Series 410, 411, 412 and 420 Hydraulic Vehicle Barrier

Operation and Maintenance Manual

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.
# CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOREWORD</td>
<td>5</td>
</tr>
<tr>
<td>1.0 PREFACE</td>
<td>5</td>
</tr>
<tr>
<td>1.1 MANUFACTURER / SUPPLIER</td>
<td>5</td>
</tr>
<tr>
<td>1.2 SERVICE / MAINTENANCE</td>
<td>5</td>
</tr>
<tr>
<td>1.3 DEFINITIONS: USER / OPERATOR / ENGINEER</td>
<td>5</td>
</tr>
<tr>
<td>1.4 PRESCRIBED USER APPLICATION</td>
<td>6</td>
</tr>
<tr>
<td>1.5 CONFORMITY WITH EUROPEAN DIRECTIVES</td>
<td>6</td>
</tr>
<tr>
<td>1.6 DELIVERY</td>
<td>6</td>
</tr>
<tr>
<td>1.7 ELECTRICAL CONNECTIONS</td>
<td>6</td>
</tr>
<tr>
<td>2.0 SAFETY</td>
<td>7</td>
</tr>
<tr>
<td>2.1 EXPLANATION OF THE SYMBOLS</td>
<td>7</td>
</tr>
<tr>
<td>2.2 GENERAL SAFETY INSTRUCTIONS</td>
<td>7</td>
</tr>
<tr>
<td>2.3 INTENDED USE</td>
<td>8</td>
</tr>
<tr>
<td>2.4 INTENDED USE</td>
<td>8</td>
</tr>
<tr>
<td>2.5 SAFETY DURING USE</td>
<td>8</td>
</tr>
<tr>
<td>2.6 SAFETY DURING MAINTENANCE, INSTALLATION AND DISASSEMBLY</td>
<td>9</td>
</tr>
<tr>
<td>3.0 DESCRIPTION</td>
<td>10</td>
</tr>
<tr>
<td>3.1 OVERVIEW</td>
<td>10</td>
</tr>
<tr>
<td>3.2 VARIANTS</td>
<td>11</td>
</tr>
<tr>
<td>3.2.1 410 Centre Yoke Barrier</td>
<td>11</td>
</tr>
<tr>
<td>3.2.2 411 Side-Acting Barrier</td>
<td>12</td>
</tr>
<tr>
<td>3.2.3 412 Side-Acting Barrier 7 - 9 Metres</td>
<td>12</td>
</tr>
<tr>
<td>3.2.4 420 Top and Bottom Skirt Barrier</td>
<td>13</td>
</tr>
<tr>
<td>3.3 PART VARIATIONS</td>
<td>13</td>
</tr>
<tr>
<td>4.0 OPERATION</td>
<td>14</td>
</tr>
<tr>
<td>4.1 PUSH BUTTON CONTROL</td>
<td>14</td>
</tr>
<tr>
<td>4.2 CARD READER SYSTEMS</td>
<td>14</td>
</tr>
<tr>
<td>4.2.1 General</td>
<td>14</td>
</tr>
<tr>
<td>4.2.2 Door Open Time</td>
<td>14</td>
</tr>
<tr>
<td>4.2.3 Transit Time</td>
<td>14</td>
</tr>
<tr>
<td>4.2.4 Card Reader Without Feedback</td>
<td>15</td>
</tr>
<tr>
<td>4.3 AUTO-CLOSE TIMER</td>
<td>15</td>
</tr>
<tr>
<td>4.4 ELECTRICAL ISOLATION</td>
<td>15</td>
</tr>
<tr>
<td>4.5 LOCK RAISE KEYSWITCH</td>
<td>16</td>
</tr>
<tr>
<td>4.6 SYSTEM TEST KEYSWITCH</td>
<td>16</td>
</tr>
<tr>
<td>4.7 MANUAL RELEASE AND LOCKUP BOLT</td>
<td>17</td>
</tr>
<tr>
<td>5.0 TECHNICAL DETAILS</td>
<td>19</td>
</tr>
<tr>
<td>5.1 INTRODUCTION</td>
<td>19</td>
</tr>
</tbody>
</table>
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 410-420 range of barrier systems.

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.

