

# DUTYPOINT **SETTING THE BAR**

## Dutypoint VS Cold Water Booster Sets



## Operation and Maintenance Manual

# DUTYPOINT

SETTING  
THE BAR

## About us.

Applied knowledge.  
Shared know-how.  
Fearless innovation.

Together, we are Dutypoint. Since 1976, we've been building up industry-defining expertise in fluid technology.

This knowledge means we solve complex challenges with straightforward solutions that are built around meeting and exceeding our clients' needs. We approach everything with the same philosophy: how will we go above and beyond?

Our commitment to collaboration and sharing knowledge galvanises and cements robust relationships. Relationships that are built to last, because our clients are our partners.

Our focus for the future? Innovation. We want to be the future of our industry, globally. Where we benchmark thought leadership, expertise and customer care.

We set the bar.

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# 1. Important Safety Information

## 1.1 Health & Safety at Work Act 1974

Section 6(a) of this Act requires manufacturers to advise their customers on the safety and the handling precautions to be observed when installing, operating, maintaining and servicing their products. The user's attention is therefore drawn to the following:

- The appropriate sections of this manual must be read before working on the equipment.
- Installation, operating and maintenance must only be carried out by suitably trained/qualified personnel.
- Normal safety precautions must be taken and appropriate procedures observed to avoid accidents.

Refer to Dutypoint for any technical advice or product information. It is the responsibility of the customer and/or the contractor:

- To ensure that anyone working on the equipment is wearing all necessary protective gear/clothing;
- Is aware of appropriate health & safety warnings and to read the information in this manual.

## 1.2 Safety Messages and Hazard Statement

**Table 1.1:** Hazard Notice Definitions

Message Level	Definition
DANGER	A hazardous situation which, if not avoided, will result in death or serious injury
WARNING	A hazardous situation which, if not avoided, could result in death or serious injury
CAUTION	A hazardous situation which, if not avoided, could result in minor injury or moderate injury
ELECTRICAL HAZARD	Risks associated with electricity will cause hazards if not properly avoided
Note	A situation which may arise resulting in undesirable conditions and/or will not cause direct hazards to persons

## 1.3 Qualified Personnel

### WARNING

**This product is intended for operation by qualified personnel only**

- Only qualified personnel are allowed to install or operate this equipment
- Qualified personnel are defined as trained staff, who are authorised to install, commission and maintain equipment, systems and circuits in accordance with relevant laws and regulations. Personnel must be familiar with the instructions and safety procedures described in this document.
- This product should not be used by anyone with mental disabilities, or anyone without the relevant experience and knowledge, unless they have received instructions on using the equipment and on the associated risks, or are supervised by a responsible person.
- Children must be supervised to ensure they do not play on or around the equipment.

## 1.4 Environmental Protection

All local regulations and codes regarding emissions and waste disposal must be followed. This may include:

- Reporting of emissions to appropriate authorities

- Sorting, recycling and disposal of solid or liquid waste
- Clean-up of spills
- Separate disposal of electrical components from domestic waste

## 1.5 Mechanical Device Servicing

- Familiarise yourself with the relevant contents of this manual
- Installation, maintenance and repair work must only be carried out by trained, skilled and suitably qualified personnel.
- Disconnect or lock-out the power source to ensure that the item(s) will remain inoperative. Locking out the equipment by switching off the release mechanism or set value WILL NOT prevent accidental starting.
- Allow the item(s) to cool if over-heated.
- CLOSE the isolating valves on the suction and discharge connections of the affected item(s).
- If working on pump, VENT slowly and cautiously – Refer to the relevant section of this manual.
- DRAIN the pump(s).

## 1.6 Pump Hand Control Mode (Where Fitted)

In the 'HAND' position the pump(s) controlled by the switch will normally run at full speed and completely independently of any control devices, and can result in pump(s) running against a closed valve head if there is no draw. This can cause the system to be maintained at the maximum pressure produced by the pump plus any incoming pressure and additional pressure caused by water surge and can potentially damage the pump and other parts of the system.

The 'HAND' option should only be used with a competent operator in attendance, or when there is a continued demand sufficient to provide constant flow through the pumps to maintain the running pressure of the system to an acceptable level.

## 1.7 Personal Protective Equipment

Use personal safety equipment according to the site conditions and employer regulations. This may include, but may not be limited to:

- Hard hat
- Safety goggles with side shields
- Protective footwear
- Protective gloves
- Respirator
- Ear protection
- First aid kit
- Safety devices

## 1.8 Precautions Before Commencing Work

Ensure that the following safety precautions are complied with before commencing work:

- Provide a suitable barrier around the work area
- Ensure all safety guards are in place and secure
- Ensure you have a clear path of exit
- Ensure that the product cannot roll or fall over and cause damage to persons or property
- Ensure all lifting equipment is in good condition and rated for the intended task
- Use a lifting harness, safety line and respirator as required
- Allow hot components to cool before handling them
- Ensure that product has been thoroughly cleaned
- Disconnect and lock out power supply, ensuring that it cannot be accidentally re-connected

- Check for any risk of explosion before using hand tools

## 1.9 Precautions During Work

- Never work alone
- Always wear protective clothing and hand protection
- Stay clear of suspended loads
- Always use appropriate lifting devices
- Beware of risks of sudden starts of any automated equipment such as level control
- Beware of starting jerks of electric motors - these can be powerful
- Do not exceed the stated operating limits of equipment
- Do not remove vent plugs from a pressurised system - ensure pressurised components are relieved of pressure before disassembly
- Ensure guards are in place during operation

## 1.10 Hazardous Fluids and Chemicals

If hazardous chemicals come into contact with skin or eyes, use the following procedures:

Condition	Action
Chemicals or hazardous fluids in eyes	<ol style="list-style-type: none"> <li>1) Hold your eyelids apart forcibly with your fingers</li> <li>2) Rinse the eyes with eyewash or running water for at least 15 minutes</li> <li>3) Seek medical attention</li> </ol>
Chemicals or hazardous fluids on skin	<ol style="list-style-type: none"> <li>1) Remove contaminated clothing</li> <li>2) Wash the skin with soap and water for at least 1 minute</li> <li>3) Seek medical attention</li> </ol>

## 1.11 Electrical Safety - High Voltages

This information is especially applicable when Variable Speed Controllers (Inverters) are fitted to pumps.

When the inverter variable speed drive head is connected to the power supply the components of the power unit as well as certain components of the master control unit – are also connected to the power supply.

### **DANGER!**

**Touching these components can seriously endanger life!**

- Before removing the frequency inverter cover, the system must be disconnected from the power supply
- After switching off the power supply wait at least 5 minutes before starting work on or in the inverter drive head - the capacitors in the intermediate circuit must be given time to discharge completely via the discharge restors.

### **ELECTRICAL HAZARD**

**Up to 800V can be present - if there are faults this can be higher**

- All work carried out when the frequency inverter is open must be performed only by suitably qualified and properly authorised personnel.

## ELECTRICAL HAZARD

**THE SYSTEM MUST ONLY BE OPERATED WHEN IT HAS BEEN CORRECTLY EARTHED AND PIPES BONDED TO EARTH IN ACCORDANCE WITH IEE REGULATIONS**

- When connecting external control wires care must be taken not to short circuit adjacent components. Bare cable ends which are not in use must be insulated.
- 

### 1.12 Electronic Safety Devices

- Inverter drives contain electronic safety devices which switch off the control element in the event of a fault developing.
  - A motor can also be stopped by 'mechanical blocking'
  - If it is switched off electronically, the motor is disconnected from the mains voltage supply via the electronics in the inverter drive.
  - Voltage fluctuation and power failures (temporary outages) can cause the motor to switch itself off.
- 

#### WARNING

**A motor will have zero current but will remain energised as it stops**

- Take necessary precautions - the motor is not voltage-free in the circuit itself
- 

#### WARNING

**Repair of faults can cause items to start up again unexpectedly**

- Ensure the motor is isolated before commencing any work
- 

#### WARNING

**High voltage tests of inverters may damage the electrical components.**

- Bridge before the incoming/outgoing terminals L-L2-L3 and U-V-W.
  - To avoid incorrect metering by capacitors incorporated in the electronic circuits, isolate the motor from the inverter drive head.
- 

### 1.13 Spare Parts

#### WARNING

**Use of non-genuine spare parts may cause damage to equipment, damage to property and voiding of warranty**

- Use genuine, Dutypoint-approved spare parts only
  - If in doubt, contact Dutypoint Service on 01452 300590.
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## 1.14 Transportation

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### Transportation Method

- This product is designed to be transported using an appropriately sized wooden pallet & utilising a forklift truck or pallet truck.

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## 1.15 Storage

The product must be stored in a covered and dry location free from heat, dirt and vibrations.

**NOTE:** Protect the product against humidity, heat sources and mechanical damage

**NOTE:** Do not place heavy weights on the packed product

## 1.16 Disposal

At the end of its working life, this product should not be disposed of with standard household waste, but rather dropped off at a collection point for the disposal of Waste Electrical and Electronic Equipment (WEEE) for recycling.

**Figure 1.2:** Waste Symbol



This is confirmed by the [Waste Symbol](#) found on the product, user manual or packaging.

Depending on their characteristics the materials may be recycled. Through recycling and other forms of processing Waste Electrical and Electronic Equipment, you can make a significant contribution towards helping to protect the environment.

Please contact your local authorities for information on the collection point nearest you.

## 1.17 Potable Water Safety

According to HSE guidance, all water systems should be cleaned, flushed and disinfected as specified in BS EN 806 and BS 8558.

A risk assessment should be performed before commissioning to identify and take into account the potential for stagnation as this may lead to microbial growth where buildings are not to be fully occupied immediately.

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### WARNING

**The temperature of stored water must be kept below 23° to prevent bacteria growth.**

- Storage cisterns should be regularly checked for signs of stagnation or microbial growth
  - See HSE guidance for more details: [www.hse.gov.uk/legionnaires](http://www.hse.gov.uk/legionnaires)
-



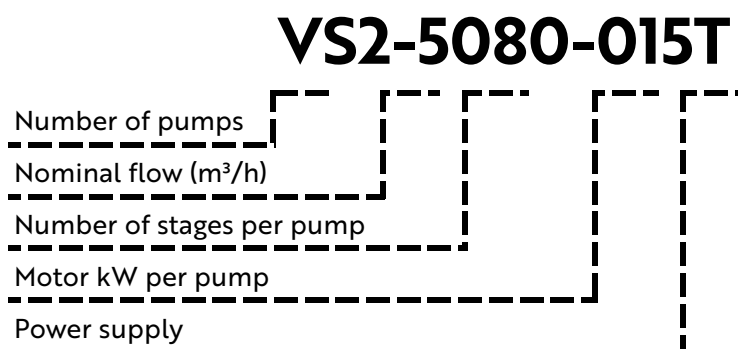


## 2. System Specifications

**Table 2.2:** Range Specifications

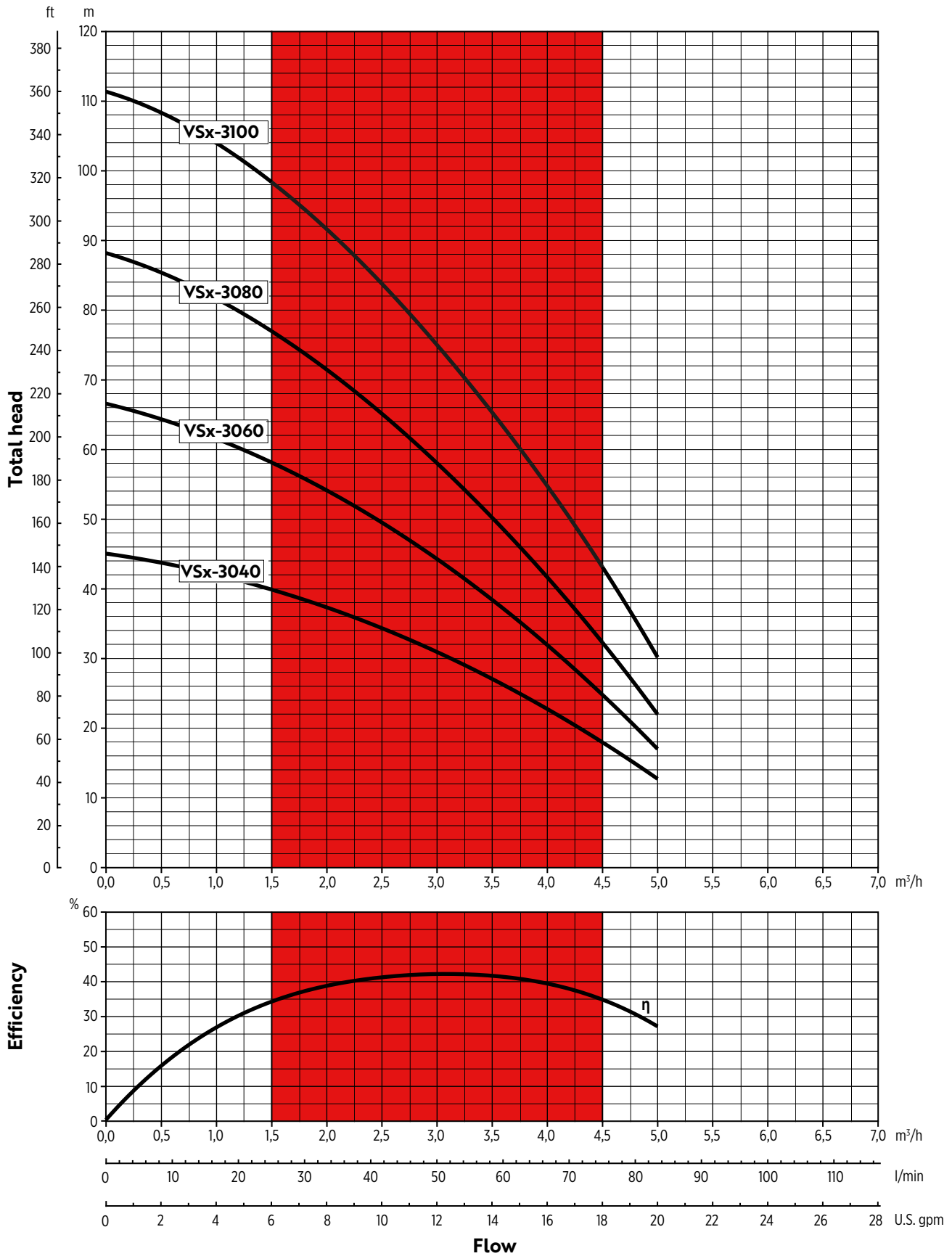
Application	Pressure boosting of potable water
Pumps	2 or 3 Dutypoint XPWA Vertical Multistage.
Duty flow rate range	0.25 -11 litres/second
Duty head range	1-9 bar
Liquid temperature range	1-23°C
Ambient temperature range	5-40°C
Humidity	Max 50%
Controller type	Dutypoint Smart Control Panel. See <a href="#">3. System Control Panel User Guide</a> (p. 16).
Maximum system pressure	15 bar
Volt free contacts	<ul style="list-style-type: none"> <li>• Common fault (normally closed)</li> <li>• Low water level (normally closed)</li> <li>• High water level (normally closed)</li> </ul>
External on/off contacts (normally open)	This feature allows the system to be remotely deactivated, for example by a BMS system. When not deactivated, the system will run as normal in automatic mode.

**Figure 2.3:** Product codes



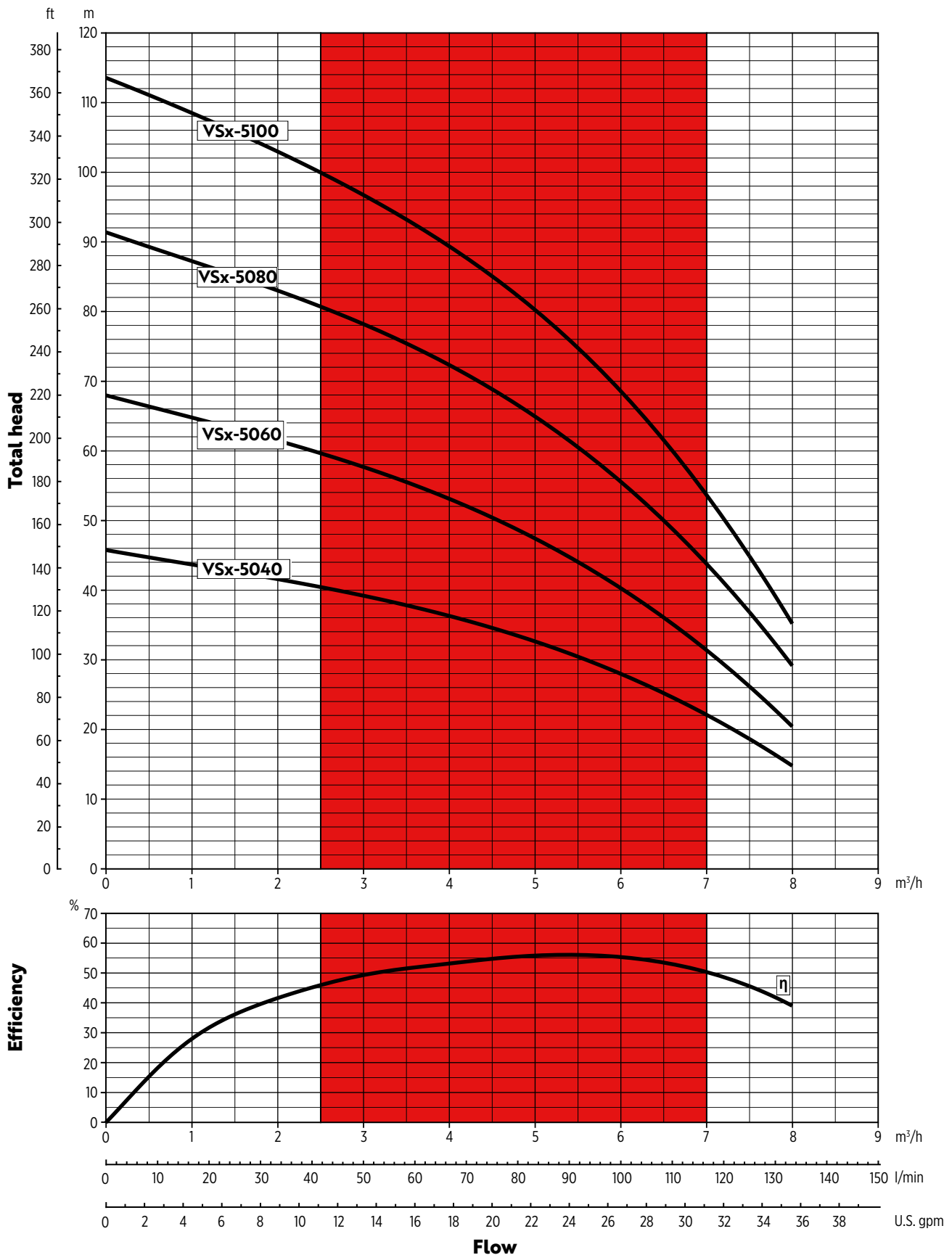
## 2.1 Pump Curves

Figure 2.4: VSx-30x Individual Pump Curves



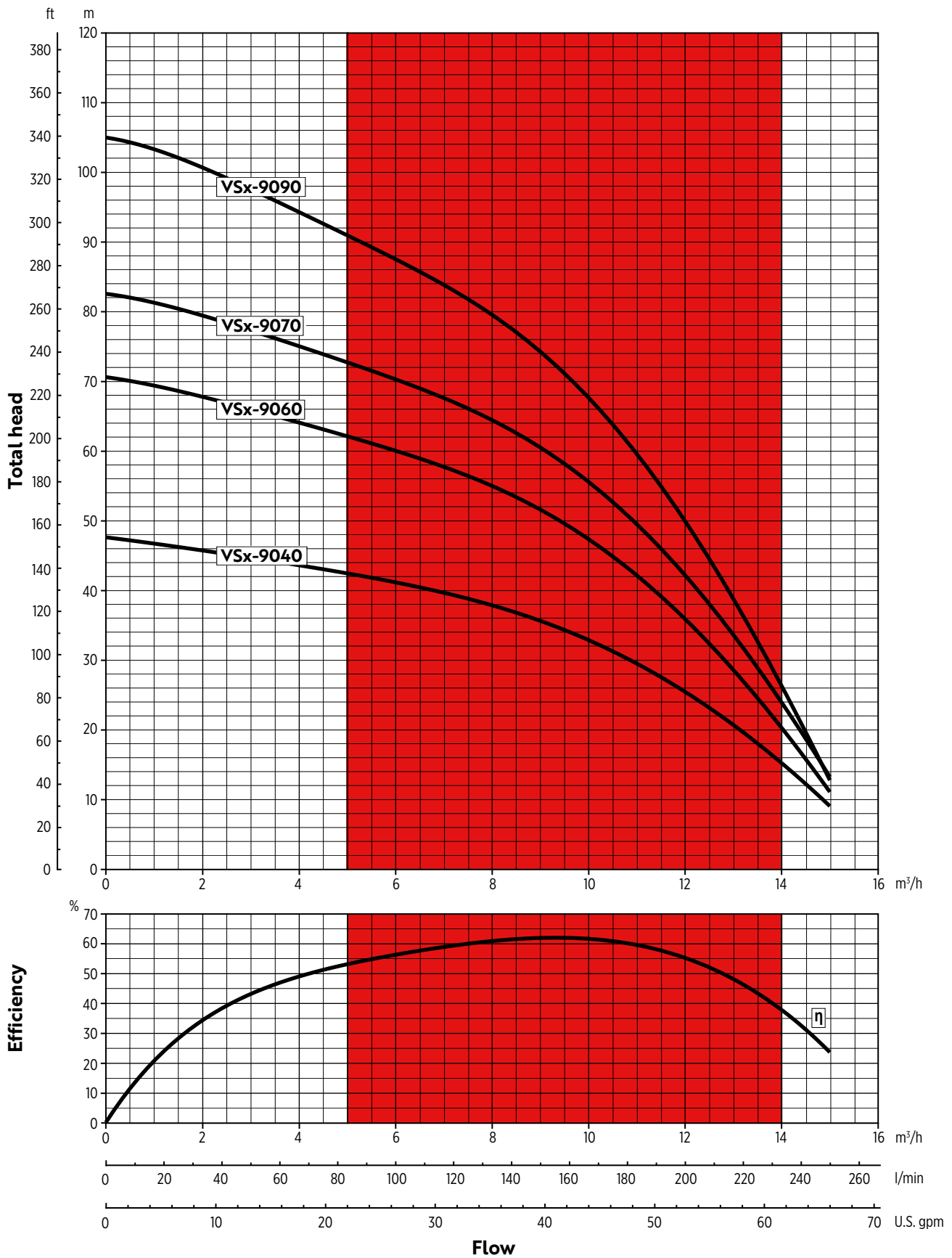
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Figure 2.5: VSx-50x Individual Pump Curves



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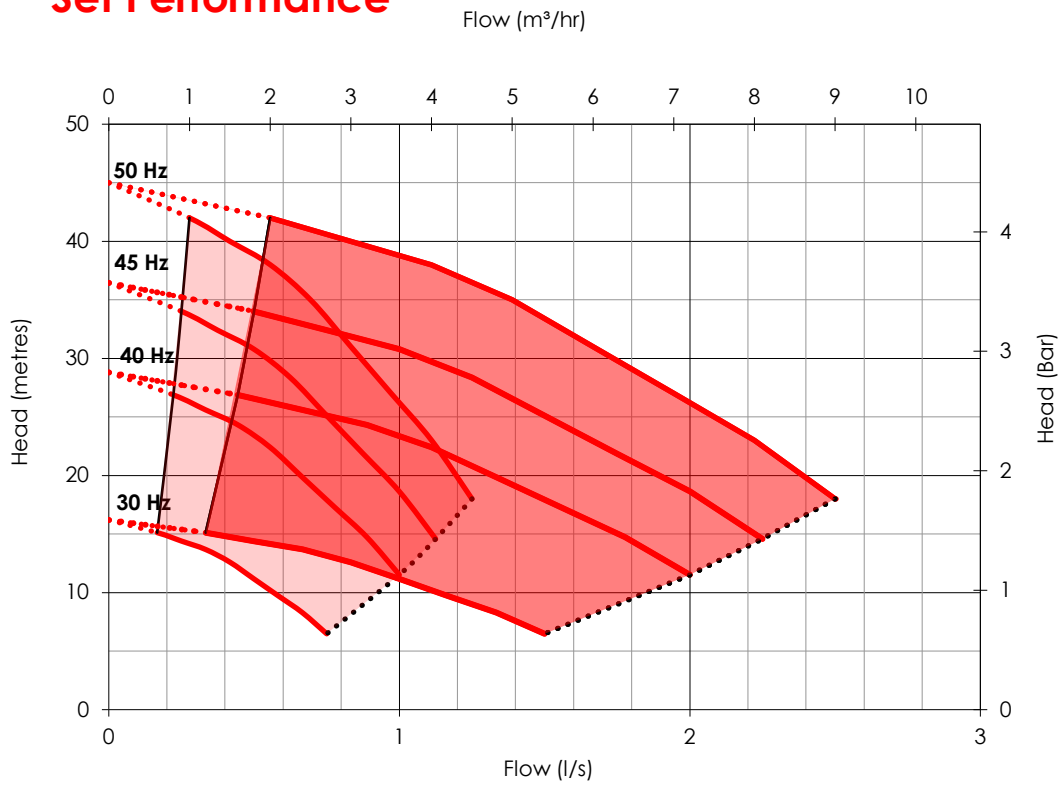
Figure 2.6: VSx-90x Individual Pump Curves



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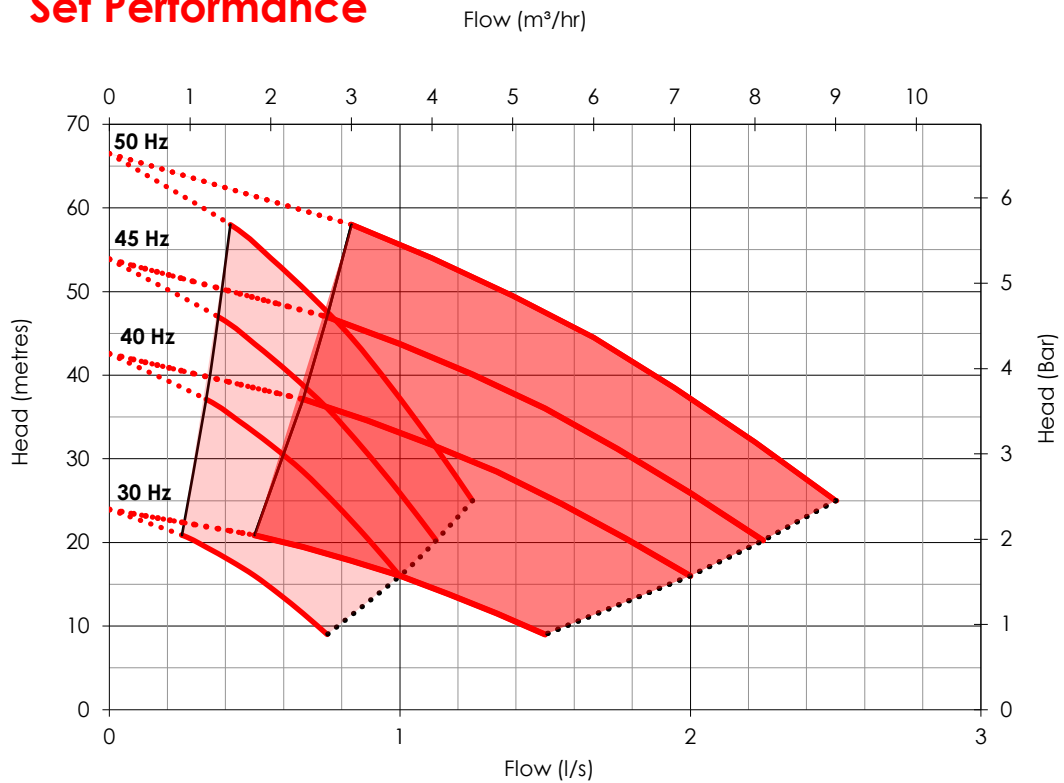
# VS2-3040-005

## Set Performance



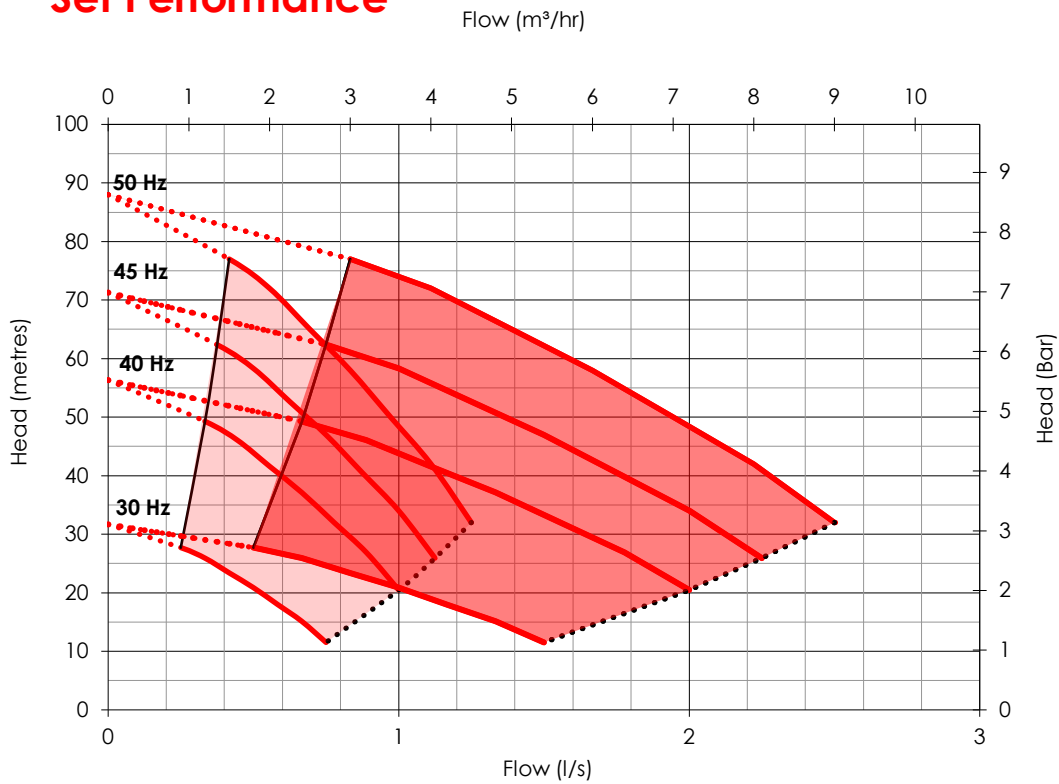
# VS2-3060-007

## Set Performance



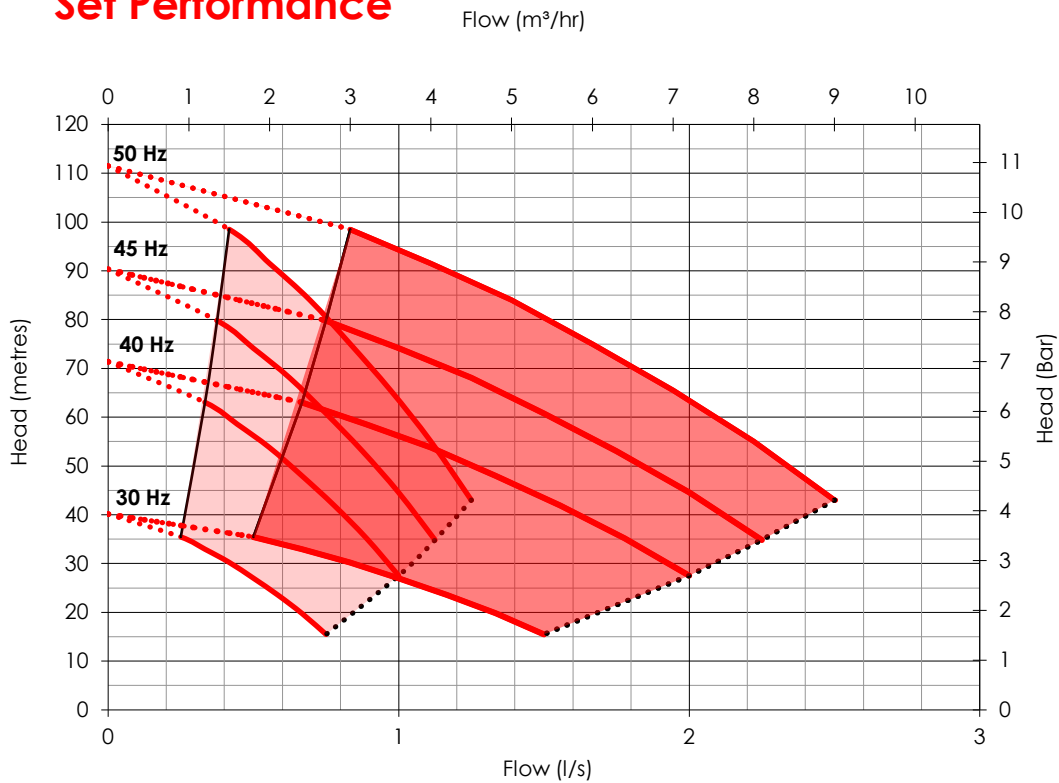
# VS2-3080-011

## Set Performance



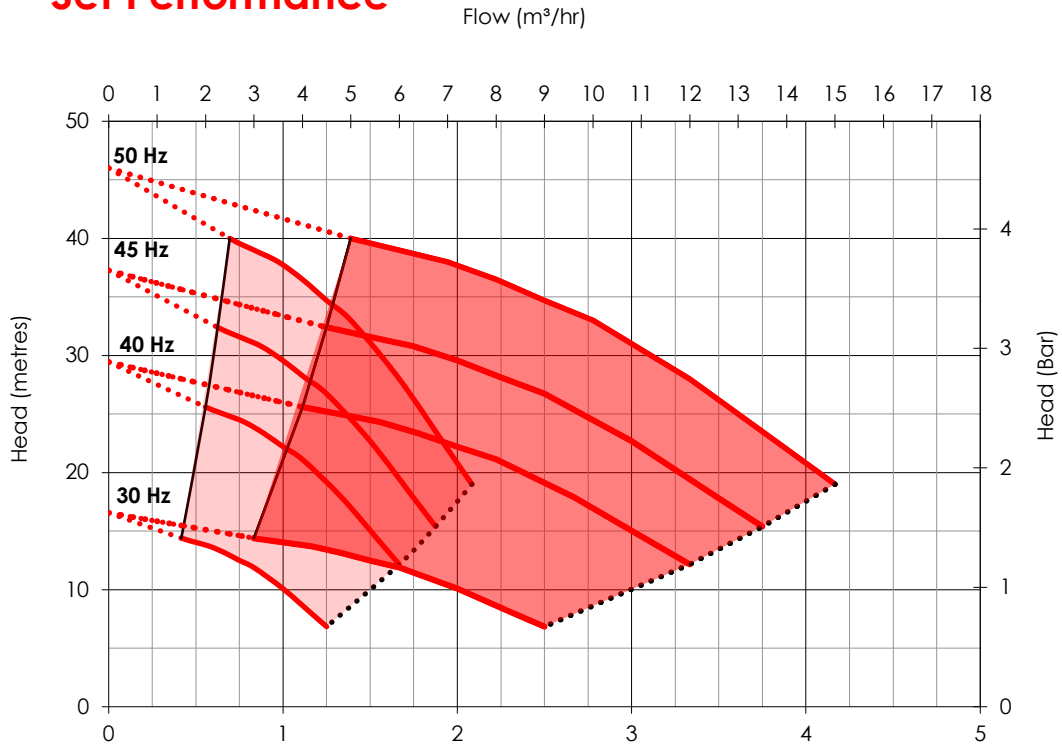
# VS2-3100-015

## Set Performance



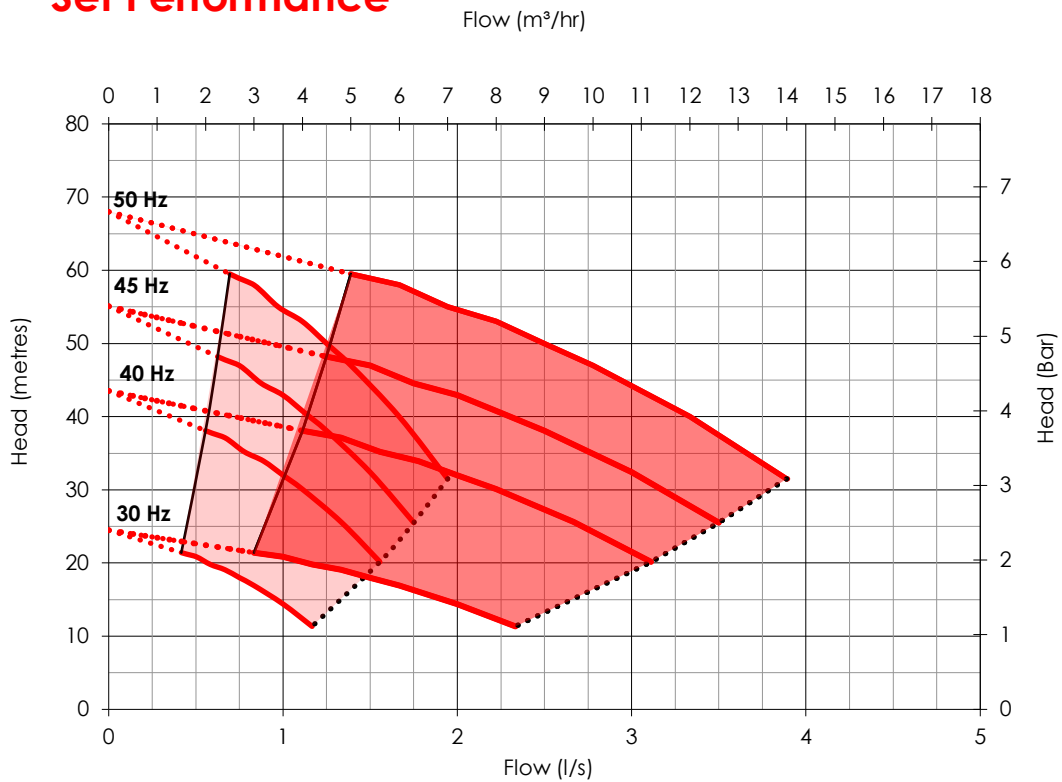
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## Set Performance



