



A CRH COMPANY

Series 620 Tripod Turnstile

Operation and Maintenance Manual



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**Please read this manual before using this product for the first time!
Act in accordance with the manual and keep it in a safe place for later use
or for the following owner.**



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FOREWORD

Thank you for choosing Heras. You have selected one of our industry-leading entrance control solutions. This manual gives operation and maintenance information for the chosen product.

DISCLAIMER

Although every effort has been made to ensure that the information contained in this manual is correct at the time of issue, no responsibility is accepted for any loss or damage arising from incorrect information.

This manual forms no part whatsoever of any contract or agreement between Heras and others. In no circumstances will Heras be responsible or liable for any costs, damage or injury whatsoever arising from the use of this Manual.

Should the product be tampered with and/or any non-approved equipment is fitted to the product then any warranty will be considered void.

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1 PREFACE

1.1 MANUFACTURER / SUPPLIER

Manufacturer: Heras UK
33 Stakehill Industrial Estate
Middleton, Manchester M24 2RW
England
Tel.: **+44(0)1302 364 551**
www.heras.co.uk

Technical Construction File: Heras UK, T&I Department

1.2 DEFINITIONS: USER / OPERATOR / ENGINEER

User: Anyone using the product.

Operator: A user who is familiar with all safety aspects dealt with in this manual. Operators are not allowed to carry out any installation work on the turnstile unless explicitly specified.

Engineer: The engineer is a Heras fitter (or an engineer employed by the customer who has been given explicit permission in writing from Heras) who is qualified to perform technical interventions on the turnstile.



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1.3 PRESCRIBED USE / APPLICATION

Only the correct installation and maintenance by an authorised/qualified company or person in agreement with the user manual, logbook, checklists and maintenance lists can ensure the safe operation of the system.

A qualified person is, according to EN 12635, a person who has the required training, qualified knowledge and practical experience required to install, test and maintain the system correctly and safely.

1.4 CONFORMITY WITH EUROPEAN DIRECTIVES

The installation complies with the following EU Directives/ regulations:

2006/42/	EC	Machine Directive
2014/30	EU	EMC Directive (electromagnetic compatibility)
305/2011	EC	Construction Product Regulation

The design and production has been executed compliant with the applicable product standard EN 13241 and the underlying standards EN 12604 and EN 12453.

A Declaration of Performance (DoP) and Declaration of Conformity (DoC) are obligatory for this product.

1.5 DELIVERY

The Series 620 must be installed, connected, set up and commissioned by a fitter or an engineer who also connects and programs any accessories. The control unit is adjusted to the options/accessories agreed with the user. The relevant options are laid down during hand-over.

Accessories can be purchased and installed afterwards at any point. Contact your supplier for this.



Turnstiles are always delivered fully tested.

After installation and commissioning, by a Heras technician or a technician trained by Heras, the cover of the turnstile must be closed to prevent unauthorised access.

2 SAFETY

2.1 EXPLANATION OF THE SYMBOLS



Caution: To prevent personal injury, you must observe the safety instructions below.



Note: To prevent material damage, you must observe the safety instructions below.



Information: This is followed by further information or by a reference to other documents.



Warning: Risk of limbs getting crushed.



Warning: Risk of injury to hands by rotating parts.

2.2 GENERAL SAFETY INSTRUCTIONS

- The operator must read the entire user manual before the turnstile is used for the first time. The instructions stated in the user manual must be observed and complied with. All other forms of use can cause unexpected hazards and are forbidden.
- The gate must only be put into use if all safety facilities are in place and connected, and work properly.
- All faults which might present a source of danger to the user or to third persons must be eliminated immediately.
- All warnings and safety notices on the equipment must be in place and clearly legible at all times.
- All alterations or extensions to the turnstile must be carried out by qualified personnel using parts which the manufacturer has defined as suitable for such alterations or extensions. Any failure to comply with these instructions will be considered as non-compliant behaviour and will invalidate the manufacturer's guarantee, as a result of which the risk entirely transfers to the user.
- Improper usage or servicing or ignoring the operating instructions can be a source of danger for persons, and/or result in material damage.
- If the meaning of any part of these installation and operating instructions is not clear, then please contact your supplier before you use the equipment.

2.3 INTENDED USE

The turnstile is intended to control access to a specific plot, premises or site. The turnstile is intended for both industrial and private use.