COPYRIGHT

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1  PREFACE

1.1  MANUFACTURER / SUPPLIER

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www.heras.co.uk

Technical Construction File: Heras Middleton T&I Department

1.2  SERVICE / MAINTENANCE

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<tr>
<th>Heras UK</th>
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<td>Heras Norway</td>
<td>+47(-) 22 900 555</td>
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<tr>
<td>Heras Sweden</td>
<td>+46(0) 77 1506050</td>
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1.3  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 barrier 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 barrier.
1.4 PRESCRIBED USE / APPLICATION

Only the correct installation and maintenance by an authorised/qualified company or person in agreement with the user manual, logbook, check lists 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.

1.5 CONFORMITY WITH EUROPEAN DIRECTIVES

The installation complies with the following EU Directives/ regulations:

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<tbody>
<tr>
<td>2006/42/ EC Machine Directive</td>
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<tr>
<td>2014/30 EU EMC Directive (EMC)</td>
<td></td>
</tr>
<tr>
<td>305/2011 EC Construction Product Regulation</td>
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</tbody>
</table>

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

1.6 DELIVERY

The barrier, drive and control unit must be installed by a fitter or an engineer who also connects and programs any accessories. The barrier control unit is adjusted to the options/accessories agreed with the user. The relevant options are laid down during hand-over. Optional accessories can be installed afterwards, simply contact the supplier.

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

1.7 ELECTRICAL CONNECTIONS

Electrical connections must be made compliant with the supplied wiring diagram. The system must be correctly earthed (Protective grounding in accordance with DIN VDE).

Because EMC-related suppression components can leak current to the earth cable, it is advised not to protect the control unit with a Residual Current Device. When switching on the system, a high starting current can be generated due to the charging of the intermediate circuit.

If after measurement during commissioning it appears that the leakage current exceeds the permitted 3.5 mA, an additional grounding, in accordance with EN 60335-1 and IEC 30364-5-54, must be provided. Measurement is made according to EN 60335-2-103. Consult your installer for this.

Take into account good shielding, for example an automatic circuit breaker 16A B characteristic.

Ensure that the feeder cables are not carrying power during commissioning.
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 barrier 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. If the meaning of any part of these instructions is not clear, contact the supplier before using the equipment.

• It is forbidden to apply the drive unit to barriers other than those stated in this manual, without Heras’ permission.

• Applying a third-party drive unit and/or safety device may affect safety compliance and will invalidate the CE mark.

• The barrier 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 barrier must be carried out by qualified engineers 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.

• This manual must always be available at the operating location. This manual must be read thoroughly and applied by all persons who are in charge of the operation, maintenance and restoration of the controls.
2.3 SAFETY PROVISIONS

- To protect people and goods from injury or damage, the barrier is fitted with safety provisions including a sensitive protective device that prevents contact with the moving beam.

- The safety provisions serve as emergency provisions that immediately stop the movement of the barrier. It is forbidden to use these provisions to stop the barrier normally.

- For a barrier with hold-to-run control, the above-mentioned safety provisions are not necessary and will therefore not be standard provisions. With this type of operation, the barrier stops immediately as soon as the switch is released.

2.4 INTENDED USE

The barrier is an entrance control product designed and intended to be used as an access control point to a specific plot, premises or site. The barrier is designed to protect the site against road-based vehicular impacts. The barrier is intended for both industrial and private use.

The barrier is not to be used to lift any loads other than permitted accessories. The barrier should not be climbed upon for any reason. The barrier should not be used in any other way than described in this manual.

The barrier drive and control unit is adjusted to the options agreed with the user. The relevant options are laid down during hand-over.

Carefully read this user manual before operating the barrier. You must always be familiar with the operating mode the barrier is in.

2.5 SAFETY DURING USE

- Keep a safe distance from the moving barrier. Warning icons to this effect should be installed in applicable locations.

- Only pass through the barrier when it is completely open.

- Safety devices serve as emergency facilities to immediately stop and reverse the barrier movement. Using them as a regular barrier stop feature is not allowed.

- When hold-to-run-control is employed, the barrier 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 barrier must stop immediately when the button or key is released. Other operating devices are not allowed.

- The barrier must be able to move freely without there being obstacles in the barrier opening passage or anywhere else on the moving trajectory of the barrier. Do not stick any objects through, over or under the barrier which might block the barrier.
• In windy conditions the barrier arm can move back and forth in the open position or during opening. This has no adverse consequences on the construction.

• Climbing the barrier is strictly forbidden as people climbing the barrier could be hurt if the barrier is started unexpectedly.

• The safety device is not active during opening.

