I
N
S
T
A
L
L

M
A
N
U
A
L

EQSS Model6253 – OverWatch™ Snorkel PHX-II

** Failure to follow this installation manual will void warranty **

éqss

éqss

AUTHORS: Kieren Grogan, Greg Santucci, Jay Nandakumar	AUTHORISED BY: Kieren Grogan	CHECKED BY: Andrew Donegan

DOCUMENT ABSTRACT:
This Installation Manual details the manufacturer's installation instructions for installing the Model6253 OverWatch™ on a Snorkel PHX-II Series Machine

PRODUCT NAME:
Model6253 OverWatch™ Operator Detection System

REFERENCE DOCUMENTS:
DO001195 Model6253 OverWatch™ User Manual

CURRENT DOCUMENT REVISION:
1.2

REVISION INFORMATION:

- 1.1 Initial Document Creation for system installation on a Snorkel PHX-II Series Machine
- 1.2 Inclusion of relay to activate horn on SW5

Important Information

Information contained in this publication regarding this device's applications and the like, is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that the application or our equipment meets with your specifications.

EQUIPMENT SAFETY SYSTEMS MAKE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING, BUT NOT LIMITED TO, IT'S CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE.

Equipment Safety Systems disclaims all liability arising from this information and its use. Use of Equipment Safety Systems' products as critical components in life support systems is not authorised except with express written approval by Equipment Safety Systems. No licenses are conveyed, implicitly or otherwise, under any Equipment Safety Systems intellectual property rights.

This is a class A product certified to AS/NZS CISPR 22:2006. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

N23041

EQUIPMENT SAFETY SYSTEMS
75 Naxos Way, Keysborough 3173 Victoria Australia
P: +61 3 8770 6555   E: support@eqss.com.au

**Snorkel PHX-II
Installation Manual**

Table of Contents

Preparation

Required Tools

The OverWatch™ has been designed to be fitted using basic workshop tools. Shown below is a list of tools required to complete the installation.

Item	Tool / Description
1	Electric Drill
2	Centre Punch
3	Hammer
4	Side Cutters
5	Drill 3.2mm
6	Drill 5.0mm
7	Sockets & Spanners
8	Needle Nose Pliers
9	Screwdrivers

Installation Time

The suggested time required to install the OverWatch™ is detailed below.

Task	Estimated Time (Minutes)
Open the operator control box	1
Drilling of all mounting holes for the various components	13
Mechanical assembly	10
Electrical assembly	10
Post installation system tests	10
Close the operator control box	1
Total	**45**

Installation Instructions

Operator Sensor

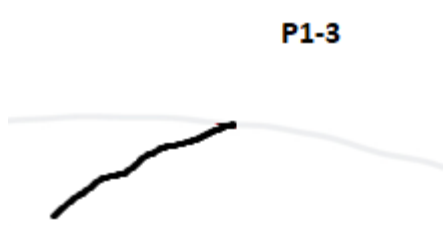| Step	Description	Diagram
1.	Drill two 5.2mm holes to mount the operator sensor in the position shown in the diagram. The sensor should be mounted at an angle of 30 degrees.	
2.	Mount the module in the located position using the supplied M4 washers, nuts and bolts.	

PARTS LIST

ITEM	QTY	STOCK NUMBER	DESCRIPTION
1	1	ME001795	OverWatch™ Sensor Guard
2	2	ME001798	OverWatch™ 7.5° Wedge
3	2	FA001213	Slotted Button Head Cap Screw, M4 x 0.7 x 20mm, 304 St. St.
4	4	FA001235	Washer, Plain, M4, 304 St. St.
11	1	AS001916	OverWatch™ ECU Module
12	2	FA001211	Socket Head Cap Screw, M4 x 0.7 x 12mm, Unbrako

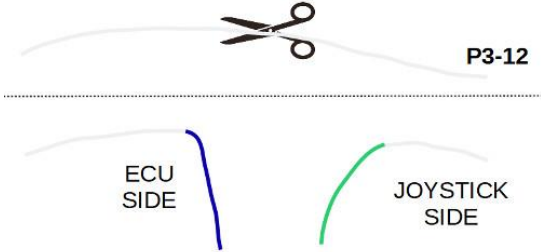| Step	Description	Diagram
3.	Drill the holes specified to mount the operator sensor cable gland and guard	
4.	Install the supplied cable gland in the location shown in the image and feed the wire from the operator sensor into the enclosure	