# VS2-5060-011

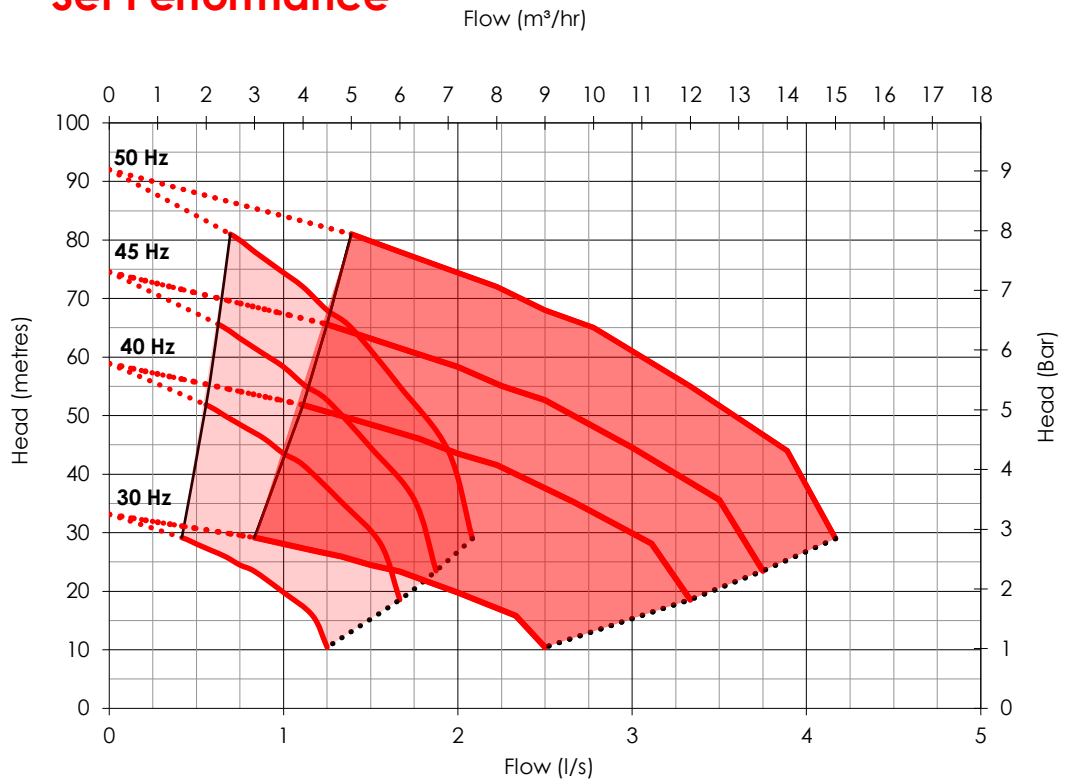
## Set Performance





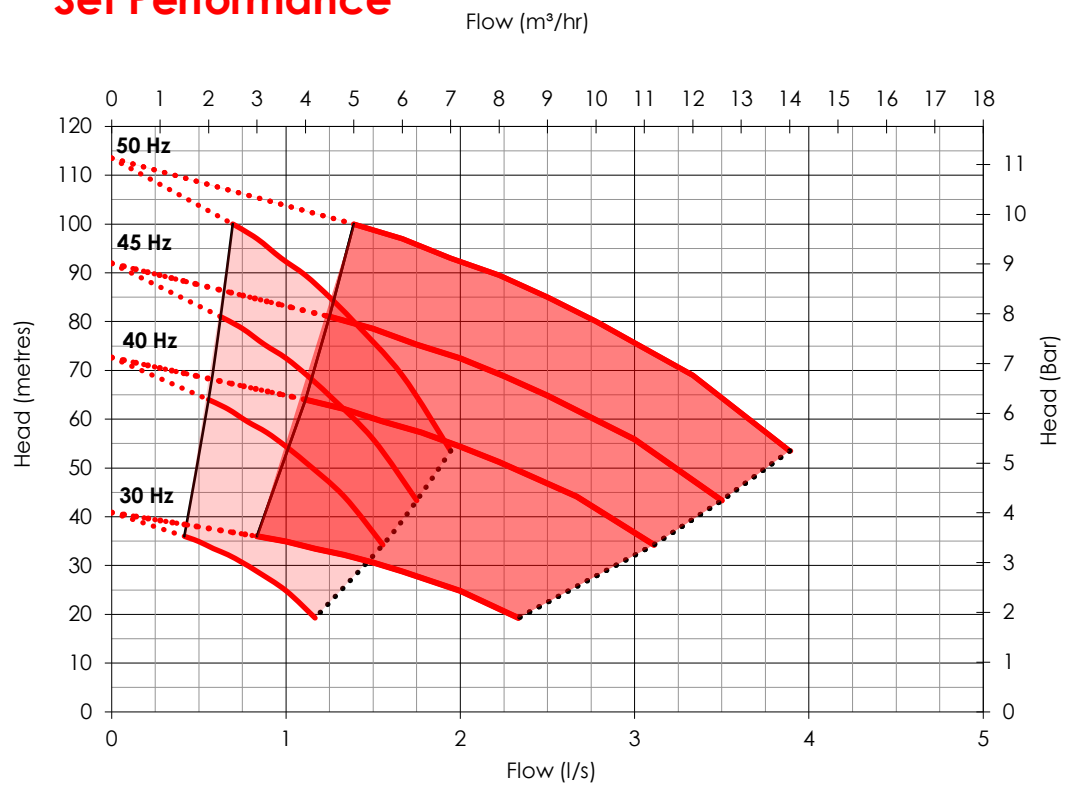
# VS2-5080-015

## Set Performance



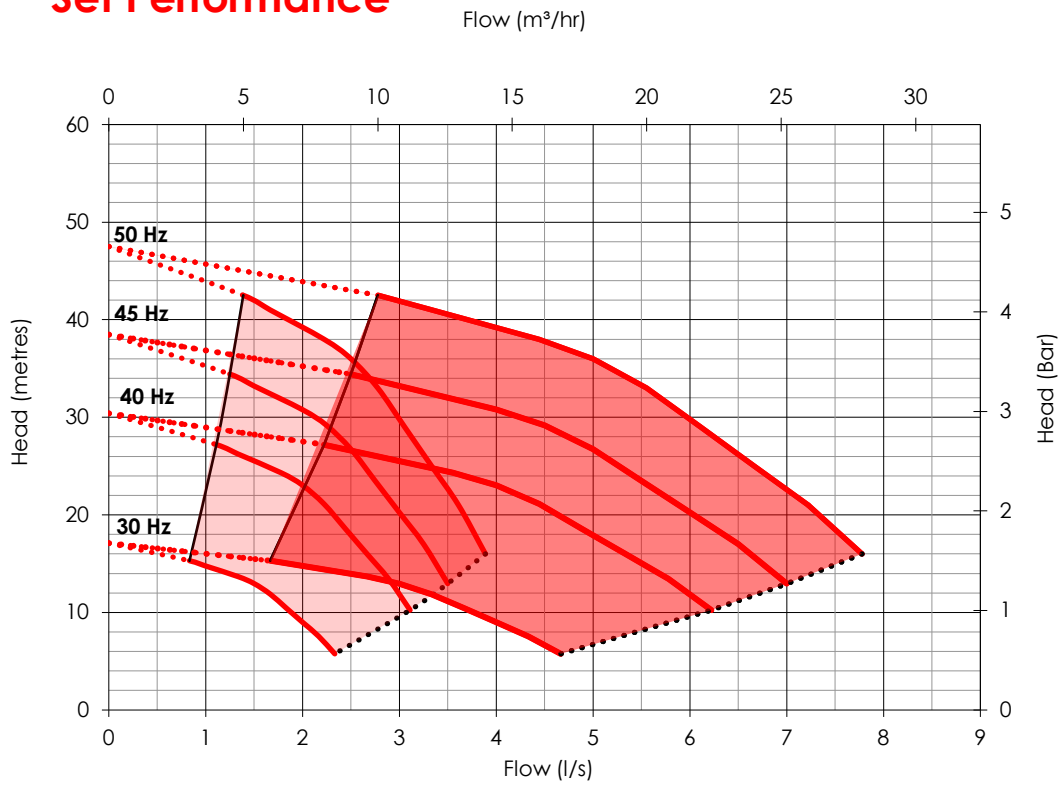
# VS2-5100-022

## Set Performance



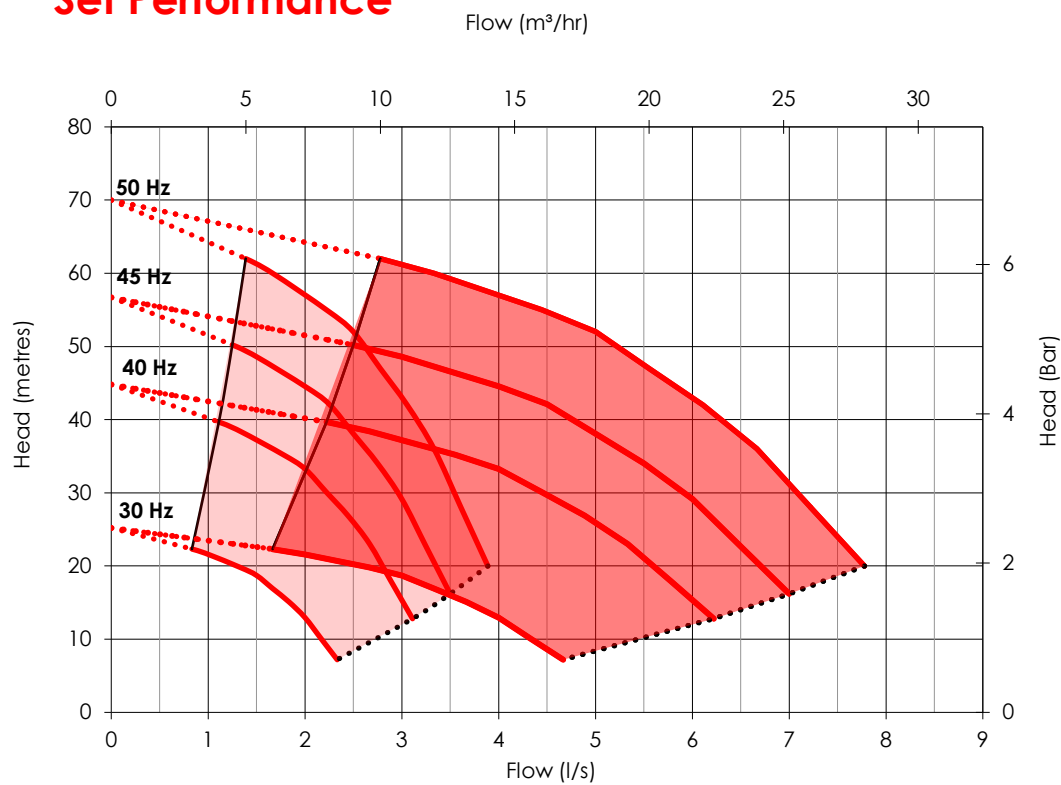
# VS2-9040-015

## Set Performance



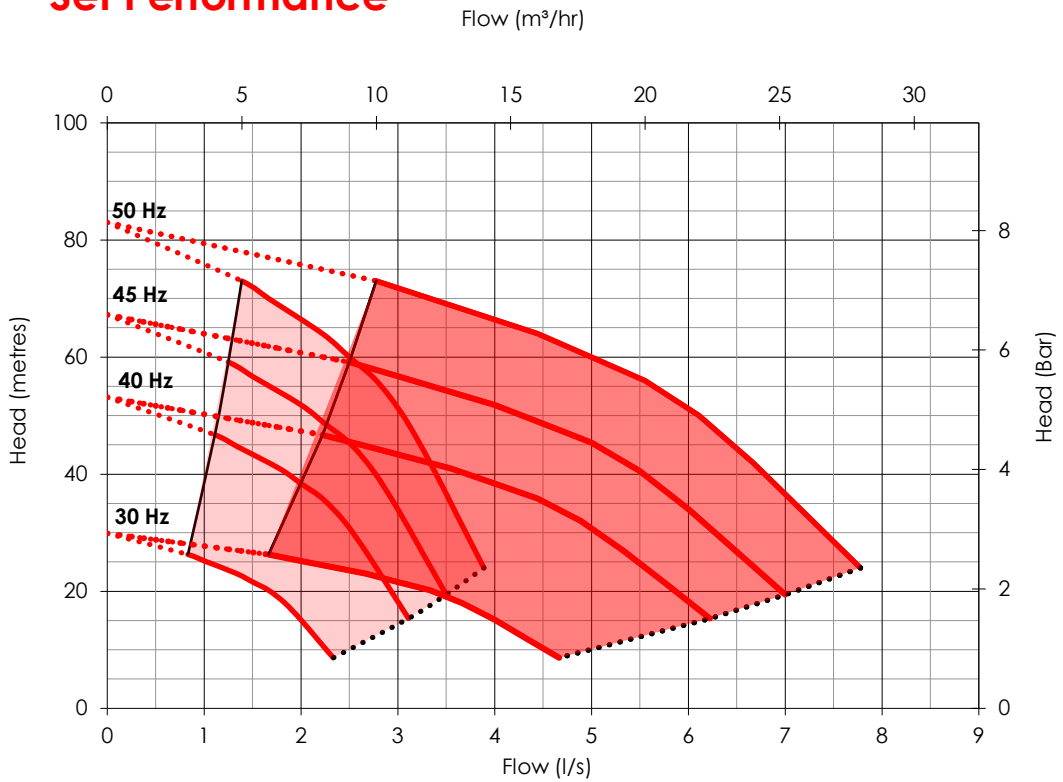
# VS2-9060-022

## Set Performance



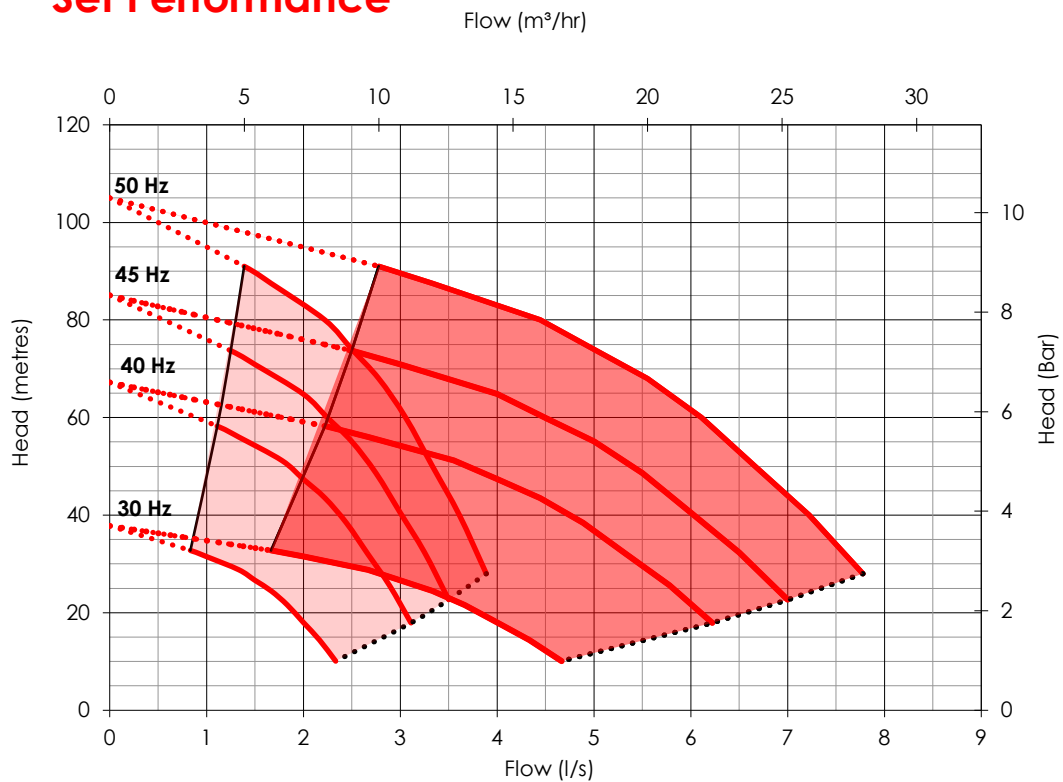
# VS2-9070-030

## Set Performance



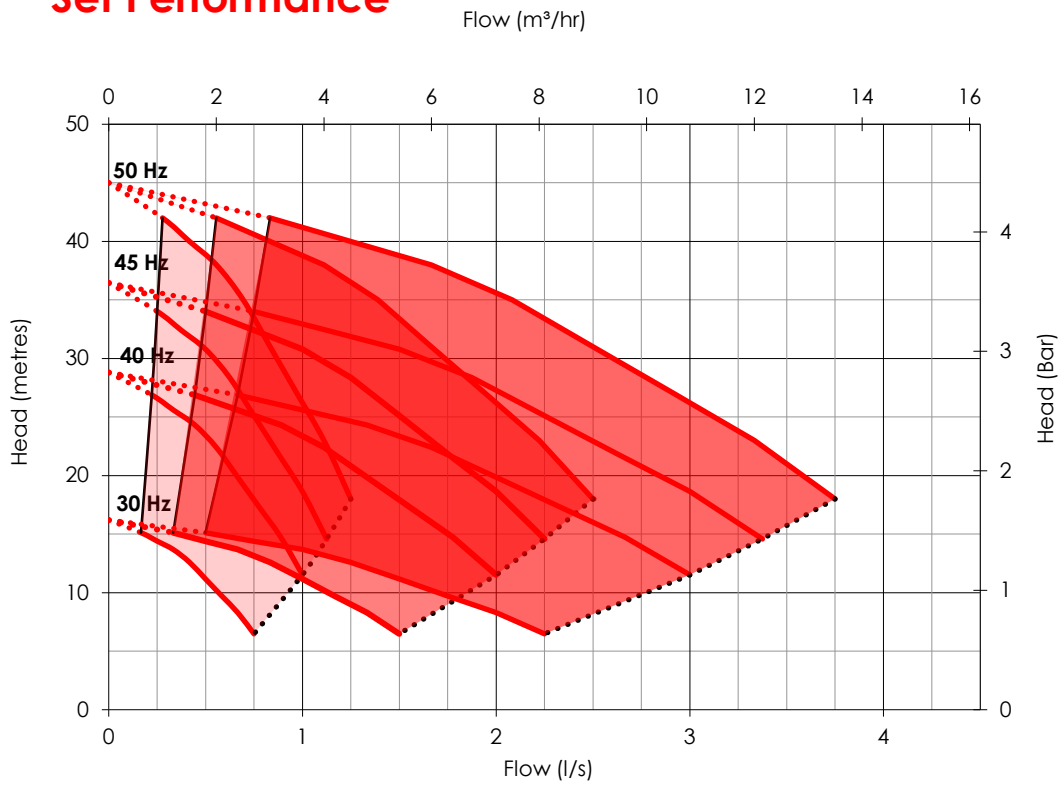
# VS2-9090-030

## Set Performance



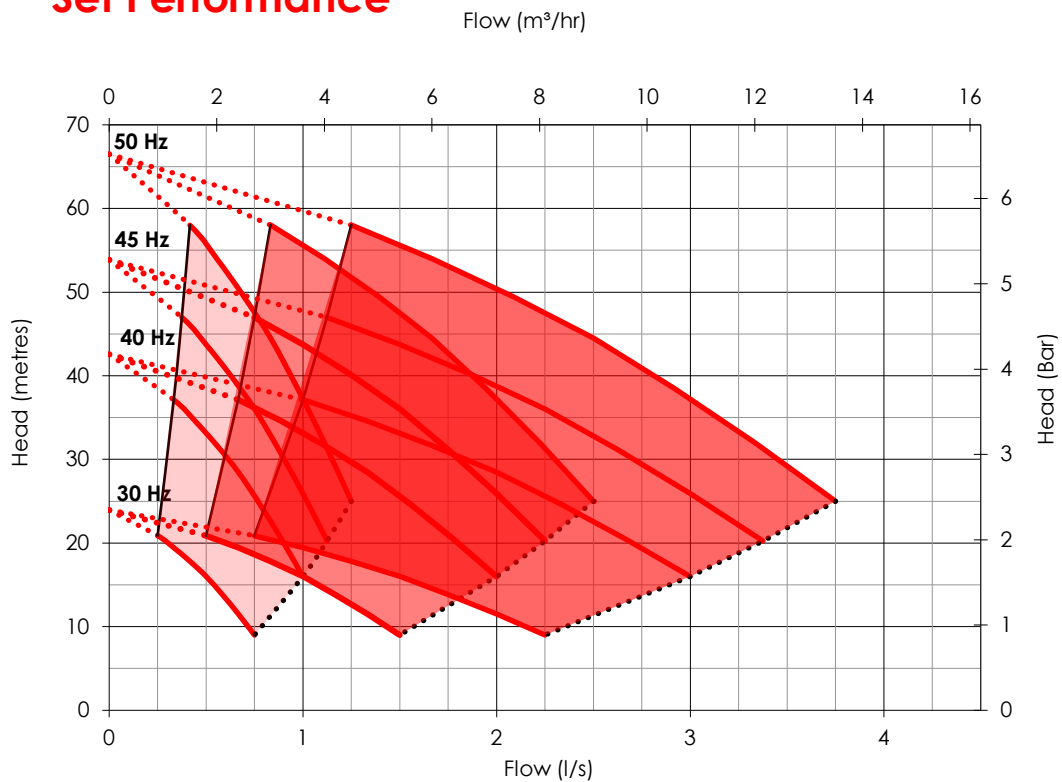
# VS3-3040-005

## Set Performance



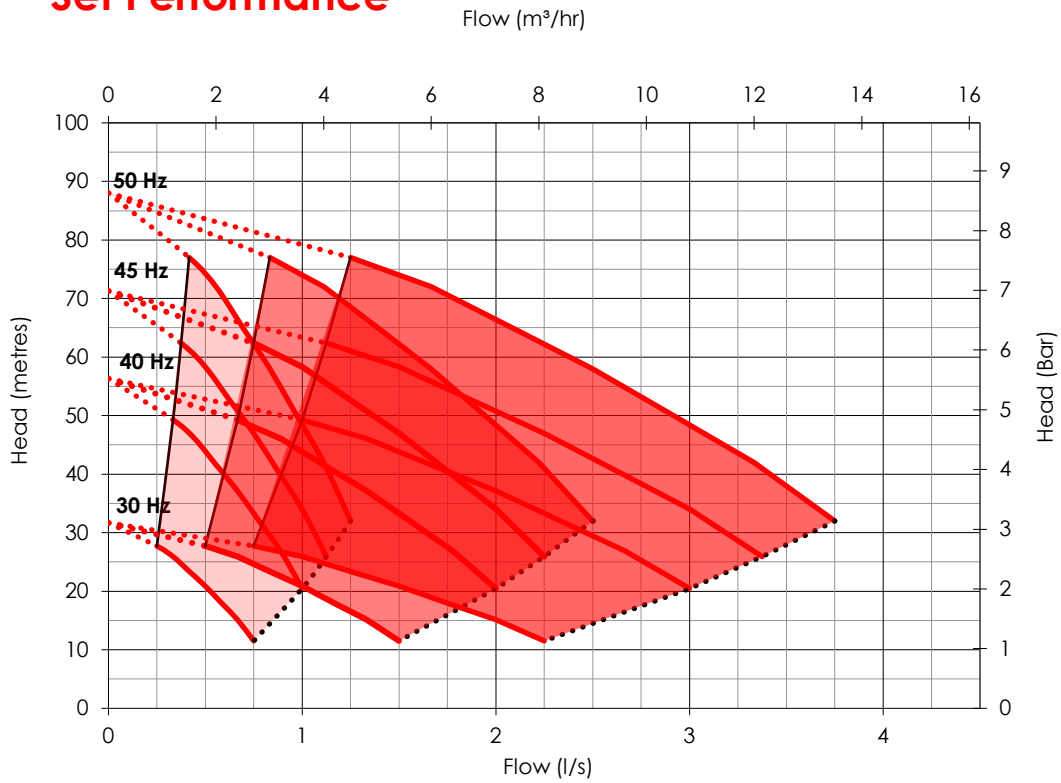
# VS3-3060-007

## Set Performance



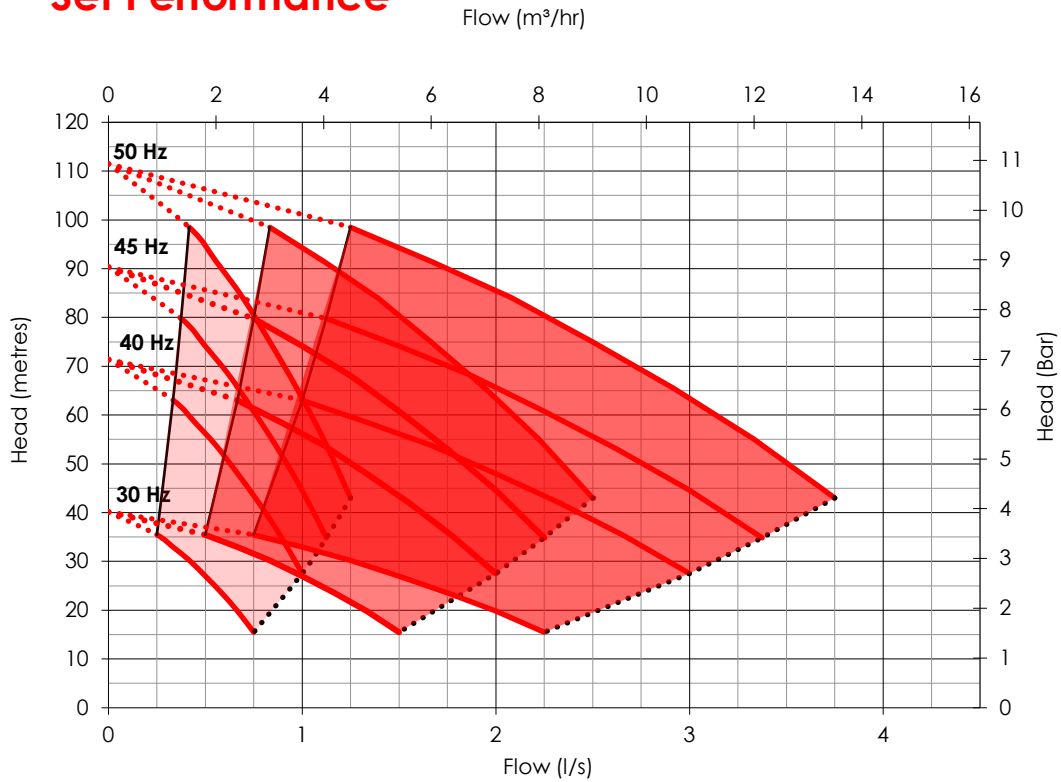
# VS3-3080-011

## Set Performance



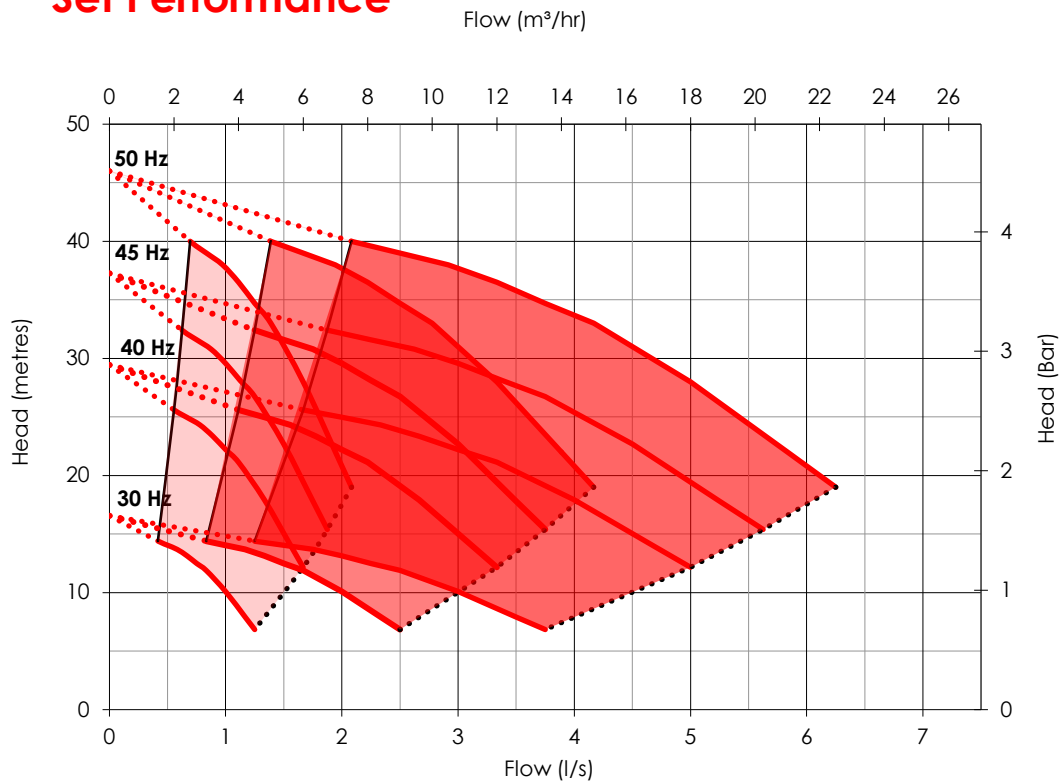
# VS3-3100-015

## Set Performance



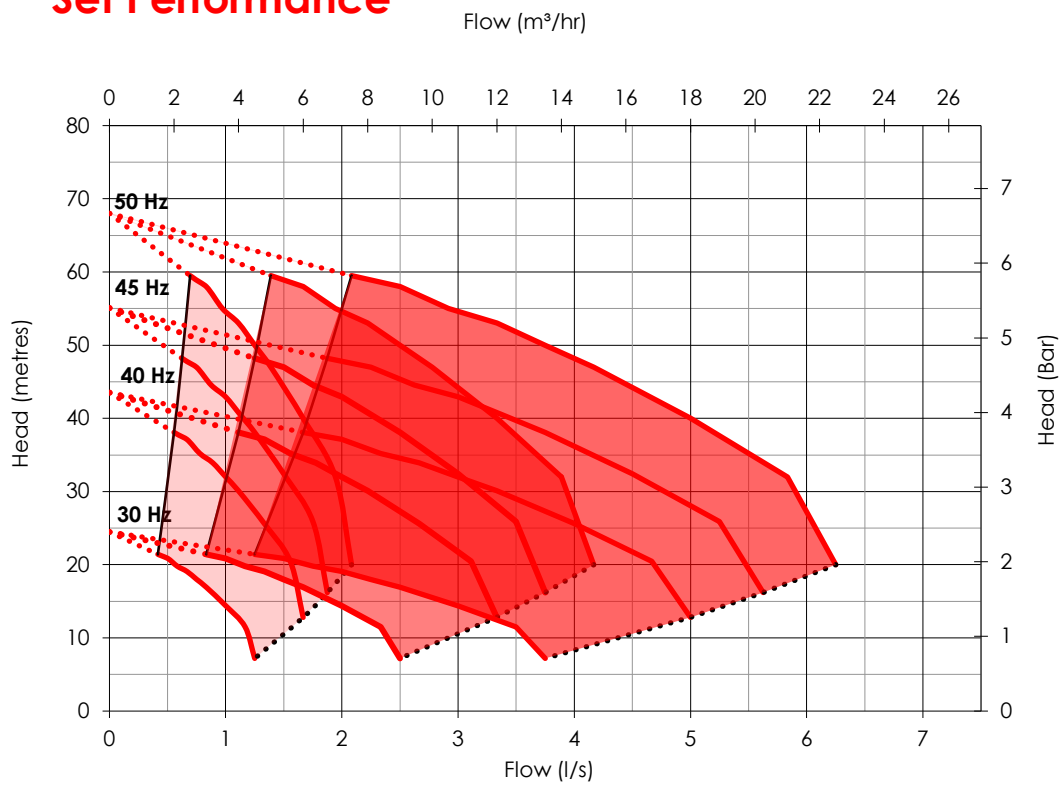
# VS3-5040-007

## Set Performance



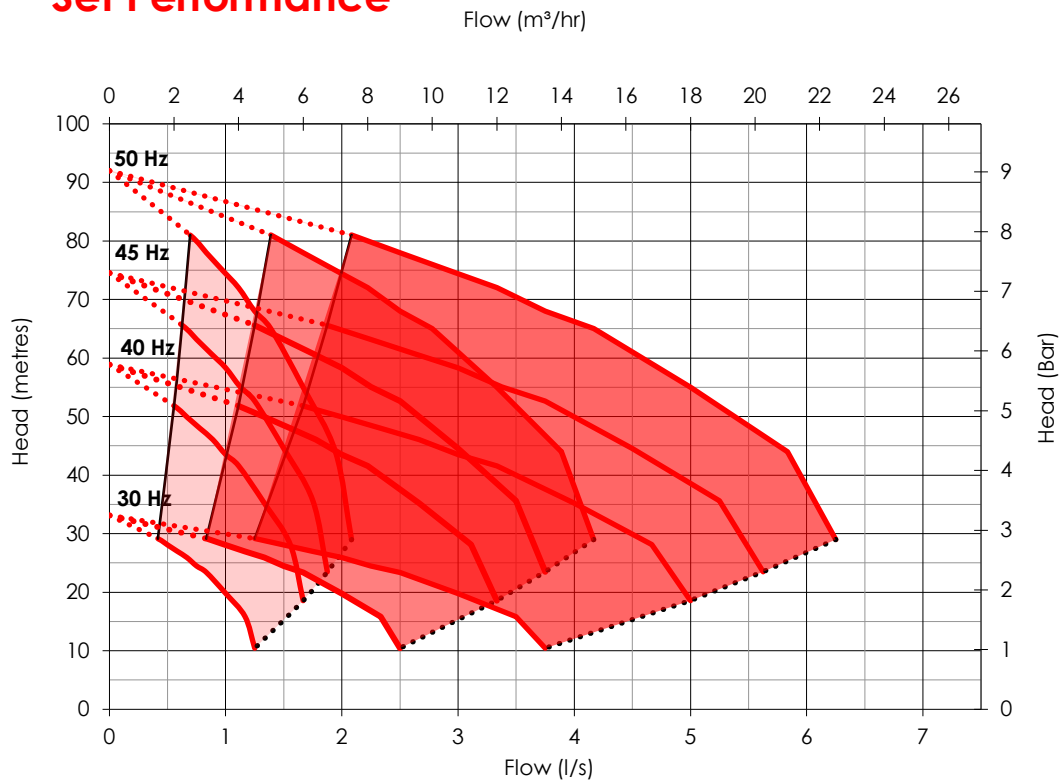
# VS3-5060-011

## Set Performance



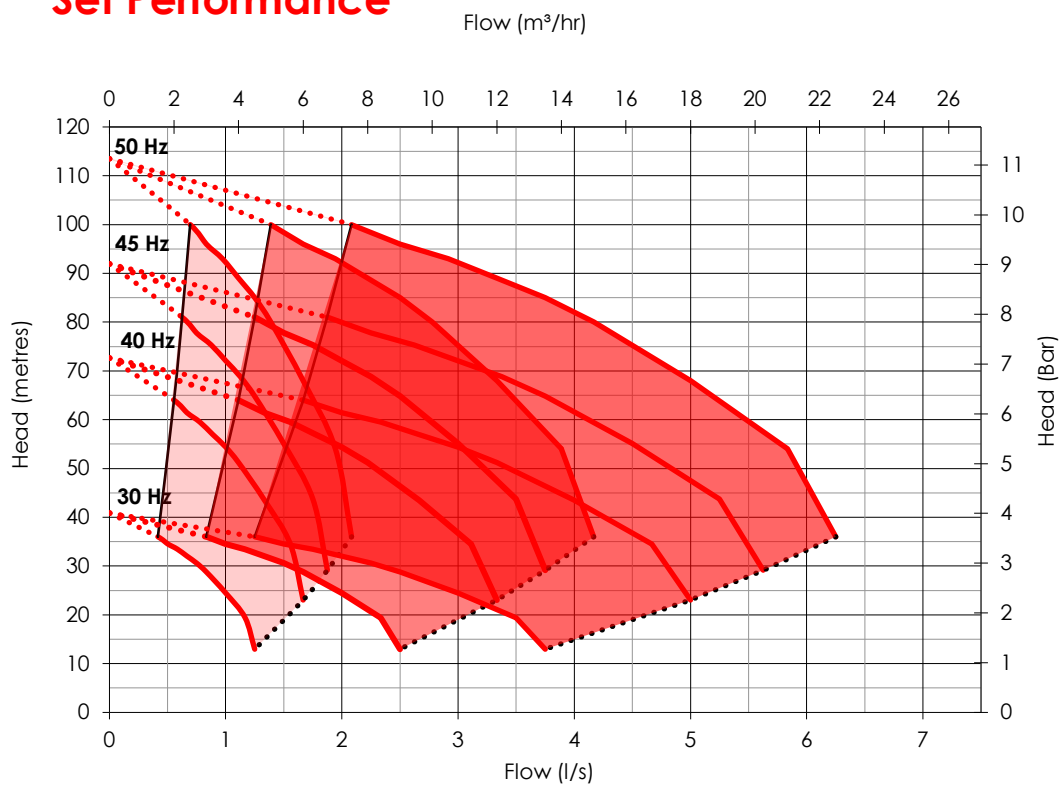
# VS3-5080-015

## Set Performance



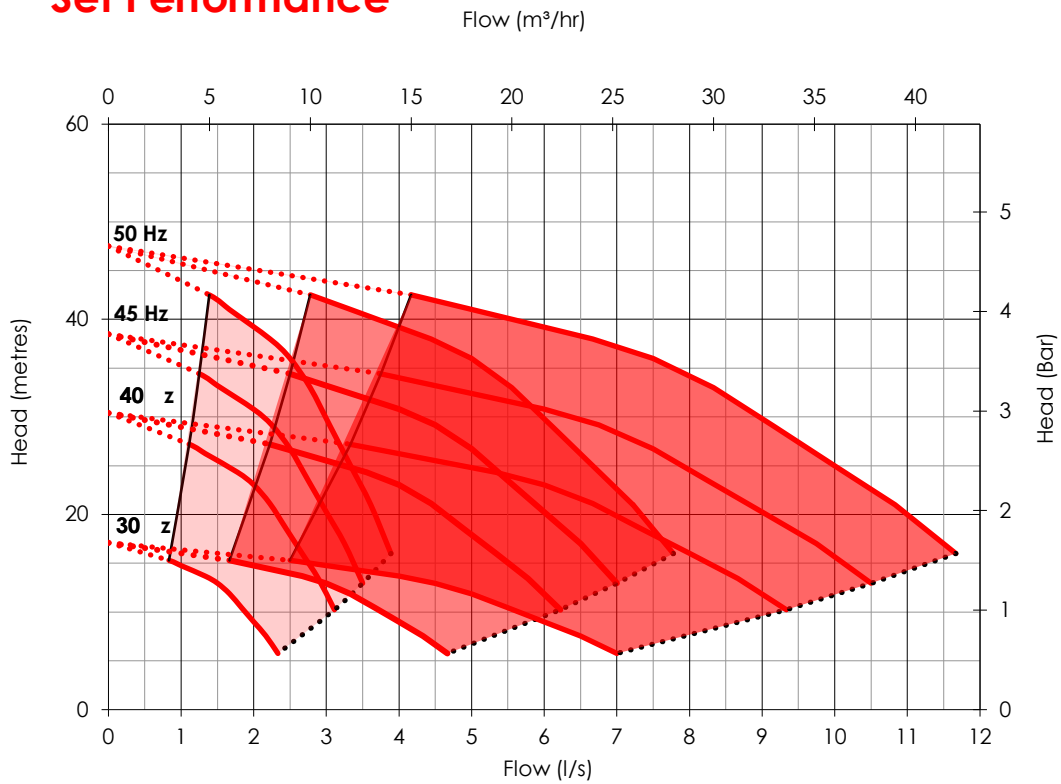
# VS3-5100-022

## Set Performance



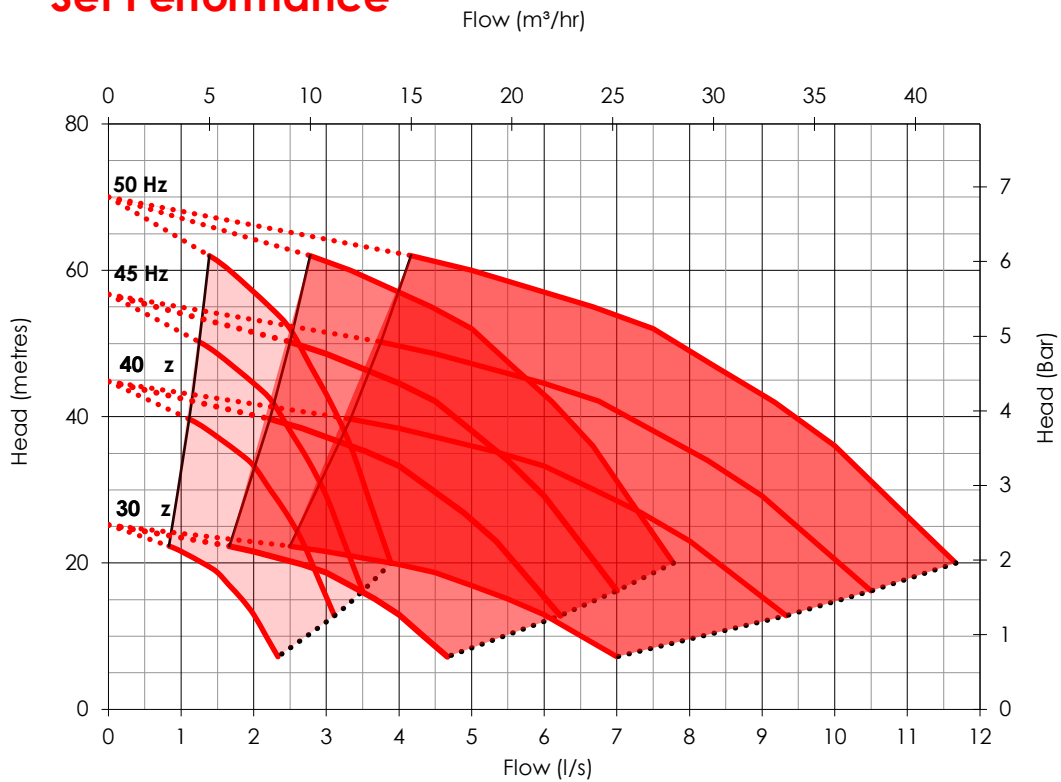
# VS3-9040-015

## Set Performance



# VS3-9060-022

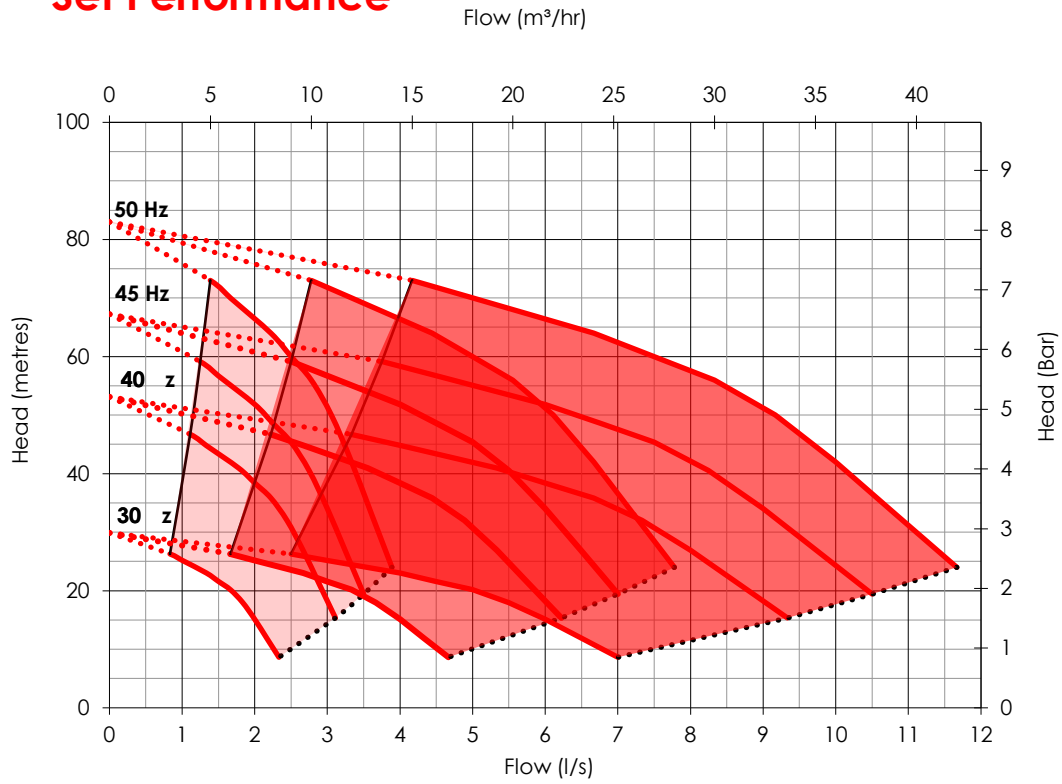
## Set Performance





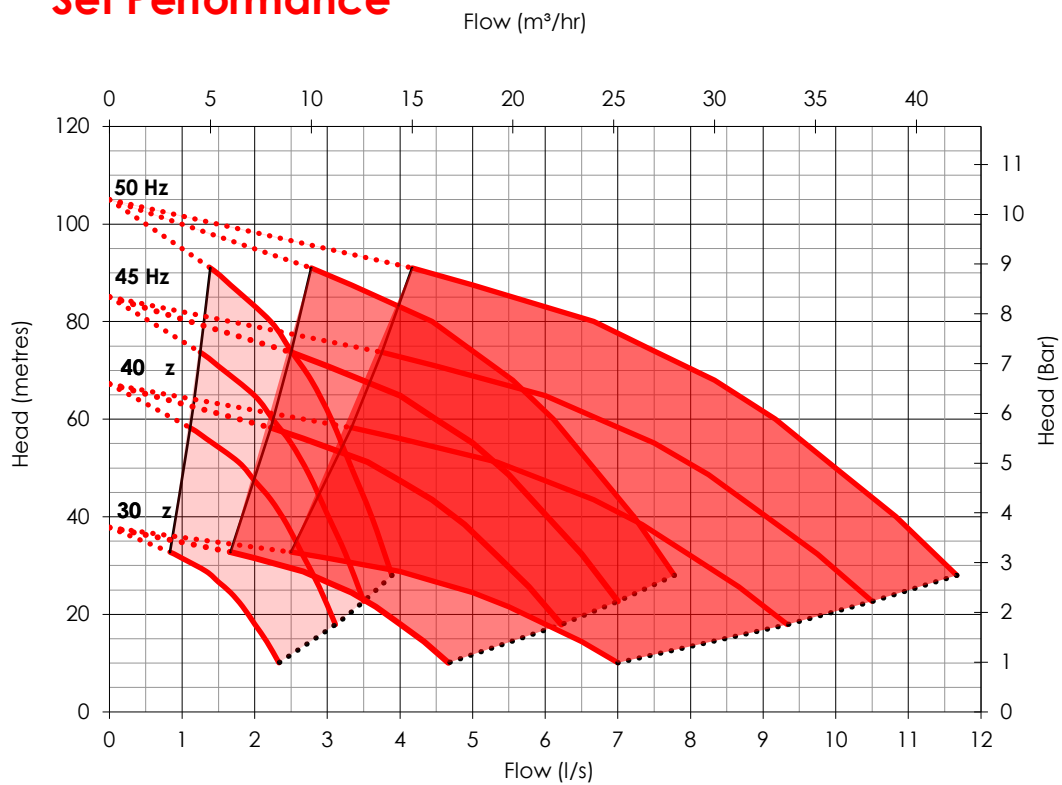
# VS3-9070-030

## Set Performance



# VS3-9090-030

## Set Performance



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## 3. System Control Panel User Guide

The Dutypoint Smart Control Panel allows access to important system information and adjustment of key parameters. Please note that in the course of normal system operation it should not be necessary to make any adjustments or to refer to the control panel display. If there is a fault with the system, the screen will normally show details of the fault and give details of suggested actions. Because most parameters are controlled using the touch screen HMI, the front of the control panel has a main isolator switch only. Individual pumps can be isolated using the breaker switches inside the control panel.