• Do not stick any objects through, over or under the barrier which might block the barrier.

• Do not place any obstacles in the opening.

• Always lock the drive unit cabinet during use.

2.6 SAFETY DURING INSTALLATION, MAINTENANCE AND DISASSEMBLY

• When work is carried out or while cleaning the barrier, 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 barrier 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 barrier at the drive unit cabinet.

• To move the barrier 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.
3 DESCRIPTION

3.1 OVERVIEW

The Series 410 - 420 Hydraulic Vehicle Barriers are heavy-duty vandal resistant barriers, which provide strong mechanical characteristic. It is used to control vehicular access in and out of a controlled area of a site. They can be either installed on the perimeter of a site or further within the site. Whilst they are primarily intended for outdoor use, they can be used indoors in building such as warehouses.

3.2 VARIANTS

The BCL Series 410 - 420 Series Barriers are available in the following variants:

- 410 Centre Yoke Barrier (no counter balance) rectangular beam
- 411 Side Acting Barrier (no counter balance & handed left/right) rectangular beam
- 412 Side Acting Barrier 7, 8 & 9 Metre Beam (no counter balance & handed left/right) round beam
- 420 ‘HSB’ Side Acting Barrier Fully Skirted (Top & Bottom) 6 metre beam maximum

3.2.1. 410 Centre Yoke Barrier

The 410 features a strong yoke which attaches the barrier beam to the barrier cabinet on both sides so that the beam is positioned centrally to the cabinet. The barrier cabinet is 3 mm thick steel. The 410 barrier can be installed with bottom skirts and a either a fixed or pogo type end support. Beams greater than 4 metres require an end support. Other than the yoke, all remaining characteristics are the same as other variants of the barrier. Maximum beam length is 7 metres rectangular.
3.2.2. 411 Side-Acting Barrier

The 411 barrier is a side-acting barrier available in either left or right hand handing. The handing of the barrier is determined by looking at the barrier arm from the rear of the barrier cabinet. The side the barrier arm is in relation to the barrier cabinet determines the handing of the barrier; hence the barrier shown here below is a right hand barrier. This type of barrier is adopted when beam lights are required as it enables the beam light cables to be routed securely from the barrier cabinet to the barrier arm. Maximum beam length is 7 metres rectangular and the barrier cabinet is 3mm thick.

3.2.3. 412 Side-Acting Barrier 7 - 9 Metre

As per the 411 the 412 barrier is a side-acting barrier available in either left or right hand handing for larger beams usually upward of six metres. The handing is determined by looking at the barrier arm from the rear of the barrier cabinet. The side the arm is on in relation to the barrier cabinet determines the handing; hence, the barrier shown here below is a right hand.

This type is installed with tension wire to help reduce flex within the barrier beam. Maximum beam length is 9 metres (round beam) and the barrier cabinet is 5mm thick.
3.2.4. 420 Top and Bottom Skirt Barrier

The previously mentioned barriers are available with bottom skirts however the series 420 HSB barrier has top and bottom skirts as standard. When the barrier arm is lowered, the skirt lattice is protruding vertically, creating a larger inhibition than that of a standard barrier. When the barrier rises the attachment strips are able to concertina, retracting the skirt onto the barrier arm and enabling the passage of vehicles including HGVs.