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6253-SLL1-141	OverWatch™ Cable Guard
2	1	M20 Gland	
3	2	FA001067	Socket Head Cap Screw, M5 x 0.8 x 12 mm, 304 St. St.
4	2	FA001174	Washer, Plain, M5, 304 St. St.
11	1	6253-SLL1-018	OverWatch™ ECU Module
12	2	FA001211	Socket Head Cap Screw, M4 x 0.7 x 12mm, Unbrako

Control Module

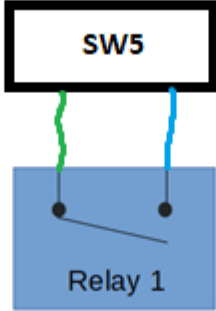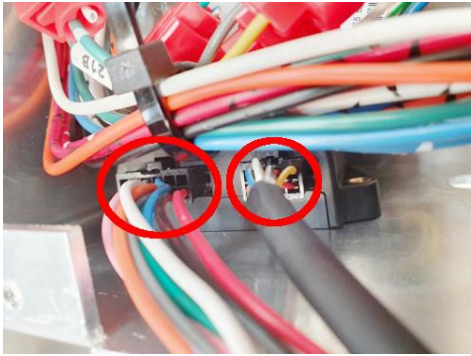| Step	Description	Diagram
1.	Drill the holes specified to mount the ECU	
2.	Mount the ECU module using the supplied bolts, nuts, and washers	 PARTS LIST <table><tr><td>ITEM</td><td>QTY</td><td>STOCK NUMBER</td><td>DESCRIPTION</td></tr><tr><td>1</td><td>4</td><td>FA001235</td><td>Washer, Plain, M4, 304 St. St.</td></tr><tr><td>2</td><td>1</td><td>AS001916</td><td>OverWatch™ ECU Module</td></tr><tr><td>3</td><td>2</td><td>FA001211</td><td>Socket Head Cap Screw, M4 x 0.7 x 12mm</td></tr></table>

Step	Description	Diagram
3.	From the machine connections loom, cut and crimp the following wires. The connection instructions will be explained in more detail in the next few steps.	<table><tr><td>**ECU PIN**</td><td>**Colour**</td><td>**Wire ID**</td><td>**Location**</td></tr><tr><td>1</td><td>Red</td><td>P3-1</td><td>+24V</td></tr><tr><td>2</td><td>Black</td><td>P1-3</td><td>GND</td></tr><tr><td>3</td><td>Green</td><td>P3-12 Joystick Side</td><td>Enable/Deadman – Switch Side</td></tr><tr><td>5</td><td>White</td><td>RLY1</td><td>Horn Relay</td></tr><tr><td>8</td><td>Blue</td><td>P3-12 ECU Side</td><td>Enable/Deadman – ECU Side</td></tr><tr><td>9</td><td>Orange</td><td>P3-7</td><td>Elevate Switch Splice</td></tr><tr><td>10</td><td>Purple</td><td>P3-6</td><td>Drive Switch Splice</td></tr><tr><td>12</td><td>Grey</td><td>P1-4</td><td>Joystick 0-5V Splice</td></tr><tr><td>RLY1</td><td>RLY Green</td><td>SW5-1</td><td>Horn Switch Side 1</td></tr><tr><td>RLY1</td><td>RLY Blue</td><td>SW5-2</td><td>Horn Switch Side 2</td></tr></table>
4.	To install the system power +24V: Crimp the red wire from the machine connection loom to the wire on pin **P3-1**	**P3-1**
5.	To install the system ground 0V: Crimp the black wire from the machine connection loom to the wire on pin **P1-3**	**P1-3**

Step	Description	Diagram
6.	The Enable/Deadman connection is on the wire from the pin position **P3-12**. Cut this wire in half and follow these steps. Crimp the green wire (Pin 3) from the machine connection loom to the joystick side of the **P3-12** wire. Crimp the blue wire (Pin 8) from the machine connection loom to the ECU side of the **P3-12** wire.	
7.	To install the joystick input: Crimp the grey wire from the machine connection loom to the wire on pin **P1-4**	
8.	To install the Drive & Elevate inputs: Connect the purple (Drive) wire from the machine connections loom to the wire from pin **P3-6**. Connect the orange (Elevate) wire from the machine connections loom to the wire from pin **P3-7**.	

