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INSTALLATION INSTRUCTIONS REL1001 & REL1002

For single action, single doors only

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IMPORTANT

Incorrect installation can damage internal mechanisms and delicate electrical circuitry, please ensure you fully understand all connection requirements before proceeding.

Relcross recommends a qualified electrical engineer certified to BS 7036 carries out installation.

If unfamiliar with installation please read the manual & understand the operator installation requirements. If there are any questions call 01380 729 600 before attempting installation – we can produce electrical drawings for your specific installation if you have purchased from Relcross.

Physical Mounting & Installation Instructions (Pull Side and Push Side Versions)

Important – Do not proceed without checking the following basic points.

The door must be single action, single swing.

The operator is a mains powered unit and must not be mounted externally.

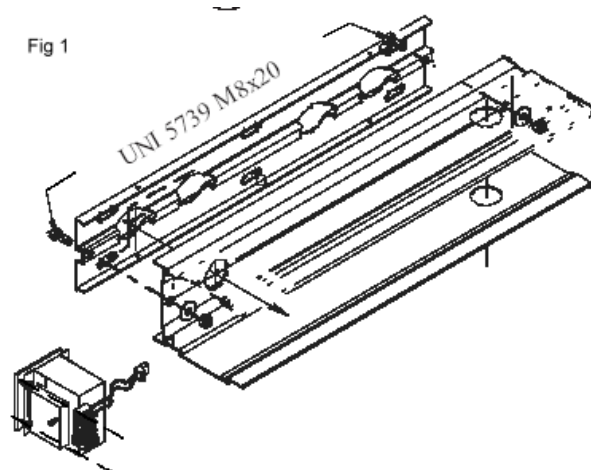
Establish the correct application, i.e. Pull Side or Push Side and that the correct arm is available for that application.

Check available space above the door and that a secure fixing can be established.
See drawing:

For Pull Side Mounting ensure that the door and frame are flush, i.e. - no reveal. If a reveal exists then special packers are required to mount the track. Refer to Relcross before proceeding (see also Arm Installation below).

See Physical Installation Drawing Sequence

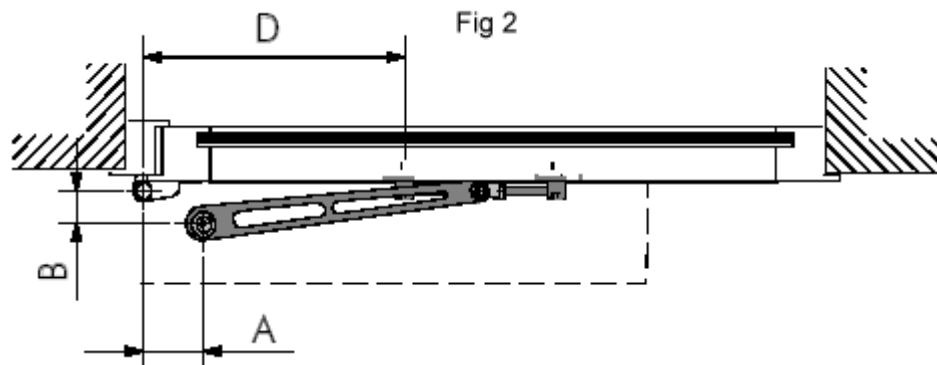
1. Using a Phillips head screwdriver, remove both end caps from the operator body. Slide the cover from the case and store these components carefully for replacement when installation is complete.
2. With the operator on the bench, locate the transformer (see Fig 1) and loosen the four screws anchoring it to the base plate. This exposes one M8 nut. Release this and the one at the opposite end (13 socket spanner) removing the base plate from the main operator body. Temporarily re-secure the transformer.
3. Affix the base plate to the transom (i.e. above the door) in accordance with the drawings provided (see Fig 2 & 3 and notes next page).



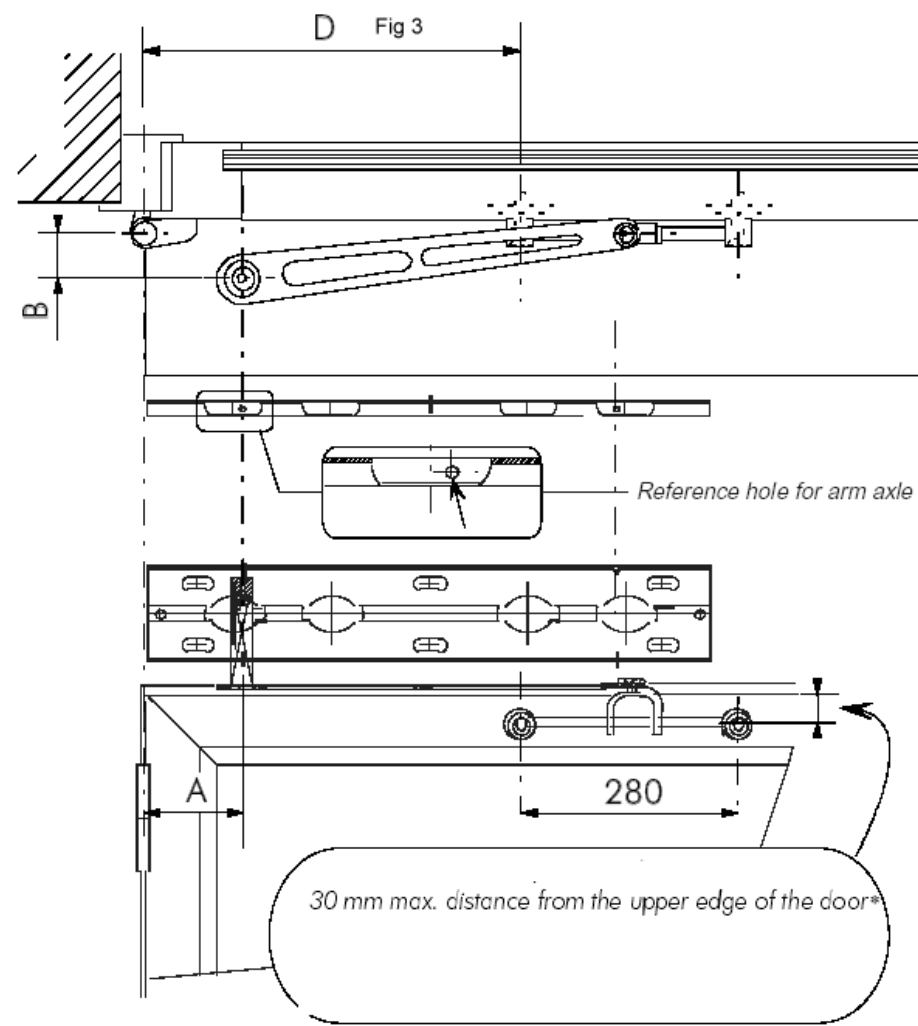
Base Plate – Horizontal Alignment (Pull & Push Side Applications)

