



Wynn Marine Ltd

2-4 Merse Road, North Moons Moat, Redditch, Worcestershire B98 9HL, United Kingdom

Tel: +44 (0) 1527 61243, Fax: +44 (0) 1527 66836

Email: customerservice@b-hepworth.com, website www.b-hepworth.com

Installation and Operation Manual

Type D MKV Straight Line Wiper

Series 8000 Network Control System

Issue 8

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

Safety Summary	1
Wiper Description	2
Wiper Installation	4
Wiper Installation Drawing	9
Wiper Installation Drawing	11
Wiper Installation Drawing	13
Wiper Installation Drawing Twin	15
Wiper Fault Finding	17
Wiper Maintenance	20
Wiper Inspection and Renewal	22
Wiper Spares List	25
Wiper Spares Drawing	28
Wiper Spares Drawing Twin	29
Wiper Arm	31
Wiper Arm	32
Double Wiper Arm	33
Double Wiper Arm	34
SLW Part Number Calculator	36
Motor Pod Part Number Calculator	38
SLW Part Number Calculator	39
Motor Pod Part Number Calculator	41
Controller Description	42
Typical Bridge Layout	47
Controller Bus Connections	48
Controller Bus Connections	49

Bus Cable Installation	50
Controller Keypad Installation	53
Controller Keypad Operation	58
Controller Keypad User Programming	60
Module Installation	65
Module Electrical Drawing	73
19 Inch Rack Installation	74
Module Electrical Drawing	83
Module Electrical Drawing	84
Connector Information	85
Controller Troubleshooting	86
Documentation	94

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 D5 DESCRIPTION AND SPECIFICATION

The 'Type D MK V' is a Heavy Duty Straight Line Wiper with an electric motor mounted externally in a housing protected to IP67. The standard motor housing position is normally supplied on the left side of the unit (mounted above the window and viewed looking into the window).

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

The variable frequency AC motor option is for 3 speed operation and must be used with the 8000 Series Controller. 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
PARV81	Induction	115V AC	1.5 A	8000 Controller	0.7/1.1/1.4	0.5 m	IP20
PARV82	Induction	220V AC	1.1 A	8000 Controller	0.7/1.1/1.4	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'.

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 (single wiper) 915mm (twin wiper), 1 nozzle is fitted, above 1015mm (single wiper) 915mm (twin wiper), 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	STROKE (mm)	STROKE (inch)	HEATER SIZE	WATTS
305 up to 430	12 up to 17	1	97	1500 up to 1800	59 up to 71	8	390
457 up to 735	18 up to 29	2	135	1930 up to 2100	76 up to 83	10	485
760 up to 1095	30 up to 42	4	211	2260	89	12	574
1118 up to 1450	43 up to 57	6	301				

Quoted Power is for nominal 115 or 230 Volts.

Heater Power Ratings – Twin Wipers

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

Quoted Power is for nominal 115 or 230 Volts.

TYPE D5 WIPER INSTALLATION

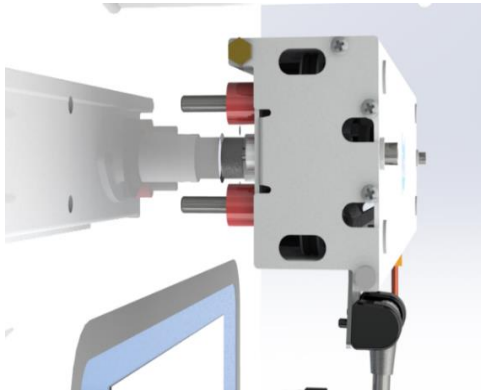


CAUTION: Ensure that the correct wiper, blade and arms are selected for each window.

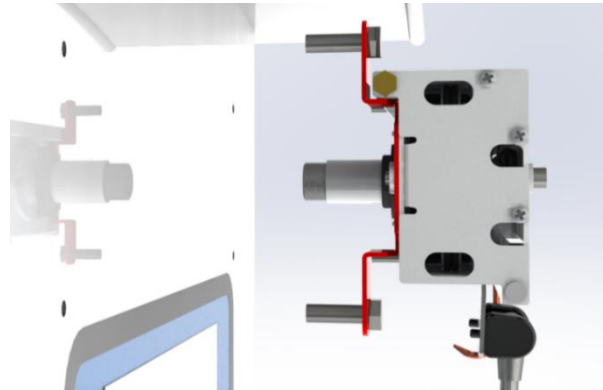
CAUTION: Before drilling, ensure that there are no obstructions / hazards at the chosen mounting position. The main frame should be mounted on a flat surface that will not bend or twist the casing, as this will prevent correct operation of the wiper.

CAUTION: Where more than one wiper unit is to be mounted close together, allow a distance of 75mm minimum between the wiper units.

Standard or Bracket Mounting



Standard 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).
3. Detach the back casing 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 172 mm.
4. Drill the remaining wiper fixing & cable holes for the multi-way cable, 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. Using the supplied M6 x 10mm screws, secure the wiper arm to the carriage plate.



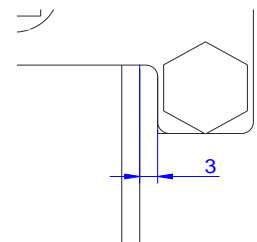
CAUTION: Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

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



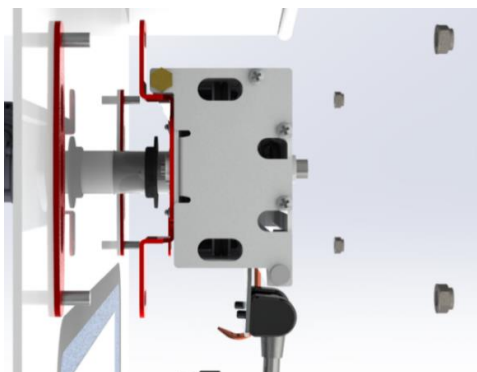
CAUTION: Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper case.

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



9. 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.
10. 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.
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.

Universal Carrier & Bracket Mounting



Universal Carrier & Bracket Mounting

1. Carefully mark the position of the 2 (3 for longer wipers) off universal carrier plates.
2. 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.
3. Drill the remaining wiper fixing & cable holes for the multi-way cable, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.
4. Fit the wiper case into position on the Universal Carrier studs and secure with supplied M10 spring washers, M10 flat washers and M10 nuts.
5. Using the supplied M6 x 10mm screws, secure the wiper arm to the carriage plate.

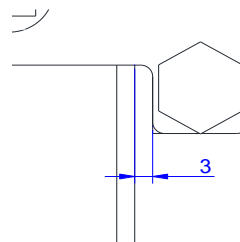


CAUTION: Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

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



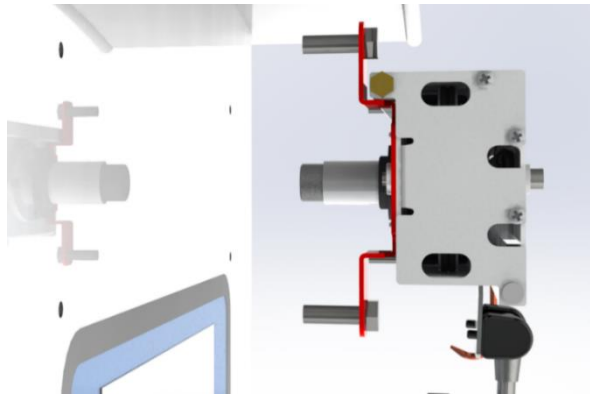
CAUTION: Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper case.



7. If necessary, slacken the screws on the wiper blade attachment clip, move the blade up or down for optimum position and then retighten screws.
8. 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.

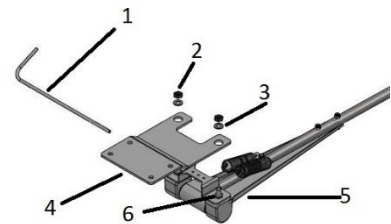
9. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front assembly to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.
10. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.

Bracket Mounting – Quick Release Arms



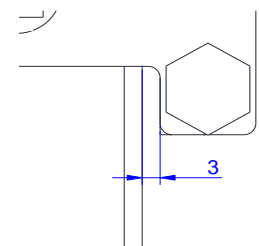
Bracket Mounting

1. Mark out and drill the 4 (6 for longer wiper units) off fixing holes (11 mm diameter).
2. Mark out and drill the cable holes for the multi-way cable, 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.



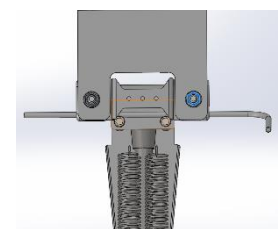
CAUTION: Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

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 case to the back case using the 2 off M8 bolts fitted.



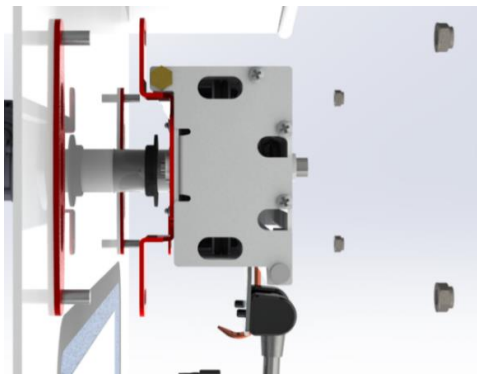
CAUTION: Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper case.

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



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.
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.

Universal Carrier & Bracket Mounting – Quick Release Arms



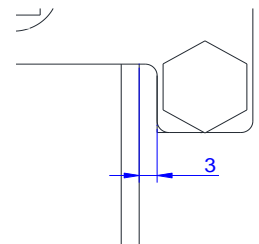
Universal Carrier & Bracket Mounting

1. Carefully mark the position of the 2 (3 for longer wipers) off universal carrier plates.
2. 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.
3. Drill the remaining wiper fixing & cable holes for the multi-way cable, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.
4. 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.

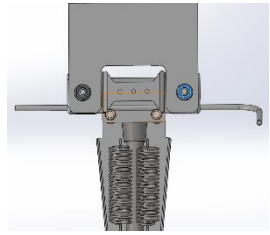
5. Fit the wiper blade to the wiper arm sub assembly (5), ensuring that the captive end of the wiper blade is at the top.
6. Bolt the front case to the back case using the 2 off M8 bolts fitted.

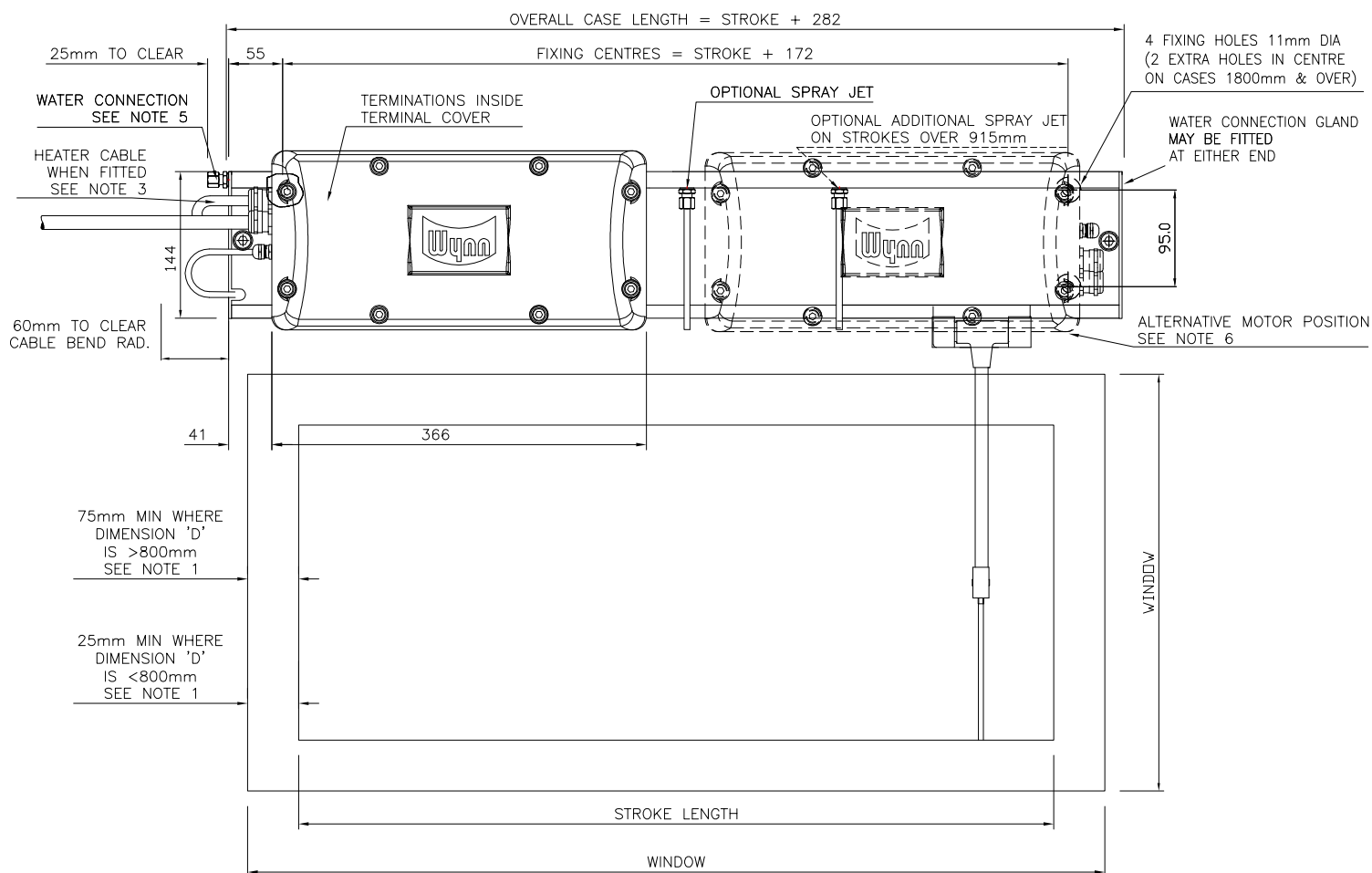


CAUTION: Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper case.

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

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. If necessary, slacken the screws on the wiper blade attachment clip, move the blade up or down for optimum position and then retighten screws.
11. 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.
12. 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.
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.



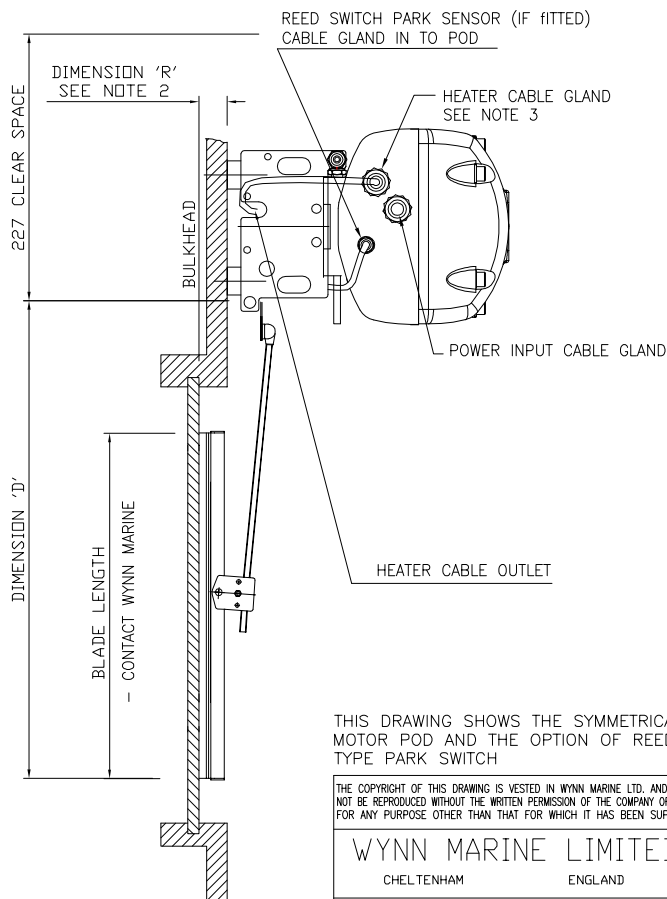


STANDARD ASSEMBLY VIEWED FROM OUTSIDE THE WINDOW

NOTES

- THESE MINIMUM DIMENSIONS ARE LIMITED BY THE CORNER RADII OF THE WINDOW.
- THE BLADE ARM MAY BE CRANKED WHERE DIMENSION 'R' IS GREATER THAN 75mm.
- HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
- CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
- CUSTOMER TO PIPE WATER DIRECTLY ONTO WATER SPRAY COUPLING.
- MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
- WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY



THIS DRAWING SHOWS THE SYMMETRICAL MOTOR POD AND THE OPTION OF REED TYPE PARK SWITCH

THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.

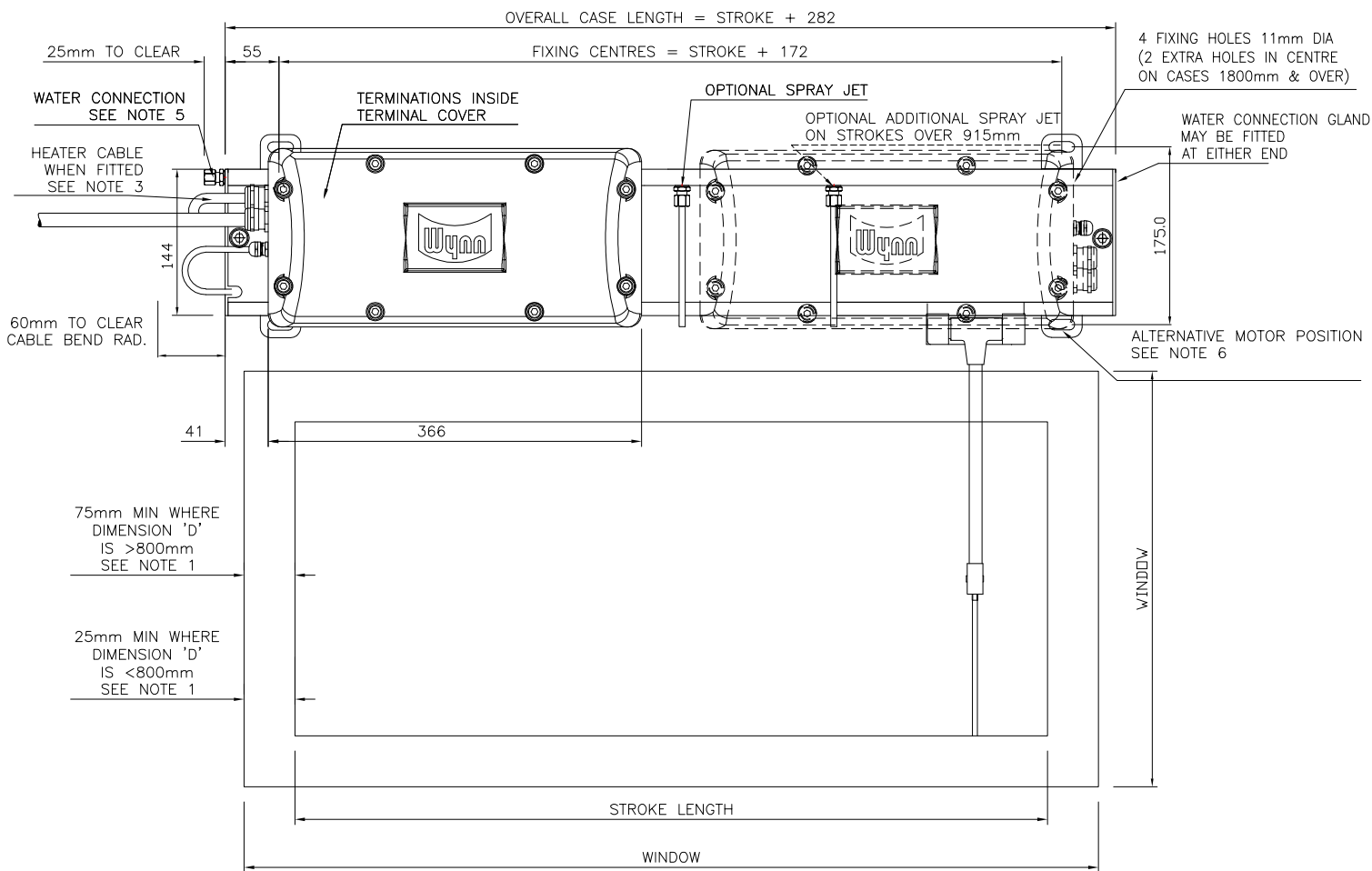
WYNN MARINE LIMITED
CHELTENHAM ENGLAND

TITLE:- SINGLE TYPE D MK 5
INSTALLATION DRG.

DRAWING No. 4030-003-SYM

CAD FILENAME+DIRECTORY	M:\DRAW\4030\4030-003-SYM						
3rd ANGLE PRO.						6	18.05.18
						5	23.01.14
						4	12.06.13
						3	11.09.09
						2	224 11.10.07
						1	192 14.05.07
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	
FINISH:-	SCALE:-	NTS	DRAWN:-	DD	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°

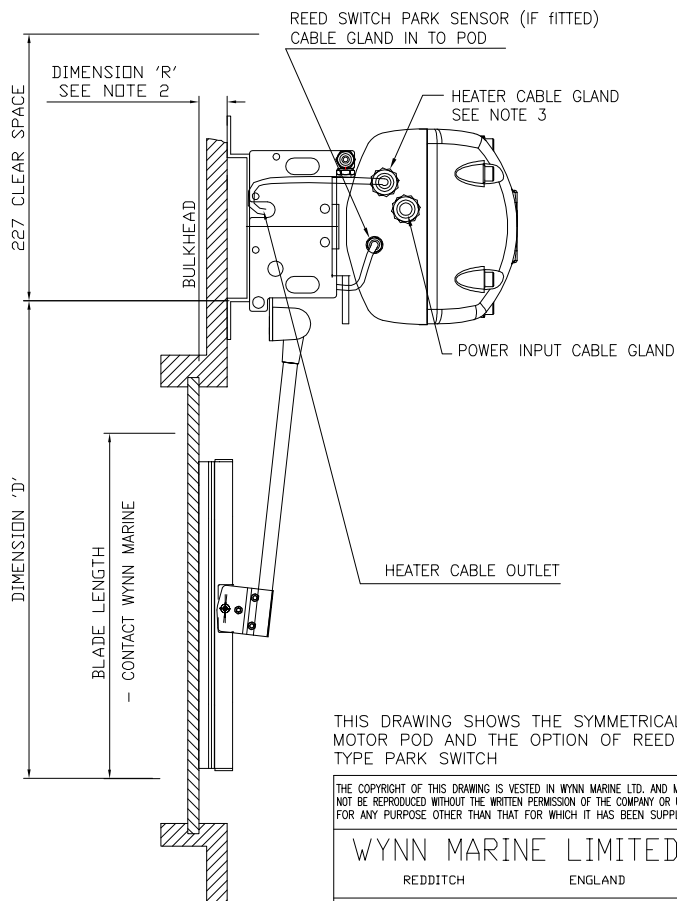


STANDARD ASSEMBLY VIEWED FROM OUTSIDE THE WINDOW

NOTES

- THESE MINIMUM DIMENSIONS ARE LIMITED BY THE CORNER RADII OF THE WINDOW.
- THE BLADE ARM MAY BE CRANKED WHERE DIMENSION 'R' IS GREATER THAN 75mm.
- HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
- CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
- CUSTOMER TO PIPE WATER DIRECTLY ONTO WATER SPRAY COUPLING. WATER CONNECTION CAN BE AT EITHER END.
- MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
- WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY



THIS DRAWING SHOWS THE SYMMETRICAL MOTOR POD AND THE OPTION OF REED TYPE PARK SWITCH

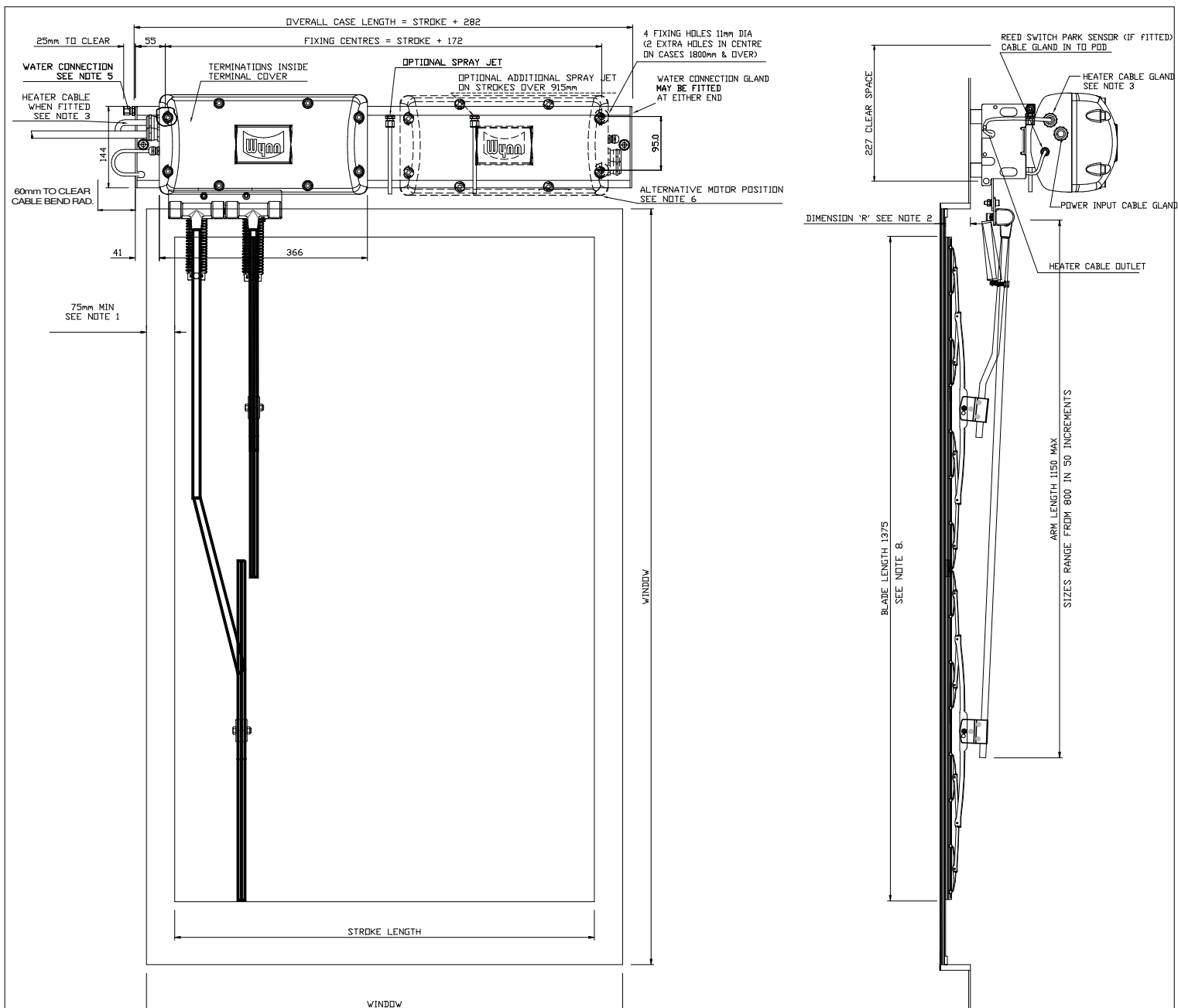
THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.

WYNN MARINE LIMITED
REDDITCH ENGLAND

TITLE:- SINGLE TYPE D MK 5
INSTALLATION DRG.

DRAWING No. 4030-003-UNI

CAD FILENAME+DIRECTORY	M:\DRAW\4030\4030-003-UNI							
3rd ANGLE PRO.								
TOLERANCES UNLESS OTHERWISE STATED DECIMAL DIMS. TO 2 PLACES ± 0.1mm NO DECIMAL PLACES ± 0.5mm ANGLES ± 1°								
						2		18.05.18
						1		21.07.14
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN
FINISH:-	SCALE:-	NTS	DRAWN:-	DD	CHKD:-	CHANGED:-		



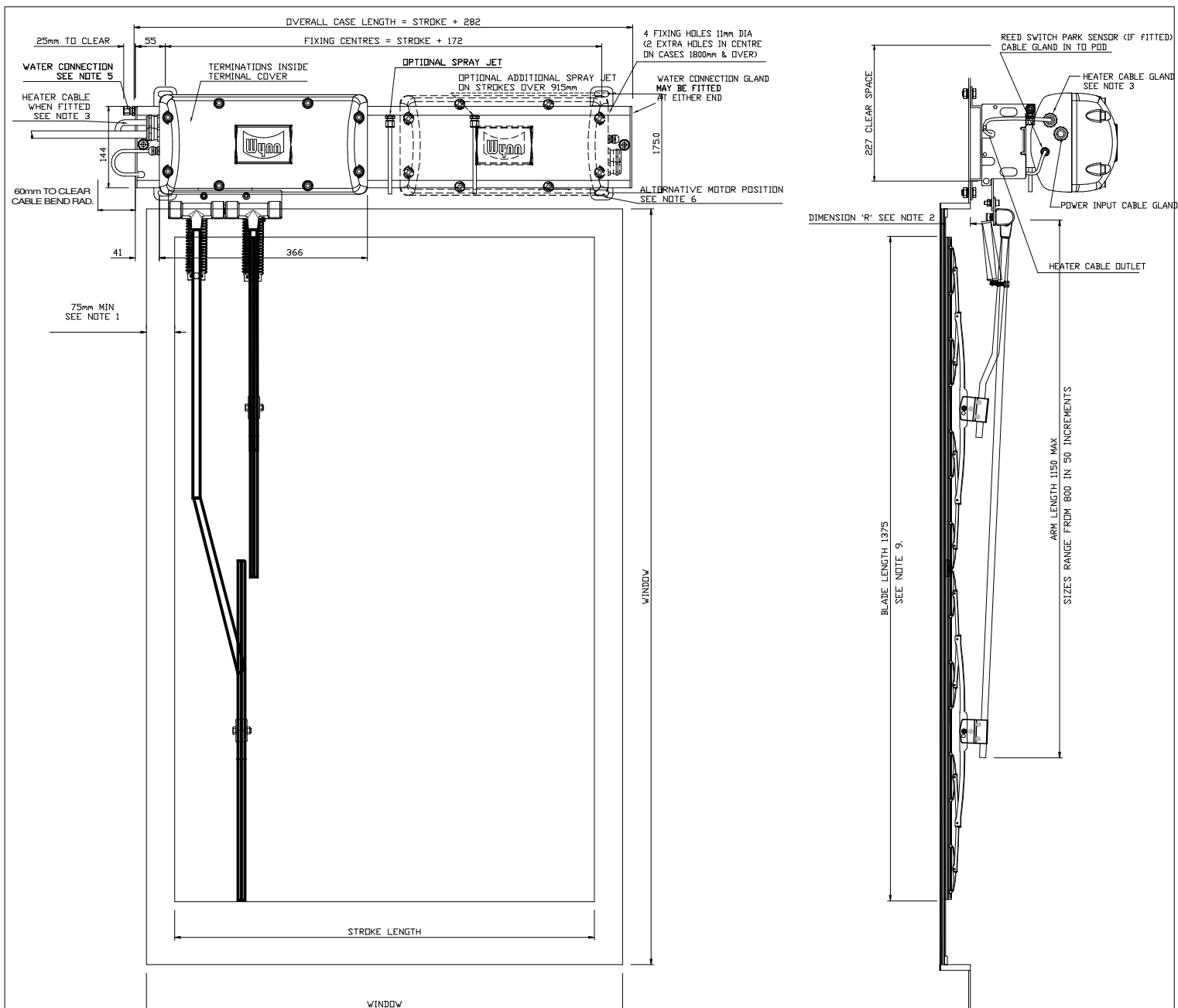
NOTES

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 75mm.
3. HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
4. CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
5. CUSTOMER TO PIPE WATER DIRECTLY ONTO WATER SPRAY COUPLING.
6. MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
7. WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.
8. WIPER BLADE LENGTH 700 EACH, OVERALL 1375.
9. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY		M:\DRAW\4030\4030-003-SYM Dbl Arm									
3rd ANGLE PRO.											
TOLERANCES UNLESS OTHERWISE STATED											
DECIMAL DIMS TO 2 PLACES ± 0.1mm											
DECIMAL DIMS TO 1 PLACE ± 0.5mm											
AND DECIMAL PLACES ± 0.5mm											
ANGLES ± 1°											
MATERIAL:-		ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE	28.10.19
FINISH:-		SCALE:-	NTS	DRAWN:-	DD	CHKD:-		CHANGED:-			


THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
WYNN MARINE LIMITED	
REDDITCH	ENGLAND
TITLE:- SINGLE TYPE D MK5	
INSTALLATION DRG.	
DRAWING No. 4030-003-SYM Dbl Arm	