The turnstile control unit can be adjusted to user needs. The turnstile is commissioned to the options agreed with the user. The relevant options are determined during site hand-over.



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2.4 SAFETY DURING USE

Children or people with a disability must not operate the turnstile. Parents must supervise their children to prevent them playing with the turnstile.

PARENTS ARE RESPONSIBLE FOR THEIR CHILDREN

- Keep a safe distance from the moving turnstile. Warning icons to this effect have been installed in various locations.
- When hold-to-run-control is employed, the turnstile must only be operated if it can be seen completely, directly and in real-time. Operation must be via a permanently installed operating device, for instance a key switch or push button. This operating device must be located in such a way that the operator's position is safe. The turnstile must stop immediately when the button or key is released. Other operating devices are not allowed.
- The turnstile must be able to move freely without there being obstacles in the gate opening passage or anywhere else on the moving trajectory of the gate.
- Do not stick any objects through, over or under the turnstile which might block its operation.
- The turnstile running surface must always be free from snow, ice or dirt that might affect its sliding behaviour. In the event of frost, check this before commissioning. If the running surface is blocked, the turnstile will not move at all or will not complete its movement. An irregular running surface may cause damage to the drive and/or road wheels.
- In certain circumstances, the sun can temporarily distort the turnstile. This has no adverse consequences for the construction.
- Climbing the turnstile is strictly forbidden as people climbing the gate could be hurt if the gate is started unexpectedly.

2.5 SAFETY DURING INSTALLATION, MAINTENANCE AND DISASSEMBLY

- When work is carried out or while cleaning the gate, the power supply to the system must be switched off and it must be ensured that it cannot be switched on unexpectedly.
- Use the necessary personal safety equipment.
- The gate is driven by means of a gear wheel. This is located under the beam and it is partly screened off by the drive unit cabinet. Beware of moving parts when carrying out maintenance under the gate at the drive unit cabinet.
- To move the gate manually, first switch the automatic fuse in the drive unit cabinet to "off" and make sure it cannot be switched on again (e.g. by locking the cabinet).
- The EN 13241 and EN 12453 standards must be taken into consideration during installation. To achieve a good safety level, both the above standards and the national regulations must be taken into account in non-EC countries.



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3 DESCRIPTION

3.1 OVERVIEW

The Series 620 Series Tripod Turnstile is an electromechanical turnstile. It is used to control pedestrian access in and out of a controlled area. 620 Series turnstiles are usually installed indoors; however they can also be installed outdoors under a canopy with suitable protection from extreme weather. Due to the dimensions of the turnstile they are more suitable for a monitored position.

3.2 EQUIPMENT DETAILS

Description:	Series 620 Tripod Turnstile
Controllers:	1 No Integrated Programmable Controller with provision for connection of remote push button and card access control.
Additional Equipment Available:	Push buttons/key switches
Electrical Supply:	Tripod turnstiles require a single phase 230VAC 50 Hz supply rated at 6 Amps. (Note: this is not the consumption of the unit).
UPS:	Available upon request and an extra, this backup system enables the turnstile to operate after local loss of electrical supply. Contact Heras for further details.
Overall Height:	1000 mm
Width to wall:	760 mm
Overall length:	600 mm
Standard finish:	Stainless steel of painted mild steel

4 OPERATION

4.1 GENERAL OPERATION

The turnstile operating mechanism is of an electro-magnetic solenoid release type, with bi-directional non-return tooth sprocket assembly to select the direction of the rotor and the pawl-locking feature.

The ratchet system ensures that the rotor returns to the locked position after each 120° movement. Intermediate movement is restricted preventing unauthorised access.

4.2 POWER FAILURE

In the case of a power failure the turnstile will unlock. Free rotation in any direction can be obtained by pushing the arms.

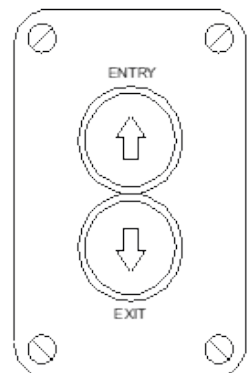
4.3 USER SAFETY GUIDE

It is essential that users operate the turnstile system in a sensible manner and in accordance with any site specific operating procedure. It is essential that users do not to push or lean on the rotors before the entry signal is given (i.e. an example may be before the card access fob is presented to the reader head). Pushing on the rotors will cause excessive friction on the release mechanism of the turnstile head. This may result in the rotor failing to release until the pressure is removed from the rotor.