The first critical dimension is dimension A. This dimension (100mm) is taken from the pivot point of the door to the center of the arm spindle on the operator and is consistent with all installations. Aligning the edge of the base plate with the pivot point will achieve the desired position (see Fig 2).

For an opening of 100° B = 65mm and D = 380 mm.



For vertical alignment refer to the layout drawing particular to the arm configuration to be used see drawings and additional information below.



Base Plate - Vertical Alignment (Pull Side Application)

There are two optional mounting heights for the base plate. The installer must determine the most appropriate location based upon the availability of a secure fixing area and headspace at the transom.

Important Notes

Vertical alignment must also take into account the fixing method for the arm. Available space must be left above the Gear Motor to effect the required bolt fixing through the top of the unit. Without this space the arm must be fixed to the Gear Motor before the Gear Motor is fixed to the base plate.

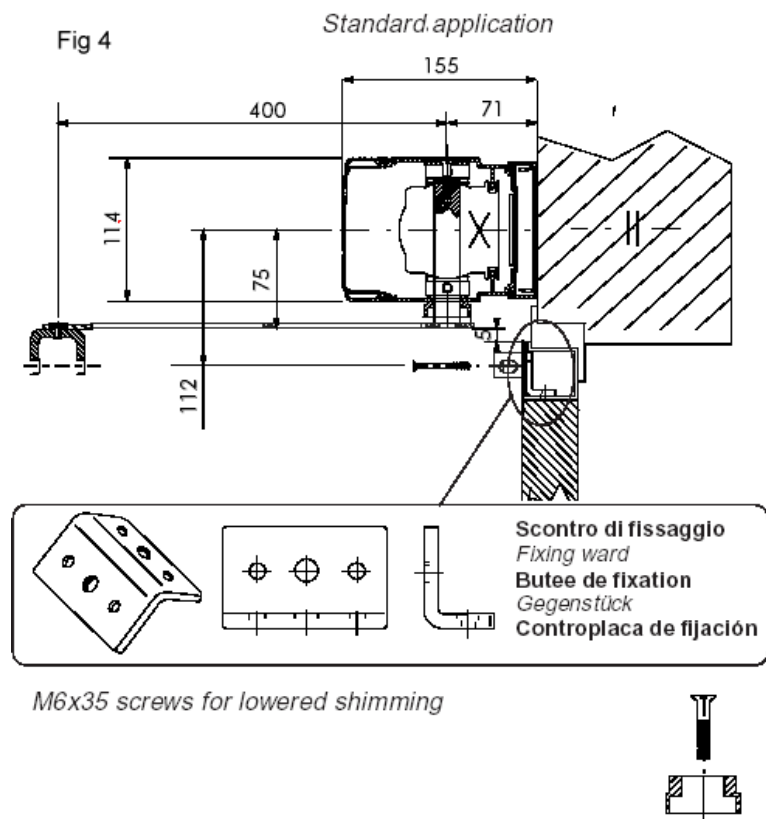
In all instances the underside of the arm must pass over the top of the door by 5mm. Not all doors are hung perfectly perpendicularly. It is important to ensure the arm passes over the door for the entire opening arc. This should be checked before making any final fixing.

The pull side arm is supplied with two black plastic shim sleeves for the arm spindle. The larger of the two allows the operator body to be mounted an additional 27mm higher up the transom.

Taking the top of the door as a reference point, the centerline of the base plate assembly is measured as follows:

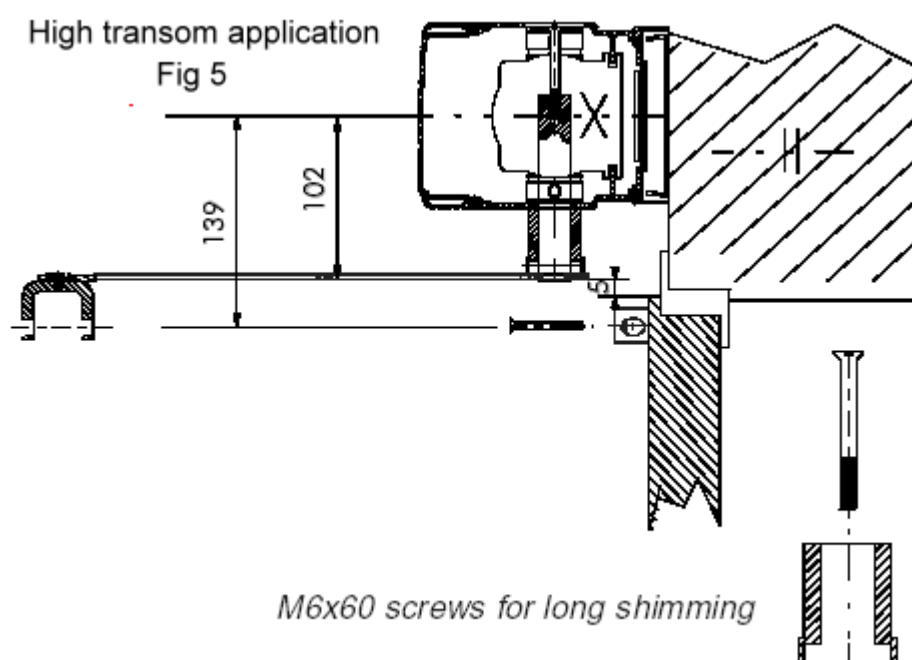
Option 1 - Standard

85mm up from the top of the door



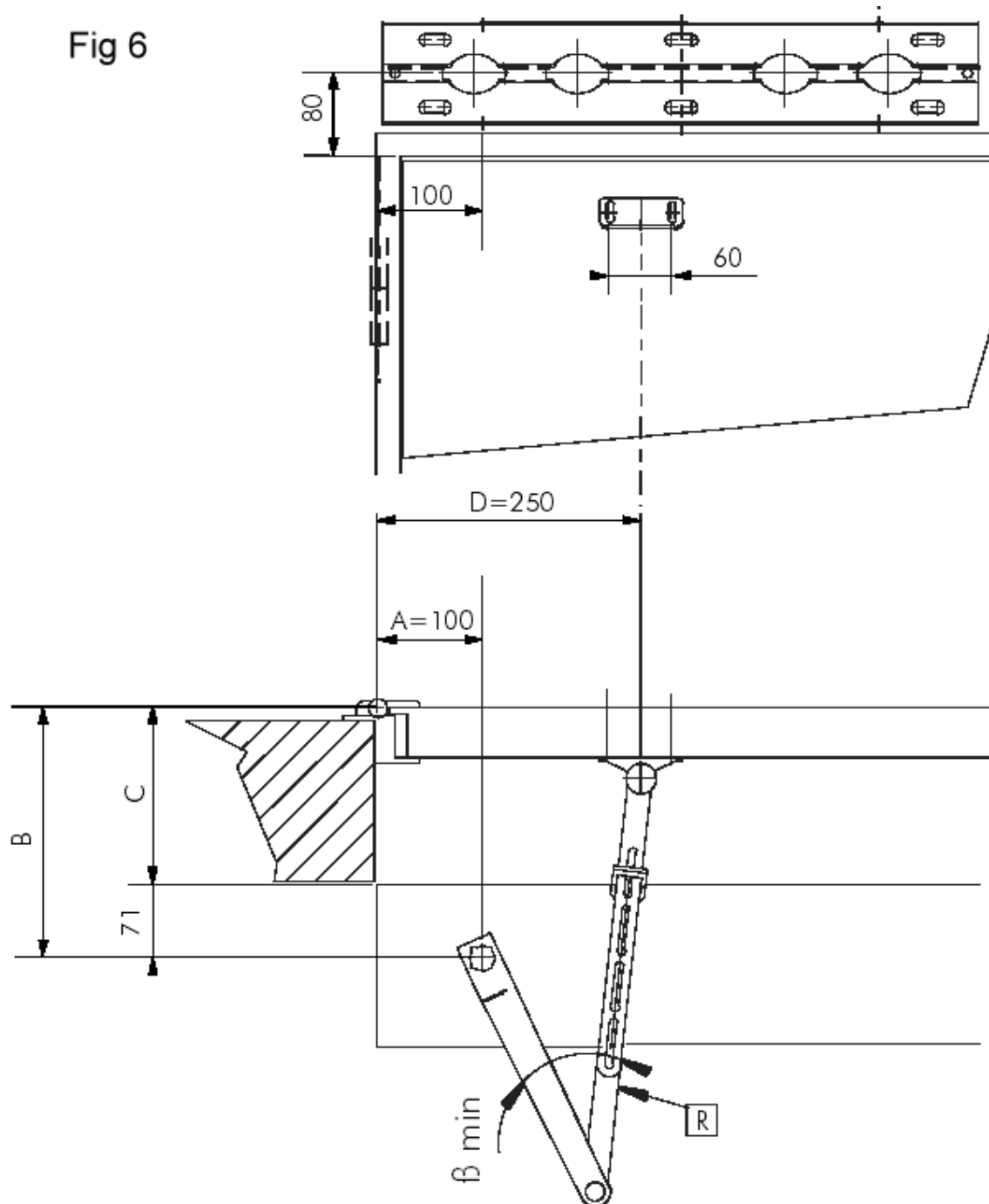
Option 2 – High Transom Fixing

112mm up from the top of the door



Base Plate - Vertical Alignment (Push Side Application)

All installations for push side applications, irrespective of door height or reveal size, require the centerline of the base plate assembly be measured at 80mm from the underside of the stop on the push side. (See Fig 6)



Base Plate Fixing

Secure the base plate at six points*. Fixings (dictated by the construction of the transom) are not supplied. Ensure that the M8 screws emerge as shown on the drawing (See drawing) *Ensure that all necessary cables are fed through the base plate before fixing – see cable inlet on Fig 1.