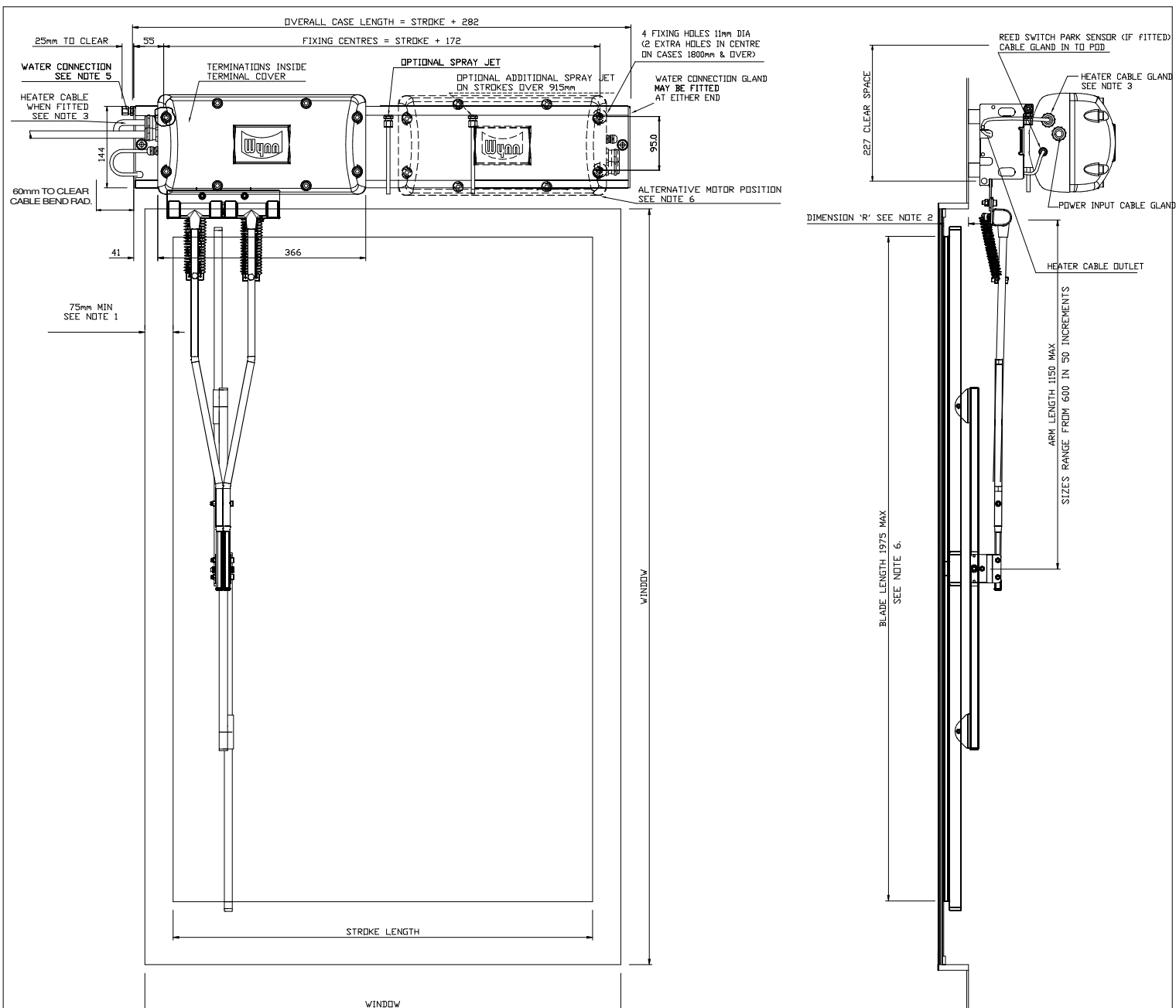
NOTES

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 75mm.
3. HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
4. CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
5. CUSTOMER TO PIPE WATER DIRECTLY ONTO WATER SPRAY COUPLING.
6. MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
7. WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.
8. WIPER BLADE LENGTH 700 EACH, OVERALL 1375..
9. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY		M:\DRAW\4030\4030-003-UNI Dbl Arm									
3rd ANGLE PRD.											
TOLERANCES UNLESS OTHERWISE STATED											
DECIMAL DIMS TO 2 PLACES ± 0.1mm											
DECIMAL DIMS TO 1 PLACE ± 0.25mm											
AND DECIMAL PLACES ± 0.5mm											
ANGLES ± 1°											
MAT'L:-		ISS. DIN	DATE	ISS. DIN	DATE	ISS. DIN	DATE	1	28.10.19		
FINISH:-		SCALE:- NTS	DRAWN:- DD	CHKD:-	CHANGED:-						

THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
WYNN MARINE LIMITED	REDDITCH ENGLAND
TITLE:- SINGLE TYPE D MK5 INSTALLATION DRG.	
DRAWING No. 4030-003-UNI Dbl Arm	



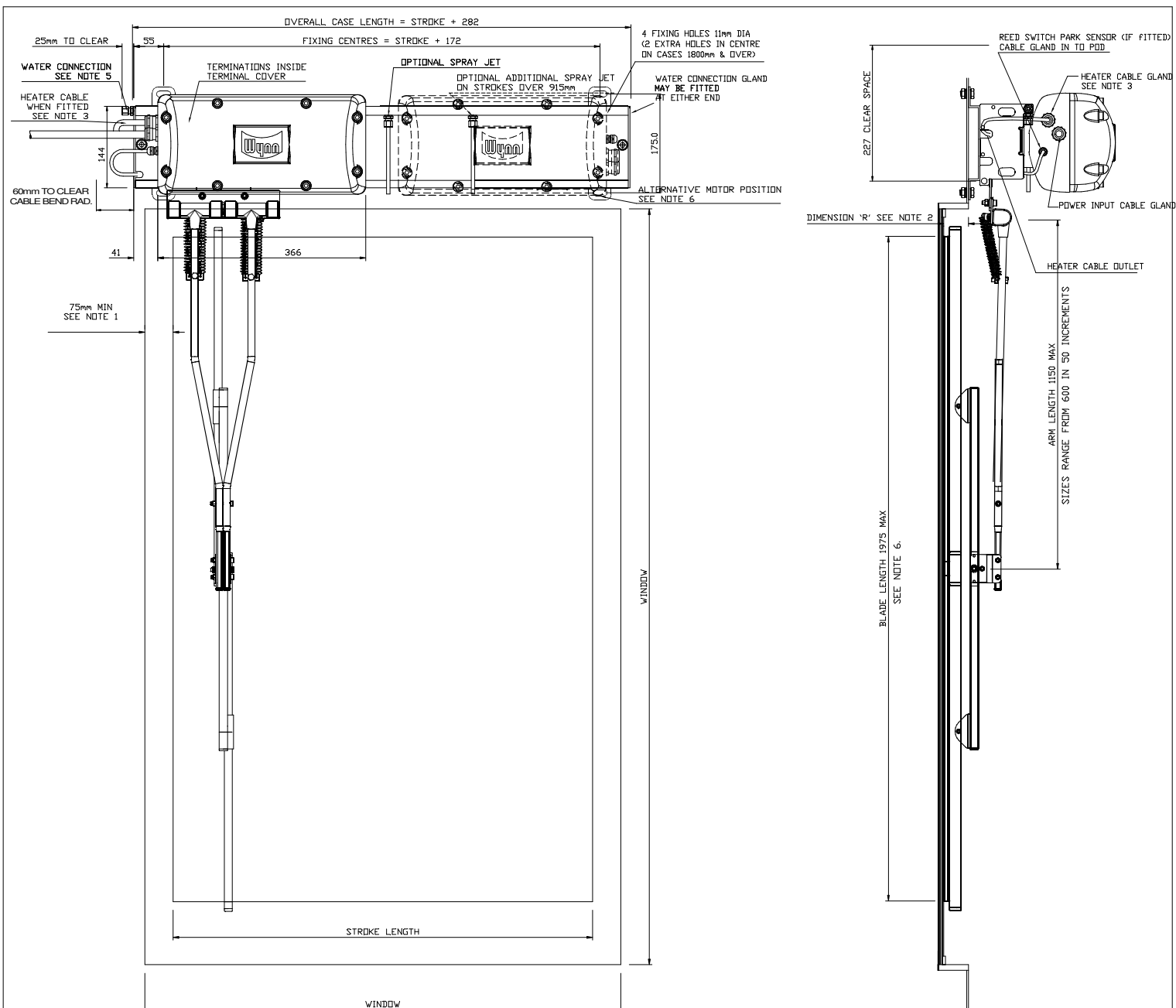
NOTES

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 75mm.
3. HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
4. CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
5. CUSTOMER TO PIPE WATER DIRECTLY ONTO WATER SPRAY COUPLING.
6. MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
7. WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.
8. DUAL WIPER BLADE LENGTHS RANGE FROM 1175 TO 1975 IN 100 INCREMENTS.
9. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY	M:\DRAW\4030\4030-003-SYM HD Arm							
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°								
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN
FINISH:-	SCALE:-	NTS	DRAWN:-	DD	CHKD:-		CHANGED:-	

THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
WYNN MARINE LIMITED	
REDDITCH	ENGLAND
TITLE:- SINGLE TYPE D MK5	
INSTALLATION DRG.	
DRAWING No. 4030-003-SYM HD Arm	



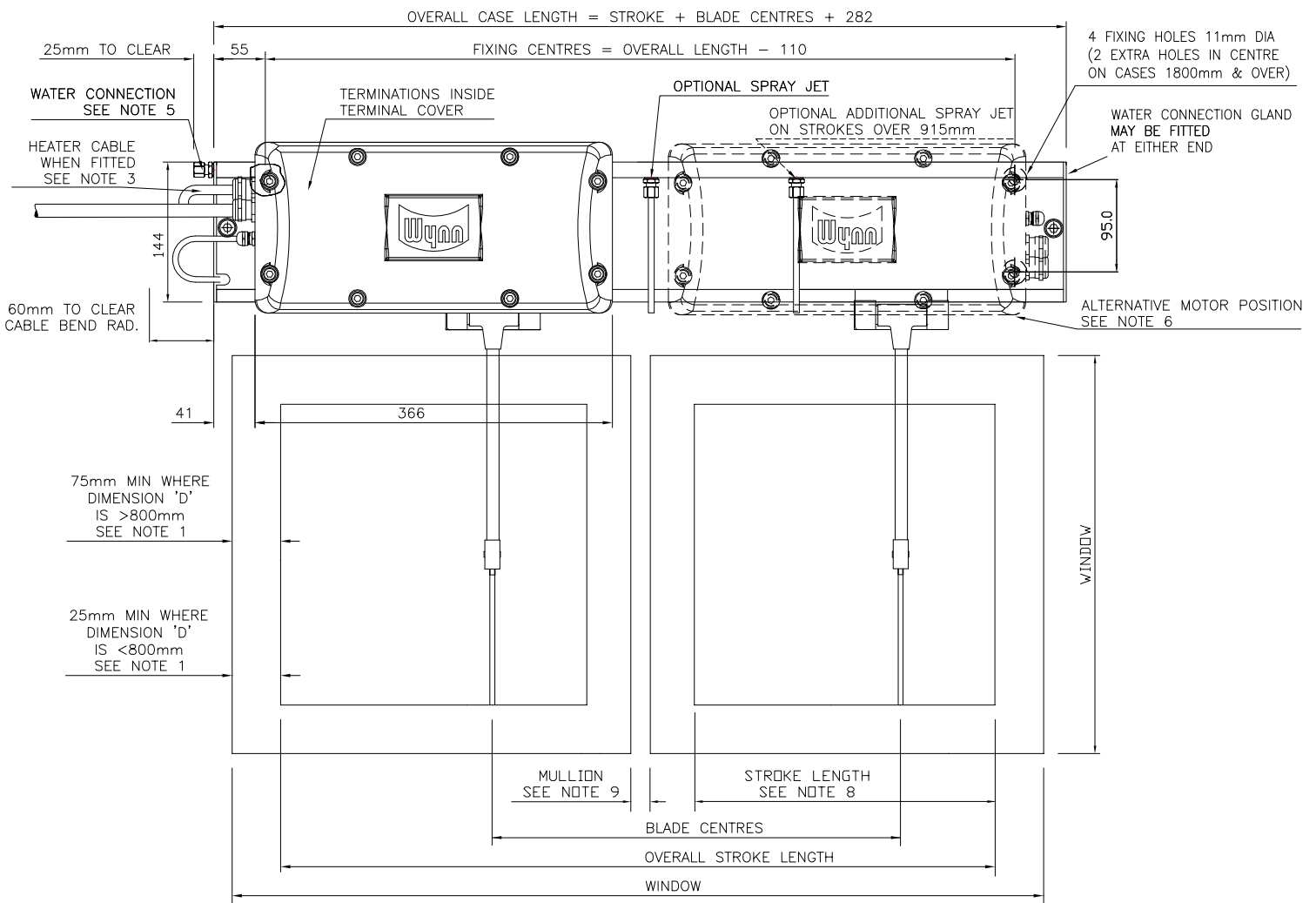
NOTES

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 75mm.
3. HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
4. CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
5. CUSTOMER TO PIPE WATER DIRECTLY ONTO WATER SPRAY COUPLING.
6. MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
7. WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.
8. DUAL WIPER BLADE LENGTHS RANGE FROM 1175 TO 1975 IN 100 INCREMENTS.
9. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY	M:\DRAW\4030\4030-003-UNI HD Arm									
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°										
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE	25.09.19
FINISH:-	SCALE:-	NTS	DRAWN:-	DD	CHKD:-		CHANGED:-			

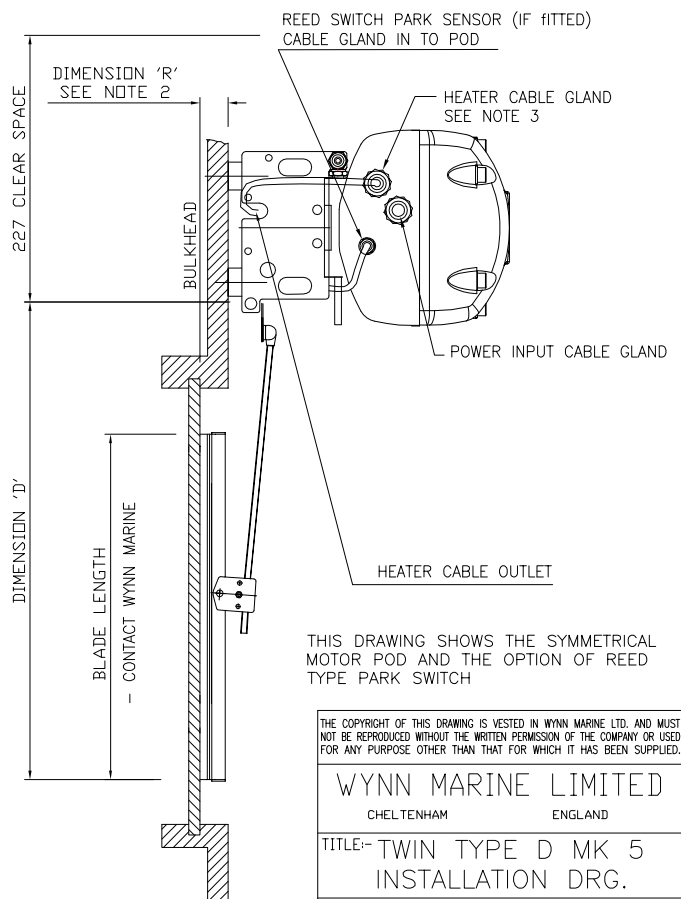
THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
WYNN MARINE LIMITED	REDDITCH ENGLAND
TITLE:- SINGLE TYPE D MK5 INSTALLATION DRG.	
DRAWING No. 4030-003-UNI HD Arm	



NOTES STANDARD ASSEMBLY VIEWED FROM OUTSIDE THE WINDOW

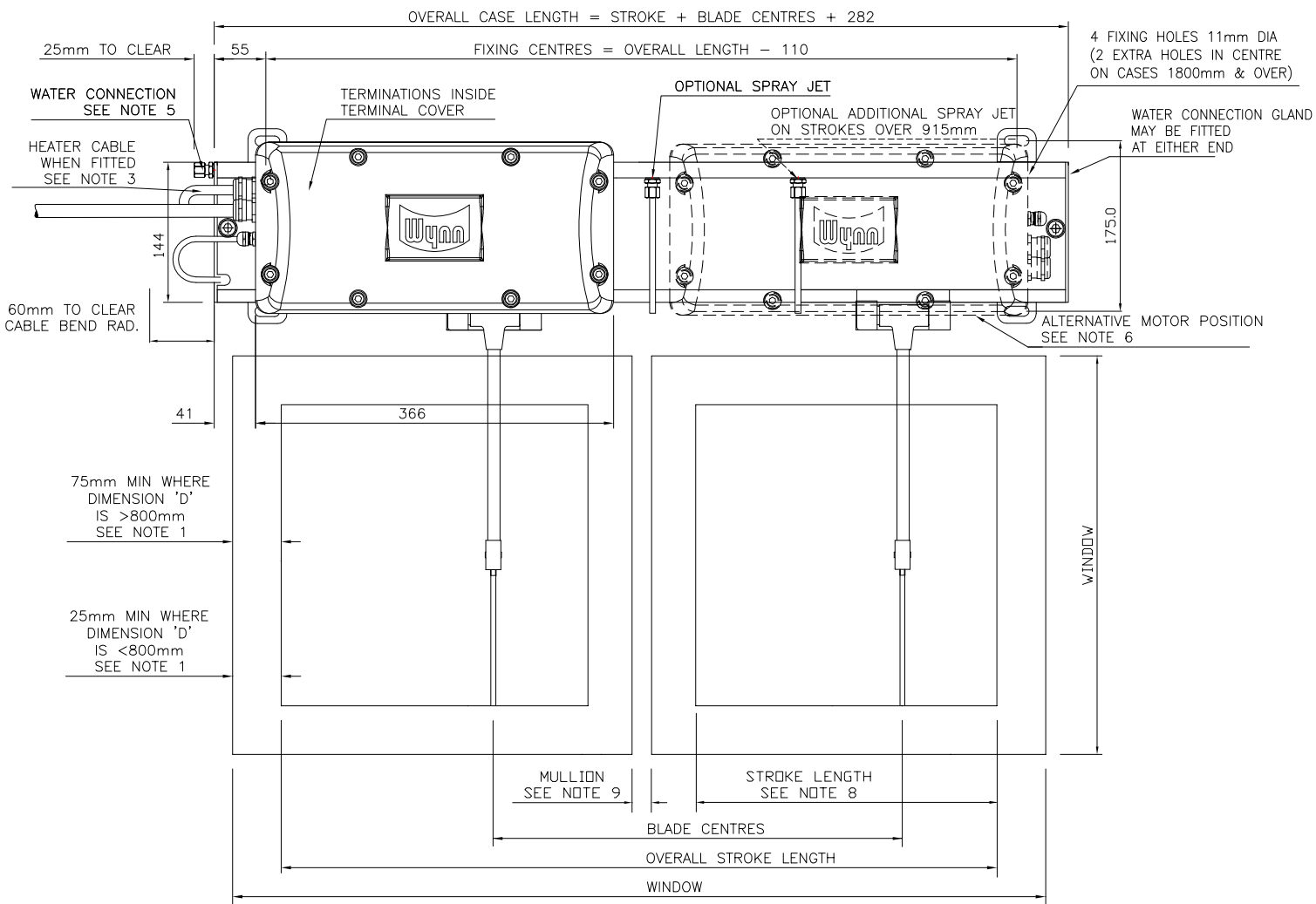
- THESE MINIMUM DIMENSIONS ARE LIMITED BY THE CORNER RADII OF THE WINDOW.
- THE BLADE ARM MAY BE CRANKED WHERE DIMENSION 'R' IS GREATER THAN 75mm.
- HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
- CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
- CUSTOMER TO PIPE WATER DIRECTLY ON TO WATER SPRAY COUPLING.
- MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
- WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.
- WHEN TWIN WIPERS ARE USED ON SINGLE WINDOWS THE WIPER BLADES SHOULD BE SET TO OVERLAP BY 25mm.
- WHEN TWIN WIPERS ARE USED ON ADJACENT WINDOWS, BLADE CENTRES SHOULD BE INCREASED BY THE WIDTH OF THE MULLION PLUS TWICE THE MINIMUM WINDOW EDGE CLEARANCE - SEE NOTE 1.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY



CAD FILENAME+DIRECTORY M:\DRAW\4030\4030-004-SYM									
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°							6		18.05.18
							5		23.01.14
							4		12.06.13
							3		11.09.09
							2	224	11.10.07
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	1	192	15.05.07
FINISH:-	SCALE:-	NTS	DRAWN:-	DD	CHKD:-	CHANGED:-			

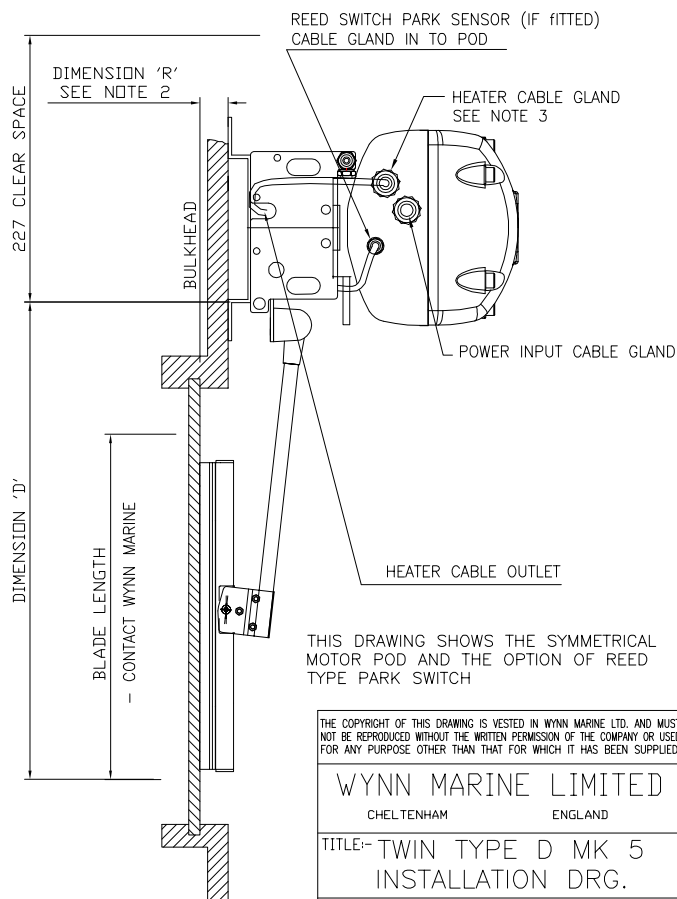
THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
WYNN MARINE LIMITED	
CHEL TENHAM	ENGLAND
TITLE:- TWIN TYPE D MK 5	
INSTALLATION DRG.	
DRAWING No. 4030-004-SYM	



NOTES STANDARD ASSEMBLY VIEWED FROM OUTSIDE THE WINDOW

- 1 THESE MINIMUM DIMENSIONS ARE LIMITED BY THE CORNER RADII OF THE WINDOW.
- 2 THE BLADE ARM MAY BE CRANKED WHERE DIMENSION 'R' IS GREATER THAN 75mm.
- 3 HEATER WHEN FITTED WILL BE WIRED INTO THE MOTOR TERMINAL BLOCK.
- 4 CUSTOMER TO ROUTE CABLING FROM MOTOR HOUSING AS REQUIRED.
- 5 CUSTOMER TO PIPE WATER DIRECTLY ON TO WATER SPRAY COUPLING. WATER CONNECTION CAN BE AT EITHER END.
- 6 MOTOR POSITION SHOWN AS STANDARD, OPPOSITE ORIENTATION AVAILABLE UPON REQUEST.
- 7 WHEN FITTED THE PARK SWITCH IS WIRED TO TERMINALS ON THE MOTOR TERMINAL BLOCK. PARKING IS AT THE MOTOR END.
- 8 WHEN TWIN WIPERS ARE USED ON SINGLE WINDOWS THE WIPER BLADES SHOULD BE SET TO OVERLAP BY 25mm.
- 9 WHEN TWIN WIPERS ARE USED ON ADJACENT WINDOWS, BLADE CENTRES SHOULD BE INCREASED BY THE WIDTH OF THE MULLION PLUS TWICE THE MINIMUM WINDOW EDGE CLEARANCE - SEE NOTE 1.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY



CAD FILENAME+DIRECTORY	M:\DRAW\4030\4030-004-UNI							
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°								
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN
FINISH:-	SCALE:-	NTS	DRAWN:-	DD	CHKD:-	CHANGED:-		

THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.

WYNN MARINE LIMITED
 CHELTENHAM ENGLAND

TITLE:- TWIN TYPE D MK 5
 INSTALLATION DRG.

DRAWING No. 4030-004-UNI

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. Check for wiring fault, broken wire or loose terminal. 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. The motor needs a reasonable amount of free space to provide sufficient cooling airflow – check. 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. 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. Idle pulley springs broken or missing. Replace.
Drive belt broken or damaged.	Inspect belt for slip or burn damage. Belt at end of life. Replace.
Idle pulley jammed.	Damaged by impact, or bearing system failed. Replace assembly.
Corrosion.	If corroded, check for water ingress through seals and tightness of connections, 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. 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. 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. Arm pivots seized due to corrosion - replace. 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). Check for wiring damage or loose wires. 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. 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. Dismantle and flush pipes.
Water frozen.	Switch on heaters.

TYPE D5 WIPER MAINTENANCE

Wynn products have been proven over many years to perform well under the harshest condition of use. No specialist tools are supplied. To maintain their performance the following schedule is recommended:

TOOLS REQUIRED:

- I. TORQUE WRENCH WITH 6MM ALLEN KEY SOCKET
- II. TORQUE WRENCH WITH 17MM SPANNER
- III. TORQUE WRENCH WITH 22MM SPANNER
- IV. TORQUE WRENCH WITH 24MM SPANNER
- V. 4MM ALLEN KEY
- VI. 5MM ALLEN KEY
- VII. 6MM ALLEN KEY
- VIII. 6MM SOCKET
- IX. 8MM SPANNER
- X. 10MM SPANNER
- XI. 10MM SOCKET
- XII. 11MM SPANNER
- XIII. 14MM SPANNER
- XIV. 3MM FLAT BLADE SCREWDRIVER
- XV. 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 the motor pod case bolts are tightened to a torque of 12-14NM.
3. Check the cable entry gland nuts are tightened to the following torque:

Motor	-	5NM
Heater	-	4.2NM
Sensor	-	4.2NM

4. 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.

5. Check the drive belt for deterioration. Replace if necessary.
6. 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. Special spanner is supplied with set of 8 guide rollers.



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

7. Check for free movement of idler pulleys in response to belt tension. Lubricate as necessary with water resistant grease.
8. 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.

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

TYPE D5 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. TORQUE WRENCH WITH 6MM ALLEN KEY SOCKET
- II. TORQUE WRENCH WITH 17MM SPANNER
- III. TORQUE WRENCH WITH 22MM SPANNER
- IV. TORQUE WRENCH WITH 24MM SPANNER
- V. 4MM ALLEN KEY
- VI. 5MM ALLEN KEY
- VII. 6MM ALLEN KEY
- VIII. 6MM SOCKET
- IX. 8MM SPANNER
- X. 10MM SPANNER
- XI. 10MM SOCKET
- XII. 11MM SPANNER
- XIII. 14MM SPANNER
- XIV. 3MM FLAT BLADE SCREWDRIVER
- XV. 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. Remove the wash jets (if fitted) from the wiper unit.
2. Remove the 2 x M8 Cap head bolts at each end of the case and set aside. For longer units, clamps will also need to be removed.
3. Carefully lower the case so it hangs on the cover end plates.
4. 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.
5. Slacken the blade clip bolts and remove blade. Set aside for reuse.
6. Re-assembly is reversal of above instructions.

Drive Belt

1. Remove the wash jets (if fitted) from the wiper unit.
2. Remove the 2 x M8 Cap head bolts at each end of the case and set aside. For longer units, clamps will also need to be removed.
3. Disengage front assembly from rear casing and support it without causing undue strain at the cables. Alternatively, open motor enclosure, disconnect wiring and draw cables out of glands. Lift off whole of front casing assembly.
4. 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.

5. 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).
6. 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.
7. 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).
8. Fit the carriage & belt assembly back into the casing and slip the belt onto the drive & idler pulleys.
9. 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.
10. Refit the front casing to the back casing and secure with the 2 off M8 cover bolts. Reconnect any cables that were removed at para 3.
11. If the motor enclosure has been opened silicone grease should be applied to the cork gasket face and the housing bolts tightened to a torque of 12-14NM. Check the cable entry gland nuts are tightened to the following torque:

Motor	-	5NM
Heater	-	4.2NM
Sensor	-	4.2NM

Guide Rollers

1. Follow the Drive Belt renewal instructions 1 to 5 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.

Motor Pod Replacement

1. Disconnect the motor pod from the ships wiring (motor, case heater, park sensor).
2. Follow the Drive Belt renewal instructions 1 to 5 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. From inside the front casing remove the 3 x M6 bolts and washers securing the motor pod to the front casing.
5. Fit new motor pod using 3 x M6 bolts and washers removed above.

6. Pass the park switch cable through the slot in the case, ensure that the rubber grommet is pushed into place. Secure the parking switch in position using the 2 screws and fittings removed above.
7. To re-assemble the wiper unit follow the Drive Belt renewal instructions 8 to 9 above.
8. Reconnect the motor pod to the ship's wiring (motor, case heater, park sensor).

Wiper Motor Replacement

1. Open motor enclosure, 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.
5. Apply silicone grease to the motor pod cork gasket face, refit the motor pod cover and tighten the cover housing bolts to a torque of 12-14NM.

Type D5 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	DD**#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 Blade	1	SP1588-474
	Connecting Rod Assembly – Twin Blade	1	SP1588-474T
11	Vee-Belt	1	SP1279-106-###
12	Idler Pulley Assembly c/w Spring (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
15a	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

Ident	Description	Quantity	Part Number
	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
15c	PM3M 24Vdc Motor	1	SP1279-558-24
	PM3M 24Vdc Motor Slow Speed	1	SP1279-558L-24
16	Drive Pod Assembly	1	See calculator 1681-188
16a	Gasket Type D Mk5 Motor Pod	1	SP4030-066
16b	Pod Cover Bolt	8	zA0008-070S
16c	Cover Bolt Washer	8	SP1642-409
17	Rear Cover less Heater	1	See calculator 1681-161
18	Heater – Single Wiper	1	SP1588010\$\$\$^
18a	Heater Clips	a/r	SP1588-056
19	End Cover Left Hand	each	SP1588-058L*
	End Cover Right Hand	each	SP1588-058R*
19a	Fixing Screw	6	zP00012S-1.0S
19b	Blanking Plug	2	1588-062
19c	Metric Pipe Fitting	1	1588-038
19d	Tubing Plug	1	1588-037
21	Main Frame	1	See calculator 1681-161
24	Self-Parking Assembly (Reed sw and Magnet) 0.6m	1	SP1588-012-T
	Self-Parking Assembly (Reed sw only) 0.6m	1	SP1587-034-T
29	Pivot Block Securing Nut	2	zNL0.25F-S
not shown	Spray Jet Kit Single	1	SP1642-481
not shown	Spray Jet Kit Twin	1	SP1642-482
not shown	Spray Jet Kit Long Single	1	SP1642-483
not shown	Cover Bolts	2	zA0008-090S

Ident	Description	Quantity	Part Number
not shown	Drive Coupling – fitted inside Drive Shaft	1	SP1279-250
not shown	L050 Rubber Spider – fitted to Drive Coupling	1	SP1279-252

*** In the Part Number means length in mm.

**# In the Part Number means length in mm 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.

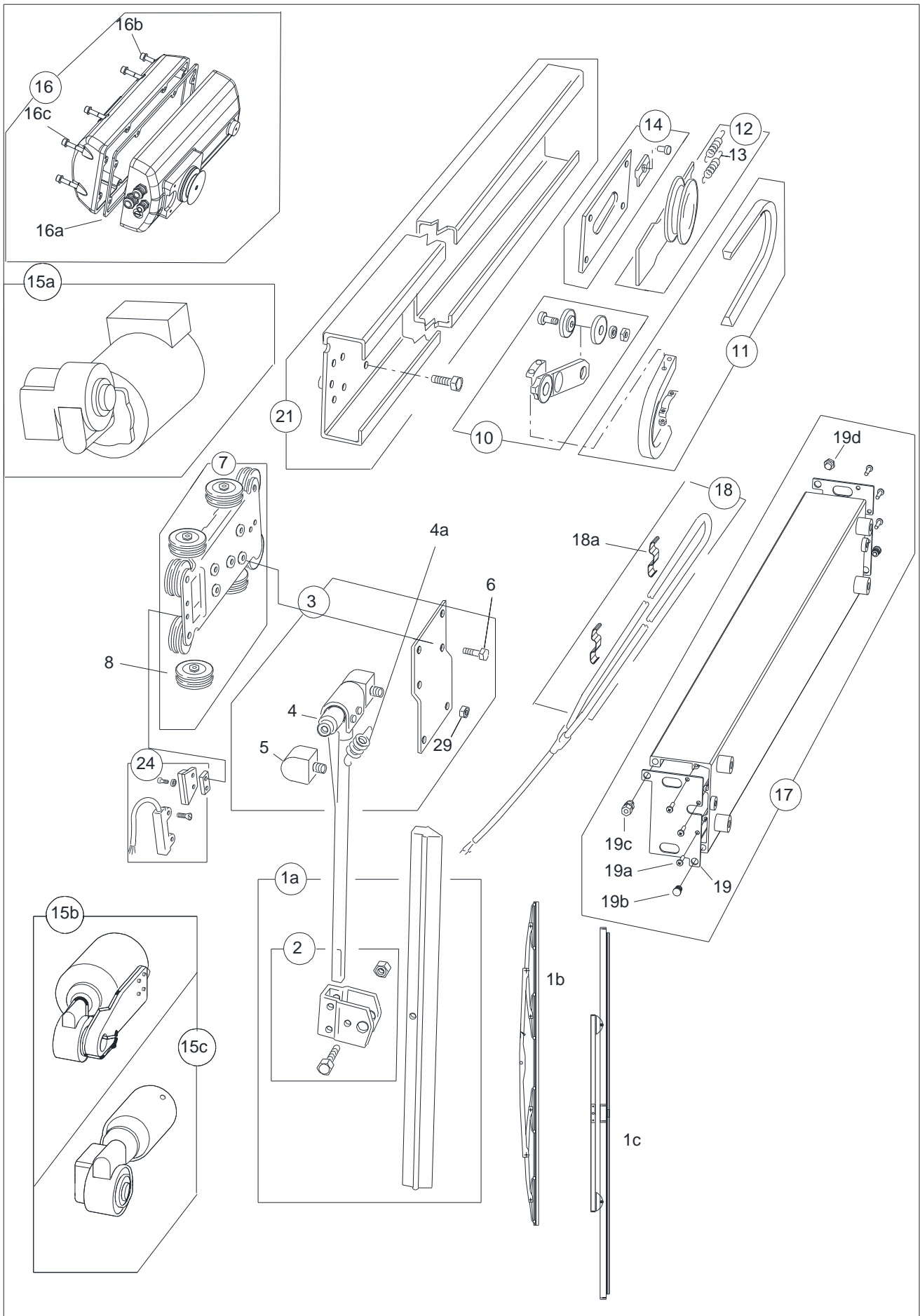
Belt length (written on belt as A###) in Inches.

