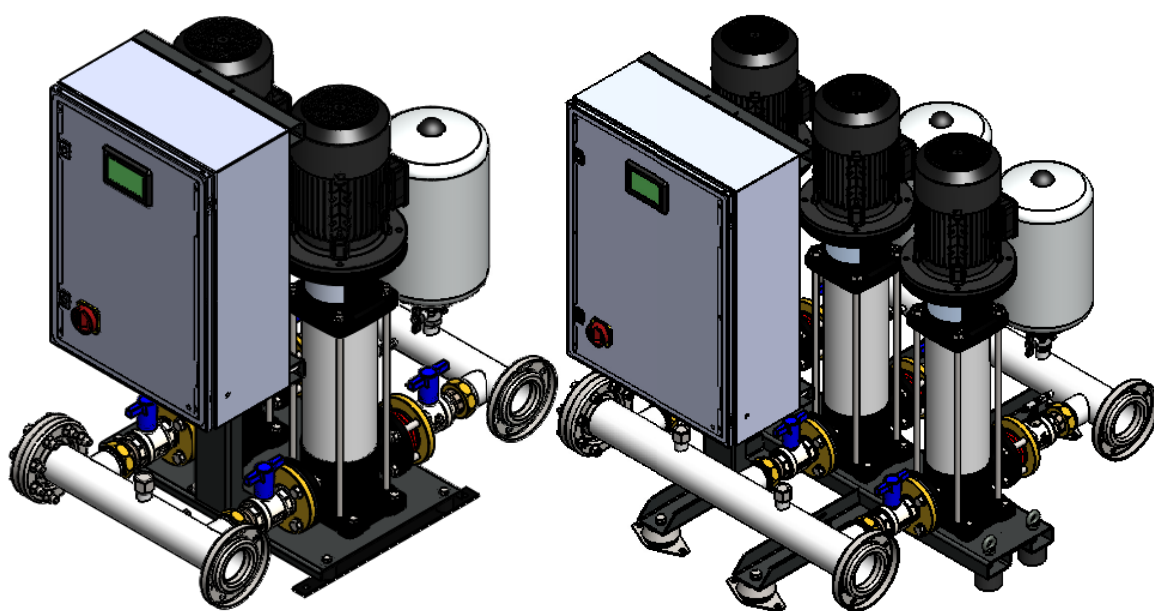


DUTYPOINT **SETTING THE BAR**

Dutypoint VT Cold Water Booster Sets



Operation and Maintenance Manual

DOC-VTOM1901



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	1) Hold your eyelids apart forcibly with your fingers 2) Rinse the eyes with eyewash or running water for at least 15 minutes 3) Seek medical attention
Chemicals or hazardous fluids on skin	1) Remove contaminated clothing 2) Wash the skin with soap and water for at least 1 minute 3) Seek medical attention

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 resistors.

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.
-

1.14 Transportation and Lifting

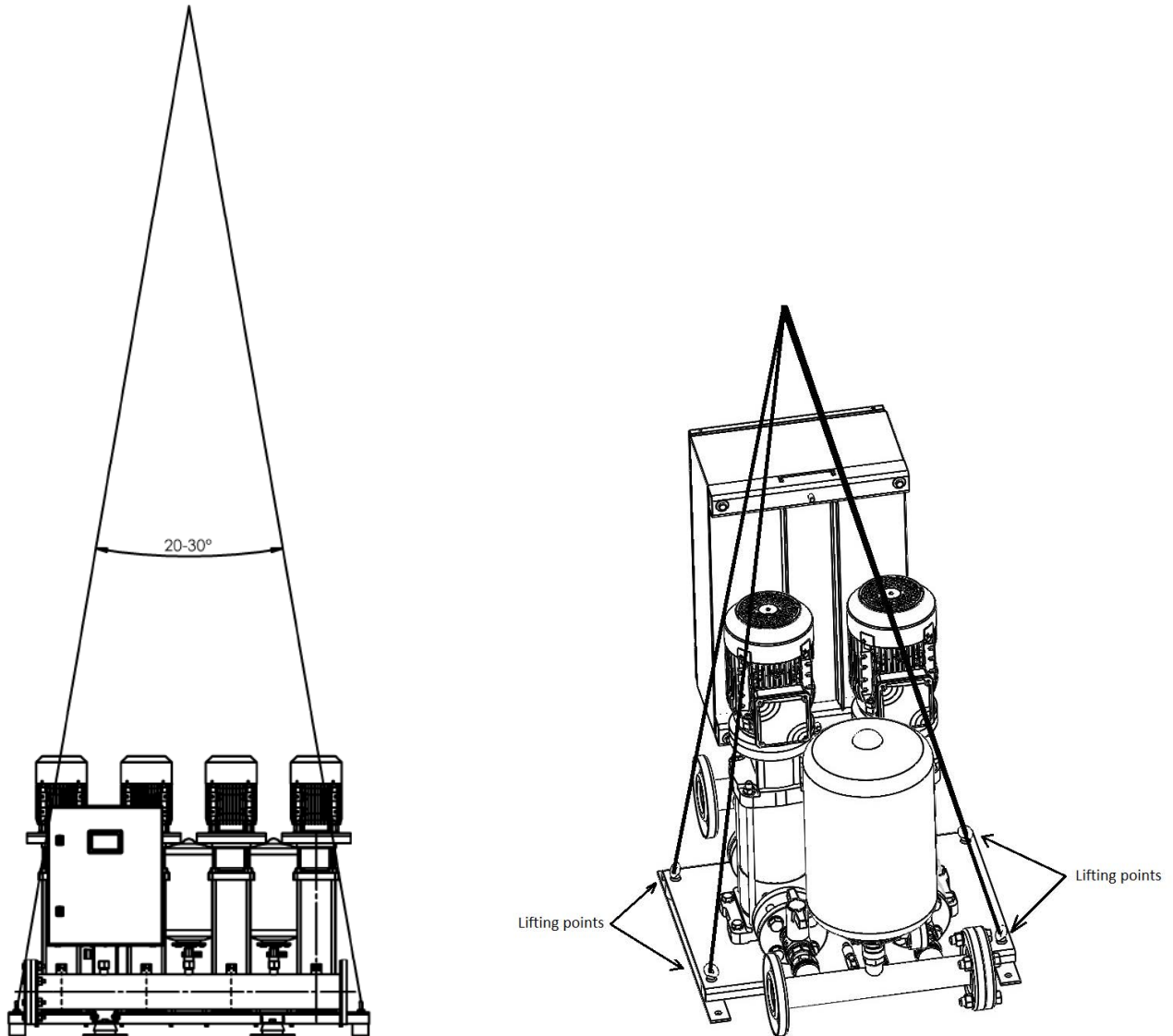
WARNING: LIFTING HAZARDS

- Stay clear of suspended loads
 - Observe accident prevention regulations in force
 - Do not damage the cables during transports; so not squeeze, bend or dray the cable
 - Always keeps the cable ends dry
 - Secure the unit against tipping over and slipping until it is mounted and fixed in its final location
 - Lift and handle the product carefully, using suitable lifting equipment (stacker, crane, crane mounting device, lifting blocks, sling ropes, etc.)
 - Always lift the unit by its lifting handle
 - This equipment has not been designed to lift people, and should not be used in this way.
-

WARNING: ASSEMBLED SYSTEMS ARE HEAVY

- This equipment has been designed to be lifted by crane
 - Failure to properly lift and support this equipment can result in serious physical injury and/or equipment damage,
 - Lift equipment only at the specifically identified lifting points.
 - Lifting devices such as eye bolts, slings and spreaders must be rated, selected and used for the entire load being lifted
 - Select the appropriate lifting points
 - Slings should be sized in accordance with the gross weight of the product that is being lifted.
 - To minimise tension in legs a sling angle of 20-30° is recommended & appropriate lifting shackles should be used. See [Figure 1.1: Lifting best practice](#) (p. 9).
-

- 1) Inspect the package
 - a) Inspect the package for damage or missing items upon delivery
 - b) Note any damaged or missing items on the shipping paperwork and contact Dutypoint immediately
 - c) File a claim with the shipping company if anything is out of order
 - d) If the product has been picked up at a distributor, file a claim with the distributor
- 2) Inspect the unit
 - a) Remove packing materials from the product
 - b) Dispose of all packing materials in accordance with local regulations
 - c) Inspect the product to determine if any parts have been damaged or are missing
 - d) If applicable, unfasten the product by removing any screw, bolts or straps. For your personal safety, be careful when you handle nails and straps.
 - e) Contact Dutypoint if you have any issues.
- 3) Attach appropriate lifting equipment

Figure 1.1: Lifting best practice

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.

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
-

2. System Specifications

Table 2.2: Range Specifications

Application	Pressure boosting of potable water
Pumps	2 or 3 Dutypoint TPX Vertical Multistage. See 7. Vertical Multistage Pumps (p. 34)
Duty flow rate range	1-28 litres/second
Duty head range	2-9 bar
Liquid temperature range	1-23°C
Ambient temperature range	5-40°C
Humidity	Max 50%
Controller type	Dutypoint Smart Control Panel. See 3. System Control Panel User Guide (p. 16).
Maximum system pressure	15 bar
Volt free contacts	<ul style="list-style-type: none"> • Common fault (normally closed) • Low water level (normally closed) • High water level (normally closed)
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

VT2-05-015T

Number of pumps

Nominal flow (m³/h)

Motor kW per pump

Power supply

2.1 Pump Curves

Figure 2.4: VTx-05 Individual Pump Curves

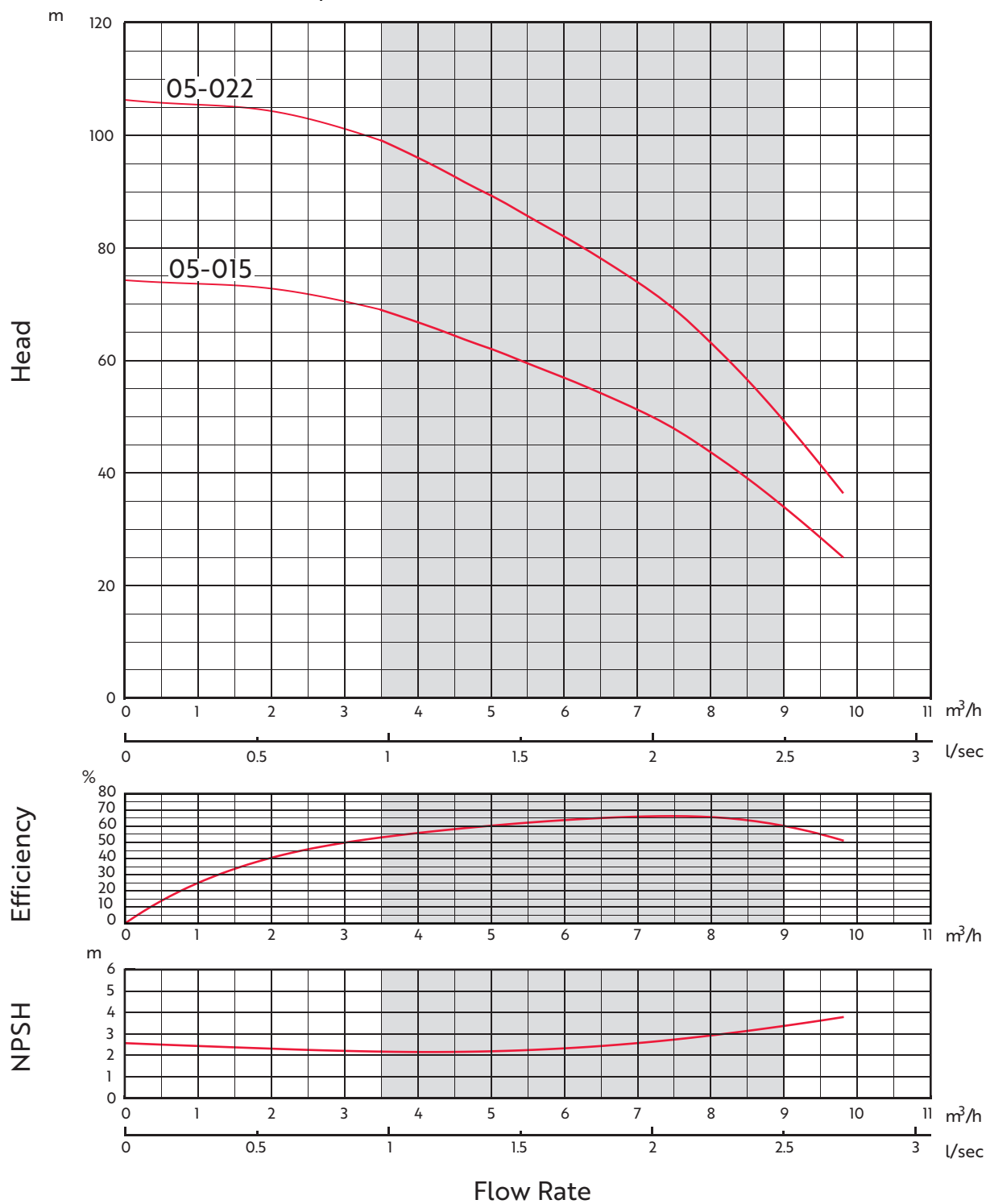


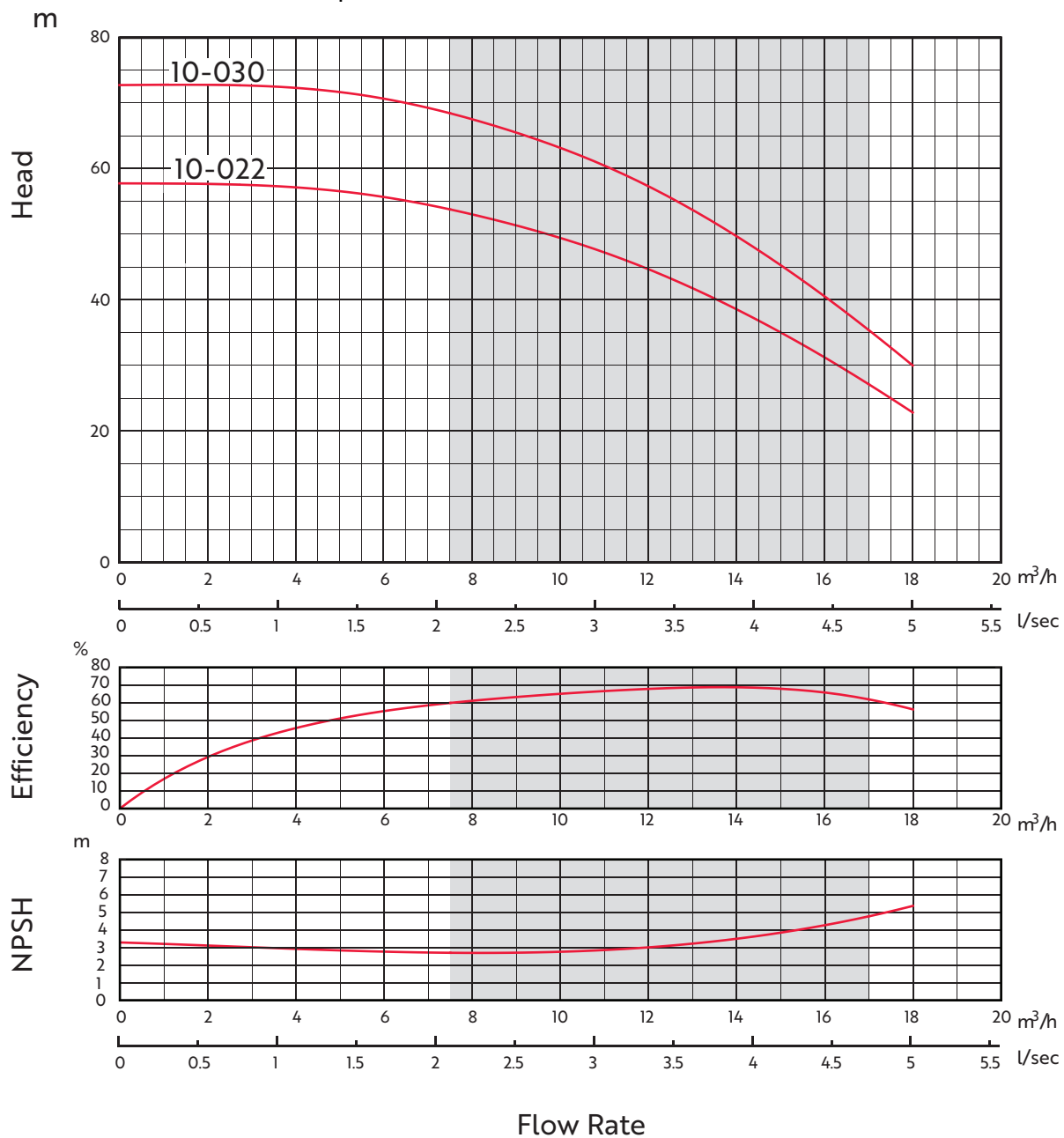
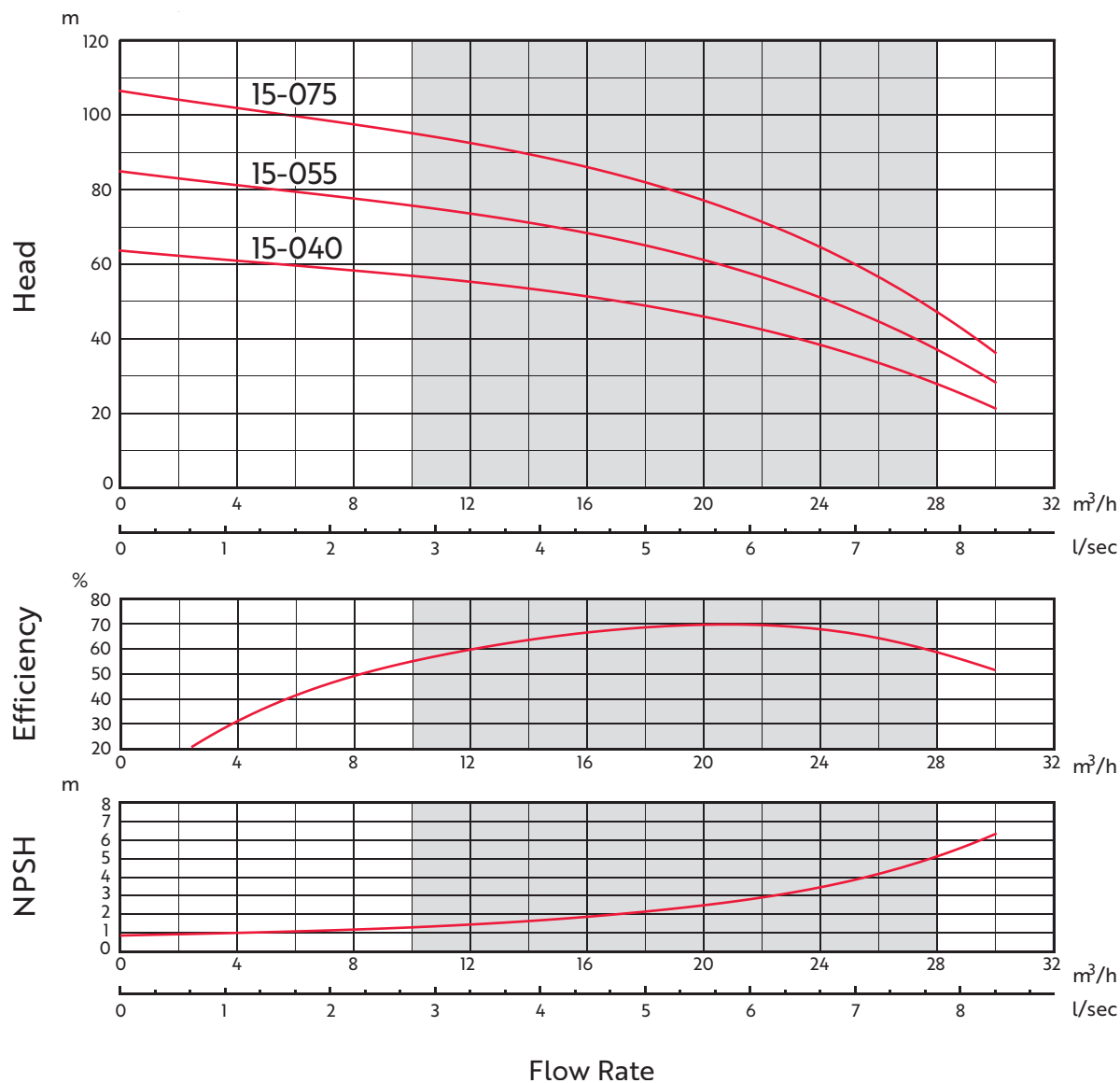
Figure 2.5: VTx-10 Individual Pump Curves

Figure 2.6: VTx-15 Individual Pump Curves

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.

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

WARNING

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

- Contact Dutypoint on 01452 300590 if you require assistance

3.1 Navigation menu

The Navigation Menu, displayed continually on the right hand side of the touch screen, allows you to access the different functions of the control panel:

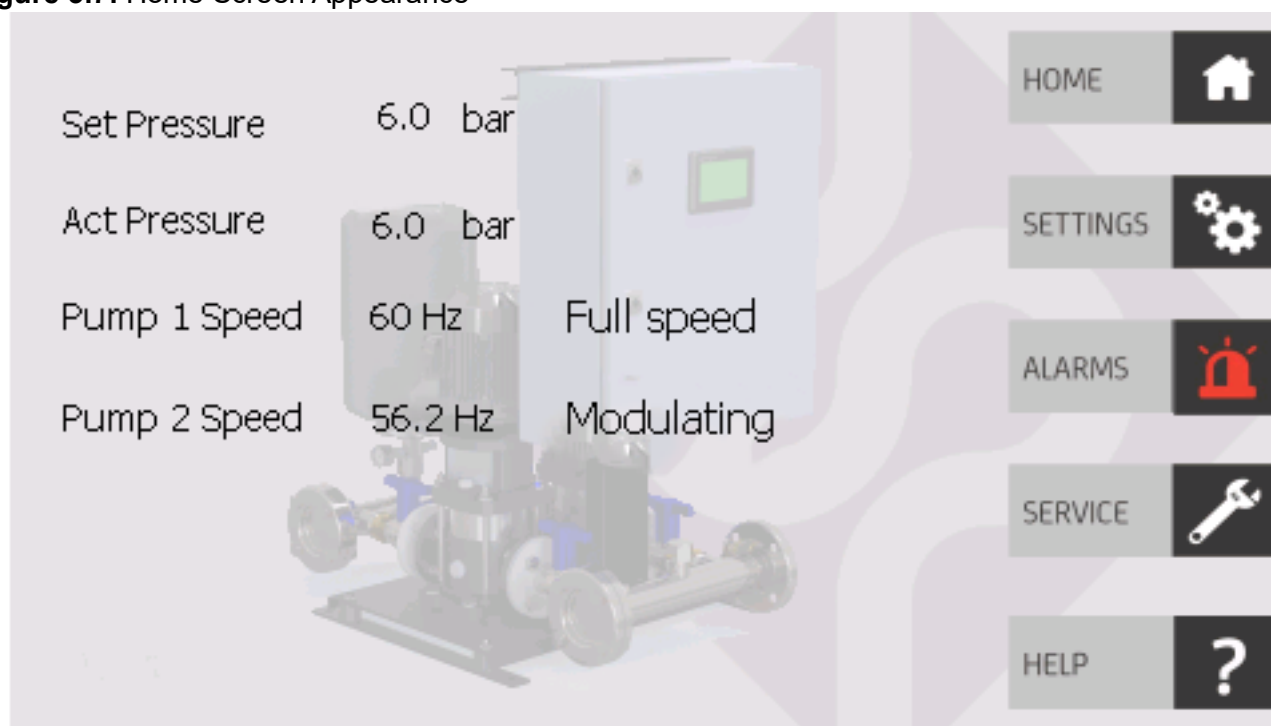
- Home: shows system operating parameters, allows the system to be deactivated and reactivated
- Settings: advanced parameters which should only be adjusted by trained engineers
- Alarms: displays a list of current alarm conditions and error codes
- Service: provides manufacturer contact details

3.2 Home screen

The home screen displays the following functions and system information which is constantly updated

Table 3.3: Home Screen Information

System Set Pressure	Displays the configured pressure set point - this is the target pressure to be maintained by the system. Please note that this is factory set and should not be adjusted during normal operation. If an adjustment is necessary, you must also follow the steps in the Commissioning section to adjust the pressure vessel pre-charge to 90% of the new set pressure.
System Actual Pressure	Displays the actual system pressure as measured by the system pressure sensor. There are occasions when the actual pressure will be slightly higher than the set pressure (by approximately 10%). If the actual pressure is consistently more than 10% above the set pressure this may indicate a fault with the pressure vessel. Please contact Dutypoint for further instructions.

Figure 3.7: Home Screen Appearance

3.3 Settings screen

The Admin Screen allows access to important system parameter adjustments. These should only be adjusted by a competent engineer and do not require adjustment in the course of normal system operation.

Table 3.4: Settings Screen Information

Option	Action	Further Details
Pressure	Loads the pressure settings page	3.5 Pressure screen (p. 18)
Inverter	Loads the inverter settings page	3.6 Inverter screen (p. 18)
Sensors	Loads the sensor settings page	3.7 Sensors screen (p. 21)
Status	Loads the pump status page	3.8 Status screen (p. 21)
Manual	Loads the manual control page	3.9 Manual screen (p. 22)
HiRise	Loads the HiRiSE settings page	3.10 HiRise screen (p. 22)
Burst pipe	Loads the burst pipe settings page	3.11 Burst pipe screen (p. 23)
Alternative enable	Enables the pump alternate function	3.12 Alternate enable screen (p. 24)
Login	Loads the service engineers' login screen	Access by Dutypoint engineers only
Anti-seize	Loads the pump anti-seize settings page	3.13 Anti-seize screen (p. 24)
Run times	Loads the run times page	3.14 Run times screen (p. 24)

3.4 Service screen

This screen provides manufacturer contact details. The Dutypoint Service Department is available Monday-Friday 7.30am-4.45pm (excluding bank holidays) to arrange service visits or to answer any technical queries.