3.3 PART VARIATIONS

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<thead>
<tr>
<th>No</th>
<th>CODE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>00066</td>
<td>HSB CABINET STD ALL (EXCEPT SIDE ACCESS)</td>
</tr>
<tr>
<td>2</td>
<td>00060</td>
<td>HSB BARRIER BODY 3mm VERSION</td>
</tr>
<tr>
<td>3</td>
<td>00069</td>
<td>HSB CABINET 3/4 ALL (SIDE ACCESS BARRIERS)</td>
</tr>
<tr>
<td>4</td>
<td>00068</td>
<td>HSB CABINET U ALL (SIDE ACCESS BARRIERS)</td>
</tr>
<tr>
<td>5</td>
<td>00064</td>
<td>HSB CABINET SIDE ENTRY STANDARD</td>
</tr>
<tr>
<td>6</td>
<td>00021</td>
<td>HSB COVER RIGHT HAND</td>
</tr>
<tr>
<td>7</td>
<td>00027</td>
<td>HSB COVER SIDE ENTRY STANDARD</td>
</tr>
<tr>
<td>8</td>
<td>00030</td>
<td>HSB COVER SIDE ENTRY LEFT HAND</td>
</tr>
<tr>
<td>9</td>
<td>00037</td>
<td>HSB YOKE 1 METRE 7FT 7INCH ONLY</td>
</tr>
<tr>
<td>10</td>
<td>00039</td>
<td>HSB YOKE 1/2 METRE ALL STANDARD 4-6 MTR</td>
</tr>
<tr>
<td>11</td>
<td>00060</td>
<td>H METRE YOKE LEFT HAND</td>
</tr>
<tr>
<td>12</td>
<td>00063</td>
<td>H METRE YOKE RIGHT HAND</td>
</tr>
<tr>
<td>13</td>
<td>00054</td>
<td>H SEC YOKE LEFT HAND</td>
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<td>14</td>
<td>00057</td>
<td>H SEC YOKE RIGHT HAND</td>
</tr>
<tr>
<td>15</td>
<td>00046</td>
<td>HSB YOKE SIDE ACTING LEFT HAND ALL LEFT HAND</td>
</tr>
<tr>
<td>16</td>
<td>00049</td>
<td>HSB YOKE SIDE ACTING RIGHT HAND ALL RIGHT HAND</td>
</tr>
<tr>
<td>17</td>
<td>00012</td>
<td>HSB DOOR STD</td>
</tr>
<tr>
<td>18</td>
<td>00025</td>
<td>HSB DOOR SIDE ENTRY</td>
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4 OPERATION

4.1 PUSH BUTTON CONTROL

When remote push button controls are installed, it is possible for an operator to allow vehicles to pass through the barrier in either entry or exit direction. Push button units can be used together with intercom systems, enabling communications between visitors to and users for approval when entering or exiting through the barrier.

4.2 CARD READER SYSTEMS

4.2.1 General

This section provides generic information involved in the factors to be taken into account when connecting card readers that have not been supplied by Heras. This information is based on the experience Heras has gained when interfacing external card reader systems that have been interfaced to our equipment in the past. In this way, this section should not be used as a definitive guide to all card reader systems that can be integrated with Heras equipment. Suppliers of any external card reader systems should contacted to ensure that the reader system is compatible with Heras equipment and capable of providing the correct functionality.

4.2.2 Door Open Time

Card Readers Systems can be interfaced to the barrier for entry and exit. The output from the card reader system must be 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 barrier control panel will only allow one open cycle per 'door open' (or activation of relay) regardless of the duration time of the 'door open'. This is necessary to avoid the barrier being held open after a vehicle has transited through the barrier.

4.2.3 Transit Time

Transit time will vary depending on the driver of each vehicle. This time is referred to as the 'transit time' Hence this transit time is dependent on the person using the barrier system and therefore varies dependant on how familiar the person is with the system and card reader. For persons who are familiar with the barrier and card reader system and who are regular users this transit time may be considerably lower than that of new users.
4.2.4. Card Reader Without Feedback

When a card reader system does not have a ‘feedback’ input which is usually used to reset the ‘door open time’ then it’s very important that the ‘door open’ time of the card reader system be set to a maximum of 1 second in order to avoid the barrier being held open longer than necessary. Many card reader systems may have a default time as high as 5 seconds this can considerably slow down the transit time for each open cycle of the barrier. In other words the transit time will be at least as long as the ‘door open’ time (therefore at least 5 seconds), this mainly causes problems when the barrier receives a card reader open whilst it is closing and has just left the fully open position.

4.3 AUTO-CLOSE TIMER

When the barrier system is set to ‘automatic logic’ and an open signal is received from either a push button or card reader the barrier will open, should no vehicle drive through the barrier then the barrier arm will re-close after a set time. The default time is 30 seconds; this time starts to elapse once the barrier is fully open. Please Note that this time can only be changed by using a computer or by EEPROM software update.

4.4 ELECTRICAL ISOLATION

We would always recommend that the barrier is isolated from the consumer unit from which the barrier is supplied prior to local isolation being carried out within the barrier cabinet. To isolate the barrier locally, switch off the unit using the isolator located within the barrier. Key no. 92215 is needed to access the door on the barrier cabinet.

---

**Single phase 230VAC barrier isolator**

**Three phase 400VAC barrier isolator**

Do not work on the barrier until it has been isolated at the main consumer unit and locked in the off position. On single phase barriers, always remove fuses from the barrier prior to working on the unit.