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### **DANGER - ELECTRICAL HAZARD**

#### **Risk of electric shock**

- Only those with suitable electrical training should open the control panel
- Do not open the control unless you are a qualified electrician or electrical engineer

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### **WARNING**

#### **The control panel should only be operated by trained and competent persons**

- Contact Dutypoint on 01452 300590 if you require assistance

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This guide relates to the VT Fitted with the all black HMI (released 06/2021)

### 3.1 Navigation panel



- HOME: loads the home screen
- SETTINGS: loads the settings screen
- ALARMS: loads the alarms viewer
- SERVICE: loads the service screen

## 3.2 Status Notification

Pump 3 Speed      (

Tank Level OK

Text in the bottom left corner of the screen will display tank status messages as follows:

- Tank Level OK: this is displayed if the tank level is sufficient and the low level float switch is not activated.
- No Water: this is displayed if the tank level has dropped to a minimum level and the low level float switch has been activated – in this state no pumps will be permitted to run.
- Tank OK – Initializing Pumps: this is displayed once the tank level has deactivated the low level float switch – the system delays the restart for a period of time to ensure a stable water supply while the tank is re-filling from a low level

## 3.3 Home Screen

Set Pressure	5.00	Bar	HOME	
Actual Pressure	5.36	Bar	SETTINGS	
Pump 1 Speed	0.0	Hz	Pump Ready - Auto	
Pump 2 Speed	0.0	Hz	Pump Ready - Auto	
Pump 3 Speed	0.0	Hz	Pump Ready - Auto	
			ALARMS	
			SERVICE	

**DUTYPOINT** 

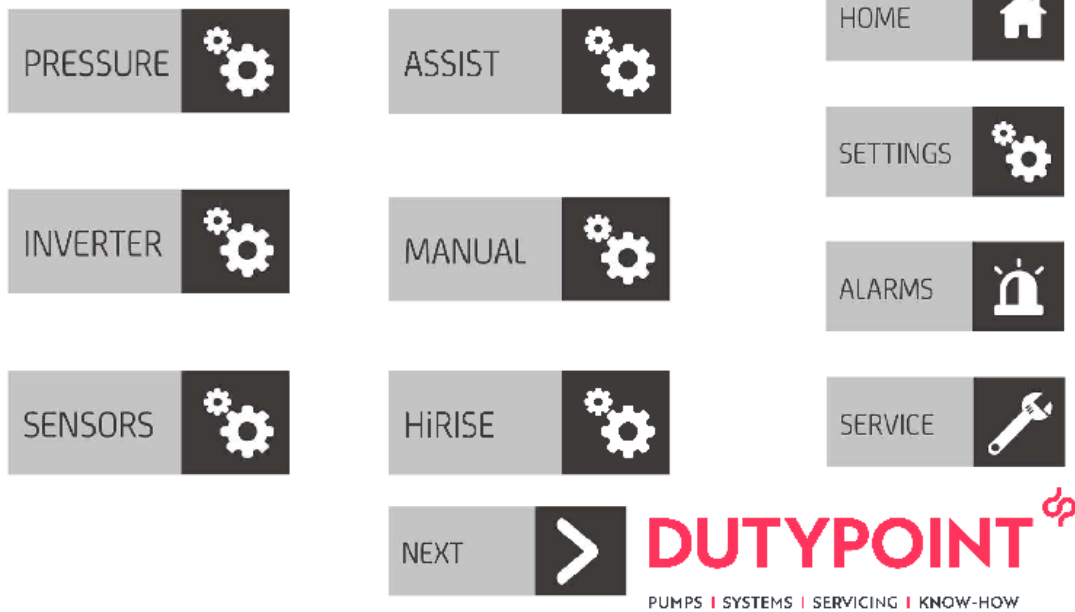
PUMPS | SYSTEMS | SERVICING | KNOW-HOW

Tank Level OK

- SET PRESSURE: Required system pressure setpoint
- ACTUAL PRESSURE: Actual system pressure
- PUMP 1 SPEED: Displays pump 1 running speed and operational status
- PUMP 2 SPEED: Displays pump 2 running speed and operational status
- PUMP 3 SPEED (If fitted): Displays pump 3 running speed and operational status

## 3.4 Settings 1

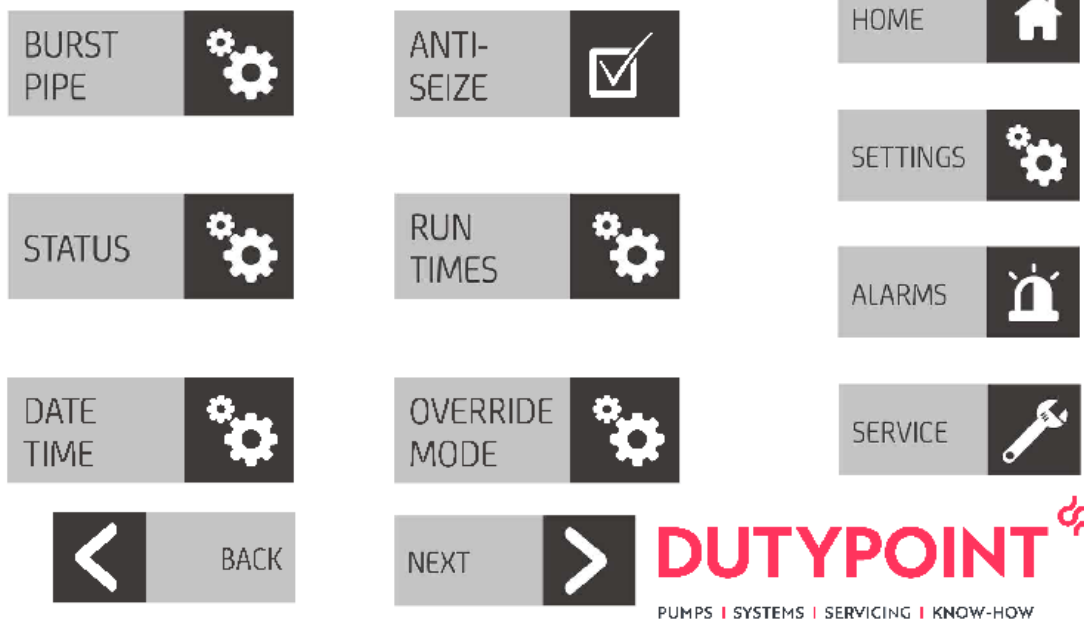
### Settings 1



- PRESSURE: Loads the pressure setpoints screen
- ASSIST: Loads the pump assist settings screen
- INVERTER: Loads the inverter settings screen
- MANUAL: Loads the pump manual control screen
- SENSORS: Loads the sensor settings screen
- HiRISE: Loads the HiRISE settings screen
- NEXT: Loads settings 2 page

## 3.5 Settings 2

### Settings 2



- BURST PIPE SETTINGS: Loads the burst pipe protection settings screen
- ANTI-SEIZE: Loads the pump anti-seize settings screen
- STATUS: Loads the pump status screen
- RUN TIMES: Loads the system & pump run time screen
- DATE TIME: Loads the date and time setting screen
- OVERRIDE MODE: Loads the override mode settings screen
- BACK: Returns to settings 1 page
- NEXT: Loads the settings 2 page

## 3.6 Settings 3

### Settings 3



- LOGIN: Loads the change user login dialog. Admin user username and password as below
  - o Username admin99
  - o Password admin
- BACK: Returns to Settings 2 screen

## 3.7 Pressure Settings

### Pressure Settings

Required Pressure  Bar

Over Pressure Alarm Setpoint  Bar

Over Pressure Alarm Delay  Sec

Pressure Drop To Start Pump  Bar



- **REQUIRED PRESSURE:** Desired system pressure set point
- **OVER PRESSURE ALARM SETPOINT:** Desired over pressure alarm setpoint (this pressure is added to the Required Pressure setpoint) the actual over pressure setpoint is displayed to the right of the value
- **OVER PRESSURE ALARM DELAY:** Delay time after over pressure has been reached before the pumps are shutdown.
- **PRESSURE DROP TO START PUMP:** Required pressure drop below setpoint to start pump operation

## 3.8 Assist

### Assist Settings

Assist Start Frequency	<input type="text" value="59.0"/>	Hz
Assist Stop Frequency	<input type="text" value="49.0"/>	Hz
Assist Ramp Time	<input type="text" value="5"/>	Sec
Assist Pump Start Delay Time	<input type="text" value="5"/>	Sec
Assist Pump Stop Delay Time	<input type="text" value="60"/>	Sec



**DUTYPOINT** 

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- ASSIST START FREQUENCY: Frequency which the running pump needs to reach before starting an assist pump (if enabled)
- ASSIST STOP FREQUENCY: Frequency for the running pumps to reach before stopping an assist pump (if enabled)
- ASSIST RAMP TIME: Assist pump inverter ramp up time – how fast the pump spins up to speed
- ASSIST PUMP START DELAY TIME: Delay time before starting an assist pump once the assist start speed has been reached
- ASSIST PUMP STOP DELAY TIME: Delay time before stopping an assist pump once the assist stop speed has been reached



## 3.9 Inverter Settings 1

### Inverter Settings 1

Pump Max Speed  Hz

Pump Max Head (Hmax)  M

Min Duty Speed  Hz

Min Run Time  Sec






Number of Pumps Fitted





- PUMP MAX SPEED: Maximum rated pump speed (as per pump data plate)
- PUMP MAX HEAD (Hmax): Maximum pump head (Hmax) as per pump data plate
- MIN DUTY SPEED: Automatically calculated minimum pump running speed (read only)
- MIN RUN TIME: How long the pump should idle for once duty has been reached before shutting the pump down
- NUMBER OF PUMPS FITTED: Number of pumps physically fitted to the booster
- NEXT: Loads Inverter Settings 2 screen

## 3.10 Inverter Settings 2

Inverter Settings 2

Number Of Duty Pumps	<input type="text" value="3"/>		HOME 
Automatic Pump Changeover Time	<input type="text" value="1"/> H	Enabled 	SETTINGS 
Ramp Up Time	<input type="text" value="1"/> Sec		ALARMS 
Ramp Down Time	<input type="text" value="1"/> Sec		SERVICE 
Motor Rated Current	<input type="text" value="4.8"/> A		

 BACK

**DUTYPOINT**   
PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- **NUMBER OF DUTY PUMPS:** Number of pumps required to fulfil the duty required. I.e, 2 pump booster running Duty/Assist = 2. 2 Pump booster running Duty/Standby = 1.
- **AUTOMATIC PUMP CHANGEOVER TIME:** If one pump runs continuously for this time (in hours) it will be automatically stopped and the next pump with the lowest run time will be started. This can also be enabled or disabled if desired
- **RAMP UP TIME:** Initial pump start ramp up time
- **RAMP DOWN TIME:** pump stop ramp down time
- **MOTOR RATED CURRENT:** Motor rated current as per motor data plate (ensure correct amps for booster voltage is entered.)
- **BACK:** Returns back to Inverter Settings 1 screen

## 3.11 Manual Control

### Manual Control

Pump 1	Pump 2	Pump 3
PUMP AUTO <input checked="" type="checkbox"/>	PUMP AUTO <input checked="" type="checkbox"/>	PUMP AUTO <input checked="" type="checkbox"/>

Manual Speed

30.0

#### CAUTION

This manual override function will disregard any system protection. Pumps will run continuously which may cause premature system or pump failure. Failure or damage due using this mode will void the warranty.



# DUTYPOINT

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

### Manual Control

Pump 1	Pump 2	Pump 3
PUMP AUTO <input checked="" type="checkbox"/>	PUMP AUTO <input checked="" type="checkbox"/>	PUMP AUTO <input checked="" type="checkbox"/>
STOP <input checked="" type="checkbox"/>		

Manual Speed

30.0

#### CAUTION

This manual override function will disregard any system protection. Pumps will run continuously which may cause premature system or pump failure. Failure or damage due using this mode will void the warranty.



# DUTYPOINT

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

This is where the pumps can be manually controlled if required. When in automatic mode the pumps will start and stop as required by the system. Pressing the PUMP AUTO will stop the pump running in automatic mode. The STOP button can be pressed to manually start the pump. Pressing the stop button or the Pump Auto button will stop the pump and return it back to automatic mode.

Placing any pump into manual mode will trigger the alarm which can only be reset once the pump is put back into automatic mode.

Number of pumps fitted will depend on how many pump manual control buttons appear in the screen

If the pump is running when put into manual mode, the next available pump will start to maintain the pressure requirements to the system

**NOTE, the manual override function will disregard any system protection. Pumps could run continuously which may cause premature system or pump failure. Failure or damage due to using this mode will void the warranty.**

### 3.12 Sensor Settings

#### Sensor Settings

Pressure Sensor Max Range  Bar

Pressure Sensor Min Range  Bar



**DUTYPOINT**   
PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- PRESSURE SENSOR MAX RANGE: Maximum range of the fitted pressure transducer
- PRESSURE SENSOR MIN RANGE: Minimum range of the fitted pressure transducer (normally 0)

### 3.13 HiRISE Settings

#### HiRISE Settings

HiRISE Run Time	<input type="text" value="90"/>	Sec
Number of HiRISE Pumps	<input type="text" value="2"/>	
HiRISE Setpoint (% of Required Pressure)	<input type="text" value="60"/>	% <input type="text" value="3.0"/> BAR
Low Water Recovery Time	<input type="text" value="60"/>	Sec
HiRISE Ramp Time	<input type="text" value="20"/>	Sec

RESTART HiRISE	<input checked="" type="checkbox"/>
-------------------	-------------------------------------



- **HiRISE RUN TIME:** How long the HiRISE function will run for on power restoration or low water event
- **NUMBER OF HiRISE PUMPS:** How many pumps to run during the HiRISE function
- **HiRISE SETPOINT:** Required pressure for HiRISE (actual pressure automatically calculated from % of required pressure) Actual setpoint is displayed on the right.
- **LOW WATER RECOVERY TIME:** Delay time after the low water float is reset before the system restarts – this is to prevent any short cycling if demand is higher than incoming water supply
- **HiRISE RAMP TIME:** Ramp up time for the inverters while in HiRISE mode
- **RESTART HiRISE:** This will stop the booster running in pressure control mode and restart the HiRISE function. If there is an active demand on the system a pressure reduction in the system will be caused.

## 3.14 Burst Pipe Settings

### Burst Pipe Settings

Burst Pipe Pressure Setpoint

3.0

Bar

2

Burst Pipe Delay

30

Sec

HOME



SETTINGS



ALARMS



SERVICE

BURST  
ENABLE

Enabled

# DUTYPOINT

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- BURST PIPE PRESSURE SETPOINT: Pressure below setpoint with pumps running to trigger the burst pipe alarm (All duty pumps need to be running before this is activated) Pressure drop below setpoint – actual alarm setpoint displayed to the right
- BURST PIPE DELAY: Delay time once the alarm pressure has been reached before alarm is triggered and pumps are shut down – alarm requires manual reset
- BURST ENABLE: Enabled/Disables burst pipe monitoring function

### 3.15 Anti-Seize settings

#### Anti Seize Settings

Spin Speed  Hz

Max Idle Time  H

Anti Seize Spin Time  Sec



Anti Seize Function Enabled



**DUTYPOINT**   
PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- SPIN SPEED: Required pump speed while anti seize spin is functional
- MAX IDLE TIME: Maximum permitted idle time required to elapse before pump is started to prevent seizing
- ANTI SEIZE SPIN TIME: How long to spin the pump for
- ANTI-SEIZE BUTTON: Enables/disables anti seize function

## 3.16 Pump Status

### Pump Status

Pump 1	Pump 1	Pump 1
Pump Ready - Auto	Pump Ready - Auto	Pump Ready - Auto
0.0 Hz	0.0 Hz	0.0 Hz
0.0 A	0.0 A	0.0 A



- Pump status: Displays pump status – if it is in auto, manual, low water etc
- Hz: Displays current motor running speed
- A: Displays current motor current draw in Amps



## 3.17 Pump Run Times

### Pump Run Times

System Run Time	6h 55m 7s
Pump 1 Run Time	7h 12m 22s
Pump 2 Run Time	7h 6m 32s
Pump 3 Run Time	7h 11m 56s

HOME



SETTINGS



ALARMS



SERVICE







# DUTYPOINT

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- SYSTEM RUN TIME: Displays total system up time
- PUMP 1 RUN TIME: Displays pump total run time
- PUMP 2 RUN TIME: Displays pump total run time
- PUMP 3 RUN TIME (If fitted): Displays pump total run time



### 3.18 Date & Time

Date & Time	03/06/21 - 11:22:21		HOME 
Set Year	<input type="text" value="2021"/>	<input type="button" value="Set"/>	SETTINGS 
Set Month	<input type="text" value="6"/>	<input type="button" value="Set"/>	ALARMS 
Set Day	<input type="text" value="3"/>	<input type="button" value="Set"/>	SERVICE 
Set Hour	<input type="text" value="10"/>	<input type="button" value="Set"/>	
Set Minutes	<input type="text" value="21"/>	<input type="button" value="Set"/>	

**DUTYPOINT**   
 PUMPS | SYSTEMS | SERVICING | KNOW-HOW

If the date and time need changing – enter the correct date/time in the relevant box and press the set button to save the new value. To compensate for BST an hour may need to be removed from the new hour value

### 3.19 Override Mode

Override Mode			HOME 
Override Required Pressure	<input type="text" value="4"/>	BAR	SETTINGS 
Number of Override Pumps	<input type="text" value="1"/>		ALARMS 
Disable Low Pressure Cutout	<input type="text" value="true"/>		SERVICE 
Disable Low Water Cutout	<input type="text" value="false"/>		

**WARNING:**  
 This feature is for use in emergency situations only and must only be activated by suitably qualified competent persons. Use of this functionality is logged in detail to memory, and extended use/misuse will invalidate warranty.

**DUTYPOINT**   
 PUMPS | SYSTEMS | SERVICING | KNOW-HOW

- OVERRIDE REQUIRED PRESSURE: Required system pressure while in override mode
- NUMBER OF OVERRIDE PUMPS: Number of duty pumps required while in override mode
- DISABLE LOW PRESSURE CUTOFF: Enables/Disables low system pressure monitoring function
- DISABLE LOW WATER CUTOFF: Enables/Disables low water cut out. If disabled then the booster set will be able to run dry and not shut down – fatal pump damage can be caused.

Override mode is a function which can alter the required pressure based on an external input to the booster.

An example would be for a separate duty for fire sprinklers. The booster can accept an input from a fire alarm panel (normally closed) which on activation will change the booster setpoint to suit the duty required for the sprinklers.

This mode allows the overriding of important booster safety features such as the low level float switch, care must be taken that the booster/building systems do not sustain serious damage while using this function.


**NOTE: This feature is for use in an emergency situation only and must only be activated by suitably qualified competent persons. Use of this functionality is logged in detail to memory which cannot be deleted. Extended use/misuse will invalidate warranty.**


Dutypoint LTD cannot be held responsible for damage occurred/sustained while this function is active


## 3.20 Alarms


Alarms


Name	Value	Time	Description	Severity


HOME



SETTINGS


ALARMS


SERVICE


RESET ALARMS


ALARMS HISTORY




PUMPS | SYSTEMS | SERVICING | KNOW-HOW

Any active alarms will be displayed in the window. Self-resetting alarms will automatically reset and normal booster operation will resume

Any alarms which require a manual reset will remain active in the window – Reset Alarms button will attempt to reset the alarm, providing the fault condition has been resolved.

Historical stored alarms are saved to the memory and can be viewed by pressing the ALARMS HISTORY button – this will load the alarm history screen

A list of alarms is listed at the end of this document.

## Alarm History:

Timestamp	Name	State	Value	Description
31/12/20 - 03:36:30	Pump1Manua	Not Triggered	0	Pump 1 in ma
31/12/20 - 03:34:47	Pump1Manua	Triggered	1	Pump 1 in ma
31/12/20 - 00:01:20	LowWater	Not Triggered	0	Low Wate
31/12/20 - 00:00:20	ExternalDisabl	Not Triggered	0	Booster disabled v
31/12/20 - 00:00:20	LowWater	Triggered	1	Low Wate
31/12/20 - 00:00:20	ExternalDisabl	Triggered	1	Booster disabled v
05/12/18 - 21:46:32	LowWater	Not Triggered	0	Low Wate
05/12/18 - 21:46:13	LowWater	Triggered	1	Low Wate
30/11/18 - 06:16:24	HighPressure	Not Triggered	0	High pressure sh
30/11/18 - 06:15:50	HighPressure	Triggered	1	High pressure sh
30/11/18 - 05:07:04	LowWater	Not Triggered	0	Low Wate



# DUTYPOINT

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

Historical alarms are saved and can be viewed in the historical alarm viewer. The triggered alarms will display in red with a white double entry once the alarm has cleared.

This list cannot be reset or cleared by the user.

## 3.21 Service Contact

### Service Contact

Dutypoint Ltd  
Shepherd Rd  
Gloucester  
GL2 5EL

service@dutypoint.com  
01452 300 590

Serial Number	12345
PLC Version	SmartBoost_021220_3512
HMI Version	SmartBoost_VT_090421
Service Due In (Days)	184

HOME



SETTINGS



ALARMS



SERVICE

**DUTYPOINT** 

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

This page displays Dutypoint contact details, the booster Serial Number, PLC & HMI software versions and how many days remain until the next service is due. This cannot be reset by anyone other than a qualified Dutypoint engineer.

### 3.22 Alarms & resolutions

Alarm	Cause	Resolution	Reset
Burst Pipe	System has detected low system pressure with all duty pumps running.	<ul style="list-style-type: none"> <li>• Check pumps are vented</li> <li>• Check there is water in the storage tank</li> <li>• Check system for major leaks</li> </ul>	Manual
Inverter 1 Comms	Controller has detected loss of communication to inverter 1	<ul style="list-style-type: none"> <li>• Check inverter is powered on and MCB hasn't tripped</li> <li>• Check inverter doesn't have an error on the screen</li> <li>• Check cables between controller &amp; inverter are tight (CAT 5 cables)</li> </ul>	Auto
Inverter 2 Comms	Controller has detected loss of communication to inverter 2	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Auto
Inverter 3 Comms (if fitted)	Controller has detected loss of communication to inverter 3	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Auto
Inverter 4 Comms (if fitted)	Controller has detected loss of communication to inverter 4	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Auto
Inverter 5 Comms (if fitted)	Controller has detected loss of communication to inverter 5	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Auto
Inverter 6 Comms (if fitted)	Controller has detected loss of communication to inverter 6	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Auto
External Disable	Booster has been disabled by an external source ie BMS etc	<ul style="list-style-type: none"> <li>• Check BMS or other externally connected control systems</li> </ul>	Auto
Inverter 1 Disable	Inverter 1 has been disabled locally – will only appear if terminals on inverter 1 & 2 have become disconnected	<ul style="list-style-type: none"> <li>• Check terminals 1 &amp; 2 on inverter are still connected</li> </ul>	Auto
Inverter 2 Disable	Inverter 2 has been disabled locally – will only appear if terminals on inverter 1 & 2 have become disconnected	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Auto

Inverter 3 Disable (if fitted)	Inverter 3 has been disabled locally – will only appear if terminals on inverter 1 & 2 have become disconnected	<ul style="list-style-type: none"> <li>As above</li> </ul>	Auto
Inverter 4 Disable (if fitted)	Inverter 4 has been disabled locally – will only appear if terminals on inverter 1 & 2 have become disconnected	<ul style="list-style-type: none"> <li>As above</li> </ul>	Auto
Inverter 5 Disable (if fitted)	Inverter 5 has been disabled locally – will only appear if terminals on inverter 1 & 2 have become disconnected	<ul style="list-style-type: none"> <li>As above</li> </ul>	Auto
Inverter 6 Disable (if fitted)	Inverter 6 has been disabled locally – will only appear if terminals on inverter 1 & 2 have become disconnected	<ul style="list-style-type: none"> <li>As above</li> </ul>	Auto
Override Mode	Booster has been put into a 2 <sup>nd</sup> required value mode by an external control source – this may be a fire alarm etc.	<ul style="list-style-type: none"> <li>Check BMS or Fire alarm panels for external signal</li> </ul>	Auto
High Pressure	Controller has detected high system pressure	<ul style="list-style-type: none"> <li>Pump speed set too high for duty</li> <li>Pressure vessel failed</li> <li>Pump ramp time too fast</li> </ul>	Manual
Pump 1 Manual	Pump 1 has been put into manual control	<ul style="list-style-type: none"> <li>Pump has been put in to manual control in the HMI settings</li> </ul>	Auto
Pump 2 Manual	Pump 2 has been put into manual control	<ul style="list-style-type: none"> <li>Pump has been put in to manual control in the HMI settings</li> </ul>	Auto
Pump 3 Manual (if fitted)	Pump 3 has been put into manual control	<ul style="list-style-type: none"> <li>Pump has been put in to manual control in the HMI settings</li> </ul>	Auto
Pump 4 Manual (if fitted)	Pump 4 has been put into manual control	<ul style="list-style-type: none"> <li>Pump has been put in to manual control in the HMI settings</li> </ul>	Auto
Pump 5 Manual (if fitted)	Pump 5 has been put into manual control	<ul style="list-style-type: none"> <li>Pump has been put in to manual control in the HMI settings</li> </ul>	Auto
Pump 6 Manual (if fitted)	Pump 6 has been put into manual control	<ul style="list-style-type: none"> <li>Pump has been put in to manual control in the HMI settings</li> </ul>	Auto



Pump 1 No Load	Controller has detected pump 1 isn't drawing any current	<ul style="list-style-type: none"> <li>• Check motor power cables from inverter to motor terminals</li> <li>• Motor has failed</li> <li>• Check motor is connected to pump housing</li> </ul>	Manual
Pump 2 No Load	Controller has detected pump 2 isn't drawing any current	<ul style="list-style-type: none"> <li>• Check motor power cables from inverter to motor terminals</li> <li>• Motor has failed</li> <li>• Check motor is connected to pump housing</li> </ul>	Manual
Pump 3 No Load (if fitted)	Controller has detected pump 3 isn't drawing any current	<ul style="list-style-type: none"> <li>• Check motor power cables from inverter to motor terminals</li> <li>• Motor has failed</li> <li>• Check motor is connected to pump housing</li> </ul>	Manual
Pump 4 No Load (if fitted)	Controller has detected pump 4 isn't drawing any current	<ul style="list-style-type: none"> <li>• Check motor power cables from inverter to motor terminals</li> <li>• Motor has failed</li> <li>• Check motor is connected to pump housing</li> </ul>	Manual
Pump 5 No Load (if fitted)	Controller has detected pump 5 isn't drawing any current	<ul style="list-style-type: none"> <li>• Check motor power cables from inverter to motor terminals</li> <li>• Motor has failed</li> <li>• Check motor is connected to pump housing</li> </ul>	Manual
Pump 6 No Load (if fitted)	Controller has detected pump 6 isn't drawing any current	<ul style="list-style-type: none"> <li>• Check motor power cables from inverter to motor terminals</li> <li>• Motor has failed</li> <li>• Check motor is connected to pump housing</li> </ul>	Manual
Pump 1 Overload	Controller has detected pump 1 is drawing more current than permitted	<ul style="list-style-type: none"> <li>• Check pump &amp; motor for signs of seizing</li> <li>• Check motor rated current is correct in settings</li> <li>• Motor windings failing</li> <li>• Check for correct input voltage</li> </ul>	Manual
Pump 2 Overload	Controller has detected pump 2 is	<ul style="list-style-type: none"> <li>• Check pump &amp; motor for signs of seizing</li> </ul>	Manual

	drawing more current than permitted	<ul style="list-style-type: none"> <li>• Check motor rated current is correct in settings</li> <li>• Motor windings failing</li> <li>• Check for correct input voltage</li> </ul>	
Pump 3 Overload (if fitted)	Controller has detected pump 3 is drawing more current than permitted	<ul style="list-style-type: none"> <li>• Check pump &amp; motor for signs of seizing</li> <li>• Check motor rated current is correct in settings</li> <li>• Motor windings failing</li> <li>• Check for correct input voltage</li> </ul>	Manual
Pump 4 Overload (if fitted)	Controller has detected pump 4 is drawing more current than permitted	<ul style="list-style-type: none"> <li>• Check pump &amp; motor for signs of seizing</li> <li>• Check motor rated current is correct in settings</li> <li>• Motor windings failing</li> <li>• Check for correct input voltage</li> </ul>	Manual
Pump 5 Overload (if fitted)	Controller has detected pump 5 is drawing more current than permitted	<ul style="list-style-type: none"> <li>• Check pump &amp; motor for signs of seizing</li> <li>• Check motor rated current is correct in settings</li> <li>• Motor windings failing</li> <li>• Check for correct input voltage</li> </ul>	Manual
Pump 6 Overload (if fitted)	Controller has detected pump 6 is drawing more current than permitted	<ul style="list-style-type: none"> <li>• Check pump &amp; motor for signs of seizing</li> <li>• Check motor rated current is correct in settings</li> <li>• Motor windings failing</li> <li>• Check for correct input voltage</li> </ul>	Manual
Service Due	Booster service due	<ul style="list-style-type: none"> <li>• Book service with Dutypoint</li> </ul>	Engineer only
Transducer failure	Controller has detected a transducer has failed	<ul style="list-style-type: none"> <li>• Check transducers are plugged in</li> <li>• Check isolation valve is open</li> </ul>	Auto
		<ul style="list-style-type: none"> <li>•</li> </ul>	

Changing the IP address:

- Press and hold a blank area of any screen to bring up the Context menu

---

Modbus Connectivity

- Protocol: Modbus Over Ethernet TCP
- IP Address: As setup in IP Settings
- Port: 502
- Memory Type, Function 16 Read Holding Registers

## 0 based registers

## Registers:

Register	Description	Data Type
400000	Actual Pressure	USINT
400001	Required Pressure	USINT
400002	Pump 1 Speed	USINT
400003	Pump 2 Speed (if fitted)	USINT
400004	Pump 3 Speed (if fitted)	USINT
400005	Pump 4 Speed (if fitted)	USINT
400006	Pump 1 Run Time	STRING
400007	Pump 2 Run Time (if fitted)	STRING
400008	Pump 3 Run Time (if fitted)	STRING
400009	Pump 4 Run Time (if fitted)	STRING
400010	Low Water (True active)	BOOL
400011	Transducer Failure (true active)	BOOL
400012	Override Mode Active (true active)	BOOL
400013	Low Pressure Alarm (true active)	BOOL
400014	External Disabled (true active)	BOOL
400015	High Pressure Alarm (true active)	BOOL
400016	General Fault (true active)	BOOL

---

## 4. Installation & Commissioning

### 4.1 Installation and Commissioning Overview

Before shipment, all Dutypoint pump sets are pre-commissioned. Whilst important procedures such as venting and rotational direction checks need to be carried out on site, initial parameters including pressure settings and delay timers will be adjusted to suit the site conditions previously advised to Dutypoint.

In practice, a system can almost invariably be made to perform more efficiently if full commissioning is carried out on site, and we always strongly recommend that commissioning is carried out by a Dutypoint Engineer.

Please note that engineer visits by Dutypoint are priced at one visit to commission one pump set. If there are multiple units on a site, special terms can be negotiated. To arrange a commissioning visit, please call the Technical Service Help line 01452 300590.

The following checks should be carried out at the initial installation before any run tests are performed.

---

#### WARNING

- Ensure that you have read and understood Section [1. Important Safety Information](#) (p. 4).
- 

### 4.2 Pipework and mechanical components

- 1) Ensure that the mounting area and any associated groundwork provides adequate support for the pump set.
- 2) Ensure all supports/brackets are in place and secure.
- 3) Verify all pipe joints are sealed and tight.

### 4.3 Electrical

---

#### WARNING

- These checks MUST be carried out by a competent electrician.
  - Ensure that the power source is sufficient to allow the running of all pumps together where there are multiple pumps in the system. This also applies to 'standby' pumps.
- 

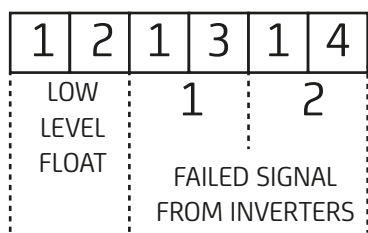
- 1) Check the motor voltage and frequency information on all the motor nameplates and on controllers etc. correspond with that of the source power supply.
- 2) Check that all electrical connections are correctly made and secure. Pay particular attention to earth and bonding connections.
- 3) Carry out specific checks for earth bonding.
- 4) Carry out NICEIC certification checks as required for the installation, e.g Earth Loop Impedance, Insulation Tests, etc.
- 5) Carry out any other pre-start checks recommended by the pump manufacturer. Refer to correct section of this manual. **DO NOT POWER UP AT THIS STAGE.**

### 4.4 Low Level Float Switch Wiring

Terminal 1 and 3 require a normally closed contact in order to allow the pump set to operate. To facilitate this the unit will be supplied with a wire loop between 1 and 3. To install a low level float switch this loop has to be removed and the float switch wired to operate as an open on fail scenario.

If 2 or more float switches are required (due to twin compartment or multiple tanks) all float switches are wired into terminals 1 and 3 in parallel.

Figure 4.8: Terminal Wiring



If installing a Dutypoint FS-series float switch, the following terminals should be used:

BROWN: Terminal 1  
 BLACK: Terminal 3  
 BLUE: Not used - terminate safely

## 4.5 Final Checks Before Commissioning

- 1) Re-check all equipment for any accidental damage caused during installation.
- 2) Carry out the pre-charging and venting procedures described next.

## 4.6 Pressure Vessel Pre-Charging (If fitted)

Refer to Section 8.3

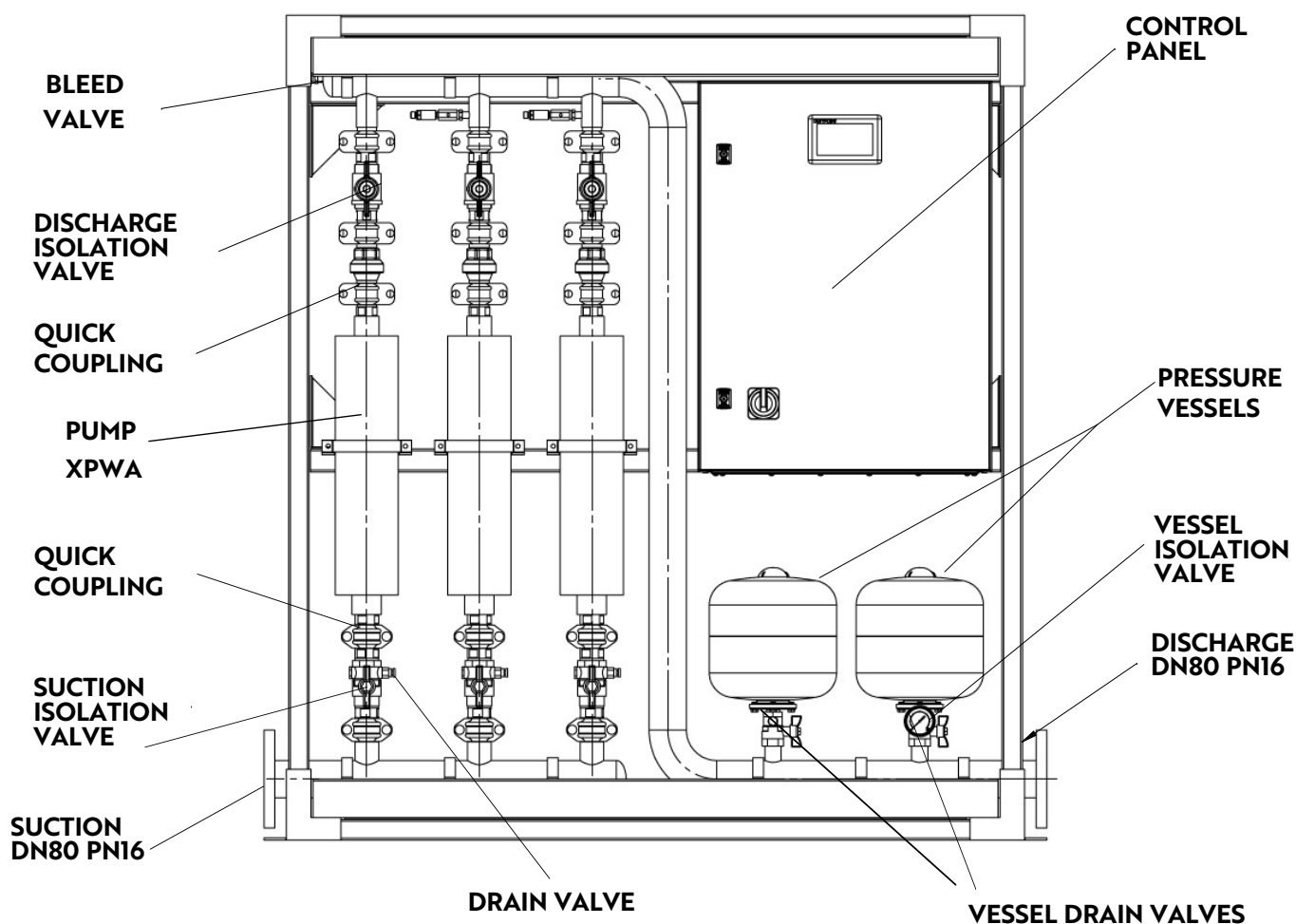
## 4.7 Venting Pumps

It is important to bleed all air from the pump body before initial start-up.

See Section 4.8 for further detail.

## 4.8 Procedure for flooded suction

Flooded Suction is defined as the condition where there is positive pressure on the suction (inlet) side of the pump(s) as is the case where the storage tank water level is at the same or higher level than the pump.



This procedure should be carried out individually for each pump in the pump set.

- 1) Open all valves on the suction (inlet) side of the pump.
- 2) Using the bleed valve on the suction manifold, allow any air in the pump body and suction pipework to vent to atmosphere.
- 3) When water (under pressure from the storage tank feeding the pump on the suction side) has filled the pumps - and no more air bubbles can be seen - close the vent screw. Depending on the height of the tank, it may be necessary to connect a hose to the bleed valve and top the system up with water.
- 4) Switch on the electrical supply to the pump motor and start the pump in AUTO mode. As each motor starts verify that the direction of rotation correctly corresponds with the direction of the arrow shown on the body of the pump. If rotation is backward STOP, switch off the pump and investigate.
- 5) Slowly open the valve on the discharge manifold outlet to the system allowing water to be pumped into the system.
- 6) Switch off, re-close the discharge valve and repeat steps 3 to 6 several times to ensure that all air is released from the pump body and local pipework.

The above procedure should be carried out individually for each pump in the pump set.

## 4.9 Procedure for Lift Suction

Lift Suction is defined where the water storage tank is at a lower level than the pump set. In this case a negative pressure condition may exist at the pump suction.

**NOTE:** The "Lift Suction" mode of operation requires specific venting procedures. Please call Dutypoint Systems Technical Support on +44 (0)1452 300590 for advice before attempting to vent the pump(s).

The advised procedure should then be carried out individually for each pump in the pump set.

## 4.10 Programming the Controller

Dutypoint Systems fit a design of Inverter/Controller that is most suitable for the design duty of the pump set.

Manufacturer's information for them is detailed later in this manual.

Carefully follow the appropriate step-by-step setting-up procedures contained in the manual, ensuring that any data required to be entered by the end user is accurately inserted where requested.

**Default login details: Username: eng Password: 123**

If in doubt please call Dutypoint Systems Technical Support on 01452 300590 for advice.

## 4.11 Operation and Performance Tests

Having checked that the pump set is installed, pre-charged, and vented in accordance with the procedures set out earlier, carry out following running tests before handing over the pump set for operational use.

- 1) Run each pump by selecting HAND (Manual) control.
- 2) Re-select to AUTO mode.
- 3) Create the conditions for a normal start and run and allow the selected 'Duty' pump to run. Whilst running observe the pressure values. Verify the pump motor speeds up / slows down in accordance with the desired control philosophy.

## 4.12 Duty/Standby Pump Sets

- 1) On Duty/Standby sets, wait for a normal stop to take place (or create the conditions where this would happen) and check that the 'Duty' pump stops. Whilst stopped simulate a fault by inhibiting the 'Duty' pump and then recreate the conditions for a normal start to take place. Check that the 'Standby' Pump now starts and runs in place of the inhibited 'Duty' pump and observe the pressure values. Verify that the pump motor speeds up / slows down in accordance with the desired control philosophy.
- 2) Wait for a normal stop to take place (or create the conditions where this would happen) and check the 'Standby' pump stops. Whilst stopped undo the inhibit to the 'Duty' pump which should now return to normal.

---

## 4.13 Duty/Assist Pump Sets

- 1) For 'Duty/Assist' applications, run the system up to pressure using the 'Duty' Pump only, then deliberately create the condition(s) which will require the 'Assist' Pump to operate as well. (e.g: open taps to reduce the pressure in the system to a point where one pump only cannot maintain the required output. Verify that the 'Assist' Pump starts and runs together with the 'Duty' Pump and that the desired pressure is duly restored and maintained.
- 2) Close the taps again (thereby reducing the demand) and check the 'Assist' Pump slows down and stops, allowing the 'Duty' Pump to continue on its own.

## 4.14 Commissioning/Handover Check

- 1) Record any indicated voltage / amperage / pressure data / controller passwords for future reference.
- 2) Re-check all isolating valves are fully open and replace any cover(s).
- 3) With all the isolators ON and the switches and/or control programs set to AUTO, the pump set is now fully operational in automatic control mode.

**NOTE:** No manual operation or attendance is required other than for routine servicing and maintenance checks. Other than for maintenance purposes, the supply to the Controller(s) and the Pump motor(s) should never be switched off.

# 5. User Maintenance

Routine user maintenance for Dutypoint pump sets.

Dutypoint pump sets have been designed to keep major maintenance requirements to a minimum. Planned maintenance of the pumps and other principal components should therefore be undertaken at the intervals recommended in the manuals referenced below.

It is essential that a full test following the Pre-Commissioning procedure is carried out on an annual basis.

In addition, the operator in charge should routinely make visual checks of the equipment during use, noting particularly any unusual noises or vibrations. This will give an immediate indication of any irregularity in the operation of the system.

## DANGER!

**Do not commence any work until:**

- You have read [1. Important Safety Information](#) (p. 4)
- You have the appropriate personal protective equipment
- You have all necessary safety equipment to hand

Refer to the appropriate manufacturer's information that is provided in the appendices of this manual for the equipment being serviced.

**Table 5.8:** Periodic User Checks for Pump Sets

Timing	Checks
Weekly	<ol style="list-style-type: none"> <li>1) Visually check the complete pump set</li> <li>2) Observe the running of the pump(s) and note any unusual vibrations or sounds.</li> </ol>
Quarterly	<ol style="list-style-type: none"> <li>1) Visually check the complete pump set</li> <li>2) Observe the running of the pump(s) and note any unusual vibration, etc.</li> <li>3) Check the cooling fan and vents on the Control Unit(s) and clear any dust or other obstructions</li> <li>4) Operate each manual isolating valve three times to ensure continued efficient working</li> </ol>
6-monthly	The pressure vessel (if fitted) should be drained and the pre-charge pressure checked. See the relevant section for more details. Ensure Non-Return Valves are still operating correctly and not letting by.
12-monthly (essential)	Carry out the full pre-commissioning procedure to verify safe operation - see <a href="#">4. Commissioning</a> (p. 26).