3.5 Pressure screen

Setting	Description
Pressure set point	Desired system pressure set point
Over pressure alarm set point	Set point for the over pressure alarm (pressure over set point)
Over pressure alarm delay	Delay between over pressure event and activation of alarm
Pressure to start pump	Pressure below set point at which pump will start
Pressure pump stop	Pressure above set point at which pump will stop



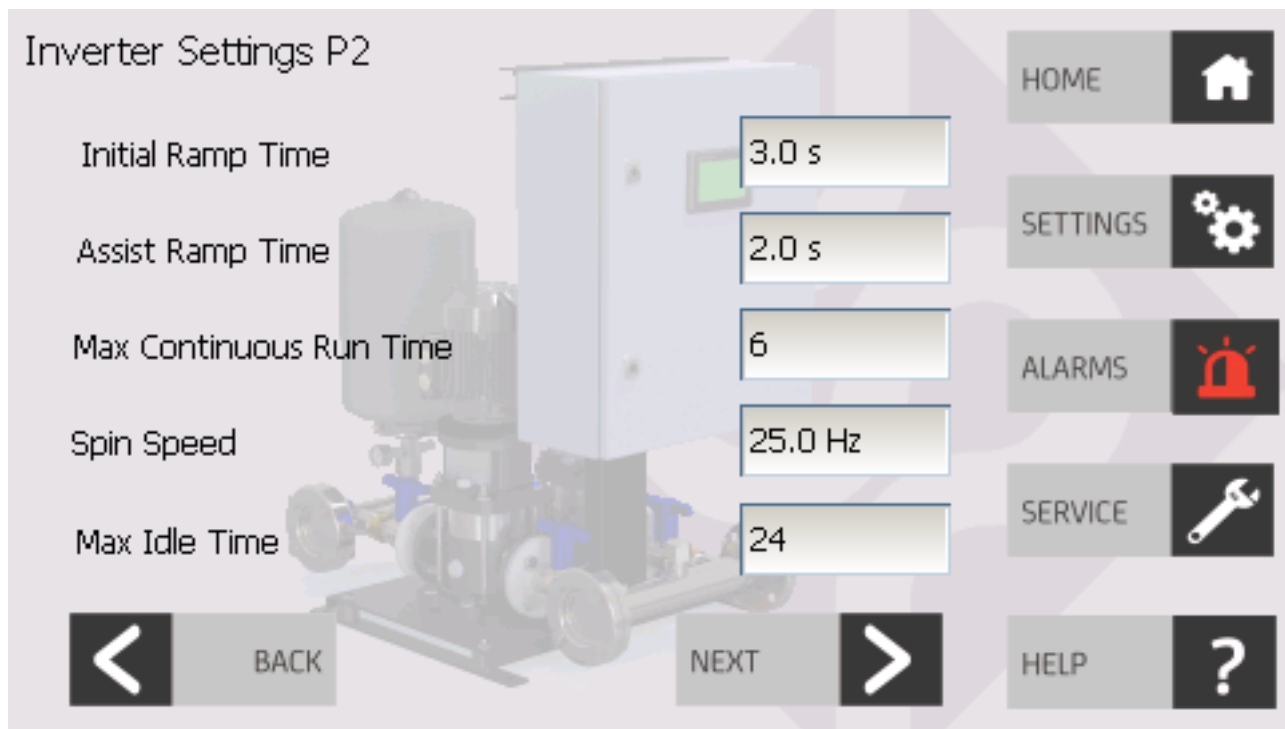
3.6 Inverter screen

Table 3.5: Inverter settings screen 1 of 3

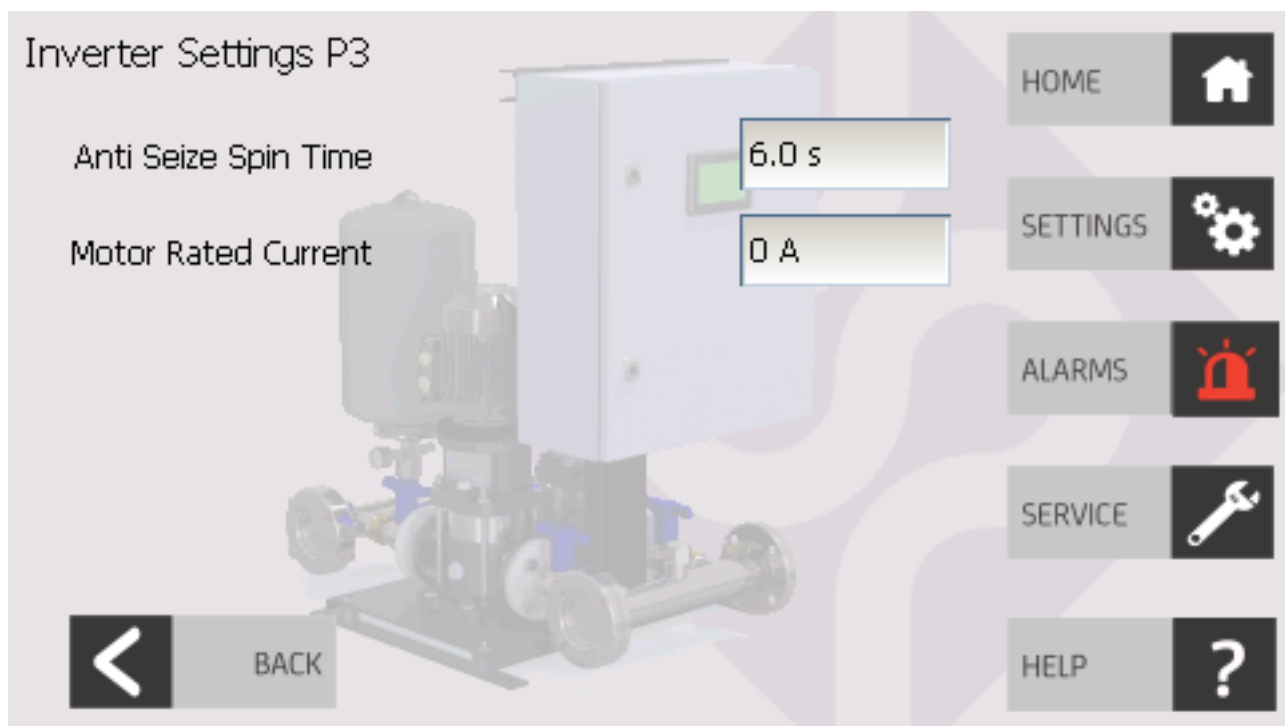
Setting	Description
Pump max speed	Maximum electrical frequency input of pump motor
Pump min speed	Minimum speed required to maintain set point pressure at zero flow (calculated automatically)
Min run time	Pump run time when at minimum frequency
Number of pumps	Number of pump available to the controller
Number of duty pumps	Number of pump to use for duty operation (note: may not exceed value for 'number of pumps')

**Table 3.6:** Inverter settings screen 2

Setting	Description
Initial ramp time	Ramp time for first pump to reach required operating speed
Assist ramp time	Ramp time for assist pump to reach required operating speed
Max continuous run time	Maximum continuous run time before handling over to assist pump
Spin speed	Run speed for the anti-seize function
Max idle time	Amount of time for pump to be idle for starting the anti-seize function

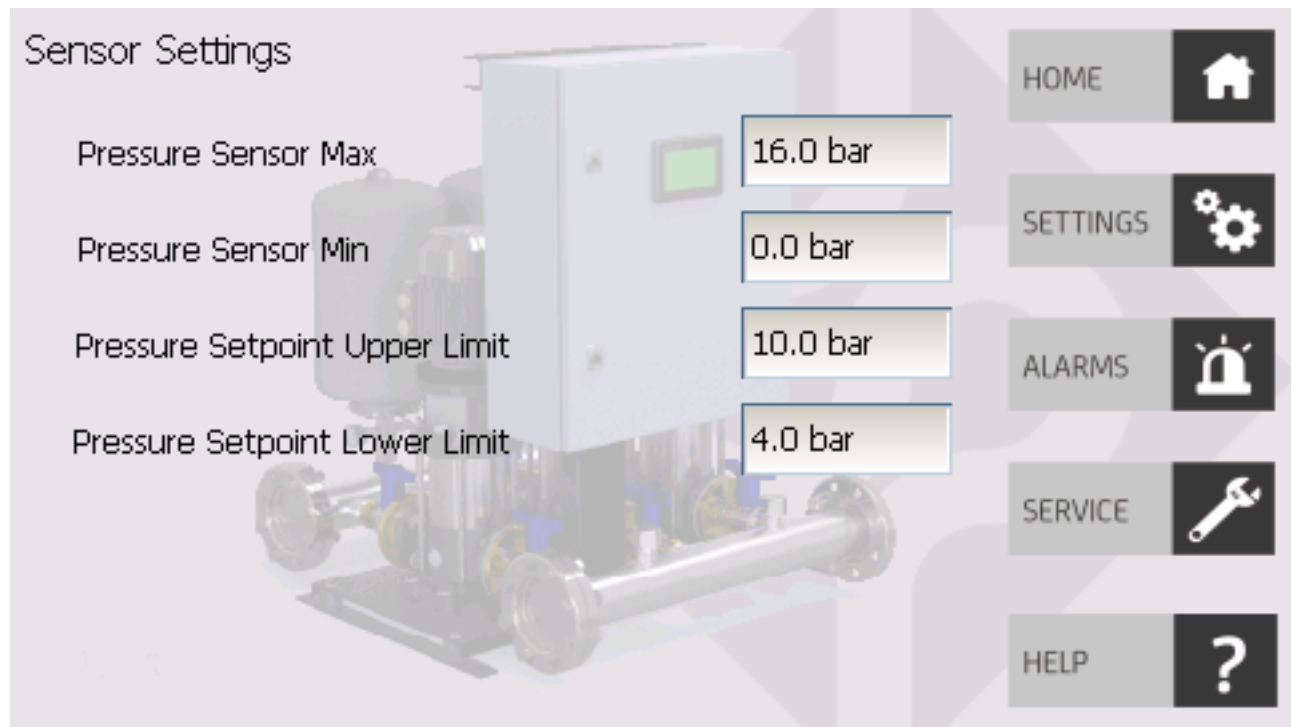
**Table 3.7:** Inverter settings screen 3

Setting	Description
Anti seize spin time	Run time for the anti-seize spin function
Motor rated current	Current as stated on the motor data plate



3.7 Sensors screen

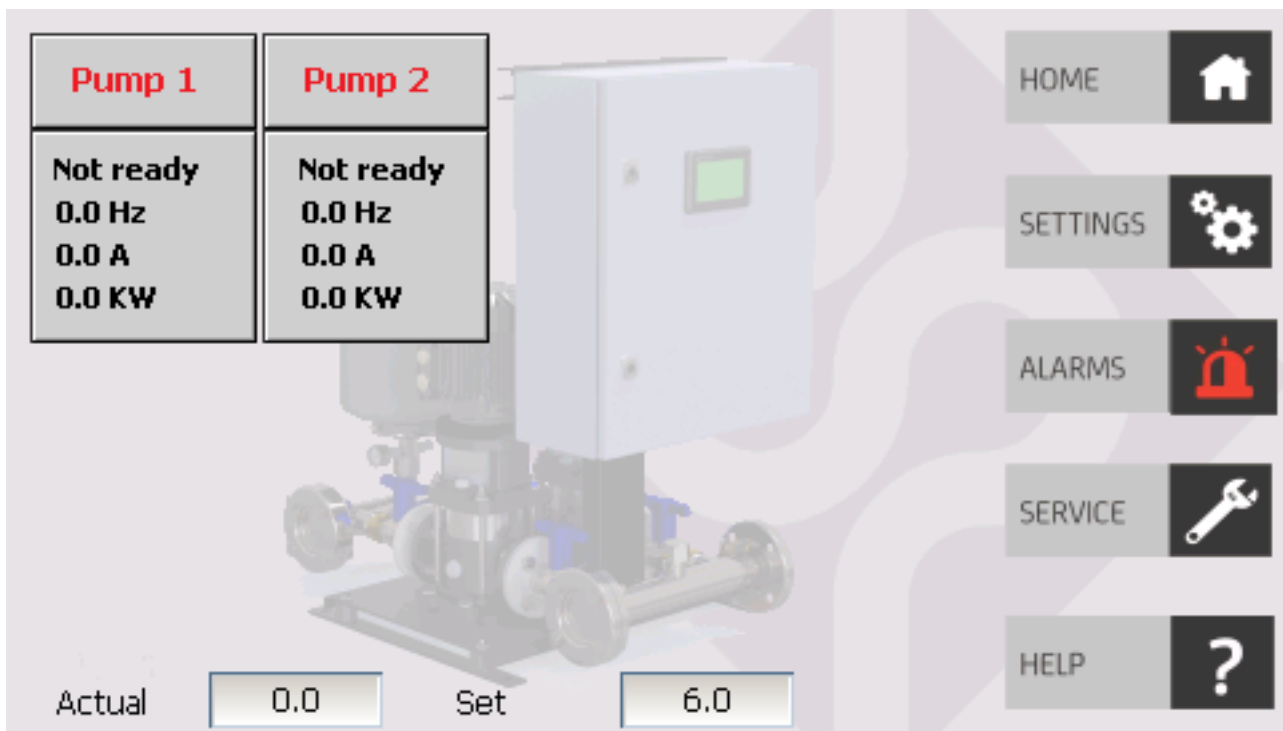
Setting	Description
Pressure sensor max	Maximum range of the pressure sensor
Pressure sensor min	Minimum range of the pressure sensor
Pressure sensor upper limit	Upper pressure limit alarm
Pressure sensor lower limit	Low pressure limit alarm



3.8 Status screen

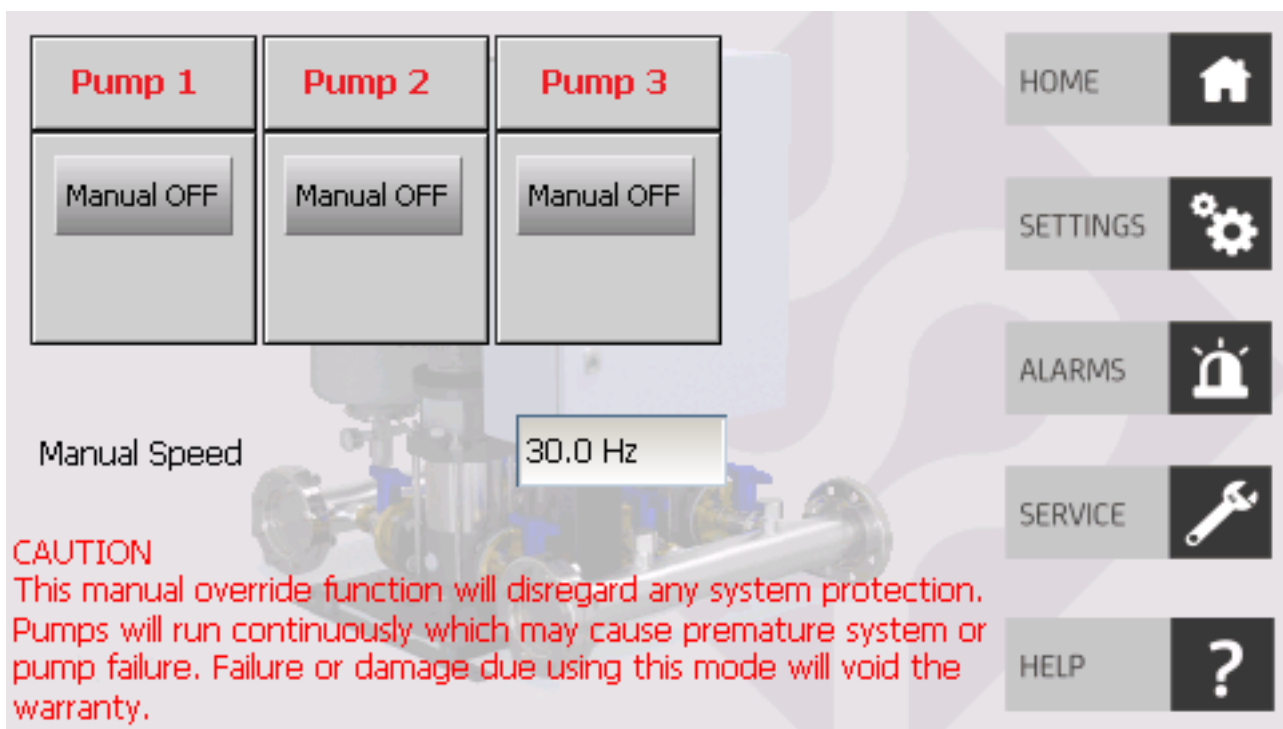
This screen displays the current status of all pumps in the set, with information displayed in the following order:

- 1) Pump running status
- 2) Pump running frequency
- 3) Current draw (amps)
- 4) Power consumption (kW)



3.9 Manual screen

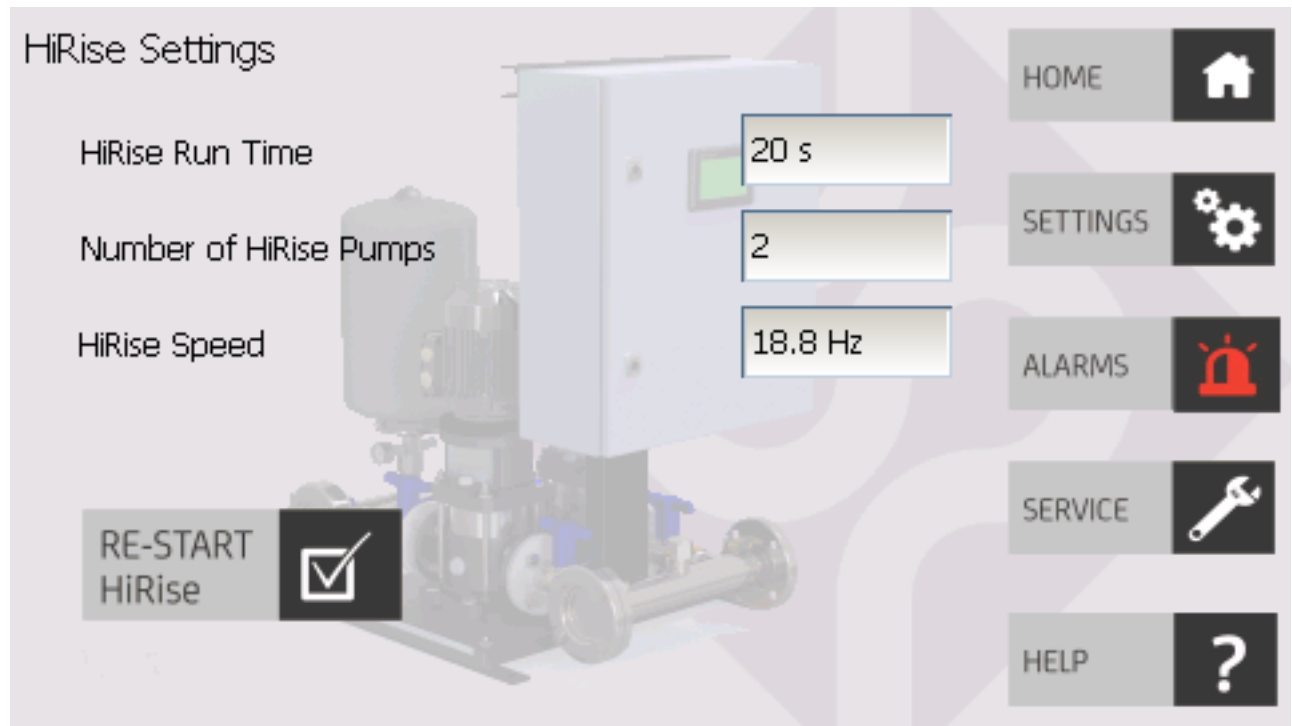
This screen allows the operator to manually run each pump at a fixed speed for a set time. This mode can be used during commissioning and service. It should not be used to operate the pump set under normal working conditions.



3.10 HiRise screen

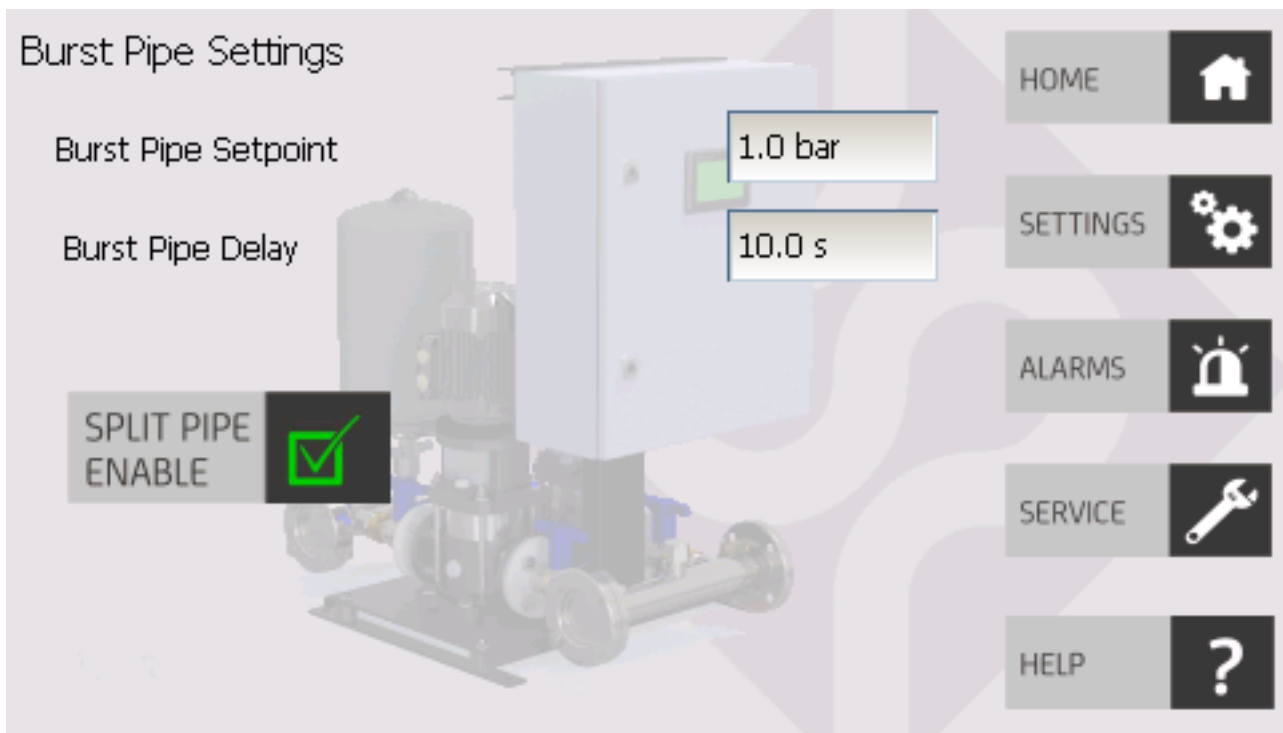
Setting	Description
HiRise run time	amount of time for the HiRise function

Setting	Description
Number of HiRise pumps	number of pumps to use for the HiRise function
HiRise speed	speed for the pumps to run in HiRise function
Re-start HiRise	re-starts the HiRise function



3.11 Burst pipe screen

Setting	Description
Burst pipe set point	pressure set point for burst pipe detection
Burst pipe delay	delay time between pressure set point being reached and alarm triggered
Burst pipe enable	enables/disables spilt pipe function



3.12 Alternate enable screen

This screen disables or enables the automatic pump alternate function. In most situations, it is not recommended to disable this option as it could cause a pump to remain unused for long periods of time.

3.13 Anti-seize screen

This option enables or enables the anti-seize function. The anti-seize function automatically runs a pump for a few seconds when it has been inactive for a long period of time. Disabling this function is not recommended under normal operating conditions. Full parameter editing is available in [Inverter screen](#) (p. 18)

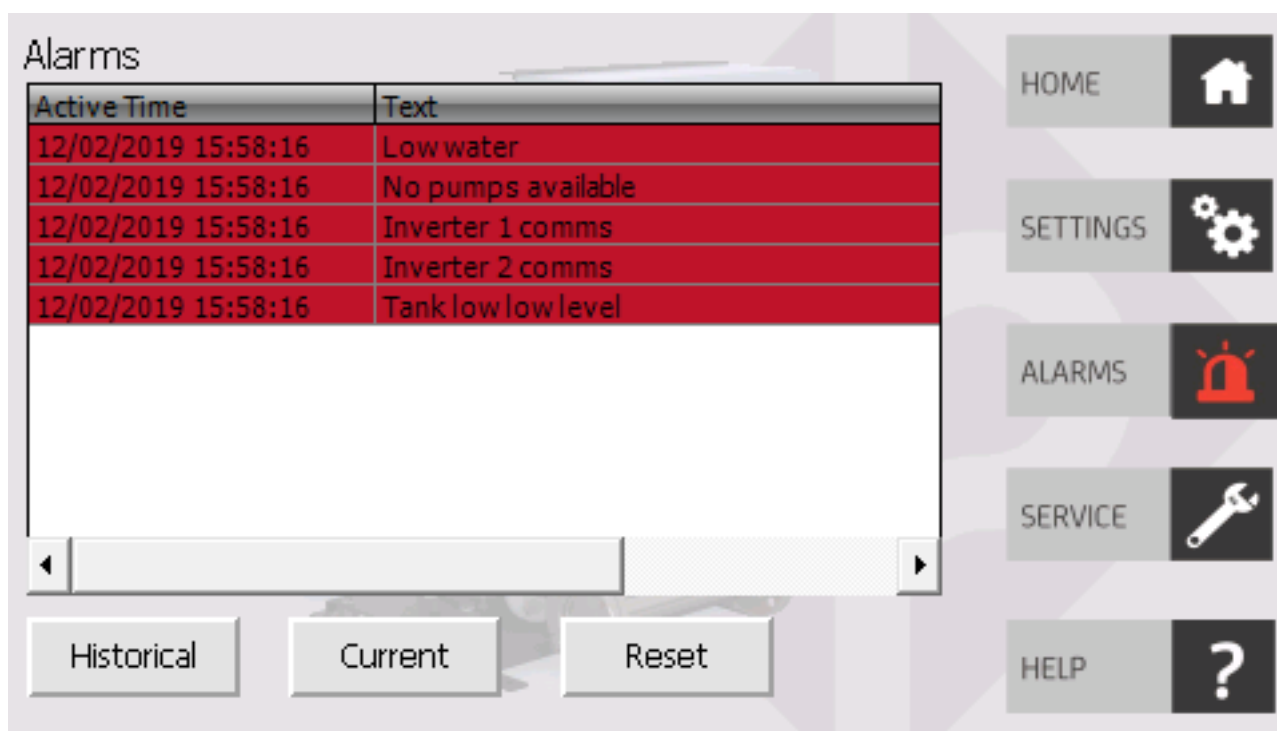
3.14 Run times screen

Information	Description
Run time	Total pump run time
Stop time	Total pump stopped time



3.15 Alarms screen

All system alarms are displayed here. Current alarms are shown in red. Active alarms which have been acknowledged are shown in green. Historical alarms which have been cleared are shown in white.



4. 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 further re-commissioning is carried out on site.

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

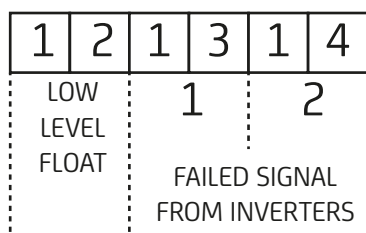
- These checks MUST be carried out by a competent electrician.
 - Ensure that the power source is sufficient to allow the running of all pumps together where there are multiple pumps in the system. This also applies to 'standby' pumps.
-

- 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 the pump manual in the Appendix of this manual. DO NOT POWER UP AT THIS STAGE.

4.4 Low Level Float Switch Wiring (Hydrovar or VASCO Systems only)

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 2. 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 2 in parallel.

Figure 4.8: Terminal Wiring

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

BROWN: Terminal 1

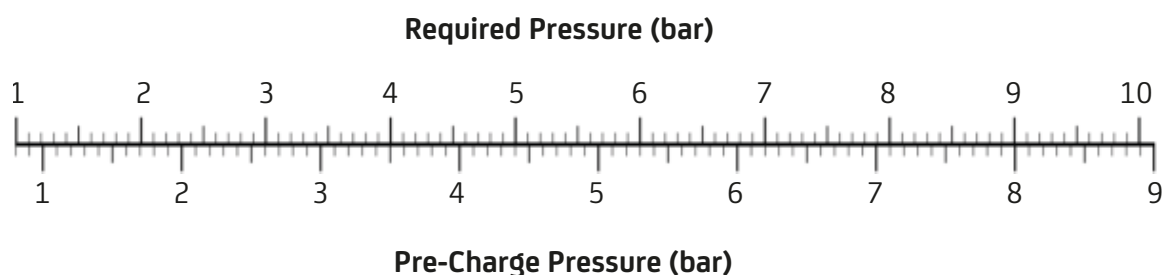
BLACK: Terminal 2

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)

Figure 4.9: Pressure Vessel Pre-charge

Before commissioning starts the pre-charge of the pressure vessels should be checked.

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 vessel(s) are totally drained of water, and that the system is switched off and no electrical parts are live.
- 2) Locate the charging valve on each vessel, accessed by removing the plastic cover on the top of the vessel
- 3) Connect a portable pressure gauge with a measuring range compatible with the expected pressures in your application, which has a flexible hose and Schrader-type connector to the charging valve.
- 4) Check the pre-charge pressure above the diaphragm in each pressure vessel correspond to criteria given in the text above.
- 5) If necessary, release or add additional air to correct.

4.7 Venting Pumps

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

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 bleed point.

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 vent screw at the top of the pump (refer to Appendix to locate), 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) escapes through the vent screw hole - and no more air bubbles can be seen - close the vent screw.
- 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.