Step	Description	Diagram
9.	To install the horn output: Connect the green wire from RLY1 to SW5-1 and the blue wire from RLY1 to SW5-2. SW5 is the push button horn switch *Note: RLY1 is attached to the machine connection harness	
10.	Connect the 8-pin connector from the Operator Sensor and the 12-pin connector from the machine connection harness, into the Control Module. Re-fit the joystick back into the enclosure	

Post Installation Configuration

Overview

After the OverWatch™ has been installed it must be configured with the parameters to suit the machine. Follow the instructions below to configure the OverWatch™.

Minimum system requirements

Any smart phone, tablet or laptop that meets the following requirements:

- The device can connect to a Wi-Fi access point supporting 802.11 b/g/n (2.4GHz) protocol

- The device has an up to date web browser installed (2019 onwards). Firefox or Chrome are recommended. Note: Microsoft Internet Explorer is not supported.

Wi-Fi Connection & Web Page Access

To enable the Wi-Fi connection on the OverWatch™ to complete the configuration follow the steps below.

1. Power down the platform control box with the ESTOP

2. Wait 10 seconds

3. Power up the platform control box with the ESTOP

4. While standing in the operator position, switch on the OverWatch™

5. As the welcome chime starts to play, cover the sensor. The LED will flash white then black to acknowledge.

6. Remove your hand from the sensor. The LED will flash white then black to acknowledge.

7. After covering then uncovering the sensor this way 2 more times, "Wi-Fi On" will be announced

8. On your Wi-Fi enabled device (laptop, tablet, smartphone, etc), show the available wireless networks

9. Select the wireless network (starts with "overwatch") to connect to the OverWatch™

10. When prompted, enter the password "12345678"

11. Open your preferred web browser (Chrome, Firefox)

12. Enter the following into the address bar http://192.168.4.1 to open the OverWatch™ main page

Machine Model Selection

Follow the instructions below to configure the OverWatch™.

1.   Select the Setup option

2.   If there is a password field at the bottom of the page, follow the instructions in Change Model Configuration to obtain the password and enter the password field

