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# Installation & Maintenance Manual
# Type C Straight Line Wiper - Inside Motor
# With
# Series 6000 Network Control System
# Issue 15

WARNING: A suitably qualified person should perform all installation and maintenance. All electrical wiring should be carried out in accordance with relevant regulations. Ensure all products are correctly earthed and all connections are made in accordance with the wiring diagram. Non-compliance may result in damage, malfunction or personal injury. Before commencing any installation or maintenance work, ensure that the electrical supply is disconnected.

# Index

# GENERAL INFORMATION AND SAFETY SUMMARY

As we will have no influence on the installation of complete windscreen wiper systems if installation is to be carried out by the customer, we are unable to accept liability for installation errors.

If you require any additional information or any special problems arise which the installation/maintenance instructions do not treat in sufficient detail please contact Customer Service at B. Hepworth and Co Ltd directly.

## Safety Precautions

### CAUTION! BEWARE OF INJURY!

**BEFORE WORKING ON THE WIPER SYSTEM, OBSERVE THE FOLLOWING REMARKS WITHOUT FAIL!**

Most wiper motors have a park setting, which permits them to default to the parked position if connected to the vehicle electrical system, even when the wiper is switched off. FOR THIS REASON, AT THIS POINT IN TIME, NEITHER MAY THE WIPER ARM BE MOUNTED, NOR MAY ANY PERSON HAVE HANDS, FINGERS, ETC ANYWHERE NEAR THE WIPER SYSTEM. Even small wiper motors can neither be braked nor stopped by hand.

**NEVER REACH INTO THE AREA OF THE DRIVE BELT WHEN THE SYSTEM IS RUNNING!**

When putting into service (i.e. when connecting the wiper motor to the vehicle electrical system, even if the wiper switch is in the off position), never leave any loose items such as screwdrivers in the area of the wiper system, as flying objects could lead to injury.

Please ensure the equipment is handled with care. Do not drop or bang the equipment down on a hard surface taking extra care around the area where the motor shaft is situated. Do not hammer the motor shaft when installing the equipment, as this will cause the motor gear plate to deform causing premature failure of the unit.

Wipers should be wrapped in protective material after installation to protect them from damage. Type of material depends on work done in the vicinity, for instance, if welding or grinding work needs to be done near the wipers then a fire resistant blanket should be used. If no welding or grinding work is required near the wipers then bubble is sufficient.

## Introduction

The Windscreen Wiper system utilised is detailed on the following pages. The primary components that form the Windscreen Wiper System are the wiper case assembly, the wiper arm assemblies and the wiper blades.

# TYPE C WIPER DESCRIPTION AND SPECIFICATION

The 'Type C' is a Heavy Duty Straight Line Wiper with an electric motor mounted internally. The wiper can be mounted either above or below the window. The motor can be positioned at either end simply by reversing the front cover of the wiper case.

All electric motors incorporate a worm reduction gearbox. Windings are to Class F insulation.

The DC motor option is suitable for single speed operation. Complies with the EMC Directive according to the following: EN 60945:2002

The AC 1-phase motor option is single speed operation. Complies with the EMC Directive according to the following: EN 60945:2002

The standard AC 3-phase motor option is for either 1 or 2 speed operation. Complies with the EMC Directive according to the following: EN 60945:2002

## *Motor Specifications*

| Motor | Type | Nominal Voltage | Full load current at 50/60 Hz | Fusing Value 50/60 Hz | Speed | Compass Safe Distance | Protection Rating |
|---|---|---|---|---|---|---|---|
| PM3M | Permanent Magnet | 24V DC | 4.5 A | 6.0 A | 1.4 m/s | 2.4 m | IP54 |
| PM3M (L) | Permanent Magnet | 24V DC | 4.5 A | 6.0 A | 0.7 m/s | 2.4 m | IP54 |
| PARV65 | 1 Phase Induction | 115 V | 2.3/2.6 A | 2.5/3.15 A | 1.4 m/s | 0.5 m | IP20 |
| PARV65L | 1 Phase Induction | 115 V | 1.5/1.6 A | 2.5/3.15 A | 0.7 m/s | 0.5 m | IP20 |
| PARV64-T | 1 Phase Induction | 230 V | 1.2/1.6 A | 2.5/3.15 A | 1.4 m/s | 0.5 m | IP20 |
| PARV64L | 1 Phase Induction | 230 V | 0.75/0.95 A | 1.0/1.6 A | 0.7 m/s | 0.5 m | IP20 |
| PARV61 | 3 Phase Induction | 115V AC | 1.3/1.1 A | 2.0/1.6 A | 0.7/1.4 m/s | 0.5 m | IP20 |
| PARV62D+ | 3 Phase Induction | 220V AC | 0.6/0.6 A | 1.0/1.0 A | 0.7/1.4 m/s | 0.5 m | IP20 |

For protection it is recommended that the wiper system have fuses fitted. The fuses will not blow in normal conditions, however if the wiper is jammed, then the fuses are designed to blow before the motor is damaged. Each wiper requires its own fuse. Fuse values shown above**.**

Compass safe distances, BSH (Germany) certified, have the values shown above. The distance quoted is the maximum figure for '*Magnet-Regelkompass'*.

Drive shaft lengths are optional. These are available in standard and gas tight versions. The standard length is 84 mm. Other lengths available are 35mm, 140mm, 200mm and 220mm. The Certificate of Conformity will advise which option has been fitted.

## *Spray nozzles & water connections*

A fresh water supply can be plumbed directly to the wiper into a 6mm overall diameter compression fitting. On stroke lengths below 1015mm, 1 nozzle is fitted, above 1015mm, 2 nozzles are fitted at ¼ stroke + 137mm from either end. The installer needs to provide pressurised water supply and the interconnecting plumbing. When the wash option is installed, the maximum pressure for the system is 8 bar or 118 PSI and the minimum pressure for adequate spray reach is 1 bar or 15 PSI. Example flow rates for a single spray jet are shown below.

## *Water System Pressure And Flow Rates*

| Pressure | | Flow rate | |
|---|---|---|---|
| **Bar** | **Psi** | **Litres/min** | **Gallons/min** |
| 1.0 | 15 | 0.95 | 0.20 |
| 1.5 | 22 | 1.20 | 0.25 |
| 2.0 | 29 | 1.40 | 0.30 |
| 3.0 | 44 | 1.75 | 0.40 |

## *De-icing Heaters*

Optional de-icing heaters may be fitted inside the wiper case to ensure effective operation in cold conditions. Standard cable length is 2M. Optional lengths are 5M, 10M, 15M and 20M. Power consumption is according to the wiper stroke length, shown below.

## *Heater Power Ratings – Single Wipers*

| STROKE (mm) | STROKE (inch) | HEATER SIZE | WATTS (24VDC) | STROKE (mm) | STROKE (inch) | HEATER SIZE | WATTS (24VDC) |
|---|---|---|---|---|---|---|---|
| 305 up to 430 | 12 up to 17 | 1 | 97 | 1500 up to 1800 | 59 up to 71 | 8 | 390 (186) |
| 457 up to 735 | 18 up to 29 | 2 | 135 | 1930 up to 2100 | 76 up to 83 | 10 | 485 (150) |
| 760 up to 1095 | 30 up to 42 | 4 | 211 | 2260 | 89 | 12 | 574 (123) |
| 1118 up to 1450 | 43 up to 57 | 6 | 301 (238) | | | | |

Quoted Power is for nominal 115 or 230 Volts (bracketed values are for 24 Volts). For stroke lengths up to 1065 mm, power ratings are the same for all voltages.

## *Heater Power Ratings – Twin Wipers*

| OVERALL STROKE (mm) | STROKE (inch) | HEATER SIZE | WATTS (24VDC) | OVERALL STROKE (mm) | STROKE (inch) | HEATER SIZE | WATTS (24VDC) |
|---|---|---|---|---|---|---|---|
| 585 up to 685 | 2 x 12 – 2 x 15 | 2 | 135 | 1855 up to 2165 | 2 x 37 – 2 x 43 | 10 | 485 (150) |
| 735 up to 1042 | 2 x 16 – 2 x 21 | 4 | 211 | 2210 up to 2565 | 2 x 44 – 2 x 51 | 12 | 574 (123) |
| 1091 up to 1445 | 2 x 22 – 2 x 29 | 6 | 301 (238) | 2645 and above | 2x 53 – 2 x 89 | 14 | 663 (106) |
| 1495 up to 1805 | 2 x 30 – 2 x 36 | 8 | 390 186) | | | | |

Quoted Power is for nominal 115 or 230 Volts (bracketed values are for 24 Volts). For stroke lengths up to 1041 mm, power ratings are the same for all voltages.

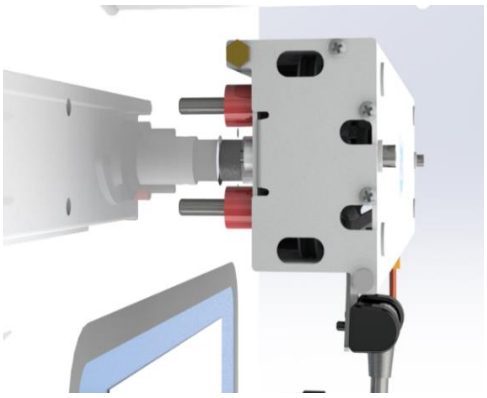
# TYPE C WIPER INSTALLATION

**CAUTION:** Ensure that the correct wiper, blade and arms are selected for each window.

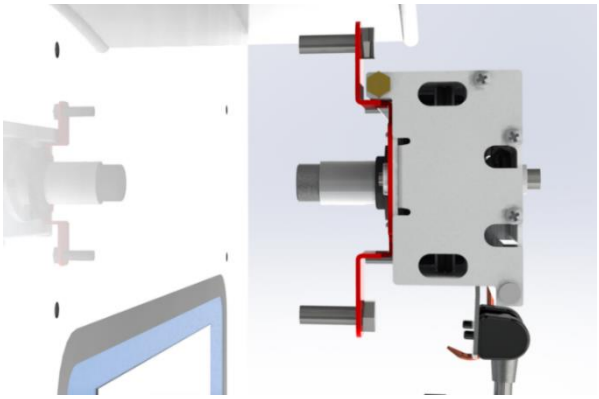
**CAUTION:** Before drilling, ensure that there are no obstructions / hazards at the chosen mounting position. The main frame should be mounted on a flat surface that will not bend or twist the casing, as this will prevent correct operation of the wiper.

**CAUTION:** Where more than one wiper unit is to be mounted close together, allow a distance of 70mm minimum between the wiper units.

## *Stud or Bracket Mounting*



**Stud Mounting**



**Bracket Mounting**

1. Locate the self-adhesive template in the correct mounting position on the outside of bulkhead (stud mounting only).

   **NOTE:** For motors mounted at the opposite end, the template should be inverted.

2. Drill the wiper 2 off fixing holes (11 mm diameter) and the drive shaft housing hole (57mm diameter).

3. Detach the front cover from main unit. Hold the back casing in the required position and mark-out the remaining fixing holes, or calculate their position from the drawing i.e. stroke length plus 266 mm.

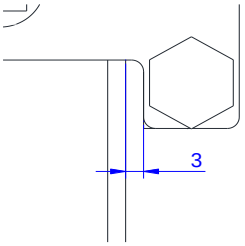
4. Drill the remaining wiper fixing & cable holes for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.

5. Fit the wiper case into position and secure with M10 bolts. Ensure that the bolts are sealed where they pass through the bulkhead.

6. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.

7. Using the supplied M6 x 10mm screws, secure the wiper arm to the carriage plate.

**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.




8. Bolt the front cover to the back case using the 2 off M8 bolts fitted.

**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.

9. If necessary, slacken the screws on the wiper blade attachment clip, move the blade up or down for optimum position and then retighten screws.

10. Move the wiper arm/blade assembly over its full stroke and check that there is no restriction to movement (the motor will offer some resistance, but should not jam the wiper). Investigate and rectify any restrictions. If necessary adjust the wiper blade up or down on the arm to avoid the window frame.

11. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front cover to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.

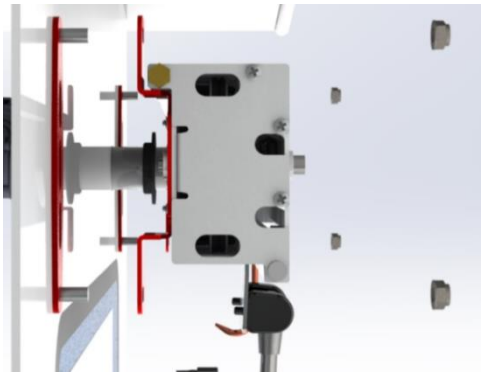
    **NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

12. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.

13. Put a small amount of grease on drive shaft body.


14. Slide motor onto the drive shaft making sure the drive gear on the motor fully engages with drive gear on drive shaft.

# *Universal Carrier & Bracket Mounting*



## Universal Bracket Mounting

1. Carefully mark the position of the drive shaft housing hole and 2 (3 for longer wipers) universal carrier plates.

2. Drill the drive shaft housing hole (57mm diameter).

3. Prepare the bulkhead and universal carrier plates carefully and weld the 2 (or 3 for longer wipers) universal mounting brackets into position. Treat bare metal to prevent corrosion.

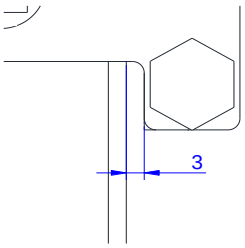
4. Drill the remaining wiper fixing & cable holes for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.

5. Fit the wiper case into position on the Universal Carrier studs and secure with supplied M10 spring washers, M10 flat washers and M10 nuts.

6. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.

7. Using the supplied M6 x 10mm screws, secure the wiper arm to the carriage plate.

**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.




8. Bolt the front cover to the back case using the 2 off M8 bolts fitted.

**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.

9. If necessary, slacken the screws on the wiper blade attachment clip, move the blade up or down for optimum position and then retighten screws.

10. Move the wiper arm/blade assembly over its full stroke and check that there is no restriction to movement (the motor will offer some resistance, but should not jam the wiper). Investigate and rectify any restrictions. If necessary adjust the wiper blade up or down on the arm to avoid the window frame.

11. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front assembly to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.

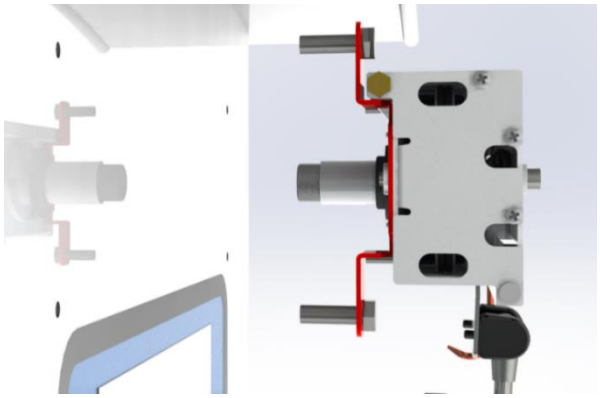
    **NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

12. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.

13. Put a small amount of grease on drive shaft body.


14. Slide motor onto the drive shaft making sure the drive gear on the motor fully engages with drive gear on drive shaft.

# *Bracket Mounting – Quick Release Arms*

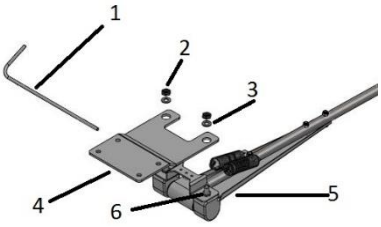


## Bracket Mounting

1. Mark out and drill the 4 (6 for longer wiper units) off fixing holes (11 mm diameter) and the drive shaft housing hole (57mm diameter).

2. Mark out and drill the cable holes for the for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.

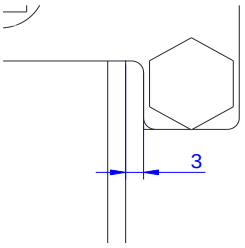
3. The wiper unit should be supplied with the arm mounting plate ***(4)*** already fitted. If it is not fitted, remove 2 x ¼ UNF Thin Nuts ***(2)*** and 2 x M6 washers ***(3)*** from the pivot block threads and remove the wiper arm sub assembly ***(5)*** from the arm mounting plate ***(4)***. Fit the arm mounting plate ***(4)*** to the wiper unit before installing the wiper unit using the supplied M6 x 10mm screws.




**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

4. Fit the wiper blade to the wiper arm sub assembly ***(5)***, ensuring that the captive end of the wiper blade is at the top.

5. Bolt the front cover to the back case using the 2 off M8 bolts fitted.

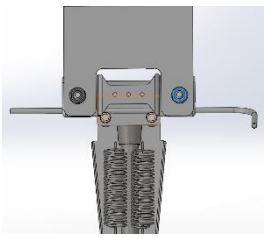



**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.

6. Fit the wiper case into position and secure with M10 bolts. Ensure that the bolts are sealed where they pass through the bulkhead.

7. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.

8. Fit the wiper arm sub assembly ***(5)*** to the arm mounting plate ***(4)*** ensuring that the wiper arm sub assembly pivot block nuts ***(6)*** sit inside the holes in the arm mounting plate ***(4)***. Refit the 2 x M6 washers ***(3)*** and 2 x ¼ UNF Thin Nuts ***(2)*** to the pivot block threads and tighten.



9. Gently lift the wiper arm away from the window and remove the spring retaining pin ***(1)***. Keep safe for future use.

10. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front cover to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.

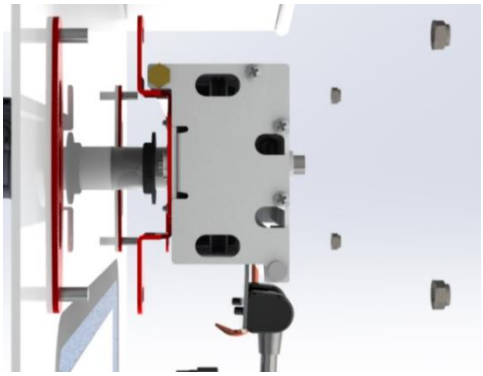
**NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

11. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.

12. Put a small amount of grease on drive shaft body.


13. Slide motor onto the drive shaft making sure the drive gear on the motor fully engages with drive gear on drive shaft.

# *Universal Carrier & Bracket Mounting – Quick Release Arms*



## Universal Bracket Mounting

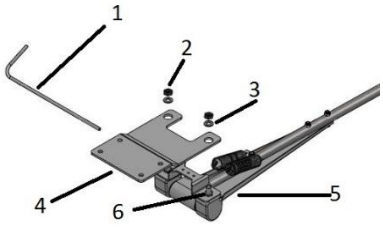
1. Carefully mark the position of the drive shaft housing hole and 2 (3 for longer wipers) universal carrier plates.

2. Drill the drive shaft housing hole (57mm diameter).

3. Prepare the bulkhead and universal carrier plates carefully and weld the 2 (or 3 for longer wipers) universal mounting brackets into position. Treat bare metal to prevent corrosion.

4. Mark out and drill the cable holes for the for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.

5. The wiper unit should be supplied with the arm mounting plate ***(4)*** already fitted. If it is not fitted, remove 2 x ¼ UNF Thin Nuts ***(2)*** and 2 x M6 washers ***(3)*** from the pivot block threads and remove the wiper arm sub assembly ***(5)*** from the arm mounting plate ***(4)***. Fit the arm mounting plate ***(4)*** to the wiper unit before installing the wiper unit using the supplied M6 x 10mm screws.

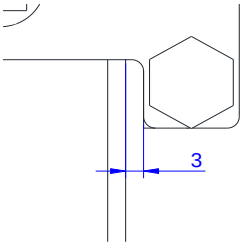



**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

6. Fit the wiper blade to the wiper arm sub assembly ***(5)***, ensuring that the captive end of the wiper blade is at the top.

7. Bolt the front cover to the back case using the 2 off M8 bolts fitted.

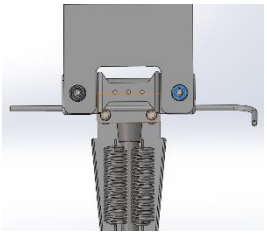
**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.




8. Fit the wiper case into position on the Universal Carrier studs and secure with supplied M10 spring washers, M10 flat washers and M10 nuts.

9. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.

10. Fit the wiper arm sub assembly ***(5)*** to the arm mounting plate ***(4)*** ensuring that the wiper arm sub assembly pivot block nuts ***(6)*** sit inside the holes in the arm mounting plate ***(4)***. Refit the 2 x M6 washers ***(3)*** and 2 x ¼ UNF Thin Nuts ***(2)*** to the pivot block threads and tighten.



11. Gently lift the wiper arm away from the window and remove the spring retaining pin ***(1)***. Keep safe for future use.

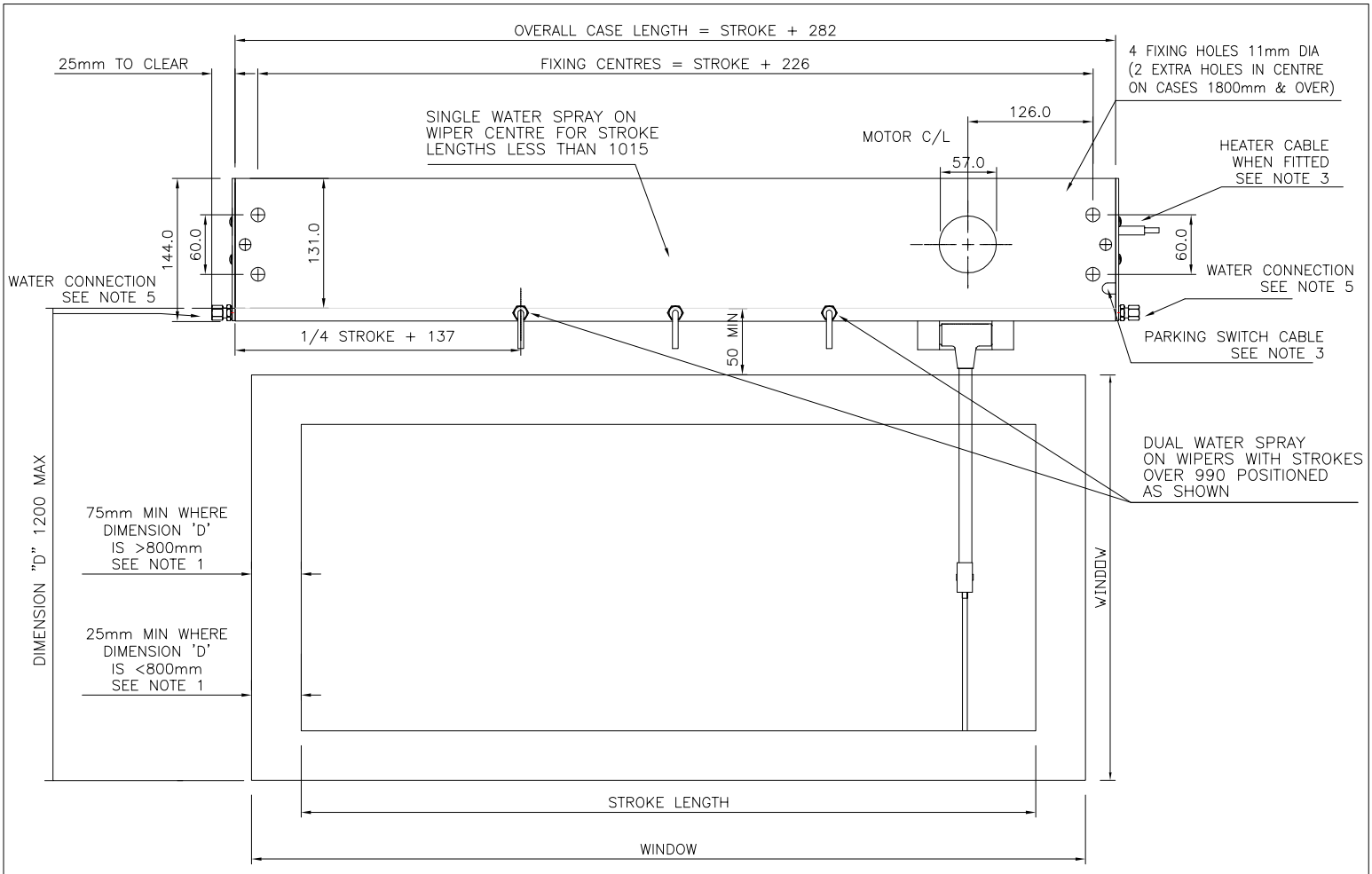
12. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front cover to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.

    **NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

13. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.

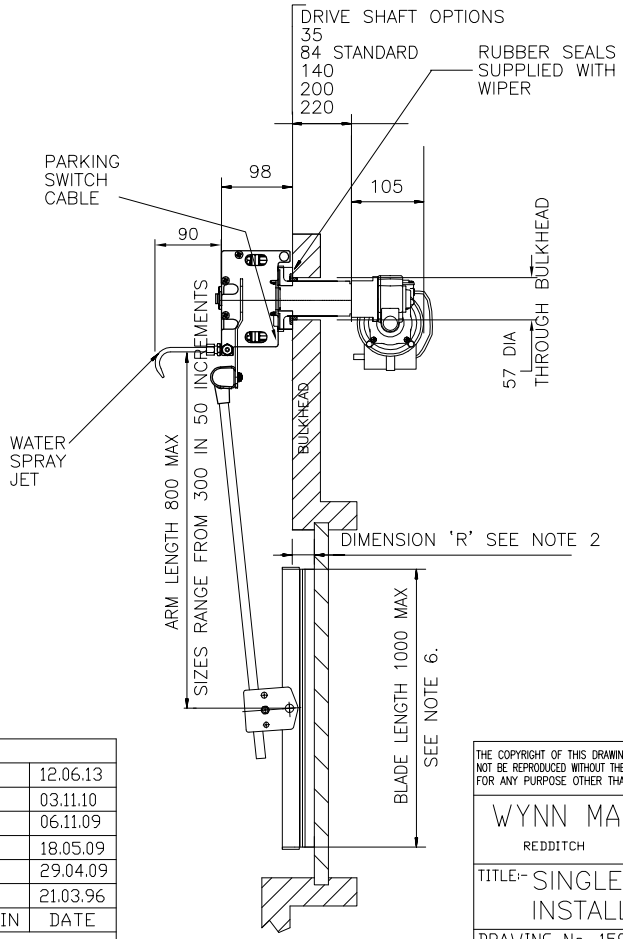
14. Put a small amount of grease on drive shaft body.


15. Slide motor onto the drive shaft making sure the drive gear on the motor fully engages with drive gear on drive shaft.




## NOTES

1. THESE MINIMUM DIMENSIONS ARE LIMITED BY THE SIZE OF THE CORNER RADII ON THE WINDOW.
2. THE BLADE ARM MAY BE CRANKED WHERE DIMENSION "R" IS GREATER THAN 75.
3. OPTIONAL HEATER AND PARKING SWITCH STANDARD CABLE LENGTH 2 METRES. PARKING SWITCH POSITIONED AT MOTOR END WHEN FITTED.
4. THE HEATER AND PARK SWITCH CABLING TO RUN THROUGH THE BULKHEAD.
5. THE WATER CONNECTION BLANKING PLUG CAN BE FITTED AT EITHER END.
6. RIGID WIPER BLADE LENGTHS RANGE FROM 300 TO 800 AND ARTICULATED WIPER BLADE LENGTHS RANGE FROM 500 TO 1000 BOTH IN 50 INCREMENTS.
7. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.
8. THE MOTOR CAN BE POSITIONED RADIALLY THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE TO SUIT THE INSTALLATION. ENSURE THAT THE ACCESS SPACE AROUND THE MOTOR SHOWN ON THE DRAWING IS MAINTAINED.




ALL DIMENSIONS IN MM FOR REFERENCE ONLY

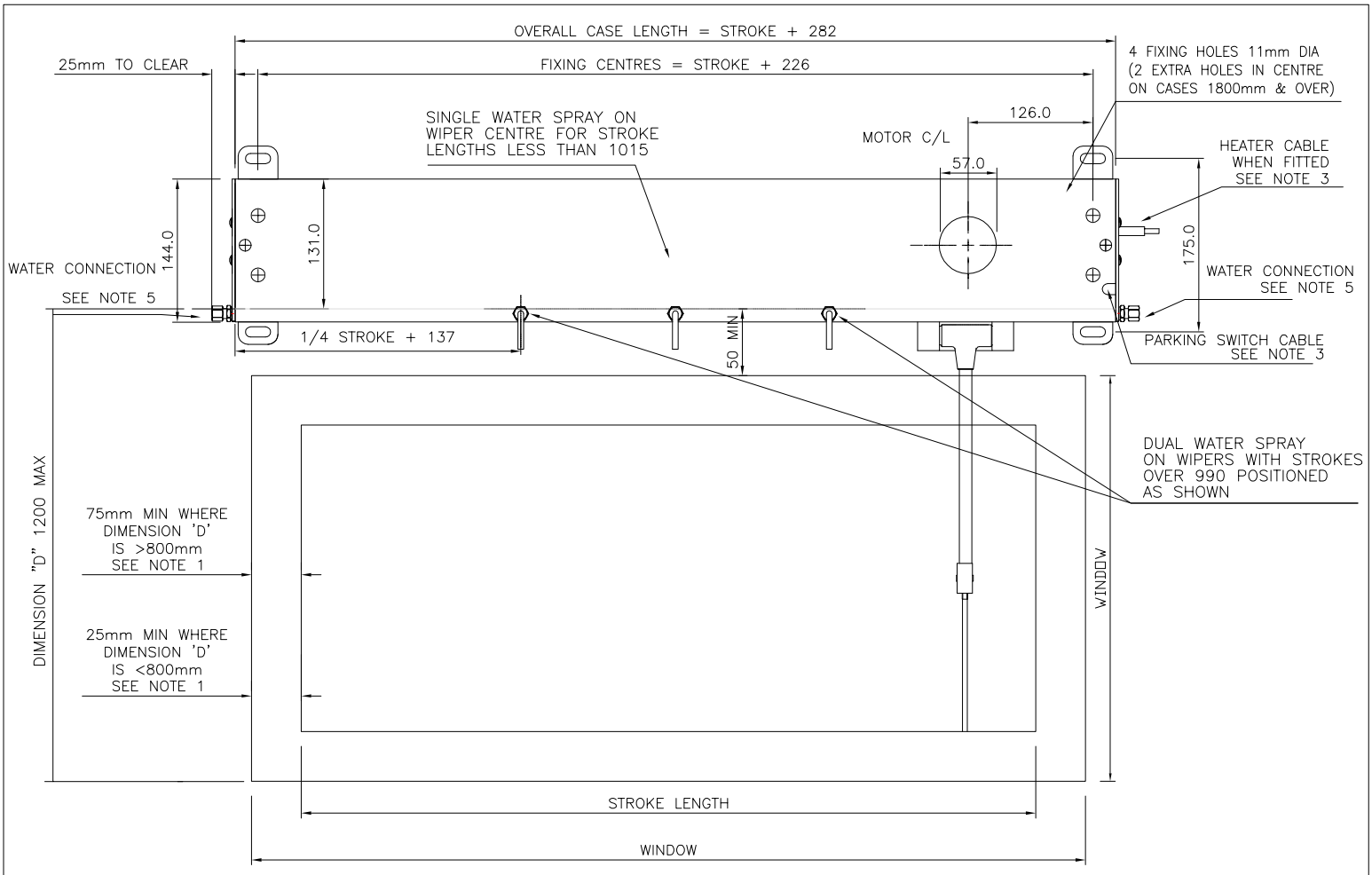
| CAD FILENAME+DIRECTORY M:\DRAW\1588\1588-01-CCOVER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3rd ANGLE PRO. | | | | | | | 6 | | 12.06.13 |
| | | | | | | | 5 | | 03.11.10 |
| TOLERANCES UNLESS OTHERWISE STATED<br>DECIMAL DIMS. TO 2 PLACES ± 0.1mm.<br>DECIMAL DIMS. TO 1 PLACE ± 0.25mm<br>NO DECIMAL PLACES ± 0.5mm<br>ANGLES ± 1° | | | | | | | 4 | | 06.11.09 |
| | | | | 9 | | 25.10.18 | 3 | | 18.05.09 |
| | | | | 8 | | 19.01.16 | 2 | | 29.04.09 |
| | | | | 7 | | 25.11.13 | 1 | | 21.03.96 |
| MAT'L:- | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE |
| FINISH:- | SCALE:- NTS | | DRAWN:- DD | | CHKD:- | | CHANGED:- | | |



WYNN MARINE LIMITED
REDDITCH ENGLAND

TITLE:- SINGLE TYPE C INSTALLATION DRG.

DRAWING No. 1588-01-CCOVER

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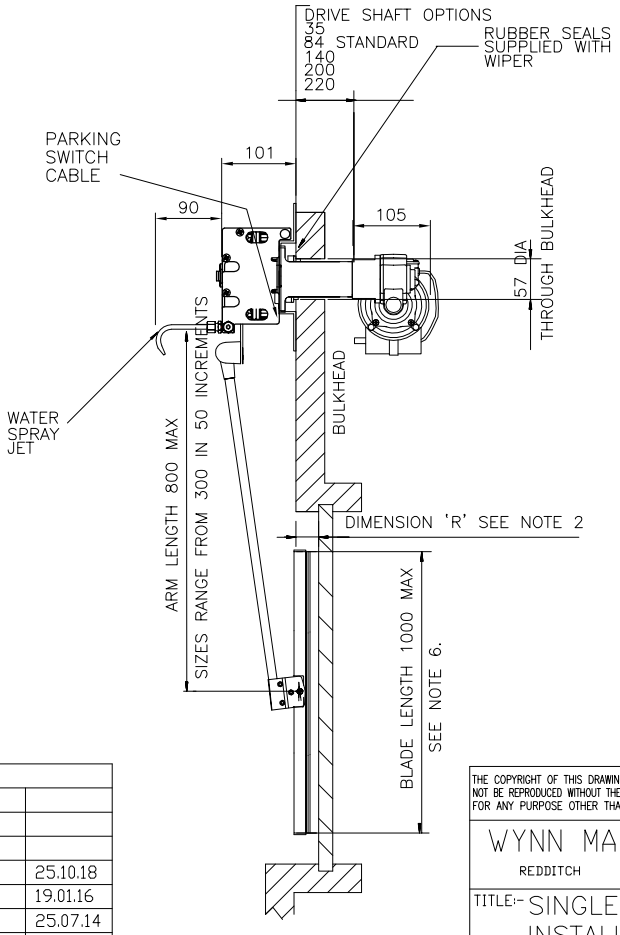


ALL DIMENSIONS IN MM FOR REFERENCE ONLY

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| 3rd ANGLE PRO. | | | | | | | | | |
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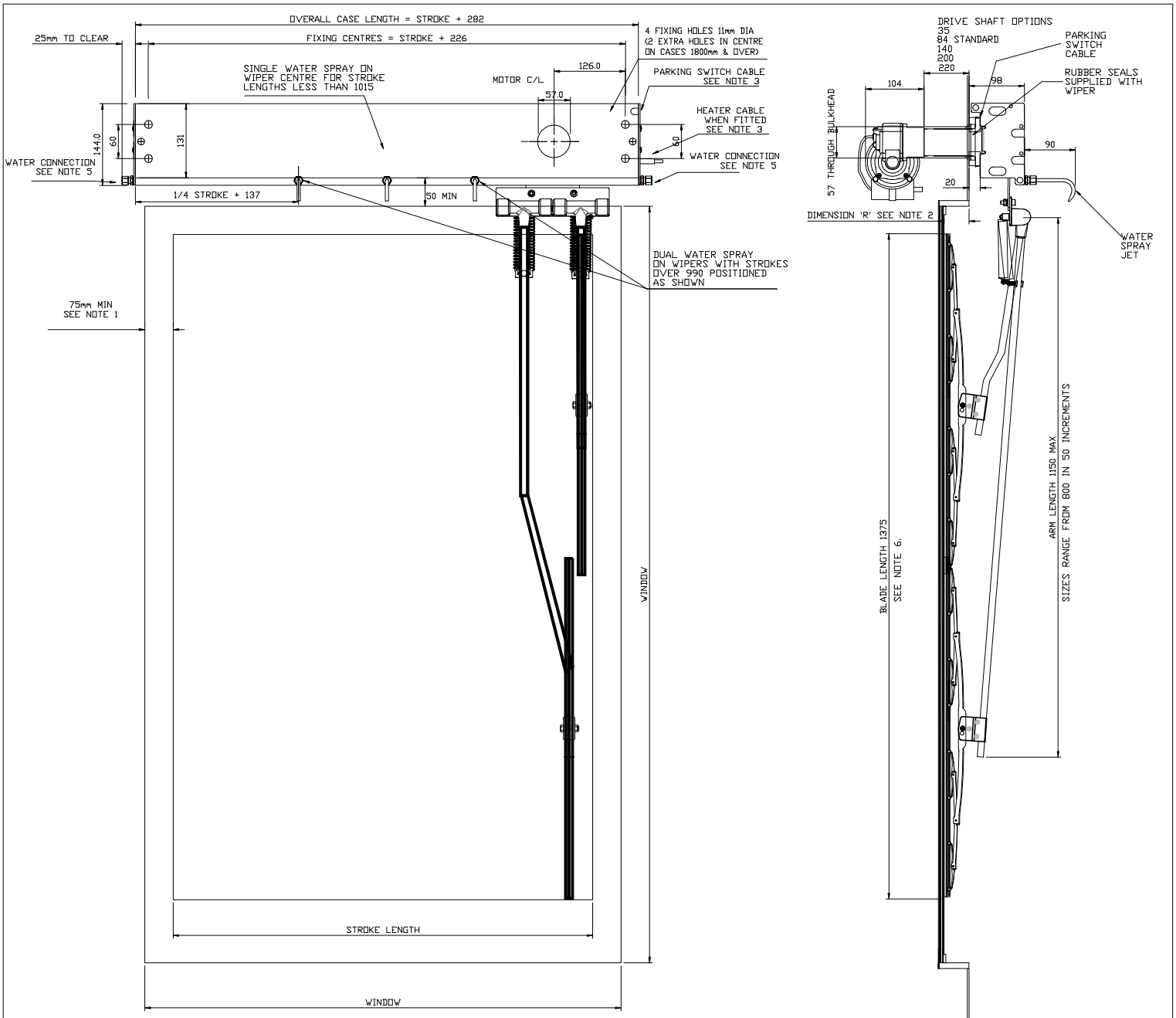
WYNN MARINE LIMITED
REDDITCH ENGLAND

TITLE:- SINGLE TYPE C INSTALLATION DRG.