It may be necessary to add the suction head of the break tank to the maximum head parameter for greater accuracy and to enable smoother running.

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 in the Appendices to 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, 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 Twin 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 Twin 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 on 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	1) Visually check the complete pump set 2) Observe the running of the pump(s) and note any unusual vibrations or sounds.
Quarterly	1) Visually check the complete pump set 2) Observe the running of the pump(s) and note any unusual vibration, etc. 3) Check the cooling fan and vents on the Control Unit(s) and clear any dust or other obstructions 4) Operate each manual isolating valve three times to ensure continued efficient working
6-monthly	The pressure vessel (if fitted) should be drained and the pre-charge pressure checked. See the relevant section for more details.
12-monthly (essential)	Carry out the full pre-commissioning procedure to verify safe operation - see 4. Commissioning (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.

Problem	Possible Causes	Recommended Action
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

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 TPX Pumps Type Indicator

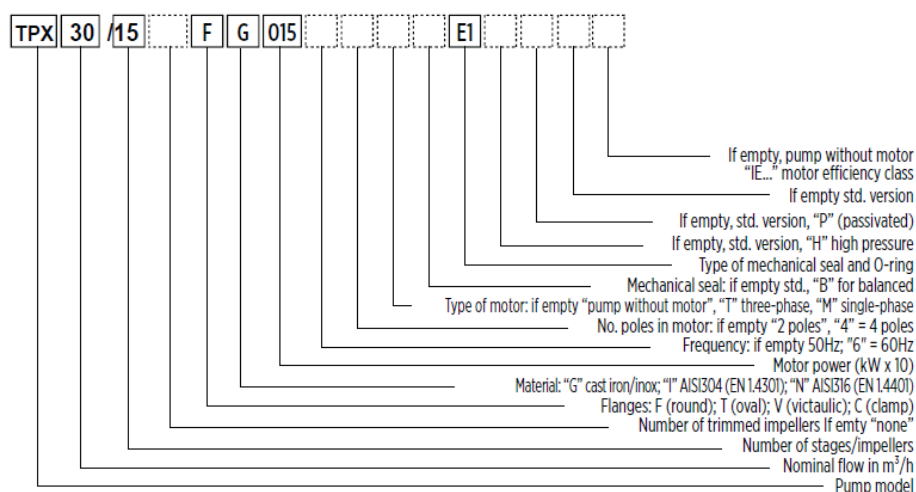


Figure 7.11: Pump Data Plate

7.2 Approved Applications

The pump is suitable for the following applications:

- Civil and industrial water distribution systems
- Irrigation
- Water treatment
- Washing systems
- HVAC (heating and cooling)

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 Operating Limits

Table 7.9: Temperatures and Altitudes

Liquid Temperature	EPDM seals: -30°C to +120°C
	VITON/KFKM seals: -10°C to +120°C
Ambient Temperature	Max 40°C (when motor works at full capacity)
Altitude	Max 1,000m above sea level (when motor works at full capacity)

Table 7.10: Maximum starts per hour

Power (kW)	2 Poles	4 Poles
0.37 - 0.55	100	250
0.75 - 3	60	140
4 - 7.5	30	60
11 - 22	15	30
30 - 55	8	15
55 - 200	4	8

7.6 Checking Rotation Direction

Check the correct direction by looking at the arrows on the casing label, or the arrow on the motor bracket.

WARNING

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

Start up the motor for 1-2 seconds and check the direction of rotation through the motor fan cover.

If the direction is incorrect:

- 1) Disconnect the power supply
- 2) In the terminal box of the motor, exchange the position of two phases of the power cable
- 3) Close the lid of the terminal box again,
- 4) Check the direction of rotation again.

7.7 Starting the Pump

Before start-up, check that:

- The pump is primed correctly
- The pump is correctly connected to the power supply
- The gate valve is closed and the inlet valve is open

Starting procedure:

- 1) Start the motor
- 2) Gradually open the valve on the delivery side of the pump
- 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.

7.8 Emptying the Pump

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

- 1) Close the gate valves of the delivery and suction pipework
- 2) Discharge the pressure of the pump
- 3) Partially unscrew the pin on the filling cap
- 4) Completely remove the discharge tap and wait for the pump to be empty
- 5) Once emptying is complete, replace and tighten the discharge tap and the pin of the filling cap.

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
-

7.9 Maintenance and Support

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

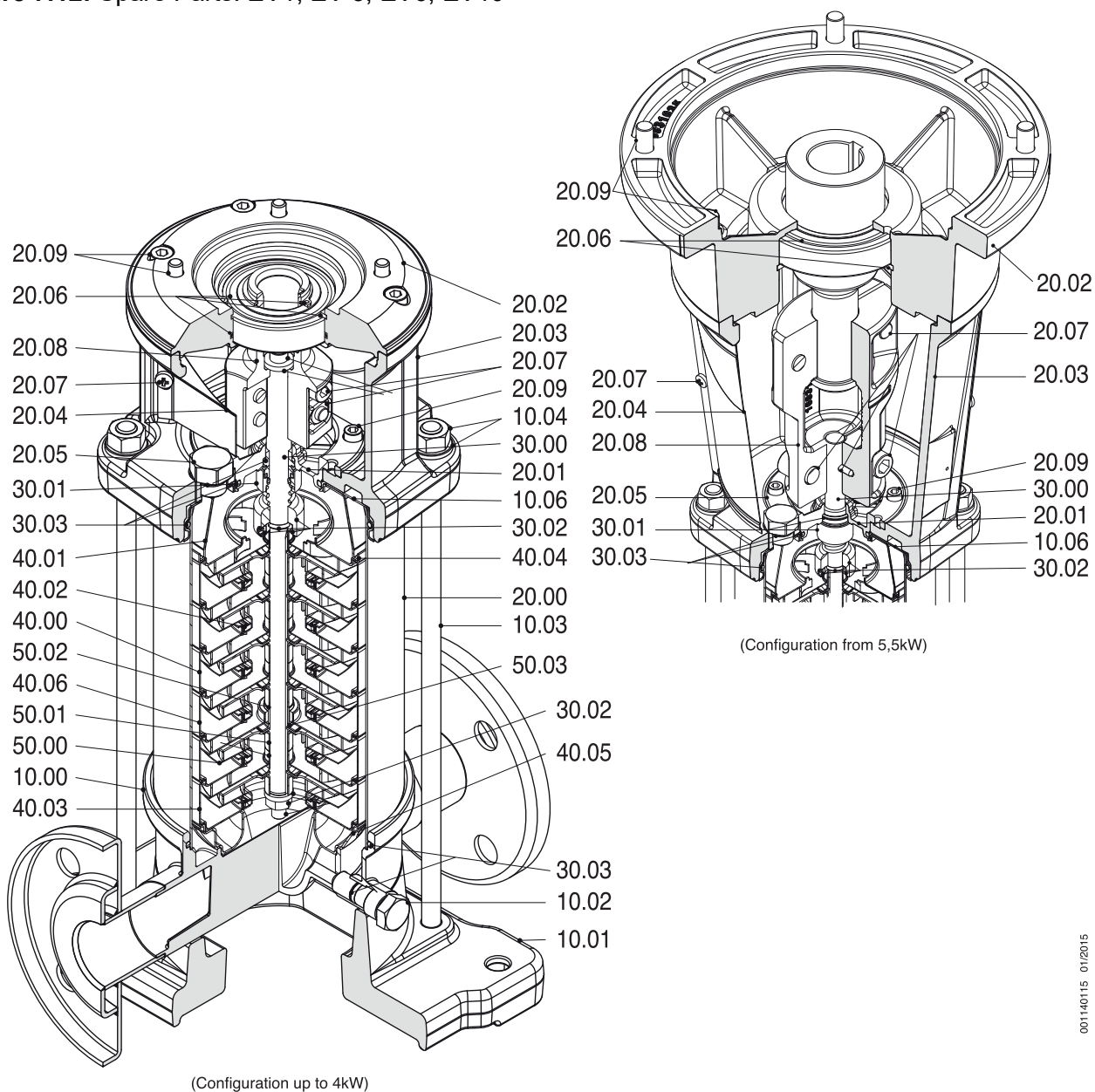
- The pump must be serviced and repaired by authorised personnel
 - Improper maintenance can void warranty and cause additional hazards
-

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.

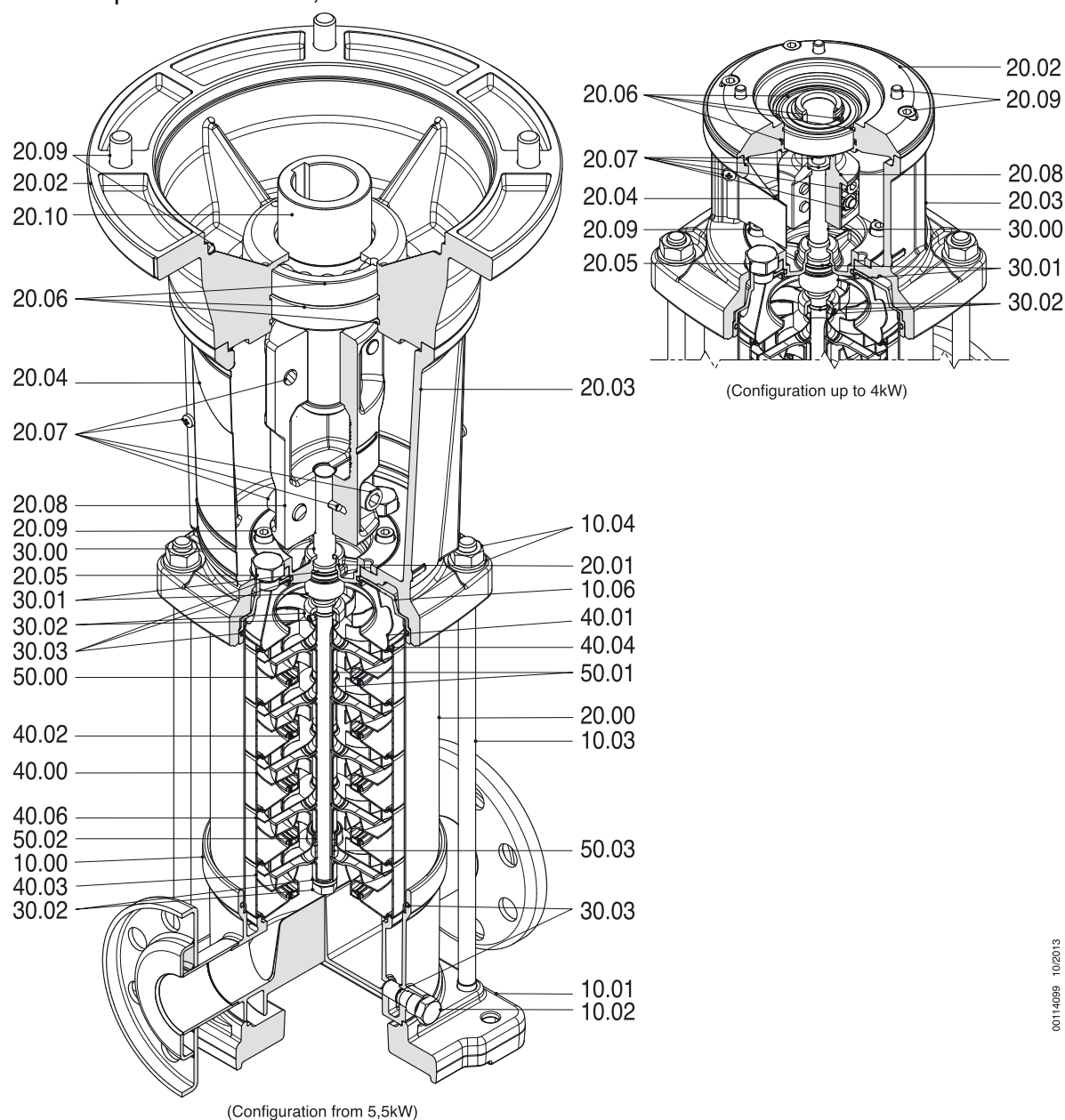
For the spare parts see [Figure 7.12: Spare Parts: EV1, EV 3, EV6, EV10](#) (p. 38), [Figure 7.13: Spare Parts: EV15, EV20](#) (p. 39) and [Figure 7.14: Spare Parts: EV30, EV45, EV65, EV95](#) (p. 40). For special maintenance instructions, please contact our Service department.

Figure 7.12: Spare Parts: EV1, EV 3, EV6, EV10

001140115 01/2015

N. rif.	Description
10.00	Pump casing
10.01	Pump fixing plate
10.02	Filling and draining plug
10.03	Tie bolt
10.04	Kit nuts and washers
10.06	Upper flange
20.00	Outer Case
20.01	Mechanical seal housing
20.02	Motor flange
20.03	Motor bracket
20.04	Coupling guard
20.05	Filling plugs
20.06	Circlips and bearings, and O-ring
20.07	Coupling fasteners
20.08	Coupling
20.09	Kit motor screws

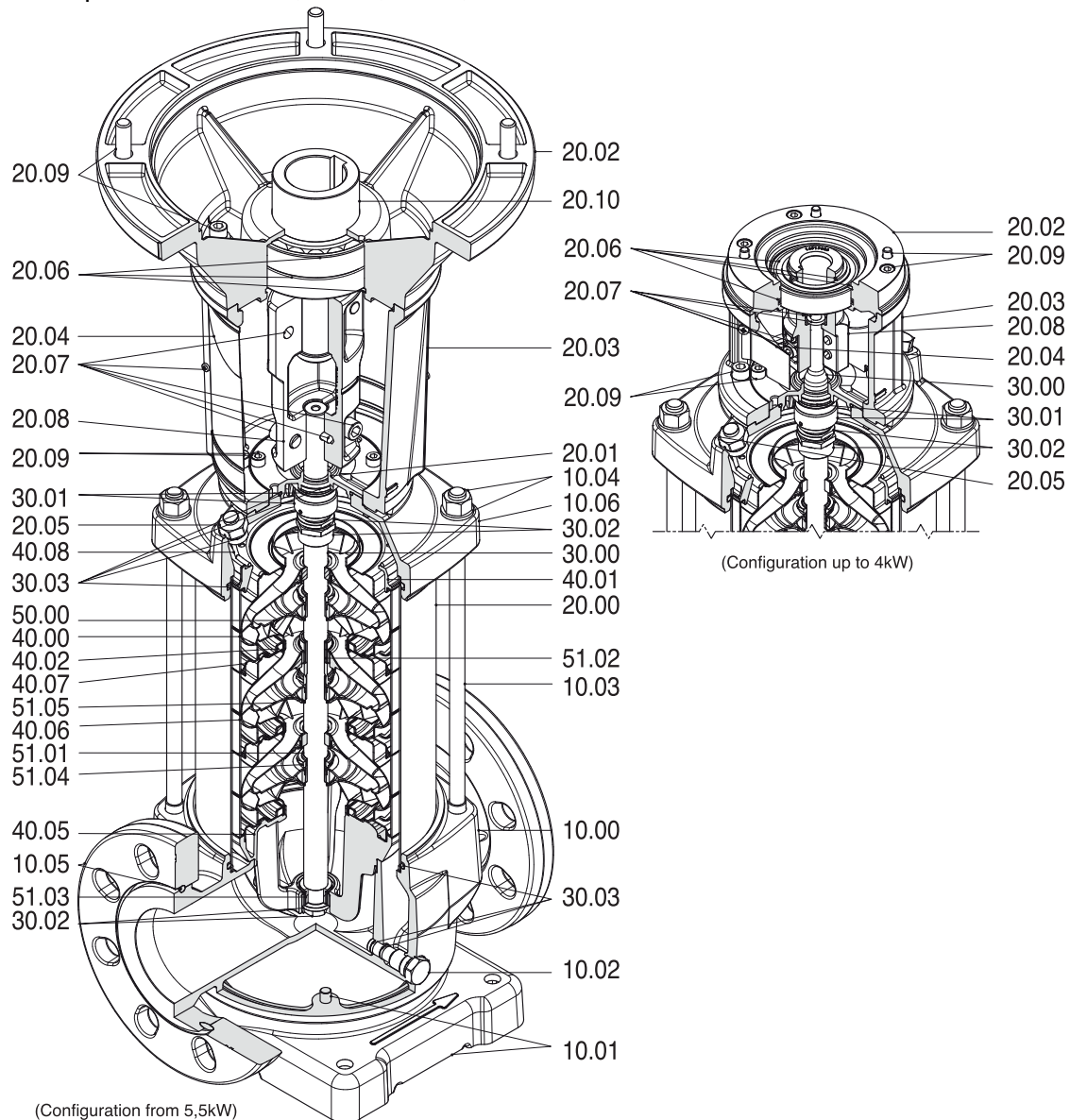
N. rif.	Description
30.00	Pump shaft
30.01	Kit Mechanical seal
30.02	Mechanical seal fastening kit
30.03	Kit O-rings
40.00	Stage housing and diffuser
40.01	Stage Centering outlet
40.02	Floating neck ring
40.03	Initial stage housing
40.04	Last Stage with diffuser
40.05	Stage Centering inlet
40.06	Stage housing and diffuser with bearing
50.00	Impeller
50.01	Impeller spacer
50.02	Intermediary sleeve
50.03	Intermediary sleeve spacer

Figure 7.13: Spare Parts: EV15, EV20

00114099 10/2013

N. rif.	Description
10.00	Pump casing
10.01	Pump fixing plate
10.02	Filling and draining plug
10.03	Tie bolt
10.04	Kit nuts and washers
10.06	Upper Flange
20.00	Outer Case
20.01	Mechanical seal housing
20.02	Motor flange
20.03	Motor bracket
20.04	Coupling guard
20.05	Filling plugs
20.06	Circlips and bearings, and O-ring
20.07	Coupling fasteners
20.08	Coupling
20.09	Kit motor screws

N. rif.	Description
20.10	Motor shaft adapter
30.00	Pump shaft
30.01	Kit Mechanical seal
30.02	Mechanical seal fastening kit
30.03	Kit O-rings
40.00	Stage housing and diffuser
40.01	Stage Centering outlet
40.02	Floating neck ring
40.03	Initial stage housing
40.04	Last Stage with diffuser
40.06	Stage housing and diffuser with bearing
50.00	Impeller
50.01	Impeller spacer
50.02	Intermediary sleeve
50.03	Intermediary sleeve spacer

Figure 7.14: Spare Parts: EV30, EV45, EV65, EV95

00114100 10/2013

N. rif.	Description
10.00	Pump casing
10.01	Pump fixing plate
10.02	Draining plug
10.03	Tie bolt
10.04	Kit nuts and washers
10.05	Kit flanges ring
10.06	Upper Flange
20.00	Outer Case
20.01	Mechanical seal housing
20.02	Motor flange
20.03	Motor bracket
20.04	Coupling guard
20.05	Filling plugs
20.06	Circlips and bearings, and O-ring
20.07	Coupling fasteners
20.08	Coupling
20.09	Kit motor screws
20.10	Motor shaft adapter

N. rif.	Description
30.00	Pump shaft
30.01	Kit Mechanical seal
30.02	Mechanical seal fastening kit
30.03	Kit O-rings
40.00	Stage housing and diffuser
40.01	Stage Centering outlet (only on EV 65/95)
40.02	Floating neck ring
40.05	Stage Centering inlet
40.06	Stage housing and diffuser with bearing
40.07	Flange clamping neck ring
40.08	Spring ring
50.00	Impeller
51.01	Split cone
51.02	Intermediary sleeve nut
51.03	Journal sleeve
51.04	Split cone nut
51.05	Intermediate impeller with screw

7.10 Replacing the Motor

For all versions of the pump with motor of rated power less or equal to 4kW, first remove the coupling safety casings to access the motor clamping screws (see fig.20).

For all other versions, the motor clamping screws are easily accessible on the exterior (see fig.19). The motor shaft must have a key drive.

NOTE: It is not necessary to carry out any operations on the pump shaft and motor shaft connection joints.

WARNING: FAILURE TO OBSERVE THESE INSTRUCTIONS MAY CAUSE PERSONAL INJURY

- Replace the safety casings where necessary

Figure 7.15: Motor Replacement Procedure (4kW or less)

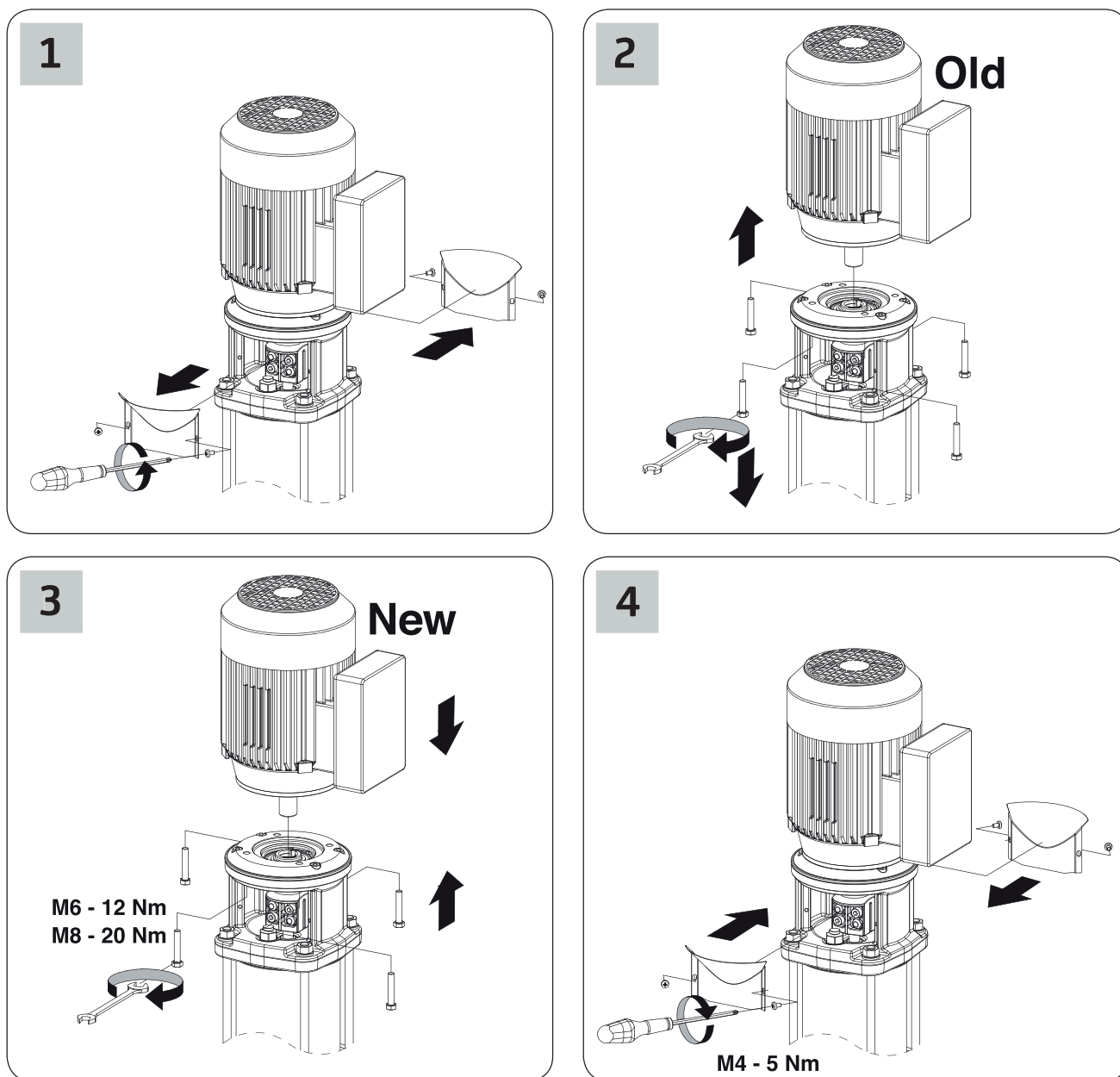
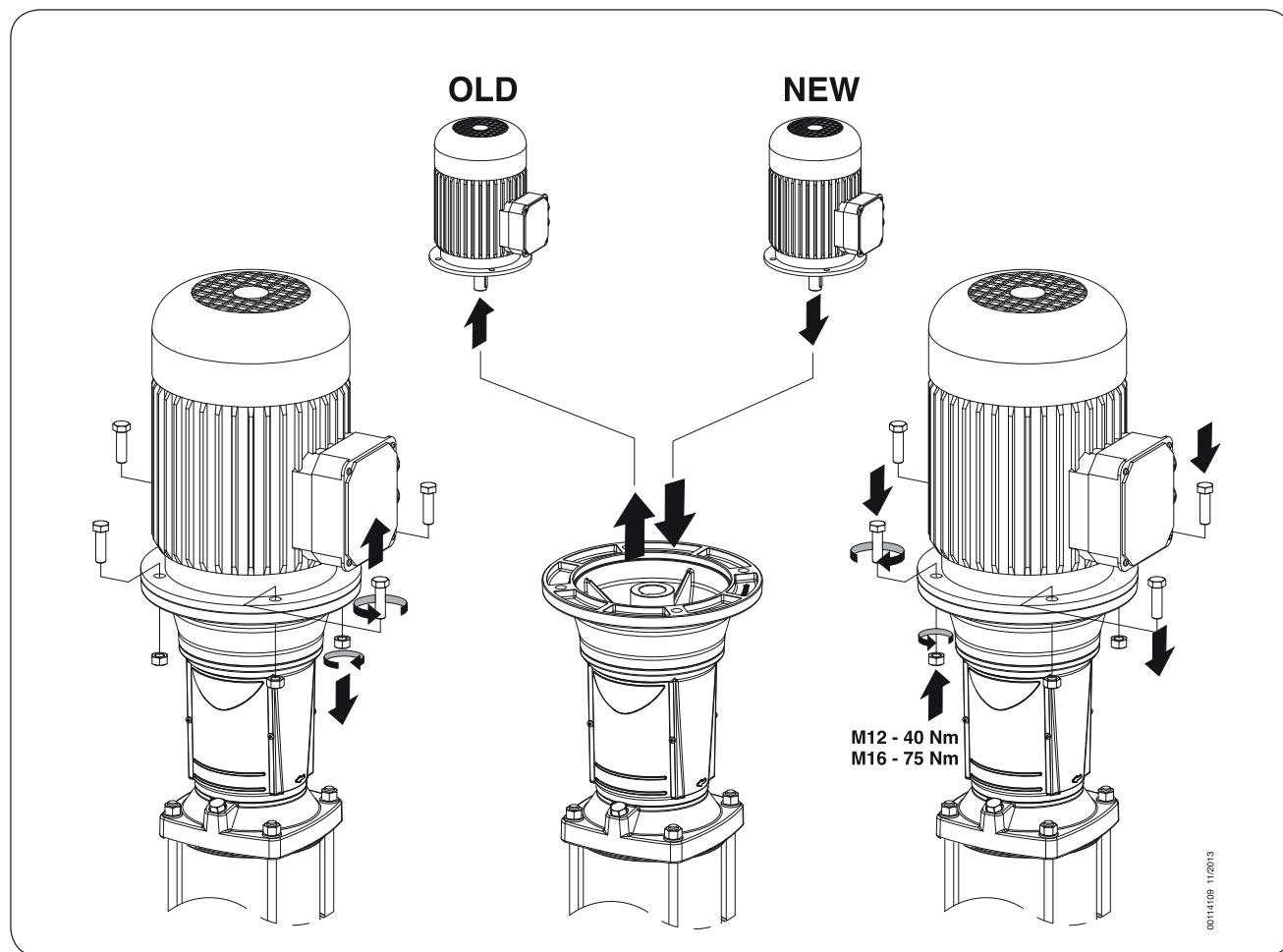
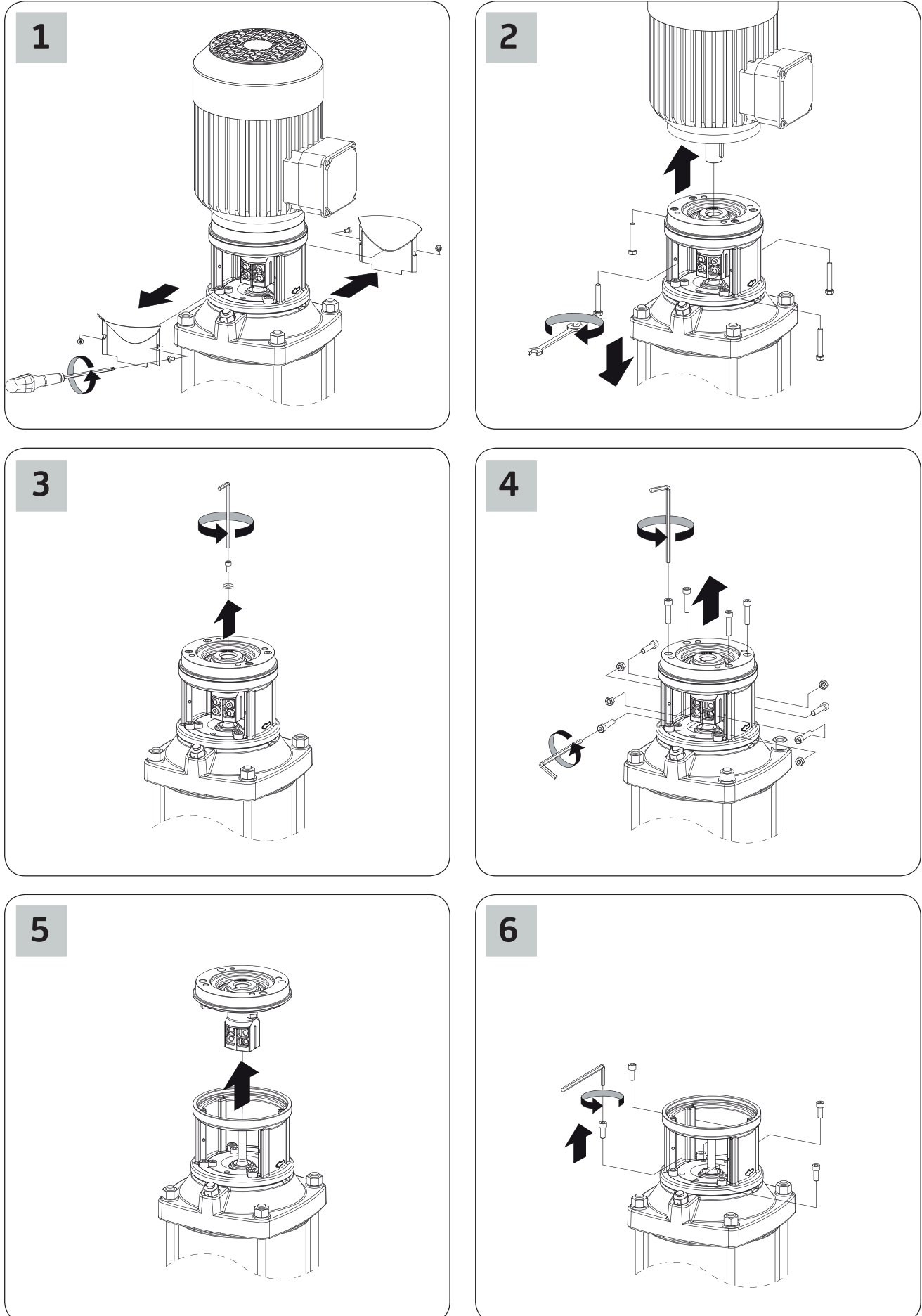


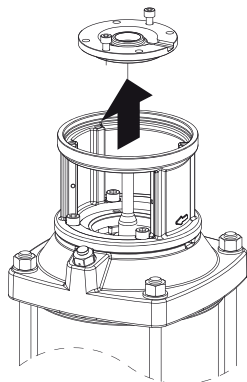
Figure 7.16: Motor Replacement Procedure (Greater than 4kW)

7.11 Replacing the Mechanical Seal

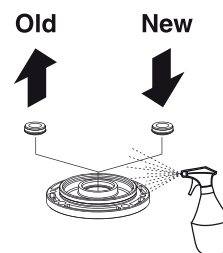
The type of mechanical seal can be identified from the pump model code - see [Figure 7.10: Dutypoint TPX Pumps Type Indicator](#) (p. 34).

