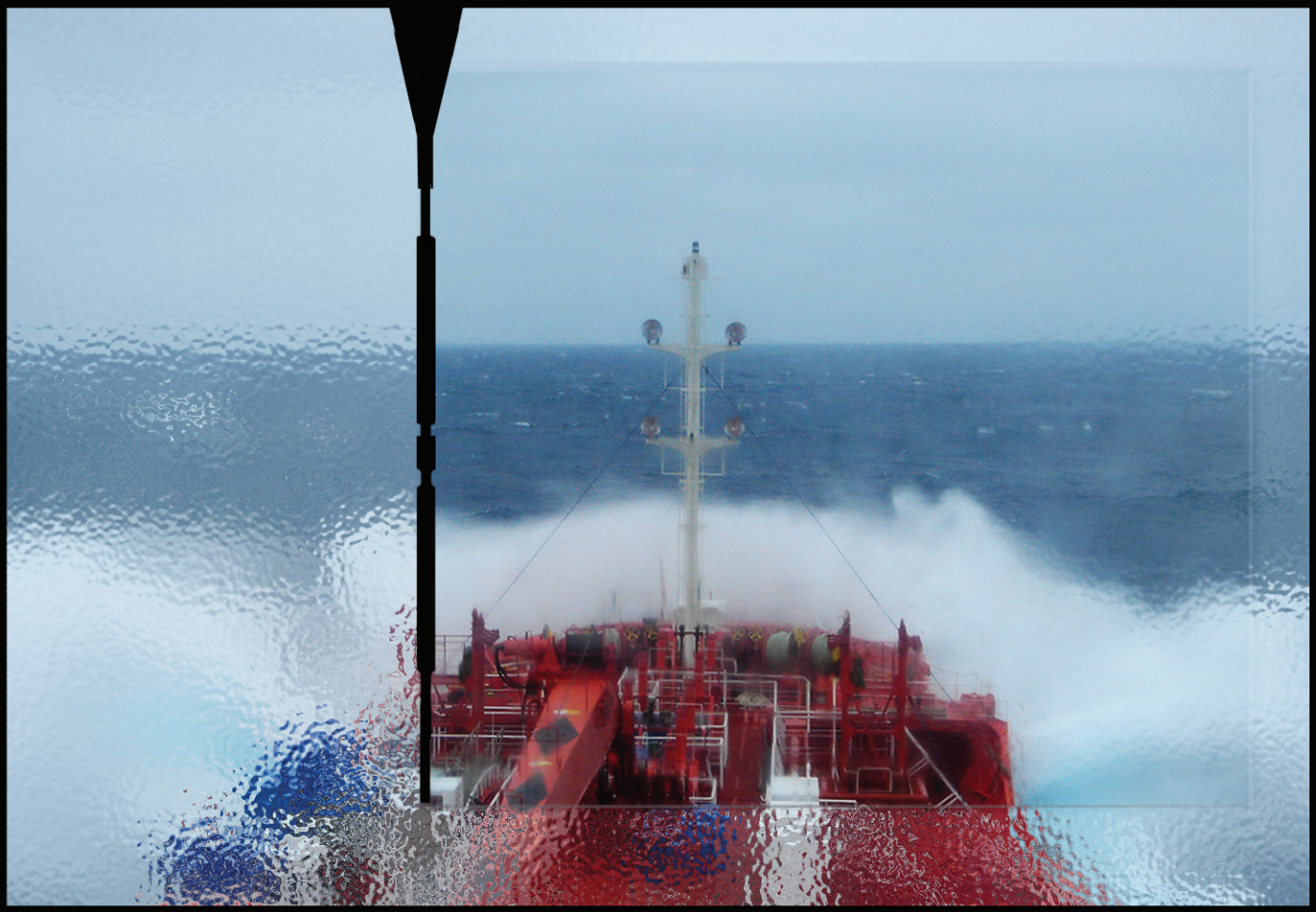
DECCAwiper



User Manual

DECCA
Heavy Duty Straight Line Wipers
Thor Control System

www.deccawiper.com

DOCUMENT FRONT SHEET

DECCAwiper

USER MANUAL

0	Initial release	05.09.2011	Indok			BS
Rev.	Reason for issue	Date	Prepared	Controlled	Approved	Released

DECCA wiper systems as

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CONTENTS

1 INTRODUCTION 6
1.1 PURPOSE OF MANUAL 6
1.2 MARKING OF EQUIPMENT 7
1.3 SYMBOLS 8
1.4 COMMON ABBREVIATIONS 8

2 INTRODUCTION 9
2.1 GENERAL DESCRIPTION 9

3 MAIN DATA 10
3.1 DIMENSIONS 10
3.2 TECHNICAL DATA 12
3.2.2 POWER SUPPLY 12
3.2.3 POWER CONSUMPTION 12
3.2.4 WEIGHTS 12

4 TECHNICAL DESCRIPTION 13
4.1 FUNCTIONAL DESCRIPTION 13
4.1.1 WIPER UNIT 13
4.1.2 WIPER ARMS 14
4.1.3 THOR CONTROL PANELS 16
4.1.4 THOR ELECTRONIC CONTROL UNIT (ECU) 17
4.2 TYPICAL INSTALLATIONS 19
4.3 WATER SPRAY SYSTEM (OPTION) 20
4.3.1 AIR PURGE SYSTEM 21

5 INSTALLATION PROCEDURE 22
5.1 LOCATION OF WIPER UNIT BRACKETS 22
5.2 BULKHEAD PENETRATION 23
5.3 WIPER CASING 23
5.4 CABLE CONNECTIONS 24
5.4.1 WIPER UNIT CABLE CONNECTON 24
5.4.2 ELECTRONIC CONTROL UNIT (ECU) CABLE CONNECTIONS 25
5.4.3 WIPER CONTROL PANEL 25
5.4.4 WATER SPRAY SYSTEM JUNCTION BOX WIRING 26

6 SYSTEM OPERATION 27
6.1 WIPER CONTROL PANEL 27

7 SPARE PARTS 28

8 WARRANTY 30

9 DRAWINGS 30

1 INTRODUCTION

1.1 PURPOSE OF MANUAL

The purpose of this manual is to provide guidance for installation and operation of Decca Straight Line Wipers controlled with the Thor Control system, as supplied by Decca Wiper Systems AS.

The manual is intended to give technical information to understand the functions and features of the Decca Wiper Systems and to be able to operate the system, together with installation, commissioning and maintenance information.

The manual shall also be used as a textbook for training of crew, and should be read and understood before operation of the wiper system.

| Changes occuring since the last issue of the manual are marked with vertical black lines in left margin.

1.2 MARKING OF EQUIPMENT

The wiper unit is identified with a label positioned on the back side of the wiper casing. An additional, similar label is positioned in a more protected location behind the wiper motor cover.

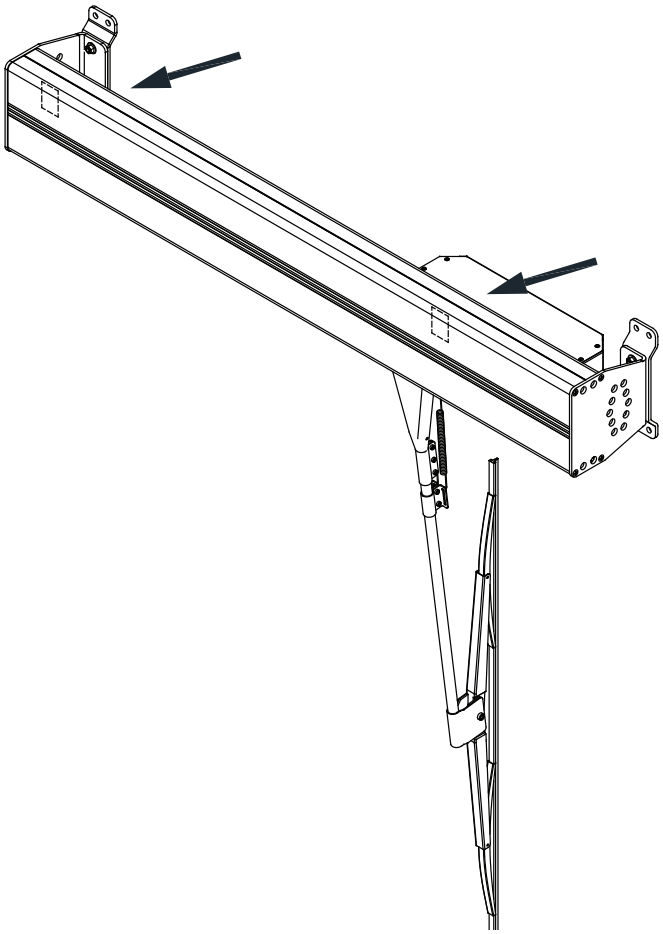


Figure 1 - Label Locations on wiper unit

The product label contains a serial number and technical information about the wiper unit.
For service and spare part orders, always refer to the information listed on the product label.

1.3 SYMBOLS

The NOTE symbol gives clarifying information or special instructions which are crucial for the equipment or to the operation performed.

The WARNING symbol gives clarifying information or special instructions where personal injuries or damage to the equipment can occur.

1.4 COMMON ABBREVIATIONS

Abbreviation		*Explanation*
mm	-	millimetres
"	-	inches
kg	-	kilogram
ECU	-	Electronic Control Unit

2 INTRODUCTION

2.1 GENERAL DESCRIPTION

Modern shipbuilding takes full account of visibility requirements. Larger wheelhouses with an omnidirectional view are part of this trend. As a result, there is an increase in window area that must be kept clear in all weather conditions. Decca straight line wipers are designed to meet these demands with reliable and efficient operation in heavy rain, storm conditions, sleet and even snow.
With unique technical design features and built with only high quality materials, Decca wipers provide a reliable wiper operation in extreme weather conditions.