Fixing the Gear Motor (Main Operator Body)

Carefully align the Gear Motor's clearance holes to the M8 screws on the base plate. Feed the cables through and then fix securely using the washers and nuts provided (13 socket spanner).

Re-secure the transformer, insert the two way plug into socket on ZP10 board.

Make all electronic connections (see the following section).

Arm Installation Pull Side (Slide Arm Installation)

Having already established the mounting height of the Gear Motor it is now necessary to fit the appropriate black plastic shim sleeve to the arm spindle.

With the door closed and the shim sleeve in place over the arm, offer the main arm to the underside of the operator. Fix the arm using the Allen headed bolt provided.

M6 x 35mm or M6 x 60mm as appropriate.

The arm is fixed down through the head of the Gear Motor Unit (See drawing).

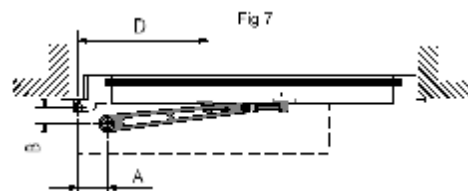
Attach the U shaped bracket (see drawing) to the end of the main arm using the steel pawl and brass bush provided. It will be necessary to introduce the bush fitting (see drawing) if the slider and fixing brackets need to be dropped down the door to obtain a more secure fixing.

Slider & Fixing Brackets

The fixing method for the U shaped bracket dictates the height at which the bar is fixed to the door. For standard installations see the following drawings.

Centers of the slide bar fixing brackets are 280mm (see drawing). The location of the first slide bar fixing bracket is measured from the pivot pint and is shown as dimension D in the following table. Dimension D can vary depending upon the desired maximum opening angle of the door (see Table and Fig 7).

	100°	120°
A	100	100
B	65	65
D	380	335



Slide the bar through the U shaped bracket and assemble the slide bar and brackets using the fixings provided.

Check that the U shaped bracket is free to move along the slide arm – for the entire opening arc of the door (i.e. back to the pre-determined maximum angle of opening) before proceeding.

Arm Installation Push Side (Articulated Arm Installation)

Having already established the mounting height of the Gear Motor it is now necessary to fit the appropriate black plastic shim sleeve to the arm spindle.

The choice of shim will dictate the fixing point height for the arm shoe at the door. It is necessary to check that an effective fixing can be made at this point (see drawing). Do not fix the arm to the door yet.

(Important - Do not use the larger shim for doors exceeding 2500mm in height.)

With the door ajar and the shim sleeve in place over the arm, offer the main arm to the underside of the operator. Fix the arm using the Allen headed bolt provided.

M6 x 35mm or M6 x 60mm as appropriate.

The arm is fixed down through the head of the Gear Motor Unit (See drawing).

During the normal operation of the door the articulated arm must pass below the underside of the stop. It is recommended that this point be checked (for the entire opening arc of the operator) before any further fixing is carried out.

The size of the reveal dictates the length of the arm and the ability of the operator to accommodate excessive opening angles (see drawing). The position of the door shoe fixing on the face of the door (in relation to the pivot point) is constant.

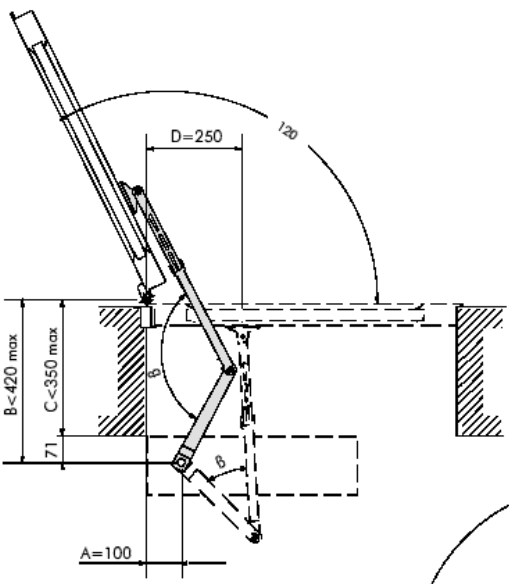
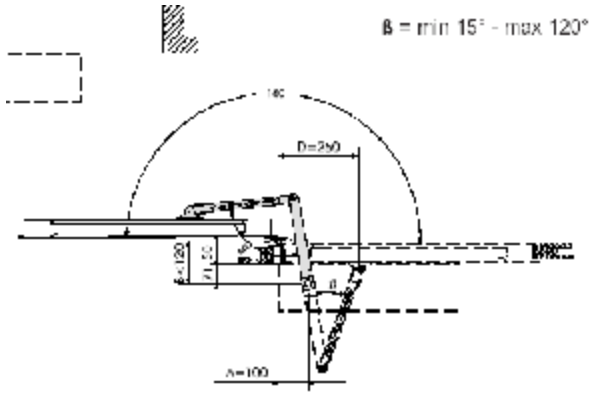
Please note – The maximum load capacity of the operator is reduced by 30% when the arm is fully extended.

Always fix an independent doorstop (wall or floor fixed) at the extent of the opening arc. This will protect the arm and the motor.

Note

Once the arm is installed it is desirable to apply stud-locking compound such as Loctite 70 to the screw that holds the U shaped clamp to the arm for pull side arm, or the screw in the elbow of the articulated arm for a push side arm.

See drawings and the following table.

$\Sigma < 120^\circ$	$\Sigma < 180^\circ$
A = 100	A = 100
B < 420	B < 120
C < 350	C < 50
D = 250	D = 250
	

Electrical Specification

Power Requirement - Standard 230V ac mains supply,

Control Board Voltage – 24V

Max. Current – 6.5A

Nominal Current – 2A

Mains Transformer & 24V Controls – Protected by 2A fuses.