Figure 7.17: Replacing the Mechanical Seal - Pumps 4kW or less

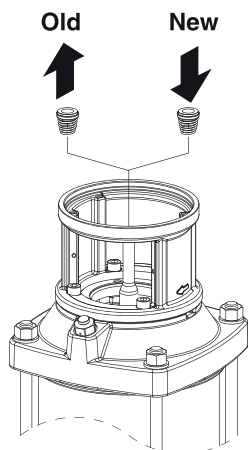
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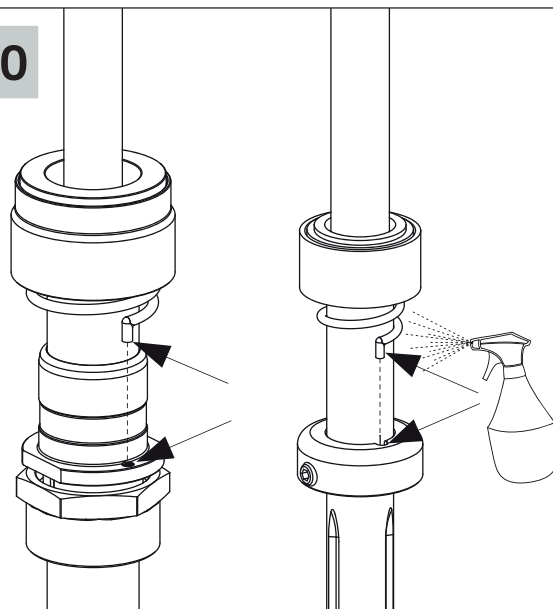
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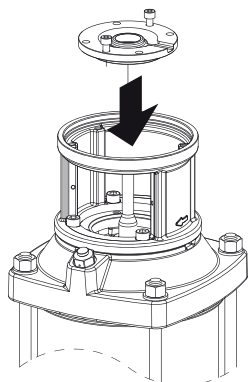
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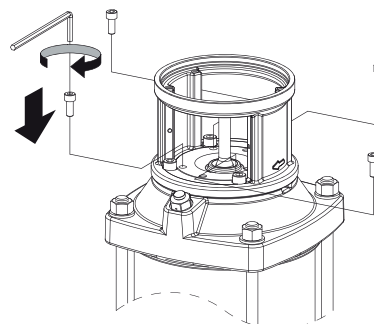


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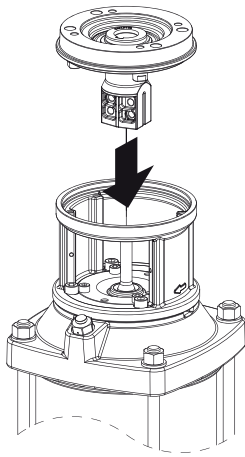


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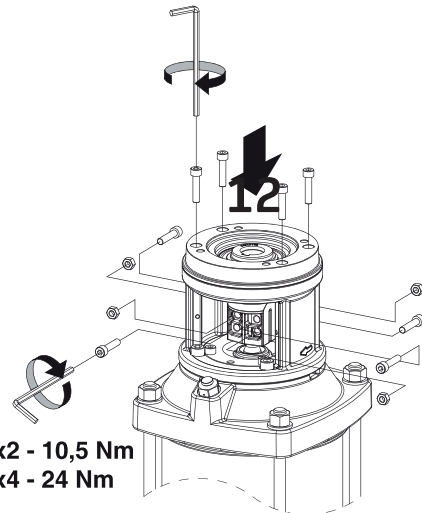
M6 - 15 Nm
M8 - 20 Nm



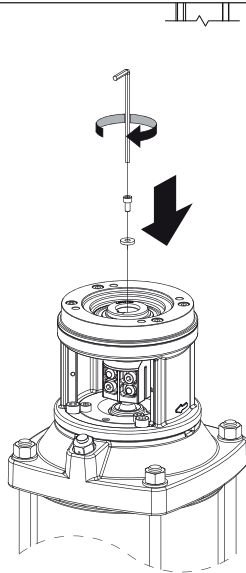
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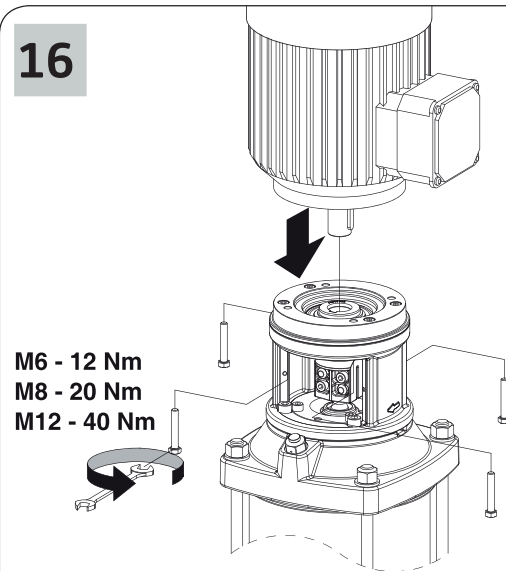
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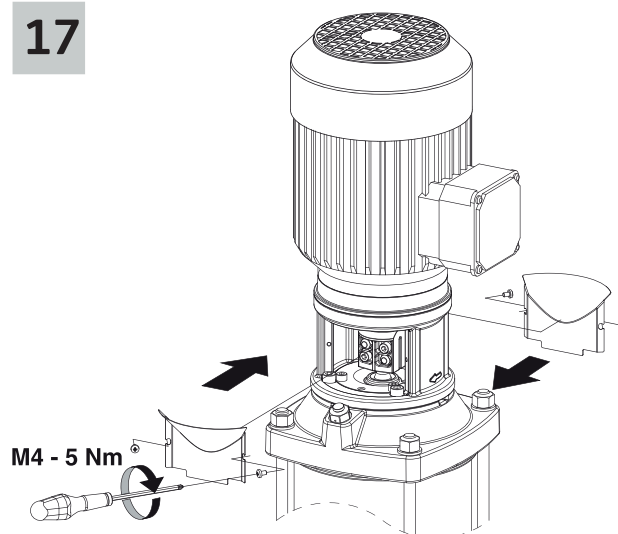
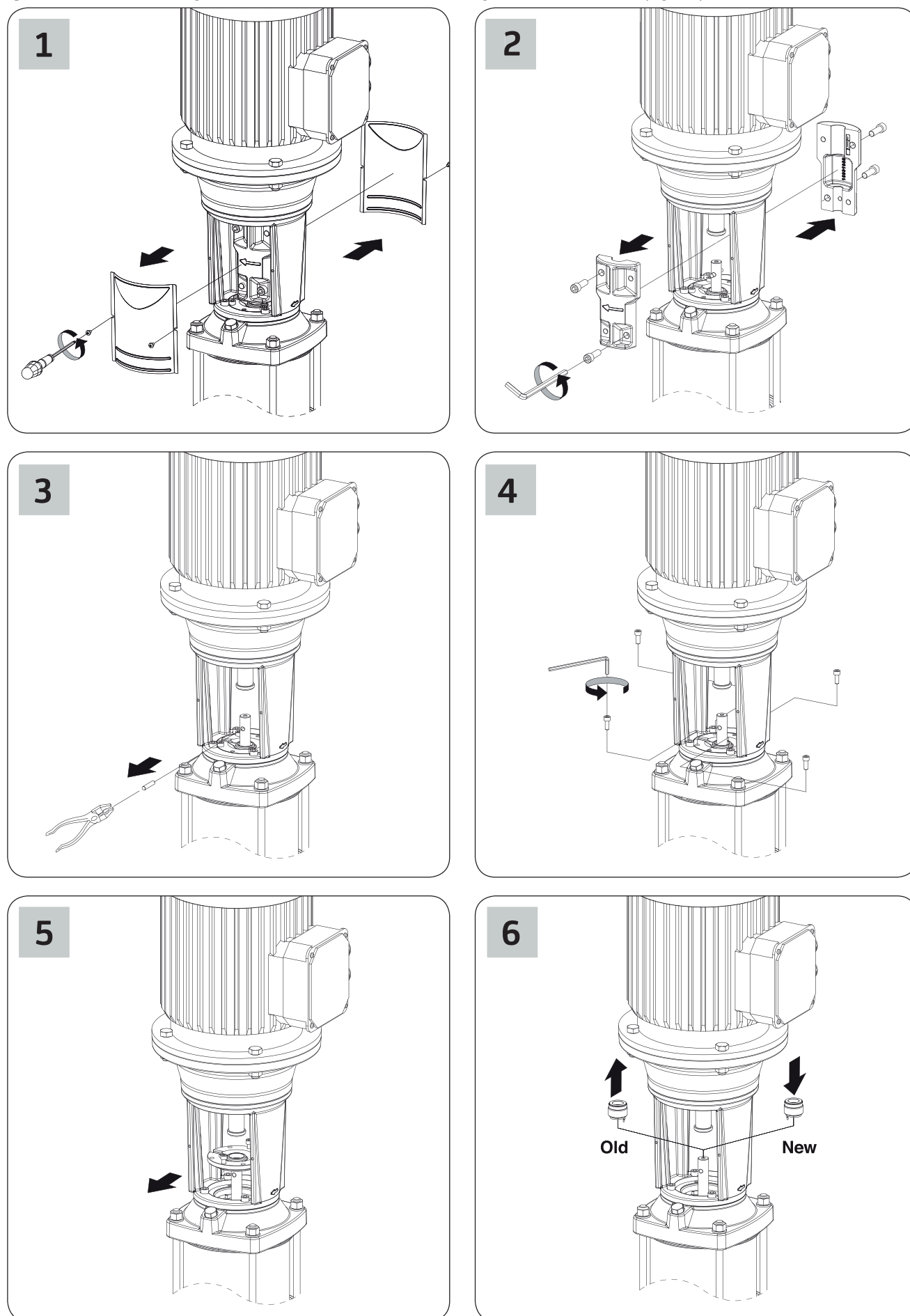
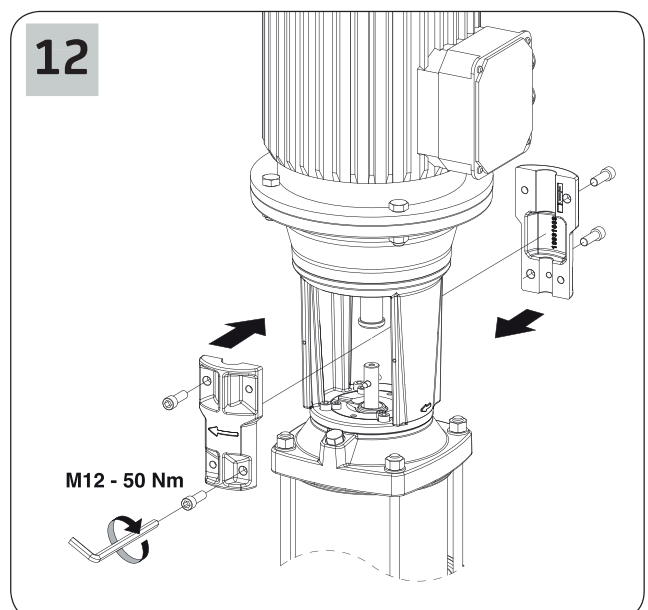
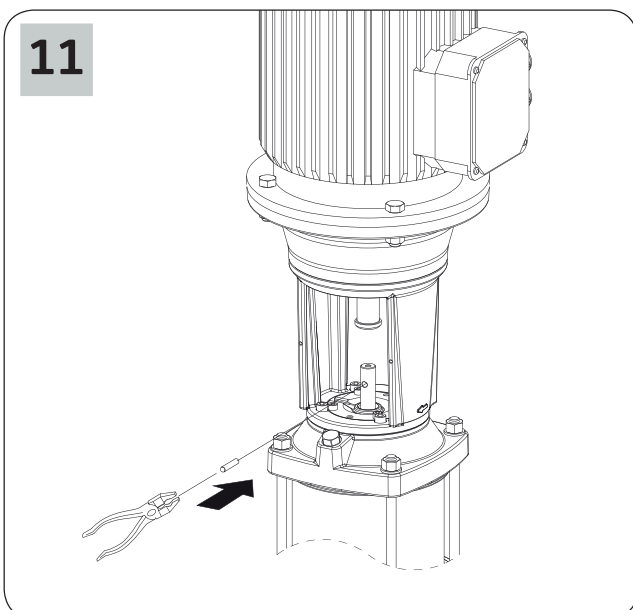
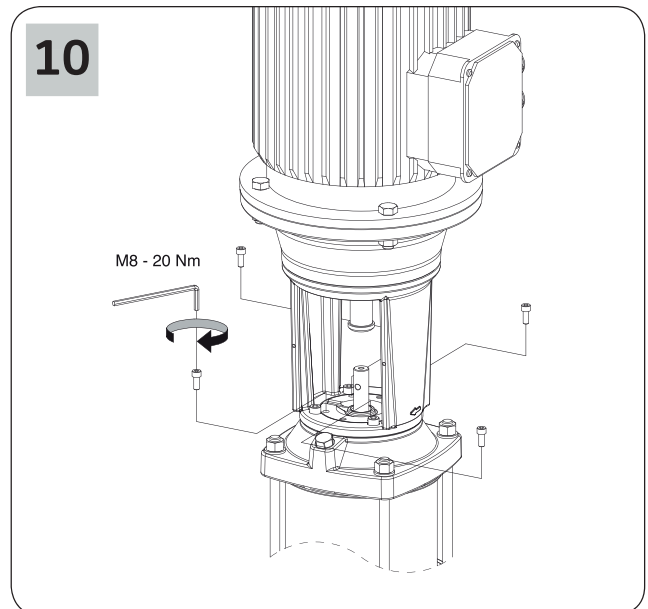
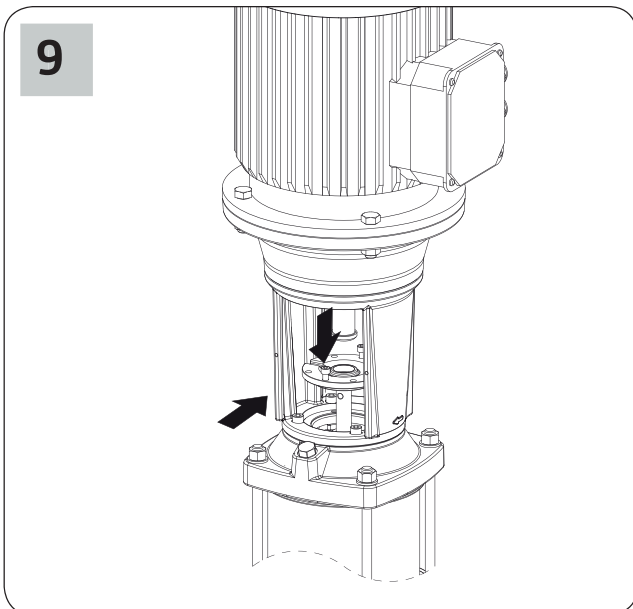
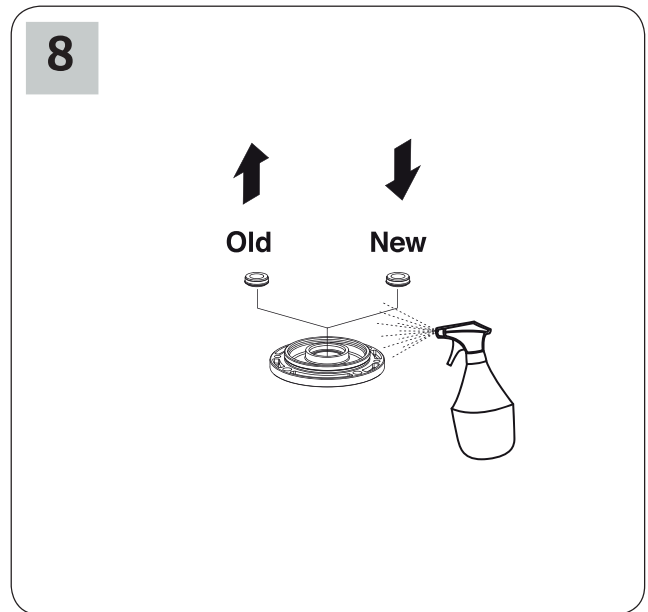
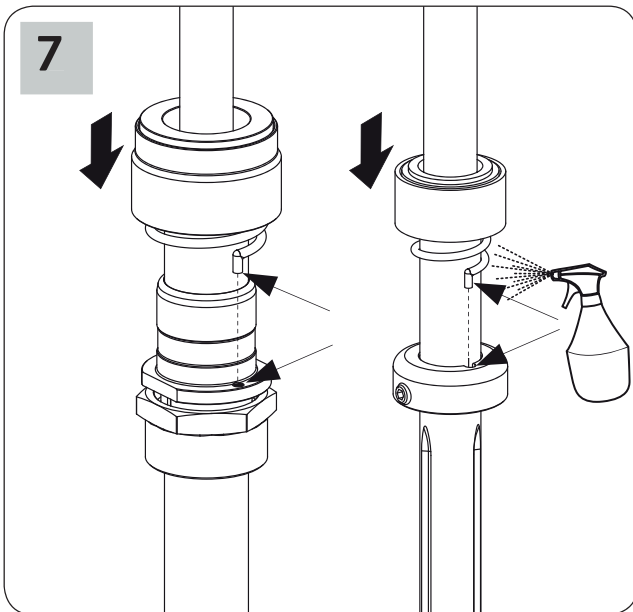
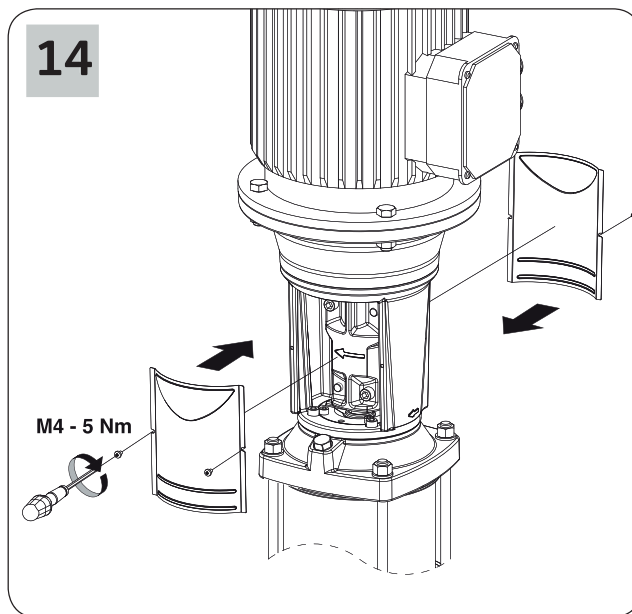
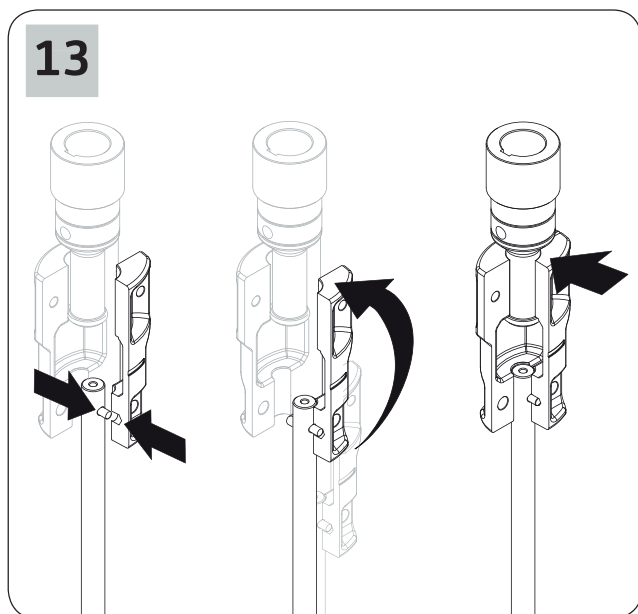


Figure 7.18: Replacing the Mechanical Seal - Pumps greater than 4kW (fig 12)





7.12 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

Problem	Possible Causes	Action
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

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 +110°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

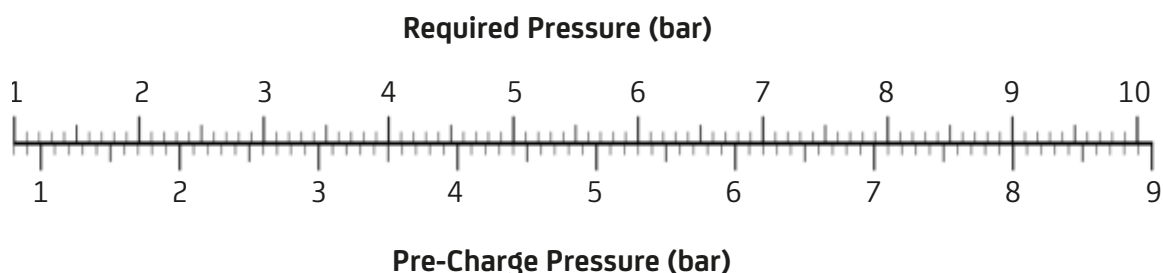
Periodic maintenance is recommended at least twice a year and should be carried out by authorised specialised personnel only.