DRAWING No. 1588-01-BKT

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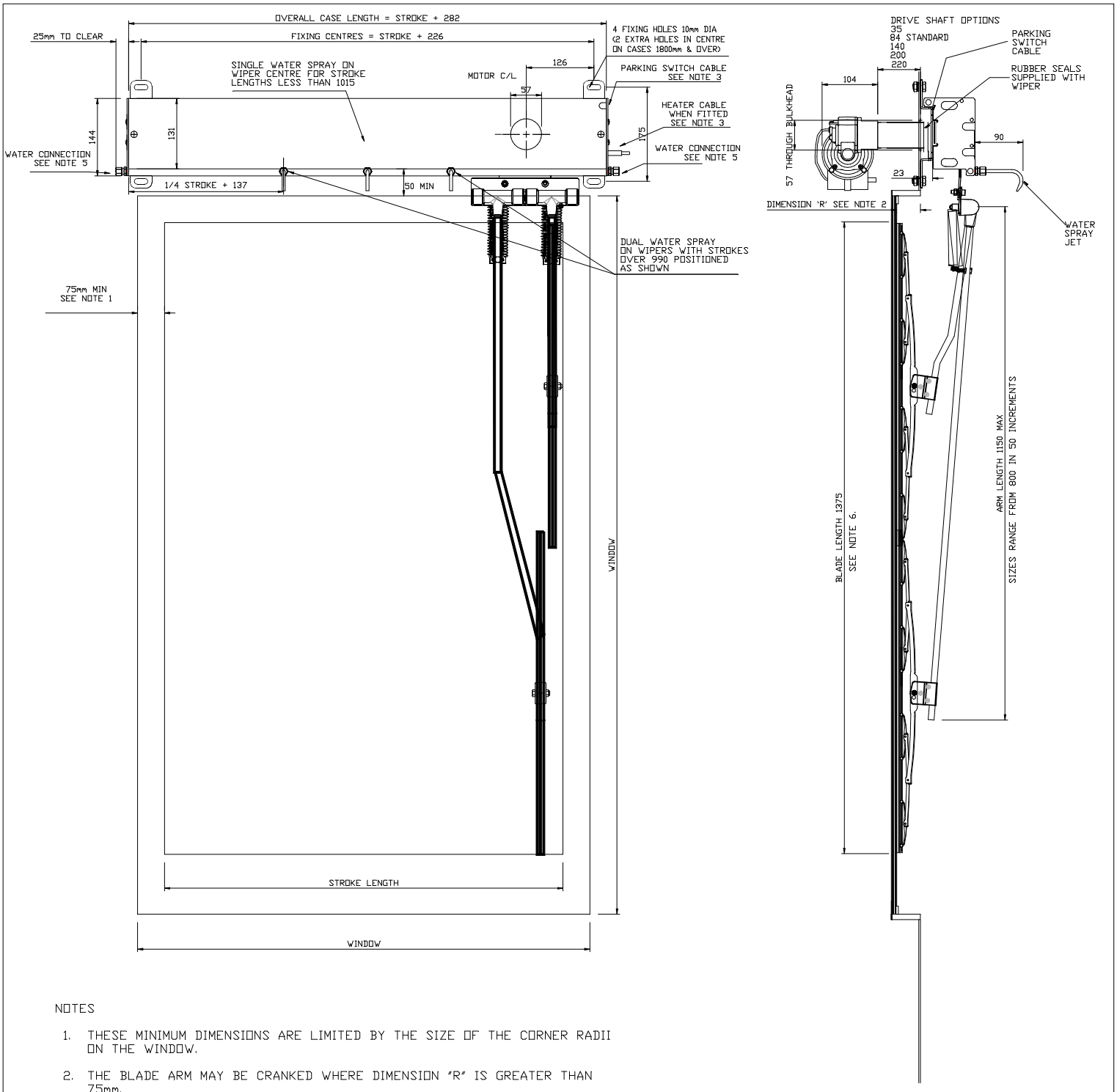


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WYNN MARINE LIMITED
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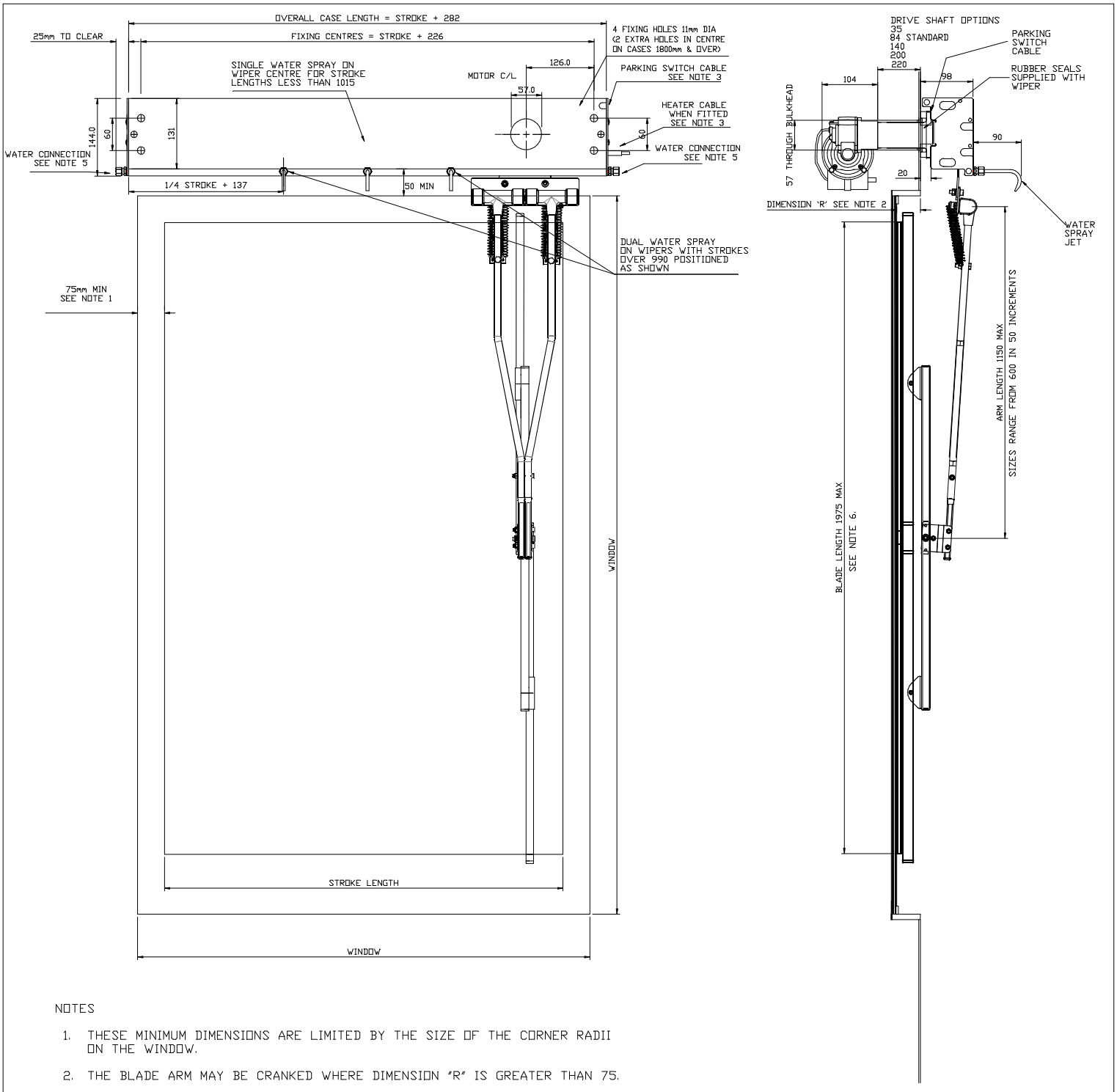


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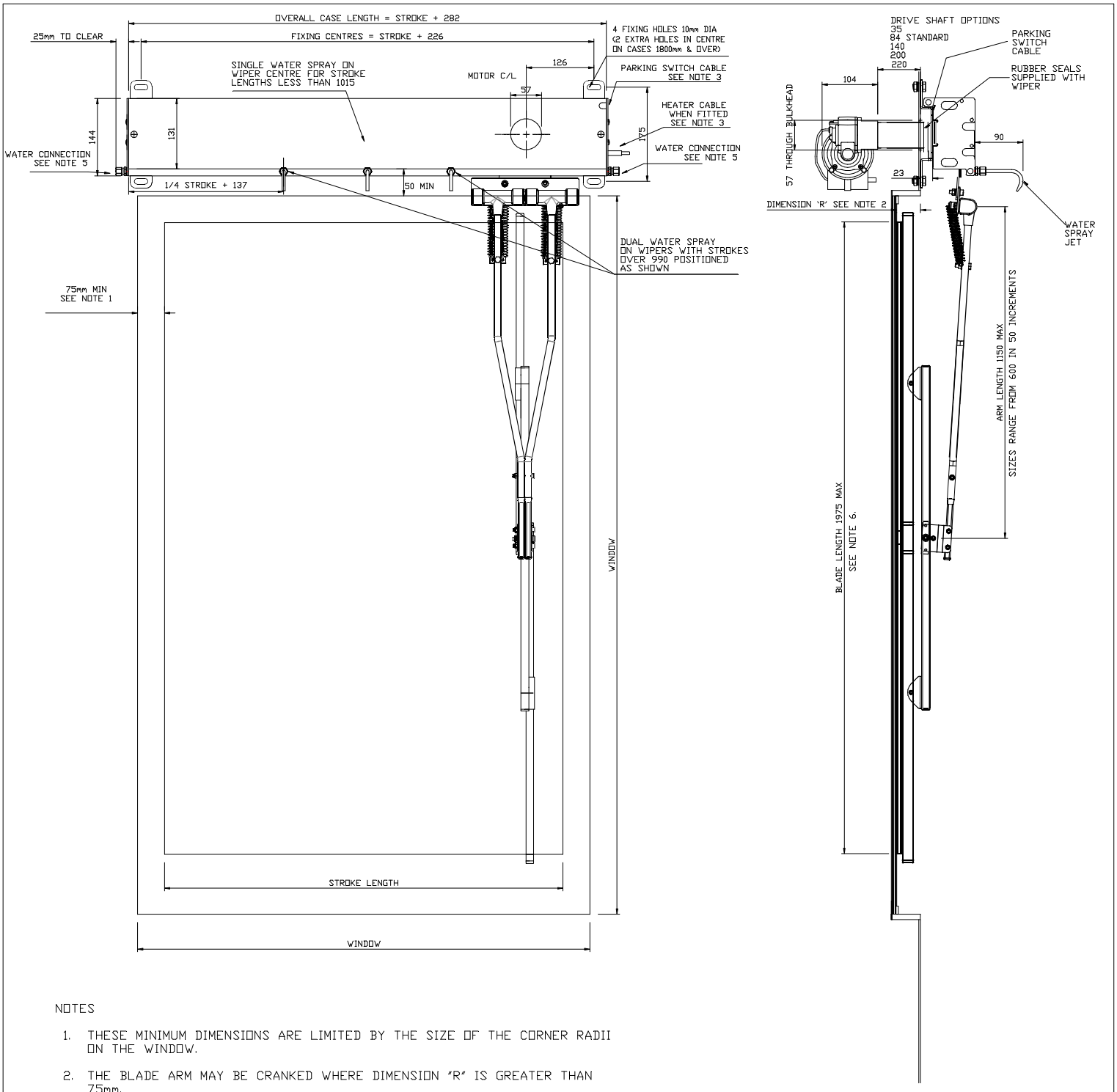


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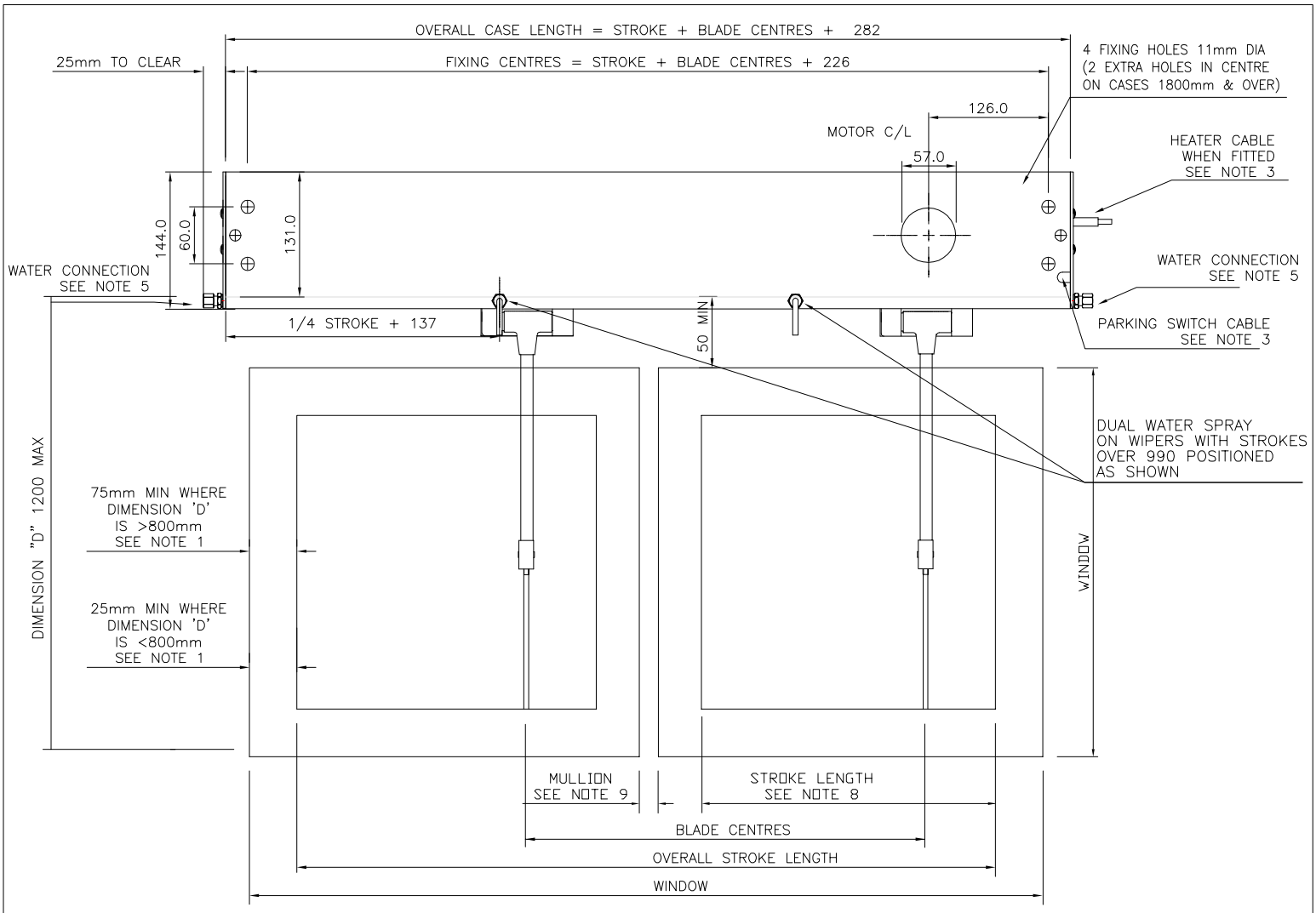


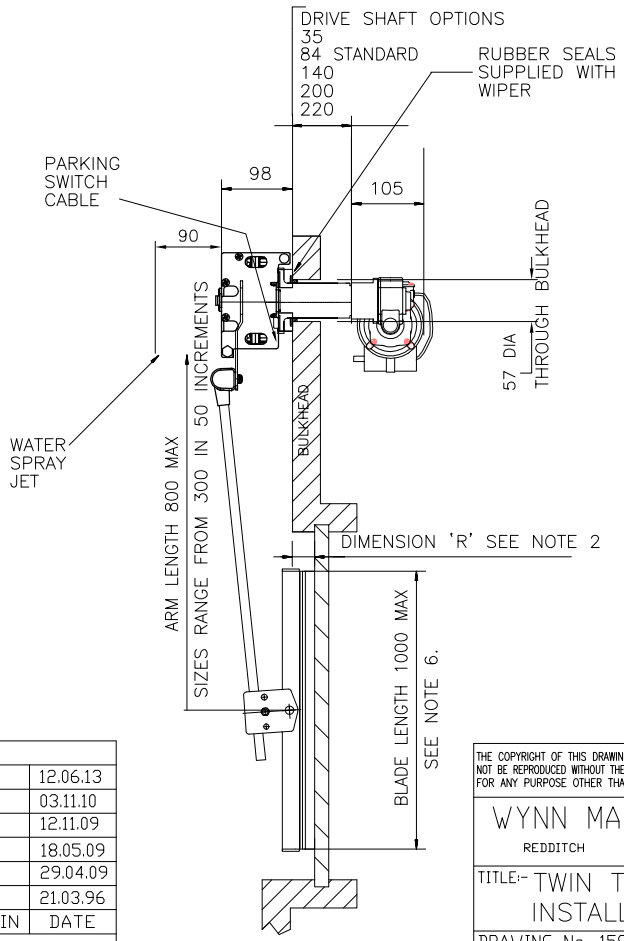


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| 3rd ANGLE PRO. | | | | | | | 6 | | 12.06.13 |
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| | | | | 9 | | 25.10.18 | 3 | | 18.05.09 |
| | | | | 8 | | 19.01.16 | 2 | | 29.04.09 |
| | | | | 7 | | 25.11.13 | 1 | | 21.03.96 |
| MAT'L:- | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE |
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WYNN MARINE LIMITED
REDDITCH ENGLAND

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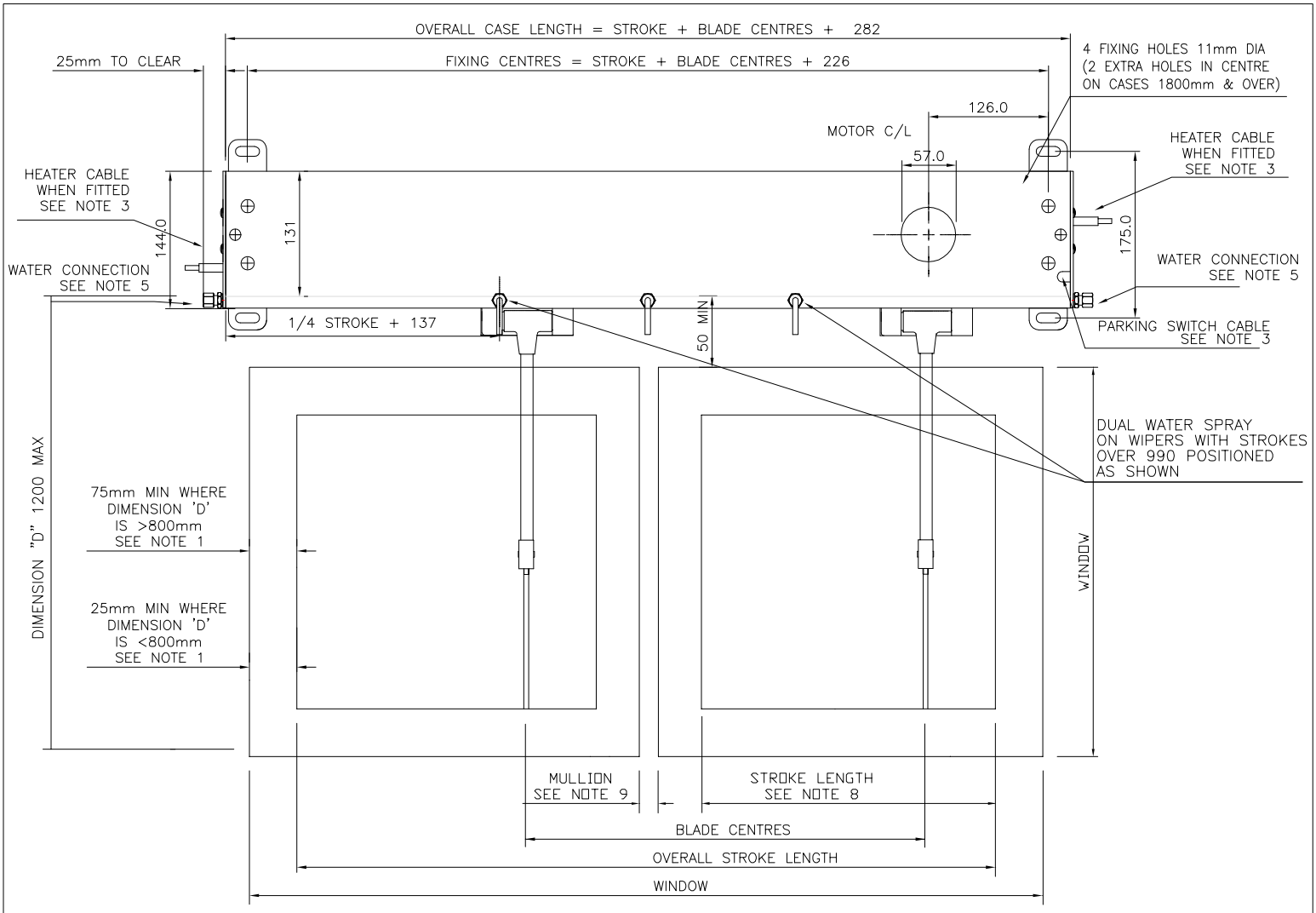
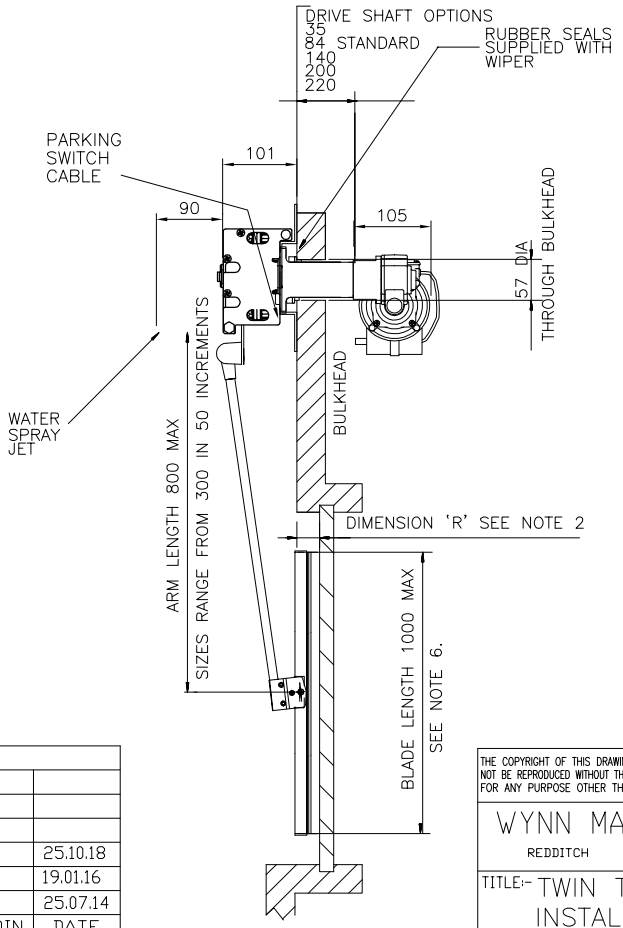
DRAWING No. 1588-03-CCOVER

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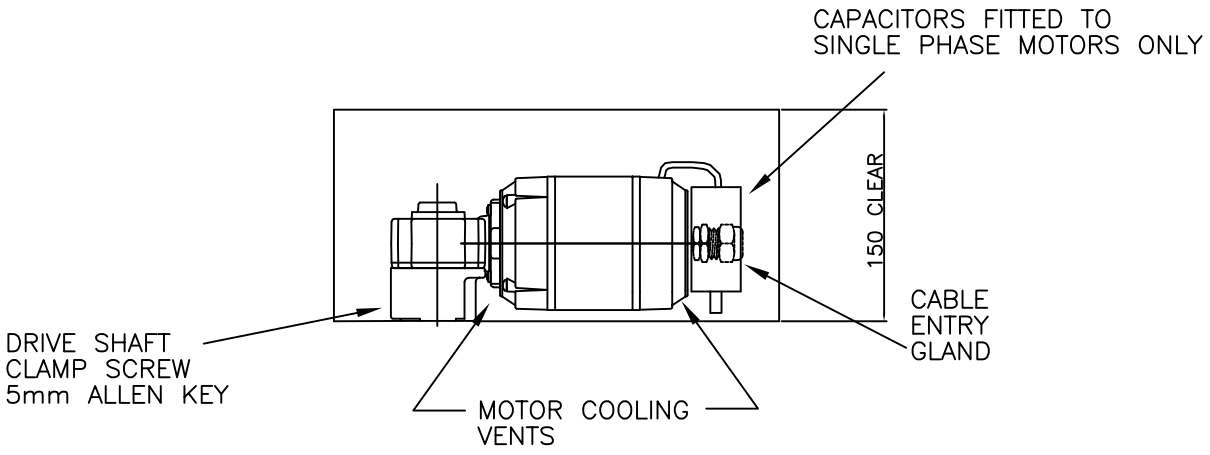
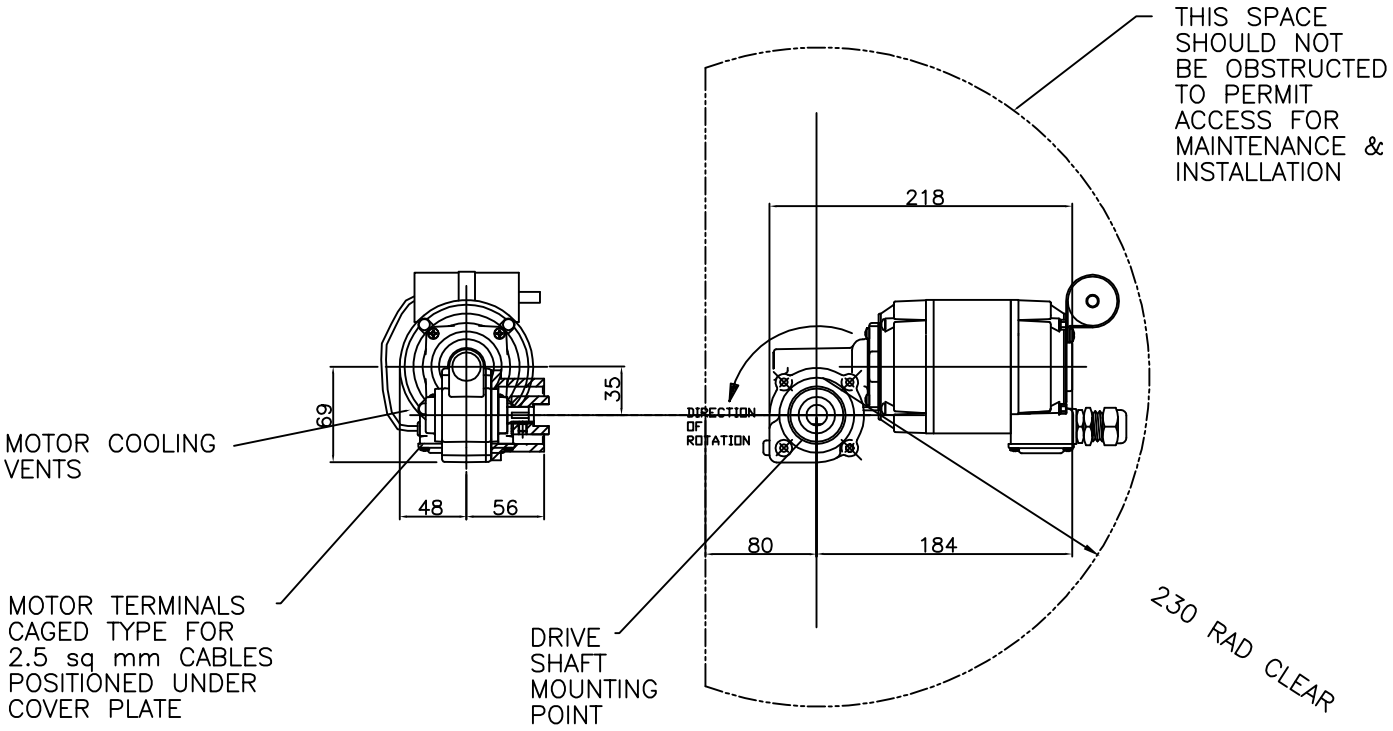



## NOTES

1. USE T RATED FUSES.
2. EARTH BONDING TO CONFORM TO APPROPRIATE NATIONAL CODES AND STANDARDS.
3. CUSTOMER TO WIRE FROM MOTOR CABLES OR TERMINATIONS TO TERMINALS ON THE CONTROLLER WHEN SUPPLIED.
4. ALL MOTORS CAN BE ROTATED THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE. NOTE THE ACCESS SPACE WILL ROTATE WITH THE MOTOR.

PARVALUX MOTORS WEIGHT 4.5Kg

## M O T O R  O P T I O N S

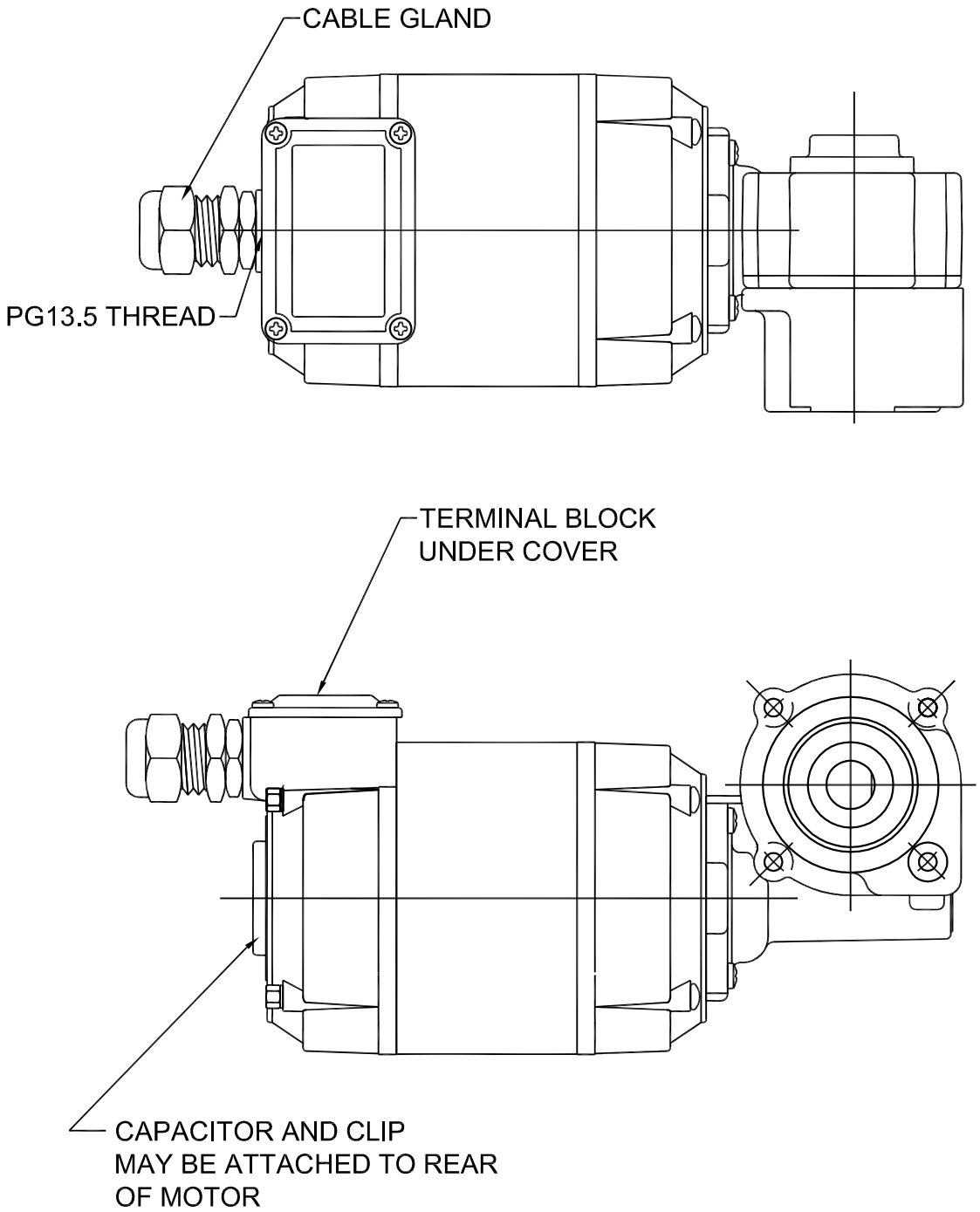
| MOTOR TYPE | VOLTAGE | Hz | PHASE | SPEED | SAFE COMPASS DISTANCE MIN | RUN CURRENT 50Hz | RUN CURRENT 60Hz | FUSE RATING 50Hz | FUSE RATING 60Hz | CAPACITOR |
|---|---|---|---|---|---|---|---|---|---|---|
| PARV61 | 115AC | 50/60 | 3 | 2 | 0.5M | 1.3A | 1.1A | 2.0A | 1.6A | – |
| PARV62D | 230AC | 50/60 | 3 | 2 | 0.5M | 0.6A | 0.6A | 1.0A | 1.0A | – |
| PARV64 | 230AC | 50/60 | 1 | 1 | 0.5M | 1.2A | 1.6A | 1.6A | 2.0A | 8.4uF M-MISC-098PARV |
| PARV64L | 230AC | 50/60 | 1 | 1 | 0.5M | 0.75A | 0.95A | 1.0A | 1.6A | 5uF M-MISC-095PARV |
| PARV65 | 115AC | 50/60 | 1 | 1 | 0.5M | 2.3A | 2.6A | 2.5A | 3.15A | 28uF M-MISC-099PARV |
| PARV65L | 115AC | 50/60 | 1 | 1 | 0.5M | 1.5A | 1.6A | 2.0A | 3.15A | 28uF M-MISC-099PARV |
| PARV81 | 115AC | 50 | 3 | V | 0.5M | 1.5A | | CONTROLLER | | – |
| PARV82 | 220AC | 50 | 3 | V | 0.5M | 1.1A | | CONTROLLER | | – |

ALL UNSPECIFIED UNITS OF LENGTH IN mm's

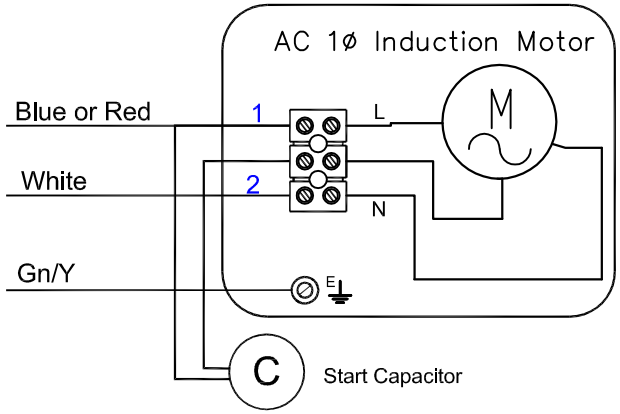
| | | | | |
|---|---|---|---|---|
| | | | WYNN MARINE LTD REDDITCH ENGLAND | THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED. |
| 5 | | 12.05.11 | | TITLE:- TYPE C WIPER STANDARD PARVALUX MOTOR OPTIONS CHART |
| 4 | | 03.11.10 | | |
| ISSUE | DIN | DATE | | DRAWING NUMBER:- INST-1588-06 |

# WIRING DIAGRAM FOR PARVALUX TYPE AC MOTORS
# FOR WYNN TYPE C STRAIGHT LINE WIPER

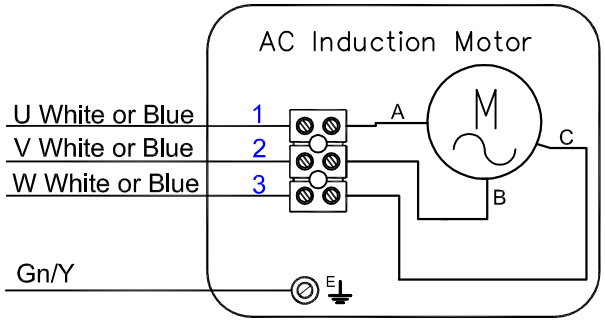




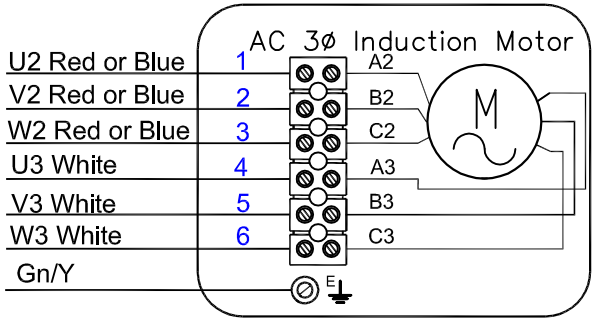

CUSTOMER
WIRING




MOTOR TERMINAL BLOCK WIRING DIAGRAM
FOR A PARVALUX 1 PHASE MOTOR
FIT CAPACITORS AS SUPPLIED




MOTOR TERMINAL BLOCK WIRING DIAGRAM
FOR A PARVALUX GA81/GA82 MOTOR




MOTOR TERMINAL BLOCK WIRING DIAGRAM
FOR A PARVALUX 3 PHASE 2SP MOTOR

# GENERAL FAULT FINDING GUIDE

**NOTE:** This fault finding guide assumes a reasonable level of technical ability and should be carried out by a suitably qualified person.