We would advise that a permit to work system be in place complete with remote isolation being carried out prior to working on the unit.
4.5 LOCK RAISE KEYSWITCH

This optional extra feature is used to raise and lock the barrier beam in the raised position for long periods of time. The key switch override (if fitted) is located on the barrier cabinet. To raise and lock the barrier insert the key into the keyswitch and turn it to the LOCK RAISE position, the beam will rise to the vertical position and remain there.

When in the lock raise position the barrier will ignore all lower signals. To lower the barrier insert the key into the key switch and turn to the LOWER position the beam will lower to the horizontal position. Return the key switch to the NORMAL position and remove the key.

4.6 SYSTEM TEST KEYSWITCH

This optional extra feature is used to test the system under fault conditions to ascertain the nature of the fault. The key switch override is fitted on the barrier cabinet. If the barrier will not raise or lower it is necessary to ascertain if the problem is with the barrier or card reader system. To isolate the card reader from the barrier the key switch should be turned to the ISOLATE position. By turning the keyswitch to the TEST position, and back to the ISOLATE position, fault diagnosis can be made. If the beam rises or lowers there is a fault with the card reader system, consult the supplier of the card reader system. If the beam does not raise the fault is with the barrier system, please contact Heras.
4.7 MANUAL RELEASE AND LOCK UP BOLT

In case of power failure, the barrier is supplied with a bolt that allows the beam to be secured in the raised position.

If the power fails with the beam in the raised position, the lock up bolt must still be fitted as a safety precaution. The lock up M16 x 75 long bolt is supplied with the barrier and located in the base of the barrier cabinet. The barrier must be isolated from the electrical supply using the isolator located within the barrier cabinet before the manual release procedure is carried out. If the power fails with the beam in the lowered position it may be necessary to raise the beam manually.

In order to do this the hydraulic cylinder must be unlocked manually. This is done by opening a tap located on the electro-hydraulic power pack. The tap is located at the rear of the power pack, it may be necessary to tilt the power pack slightly to aid access to the tap. Turn the tap to the open position as shown in the photo here below.
Once the tap is open the beam can be raised manually by going to the end of the beam and ‘walking’ the beam to the vertical position.

Care must be taken at all times to ensure that correct lifting procedures are followed. When the beam has been fully raised to 85 degrees, the lock up bolt can be fitted in position and securely tightened.

If the beam is raised manually, it must be lowered manually, before the power is restored to the barrier. In order to do this, carefully remove the lock up bolt, the beam can now be ‘walked’ to the lowered position.

Ensure the lock up bolt is safely stored in the base of the barrier cabinet for future use. Close the release tap to close position.

Ensure that all pedestrians and vehicle traffic are well clear of the barrier before the power is restored.

Test the function of the barrier to ensure that it is working correctly.
5 TECHNICAL DETAILS

5.1 INTRODUCTION

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 system failure.

5.2 CONTROL PANEL

The control panel for the barrier 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.

Additional inputs can be programmed on the PLC this option is available as an extra.

Only qualified personnel should work within the control panel. Always Test that no voltage is present prior to working on the barrier unit.
5.3 MECHANICAL ARRANGEMENT AND DRIVE OPERATION

The barrier cabinet is manufactured from steel plates and folded sheets; surface finished to BS4800 04E53 colour (Poppy Red). The barrier arm is made from extruded aluminium section for barriers having rectangular arms and rolled aluminium section for barriers having round arms. The yoke is manufactured using mild steel and the power transmission through the yoke is via the linear hydraulic cylinder. Heavy duty bearings ensure trouble free operation and ensure that the rotary motion of the yoke shaft has minimum friction.

5.4 ELECTRICAL LIMITS

The travel of the barrier is governed by electro mechanical limit switches. The limit switches are normally closed hence the PLC receives 24VDC from each limit until they are operated. When operated the 24VDC is removed to the respective PLC input. This is a fail-safe configuration which simulates a limit being operated in the event of cable failure/damage; and this in turn avoids unnecessary driving of the barrier arm past its electrical limits.