- 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



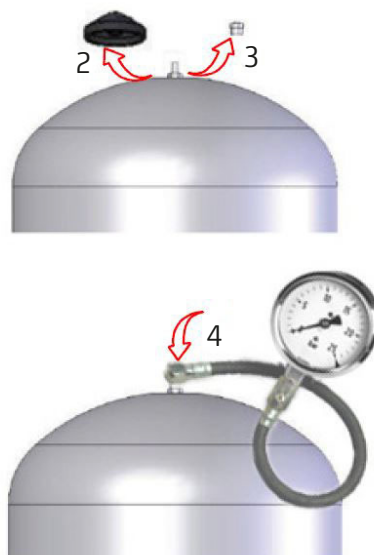
On variable speed systems the pre-charge air pressure for vessels should be 90% of the maximum pressure generated by the pump in the pipework system

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	9.1 Twin Pump 1.5kW 3-Phase 400V (p. 58)
		2.2	SCP-00051-999	9.2 Twin Pump 2.2kW 3-Phase 400V (p. 61)
		4	SCP-00052-999	9.3 Twin Pump 3.0 and 4.0kW 3-Phase 400V (p. 64)
		5.5	SCP-00053-999	9.4 Twin Pump 5.5kW 3-Phase 400V (p. 67)
	240/1/50	1.5	SCP-00064-999	9.5 Twin Pump 1.5kW 1-Phase 240V (p. 70)
		2.2	SCP-00065-999	9.6 Twin Pump 2.2kW 1-Phase 240V (p. 73)
		4	SCP-00066-999	9.7 Twin Pump 3.0 and 4.0kW 1-Phase 240V (p. 76)
3	400/3/50	1.5	SCP-00054-999	9.8 Triple Pump 1.5kW 3-Phase 400V (p. 79)
		2.2	SCP-00055-999	9.9 Triple Pump 2.2kW 3-Phase 400V (p. 82)
		4	SCP-00056-999	9.10 Triple Pump 3.0 and 4.0kW 3-Phase 400V (p. 85)
		5.5	SCP-00057-999	9.11 Triple Pump 5.5kW 3-Phase 400V (p. 88)
		7.5	SCP-00058-999	9.12 Triple Pump 7.5kW 3-Phase 400V (p. 91)
	240/1/50	1.5	SCP-00069-999	9.13 Triple Pump 1.5kW 1-Phase 240V (p. 94)
		2.2	SCP-00070-999	9.14 Triple Pump 2.2kW 1-Phase 240V (p. 97)
		4	SCP-00071-999	9.15 Triple Pump 3.0 and 4.0kW 1-Phase 400V (p. 100)

9.1 Twin Pump 1.5kW 3-Phase 400V

Figure 9.21: Sheet 1 of 3

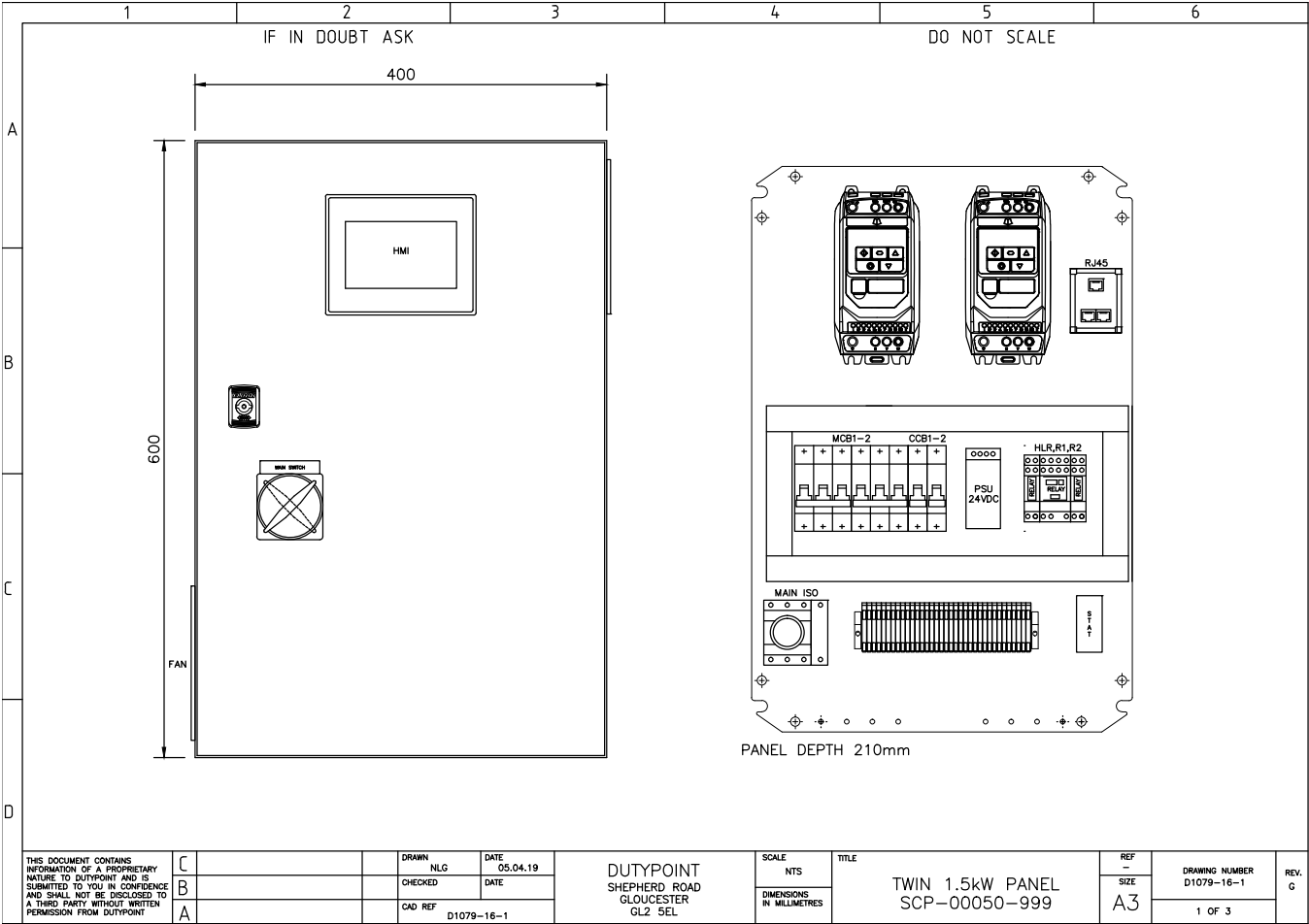


Figure 9.22: Sheet 2 of 3

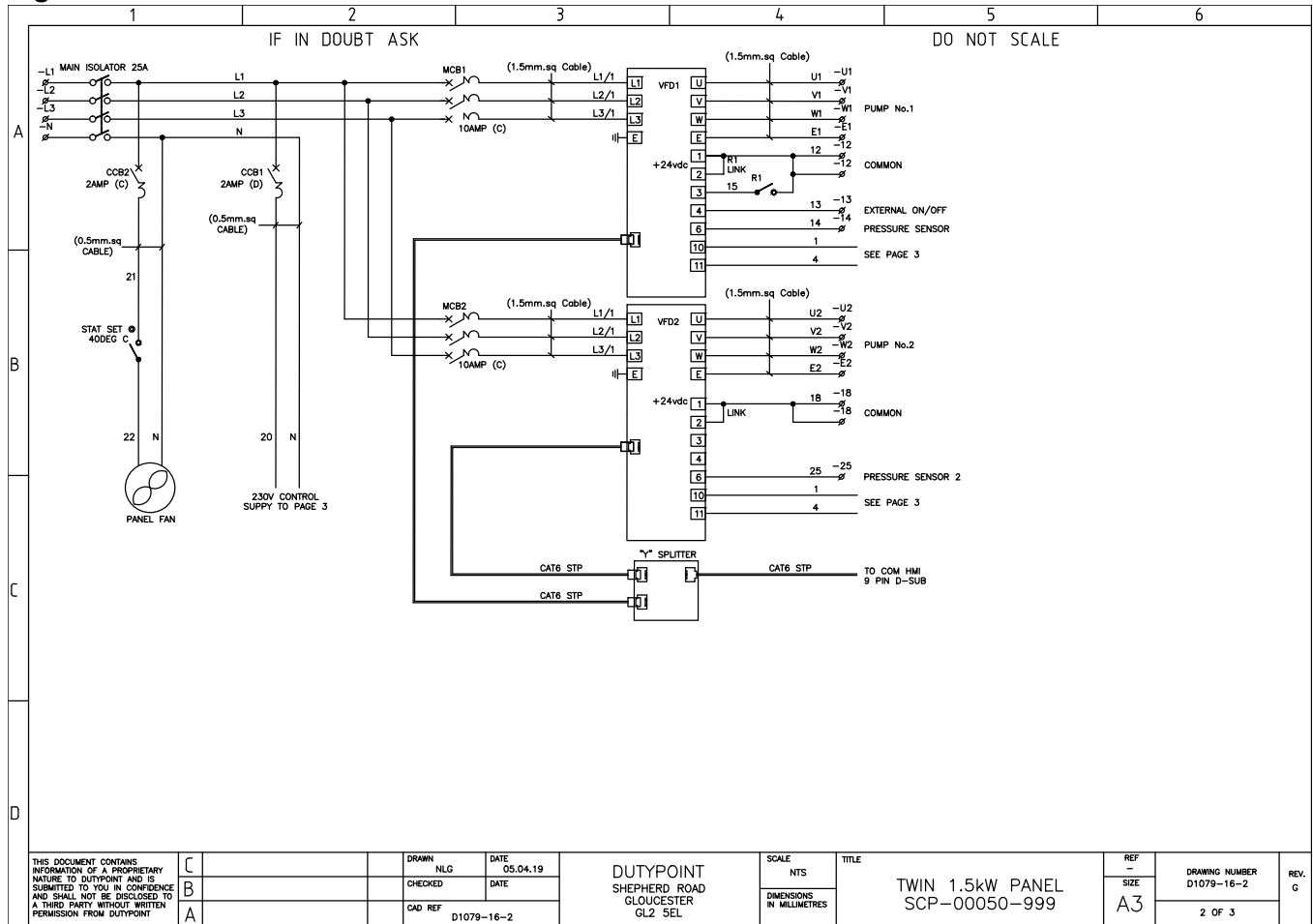


Figure 9.23: Sheet 3 of 3

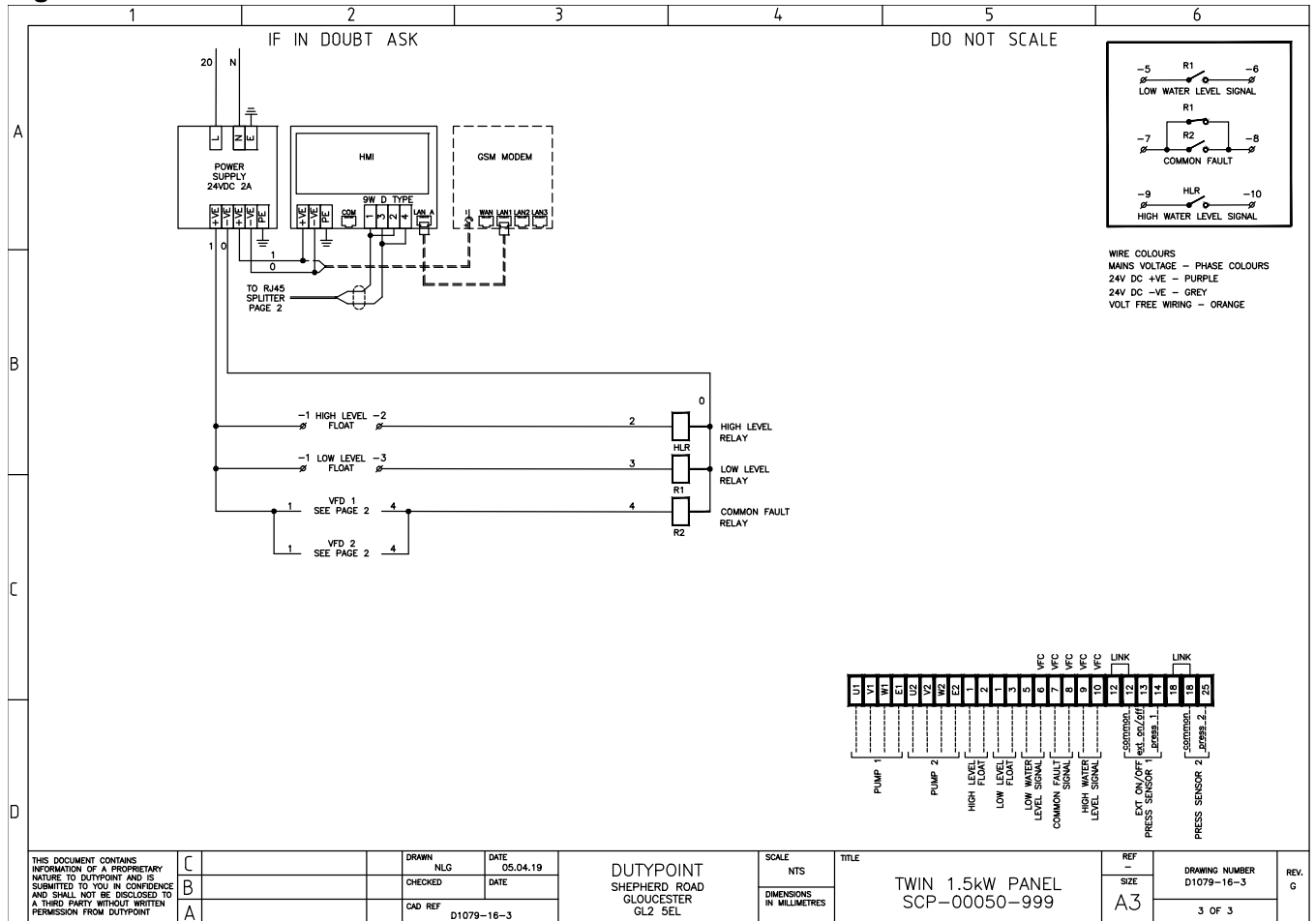
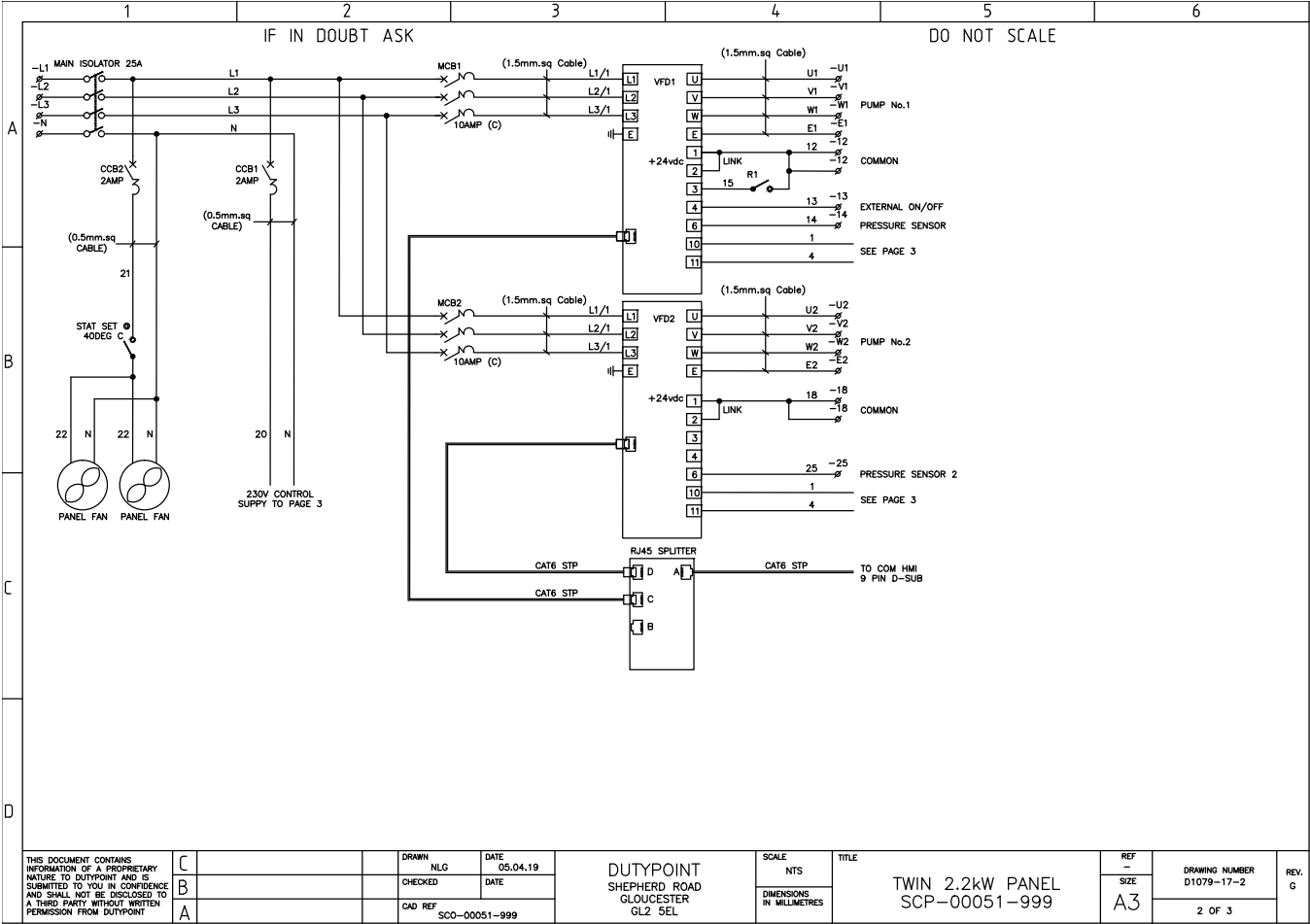


Figure 9.25: Sheet 2 of 3



1
2
4
5
6

IF IN DOUBT ASK

DO NOT SCALE

R1

-5 -6

LOW WATER LEVEL SIGNAL

R1

-7 -8

COMMON FAULT

HLR

-9 -10

HIGH WATER LEVEL SIGNAL

WIRE COLOURS
 MAINS VOLTAGE ~ PHASE COLOURS
 24V DC +VE ~ PURPLE
 24V DC -VE ~ GREY
 VOLT FREE WIRING ~ ORANGE

UT	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20
PUMP 1	PUMP 2	HIGH LEVEL FLOAT	LOW LEVEL FLOAT	LOW LEVEL FLOAT	LOW WATER LEVEL SIGNAL	COMMON FAULT SIGNAL	HIGH WATER LEVEL SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL	COMMON FAULT SIGNAL

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C B A		DRAWN NLG	DATE 05.04.19
		CHECKED	DATE
	CAD REF	SCP-00051-999	