*Problems: Control panel does not operate wiper.*

| **Possible Cause** | **Solution** |
|---|---|
| No Power. | Check power supply is on and working. |
| Power not reaching motor | Check ship's incoming supply fuses or circuit breakers.<br>Check for wiring fault, broken wire or loose terminal.<br>If possible confirm (with voltmeter) power is present at motor input and output terminals of control module. |
| Connections to motor incorrect. | Check wiring according to the appropriate electrical installation drawing. |
| Ship's voltage too low. | Check voltage as close to the motor as possible, with motor running. See relevant tables for acceptable values. |
| Motor Thermal Cut Out tripped. Single Phase AC motors only. | The 1 Ø AC motors have a thermal cut out embedded into the stator winding. If the motor gets too hot the thermal cut out disconnects the supply to the motor. Switch off and allow the motor to cool down. About 20 minutes later the cut out will reset allowing normal operation. |
| Motor brushes or commutator worn (DC motor only) | Check motor commutator and brushes |
| Motor burned out. | This should not be possible - could happen by incorrect voltage of motor, or a motor fault.<br>The motor needs a reasonable amount of free space to provide sufficient cooling airflow – check.<br>The motor should be protected by fuses, check type and rating. |
| Wiper motor not fully engaged on coupling. | Slacken pinch bolt, move motor and/or wiper arm to align coupling and push motor into engagement with coupling.<br>Retighten pinch bolt. Make sure that the rubber coupling is fitted |
| Carriage motion jammed. | It should be possible by pushing the blade arm to move the mechanism over the stroke length. Remove cover and check for obstructions. Check the Blade Arm Screws. |
| Drive pulley turning but belt slipping. | Excessive friction - Check carriage rollers and motor drive coupling. Replace as required.<br>Idler pulley springs broken or missing. Replace. |
| Drive belt broken or damaged. | Inspect belt for slip or burn damage.<br>Belt at end of life. Replace. |
| Idler pulley jammed. | Damaged by impact, or bearing system failed. Replace assembly. |
| Corrosion. | If corroded, check for water ingress through seals and tightness of connections,<br>Replace wiper unit if necessary |

*Problem: Wiper runs but at wrong speed*

| Possible Cause | Solution |
|---|---|
| Ship's voltage incorrect. | Check voltage as near as possible to the motor, with motor running. |
| Motor brushes worn (DC Only) | Inspect brushes and replace as necessary. |
| High / Low speed wiring incorrect (3 Phase 2 Speed models only) | Check wiring complies with appropriate drawing. |
| One phase missing (3 Phase 2 Speed models only) | Check controller.<br>Check ships fuses. |

*Problem: Wiper runs but is noisy*

| Possible Cause | Solution |
|---|---|
| Wiper arm is obstructed by: - Window frame, spray jets, etc. | If necessary gently bend arms or spray jets out of path of wiper arm. |
| Incorrect arm attachment screws. | These must not be longer than the 10mm screws provided by Wynn |
| Vibration of wiper unit | Check the front cover fixing screws are secure. |
| Arm attachment plate fouling on wiper case | Attachment screws not fully tightened - check.<br>Blade arm or bracket bent out of place - check. |

*Problem: Wiper does not clean the screen properly.*

| Possible Cause | Solutions |
|---|---|
| Blade not in contact with screen. | Blade or arm bent - inspect and replace.<br>Arm pivots seized due to corrosion - replace.<br>Heaters ineffective allowing ice build up. |
| Weak springs on blade arm. | Stronger springs may be required. Contact Agent/Distributor |
| Broken springs on blade arm. | Investigate reason of failure and replace. Springs are good down to -40°C. |
| Blade rubber missing or damaged. | Maintenance item. Replace as required. |

*Problem: Wiper does not park correctly*

| Possible Cause | Solution |
|---|---|
| Park Sensor failed. | Check reed sensor action, will need tester (meter). |
| Park Sensor Actuator missing. | Check magnet/spacer arrangement on carriage. |

*Problem: If fitted, heater does not become warm when switched on*

| Possible Cause | Solutions |
|---|---|
| Fuse blown or circuit breaker tripped (if fitted). | Check for short-circuited heater, will need tester (meter).<br>Check for wiring damage or loose wires.<br>Check connections are good. |
| Heater failed. | Check for continuity, will need tester (meter). |
| Earth leakage circuit breaker trips. | It is common for earth leakage to rise if a heater has not been used for a while - if possible allow heater the warm up so to dry out.<br>The heater's water seal or cable may be damaged allowing ingress of water - check and replace. |
| No power. | Check Controller. |

*Problem: If fitted, little or no washer water comes out when button pressed.*

| Possible Cause | Solution |
|---|---|
| Pump or supply pressure too low. | Check Ship's water supply, or pump for output pressure. |
| On reservoir systems, empty. | Check - refill. |
| Water control valve faulty or not operating. | Check solenoid valve continuity. Replace if open circuit. |
| Supply lines or jets blocked. | Try air purge, if available.<br>Dismantle and flush pipes. |
| Water frozen. | Switch on heaters. |

# TYPE C WIPER MAINTENANCE

Wynn products have been proven over many years to perform well under the harshest condition of use. To maintain their performance the following schedule is recommended:

## TOOLS REQUIRED:

I. 4MM ALLEN KEY
II. 5MM ALLEN KEY
III. 6MM ALLEN KEY
IV. 6MM SOCKET
V. 8MM SPANNER
VI. 10MM SPANNER
VII. 10MM SOCKET
VIII. 11MM SPANNER
IX. 3MM FLAT BLADE SCREWDRIVER
X. NO2 CROSS POINT SCREWDRIVER

### *Every 6 Months*

### *DC motors only*

1. Inspect the motor brushes. Remove motor end cover. Prevent brushes from running down to less than 6mm height in service. Brushes can be lifted out of their holder after lifting off the springs. Replace brushes back into same holder and in the same orientation. Ensure that the brush 'pig tails' is free and that the springs are correctly replaced.

2. When replacing brushes, carefully clear out any residual carbon dust from the motor.

**WARNING:** DO NOT INHALE THE CARBON DUST.

3. Inspect the motor commutator – it should still be bright. If it is blackened the motor should be replaced or serviced. This can be done with light cleaning with 'flour' paper, but not 'emery' paper.

### *Every 12 Months*

1. Check condition of the Articulated/Rigid Wiper Blade. Replace if necessary.

2. Check Heaters if fitted. If these have not been used for some time, then leave them on for approximately 2 hours.

   **NOTE:** If not used for long periods, some mineral insulated heaters will take up moisture and begin to show current leakage to ground. By running them for the stated time this process can be reversed and the insulation returned to near infinity values. When dry, insulation resistance is > 100 M ohm at 500V.

3. Check the drive belt for deterioration. Replace if necessary.

4. Check carriage is smooth and all guide rollers are free to rotate. Inspect 'tyres' on the guide rollers for splitting / perishing. Replace complete roller if necessary.

**Caution:** Guide rollers have an integral dry bearing and MUST NOT be oil or grease lubricated.

5. Check for free movement of idler pulleys in response to belt tension. Lubricate as necessary with water resistant grease.

6. Ensure free movement of drive pulley. Replace if damaged or when showing signs of excessive wear.

   **NOTE:** The drive pulley is jig assembled and should not be dismantled.

7. Check for free blade arm spring movement. Dismantle, re-grease or replace if necessary.

# TYPE C WIPER INSPECTION / RENEWAL OF PARTS

**WARNING:** To ensure health & safety, remove power from the control unit, before working on any parts of the wiper either inside or outside.

## TOOLS REQUIRED:

I. 4MM ALLEN KEY
II. 5MM ALLEN KEY
III. 6MM ALLEN KEY
IV. 6MM SOCKET
V. 8MM SPANNER
VI. 10MM SPANNER
VII. 10MM SOCKET
VIII. 11MM SPANNER
IX. 3MM FLAT BLADE SCREWDRIVER
X. NO2 CROSS POINT SCREWDRIVER

### *Blade Replacement*

1. Loosen the 2 x 8mm nuts on the blade attachment clip.
2. Slide the blade attachment clip and blade assembly off the wiper arm.
3. Re-assembly is reversal of above instructions.

### *Arm Replacement*

1. If Heaters are fitted disconnect from terminals to allow the cover to be removed from the wiper.

   OUTSIDE

2. Remove any pipework fittings / blanking plugs from both ends of the wiper.
3. Slacken cable glands and withdraw heater cable from bulkhead.
4. Remove the 2 x M8 Cap head bolts at each end of the cover and set aside.
5. Carefully remove the cover and set aside.
6. Remove the 4 x M6x10mm screws securing the arm to the carriage plate. The arm and blade assembly is now free from the wiper, set both assembly and fasteners aside.
7. Slacken the blade clip bolts and remove blade. Set aside for reuse.
8. Re-assembly is reversal of above instructions.

### *Drive Belt*

1. If Heaters are fitted disconnect from terminals to allow the cover to be removed from the wiper.

   OUTSIDE

2. Remove any pipework fittings from both ends of the wiper.
3. Slacken cable glands and withdraw heater cable from bulkhead.
4. Remove the 2 x M8 Cap head bolts at each end of the cover and set aside.

5. Carefully remove the cover and set aside.

6. Remove the 4 x M6x10mm screws securing the arm to the carriage plate. The arm and blade assembly is now free from the wiper, set both assembly and fasteners aside.

7. Slip the belt off the spring-loaded pulleys then slide the carriage/belt assembly out of the end of the case at the idler pulley end. Note: The assembly can be removed from the drive pulley end, but the park sensor will then need to be detached first (where fitted).

8. In multi wiper installations, if there is insufficient space between adjacent wipers to remove the carriage, then it will be necessary to draw the carriage / belt assembly through adjacent wiper cases, detaching park sensors where necessary.

9. Inspect the drive belt and replace if damaged or worn. To detach the drive belt, note how the parts are assembled, then undo the 2 small nuts securing the belt to the clip.

10. Fit a new belt. Spare belts are supplied with nuts and clip plate. Refit and tighten nuts to the same height as the original and secure with Loctite thread lock (or similar).

11. Fit the carriage & belt assembly back into the casing and slip the belt onto the drive & idler pulleys.

12. Move the carriage by hand and ensure that it travels the full stroke length freely and without any obstruction. (Motion will feel restricted because the motor is being rotated if in doubt discount the motor). Refit the blade assembly with special screws removed.

13. Refit the front cover and secure with the 2 off M8 cover bolts. Reconnect any pipework fittings removed in para 2, and heater cable if removed at para 1.

## *Guide Rollers*

1. Follow the Drive Belt renewal instructions 1 to 7 above.

2. Remove the M5 Nylock nut & flat washer securing the guide roller and remove the guide roller. M5 Nylock nuts & flat washers supplied with set of 8 guide rollers.

3. Fit the new guide roller and secure with the M5 Nylock nut & flat washer. Ensure that M5 Nylock nut is tightened firmly.

4. Re-assembly is reversal of above instructions.

**Caution:** Guide rollers have an integral dry bearing and MUST NOT be oil or grease lubricated.

## *Drive Shaft and Pulley Assembly*

1. Slacken the clamping bolt securing the motor to the drive shaft assembly, withdraw the motor from the shaft and set aside ensuring the black coupling is kept with the motor.

2. Follow the Drive Belt renewal instructions 1 to 6 above.

3. Remove the 2 screws securing the park switch to the wiper case, withdrawing the cable through the slot in the case. Keep screws and fittings safe.

4. Dismount wiper from bulkhead and set aside fixings.

5. Unbolt drive shaft and pulley assembly from the main body of the wiper and set the fixings aside.

6. Withdraw the assembly from the wiper body and discard.

7. Insert the new assembly onto the body. Re-assembly is reversal of the above instructions and in accordance with the standard wiper installation instructions elsewhere in the manual.

## *Wiper Motor Replacement*

1. Disconnect motor wiring and make a note of the connections.

2. Loosen motor pinch bolt and remove motor.

3. Ensure new motor has a rubber coupling fitted to the dog gear. Line up motor dog gear with drive shaft dog gear and slide motor into position. Tighten pinch bolt.

4. Wire to motor terminal connections.

# *Type C Common Cover Wiper Spares List*

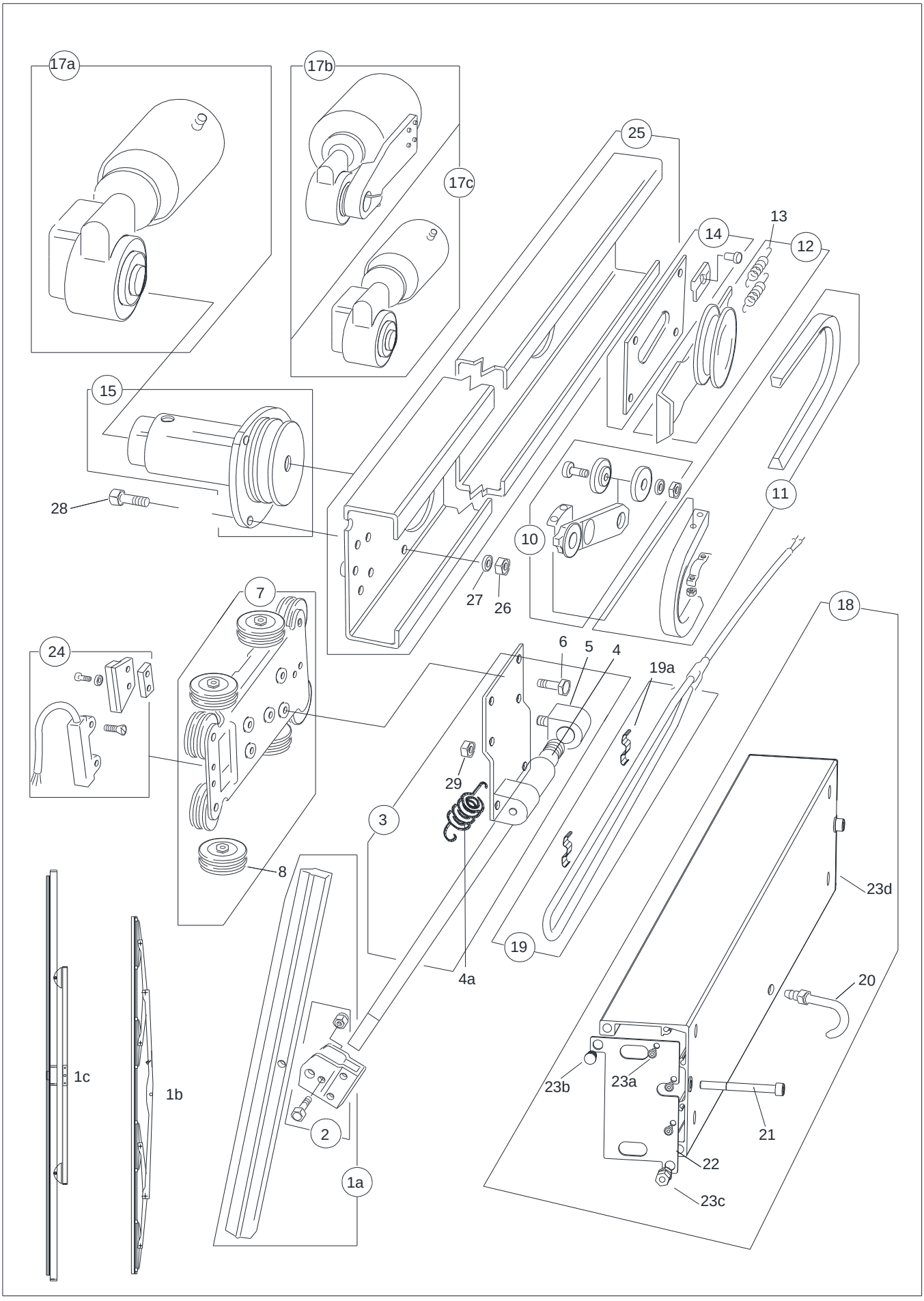
| Ident | Description | Quantity | Part Number |
|---|---|---|---|
| 1a | Flat Blade Assembly | 1 | FB WSL *** |
| 1b | Articulated Blade Assembly | 1 | SP1279-553-*** |
| 1c | Heavy Duty Dual Blade Assembly | 1 | 805201-*** |
| 2 | Blade Attachment Clip (14mm Articulated Blade & FB) | 1 | SP1279-493 |
| | Blade Attachment Clip (20mm Articulated Blade) | 1 | SP1279-532 |
| 3 | Blade Arm Assembly | 1 | CC**#R |
| 4 | Blade Arm Torsion Spring | 1 | SP1292-221 |
| 4a | Arm Spring(s) - where fitted at top of arm ‡ | A/R | 1279-157 |
| 5 | Blade Arm Pivot Blocks | 1 Kit/arm | SP1279-486-#.# |
| 6 | Arm Attachment Screws | Set of 4 | SP1588-488 |
| 7 | Carriage Plate Assembly – Single Blade | 1 | SP1588-005-M |
| | Carriage Plate Assembly – Twin Blade | 1 | SP1588-312-*** |
| 8 | 8 Guide Rollers C/W Nuts | Set of 8 | SP1588-117 |
| | Guide Roller Assy | 1 | SP1588-006 |
| 10 | Connecting Rod Assembly – Single | 1 | SP1588-474 |
| | Connecting Rod Assembly – Twin Blade | 1 | SP1588-474T |
| 11 | Vee-Belt | 1 | SP1279-106-### |
| 12 | Idler Pulley Assembly c/w Springs (Single Blade) | 1 | SP1588-452 |
| | Idler Pulley Assembly c/w Spring (Twin Blade) | 1 | SP1588-452T |
| 13 | Idler Pulley Tension Spring (Single Blade) | Set of 2 | SP1279-157 |
| | Idler Pulley Tension Spring (Twin Blade) | Set of 2 | SP1279-496 |
| 14 | Idler Pulley Guide Assembly | 1 | SP1588-490 |
| 15 | Drive Shaft and Pulley Assembly - 84mm Std | 1 | SP1588-009-117 |
| | Drive Shaft and Pulley Assembly - 140mm | 1 | SP1588-009-173 |
| | Drive Shaft and Pulley Assembly - 200mm | 1 | SP1588-009-233 |
| | Drive Shaft and Pulley Assembly - 220mm | 1 | SP1588-009-253 |

| Ident | Description | Quantity | Part Number |
|---|---|---|---|
| | Drive Shaft and Pulley Assembly - 240mm | 1 | SP1588-009-273 |
| | Drive Shaft and Pulley Assembly - 310mm | 1 | SP1588-009-310A |
| | Drive Shaft and Pulley Assembly - 35mm | 1 | SP1642-003 |
| | Gas Tight Drive Shaft and Pulley Assembly Std | 1 | SP1588-030-117 |
| | Gas Tight Drive Shaft and Pulley Assembly 140mm | 1 | SP1588-030-173 |
| | Gas Tight Drive Shaft and Pulley Assembly 200mm | 1 | SP1588-030-233 |
| 17a | Parvalux 61, 115V AC, 50/60Hz, 3-Ph, 2 Speed | 1 | SP1490-000GA61 |
| | Parvalux 62D+, 230V AC, 50/60Hz, 3-Ph, 2 Speed | 1 | SP1490-000GA62D |
| | Parvalux 64-T, 230V AC, 50/60Hz, 1-Ph, 1 Speed | 1 | SP1490-000GA64 |
| | Parvalux 64L, 230V AC, 50/60Hz, 1-Ph, Low Speed | 1 | SP1490-000GA64L |
| | Parvalux 65, 115V AC, 50/60Hz, 1-Ph, 1 Speed | 1 | SP1490-000GA65 |
| | Parvalux 65L, 115V AC, 50/60Hz, 1-Ph, Low Speed | 1 | SP1490-000GA65L |
| | Parvalux 81, 115V AC, 3 Speed | 1 | SP1490-000GA81 |
| | Parvalux 82, 220V AC, 3 Speed | 1 | SP1490-000GA82 |
| 17c | PM3M 24Vdc Motor | 1 | SP1279-558-24 |
| | PM3M 24Vdc Motor Slow Speed | 1 | SP1279-558L-24 |
| 18 | Front Cover - Less Heater | 1 | See calculator 1681-161 |
| 19 | Heater - Single Wiper | 1 | SP1588010$$$^^^ |
| 19a | Heater Clip | A/R | SP1588-056 |
| 20 | Spray Tube Assembly | 1 | SP1588-418 |
| 21 | Cover Bolts | each | zA0008-090S |
| 22 | End Cover Left Hand | each | SP1588-058L* |
| | End Cover Right Hand | each | SP1588-058R* |
| 23a | Fixing Screw | 6 | zP00012S-1.0S |
| 23b | Blanking Plug | 2 | 1588-062 |
| 23c | Metric Pipe Fitting | 1 | 1588-038 |
| 23d | Tubing Plug | 1 | 1588-037 |

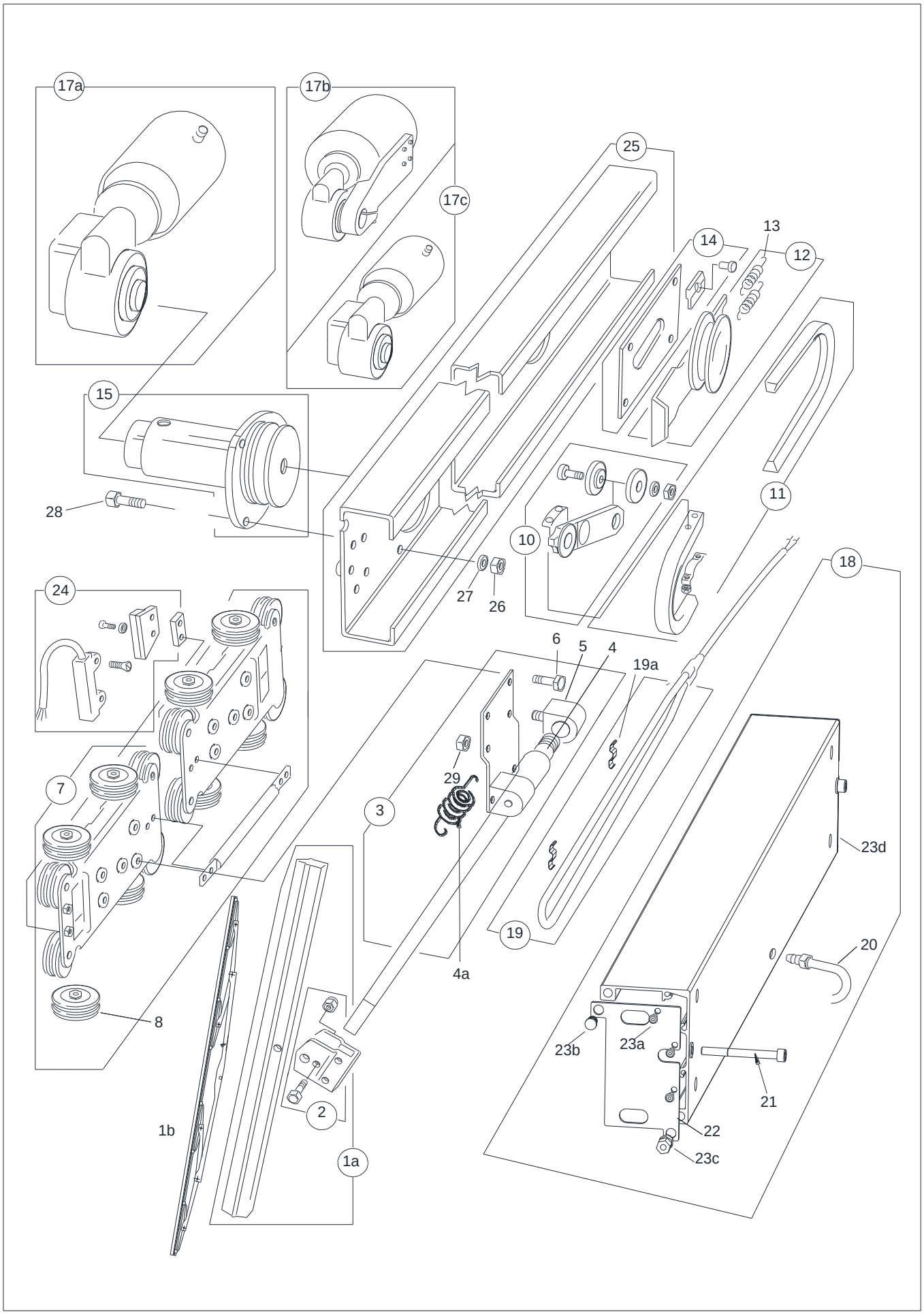
| Ident | Description | Quantity | Part Number |
|---|---|---|---|
| 24 | Self-Parking Assembly (Reed sw and magnet) 2m | 1 | SP1588-012-1 |
| | Self-Parking Assembly (Reed sw only) 2m | 1 | SP1587-034-1 |
| 25 | Main Frame | 1 | See calculator 1681-161 |
| 26 | Motor Housing Nut | each | 10015100 |
| 27 | Motor Housing Washer | each | 10025306B |
| 28 | Motor Housing Bolt | each | zA0006-020S |
| 29 | Pivot Block Securing Nut | 2 | zNL0.25F-S |
| | | | |
| not shown | Wash Fittings SLW Single | 1 | SP1588-672 |
| not shown | Wash Fittings SLW Twin | 1 | SP1588-673 |
| not shown | Wash Fittings SLW Single Long | 1 | SP1588-674 |
| not shown | Drive Coupling – fitted inside Drive Shaft | 1 | SP1279-250 |
| not shown | L050 Rubber Spider – fitted to Drive Coupling | 1 | SP1279-252 |
| not shown | Sealing Grommet – fitted around Drive Shaft | 1 | SP1279-137 |
| not shown | Sealing Grommet Spacer– fitted around Drive Shaft | 1 | SP1588-745 |

*** In the Part Number means length in mm.
**# In the Part Number means length in cm and arm spring pressure code.
#.# In the Part Number means spring pressure in lb/ft. This is determined by Wynn according to arm and blade dimensions, together with any window rake angle from the vertical. This value can also be obtained from the original order documentation. See Wynn Agent for more details.
### Belt length (written on belt as A###) in Inches.
‡ Where required, extra spring pressure is obtained by the addition of 1 or 2 springs to the wiper arm. Where fitted, order 1 or 2 as required. Contact Wynn Agent for more details.
$$$ Where $$$ is voltage (220,115 or 024)
^^^ Where ^ is heater length code.

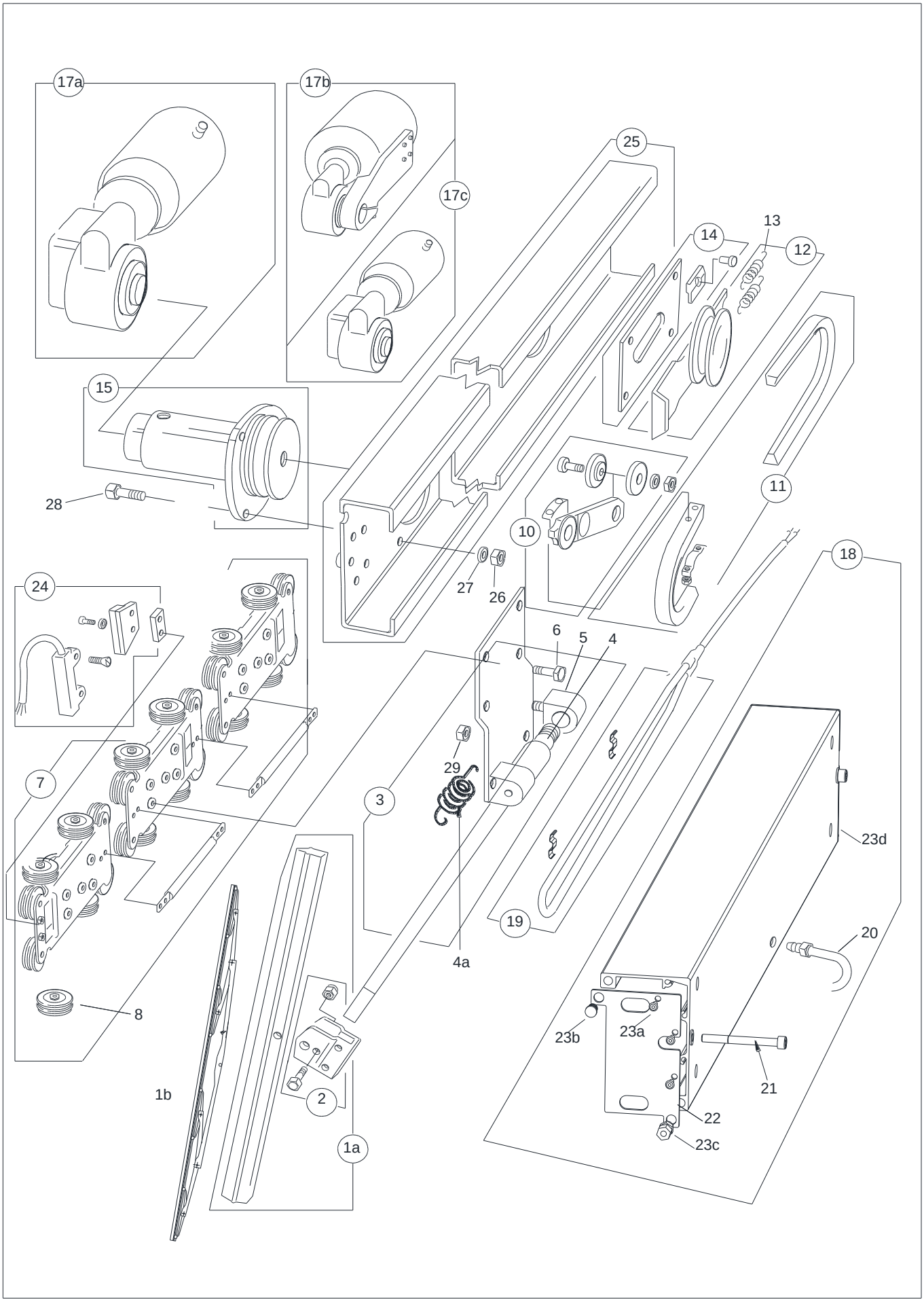
# *Type C Common Cover Single Spare Parts Drawing*



# *Type C Common Cover Twin Spare Parts Drawing (Short)*



# *Type C Common Cover Twin Spare Parts Drawing (Long)*



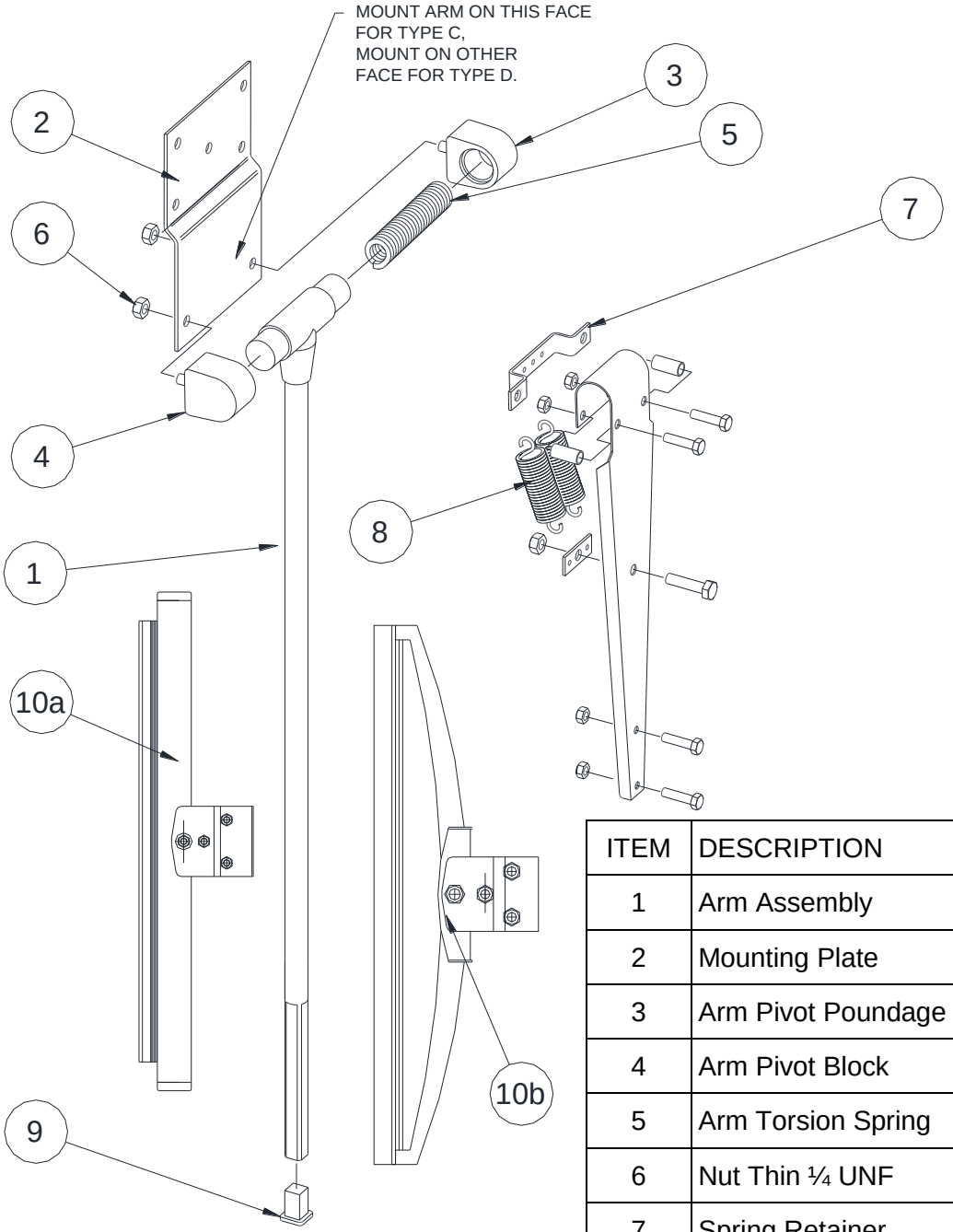
# *SLW Wiper Arm*

The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper, two wiper arm assemblies on a twin bladed wiper and three wiper arm assemblies on a triple bladed wiper unit.

The wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.



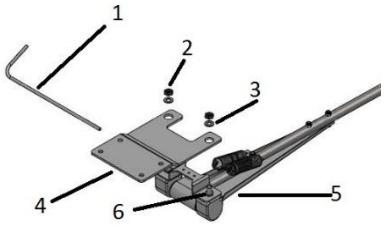

| ITEM | DESCRIPTION | QTY |
|---|---|---|
| 1 | Arm Assembly | 1 |
| 2 | Mounting Plate | 1 |
| 3 | Arm Pivot Poundage Block | 1 |
| 4 | Arm Pivot Block | 1 |
| 5 | Arm Torsion Spring | 1 |
| 6 | Nut Thin ¼ UNF | 2 |
| 7 | Spring Retainer | 1 (A/R) |
| 8 | Additional Spring | (0, 1, 2) |
| 9 | Sealing Plug | 1 |
| 10a | Flat Blade | 1 |
| 10b | Articulated Blade | |

# QUICK FIT SLW WIPER ARM INSTALLATION

**CAUTION:** Ensure that the correct wiper, blade and arms are selected for each window. The wiper arm should not be installed/removed without the spring retaining pin fitted.

## *Installation*

**NOTE:** The wiper unit should be supplied with the arm mounting plate *(4)* already fitted. If it is not fitted, remove 2 x ¼ UNF Thin Nuts *(2)* and 2 x M6 washers *(3)* from the pivot block threads and remove the wiper arm sub assembly *(5)* from the arm mounting plate *(4)*. Fit the arm mounting plate *(4)* to the wiper unit before installing the wiper unit.

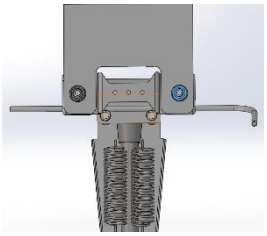



1. Remove 2 x ¼ UNF Thin Nuts ***(2)*** and 2 x M6 washers ***(3)*** from the pivot block threads.

2. Fit the wiper blade to the wiper arm sub assembly ***(5)***, ensuring that the captive end of the wiper is at the top.

3. Fit the wiper arm sub assembly ***(5)*** to the arm mounting plate ***(4)*** ensuring that the wiper arm sub assembly pivot block nuts ***(6)*** sit inside the holes in the arm mounting plate ***(4)***. Refit the 2 x M6 washers ***(3)*** and 2 x ¼ UNF Thin Nuts ***(2)*** to the pivot block threads and tighten.