‡ 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.

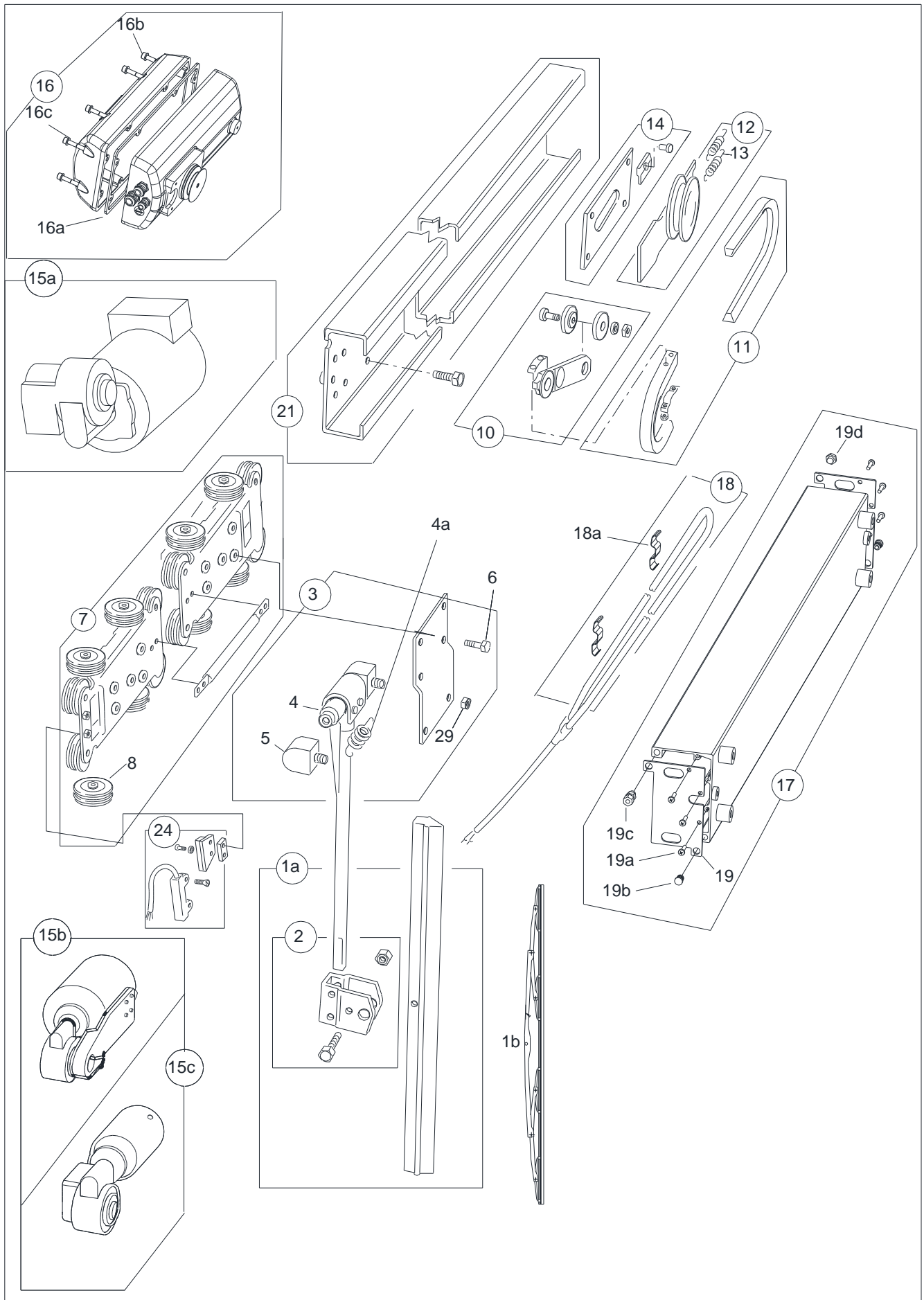
\$\$\$ Where \$\$\$ is voltage (220,115 or 024)

^^ Where ^ is heater length code.

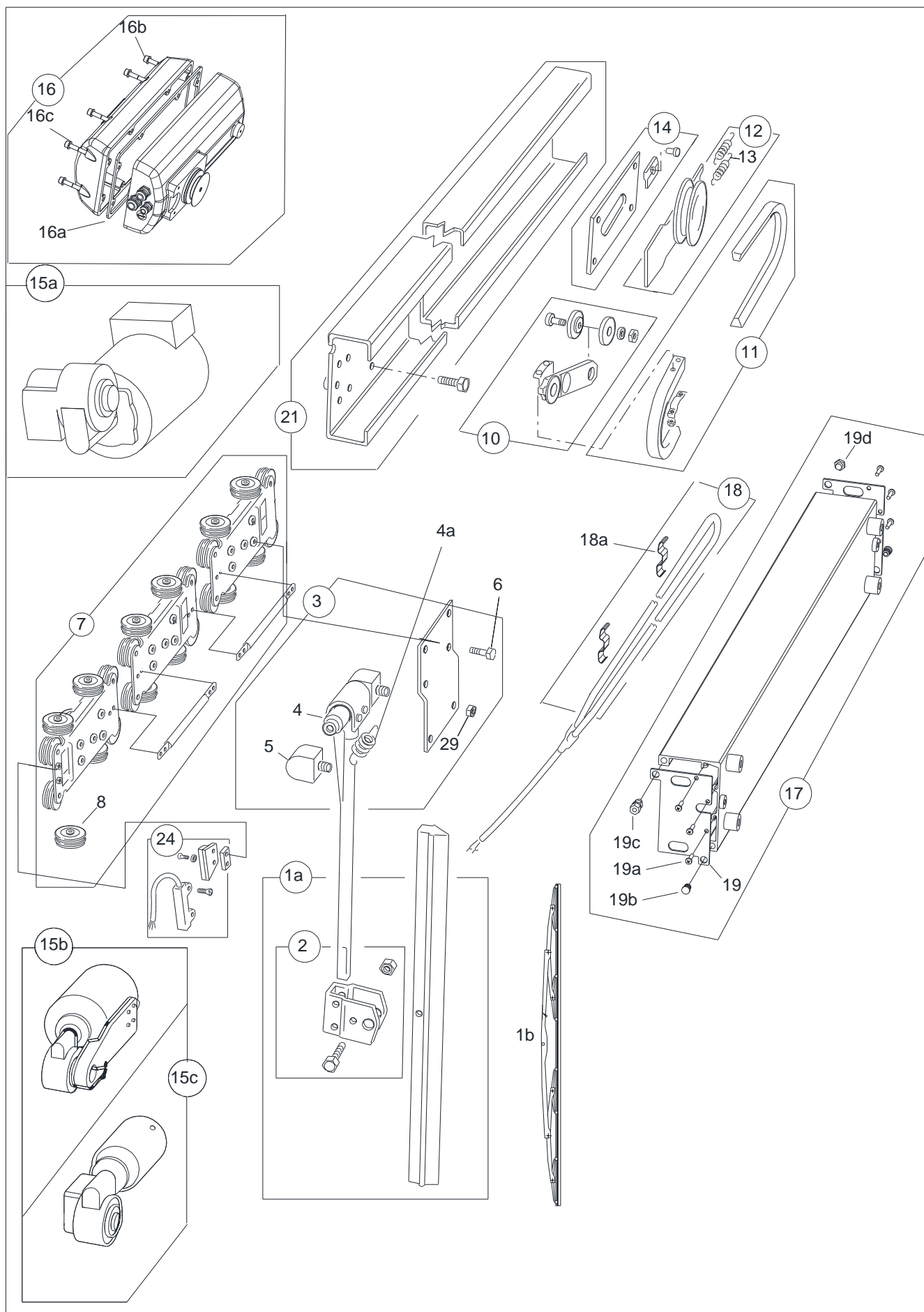
Type D5 Single Spare Parts Drawing



Type D5 Twin Spare Parts Drawing (Short)



Type D5 Twin Spare Parts Drawing (Long)



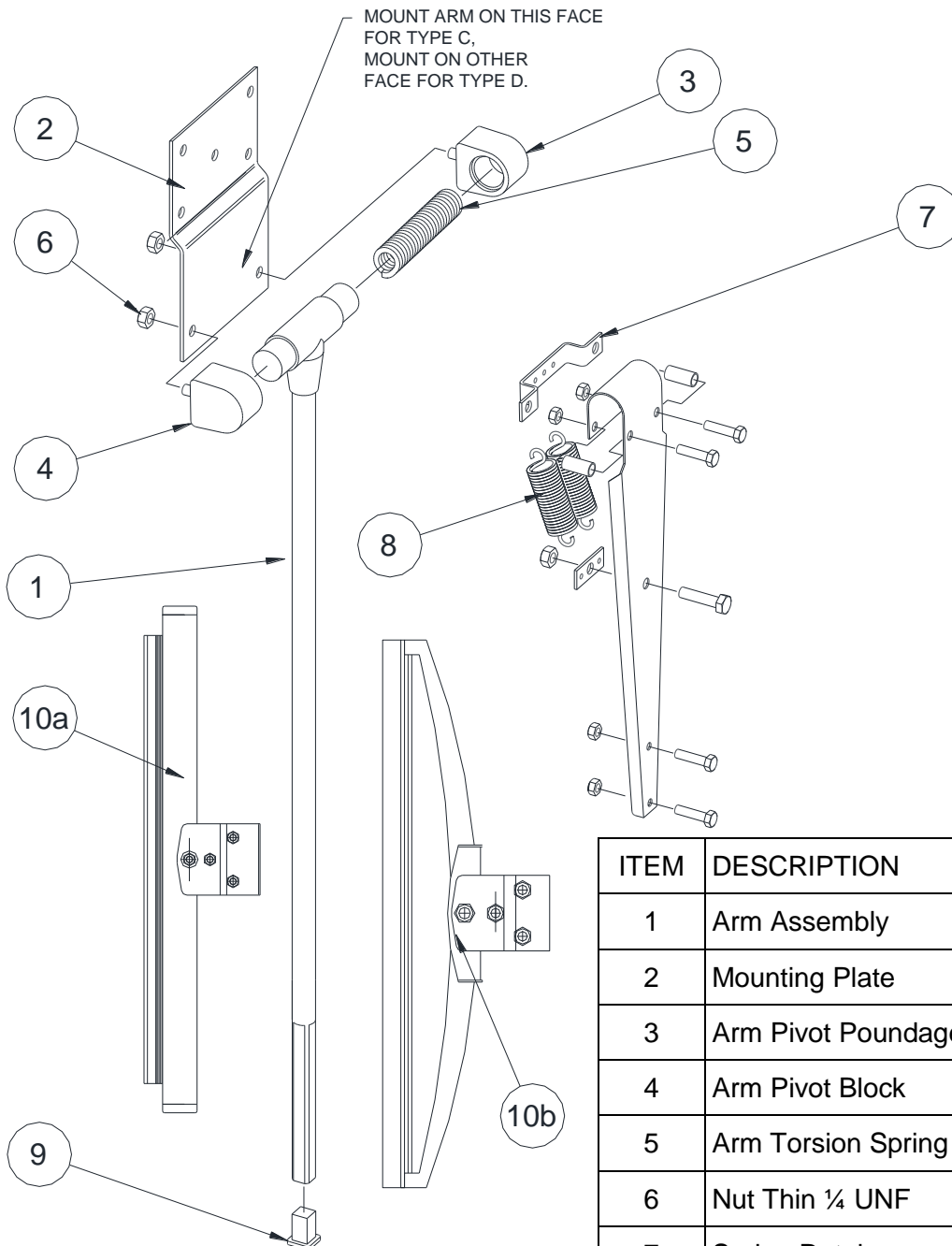
SLW Wiper Arm

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

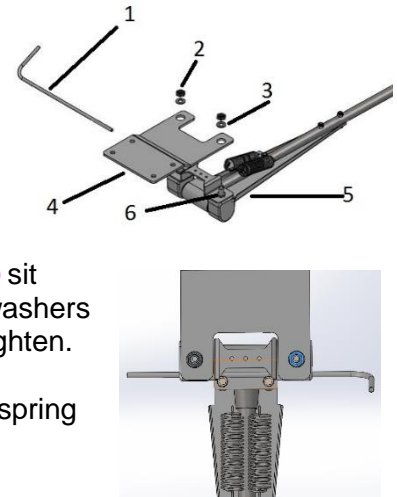


CAUTION: Ensure that the correct wiper, blade and arms are selected for each window. The wiper arm should not be installed/removed without the spring retaining pin fitted.

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.

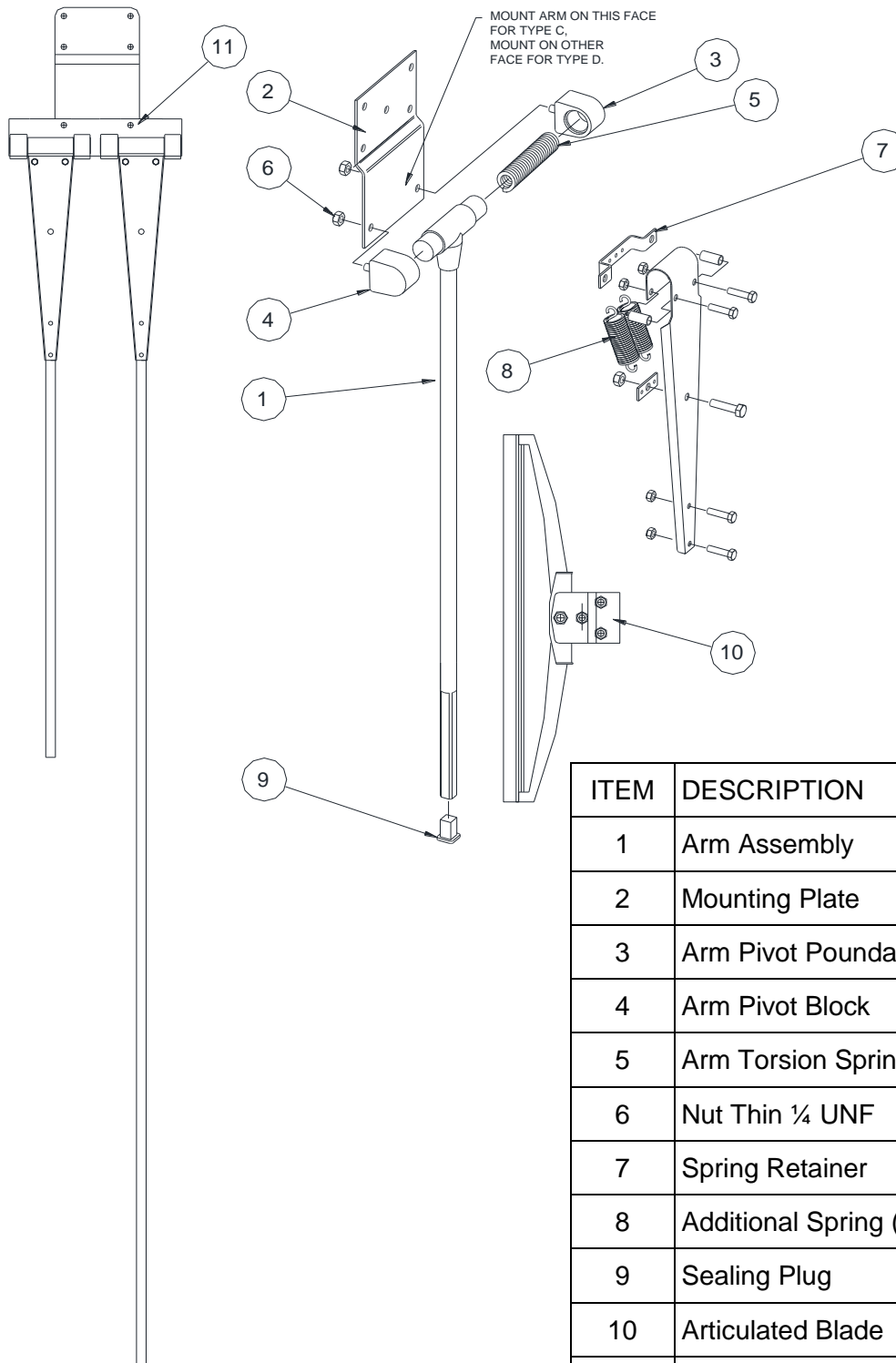
SLW Double Wiper Arm Assembly

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.



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
10	Articulated Blade	2
11	Double Arm Mtg Plate	2

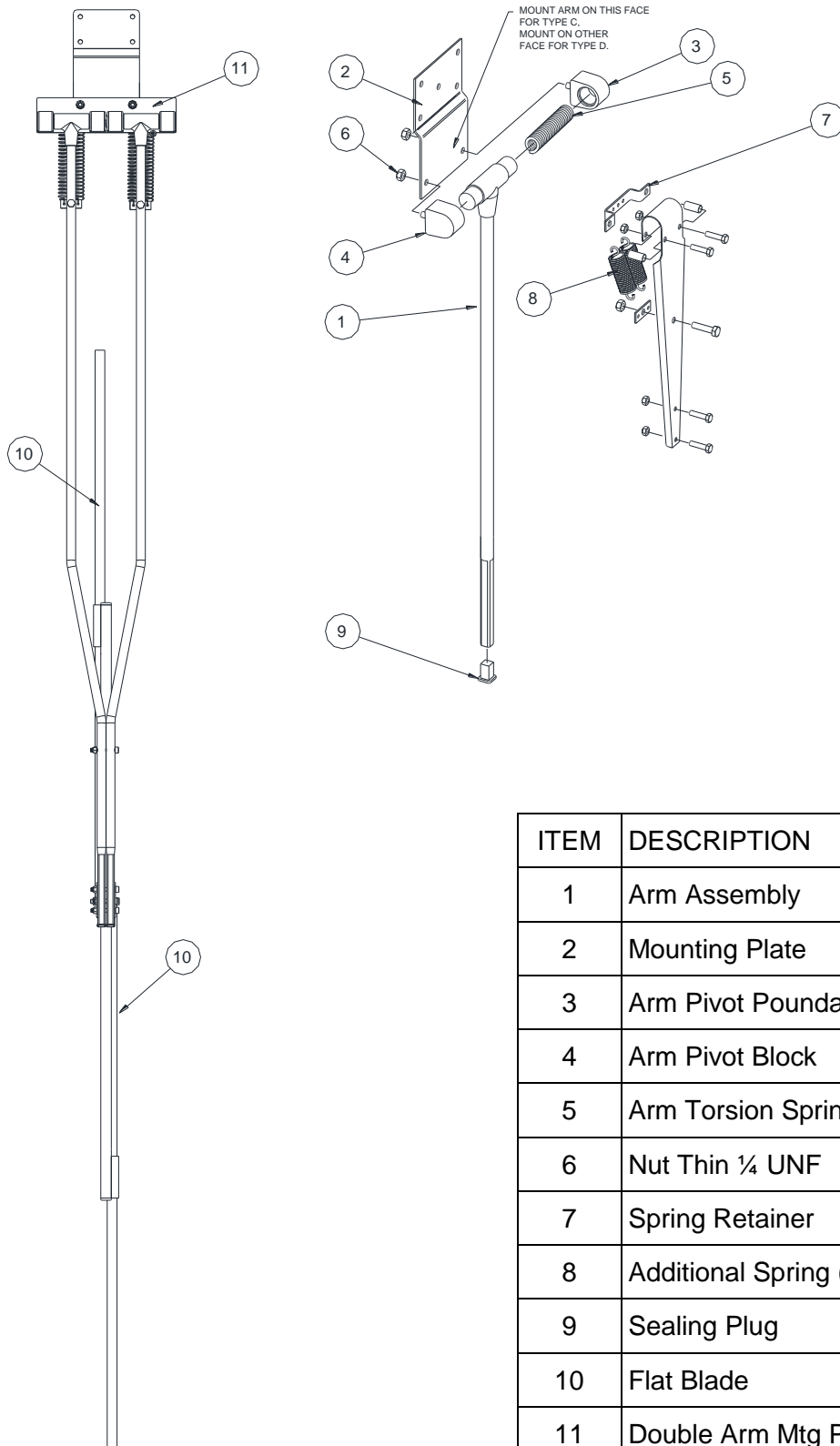
SLW Heavy Duty Wiper Arm Assembly

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.

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.



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 1/4 UNF	4
7	Spring Retainer	2(A/R)
8	Additional Spring (per arm)	(0, 1, 2)
9	Sealing Plug	2
10	Flat Blade	2
11	Double Arm Mtg Plate	2

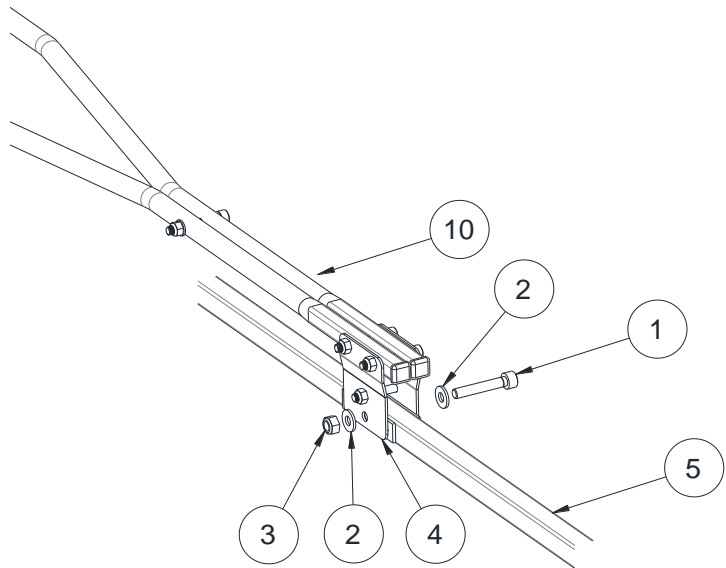
FITTING THE WIPER BLADE CARRIER

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

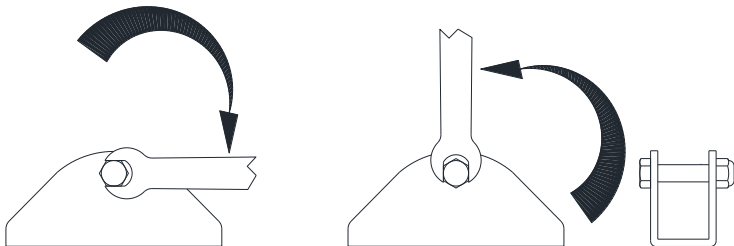
DO NOT over tighten blade carrier retaining bolt and nut, as blade carrier is required to pivot on glass.

Ref Figure – Nut Tightening

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

Figure – Nut Tightening

Secure nut
until tight 1/4 turn back



NOTE

Pictorial representation only, May not be exact to supplied arm

EXAMPLE
NUMBER

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

WIPER TYPE	CODE
D1	D1
D2	D2
D3	D3
D4	D4
D5	D5
C1	C1
C2	C2
C3	C3
C4	C4
C5	C5
C6	C6
C7	C7
C8	C8
C9	C9

STROKE TYPE	CODE
Single	1
Twin	2
Special Twin Case (Non-std crs)	Q
Special Single (See Instructions)	S
Special Twin (See Instructions)	T
Type C Single Old Style Cse/Cvr	3
Type C 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 583	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 33	2 X 835	33	
2 X 34	2 X 865	34	
2 X 35	2 X 890	35	
2 X 36	2 X 915	36	
2 X 37	2 X 940	37	
2 X 38	2 X 965	38	
2 X 39	2 X 990	39	
2 X 40	2 X 1015	40	
2 X 41	2 X 1040	41	
2 X 42	2 X 1065	42	
2 X 43	2 X 1095	43	
2 X 44	2 X 1145	44	
2 X 45	2 X 1195	45	
2 X 46	2 X 1245	46	
2 X 47	2 X 1295	47	
2 X 48	2 X 1345	48	
2 X 49	2 X 1395	49	
2 X 50	2 X 1445	50	
2 X 51	2 X 1495	51	
2 X 52	2 X 1545	52	
2 X 53	2 X 1595	53	
2 X 54	2 X 1645	54	
2 X 55	2 X 1695	55	
2 X 56	2 X 1745	56	
2 X 57	2 X 1795	57	
2 X 58	2 X 1845	58	
2 X 59	2 X 1895	59	
2 X 60	2 X 1945	60	
2 X 61	2 X 1995	61	
2 X 62	2 X 2045	62	
2 X 63	2 X 2095	63	
2 X 64	2 X 2145	64	
2 X 65	2 X 2195	65	
2 X 66	2 X 2245	66	
2 X 67	2 X 2295	67	
2 X 68	2 X 2345	68	
2 X 69	2 X 2395	69	
2 X 70	2 X 2445	70	
2 X 71	2 X 2495	71	
2 X 72	2 X 2545	72	
2 X 73	2 X 2595	73	
2 X 74	2 X 2645	74	
2 X 75	2 X 2695	75	
2 X 76	2 X 2745	76	
2 X 77	2 X 2795	77	
2 X 78	2 X 2845	78	
2 X 79	2 X 2905	79	
2 X 80	2 X 2955	80	
2 X 81	2 X 3005	81	
2 X 82	2 X 3055	82	
2 X 83	2 X 3105	83	
2 X 84	2 X 3155	84	
2 X 85	2 X 3205	85	
2 X 86	2 X 3255	86	
2 X 87	2 X 3305	87	
2 X 88	2 X 3355	88	
2 X 89	2 X 3405	89	
2 X 90	2 X 3455	90	
2 X 91	2 X 3505	91	
2 X 92	2 X 3555	92	
2 X 93	2 X 3605	93	
2 X 94	2 X 3655	94	
2 X 95	2 X 3705	95	
2 X 96	2 X 3755	96	
2 X 97	2 X 3805	97	
2 X 98	2 X 3855	98	
2 X 99	2 X 3905	99	
2 X 100	2 X 3955	100	
2 X 101	2 X 4005	101	
2 X 102	2 X 4055	102	
2 X 103	2 X 4105	103	
2 X 104	2 X 4155	104	
2 X 105	2 X 4205	105	
2 X 106	2 X 4255	106	
2 X 107	2 X 4305	107	
2 X 108	2 X 4355	108	
2 X 109	2 X 4405	109	
2 X 110	2 X 4455	110	
2 X 111	2 X 4505	111	
2 X 112	2 X 4555	112	
2 X 113	2 X 4605	113	
2 X 114	2 X 4655	114	
2 X 115	2 X 4705	115	
2 X 116	2 X 4755	116	
2 X 117	2 X 4805	117	
2 X 118	2 X 4855	118	
2 X 119	2 X 4905	119	
2 X 120	2 X 4955	120	
2 X 121	2 X 5005	121	
2 X 122	2 X 5055	122	
2 X 123	2 X 5105	123	
2 X 124	2 X 5155	124	
2 X 125	2 X 5205	125	
2 X 126	2 X 5255	126	
2 X 127	2 X 5305	127	
2 X 128	2 X 5355	128	
2 X 129	2 X 5405	129	
2 X 130	2 X 5455	130	
2 X 131	2 X 5505	131	
2 X 132	2 X 5555	132	
2 X 133	2 X 5605	133	
2 X 134	2 X 5655	134	
2 X 135	2 X 5705	135	
2 X 136	2 X 5755	136	
2 X 137	2 X 5805	137	
2 X 138	2 X 5855	138	
2 X 139	2 X 5905	139	
2 X 140	2 X 5955	140	
2 X 141	2 X 6005	141	
2 X 142	2 X 6055	142	
2 X 143	2 X 6105	143	
2 X 144	2 X 6155	144	
2 X 145	2 X 6205	145	
2 X 146	2 X 6255	146	
2 X 147	2 X 6305	147	
2 X 148	2 X 6355	148	
2 X 149	2 X 6405	149	
2 X 150	2 X 6455	150	
2 X 151	2 X 6505	151	
2 X 152	2 X 6555	152	
2 X 153	2 X 6605	153	
2 X 154	2 X 6655	154	
2 X 155	2 X 6705	155	
2 X 156	2 X 6755	156	
2 X 157	2 X 6805	157	
2 X 158	2 X 6855	158	
2 X 159	2 X 6905	159	
2 X 160	2 X 6955	160	
2 X 161	2 X 7005	161	
2 X 162	2 X 7055	162	
2 X 163	2 X 7105	163	
2 X 164	2 X 7155	164	
2 X 165	2 X 7205	165	
2 X 166	2 X 7255	166	
2 X 167	2 X 7305	167	
2 X 168	2 X 7355	168	
2 X 169	2 X 7405	169	
2 X 170	2 X 7455	170	
2 X 171	2 X 7505	171	
2 X 172	2 X 7555	172	
2 X 173	2 X 7605	173	
2 X 174	2 X 7655	174	
2 X 175	2 X 7705	175	
2 X 176	2 X 7755	176	
2 X 177	2 X 7805	177	
2 X 178	2 X 7855	178	
2 X 179	2 X 7905	179	
2 X 180	2 X 7955	180	
2 X 181	2 X 8005	181	
2 X 182	2 X 8055	182	
2 X 183	2 X 8105	183	
2 X 184	2 X 8155	184	
2 X 185	2 X 8205	185	
2 X 186	2 X 8255	186	
2 X 187	2 X 8305	187	
2 X 188	2 X 8355	188	
2 X 189	2 X 8405	189	
2 X 190	2 X 8455	190	
2 X 191	2 X 8505	191	
2 X 192	2 X 8555	192	
2 X 193	2 X 8605	193	
2 X 194	2 X 8655	194	
2 X 195	2 X 8705	195	
2 X 196	2 X 8755	196	
2 X 197	2 X 8805	197	
2 X 198	2 X 8855	198	
2 X 199	2 X 8905	199	
2 X 200	2 X 8955	200	
2 X 201	2 X 9005	201	
2 X 202	2 X 9055	202	
2 X 203	2 X 9105	203	
2 X 204	2 X 9155	204	
2 X 205	2 X 9205	205	
2 X 206	2 X 9255	206	
2 X 207	2 X 9305	207	
2 X 208	2 X 9355	208	
2 X 209	2 X 9405	209	
2 X 210	2 X 9455	210	
2 X 211	2 X 9505	211	
2 X 212	2 X 9555	212	
2 X 213	2 X 9605	213	
2 X 214	2 X 9655	214	
2 X 215	2 X 9705	215	
2 X 216	2 X 9755	216	
2 X 217	2 X 9805	217	
2 X 218	2 X 9855	218	
2 X 219	2 X 9905	219	
2 X 220	2 X 9955	220	
2 X 221	2 X 10005	221	
2 X 222	2 X 10055	222	
2 X 223	2 X 10105	223	
2 X 224	2 X 10155	224	
2 X 225	2 X 10205	225	
2 X 226	2 X 10255	226	
2 X 227	2 X 10305	227	
2 X 228	2 X 10355	228	
2 X 229	2 X 10405	229	
2 X 230	2 X 10455	230	
2 X 231	2 X 10505	231	
2 X 232	2 X 10555	232	
2 X 233	2 X 10605	233	
2 X 234	2 X 10655	234	
2 X 235	2 X 10705	235	
2 X 236	2 X 10755	236	
2 X 237	2 X 10805	237	
2 X 238	2 X 10855	238	
2 X 239	2 X 10905	239	
2 X 240	2 X 10955	240	
2 X 241	2 X 11005	241	
2 X 242	2 X 11055	242	
2 X 243	2 X 11105	243	
2 X 244	2 X 11155	244	
2 X 245	2 X 11205	245	
2 X 246	2 X 11255	246	
2 X 247	2 X 11305	247	
2 X 248	2 X 11355	248	
2 X 249	2 X 11405	249	
2 X 250	2 X 11455	250	
2 X 251	2 X 11505	251	
2 X 252	2 X 11555	252	
2 X 253	2 X 11605	253	
2 X 254	2 X 11655	254	
2 X 255	2 X 11705	255	
2 X 256	2 X 11755	256	
2 X 257	2 X 11805	257	
2 X 258	2 X 11855	258	
2 X 259	2 X 11905	259	
2 X 260	2 X 11955	260	
2 X 261	2 X 12005	261	
2 X 262	2 X 12055	262	
2 X 263	2 X 12105	263	
2 X 264	2 X 12155	264	
2 X 265	2 X 12205	265	
2 X 266	2 X 12255	266	
2 X 267	2 X 12305	267	
2 X 268	2 X 12355	268	
2 X 269	2 X 12405	269	
2 X 270	2 X 12455	270	
2 X 271	2 X 12505	271	
2 X 272	2 X 12555	272	
2 X 273	2 X 12605	273	
2 X 274	2 X 12655	274	
2 X 275	2 X 12705	275	
2 X 276	2 X 12755	276	
2 X 277	2 X 12805	277	
2 X 278	2 X 12855	278	
2 X 279	2 X 12905	279	
2 X 280	2 X 12955	280	
2 X 281	2 X 13005	281	
2 X 282	2 X 13055	282	
2 X 283	2 X 13105	283	
2 X 284	2 X 13155	284	
2 X 285	2 X 13205	285	
2 X 286	2 X 13255	286	
2 X 287	2 X 13305	287	
2 X 288	2 X 13355	288	
2 X 289	2 X 13405	289	
2 X 290	2 X 13455	290	
2 X 291	2 X 13505	291	
2 X 292	2 X 13555	292	
2 X 293	2 X 13605	293	
2 X 294	2 X 13655	294	
2 X 295	2 X 13705	295	
2 X 296	2 X 13755	296	
2 X 297	2 X 13805	297	
2 X 298	2 X 13855	298	
2 X 299	2 X 13905	299	
2 X 300	2 X 13955	300	

LOW SPEED (U)

SPECIAL TWIN

ST

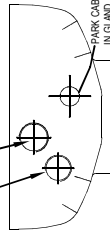
(for twins - eqt 2:24" is shown as 24 with the 2 being stated at the previous part number digit)

CONTROLLED

07 April 2011 12:44:41

MOTOR GLAND (PG16)

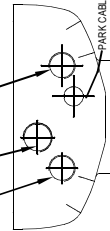
HEATER GLAND (PG13)



MOTOR BASE 4030-074

MOTOR GLAND (PG16)

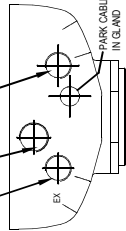
HEATER GLAND (PG13)



MOTOR BASE 4030-075

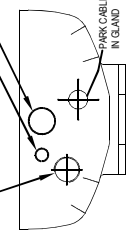
MOTOR GLAND (PG16)

HEATER GLAND (PG13)



MOTOR BASE 4030-076

HEATER GLAND (PG13)



MOTOR BASE 4030-089

NOTE CRITICAL DIMENSIONS MARKED THUS 'CD'
SIGNIFICANT DETAILS MARKED THUS 'SD'

Mail. Type - Finish 1 - REMOVE SHARP EDGES
Mail. Part No. - Finish 2 -
Mail. Size - Other info -

CONTROLLED

Issue Date - 07/04/2011

GENERAL TOLERANCES

unless otherwise stated
Dimension - No decimal place ± 1
Dimension - One decimal place ± 0.5
Dimension - Two decimal places ± 0.25
Dimension - Three decimal places ± 0.125
Dimension - Four decimal places ± 0.0625
Angular Dimension $\pm 1^\circ$

3RD ANGLE



DO NOT SCALE

IF IN DOUBT ASK

1681-188

THIS GIVES THE PART NO FOR A COMPLETE MOTOR POD

MP

WIPER TYPE	CODE
D2	D2
D4	D4
D5	D5

PARKING CABLE LENGTH	CODE
Not Supplied	0
2 Metres	1
5 Metres	2
10 Metres	3
20 Metres	4
Terminated in Enclosure	5
	6

NOTE: DESCRIPTIONS ARE FOR REFERENCE ONLY AND ARE NOT EXHAUSTIVE. OTHER OPTIONS ARE POSSIBLE ie REED SWITCH PARKING OR TWIN HEATERS.