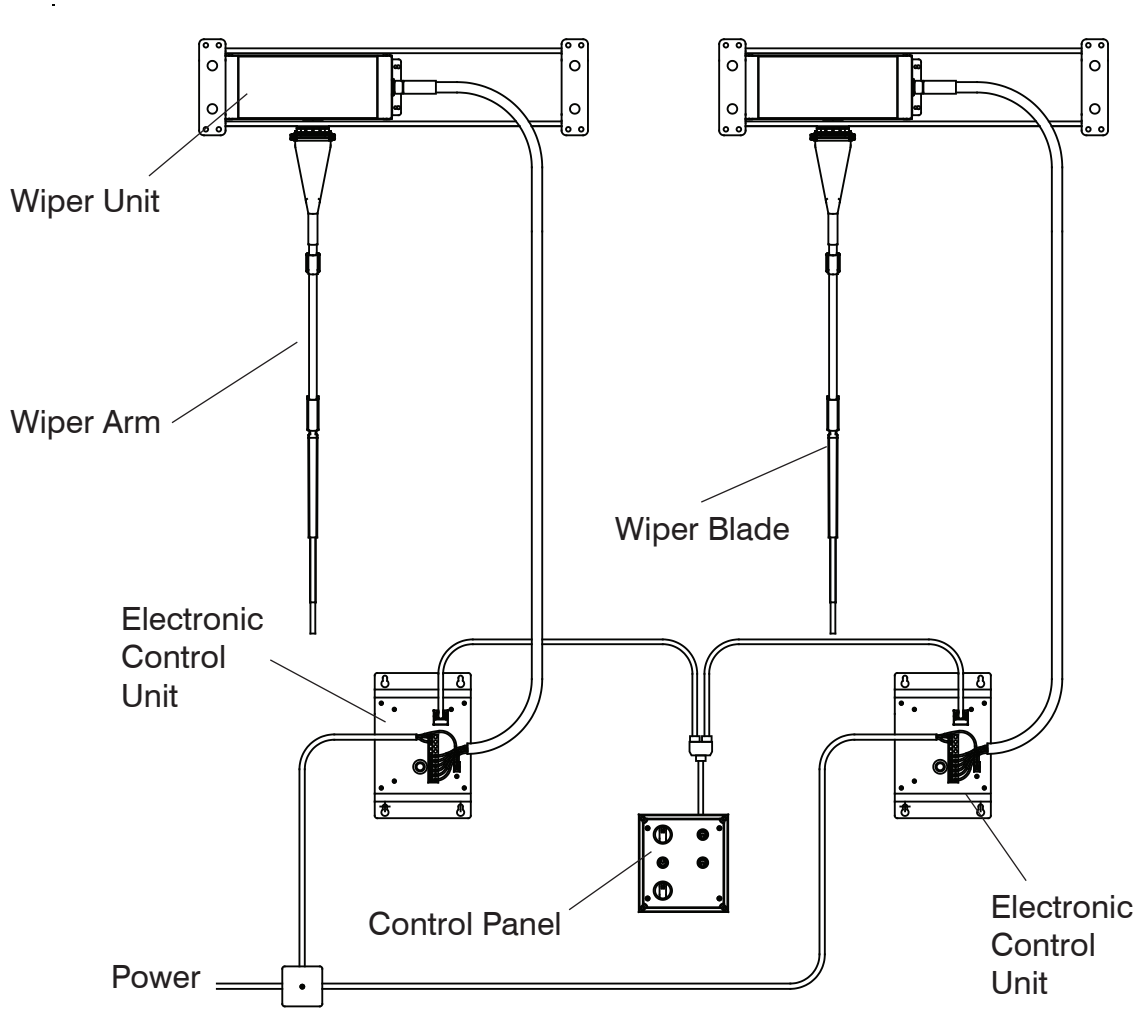


Figure 2 - Example of 2 wiper, 1 group wiper system

3 MAIN DATA

3.1 DIMENSIONS

The wiper units are delivered in 50mm (1,96”) increment stroke lengths ranging from 500mm (16,69”) to 3000mm (118,11”). The wiper blades range from 500mm (19.68”) to 1000mm (39.37”), and the wiper arm length can be adjusted to fit the window on site.

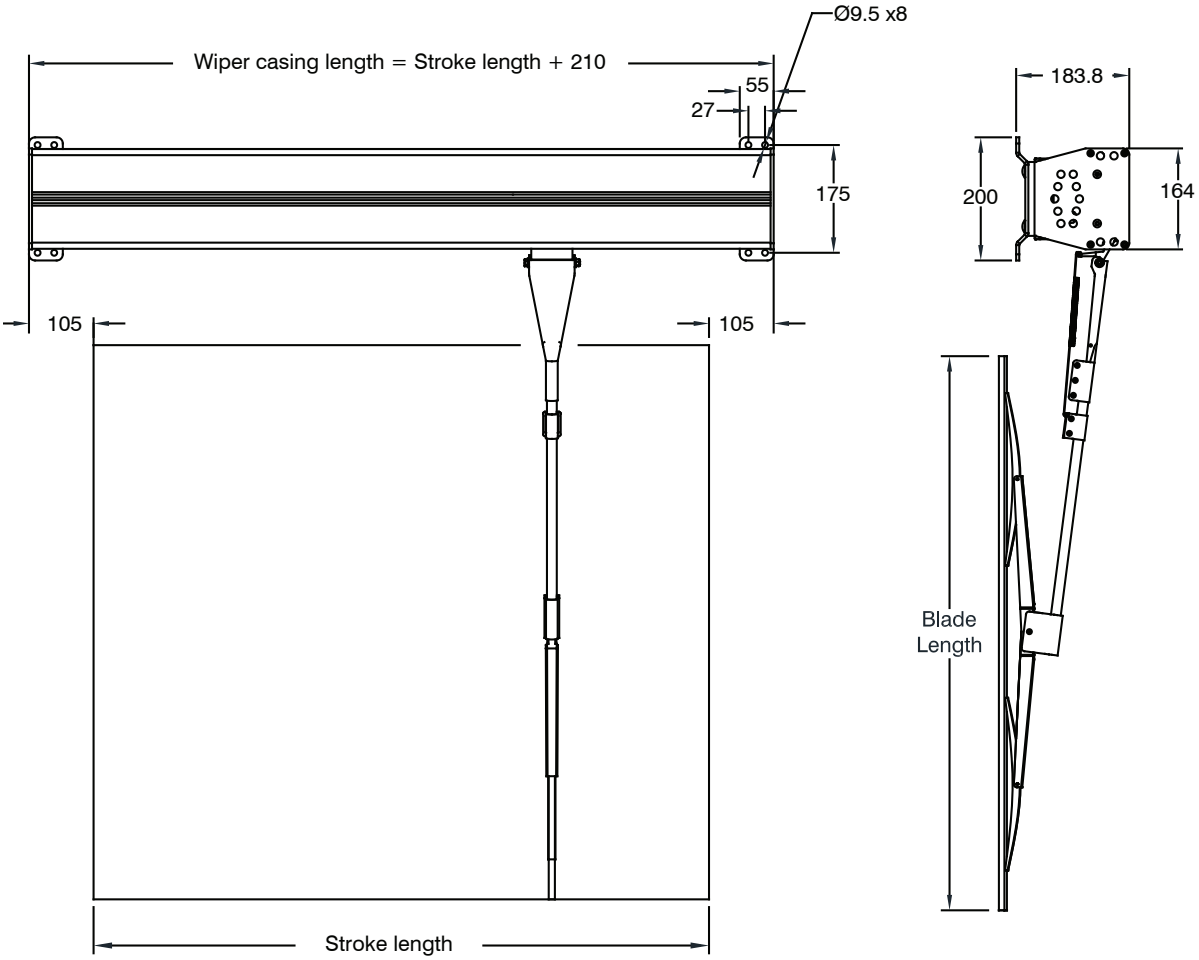


Figure 3 - Wiper Unit Dimensions (all measurements in mm)

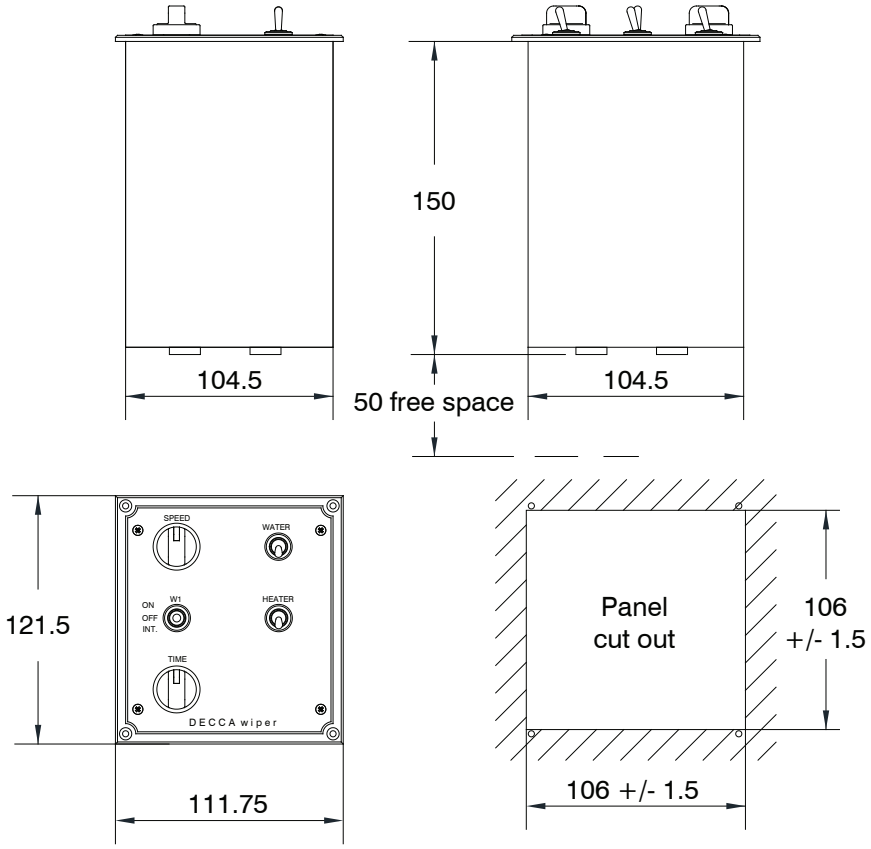


Figure 4 - Control Panel 12170 series dimensions - Thor Control with ECU (all measurements in mm)