4. Gently lift the wiper arm away from the window and remove the spring retaining pin ***(1)***. Keep safe for future use.



## *Arm Removal/Replacement*

### *Removal*

1. Gently lift the wiper arm away from the window and insert the spring retaining pin ***(1)***.

2. Remove 2 x ¼ UNF Thin Nuts ***(2)*** and 2 x M6 washers ***(3)*** from the pivot block threads. Keep safe for future use.

3. Remove the wiper arm sub assembly ***(5)*** from the arm mounting plate ***(4)***.

### *Replacement*

1. Fit the wiper arm sub assembly ***(5)*** to the arm mounting plate ***(4)*** ensuring that the wiper arm sub assembly pivot block nuts ***(6)*** sit inside the holes in the arm mounting plate ***(4)***. Refit the 2 x M6 washers ***(3)*** and 2 x ¼ UNF Thin Nuts ***(2)*** to the pivot block threads and tighten.

2. Gently lift the wiper arm away from the window and remove the spring retaining pin ***(1)***. Keep safe for future use.

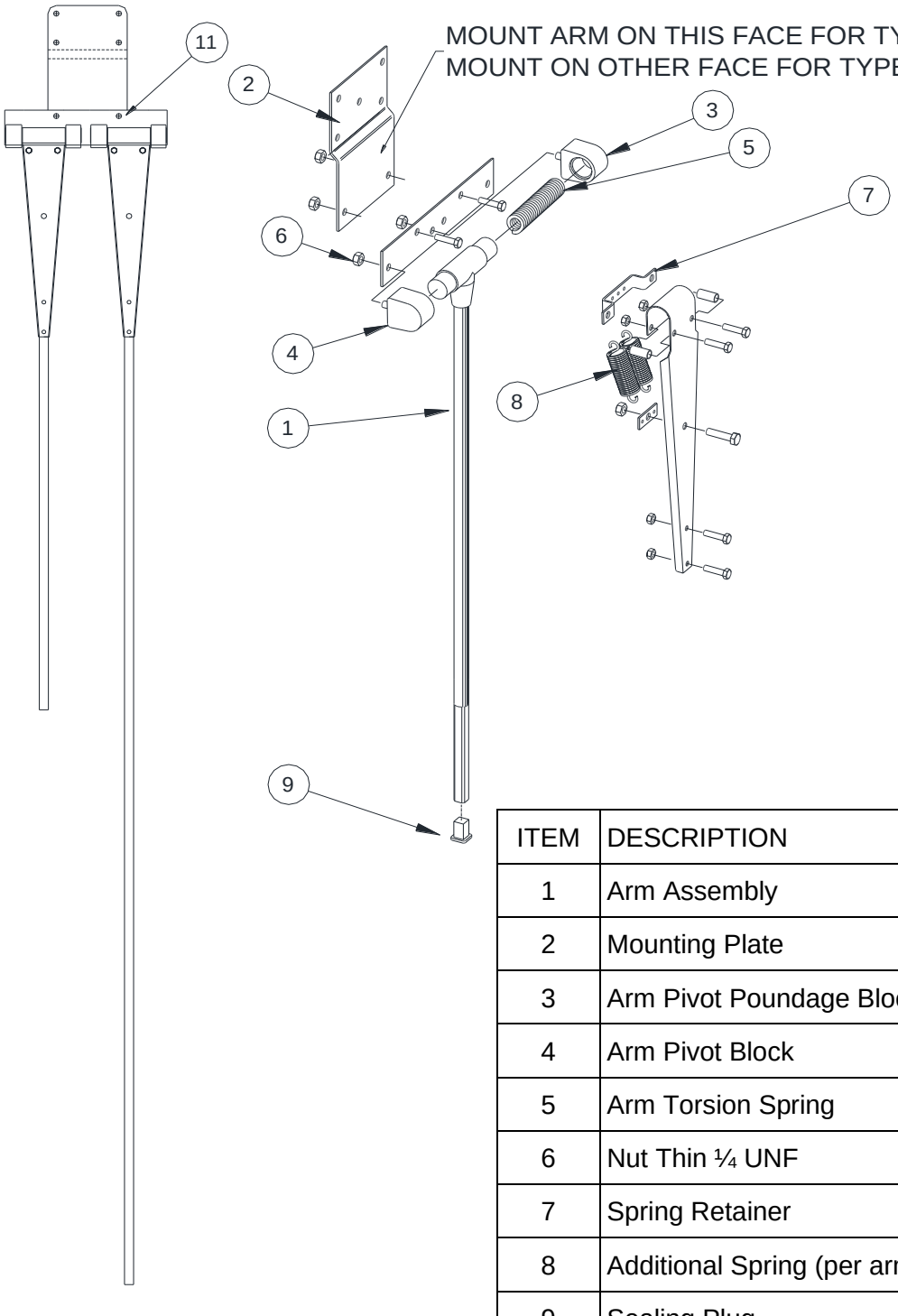
# *SLW Double Wiper Arm Assembly*

The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper, two wiper arm assemblies on a twin bladed wiper.

The double wiper arm mounting plate is secured to the wiper arm mounting plate with two bolts, washers and nuts. The complete wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.




VIEWED FROM OUTSIDE

| ITEM | DESCRIPTION | QTY |
|---|---|---|
| 1 | Arm Assembly | 2 |
| 2 | Mounting Plate | 1 |
| 3 | Arm Pivot Poundage Block | 2 |
| 4 | Arm Pivot Block | 2 |
| 5 | Arm Torsion Spring | 2 |
| 6 | Nut Thin ¼ UNF | 4 |
| 7 | Spring Retainer | 2(A/R) |
| 8 | Additional Spring (per arm) | (0, 1, 2) |
| 9 | Sealing Plug | 2 |
| 11 | Double Arm Mtg Plate | 2 |

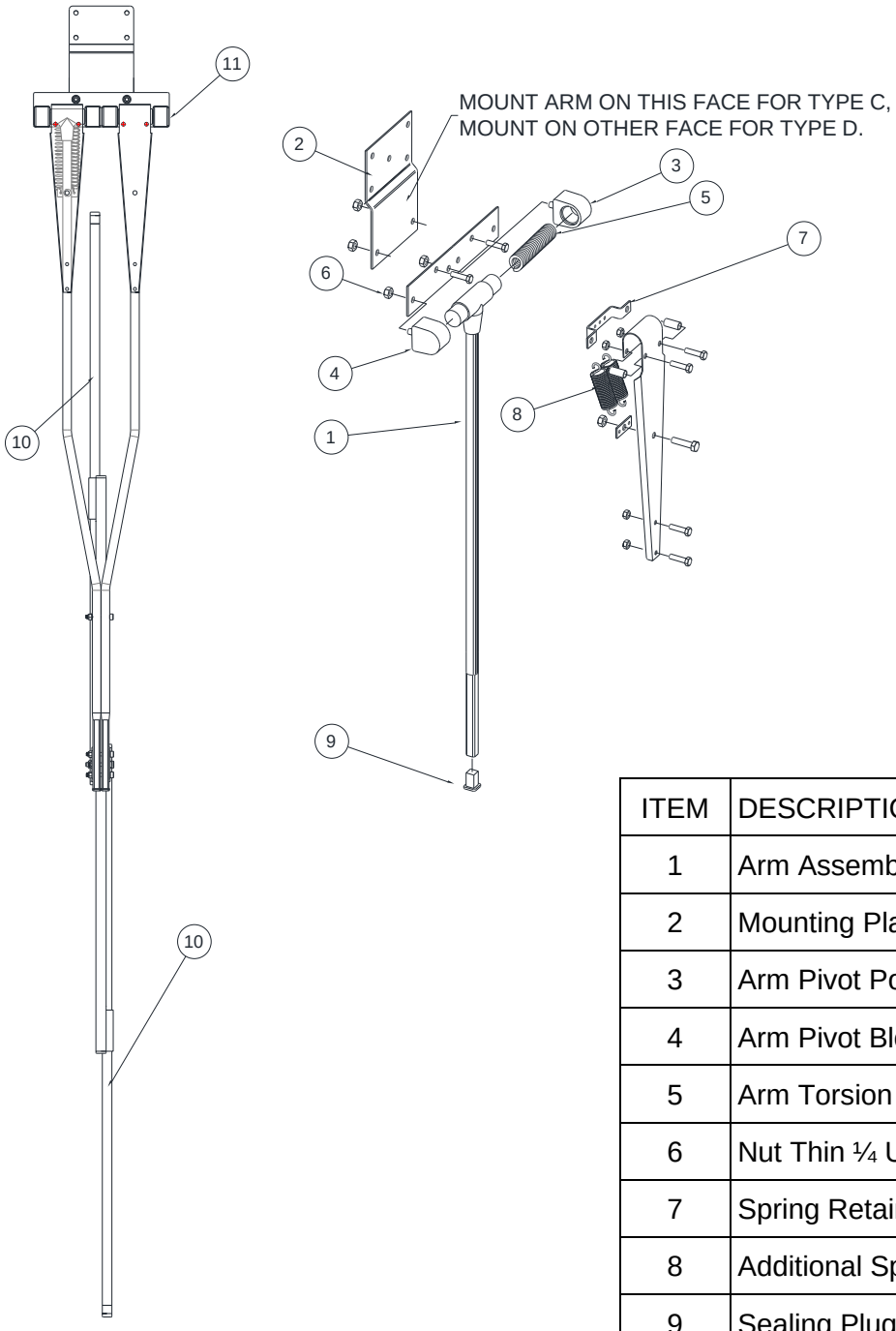
# *SLW Heavy Duty Wiper Arm Assembly – 600-950mm*

The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper.

The heavy duty wiper arm mounting plate is secured to the wiper arm mounting plate with two bolts, washers and nuts. The complete wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.




OUTSIDE LOOKING IN

| ITEM | DESCRIPTION | QTY |
|---|---|---|
| 1 | Arm Assembly | 2 |
| 2 | Mounting Plate | 1 |
| 3 | Arm Pivot Poundage Block | 2 |
| 4 | Arm Pivot Block | 2 |
| 5 | Arm Torsion Spring | 2 |
| 6 | Nut Thin ¼ UNF | 4 |
| 7 | Spring Retainer | 2 |
| 8 | Additional Spring (per arm) | 2 |
| 9 | Sealing Plug | 2 |
| 10 | Flat Blade | 2 |
| 11 | Double Arm Mtg Plate | 2 |

# *SLW Heavy Duty Wiper Arm Assembly – 1000-1150mm*

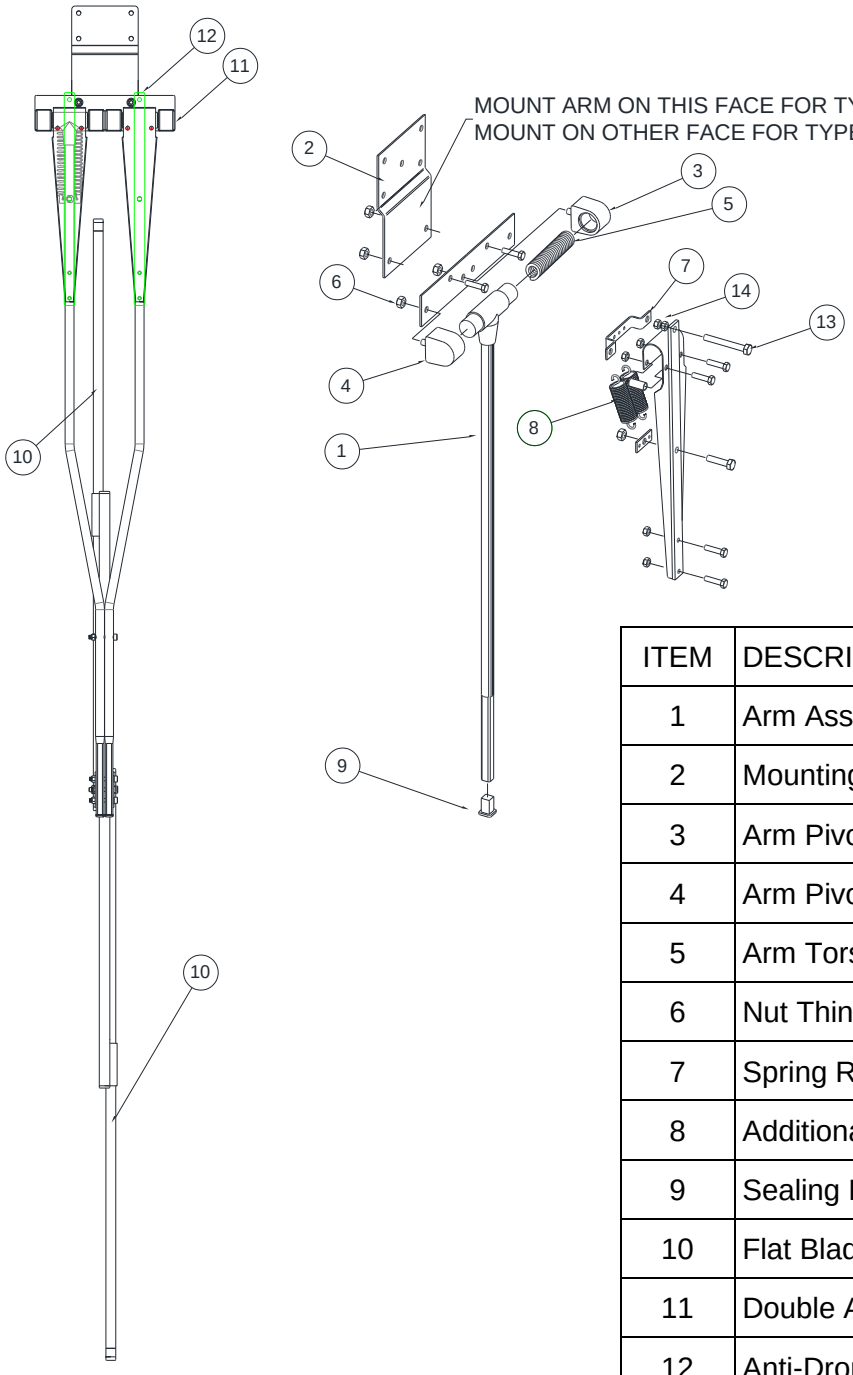
The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper.

The heavy duty wiper arm mounting plate is secured to the wiper arm mounting plate with two bolts, washers and nuts. The complete wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.

The arm is fitted with an Anti-Drop plate. This can be adjusted to provide addition pressure to the wiper blade.




OUTSIDE LOOKING IN

| ITEM | DESCRIPTION | QTY |
|---|---|---|
| 1 | Arm Assembly | 2 |
| 2 | Mounting Plate | 1 |
| 3 | Arm Pivot Poundage Block | 2 |
| 4 | Arm Pivot Block | 2 |
| 5 | Arm Torsion Spring | 2 |
| 6 | Nut Thin ¼ UNF | 4 |
| 7 | Spring Retainer | 2 |
| 8 | Additional Spring (per arm) | 3 |
| 9 | Sealing Plug | 2 |
| 10 | Flat Blade | 2 |
| 11 | Double Arm Mtg Plate | 2 |
| 12 | Anti-Drop Plate | 2 |
| 13 | Adjustment Bolt | 2 |
| 14 | Lock Nuts | 4 |

# FITTING THE WIPER BLADE CARRIER

**The wiper blades should be changed every 12 months but this is dependent on use and operating conditions**

***Ref Figure – Dual Blade Clip***

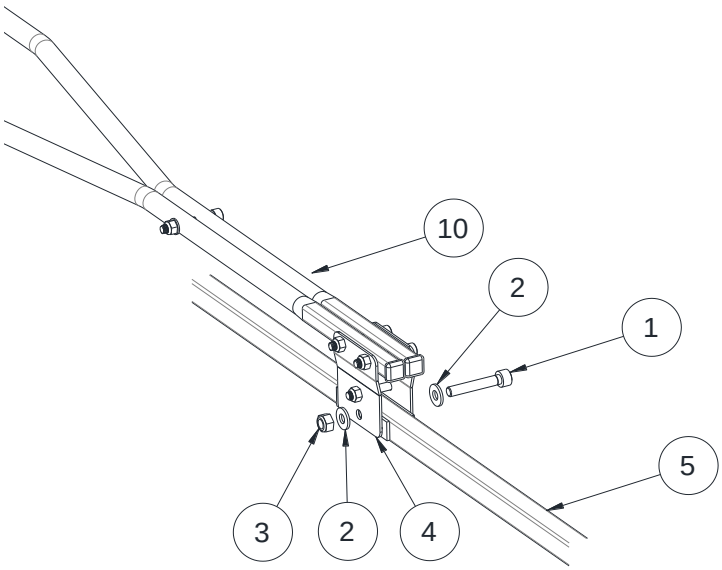
1. Remove one M6 blade retaining bolt ***(1),*** two M6 flat washers ***(2),*** and M6 Nylock nut ***(3),*** from blade clip on double wiper arm assy ***(10)***.

2. Place dual blade carrier assy ***(5)***, into blade clip on Arm ***(10)***.

3. Ensure that all fixing holes align.

4. Secure in place with one M6 blade retaining bolt ***(1),*** two M6 flat washers ***(2),*** and M6 Nylock nut ***(3).***

***Figure – Dual Blade Clip***

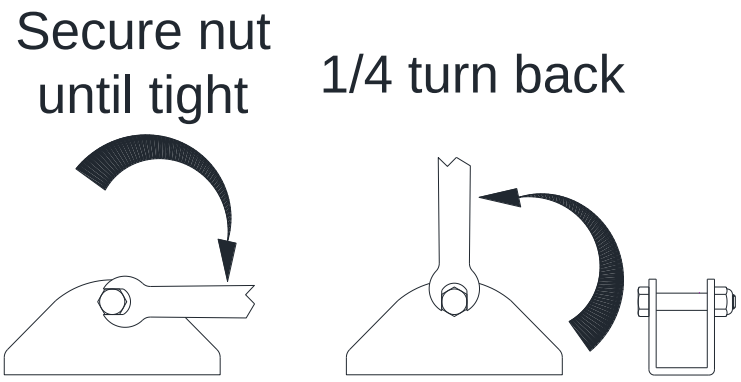



**IMPORTANT**
**DO NOT over tighten blade carrier retaining bolt and nut, as blade carrier is required to pivot on glass.**

***Ref Figure – Nut Tightening***

5. Secure nut until tight – then 1/4 turn back

***Figure – Nut Tightening***




***NOTE***
***Pictorial representation only, May not be exact to supplied arm***

# COMPLETE WIPER PART NUMBERS

EXAMPLE NUMBER

| D | 5 | 1 | 1 | 9 | B | 1 | A | 1 | C | E | B | A | 1 | A | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| WIPER TYPE | CODE |
|---|---|
| D1 | D1 |
| D2 | D2 |
| D4 | D4 |
| D5 | D5 |
| C - 35mm Drive Shaft | C1 |
| C - 84mm Drive Shaft | C2 |
| C - 140mm Drive Shaft | C3 |
| C - 200mm Drive Shaft | C4 |
| C - 220mm Drive Shaft | C5 |
| C - 84mm Gastight Drv Shft | C6 |
| C - 140mm Gastight Drv Shft | C7 |
| C - 200mm Gastight Drv Shft | C8 |

| STROKE TYPE | CODE |
|---|---|
| Single | 1 |
| Twin | 2 |
| Special Twin Case (Non-std ctrs) | Q |
| Special Single (See Instructions) | S |
| Special Twin (See Instructions) | T |
| Type C Single Old Style Cse/Cvr | 3 |
| Type D Single Old Style Cse/Cvr | 4 |
| Type C Twin Old Style Cse/Cvr | 5 |
| Type D Twin Old Style Cse/Cvr | 6 |
| Type 76 Converted to Type D | 7 |

| TWIN STROKE LENGTH STANDARD 1 INCH (25MM) STROKE OVERLAP | | | |
|---|---|---|---|
| INCHES | MILLIMETRES | | CODE |
| 2 X 13 | 2 X 330 | 13 | |
| 2 X 14 | 2 X 356 | 14 | |
| 2 X 15 | 2 X 380 | 15 | |
| 2 X 16 | 2 X 407 | 16 | |
| 2 X 17 | 2 X 430 | 17 | |
| 2 X 18 | 2 X 457 | 18 | |
| 2 X 19 | 2 X 480 | 19 | |
| 2 X 20 | 2 X 510 | 20 | |
| 2 X 21 | 2 X 533 | 21 | |
| 2 X 22 | 2 X 558 | 22 | |
| 2 X 23 | 2 X 585 | 23 | |
| 2 X 24 | 2 X 610 | 24 | |
| 2 X 25 | 2 X 635 | 25 | LOW SPEED (L) |
| 2 X 26 | 2 X 660 | 26 | |
| 2 X 27 | 2 X 685 | 27 | |
| 2 X 28 | 2 X 710 | 28 | |
| 2 X 29 | 2 X 735 | 29 | |
| 2 X 30 | 2 X 760 | 30 | |
| 2 X 31 | 2 X 787 | 31 | |
| 2 X 32 | 2 X 810 | 32 | |
| 2 X 34 | 2 X 865 | 34 | |
| 2 X 36 | 2 X 915 | 36 | |
| 2 X 40 | 2 X 1015 | 40 | |
| 2 X 41 | 2 X 1040 | 41 | |
| 2 X 43 | 2 X 1095 | 43 | |
| 2 X 45 | 2 X 1145 | 45 | |
| 2 X 47 | 2 X 1195 | 47 | |
| 2 X 49 | 2 X 1245 | 49 | |
| 2 X 52 | 2 X 1335 | 52 | |
| 2 X 57 | 2 X 1450 | 57 | |
| 2 X 61 | 2 X 1560 | 61 | |
| 2 X 67 | 2 X 1700 | 67 | |
| 2 X 71 | 2 X 1800 | 71 | |
| 2 X 76 | 2 X 1930 | 76 | |
| 2 X 79 | 2 X 2005 | 79 | |
| SPECIAL TWIN | | ST | |

(for twins , eg: 2x24" is shown as 24 with the 2 being stated at the previous part number digit)

| SINGLE STROKE LENGTH CODE | |
|---|---|
| INCHES | MM |
| 12 | 305 |
| 13 | 330 |
| 14 | 356 |
| 15 | 380 |
| 16 | 407 |
| 17 | 430 |
| 18 | 457 |
| 19 | 480 |
| 20 | 510 |
| 21 | 533 |
| 22 | 558 |
| 23 | 585 |
| 24 | 610 |
| 25 | 635 |
| 26 | 660 |
| 27 | 685 |
| 28 | 710 |
| 29 | 735 |
| 30 | 760 |
| 31 | 787 |
| 32 | 810 |
| 33 | 840 |
| 34 | 865 |
| 35 | 890 |
| 36 | 915 |
| 37 | 940 |
| 38 | 965 |
| 39 | 990 |
| 40 | 1015 |
| 41 | 1040 |
| 43 | 1095 |
| 45 | 1145 |
| 47 | 1195 |
| 49 | 1245 |
| 51 | 1295 |
| 53 | 1335 |
| 55 | 1400 |
| 57 | 1450 |
| 59 | 1500 |
| 61 | 1560 |
| 63 | 1605 |
| 67 | 1700 |
| 71 | 1800 |
| 76 | 1930 |
| 79 | 2005 |
| 89 | 2260 |

| HEATER | CODE |
|---|---|
| No Heater | 0 |
| 24v Heater | A |
| 115v Heater | B |
| 220v Heater | C |
| SEE INST | S |

| HEATER CABLE LENGTH | CODE |
|---|---|
| Not Supplied | 0 |
| 2 Metres | 1 |
| 3 Metres | 7 |
| 5 Metres | 2 |
| 6 Metres | 8 |
| 8 Metres | 9 |
| 10 Metres | 3 |
| 15 Metres | A |
| 20 Metres | 4 |
| 25 Metres | 5 |
| Terminated in Enclosure | 6 |
| Junction Box | J |

| PARKING | CODE |
|---|---|
| Parking Not Fitted | 0 |
| **Standard Drive End Parking** | |
| Normally open ) Reed Switch (TYPE D) | - A |
| Normally open ) Reed Switch (TYPE C) | - B |
| Proximity Switch (TYPE D) | - J |
| **Non-Standard Drive End Parking** | |
| Proximity Switch (TYPE D) | - G |
| Reed Switch Change over (Special Type C) | - C |
| **Standard Idler End Parking** | |
| Normally open ) Reed Switch (TYPE D) | - D |
| Normally Open ) Reed Switch (Type C) ) | - E |
| **Non-Standard Idler End Parking** | |
| Proximity Switch (Type D) | - H |
| Reed Switch c/over (Special Type C) | - F |

| PARKING CABLE LENGTH | CODE |
|---|---|
| Not Supplied | 0 |
| 2 Metres | 1 |
| 3 Metres | 7 |
| 5 Metres | 2 |
| 6 Metres | 8 |
| 8 Metres | 9 |
| 10 Metres | 3 |
| 15 Metres | A |
| 20 Metres | 4 |
| 25 Metres | 5 |
| Terminated in Enclosure | 6 |
| Junction Box | J |

| Wiper Type | Motor Type | Code |
|---|---|---|
| MOTOR NOT SUPPLIED | | MO |
| MOTOR SEPARATE | | 40 MM |
| NO POD | | 00 |
| C/D | 115vac 1ph 50/60hz 1Sp GA65 | CA |
| C/D | 115vac 1ph 50/60hz Low Sp GA65-L | CB |
| C/D | 115vac 3ph 50/60hz 2Sp GA61 | CE |
| C | 115vac 3ph 50/60hz 2Sp IP23 GA61-IP23 | CF |
| B/C/D | 115vac 3ph 50/60hz 1Sp GA63 | CG |
| C/D | 230vac 1ph 50/60hz 1Sp GA64 | CH |
| C/D | 230vac 1ph 50/60hz Low Sp GA64L | CJ |
| C | 230vac 1ph 50/60hz 1Sp IP23 GA64-IP23 | CL |
| C/D | 230vac 3ph 50/60hz 2Sp GA62D | CM |
| C/D | 230vac 3ph 50/60hz 1Sp GA68 | CN |
| C/D5 | 24vdc 320rpm 90W (1279-557) PM3 | CS |
| C | 230vac 3ph 50/60hz 2Sp GA62D-IP23-E (emc) | CV |
| C | 100vac 1ph 1sp GA69 | CW |
| C/D | 414vac 3ph 50/60hz 2 Sp | CX |
| D5/C | 24vdc **162rpm** SLOW (1279-557L) PM3 | CY |
| C/D2 | Pneumatic Drive Motor | PN |
| C/D | 110V 360RPM (1279-559-01) PM3 | CZ |

| For use **only** when replacing a Type B with a Type C | | | |
|---|---|---|---|
| C | 115vac 1ph 50hz Var Sp | SD 11 | CC |
| C | 115vac 1ph 60hz Var Sp | SD11 | CD |
| C | 230vac 1ph 50/60hz Var Sp | SD11 | CK |

| **Motors for use with the 8000 series control system** | | | |
|---|---|---|---|
| C/D | 115vac 1 & 3ph 50/60hz | GA81 | DA |
| C/D | 230vac 1 & 3ph 50/60hz | GA82 | DB |

| MOTOR CABLE LENGTH | | | |
|---|---|---|---|
| MULTIPLE CABLES (D) | SINGLE CABLE (D) | | TYPE C |
| Not Supplied | A | A | A |
| 2 Metres | B | K | S |
| 3 Metres | X | Y | G |
| 5 Metres | C | L | T |
| 6 Metres | 6 | Q | Z |
| 7 Metres | | 7 | |
| 10 Metres | D | M | U |
| 12 Metres | | H | |
| 15 Metres | | R | J |
| 20 Metres | E | N | V |
| 25 Metres | F | P | W |

| PAINT FINISH | CODE |
|---|---|
| Standard White | A |
| Ad Light Grey BS381C/697 | B |
| Munsell Green N7.5 | C |
| R84890 Haze Grey | D |
| RAL 7001 | E |
| Storm Grey | F |
| Int Paint H725 | G |
| French Gry J724 BS381C/ 630 | H |
| Light Grey BS381C/631 | J |
| RAL 7000 Navy Grey ) (Bruno Peter Type 76) ) | K |
| Cream 20320 | L |
| Yellow RAL 1003 | M |
| Int Paint E459 | N |
| Black Dull RAL 9005 | P |
| Canadian Grey CL1647 | R |
| Lt W'work GRY BS381C676 | T |
| SWEDISH NAVY GREY | - U |
| NC S5005-R808 | |
| LIGHT GREY RAL 7035 | -V |
| Special Paint (see special instructions) | S |

| SPRAY | CODE |
|---|---|
| No Spray | 0 |
| Std Spray Fitted | 1 |
| Spray Std + Banjo | 2 |
| Spray Jet S/Steel | 3 |
| 150mm Spray Jet | 4 |
| SEE INST | S |

| MOTOR POSITION (viewed from outside) | CODE |
|---|---|
| Above Window Left | A |
| Above Window Right | B |
| Below Window Left | C |
| Below Window Right | D |
| Left Side Window Top | E |
| Right Side Window Top | F |
| Left Side Window Bttm * | G |
| Right Window Bottom * | H |

*NOTE * = NOT RECOMMENDED

| Wheels | CODE |
|---|---|
| Standard | - |
| Solid | SW |

| MOUNTING | CODE |
|---|---|
| Std Boss - 24 O/A (1588-057) | - |
| Boss - 26 O/A (1588-820) | B |
| Bracket (1588-870 - Type C) (1642-870 - Type D) | C |
| ~~Universal Carrier~~ (DO NOT USE) ~~(4588-874 & BRACKET)~~ | D |
| Boss - 64 O/A (1588-057-60) | E |
| Quick Release - No Plug (1642-468) | F |
| Quick Release and CVN Plug (1642-468) + (A-ELEC-701) | G |
| QUICK RELEASE ONLY (1588-647) | H |
| C-SHAPED BRACKET (1588-874 - Type C) (1642-874 - Type D) | J |

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3rd ANGLE PRO.

TOLERANCES UNLESS OTHERWISE STATED
DECIMAL DIMS. TO 2 PLACES ± 0.1mm.
DECIMAL DIMS. TO 1 PLACE ± 0.25mm
NO DECIMAL PLACES ± 0.5mm
ANGLES ± 1°

| MOD STATUS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | s1702 | 17.10.11 | 40 | S21993 | 15.12.16 | 35 | S7760 | 21.08.13 | | |
| 29 | S618 | 10.05.11 | 39 | S21025 | 14.12.16 | 34 | S6646 | 18.04.13 | | |
| 28 | S448 | 19.04.11 | 38 | S21726 | 24.11.16 | 33 | S6249 | 07.03.13 | | |
| 27 | 11-134 | 08.03.11 | 37 | S15178 | 30.07.2015 | 32 | s2930 | 16.03.12 | | |
| 41 | S23510 | 03.05.17 | 36 | S11968 | 16.10.2014 | 31 | S2641 | 15.02.12 | | |
| MAT'L:- | ISS. | DIN DATE | ISS. | DIN | DATE | ISS. | DIN | DATE | | |
| FINISH:- | SCALE:- | DRAWN:- DD | CHKD:- | | | CHANGED:- DD | | | | |

USED ON:



Wynn MARINE LIMITED
CHELTENHAM ENGLAND

TITLE:- STRAIGHT LINE WIPER UNIT PART NUMBER OPTIONS

DRAWING No. 1681-161

# SPARES ORDERING

EXAMPLE NUMBER

| D | 5 | 1 | 1 | 1 | 9 | B | 1 | A | 1 | 1 | A | 1 | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * | * | * | * | * | * | * | * | * | * | * | * | * | * |

| WIPER TYPE | CODE |
|---|---|
| D1 | -D1 |
| D2 | -D2 |
| D4 | -D4 |
| D5 | -D5 |
| C | -C1 |

| COVER / CASE | CODE |
|---|---|
| COVER | -1 |
| CASE | -2 |
| COVER old style C | -3 |
| COVER old style D | 4 |

| STROKE TYPE | CODE |
|---|---|
| Single | 1 |
| Twin | 2 |
| Special Twin Case (Non-std ctrs) | Q |
| Special Single (See Instructions) | S |
| Special Twin (See Instructions) | T |

| SINGLE STROKE LENGTH CODE | |
|---|---|
| INCHES | MM |
| 12 | 305 |
| 15 | 350 |
| 17 | 430 |
| 19 | 480 |
| 21 | 533 |
| 23 | 585 |
| 25 | 635 |
| 27 | 685 |
| 29 | 735 |
| 31 | 787 |
| 33 | 840 |
| 35 | 890 |
| 37 | 940 |
| 39 | 990 |
| 41 | 1040 |
| 43 | 1095 |
| 45 | 1145 |
| 47 | 1195 |
| 49 | 1245 |
| 51 | 1295 |
| 53 | 1335 |
| 55 | 1400 |
| 57 | 1450 |
| 59 | 1500 |
| 61 | 1560 |
| 63 | 1605 |
| 67 | 1700 |
| 71 | 1800 |
| 76 | 1930 |
| 79 | 2005 |
| 89 | 2260 |

| TWIN STROKE LENGTH STANDARD 1 INCH (25MM) STROKE OVERLAP | | |
|---|---|---|
| INCHES | MILLIMETRES | CODE |
| 2 X 13 | 2 X 330 | 13 |
| 2 X 14 | 2 X 356 | 14 |
| 2 X 15 | 2 X 380 | 15 |
| 2 X 16 | 2 X 407 | 16 |
| 2 X 17 | 2 X 430 | 17 |
| 2 X 18 | 2 X 457 | 18 |
| 2 X 19 | 2 X 480 | 19 |
| 2 X 20 | 2 X 510 | 20 |
| 2 X 21 | 2 X 533 | 21 |
| 2 X 22 | 2 X 558 | 22 |
| 2 X 23 | 2 X 585 | 23 |
| 2 X 24 | 2 X 610 | 24 |
| 2 X 25 | 2 X 635 | 25 |
| 2 X 26 | 2 X 660 | 26 |
| 2 X 27 | 2 X 685 | 27 |
| 2 X 28 | 2 X 710 | 28 |
| 2 X 29 | 2 X 735 | 29 |
| 2 X 30 | 2 X 760 | 30 |
| 2 X 31 | 2 X 787 | 31 |
| 2 X 32 | 2 X 810 | 32 |
| 2 X 34 | 2 X 865 | 34 |
| 2 X 36 | 2 X 915 | 36 |
| 2 X 40 | 2 X 1015 | 40 |
| 2 X 41 | 2 X 1040 | 41 |
| 2 X 43 | 2 X 1095 | 43 |
| 2 X 45 | 2 X 1145 | 45 |
| 2 X 47 | 2 X 1195 | 47 |
| 2 X 49 | 2 X 1245 | 49 |
| 2 X 52 | 2 X 1335 | 52 |
| 2 X 57 | 2 X 1450 | 57 |
| 2 X 61 | 2 X 1560 | 61 |
| 2 X 67 | 2 X 1700 | 67 |
| 2 X 71 | 2 X 1800 | 71 |
| 2 X 76 | 2 X 1930 | 76 |
| 2 X 79 | 2 X 2005 | 79 |
| SPECIAL TWIN | | ST |

(for twins , eg: 2x24" is shown as 24 with the 2 being stated at the previous part number digit)

| HEATER | CODE |
|---|---|
| No Heater | -0 |
| 24v Heater | -A |
| 115v Heater | -B |
| 220v Heater | -C |
| SEE INST | -S |

NOTE: HEATERS FITTED TO COVERS ONLY

| HEATER CABLE LENGTH | CODE |
|---|---|
| Not Supplied | -0 |
| 2 Metres | -1 |
| 3 Metres | -7 |
| 5 Metres | -2 |
| 6 Metres | -8 |
| 8 Metres | -9 |
| 10 Metres | -3 |
| 15 Metres | -A |
| 20 Metres | -4 |
| 25 Metres | -5 |
| Terminated in Enclosure | -6 |

## WIPER SPARE CASE/COVER PART NUMBERS

| PARKING CABLE LENGTH | CODE |
|---|---|
| Not Supplied | -0 |
| 2 Metres | -1 |
| 3 Metres | -7 |
| 5 Metres | -2 |
| 6 Metres | -8 |
| 8 Metres | -9 |
| 10 Metres | -3 |
| 15 Metres | -A |
| 20 Metres | -4 |
| 25 Metres | -5 |

| PARKING | CODE |
|---|---|
| Parking Not Fitted | 0 |
| **Standard Drive End Parking** | |
| Normally open ) Reed Switch (TYPE D) | - A |
| Normally open ) Reed Switch (TYPE C) | - B |
| Proximity Switch (TYPE D) | - J |
| **Non-Standard Drive End Parking** | |
| Proximity Switch (TYPE D) | - G |
| Reed Switch Change over (Special Type C) | - C |
| **Standard Idler End Parking** | |
| Normally open ) Reed Switch (TYPE D) | - D |
| Normally Open ) Reed Switch (Type C) ) | - E |
| **Non-Standard Idler End Parking** | |
| Proximity Switch (Type D) | - H |
| Reed Switch c/over (Special Type C) | - F |

| PAINT FINISH | CODE |
|---|---|
| Standard White | - A |
| Admiralty Light Grey | - B |
| Munsell Green N7.5 | - C |
| R84890 Haze Grey | - D |
| RAL 7001 | - E |
| Storm Grey | - F |
| Int Paint H725 | - G |
| French Grey J724 | - H |
| Light Grey BS381C | - J |
| RAL 7000 Navy Grey (Bruno Peter Type 76) | - K |
| Cream 20320 | - L |
| Yellow RAL 1003 | - M |
| Int Paint E459 | - N |
| Black Dull RAL 9005 | - P |
| Canadian Grey CL1647 | - R |
| RAL 7037 Dusty Grey | - T |
| SWEDISH NAVY GREY NC S5005-R808 | - U |
| LIGHT GREY RAL 7035 | -V |
| Special Paint (see special instructions) | - S |

| SPRAY | CODE |
|---|---|
| No Spray | - 0 |
| Std Spray Fitted | - 1 |
| Spray Std + Banjo | - 2 |
| Spray Jet S/Steel | - 3 |
| 150mm Spray Jet | - 4 |
| SEE INST | - S |

NOTE: SPRAY FITTED TO COVERS ONLY. NO SPRAY ON 80, B OR 48

| WINDOW HANDING | |
|---|---|
| Not Supplied | -0 |
| LEFT | -1 |
| RIGHT | -2 |

(above window)

| MOUNTING | CODE |
|---|---|
| Std Boss - 24 O/A (1588-057) | - |
| Boss - 26 O/A (1588-820) | B |
| Bracket (1588-870 - Type C) (1642-870 - Type D) | C |
| ~~Universal Carrier~~ (DO NOT USE) ~~(1588-874 & BRACKET)~~ | D |
| Boss - 64 O/A (1588-057-60) | E |
| Quick Release - No Plug (1642-468) | F |
| Quick Release and CVN Plug (1642-468) + (A-ELEC-701) | G |
| QUICK RELEASE ONLY (1588-647) | H |
| C-SHAPED BRACKET (1588-874 - Type C) (1642-874 - Type D) | J |

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3rd ANGLE PRO.