MOTOR TYPE	HEATER TERMINATED IN MOTOR POD	CABLE TYPE	PARKING TYPE	MOTOR GLAND	HEATER GLAND	PARK OUT PARK IN
DC & IPH	HEATER NOT TERMINATED	MULTIPLE CABLE REED SV	PG 13.5	BLANK	BLANK	BLANK 001
SPH	HEATER TERMINATED	MULTIPLE CABLE REED SV	PG 21	PG 13.5	BLANK	BLANK 002
DC & IPH	HEATER NOT TERMINATED	SINGLE CABLE REED SV	PG 16	BLANK	BLANK	PG 9 003
SPH	HEATER TERMINATED	SINGLE CABLE REED SV	PG 16	BLANK	BLANK	PG 9 003
DC & IPH	HEATER NOT TERMINATED	SINGLE CABLE REED SV	PG 16	PG 13.5	BLANK	PG 9 004
SPH	HEATER TERMINATED	SINGLE CABLE REED SV	PG 16	PG 13.5	BLANK	PG 9 004
DC & IPH	HEATER NOT TERMINATED	MULTIPLE CABLE REED SV	PG 16	BLANK	BLANK	BLANK 005
SPH	HEATER TERMINATED	MULTIPLE CABLE REED SV	PG 16	PG 13.5	BLANK	BLANK 006
OLD STYLE GLAND FORMAT		SINGLE CABLE REED SV	PG 16	PG 13.5	BLANK	PG 9 004
		PG 16	BLANK	PG 16	BLANK	008
SPECIAL		MULTIPLE CABLE REED SV	PG 21	PG 16	PG 16	PG 9 009
DC & IPH	TWIN HEATERS TERMINATED	SINGLE CABLE REED SV	PG 16	PG 13.5	PG 13.5	PG 9 010
OLD STYLE GLAND FORMAT		MULTIPLE CABLE REED SV	PG 21	PG 16	PG 13.5	BLANK 011
DC & IPH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	BLANK	PG 13.5	PG 13.5	BLANK 012
SPH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 21	PG 13.5	PG 13.5	BLANK 013
DC & IPH	HEATER NOT TERMINATED	SINGLE CABLE PROX SV	PG 16	BLANK	BLANK	BLANK 005
SPH	HEATER TERMINATED	SINGLE CABLE PROX SV	PG 16	BLANK	BLANK	BLANK 005
DC & IPH	HEATER NOT TERMINATED	SINGLE CABLE PROX SV	PG 16	PG 13.5	BLANK	BLANK 006
SPH	HEATER TERMINATED	SINGLE CABLE PROX SV	PG 16	PG 13.5	BLANK	BLANK 006
DC & IPH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	PG 16	BLANK	PG 13.5	BLANK 014
SPH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK 015
OLD STYLE GLAND FORMAT		SINGLE CABLE PROX SV	PG 16	PG 13.5	BLANK	BLANK 005
		PG 16	BLANK	PG 16	BLANK	008
SPECIAL		MULTIPLE CABLE PROX SV	PG 21	PG 16	PG 16	BLANK 016
DC & IPH	TWIN HEATERS TERMINATED	SINGLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK 015
OLD STYLE GLAND FORMAT		MULTIPLE CABLE PROX SV	PG 21	PG 16	PG 13.5	BLANK 011
VARIABLE	HEATER TERMINATED	SINGLE CABLE REED SV	PG 16	NONE	BLANK	PG 9 EX4
DC & IPH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	BLANK	PG 13.5 020
SPH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	BLANK	PG 13.5 021
DC & IPH	HEATER NOT TERMINATED	NONE	PG 16	PG 13.5	PG 9	PG 9 022
SPH	HEATER TERMINATED	NONE	PG 16	PG 13.5	BLANK	PG 13.5 023
DC & IPH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	PG 13.5	BLANK	PG 13.5	BLANK 024
SPH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK 024
CONFIGURATION TO INCLUDE POD WITH JUNCTION BOX (4030-089)						

Wiper Type	Motor Type	Code
MOTOR NOT SUPPLIED		MO
11Vac 1ph 50/60Hz 1Sp	GA85	CA
11Vac 3ph 50/60Hz Low Sp	GA85-L	CB
11Vac 3ph 50/60Hz 2Sp	GA81	CG
11Vac 3ph 50/60Hz 1Sp	GA63	CH
230Vac 1ph 50/60Hz 1Sp	GA64	CJ
230Vac 3ph 50/60Hz Low Sp	GA64L	CK
230Vac 3ph 50/60Hz 2Sp	GA68	CL
230Vac 3ph 50/60Hz 1Sp	GA68	CM
24Vdc 320rpm 90W (1279-051) PM3	GA88	CP
D2	24Vdc 320rpm 150W (1279-513) PM5	CR
D5	24Vdc 320rpm 90W (1279-557) PM3	CS
D6	24Vdc 320rpm 150W (1279-555) PM5	CT
D2	24Vdc 162rpm SLOW (1279-557L) PM3	CY
D5	Pneumatic Drive Motor	PN

Motor for use with the 8000 series control system	Code
C/D 230vac 1 & 3ph 50/60Hz	GA81
C/D 110vac 1 & 3ph 50/60Hz	GA82
	DA
	DB

PARKING	CODE
Parking Not Fitted	0
Standard Drive End Parking	
Normally open) - A
Reed Switch (Type D)	- G
Proximity Switch (Std D)	- G
Non Standard Idler End Parking	
Normally open) - D
Reed Switch (Type D)	- D
Proximity Switch (Type D) - H	- H

MOTOR CABLE LENGTH	MULTIPLE CABLES (D)	SINGLE CABLE (D)
2 Metres	A	A
3 Metres	B	K
5 Metres	C	Y
6 Metres	X	L
7 Metres	D	7
12 Metres	H	H
15 Metres	R	R
20 Metres	E	N
25 Metres	F	P

HEATER FITTINGS LOOSE IN BAG FOR CUSTOMER FIT
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.

17.	S25963 - JB VARIANT ADDED	09/04/18	MB
16.	S12011 - GA8# MOTOR MOD	21/10/14	APG
15.	S6127 - 023 VARIANT MOD	21/02/13	J.E.E.
14.	S5407 - POD BASE VARIANTS	11/12/12	J.E.E.
13.	S4306 - NEW VARIANT ADDED	21/08/12	J.E.E.
12.	D.O REQ. S484 DRAWING RE-FRAMED FOR PDF PURPOSES. OLD FORMAT NOT SUPPORTED.	07/04/11	D.G.H
Issue	Changes/Mod No.	Date	Name
Drawing Log No.	Drawn by	Approved by	Drawing Date
025	D.D		08/12/05
'D' TYPE SLW			
REF - COMPLETE MOTORPOD			
REF - PART NUMBER OPTIONS			
1681-188			17

EXAMPLE
NUMBER

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

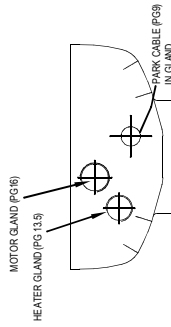
WIPER TYPE	CODE
D1	D1
D2	D2
D3	D3
D4	D4
D5	D5
C1	C1
C2	C2
C3	C3
C4	C4
C5	C5
C6	C6
C7	C7
C8	C8
C9	C9

STROKE TYPE	CODE
Single	1
Twin	2
Special Twin Case (Non-std crs)	Q
Special Single (See Instructions)	S
Special Twin (See Instructions)	T
Type C Single Old Style Cse/Cvr	3
Type C 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

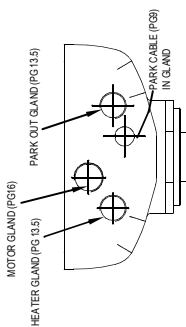
TWIN STROKE LENGTH STANDARD			
1 INCH (25MM) STROKE OVERLAP			
INCHES	MILLIMETRES	CODE	
2 X 13	2 X 330	13	
2 X 14	2 X 356	14	
2 X 15	2 X 380	15	
2 X 16	2 X 407	16	
2 X 17	2 X 430	17	
2 X 18	2 X 457	18	
2 X 19	2 X 480	19	
2 X 20	2 X 510	20	
2 X 21	2 X 533	21	
2 X 22	2 X 558	22	
2 X 23	2 X 583	23	
2 X 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 33	2 X 835	33	
2 X 34	2 X 865	34	
2 X 35	2 X 890	35	
2 X 36	2 X 915	36	
2 X 37	2 X 940	37	
2 X 38	2 X 965	38	
2 X 39	2 X 990	39	
2 X 40	2 X 1015	40	
2 X 41	2 X 1040	41	
2 X 42	2 X 1065	42	
2 X 43	2 X 1095	43	
2 X 44	2 X 1145	44	
2 X 45	2 X 1195	45	
2 X 46	2 X 1245	46	
2 X 47	2 X 1295	47	
2 X 48	2 X 1345	48	
2 X 49	2 X 1395	49	
2 X 50	2 X 1445	50	
2 X 51	2 X 1495	51	
2 X 52	2 X 1545	52	
2 X 53	2 X 1595	53	
2 X 54	2 X 1645	54	
2 X 55	2 X 1695	55	
2 X 56	2 X 1745	56	
2 X 57	2 X 1795	57	
2 X 58	2 X 1845	58	
2 X 59	2 X 1895	59	
2 X 60	2 X 1945	60	
2 X 61	2 X 1995	61	
2 X 62	2 X 2045	62	
2 X 63	2 X 2095	63	
2 X 64	2 X 2145	64	
2 X 65	2 X 2195	65	
2 X 66	2 X 2245	66	
2 X 67	2 X 2295	67	
2 X 68	2 X 2345	68	
2 X 69	2 X 2395	69	
2 X 70	2 X 2445	70	
2 X 71	2 X 2495	71	
2 X 72	2 X 2545	72	
2 X 73	2 X 2595	73	
2 X 74	2 X 2645	74	
2 X 75	2 X 2695	75	
2 X 76	2 X 2745	76	
2 X 77	2 X 2795	77	
2 X 78	2 X 2845	78	
2 X 79	2 X 2895	79	
2 X 80	2 X 2945	80	
2 X 81	2 X 2995	81	
2 X 82	2 X 3045	82	
2 X 83	2 X 3095	83	
2 X 84	2 X 3145	84	
2 X 85	2 X 3195	85	
2 X 86	2 X 3245	86	
2 X 87	2 X 3295	87	
2 X 88	2 X 3345	88	
2 X 89	2 X 3395	89	
2 X 90	2 X 3445	90	
2 X 91	2 X 3495	91	
2 X 92	2 X 3545	92	
2 X 93	2 X 3595	93	
2 X 94	2 X 3645	94	
2 X 95	2 X 3695	95	
2 X 96	2 X 3745	96	
2 X 97	2 X 3795	97	
2 X 98	2 X 3845	98	
2 X 99	2 X 3895	99	
2 X 100	2 X 3945	100	
2 X 101	2 X 3995	101	
2 X 102	2 X 4045	102	
2 X 103	2 X 4095	103	
2 X 104	2 X 4145	104	
2 X 105	2 X 4195	105	
2 X 106	2 X 4245	106	
2 X 107	2 X 4295	107	
2 X 108	2 X 4345	108	
2 X 109	2 X 4395	109	
2 X 110	2 X 4445	110	
2 X 111	2 X 4495	111	
2 X 112	2 X 4545	112	
2 X 113	2 X 4595	113	
2 X 114	2 X 4645	114	
2 X 115	2 X 4695	115	
2 X 116	2 X 4745	116	
2 X 117	2 X 4795	117	
2 X 118	2 X 4845	118	
2 X 119	2 X 4895	119	
2 X 120	2 X 4945	120	
2 X 121	2 X 4995	121	
2 X 122	2 X 5045	122	
2 X 123	2 X 5095	123	
2 X 124	2 X 5145	124	
2 X 125	2 X 5195	125	
2 X 126	2 X 5245	126	
2 X 127	2 X 5295	127	
2 X 128	2 X 5345	128	
2 X 129	2 X 5395	129	
2 X 130	2 X 5445	130	
2 X 131	2 X 5495	131	
2 X 132	2 X 5545	132	
2 X 133	2 X 5595	133	
2 X 134	2 X 5645	134	
2 X 135	2 X 5695	135	
2 X 136	2 X 5745	136	
2 X 137	2 X 5795	137	
2 X 138	2 X 5845	138	
2 X 139	2 X 5895	139	
2 X 140	2 X 5945	140	
2 X 141	2 X 5995	141	
2 X 142	2 X 6045	142	
2 X 143	2 X 6095	143	
2 X 144	2 X 6145	144	
2 X 145	2 X 6195	145	
2 X 146	2 X 6245	146	
2 X 147	2 X 6295	147	
2 X 148	2 X 6345	148	
2 X 149	2 X 6395	149	
2 X 150	2 X 6445	150	
2 X 151	2 X 6495	151	
2 X 152	2 X 6545	152	
2 X 153	2 X 6595	153	
2 X 154	2 X 6645	154	
2 X 155	2 X 6695	155	
2 X 156	2 X 6745	156	
2 X 157	2 X 6795	157	
2 X 158	2 X 6845	158	
2 X 159	2 X 6895	159	
2 X 160	2 X 6945	160	
2 X 161	2 X 6995	161	
2 X 162	2 X 7045	162	
2 X 163	2 X 7095	163	
2 X 164	2 X 7145	164	
2 X 165	2 X 7195	165	
2 X 166	2 X 7245	166	
2 X 167	2 X 7295	167	
2 X 168	2 X 7345	168	
2 X 169	2 X 7395	169	
2 X 170	2 X 7445	170	
2 X 171	2 X 7495	171	
2 X 172	2 X 7545	172	
2 X 173	2 X 7595	173	
2 X 174	2 X 7645	174	
2 X 175	2 X 7695	175	
2 X 176	2 X 7745	176	
2 X 177	2 X 7795	177	
2 X 178	2 X 7845	178	
2 X 179	2 X 7895	179	
2 X 180	2 X 7945	180	
2 X 181	2 X 7995	181	
2 X 182	2 X 8045	182	
2 X 183	2 X 8095	183	
2 X 184	2 X 8145	184	
2 X 185	2 X 8195	185	
2 X 186	2 X 8245	186	
2 X 187	2 X 8295	187	
2 X 188	2 X 8345	188	
2 X 189	2 X 8395	189	
2 X 190	2 X 8445	190	
2 X 191	2 X 8495	191	
2 X 192	2 X 8545	192	
2 X 193	2 X 8595	193	
2 X 194	2 X 8645	194	
2 X 195	2 X 8695	195	
2 X 196	2 X 8745	196	
2 X 197	2 X 8795	197	
2 X 198	2 X 8845	198	
2 X 199	2 X 8895	199	
2 X 200	2 X 8945	200	
2 X 201	2 X 8995	201	
2 X 202	2 X 9045	202	
2 X 203	2 X 9095	203	
2 X 204	2 X 9145	204	
2 X 205	2 X 9195	205	
2 X 206	2 X 9245	206	
2 X 207	2 X 9295	207	
2 X 208	2 X 9345	208	
2 X 209	2 X 9395	209	
2 X 210	2 X 9445	210	
2 X 211	2 X 9495	211	
2 X 212	2 X 9545	212	
2 X 213	2 X 9595	213	
2 X 214	2 X 9645	214	
2 X 215	2 X 9695	215	
2 X 216	2 X 9745	216	
2 X 217	2 X 9795	217	
2 X 218	2 X 9845	218	
2 X 219	2 X 9895	219	
2 X 220	2 X 9945	220	
2 X 221	2 X 9995	221	
2 X 222	2 X 10045	222	
2 X 223	2 X 10095	223	
2 X 224	2 X 10145	224	
2 X 225	2 X 10195	225	
2 X 226	2 X 10245	226	
2 X 227	2 X 10295	227	
2 X 228	2 X 10345	228	
2 X 229	2 X 10395	229	
2 X 230	2 X 10445	230	
2 X 231	2 X 10495	231	
2 X 232	2 X 10545	232	
2 X 233	2 X 10595	233	
2 X 234	2 X 10645	234	
2 X 235	2 X 10695	235	
2 X 236	2 X 10745	236	
2 X 237	2 X 10795	237	
2 X 238	2 X 10845	238	
2 X 239	2 X 10895	239	
2 X 240	2 X 10945	240	
2 X 241	2 X 10995	241	
2 X 242	2 X 11045	242	
2 X 243	2 X 11095	243	
2 X 244	2 X 11145	244	
2 X 245	2 X 11195	245	
2 X 246	2 X 11245	246	
2 X 247	2 X 11295	247	
2 X 248	2 X 11345	248	
2 X 249	2 X 11395	249	
2 X 250	2 X 11445	250	
2 X 251	2 X 11495	251	
2 X 252	2 X 11545	252	
2 X 253	2 X 11595	253	
2 X 254	2 X 11645	254	
2 X 255	2 X 11695	255	
2 X 256	2 X 11745	256	
2 X 257	2 X 11795	257	
2 X 258	2 X 11845	258	
2 X 259	2 X 11895	259	
2 X 260	2 X 11945	260	
2 X 261	2 X 11995	261	
2 X 262	2 X 12045	262	
2 X 263	2 X 12095	263	
2 X 264	2 X 12145	264	
2 X 265	2 X 12195	265	
2 X 266	2 X 12245	266	
2 X 267	2 X 12295	267	
2 X 268	2 X 12345	268	
2 X 269	2 X 12395	269	
2 X 270	2 X 12445	270	
2 X 271	2 X 12495	271	
2 X 272	2 X 12545	272	
2 X 273	2 X 12595	273	
2 X 274	2 X 12645	274	
2 X 275	2 X 12695	275	
2 X 276	2 X 12745	276	
2 X 277	2 X 12795	277	
2 X 278	2 X 12845	278	
2 X 279	2 X 12895	279	
2 X 280	2 X 12945	280	
2 X 281	2 X 12995	281	
2 X 282	2 X 13045	282	
2 X 283	2 X 13095	283	
2 X 284	2 X 13145	284	
2 X 285	2 X 13195	285	
2 X 286	2 X 13245	286	
2 X 287	2 X 13295	287	
2 X 288	2 X 13345	288	
2 X 289	2 X 13395	289	
2 X 290	2 X 13445	290	
2 X 291	2 X 13495	291	
2 X 292	2 X 13545	292	
2 X 293	2 X 13595	293	
2 X 294	2 X 13645	294	
2 X 295	2 X 13695	295	
2 X 296	2 X 13745	296	
2 X 297	2 X 13795	297	
2 X 298	2 X 13845	298	
2 X 299	2 X 13895	299	
2 X 300	2 X 13945	300	
2 X 301	2 X 13995	301	
2 X 302	2 X 14045	302	
2 X 303	2 X 14095	303	
2 X 304	2 X 14145	304	
2 X 305	2 X 14195	305	
2 X 306	2 X 14245	306	
2 X 307	2 X 14295	307	
2 X 308	2 X 14345	308	
2 X 309	2 X 14395	309	
2 X 310	2 X 14445	310	
2 X 311	2 X 14495	311	
2 X 312	2 X 14545	312	
2 X 313	2 X 14595	313	
2 X 314	2 X 14645	314	
2 X 315	2 X 14695	315	
2 X 316	2 X 14745	316	
2 X 317	2 X 14795	317	
2 X 318	2 X 14845	318	
2 X 319	2 X 14895	319	
2 X 320	2 X 14945	320	
2 X 321	2 X 14995	321	
2 X 322	2 X 15045	322	
2 X 323	2 X 15095	323	
2 X 324	2 X 15145	324	
2 X 325	2 X 15195	325	
2 X 326	2 X 15245	326	
2 X 327	2 X 15295	327	
2 X 328	2 X 15345	328	
2 X 329	2 X 15395	329	
2 X 330	2 X 15445	330	

CONTROLLED

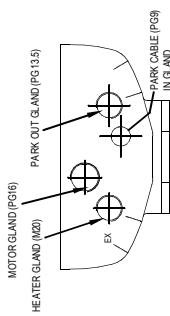
07 April 2011 12:44:41



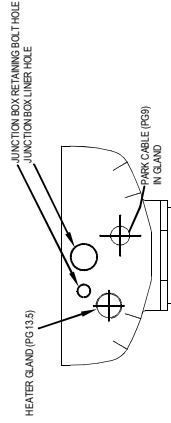
MOTOR BASE 4030-074



MOTOR BASE 4030-075



MOTOR BASE 4030-076



MOTOR BASE 4030-089

THIS GIVES THE PART NO FOR A COMPLETE MOTOR POD

MP

WIPER TYPE	CODE
D2	D2
D4	D4
D5	D5

PARKING CABLE LENGTH	CODE
Not Supplied	0
2 Metres	1
5 Metres	2
10 Metres	3
20 Metres	4
Terminated in Enclosure	5
	6

NOTE: DESCRIPTIONS ARE FOR REFERENCE ONLY AND ARE NOT EXHAUSTIVE. OTHER OPTIONS ARE POSSIBLE ie REED SWITCH PARKING OR TWIN HEATERS.

Wiper Type	Motor Type	Code
MOTOR NOT SUPPLIED		MO
11Vac 1ph 50/60hz 1Sp	GA85	CA
11Vac 3ph 50/60hz Low Sp	GA85-L	CB
11Vac 3ph 50/60hz 2Sp	GA81	CG
11Vac 3ph 50/60hz 1Sp	GA63	CH
230Vac 1ph 50/60hz 1Sp	GA64	CJ
230Vac 3ph 50/60hz Low Sp	GA64L	CK
230Vac 3ph 50/60hz 2Sp	GA68	CL
230Vac 3ph 50/60hz 1Sp	GA68L	CM
24Vdc 320rpm 90W (1279-051) PM3	GA88	CP
D2 24Vdc 320rpm 150W (1279-513) PM5	GA88	CR
D5 24Vdc 320rpm 90W (1279-557) PM3	GA88	CS
D5 24Vdc 320rpm 150W (1279-555) PM5	GA88	CT
D2 24Vdc 162rpm SLOW (1279-557L) PM3	GA88	CY
D2 Pneumatic Drive Motor	GA88	PN

Motors for use with the 8000 series control system	Code
C/D 230vac 1 & 3ph 50/60hz	GA81
C/D 110vac 1 & 3ph 50/60hz	GA82
	DB

PARKING	CODE
Parking Not Fitted	0
Standard Drive End Parking	
Normally open) - A
Reed Switch (TYPE D)) - G
Proximity Switch (Std D)	- G
Non Standard Idler End Parking	
Normally open) - D
Reed Switch (TYPE D)) - D
Proximity Switch (Type D) - H	

MOTOR CABLE LENGTH	SINGLE CABLE (D)
MULTIPLE CABLES (D)	
2 Metres	A
3 Metres	B
5 Metres	C
6 Metres	X
7 Metres	Y
12 Metres	Z
15 Metres	H
20 Metres	R
25 Metres	E
	F

HEATER FITTINGS LOOSE IN BAG FOR CUSTOMER FIT
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.
ALL GLANDS AND PLUGS TO BE BAGGED AND ATTACHED EXCEPT MOTOR OR GLAND WHICH SHOULD BE FITTED.

MOTOR TYPE	HEATER TERMINATED IN MOTOR POD	CABLE TYPE	PARKING TYPE	MOTOR GLAND	HEATER GLAND	PARK OUT PARK IN GLAND	CODE
DC & 1PH	HEATER NOT TERMINATED	MULTIPLE CABLE REED SV	PG 13.5	BLANK	BLANK	BLANK	001
SPH	HEATER TERMINATED	MULTIPLE CABLE REED SV	PG 21	PG 13.5	BLANK	BLANK	002
DC & 1PH	HEATER NOT TERMINATED	SINGLE CABLE REED SV	PG 16	BLANK	BLANK	PG 9	003
SPH	HEATER TERMINATED	SINGLE CABLE REED SV	PG 16	BLANK	BLANK	PG 9	003
DC & 1PH	HEATER NOT TERMINATED	SINGLE CABLE REED SV	PG 16	PG 13.5	BLANK	PG 9	004
SPH	HEATER TERMINATED	SINGLE CABLE REED SV	PG 16	PG 13.5	BLANK	PG 9	004
DC & 1PH	HEATER NOT TERMINATED	MULTIPLE CABLE REED SV	PG 16	BLANK	BLANK	BLANK	005
SPH	HEATER TERMINATED	MULTIPLE CABLE REED SV	PG 16	PG 13.5	BLANK	BLANK	006
OLD STYLE GLAND FORMAT		SINGLE CABLE REED SV	PG 16	PG 13.5	BLANK	PG 9	004
		PG 16	BLANK	PG 16	PG 16	PG 16	008
SPECIAL		MULTIPLE CABLE REED SV	PG 21	PG 16	PG 16	PG 9	009
DC & 1PH	TWIN HEATERS TERMINATED	SINGLE CABLE REED SV	PG 16	PG 13.5	PG 13.5	PG 9	010
OLD STYLE GLAND FORMAT		MULTIPLE CABLE REED SV	PG 21	PG 16	PG 13.5	BLANK	011
DC & 1PH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	BLANK	PG 13.5	PG 13.5	BLANK	012
SPH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 21	PG 13.5	PG 13.5	BLANK	013
DC & 1PH	HEATER NOT TERMINATED	SINGLE CABLE PROX SV	PG 16	BLANK	BLANK	BLANK	005
SPH	HEATER NOT TERMINATED	SINGLE CABLE PROX SV	PG 16	BLANK	BLANK	BLANK	005
DC & 1PH	HEATER NOT TERMINATED	SINGLE CABLE PROX SV	PG 16	PG 13.5	BLANK	BLANK	006
SPH	HEATER TERMINATED	SINGLE CABLE PROX SV	PG 16	PG 13.5	BLANK	BLANK	006
SPH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK	014
DC & 1PH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK	015
OLD STYLE GLAND FORMAT		SINGLE CABLE PROX SV	PG 16	PG 13.5	BLANK	BLANK	006
		PG 16	BLANK	PG 16	BLANK	PG 16	008
SPECIAL		MULTIPLE CABLE PROX SV	PG 21	PG 16	PG 16	BLANK	016
DC & 1PH	TWIN HEATERS TERMINATED	SINGLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK	015
OLD STYLE GLAND FORMAT		MULTIPLE CABLE PROX SV	PG 21	PG 16	PG 13.5	BLANK	011
VARIABLE	HEATER TERMINATED	SINGLE CABLE REED SV	PG 16	NONE	BLANK	PG 9	EX4
DC & 1PH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	BLANK	PG 13.5	020
SPH	HEATER TERMINATED	NONE	PG 16	PG 13.5	PG 13.5	PG 9	021
DC & 1PH	HEATER TERMINATED	NONE	PG 16	PG 13.5	PG 13.5	PG 9	022
DC & 1PH	HEATER NOT TERMINATED	MULTIPLE CABLE PROX SV	PG 13.5	BLANK	BLANK	BLANK	023
DC & 1PH	HEATER TERMINATED	MULTIPLE CABLE PROX SV	PG 16	PG 13.5	PG 13.5	BLANK	024
CONFIGURATION TO INCLUDE POD WITH JUNCTION BOX (4030-089)							

NOTE CRITICAL DIMENSIONS MARKED THUS 'CD' SIGNIFICANT DETAILS MARKED THUS 'SD'

Mail. Type - Finish 1 - REMOVE SHARP EDGES
Mail. Part No. - Finish 2 -
Mail. Size - Other info -

CONTROLLED

Issue Date - 07/04/2011

GENERAL TOLERANCES unless otherwise stated
Dimension - No decimal place ± 1
Dimension - One decimal place ± 0.5
Dimension - Two decimal places ± 0.25
Dimension - Three decimal places ± 0.125
Dimension - Four decimal places ± 0.0625
Angular Dimension $\pm 1^\circ$



A Division of B. Hepworth
B. Hepworth & Co. Ltd
2-4 Merse Road North Moors Mead
Redditch Worcestershire B98 9HL
tel 01527 63057 fax 01527 66836

3RD ANGLE

DO NOT SCALE

IF IN DOUBT ASK

'D' TYPE SLW

REF - COMPLETE MOTORPOD
REF - PART NUMBER OPTIONS

1681-188

17

SERIES 8000 CONTROL SYSTEM

The Series 8000 Network Control System contains a touch sensitive keypad and a wiper motor control PCB that can fitted in individual modules or in multiples in a range of 19" Racks.

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, and are touch sensitive with three wiper speeds, two intermittent speeds, wash program, window and wiper case heat keys. Customised keypads are available on request.