## 6. Booster Set Troubleshooting

The information in this section is common to all Dutypoint pump sets. For more detailed troubleshooting information that is specific to the type and model of pump and controller used in this product, please refer to the manufacturer's literature.

### FIRST STEP WHEN A FAULT OCCURS:

- When a fault first occurs, turn off the main power to the pump set and leave off for around 1 minute.
- Switching power back on and re-energising the system may be sufficient to clear the fault.

### 6.1 Booster Set Problems, Causes and Recommended Actions

Problem	Possible Causes	Recommended Action
Pump will not start	No electrical power	Check and rectify
	Blown fuse	Check and rectify
	Overload trip	Check and rectify
Low or zero output discharge	The rotating part(s) of the pump is/are partially or completely obstructed, e.g. impeller obstructed by foreign matter	Strip the pump to inspect and rectify
	Pump not primed - WARNING: running the pump 'dry' can cause serious damage to the mechanical seal.	Having first checked the mechanical seal for damage, prime and air-bleed the pump and try again
	Valve in suction pipework closed or partially closed.	Check all appropriate valves are fully open.
	Incorrect pump rotation	Check and rectify.
Pump vibrates and/or is noisy	Pump is cavitating	Increase the discharge back pressure slightly by progressively closing a manual isolating valve on the discharge side until the cavitation stops.
	Motor bearings worn	Check and rectify
	The rotating part(s) of the pump is(are) partially or completely obstructed. E.g. impeller obstructed by foreign matter.	Strip the pump to inspect and rectify
Pump runs continuously	If the pump has a "Hand Control" option on it's control panel.	Switching to "Auto" should restore normal control. If normal control is not returned an immediate service visit is required.
	Pump has no "Hand Control" option.	An immediate service visit is required.

<b>Problem</b>	<b>Possible Causes</b>	<b>Recommended Action</b>
Overload trip	Pipework or the pump chamber has a partial blockage.	Check and rectify
	Momentary loss of one phase of power supply	Check and try again
	Discharge flow rate too high	Reduce by the discharge flow rate by increasing the discharge back pressure slightly, progressively closing a manual isolating valve on the discharge side: then try again
	Overload trip setting too low for rated duty	Check and (if necessary) reset the overload trip value

## 6.2 Additional Troubleshooting

---

### **WARNING : RISK OF ELECTRIC SHOCK**

- Before any repairs to the pump, check that the power supply is disconnected and that it cannot be accidentally reconnected during maintenance operations
- 

### **WARNING: HOT AND HAZARDOUS LIQUIDS**

- If the pump is used for hot and/or hazardous liquids, the personnel carrying out repair work must be informed.
  - Clean the pump in order to ensure the safety of the operator
- 

### **WARNING: RISK OF IMPROPER USE**

- The pump must be serviced and repaired by authorised personnel
  - Improper maintenance can void warranty and cause additional hazards
-

Problem	Possible Causes	Action
The pump turns but does not delivery liquid	Internal parts are obstructed by foreign bodies	Disassemble and clean the pump
	The suction pipe is blocked	Unblock the pipe
	Air is entering the suction pipe	Check that the pipe is airtight right up to the pump and seal
	The pump is not primed	Re-prime the pump by filling it. Check that the base valve is air tight
	The suction pressure is too low and generally accompanied by cavitation noise	Excessive loss of heat in suction or the suction height is excessive (check the NPSH of the pump)
	Voltage is too low to power the motor	Check the voltage of the motor terminals and the correct diameter of the connections
The pump vibrates	Anchorage to base not tight	Check and fully tighten the nuts on the bolts of the studs
	Foreign bodies obstructing the pump	Disassemble and clean the pump
	Obstruction in the pump rotation	Check that the pump can rotate freely without any abnormal resistance
	Faulty electrical connection	Check the pump connections
The motor heats up abnormally	Insufficient voltage	Check the voltage at the motor terminals - the voltage should be $\pm 10\%$ (6% for 60Hz motors) of the rated voltage
	Pump blocked by foreign bodies	Disassemble and clean the pump
	Ambient temperature higher than 40°C	The motor is designed to function at a maximum ambient temperature of 40°C at full speed. Contact Dutypoint Service to discuss.
	Connection error in the terminal board	Follow the instructions on the motor plate.
The pump does not deliver sufficient pressure	The motor is not rotating at normal speed	Disassemble pump and correct the problem
	Motor faulty	Replace motor
	Pump is not filling properly	Open the bleed valve of the pump and bleed until all air bubbles disappear
	Motor rotating in reverse	Invert the rotation direction by exchanging two phase wires on the motor terminal board, or the motor protection breaker.
	The discharge-priming cap is not fully screwed on	Check and tighten
	Voltage insufficient to power the motor	Check the voltage of the motor terminals and the correct diameter of the connections

<b>Problem</b>	<b>Possible Causes</b>	<b>Action</b>
The automatic circuit breaker trips	Relay value is too low	Check the intensity with an ammeter or record the intensity value indicated on the motor plate
	Voltage is too low	Check that the diameter of the conductors of the electrical cable is correct
	Interruption of a phase	Check the electrical cable or fuse and replace if necessary
	Relay is faulty	Replace relay
The flow is not regular	The suction height is not observed	Check the installation conditions and the recommendations in this manual
	The suction pipe diameter is smaller than the diameter of the pump connections	The suction pipe diameter should match the pump
	The filter and suction piping are partially blocked	Clean the suction duct

# 7. Vertical Multistage Pumps

## WARNING: ELECTRICAL HAZARD

- All instructions in this section of the manual should be observed when working on the pumps
- Failure to observe these instructions may result in electric shock, with serious risk of death or injury

## WARNING: HOT SURFACES

- Follow all safety instructions

## WARNING: NOT SAFE FOR CHILDREN OR THOSE WITH REDUCED PHYSICAL, SENSORY OR MENTAL ABILITIES

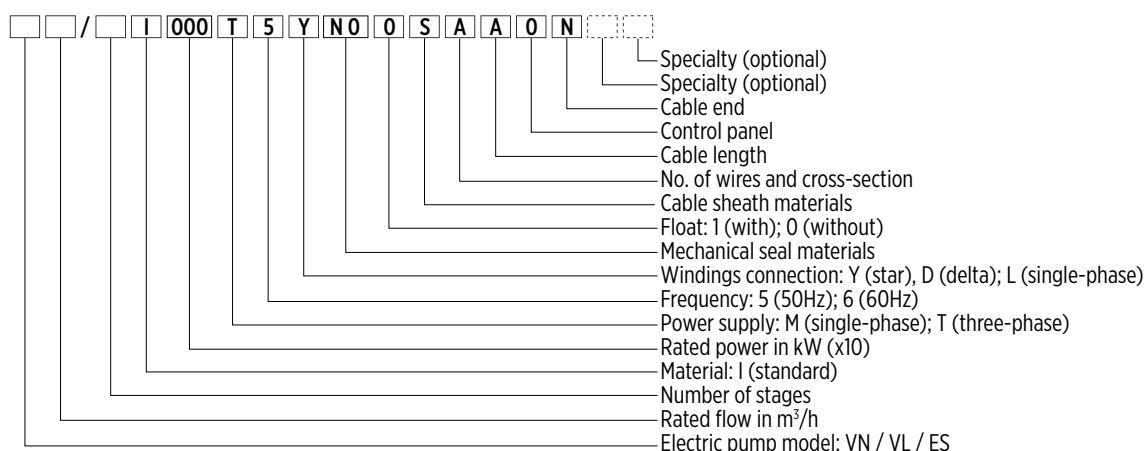
- This equipment must not be used by children, those with reduced abilities or those lacking in experience, expertise, unless supervised or instructed
- Children should not be allowed to use the equipment or play in the vicinity

**NOTE:** The pump should not be used outside the limits described in the technical specifications. It is necessary to observe the instructions regarding the nature, density, temperature and volume of the pumped liquid, rotation speed and direction, pressure and motor power as well as all the other instructions contained in this manual or the documentation attached to the contract. The data plate indicates the model, the main service specifications and the serial number. It is important to provide these indications when requesting repairs or support and for requesting spare parts.

**NOTE:** The manufacturer declines all liability for any damage that may, directly or indirectly, be caused to people or things as a result of failure to observe all of the provisions indicated in the instructions manual provided and in particular the warnings concerning installation, use and maintenance of the electric pump or in conditions other than those specified on the data plate. The warranty expires definitively in the case of negligence or incorrect use of the product.

## 7.1 Identification of Pump Model and Specification

**Figure 7.10:** Dutypoint XPWA Pumps Type Indicator



**Figure 7.11:** Pump Data Plate

## 7.2 Approved Applications

The pump is suitable for the following applications:

- Clean water applications at room temperature

## 7.3 Forbidden Uses

The pump is not suitable for:

- Pumping liquids not compatible with construction materials.
- Pumping hazardous liquids (for example toxic, explosive, inflammable or corrosive liquids)
- Pumping food grade liquids other than water (for example wine or milk)
- Pumping liquids containing abrasive, solid or fibrous substances
- Working outside of the rated capacity field specified on the data plate
- Environments with explosive or corrosive atmospheres
- Outdoor installations without protection from atmospheric agents (e.g. sun, rain, high or freezing temperatures)

## 7.4 Special Uses

Contact Dutypoint in the following cases:

- If the pump is used to pump liquids with viscosity or density greater than water (a motor with a proportionately higher power should be used).
- The water to be pumped has been chemically treated (softened, chlorinated, de-mineralised etc.)
- In any other situation other than those listed under permitted use.



## 7.5 Starting the Pump

Before start-up, check that:

- Electrical power is off and isolated.
- Check the pump set is primed correctly
- The pump set is correctly connected to the power supply
- The discharge valve is closed and the Suction valve(s) are open.
- Ensure that all **isolation valves** are open.

Starting procedure:

- 1) Start the pump set
- 2) Gradually open the valve on the discharge side of the pump set
- 3) After a few seconds of noisy operation to expel any air, the pump should function quietly and regularly without any changes in pressure. If not, refer to the Troubleshooting table.

## 7.6 Emptying & Replacing the Pump

If it is necessary to empty/replace the pump, for example for maintenance or long periods of inactivity:

- 1) Switch off the pump set and isolate the electrical power.
- 2) Close the Suction and Discharge valves to isolate the pump.
- 3) Slowly open the Pump Drain valve located above the Suction Isolation Valve and allow water to drain into a container.
- 4) Remove the the pump and disconnect the power cable in the Control Panel.
- 5) Replace with a new XPWA pump.

**NOTE:** Some liquid may remain in the pump following this procedure. In order to remove all liquid, the pump must be completely disassembled.

---

### **WARNING: LIQUID CAN CAUSE DAMAGE**

- Pay attention to the discharged liquid to ensure that it does not cause damage to persons or property
- 

## 7.7 Maintenance and Support

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### **WARNING : RISK OF ELECTRIC SHOCK**

- Before any repairs to the pump, check that the power supply is disconnected and that it cannot be accidentally reconnected during maintenance operations
- 

---

### **WARNING: HOT AND HAZARDOUS LIQUIDS**

- If the pump is used for hot and/or hazardous liquids, the personnel carrying out repair work must be informed.
  - Clean the pump in order to ensure the safety of the operator
- 

---

### **WARNING: RISK OF IMPROPER USE**

- The pump must be serviced and repaired by authorised personnel
  - Improper maintenance can void warranty and cause additional hazards
- 

---

### **WARNING: LIQUID CAN CAUSE DAMAGE**

- Pay attention to the discharged liquid to ensure that it does not cause damage to persons or property
- 

The electric pump does not require any specific ordinary scheduled maintenance. If the user wishes to prepare a scheduled maintenance plan, bear in mind that the due dates depend on the type of liquid pumped and the running conditions.



## 8. Pressure Vessel

The pressure vessel supplied as part of your Dutypoint product is used to absorb and conserve the potential energy of pressurised liquid. Stored energy from liquid under pressure is transferred to the water system when required.

### 8.1 Installation Safety Notes

These notes are taken from the pressure vessel installation manual:

- This product is designed to hold water up to +100°C
- Never exceed the maximum working pressure and temperature of the expansion tank; ensure appropriate controls are installed for this purpose.
- During installation prepare adequate systems for drainage to limit damage caused by leakage from the tank, draining and venting.
- During installation the installer should account for external stress such as traffic, wind and earthquakes.
- Always install the appliance in conformity to current legislation.
- This product must be installed and regularly inspected by qualified personnel only.
- The manufacturer shall not be held liable for any personal or material damage caused by the product if installed and/or used improperly or in way anyhow diversely from manufacturer's specifications.
- Exceeding temperature and pressure limits specified by the manufacturer will give cause to cancel any guarantee covering the product as well as any manufacturer's liability.
- For fluids other than water, check compatibility before installing.
- The appliance must be installed in a safe place with access for authorized personnel only.
- The appliance must be protected by an appropriate earthing systems or isolated from the system by a dielectric joint.

### 8.2 Periodic Maintenance

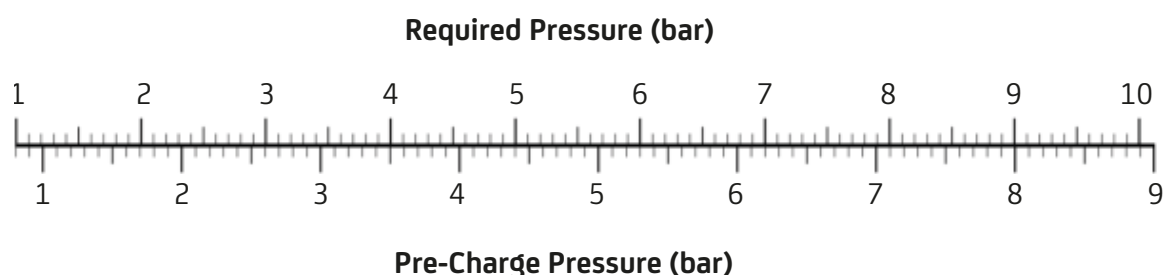
Periodic maintenance is recommended at least twice a year and should be carried out by authorised specialised personnel only.

- 1) First check that the pressure vessel is totally drained of water, and that the system is switched off and no electrical parts are live.
- 2) Check and, if necessary reset the pre-charge pressure, using the instructions below. Ensure that the pressure does not exceed the value specified in the procedure.

### 8.3 Checking and Adjusting Pressure Vessel Pre-Charge

Before commissioning starts and during every routine service, the pre-charge of the pressure vessels should be checked according to the following chart and instructions.

**Figure 8.19:** Pressure Vessel Pre-charge



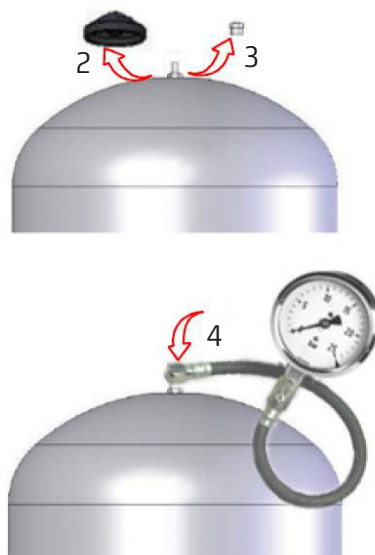
On variable speed systems the pre-charge air pressure for vessels should be 90% of the maximum pressure generated by the pump in the pipework system

e.g: If the maximum pressure generated by the pump in a system is 6 bar, this will require a pre-charge pressure of  $6 \times 90\% = 5.4$  bar.

To verify the pre-charge pressure:

- 1) First check that the expansion or pressure tank is totally drained of water and isolated.
- 2) Refer to [Figure 8.20: Pre-Charging a Pressure Vessel](#) (p. 54). Remove the air vent cover.
- 3) Unscrew the air valve cap.
- 4) Connect a pressure gauge. Verify that the pre-charge pressure is correct. If it is low then the vessel pre-charge must be corrected by additional inflation of the diaphragm.
- 5) When the pre-charge pressure is correct replace the air valve cap and vent cover.

**Figure 8.20:** Pre-Charging a Pressure Vessel



## 8.4 General Maintenance and Repair

Disconnect all electrical equipment before starting on any maintenance jobs or checking the installation pressure and temperature. The pre-charge pressure should be checked and if necessary corrected during any maintenance work.

## 8.5 Diaphragm Replacement

To replace a diaphragm:

- 1) Empty the expansion tank
- 2) Remove the pre-charging by releasing the air vent.
- 3) Loosen the M8 screws fastening the flange
- 4) Remove the flange
- 5) Extract the diaphragm and replace it

## 8.6 Installing a Replacement Vessel

Read these instructions carefully before installing the product:

- 1) Make sure the product is in good condition. If the product is damaged do not start on installation but take it back to the seller for immediate replacement.
- 2) The product must be installed in the position (vertical or horizontal) specified in the technical specifications.
- 3) While the system is cold, measure the static pressure with a gauge, at the point where the tank has to be installed.

- 4) Set the pre-charge pressure, using the procedure earlier in this section. Ensure that the pressure does not exceed the value specified in the procedure.
- 5) The appliance must be supplied with efficient and sufficient safety and control facilities, in particular the safety valve must be connected to the appliance and be free from interference and must be gauged to the quantity of fluid to be discharged. The safety valve should also be designed to ensure that the pressure does not permanently exceed the maximum tolerated pressure (a temporary pressure peak, limited to 10% of the maximum tolerated pressure, is allowed).
- 6) Make sure the cap of the valve is fitted tightly after pre-loading and that there is no leakage.



# 9. Control Panel Wiring Diagrams

No. Pumps	Voltage	kW	Panel Part No.	Wiring Diagram
2	400/3/50	1.5	SCP-00050-999	<a href="#">9.1 Twin Pump 1.5kW 3-Phase 400V</a> (p. 58)
		2.2	SCP-00051-999	<a href="#">9.2 Twin Pump 2.2kW 3-Phase 400V</a> (p. 61)
		4	SCP-00052-999	<a href="#">9.3 Twin Pump 3.0 and 4.0kW 3-Phase 400V</a> (p. 64)
		5.5	SCP-00053-999	<a href="#">9.4 Twin Pump 5.5kW 3-Phase 400V</a> (p. 67)
	240/1/50	1.5	SCP-00064-999	<a href="#">9.5 Twin Pump 1.5kW 1-Phase 240V</a> (p. 70)
		2.2	SCP-00065-999	<a href="#">9.6 Twin Pump 2.2kW 1-Phase 240V</a> (p. 73)
		4	SCP-00066-999	<a href="#">9.7 Twin Pump 3.0 and 4.0kW 1-Phase 240V</a> (p. 76)
3	400/3/50	1.5	SCP-00054-999	<a href="#">9.8 Triple Pump 1.5kW 3-Phase 400V</a> (p. 79)
		2.2	SCP-00055-999	<a href="#">9.9 Triple Pump 2.2kW 3-Phase 400V</a> (p. 82)
		4	SCP-00056-999	<a href="#">9.10 Triple Pump 3.0 and 4.0kW 3-Phase 400V</a> (p. 85)
		5.5	SCP-00057-999	<a href="#">9.11 Triple Pump 5.5kW 3-Phase 400V</a> (p. 88)
		7.5	SCP-00058-999	<a href="#">9.12 Triple Pump 7.5kW 3-Phase 400V</a> (p. 91)
	240/1/50	1.5	SCP-00069-999	<a href="#">9.13 Triple Pump 1.5kW 1-Phase 240V</a> (p. 94)
		2.2	SCP-00070-999	<a href="#">9.14 Triple Pump 2.2kW 1-Phase 240V</a> (p. 97)
		4	SCP-00071-999	<a href="#">9.15 Triple Pump 3.0 and 4.0kW 1-Phase 400V</a> (p. 100)



# 9.1 Twin Pump 1.5kW 3-Phase 400V

Figure 9.21: Sheet 1 of 3

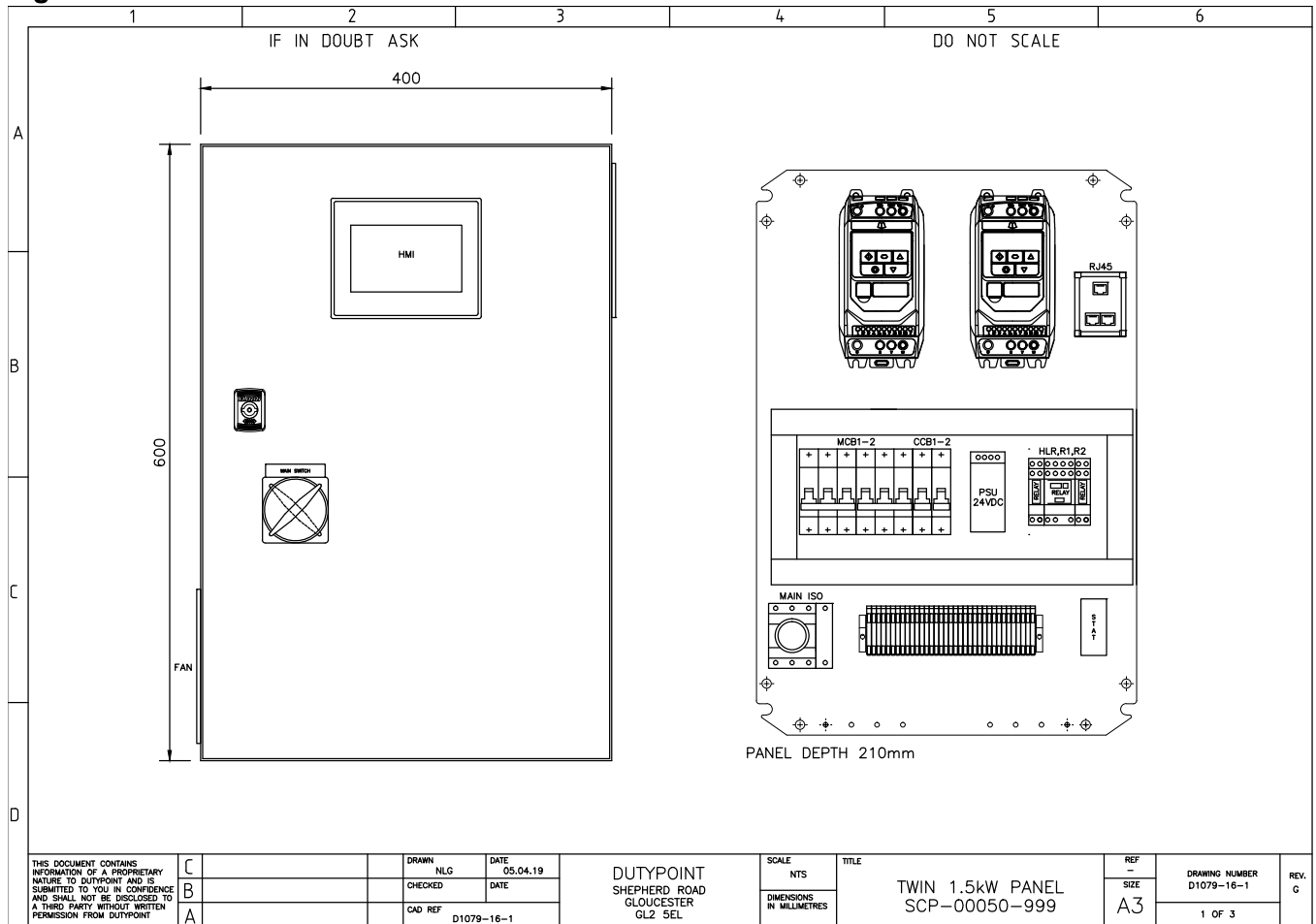


Figure 9.22: Sheet 2 of 3

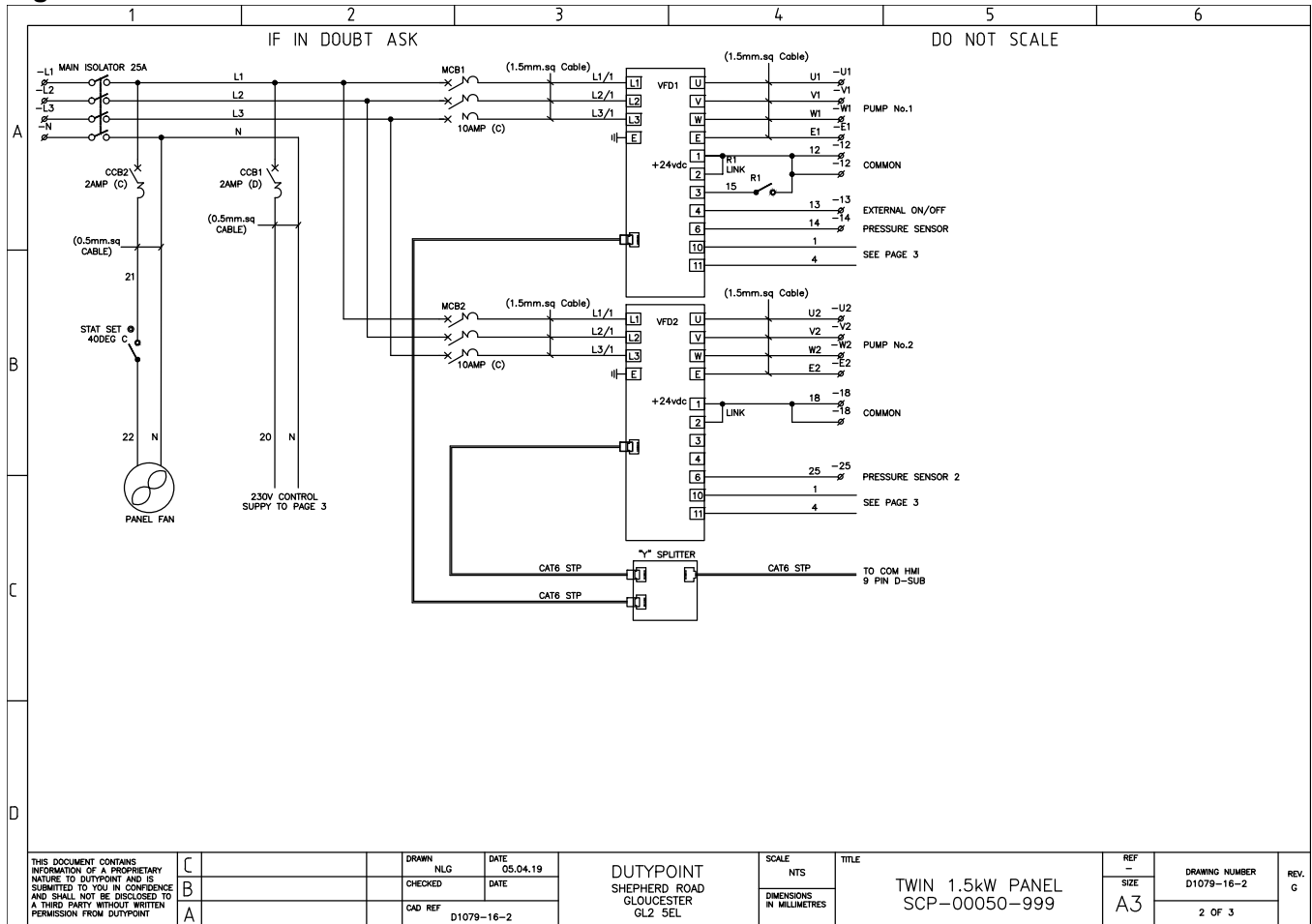
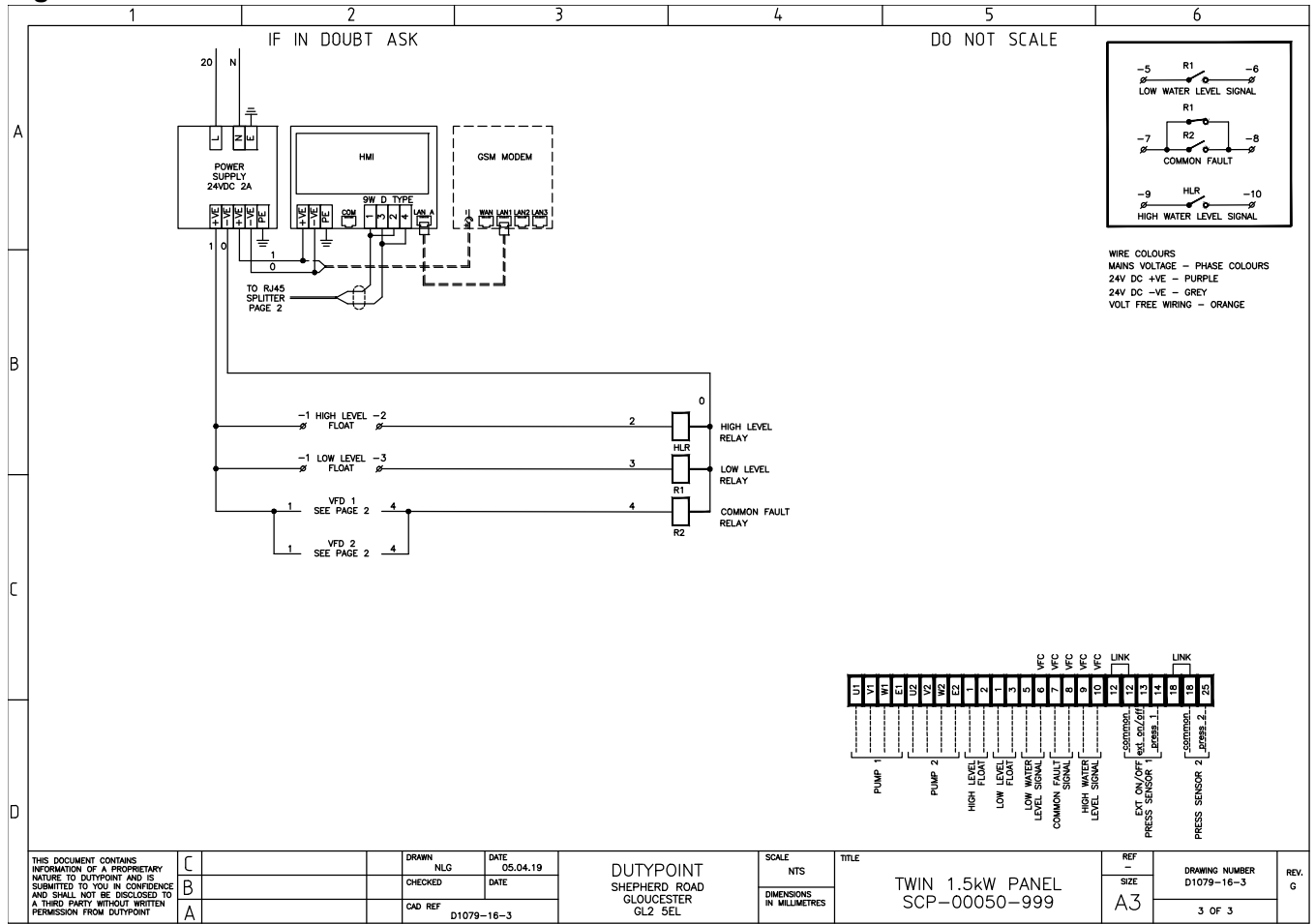


Figure 9.23: Sheet 3 of 3



## 9.2 Twin Pump 2.2kW 3-Phase 400V

Figure 9.24: Sheet 1 of 3

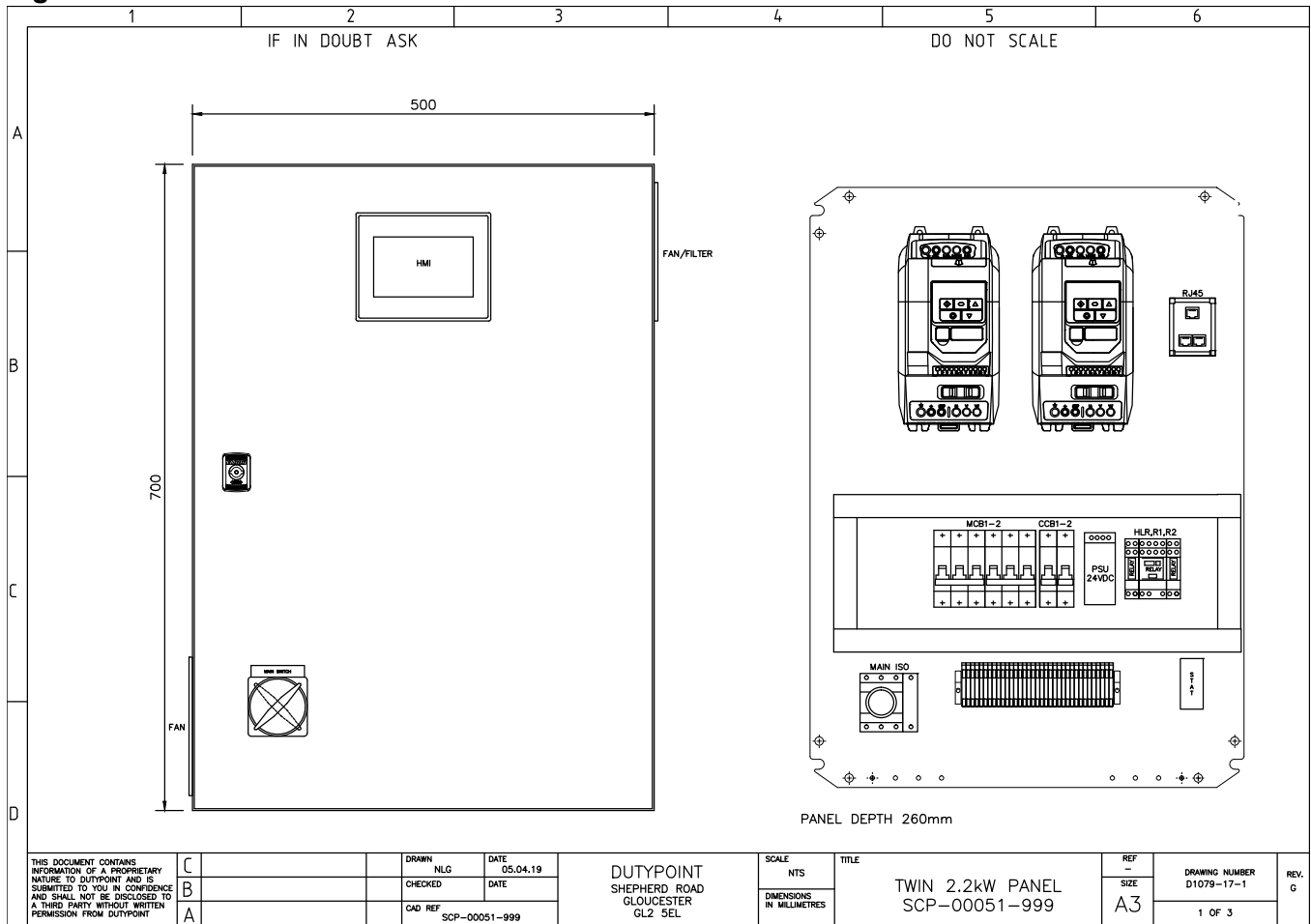


Figure 9.25: Sheet 2 of 3

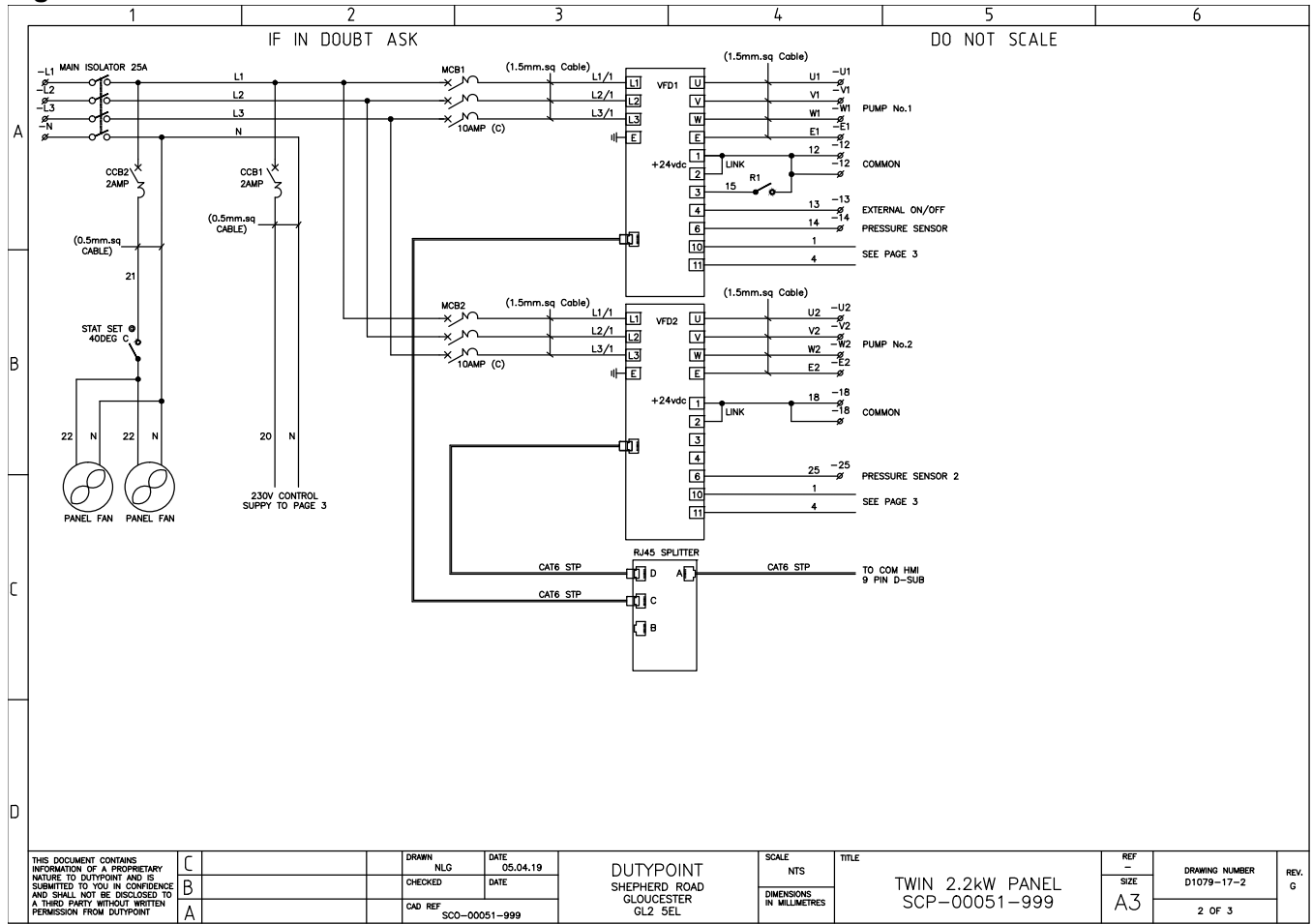
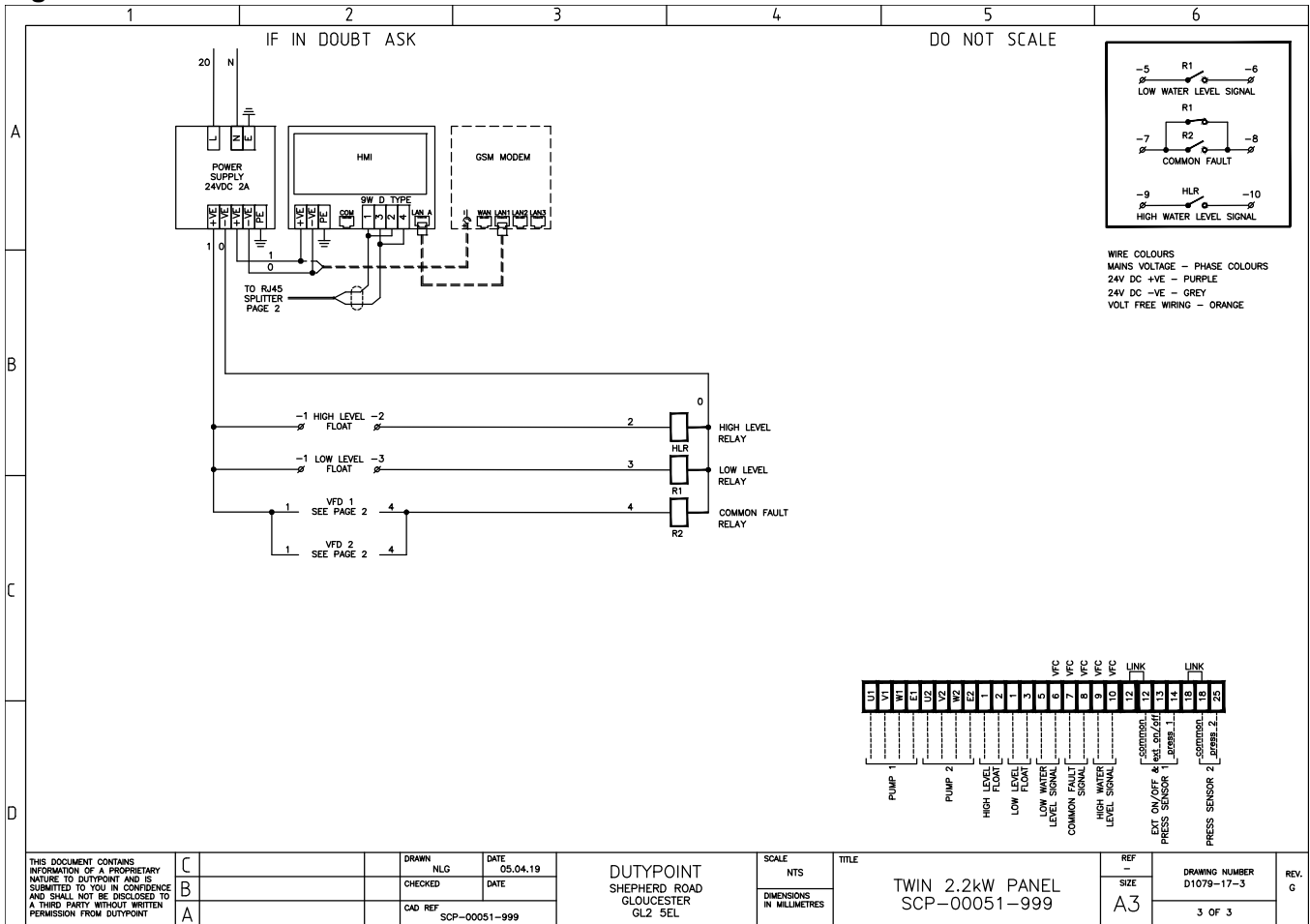


Figure 9.26: Sheet 3 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT	C		DRAWN	NLG	DATE	05.04.19	DUTYPOINT SHEPHERD ROAD GLOUCESTER GL2 5EL	SCALE	NTS	TWIN 2.2kW PANEL SCP-00051-999	REF	DRAWING NUMBER D1079-17-3	REV. G
	B		CHECKED		DATE			DIMENSIONS IN MILLIMETRES	SIZE		A3		
	A		CAD REF	SCP-00051-999					3 OF 3				