DUTYPOINT
SHEPHERD ROAD
GLOUCESTER
GL2 5EL

SCALE NTS	TITLE TWIN 2.2kW PANEL SCP-00051-999
DIMENSIONS IN MILLIMETRES	

REF =	DRAWING NUMBER D1079-17-3
SIZE A3	REV. G
3 OF 3	

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

Figure 9.27: Sheet 1 of 3

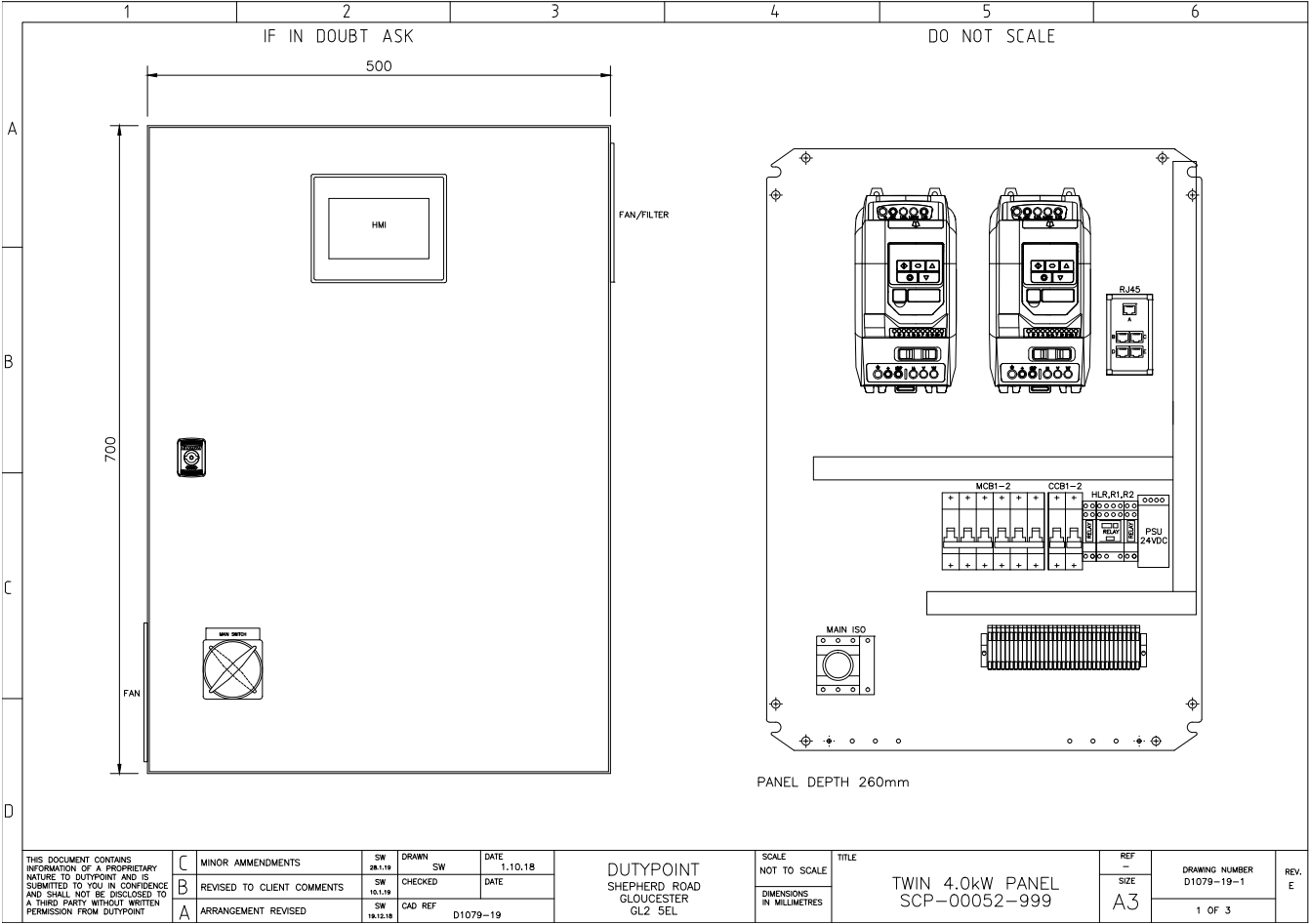


Figure 9.28: Sheet 2 of 3

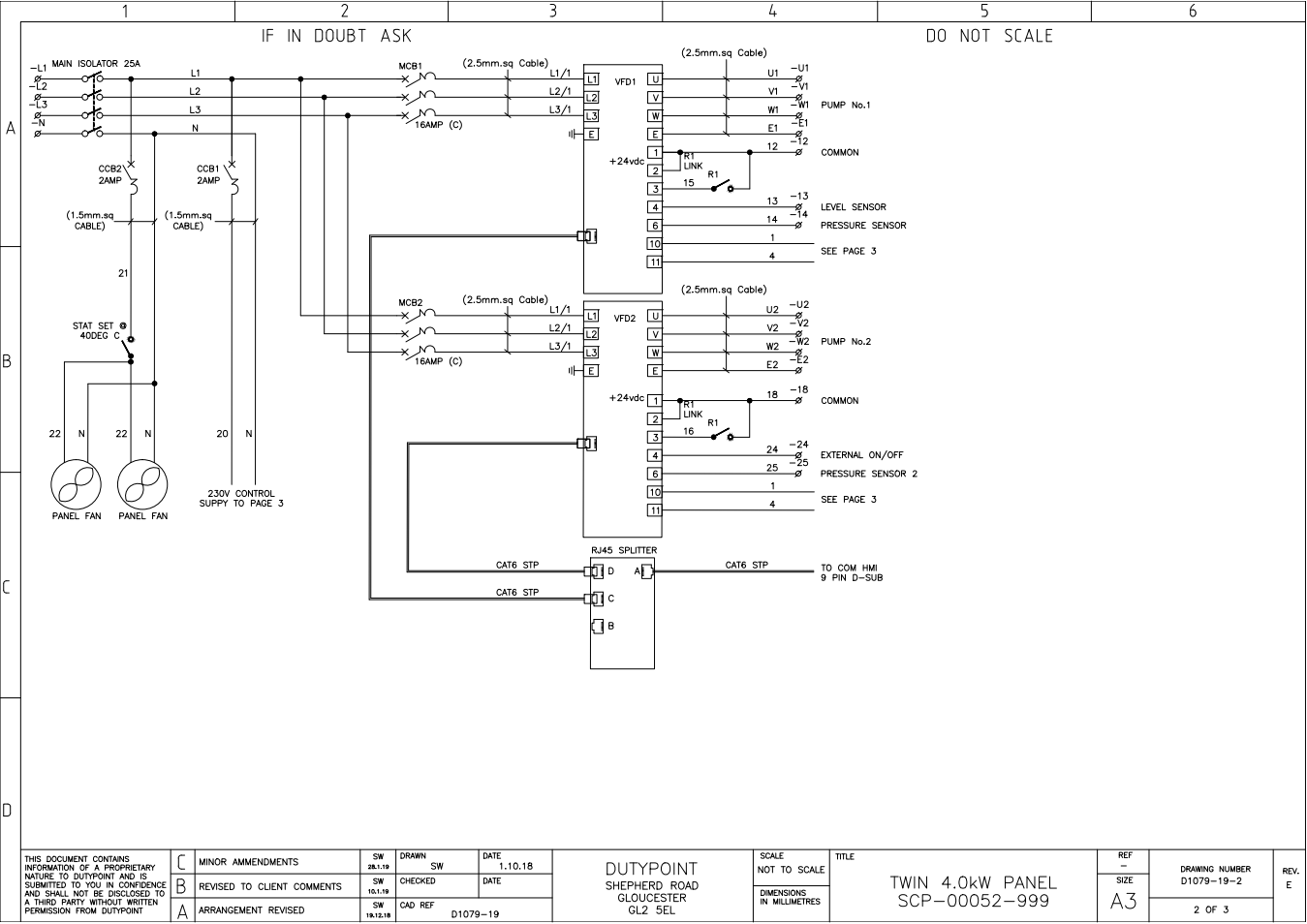


Figure 9.29: Sheet 3 of 3

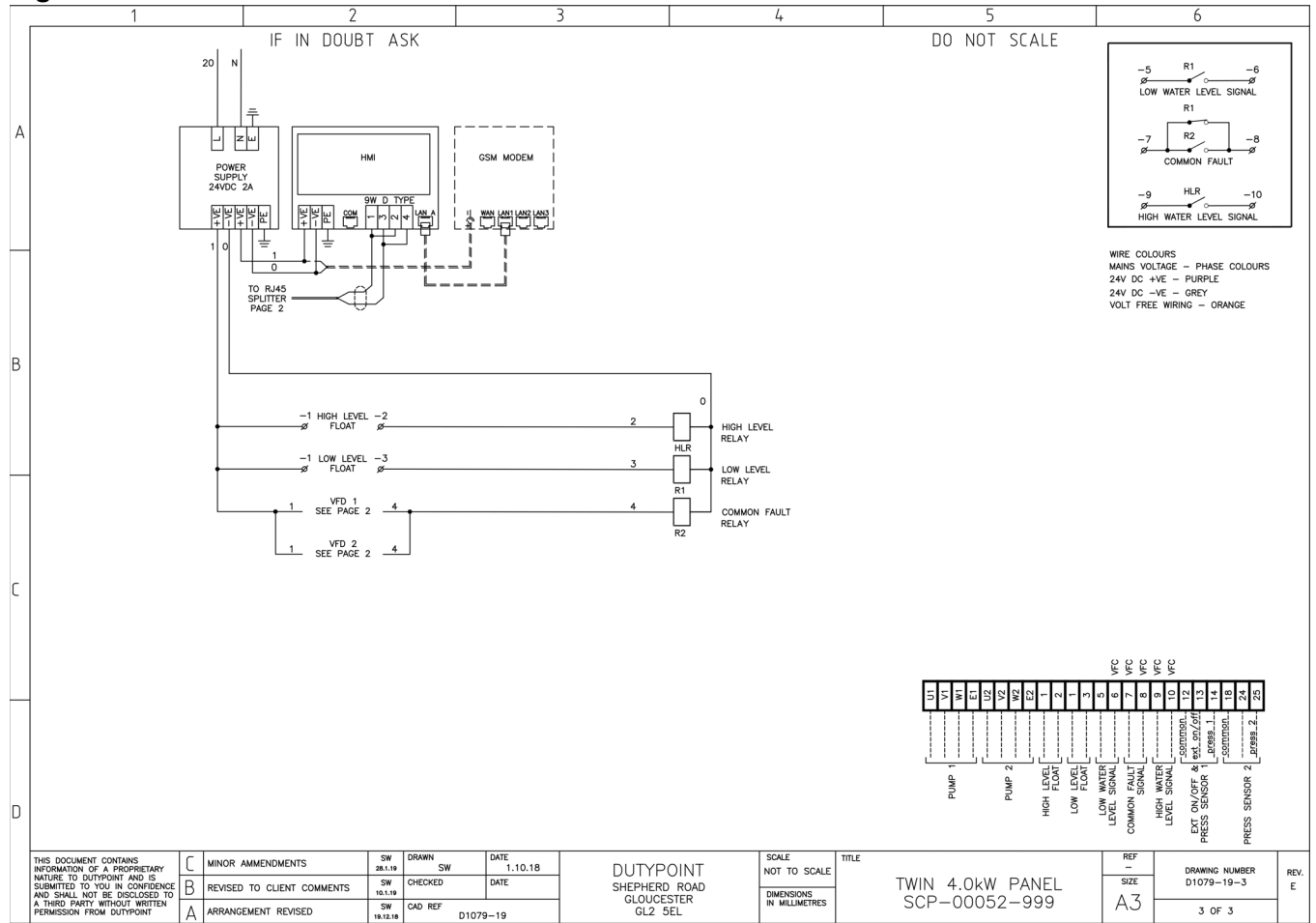


Figure 9.31: Sheet 2 of 3

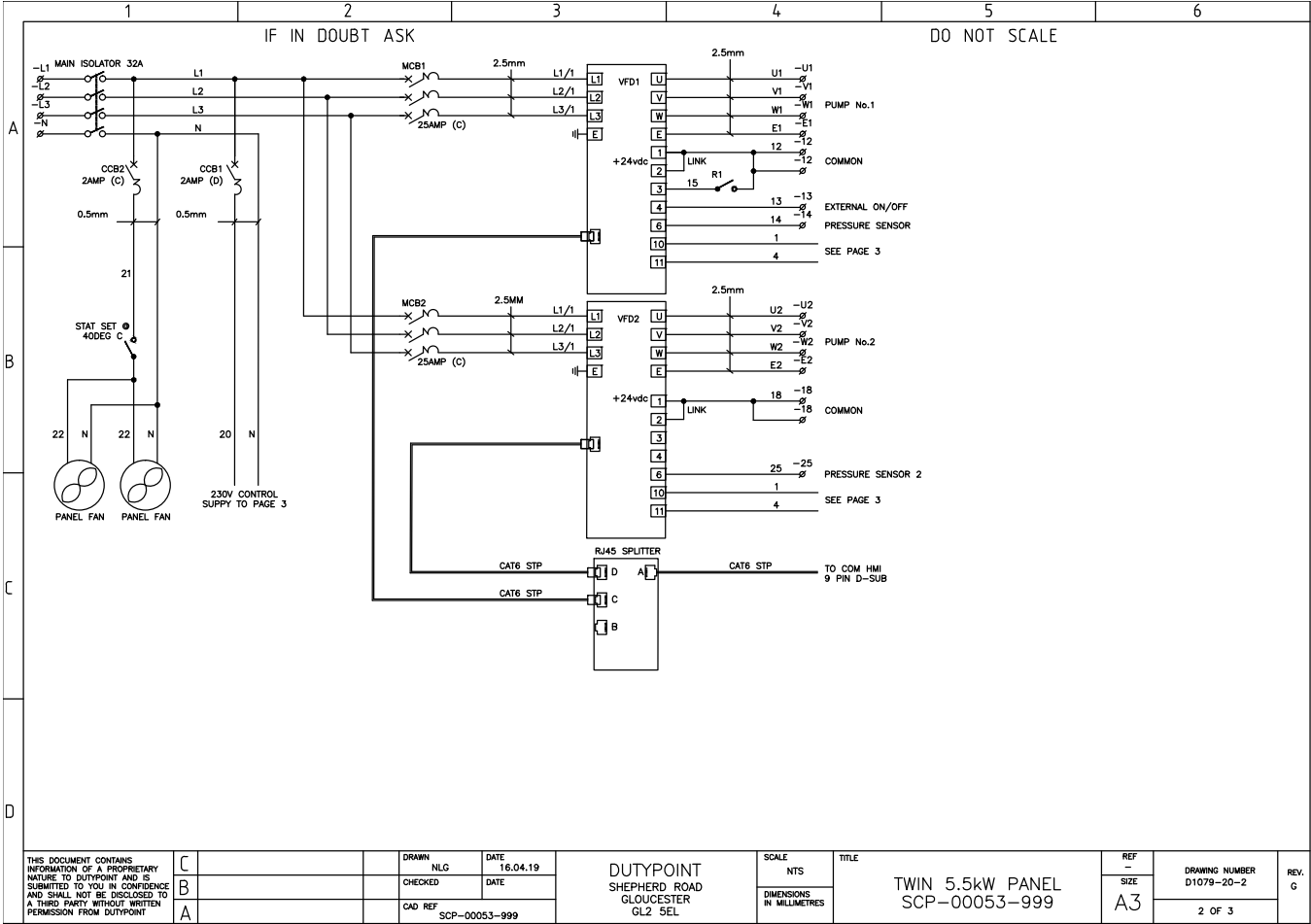
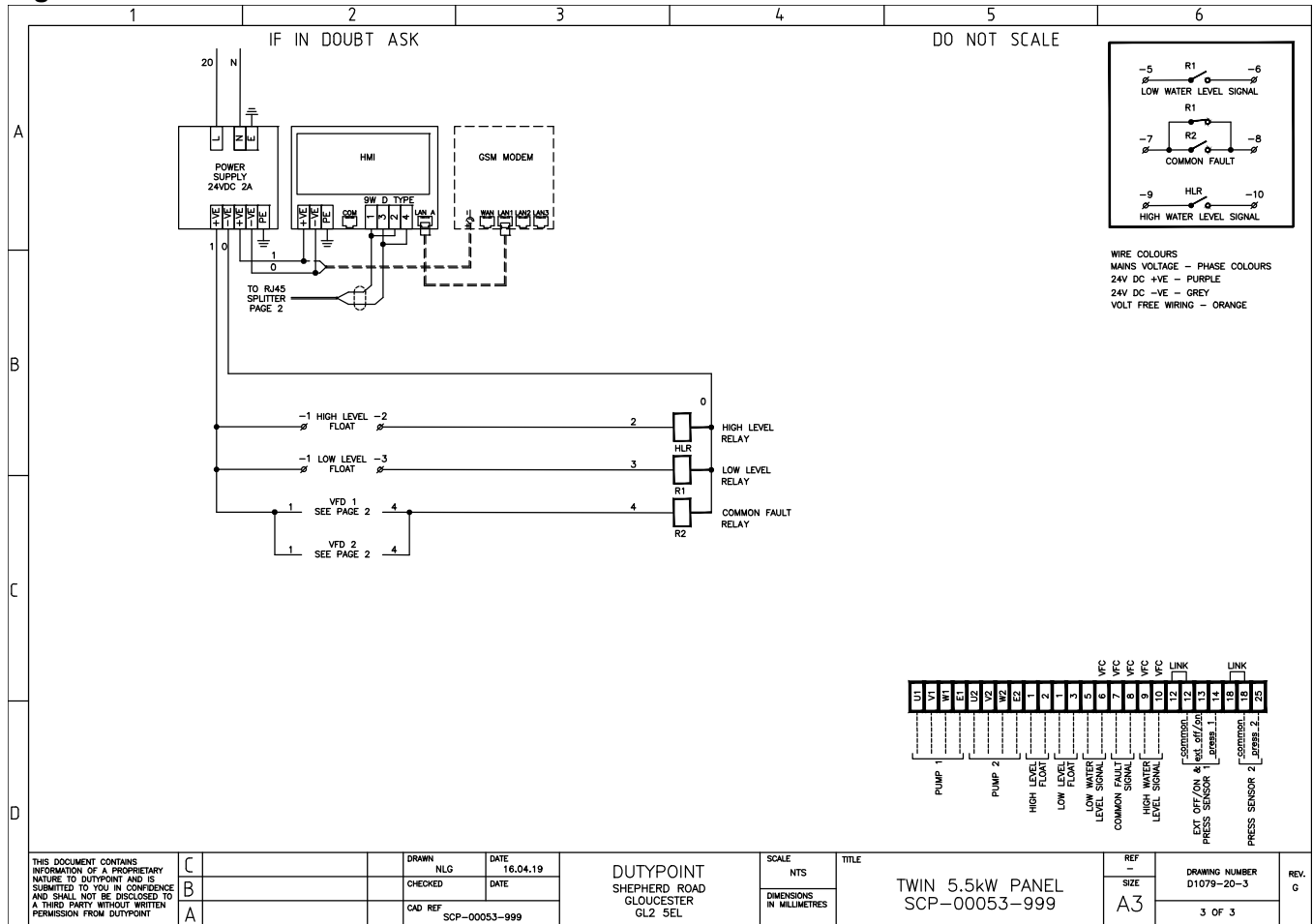
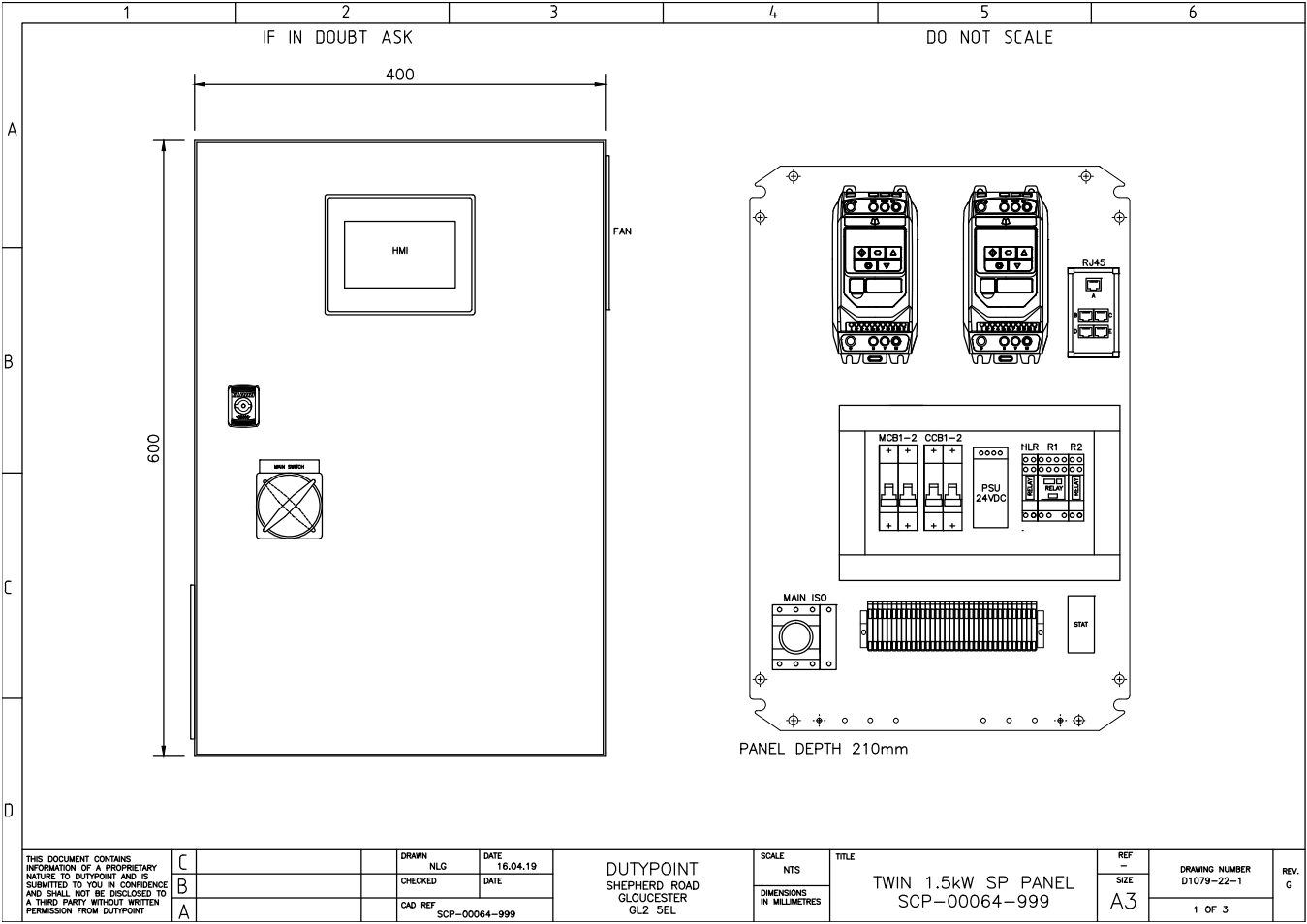


Figure 9.32: Sheet 3 of 3



9.5 Twin Pump 1.5kW 1-Phase 240V

Figure 9.33: Sheet 1 of 3



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Figure 9.35: Sheet 3 of 3

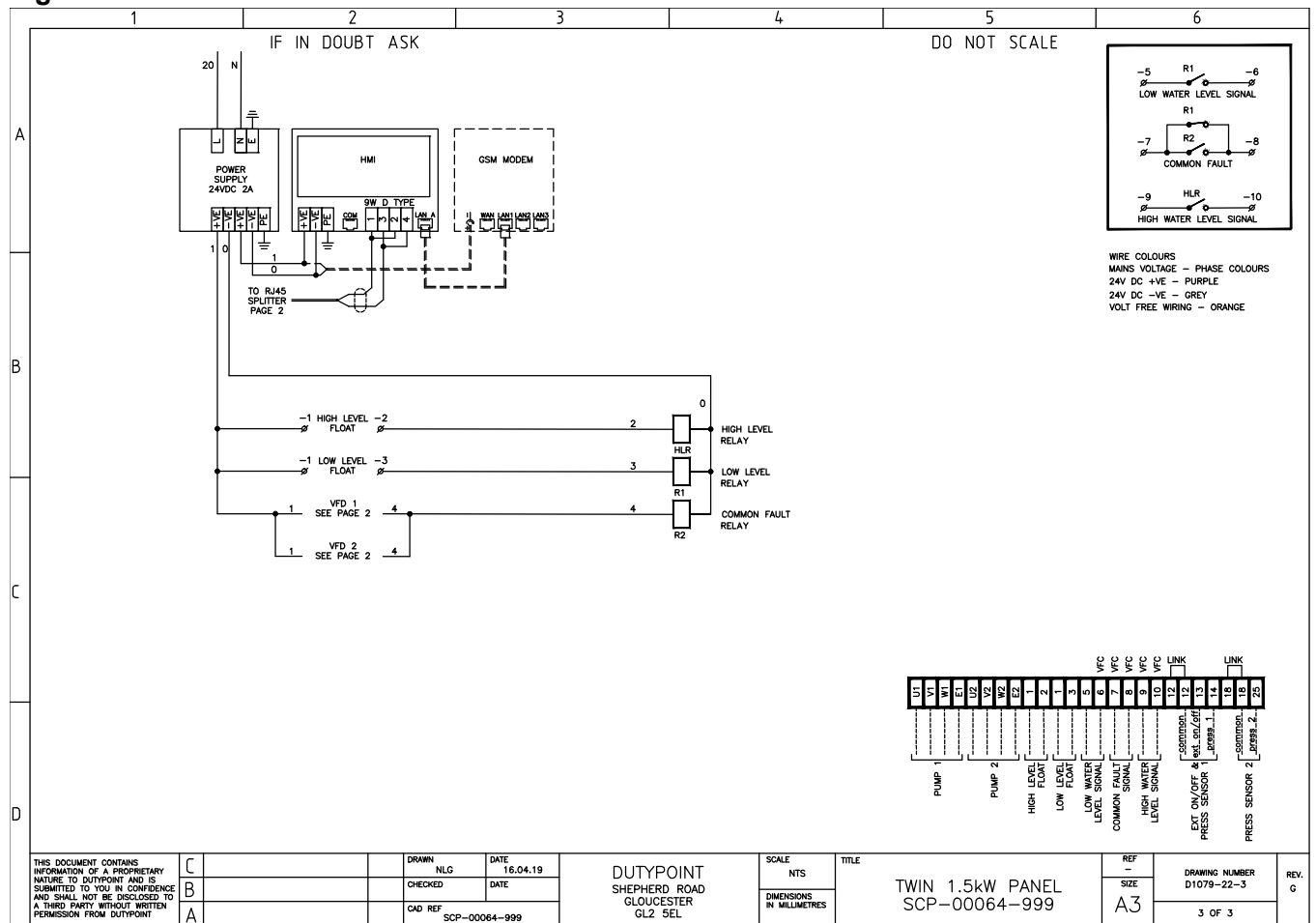
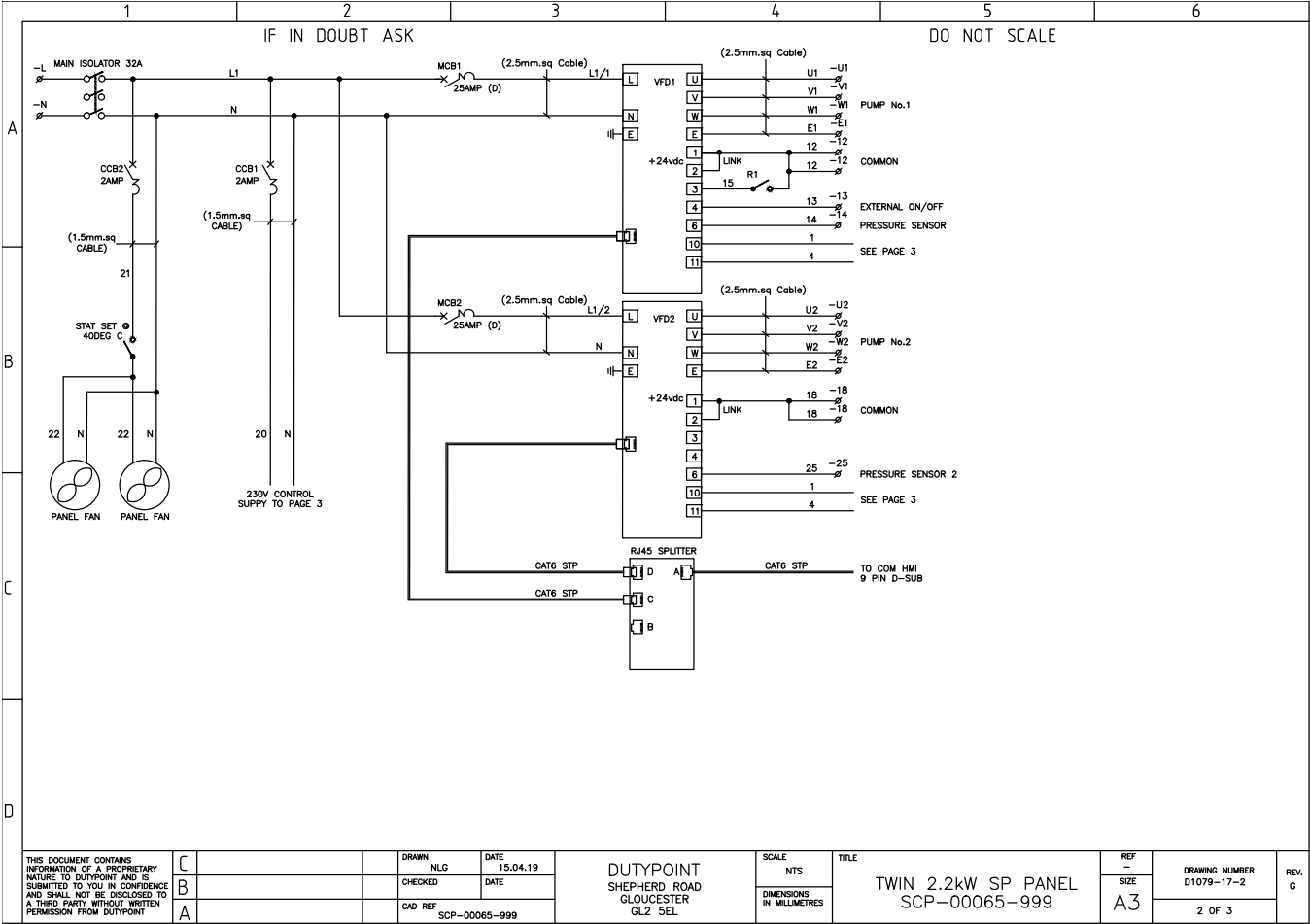


Figure 9.37: Sheet 2 of 3



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

Figure 9.39: Sheet 1 of 3

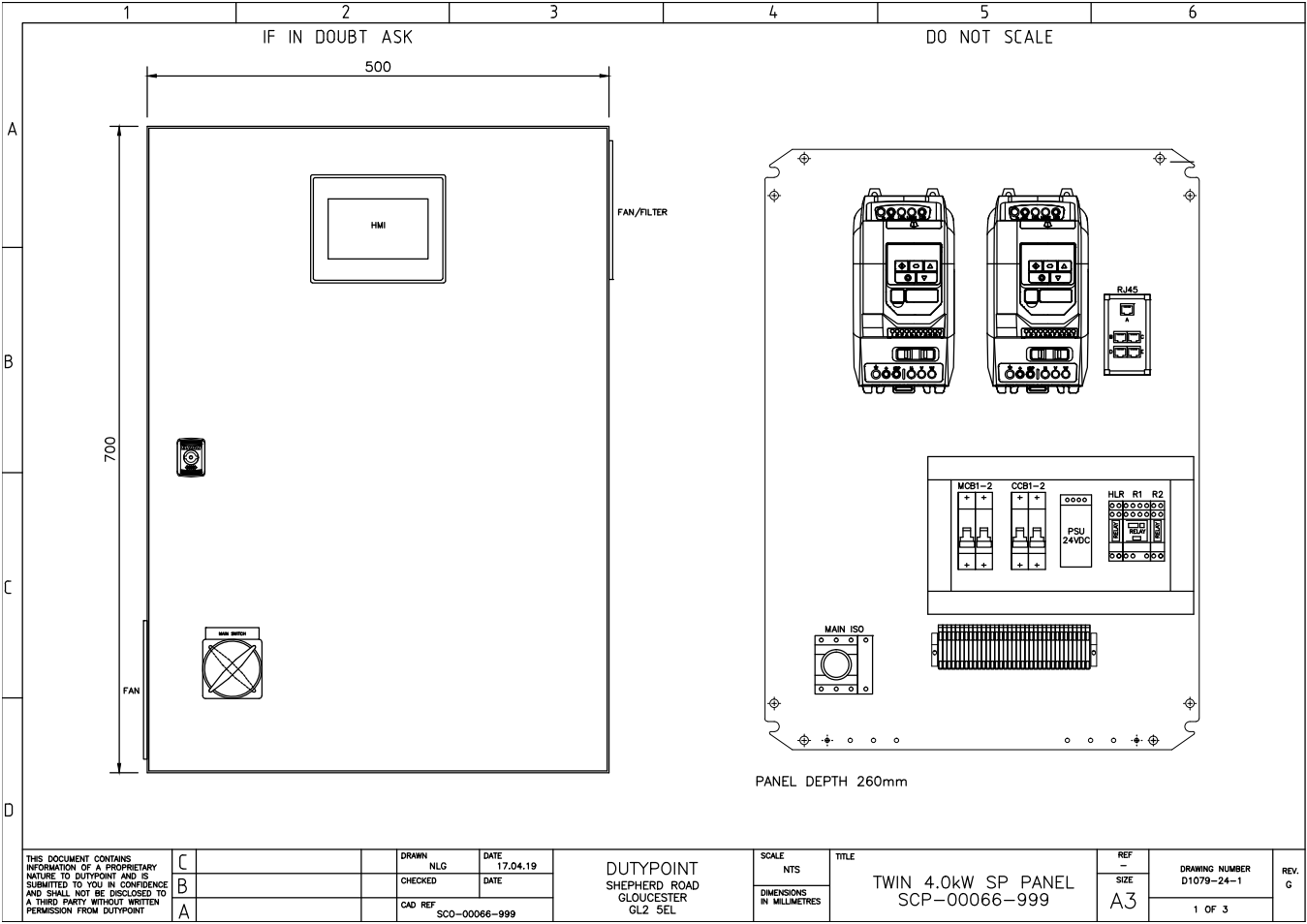


Figure 9.40: Sheet 2 of 3

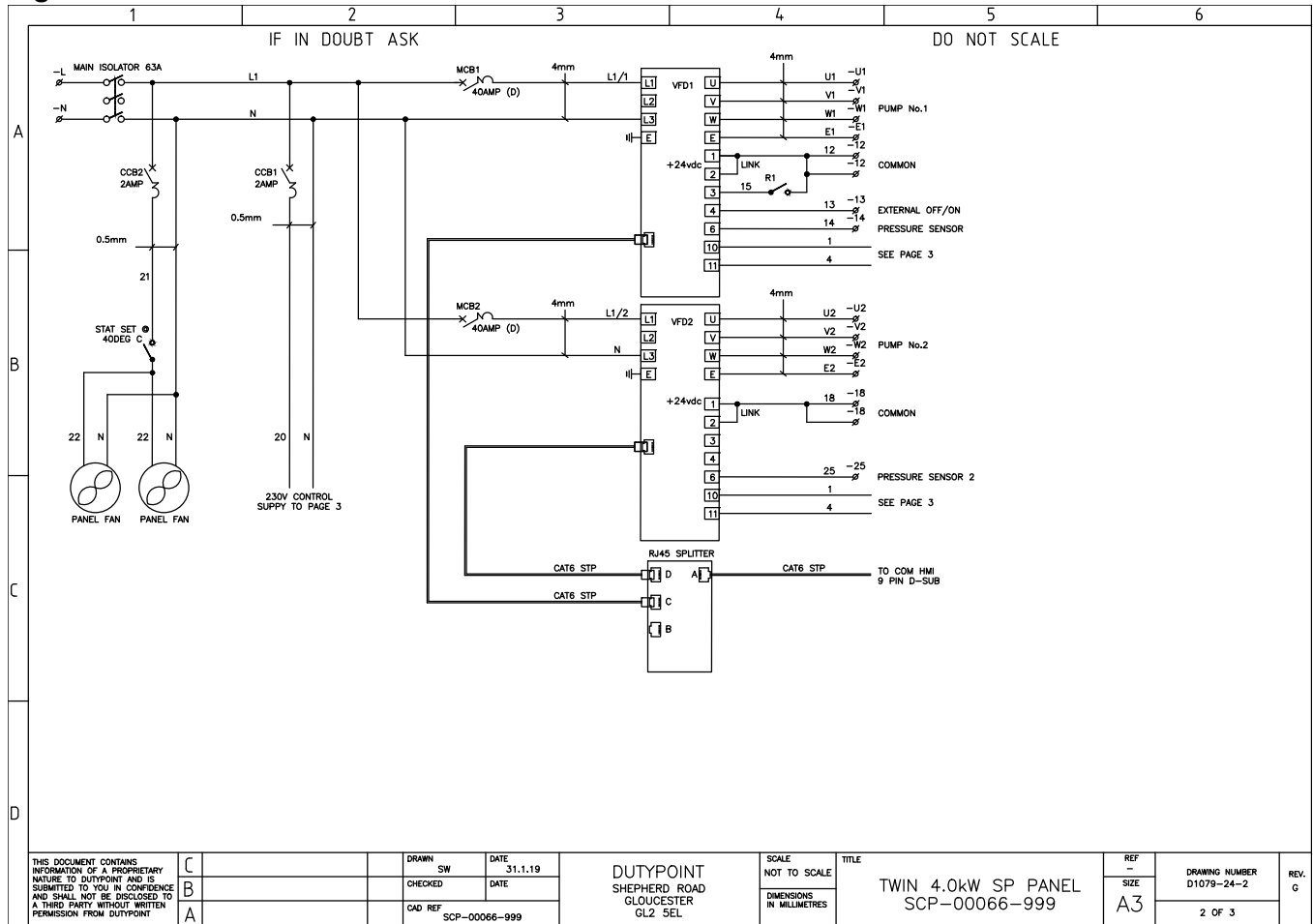
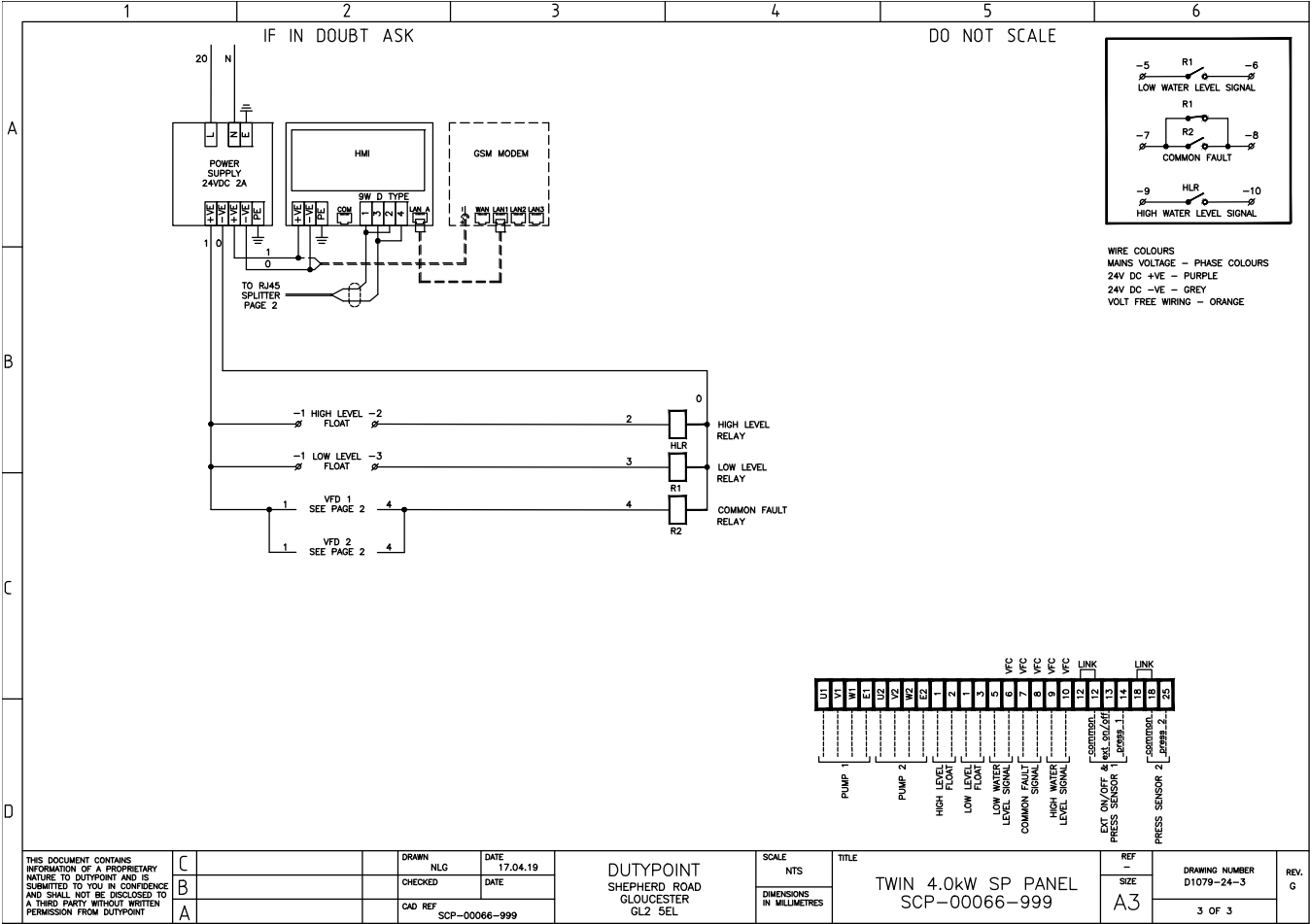