5.5 MECHANICAL LIMITS

As well as having electrical limits the barrier also has mechanical limits for each respective direction of travel (up/down). These limits are in the form of M16 bolt heads upon which a quadrant drives upon. It is important that the mechanical limits are set in order that there is a 5mm gap between the bolt heads and the quadrant at both the fully lowered and fully raised positions.
5.6 PROGRAMMABLE CONTROLLER

The main control component, the programmable controller, includes 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; the program being stored in RAM, which allows the program to be modified. Inputs I1 to I4 are digital, whereas inputs IB to IE digital/analogue inputs. All inputs activate when + 24 Volts is fed into the relevant input. The outputs are relay contacts which are capable of switching 8 Amp resistive loads.
5.7 CONTROLLER PARAMETER VARIABLES

The PLC controller has four 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/minus button:

The parameters are as follows:

5.7.1. Auto-Close

This function will automatically close the barrier (from the fully open position) after an adjustable time delay. The default time delay is factory set to 30 seconds, however the time delay is only active when the auto-close parameter has been switched on. The procedure for switching on/off the auto-close parameter is as follows see picture of controller here above:

Press and hold MINUS button on PLC to view parameter screen

If “00000 AUTO CLOSE” is shown then this indicates that the function is currently switched OFF

If “00001 AUTO CLOSE” 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.
5.7.2. **Loop Closing**

This function will automatically close the barrier after a vehicle has passed over the safety induction loop and/or the free exit loop to maximise site security. The procedure for switching on/off the Loop Closing parameter is as follows see picture of controller on previous page:

- Press and hold MINUS button on PLC to view parameter screen
- If “00000 LOOP CLOSE” is shown then this indicates that the function is currently switched OFF
- If “00001 LOOP CLOSE” 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.

5.7.3. **Collision Return**

This function will reopen the barrier arm should a vehicle become present on the safety induction loop whilst the barrier is closing. When collision return is switched OFF then the barrier arm will stop and will not reopen when a vehicle becomes present on the safety induction loop during the closing of the barrier. The factory setting is OFF. 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 screen.
- If “00000 COL RETURN” is shown then this indicates that the function is currently switched OFF
- If “00001 COL RETURN” is shown then this indicates that the function is currently switched ON
- To switch between ON/OFF Press and hold the both A and 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.
5.7.4. **Lower Memory**

This function is designed to work in tandem with the “Loop Closing” function and should therefore not be activated without the “Loop Closing” function also being active. The purpose of the function is to delay the initial closing of the barrier after a vehicle has passed through the barrier without the barrier being fully raised. Examples of how the function works is given here below: The procedure for switching on/off the Lower Memory parameter is as follows:

- Press and hold MINUS button on PLC to view parameter screen
- If “00000 LOWER MEM.” is shown then this indicates that the function is currently switched OFF
- If “00001 LOWER MEM.” is shown then this indicates that the function is currently switched ON
- To switch between ON/OFF Press and hold the both A and 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.

5.7.5. **Parameter Factory Settings**

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

- 00001 indicates that a parameter is ON
- 00000 indicates that a parameter is OFF

Factory settings are shown here below:

![Parameter Factory Settings Diagram](image)

These settings are default settings and will be used unless otherwise required.
5.8 ADJUSTABLE INTERNAL TIMERS

The PLC timers can be adjusted using the buttons located on the front face of the PLC whilst making reference to the LCD display also located on the front face of the PLC.

5.8.1. Factory Default Timer Values

It is important to note that some timers are set in tenths of a second whereas most are set in units of a second.

<table>
<thead>
<tr>
<th>Timer</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raise run timer</td>
<td>MACRO 005 FB 049 TIMER A/C on delay 00018 (seconds)</td>
</tr>
<tr>
<td>Auto-close timer</td>
<td>MACRO 003 FB021 TIMER A/C on delay 00030 (seconds)</td>
</tr>
<tr>
<td>Loop filter timer</td>
<td>MACRO 000 FB138 TIMER A/C on delay 00000 (milli-seconds)</td>
</tr>
<tr>
<td>Lower run timer</td>
<td>MACRO 007 FB057 TIMER A/C on delay 00018 (seconds)</td>
</tr>
<tr>
<td>Lower solenoid timer</td>
<td>MACRO 007 FB006 TIMER A/C on delay 00003 (seconds)</td>
</tr>
</tbody>
</table>
5.8.2. **Raise Run Timer**

Should the barrier arm fail to reach the top limit switch within the time set within the "raise run timer" then the PLC controller will automatically shut down the motor. Use the following process to access/adjust the timer:

- During standby the controller displays screen (a)
- Simultaneously press ESC and OK
- The Escape Screen (b) will be displayed
- Using MINUS button select parameters and then press OK
- The following screen will be displayed indicating that you are within the timer menu. You will notice the number located at the top right hand corner of the screen is highlighted and flashing
- Press OK and the number will flash without any highlight
- Using the MINUS button scroll through the numbers, you will notice the message “CHOSE FBD” is displayed.
- Once you have reached “MACRO 005 FBD 049” then press OK this will display the value of the timer and its configuration (on delay or off delay)
- Now using the MINUS key scroll down to the timer value
- Press the OK button and then use the PLUS and MINUS keys to adjust the timer value to the desired value.
5.8.3. **Lower Run Timer**

Should the barrier arm fail to reach the bottom limit switch within the time set within the "lower run timer" then the PLC controller will automatically shut down the motor and solenoid.

5.8.4. **Lower Solenoid Timer**

As the barrier lowers, both outputs of the controller are activated. When the barrier reaches the bottom limit, output one deactivates while output two remains active for a set time, determined by the lower solenoid timer. This function utilises gravity as a final slowdown during closing. The timer should be set at 3 seconds. Altering this will affect the correct functioning of the barrier.

5.8.5. **Loop Filter Timer**

This timer is used to filter out erratic switching of safety devices connected to the loop circuit via connectors 11 & 12. This filter function is especially important when photocells are being used in place of inductive loops to close the barrier. When “Loop Closing” is active and the loop circuit is first interrupted and then uninterrupted the barrier will automatically lower. The filter creates a delay between the photocell being cleared and the barrier lowering. An example where this filter could be used are sites where HGV vehicles with a variety of trailer shapes (and gaps between cabin and trailer).

5.8.6. **Switch Mode Power Supply Unit**

The control panel has a 230VAC to 24VDC switch mode PSU which provides the low voltage for the controls.

The PSU is able to electronically convert 100VAC - 240VAC both single phase and two phase voltages into 24VDC voltage. A switch-mode PSU does not convert the voltage using windings. It uses a switching regulator. While a line regular maintains the desired output voltage by dissipating excess power in a pass power transistor, the switched-mode power supply switches a power transistor between saturation (full on) and cut off (completely off) with a variable duty cycle whose average is the desired output voltage. The unit is capable of full short circuit protection and is therefore able to be connected to a suitably sized load (no greater than the power rating of the PSU) without any need for a conventional fuse being connected. The unit has a DC low and DC OK indicator located on the front of the unit.
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 will be pleased to provide a quote for a preventative maintenance scheme.

A system logbook should be 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 skilled 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.
6.4 ROUTINE MAINTENANCE

6.4.1. Monthly

Note: all maintenance other than cleaning should be carried out by qualified by engineers.

- Clean externally with a mild non-abrasive detergent
- Check all exterior fixings and bolts and re-tighten

6.4.2. Six Monthly

- Check overall barrier condition for deterioration
- Check foundation bolts are secure and re-grease
- Check security of bolts on all equipment (when supplied)
- Check control panel for correct operation
- Check all cable terminations are secure (isolate electrical supply)
- Check yoke bearing assembly and grease if necessary
- Check full operation of barrier including all associated safety devices, check all control points

6.4.3. Annually

- Examine oil level and top up if necessary (do not fully fill the oil tank)
- Check limit switch operation
- Check solenoid operation
- Carry out insulation test on motor and ensure thermal overload is set correctly for the load of the motor
- Check pressure setting using an appropriate hydraulic pressure gauge
- Ensure that top hat protecting the moving parts of the transmission is securely fitted

7 DECOMMISSIONING AND REMOVAL

Ensure that the barrier 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.
### 8 RECOMMENDED SPARES

#### 8.1 GENERAL SPARES

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>001086</td>
<td>1</td>
</tr>
<tr>
<td>PSU</td>
<td>001078</td>
<td>1</td>
</tr>
<tr>
<td>Electro-hydraulic power pack 230VAC single phase</td>
<td>000351, 000352, 000353</td>
<td>2</td>
</tr>
<tr>
<td>Electro-hydraulic power pack 230VAC three phase</td>
<td>000222</td>
<td>1</td>
</tr>
<tr>
<td>Standard cylinder (up to 4 metre arm)</td>
<td>000303</td>
<td>1</td>
</tr>
<tr>
<td>Medium cylinder (4 to 6 metre arm and hi-sec)</td>
<td>000304</td>
<td>1</td>
</tr>
<tr>
<td>Medium cylinder (*over 6 metre arm)</td>
<td>000305</td>
<td>1</td>
</tr>
<tr>
<td>PD132 Loop detector</td>
<td>000334</td>
<td>2</td>
</tr>
</tbody>
</table>