# 9.3 Twin Pump 3.0 and 4.0kW 3-Phase 400V

Figure 9.27: Sheet 1 of 3

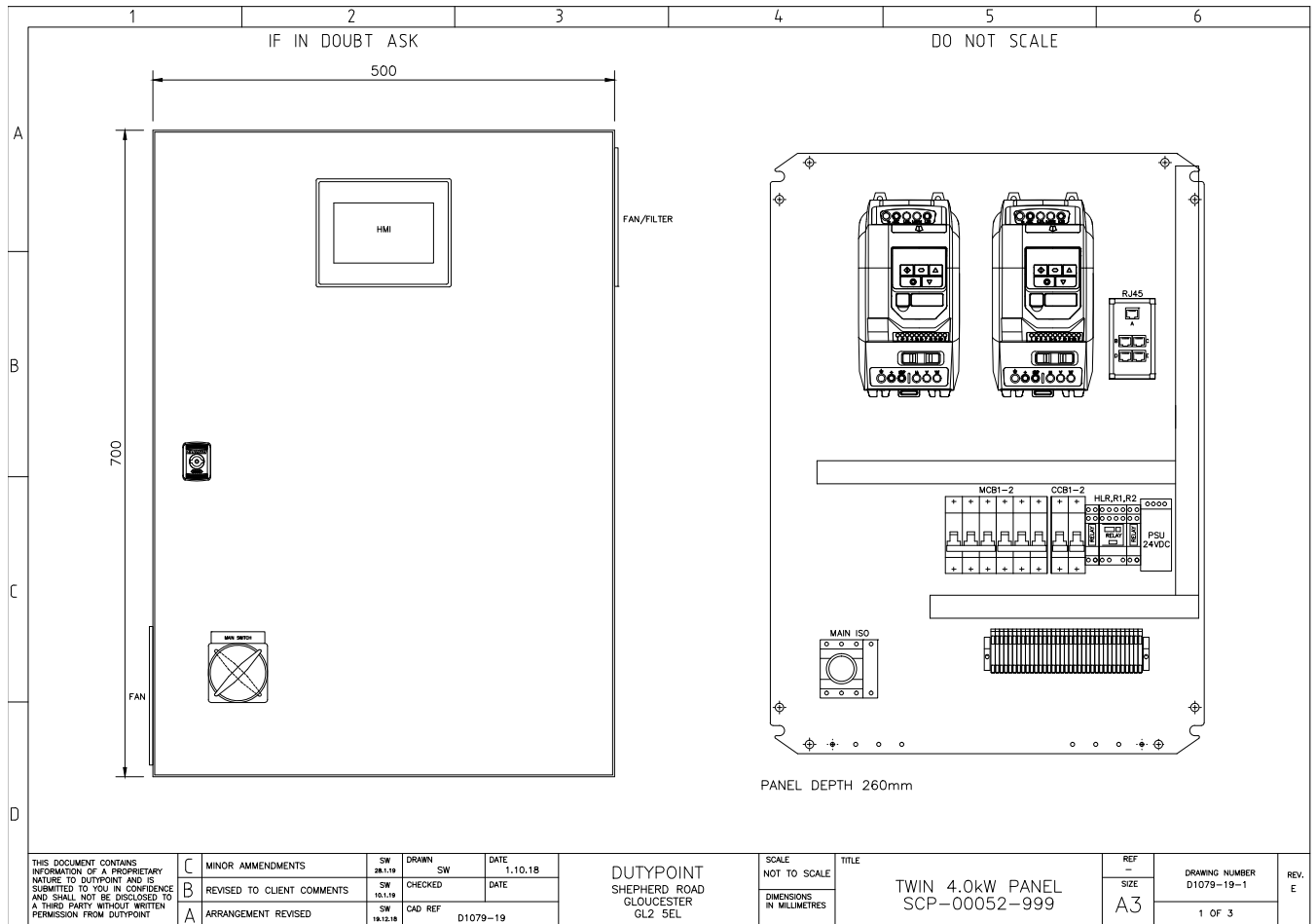


Figure 9.28: Sheet 2 of 3

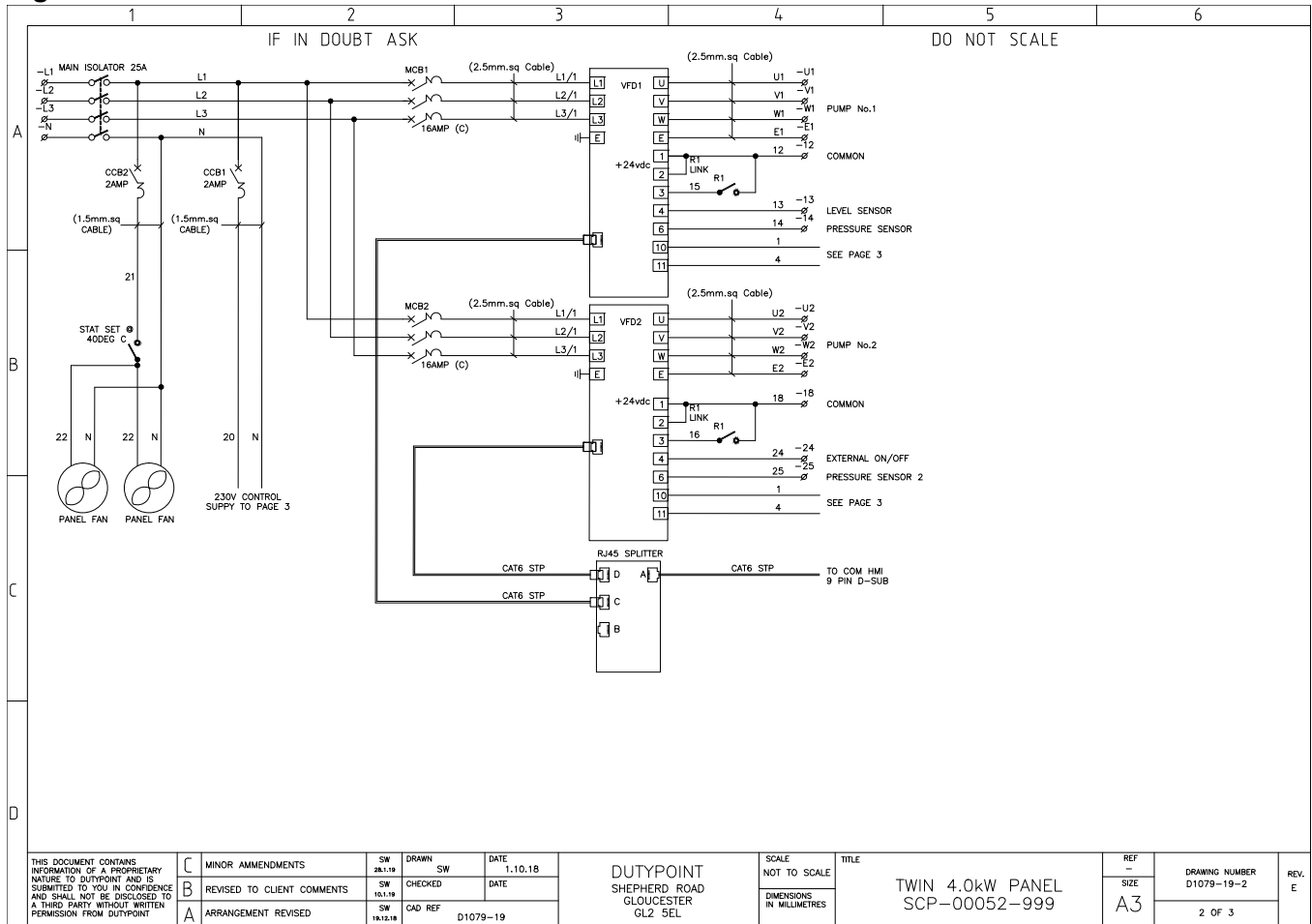
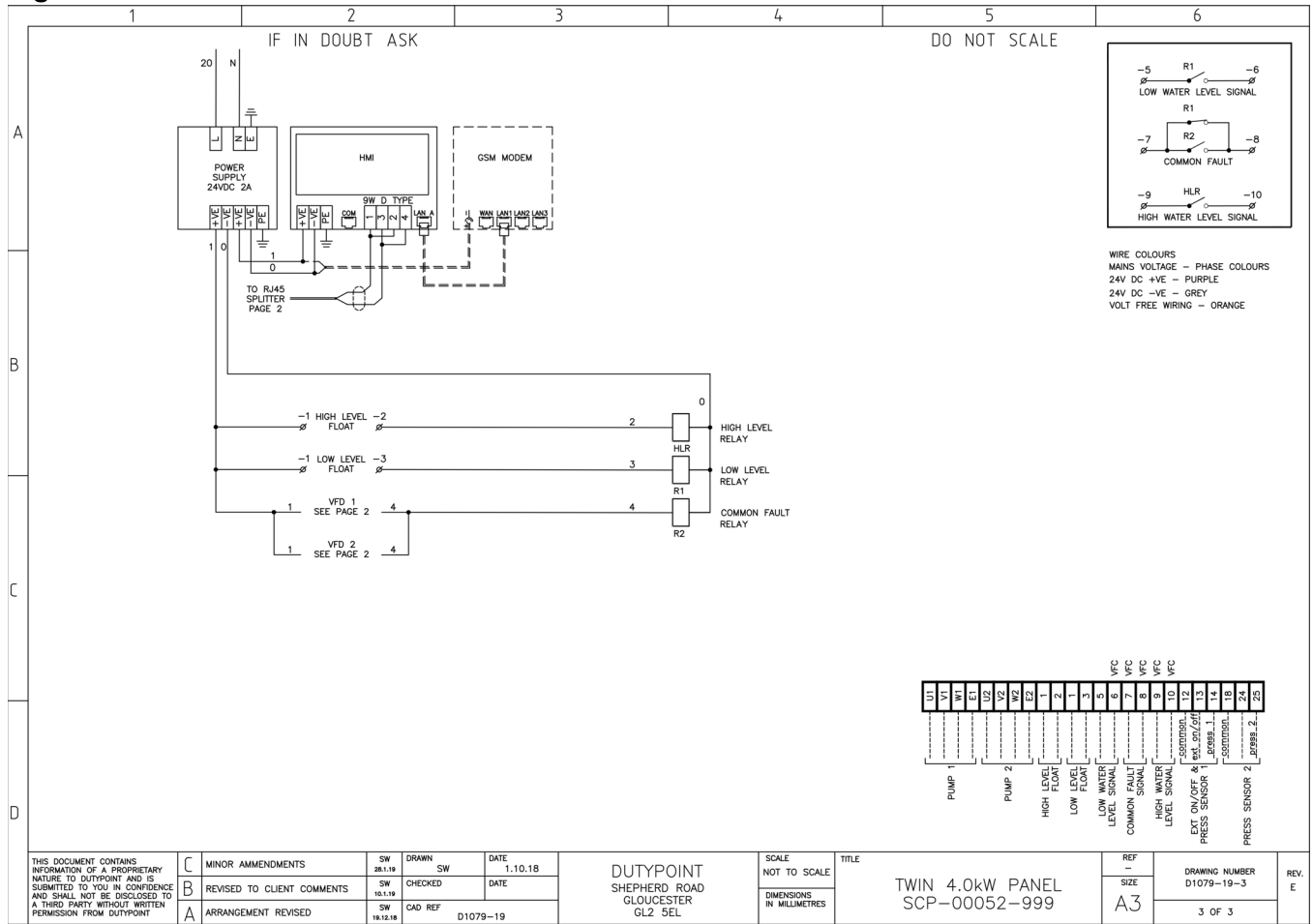




Figure 9.29: Sheet 3 of 3



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C	MINOR AMMENDMENTS	SW	DRAWN	DATE	1.10.18
B	REVISED TO CLIENT COMMENTS	SW	CHECKED	DATE	
A	ARRANGEMENT REVISED	SW	CAD REF	D1079-19	

DUTYPOINT  
 SHEPHERD ROAD  
 GLOUCESTER  
 GL2 5EL

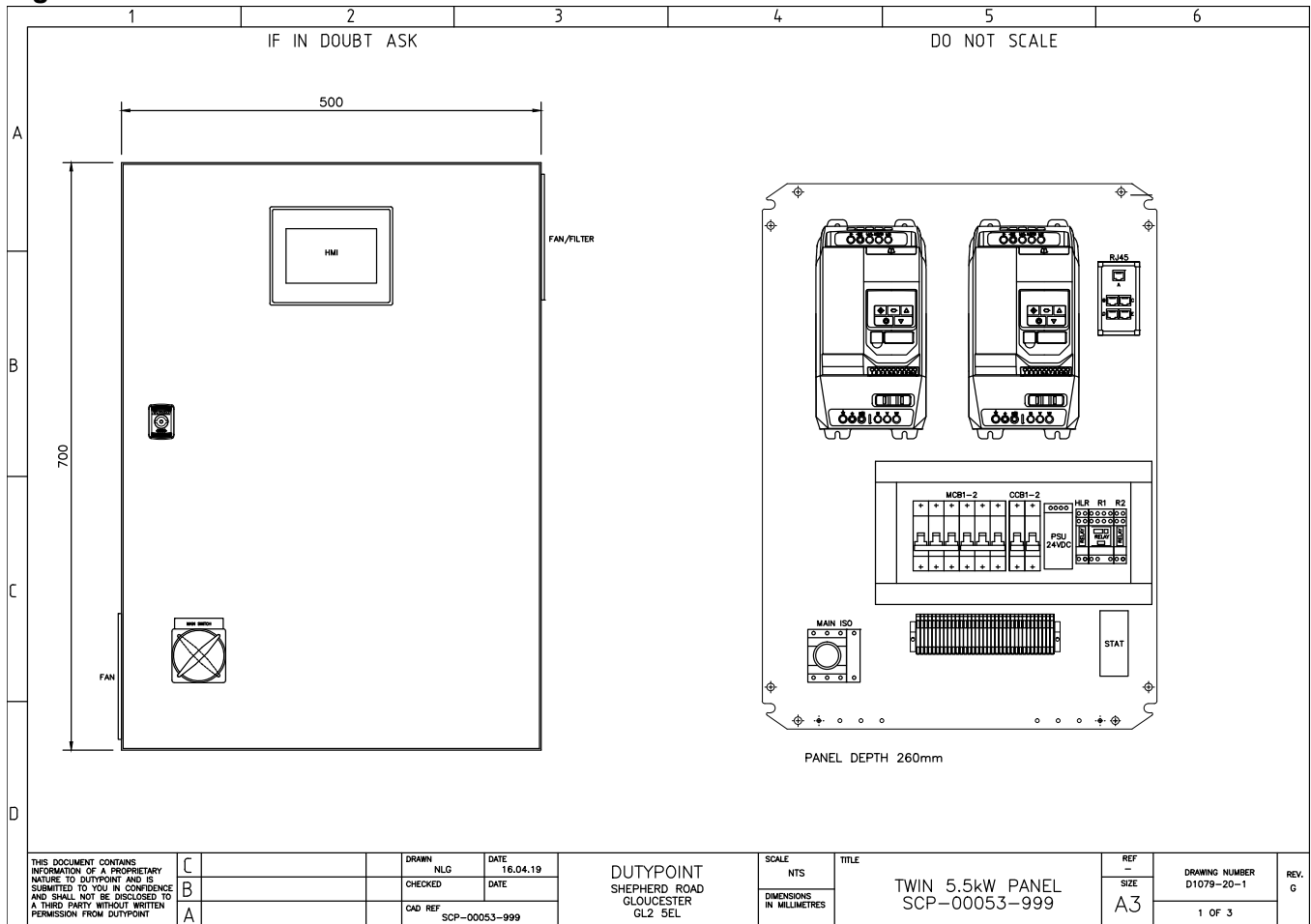
SCALE  
 NOT TO SCALE  
 DIMENSIONS  
 IN MILLIMETRES

TITLE  
 TWIN 4.0kW PANEL  
 SCP-00052-999

REF	I	DRAWING NUMBER	REV.
A3	SIZE	D1079-19-3	E
		3 OF 3	

# 9.4 Twin Pump 5.5kW 3-Phase 400V

Figure 9.30: Sheet 1 of 3



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DRAWN	NLG	DATE	16.04.19
CHECKED		DATE	
CAD REF	SCP-00053-999		

DUTYPOINT  
SHEPHERD ROAD  
GLOUCESTER  
GL2 5EL

SCALE	NTS
DIMENSIONS	IN MILLIMETRES

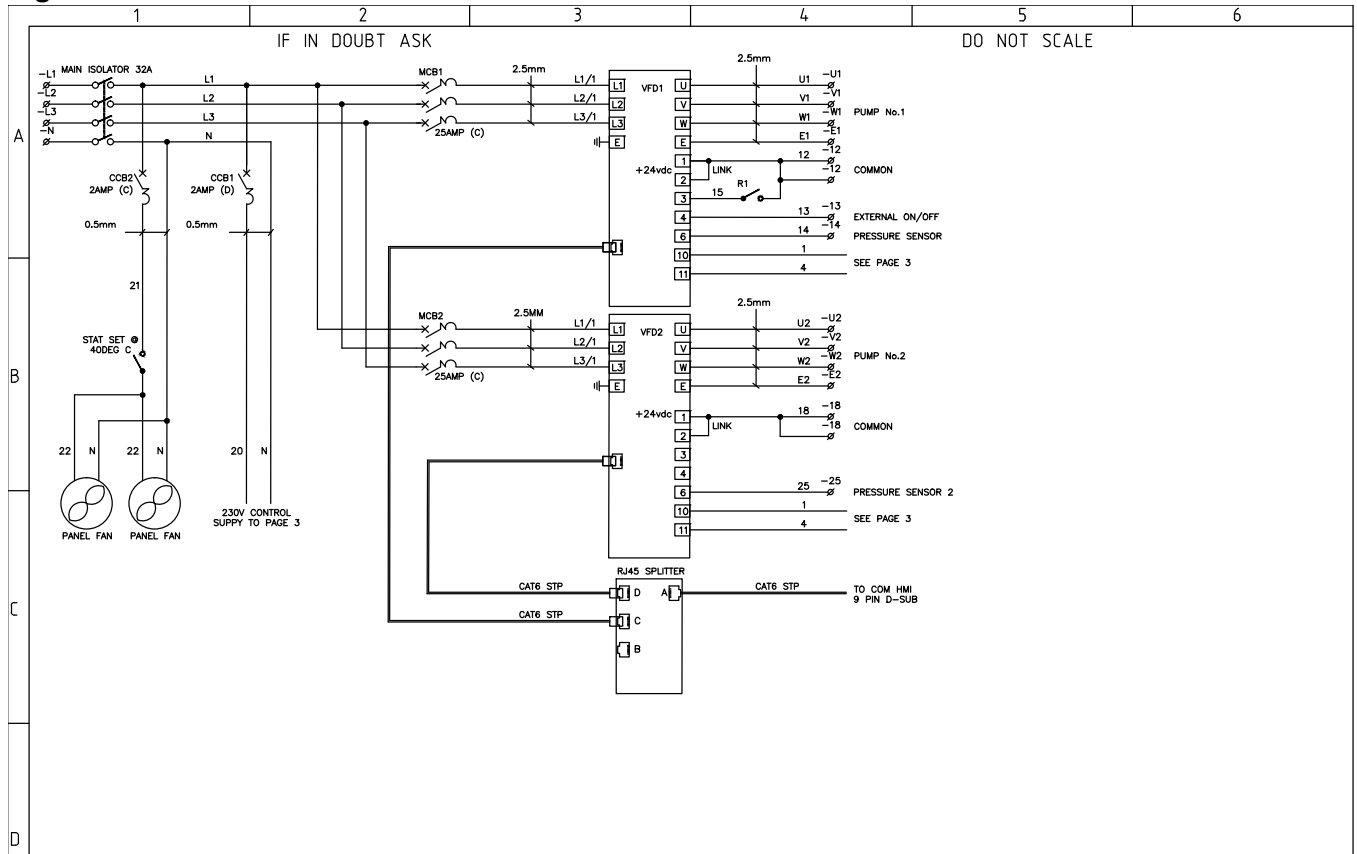
TITLE  
TWIN 5.5kW PANEL  
SCP-00053-999

REF	
SIZE	A3

DRAWING NUMBER	D1079-20-1
1 OF 3	

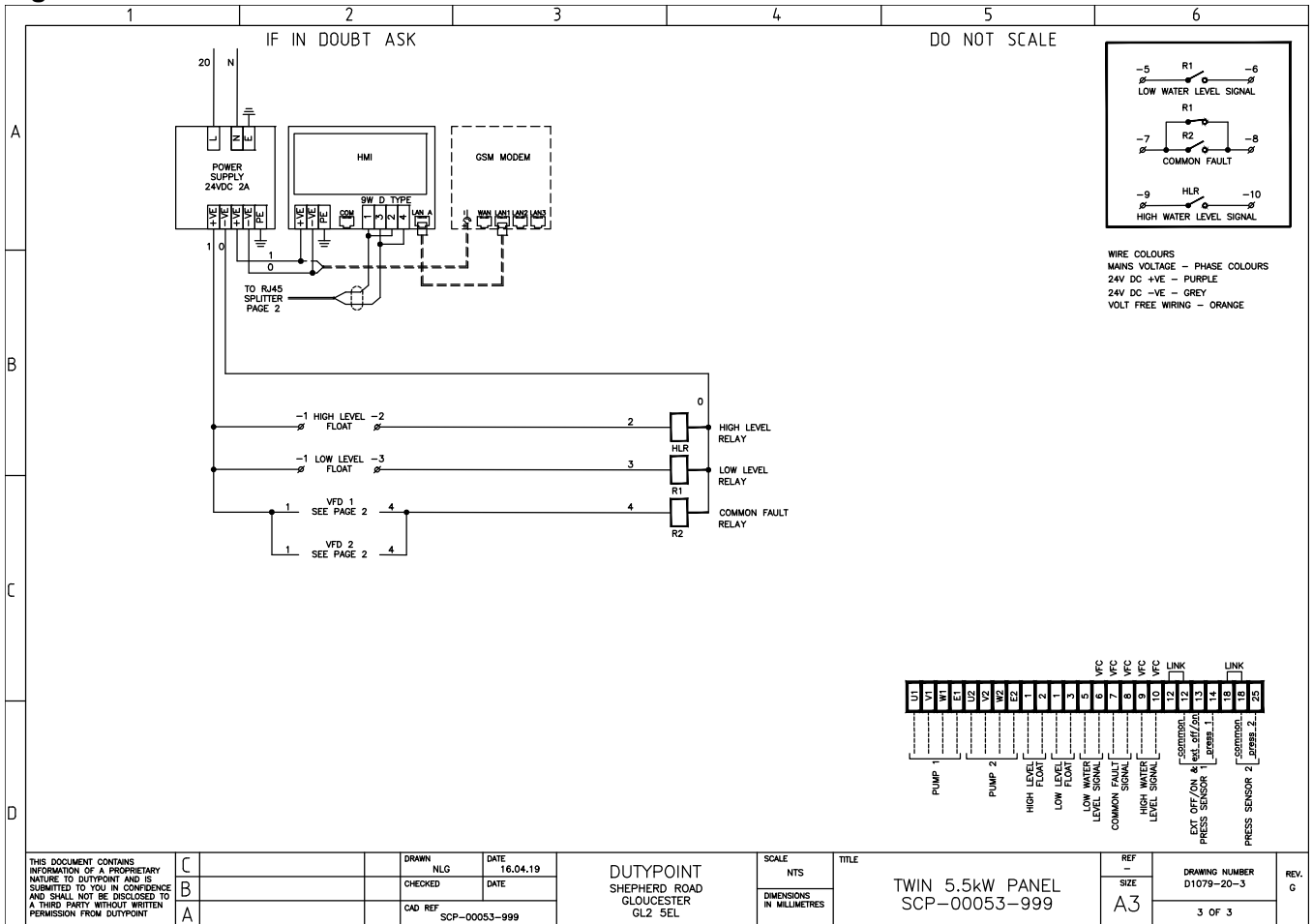
REV.	G
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Figure 9.31: Sheet 2 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT	C	DRAWN	NLG	DATE	16.04.19	DUTYPOINT SHEPHERD ROAD GLOUCESTER GL2 5EL	SCALE NTS DIMENSIONS IN MILLIMETRES	TITLE TWIN 5.5kW PANEL SCP-00053-999	REF	DRAWING NUMBER D1079-20-2	REV. G	
	B	CHECKED		DATE					SIZE			A3
	A	CAD REF	SCP-00053-999									2 OF 3

Figure 9.32: Sheet 3 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT

C		DRAWN	NLG	DATE	16.04.19
B		CHECKED		DATE	
A		CAD REF	SCP-00053-999		

DUTYPOINT  
 SHEPHERD ROAD  
 GLOUCESTER  
 GL2 5EL

SCALE  
 MTS  
 DIMENSIONS  
 IN MILLIMETRES

TITLE  
 TWIN 5.5kW PANEL  
 SCP-00053-999

REF  
 I  
 SIZE  
 A3

DRAWING NUMBER  
 D1079-20-3  
 3 OF 3

REV.  
 G

# 9.5 Twin Pump 1.5kW 1-Phase 240V

Figure 9.33: Sheet 1 of 3

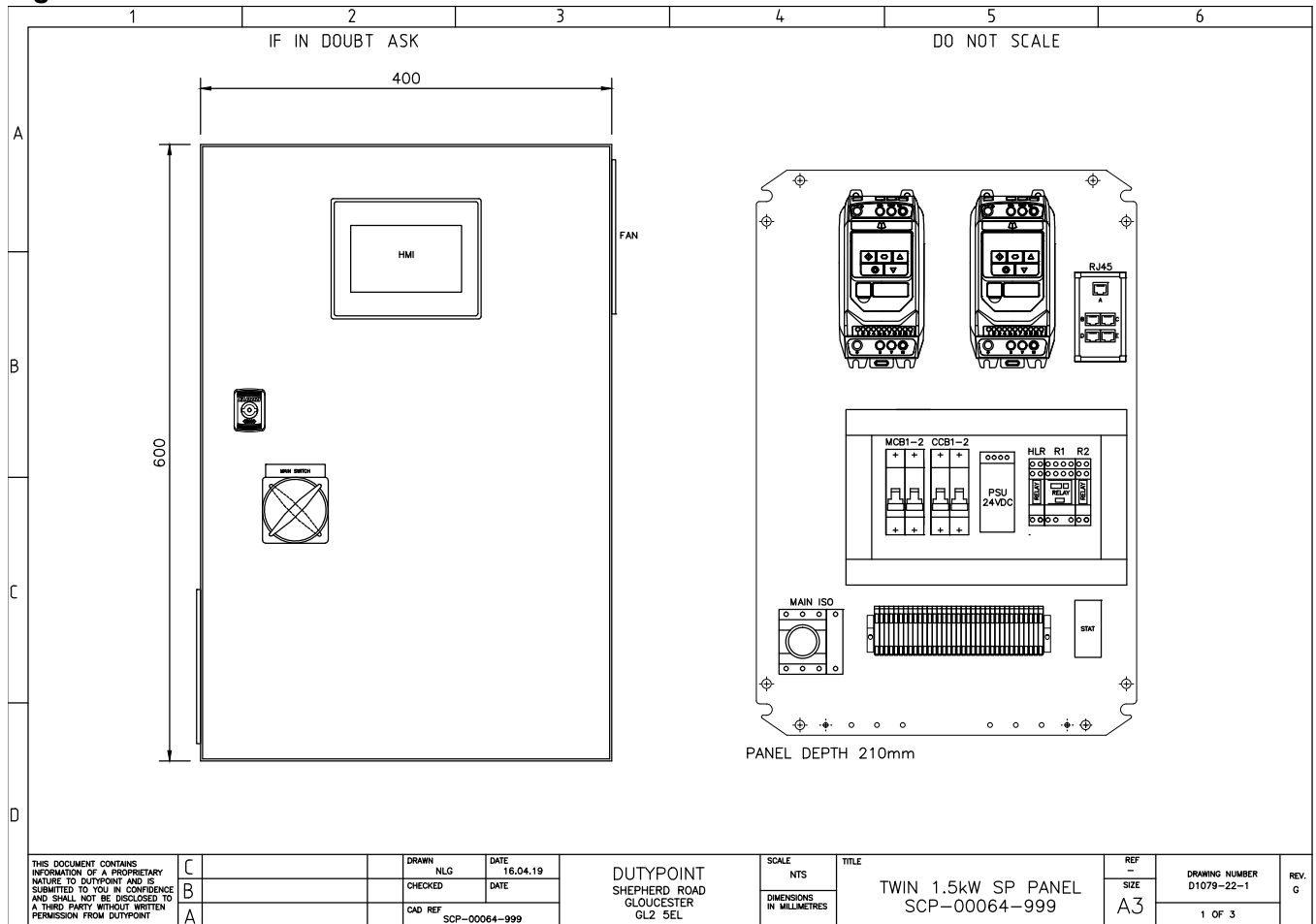


Figure 9.34: Sheet 2 of 3

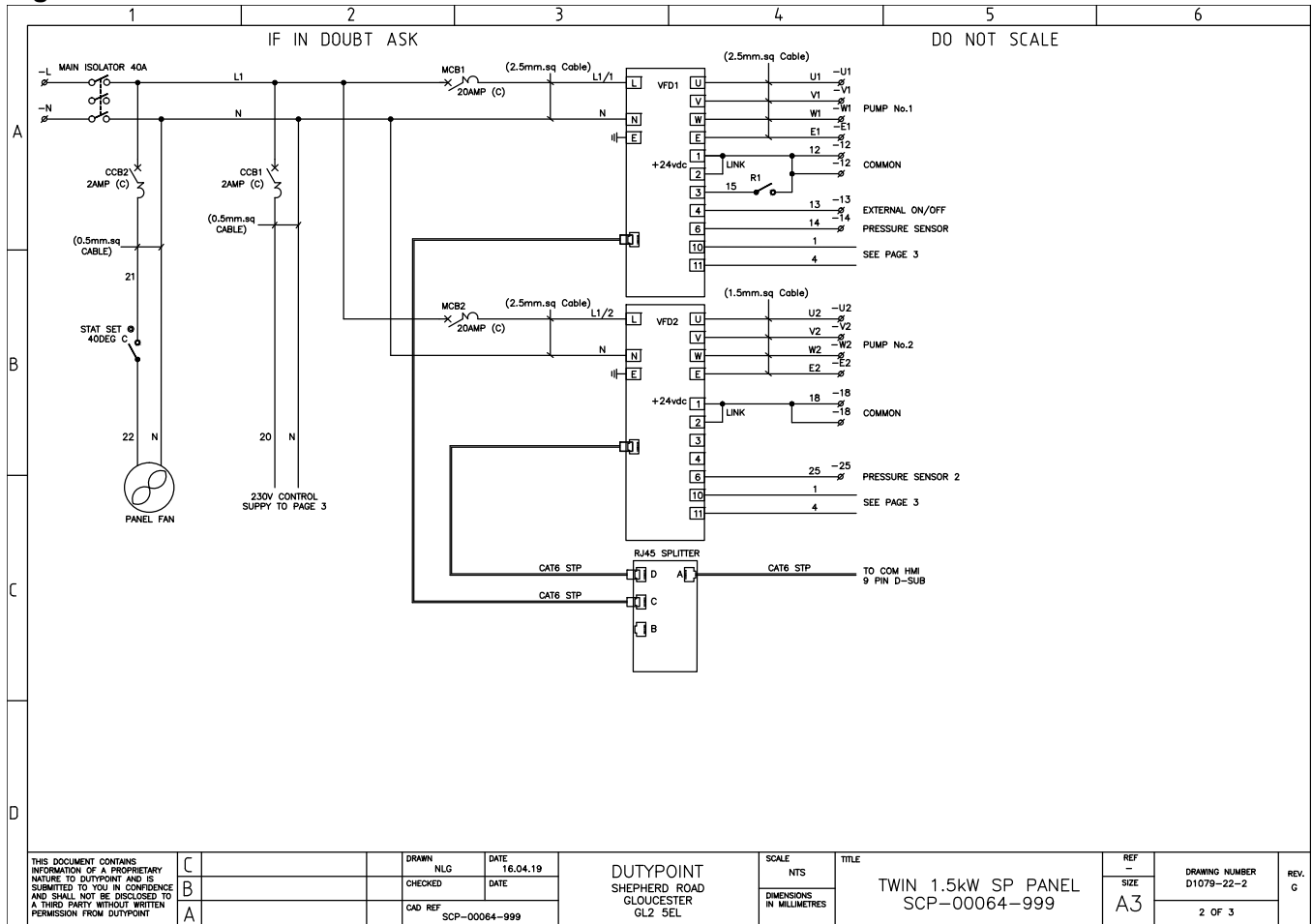
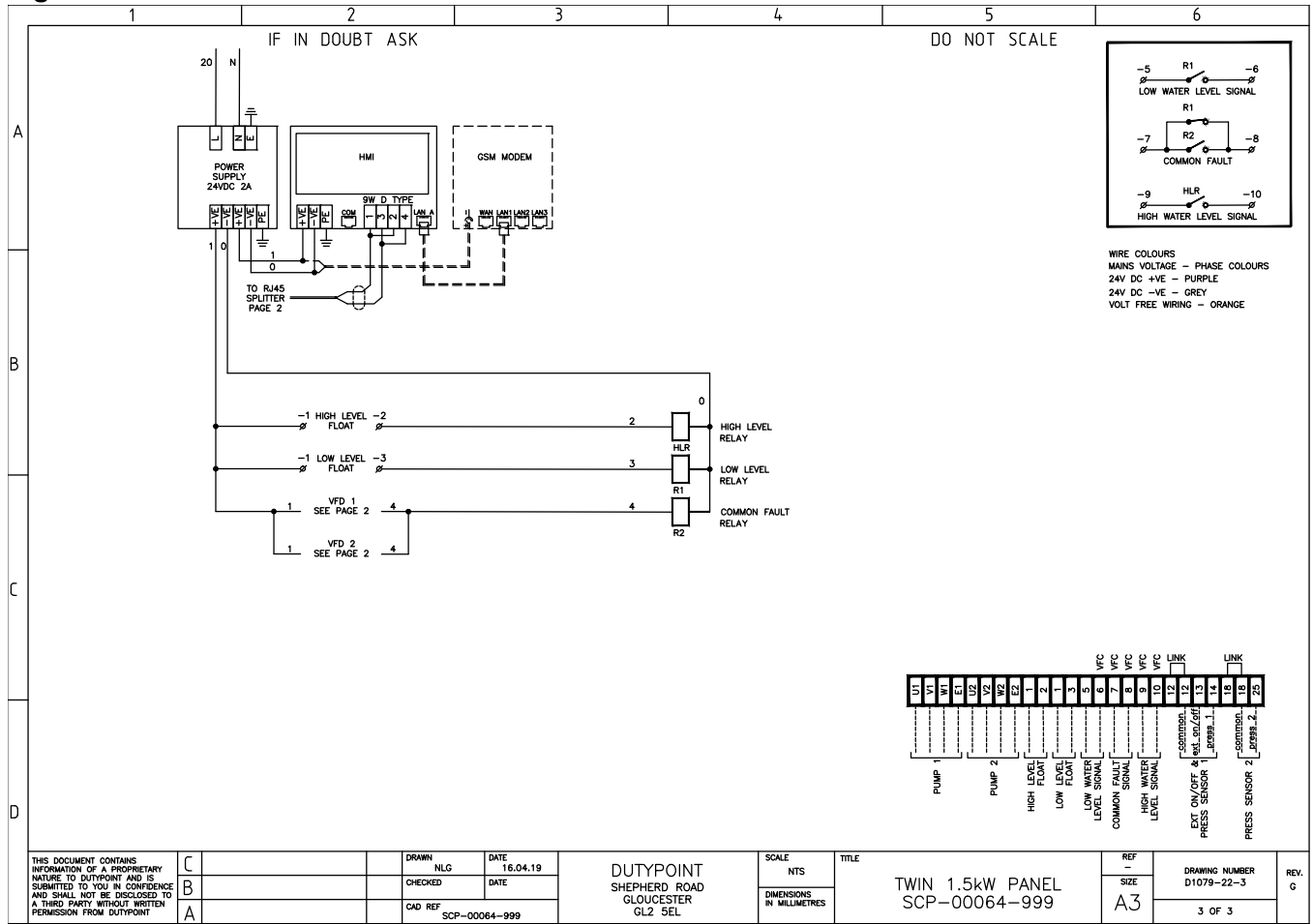


Figure 9.35: Sheet 3 of 3



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C	DRAWN	NLG	DATE	16.04.19
B	CHECKED		DATE	
A	CAD REF	SCP-00064-999		

DUTYPOINT  
 SHEPHERD ROAD  
 GLOUCESTER  
 GL2 5EL

SCALE  
 NTS  
 DIMENSIONS  
 IN MILLIMETRES

TITLE  
 TWIN 1.5kW PANEL  
 SCP-00064-999

REF	SIZE	DRAWING NUMBER	REV.
A3		D1079-22-3	G
		3 OF 3	

# 9.6 Twin Pump 2.2kW 1-Phase 240V

Figure 9.36: Sheet 1 of 3

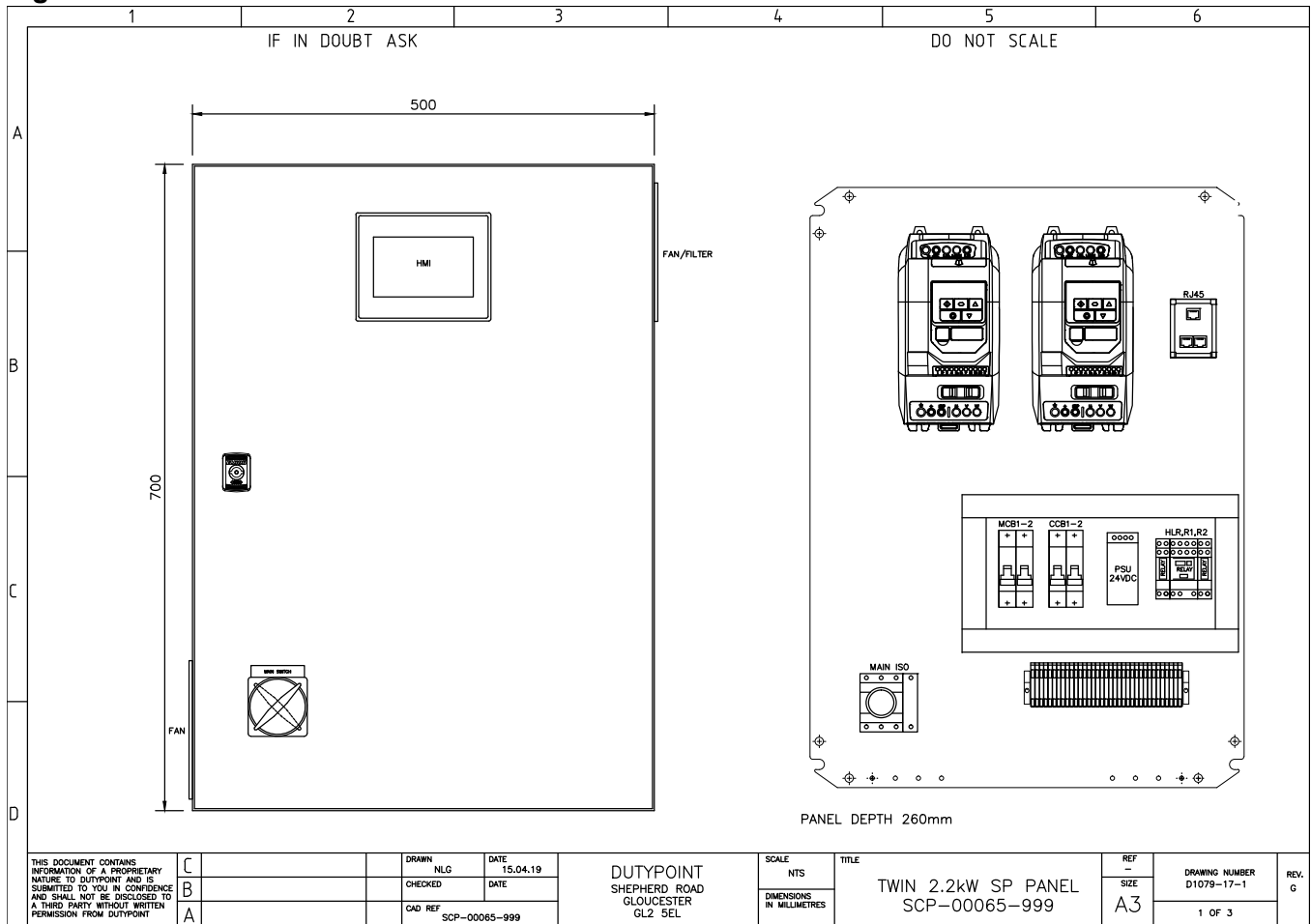




Figure 9.37: Sheet 2 of 3

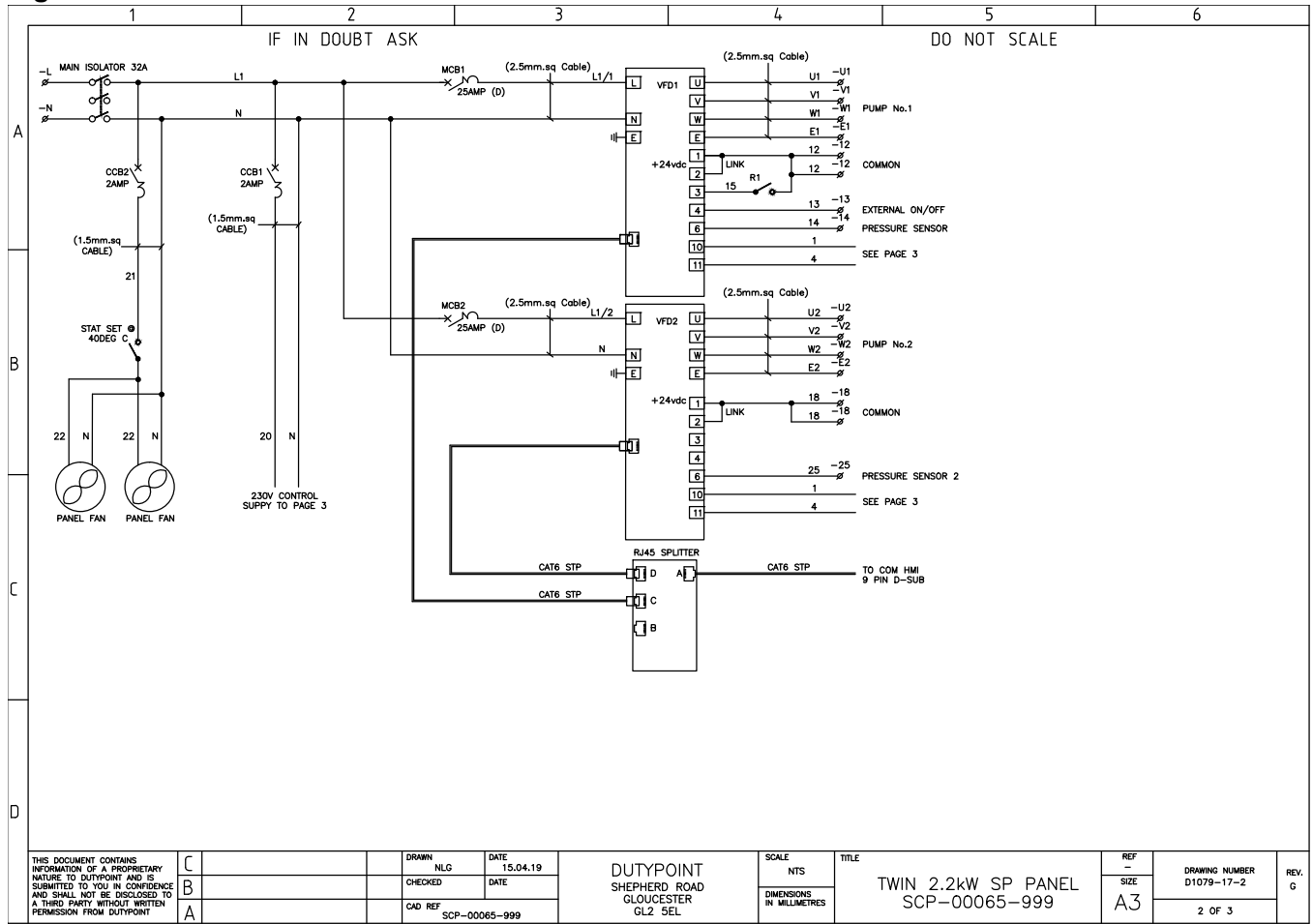
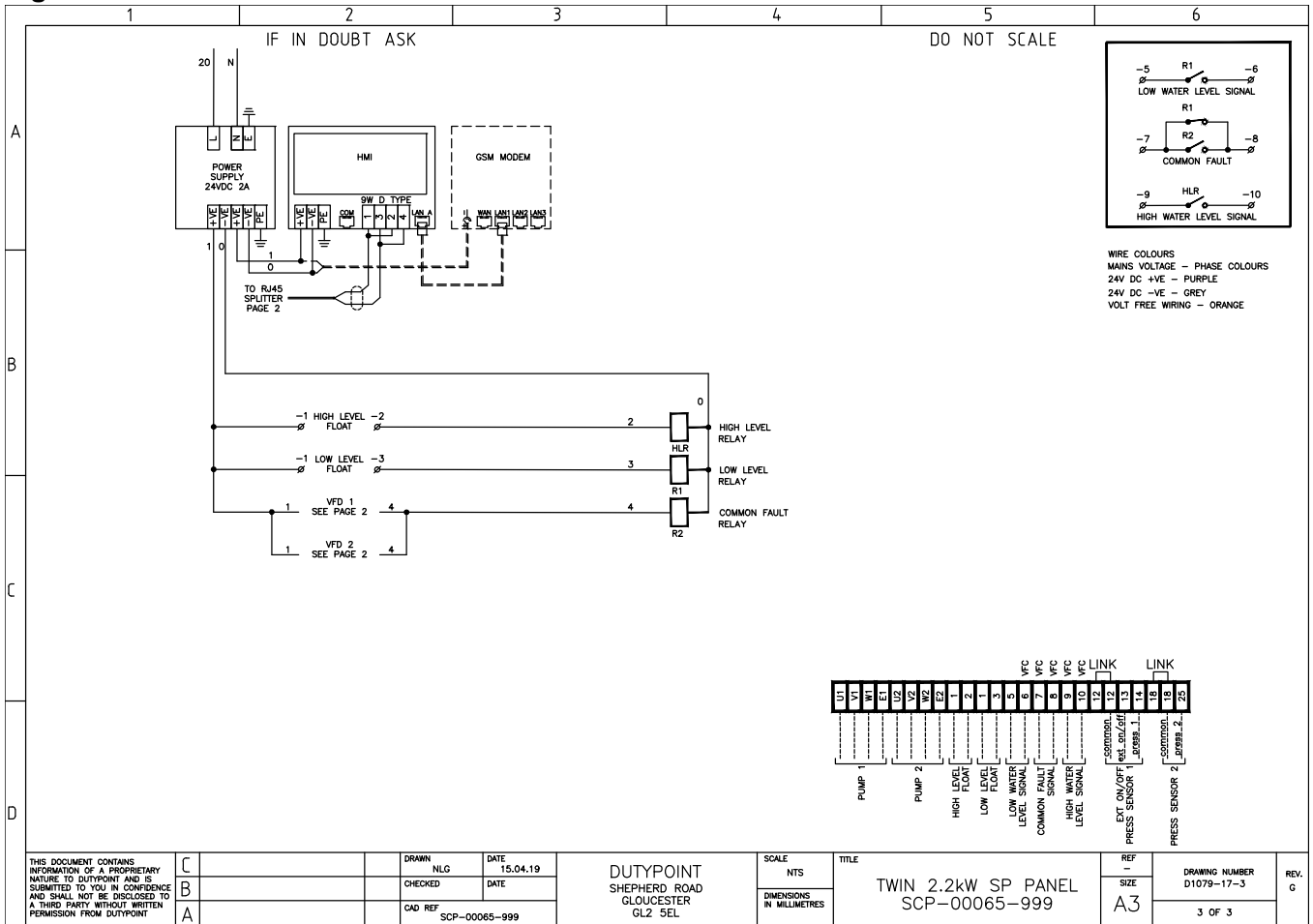