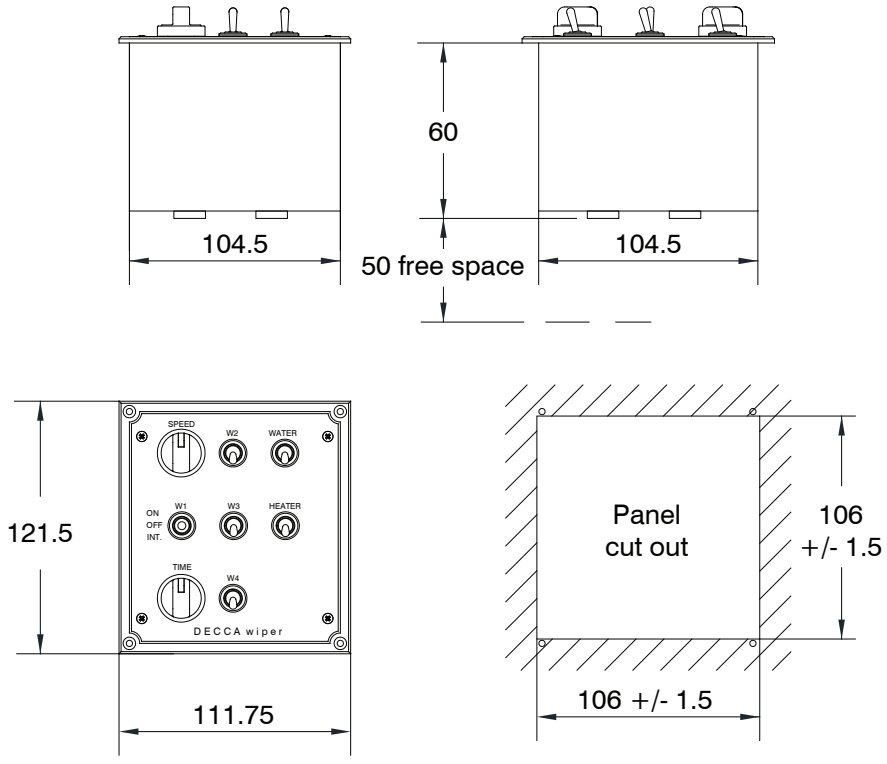


Figure 5 - Control Panel 12160 series dimensions - Thor Control with Group Control (all measurements in mm)

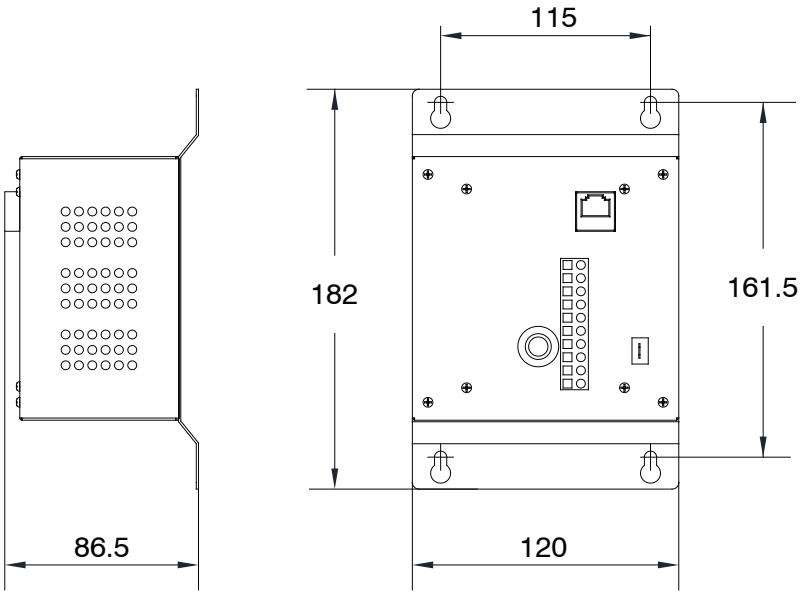


Figure 6 - Electronic Control Unit (all measurements in mm)

3.2 TECHNICAL DATA

3.2.2 Power supply

Power supply voltages:110VAC Single Phase, 220VAC Single Phase or 24V DC

3.2.3 Power consumption

Power consumption: 90W for motor and 75W for heater element
Heater elements are equipped on 110VAC and 220VAC systems only

3.2.4 Weights

Wiper Unit (Single wiper 500mm stroke):	11,0kg	(24,2lb)	(387.2oz)
Additional weight pr. 100mm stroke:	0,5kg	(1,1lb)	(17,6oz)
Control Panel 12170:	1,5kg	(3,3lb)	(52,8oz)
Control Panel 12160:	0,5kg	(1,1lb)	(17,6oz)
Electronic Control Unit (ECU):	1,0kg	(2,2lb)	(35,2oz)

4 TECHNICAL DESCRIPTION

4.1 FUNCTIONAL DESCRIPTION

4.1.1 Wiper Unit

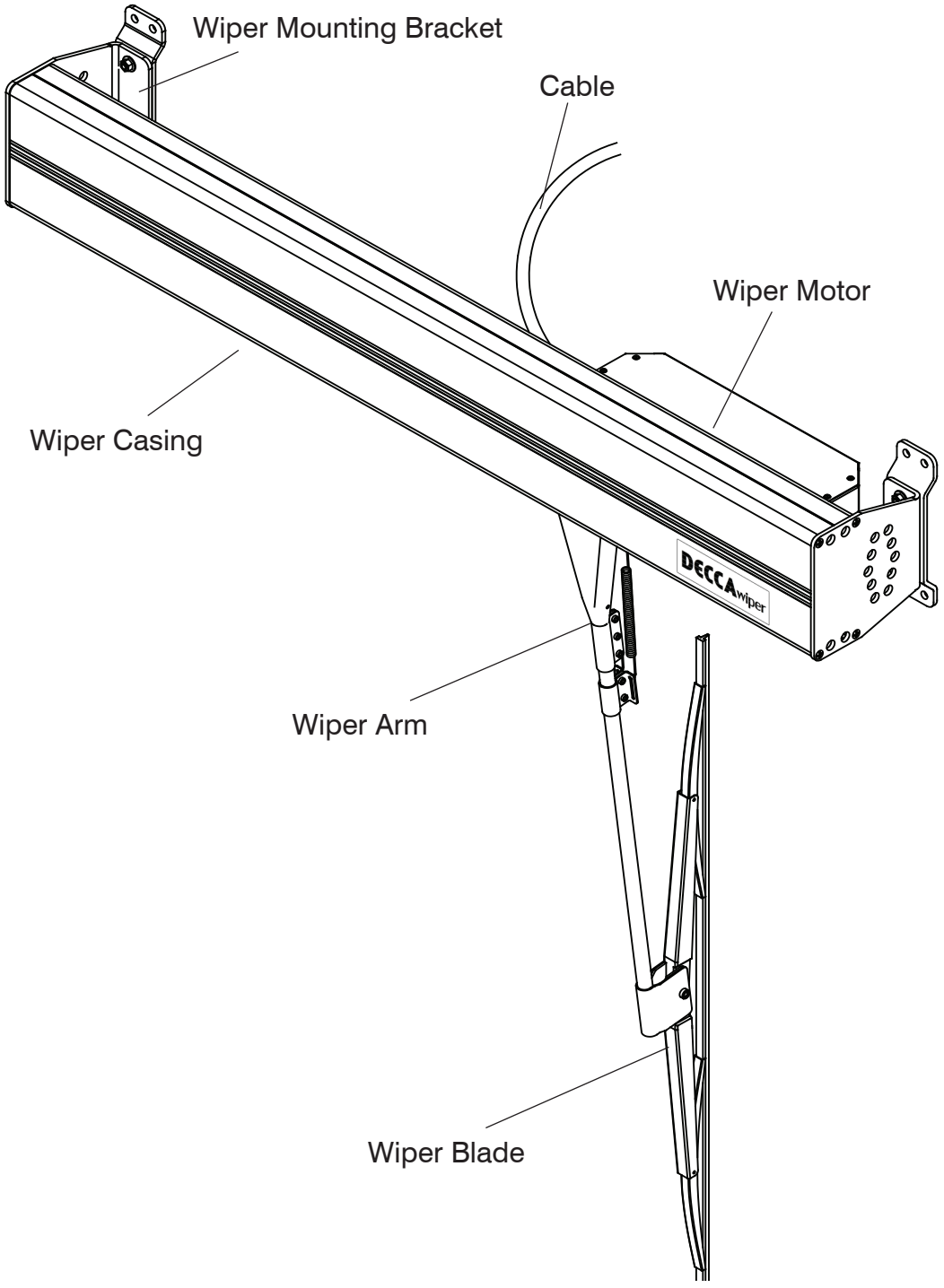


Figure 7 - Wiper Unit

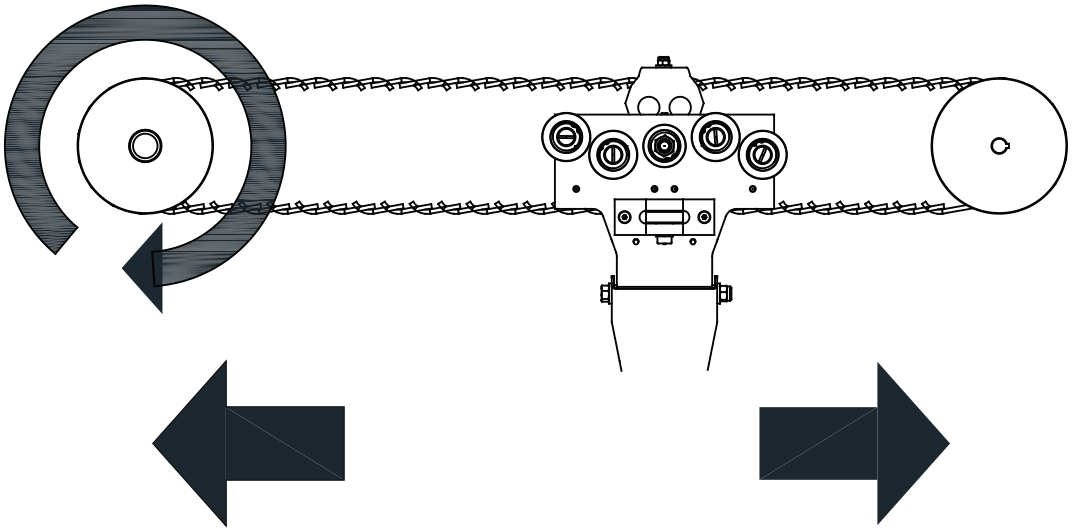


Figure 8 - Wiper Function - as viewed from front of wiper unit

4.1.2 Wiper Arms

The arm is supplied in full length, and is cut to appropriate length on site.
The three M4 DIN912 bolts on the upper part of the arm assy secure the arm in correct position.
This mechanism allows +/- 30mm fine adjustment of the arm length.

The wiper arm features step less spring tension adjustment by means of two springs and a spring tension clamp that is secured by two M4 DIN912 bolts.

The spring tension clamp should be positioned so that the wiper blade is pressed against the window with a force of approximately 2 kg (4 lb). See figure 10 for practical advice on spring tension adjustment.