TOLERANCES UNLESS OTHERWISE STATED
DECIMAL DIMS. TO 2 PLACES ± 0.1mm.
DECIMAL DIMS. TO 1 PLACE ± 0.25mm
NO DECIMAL PLACES ± 0.5mm
ANGLES ± 1°

| MOD STATUS | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 30 | s1702 | 17.10.11 | 40 | S21993 | 15.12.16 | 35 | S7760 | 21.08.13 |
| | 29 | S618 | 10.05.11 | 39 | S21025 | 14.12.16 | 34 | S6646 | 18.04.13 |
| | 28 | S448 | 19.04.11 | 38 | S21726 | 24.11.16 | 33 | s6249 | 07.03.13 |
| | 27 | 11-134 | 08.03.11 | 37 | S15178 | 30.07.2015 | 32 | s2930 | 16.03.12 |
| | 41 | S23510 | 03.05.17 | 36 | S11968 | 16.10.2014 | 31 | S2641 | 15.02.12 |

MAT'L:-
FINISH:-
SCALE:-
DRAWN:- DD
CHKD:-
CHANGED:-

USED ON:



MARINE LIMITED
CHELTENHAM ENGLAND

TITLE:- STRAIGHT LINE WIPER COVER/CASE SPARES PART NUMBER OPTIONS

DRAWING No. 1681-161

# SERIES 6000 CONTROL SYSTEM

The Series 6000 Network Control System contains a conductive dome switch keypad and wiper motor control modules that are available for 24V DC motors, AC single phase single speed motors and AC three phase two speed motors.

## The Keypad

This is specially designed for marine applications and by using the latest modern electronics the system is very robust. The intermittent and wash cycle timings can be easily programmed from the keypad. The background illumination on the key icons can be dimmed to completely off.

Standard keypads are flush mounted into the Bridge Console, with one or two wiper speeds, three intermittent speeds, wash program, window and wiper case heat keys. Customised keypads are available on request.

**It is recommended that the Wynn supplied PSU is used to provide a regulated, stabilised and independent power source for the bus. If an existing ships 24V supply is to be used then it must be galvanically isolated with a DC to DC converter, this is to reduce the effects of noise on the 0V line from the ships supply interfering with the bus communications. Each independent control system should have its own power supply.**

## The AC Wiper Motor Modules

These have a mains operating voltage of 110 or 230v AC at 50~60Hz 1 phase or 3 phase.

The wiper motor control modules are extremely flexible in the combination of functions they may control. They are factory configured to provide most combinations of wiper, wiper heater, wash/purge system and window heat control.

The wiper motor control modules have a group address so wipers can be selectively controlled from the keypad. They are pre-set in production but can also be reset by the customer.

Power for the wiper, heater or wash system is taken directly to the wiper motor control module adjacent to the wiper unit, with a keypad flush mounted into the Bridge Console.

Wiper motor control modules may be configured with a single AC input providing power to Motor, Heater, Wash and Air Purge; or may be provided with mixed supplies for 230 V AC Motors and 24 V AC or DC Heaters.

Two Control Module Types are available: The 6100 for Single Phase motors and 6300 for Three Phase motors.

Most modules are available with two additional outputs for wash, purge, case/arm heat and window heat. The module can only be configured for a maximum of one of each type of output.

The standard 6100 module has standard two additional outputs.

The extended 6100 module has four additional outputs.

The standard 6300 module has no additional outputs.

The extended 6300 module has two additional outputs.

# The DC Wiper Motor Modules

These have an operating voltage of 24V DC.

**A regulated and stabilised power source is recommend for the motor 24V DC supply. .**

The wiper motor control modules have a group address so wipers can be selectively controlled from the keypad. They are pre-set in production but can also be reset by the customer.

The standard 6200 modules has only one additional output option. The output can be set by DIP switch for wash, purge, case/arm heat or window heat.

# System Compatibility and Requirements

The systems comply with ISO 60945 ESD, EMC and environmental specifications.

Bus wiring is must consist of a twisted pair for the communication lines (Bus+, Bus-) and a twisted pair for the power lines (24V, 0V). The cable must comply with the DeviceNet specification and the communication pair have a characteristic impedance of 120 Ohms.

The cable size is dependent on the distance between the first keypad and furthest wiper module:-

| **Bus Length** | **Min Cable Size** | |
|---|---|---|
| | **Power** | **Data** |
| Up to 100m | 1.5 mm² (15 AWG) | 0.96mm² (18 AWG) |
| Above 101m | 2.5 mm² (13 AWG) | 0.96mm² (18 AWG) |

A terminating resistor module must be connected into the communication lines at the first keypad and a terminating resistor module must be connected across the communication lines at the last module.

# Technical specifications

Input supply bus: 24Vdc +/- 2 V
Current consumption Keypad: 55mA
Current consumption Standard 6100/6300 Module: 65mA
Current consumption 6200 Module: 20mA
Current consumption Extended 6100/6300 Module: 110mA

# INSTALLING DEVICENET BUS CABLES

## *General Guidelines*

Bus cables should ideally be installed in their own steel cable channels or conduits. Plastic trunking provides no screening whatsoever: it is just a cable tidy. Basket type cable trays also do not provide screening.

If not installed in conduit bus cables should be brightly coloured and installed where they are clearly visible and separate from all other cables in order to improve any interference pickup and to avoid accidental damage.

When installing, it is important not to distort or damage bus cables since this can cause reflections to occur in the network. ***In particular, do not twist or stretch bus cables, do not squash or crimp them and adhere to the recommended minimum bend radius*** (typically stranded cables: 45mm for a single bend and 65mm for repeated bending).

## *Bus cable selection*

The bus cable must comply with the DeviceNet specification and the communication pair have a characteristic impedance of 120 Ohms. DeviceNet spec cables provide data & power combined.

The cable size is dependent on the distance between the first keypad and furthest wiper module:-

| **Bus Length** | **Min Cable Size** | |
|---|---|---|
| | **Power** | **Data** |
| Up to 100m | 1.5 mm² (15 AWG) | 0.96mm² (18 AWG) |
| Above 101m | 2.5 mm² (13 AWG) | 0.96mm² (18 AWG) |

Suitable cables for bus systems up to 100m are:-

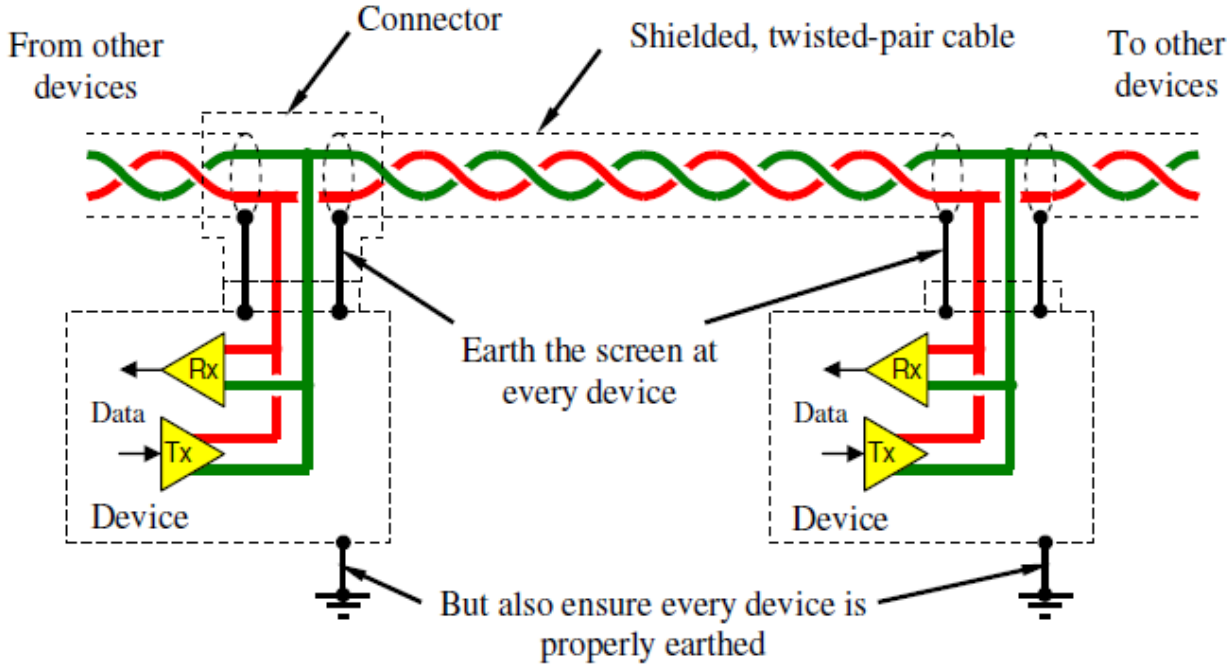
a) Belden 3082A
b) Leoni L45467-F21-W6
c) SAB DN 656 Trunk Cable Pt No 06562781
d) LAPP Unitronic Bus FD P DeviceNet Trunk Cable Pt No 2170 254
e) LAPP Unitronic FD P DeviceNet Thick Pt No 2170 344
f) LAPP Unitronic DeviceNet Thick Pt No 2170 340

Over 101m a separate, screened, power cable should be used.

***All factory and relevant approvals testing has been completed using Belden 3082A cable. This is our recommend cable to use.***

## *Screening balanced cables*

DEVICENET RS-485 transmission is balanced to improve noise rejection. Therefore we should earth the cable screen at both ends to ensure that it is effective at high frequencies. This is normally done by connecting the cable screen to the device earth via the connectors. However, we must make sure that the device is correctly earthed. Poor shielding or earthing is a very common wiring error.




## *Cable Segregation*

To reduce the chances of interference pickup, it is important that bus cables are run separately from other types of cable. It is useful to categorise various cable applications as follows:

*Category I:*

- Fieldbus and LAN cables (e.g. DeviceNet, Ethernet etc.).
- Shielded cables for digital data (e.g. printer, RS232 etc.).
- Shielded cables for low voltage (≤25V) analogue and digital signals.
- Low voltage power supply cables (≤60V).
- Coaxial signal cables

*Category II:*

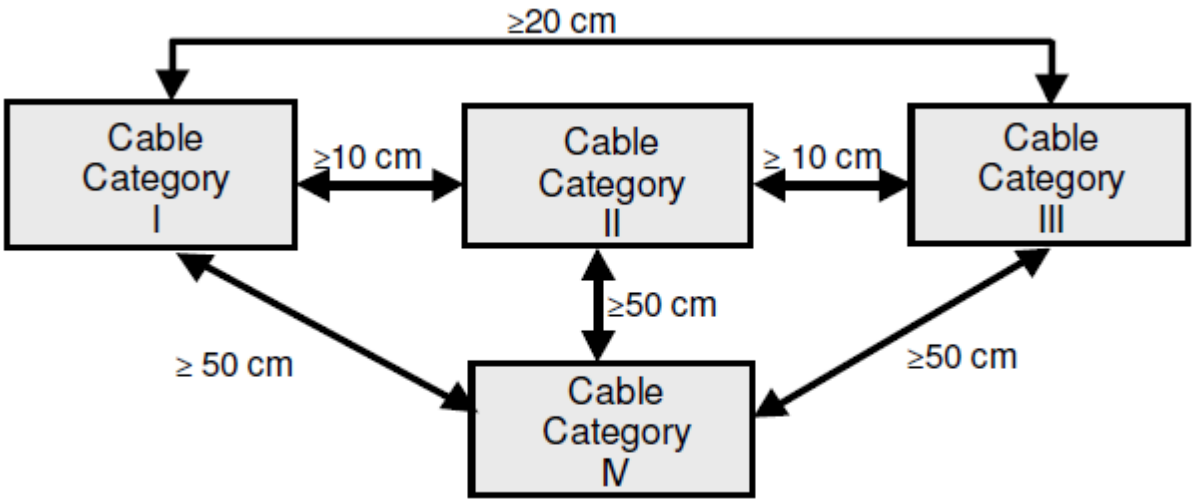
- Cables carrying DC voltages >60V and ≤400 V
- Cables carrying AC voltages >25V and ≤400 V

*Category III:*

- Cables carrying DC or AC voltages >400 V
- Cables with heavy currents.
- Motor/drive/inverter cables.
- Telephone cables (can have transients >2000V).

*Category IV:*

- Cables of categories I to III at risk from direct lightning strikes (e.g. connections between components in different buildings)

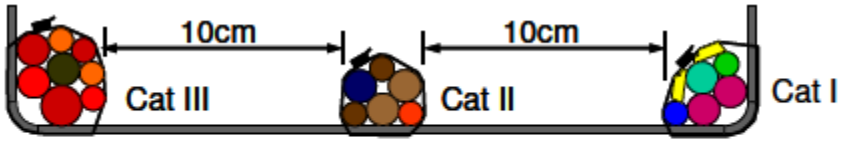



**Separation distances for cables of different category**

Sometimes it is impossible to adhere to the separation distances. Where cables have to cross, they should cross at right angles and should never run in parallel even for short distances.

## *Use of cable trays and channels*

Cables from the same category can be bundled together or laid directly beside each other in the same cable trays. Cables of different category must be separated by at least the distances shown.




**Cables mounted on a cable tray, rack or ladder must be separated by the recommended clearances**

## *Common RS-485 wiring errors*

It is common to find simple RS-485 wiring and layout errors in the field. The most frequently occurring errors are described below:

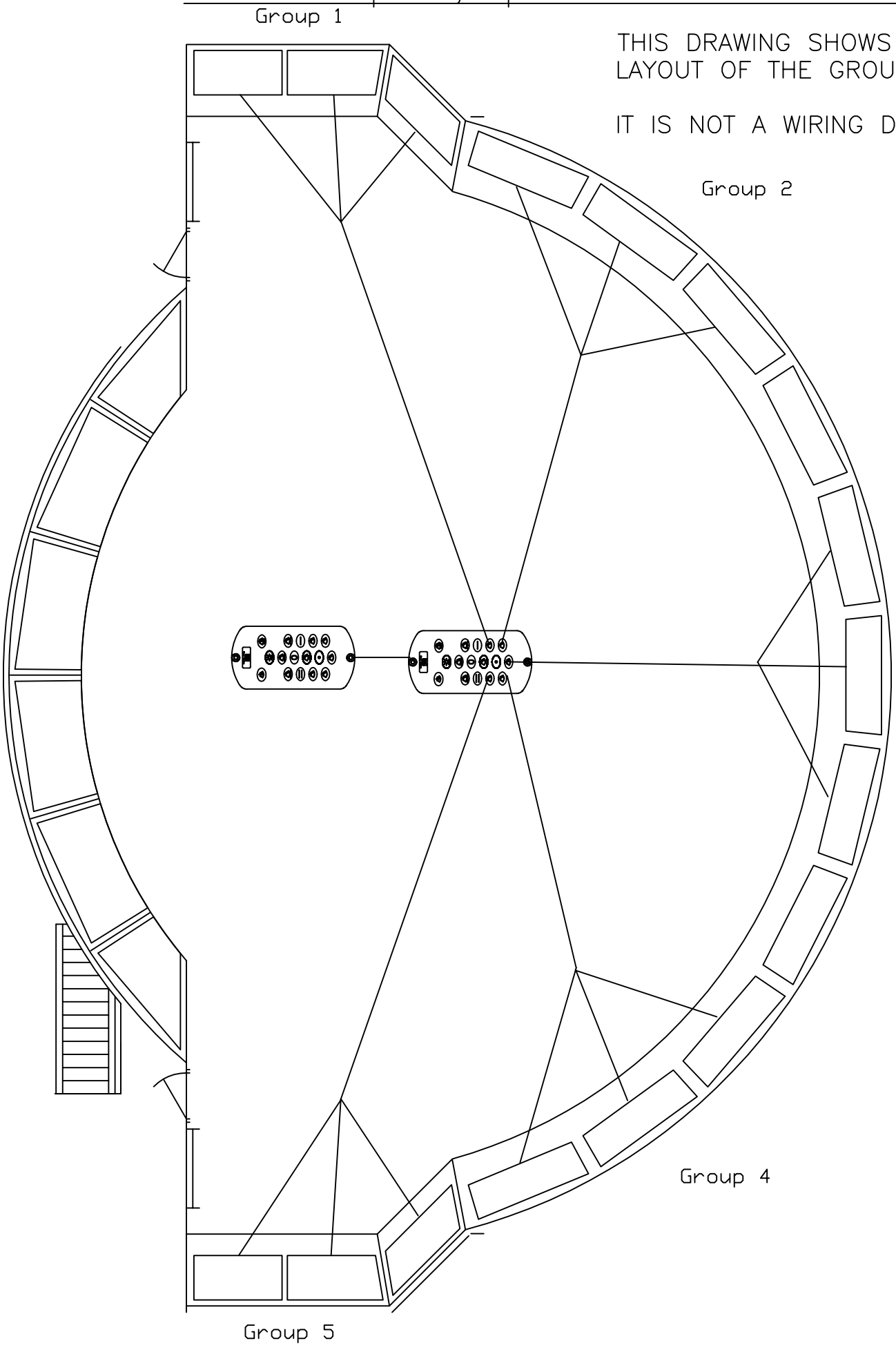
1. Termination problems:
   a. Lack of bus terminations (6000-TR120) at the end of the bus.

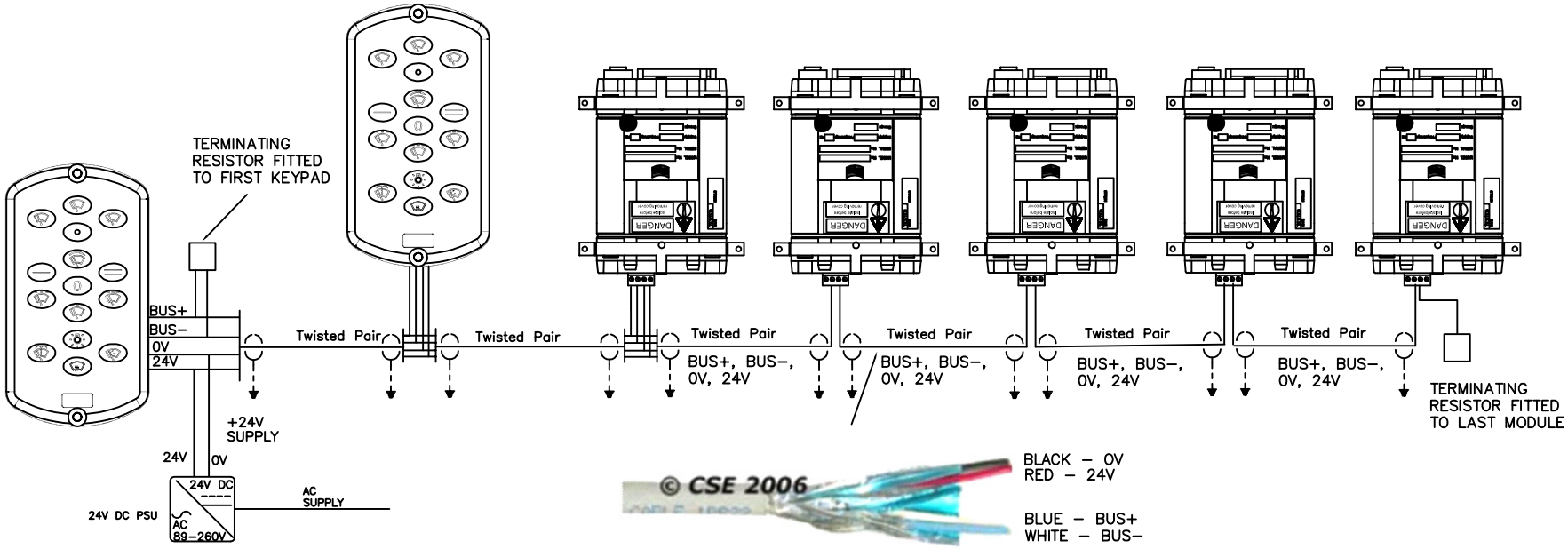
2. Pickup and interference caused by:
   a. Laying bus cables too close to electrically noisy power cables or equipment.
   b. Lack of proper earthing of the cable screen at every device.

3. Wiring problems:
   a. Wrong cable used.
   b. Damaged cable (including squashed, over-bent)
   c. Swapped cores at a device
   d. Un-earthed screen (not connected at every device, un-earthed devices etc.)

# TYPICAL BRIDGE LAYOUT

## With slave panel, upto a maximum of 6 slaves.






CABLE SCREEN MUST BE CONNECTED TO EARTH AT ALL CONNECTION POINTS

| Total Bus Length | Min Cable Size | | Notes |
|---|---|---|---|
| | Power | Data | |
| Up to 100m | 1.5 mm² (15 AWG) | 0.96mm² (18 AWG) | See note 1 |
| Above 101m | 2.5 mm² (13 AWG) | 0.96mm² (18 AWG) | See note 2 |

Notes

1. DeviceNet spec cables provide data & power combined. Suitable cables are:-
   a) Belden 3082A
   b) Leoni L45467-F21-W6
   c) SAB DN 656 Trunk Cable Pt No 06562781
   d) LAPP Unitronic Bus FD P DeviceNet Trunk Cable Pt No 2170 254
   e) LAPP Unitronic DeviceNet FD Thick Pt No 2170 344
   f) LAPP Unitronic DeviceNet Thick Pt No 2170 340
2. Separate power and data cables should be used.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3rd ANGLE PROJ. | | | | | | | 5 | | 11.2.09 | MOD STATUS | THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED. |
| TOLERANCES UNLESS OTHERWISE STATED<br>DECIMAL DIMS. TO 2 PLACES ± 0.1mm.<br>DECIMAL DIMS. TO 1 PLACE ± 0.25mm<br>NO DECIMAL PLACES ± 0.5mm<br>ANGLES ± 1° | | | | 9 | | 17.09.13 | 4 | | 14.5.08 | | |
| | | | | 8 | | 28.06.12 | 3 | | 26.5.05 | | WYNN MARINE LIMITED<br>CHELTENHAM ENGLAND |
| | | | | 7 | | 11.1.10 | 2 | | 16.5.05 | | |
| | | | | 6 | | 11.2.09 | 1 | | 2.12.04 | | TITLE:- 6000 Series Module Connections |
| MAT'L:- | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE | | |
| FINISH:- | SCALE:- NTS | | DRAWN:- JR | | CHKD:- | | CHANGED:- | | | | DRAWING No. EL–6000–BUS |

# INSTALLATION OF SHIELDED TWISTED PAIR CABLE

*Belden DeviceBus ® for ODVA DeviceNet*


- ODVA Class 2 Thick
- 15 and 18 AWG Stranded Tinned Copper
- 100% individually foil shielded + overall 65% TC Braid
- Drain Wire
- PVC Insulation (Power)
- FPE Insulation (data)
- Lt Gray sunlight / oil resistant PVC jacket
- Temp Rating 75°C
- **Conductor (stranding) Diameter Nom. DCR** - (2) 15 AWG TC (19 x 28) 3.6 Ω/ 1000 ft
- **Conductor (stranding) Diameter Nom. DCR** - (2) 18 AWG TC (19 x 30) 6.9 Ω/ 1000 ft, Nom. Characteristic Impedance 120 Ω, Nom. Capacitance Conductor to Conductor 12 pF/ft
- **Shielding materials Nom. DCR** - 100% individual foil + overall 65% TC braid 1.8 Ω/ 1000 ft,
- **Nominal OD** - 0.48", 12.19mm

This guide is based on the use of Belden 3082A cable (or similar, see specification above).

The cable is made up of a 15AWG power pair (red/black) and a 18AWG data pair (blue/white), each pair is individually foil screened with a drain wire, and an overall shielding braid.

In line with IEC 61000-5-2 the screen needs to be terminated at both ends of the cable.

The cable should be prepared as follows:-

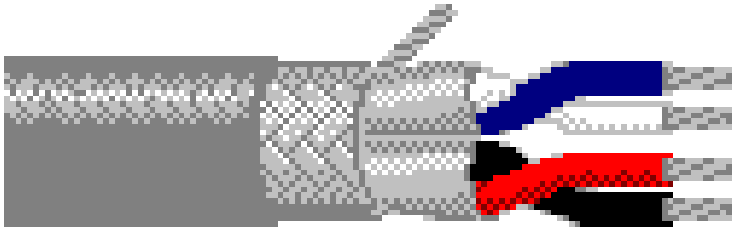
1. Strip the outer insulation back 50mm

2. Carefully peel back the braid and twist to form a conductor.

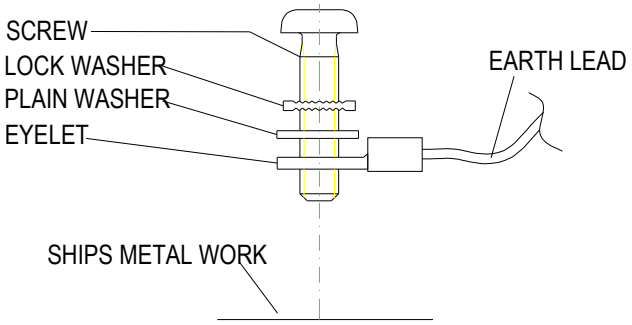
3. Remove the foil insulation leaving 5mm showing.

4. Untwist each pair and strip back insulation on each conductor 5mm and twist strands together.

5. Twist the braid conductor and drain wire together and terminate with an eyelet. The cable should now look something like this:

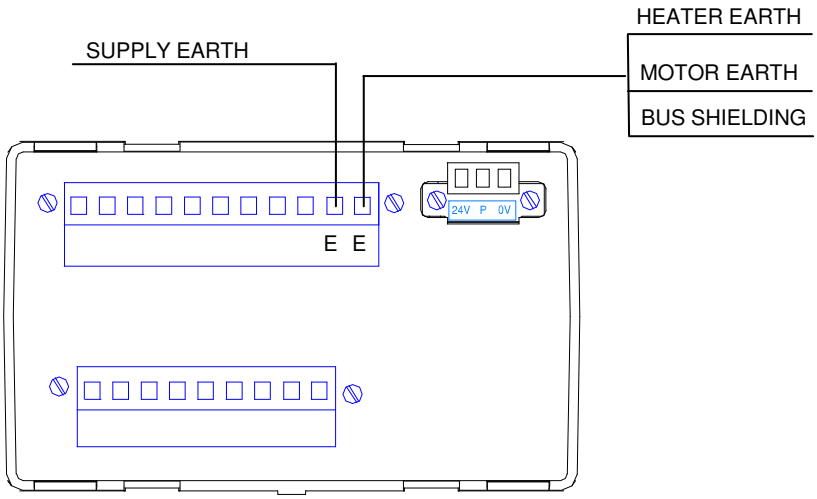


6. Secure the eyelet to the ships metal work using a suitable self-tapping screw, lock wash and plain washer, applying silicon grease to the surface prior to fitting. This is the preferred method.




If the ships hull is non metallic or if there is no suitable earth bonding point is available then an alternative is to connect the braid to an appropriate point on the earth system, such as the control module earth located at the opposite end on the module.

The control module earths can only accommodate two connections, so if more than two earths are required to be connected to the module they must be joined together with a suitable connector and then a fly lead connected to the control module.




7. Connect the conductors to the keypad/module 4 way bus connector as follows:

| Bus Connection | Colour |
|---|---|
| 24V Power | Red |
| 0V Power | Black |
| Bus - | White |
| Bus + | Blue |

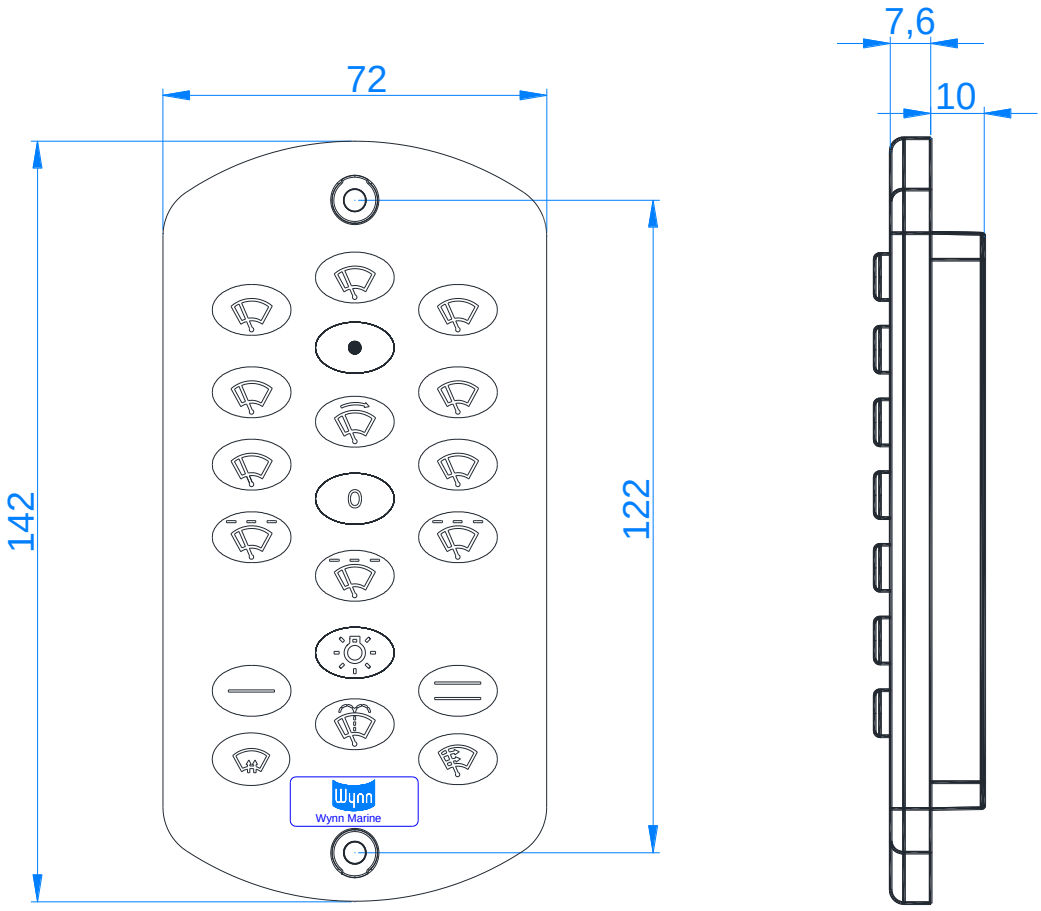
# 6500 KEYPAD

## Technical specifications

| | |
|---|---|
| Input supply | 24VDC – From Bus |
| Maximum number of groups | 7 |
| Number of Auxiliary controls | 4 |
| Technology | Conductive Dome Switch |
| Communications | RS485 |
| Illumination | 2 colour LED – Fully dimmable |

### *Keypad Dimensions*

The overall keypad dimensions are shown in the diagram below.



**The 6500 keypad must be panel mounted, but can be in any plane it is important to ensure access can be gained to the rear connectors.**

**The 4-way connector mounted on the rear of the keypad enclosure accept a Phoenix Contact style plug with screw terminals.**

**The 4-way connector is for the bus connection.**

**There are no adjustable or user-serviceable parts within the keypad.**

**WARNING!**
**The Keypad module is a low voltage (24V DC) module – It has been designed to withstand bus wiring errors without damage but any voltage over 40V dc applied to the unit will destroy it and will void any warranty.**

**Installation procedures must be carried out with care, to ensure correct and safe operation. If you are in any doubt, consult qualified and competent engineering personnel, or consult Wynn Marine technical support (contact details on front and rear cover of this document).**

**A Termination resistor (6000-TR120) must be connected to the first keypad in the bus line only.** ***(Supplied with keypad)*** **On multiple keypad systems all other keypads are connected directly onto the bus without the termination resistor.**

**A Termination resistor (6000-TR120)** ***(Supplied with keypad)*** **must be connected to the last module on the bus.**

**Only connect the devices to the bus, power and outputs when you are sure the wiring is correct. Connect the plug firmly. Make all connections with the power off.**

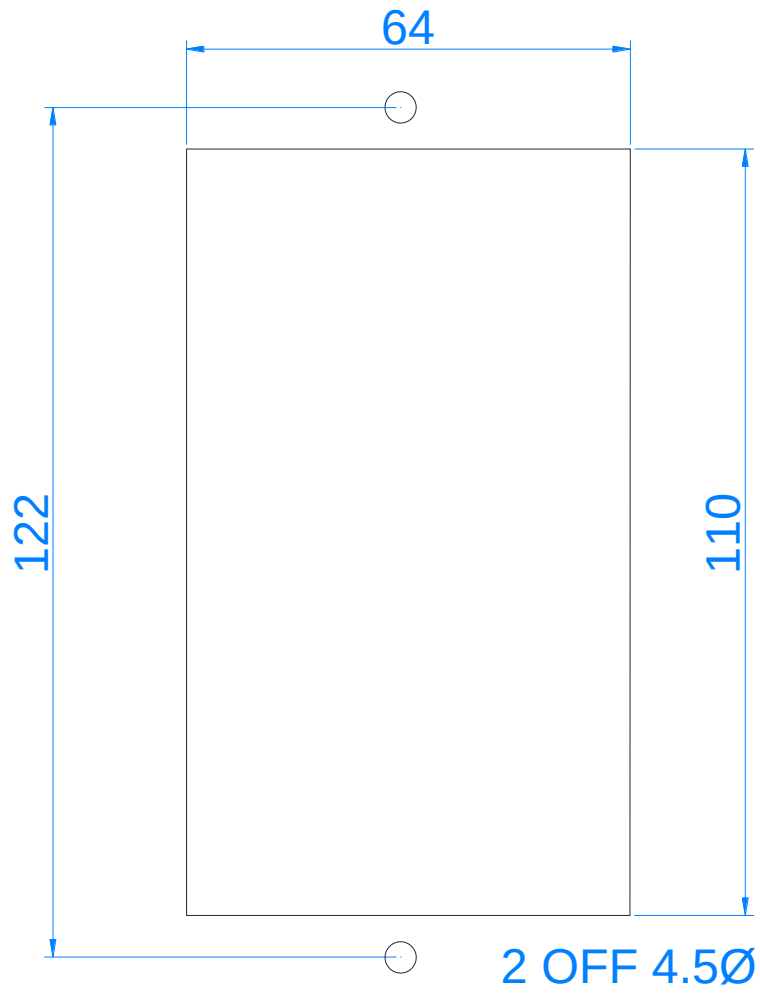
# INSTALLATION INSTRUCTIONS

**IMPORTANT**
**Installation procedures must be carried out with care, to ensure correct and safe operation. If you are in any doubt, consult qualified and competent engineering personnel, or consult Wynn Marine technical support (contact details on front and rear cover of this document).**

### *Ref Figure - Panel Cut-Out Requirements*

1. Provide a cut out in console for keypad according to dimensions.

*Panel Cut-Out Requirements*

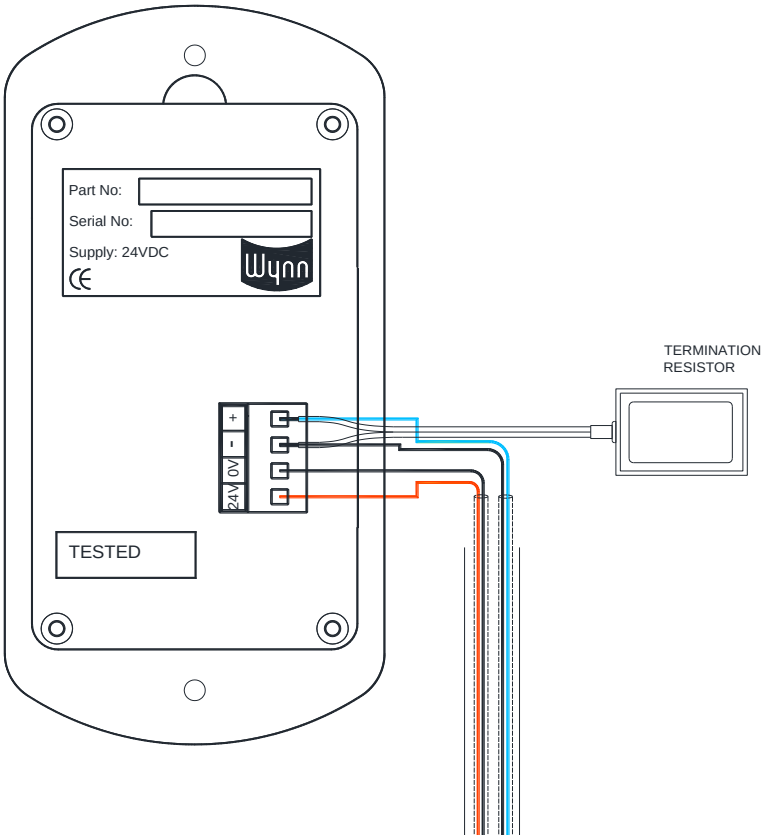



### *Ref Figure - Keypad Dimensions*

2. The key pad is secured to the panel by M4 fixings (not supplied):

   M4 x 12 pan-head screw (2 off, inserted through front of keypad)
   M4 plain washer (2 off)
   M4 shake-proof washer (2 off)
   M4 nut (2 off, to rear of mounting panel)

## *Connection Details*




3. Connect termination resistor and bus cable to 4-way connector.
   ***In accordance to wiring diagram.***

4. Fit connector into keypad. (Ref notes above).

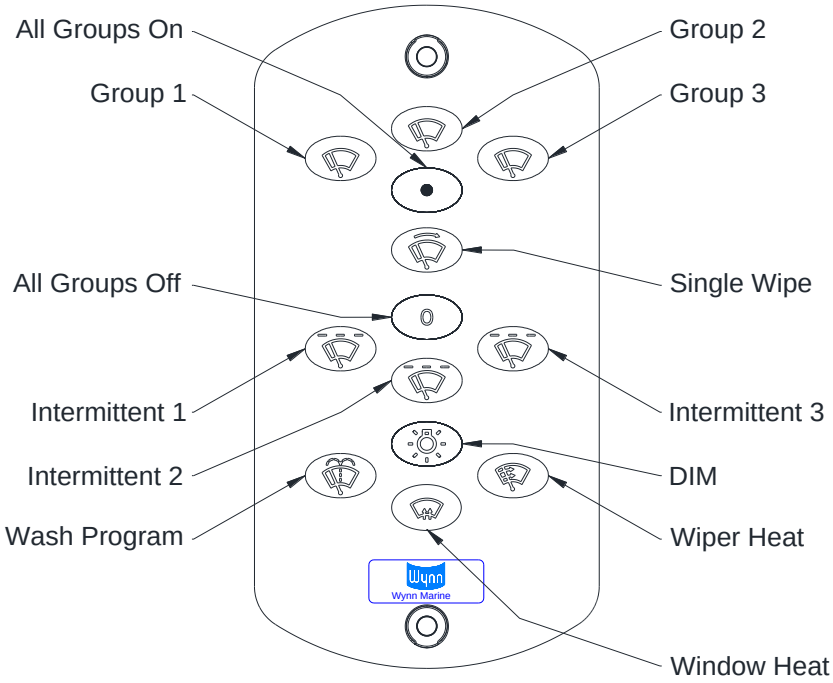
# 6500 KEYPAD OPERATION

The 6500 Keypad is a component part of the Wynn Marine 6000 Series of screen control devices. The keypad is the user-interface to the 6000 system, enabling all devices to be controlled from one or more keypads.