Circuit Board – Protected by 630mA fuse.

Max. Power Consumption – 150W

The 24V accessories' total voltage must not exceed 15W (including locking device).

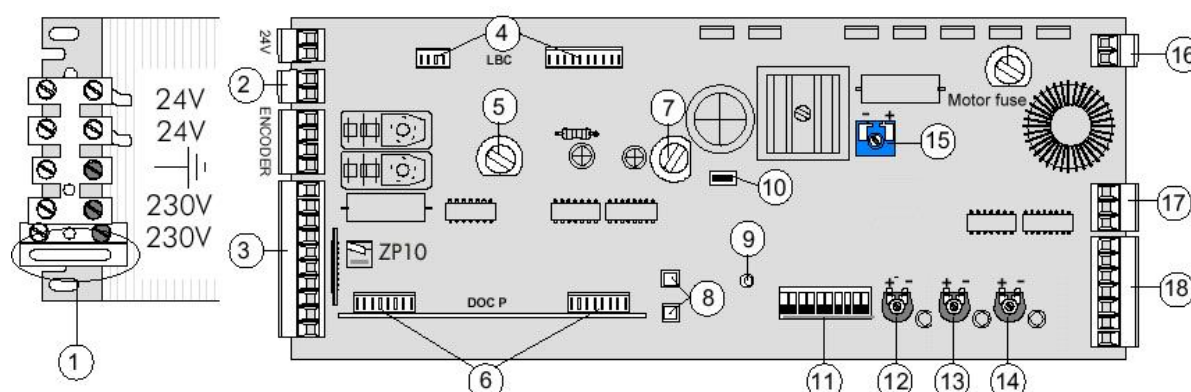
IMPORTANT NOTES:

WHEN AUTOMATION IS NOT REQUIRED AND THE DOORS ARE LOCKED FOR SECURITY PURPOSES, WE STRONGLY RECOMMEND THE USE OF A KEY SWITCH TO PREVENT UNNECESSARY OPERATION.

IF REMOTE ACTIVATION SENSORS ARE USED TO INITIATE THE OPERATOR OPENING OR IF WIND STOP IS USED THE INSTALLATION IS CLASSIFIED AS A HIGH ENERGY SYSTEM AND SAFETY SENSORS MUST BE FITTED - BS 7036:1996 PART 7.5.3 Refers

THE UNIT IS FITTED WITH SURGE SUPPRESSORS – USING HIGH VOLTAGE TEST EQUIPMENT AT GREATER THAN 250 VOLTS WILL DAMAGE THE SUPPRESSOR.

ZP 10 Motherboard Layout



Key to drawing

1. Fuse - 240 V AC supply	2. 24 V DC Backup battery connection	3. 10 way connector
4. LBP7 connection for 7032 board	5. Fuse	6. DOC P Connector
7. Fuse	8. Chiursura (close) Apertura (Open) buttons	9. LED
10. Reset Switch	11. Dipswitches	12. VEL – Door speed
13. RAL – Slowdown speed	14. TCA – Time at open position 2-16 seconds	15. Forza – Motor Torque
16. Motor connections	17. To slave unit (if used)	18. 7 way connector

Please note: slight variations occur, more recent ZP10 boards have a motor fuse and trimmers are in slightly different locations in that items 12 13 & 14 are adjacent to each other.

10 way connector pin outs (see item 3):

Pins	Description
10 & 11	24 V AC accessory power - 15W maximum (600 mA approx)
1 & 2	Shorted out as supplied – use with switch for emergency or key S to disable
2 & R1	Normally open contacts for push button and/or PIR motion detector
2 & R2	Normally open contacts for safety sensor opening side (set Dipswitch 9 to on)
2 & R3	Not used
2 & M	Normally open contacts - can be used with manual push button
2 & C1	Normally closed contacts of safety sensor on closing side – re-open on closing cycle when contacts open (set Dipswitch 8 to off)

Switching contacts are all volt free, normally open switches

A manual push button or other PIR with normally open contacts is connected across pins 2 & R1

Safety sensor – opening side set dipswitch 9 to ON, connect sensor normally open contact connected across pins 2 & R2. The operator will halt on the opening cycle and continue once the object or person has moved. A cam switch to inhibit the safety sensors at the closed position will prevent unnecessary activation

Safety sensor – closing side set dipswitch 8 to OFF & safety sensor normally closed contact connected across pins 2 & C1. The operator will stop & re-open, remaining in the open position – the red LED on ZP10 board will illuminate whilst the circuit between 2 & C1 is open & the operator will not close.

Providing the load does not exceed 15 Watts (approx 600 mA) the sensors may be powered from the 24V AC accessory connection – caution, overload will cause damage.

Electrical Connections

The ZP10 motherboard has components susceptible to damage by static discharge, when making connections observe necessary anti-static precautions.

1. Connect a 230V main supply from a fused spur to the transformer - live to the fuse, ensuring the unit is correctly earthed.

Activation & safety sensor connections below are to the 10 way connector, if a master & slave pair is being used, make all connections to the master operator.

2. Connect a request to exit switch (and/or a presence sensor PIR or Microwave detector) normally open contacts across terminals 2 and R1.
3. Safety sensors, fitted to:
Opening side of door - **normally open** switch connect to pins 2 & R2 set dipswitch 9 to on
Closing side of door - **normally closed** switch connect to pins 2 & C1 & set dipswitch No 8 to off.
4. Providing the safety sensors are 24 V AC powered and will not exceed 15 W or 600 mA total load, sensors may be supplied from pins 10 & 11 on the 10 way connector
5. Emergency stop or key switch: remove the short white cable loop connected between pins 1 & 2 of the 10 way plug and connecting a push to break switch, implements an emergency stop or key switch (KS-1 ALT) to disable.
6. Ensure dipswitches are set correctly:

With a single operator, set dipswitches as shown below, unless configuring as Master & Slave see example on next page.