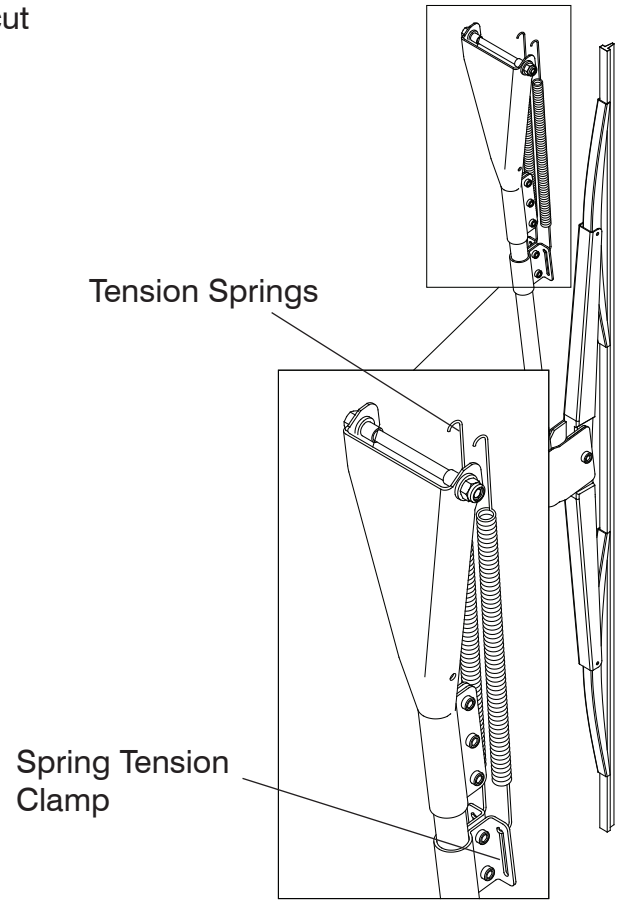
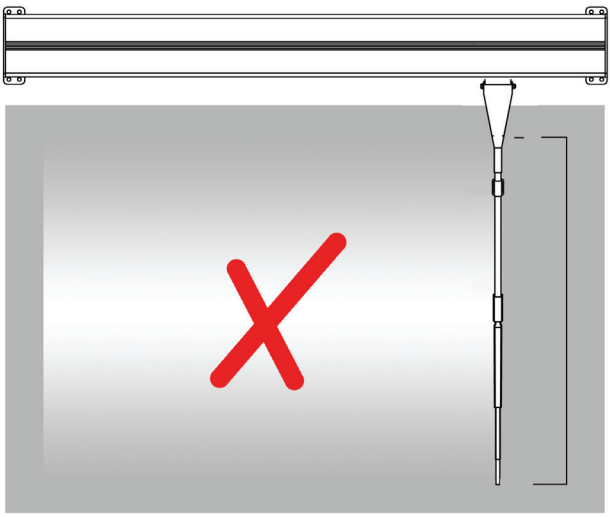
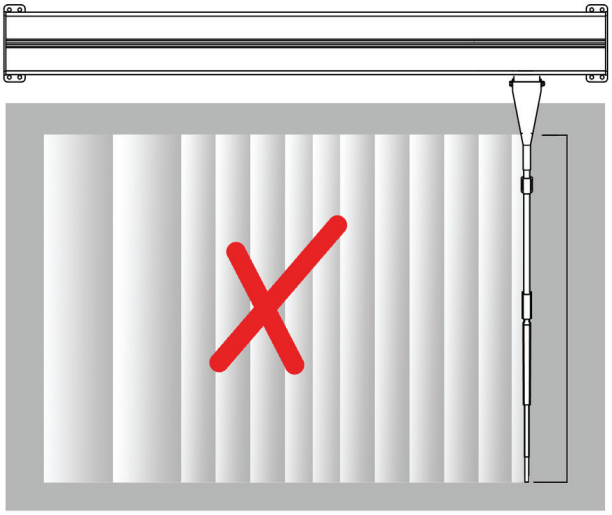


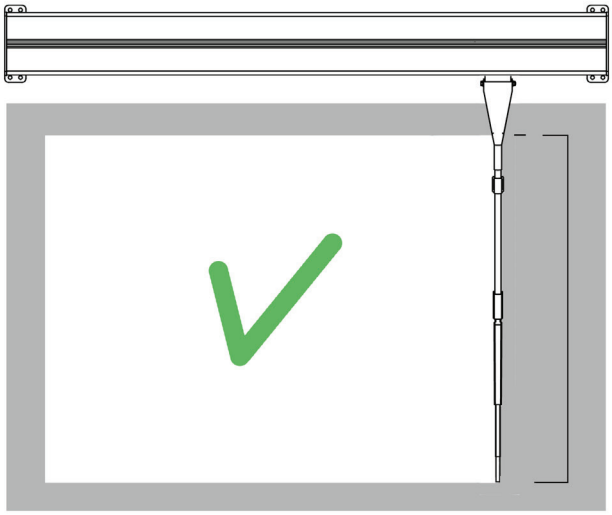
Figure 9 - Wiper Arm



Tension too low



Tension too high



Tension correctly adjusted

Figure 10 - Wiper Tension Adjustment

4.1.3 Thor Control Panels

The wiper system is operated from the control panel, typically mounted with good access from the operator's position. From the control panel the wiper/groups are switched on and off, and the wiper speed and intermittent settings are adjusted. Optionally the Thor control panel can be supplied for operation of water spray and air purge. AC powered versions are also supplied for control of heated wiper casings.

The Thor control panel is available in two different versions, the 12170 series with integrated ECU (Electronic Control Unit) for control of a single wiper and the 12160 series with separate ECU for control of several wipers in one or more groups.

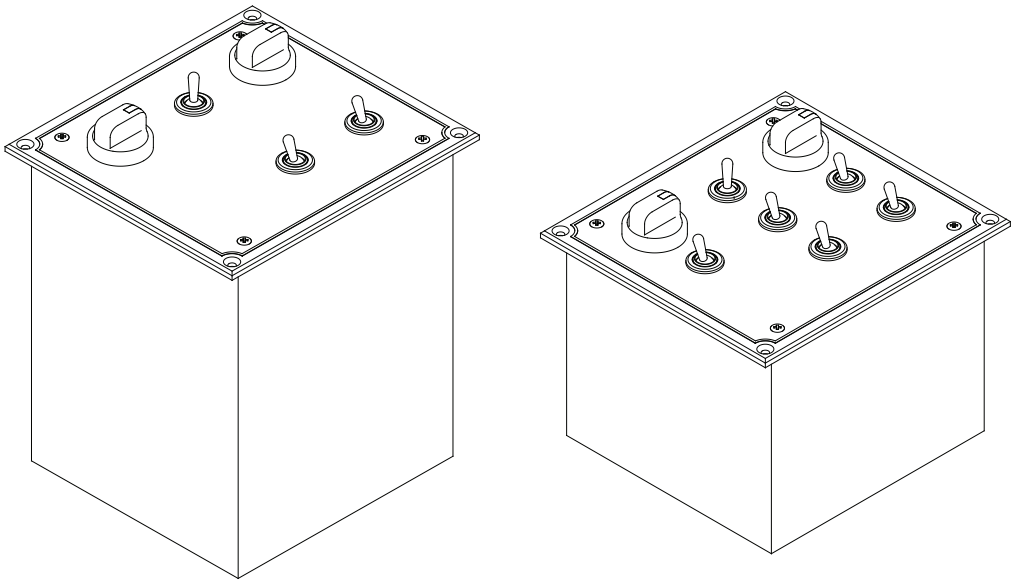


Figure 11 - Thor Control Panel 12170 series (left) and 12160 series (right)

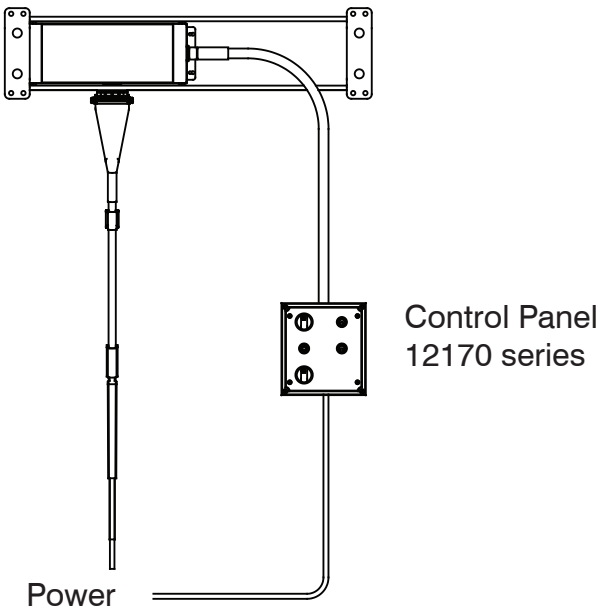


Figure 12 - Single Wiper and Control Panel

4.1.4 Thor Electronic Control Unit (ECU)

When equipped with more than one wiper, each wiper is controlled by a separate electronic control unit (ECU).
The ECU distributes control signals to the wiper and the optional water spray system, with input from the control panel.
The ECU has a protection grade IP20, and should be located in a well vented area where it is not exposed to excess dust or moisture. Allow at least 50mm free space on all sides.

The ECU should be placed where there is good access for future service. Placing the ECU above ceiling panels or below floor panels is therefore not recommended.
Consult with your Decca supplier for practical advice and project specific solutions."