## User Operational Description

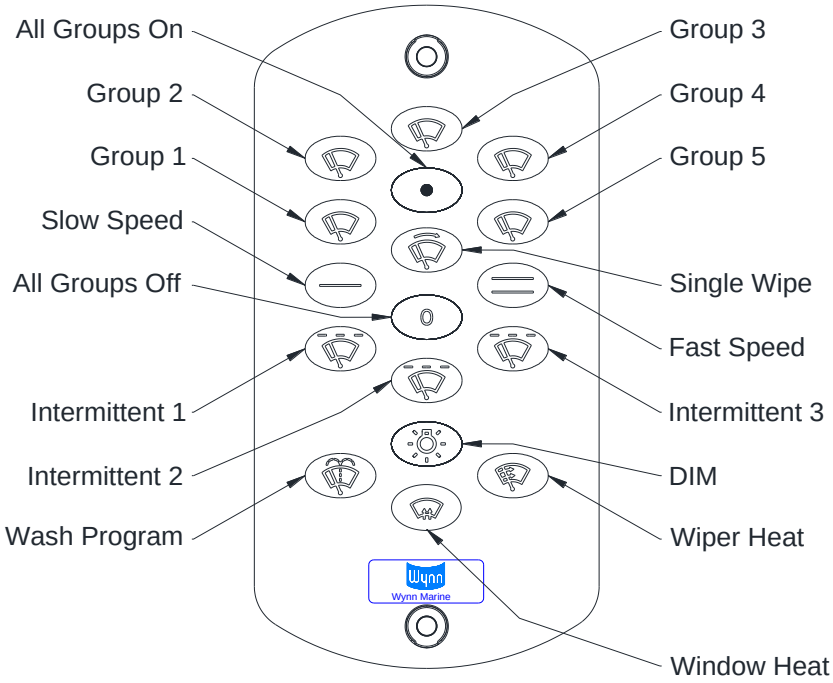
This section describes end-user operation of the System 6000 Keypad in normal usage.

The diagram below shows a typical 6500 Keypad layout (three-way, one-speed) and the names given to the keys.



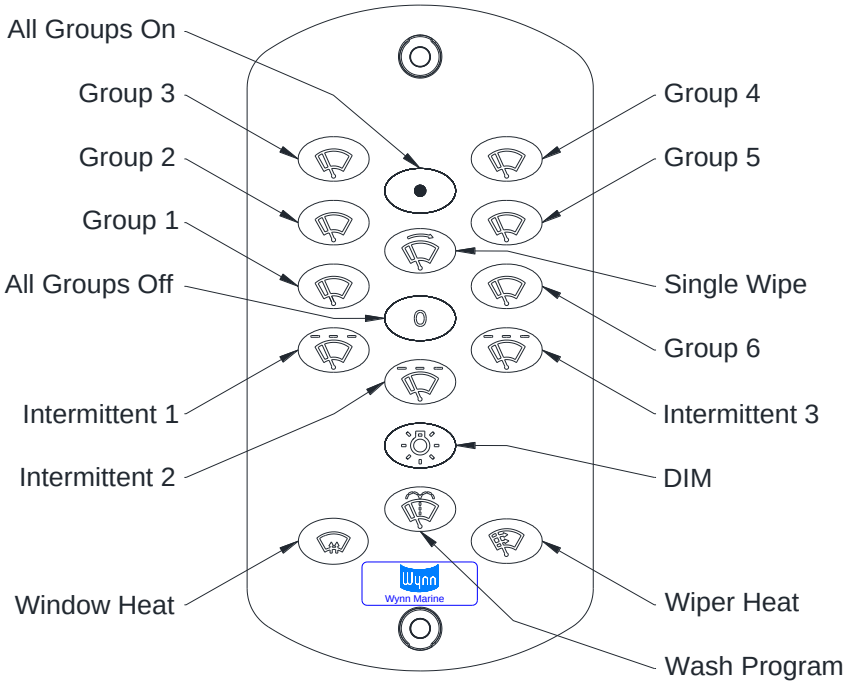

**Keypad Icons 2-5 Way One Speed Keypads**

The diagram below shows a typical 6500 Keypad layout (five-way, two-speed) and the names given to the keys.



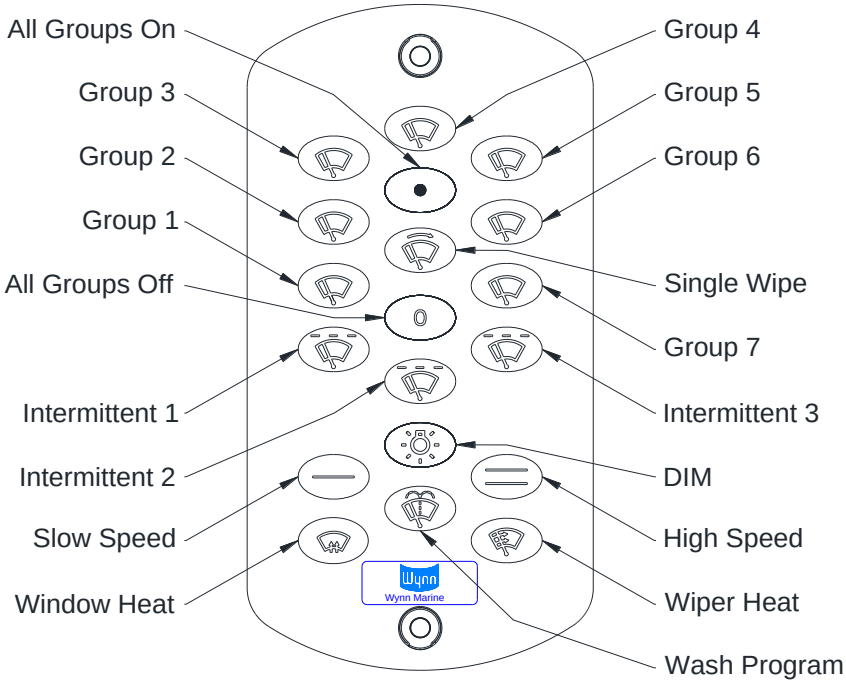

**Keypad Icons 2-5 Way Two Speed Keypads**

The diagram below shows a typical 6500 Keypad layout (six-way, one-speed) and the names given to the keys.




## Keypad Icons 6-7 Way One Speed Keypads

The diagram below shows a typical 6500 Keypad layout (seven-way, two-speed) and the names given to the keys.




## Keypad Icons 6-7 Way Two Speed Keypads

On power being supplied to the keypad, all icons will turn **GREEN** to show availability.
When in operation, icons will turn **RED** to show those in use.

If the **DIM** key is illuminated red, it indicates the keypad is arbitrating for the control bus. Wait for the **DIM** key to extinguish before attempting to use the keypad.

# Description and Operation of Keypad

| Icon | Description | Operation |
|---|---|---|
|  | Individual Wiper Group | ***Press -*** turns group on in normal speed.<br>Group icon turns **RED**<br>***Press -*** while running, turns group off. **RED** light turns **GREEN** |
|  | All Wiper Groups - Turn Off | ***Press -*** while running turns all groups off.<br>**RED** lights turns **GREEN** |
|  | All Wiper Groups - Turn On | ***Press -*** turns all groups on in normal speed.<br>Group icons turns **RED** |
|  | Single wipe | ***Press -*** turns all groups on for single wipe in normal speed<br>*(does not affect any group already wiping)* |
|  | Low Speed | ***Press -*** followed by ***group icon*** or ***all group icon*** turns group(s) on in low speed or to low speed if in any other setting<br>Icon will turn **RED** whilst icons pressed ***Group icon(s)*** turn **RED**<br>***Press -*** while running, turns ***group icon(s)*** off. **RED** light turns **GREEN** |
|  | High Speed | ***Press -*** followed by ***group icon*** or ***all group icon*** turns group(s) on in high speed or to high speed if in any other setting<br>Icon will turn **RED** whilst icons pressed ***Group icon(s)*** turn **RED**<br>***Press -*** while running, turns ***group icon(s)*** off. **RED** light turns **GREEN** |
|  | Heated Wiper | ***Press -*** turns all heated wipers on.<br>*Heated Wipers = heated unit and/or heated arm and/or heated wash jet)*<br>Heated wiper icon turns **RED**<br>***Press -*** while on, turns all heated wipers off. **RED** light turns **GREEN** |
|  | Heated Screen | ***Press -*** turns on all heated screens.<br>Heated wiper icon turns **RED**<br>***Press -*** while on, turns all heated screens off. **RED** light turns **GREEN** |
|  | Intermittent 1 | ***Press -*** followed by ***group icon*** or ***all group icon*** turns group(s) on in/to intermittent wipe- short delay *(Default - 8 second interval between wipes)*<br>Icon turns **RED** and ***group icon(s)*** turn **RED**<br>***Press -*** while running, turns intermittent wipe off. **RED** light turns **GREEN** |
|  | Intermittent 2 | ***Press -*** followed by ***group icon*** or ***all group icon*** turns group(s) on in/to intermittent wipe- long delay *(Default - 12 second interval between wipes)*<br>Icon turns **RED** and ***group icon(s)*** turn **RED**<br>***Press -*** while running, turns intermittent wipe off. **RED** light turns **GREEN** |
|  | Intermittent 3 | ***Press -*** followed by ***group icon*** or ***all group icon*** turns group(s) on in/to intermittent wipe- long delay *(Default - 16 second interval between wipes)*<br>Icon turns **RED** and ***group icon(s)*** turn **RED**<br>***Press -*** while running, turns intermittent wipe off. **RED** light turns **GREEN** |
|  | Dim | ***Press -*** repeatedly to cycle through from maximum brightness to off, then back to maximum brightness.<br>Stop pressing icon at required brightness |
|  | Wash | ***Press -*** followed by ***group icon*** or ***all group icon*** starts wash cycle<br>Wash icon turns **RED** and ***group icon(s)*** turn **RED**<br>***Press -*** while in cycle terminates wash cycle. **RED** light turns **GREEN**<br>*On installations with air-purge, purge will be activated as part of wash cycle.* |

*Default timings for wash cycle*

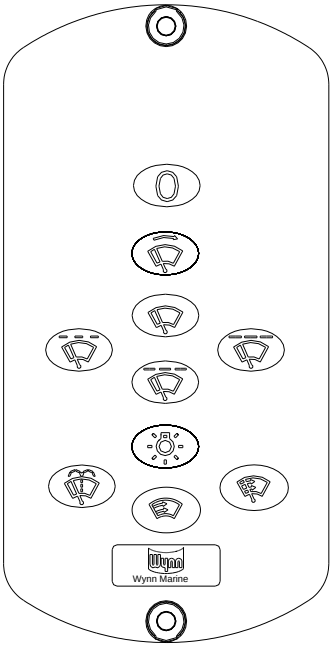
Water is sprayed onto screen for 10 seconds. Wiper starts five seconds after ***group icon*** or ***all group icon*** is pressed and wipes for a period of fifteen seconds.

If Air-purge fitted

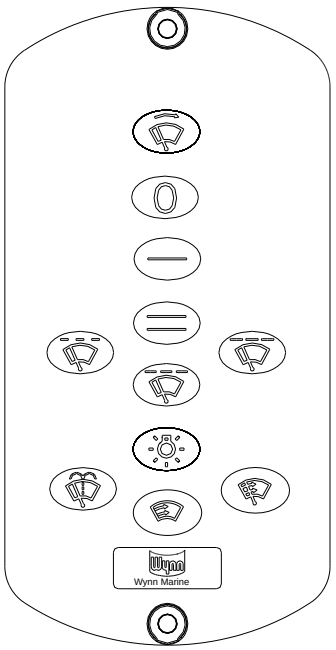
After completion of water spray period, air purge is activated for five seconds. Wiper continues for a period after end of air purge.

# KEYPAD CONFIGURATIONS

The Keypad may be supplied in a number of formats; from one-way/group to seven-way/group, and single-speed or two-speed. The following diagrams show the layouts for all formats. The Group buttons are labelled for illustrative purposes only.



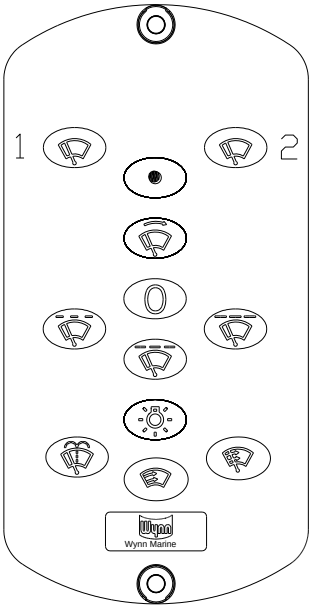

1 way, single speed



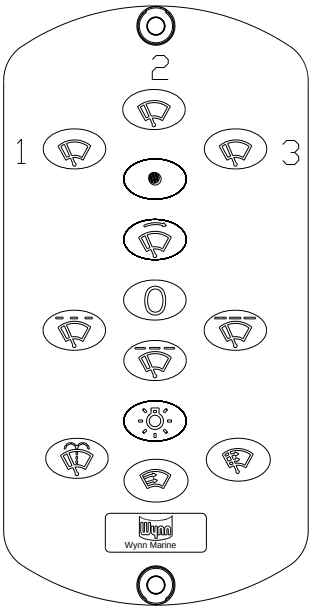

1 way, two speed

*Single Group Format*

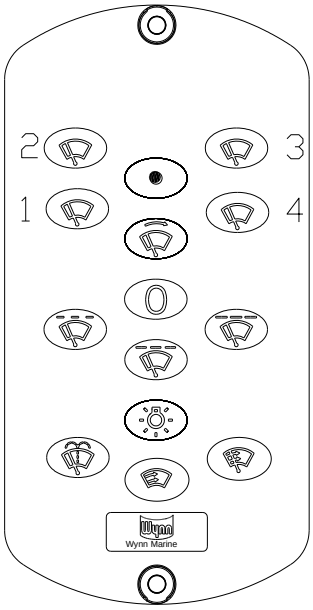
Note: Greyed keys may or may not be present, depending on how the Keypad is specified.



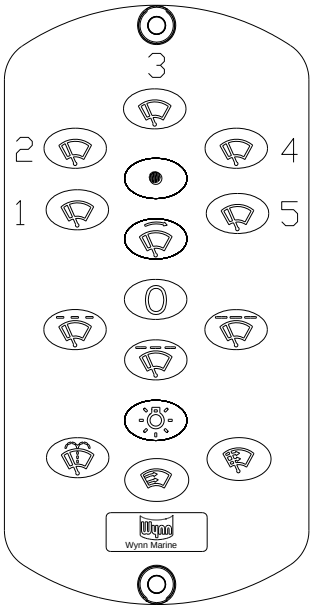

2 way, single speed



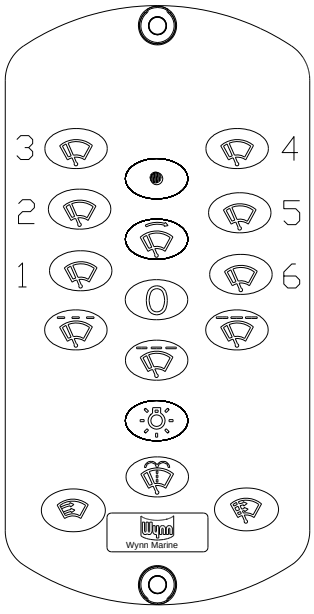

3 way, single speed



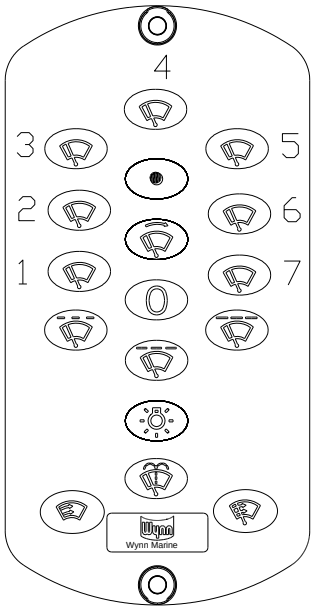

4 way, single speed




5 way, single speed



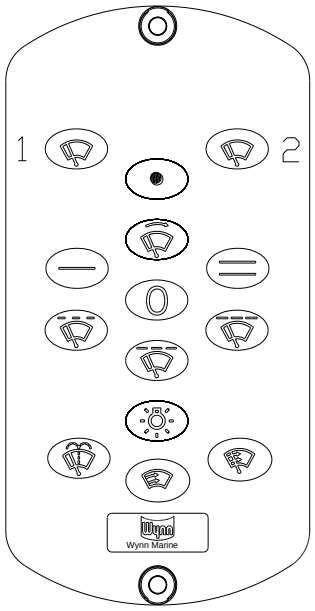

6 way, single speed



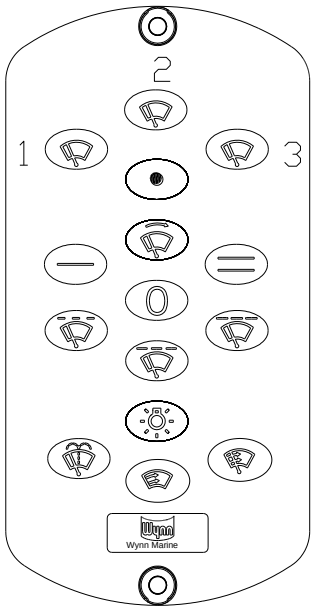

7 way, single speed

*Multi-Group, single-speed format*

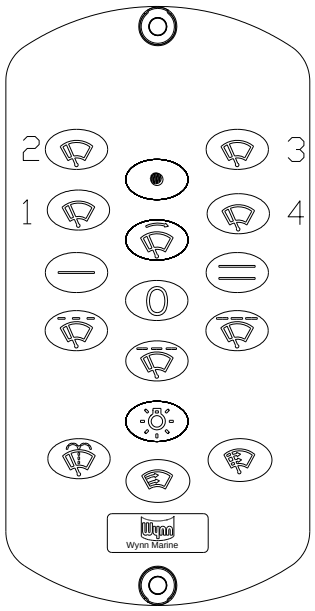
Note: Greyed keys may or may not be present, depending on how the Keypad is specified.



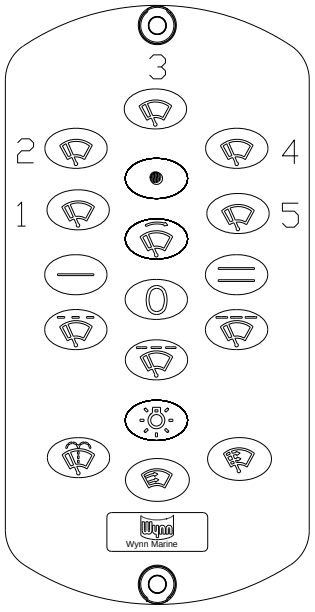

2 way, two speed



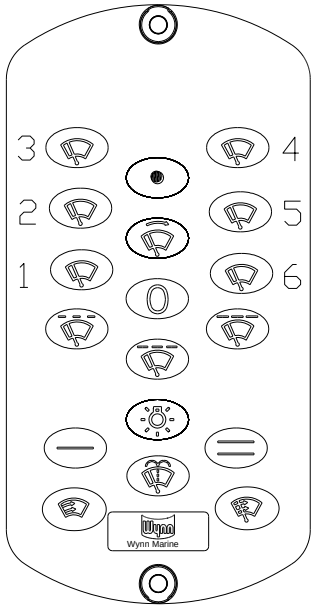

3 way, two speed



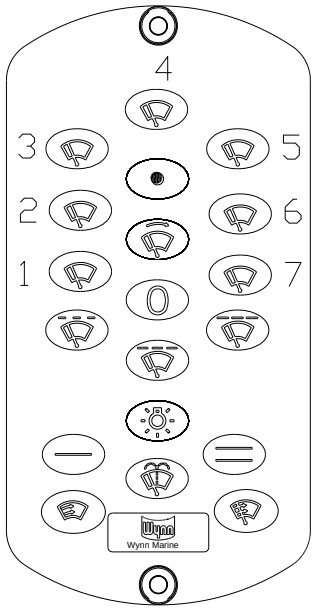

4 way, two speed




5 way, two speed




6 way, two speed




7 way, two speed

*Multi-Group, two-speed format*

Note: Greyed keys may or may not be present, depending on how the Keypad is specified.

# 6500 KEYPAD USER-PROGRAMMING

## Introduction

**The 6000 system features a user-programmable set-up mode, enabling the end-user to configure the system to requirements. In Set-up mode, the user can:**

- Programme the wiper intermittent periods

- Programme the wash cycle timing (wash period and optional air purge period).
- Select wash with-or-without wipe and programme wipe delay and wipe hold times.
- Set all groups or individual-group wash cycle timings (multi-way systems only).

- Restore default wiper intermittent rates and wash cycle timings.

**The following sections describe how to enter and exit set-up mode, and how to programme the system to the user's requirements.**

### *Entering and Exiting User Set-Up Mode*

**NOTE**
**On power up, the 6500 keypad will operate normally.**

| | USER KEY-SEQUENCE | LED INDICATION | RESULTING ACTION |
|---|---|---|---|
| **First Step** | DIM ☼ & WIPER OFF 0 | DIM LIGHT FLASHES | Enter user set up mode. |
| **Programmable Steps as Required** | *With reference to the following charts for setting Intermittent Periods; All Groups or Individual-Group Wash Cycle Timings; Wash/Air Purge with Extended Wipe; and restoration of Factory Default:* | | |
| **Last Step** | DIM ☼ & WIPER OFF 0 | DIM LIGHT GREEN | User set up mode exited. |

**IMPORTANT**
**The system will not exit set-up mode if programming of intermittent periods or wash cycle is not complete. User must complete programming before system will allow itself to return to the normal operating mode.**

## *Programming the Intermittent Periods*

**The default intermittent rates are 8, 12, and 16 seconds for intermittent keys INTERMITTENT 1 , INTERMITTENT 2 , and INTERMITTENT 3 respectively.**

*To Programme a new Wiper Intermittent Period*

| | USER KEY-SEQUENCE | LED INDICATION | RESULTING ACTION |
|---|---|---|---|
| **Step 1** | DIM & WIPER OFF 0 | DIM LIGHT FLASHES | Enter user set up mode. |
| **Step 2** | INTERMITTENT or or | CORRESPONDING LIGHT FLASHES | All groups will perform a single wipe. |
| | ***Wait until next wipe is required*** *- (time from first wipe to second wipe is stored)* | | |
| **Step 3** | INTERMITTENT or or | CORRESPONDING LIGHT EXTINGUISHES | All groups will perform a single wipe at new time. |
| **Step 4** | DIM & WIPER OFF 0 | DIM LIGHT GREEN | User set up mode exited. |

**NOTE**
**Settings are stored in the non-volatile memory of the system. They are retained even if the power is removed from the system. Previous intermittent rates are overwritten.**

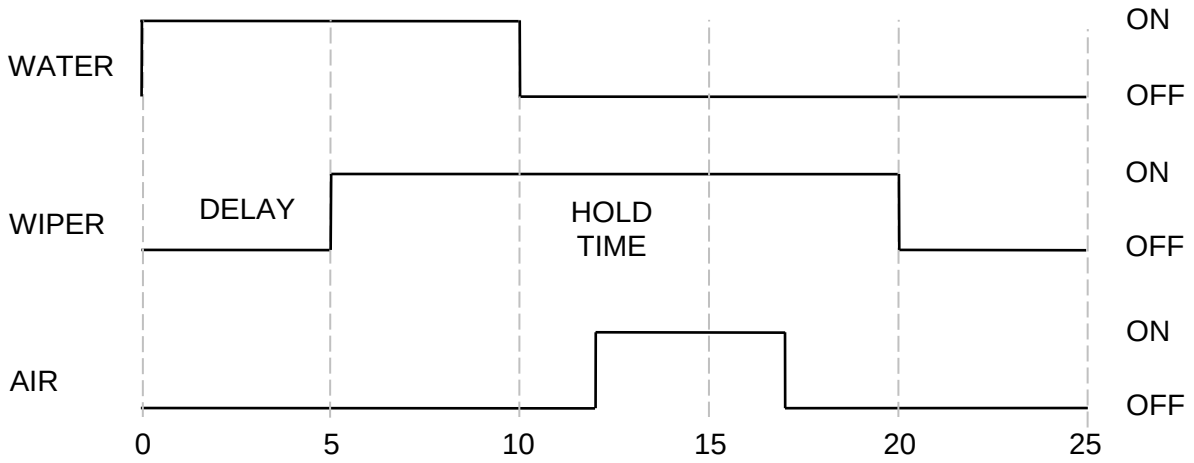
**Maximum period for any intermittent parameter is fifty seconds. If user does not press INTERMITTENT key for a second time within fifty seconds, the programming is aborted and no change is made to the settings.**

## *Wash Cycle Timings*

**A wash cycle comprises of a screen wash followed by an air-purge (if present in the system). Optionally the wiper will start after a delay and continue wiping during the remaining wash and air-purge.**

**The default wash cycle timings are as follows:**

- Inclusive Wash [On]
- Wash time [10 seconds]
- Air purge time [5 seconds] *(Starts after wash finishes)*
- Wipe with Wash [On]
- Wipe delay [5 seconds] *(Starts 5 seconds after wash starts)*
- Wipe hold time [15 seconds] *(Finishes after wash and purge finish)*



## *Programming the Wash Cycle Timings*

A group can be programmed so that its wash cycle timings are determined by *all-inclusive* wash cycle timings, which operate on all groups, or by *individual* wash cycle timings which operate on a single group only.

By default, the wash timings of groups are determined by *all-inclusive* wash cycle timings.

**NOTE**
**Settings are stored in the non-volatile memory of the system. They are retained even if the power is removed from the system. Previous wash cycle periods are overwritten.**

**Maximum period for any wash cycle parameter is fifty seconds. If user does not press an APPROPRIATE KEY within the fifty seconds period, the programming is aborted and no change is made to the settings.**

## *Programming a Wash/Air Purge with Extended Wipe Cycle*

The following table describes the key steps required to program the keypad for a wash/air purge cycle with extended auto-wipe.

*To Programme a Wash/Air Purge with Extended Wipe Cycle*

| | USER KEY-SEQUENCE | LED INDICATION | RESULTING ACTION |
|---|---|---|---|
| **Step 1** | DIM & WIPER OFF 0 | DIM LIGHT FLASH | Enter user set up mode. |
| **Step 2** | WASH | WASH LED RED | |
| **Step 3** | GROUP or | GROUP LED ON | Wash ON |
| **Step 3** | ALL GROUPS • (Ref Note 1) | ALL GROUP LEDs ON | Wash ON |
| | ***Wait until enough water is on the screen*** | | |
| **Step 4** | SINGLE WIPE (Ref Note 2) | SINGLE WIPE LED ON | Wiper ON |
| | ***Wait until wiper has cleaned screen*** | | |
| **Step 5** | WASH | Group LEDs FLASH | Wash OFF, [Purge ON] |
| | ***Wait until enough air has cleared water from the wash jets*** | | |
| **Step 6** | WASH | Group LED OFF | [Purge OFF] |
| | ***Wait until wiper has cleaned remaining water from screen*** | | |
| **Step 7** | WIPER OFF 0 | WASH & SINGLE WIPE LEDs OFF | Wipe OFF.<br>Wash-on, Purge-on, Wipe delay, and Wipe-hold times are SAVED |
| **Step 8** | DIM & WIPER OFF 0 | DIM LIGHT GREEN | User set up mode exited. |

**NOTE 1**
**ALL GROUPS • key is pressed only on multi-way keypads.**

**NOTE 2**
**SINGLE WIPE key starts the wipers which will remain ON until the WIPER OFF 0 key is pressed (step 7). Its behaviour differs from that in normal operating mode.**

**NOTE 3**
**If the group has an air purge unit present, it will be activated by this cycle.**

## *Restoring Default Intermittent Wipe and Wash Cycle Timings*

The user may restore the default settings for intermittent wipe periods and wash cycle timings.

*To restore default settings*

| | USER KEY-SEQUENCE | LED INDICATION | RESULTING ACTION |
|---|---|---|---|
| **Step 1** | DIM ☼ & WIPER OFF 0 | DIM LIGHT FLASH | Enter user set up mode. |
| **Step 2** | SINGLE WIPE & WIPER OFF 0 | DIM LIGHT FLASH | Default settings restored. |
| **Step 3** | DIM ☼ & WIPER OFF 0 | DIM LIGHT GREEN | User set up mode exited. |

**IMPORTANT**
**If wash cycle and/or intermittent periods have been previously set to customised values, this command will override the customised settings which will be permanently lost.**

# 6000 TROUBLESHOOTING GUIDE

The following guide should help users diagnose any problems with a 6000 Series System. The guide is split into 2 sections; Keypad issues and Module issues.

## Keypad Issues

*Systems With A Single Keypad*

| Problem | Solution |
|---|---|
| Devices do not operate when keys are pressed, and/or no key illumination | There is no power to the Keypad.<br><br>Check that the 24V supply is present at the connector on the rear. |
| Keypad is illuminated, but devices still do not function | The WiperNet connections between Keypad and device module(s) are not continuous.<br><br>Check continuity. |
| No Keypad illumination | The dimming level is set to minimum.<br><br>Hold down the DIM key until the key illumination is at the level you require |
| Still no Keypad illumination | When ambient light levels are high, it may be difficult to see any background lighting at all.<br><br>Shade the Keypad with your hand and cycle the lighting by holding down the DIM key. |
| DIM key lit red, but nothing else and no response | Keypad has failed its power-up sequence. Re-cycle the power and try again.<br><br>Wait at least 30 seconds for the DIM key to extinguish.<br><br>If the problem persists, contact Customer Services. |
| DIM key is flashing | The Keypad is in User Set-Up Mode.<br><br>Press the WIPER OFF and DIM keys simultaneously to return to Normal-Operating Mode. |
| Wash cycle is not operating as I want it to | You need to re-programme the wash cycle in User Set-Up Mode. |
| The intermittent periods are not as I would like | You need to re-programme the intermittent periods in User Set-Up Mode. |
| Remote input does not work at all | The Keypad is programmed not to respond to the remote input.<br><br>Contact Customer Services. |
| Remote input activates some wipers but not others | The Keypad is programmed not to respond to the remote input.<br><br>Contact Customer Services. |
| Remote input works strangely | The type of remote switch does not correspond to that expected by the Keypad.<br><br>Contact Customer Services. |

## *Systems With Multiple Keypads*

Try the list of problems above first, before attempting to diagnose a problem with a multi-Keypad system.

| **Problem** | **Solution** |
|---|---|
| All Keypads have DIM key illuminated, and will not respond | Wait at least 30 seconds for the DIM key(s) to extinguish.<br><br>If the DIM key still fails to extinguish, disconnect all Keypads from the system and replace each one in the system one by one, and check that it functions. You must power down the system (the 24V at least), before returning a Keypad to the system. If the Keypad is inserted with the power on, it will not be registered with the Master Keypad and will continue to be ignored.<br><br>If the problem persists, contact Customer Services. |
| Some DIM keys lit red, but nothing else and no response | The Keypads with DIM keys illuminated are not connected properly or were not present when the register was taken at power up. Power down the 24V supply, wait a few seconds for the supply rail to drop, then re-apply the power. All Keypads should be registered. If the problem persists, there is a connection problem.<br><br>Check WiperNet continuity. |
| Keypad takes a long time to take-control | There is user activity on another Keypad within the system. If another Keypad is in use, it will take approx five seconds of inactivity before a request to take-control is ‘serviced’. |
| Keypad will not take-control | The Keypad is not connected properly or was not present when the register was taken. Power down the 24V supply, wait a few seconds for the supply rail to drop, then re-apply the power. The Keypad should be registered. If the problem persists, there is a connection problem.<br><br>Check WiperNet continuity. |

# Module Issues

**WARNING:** Ensure that all power is disconnected whilst working on the controller.

The controller contains no user serviceable items.

Check that other wipers within the group are working, showing that the problem is not a system problem.