1	2	3	4	5	6	7	8	9	10	
							n			ON
n	n	n	n	n	n	n		n	n	OFF

7. Set dipswitch 10 to ON & see section on setting limits of operation

Note

Depending on operator orientation it may be necessary to exchange the motor phase wires blue & brown.

When considering electrical connections, it may be desirable to install the operator, and install a simple 'push to make' button across pins 2 & R1 to obtain desired functionality, before installing other activation and safety sensors.

If the doors are not master & slave please go to section on setting desired open angle of the door bottom of next page

Important

If the doors are to be locked when not operational (ie during silent hours) it is strongly recommended that a keyswitch isolating any PIRs be installed to prevent activation when locked. Wedging the doors open or locking them without using an override may cause permanent damage to the ZP10 circuit board.

Master and Slave connection (for double doors - if applicable)

1. For rebated doors, the first door to close must be designated the **SLAVE operator – dipswitch 1 to on & second door to close the MASTER**
2. Ensure the power is OFF
3. PIRs and push buttons are connected to the MASTER operator only
4. Configure as Master & Slave, set dipswitch 2 on Master to on and dipswitch 1 on Slave to on, ie:

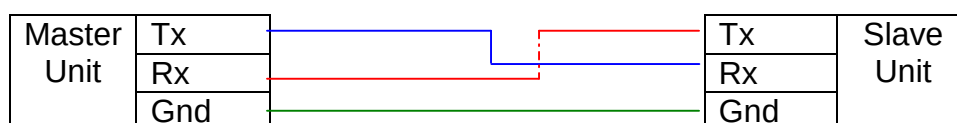
Master unit

1	2	3	4	5	6	7	8	9	10	
	n						n			ON
n		n	n	n	n	n		n	n	OFF

Slave unit

1	2	3	4	5	6	7	8	9	10	
n							n			ON
	n	n	n	n	n	n		n	n	OFF

5. Using 3 core cable connect master to slave (see connector 17) as follows:



IE: Transmitter to Receiver, Receiver to Transmitter and Gnd to Gnd

If a battery backup is used then a link is to be connected between pins 1 & 3 on the 7 way connector - item 18 on ZP10 diagram (do this for both operators)

Setting the desired opening angle – limits of operation

The desired opening angle is the maximum the door will travel during the opening arc. If the backup battery has been connected, disconnect it before commencing this procedure as the power must be removed.

1. With the door in the closed position and the power OFF, set dipswitch 10 to ON.
2. Switch power to ON
3. Press button C (marked Churisura - [8 on drawing](#)) – the red LED lights then goes out on release.
4. Still with dipswitch 10 set to ON, manually open the door to the desired maximum opening angle.
5. Press button A (marked Apatura) – the red LED lights then goes out on release.
6. With the door still in the open position, set dipswitch 10 to OFF.
7. Switch the Operator. The door will close.
8. Check the newly set opening angle by switching the operator once more. The door should open to the desired maximum angle and close again.

Setting Operating Speeds & Opening Times

Trimmers 12, 13 & 14 are used for this exercise (see Control Panel Drawing).

The **normal operating speed** with the **VEL** Trimmer ([12 on the drawing](#)), i.e. the door speed on both the opening and closing cycles – the first 60 degrees.

The operator is factory set at a mid range setting. Turning the trimmer in a clockwise direction increases speed. Turning the trimmer in an anti-clockwise direction decreases speed.

The **secondary or 'slowdown' speed** the **RAL** Trimmer ([13 on the drawing](#)), the final arc on both opening and closing cycles – over the final 30 degrees.

The operator is factory set at a mid range setting. Turning the trimmer in a clockwise direction increases speed. Turning the trimmer in an anti-clockwise direction decreases speed.

The **hold open delay** at the preset maximum opening angle is set via the **TCA** Trimmer ([14 on the drawing](#)).

The operator is factory set at a mid range setting of 7 seconds. Delay may be increased up to 16 seconds by turning the trimmer in a clockwise direction. Turning the trimmer in an anti-clockwise direction decreases delay.

Safety & Obstacle Detection

Obstacles detected during the opening arc - the operator is pre-set to stop at the obstacle and re-open the door. Remove the obstacle and switch the operator again.

Obstacles detected during the closing arc - the operator is pre-set to stop at the obstacle and re-open to the maximum opening angle. The operator will close again after the pre-set delay time has elapsed. This sequence will be repeated twice unless the obstacle is removed. If the obstacle is not removed the door will rest at the pre-set maximum opening angle. Remove the obstacle and switch the operator again the door will then close and return to normal operation.

Safety Sensors

There are two modes of operation that may be used depending on the installation requirements:

Momentary stop may be achieved by connecting a safety sensor normally open contacts across 2 & R2 with dipswitch 9 to ON.

Re-open during the closing phase may be achieved by connecting a safety sensor normally closed contacts across 2 & C1.

Notes on P16 also cover this

Installation of Battery Back-Up

Observe all necessary anti-static precautions at all times.

The operator is equipped with a Battery Back-Up feature comprising:

1. 2 off Yuasa 12V 0.8Ah valve regulated lead acid batteries.
2. 1 off MA7032 daughter board

Ensure the power is disconnected and check the supply is dead.

Locate connections for the LBP7 at the upper left hand side of the motherboard.

Align the MA 7032 daughter board to the pins, ensuring they line up correctly with the ZIP10 board and carefully press home. Check the alignment is correct, as incorrect alignment will cause damage or failure.