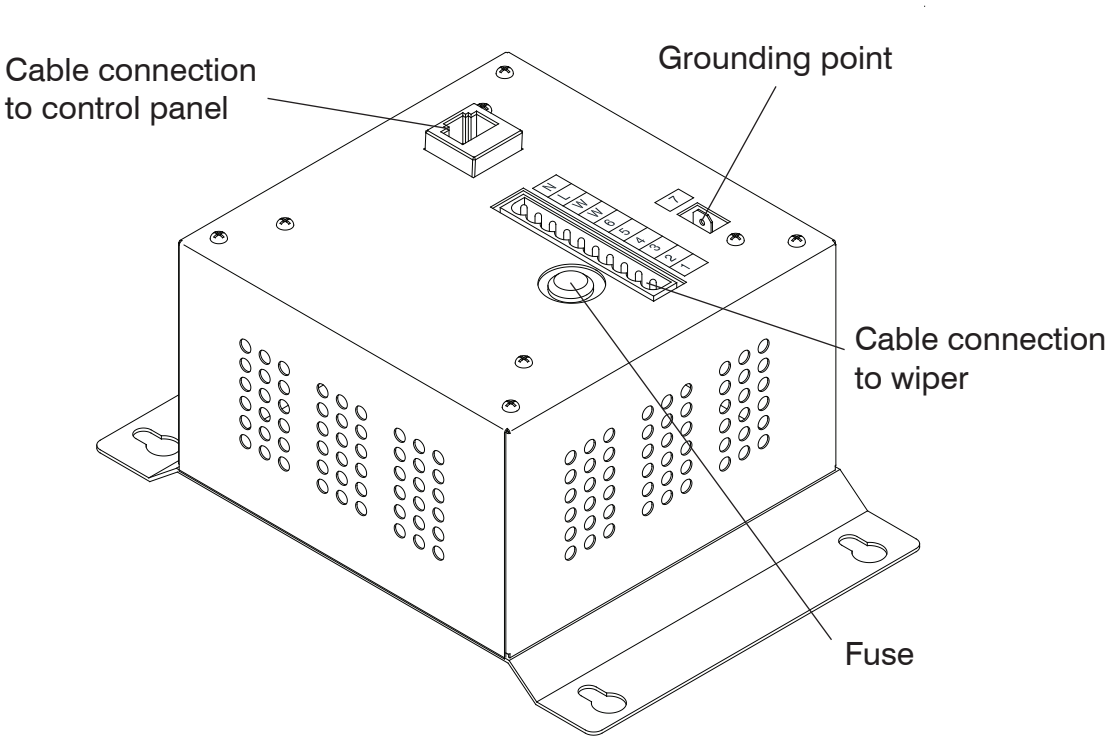


Figure 13 - Thor Electronic Control Unit 12157

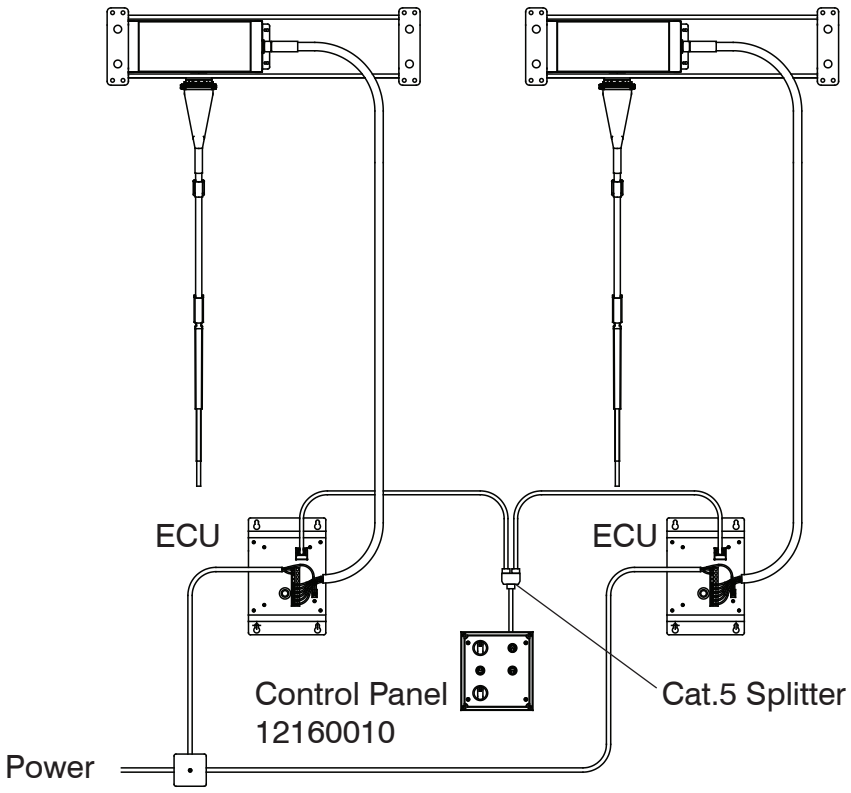


Figure 14 - Wipers/groups operated in parallel

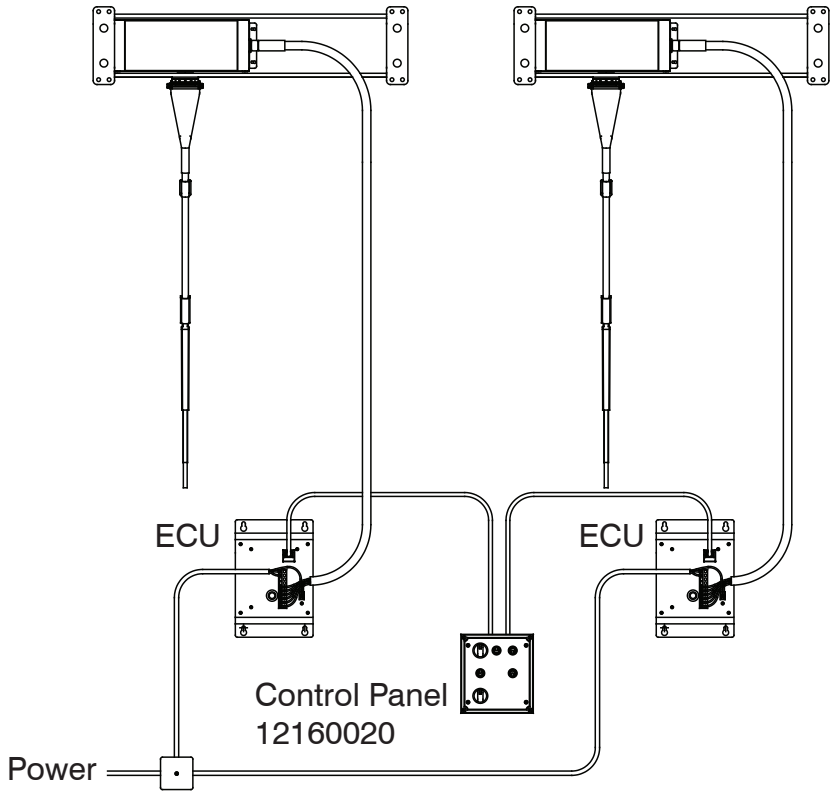


Figure 15 - Up to four Wipers/Groups, separate Operation

4.2 TYPICAL INSTALLATIONS

A standard wiper installation features a single arm wiper unit that is mounted above or below the window frame. See examples in figure 16.

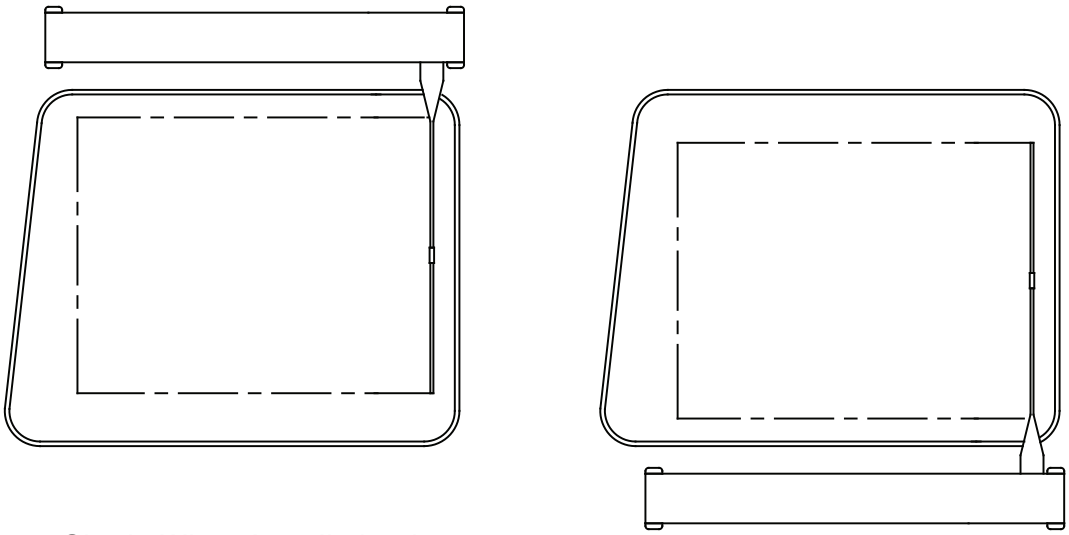


Figure 16 - Single Wiper Installation Layouts

Taller windows require two wipers to ensure maximum visibility, where one wiper unit covers the upper part and the other covers the lower part of the window. See example in figure 17, left side. Optionally, the wiper unit can be supplied with two wiper arms. The dual arm wiper unit can either be configured to cover one large window, or two smaller adjacent windows. See examples in figure 17, right side.

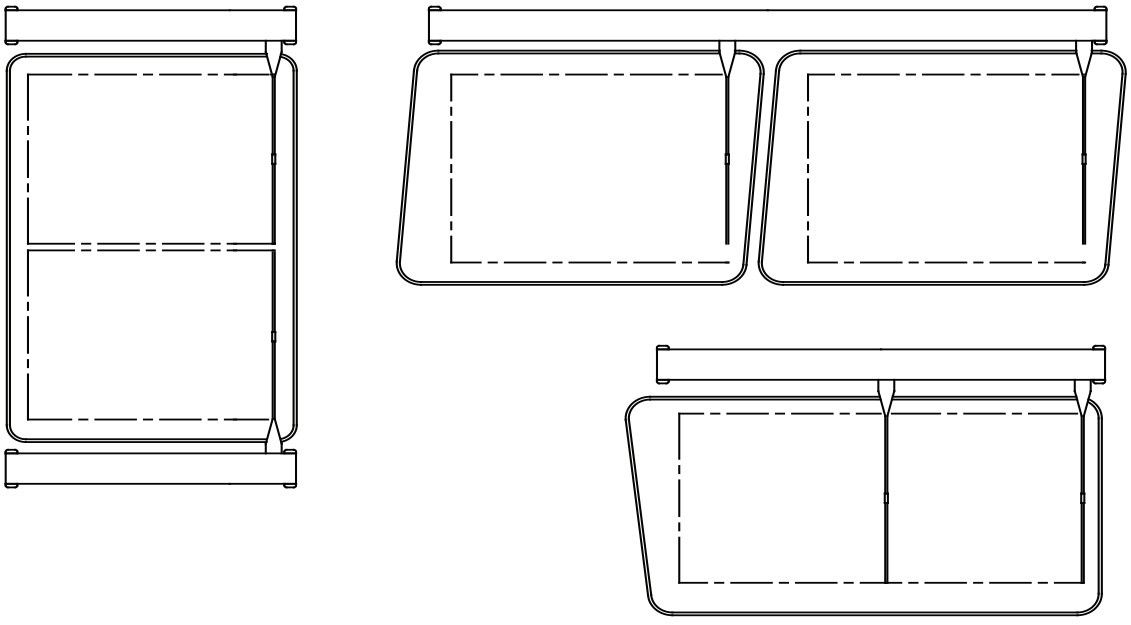


Figure 17 - Dual Wiper Installation Layouts

4.3 WATER SPRAY SYSTEM (OPTION)

Decca wipers can be equipped with an optional water spray system that consists of 12mm OD piping and nozzles, all in stainless steel (316L). The water spray system can be installed onto the wiper mounting brackets, or directly onto the bulkhead.