*Problem: Control module does not operate wiper.*

| **Possible Cause** | **Solution** |
|---|---|
| No Power. | Verify that fuses or circuit breakers (customer supplied) have not blown.<br>Check that the bus supply (24VDC) and motor supply voltages (115/220VAC) are present at the module. |
| Plugs Loose | Verify 4 way bus, 11 way power/motor and 9 way auxiliary output connectors are fully pushed in. |
| Verify Group settings are correct (initial installation only) | Group switch should be set to 1, 2, 3, 4, 5, 6 or 7. Any other position will not work. |
| Bus connections incorrect. (initial installation only) | Check for the correct connections of the cables between wiper modules (24V to 24V, 0V to 0V, bus+ to bus+, bus- to bus-,)<br>Check wiring between modules to ensure all modules, power supply and control panel are correctly connected. |
| Connections to motor incorrect. (initial installation only) | Check for wiring fault, broken wire or loose terminal.<br>If possible confirm (with voltmeter) power is present at motor input and output terminals of control module. Check wiring according to the appropriate electrical installation drawing. |
| Motor Faulty | Replace Motor |
| Module Faulty | Check with known working module first; replace module with correct part number. |

*Problem: Motor only runs at one speed (3 phase module only).*

| **Possible Cause** | **Solution** |
|---|---|
| Plugs Loose | Verify 11 way power/motor is fully pushed in. |
| Connections to motor incorrect. (initial installation only) | Check for wiring fault, broken wire or loose terminal.<br>If possible confirm (with voltmeter) power is present at motor input and output terminals of control module. Check wiring according to the appropriate electrical installation drawing. |
| Motor Faulty | Replace Motor |
| Module Faulty | Check with known working module first; replace module with correct part number. |

*Problem: Wiper does not park correctly*

| Possible Cause | Solution |
|---|---|
| Plugs Loose | Verify 3 way park connector is fully pushed in. |
| Connections to park switch. (initial installation only) | Check for wiring fault, broken wire or loose terminal. |
| Park switch faulty | If possible confirm (with multimeter) open circuit on park switch wires when wiper not parked and short circuit when wiper arm in park position. Check wiring according to the appropriate electrical installation drawing.<br>Replace park switch |

*Problem: Heater does not warm up.*

| Possible Cause | Solution |
|---|---|
| Wrong module type | Check module part number. |
| Plugs Loose | Verify 11 way & 9 way are fully pushed in. |
| Connections to heater incorrect. (initial installation only) | Check for wiring fault, broken wire or loose terminal.<br>If possible confirm (with voltmeter) power is present at heater output terminals of control module. Check wiring according to the appropriate electrical installation drawing. |
| Heater Faulty | Replace Heater |
| Module Faulty | Check with known working module first; replace module with correct part number. |

*Problem: Wash Solenoid does not operate.*

| Possible Cause | Solution |
|---|---|
| Wrong module type | Check module part number. |
| Plugs Loose | Verify 11 way & 9 way are fully pushed in. |
| Connections to solenoid incorrect. (initial installation only) | Check for wiring fault, broken wire or loose terminal.<br>If possible confirm (with voltmeter) power is present at solenoid output terminals of control module. Check wiring according to the appropriate electrical installation drawing. |
| Solenoid Faulty | Replace Solenoid |
| Module Faulty | Check with known working module first; replace module with correct part number. |

*Problems: Purge Solenoid does not operate.*

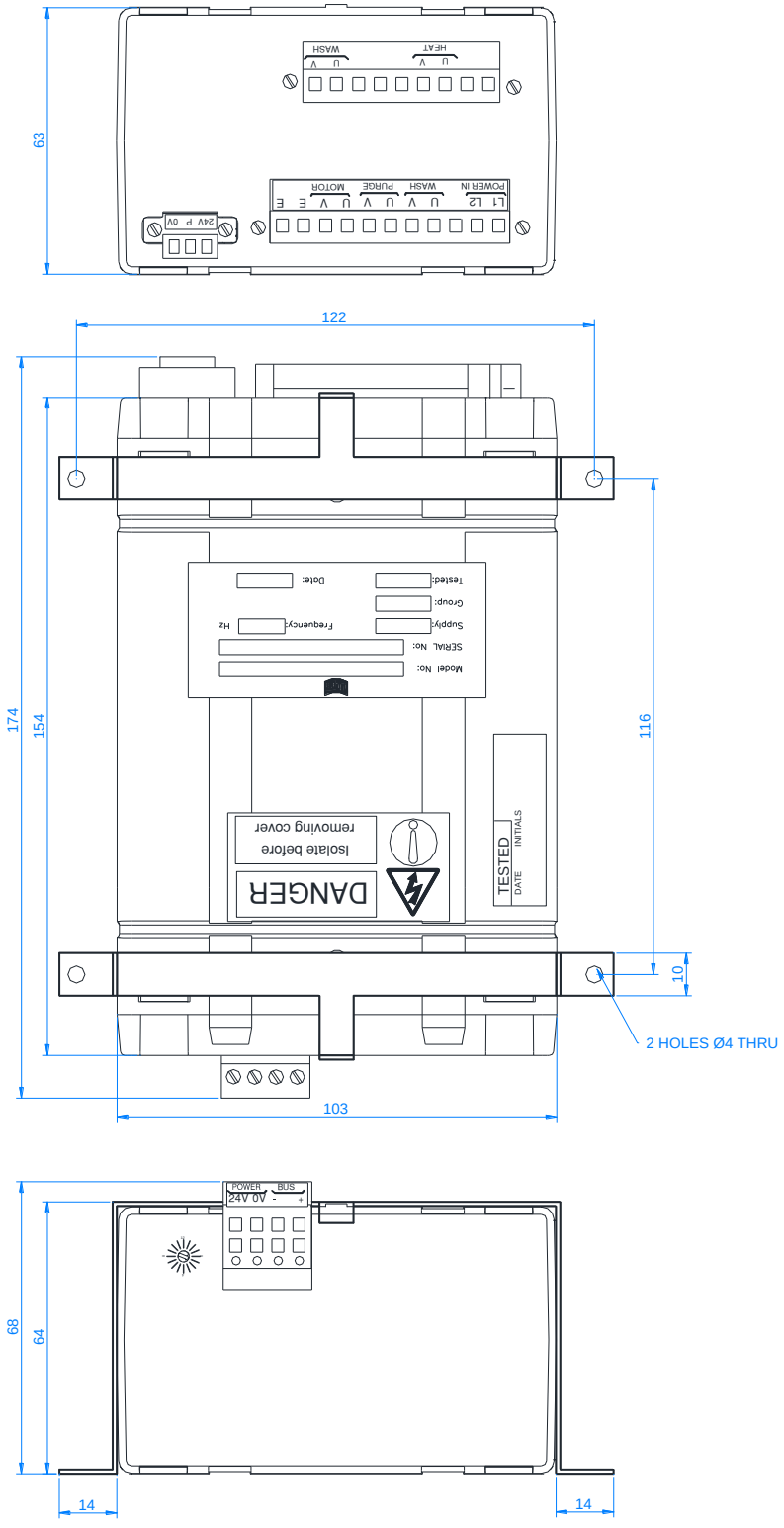
| Possible Cause | Solution |
|---|---|
| Wrong module type | Check module part number. |
| Plugs Loose | Verify 11 way & 9 way are fully pushed in. |
| Connections to solenoid incorrect. (initial installation only) | Check for wiring fault, broken wire or loose terminal.<br>If possible confirm (with voltmeter) power is present at solenoid output terminals of control module. Check wiring according to the appropriate electrical installation drawing. |
| Solenoid Faulty | Replace Solenoid |
| Module Faulty | Check with known working module first; replace module with correct part number. |

# 6100 MODULE

## Technical specifications

| | |
|---|---|
| Input supply motor PCB | 115 or 230 Vac 1Ph |
| Input supply additional PCB | 24Vdc, 115Vac or 230Vac 1Ph |
| Wash output | min 40mA, max 6A |
| Purge output | min 40mA, max 6A |
| Case heat output | min 40mA, max 6A |
| Window heat output | min 40mA, max 6A |

### *Module Dimensions*



# INSTALLATION INSTRUCTIONS

**IMPORTANT**
**Wiper modules should be mounted in accordance with recommendations in IEC60945 sect 4.7.1. Care should be taken to install the units in line with the unit labelling and bridge layout drawings.**

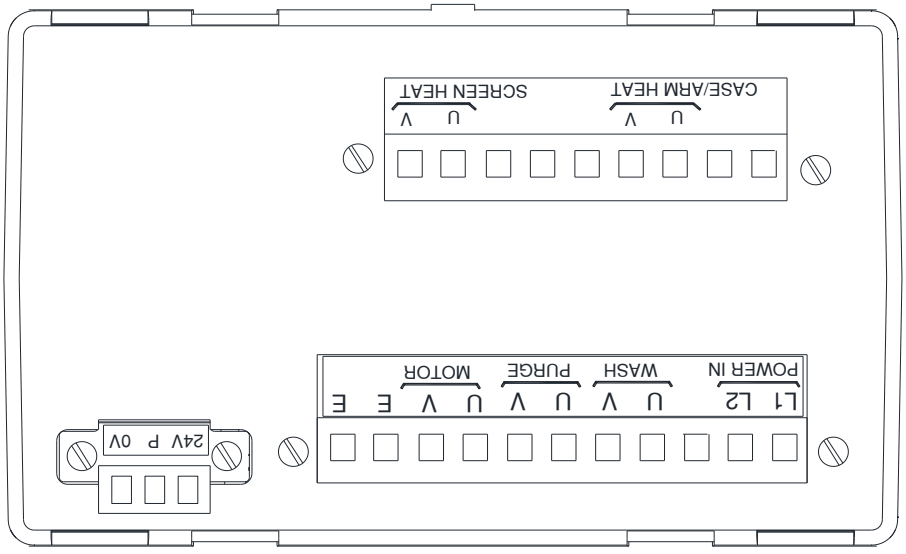
**The module is supplied with the connector plugs fitted to the module sockets. The plugs can be removed for ease of installation.**

For 6100 modules, Motor power and two additional outputs may be switched via the 11-way connector. The 9-way connector will be fitted for additional options. This can be any combination of case heat, wash, purge and window heat.

Recommended is to use one output for the case heater, this can save cost in cable.

For split power sources (i.e. 230VAC Motor with 24V AC or DC Heaters), power to the Heater is derived from the 9-way connector).

*Rear Panel Connections*




**Choose a location for motor control module so that it is within range of motor cable, wiper heat/arm heater cable and park switch cable.**

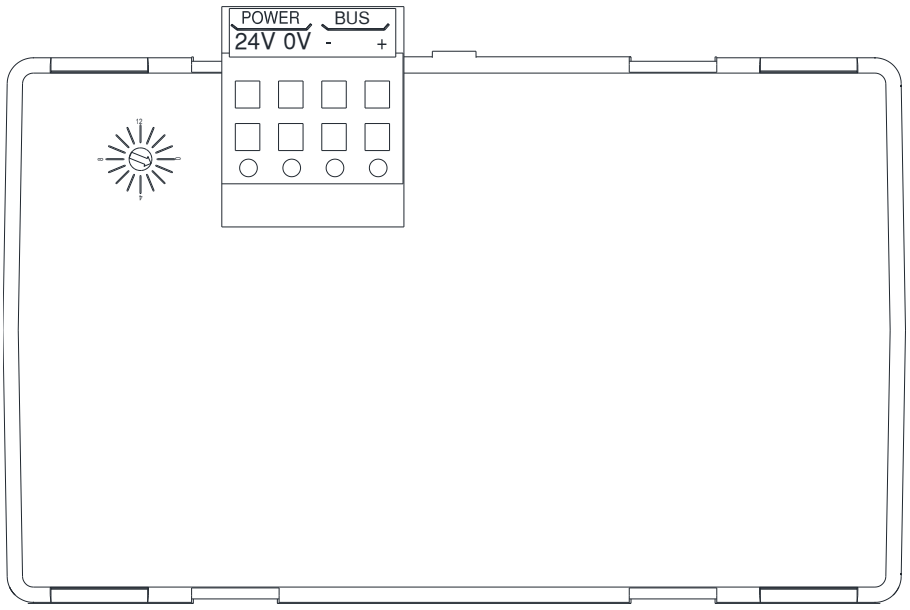
1. Mount the modules with the fixing clamps provided.

2. Connect the motor cable and power cable to the 11-way connector in accordance with the wiring diagram.

3. Connect the Park Switch cable to the 3-way connector in accordance with the wiring diagram.

4. Connect any required Heat/Wash/Purge cabling to the 11 way or 9-way connector if present.

## *Front Panel Connections*




**RS 485 bus must be wired as one continuous bus without splitting of wiring.**
**The 4-way connector is double height to allow for continuous linking between the modules.**

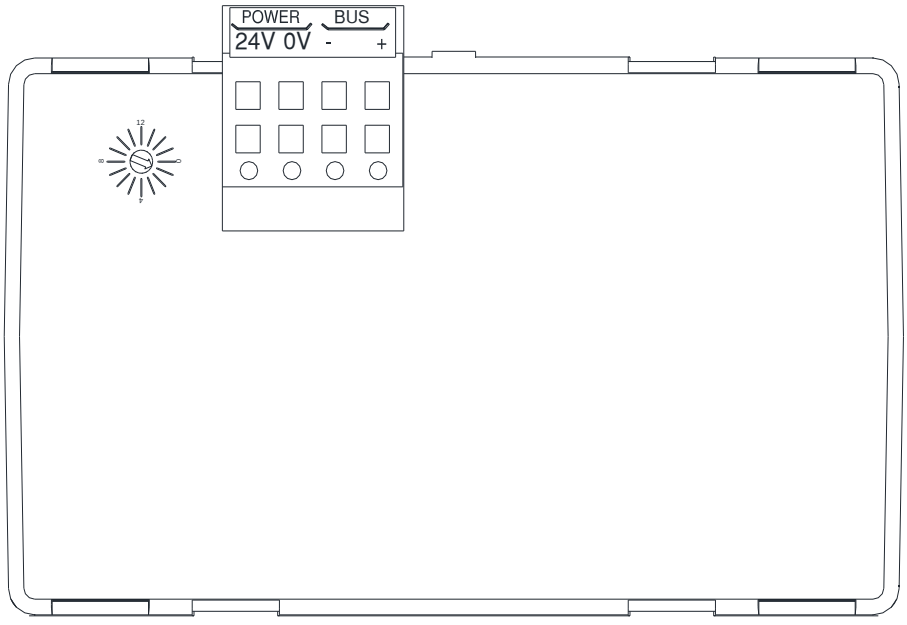
5. Connect bus cable to 4-way connector in accordance with the wiring diagram.

6. The terminating resistor module must be connected to the last module in the chain in accordance with the wiring diagram.

7. Ensure/set the Group Switch to the correct Group (see group switch drawing).

8. To change group, using a small screwdriver rotate the group switch one position to the right to go up one group, rotate the group switch one position to the left to go down one group.

## *Group Switch*



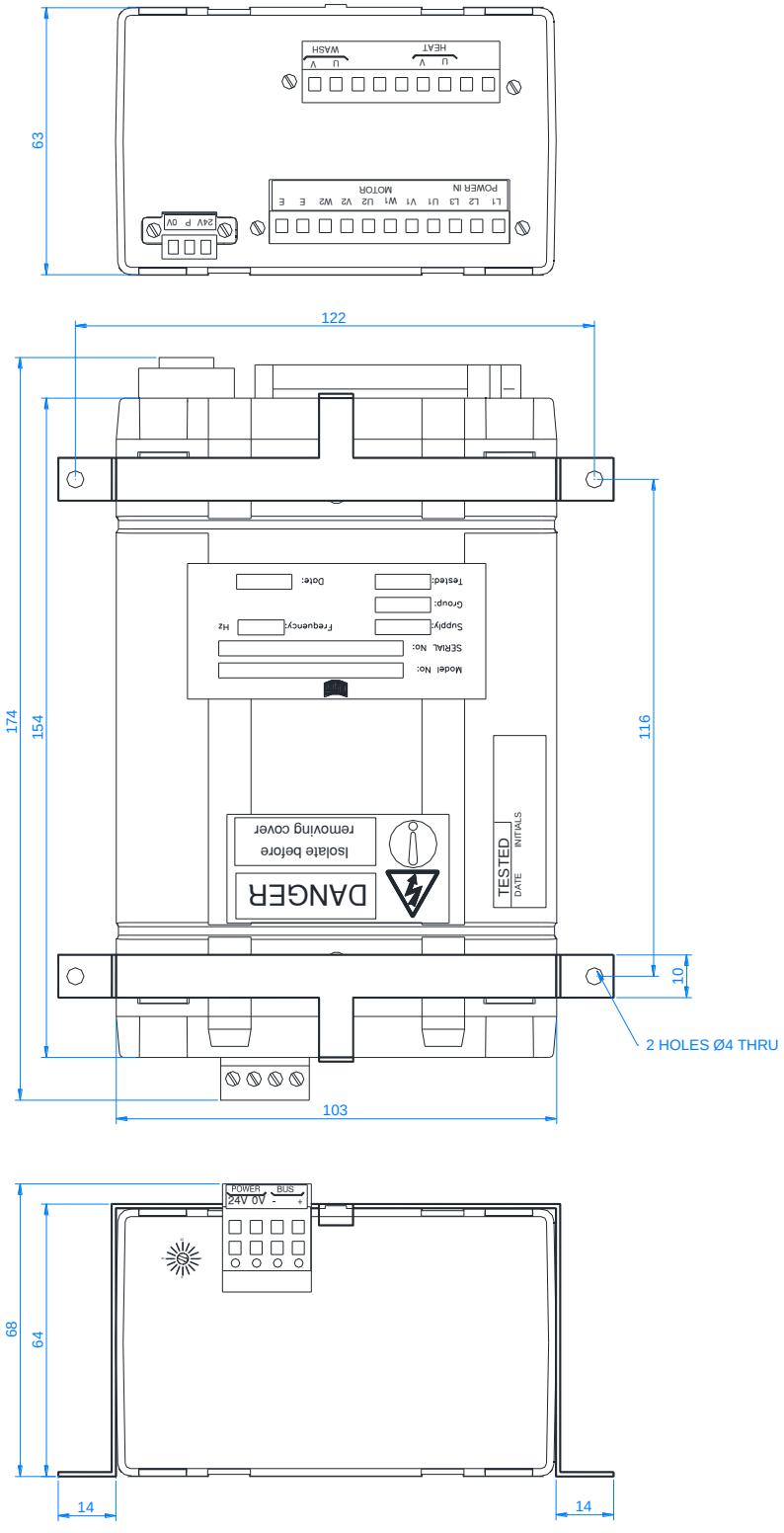

GROUP 1 GROUP 2 GROUP 3 GROUP 4 GROUP 5 GROUP 6 GROUP 7

# 6300 MODULE

## Technical specifications

| | |
|---|---|
| Input supply motor PCB | 115 or 230 Vac 3Ph |
| Input supply additional PCB | 24Vdc, 115Vac or 230Vac 1Ph |
| Wash output | min 40mA, max 6A |
| Purge output | min 40mA, max 6A |
| Case heat output | min 40mA, max 6A |
| Window heat output | min 40mA, max 6A |

### *Module Dimensions*



# INSTALLATION INSTRUCTIONS

**IMPORTANT**
**Wiper modules should be mounted in accordance with recommendations in IEC60945 sect 4.7.1. Care should be taken to install the units in line with the unit labelling and bridge layout drawings.**

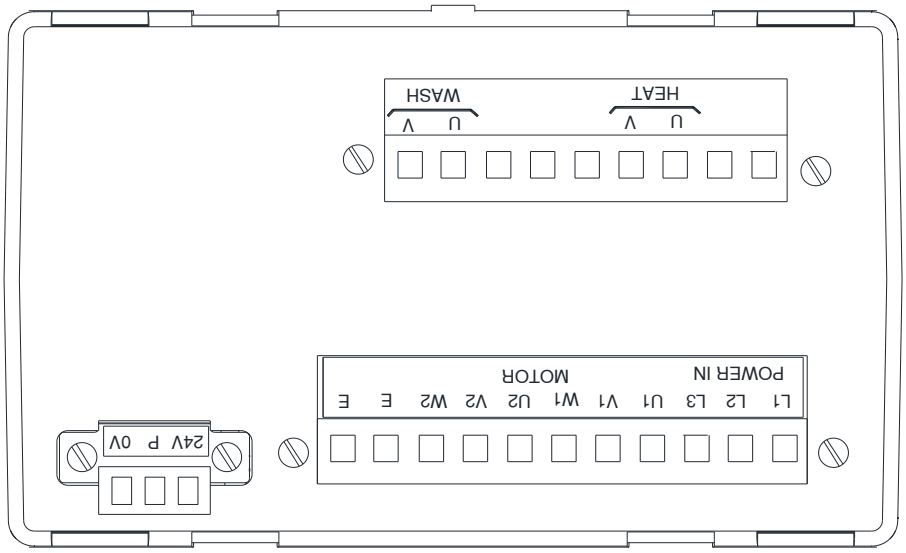
**The module is supplied with the connector plugs fitted to the module sockets. The plugs can be removed for ease of installation.**

For 6300 modules, motor power only is provided on the 11-way connector. Heat and Wash may be controlled via the additional 9-way connector if fitted.

Recommended is to use one output for the case heater, this can save cost in cable.

For split power sources (i.e. 230VAC Motor with 24V AC or DC Heaters), power to the Heater is derived from the 9-way connector).

*Rear Panel Connections*




**Choose a location for motor control module so that it is within range of motor cable, wiper heat/arm heater cable and park switch cable.**

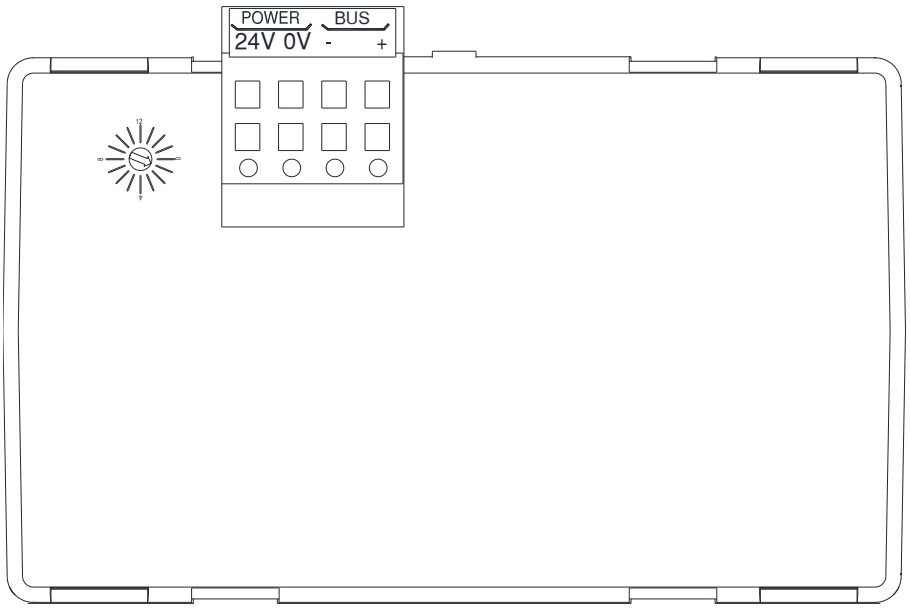
1. Mount the modules with the fixing clamps provided.

2. Connect the motor cable and power cable to the 11-way connector in accordance with the wiring diagram. Power Phasing must not be swapped – if L1, L2 or L3 are incorrectly connected, internal software fusing will not function correctly.

3. Connect the Park Switch cable to the 3-way connector in accordance with the wiring diagram.

4. Connect any required Heat/Wash/Purge cabling to the 9-way connector if present.

## *Front Panel Connections*




**RS 485 bus must be wired as one continuous bus without splitting of wiring.**
**The 4-way connector is double height to allow for continuous linking between the modules.**

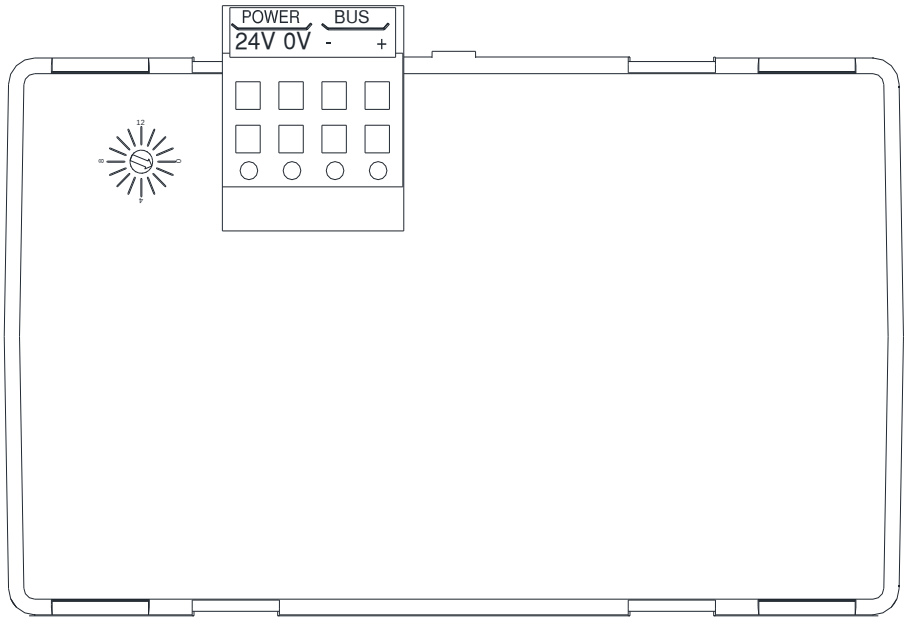
5. Connect bus cable to 4-way connector in accordance with the wiring diagram.

6. The terminating resistor module must be connected to the last module in the chain in accordance with the wiring diagram.

7. Ensure/set the Group Switch to the correct Group (see group switch drawing).

8. To change group, using a small screwdriver rotate the group switch one position to the right to go up one group, rotate the group switch one position to the left to go down one group.

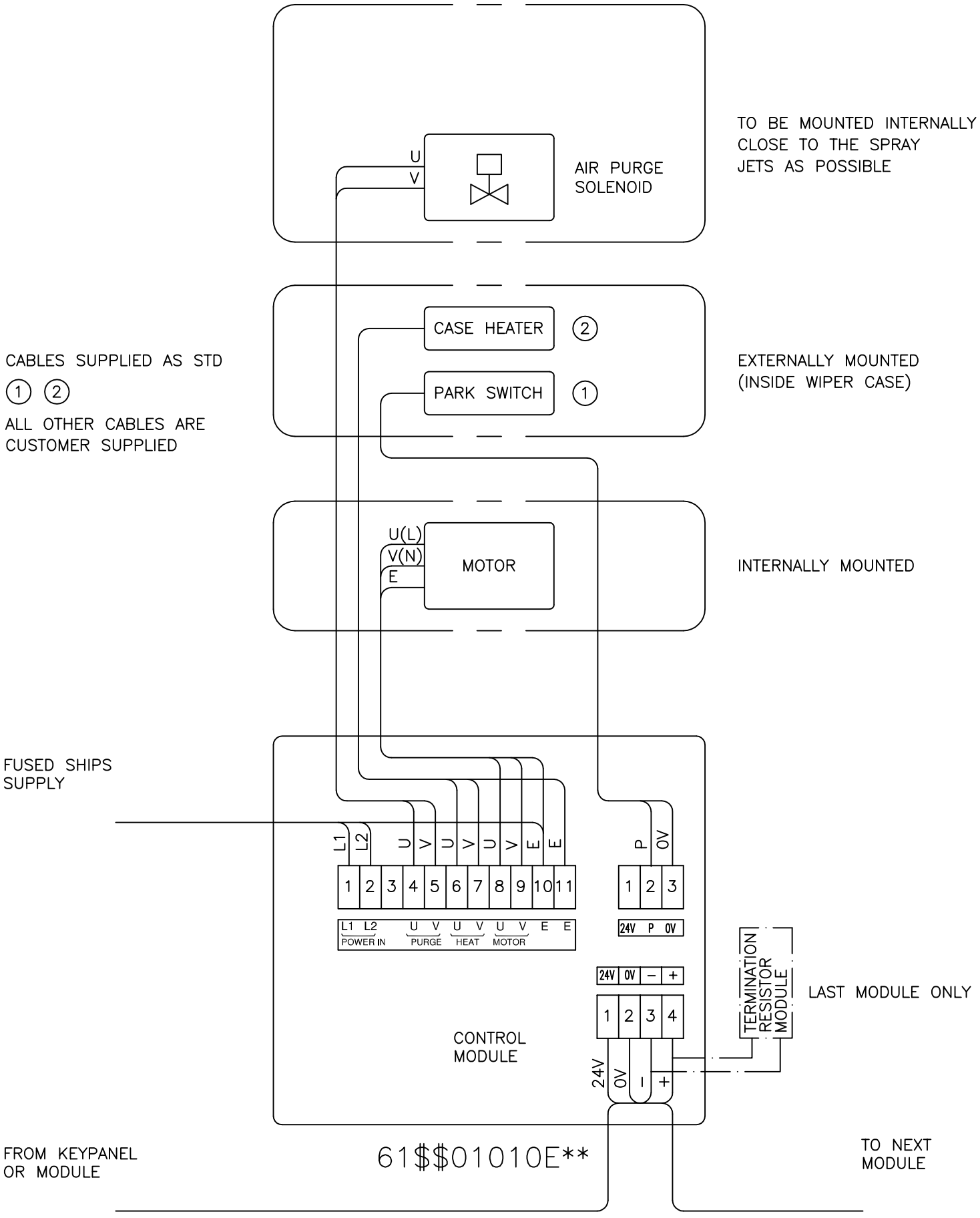
## *Group Switch*

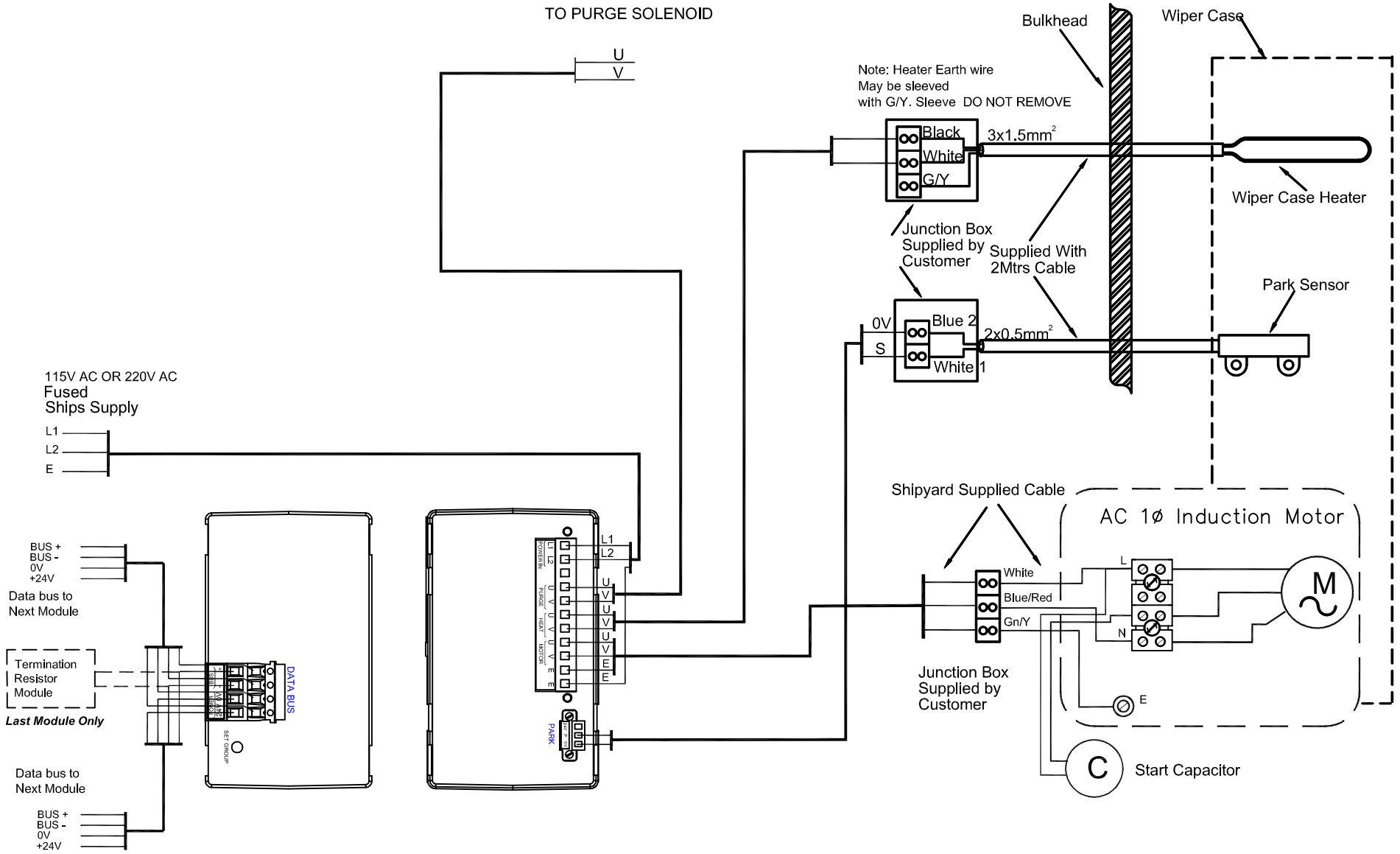



GROUP 1 GROUP 2 GROUP 3 GROUP 4 GROUP 5 GROUP 6 GROUP 7

WINDOW NO.

SER. NO.



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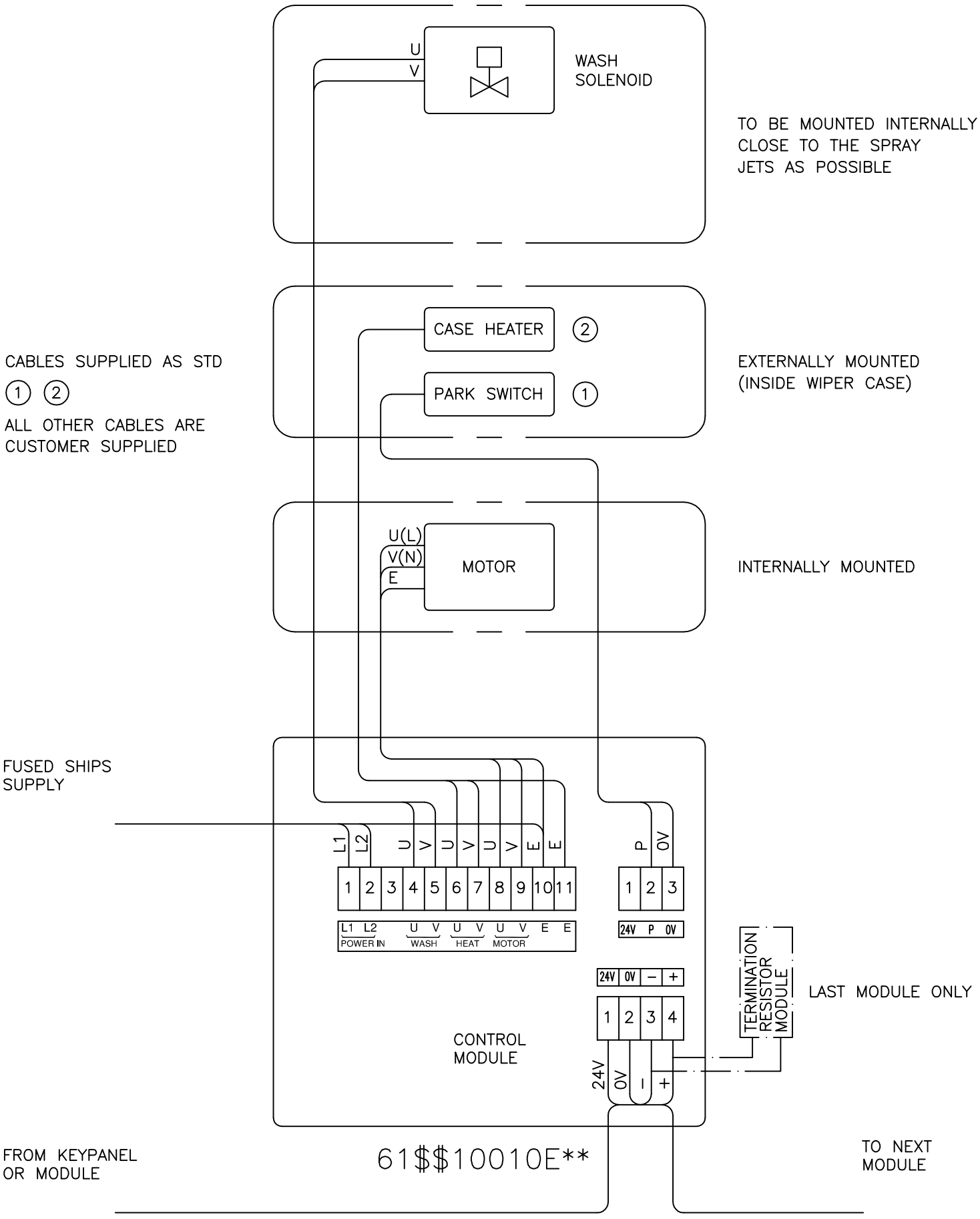