Figure 9.41: Sheet 3 of 3



9.8 Triple Pump 1.5kW 3-Phase 400V

Figure 9.42: Sheet 1 of 3

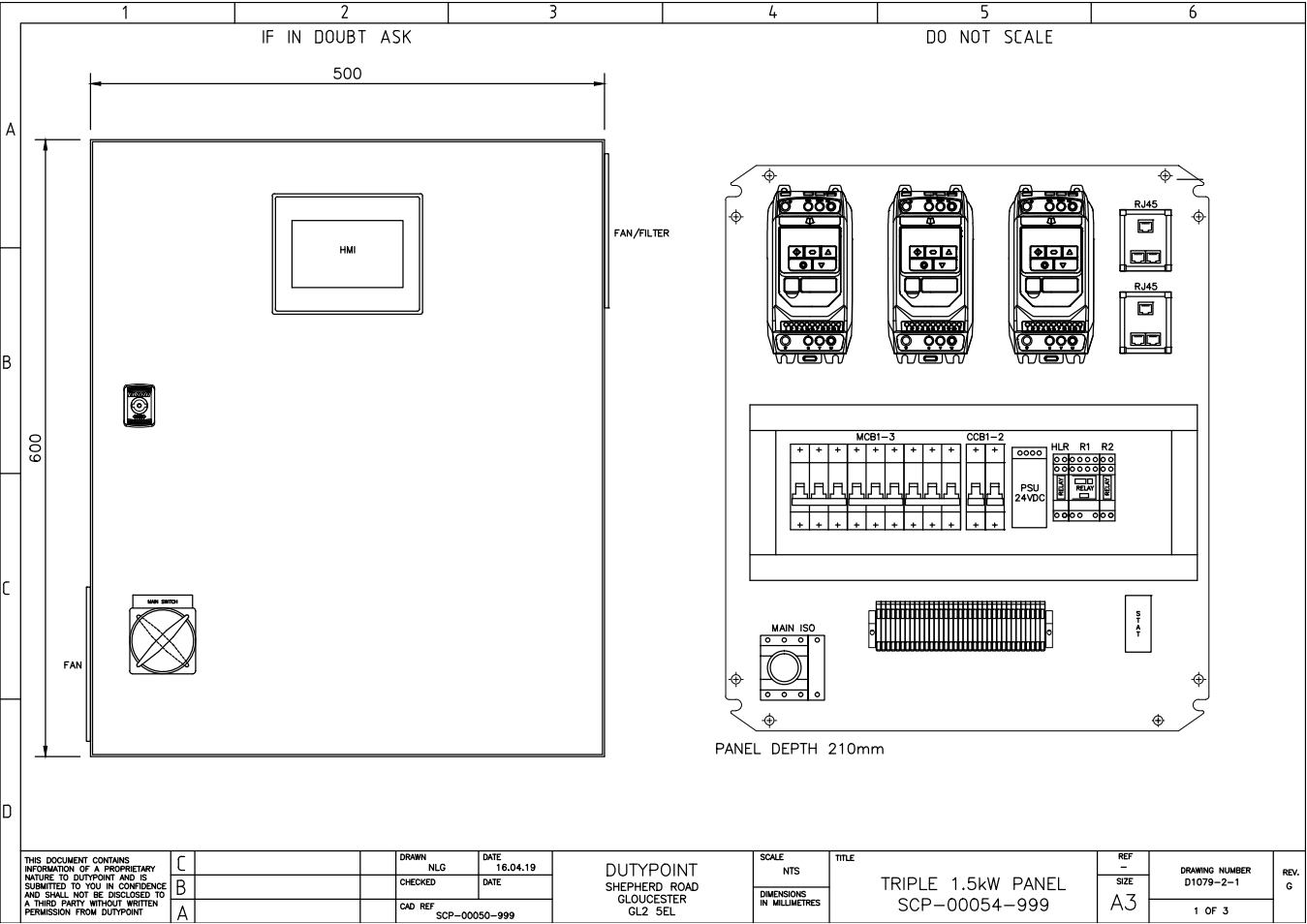


Figure 9.43: Sheet 2 of 3

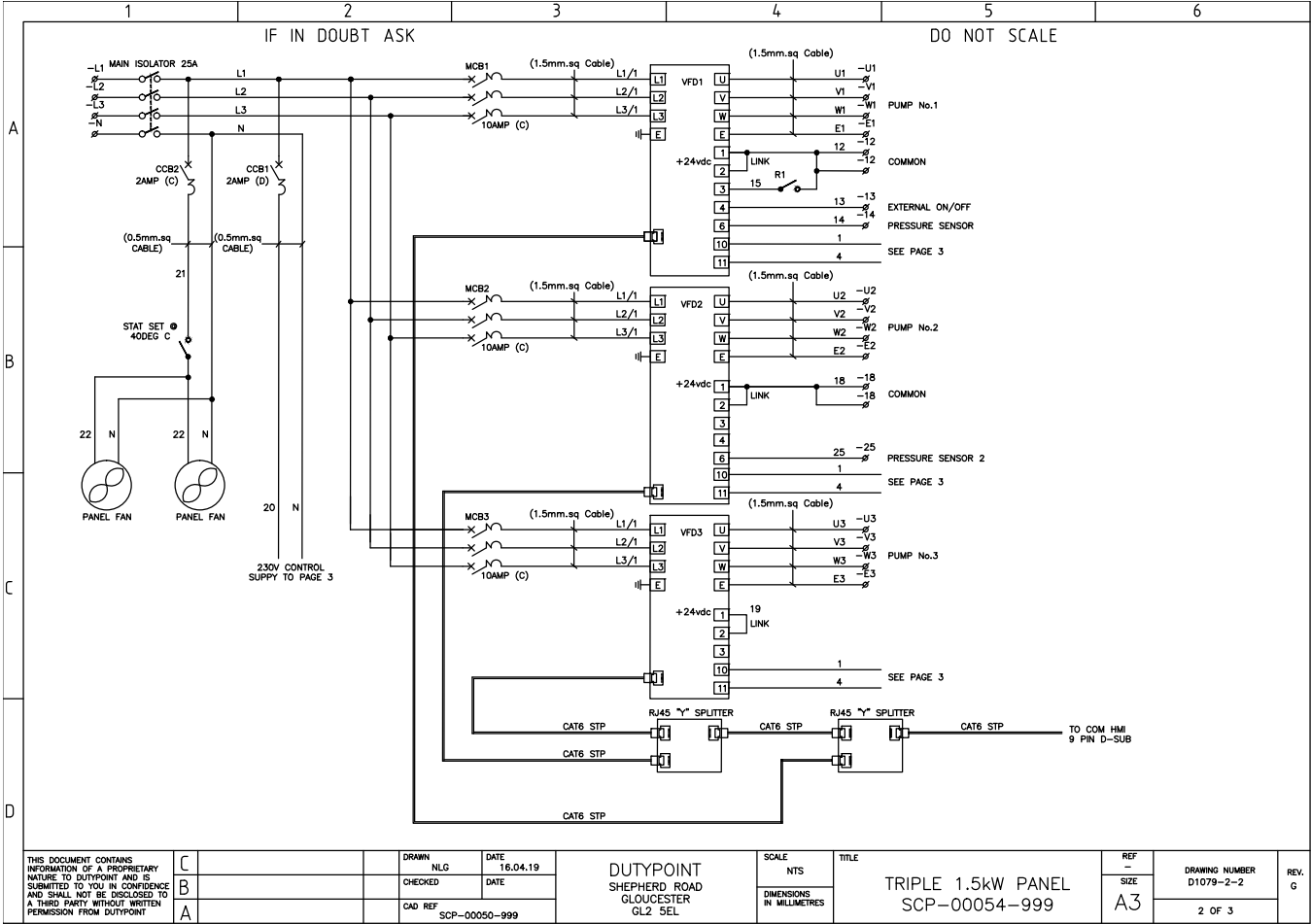
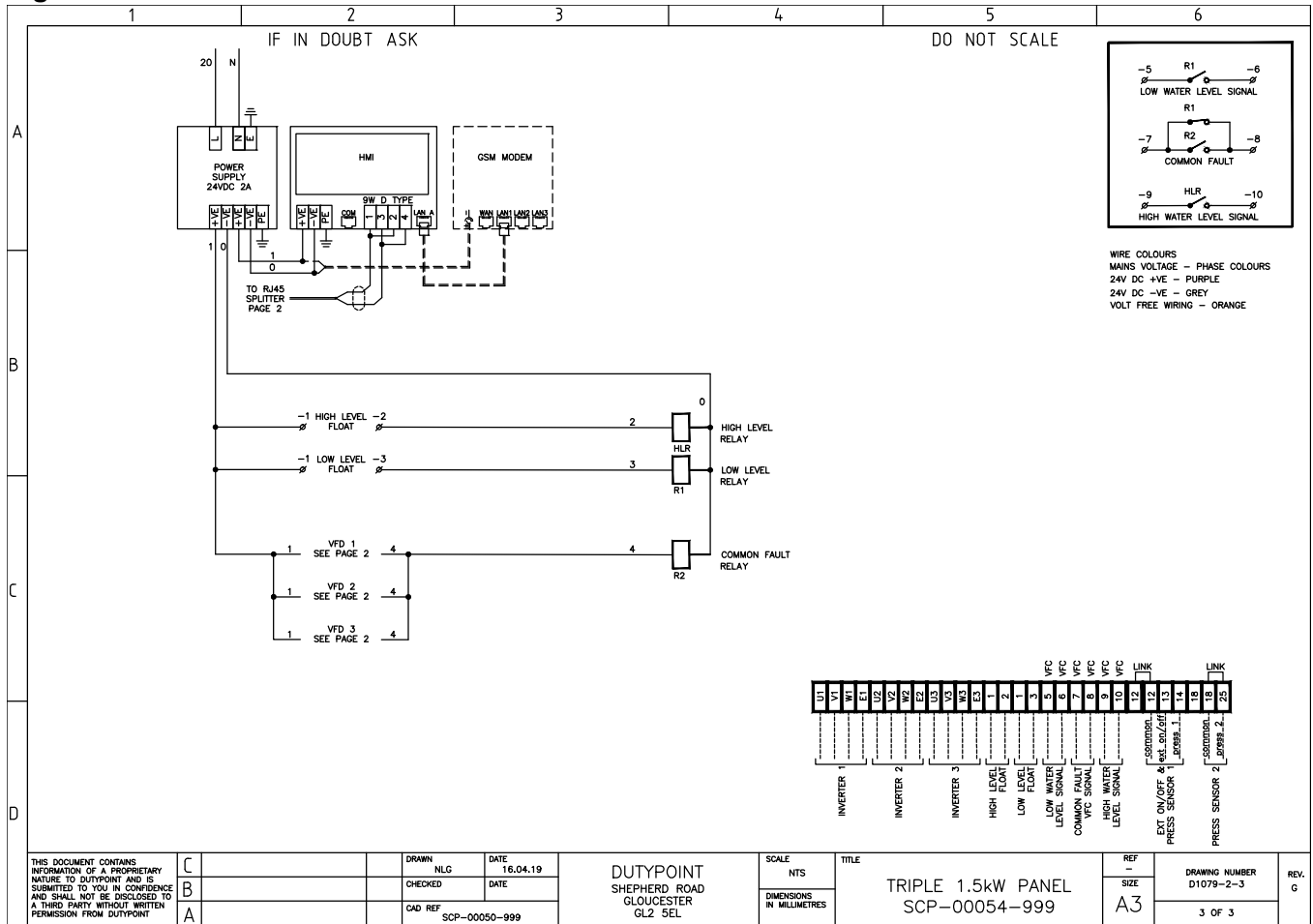


Figure 9.44: Sheet 3 of 3



9.9 Triple Pump 2.2kW 3-Phase 400V

Figure 9.45: Sheet 1 of 3

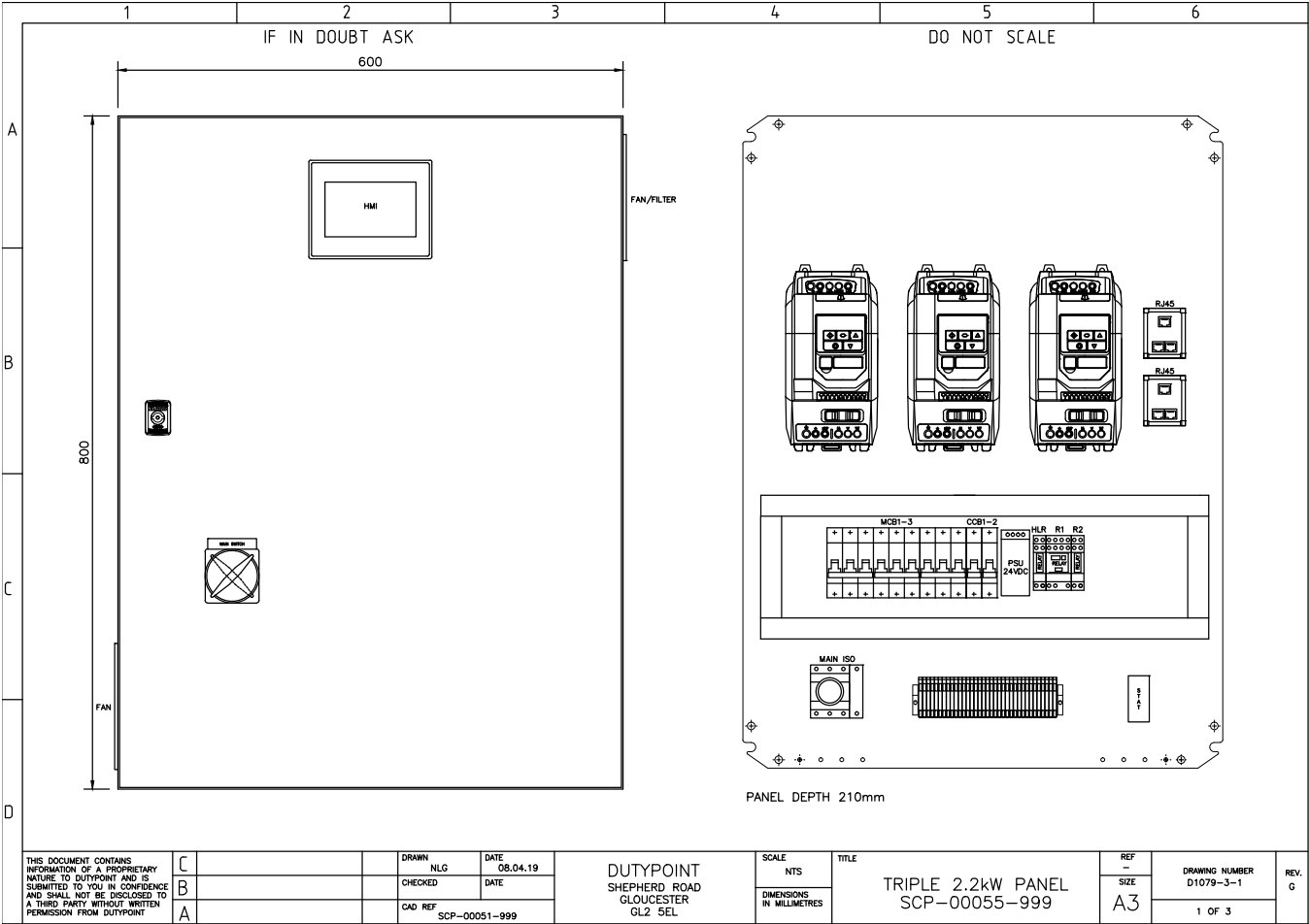


Figure 9.46: Sheet 2 of 3

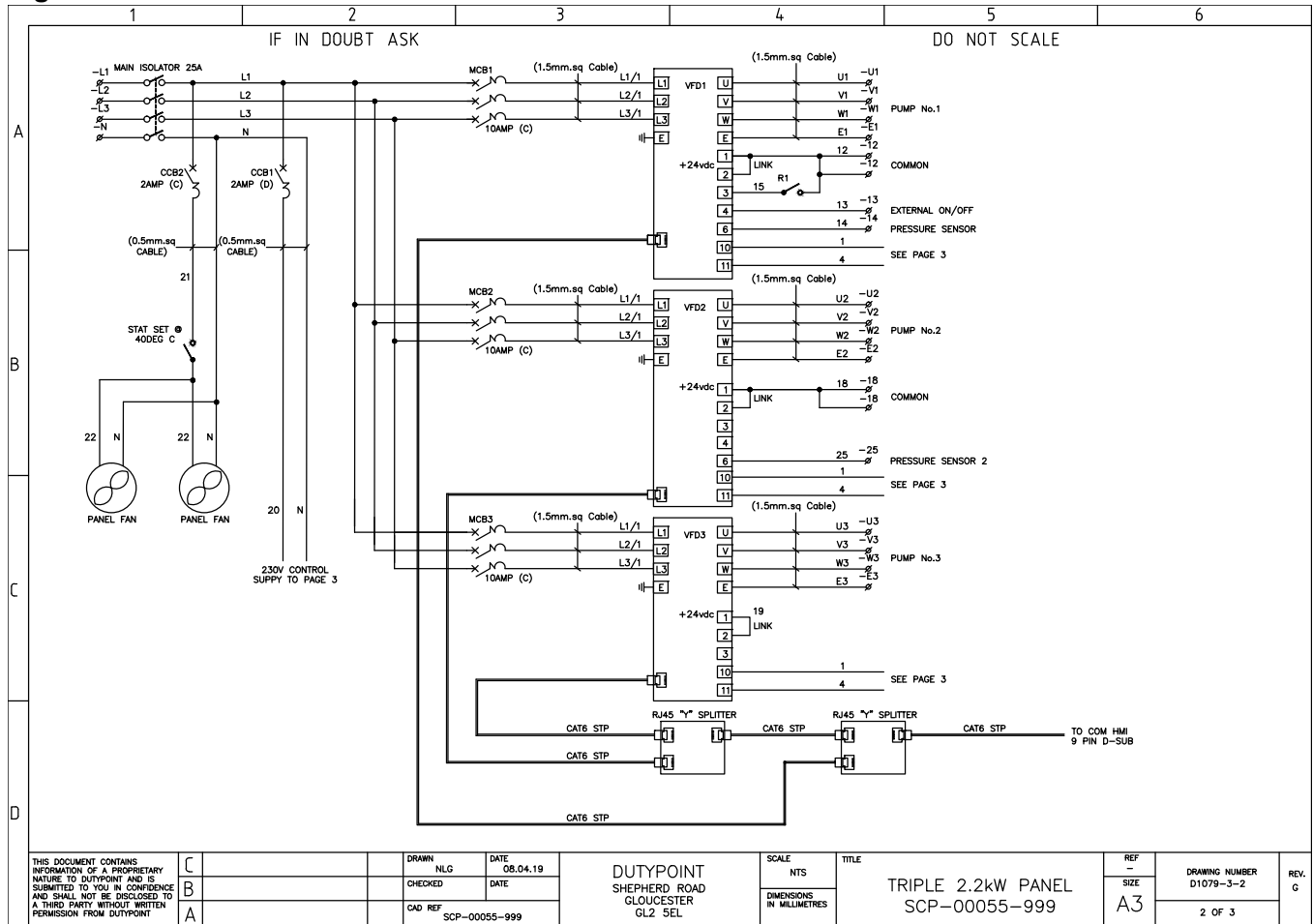
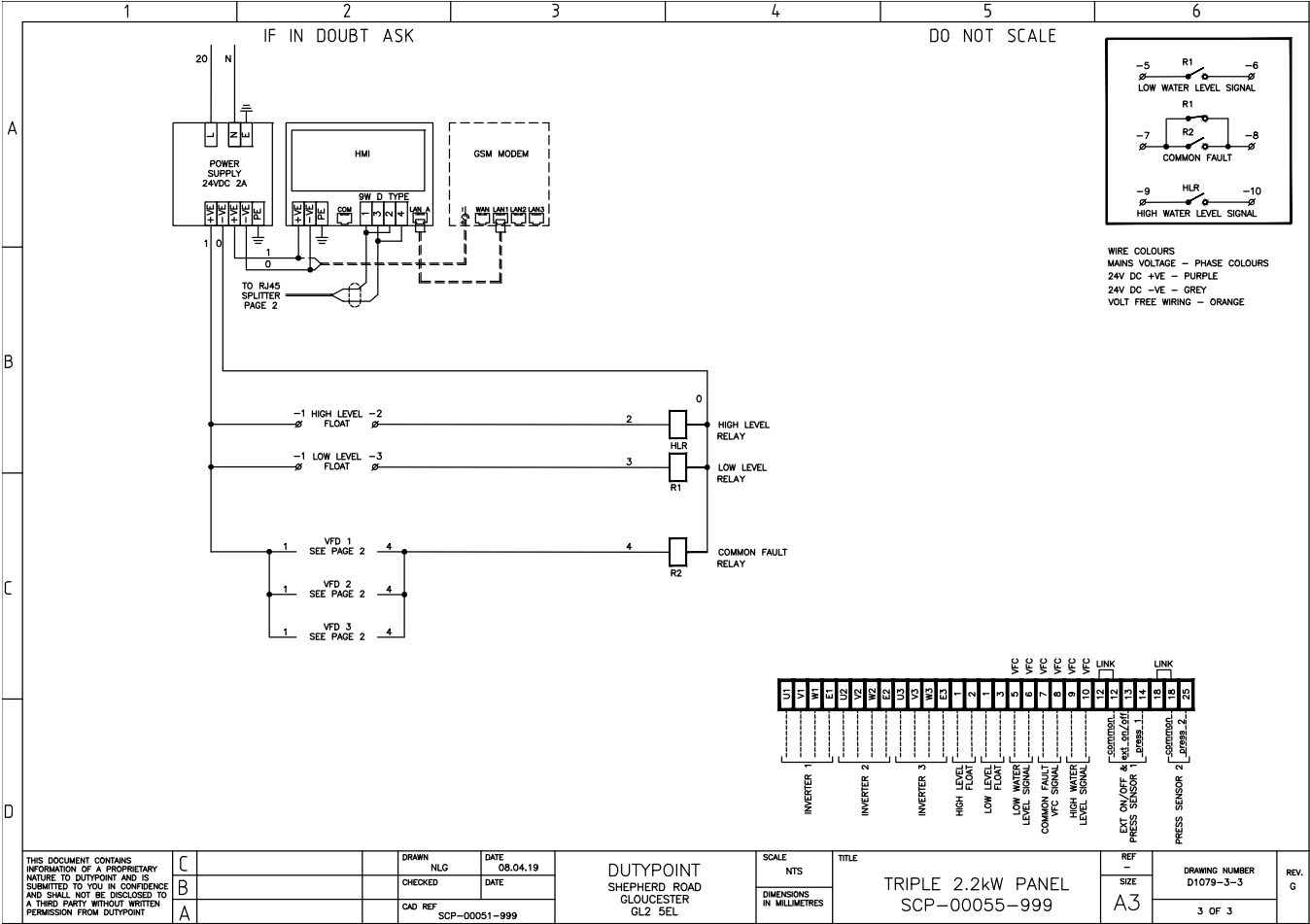