Figure 9.38: Sheet 3 of 3



# 9.7 Twin Pump 3.0 and 4.0kW 1-Phase 240V

Figure 9.39: Sheet 1 of 3

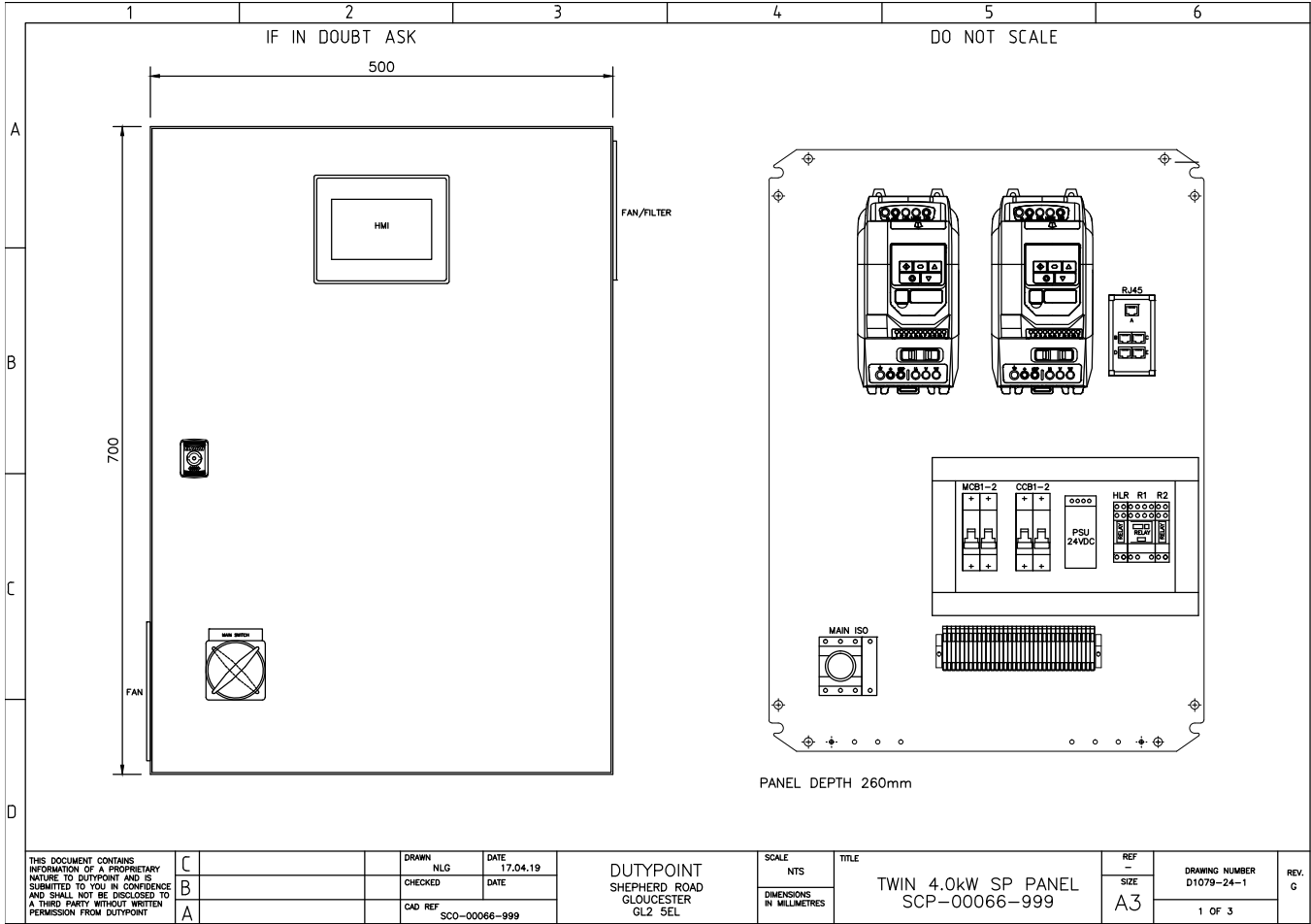
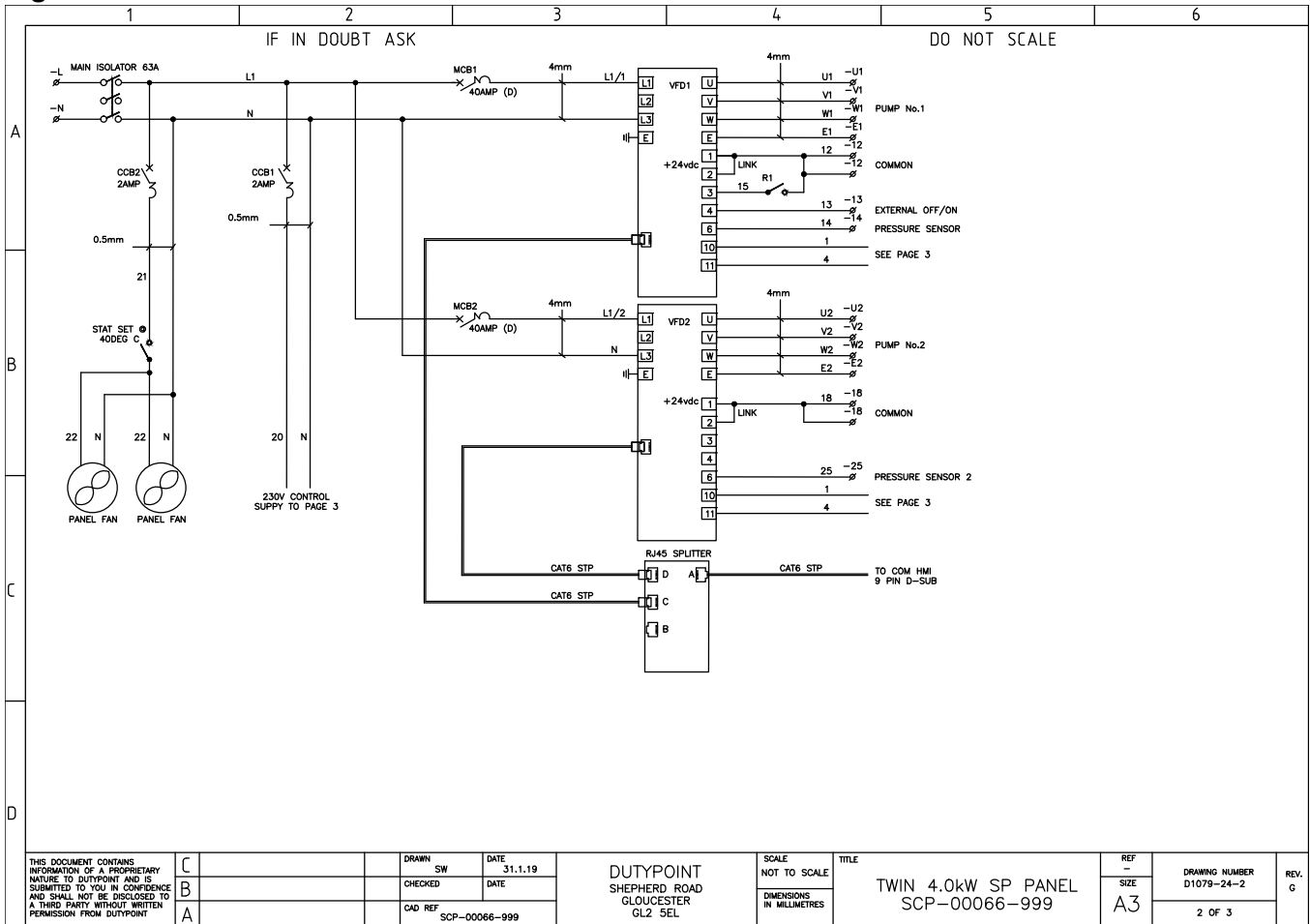


Figure 9.40: Sheet 2 of 3





# 9.8 Triple Pump 1.5kW 3-Phase 400V

Figure 9.42: Sheet 1 of 3

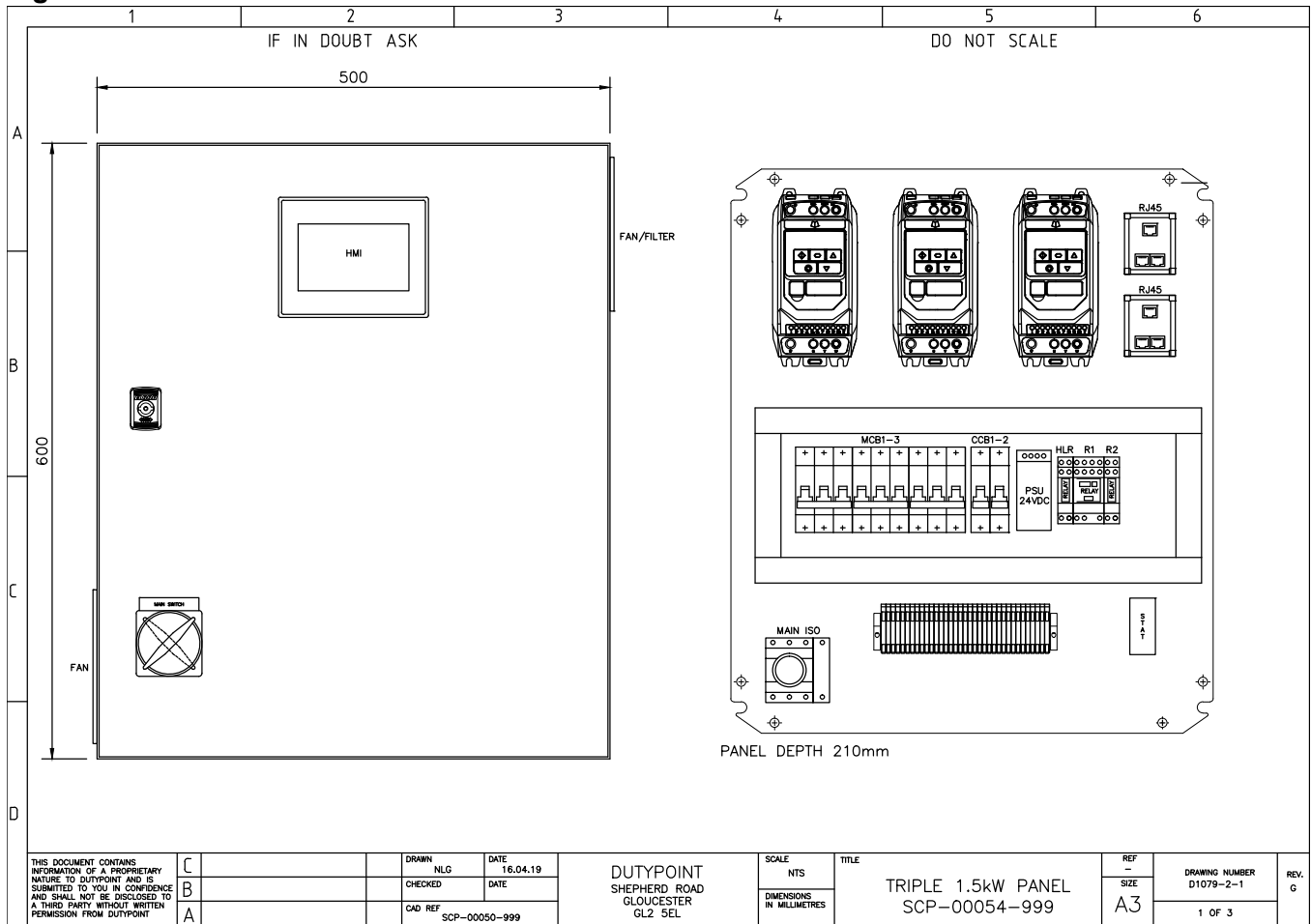
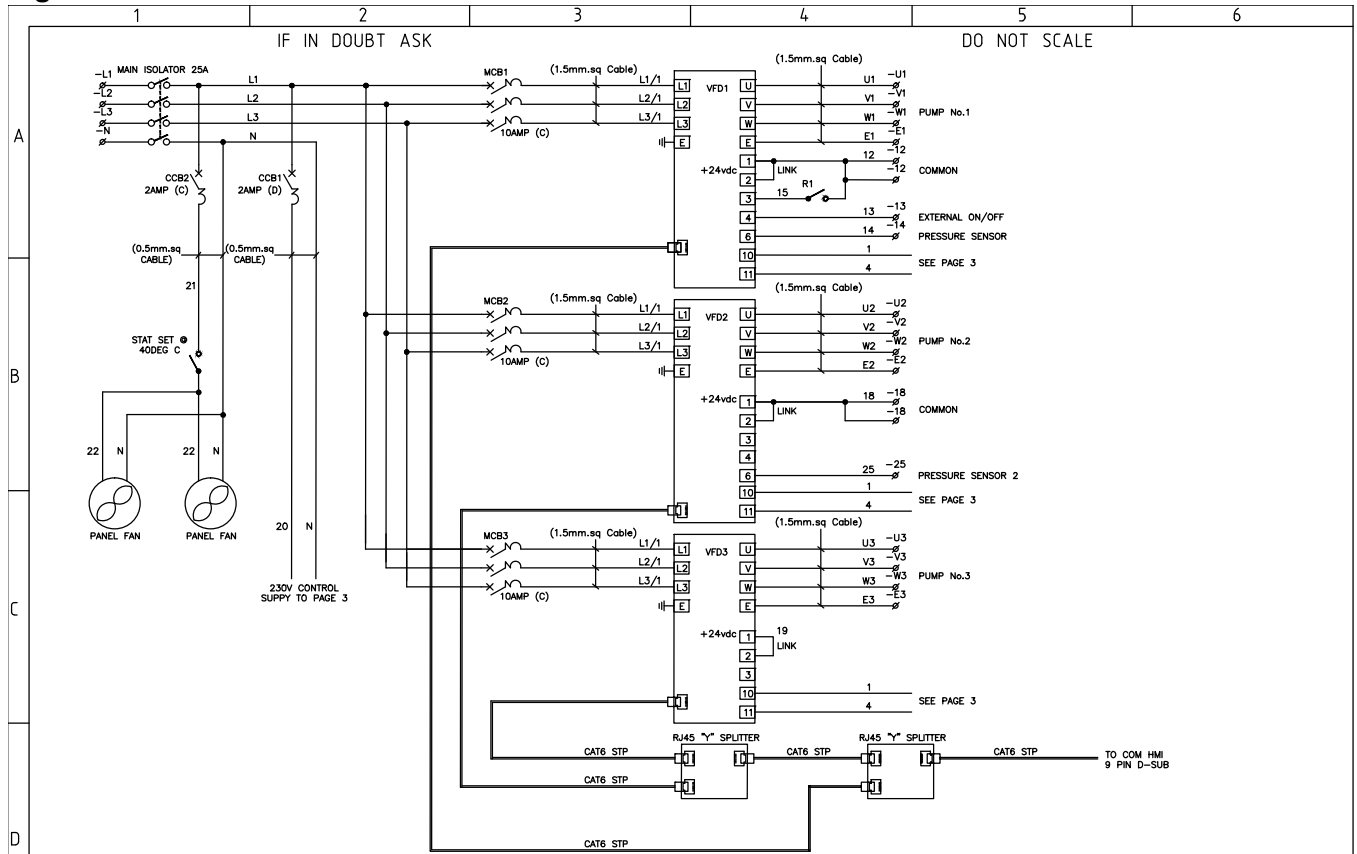
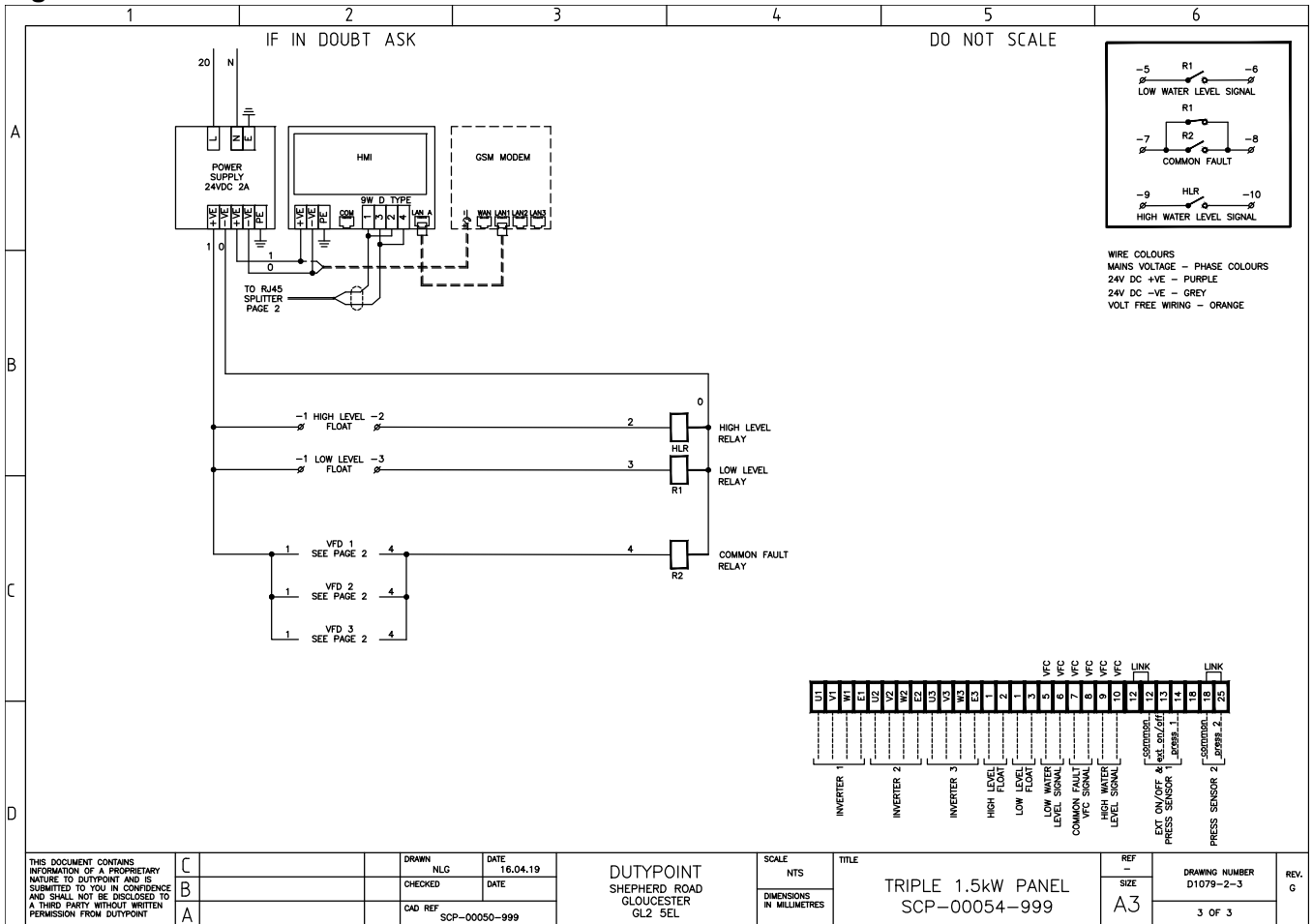


Figure 9.43: Sheet 2 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT	C	DRAWN	NLG	DATE	16.04.19	DUTYPOINT SHEPHERD ROAD GLOUCESTER GL2 5EL	SCALE NTS DIMENSIONS IN MILLIMETRES	TITLE TRIPLE 1.5kW PANEL SCP-00054-999	REF	DRAWING NUMBER D1079-2-2	REV. G	
	B	CHECKED		DATE					SIZE			A3
	A	CAD REF	SCP-00050-999						2 OF 3			

Figure 9.44: Sheet 3 of 3



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C		DRAWN	NLG	DATE	16.04.19
B		CHECKED		DATE	
A		CAD REF	SCP-00050-999		

DUTYPOINT  
 SHEPHERD ROAD  
 GLOUCESTER  
 GL2 5EL

SCALE	NTS
DIMENSIONS	IN MILLIMETRES

TITLE  
 TRIPLE 1.5kW PANEL  
 SCP-00054-999

REF I  
 SIZE  
 A3

DRAWING NUMBER  
 D1079-2-3  
 3 OF 3

REV.  
 G



# 9.9 Triple Pump 2.2kW 3-Phase 400V

Figure 9.45: Sheet 1 of 3

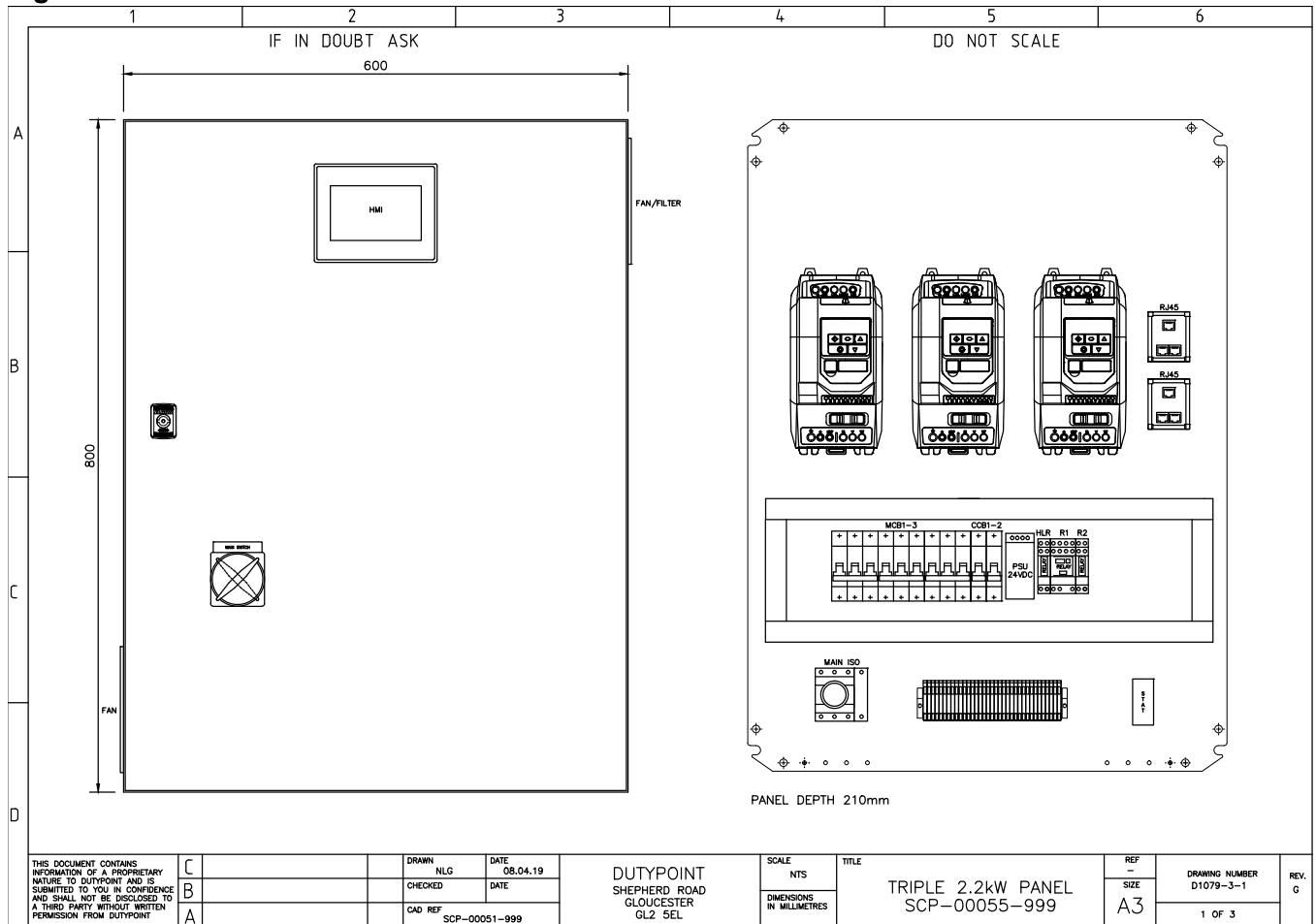


Figure 9.46: Sheet 2 of 3

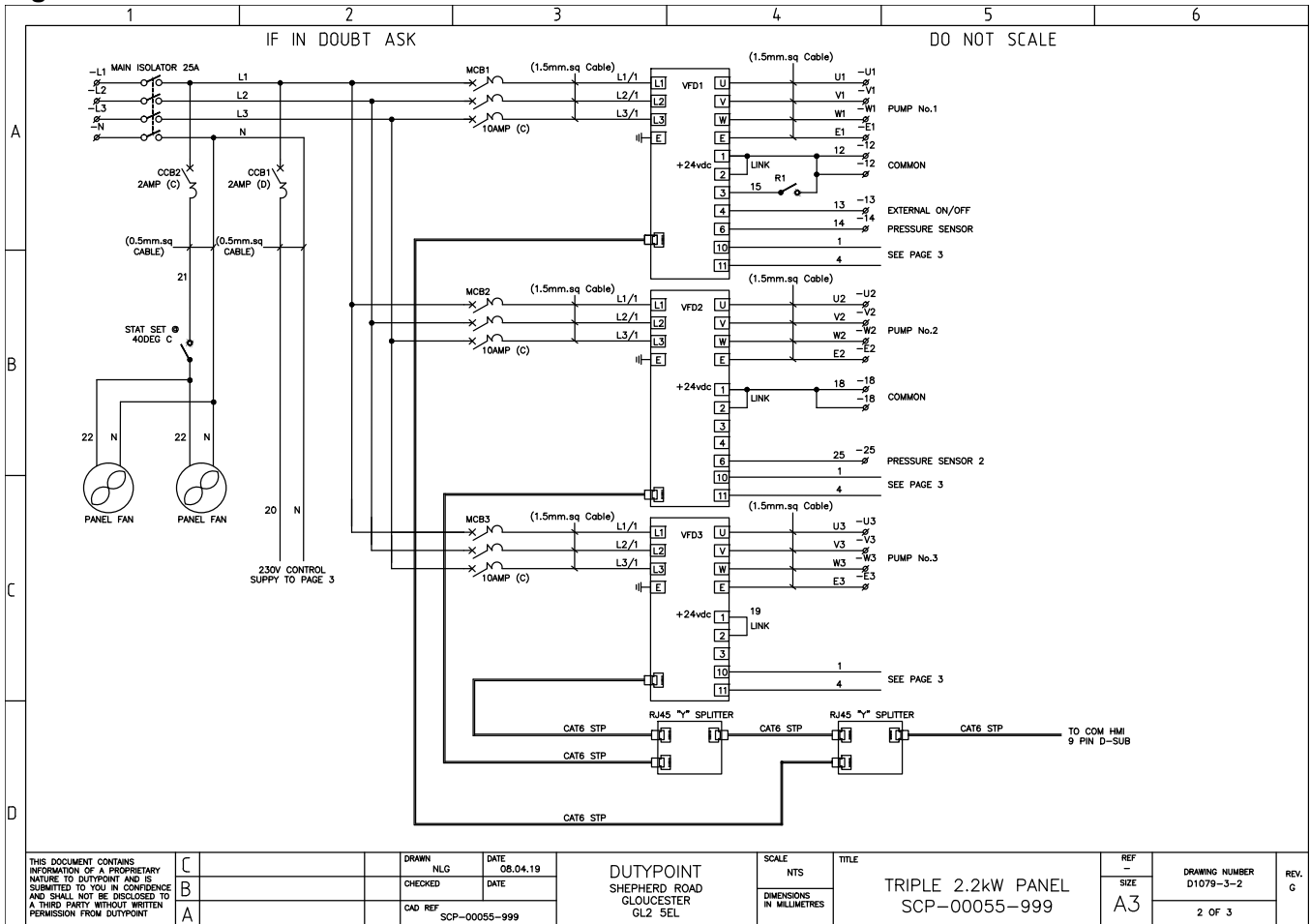
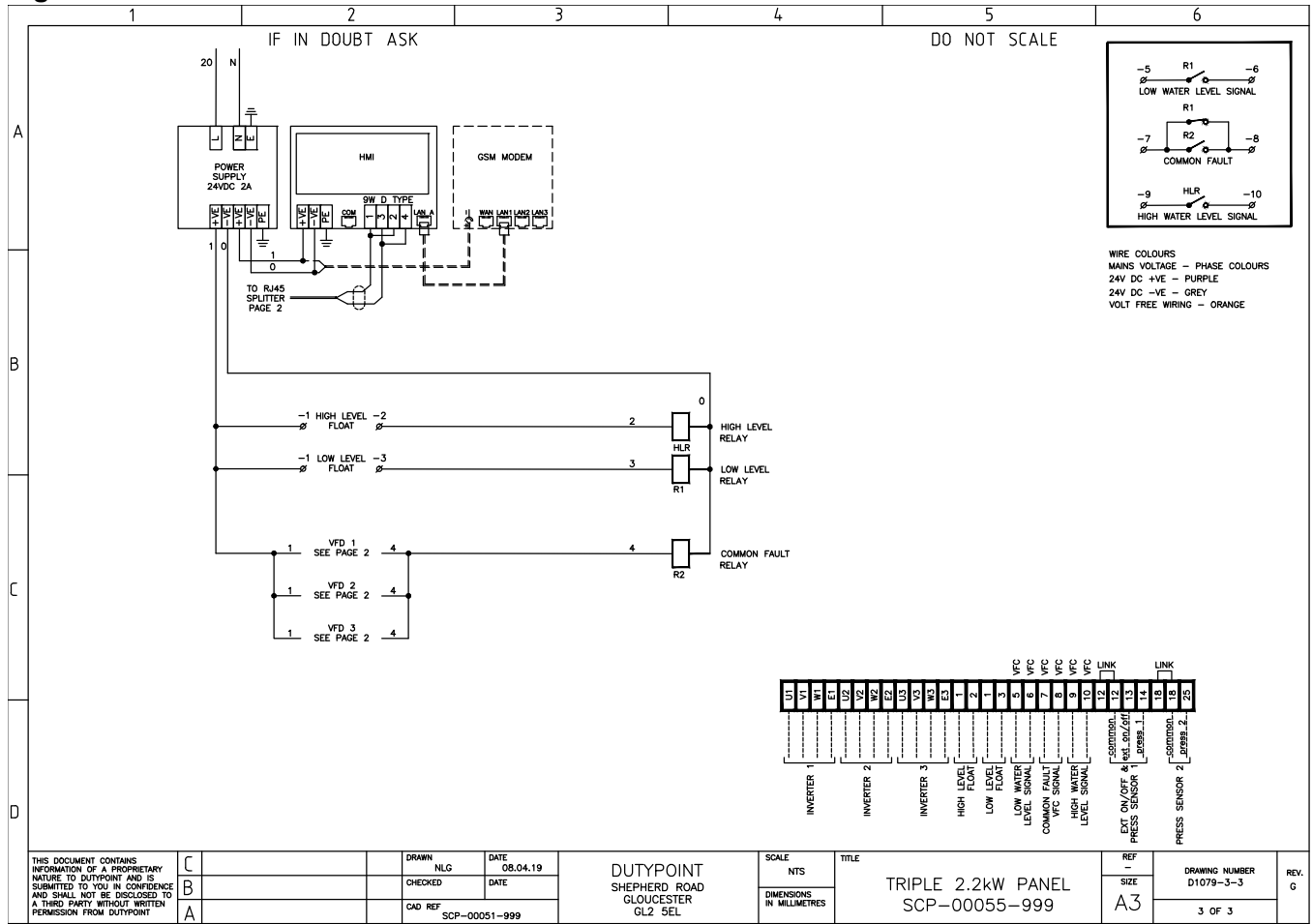


Figure 9.47: Sheet 3 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT

C B A	REF	DRAWN	DATE
		NLG	08.04.19
	CHECKED	DATE	
	CAD REF	SCP-00051-999	

DUTYPOINT  
 SHEPHERD ROAD  
 GLOUCESTER  
 GL2 5EL

SCALE  
 NTS  
 DIMENSIONS  
 IN MILLIMETRES

TITLE  
 TRIPLE 2.2kW PANEL  
 SCP-00055-999

REF	DRAWING NUMBER	REV. G
1	D1079-3-3	
SIZE	3 OF 3	

# 9.10 Triple Pump 3.0 and 4.0kW 3-Phase 400V

Figure 9.48: Sheet 1 of 3

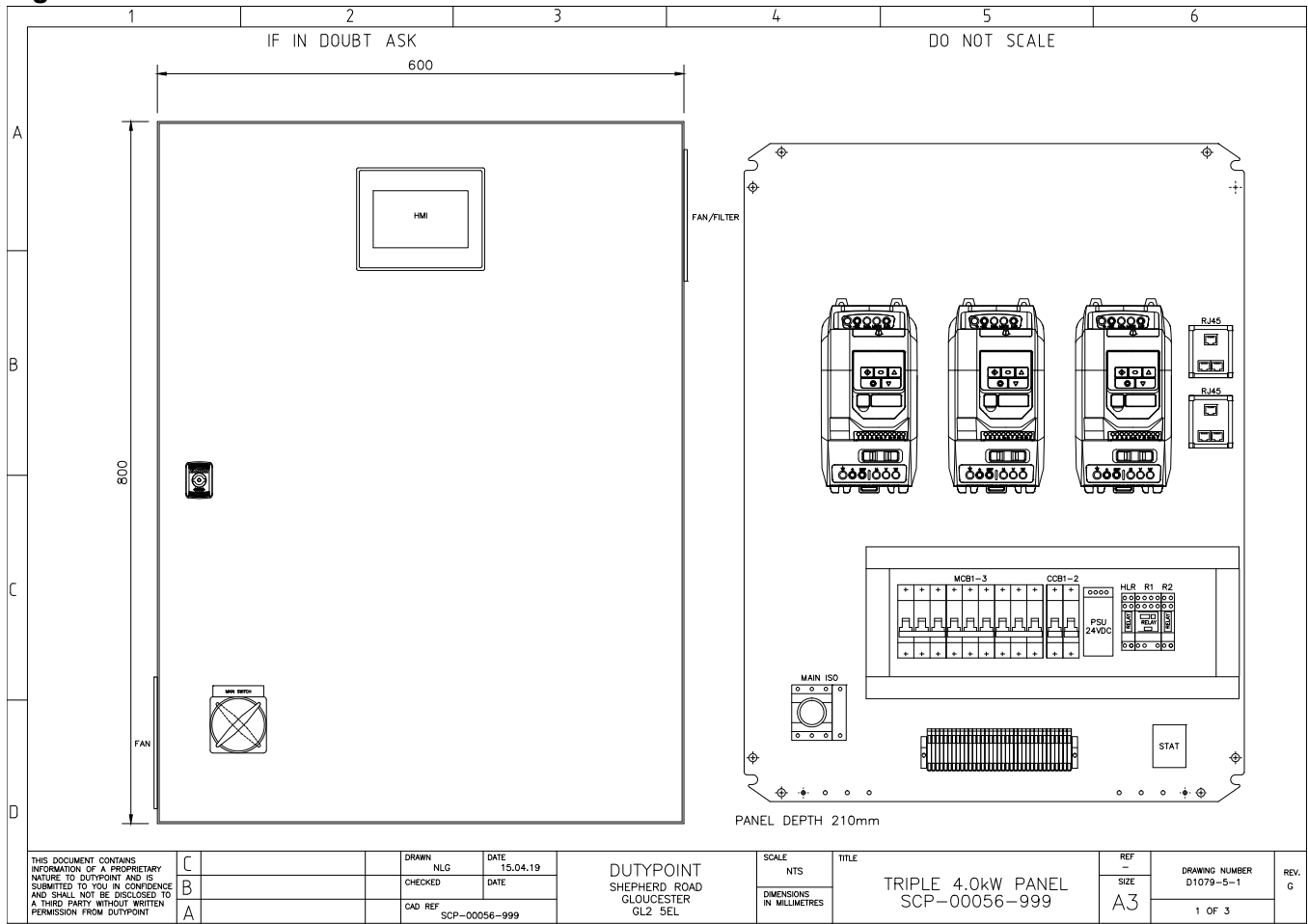
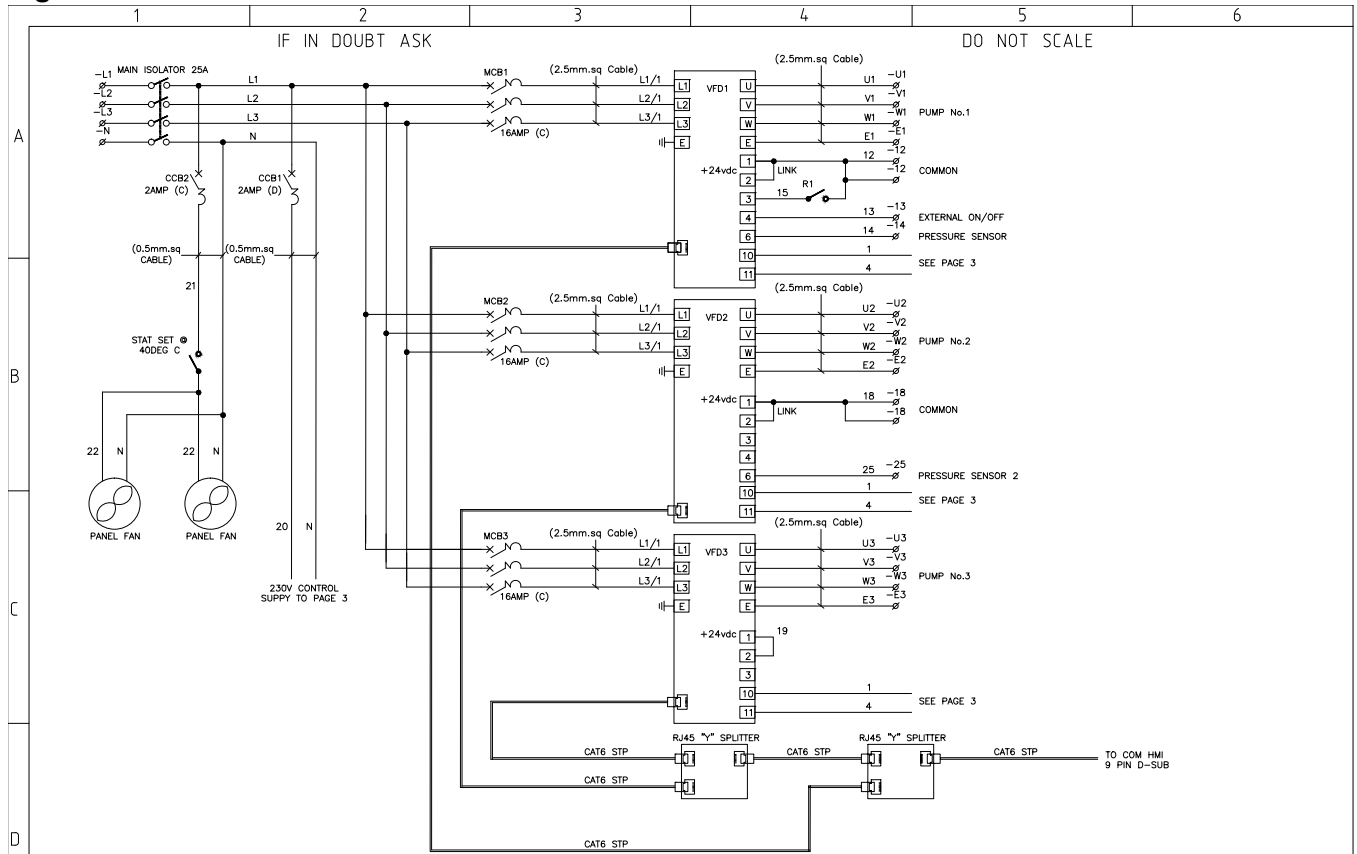
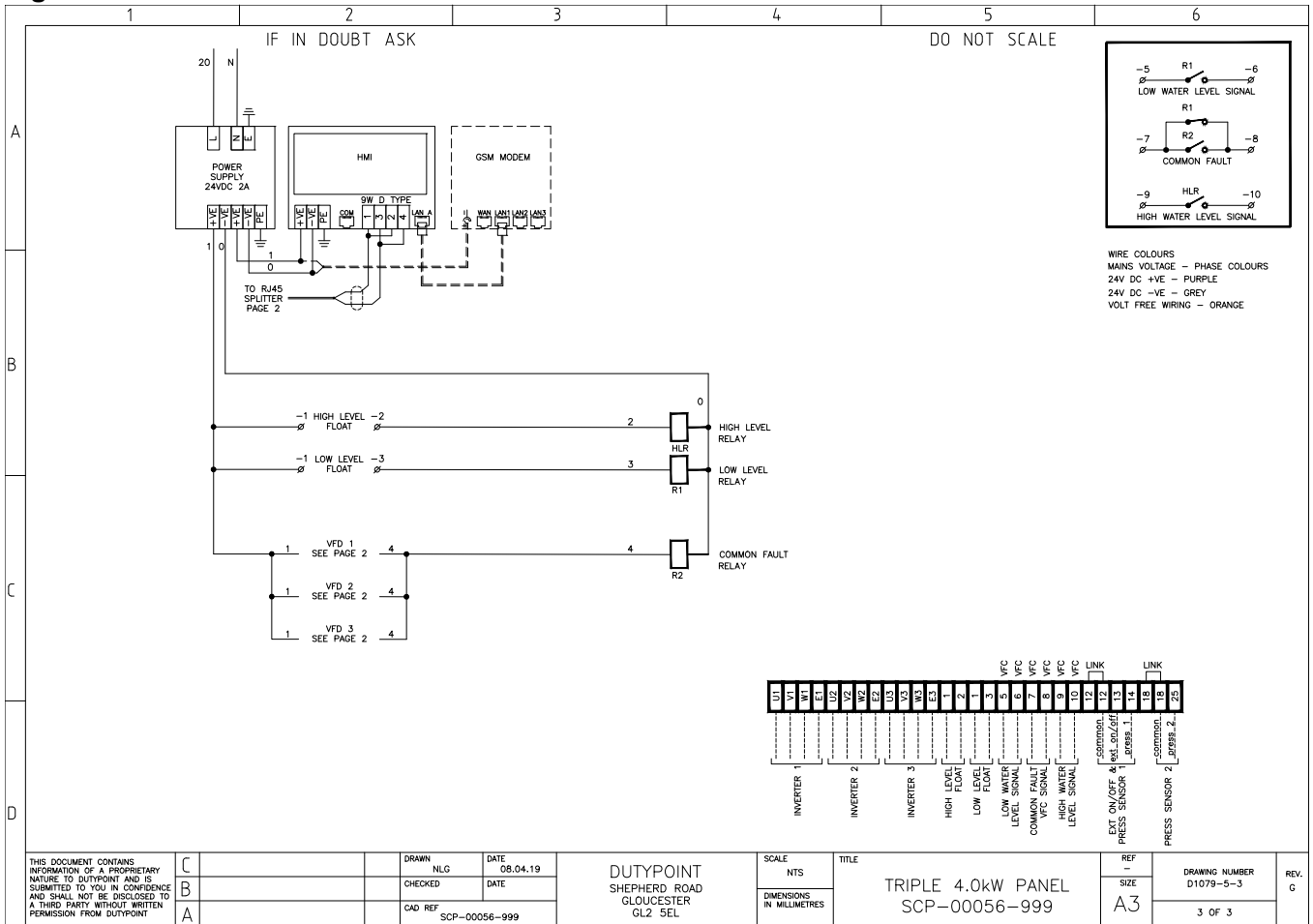