Turnstiles should not be used to evacuate persons. Appropriate emergency exit doors/gates should be used in an emergency.

4.4 OPERATING MODES

When remote push button controls are installed it is possible for an operator to allow persons to pass through the turnstile in either entry or exit direction. Push button units can be used together with intercom systems which allow visitors to speak to someone in order to gain entry / exit through the turnstile.



Typical push button unit



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4.5 CARD READER SYSTEMS

4.5.1. General

This section is intended to provide a basic understanding of the factors that should be taken into account when it is intended to connect card readers that have not been supplied by Heras. This information is only relevant to the experience Heras has gained over the past 20 years and is based on our understanding of the card reader systems that have been interfaced to our turnstiles in the past.

This should not be used as a definitive guide to all card reader systems that may be connected to our turnstiles (or that you intend to connect). You should consult your card reader provider to clarify that the reader system is compatible with our turnstiles and are capable of providing the correct functionality.

4.5.2. Door Open Time

As mentioned in the previous section Card Readers Systems can be interfaced to the turnstile for entry and/or exit. It is necessary that the output from the card reader system is a volt free contact and has a normally open configuration. Many card reader systems refer to the period of time that the relay output (of the reader system) is activated as "door open" time. The turnstile control panel will only allow one rotation per "door open" (or activation of relay) regardless of the duration time of the "door open". This is necessary to avoid the turnstile rotating more than once per "door open" time.

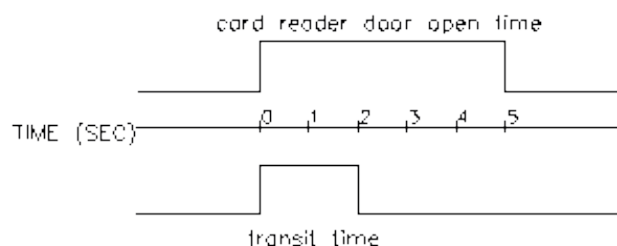
4.5.3. Transit Time

It is important to note that it is possible for a person to transit through the turnstile very quickly; this transit time is dependent on the person using the turnstile and therefore varies dependant on how familiar the person is with the turnstile and card reader. For persons who are familiar with the turnstile and card reader system and who are regular users this transit time can be as low as 2 seconds.

4.5.4. Card Readers Without Feedback

When a card reader system does not have a "feedback" input which is usually used to reset the "door open time" this means that the "door open" time of the card reader system be set to a maximum of 1 second in order to allow a quick transit through the turnstile. Please note that many card reader systems may have a default time as high as 5 seconds this will considerably slow down the transit time for each entry/exit (rotation). In other words the transit time will be at least as long as the "door open" time (therefore at least 5 seconds).

In instances where each person using the turnstile has a transit time of 2 seconds; then the above (5-second door open time) will result in a 3-second lag/delay between each person being able to use the card reader and therefore being able to use the turnstile.



Representation of 2 second transit time with 3 second lag

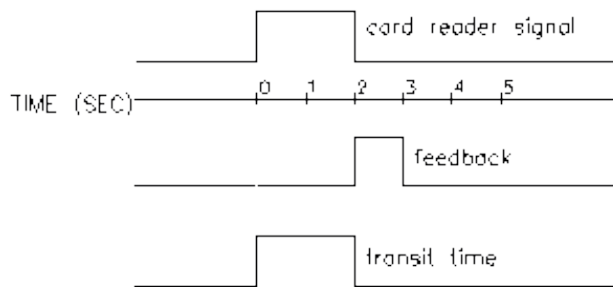


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4.5.5. Card Readers With Feedback

When a card reader system which requires “feedback” is installed then we would recommend that the “door open” time should be set to the same value as the “Re-Lock” time minus 2 seconds (see section 2.4). This type of card reader system requires an output from the turnstile to tell it when to lock the turnstile (this is provided as standard). This output which is connect to an input on the card reader system is usually referred to as “feedback”.