The Wiper Motor Control PCB

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

Each module generates its own 24v DC supply for the control circuitry and keypads from the mains voltage, so there is no requirement for an external PSU.

Each motor control PCB has four additional outputs which can be used for wash, purge, wiper heater and window heater control. The modules have a group address so wipers can be selectively controlled from the keypad. They are preset in production but can also be reset by the customer.

Power for the wiper, heaters and wash system is taken directly to the control module, located close to the wiper unit or to the 19 inch Rack Units located in a suitable room. Onboard current monitoring circuitry will isolate and shut down the motor output if too much current is drawn. The Auxiliary outputs are protected by an internal fuse, 10A total for all four outputs.

The connectors are high quality Cage clamp connectors. There are double height connectors for bus and power input. All other connectors are single height.

System Compatibility And Requirements

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

The bus communications protocol can be either RS485 or CAN-bus. CAN-bus systems can easily be interfaced with touch screens.

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 power lines are connected at each module to ensure a constant supply to the keypad in the event of a module failure. 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 wiper module/rack unit and furthest keypad:-

Bus Length	Min Cable Size	
	Power	Data
Up to 100m	0.38 mm ² (22 AWG)	0.22mm ² (24 AWG)
Above 101m	1.5 mm ² (15 AWG)	0.96mm ² (18 AWG)

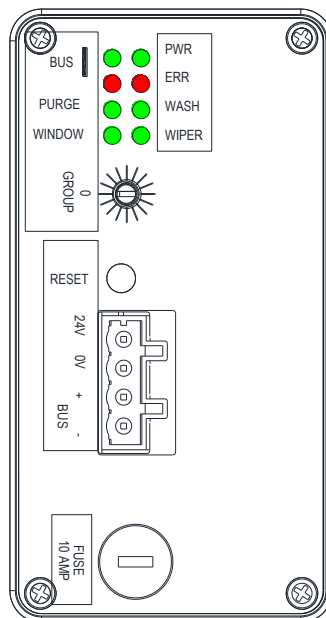
A terminating resistor module must be connected into the communication lines at the first keypad and a terminating resistor module must be connected across the communication lines at the last module.

Integrated Fault Diagnosis

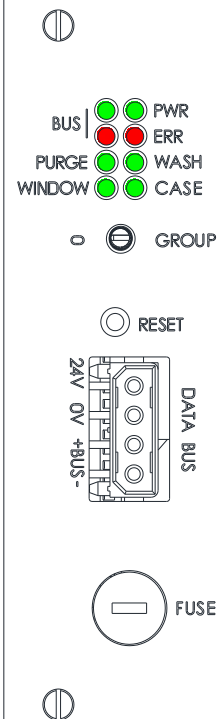
Each wiper motor control PCB has a built in, real time integrated fault diagnosis, which is made visual by LED's on the end panel.

The diagnostic real time fault functions are:-

PWR	ON	Internal/external supply status (indication that the module has power)
BUS	ON	Bus activity (indication that the bus is working correctly)
PURGE	ON	Output status, for the wash, purge, wiper heater, window heater (indication of auxiliary output status)
WASH	ON	
WINDOW	ON	
WIPER	ON	
BUSERR	ON	Bus command errors
ERR	FLASH 0.5/1.5 sec	PCB Overheat detection
ERR	FLASH 2.5/0.5 sec	Park switch not detected
ERR	FLASH 1.0/1.0 sec	Over current detection (on all outputs)
ERR	FLASH 0.5/0.5 sec	Short circuit detection (on all outputs)
PWR BUS	FLASH TOGETHER	Phase missing (3 phase systems)



MODULE



RACK

FRONT PANEL SHOWING DIAGNOSTIC LED'S

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 wiper module/rack unit and furthest keypad:-

Bus Length	Min Cable Size	
	Power	Data
Up to 100m	0.38 mm ² (22 AWG)	0.22mm ² (24 AWG)
Above 101m	1.5 mm ² (15 AWG)	0.96mm ² (18 AWG)

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

- a) Belden 3084A
- b) Leoni L45467-F16-W6
- c) SAB DN 656 Drop Cable Pt No 06562241
- d) LAPP Unitronic Bus FD P DeviceNet Drop Cable Pt No 2170 255
- e) LAPP Unitronic FD P DeviceNet Thin Pt No 2170 345
- f) LAPP Unitronic DeviceNet Thin Pt No 2170 341

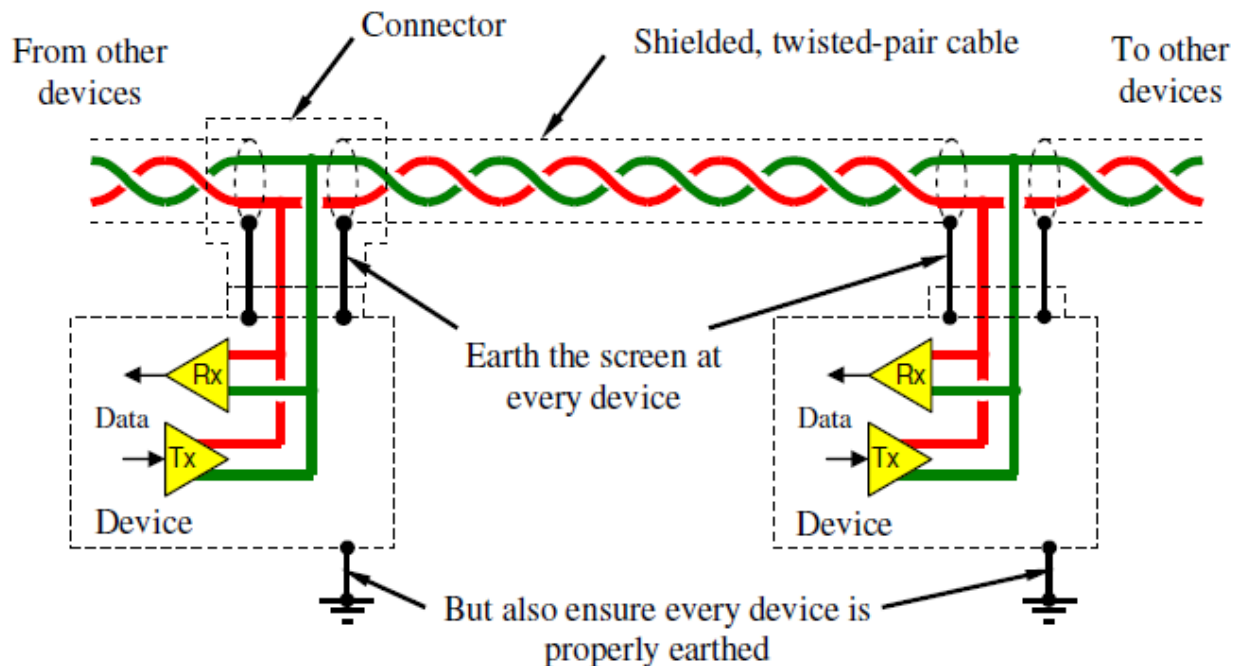
Suitable cables for bus systems over 101m are:-

- 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

All factory and relevant approvals testing has been completed using Belden 3084A 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 ($\leq 25V$) analogue and digital signals.
- Low voltage power supply cables ($\leq 60V$).
- Coaxial signal cables

Category II:

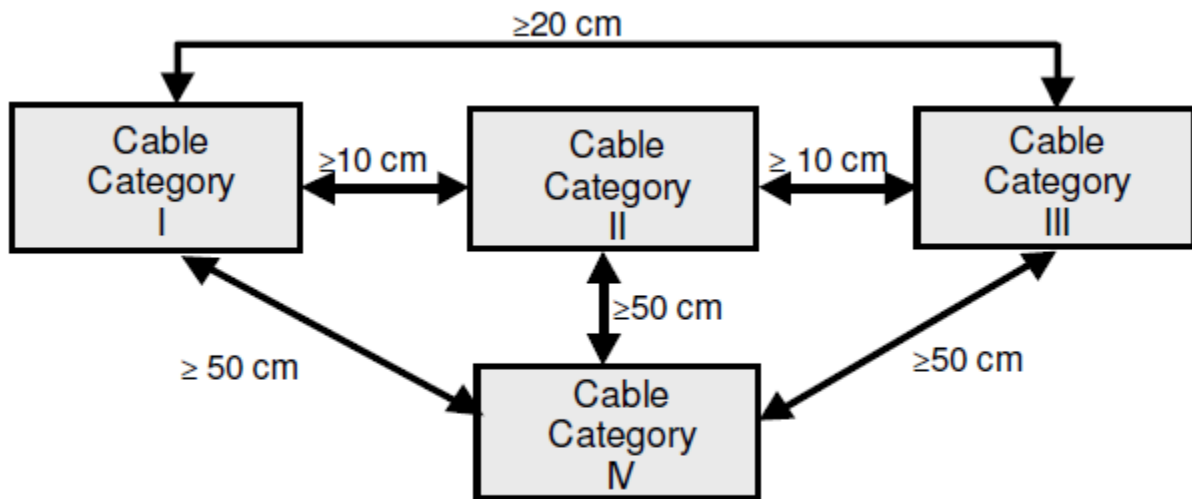
- Cables carrying DC voltages $>60V$ and $\leq 400 V$
- Cables carrying AC voltages $>25V$ and $\leq 400 V$

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)

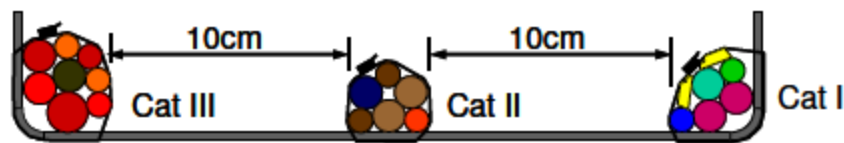


Separation distances for cables of different category

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

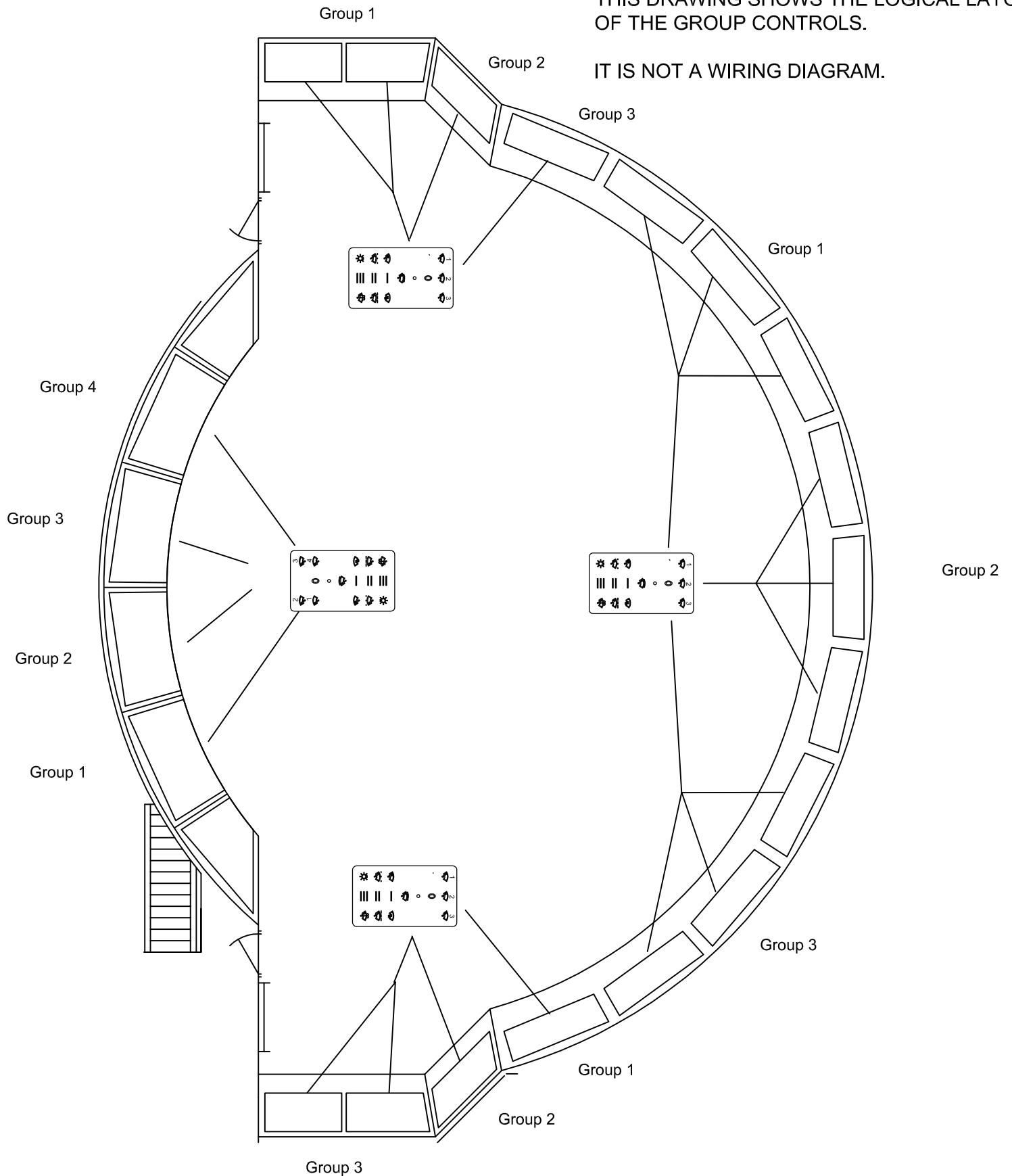
It is common to find simple RS-485 wiring and layout errors in the field. The most frequently occurring errors are described below:

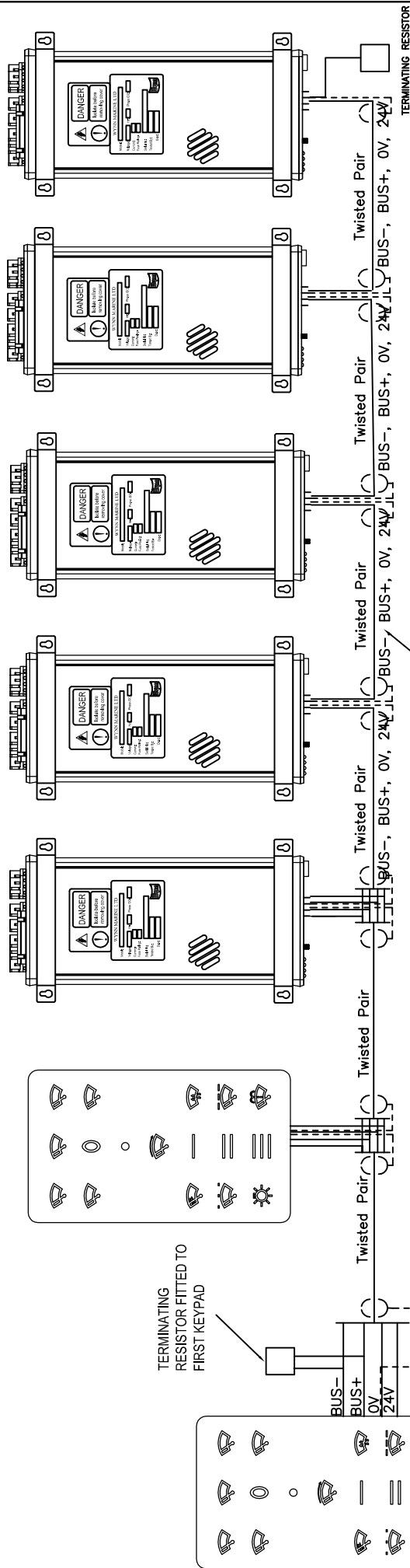
1. Termination problems:
 - a. Lack of bus terminations (6000-TR120) at the end of the bus.
2. Pickup and interference caused by:
 - a. Laying bus cables too close to electrically noisy power cables or equipment.
 - b. Lack of proper earthing of the cable screen at every device.
3. Wiring problems:
 - 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

THIS DRAWING SHOWS THE LOGICAL LAYOUT OF THE GROUP CONTROLS.

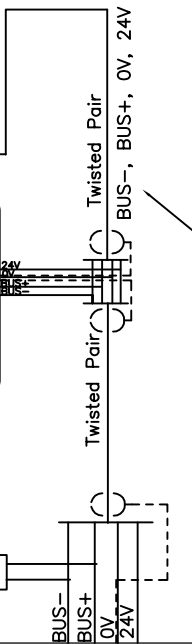
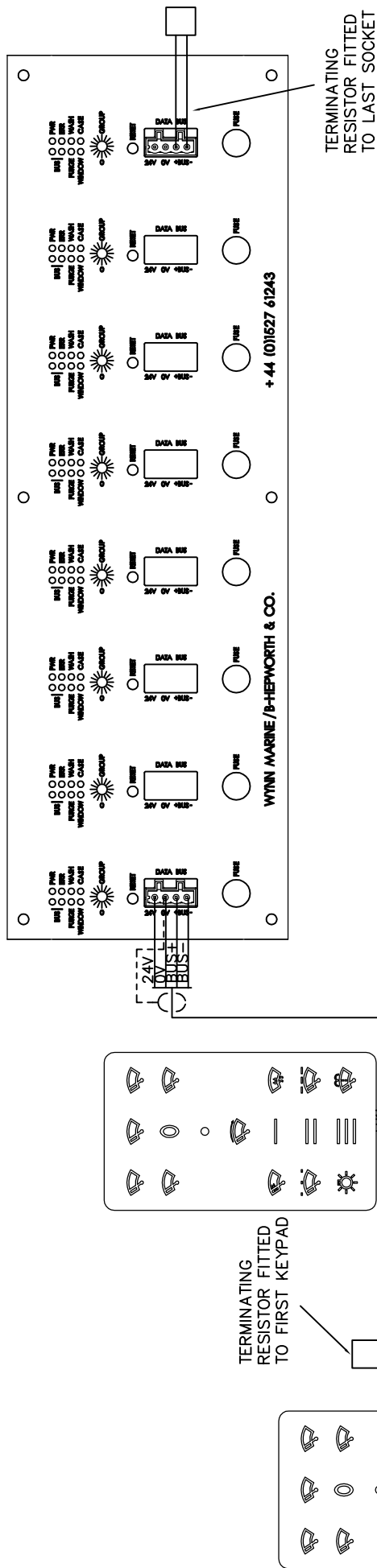
IT IS NOT A WIRING DIAGRAM.





CABLE SCREEN MUST BE CONNECTED TO BUS 0V AT ALL CONNECTION POINTS

THE COPYRIGHT OF THIS DRAWING IS VESTED IN B. HEPWORTH 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.										B. HEPWORTH & CO LTD	
ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	TITLE:- 8200 BUS WIRING	
DRAWN: DM										DRAWING No. 8200-BUS-MODULE	
APPROVED:										THIRD ANGLE PROJECTION	
CHANGED:										SCALE: 1:1	
CAD FILE										DATE	
										2	
										11.07.17	



CABLE SCREEN MUST BE CONNECTED TO BUS 0V AT ALL CONNECTION POINTS

THE COPYRIGHT OF THIS DRAWING IS VESTED IN B. HEPWORTH 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.										B. HEPWORTH & CO LTD									
29.08.13										TITLE:- 8200 BUS WIRING									
1										DRAWING No. 8200-BUS-19RACK									
ISS. DIN DATE ISS. DIN DATE ISS. DIN DATE ISS. DIN DATE										THIRD ANGLE PROJECTION									
DRAWN: DM										SCALE: 1:1									
CHANGED:										CAD FILE									
APPROVED:																			

INSTALLATION OF SHIELDED TWISTED PAIR CABLE

Belden DeviceBus ® for ODVA DeviceNet



- 300V Class 2 Thin
- 22 and 24 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
- Thin 75°C
- **Conductor (stranding) Diameter Nom. DCR** - (2) 22 AWG TC (154 x 44) 17.5 Ω / M', 57.4 Ω /km
- **Conductor (stranding) Diameter Nom. DCR** - (2) 24 AWG TC (105 x 44) 28.0 Ω / M', 91.9 Ω /km, Nom. Characteristic Impedance 120 Ω , Nom. Capacitance Conductor to Conductor 12 pF/ft
- **Shielding materials Nom. DCR** - 100% individual foil + overall 65% TC braid 3.2 Ω / M', 10.5 Ω /km
- **Nominal OD** - 0.28", 7.11mm

This guide is based on the use of Belden 3084A cable (or similar, see specification above).

The cable is made up of a 22AWG power pair (red/black) and a 24AWG data pair (blue/white), each pair is individually foil screened with a drain wire, and an overall shielding braid.

For installation in a Wynn 8000 Series Network Control System, the screen needs to be terminated at both ends of each piece of bus cable.

Poor Screening = Poor reliability

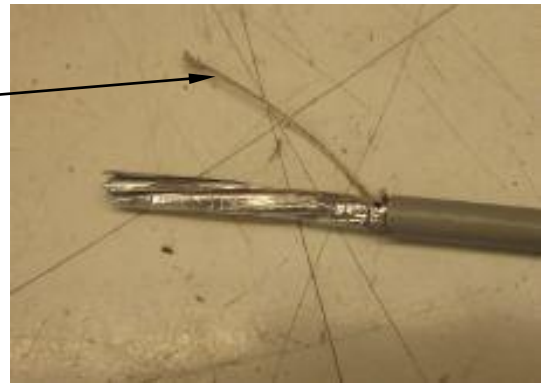
Both end of the cable should be prepared as follows:-

1. Strip the outer insulation back 50mm.

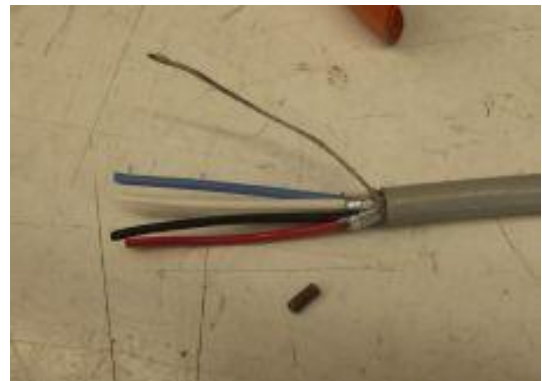


2. Carefully peel back the braid and trim back to insulation.

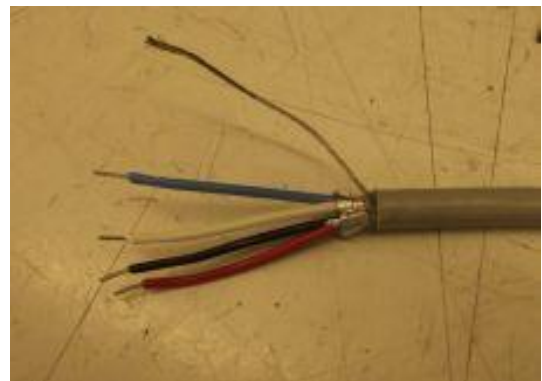
Do not cut drain wire.



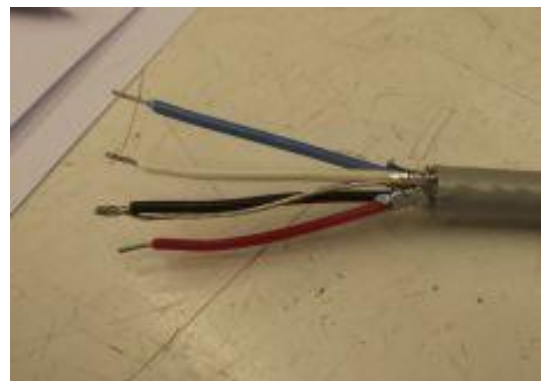
3. Remove the foil insulation leaving 5mm showing.



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



5. Secure the braid/drain wire together with the 0V conductor - Black in the bus plug. This connection is electrically bonded to the Earth pin on the mains connection plug.



6. Connect the conductors to the keypad 4 way bus connector as follows:

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



7. Connect termination resistor (6000-TR120) to Bus+ & Bus- connections. (First Keypad Only)



8. Connect the conductors to the module 4 way bus connector as follows:

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



9. Connect termination resistor (6000-TR120) to Bus+ & Bus- connections. (Last module only)



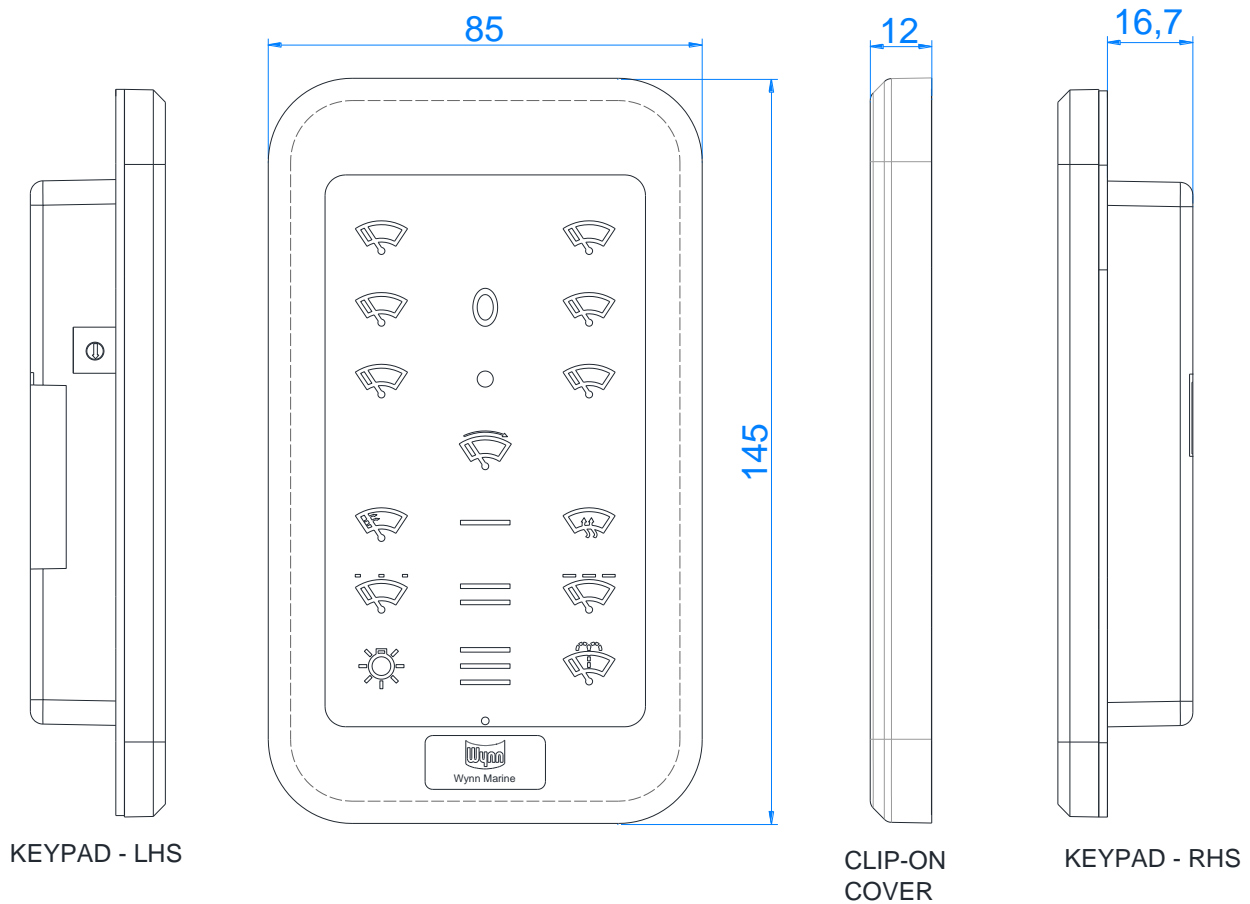
8500 KEYPAD

Technical specifications

Input supply	24VDC – From Bus
Maximum number of groups	9
Number of Auxiliary controls	4
IP rating	IP66
Technology	Capacitive Touchpad
Communications	RS485/CANBUS/(USB – Service only)
Illumination	3 colour LED – Fully dimmable

Keypad Dimensions

The overall keypad and clip-on cover dimensions are shown in the diagram below.



The 8500 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 2-way and 4-way connectors are mounted on the rear of the keypad enclosure except a Phoenix Contact style plug with screw terminals.

The 2-way connector is for remote interface operation (future option) and the 4-way connector for the bus connection.

A 16 position rotary switch may be fitted to allow Keypad to be configured as Master or Slave.

An earth terminal is fitted for connection to local earth.

A USB connector is fitted; this is for Service Personnel access only.

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).

A Master keypad sends wiper commands directly to the wiper control modules.

A Slave keypad sends button press commands to the Master keypad.

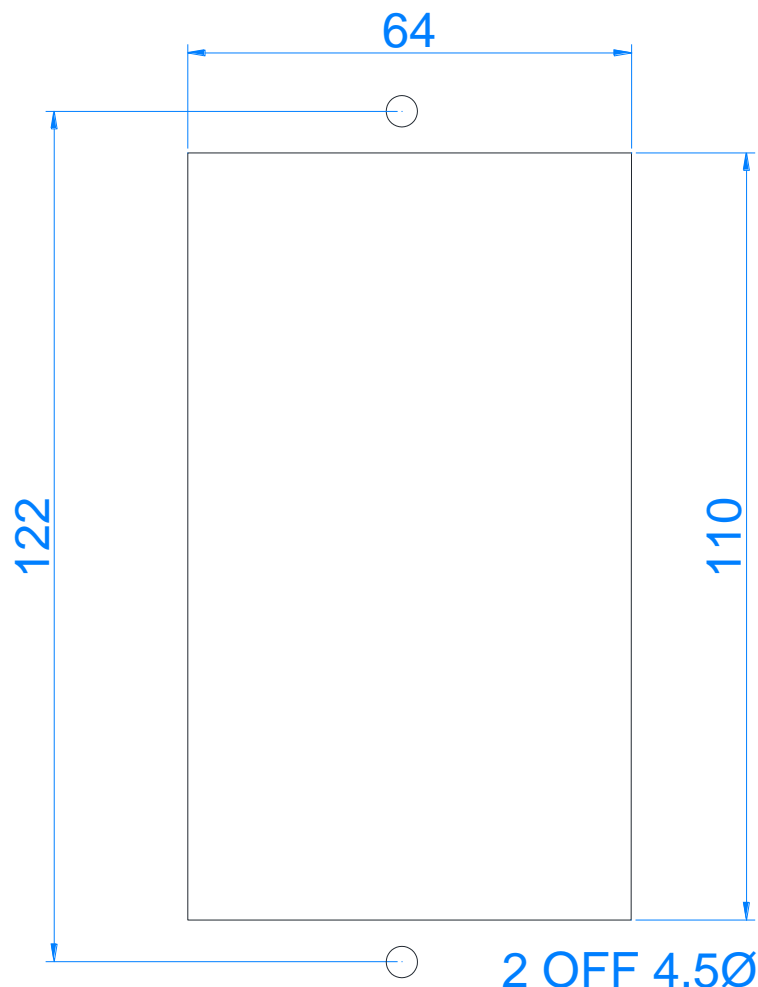
In a single keypad control system the keypad must be set to Master. If the keypad is set to Slave it cannot control the wipers.

In a multiple keypad control system one keypad only must be set to Master, the remainder to a different Slave number. This is so the Master keypad can identify which slave keypad sent the button press commands.

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

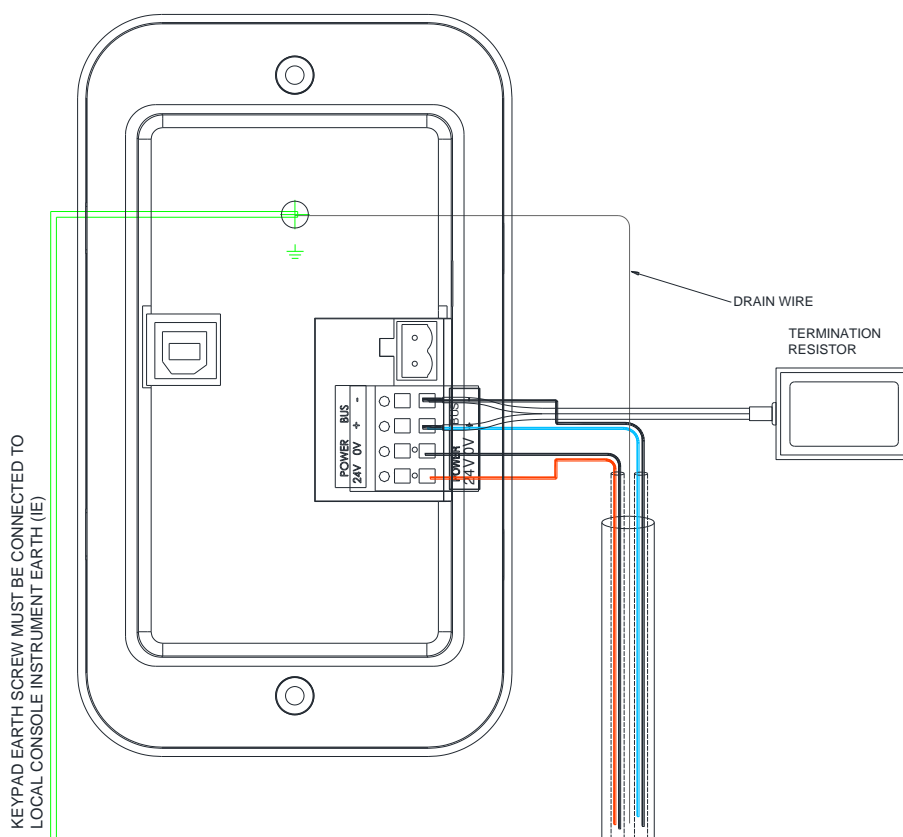
- For a single keypad system ensure that the Master/Slave Rotary Switch is set to 1. For multiple keypad systems ensure that the Master/Slave Rotary Switch is set to a different position (2 to F, maximum 14 slaves).