Mount the batteries to the operator using the clips provided. The batteries are mounted adjacent to the motherboard and slide into place from the right hand side (remember, this is for an installation on a right hand hung door). For left hand hung doors the operator is effectively upside down and the batteries slide in from the left hand side. See the sketch for guidance on this arrangement.

Note - The batteries will be further secured once the cover slides into place; i.e. when set-up and installation is complete.

Locate the 7-way connector on the ZP10 board (terminal board 18 on P11). Remove the connector plug on terminal 18, short out pins 1 & 3 and replace the plug. **Note:** this may be supplied fitted.

The batteries are supplied connected in series. Connect the strip connector (attached to the batteries) with suitable cable to the battery connector terminal on the ZP 10 board (terminal 2 on P11) - checking polarity is correct. Some batteries are supplied with cable marked with a white stripe, this is positive but advisable to check with a voltmeter meter.

Power up the unit.

Allow the batteries to charge for approximately 2 hours and test the batteries – disconnect the mains power. The operator should function normally completing a cycle under battery power. A further six to ten complete operations should be possible; dependent upon the level of charge in the battery.

If the battery back-up function does not operate, check polarity and allow the batteries to charge for approximately 2 hours.

Relcross Automatic Operator – General Characteristics

Models REL1001 & REL1002

An automatic door operator, for internal applications only, for installation on single action hinged or pivoted doors from 650mm to 1200mm maximum width.

Dimensions mm 580 L * 114 W * 152 H inc cover. Weight 12.0 Kg approx

Reversible 24V gear motor with built-in control board.

Designed and manufactured for Relcross by Came S.p.A. with an IP40 protection level. Supplied c/w battery back-up feature (including 2 batteries) standard.

Warranty period – 12 months.

Model REL1001 Supplied c/w 'Slide' Arm for Pull Side applications only.

Model REL1002 Supplied c/w 'Articulated' Arm for Push Side applications only.

Technical Characteristics

Power Supply	Motor Max. Current	Nominal Current	Max Power Consumption	Max Torque	Reduction Ratio	Operating Temperature
230Vac 50/60Hz	6A	(230V) 0.6A	138W	40Nm	1/108	-20f to 70f

Dipswitch Functionality

Switch	Function	Note
1. ON	Designates the unit as a slave	Normally OFF unless Master/Slave combination
2. ON	Designates the unit as a master	Normally OFF unless Master/Slave combination
3. OFF	Not used leave OFF	Always OFF
4. ON	Obstacle detection - closing	Interrupts operation of PIR or push button
5. ON	Activates step by step selector	Normally OFF See note 1 below
6. ON	Wind stop	Normally OFF Caution - see note 2 below
7. ON	Push and go	Pushing the door will initiate operation
8. OFF	Re-open when closing	Safety sensor across 2 & C1 N/C contact see 3
9. ON	Momentary stop	Safety sensor across 2 & R2 see note 4 below
10. ON	Limit switch programming	See section on programming P13

Notes:

1. Switch power to off before making adjustments to dip switches
2. We strongly advise that dipswitch 6 (Wind stop) be set to OFF as the motor will draw increased current, under extreme conditions this may cause premature failure to the ZP10 motherboard. **If wind stop is used, the installation is classified as a high energy system and safety sensors MUST be used.** Using wind stop will disable push and go.
3. **For closing side safety sensor** – Dipswitch 8 to on & connect a safety sensor normally closed contact between terminals 2 & C1. When closing, the door will stop & re-open remaining open until safety sensor signal is removed ie contact from terminal 2 - C1 closed.
4. **For opening side safety sensor** – Dipswitch 9 to on & connect a safety sensor normally open contact across 2 & R2. The door will momentarily stop. When the obstacle is removed the door will resume its sequence if opening. A cam switch to inhibit the safety sensors at the closed position will prevent unnecessary activation
5. Connect actuating push buttons and/or activation presence sensor PIR across 2 & R1.

Troubleshooting

Operator does not move:

1. Check 240V AC power to transformer correct, (LEDs on daughter board 7032 should be illuminated) If no power check supply fused spur and fuse on transformer.
2. Check dipswitches in correct position (4 & 8 to on for simple set up - P13)
3. Check cabling to push buttons &/or sensors – to simulate a request to open momentarily connect a shorting strap between pins 2 & R1 on the 10 way connector located near the transformer. If this works then there is a fault in the cable from the push button or activation sensor
4. If power is OK, reset programming and re-program the fully shut and fully open limits as described on [page 13](#) - Setting the desired opening angle

Door attempts operate in the wrong direction or opens a short distance, red LED may flash:

If the door cannot be set up to open correctly then the motor phases may need reversing, switch off and remove battery connection, then remove the plug supplying the motor P16. Remove and change over the blue and brown wires to the motor to reverse the phases, replace plug and power up. Reset Open & close limits as per procedure on P12 – 'Setting desired opening angle'.

Door Opens but does not shut:

1. Check the torque control is not set too low
2. Check there is not a permanent request to open – red LED permanently on
3. Check the slow down speed is not too low

A combination of 1 & 3 above can cause the operator to 'stall' on the opening cycle. If the operator does not fully open then the red light will not flash and the door will remain partially open. To overcome this the Motor Torque trimmer and/or the RAL (Slowdown) trimmer will need adjustment.

Door detects an obstacle, opens 3 times then stalls

This is a feature of obstacle detection that prevents the door cycling when an object is not removed from the doors path. Remove the object and issue a request to open and the doors should cycle. If not close them manually & they should function correctly.