Figure 9.49: Sheet 2 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT	C	DRAWN	NLG	DATE	15.04.19	DUTYPOINT SHEPHERD ROAD GLOUCESTER GL2 5EL	SCALE NTS DIMENSIONS IN MILLIMETRES	TITLE TRIPLE 4.0kW PANEL SCP-00056-999	REF	DRAWING NUMBER D1079-5-2	REV. G	
	B	CHECKED		DATE					SIZE			A3
	A	CAD REF	SCP-00056-999						2 OF 3			

Figure 9.50: Sheet 3 of 3



# 9.11 Triple Pump 5.5kW 3-Phase 400V

Figure 9.51: Sheet 1 of 3

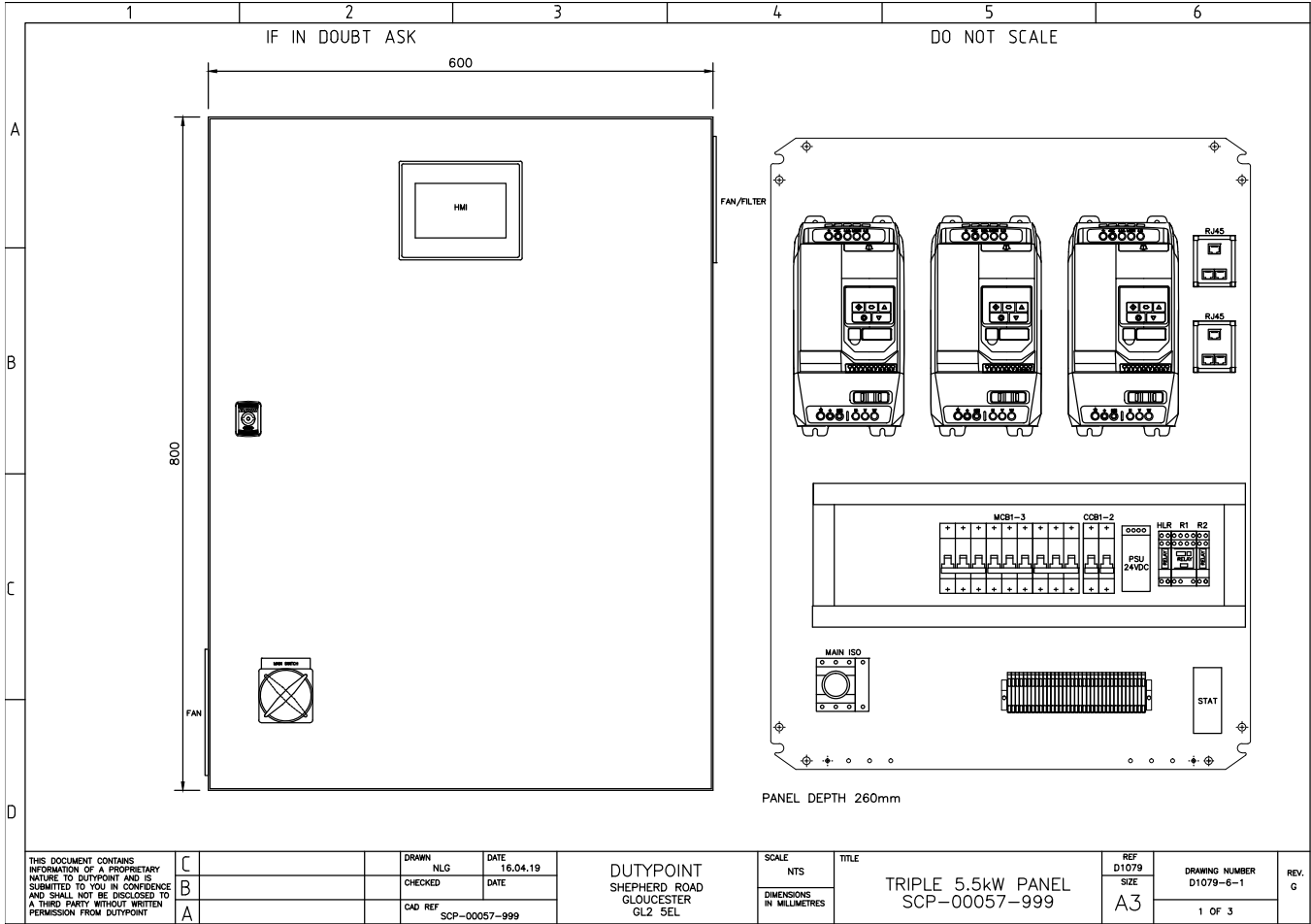


Figure 9.52: Sheet 2 of 3

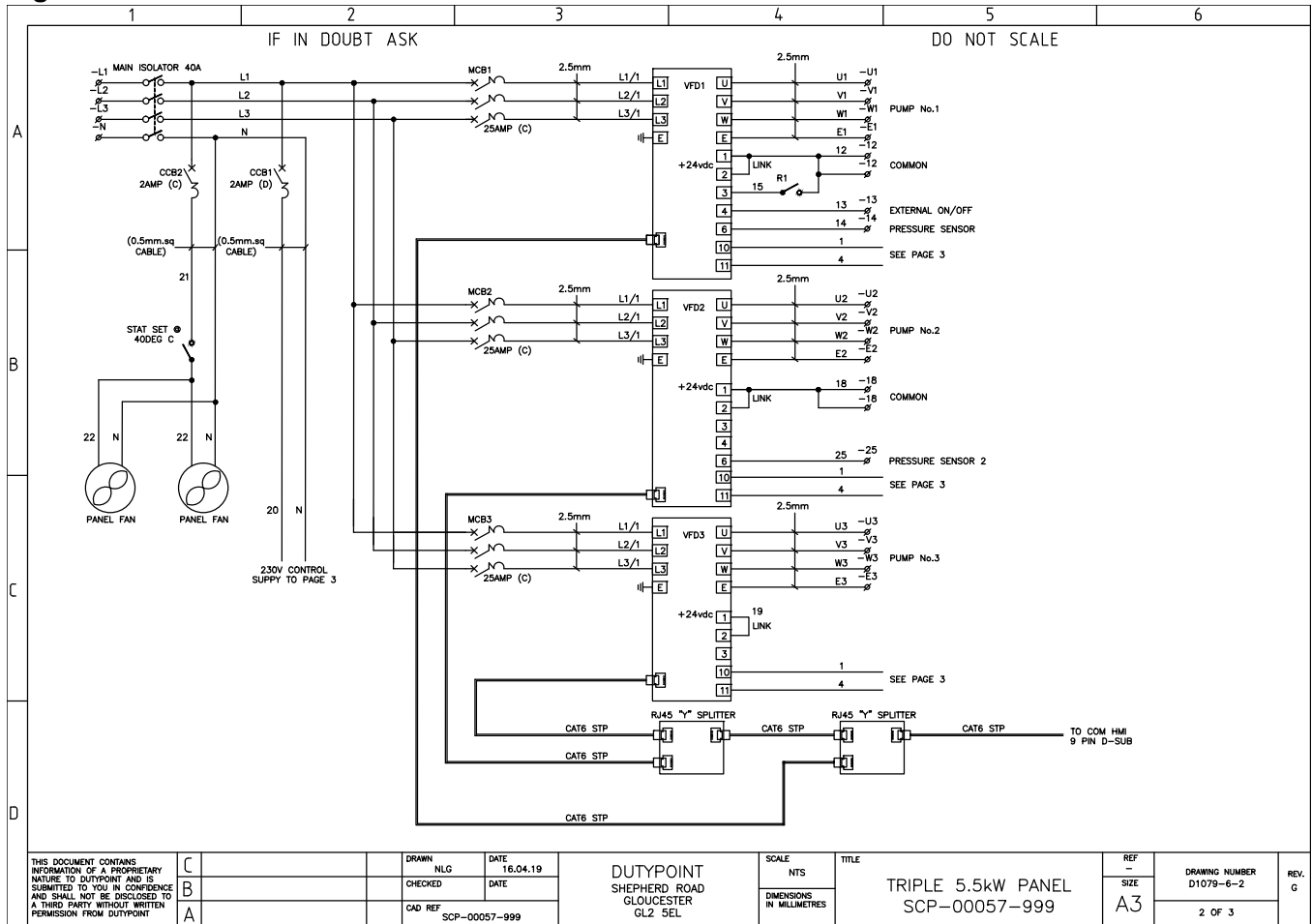
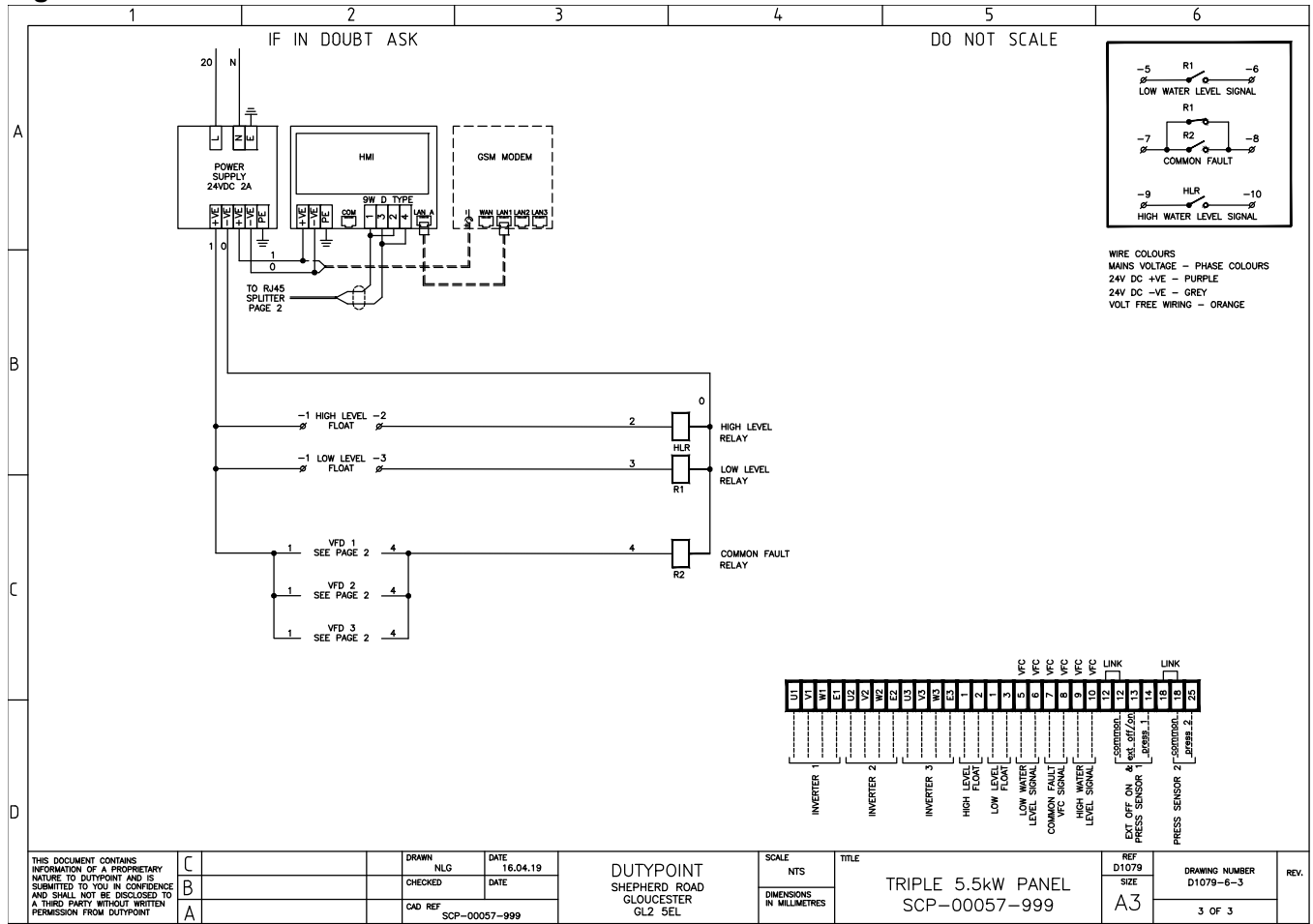




Figure 9.53: Sheet 3 of 3



# 9.12 Triple Pump 7.5kW 3-Phase 400V

Figure 9.54: Sheet 1 of 3

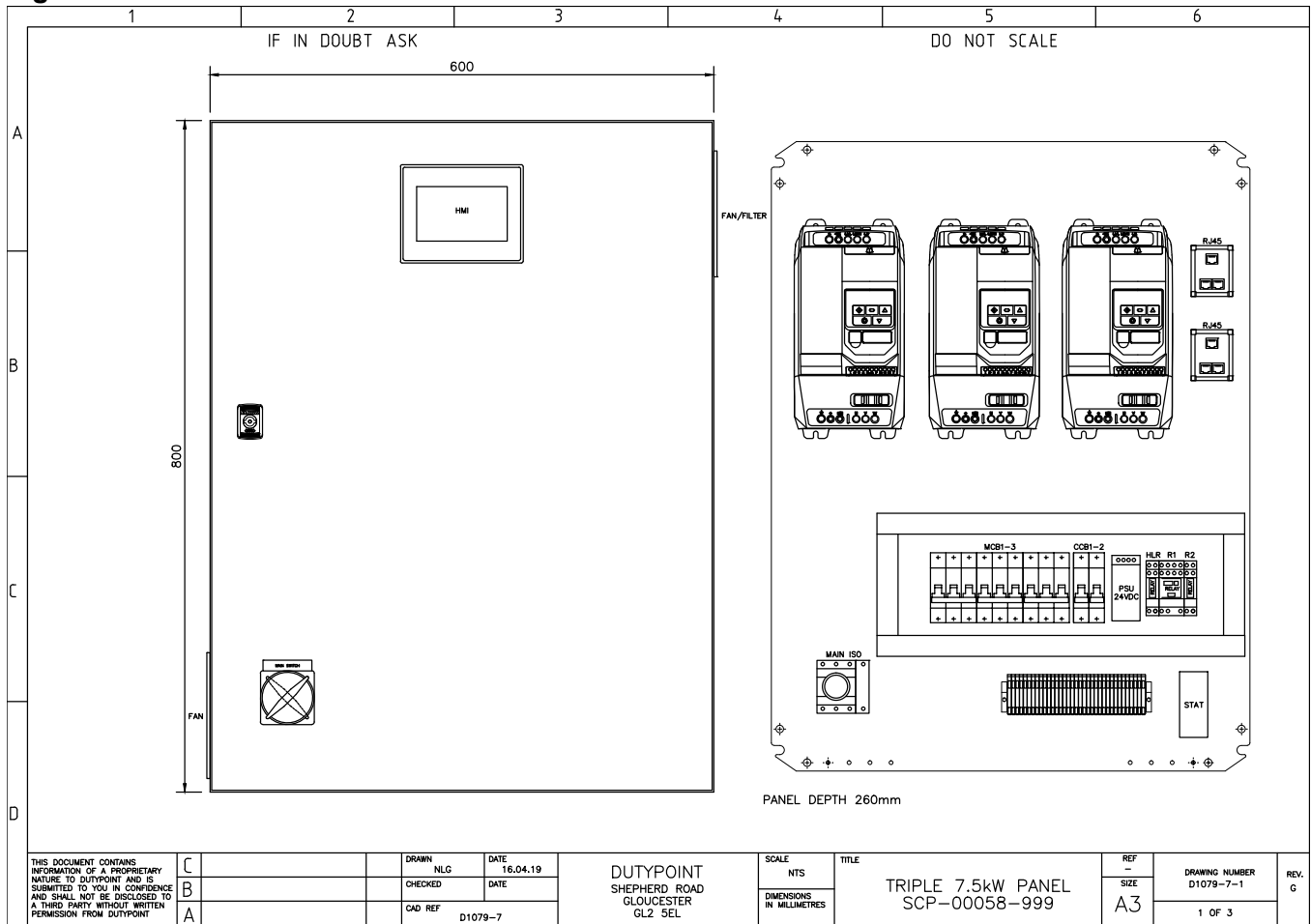
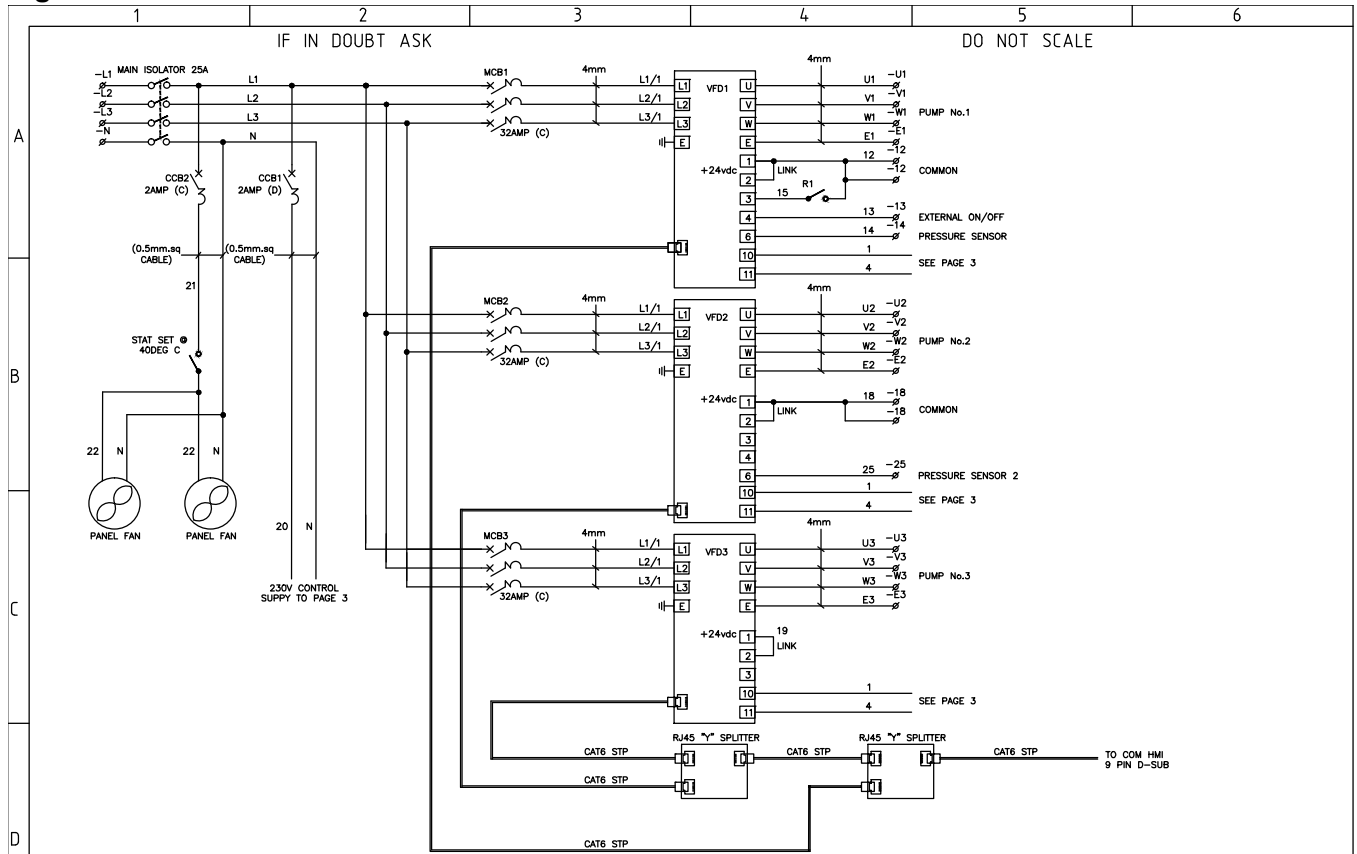


Figure 9.55: Sheet 2 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT	C	DRAWN	NLG	DATE	08.04.19	DUTYPOINT SHEPHERD ROAD GLOUCESTER GL2 5EL	SCALE NTS DIMENSIONS IN MILLIMETRES	TITLE TRIPLE 7.5kW PANEL SCP-00058-999	REF	DRAWING NUMBER D1079-7-2	REV. G	
	B	CHECKED		DATE					SIZE			A3
	A	CAD REF	SCP-00058-999						2 OF 3			



# 9.13 Triple Pump 1.5kW 1-Phase 240V

Figure 9.57: Sheet 1 of 3

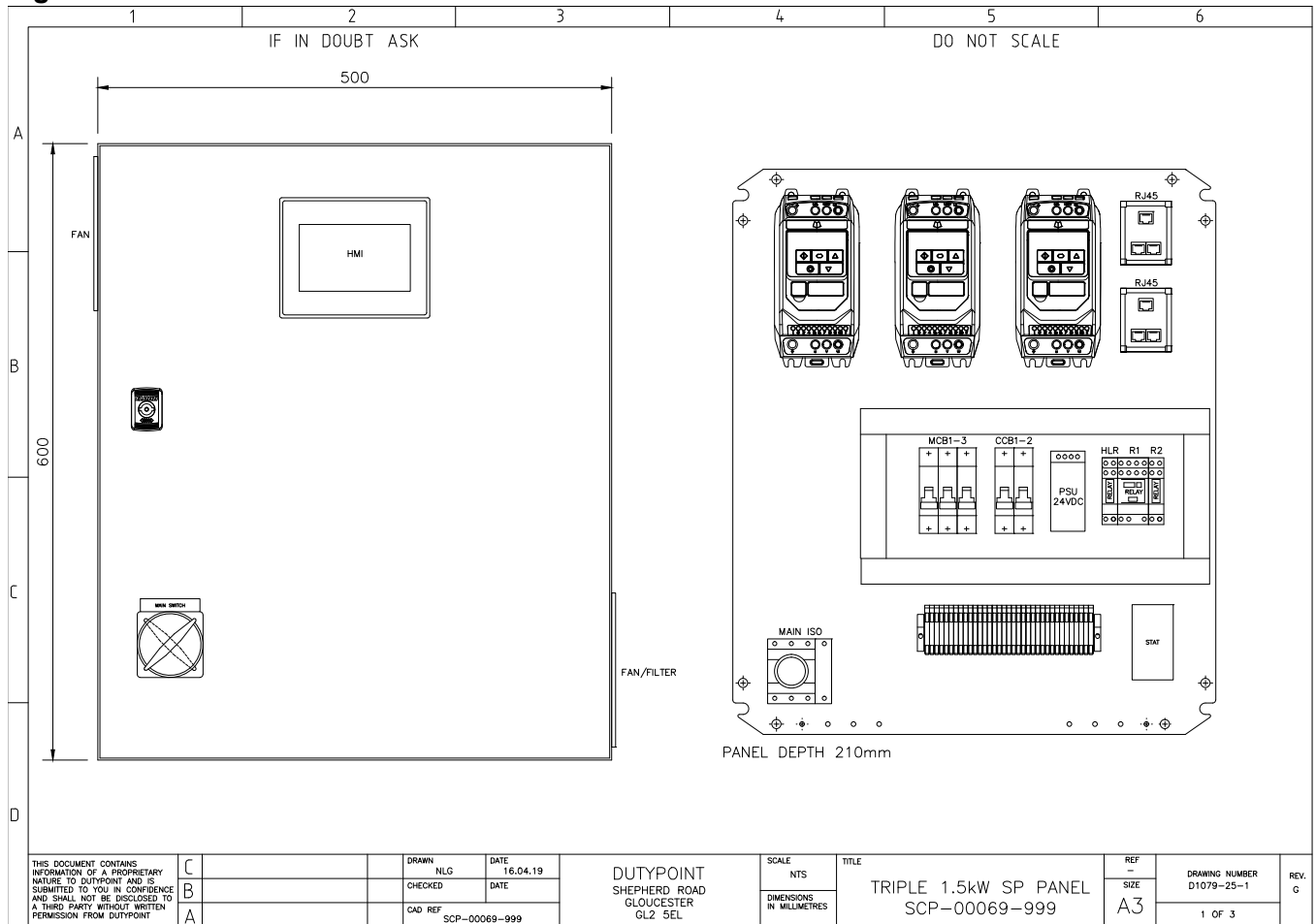
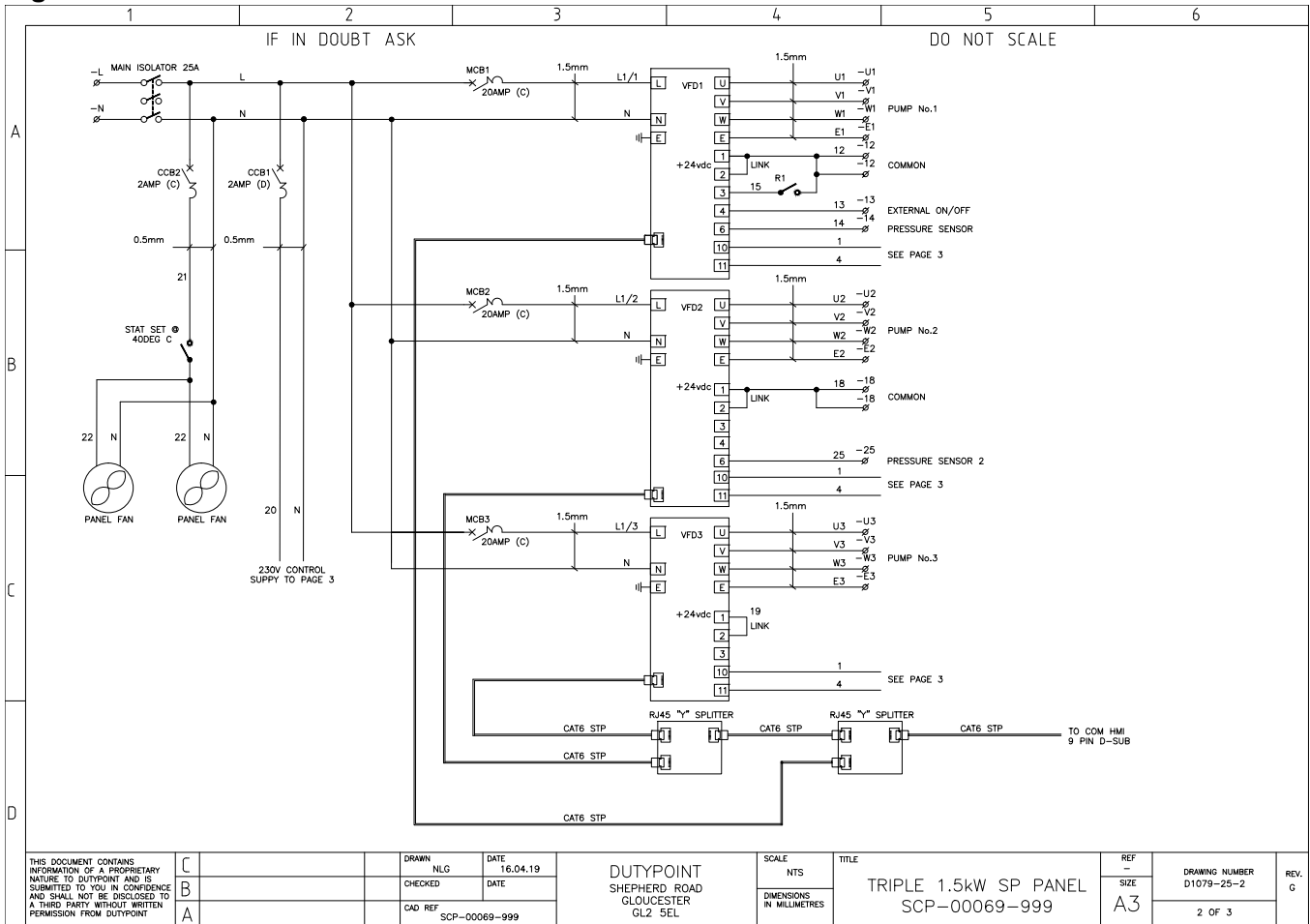


Figure 9.58: Sheet 2 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT

C  
B  
A

DRAWN NLG DATE 16.04.19  
CHECKED DATE  
CAD REF SCP-00069-999

DUTYPOINT  
SHEPHERD ROAD  
GLOUCESTER  
GL2 5EL

SCALE MTS  
DIMENSIONS IN MILLIMETRES

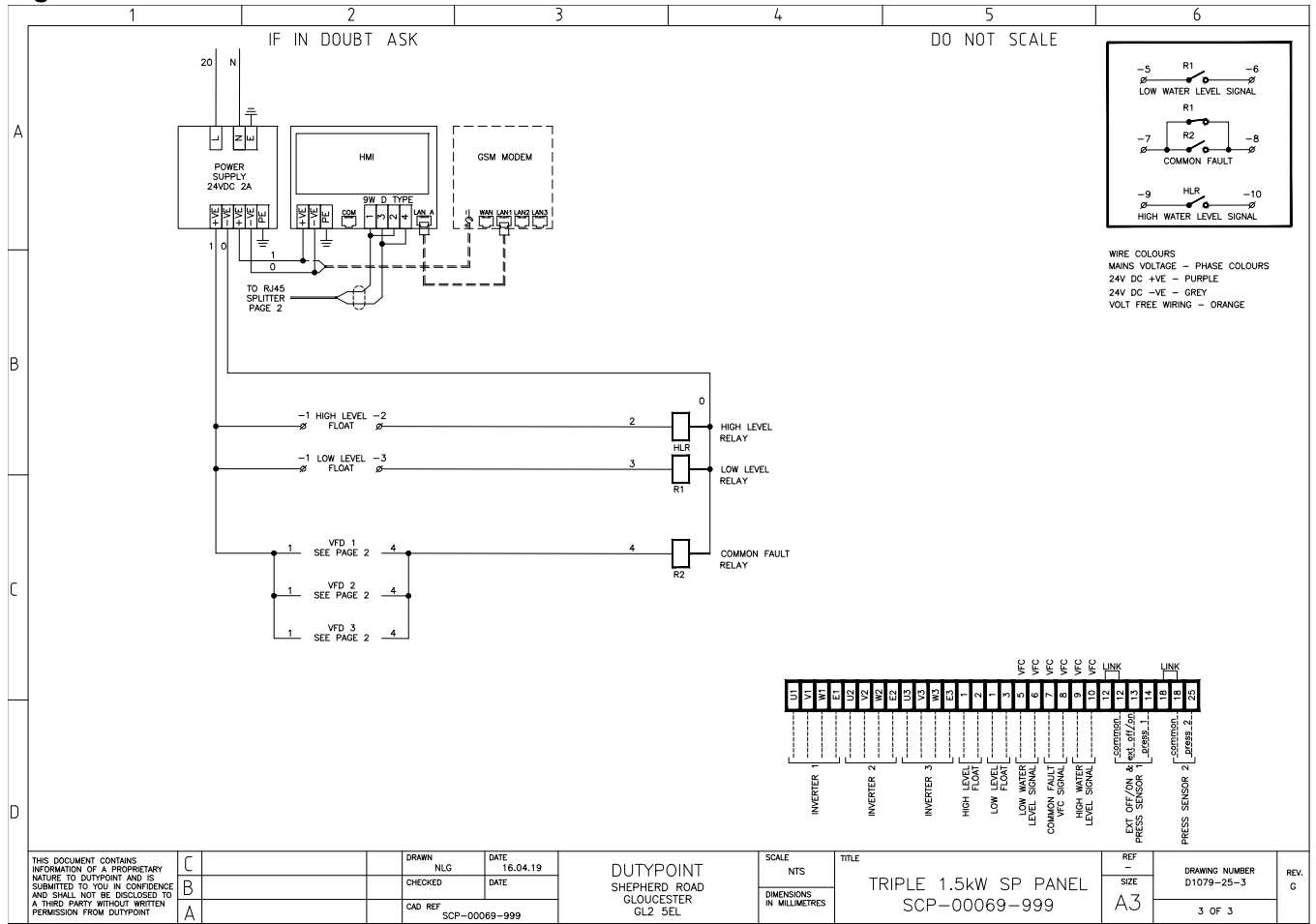
TITLE  
TRIPLE 1.5kW SP PANEL  
SCP-00069-999

REF SIZE  
A3

DRAWING NUMBER  
D1079-25-2  
2 OF 3

REV. G

Figure 9.59: Sheet 3 of 3



# 9.14 Triple Pump 2.2kW 1-Phase 240V

Figure 9.60: Sheet 1 of 3

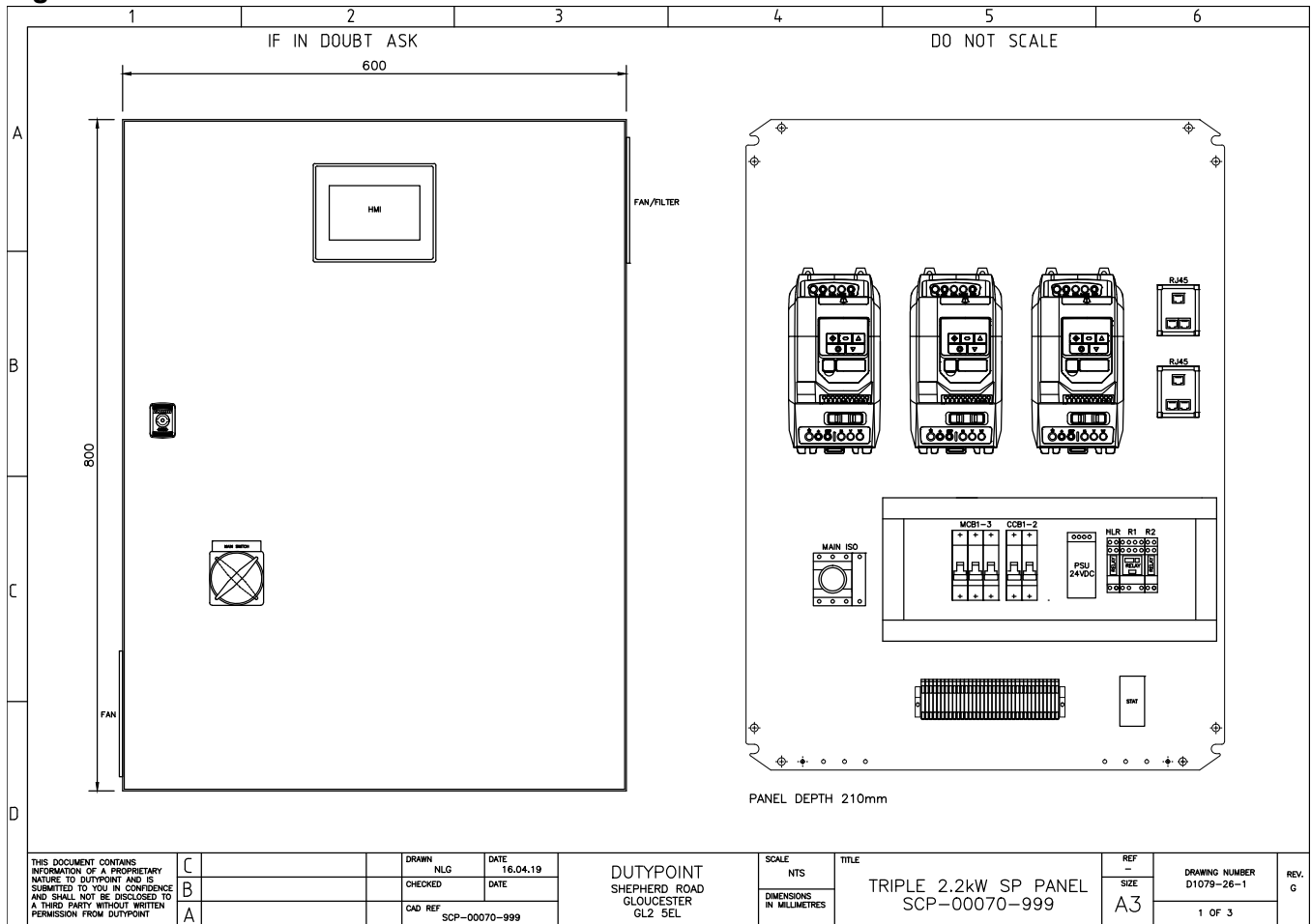
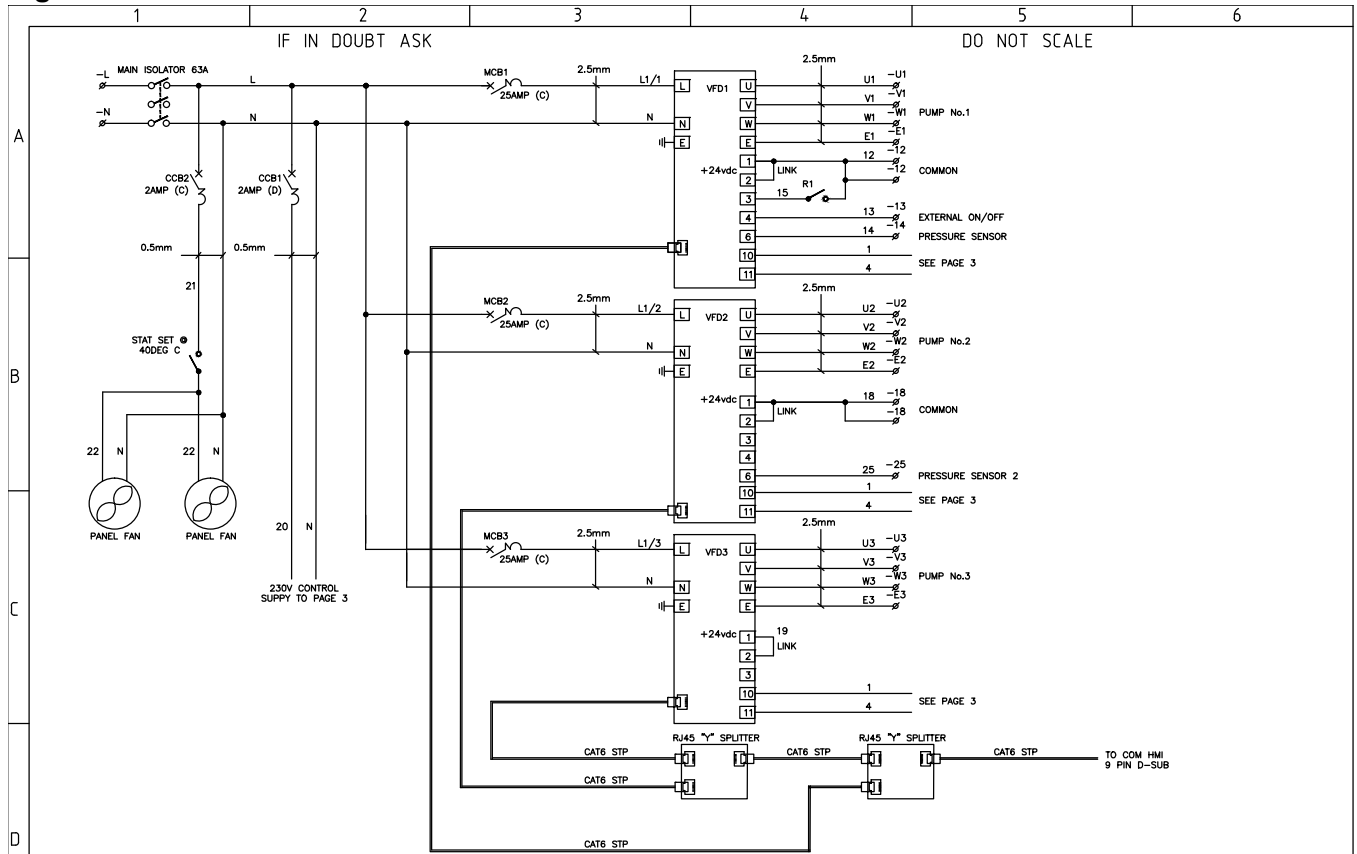