3.   Select the EWP Model from the drop-down list and click Set

4.   Click on Proceed to Test to begin the installation test
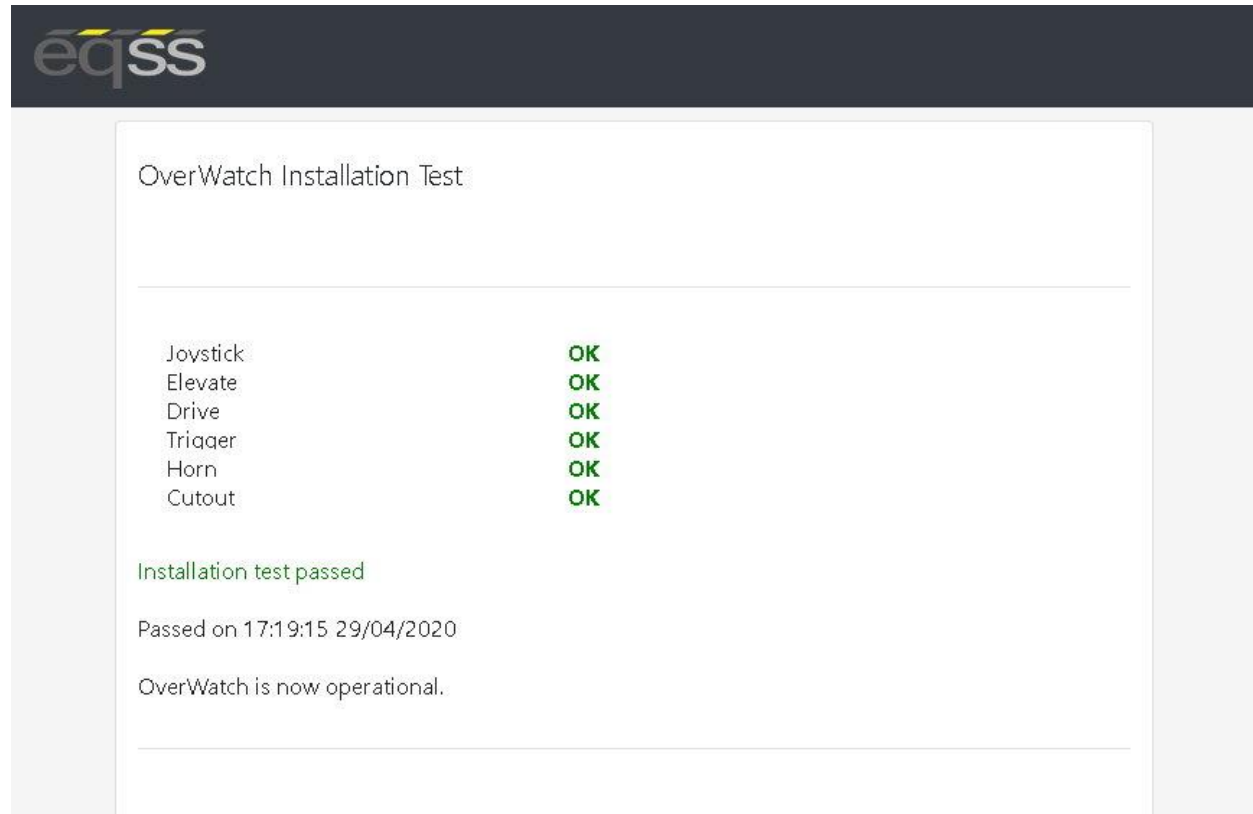
Installation Test

After the model configuration has been set or updated an Installation Test must be performed. This will ensure the installation has been correctly performed and the OverWatch™ is functioning correctly.

Follow the instructions on the web page to complete the Installation Test.

EQUIPMENT SAFETY SYSTEMS	Snorkel PHX-II
75 Naxos Way, Keysborough 3173 Victoria Australia	Installation Manual
P: +61 3 8770 6555 E: support@eqss.com.au	

| **REV 1.2** | **03/06/2020** | **Model6253 OverWatch™ Installation Manual** | **Document # DO001204** |
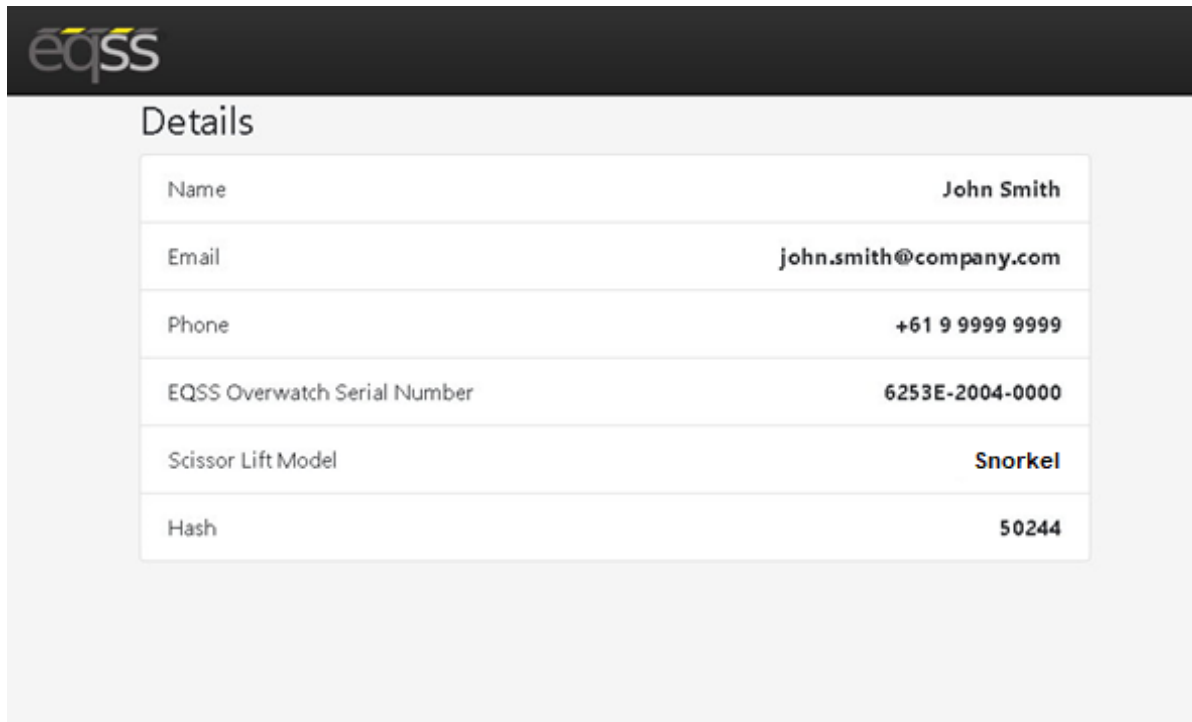
Change Model Configuration