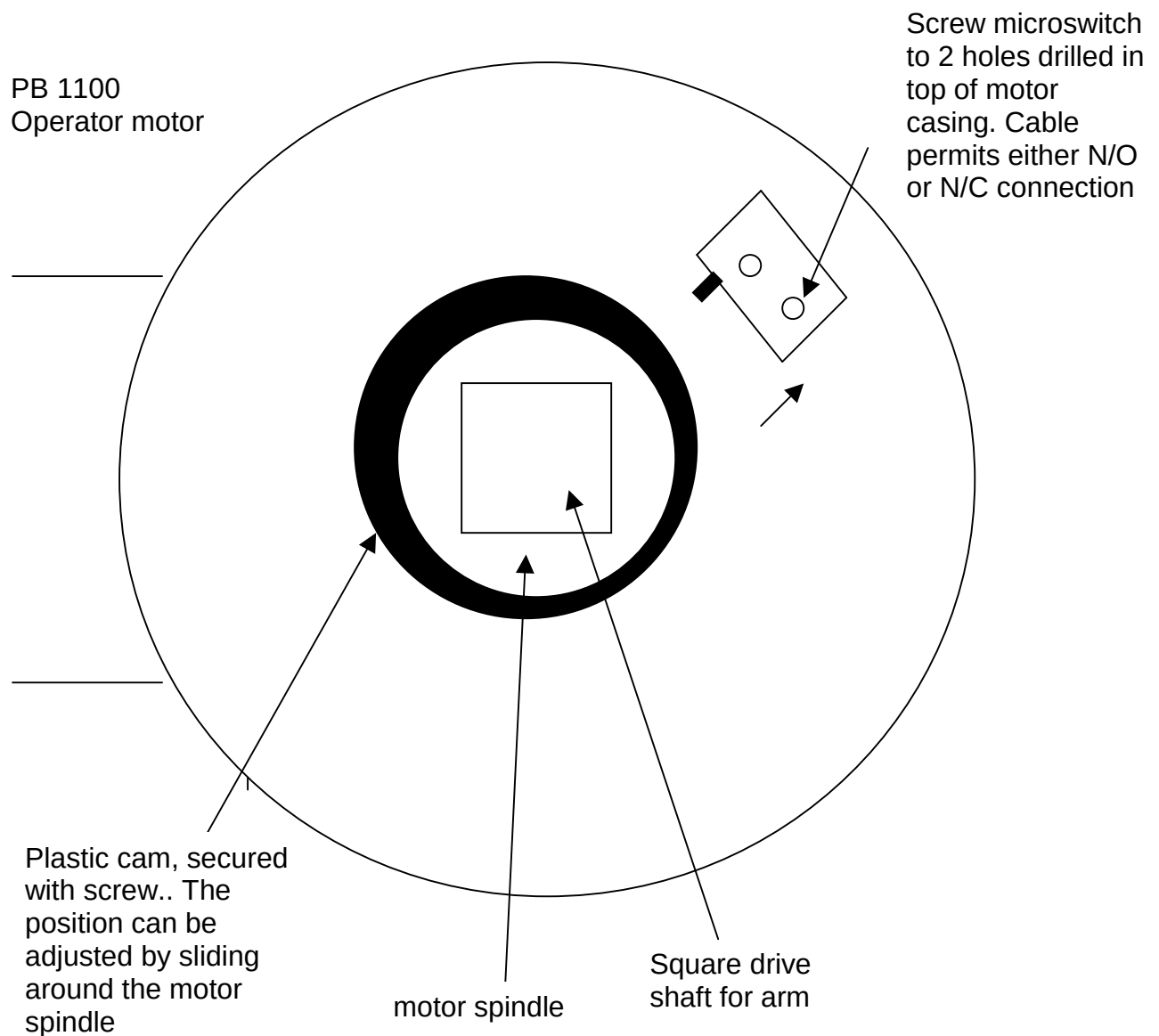
Pair of doors master & slave continuously open & shut

Ensure that the master operator shuts slightly after the slave door, this can be achieved by adjusting the speed of the master operator. This is important when installing a rebated pair of doors

Notes:

1. Connections to ancillary equipment ie PIRs must be made using suitable good quality multi stranded cable. DO NOT USE SOLID CORE TELEPHONE CABLE.
2. The accessory supply output across pins 11 & 10 of the 10-way connector (item 3 as per [motherboard diagram](#)) is 24V AC is 15W **maximum current** of 600 mA @ 24VAC.
3. We strongly advise that dipswitch 6 (Wind stop) be set to OFF as it causes the motor to draw excessive current, under extreme conditions this may cause premature failure to the ZP10 motherboard. If wind stop is used, it MUST be classified as a high energy system.
4. To reset all programming, the reset switch is a small rectangular red button located in the center of the motherboard. Following a reset, the operators open and closed limits will have to be re-programmed as per [motherboard diagram](#) - item 10.
5. This document is available in Adobe Acrobat format from <http://www.relcross.co.uk/support>
6. We advise the use of Locktite or similar stud lock to retain arm screws

Optional microswitch deployed where the door opens onto a wall and the safety sensor detects the wall halting the door prematurely



Fit microswitch as shown above, if fitted to pair of doors in master and slave configuration, one cam & microswitch assembly is required for the master operator

Connect cable as follows, either:

If using BEA sensor connect to inhibit circuit – refer to BEA supplied instructions OR
Connect across normally open or normally closed * contacts of safety sensor to either maintain or break * the safety sensor circuit when the microswitch is a depressed. (* this will vary depending on how the safety sensor is connected)

Ascertain desired cut out angle for sensor and rack plastic cam around motor spindle until microswitch activated

Check satisfactory operation