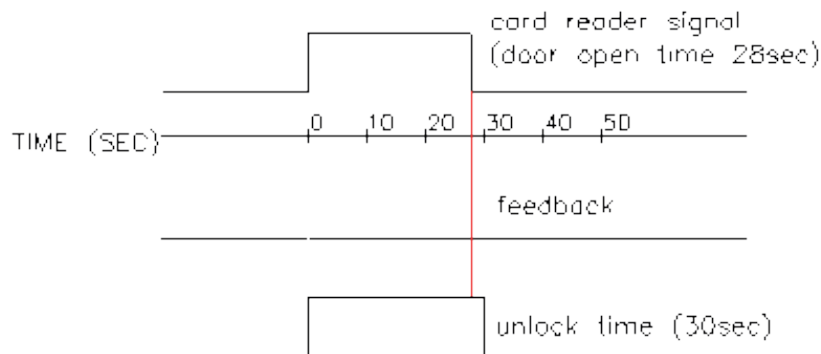
This type of card reader system is used when more accurate monitoring of access/egress to site is needed.



Representation of 2 second transit time with feedback

4.6 RE-LOCK TIMER

When an entry or exit signal is received from either a push button or card reader the turnstile will unlock in the relevant direction, should no person walk through the turnstile then the turnstile controller will relock after 30 seconds. This parameter is preset within the controller’s software.



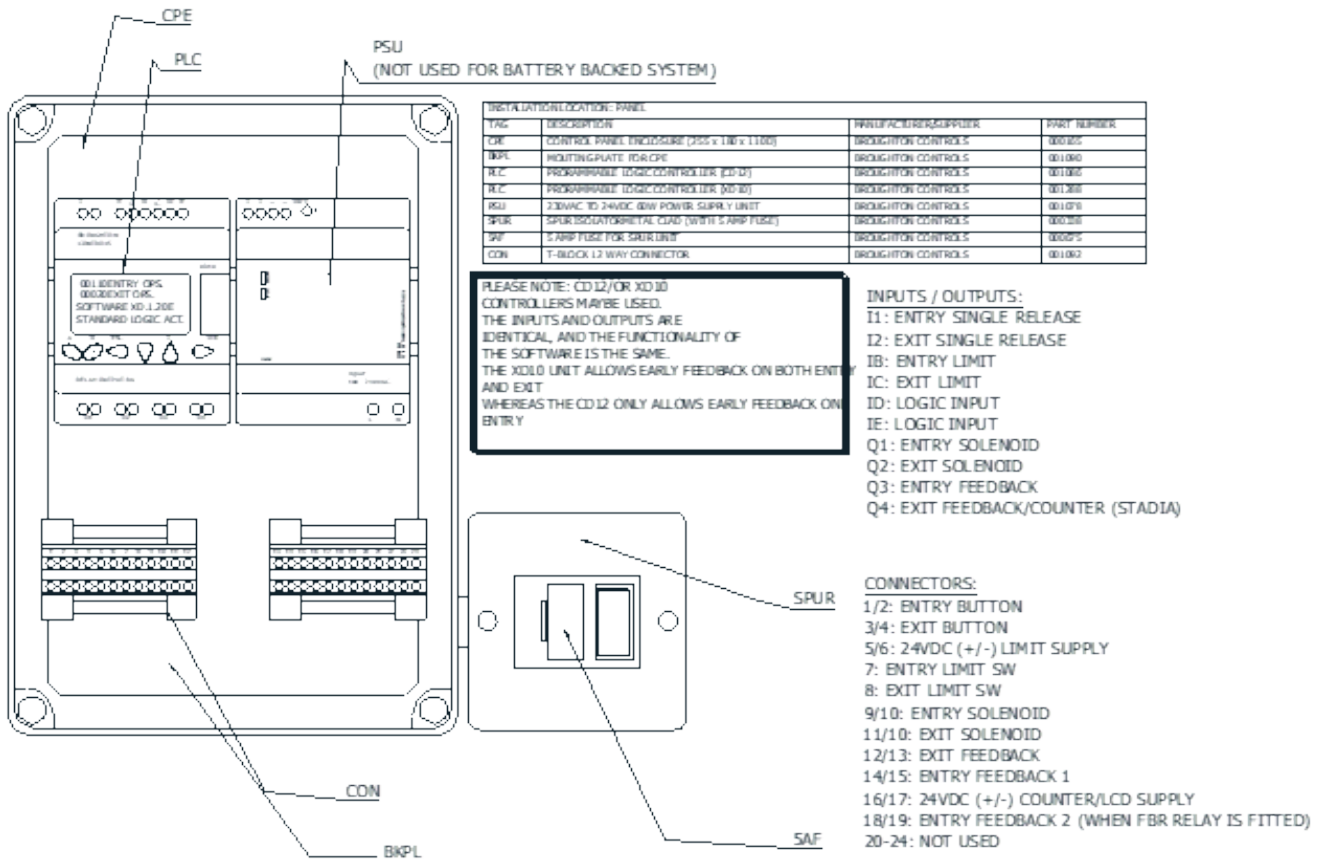
Representation of no transit (entry or exit to site) & 30 sec relock