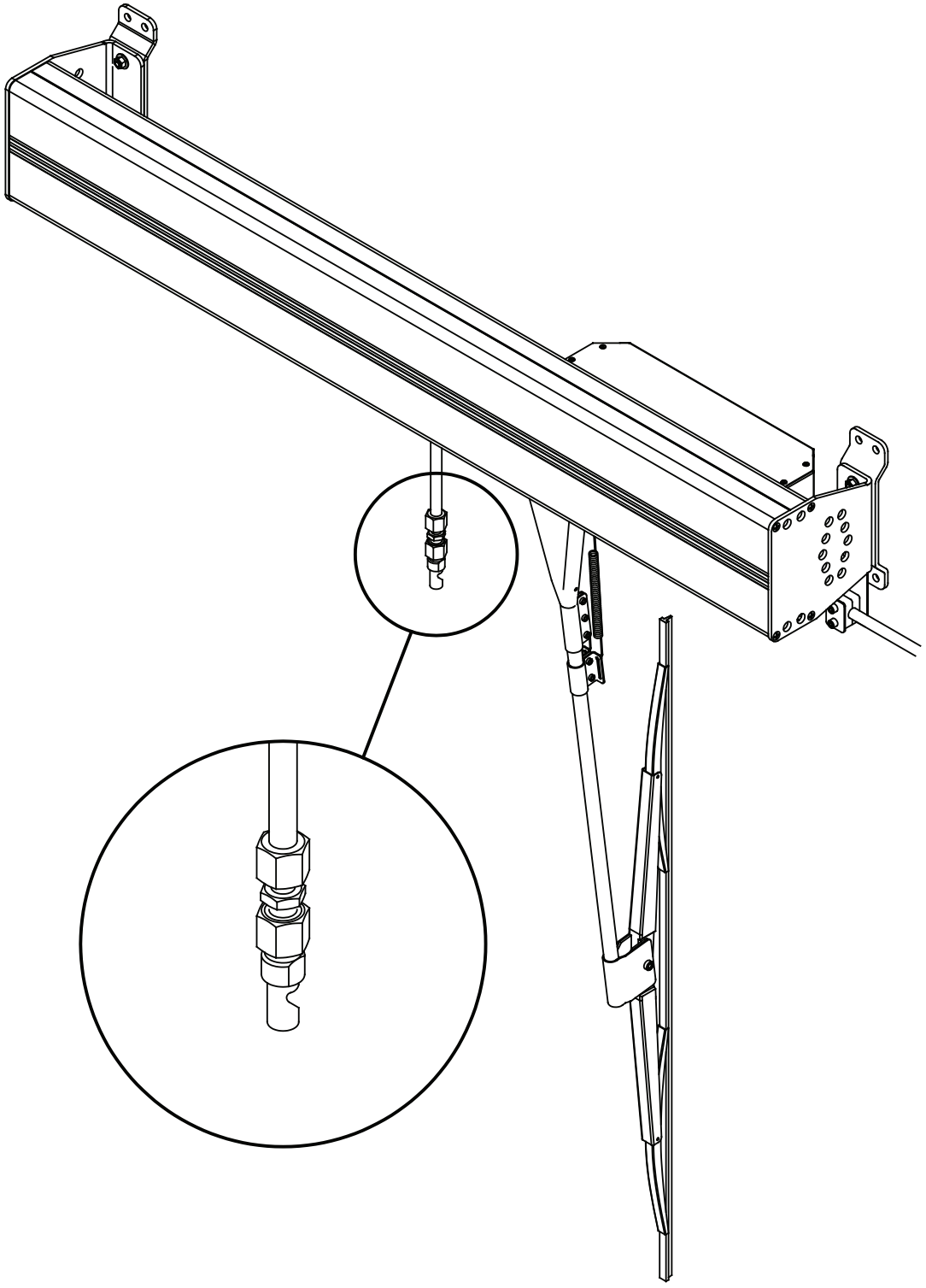


Figure 18 - Water Spray System

4.3.1 Air Purge System

To prevent trapped water from freezing inside the water spray piping at sub zero temperatures, the Decca wipers can be equipped with an air purge system.
The system comprises two solenoid valves and an electronic valve controller with a programmable timer function. Air is supplied from the ship's compressed air system.

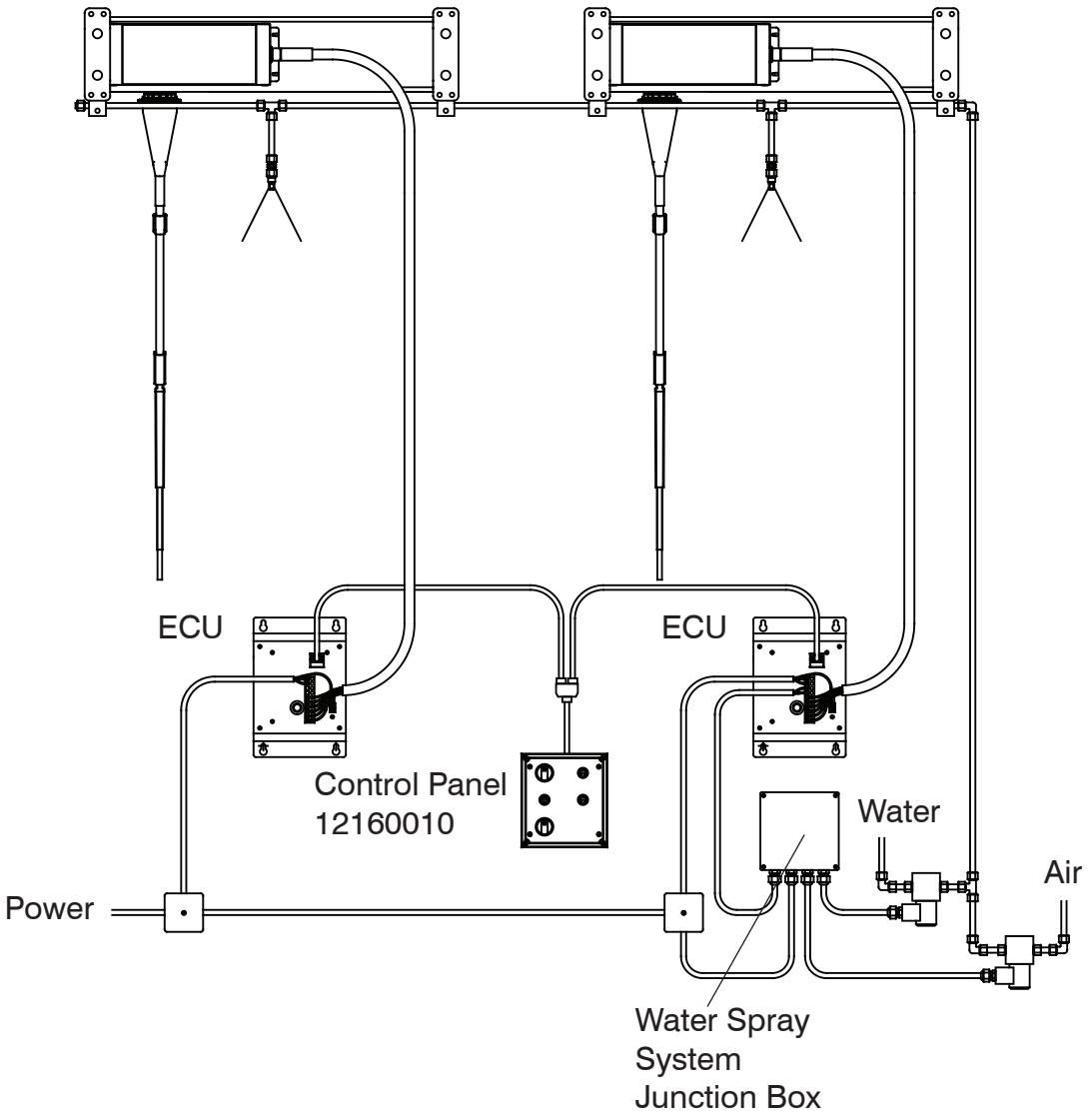


Figure 19 - Water Spray System with Air Purge

5 INSTALLATION PROCEDURE

5.1 LOCATION OF WIPER UNIT BRACKETS

The wiper unit is equipped with two fixing brackets. The brackets can either be welded or bolted to the bulkhead. Note that the standard brackets are made of aluminium, but mild steel brackets can be ordered as an option.
Check the distance between the mounting holes on the end covers of the wiper unit compared with measurements given in Figure 20.
The wiper casing should be placed as close to the window frame as possible.
Please consult your Decca supplier for project specific CAD drawings.

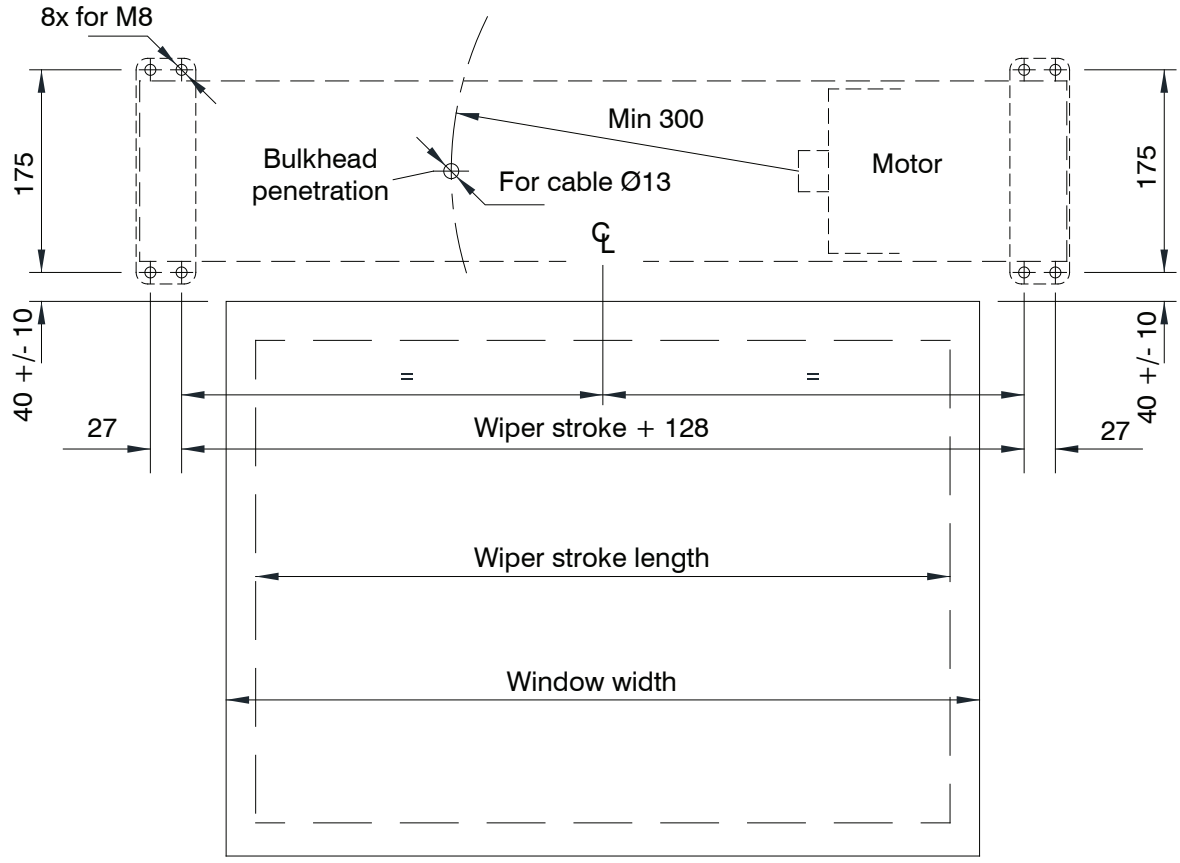


Figure 20 - Wiper Unit Footprint (all measurements in mm)