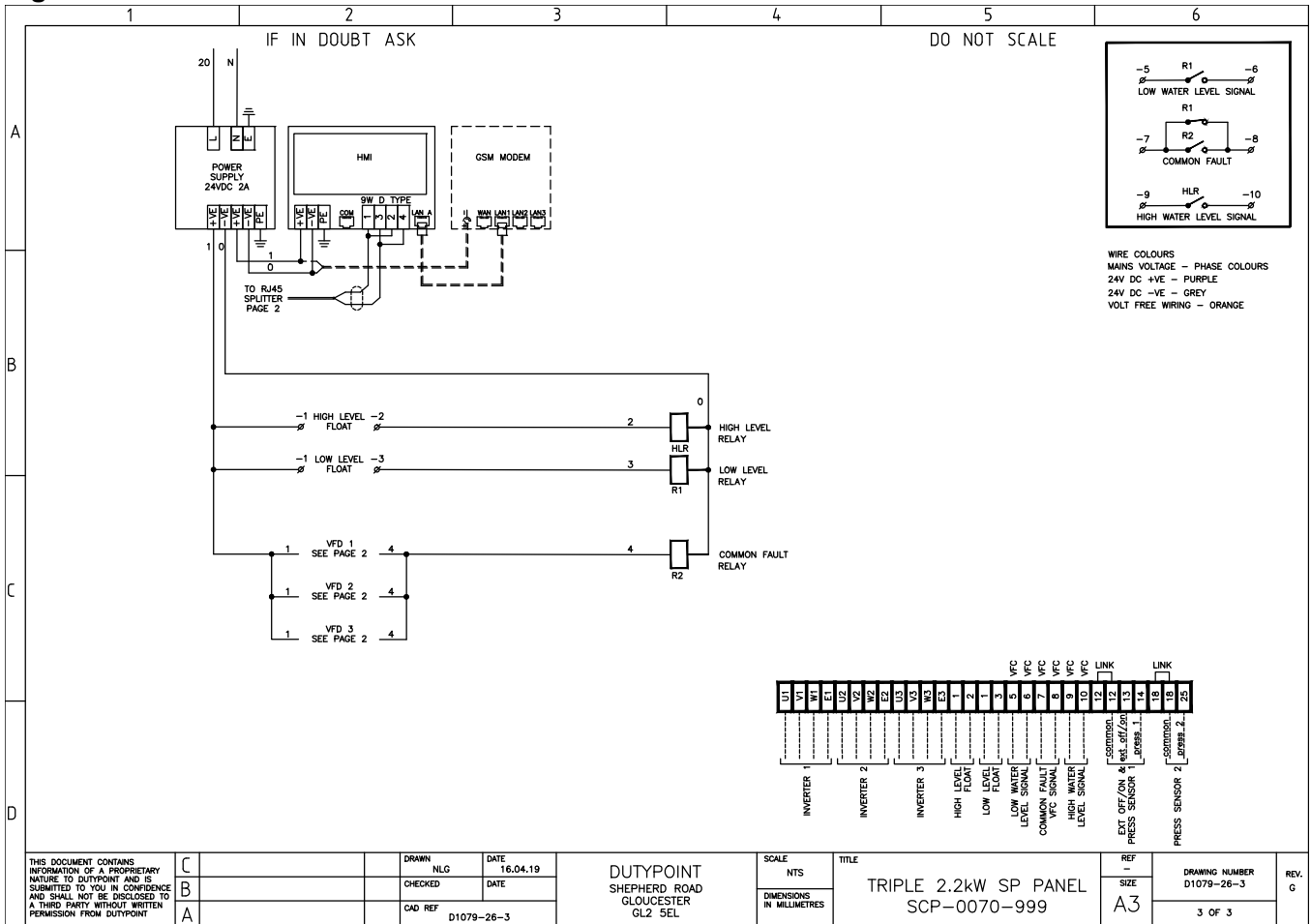


Figure 9.61: Sheet 2 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT	C	DRAWN	NLG	DATE	16.04.19	DUTYPOINT SHEPHERD ROAD GLOUCESTER GL2 5EL	SCALE NTS DIMENSIONS IN MILLIMETRES	TITLE TRIPLE 2.2kW SP PANEL SCP-00070-999	REF	DRAWING NUMBER D1079-26-2	REV. G	
	B	CHECKED		DATE					SIZE			A3
	A	CAD REF	SCP-00070-999						2 OF 3			

Figure 9.62: Sheet 3 of 3



# 9.15 Triple Pump 3.0 and 4.0kW 1-Phase 400V

Figure 9.63: Sheet 1 of 3

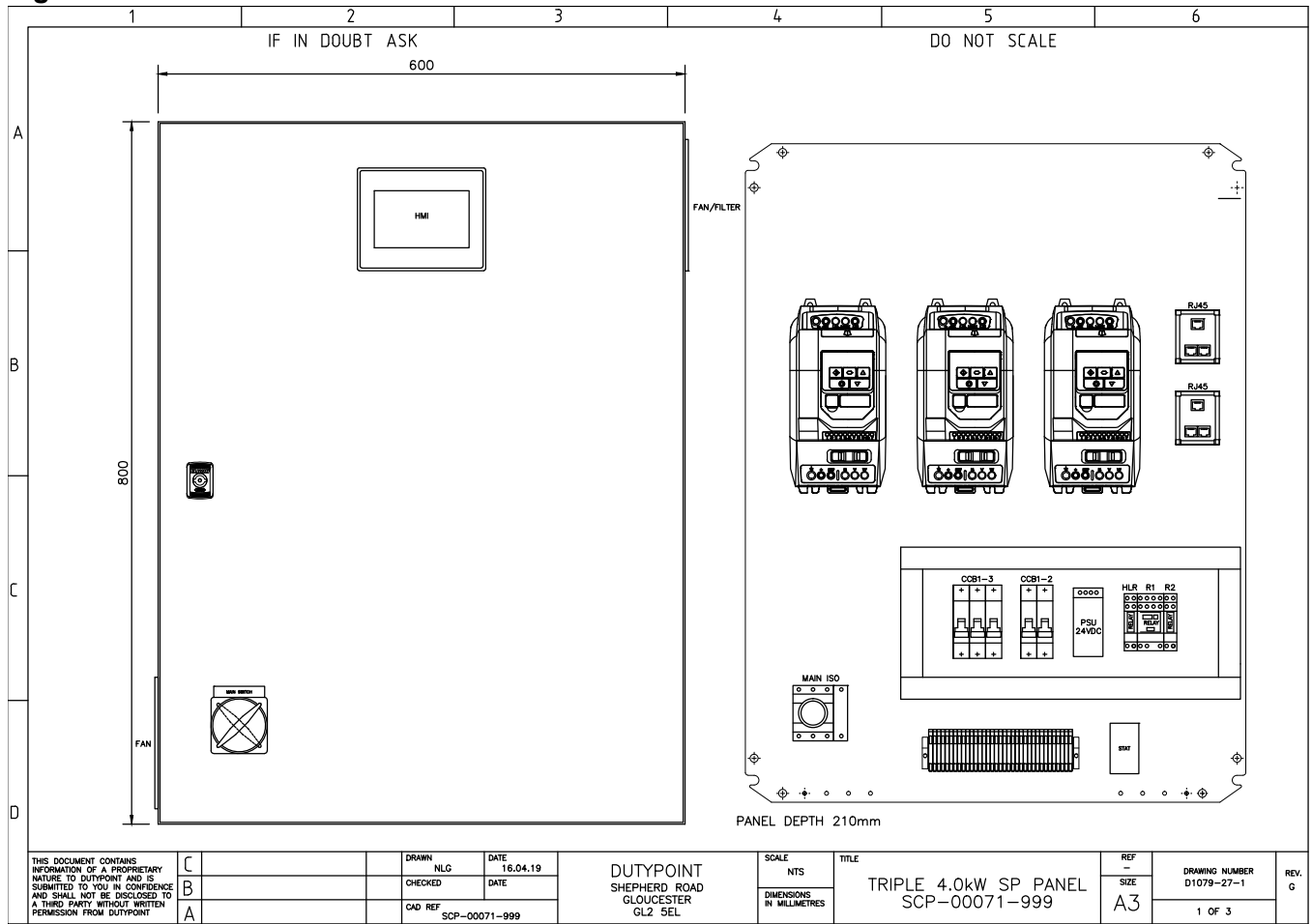


Figure 9.64: Sheet 2 of 3

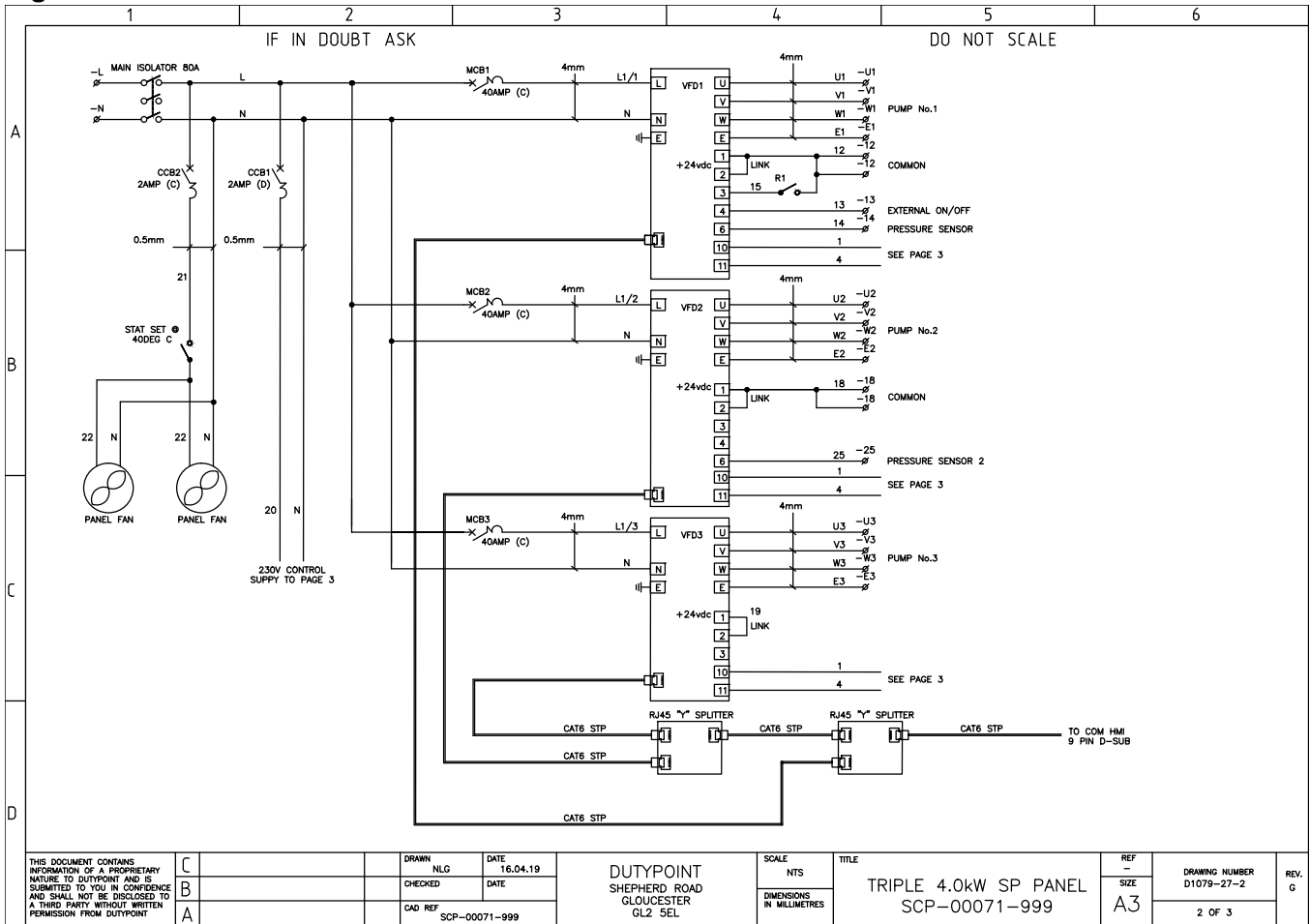
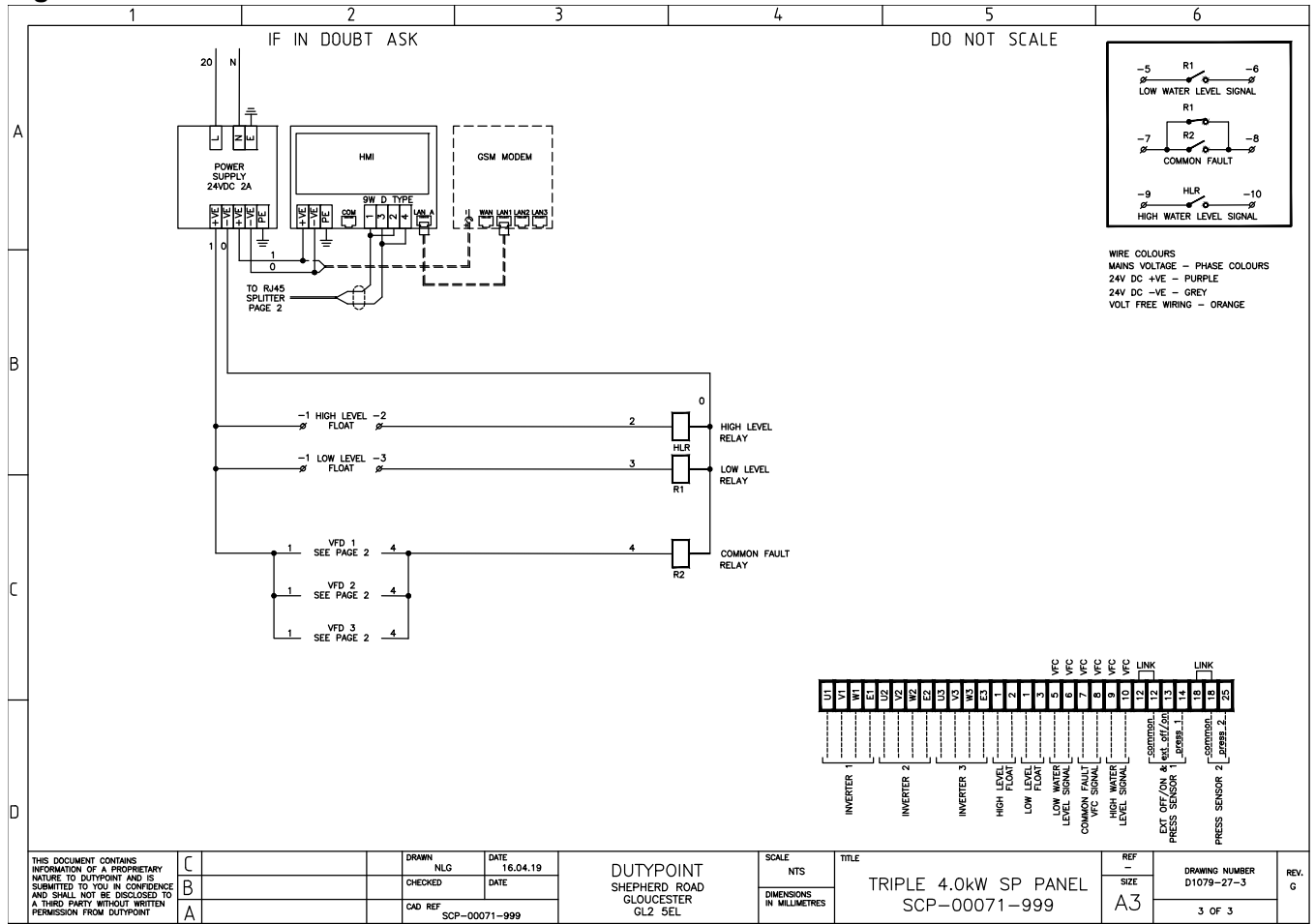


Figure 9.65: Sheet 3 of 3



THIS DOCUMENT CONTAINS INFORMATION OF A PROPRIETARY NATURE TO DUTYPOINT AND IS SUBMITTED TO YOU IN CONFIDENCE AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN PERMISSION FROM DUTYPOINT

C	DRAWN	NLG	DATE	16.04.19
B	CHECKED		DATE	
A	CAD REF	SCP-00071-999		

DUTYPOINT  
 SHEPHERD ROAD  
 GLOUCESTER  
 GL2 5EL

SCALE  
 NTS  
 DIMENSIONS  
 IN MILLIMETRES

TITLE  
 TRIPLE 4.0kw SP PANEL  
 SCP-00071-999

REF	DRAWING NUMBER	REV.
A3	D1079-27-3	G
	3 OF 3	

# 10. Controls and Inverters Reference Guide

Please read the IMPORTANT SAFETY INFORMATION below, and all Warning and Caution information elsewhere when carrying out any work on the inverter drives. This information is provided for reference purposes and should be not be referred to in normal operation of the product. The majority of the inverter parameters are controller by the touch screen display. If in doubt, consult Dutypoint before making any adjustments.

## 10.1 Important Safety Information

---

### **DANGER: RISK OF ELECTRIC SHOCK.**

- This variable speed drive product is intended for professional incorporation into complete equipment or systems as part of a fixed installation. If installed incorrectly it may present a safety hazard. The system uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction. Only qualified electricians are allowed to install and maintain this product.
- System design, installation, commissioning and maintenance must be carried out only by personnel who have the necessary training and experience. They must carefully read this safety information and the instructions in this Guide and follow all information regarding transport, storage, installation and use of the inverter, including the specified environmental limitations.
- Do not perform any flash test or voltage withstand test on the product. Any electrical measurements required should be carried out with the product disconnected. Internal surge arrestors are fitted, intended to protect against damage due to mains borne spikes, which will result in the product failing the flash test
- Electric shock hazard! Disconnect and ISOLATE the product before attempting any work on it. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply. Always ensure by using a suitable multimeter that no voltage is present on any drive power terminals prior to commencing any work.
- Where supply to the drive is through a plug and socket connector, do not disconnect until 10 minutes have elapsed after turning off the supply.
- Ensure correct earthing connections and cable selection as per defined by local legislation or codes. The drive may have a leakage current of greater than 3.5mA; furthermore the earth cable must be sufficient to carry the maximum supply fault current which normally will be limited by the fuses or MCB. Suitably rated fuses or MCB should be fitted in the mains supply to the drive, according to any local legislation or codes.
- Do not carry out any work on the drive control cables whilst power is applied to the drive or to the external control circuits.

---

### **DANGER: RISK OF DAMAGE TO PROPERTY**

- Within the European Union, all machinery in which this product is used must comply with Directive 98/37/EC, Safety of Machinery. In particular, the machine manufacturer is responsible for providing a main switch and ensuring the electrical equipment complies with EN60204-1.
- The level of integrity offered by the inverter control input functions – for example stop/start, forward/reverse and maximum speed, is not sufficient for use in safety-critical applications without independent channels of

protection. All applications where malfunction could cause injury or loss of life must be subject to a risk assessment and further protection provided where needed.

- The driven motor can start at power up if the enable input signal is present.
- The STOP function does not remove potentially lethal high voltages. ISOLATE the drive and wait 10 minutes before starting any work on it. Never carry out any work on the Drive, Motor or Motor cable whilst the input power is still applied.
- The inverter can be programmed to operate the driven motor at speeds above or below the speed achieved when connecting the motor directly to the mains supply. Obtain confirmation from the manufacturers of the motor and the driven machine about suitability for operation over the intended speed range prior to machine start up.
- Do not activate the automatic fault reset function on any systems whereby this may cause a potentially dangerous situation.
- Inverters are intended for indoor use only
- When mounting the drive, ensure that sufficient cooling is provided. Do not carry out drilling operations with the drive in place, dust and swarf from drilling may lead to damage.
- The entry of conductive or flammable foreign bodies should be prevented. Flammable material should not be placed close to the drive
- Ensure that the supply voltage, frequency and no. of phases (1 or 3 phase) correspond to the rating of the inverter as delivered.
- Never connect the mains power supply to the Output terminals U, V, W.
- Do not install any type of automatic switchgear between the drive and the motor. This may cause the drive protection to activate, resulting in a trip and loss of operation.
- Wherever control cabling is close to power cabling, maintain a minimum separation of 100 mm and arrange crossings at 90 degrees
- Ensure that all terminals are tightened to the appropriate torque setting
- Do not attempt to carry out any repair of the inverter. In the case of suspected fault or malfunction, contact Dutypoint for further assistance.

## 10.2 Commissioning

The information in this section is required to operate the motor with the best possible efficiency level, to protect the motor against damage from overload,

**Table 10.11:** Motor Nameplate Information

The inverter uses the information from the motor nameplate to operate the motor with the best possible efficiency level and protect the motor against possible damage due to operation in overload condition. In order to achieve this, the inverter requires that the following information from the motor nameplate is entered into the parameters

<b>Code</b>	<b>Required Information</b>	<b>Description</b>
P1-07	Motor Rated Voltage	This is the operating voltage for the motor in its present wiring configuration (Star or Delta). The maximum output voltage from the inverter can never exceed the incoming supply voltage.
P1-08	Motor Rated Current	This is the full load current of the motor from the nameplate
P1-09	Motor Rated Frequency	This is the standard operating frequency of the motor, generally 50 or 60Hz
P1-10	Motor Rated Speed	This parameter can optionally be set to the RPM shown on the motor nameplate. When this parameter is entered, all speed related parameters in the drive are displayed in RPM. When the parameter is set to zero, all speed related parameters are displayed in Hz.

**Table 10.12:** Minimum and Maximum Frequencies/Speeds

The inverter units are factory set to operate the motor from zero up to base speed (50 or 60Hz output). In general, this operating range is suitable for a wide range of requirements, however in some cases it may be desired to adjust these limits, e.g. where the maximum speed of a fan or pump may provide excessive flow, or where operation below a certain speed is never required. In this case, the following parameters can be adjusted to suit the application :-

Code	Required Information	Description
P1-01	Maximum Frequency.	In general this should match the motor rated frequency. If operation above this frequency is desired, confirmation from the motor manufacturer, and the manufacturer of any connected fan or pump should be sought that this is permissible, and will not cause damage to the equipment.
P1-02	Minimum Frequency	A suitable minimum can be set to prevent the motor operating at low speed, which may cause the motor to overheat. In some applications, such as a pump circulating water through a boiler, it may be necessary to set a speed to ensure the boiler does not run dry during operation.

**Table 10.13:** Acceleration and Deceleration Ramp Times

Inverter units are factory set with acceleration and deceleration ramp rates set to 30 seconds. The default value is suitable for the majority of applications but can be altered by changing the values in parameters P1-03 and P1-04. Care must be taken to ensure the driven load is capable of performing the specified ramps and that nuisance trips due to excessively short ramp times are not produced.

The ramp times entered in the parameter set always specify the time taken to ramp between 0Hz and motor rated speed P1-09. For example; If ramp rate = 30 seconds and P1-09 (motor base speed) = 50Hz, and assuming the motor is currently running at 25Hz and the drive is commanded to accelerate to 50Hz. The time taken to reach 50Hz would be 30 seconds (P1-03) / 50 (P1-09) \* 25 (required change in speed) = 15(s)

Code	Required Information	Description
P1-03	Acceleration Ramp Rate	Time taken for the drive to accelerate the motor from 0Hz to Motor base speed, P1-09 in seconds.
P1-04	Deceleration Ramp Rate	Time taken for the drive to decelerate the motor from Motor base speed, P1-09 to 0Hz in seconds.

**Table 10.14:** Stop Mode Selection

Inverter units can be programmed to either apply a fixed deceleration to the motor during stopping, or to release control of the motor and allow it to coast or free-wheel to a stop. The default selection is for the drive is ramp to stop and behaviour is programmed using parameter P1-05.

Code	Required Information	Description
P1-05	Stop Mode Select	Defines how the motor will be stopped in the event of the enable input being removed from the drive. Ramp to stop (P1-05 = 0) will ramp the drive to stop using the value for deceleration entered in P1-04. Coast to stop (P1-05 = 1) will allow the motor to coast to stop (uncontrolled).

**Table 10.15:** Voltage Boost



Voltage boost is used to increase the applied motor voltage at low output frequencies, in order to improve low speed and starting torque. Excessive boost levels may result in increased motor current and temperature, and force ventilation of the motor may be required.

Code	Required Information	Description
P4-01	Torque Mode	The default value for Torque boost is set 0.0%, and this should only be increased if the starting torque is insufficient. Ensure that the correct Constant or Variable Torque mode is set in P4-01 before adjusting the boost.

## 10.3 Advanced Parameters

The inverter advanced parameter set consists of 7 groups as follows:

- Group 1 – Basic Parameter Set
- Group 2 – Extended Parameter Set
- Group 3 – User PID Control Parameter Set
- Group 4 – Motor Control Parameters
- Group 5 – Field Bus Communications Parameter Set
- Group 8 – Application Specific Functions Parameter Set
- Group 0 – Monitoring and Diagnostic Parameters (Read Only)

When the inverter is reset to factory defaults, or is in its factory supplied state, only Group 1 Parameters can be accessed. In order to allow access to parameters from the higher level groups, P1-14 must be set to the same value as P2-40 (Default setting = 101). With this setting, parameter groups 1 – 5 and group 8 can be accessed, along with the first 39 parameters in Group 0. These parameters are listed in the tables below. For advanced parameter access, P1-14 can be set to the same value as P6-30 (Default setting = 201), which allows access to all parameter groups and ranges. Advanced parameter descriptions are listed in the advanced user guide. Values given in brackets ( ) are default settings for horsepower rated drive models.

**Table 10.16:** Parameter Group 1 - Basic Parameters Set

Par	Parameter Name	Minimum	Maximum	Default	Units
P1-01	Maximum Speed Limit	P1-02	500.0	50.0(60.0)	Hz/RPM
	Maximum output frequency or motor speed limit – Hz or rpm. If P1-10 >0, the value entered / displayed is in Rpm Note : The maximum possible setting of is limited to the lowest value of: <ul style="list-style-type: none"> <li>• 5 x P1-09</li> <li>• 5 x P1-10</li> <li>• P2-24 / 16</li> <li>• 500.0Hz</li> </ul>				
P1-02	Minimum Speed Limit	0.0	P1-01	0.0	Hz/RPM
	Minimum speed limit – Hz or RPM. If P1-10 >0, the value entered / displayed is in Rpm				
P1-03	Acceleration Ramp Time	0.0	6000.0	30.0	Seconds
	Acceleration ramp time from 0 to base speed (P-1-09) in seconds.				
P1-04	Deceleration Ramp Time	0.0	6000.0	30.0	Seconds
	Deceleration ramp time from base speed (P1-09) to standstill in seconds.				

Par	Parameter Name	Minimum	Maximum	Default	Units
P1-05	Stop Mode Select	0	1	0	-
	0: Ramp To Stop. When the enable signal is removed, the drive will ramp to stop, with the rate controlled by P1-04 as described above. 1: Coast to Stop. When the enable signal is removed the motor will coast (freewheel) to stop 2: AC Flux Braking. Provides additional braking torque capability when decelerating.				
P1-06	Reserved	-		-	-
	-				
P1-07	Motor Rated Voltage	0	Drive dependent		Volts
	For Induction Motors - Enter the rated (nameplate) voltage of the motor (Volts) For PM & BLDC Motors - Enter the back EMF at rated motor speed				
P1-08	Motor Rated Current	Drive dependent	Drive rated current	100% drive rated current	Amps
	This parameter should be set to the rated (nameplate) current of the motor				
P1-09	Motor Rated Frequency	25	500	50(60)	Hz
	This parameter should be set to the rated (nameplate) frequency of the motor				
P1-10	Motor Rated Speed	0	30000	0	RPM
	This parameter can optionally be set to the rated (nameplate) rpm of the motor. When set to the default value of zero, all speed related parameters are displayed in Hz, and the slip compensation for the motor is disabled. Entering the value from the motor nameplate enables the slip compensation function, and the Optidrive display will now show motor speed in estimated rpm. All speed related parameters, such as Minimum and Maximum Speed, Preset Speeds etc. will also be displayed in Rpm.				
P1-11	Torque Boost	0.0	0.0	Drive dependent	%
	Torque Boost is used to increase the applied motor voltage and hence current at low output frequencies. This can improve low speed and starting torque. Increasing the boost level will increase motor current at low speed, which may result in the motor temperature rising - force ventilation of the motor may then be required. In general, the lower the motor power, the higher the boost setting that may be safely used. For IM motors, a suitable setting can usually be found by operating the motor under very low or no load conditions at approximately 5Hz, and adjusting P1-11 until the motor current is approximately the magnetising current This parameter is also effective when using alternative motor types, P4-01 = 3, 4 or 5. In this case, the boost current level is defined as $4 \times P1-11 \times P1-08$				
P1-12	Control Mode Select	0	6	0	-
	0: Terminal Control. The drive responds directly to signals applied to the control terminals. 1: Uni-directional Keypad Control. The drive can be controlled in the forward direction only using the internal or remote Keypad 2: Uni-directional Keypad Control. As above. 3: PID Control. The output frequency is controlled by the internal PID controller. 4: Fieldbus Control by the selected Fieldbus (Group 5 Parameters) – Excluded BACnet (see option 6) 5: Slave Mode. The drive acts as a Slave to a connected Optidrive operating in Master Mode 6: BACnet Mode. Drive communicates / responds as a slave within a BACnet network.				

Par	Parameter Name	Minimum	Maximum	Default	Units
P1-13	Digital Input Function	0	14	1	-
	Defines the function of the digital inputs. When set to 0 the inputs are user defined using group 9 parameters or the PLC software function in the OptiTools Studio software package. When set to a value other than 0 the digital input configuration is defined by digital input definition table				
P1-14	Extended Menu Access	0	30000	0	-
	Parameter Access Control. The following settings are applicable: P1-14 <> P2-40 and P1-14 <> P6-30: Allows access to Parameter Group 1 only P1-14 = P2-40 (101 default): Allows access to Parameter Groups 0 – 5 and group 8 P1-14 = P6-30 (201 default): Allows access to Parameter Groups 0 - 9				

**Table 10.17:** Digital Input Configuration Parameter P1-13

P1-13	Local (Hand) Control Function	Digital Input 2 (Terminal 2)	Digital Input 2 (Terminal 3)	Digital Input 3 (Terminal 4)	Analogue Input 1 (Terminal 6)	Analogue Input 2 (Terminal 10)	Notes
0	N/A	All functions user defined or configured through PLC function.					
1	Analogue Input 2	O: Stop C: Run/Enable	O: Normal Operation C: Preset 1 / PI Set-Point 2	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	When input 3 in closed: Speed reference = Analogue Input 2 Start command = Input 1. In PI Mode, Analogue Input 1 must be used for feedback
2		O: No function C: Momentary Start	O: Stop/Disable C: Run permit	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	
3		O: Stop C: Run/Enable	O: Forward C: Reverse	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	
4		O: Stop C: Run/Enable	O: Fire mode C: Normal operation	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	

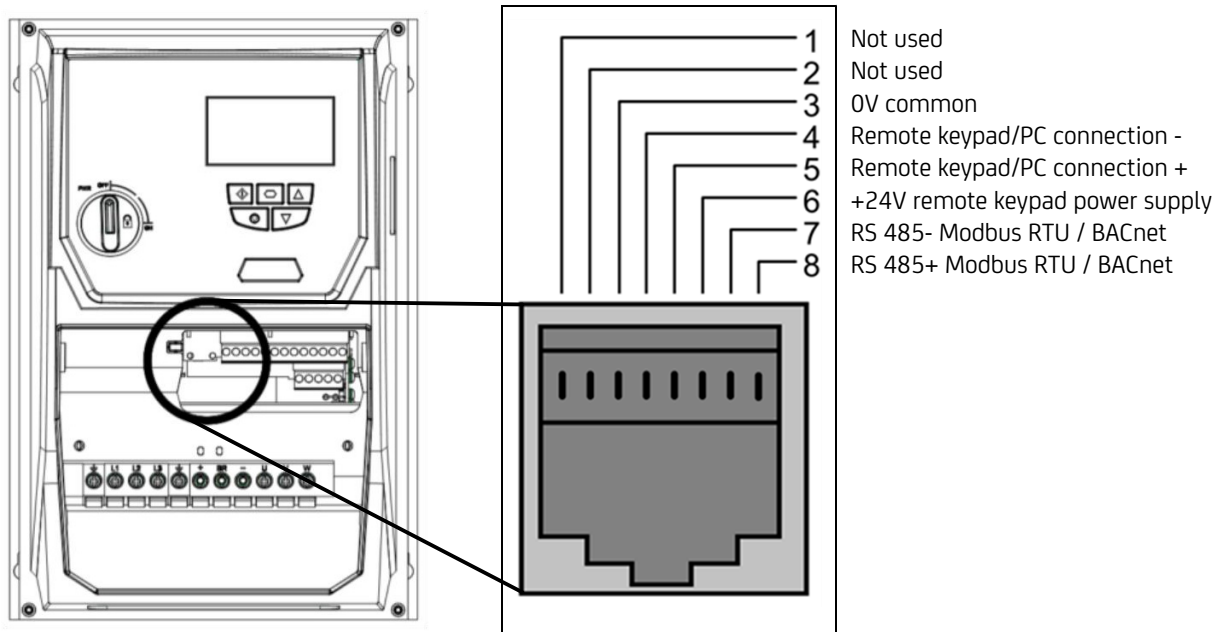
P1-13	Local (Hand) Control Function	Digital Input 2 (Terminal 2)	Digital Input 2 (Terminal 3)	Digital Input 3 (Terminal 4)	Analogue Input 1 (Terminal 6)	Analogue Input 2 (Terminal 10)	Notes
5	Preset Speeds	O: Stop C: Run/Enable	O: Preset speed 1 C: Preset speed 2	O: Remote Control C: Local Control	Analogue In 1	O: Ext Trip C: Normal Operation	When Input 3 is closed: Speed reference = preset speed 1/2 Start command = input 1
6		O: No function C: Momentary start	O: Stop/Disable C: Run permit	O: Remote Control C: Local Control	Analogue In 1	O: Preset 1 C: Preset 2	
7		O: Stop C: Run/Enable	O: Forward C: Reverse	O: Remote Control C: Local Control	Analogue In 1	O: Preset 1 C: Preset 2	
8		O: Stop C: Run/Enable	O: Fire mode C: Normal operation	O: Remote Control C: Local Control	Analogue In 1	O: Preset 1 C: Preset 2	
9	Keypad Speed Reference	O: Stop C: Run/Enable	O: Normal Operation C: Preset 1 / PI Set-Point 2	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	When input 3 is closed: Speed reference = keypad Start command = determined by P2-37
10		O: Stop C: Run/Enable	O: Normal Operation C: Preset 1 / PI Set-Point 2	O: Remote Control C: Local Control	Analogue In 1	O: Ext Trip C: Normal Operation	
11		O: No function C: Momentary start	O: Stop/Disable C: Run permit	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	
12		O: Stop C: Run fwd	O: Forward C: Reverse	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	
13		O: Stop C: Run fwd	O: Fire mode C: Normal operation	O: Remote Control C: Local Control	Analogue In 1	Analogue In 2	

P1-13	Local (Hand) Control Function	Digital Input 2 (Terminal 2)	Digital Input 2 (Terminal 3)	Digital Input 3 (Terminal 4)	Analogue Input 1 (Terminal 6)	Analogue Input 2 (Terminal 10)	Notes
14		O: Stop C: Run	O: Forward C: Reverse	Digital Input 3	Analogue Input 1	Analogue Input 2	Preset Speed
				Off	Off	Off	1
				On	Off	Off	2
				Off	On	Off	3
				On	On	Off	4
				Off	Off	On	5
				On	Off	On	6
				Off	On	On	7
				On	On	On	8

### 10.4 RS-485 Communications

The inverter has an RJ45 connector located within the wiring enclosure of the drive. This connector allows the user to set up a drive network via a wired connection. The connector contains two independent RS485 connections, one for the inverter’s proprietary protocol and one for Modbus RTU / BACnet. Both connections can be used simultaneously.

Figure 10.66: RJ45 Connector



#### WARNING: THIS IS NOT AN ETHERNET CONNECTION

- Do not connect directly to an Ethernet port
- When using Modbus RTU or BACnet, ensure that the 0V signal (T3) is also used to avoid comms errors and potentially damaging common mode voltages

## 10.5 Emergency manual control mode in case of HMI failure

### WARNING

#### Take extreme care when performing this operation

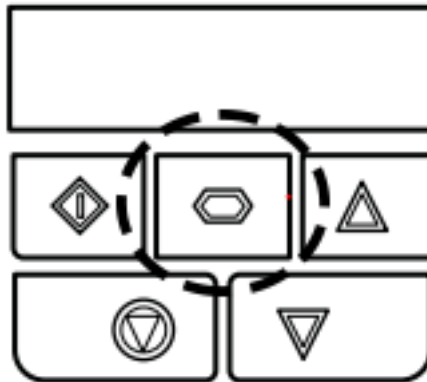
- Do not attempt to implement this procedure unless you understand the implications fully
- The control panel should only be opened by a qualified electrician
- This should only be attempted by a qualified and competent person

**NOTE:** This operation enables a single pump to be run directly by its individual inverter drive in case of failure of the HMI controller.

**NOTE:** It is advisable to disable the other pumps by switching off their drive isolators

- 1) Open panel and locate drive 1 (far left hand drive)
- 2) Press and hold the *Inverter Navigate button* until P-01 appears on screen

**Figure 10.67:** Inverter Navigate button



- 3) Press the up arrow until P-02 is shown and press the navigate button and change the value to the minimum required frequency to maintain pressure at the required pressure (what the controller displays under Settings > Inverter > Pump Min Speed
- 4) Press the Up arrow until P-12 is shown and press the Navigate button again
- 5) Change the value using the up and down arrows to read 5 and press the navigate button again to return to the main menu
- 6) Press the up arrow until P-14 is displayed, press the navigate button and using the arrows enter the value 201, then press the navigate button again
- 7) Press the up arrow until P-45 is shown and press the Navigate button enter a pressure set point value – this value needs to be in % of the maximum range of the transducer (16BAR) so 0% will be 0BAR and 100% will be 16BAR. Press the Navigate button to save the set point
- 8) Press the up arrow until P-46 is shown and press the Navigate button and change the value to read 1 and press the Navigate button to save the value
- 9) Press the up arrow until P-48 is shown and press the Navigate button and change the value to 20 press the navigate button to save the value
- 10) Press the up arrow until P-49 is shown and press the Navigate button and change the value to 1 press the navigate button to save the value.

The system will now run in single pump mode. Once the fault has been rectified, normal operation must be manually restored by following this procedure:

- 1) Press and hold the Navigate button until P-01 is displayed
- 2) Press the up button until P-02 is displayed and press the navigate button. Change the value to 0 and press the Navigate button to save the value
- 3) Press the up button until P-12 is displayed and press the navigate button. Change the value to 4 and press the Navigate button to save the value

## 10.6 BMS Interface

Either of the 2 Ethernet ports can be used for BMS connection. The protocol is Modbus over Ethernet.

**Table 10.18:** BMS Tags

Name	Data Type	Size	Array Size	Access Right	Offset	Gain	Index Register Number	Address_2
Pump 1 Run Time	UINT32	1	1	Read	0	1	0	40000
Pump 2 Run Time	UINT32	1	1	Read	0	1	0	40001
Pump 3 Run Time	UINT32	1	1	Read	0	1	0	40002
Pump 1 Starts	UINT32	1	1	Read	0	1	0	40003
Pump 2 Starts	UINT32	1	1	Read	0	1	0	40004
Pump 3 Starts	UINT32	1	1	Read	0	1	0	40005
Pump 1 Idle Time	UINT32	1	1	Read	0	1	0	40006
Pump 2 Idle Time	UINT32	1	1	Read	0	1	0	40007
Pump 3 Idle Time	UINT32	1	1	Read	0	1	0	40008
Pressure Set Point	FLOAT	1	1	Read	0	1	0	40009
Actual Pressure	FLOAT	1	1	Read	0	1	0	40013
Pump 1 Actual Speed	FLOAT	1	1	Read	0	1	0	40014
Pump 2 Actual Speed	FLOAT	1	1	Read	0	1	0	40015
Pump 3 Actual Speed	FLOAT	1	1	Read	0	1	0	40016
Low Water Alarm	BOOL	1	1	Read	0	1	0	10017
Booster Set General Fault	BOOL	1	1	Read	0	1	0	10018
Over Pressure Alarm	BOOL	1	1	Read	0	1	0	10019
APP_GvHmi_HmiDutyPressureSensorActual	FLOAT	1	1	Read	0	1	0	40020
Standby Sensor Failed	BOOL	1	1	Read	0	1	0	10021
Booster Set External Inhibit	BOOL	1	1	Read	0	1	0	10022
Main Sensor Failed	BOOL	1	1	Read	0	1	0	10023

# Dutypoint Standard Warranty

Your Dutypoint Systems standard product warranty is valid for a period of 24 months.

To qualify for 24 months cover, commissioning must take place in the first 12 months from date of despatch, and a servicing visit must be completed within 12 months from date of commissioning.

Full terms and conditions are located on the website <https://www.dutypoint.com/terms-and-conditions/>

If you need to contact us regarding your warranty or any issue regarding your Dutypoint product, please contact our service department:

- Tel: +44(0)1452300590
  - Email: [service@dutypoint.com](mailto:service@dutypoint.com)
-



# 12. Declaration of Conformity UKCA & CE

We: Dutypoint Limited

Of: Quedgeley West Business Park, Gloucester, Gloucestershire, United Kingdom in accordance with the following directives & regulations:

- 2006/42/EC : Machinery Directive
- S.I. 2008:1597 The Supply of Machinery (Safety) Regulations 2008
  
- 2014/68/EU : Pressure Equipment Directive
- S.I. 2016:1105 Pressure Equipment (Safety) Regulations 2016
  
- 2014/30/EU : Electromagnetic Compatibility Directive
- S.I. 2016:1091 Electromagnetic Compatibility Regulations 2016
  
- 2014/35/EU : Low Voltage Directive.
- S.I. 2016:1101 Electromagnetic Compatibility Regulations 2016



Hereby declare that the equipment:

Product Range	VS Range
---------------	----------

Is in conformity with the applicable requirements of the following documents:

- EN 809:1998+A1:2009: Pumps and pump units for liquids - Common safety requirements
- EN 60204-1:2018: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- EN ISO 12100:2010: Safety of machinery - General principles for design
- EN 61000-6-2:2019: Electromagnetic compatibility (EMC) — Part 6-2: Generic standards
- EN 61000-6-4:2019: Electromagnetic compatibility (EMC) — Part 6-4: Generic standards

I hereby declare that the equipment described above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable essential requirements of the directives.

Nigel Freeman, Director  
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