5 TECHNICAL DETAILS

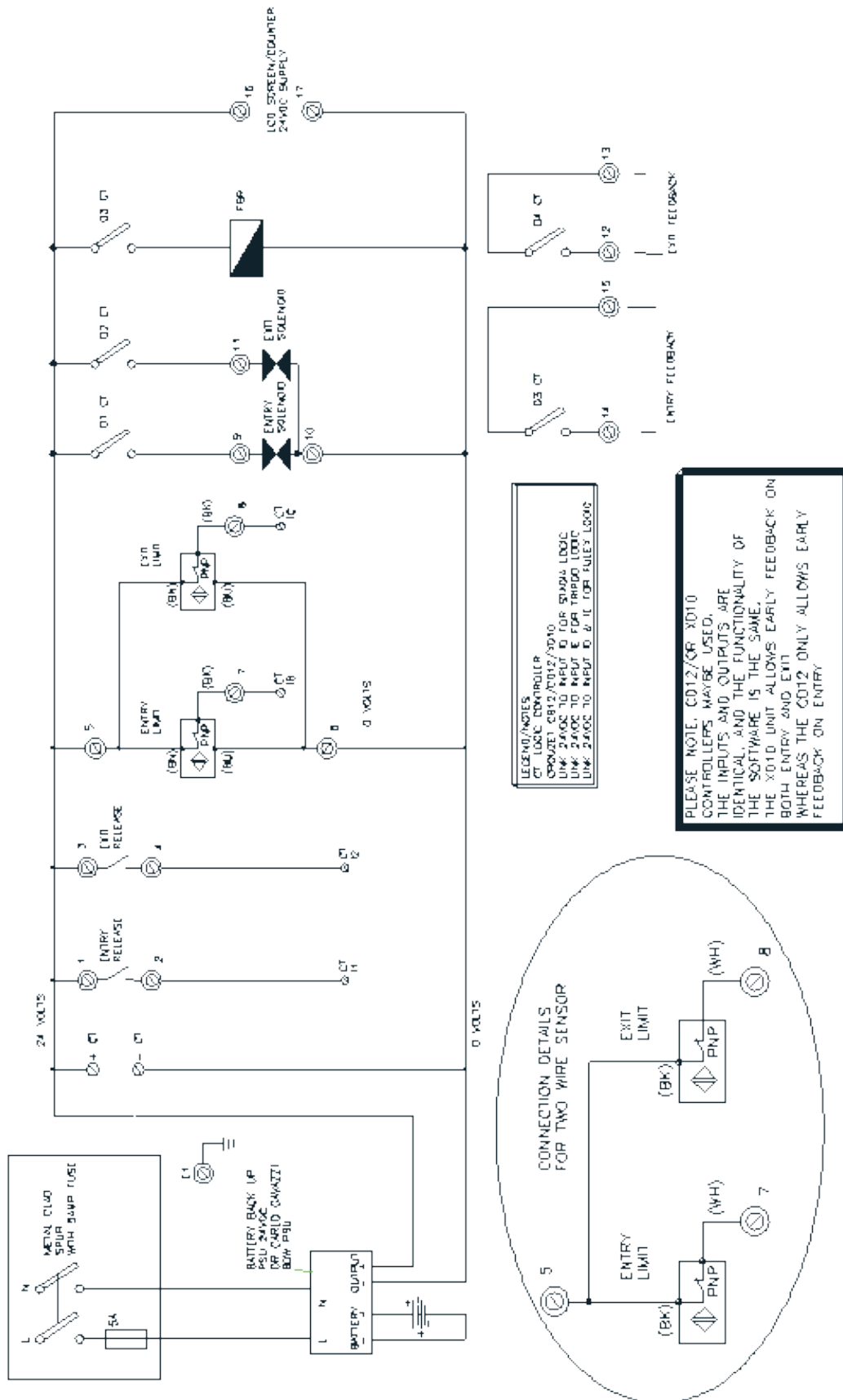
5.1 CONTROL PANEL

The control panel for the turnstile incorporates a PLC, a switch-mode power supply unit and a set of field termination connectors/terminals.