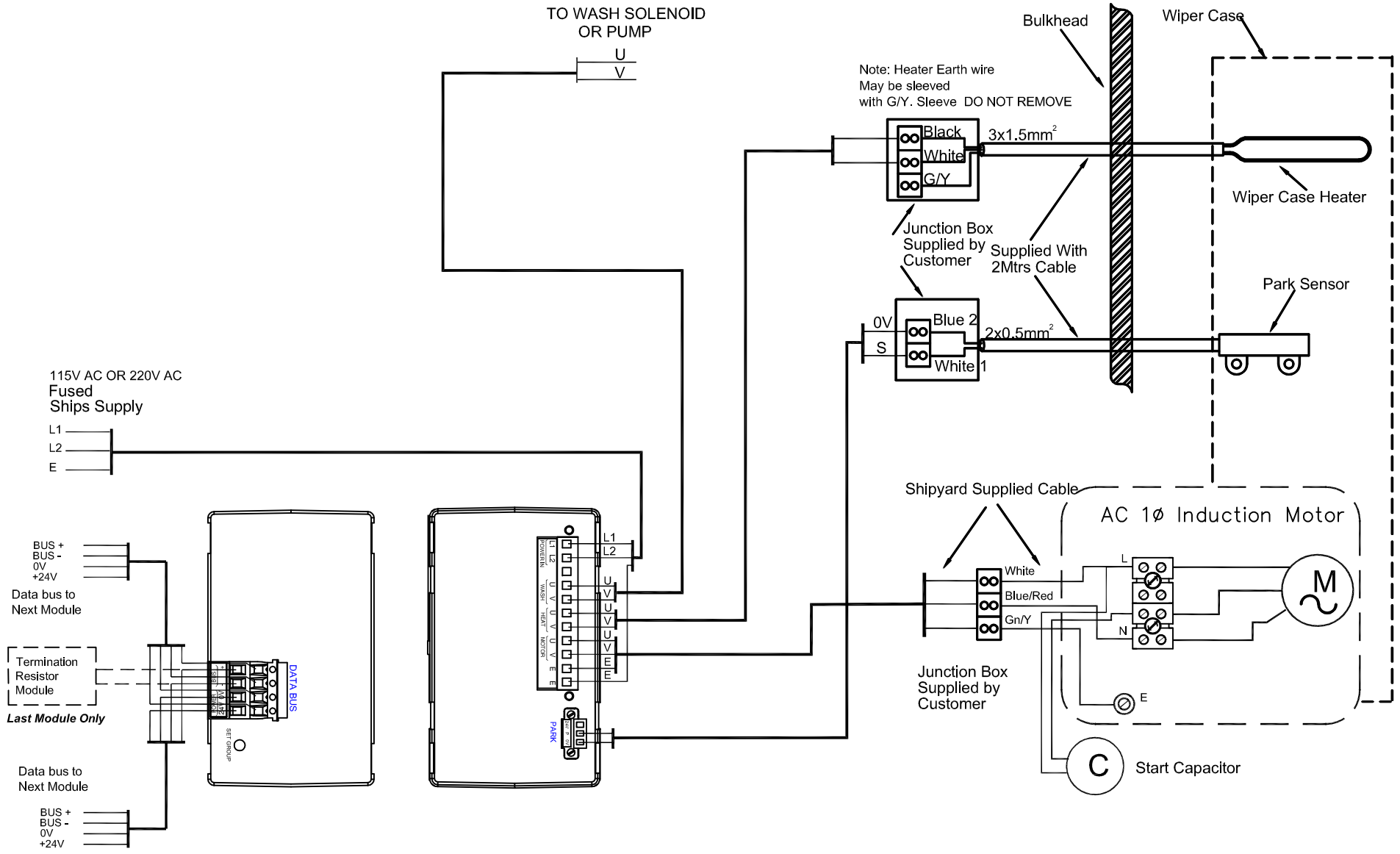


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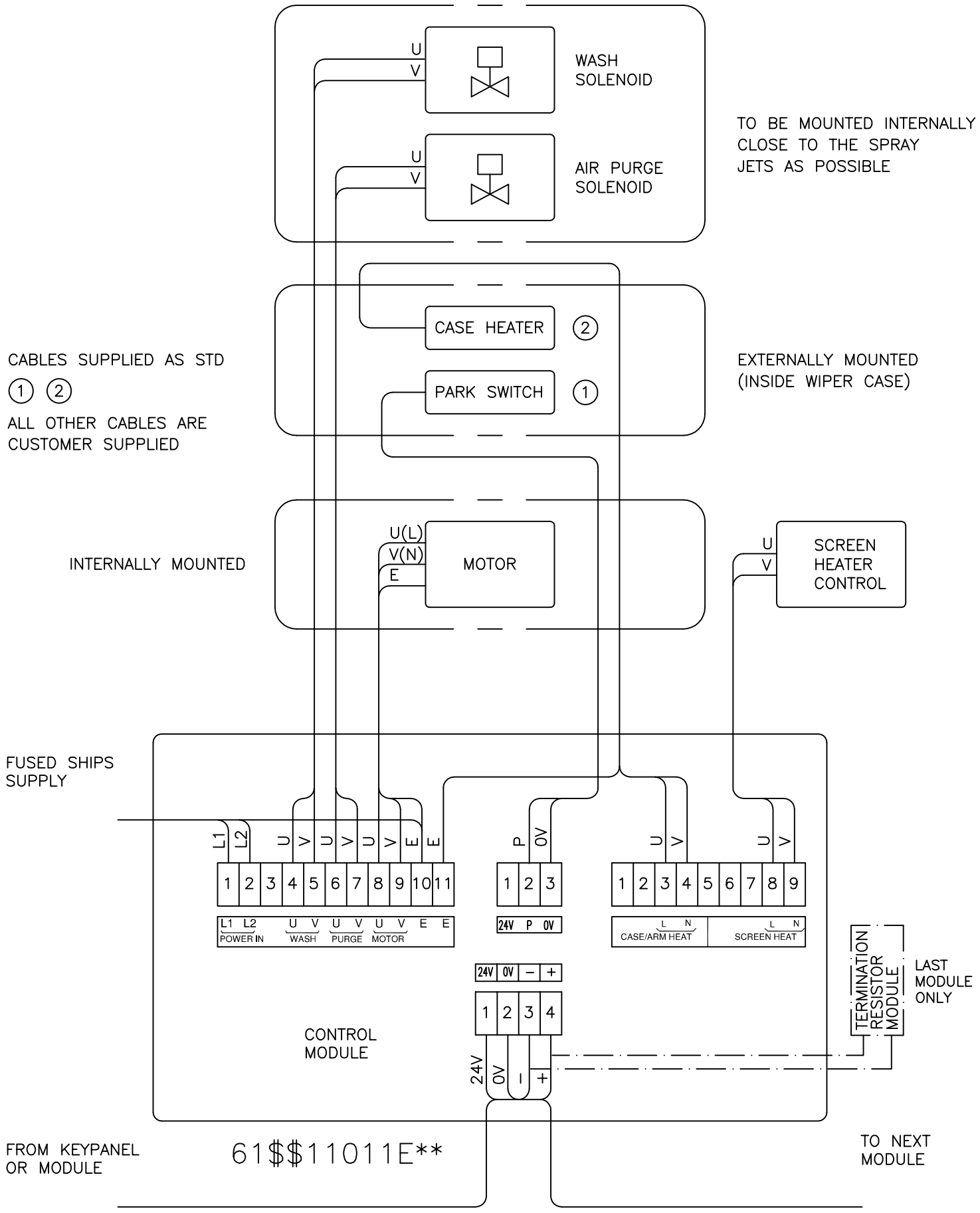

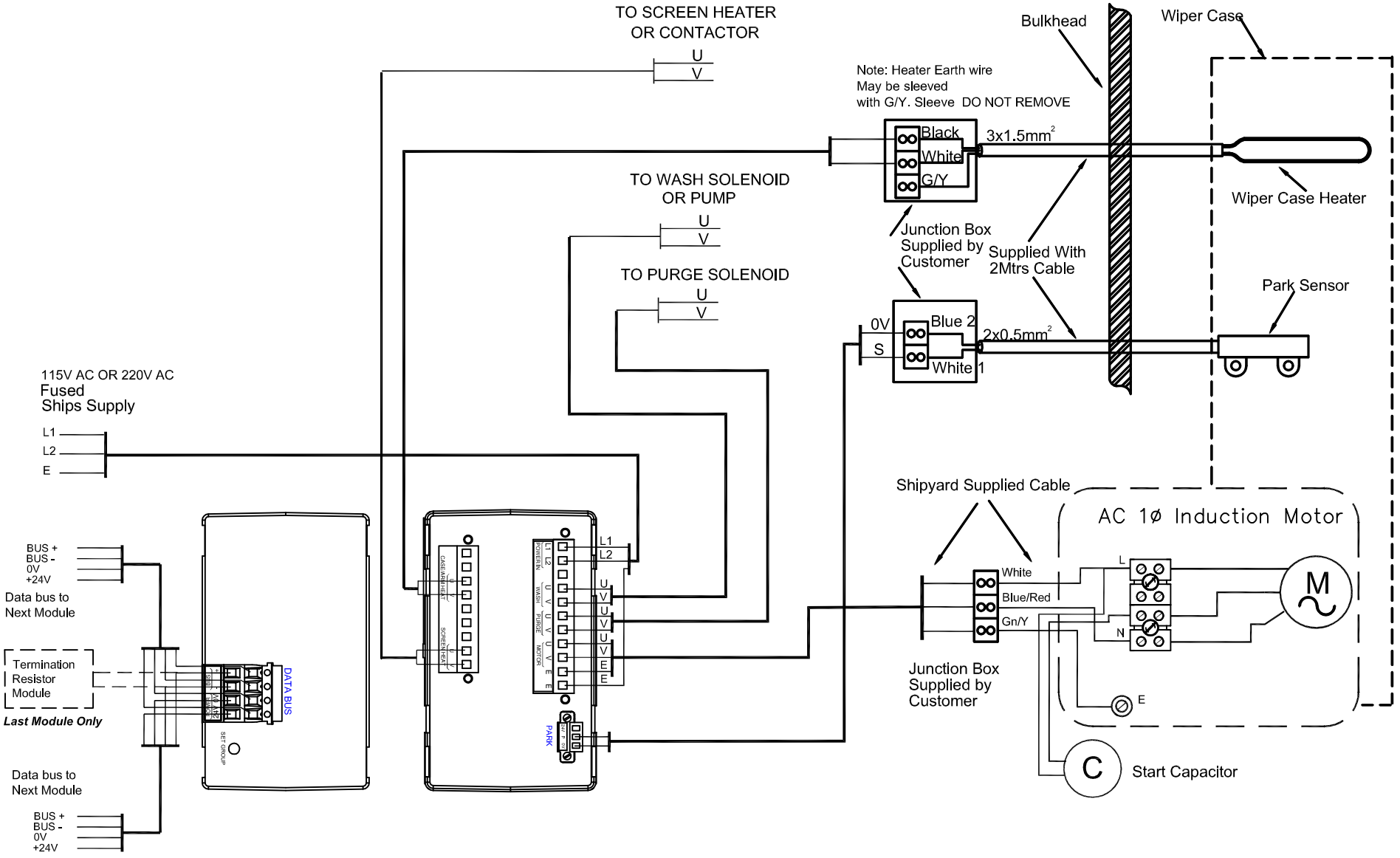


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| 3rd ANGLE PRO. | | | | | | | | 6 | | 05.02.21 | MOD STATUS |
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| | | | | | | | | 4 | | 19.02.12 | |
| | | | | | | | | 3 | | 26.03.09 | |
| | | | | | | | | 2 | | 17.12.08 | |
| | | | | | | | | 1 | | 27.10.08 | |
| MAT'L:- | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE | | |
| | SCALE:-NTS | | DRAWN:- DCT | | CHKD:- | | CHANGED:- | | | | |

TOLERANCES UNLESS OTHERWISE STATED
DECIMAL DIMS. TO 2 PLACES ± 0.1mm.
DECIMAL DIMS. TO 1 PLACE ± 0.25mm
NO DECIMAL PLACES ± 0.5mm
ANGLES ± 1°



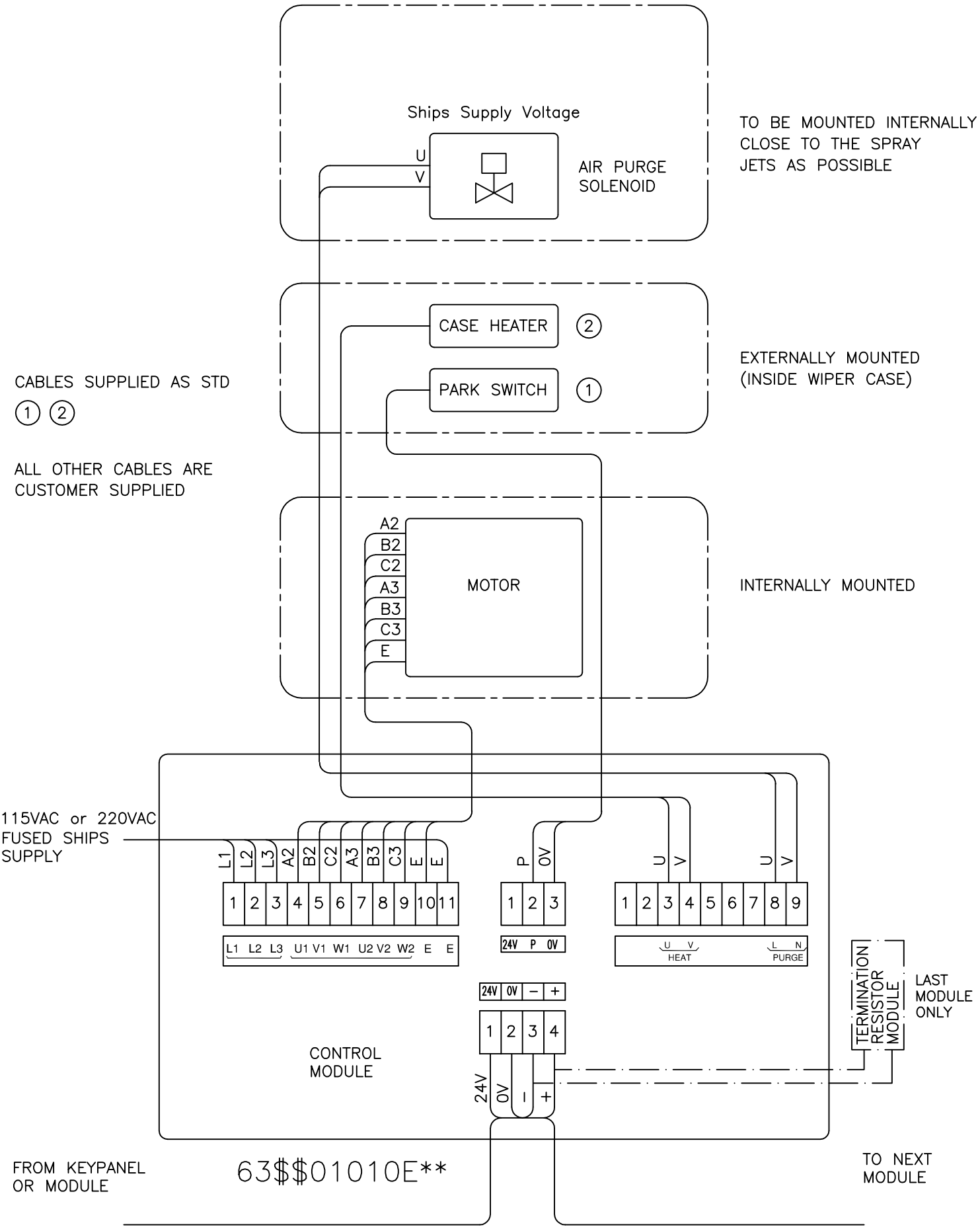
WYNN MARINE LIMITED
REDDITCH ENGLAND

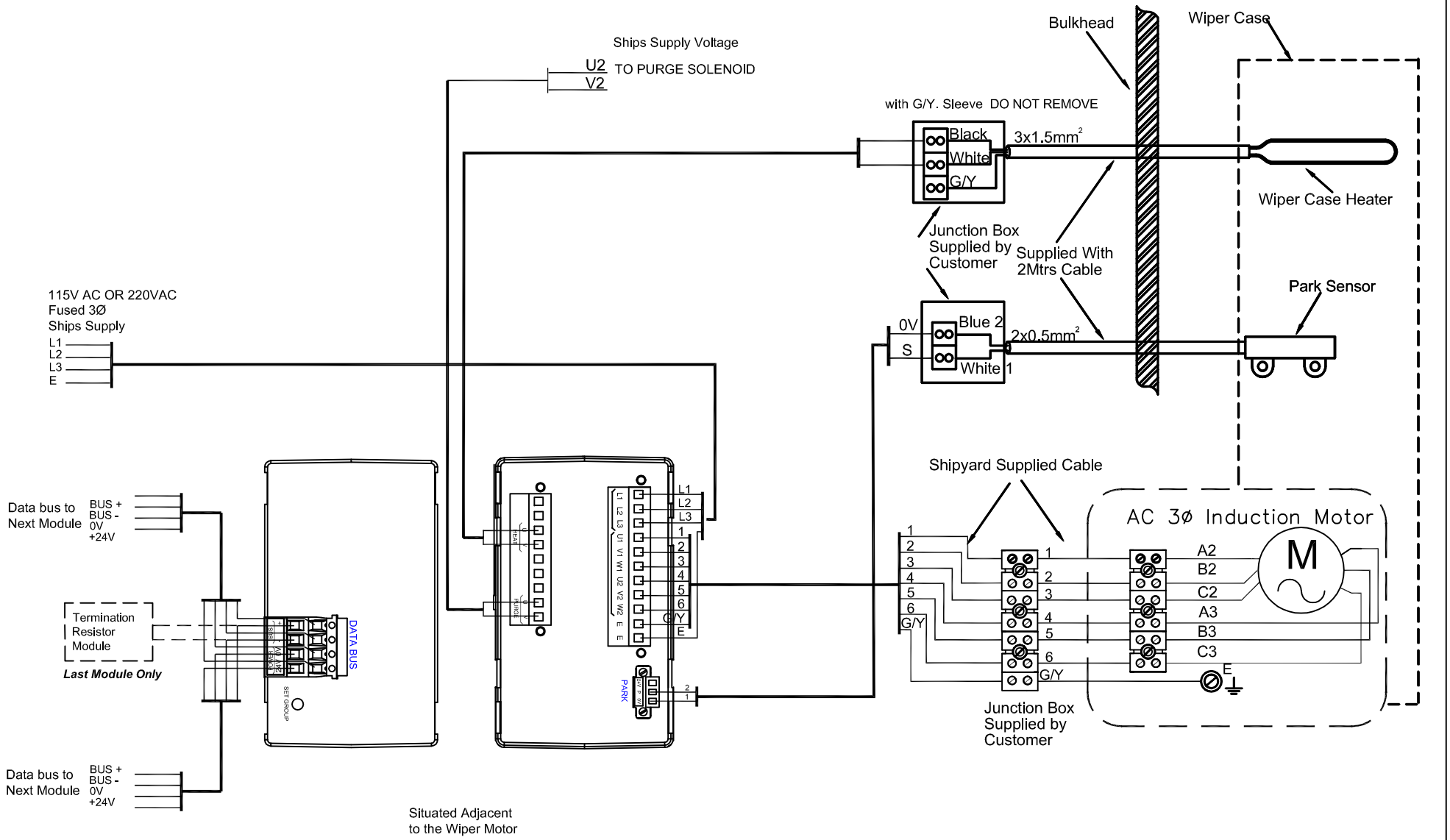
TITLE:- Connection Diagram for 6000 Series Control System to 'C' Type Wiper with a 1 Phase AC Motor

DRAWING No. 61$$11011E

WINDOW NO.

SER. NO.



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| 3rd ANGLE PRO. | | | | | | | 6 | | 05.02.21 | MOD STATUS | THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED. |
| | | | | | | | 5 | | 19.02.12 | | |
| TOLERANCES UNLESS OTHERWISE STATED<br>DECIMAL DIMS. TO 2 PLACES ± 0.1mm.<br>DECIMAL DIMS. TO 1 PLACE ± 0.25mm<br>NO DECIMAL PLACES ± 0.5mm<br>ANGLES ± 1° | | | | | | | 4 | | 19/12/11 | | WYNN MARINE LIMITED<br>REDDITCH ENGLAND |
| | | | | | | | 3 | | 26/03/09 | | |
| | | | | | | | 2 | | 15.12.08 | | TITLE:- Connection Diagram for 6000 Series Control System to 'C' Type Wiper with a 3 Phase AC Motor |
| | | | | | | | 1 | | 16.10.08 | | |
| MAT'L:- | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE | | |
| cad file:- 6000\EL\6030\C-i1 | SCALE:-NTS | | DRAWN:- DCT | | CHKD:- | | CHANGED:- | | | | DRAWING No. 63$$01010E |

WINDOW NO.

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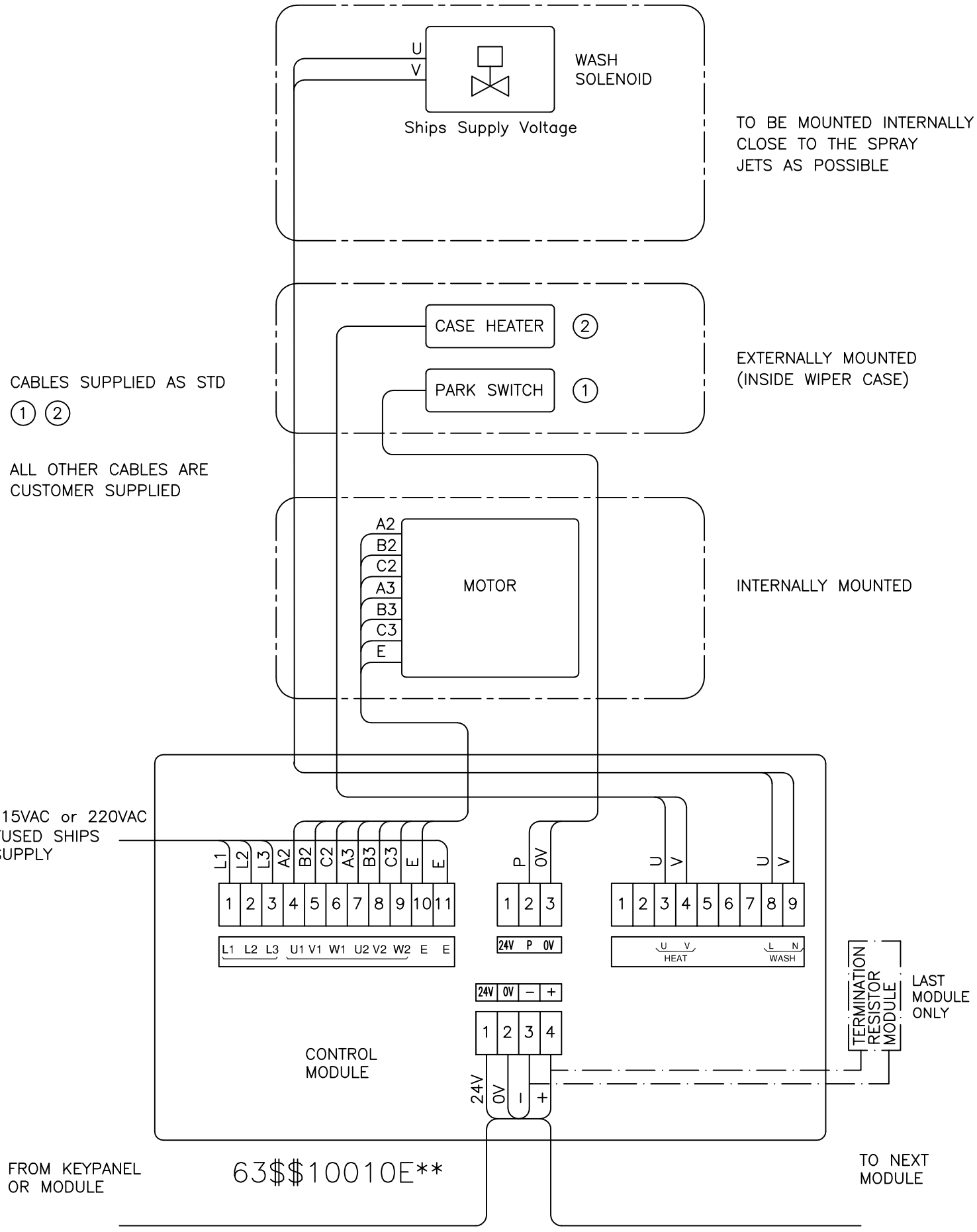

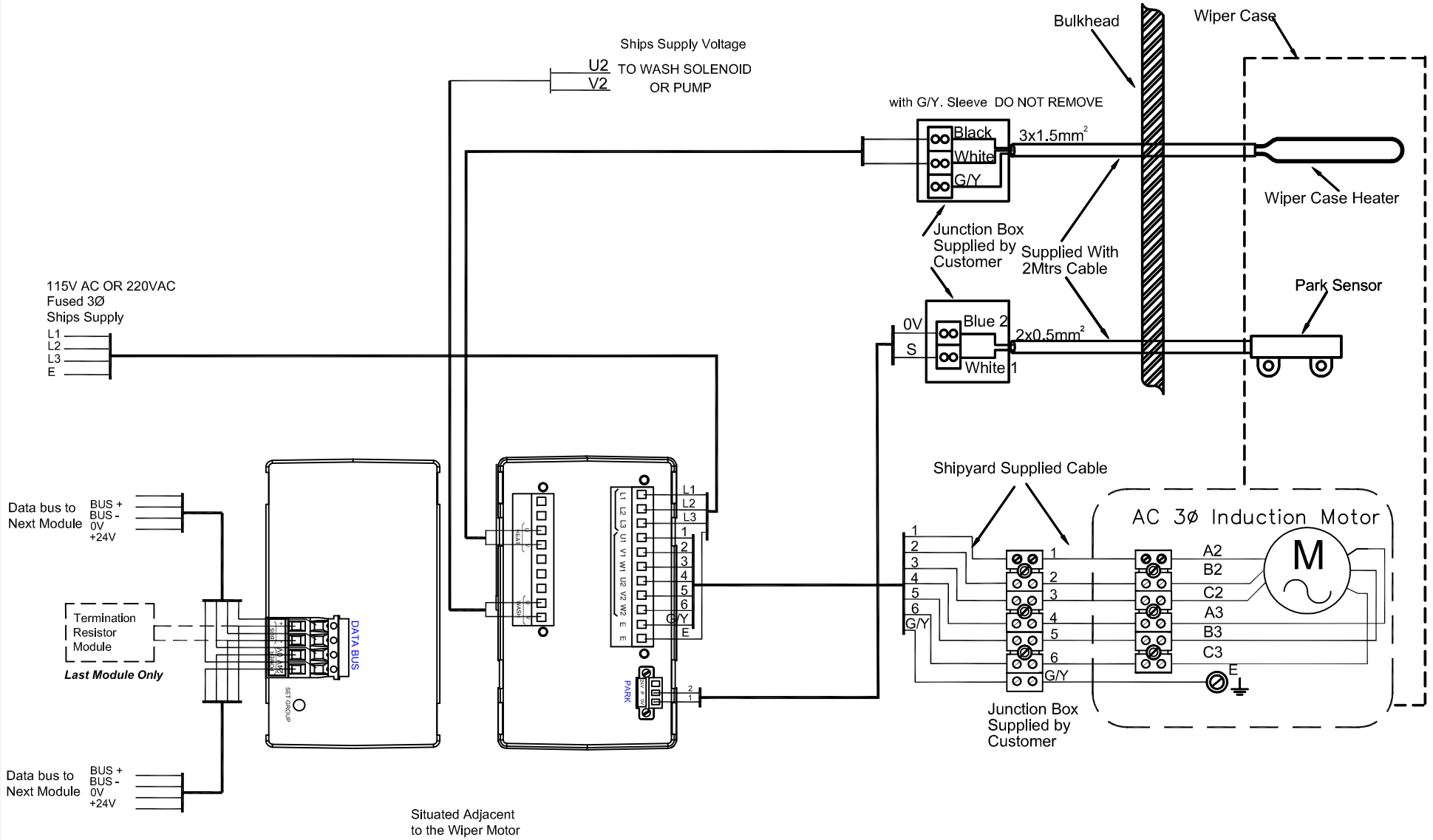


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| | | | | | | | 4 | | 26/01/09 | | WYNN MARINE LIMITED |
| TOLERANCES UNLESS OTHERWISE STATED<br>DECIMAL DIMS. TO 2 PLACES ± 0.1mm.<br>DECIMAL DIMS. TO 1 PLACE ± 0.25mm<br>NO DECIMAL PLACES ± 0.5mm<br>ANGLES ± 1° | | | | | | | 3 | | 21.07.08 | | REDDITCH ENGLAND |
| | | | | 8 | | 05.02.21 | 2 | | 19.10.04 | | TITLE:- Connection Diagram for 6000 Series Control System to 'C' Type Wiper with a 3 Phase AC Motor |
| | | | | 7 | | 19.02.12 | 1 | | 6.7.04 | | |
| MAT'L:- | ISS. | DIN | DATE | ISS. | DIN | DATE | ISS. | DIN | DATE | | |
| cad file:- 6000\EL\6030\C-i1 | SCALE:-NTS | | DRAWN:- DCT | | CHKD:- | | CHANGED:- | | | | DRAWING No. 63$$10010E |

# SERIES 6000 FAULT FINDING

**WARNING:** Ensure that all power is disconnected whilst working on the controller.

The controller contains no user serviceable items.

In the event of a fault, verify the following:

1. The green power backlighting on the keypad is on, showing 24V is present.

2. Other wipers within the group are working, showing that the problem is not a system problem.

3. Verify that fuses or circuit breakers (customer supplied) have not blown.

4. Verify connections have not become loose.

5. Verify the wiring to the module is correct as per installation drawings (initial installation only).

6. Check that the bus supply (24VDC) and motor supply voltages (115/220VAC) are present at the module.

7. Verify Group settings are correct (initial installation only – once installed these are fixed).

8. Modules may be swapped only if they are from a wiper of the same motor type (CA, CB, CH, CJ, CM) otherwise the onboard software fuse may not adequately protect the system, or it may trip the system unnecessarily. Note position of the front panel rotary switch on both modules. Ensure the replacement module is set to the same value as the module under test. The 24 V supply needs to be turned off and on again each time a switch change has been made.

9. If the fault still exists when a known working module has been installed it may be that the software fuse has been activated and is protecting a faulty motor/heater/solenoid valve/wiring. Use the following check list:-

    a) Using a meter check the voltage on the motor output (Between each phase), this should be the same as the supply voltage.

    b) If no power is present at the output terminals of the control module, or is only present for a short period of time, disconnect the motor and measure again.

    c) If voltage is now present then there is a problem with the motor or a short in the wiring.

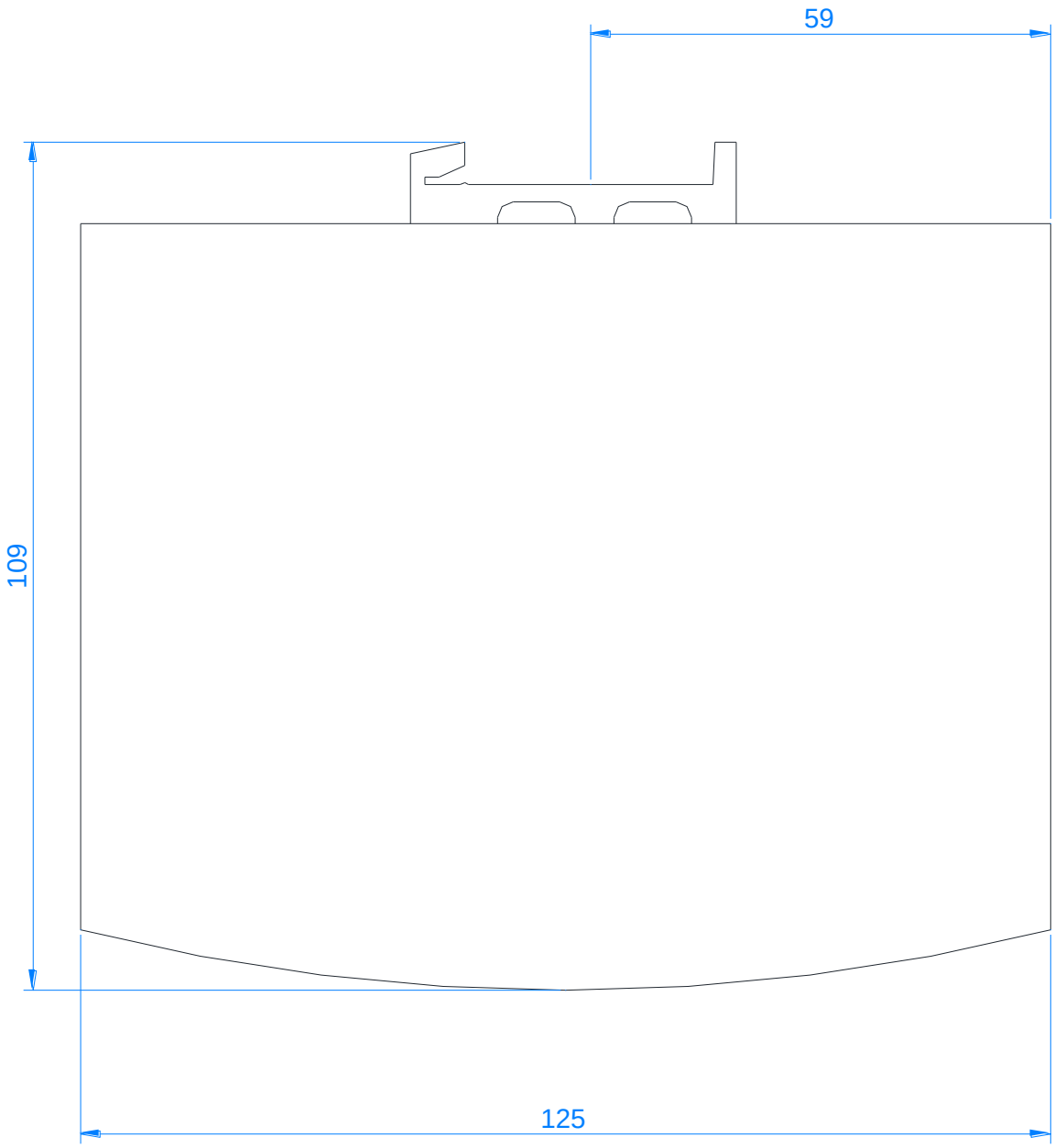
    d) Using a meter check the voltage on the relevant auxiliary output (heater/wash solenoid/purge solenoid), this should be the same as the supply voltage in a module with a ‘1’ in the code.

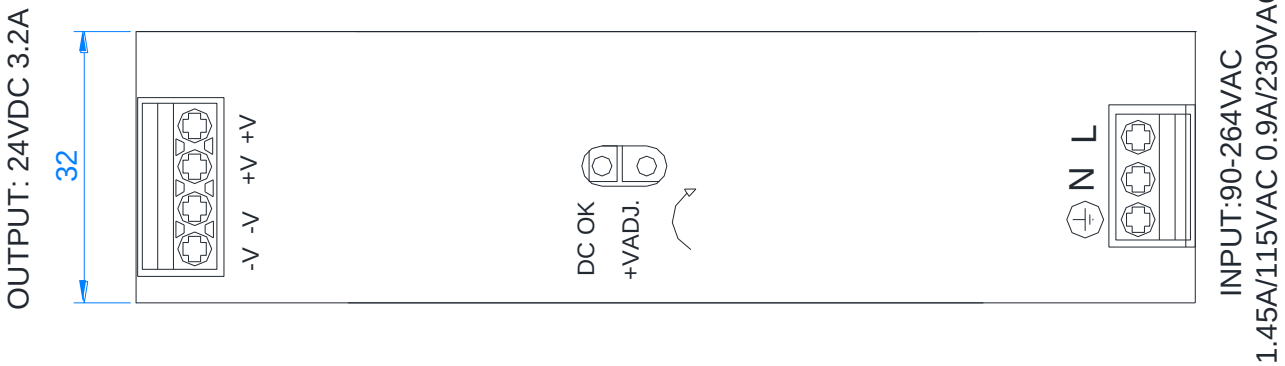
    e) If no power is present at the output terminals of the control module, or is only present for a short period of time, disconnect the output device and measure again.

    f) If voltage is now present then there is a problem with the output device or a short in the wiring (there may be a voltage reading on outputs on the secondary board with no device connected or button pressed on the keypad, this is normal, the voltage should rise when the relevant button is pressed on the keypad).

# 3000-006 PSU

MOUNT USING 35mm X 7.5mm TOP HAT DIN RAIL



# DOCUMENTATION

Whilst every effort is made to provide accurate information in good faith, no responsibility can be accepted by Wynn for inaccuracies and Wynn reserves the right to alter and amend specifications and designs without prior notice in line with our policy of continued improvement.

## *Spares Parts*

To enable technical troubleshooting and ordering of spare parts, this manual should be kept in a safe place on board. It is also advisable to keep one set of spare parts on board for emergency use. Please contact Wynn directly or your local distributor / service centre for all order requirements.

## *Maintenance Schedules*

Plan your maintenance work according to the schedule in this manual.

## *Our Commitment*

We are committed to a 10 year product support programme. This ensures that any spare part will be available for any wiper at least 10 years after its purchase. It is strongly recommended that only genuine replacement parts manufactured by WYNN be used. This will guarantee that only suitable materials have been used and will ensure interchangeability of parts.

## *Quality and Testing*

We are committed to the principles of Total Quality Management, ISO 9000. We manufacture our range of marine products to the highest standard and quality. We therefore maintain an ongoing schedule of product improvement and testing. To help us sustain such standards we maintain a salt-water test rig on which our products are taken, at random from the production line, and subjected to 3,000 hour continuous testing. We are sure you will receive many years trouble-free service from your Wynn product and hope you find this information pack comprehensive.

## *Guarantee*

All Wynn equipment is tested before despatch from our works. The Windscreen Wiper System supplied has a 1 year warranty period provided the installation of the system and the subsequent maintenance is in accordance with the installation/maintenance instructions.

We cannot accept any responsibility for the installation of equipment, or damage to the equipment during installation, or normal wear and tear. The guarantee is negated if the equipment is not installed strictly observing the instructions set out in this manual, or not maintained as specified.

The Wiper System is very reliable but to ensure its continued smooth running we recommend that the following guidelines are adhered to:-

### *Monthly*

- Check for wear on all parts subject to friction

- Visual inspection should be made of the blades to ensure that they are still in good condition and replace as soon as there are signs of wear or damage

### *Annually*

- It is recommended that the blades are changed every 12 months

After the Wiper System has been operating in severe weather conditions it is advisable to thoroughly check the unit for signs of wear or damage.

This warranty excludes the wiper blades which are a consumable item and any replacements that are detailed in the manual as part of any regular maintenance requirement.

This guarantee is expressly in lieu of all other guarantees expressed or implied and of all other obligations of liabilities on our part, and we neither assume nor authorise any other person to assume for us any other liability in connection with the sale of our equipment. Faulty equipment must be returned, carriage paid, to our works for examination. Any legal action must be settled in the English courts under English law.

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A worldwide network of agents supports Wynn's Marine product range. For details of the nearest Wynn agent please contact our Head Office. Wynn Agents operate in the following countries.

Algeria, Argentina, Australia, Brazil, Bulgaria, Canada, Chile, China, Columbia, Croatia, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, India, Israel, Italy, Japan, Latvia, Lithuania, Netherlands, New Zealand, Norway, Peru, Portugal, Romania, Russia, Singapore, South Africa, South Korea, Sweden, Taiwan, Thailand, Turkey, UAE, U.S.A.


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