5.2 BULKHEAD PENETRATION

It is important to mimimize the tension on the cable and the connector. In order to obtain an optimal location of the bulkhead penetration the hole should be drilled according to the dimension given in figure 20. The cable has an OD of 13mm. The cable gland for bulkhead penetration is not supplied, and must therefore be sourced by installer.

Avoid sharp bends or edges, the minimum cable bending radius is 75mm. Protect the connectors from water during installation

5.3 WIPER CASING

The wiper unit is mounted to the brackets after installation of cable. The wiper unit is bolted to the brackets using carriage bolts for easy fitting and removal, secured with washers and self locking nuts.

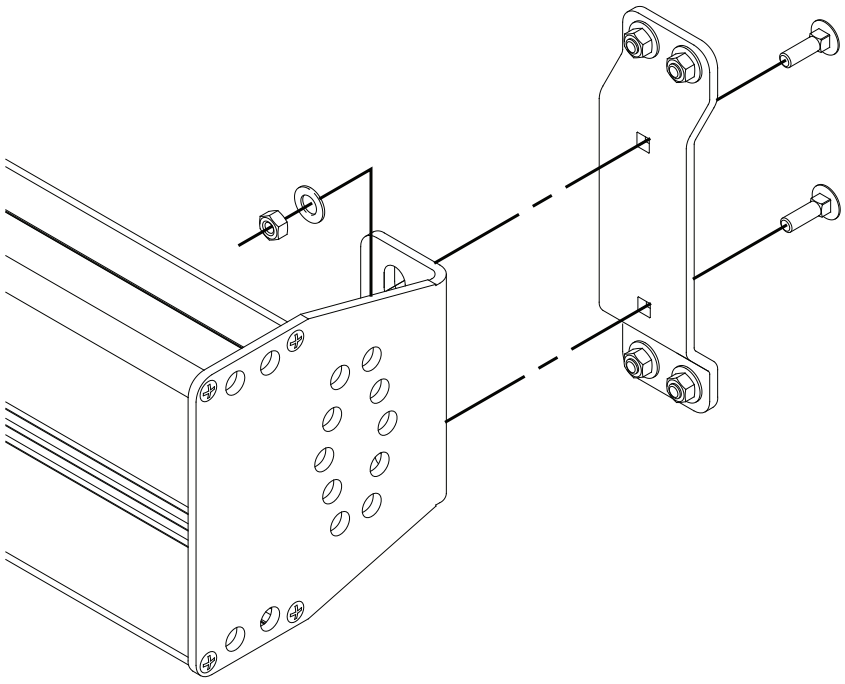


Figure 21 - Wiper Casing Mounting

5.4 CABLE CONNECTIONS

5.4.1 Wiper Unit Cable Connecton

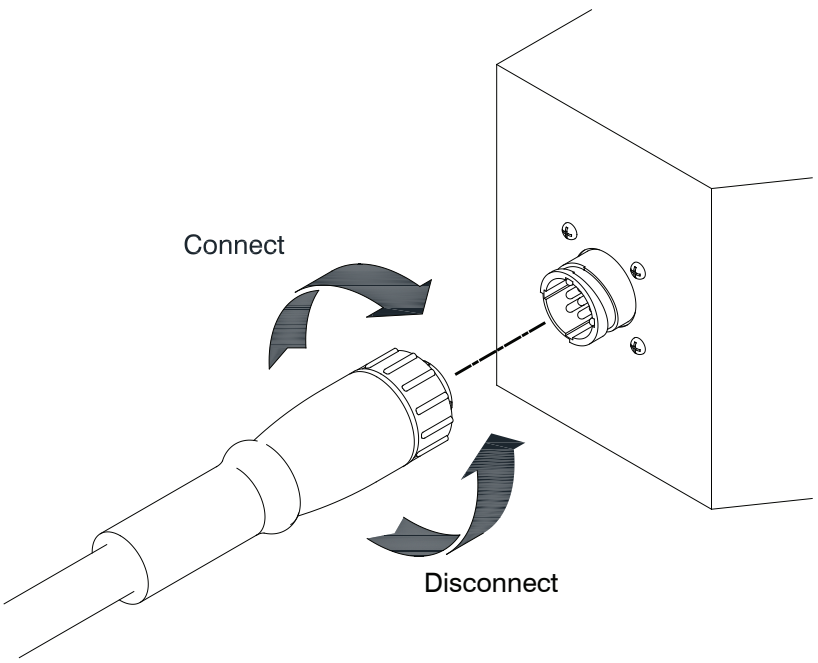


Figure 22 - Cable Connection

Rotate the cable connector to enter the guides in the mating connector.
This will then form a waterproof connection.
Secure by twisting the outer lock ring clockwise until it clicks into locked position.

Always make sure that power is switched off before doing any kind of maintenance to the electric circuits

The cable connector should only be twisted by hand. Use of tools and excessive force will damage the connector

5.4.2 Electronic Control Unit (ECU) Cable Connections

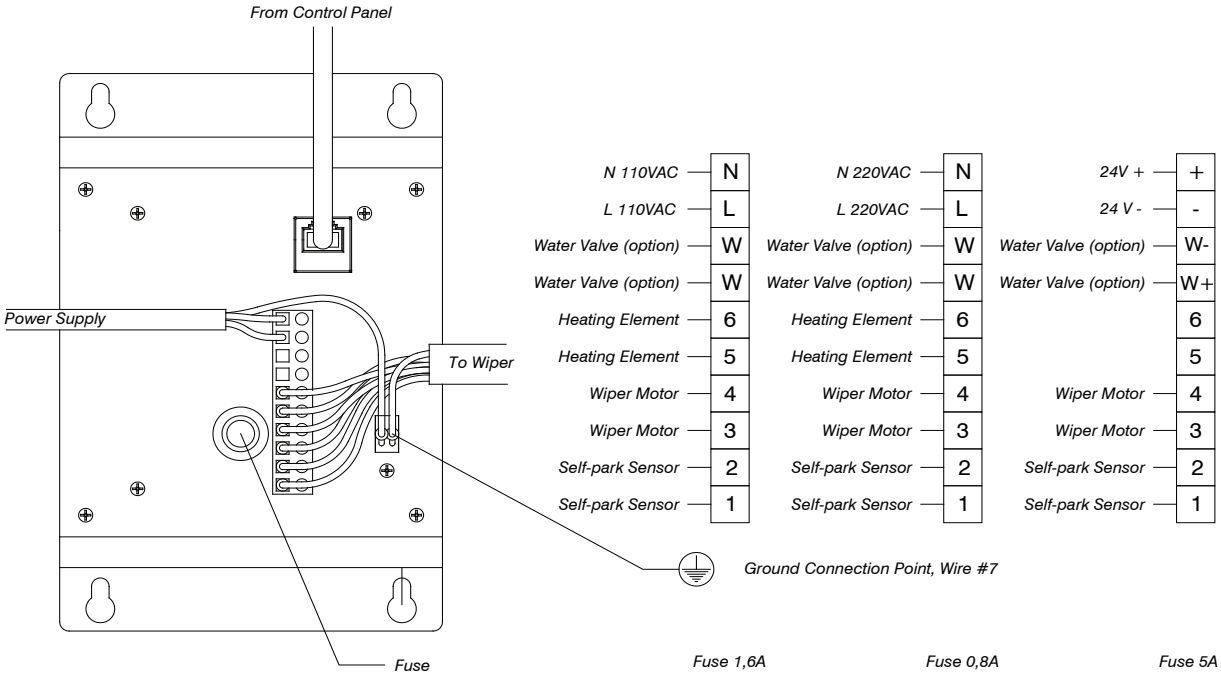


Figure 23 - ECU Cable Connections

Wires #1 to #7 are already connected to different functions inside the wiper unit, and should be connected to the ECU according to the table above to function properly.

Cut the cable from the wiper unit to a suitable length, and remove 50 to 100mm of the cable sheath, armour and bedding.
The wiper cable contains four pairs, and each pair is marked with their respective pair number. Remove the plastic coated aluminium tape and the pair screen conductors. Notice that the wires is marked with numbers 1 to 8. Cable #8 is not used for this application, and can therefore safely be removed.

5.4.3 WIPER CONTROL PANEL

The 12170 series wiper control panel is connected directly to the to the wiper/wiper group with a termination like that of the ECU.

The 12160 series wiper control panel is connected to the ECU through a Cat.5 FTP data communication cable.

5.4.4 WATER SPRAY SYSTEM JUNCTION BOX WIRING

The optional water spray/air purge system is connected to the ECU via a junction box. The signal and power distribution are connected as illustrated below.