The connection details and layout of the control panel is shown below:



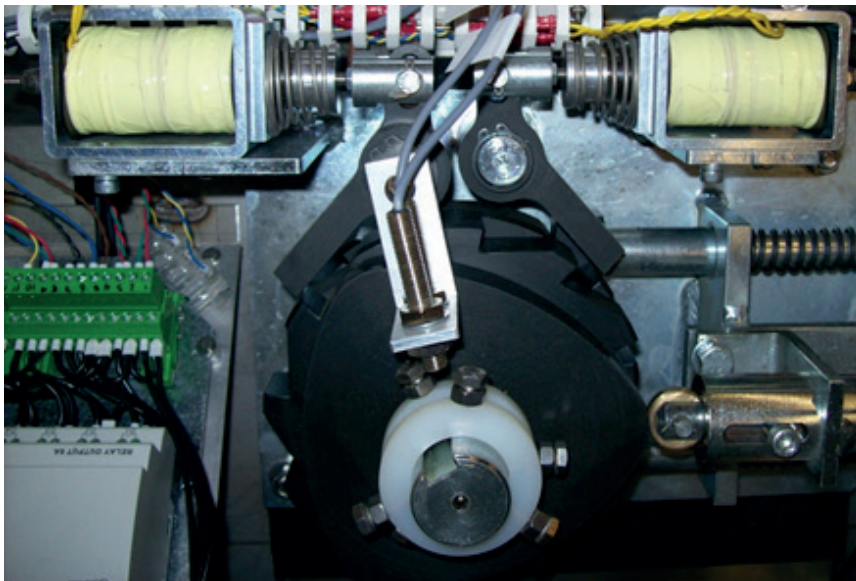
Only qualified, electrically competent personnel should perform works on the control panel. Ensure that the panel is isolated prior to working on the unit.



5.2 MECHANICAL ARRANGEMENT AND DRIVE OPERATION

5.2.1. Head Mechanism

The turnstile head mechanism is located at the top of the turnstile base unit under the lid and is coupled directly to the turnstile rotor. There are two 24VDC solenoids used to secure and release the turnstile. When the relevant solenoid is de-energised this allows the turnstile to release in either the entry or exit direction. There are two PNP 24VDC normally closed proximity limit switches, which provide feedback to the control panel to energise the relevant solenoid and thus relock the turnstile after one 120 degree rotation.



5.2.2. Power Fail Release

In the case of power failure the turnstile will unlock.

5.2.3. PNP Proximity Sensors

Note only PNP proximity limits should be used with the turnstile controller NPN sensors will not work with the controller. These should preferably be of a normally closed configuration for standardisation reasons; however it is possible to use PNP normally open sensors without any reliability issues.

Entry & Exit Proximity Sensor Setting

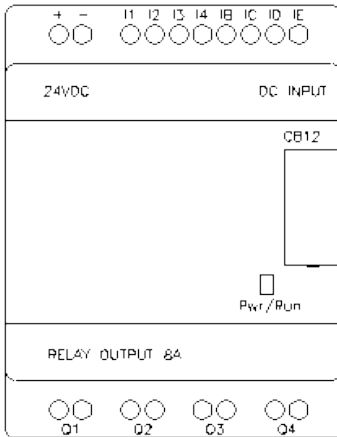
Check the gap between each sensing screw and the proximity switch and adjust if necessary by turning the screws with a screwdriver until a gap of 1mm is achieved on all screws.

When the switch detects then the yellow LED at the end of proximity switch will switch off.

Check the operation of the turnstile in the relevant direction using a signal from the control equipment i.e. push button, card reader etc.

5.3 PROGRAMMABLE CONTROLLER

The control logic for the turnstile incorporates a Programmable Controller as the main control component. This incorporates input terminals and output terminals. The controller is used to replace a large number of relays and timers. The controller is programmed via a PC/Laptop and stored in a RAM, enabling the program to be modified on site to ensure that the system performs exactly as required.



The inputs are digital and activate when + 24 Volts is fed into the relevant input terminal. Any proximity limits connected to the inputs of the PLC must be PNP type. The outputs are relay contacts which are capable of switching 8 Amp resistive loads.



Only qualified, electrically competent personnel should perform works on the control panel. Ensure that the panel is isolated prior to working on the unit.