To reconfigure the OverWatch™ for a different model requires an authorisation password to be supplied by a service manager. The authorisation password is generated from the EQSS website. The EQSS website requires a login username and password. If you are a service manager and don't have a username and password, contact EQSS to register. Follow the instructions below to obtain an authorisation password.

1. Open your preferred web browser and enter the following into the address bar http://www.eqss.com.au/overwatch to open the Login page

2. Select Customer

3. Enter your username and password

4. Ask the service technician for the serial number shown on the Setup page or on the ECU module along with the owner details of the EWP and complete the details form then click Generate Hash

5. Provide the 5-digit hash password to the service technician

OEM Special Configuration

Overview

When installing the OverWatch™ on a new model there are a number of parameters which need to be adjusted or fine-tuned to suit a specific EWP model. The instructions below should be performed by the OEM of the EWP. Once the OverWatch™ settings have been set and tested, they will then be supplied to EQSS to be used for other installations.

Wi-Fi Connection & OEM Web Page Access

To enable the Wi-Fi connection on the OverWatch™ to complete the configuration follow the steps below.

1. Power down the platform control box with the ESTOP

2. Wait 10 seconds

3. Power up the platform control box with the ESTOP

4. While standing in the operator position, switch on the OverWatch™

5. As the welcome chime starts to play, cover the sensor. The LED will flash white then black to acknowledge.

6. Remove your hand from the sensor. The LED will flash white then black to acknowledge.

7. After covering then uncovering the sensor this way 2 more times, "Wi-Fi On" will be announced

8. On your Wi-Fi enabled device (laptop, tablet, smartphone, etc), show the available wireless networks

9. Select the wireless network (starts with "overwatch") to connect to the OverWatch™

10. When prompted, enter the password "12345678"

11. Open your preferred web browser (Chrome, Firefox)

12. Enter the following into the address bar http://192.168.4.1/oem.html to open the OverWatch™ OEM page

13. Follow the instructions in OEM Password below to obtain the OEM login password

OEM Password

The OEM settings are password protected. The OEM password is generated from the EQSS website. The EQSS website requires a login username and password. If you are an OEM and do not have a username and password, contact EQSS to register. Follow the instructions below to obtain an OEM password.

1. Open your preferred web and enter the following into the address bar http://www.eqss.com.au/overwatch to open the Login page

2. Select OEM

3. Enter your username and password

4. Enter your name and contact details along with the serial number of the OverWatch™ then click Generate Hash

5. Enter the 5-digit hash password into the OEM password field

Settings

The OEM Settings page allows modification of all the OverWatch™ parameters. See the sections below for details on each setting.