NOTE

If the keypad is not fitted with a rotary switch the Master/Slave configuration is carried out by user programming via keypad buttons. See 8500 KEYPAD USER-PROGRAMMING, Setting the keypad to Master or Slave.

Connection Details



- Connect termination resistor and bus cable to 4-way connector (**Supplied in keypad socket**)
In accordance to wiring diagram.
- Fit connector into keypad. (Ref notes above).
- Connect bus cable drain wire to Keypad Earth Screw, and connected Keypad Earth Screw to console instrument earth. (Instrument earth is a separate earth point a minimum 3m away from 230v supply earth point.)
In accordance to wiring diagram.

6. Remove front clip-on cover, fit keypad into opening and secure keypad to panel with suitable M4 fixings. (***Not supplied***)
7. Refit clip-on cover with Wynn logo at bottom.

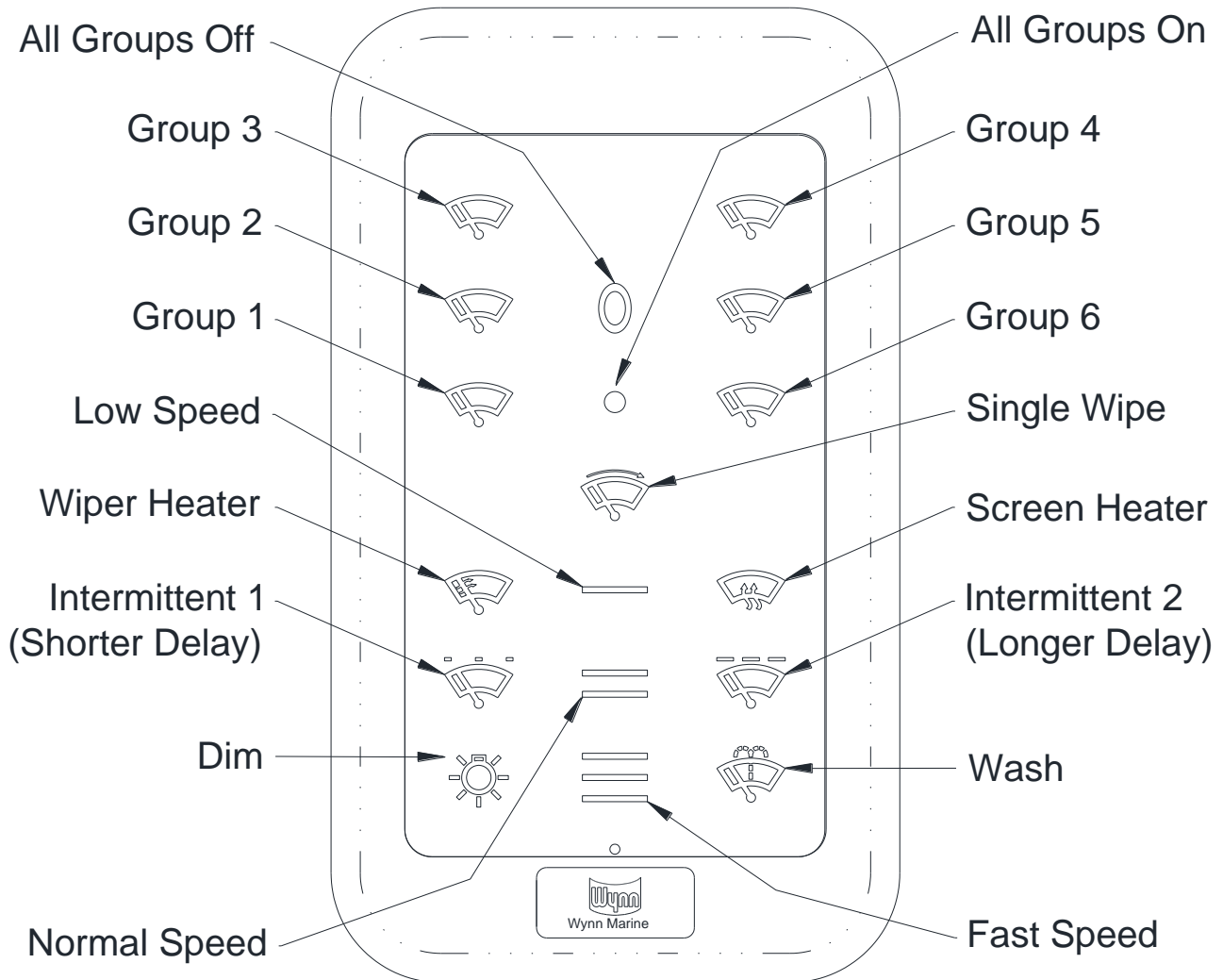
8500 KEYPAD OPERATION

The 8500 Keypad is a component part of the Wynn Marine 8000 Series wiper control devices.

User Operational Description

This section describes end-user operation of the 8500 Keypad in normal usage.

The diagram below shows a typical 8500 6 way Keypad layout and the names given to the keys.



Keypad Icons












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.

Systems with Multiple keypads.

Keypads should be supplied pre-configured as Master or Slave. In a multiple keypad system there can only be one Master Keypad, all other must be set as Slaves, each with a different address.

If more than one Keypad is fitted in the bus see paragraph 2 in installation instructions for correct setting of Master/Slave rotary switch.

Description and Operation of Keypad

Icon	Description	Operation
	Individual Wiper Group	Press - turns group on in normal speed. Group icon turns RED Press - while running, turns group off. RED light turns GREEN
	All Wiper Groups - Turn Off	Press - while running turns all groups off. RED lights turns GREEN
	All Wiper Groups - Turn On	Press - turns all groups on in normal speed. Group icons turns RED
	Single wipe	Press - turns all groups on for single wipe in normal speed (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 Icon will turn RED whilst icons pressed Group icon(s) turn RED Press - while running, turns group icon(s) off. RED light turns GREEN
	Normal Speed	Press - followed by group icon or all group icon turns group(s) on in normal speed or to normal speed if in any other setting Icon will turn RED whilst icons pressed Group icon(s) turn RED 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 Icon will turn RED whilst icons pressed Group icon(s) turn RED Press - while running, turns group icon(s) off. RED light turns GREEN
	Heated Wiper	Press - turns all heated wipers on. Heated Wipers = heated unit and/or heated arm and/or heated wash jet) Heated wiper icon turns RED Press - while on, turns all heated wipers off. RED light turns GREEN
	Heated Screen	Press - turns on all heated screens. Heated wiper icon turns RED Press - while on, turns all heated screens off. RED light turns GREEN
	Intermittent 1 (Shorter Delay)	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) Icon turns RED and group icon(s) turn RED Press - while running, turns intermittent wipe off. RED light turns GREEN
	Intermittent 2 (Longer Delay)	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) Icon turns RED and group icon(s) turn RED 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. Stop pressing icon at required brightness
	Wash	Press - followed by group icon or all group icon starts wash cycle Wash icon turns RED and group icon(s) turn RED Press - while in cycle terminates wash cycle. RED light turns GREEN 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.

8500 KEYPAD USER-PROGRAMMING

Introduction

The 8000 system features a user-programmable set-up mode, which enables the end-user to programme the system to their 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 8500 keypad will operate normally.

	USER KEY-SEQUENCE	LED INDICATION	RESULTING ACTION
First Step	DIM  & WIPER OFF 	DIM LIGHT FLASHES	Enter user set up mode.
Programmable Steps as Required	<i>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:</i>		
Last Step	DIM  & WIPER OFF 	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 and 12 seconds for intermittent keys **INTERMITTENT 1** and **INTERMITTENT 2** 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 🚦	CORRESPONDING LIGHT FLASHES	All groups will perform a single wipe.
	<i>Wait until next wipe is required</i> - (time from first wipe to second wipe is stored)		
Step 3	INTERMITTENT 🚦 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.

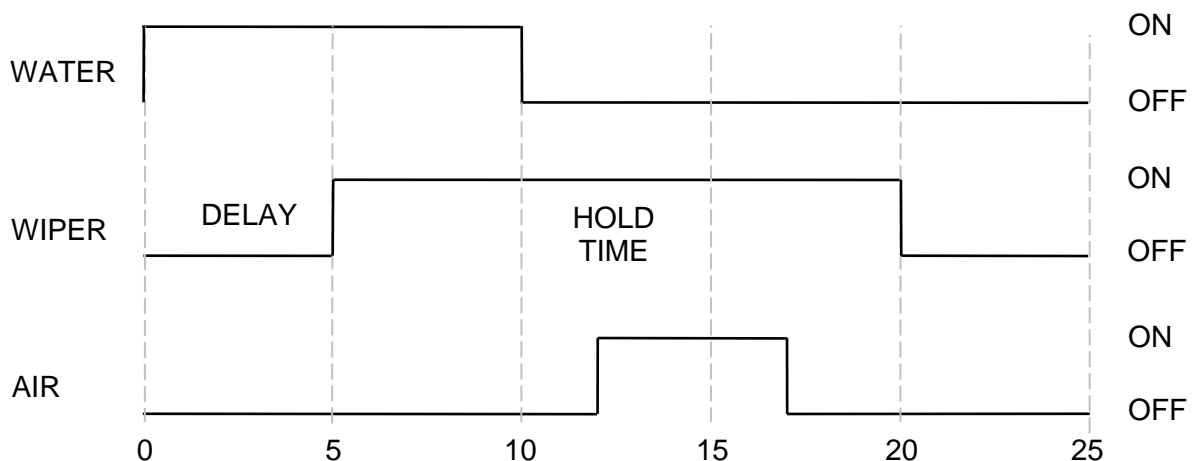
Maximum period for any intermittent parameter is fifty seconds. If user does not press **INTERMITTENT** key for a second time within fifty seconds, the programming is aborted and no change is made to the settings.

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 five minutes. If user does not press an APPROPRIATE KEY within the five minute period, the programming is aborted and no change is made to the settings.

To Programme a Wash-Without-Wipe Cycle

	USER KEY-SEQUENCE	LED INDICATION	RESULTING ACTION
Step 1	DIM  & WIPER OFF 	DIM LIGHT FLASHES	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
	<i>Wait until enough water is on the screen</i>		
Step 4	WASH 	WASH LED ORANGE	Wash OFF, [Purge ON]
	<i>Wait until enough air has cleared water from the wash jets</i>		
Step 5	WASH 	WASH LED OFF	[Purge OFF]
Step 6	WIPER OFF 	WASH & SINGLE WIPE LEDs OFF	Wash-on and Purge-on, times are SAVED
Step 7	DIM  & WIPER OFF 	DIM LIGHT GREEN	User set up mode exited.












NOTE 1

ALL GROUPS  key is pressed only on multi-way keypads.

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 	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
	<i>Wait until enough water is on the screen</i>		
Step 4	SINGLE WIPE  (Ref Note 2)	SINGLE WIPE LED ON	Wiper ON
	<i>Wait until wiper has cleaned screen</i>		
Step 5	WASH 	WASH LED ORANGE	Wash OFF, [Purge ON]
	<i>Wait until enough air has cleared water from the wash jets</i>		
Step 6	WASH 	WASH LED OFF	[Purge OFF]
	<i>Wait until wiper has cleaned remaining water from screen</i>		
Step 7	WIPER OFF 	WASH & SINGLE WIPE LEDs OFF	Wipe OFF. Wash-on, Purge-on, Wipe delay, and Wipe-hold times are SAVED
Step 8	DIM  & WIPER OFF 	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  key is pressed (step 7). Its behaviour differs from that in normal operating mode.

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 	DIM LIGHT FLASH	Enter user set up mode.
Step 2	HIGH SPEED 	No further indications are given	
Step 3	SINGLE WIPE 	No further indications are given	
Step 4	HIGH SPEED 	No further indications are given	
Step 5	SINGLE WIPE 	No further indications are given	
Step 6	HIGH SPEED 	DIM LED, HIGH SPEED LED AND SINGLE WIPE LED FLASH TOGETHER FOR 5 SECONDS	Default settings restored

IMPORTANT

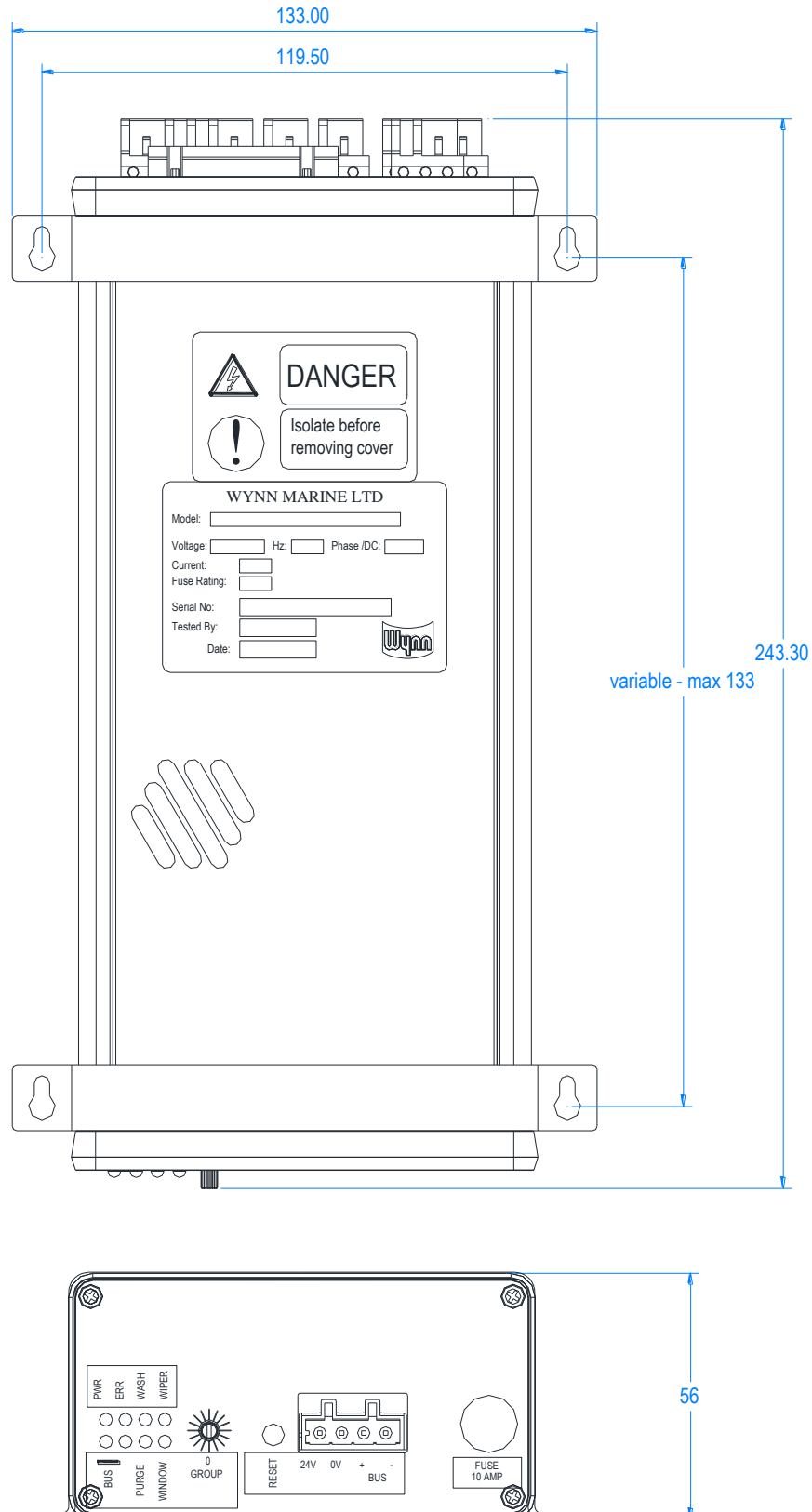
If wash cycle and/or intermittent periods have been previously set to customised values, this command will override the customised settings which will be permanently lost.

8200 MODULE

Technical specifications

Input supply	115 or 230 Vac 1Ph/3Ph 50/60Hz
Maximum Input Current	15A
Total Auxiliary Output Load	10A

Module Dimensions



INSTALLATION INSTRUCTIONS

IMPORTANT

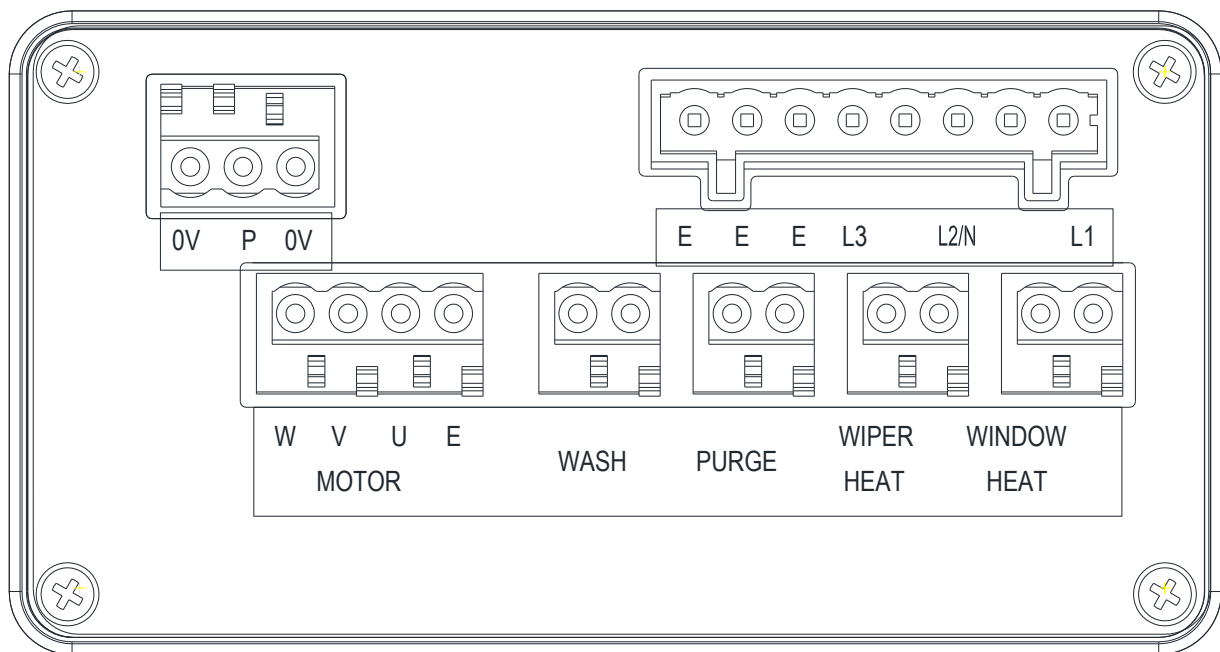
Wiper modules should be mounted in accordance with recommendations in IEC60945 sect 4.7.1. Care should be taken to install the units in line with the unit labelling and bridge layout drawings.

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

A cable insertion tool is supplied for use with the single height connectors.



Rear Panel Connections



If junction boxes and shipyard supplied cables are used to extend the supplied cables, separate shielded cables must be used for wiper motor/heater/earth (6 or 7 core cable) and park switch (2 core cable).

The cable screen for wiper motor/heater/earth cable must be connected to ships earth at both ends of the cable.

The cable screen for park switch cable must be connected to instrument earth at rack/cabinet end of the cable only. (Instrument earth is a separate earth point a minimum 3m away from 230v supply earth point.)

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 modules with fixing clamps provided.

Enough space must be left between and around the modules for cooling air and to allow room for cables and plugs at both ends of the module.

2. Connect motor cable to 4-way motor connector. *(Supplied in module socket)* In accordance with the wiring diagram.



3. Connect park switch cable to 3-way connector. *(Supplied in module socket)* In accordance with the wiring diagram.



4. *If required* - connect wiper heat cabling to 2-way connector. *(Supplied in module socket)* In accordance with the wiring diagram.



5. *If required* - connect window heat cabling to 2-way connector. *(Supplied in module socket)* In accordance with the wiring diagram.



6. *If required* - connect wash cabling to 2-way connector. *(Supplied in module socket)* In accordance with the wiring diagram.



7. **If required** - connect purge cabling to 2-way connector. (*Supplied in module socket*) In accordance with the wiring diagram.



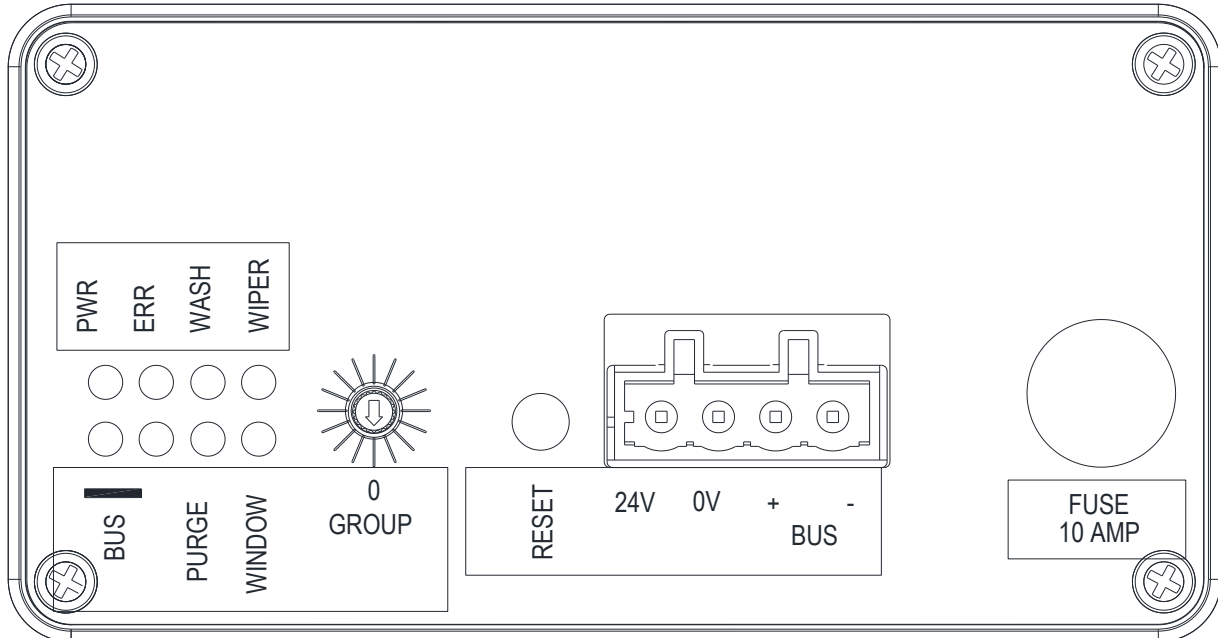
NOTE

The 8-way connector is double height to allow for continuous linking between the modules. In three phase systems the phases should be rotated between modules to balance the load.

8. Connect the power cable to 8-way connector (*Supplied in module socket*) in accordance with the wiring diagram.



Front Panel Connections



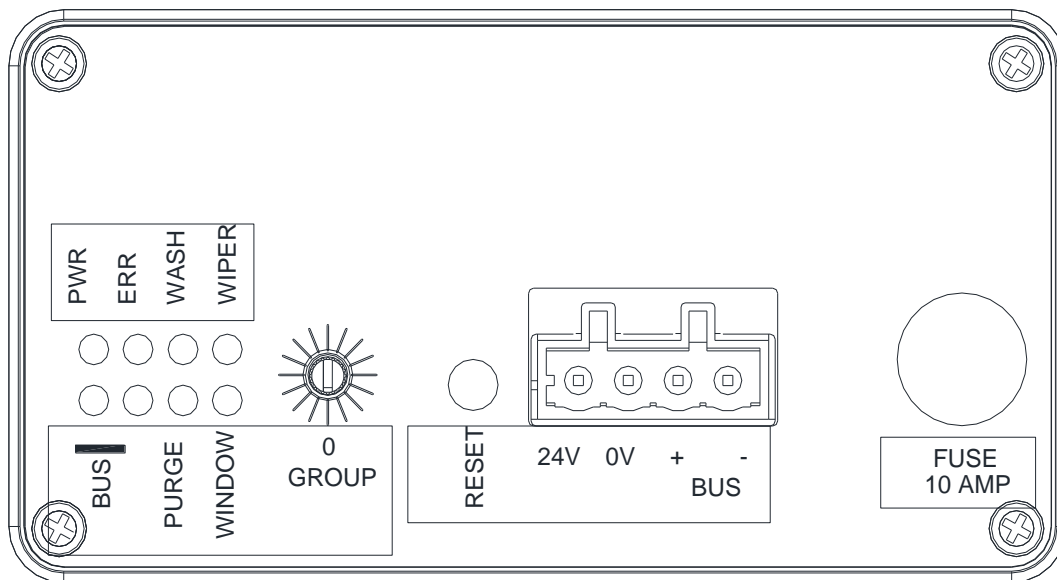
RS 485/CAN bus must be wired as one continuous bus without splitting of wiring.
The 4-way connector is double height to allow for continuous linking between the modules.

9. Connect bus cable to 4-way connector (*Supplied in module socket*) In accordance with the wiring diagram.

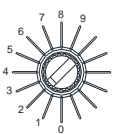


10. The terminating resistor module must be connected to the last module in the chain in accordance with the wiring diagram.
11. Ensure/set the Group Switch to the correct Group (see group switch drawing).
12. To change group, using a small screwdriver rotate the group switch one position to the right to go up one group, rotate the group switch one position to the left to go down one group. If the module is power up, press the reset button.

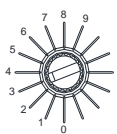
Group Switch



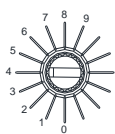
GROUP 1



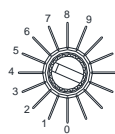
GROUP 2



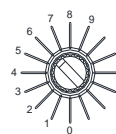
GROUP 3



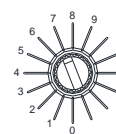
GROUP 4



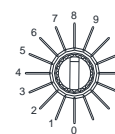
GROUP 5



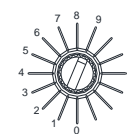
GROUP 6



GROUP 7









GROUP 8

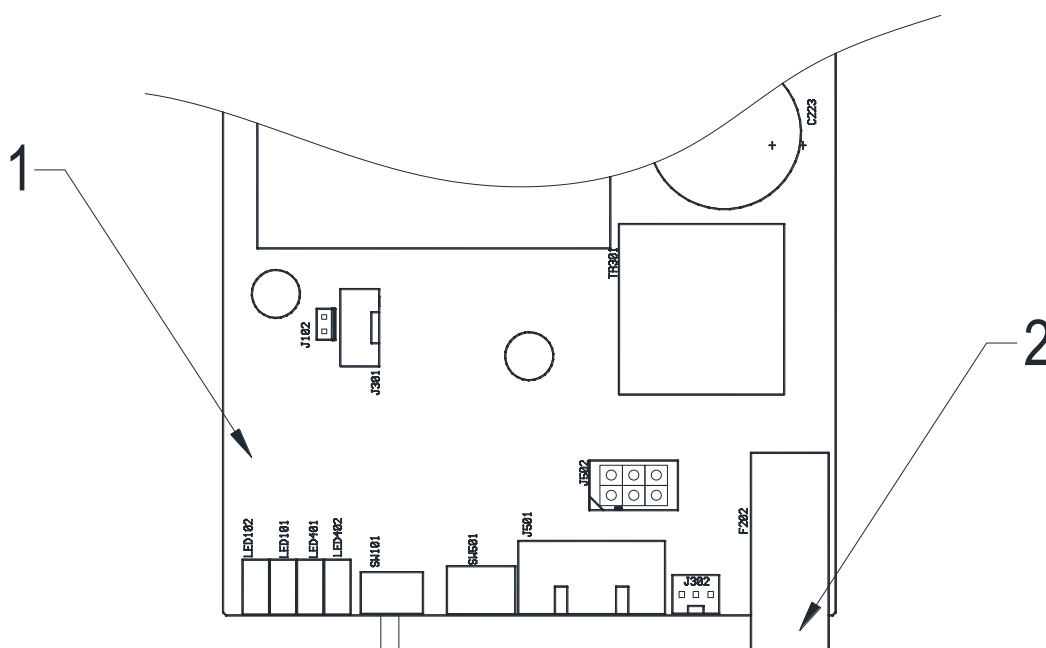


GROUP 9

Module Spares List

	Item No	Item Description	Qty Per Module
1	SP8200-PCB	SPARE 8200 MODULE PCB & COOLING	1
2	A-ELEC-267	FUSE ANTISURGE 10A	1
	10186900	WAGO CABLE INSERTION TOOL	1
	10186800	WAGO 231-602 AUXILIARY MALE CONN 2P	4
	10186710	WAGO 231-604 MOTOR MALE 4 WAY CONNECTOR	1
	10186400	WAGO 721-2104 BUS FEMALE 4P	1
	10186600	WAGO 231-603 PARK MALE 3P	1
	10186500	WAGO 721-2108 FEMALE 8P NO CODING PINS	1
	10186000	8000 MOUNTING STRAP	2

Module Spare Parts Drawing



Module PCB Replacement



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

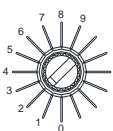


WARNING: Shock Hazard. Board contains capacitors that may still be charged.

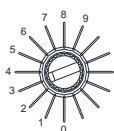
1. Switch off the mains power to the module.
2. Disconnect the main input, motor, park switch and any auxiliary plugs from the rear of the module.
3. Disconnect the bus plug from the front panel.
4. Loosen the 2 x module fixing clamps and remove the module.
5. Remove the 4 x screws securing the module front cover plate, and remove the cover plate and plastic surround.
6. Slide the module bottom cover out of the case.
7. Remove the PCB. Note the setting of the group switch.



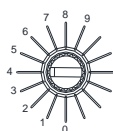
GROUP 1



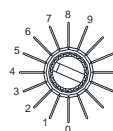
GROUP 2



GROUP 3



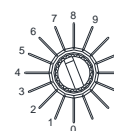
GROUP 4



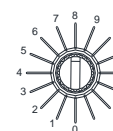
GROUP 5



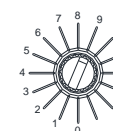
GROUP 6



GROUP 7



GROUP 8



GROUP 9

8. Rotate the group switch of the replacement PCB to the same number as noted above.
9. Slide the new PCB into the module case ensuring PCB is fitted into the correct PCB guides in the case and the PCB is fully pushed into the connector at the rear of the module case.
10. Refit the module bottom cover.
11. Refit the front cover plate and plastic surround, secure with the 4 x screws.

12. Refit the module and secure in place with the 2 x module fixing clamps.
13. Refit the 4 way bus plugs to the front of the module.
14. Reconnect the motor, park switch, auxiliary and mains input plugs to the rear of the module.
The 8200 module is now ready for use.
15. Switch on the mains power.