5.4 LOGIC LINKS

Inputs ID & IE allow the turnstile to operate in different control application logic. There are 4 versions of software in the one controller thereby allowing standardisation of the control panel.

The followings configuration of links should be used:

5.4.1. Tripod Logic

Input IE linked to 24VDC of controller. Tripod logic simply inverts output 1 and output 2 of the controller to work with entry & exit solenoids that are configured to unlock when power is removed from the turnstile.

5.4.2. PNP Proximity Sensors

Only PNP proximity limits should be used with the turnstile controller NPN sensors will not work with the controller. These should preferably be of a normally closed configuration for standardisation reasons; however it is possible to use PNP normally open sensors without any reliability issues.

It is beneficial to use a plug-in LCD display to carry out the following adjustments. This unit is not supplied with the turnstile and is available on request. The display monitors the inputs/ outputs of the turnstile controller.

5.4.3. Entry & Exit Proximity Sensor Setting

- Check the gap between each sensing screw and the proximity switch and adjust if necessary by turning the screws with a screwdriver until a gap of 1mm is achieved on all screws.
- Note: 90° turnstiles have 4 sensing screws; 120° turnstiles have 3.
- When the switch detects then the yellow LED at the end of proximity switch will switch off.
- Check the operation of the turnstile in the relevant direction using a signal from the control equipment i.e. push button, card reader etc.

5.4.4. Standard Logic

This logic is suitable when both entry & exit solenoids are configured to lock when power is removed from the turnstile. With this configuration output 3 & output 4 of the controller will work as entry and exit feedbacks respectively.

5.4.5. Stadia Logic

This logic works as per the standard logic with exception to output 4. When stadia logic is used then output 4 works in tandem with output 3. This allows output 3 to be kept as entry feedback while output 4 is used to switch 24VDC to an electromechanical counter, which records the number of entry rotations.

5.4.6. FULEX Logic

FULEX stands for Fail Unlocked Exit. This logic is used when only the exit solenoid is configured to unlock when power is removed from the turnstile. Please note to achieve this for entry in place of exit, i.e. only the entry solenoid should unlock when power is removed from the turnstile then it is merely necessary to interchange the entry field terminations with those of the exit.

5.5 CONTROLLER PARAMETER VARIABLES

The PLC controller has three parameters which can be switched on or off using the buttons located on the front of the PLC controller.

To view the parameter screen press and hold the down the MINUS button.

The parameters are as follows:

5.5.1. Normally Closed Feedback (NC FEEDBACK)

This function will allow feedback outputs O3 & O4 to be switched from normally open to normally closed during standby.

The procedure for switching on/off this parameter is as follows see picture of controller here above:

- Press and hold MINUS button on PLC to view parameter screen
- If "00000NC FEEDBACK" is shown then this indicates that the function is currently switched OFF
- If "00001NC FEEDBACK" is shown then this indicates that the function is currently switched ON
- To switch between ON/OFF Press and hold the A button located on PLC for 10 continuous seconds.
- Once again press and hold the MINUS button on PLC to view parameter screen and verify the parameters.



5.5.2. Early Feedback (EARLY FEED)

This function allows the feedback outputs to be activated at the start of the turnstile's rotation. When this function is off the feedback outputs will activate towards the end of the turnstile's rotation. The procedure for switching on/off the early feedback parameter is as follows see picture of controller on previous page:

- Press and hold MINUS button on PLC to view parameter screen
- If "00000EARLY FEED" is shown then this indicates that the a function is currently switched OFF
- If "00001EARLY FEED" is shown then this indicates that the function is currently switched ON
- To switch between ON/OFF Press and hold the B button located on PLC for 10 continuous seconds.
- Once again press and hold the MINUS button on PLC to view parameter screen and verify the parameters.

5.5.3. Hold Open Logic (HOLD OP LOG)

When this parameter is active an open input will allow the turnstile to rotate more than once per release signal. The number of rotations is dependent on the length of the signal. Should the release signal be longer than the average transit time then it will be possible to rotate the turnstile rotor more than once which is suitable for card readers using free entry/exit time zones but will be unsuitable for normal operation.