#### 8.2 CABINET SPARES

<table>
<thead>
<tr>
<th>Description</th>
<th>Variant</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSB cabinet standard</td>
<td>All except side access</td>
<td>00006</td>
<td>1</td>
</tr>
<tr>
<td>HSB barrier body 5mm version</td>
<td>All</td>
<td>00480</td>
<td>1</td>
</tr>
<tr>
<td>HSB cabinet SE</td>
<td>Side access</td>
<td>00009</td>
<td>1</td>
</tr>
<tr>
<td>HSB cover-standard</td>
<td>All except side access</td>
<td>00018</td>
<td>1</td>
</tr>
<tr>
<td>HSB cover-left hand</td>
<td>All except side access</td>
<td>00024</td>
<td>1</td>
</tr>
<tr>
<td>HSB cover-right hand</td>
<td>All except side access</td>
<td>00021</td>
<td>1</td>
</tr>
<tr>
<td>HSB cover side entry standard</td>
<td>Side access</td>
<td>00027</td>
<td>1</td>
</tr>
<tr>
<td>HSB cover side entry left hand</td>
<td>Side access</td>
<td>00030</td>
<td>1</td>
</tr>
<tr>
<td>HSB yoke 1 metre all standard</td>
<td>7 metre only</td>
<td>00037</td>
<td>1</td>
</tr>
<tr>
<td>HSB yoke 1/2 metre</td>
<td>4-6 metre standard</td>
<td>00039</td>
<td>1</td>
</tr>
<tr>
<td>8 metre yoke left-hand</td>
<td>8 metre</td>
<td>00060</td>
<td>1</td>
</tr>
<tr>
<td>8 metre yoke right-hand</td>
<td>8 metre</td>
<td>00063</td>
<td>1</td>
</tr>
<tr>
<td>Hi-sec yoke left-hand</td>
<td>Hi sec</td>
<td>00054</td>
<td>1</td>
</tr>
<tr>
<td>Hi-sec yoke right-hand</td>
<td>Hi sec</td>
<td>00057</td>
<td>1</td>
</tr>
<tr>
<td>HSB yoke side acting left hand</td>
<td>All left hand</td>
<td>00046</td>
<td>1</td>
</tr>
<tr>
<td>HSB yoke side acting right hand</td>
<td>All right hand</td>
<td>00049</td>
<td>1</td>
</tr>
<tr>
<td>HSB door std</td>
<td>All except side access</td>
<td>00012</td>
<td>1</td>
</tr>
<tr>
<td>HSB door side entry</td>
<td>Side access</td>
<td>00015</td>
<td>1</td>
</tr>
</tbody>
</table>
9 DRAWINGS
9.1 HYDRAULIC CIRCUIT
9.2 ELECTRO-HYDRAULIC POWER PACK
10 TECHNICAL INFORMATION

10.1 DETAILS

Series: 410 – 420 Hydraulic Vehicle Barrier

Controllers: 1 No Integrated Programmable Controller with provision for connection of remote push button and card access control.

Additional Available Equipment: Skirts, Vehicle Loop Detectors, Photocells, Traffic Lights & Push Buttons/Keyswitches, Signs, Sounders, Locks and Safety Edges

Electrical Supply: SP Models required a Single Phase 230VAC 50 Hz Supply rated @ 10 Amps. TP Models required a Three Phase & Neutral 400VAC 50 Hz Supply rated @ 6 Amps. (Note: this is not the consumption of the unit)

Available on request as an extra is the choice of a backup system to allow the barrier to operate after loss of the site’s electrical supply.

UPS: Note: UPS Systems provide back-up to single phase electrical supplies. Normally a single phase barrier is used. A three phase barrier can be used with UPS by installing a Single Phase Inverter which allows the barrier’s motor be run in Delta 230VAC three phase

Cabinet Dimensions: 400 x 300 x 3/5mm

Cabinet Overall Height: 1150mm

Beam Sections Available: 100 x 50 x 3 mm Rectangular Section
100 x 3 mm Circular Section

Beam Centre Height: 1000 mm

Operating Time: 8-15 Seconds

Standard Colour: BS 04E53 Poppy Red – Other RAL/BS colours available on request.