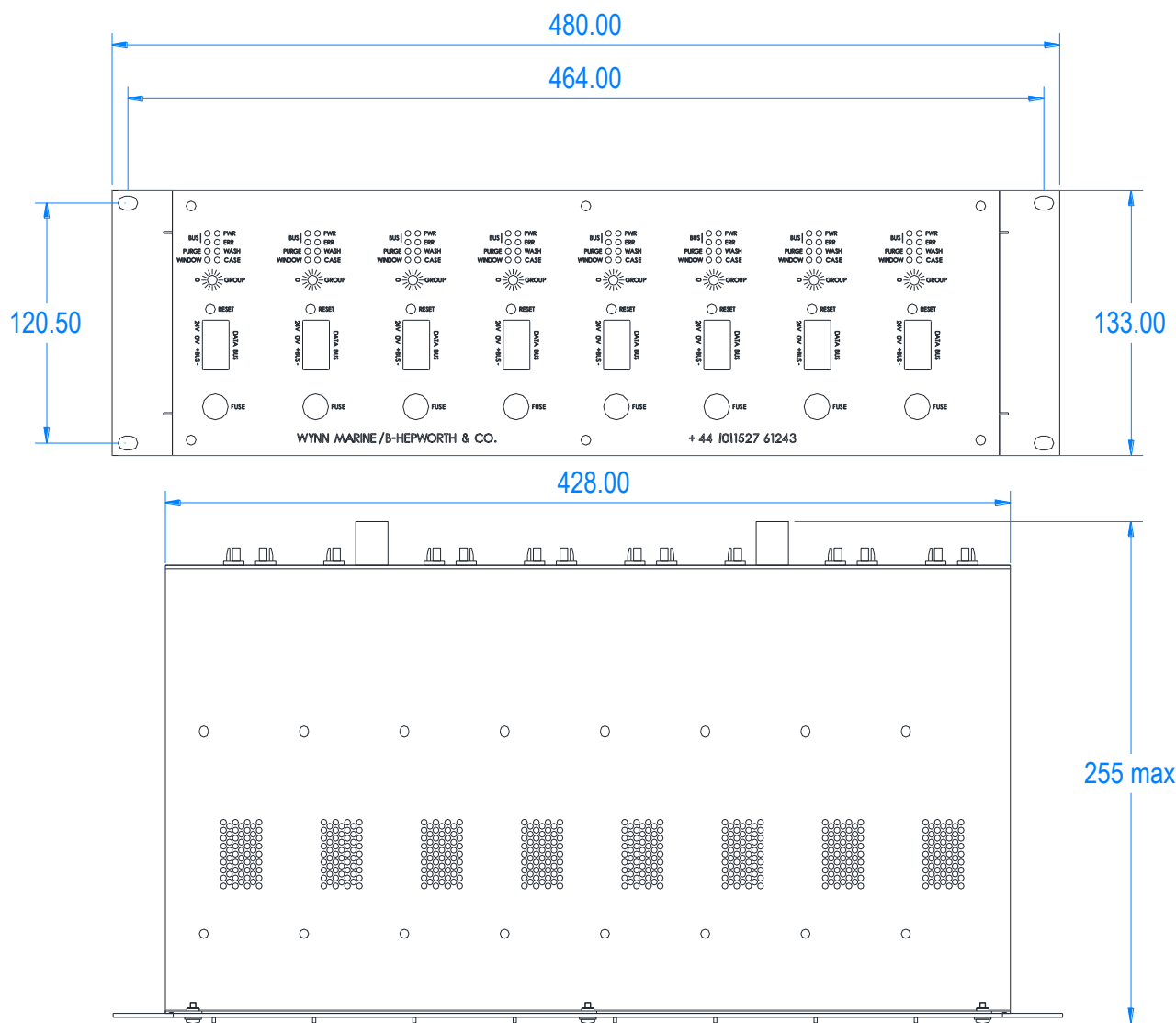
828\$RX-EL-TYPE D

8219 19" RACK INSTALLATION

Technical specifications

Input supply	115 or 230 Vac 1Ph/3Ph 50/60Hz
Maximum Input Current	15A – Per controller card
Total Auxiliary Output Load	10A – Per controller card
Module Height	3U
Max number of cards per rack	8

Module Dimensions



INSTALLATION INSTRUCTIONS

IMPORTANT

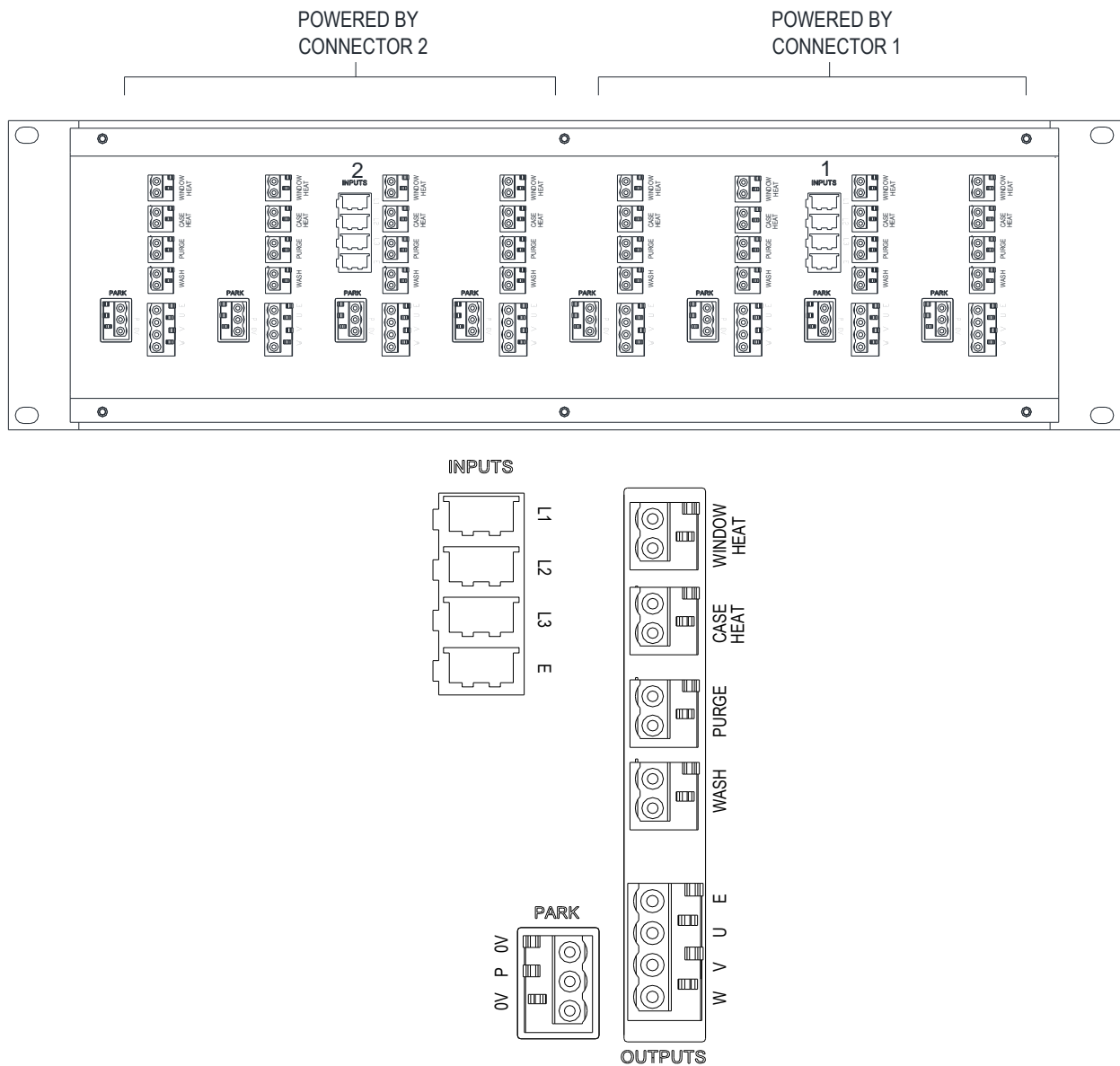
Wiper modules should be mounted in accordance with recommendations in IEC60945 sect 4.7.1. Care should be taken to install the units in line with the unit labelling and bridge layout drawings.

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

A cable insertion tool is supplied for use with the single height connectors.



Rear Panel Connections



Rack units are supplied either as a separate unit suitable for mounting in a 19" cabinet or other suitable mounting position, or are supplied ready fitted to a suitable cabinet with the internal bus connections already complete.

Choose a location for the 19" Rack Unit or cabinet. The smaller units 3U to 15U can be wall mounted units, 18U to 24U units can be fitted to the floor. Motor cable and park switch cables should be fed into the enclosure. Auxiliary outputs **MUST NOT** be wired in parallel, this will cause damage to the PCB.

If junction boxes and shipyard supplied cables are used to extend the supplied cables, separate shielded cables must be used for wiper motor/heater/earth (6 or 7 core cable) and park switch (2 core cable).

The cable screen for wiper motor/heater/earth cable must be connected to ships earth at both ends of the cable.

The cable screen for park switch cable must be connected to instrument earth at rack/cabinet end of the cable only. (Instrument earth is a separate earth point a minimum 3m away from 230v supply earth point.)

Enough space must be left between and around the Rack Modules or Cabinet for cooling air.

1. Connect motor cable to 4-way motor connector. (*Supplied in module socket*) In accordance with the wiring diagram.



2. Connect park switch cable to 3-way connector. (*Supplied in module socket*) In accordance with the wiring diagram.



3. *If required* - connect wiper heat cabling to 2-way connector. (*Supplied in module socket*) In accordance with the wiring diagram.



IMPORTANT

Auxiliary outputs **MUST NOT** be wired in parallel. This will cause damage to the PCB.

4. **If required** - connect window heat cabling to 2-way connector. (*Supplied in module socket*) In accordance with the wiring diagram.



IMPORTANT

Auxiliary outputs **MUST NOT** be wired in parallel. This will cause damage to the PCB.

5. **If required** - connect wash cabling to 2-way connector. (*Supplied in module socket*) In accordance with the wiring diagram.



IMPORTANT

Auxiliary outputs **MUST NOT** be wired in parallel. This will cause damage to the PCB.

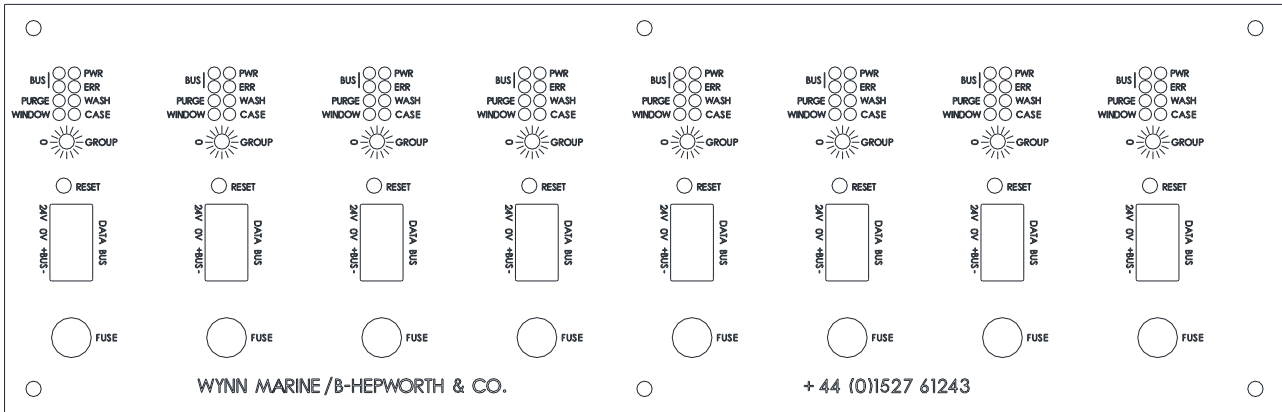
6. **If required** - connect purge cabling to 2-way connector. (*Supplied in module socket*) In accordance with the wiring diagram.



7. Connect the power cable to 4-way connector (*Supplied in module socket*) in accordance with the wiring diagram.



Front Panel Connections



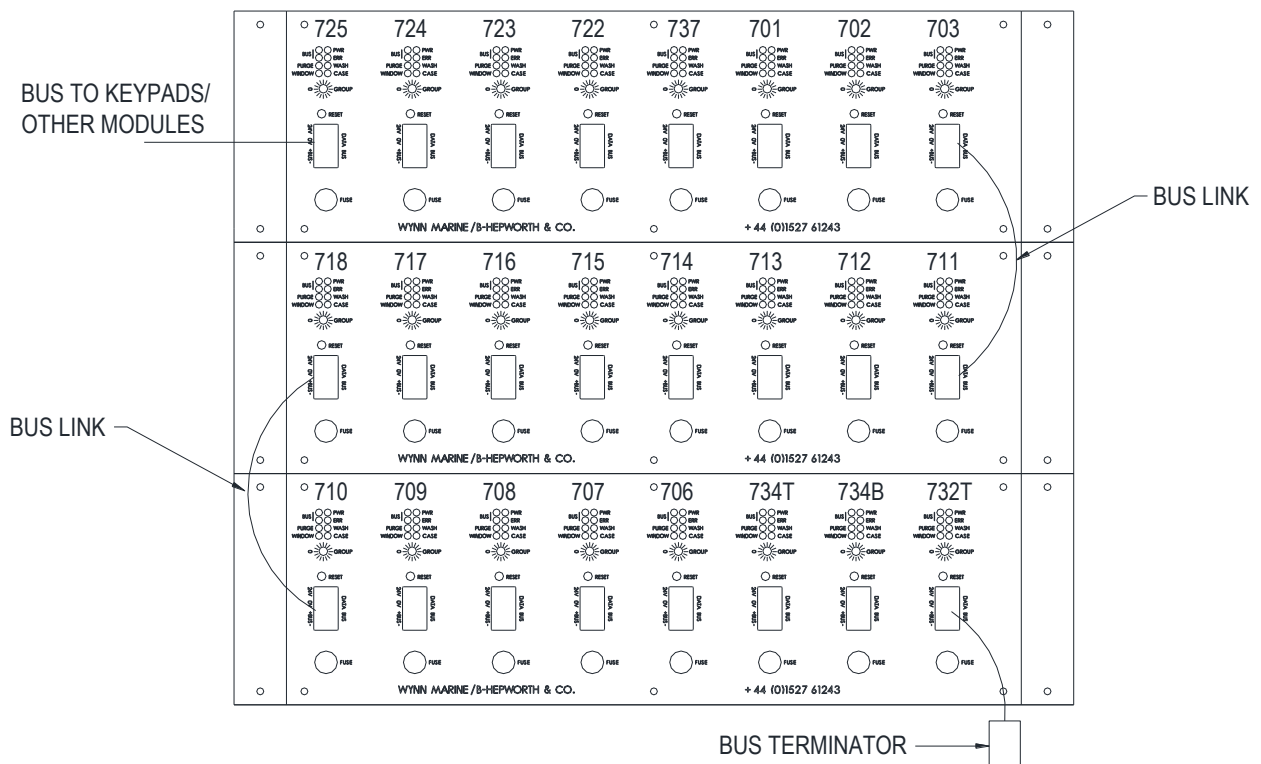
RS 485/CAN bus must be wired as one continuous bus without splitting of wiring. The bus is internally wired between all PCB.

- Connect bus cable to 4-way connector (*Supplied in module socket*) In accordance with the wiring diagram.



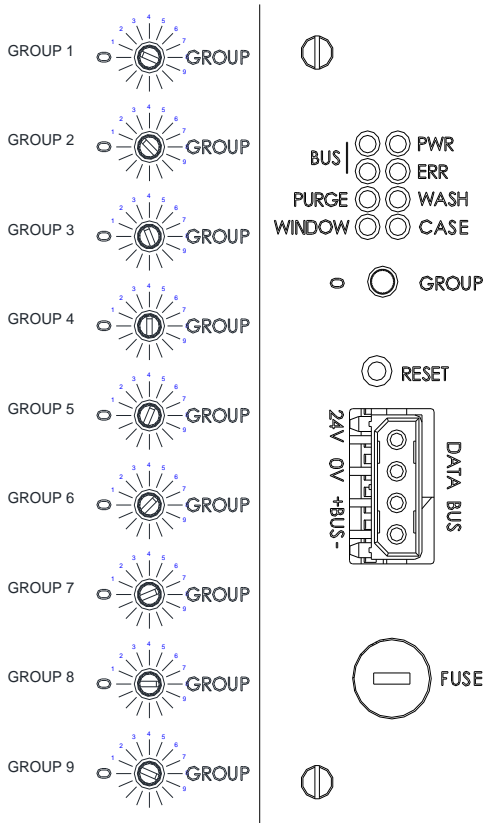
- The terminating resistor module must be connected to the last module in the chain in accordance with the wiring diagram.

Example of bus connections made in a 3 rack cabinet



Group Switch

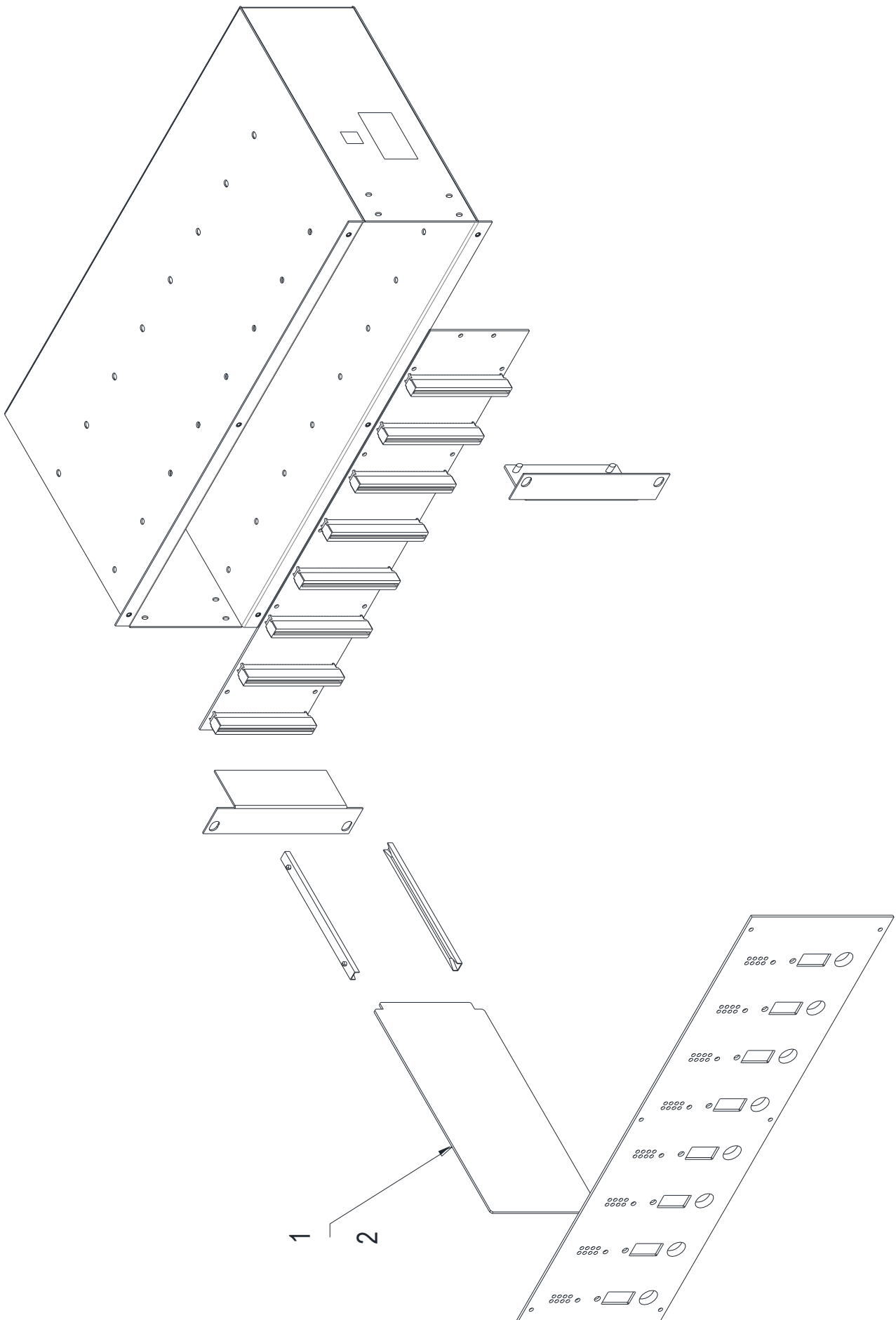
10. The group switch on each wiper control PCB is pre-set in the factory. Ensure/set the Group Switch to the correct Group (see group switch drawing below and bus wiring drawings when available (group number indicated in blue)).
11. To change group, using a small screwdriver rotate the group switch one position to the right to go up one group, rotate the group switch one position to the left to go down one group. If the module is powered up, press the reset button.



19" Rack Module Spares List

Ident	Item Part No	Item Description	Qty Per Module
1	SP8200-PCB	SPARE 8200 MODULE PCB & COOLING	1
2	A-ELEC-267	FUSE ANTISURGE 10A	1
	10186900	WAGO CABLE INSERTION TOOL	1
	10186800	WAGO 231-602 AUXILIARY MALE CONN 2P	4
	10186710	WAGO 231-604 MOTOR MALE 4 WAY CONNECTOR	1
	10186600	WAGO 231-603 PARK MALE 3P	1
	10186400	WAGO 721-2104 BUS FEMALE 4P	1
	10186510	WAGO 831-3104 POWER FEMALE 4P	2 Per Rack

19" Rack Module Spare Parts Drawing



19" Rack Module PCB Replacement

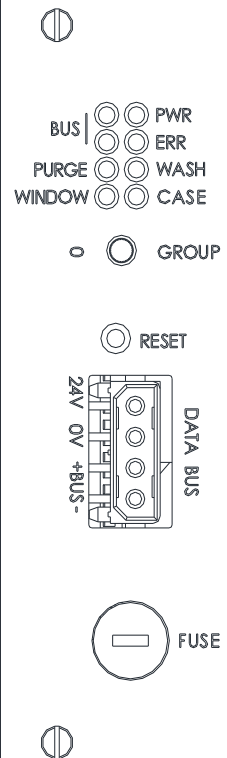
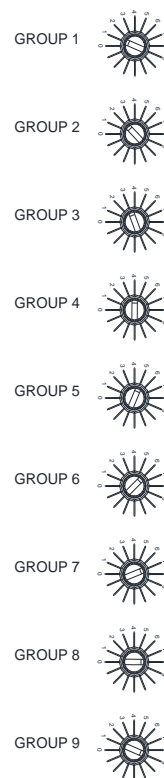


WARNING: Ensure that all power is disconnected whilst working on the controller.



WARNING: Shock Hazard. Board contains capacitors that may still be charged.

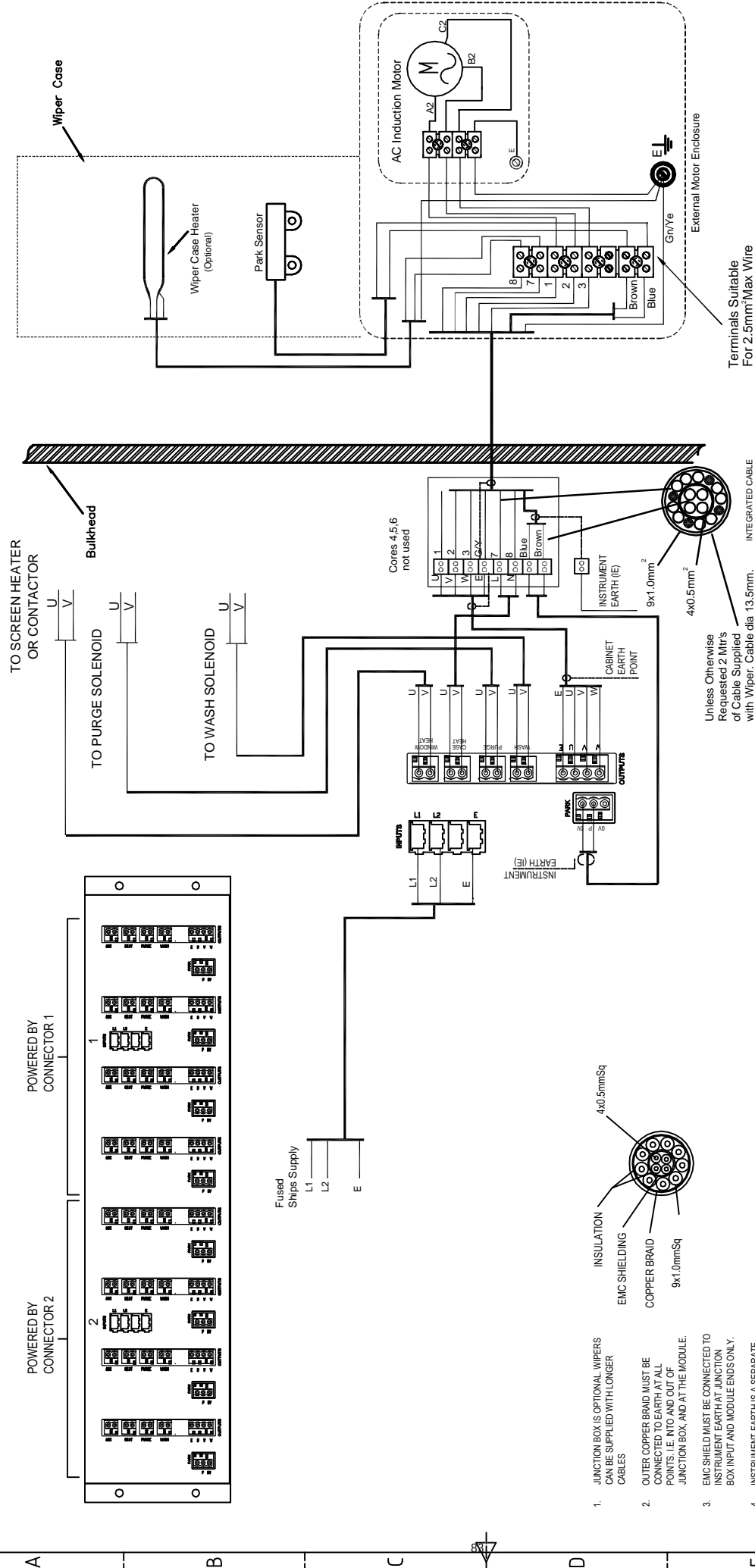
1. Switch off the mains power to the rack unit.
2. Remove the 4 way bus plugs and remove the 6 screws securing the 19" rack unit cover plate, and remove the cover plate.
3. Remove the PCB to be replaced. Note the setting of the group switch.
4. Rotate the group switch of the replacement PCB to the same number as noted above.
5. Slide the new PCB into the 19" rack unit ensuring PCB is fitted into the PCB guides and the PCB is fully pushed into the connector at the rear of the 19" rack unit.
6. Refit the 19" rack cover plate with the 6 screws. Refit Bus 4 way plugs. The 8200 19" Rack is now ready for use.
7. Switch on the mains power to the rack unit.



8000 system wiring diagrams for D type wipers.

These diagrams cover the vast majority of wiper installations. In the case that these diagrams do not cover your specific installation please contact customer services on +44 1527 61243

RACK REAR VIEW

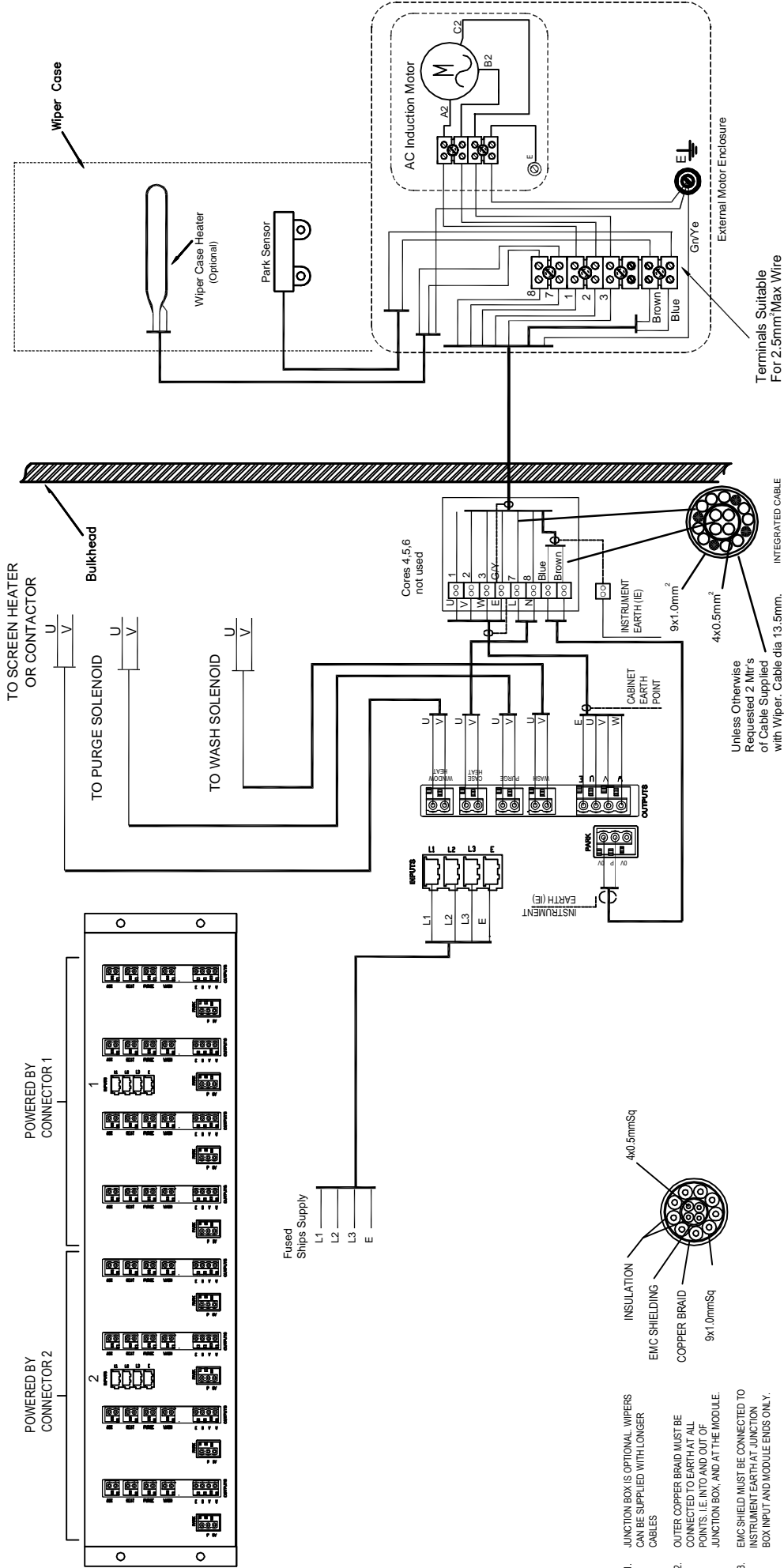


B		CABLE EARTHING INFO ADDED		14/04/15		DCM	
Issue		Charges/Mod No.		Date		Name	
13/03/13		APG		13/03/13		S6200	
Date		Drawn by		Approved by		Drawing Log No.	
ELECTRICAL SCHEMATIC		8219 RACK TO 'D' TYPE WIPER		13/03/13		S6200	
8219R-EL-DTYPE-1PH		IF IN DOUBT ASK		DO NOT SCALE		3RD ANGLE	
8219R-EL-DTYPE-1PH		OUTSIDE LOOKING IN		REMOVE SHARP EDGES		B	
NOTE CRITICAL DIMENSIONS MARKED THUS 'CD'		SIGNIFICANT DETAILS MARKED THUS 'SD'		Finish -		Matl. Type -	
Matl. Part No. -		Matl. Size -		Other info -		8219R-EL-DTYPE-1PH	
GENERAL TOLERANCES		All dimensions are in mm unless otherwise stated		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension		Dimension - No decimal place		Dimension - One decimal place	
Dimension - Two decimal places		Dimension - Three decimal places		Dimension - Four decimal places		Angular Dimension	
Dimension - No decimal place		Dimension - One decimal place		Dimension - Two decimal places		Dimension - Three decimal places	
Dimension - Four decimal places		Angular Dimension					

8000 system wiring diagrams for D type wipers.

These diagrams cover the vast majority of wiper installations. In the case that these diagrams do not cover your specific installation please contact customer services on +44 1527 61243

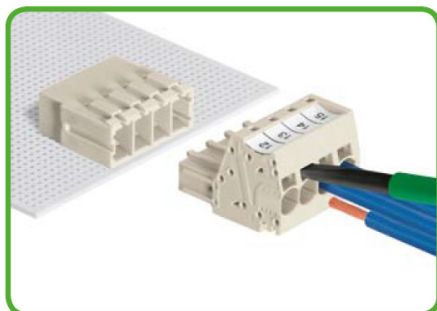
RACK REAR VIEW



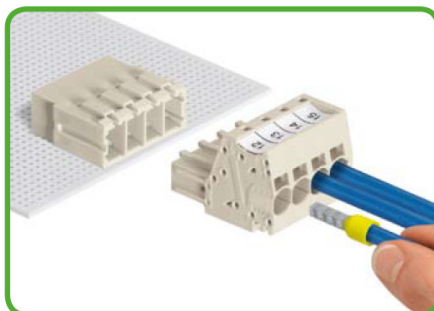
B		CABLE EARTHING INFO ADDED		14/04/15		DCM
Issue	Date	Changes/Mod No.	Drawn by	Approved by	Date	Name
	13/03/13		APG			
ELECTRICAL SCHEMATIC						
8219 RACK TO 'D' TYPE WIPER						
A Division of B. Hepworth B. Hepworth & Co. Ltd 2-4 Merse Road, North Moors Moat, Redditch, Worcestershire. B98 9HL tel 01527 63057; fax 01527 66836						
8219R-EL-DTYPE-3PH						
B						
8						

GENERAL TOLERANCES		All dimensions are in mm unless otherwise stated		IF IN DOUBT ASK		8	
Dimension - No decimal places		± 1		DO NOT SCALE		6	
Dimension - One decimal place		± 0.5		3RD ANGLE		3	
Dimension - Two decimal places		± 0.25		OUTSIDE LOOKING IN		2	
Dimension - Three decimal places		± 0.125		REMOVE SHARP EDGES		1	
Dimension - Four decimal places		± 0.0625		NOTE CRITICAL DIMENSIONS MARKED THUS 'CD'		3	
Angular Dimension		± 1°		SIGNIFICANT DETAILS MARKED THUS 'SD'		2	
Finish -		Matl. Type -		Matl. Part No. -		1	
Matl. Size -		Other info -		8219R-EL-DTYPE-3PH		B	
Matl. Size -		Other info -		8		8	

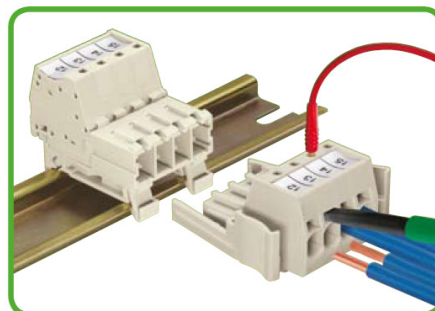
MULTI CONNECTION SYSTEM



Inserting fine-stranded conductors via 5.5 x 0.8 mm screwdriver.

