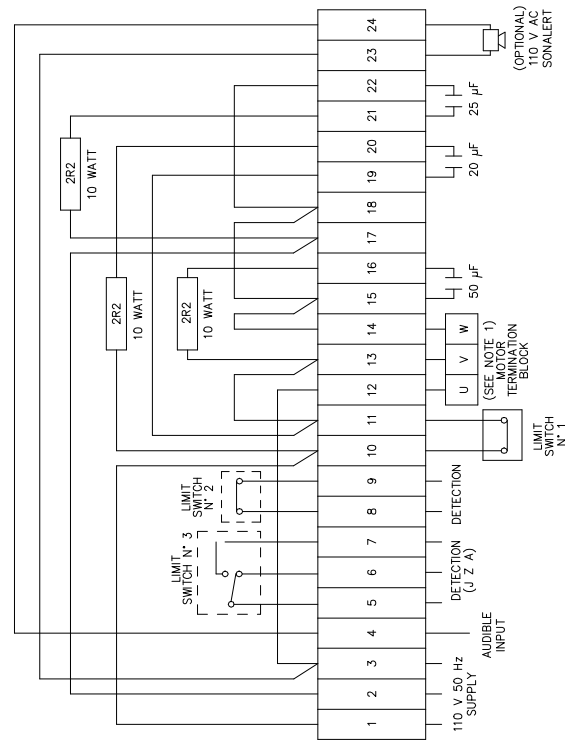
ITEM NO.	PART NO.	DESCRIPTION	QUANTITY PER ASSEMBLY
17	MRG A21350052	Cover, Perspex	1
18	SCP A38330825	M8 x 25 Cap Screw ZP	2 each
19	WFT A39770008	M8 Flat Washer ZP	2 each
20	WSG A39790008	M8 Spring Washer ZP	2 each
21	SSH A38320616	M6 x 16 Hex Set Screw ZP	8 each
22	WFT A39770006	M6 Flat Washer ZP	8 each
23	WSG A39790006	M6 Spring Washer ZP	8 each
24	SGB A38310608	M6 x 8 Grub Screw ZP	6 each
25	SPH A38280530	M5 x 30 Pan Head Screw ZP	2 each
26	SPH A38280516	M5 x 16 Pan Head Screw ZP	3 each
27	WFT A39770005	M5 Flat Washer ZP	5 each
28	WSG A39790005	M5 Spring Washer ZP	5 each
29	SPH A38280430	M4 x 30 Pan Head Screw ZP	6 each
30	SPH A38280416	M5 x 16 Pan Head Screw ZP	2 each
31	SCK A38290412	M4 x 12 C/S Screw ZP	2 each
32	WFT A39770004	M4 Flat Washer ZP	8 each
33	WSG A39790004	M4 Spring Washer ZP	8 each
34	TER A38890111	Klippon Terminal	24 each
35	TER A38890112	Klippon End Clamp	2 each
36	TER A38890113	Klippon End Plate	1
37	MRG A26000223	Terminal Mounting Bracket	1
38	ECD A31900001	Electrical Cable Duct	1 metre
39	CAP A31121020	Motor Capacitor 20 uF	1
40	CAP A31121025	Motor Capacitor 25 uF	1
40	CAP A31121150	Motor Capacitor 50 uF	1
41	RES A37850001	Resistor 2R2 10 Watt	3 each
42	EWC A39950001	Single Core 46/0.20T White Flex	14 metres
43	LUG A35480003	Lug, Bundy Red Pre-ins Spade	4 each
44	LUG A35480007	Lug, Bundy Red 1.5 M4 Hole	2 each
45	LBL A25250052	Label Commission Label	1

magnetic
automation



SEE NOTE 2: (AS SHOWN L/H GATE)

MAGNETIC AUTOMATION	
JOB NO	CUSTOMER 19 BEVERAGE.DRV.TULLAMARINE,VIC3043
DATE	TITLE 28-04-95 PEDESTRIAN GATE
DRAWN	CHECKED DIRK MSG 2/3 L/R
DRAWING NO	SHEET 1 OF 1
REVISED	858-1
ISSUED TO:	COPIES:



- NOTE 1: (MOTOR TERMINAL BLOCK CONNECTIONS)
 L/H PED GATE- U=BLUE, V=BROWN AND W=BLACK
 R/H PED GATE- U=BLUE, V=BLACK AND W=BROWN
- NOTE 2: (CAM SWITCH ADJUSTMENTS)
 LIMIT SWITCH N° 3 IS MADE BETWEEN 5-6 WHEN GATE IS OPEN (10° - 90°)
 BETWEEN 5-7 WHEN GATE IS CLOSED (0° - 10°)
 LIMIT SWITCH N° 2 IS MADE WHEN GATE IS OPEN FOR PEDESTRIAN TRAFFIC (80° - 90°)
 LIMIT SWITCH N° 1 IS OPEN WHEN GATE IS OPEN FOR PEDESTRIAN TRAFFIC (80° - 90°)
- NOTE 3: CAM SCREWS TO BE ACCESSABLE ON CAMS WHEN GATE IS IN THE OPEN POSITION