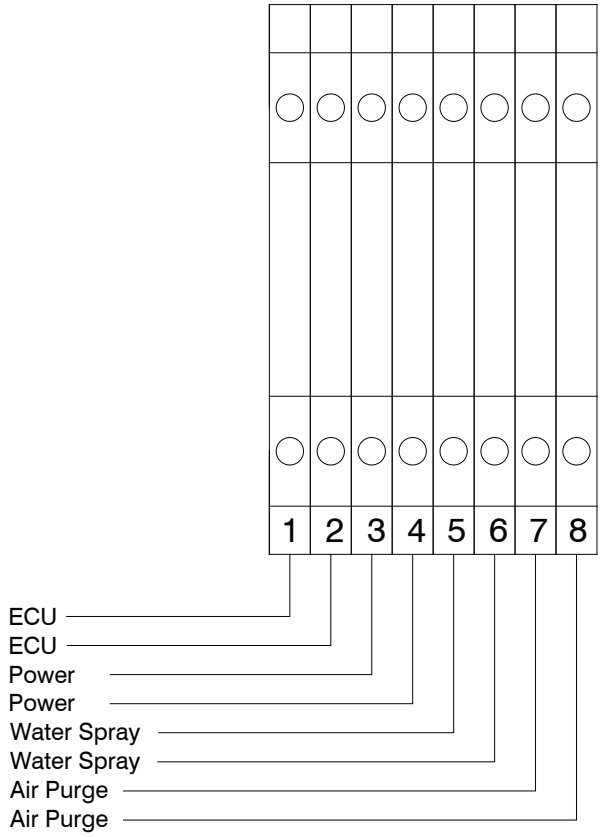


Figure 24 - Water Spray System Junction Box Wiring

Always make sure that power is switched off before doing any kind of maintenance to the electric circuits

6 SYSTEM OPERATION

6.1 WIPER CONTROL PANEL

The wiper(s) are controlled from the control panel which has a number of toggle switches in addition to two analog controls.
The toggle switches control individual wipers or wiper groups, from one up to four.
The switches are marked **W1** up to **W4**.
In position **ON** (switch up) the wiper/wiper group is running continously.
In position **INT** (switch down) the wiper/wiper group is running in intermittent mode.

The analog adjustment **SPEED** controls the wiper speed. Rotate clockwise to increase the speed.

The analog adjustment **TIME** controls the intermittent time between each wiper stroke. Rotate clockwise to decrease the time delay.

The two position toggle switch **HEATER** activates the de-icing heater element in each wiper casing when switced in up position.

The spring return toggle switch **WATER** activates the water flushing when switched in up position. The water solenoid valve is open for as long as the **WATER** switch is held in up position. If the Decca Air Purge module (OPTION) is installed, the solenoid valve for compressed air will automatically open for 30 seconds upon release of the **WATER** switch (see chapter 4.3.1 Air Purge System).

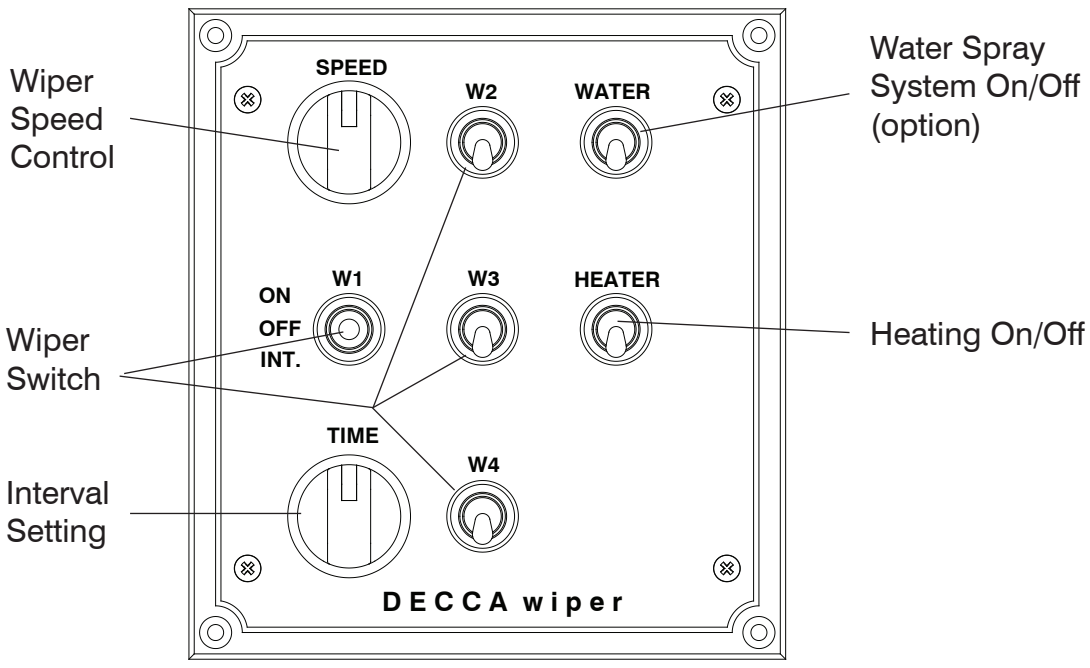


Figure 25 - Wiper Control Panel

7 SPARE PARTS

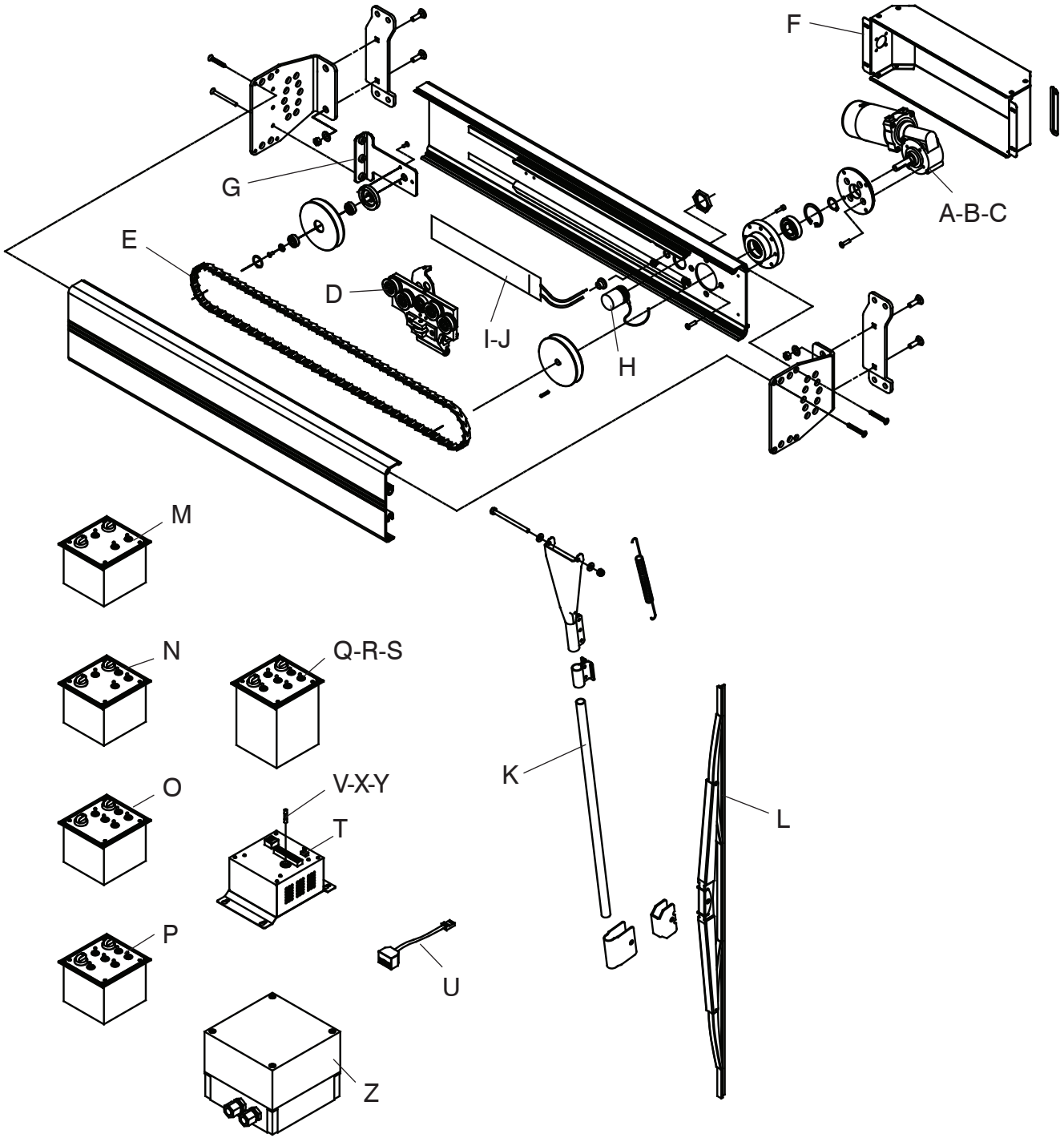


Figure 26 - Spare Parts

Identification	Description	Remarks	Decca No.
	Wiper Unit		
A	Motor, Parvalux, 220VAC systems	Single speed PM3	80000301
B	Motor, Parvalux, 110VAC systems	Single speed PM11	80000302
C	Motor, Parvalux, 24VDC systems	Single speed PM11	80000303
D	Carriage assy		80000001
E	Drive belt, Profile A	Specify length (m)	10570105
F	Motor Cover		10570144
G	Drive belt tension bracket		82000002
H	Parking Sensor, NBN15		50102001
I	Heater element, 220VAC		50103001
J	Heater element, 110VAC		50103004
	Wiper arms and blades		
K	Wiper arm, complete		82000004
L1	Wiper Blade, 500mm		10500500
L2	Wiper Blade, 600mm		10500600
L3	Wiper Blade, 700mm		10500700
L4	Wiper Blade, 800mm		10500800
L5	Wiper Blade, 900mm		10500900
L6	Wiper blade, 1000mm		10501000
	Control Panels		
M	Thor Control Panel for 1 wiper/group		12160010
N	Thor Control Panel for 2 wipers/groups		12160020
O	Thor Control Panel for 3 wipers/groups		12160030
P	Thor Control Panel for 4 wipers/groups		12160040
Q	Thor Control Panel w/internal ECU, 220VAC		12170001
R	Thor Control Panel w/internal ECU, 110VAC		12170002
S	Thor Control Panel w/internal ECU, 24VDC		12170003
	Electronic Control Unit		
T1	Thor Electronic Control Unit, 220VAC		12157001
T2	Thor Electronic Control Unit, 110VAC		12157002
T3	Thor Electronic Control Unit, 24VDC		12157003
	Miscellaneous		
U	Y-splitter, Cat.5, 2xRJ45(F) 1xRJ45(M)		50400001
V	Fuse, TR5 0,8A for ECU, 220VAC		50508001
X	Fuse, TR5 1,6A for ECU, 110VAC		50508002
Y	Fuse, TR5 5,0A for ECU, 24VDC		50508003
Z1	Junction Box, Water Spray System	220VAC	12233001
Z2	Junction Box, Water Spray System	110VAC	12233002

8 WARRANTY

Standard warranty is 12 month from delivery from shipyard to ship owner, or 24 months from delivery to shipyard, whichever comes first.

Wiper blades are not covered by the warranty.

9 DRAWINGS

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