Note: When a hold open input is active the turnstile will always momentarily relock order to stop the rotor being pushed at velocity, which could result in injury to users. Should both entry and exit hold open inputs be activated together then the controller will default to exit. It the turnstile rotor after each complete rotation it will then immediately unlock the rotor to allow the next rotation. This feature is necessary in will not allow the turnstile be held open in both directions (entry and exit). The procedure for switching on/off the Collision Return parameter is as follows see picture of controller on previous page



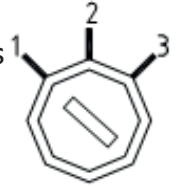
Press and hold MINUS button on PLC to view parameter scree

- If "00000HOLD OP LOG" is shown then this indicates that the a function is currently switched OFF
- If "00001HOLD OP LOG" is shown then this indicates that the function is currently switched ON
- To switch between ON/OFF Press and hold the both A & B buttons located on PLC for 10 continuous seconds.
- Once again press and hold the MINUS button on PLC to view parameter screen and verify the parameters.

5.6 FAULT DIAGNOSIS

In the event that the turnstile will not rotate, it is possible to test the system via the Card reader test key switch as follows: -

- Change the key switch position from normal operation (position 1) to Card reader isolate (position 2). This will isolate either the entry or exit card readers depending on which key switch is being operated.
- Change the key switch position to turnstile rotate (position 3), and the Turnstile should rotate.
- If the turnstile rotates the fault is with the Card reader signal.
- If however the turnstile does not rotate the fault may be with the turnstile equipment. In this event please contact Heras.



5.7 POWER SUPPLY UNIT

5.7.1. Standard

The control panel has a 230VAC to 24VDC switch mode PSU which provides the low voltage for the controls. A further 230VAC to 15VDC switch mode PSU is installed to the underside of the control panel. The 15VDC PSU provides power to the two solenoids. The power supply units also take care of thermal overload of the 24VDC & 15VDC outputs this provides the electrical protection on the inputs/outputs of the control panel as well as the solenoids and proximity switches.



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6 MAINTENANCE

6.1 OVERVIEW

The equipment described in this manual is designed to a high standard in order to cope easily with long periods of arduous duty. It is however, necessary to maintain the working efficiency at a level, which reduces wear and tear and so avoids premature breakdown.

A scheme of planned preventative maintenance will ensure an optimum return of reliability and security, at a minimum cost. Heras can provide a quote for a preventative maintenance scheme.

It is recommended that a system logbook is kept for the system and a record kept of faults, damage, breakdowns and spares used. This record will help to identify any continuing problems such as worn or miss-aligned components.

6.2 WARNING

Whenever work is to be carried out, or checks are to be made on electrical components or connections, the complete system must be isolated at or adjacent to the control cabinet and locked out until work is completed.

It is recommended that a 'permit to work' system is instituted and that proper control of the mains supply is affected.

6.3 LIVE WORKING

If it is necessary to work on live equipment, such work must be carried out by personnel who are aware of potential dangers and of the necessary safety precautions, which must be taken.

Rotating parts of drive systems may present a particular danger of snagging or pick-up of loose clothing. For this reason, ties, scarves or other loose items must be removed.



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6.4 ROUTINE MAINTENANCE

The turnstile should be cleaned externally every month with a mild non-abrasive detergent. Fixing bolts should be checked and re-tightened if necessary.

The purpose of this section of the manual is to provide basic information about the equipment used in the installation, particularly as an aid to fault diagnosis and/or reporting in the event of a system failure and maintenance of the rotating head.

6.4.1. *Monthly Maintenance*

- Check all fastenings for tightness.
- Lubricate round fixing.
- Check drop arm device operation, adjust & lubricate.
- Check pressure of belt.

6.4.2. *Six Monthly Maintenance*

- Check overall turnstile condition for deterioration.
- Check foundation bolts are secure and re-tighten if necessary.
- Check security of bolts on any auxiliary equipment (when supplied).
- Check control panel for correct operation.
- Check all cable terminations are secure (isolate electrical supply)
- Check all control points

6.4.3. *Annual Maintenance*

- Check encoder & replace if used more than 1 million times
- Check encoder & replace if used more than 1 million times
- Check motor & replace if used more than 1 million times
- Any maintenance other than cleaning should be carried out by qualified by Heras engineers.

6.5 DECOMMISSIONING AND REMOVAL

- Ensure that the gate is dismantled by a qualified technician.
- Disconnect the electricity supply in a safe way from the drive unit.
- Use the installation manual.
- At the end of their service lives the products must be disposed of in accordance with all
- local, regional and national rules and instructions.

Local supplier stamp:

Heras
33 Stakehill Industrial Estate
Middleton
Manchester
M24 2RW
United Kingdom



A CRH COMPANY