Setting Name	Description	Default
deltaseek	This specifies which of the previous lidar reading to compare against the current one to calculate the speed.	20
max_safe_velocity	This is the velocity threshold for the cutout in cm/s. for drive mode.	100
max_safe_displacement	This is the maximum permitted distance in cm the operator may be away from the calibration position in drive mode.	45
max_safe_velocity_elevate	This is the velocity threshold for the cutout in cm/s. in elevate mode.	80
max_safe_displacement_elevate	This is the maximum permitted distance in cm the operator may be away from the calibration position in elevate mode.	40
max_safe_velocity_neutral	This is the velocity threshold for the cutout in cm/s. in neutral mode.	60
max_safe_displacement_neutral	This is the maximum permitted distance in cm the operator may be away from the calibration position in neutral mode.	40
fwddispadj	The coefficient to apply to the displacement when the displacement is toward the sensor.	-0.6
fwdveladj	The coefficient to apply to the velocity when the displacement is toward the sensor.	-1.0
zone_obstruction	If the lidar sensor reading is below this, the lidar is considered to be obstructed (with paint or thick coat of dust) and the system is cutout until the obstruction is cleared.	5
zone_minimum	Any lidar reading below this will trigger a cutout with the message: "Operator Zone"	15
zone_maximum	Any lidar reading above this will trigger a cutout with the message: "Operator Zone"	120
horn_count_max	The number of times the horn will sound when alerting the operator if the trigger remains pressed during the cutout.	2
horn_time_ms	The amount of time in milliseconds each individual horn should play.	200
adc_elevate_threshold	For the elevate ADC input, a reading above this indicates the EWP is in elevate mode.	3000
adc_drive_threshold	For the drive ADC input, a reading above this indicates the EWP is in drive mode.	3000

Setting Name	Description	Default
adc_trigger_threshold	For the trigger ADC input, a reading above this indicates the trigger switch is pressed.	3000
adc_joystick_fwd_threshold	For the joystick ADC input, a reading above this indicates the joystick has been pushed forward.	1500
adc_joystick_bwd_threshold	For the joystick ADC input, a reading below this indicates the joystick has been pulled backward.	1400
override_cooldown	The amount of time in milliseconds the system will wait before accepting another override request.	20000
override_time	The amount of time in milliseconds the override will last before it expires, and normal operation is resumed.	15000
override_listening_time	The amount of time in milliseconds the system will wait while the trigger is held down before considering it not to be part of the triple click override request.	300
override_reset_time	The amount of time in milliseconds the override system will wait before resuming listening after the trigger has been released at the end of an override period.	500
override_triple_click_time	The amount of time in milliseconds 3 clicks of the trigger needs to occur in order to trigger the override.	2000
lidar_fault_timeout	The amount of time in milliseconds of silence from the sensor module before a fault condition is triggered.	1000
cutout_fault_timeout	The amount of time in milliseconds a discrepancy between the cutout and the cutout sensor is permitted before a fault condition is triggered.	3000
throttle_time	Period after the trigger is pressed, during which the system does not track velocity.	2000
stuck_time	Period, after cutout to determine if the operator is not moving and is trapped	5000
time_before_welcome	Time after power on before welcome audio is played	250
stuck_time_long	After the stuck time this is the interval between horn alerts	10000
stuck_displacement	The threshold of operator movement before the operator is considered trapped after a cutout.	20
wifi_on_clicks_count	The number of times the trigger is pressed to enter Wi-Fi mode.	10
wifi_on_clicks_time	The amount of time in milliseconds after power on to enter Wi-Fi mode.	10000
driving_state_timeout	Mode selection switch timeout	7000

Polarity and Input Style

The table below describes each setting

Setting Name	Description	Default
joystick_drive_forward	Direction of joystick to move machine forward	forward
joystick_elevate_upward	Direction of joystick to move machine upwards	backward
joystick_neutral_move	Which direction requires monitoring when in neutral	forward
elevate_polarity	Direction of signal logic	high
drive_polarity	Direction of signal logic	high
trigger_polarity	Direction of signal logic	high
joystick_polarity	Direction of signal logic	high
driving_state_input	Direct or timer based	direct
neutral_safe	Safe or not safe	yes

Bypass

Setting Name	Description	
overwatch_state	Redundant	active
test_cutout_state	Test channel enabled for primary cutout	bypassed

Date and Time

Setting Name	Description
Date	Enter the current date to be saved into the OverWatch™
Time	Enter the current time to be saved into the OverWatch™
Set date and time	Press to store the displayed date and time into the OverWatch™
Read OverWatch date and time	Press to display the current date and time stored in the OverWatch™

EQUIPMENT SAFETY SYSTEMS
75 Naxos Way, Keysborough 3173 Victoria Australia
P: +61 3 8770 6555 E: support@eqss.com.au

**Snorkel PHX-II
Installation Manual**

| REV 1.2 | 03/06/2020 | Model6253 OverWatch™ Installation Manual | Document # DO001204 |

Connection Schematics

Model 6253 OverWatch™
Digital Controls Application Note

Page 1 of 1

EQSS © 2019