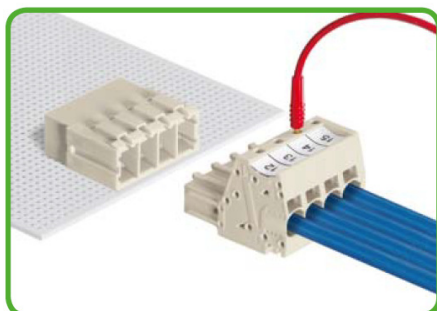


Inserting solid and ferruled conductors via push-in termination – no operating tool needed.



Male connector with CAGE CLAMP®S mounted on DIN 35-rail.

831 Series

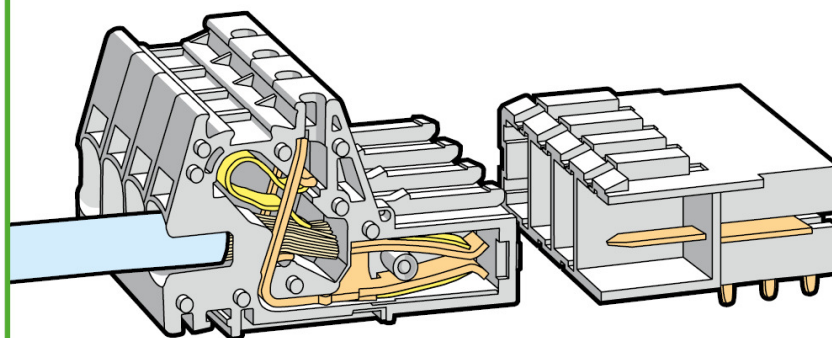


Testing with 2 mm Ø test plug.



Break or cut off coding pin from female connector . . .

100 % protected against mismatching



MCS-MAXI

Pin spacing 7.62 mm



. . . Insert coding pin into male connector (break first) until it engages.



Marking via WMB or miniature WSB marker strips.



Marking via factory direct printing.



CAGE CLAMP®S clamps the following copper conductors:*

solid

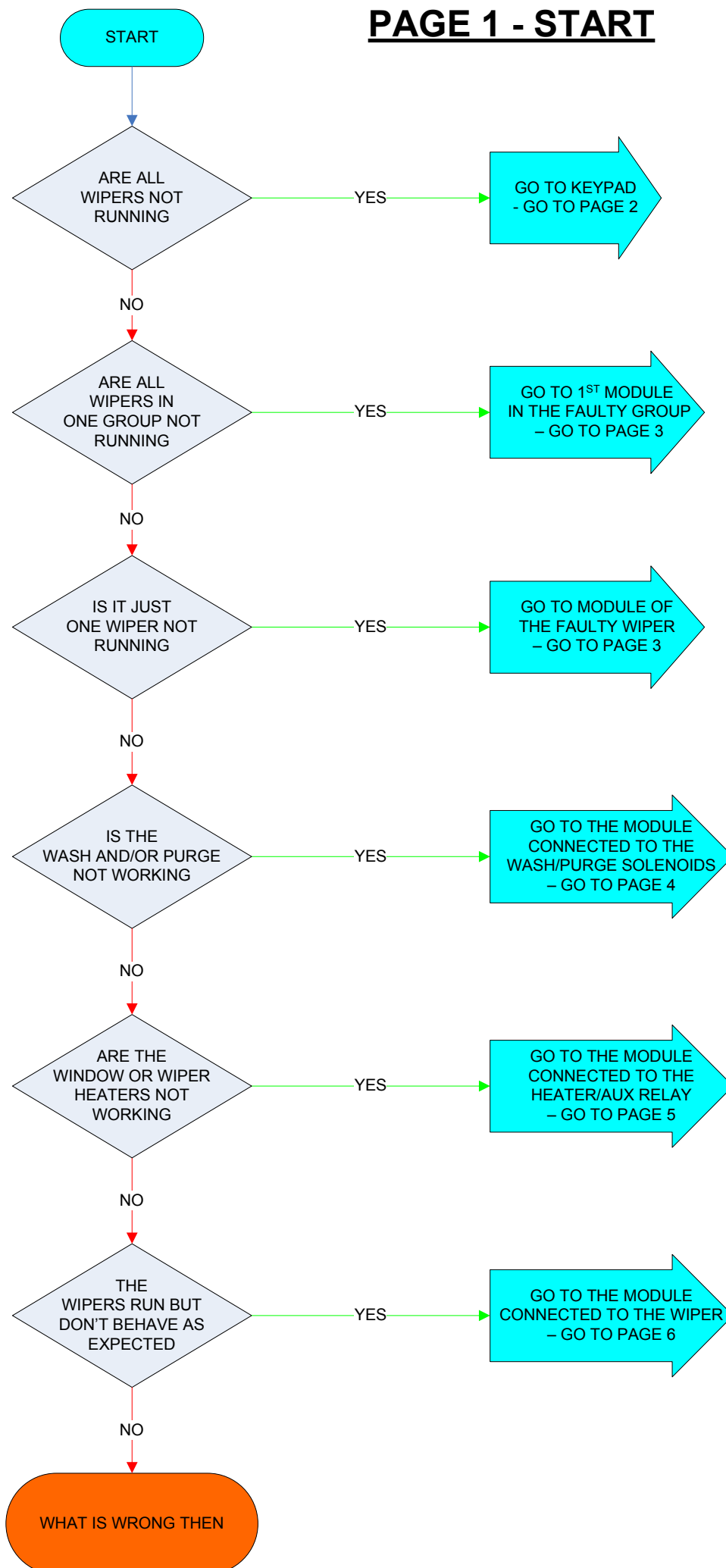


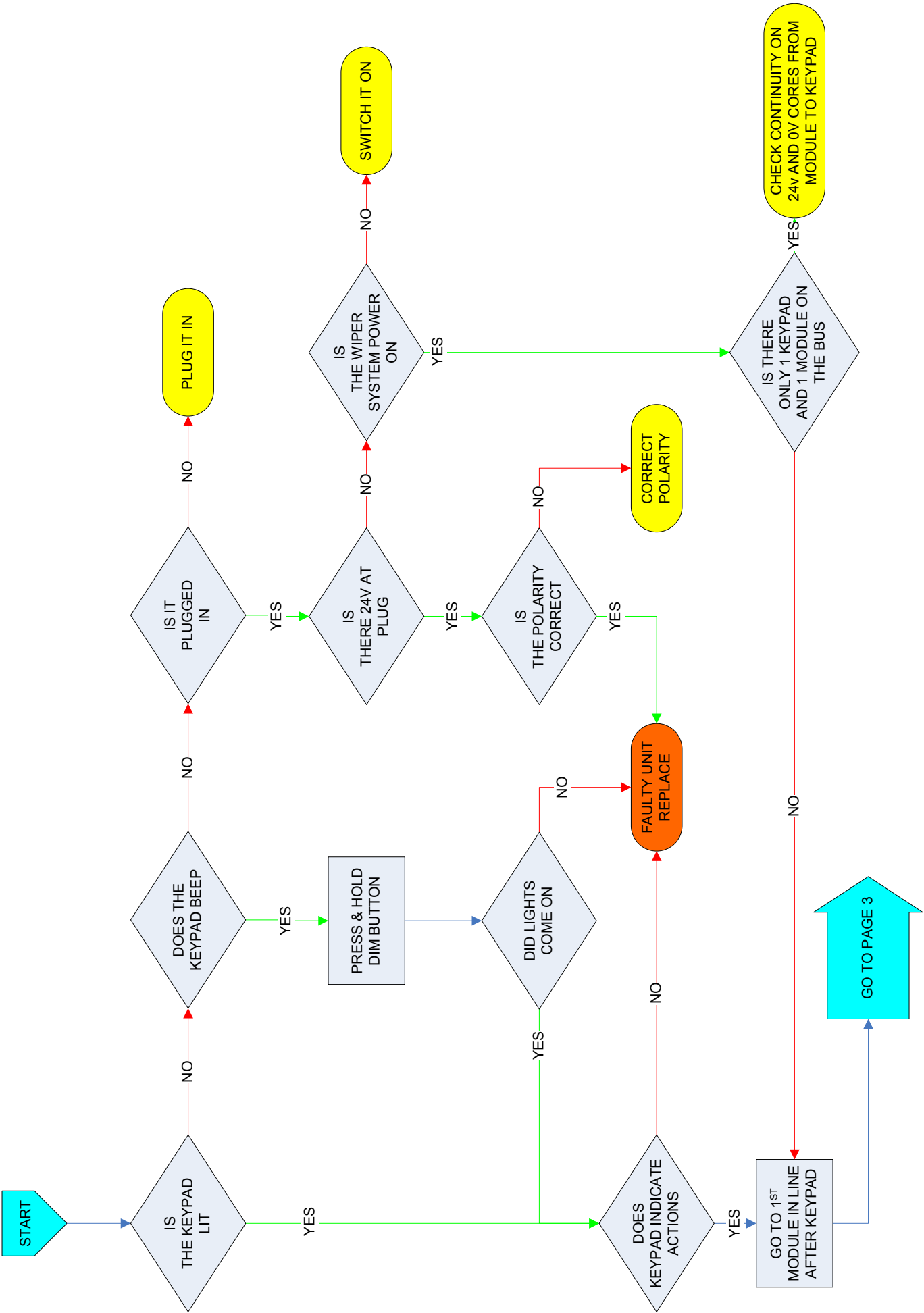
stranded



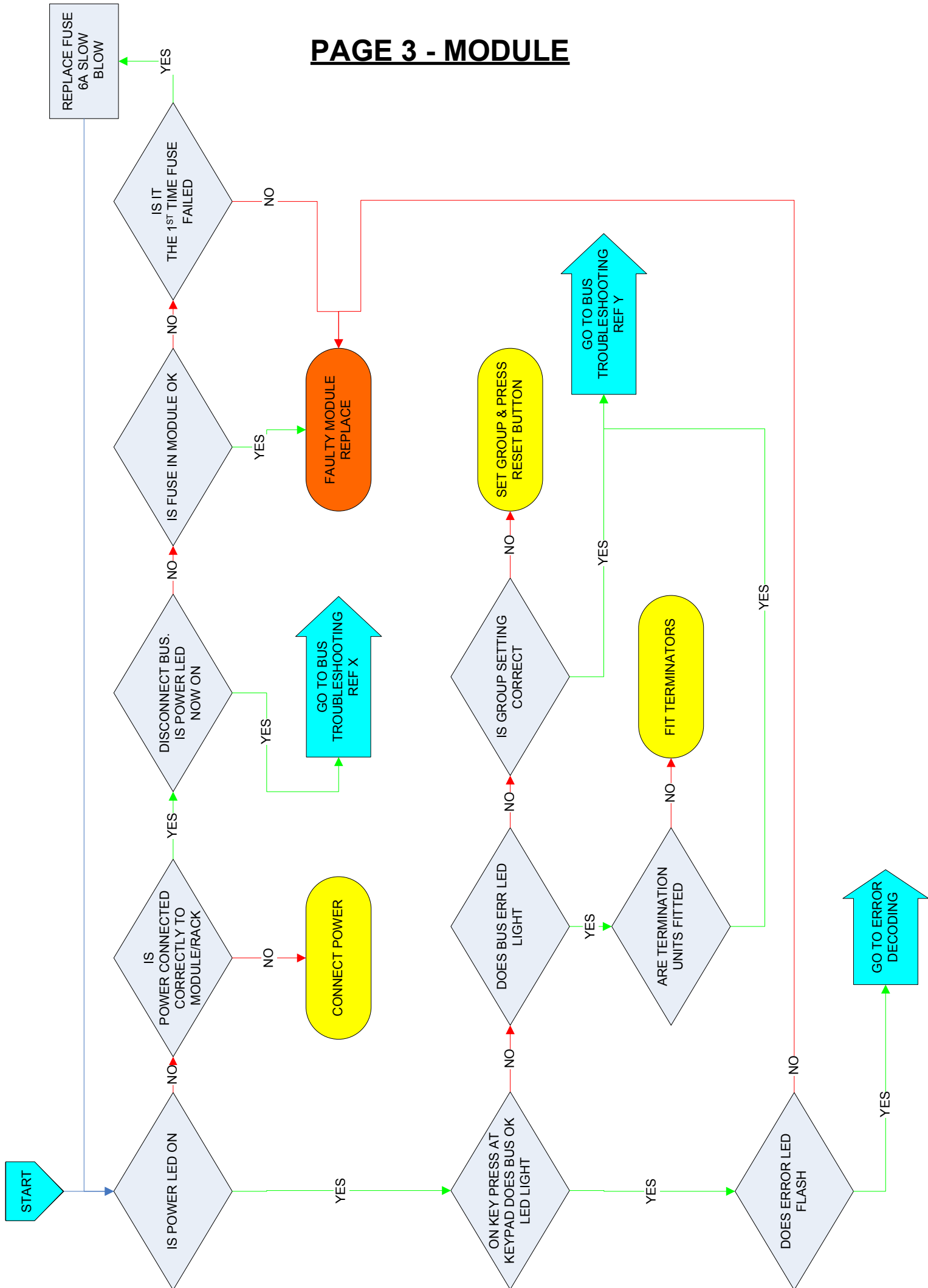
fine-stranded, also with tinned single strands

PAGE 1 - START

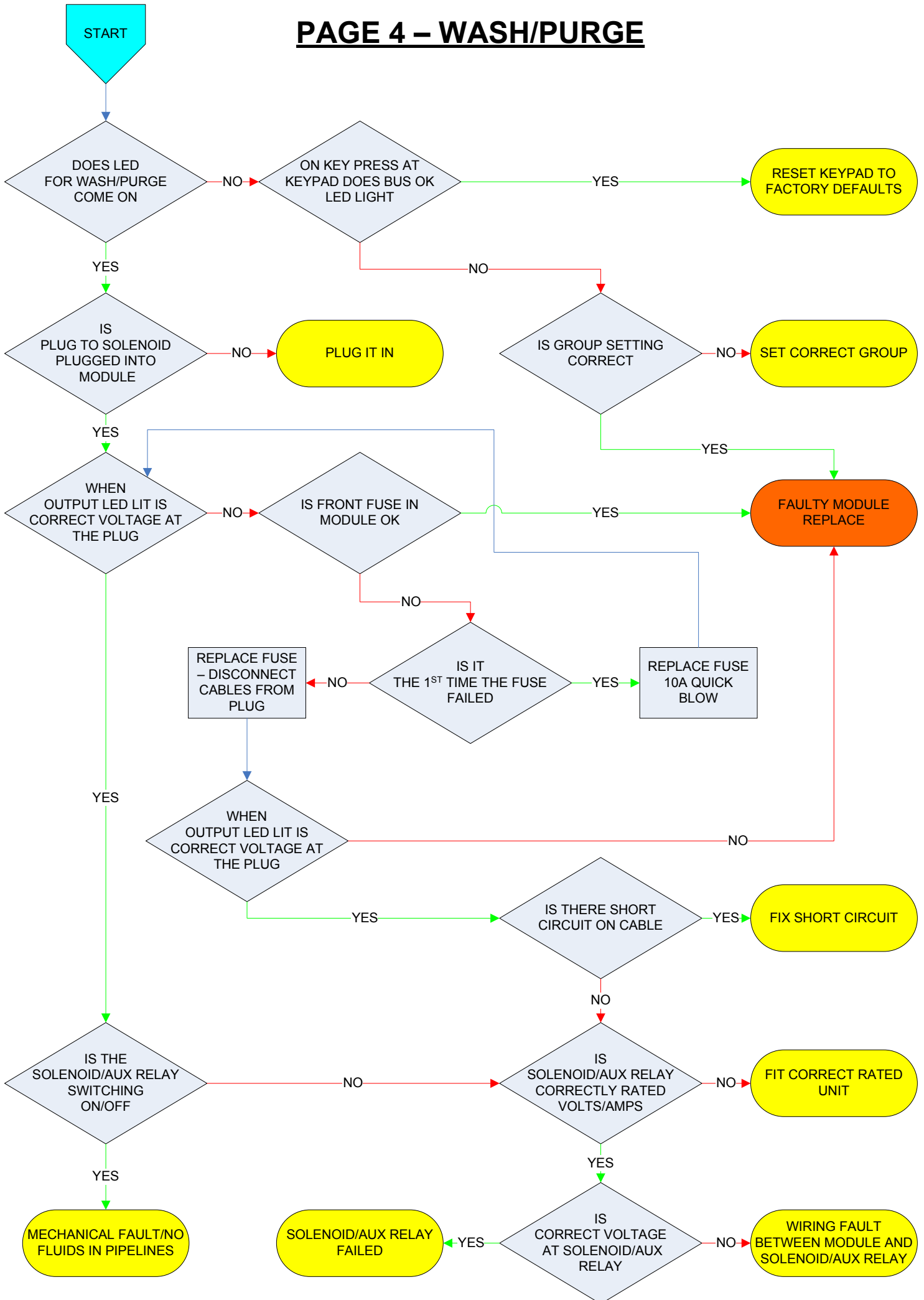




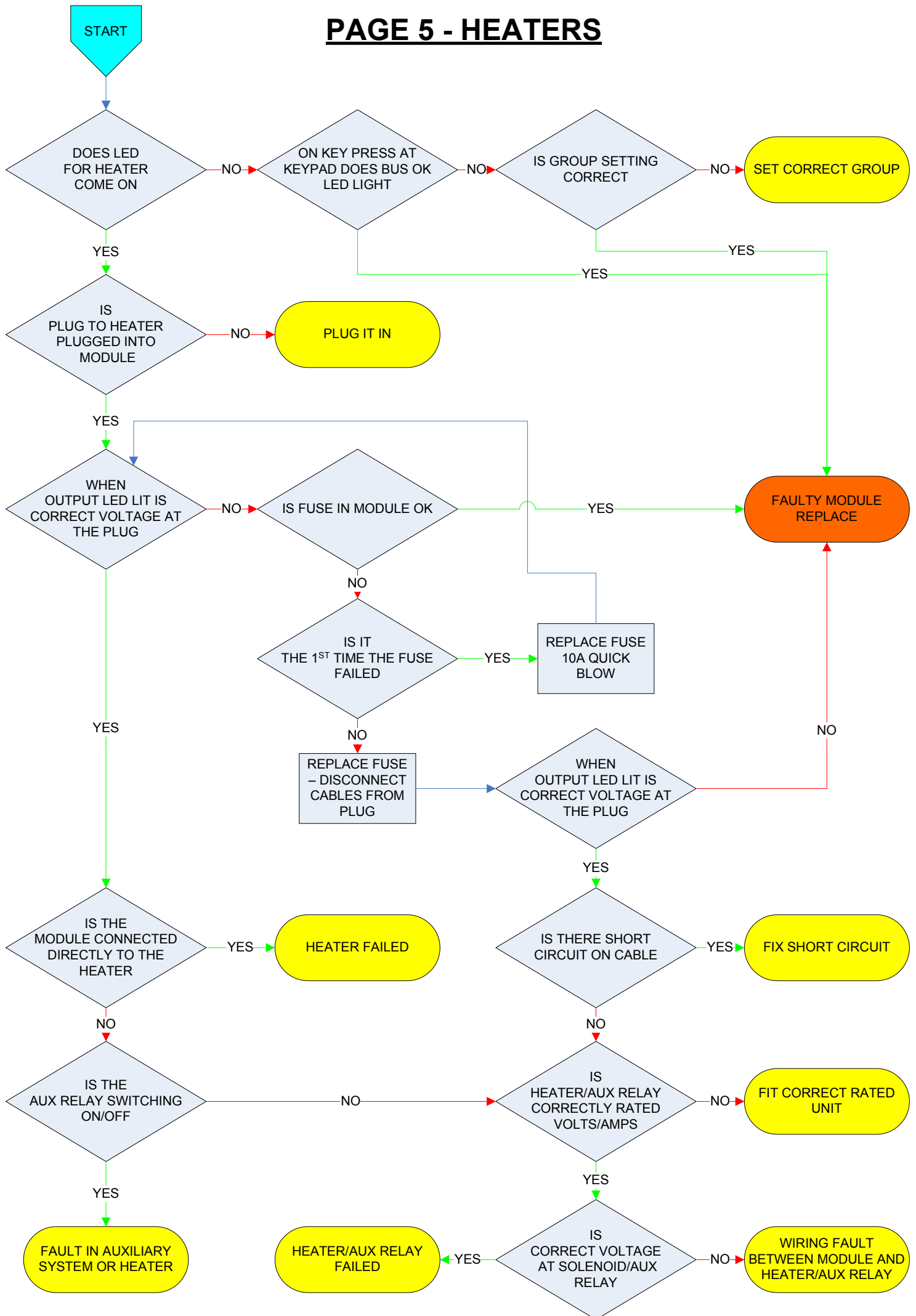
PAGE 3 - MODULE



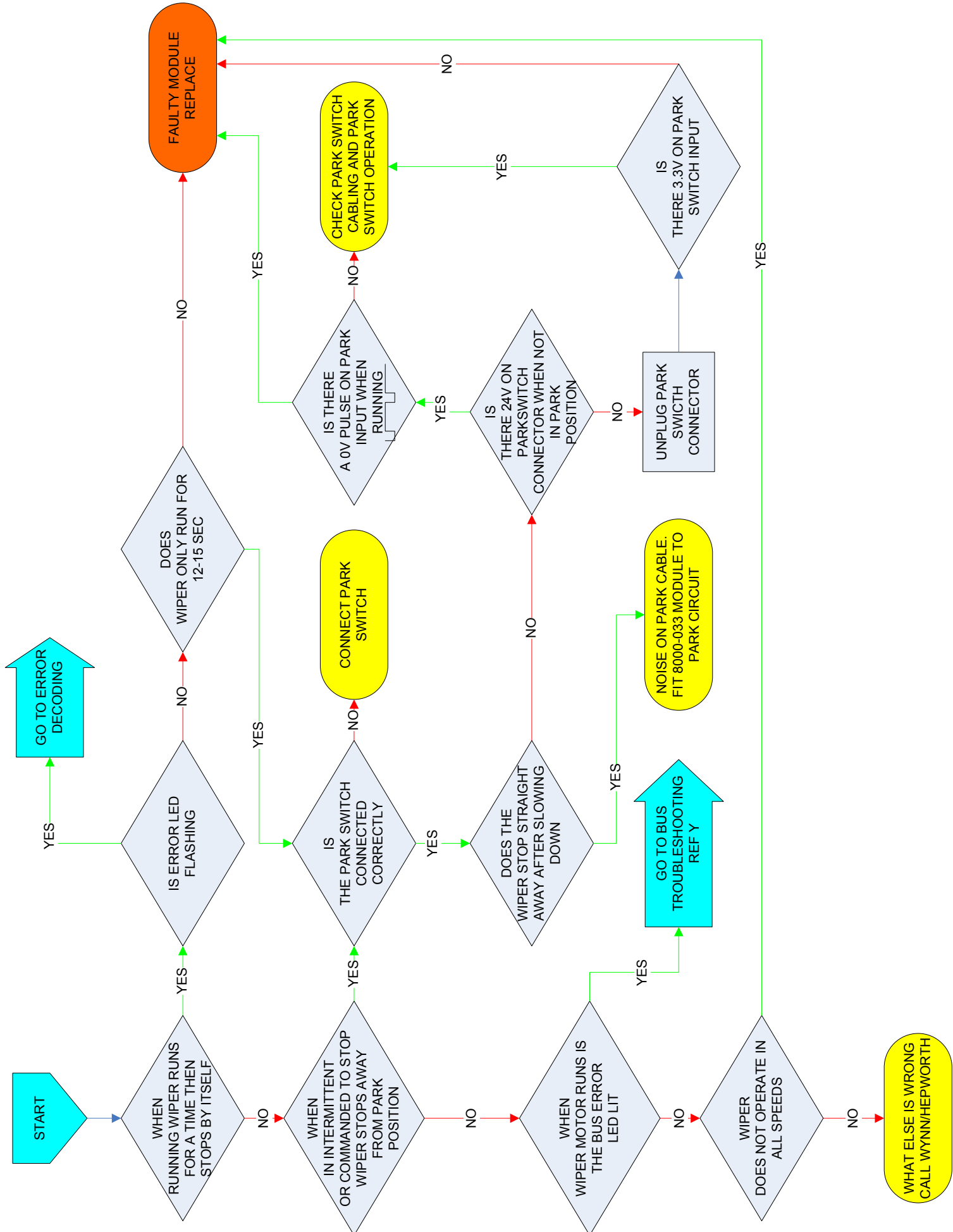
PAGE 4 – WASH/PURGE



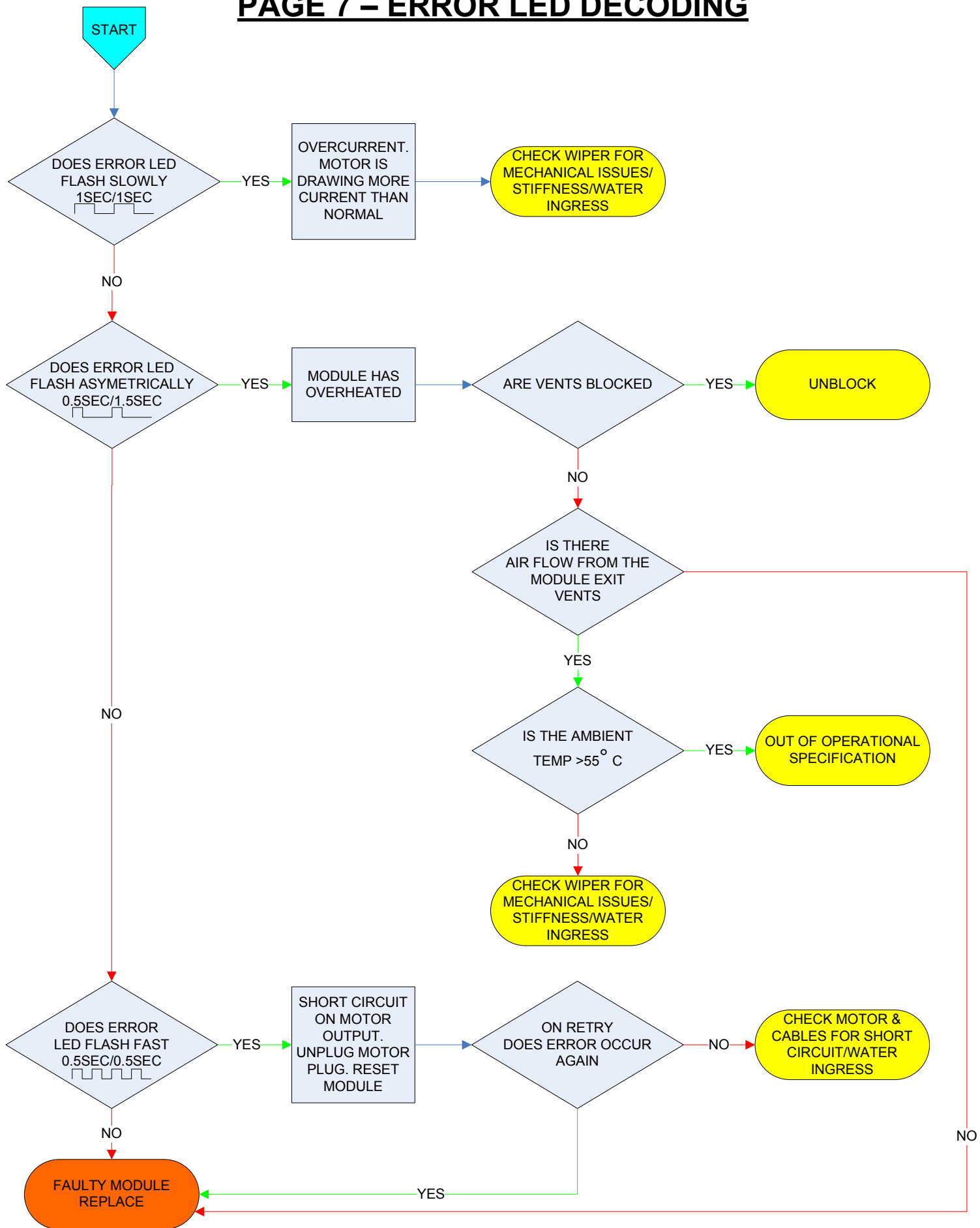
PAGE 5 - HEATERS



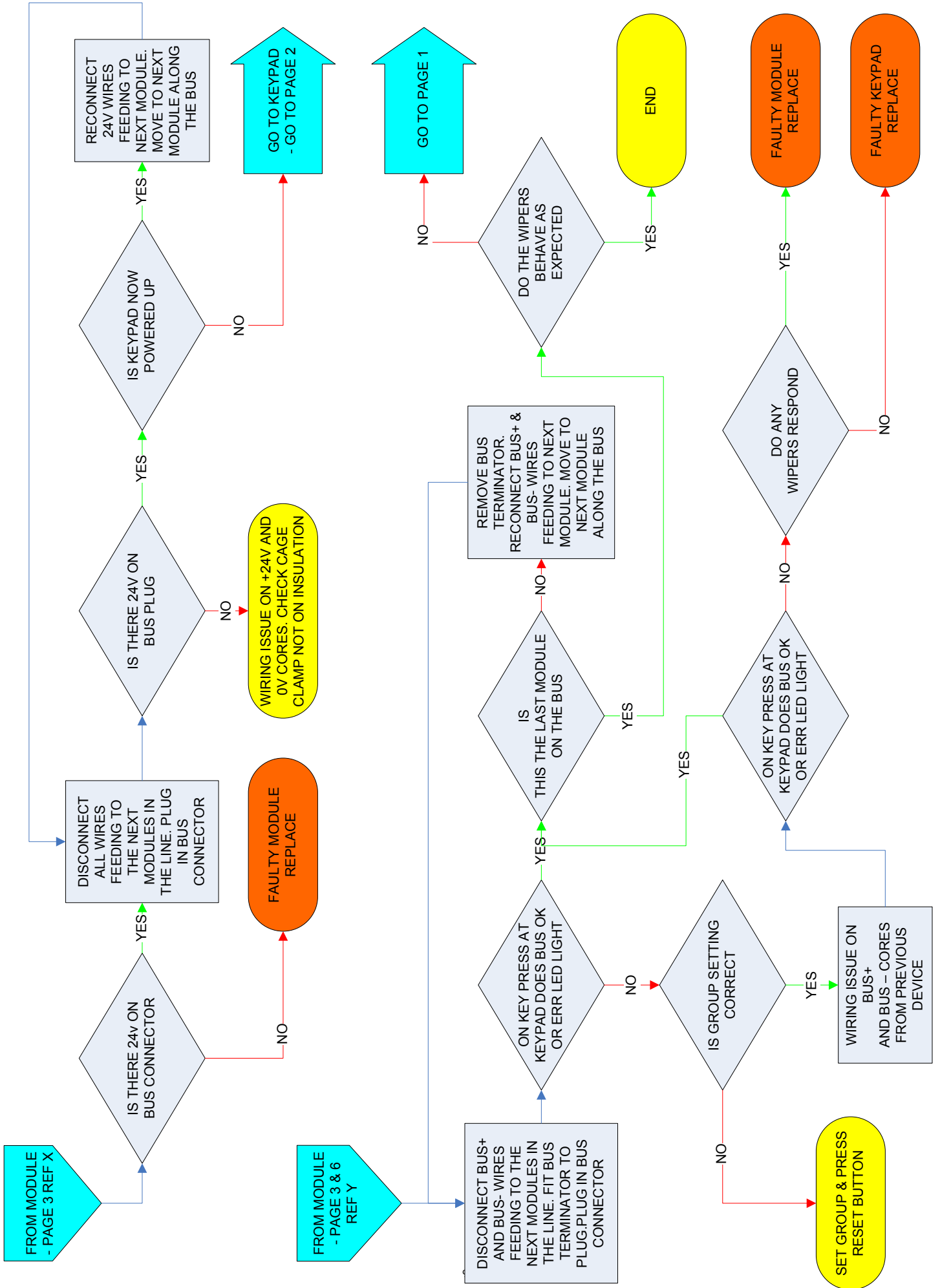
PAGE 6 – UNEXPECTED BEHAVIOUR



PAGE 7 – ERROR LED DECODING



PAGE 8 – BUS



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 or 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.

THIS PAGE INTENTIONALLY LEFT BLANK

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.

Argentina, Australia, Brazil, Canada, Chile, China, Croatia, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Iceland, India, Israel, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Oman, Peru, Poland, Portugal, Russia, Singapore, South Africa, Spain, Sweden, Taiwan, Turkey, Ukraine, U.S.A.



Wynn Marine Ltd

2-4 Merse Road, North Moons Moat, Redditch, Worcestershire B98 9HL

Tel: +44 (0) 1527 61243, Fax: +44 (0) 1527 66836

Email: customerservice@b-hepworth.com, website www.b-hepworth.com