Figure 9.47: Sheet 3 of 3



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

Figure 9.48: Sheet 1 of 3

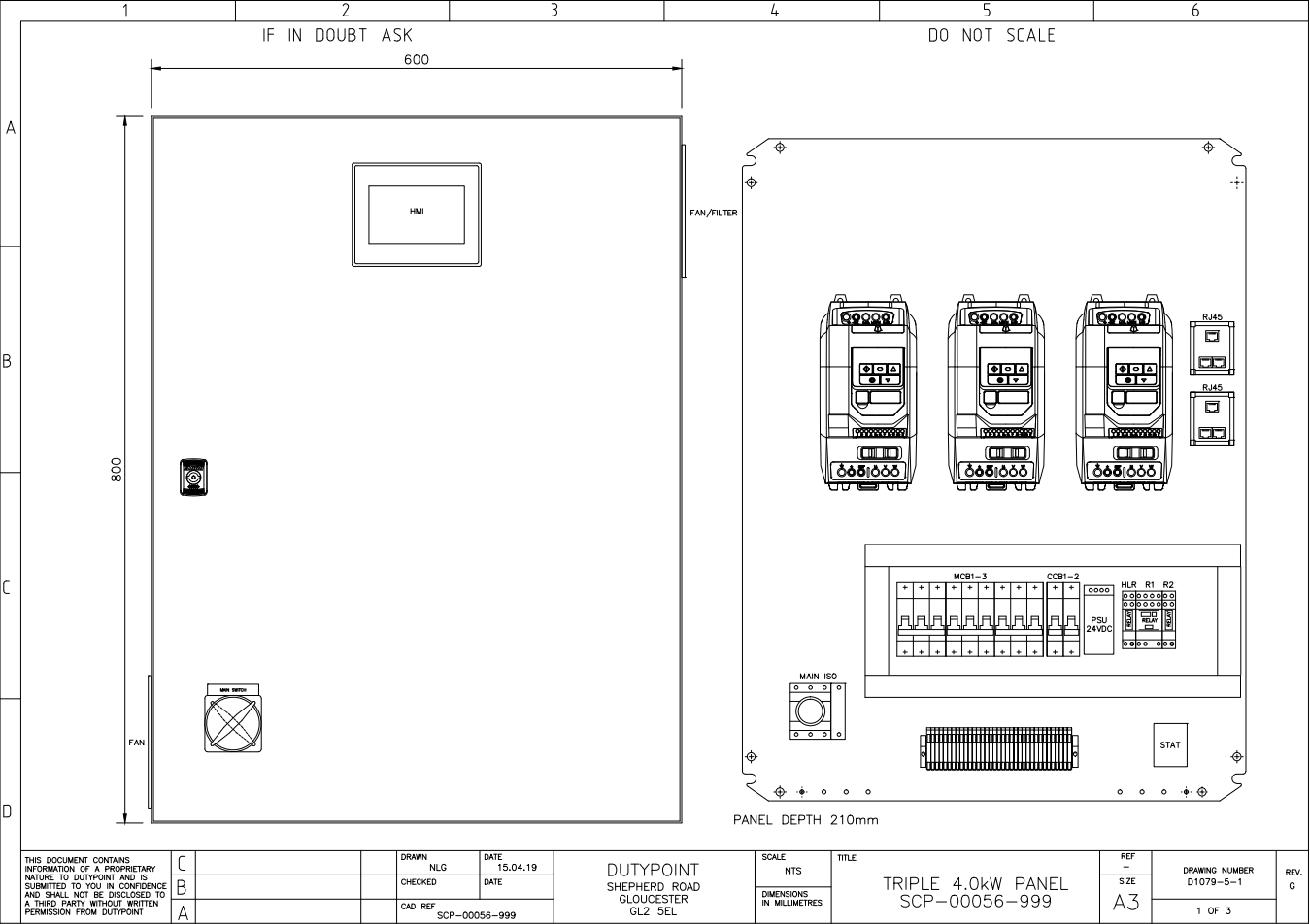


Figure 9.49: Sheet 2 of 3

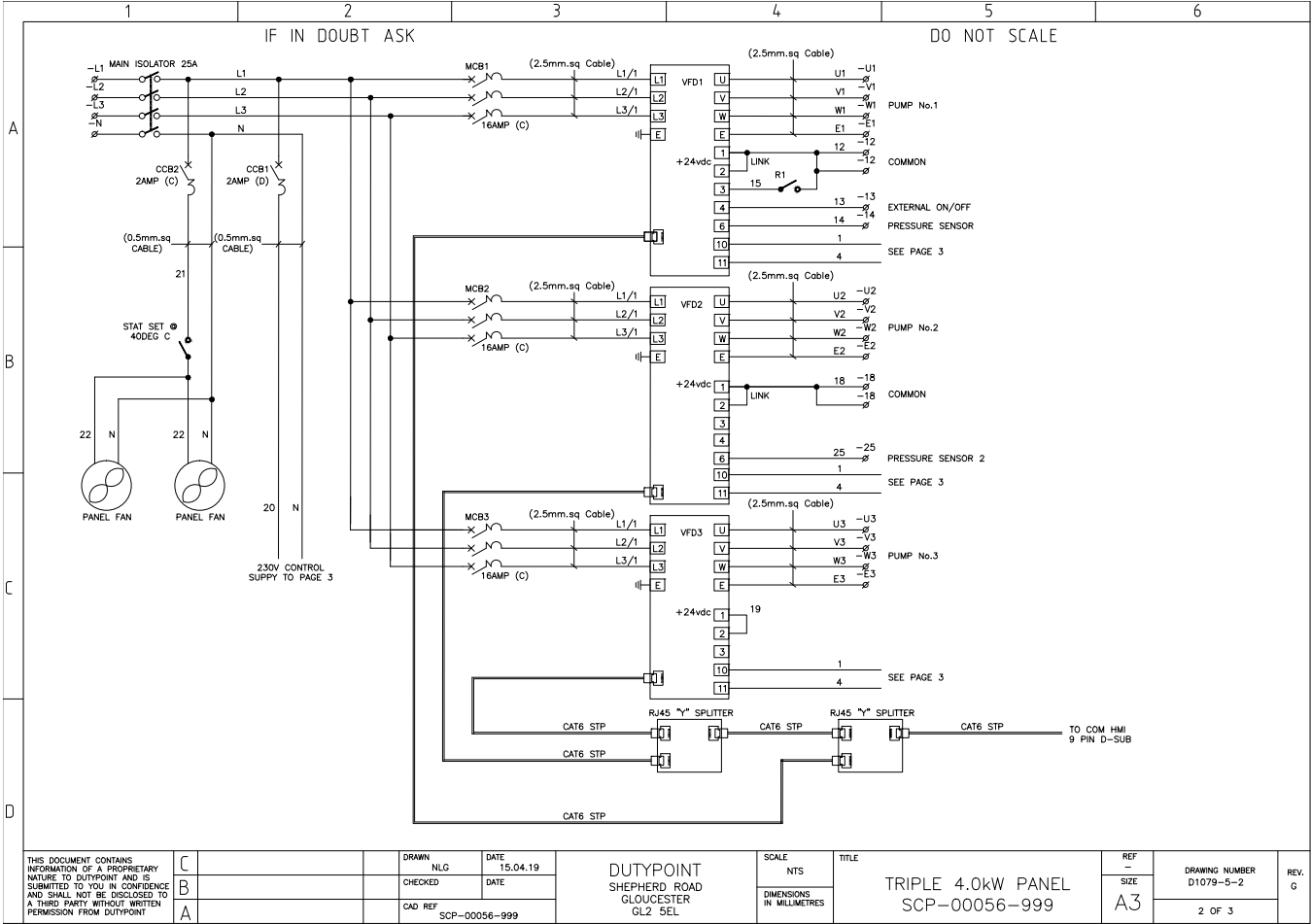
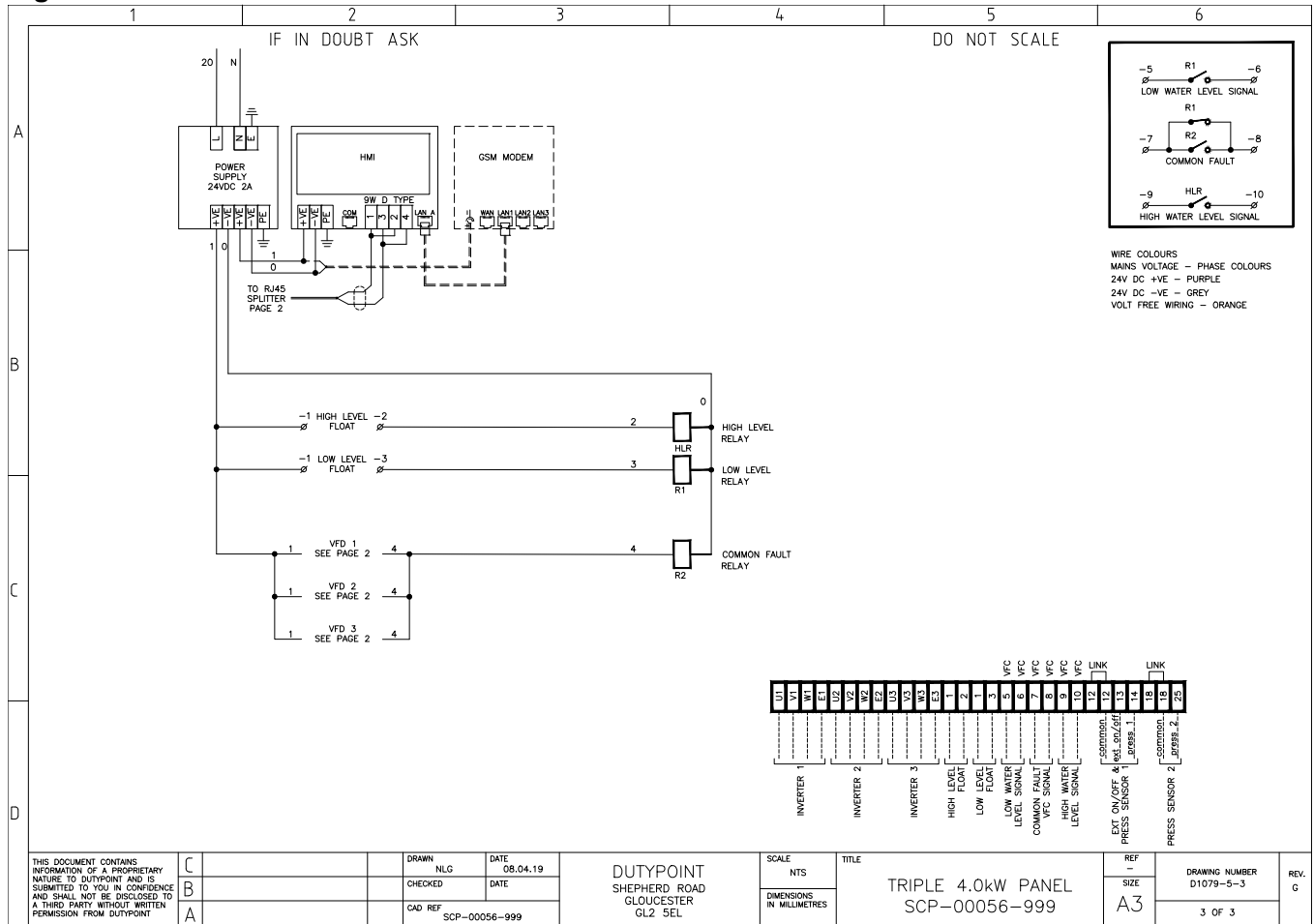


Figure 9.50: Sheet 3 of 3



9.11 Triple Pump 5.5kW 3-Phase 400V

Figure 9.51: Sheet 1 of 3

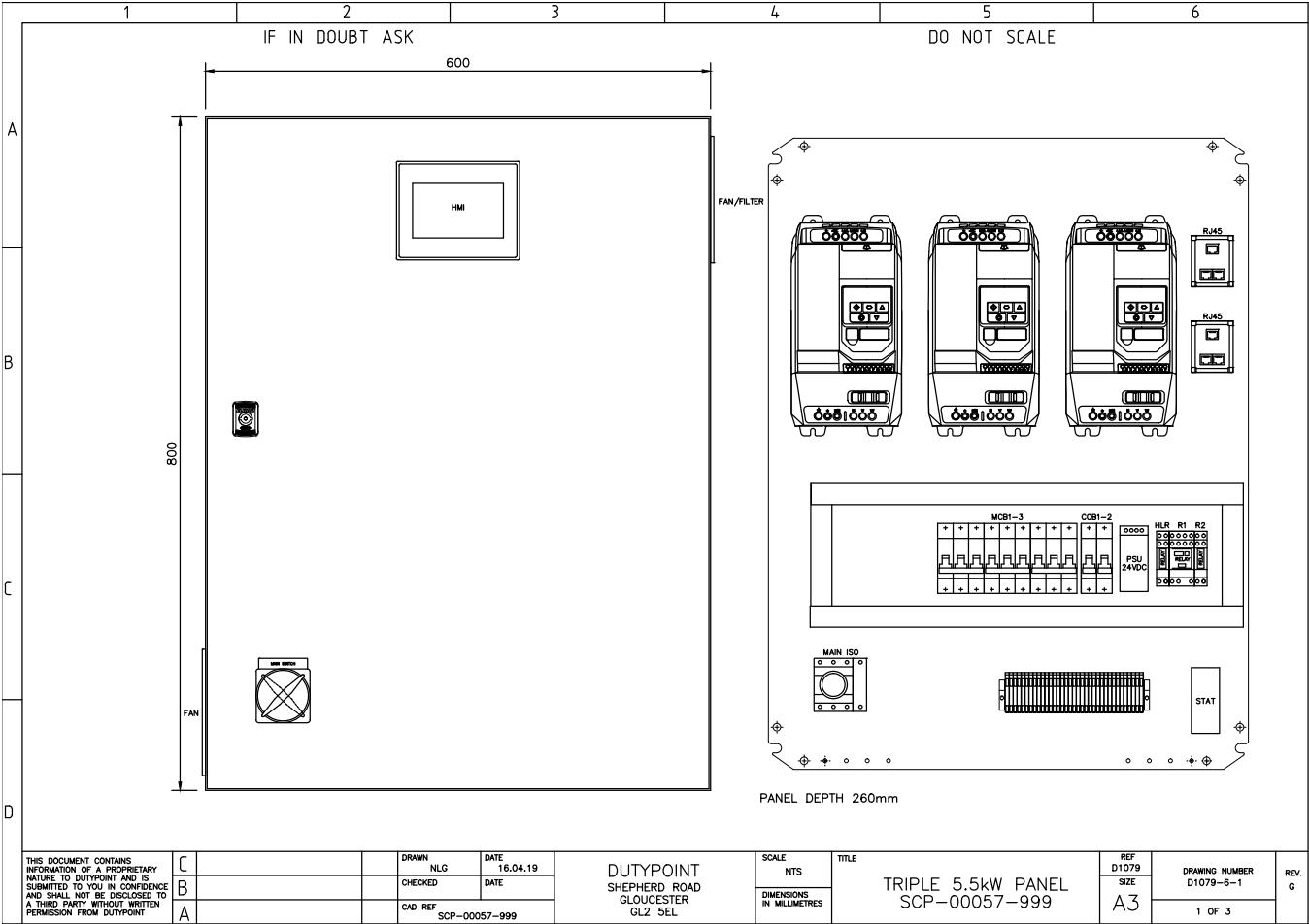


Figure 9.52: Sheet 2 of 3

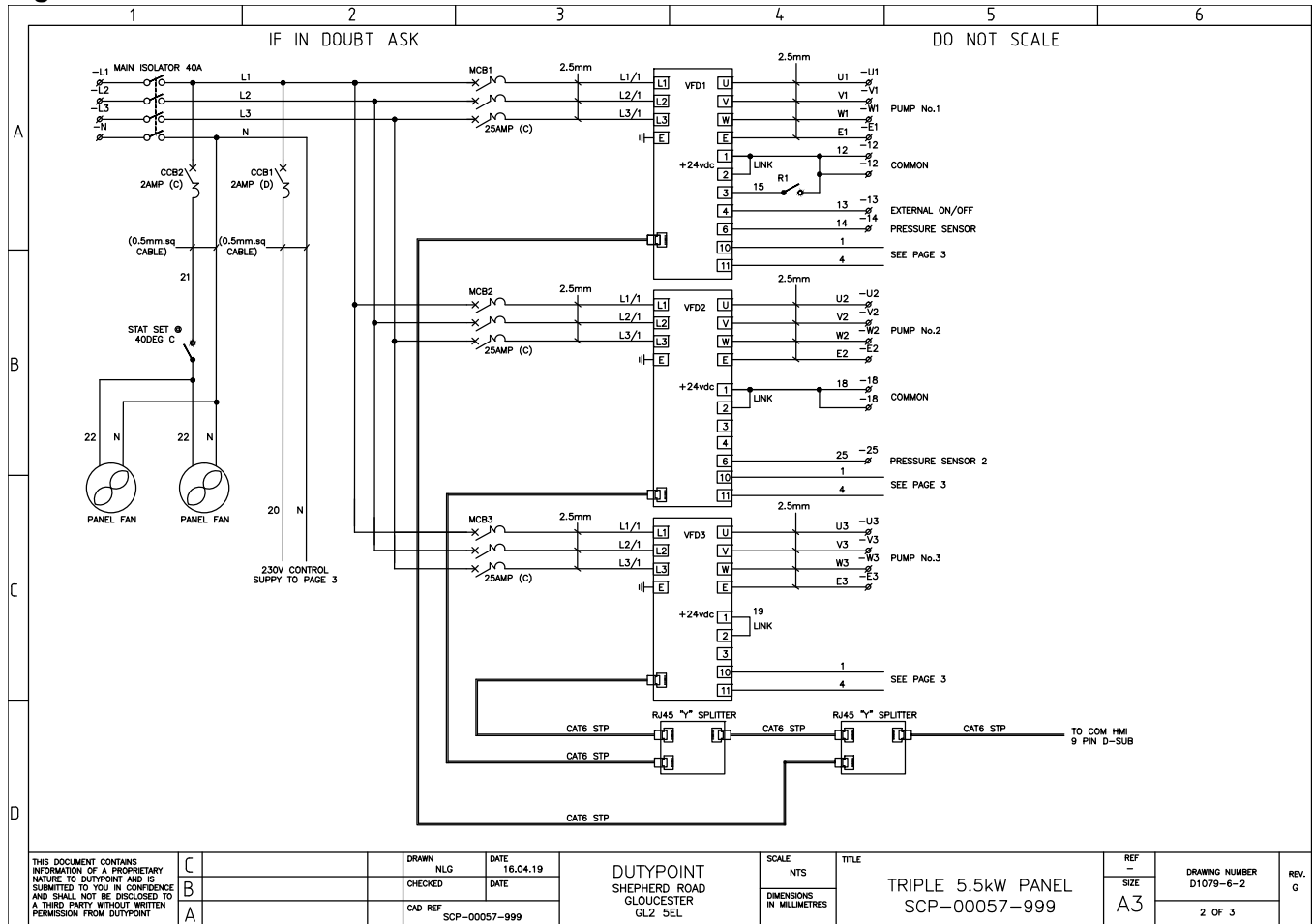
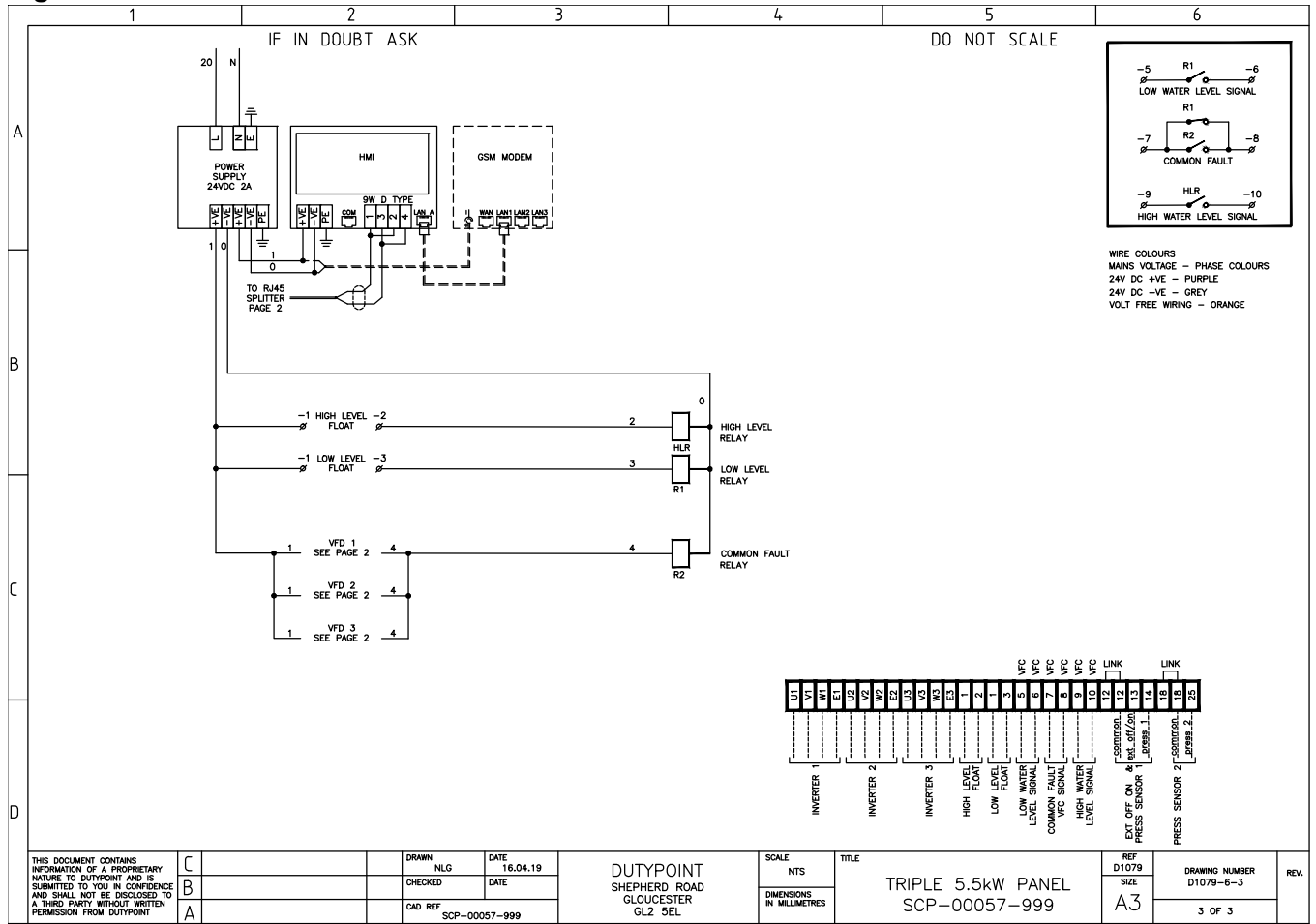


Figure 9.53: Sheet 3 of 3



9.12 Triple Pump 7.5kW 3-Phase 400V

Figure 9.54: Sheet 1 of 3

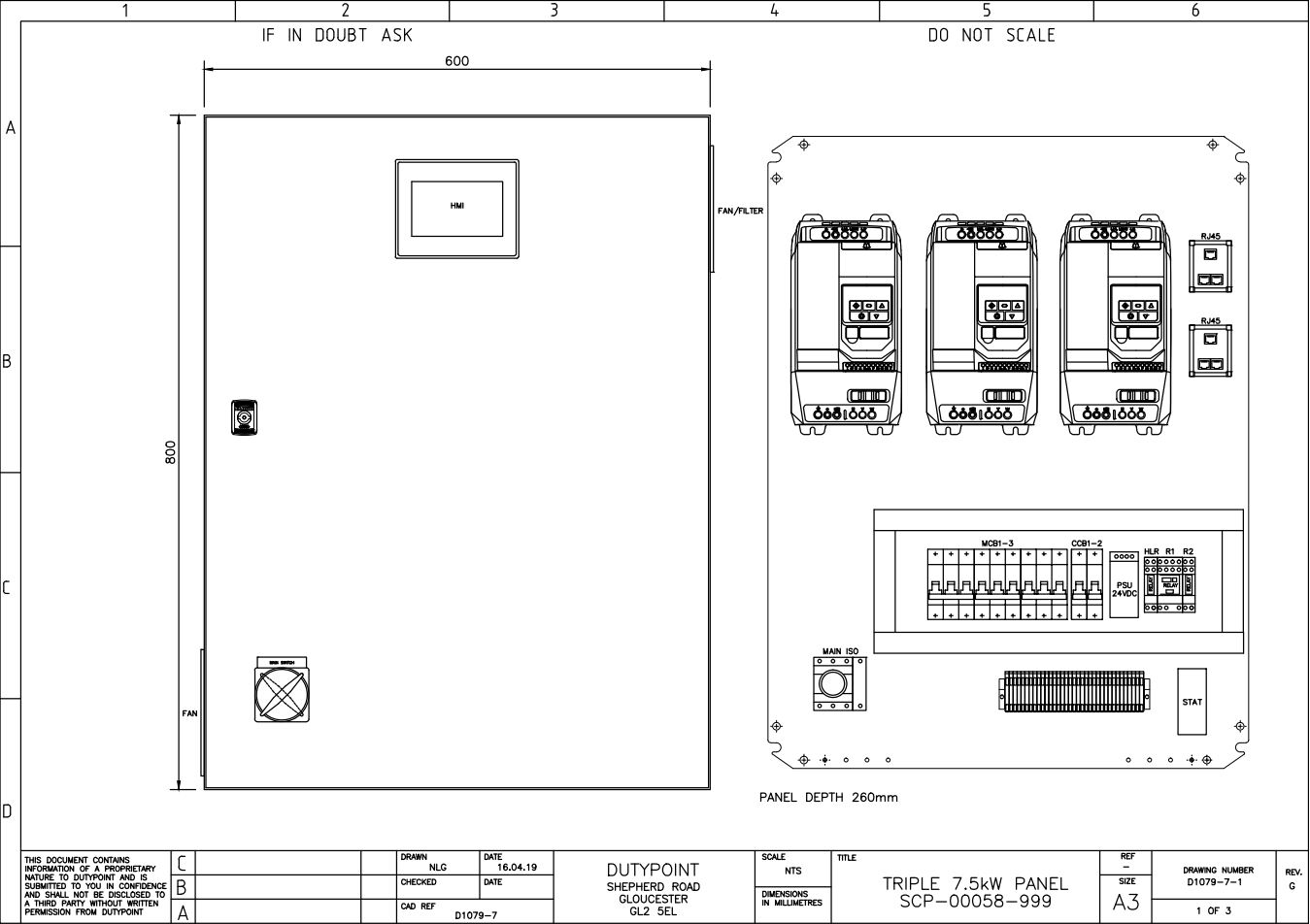
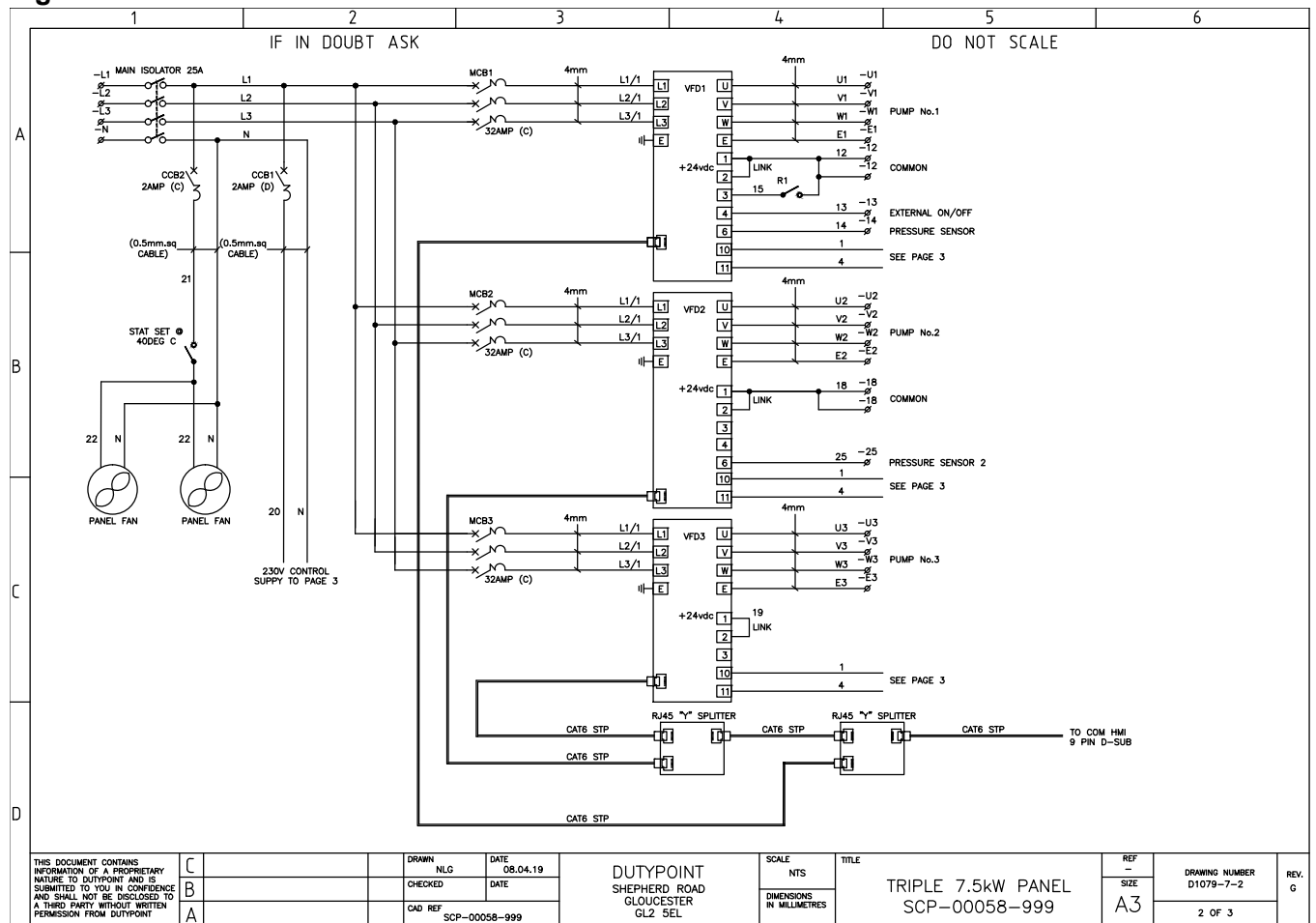


Figure 9.55: Sheet 2 of 3



[illegible]

9.13 Triple Pump 1.5kW 1-Phase 240V

Figure 9.57: Sheet 1 of 3

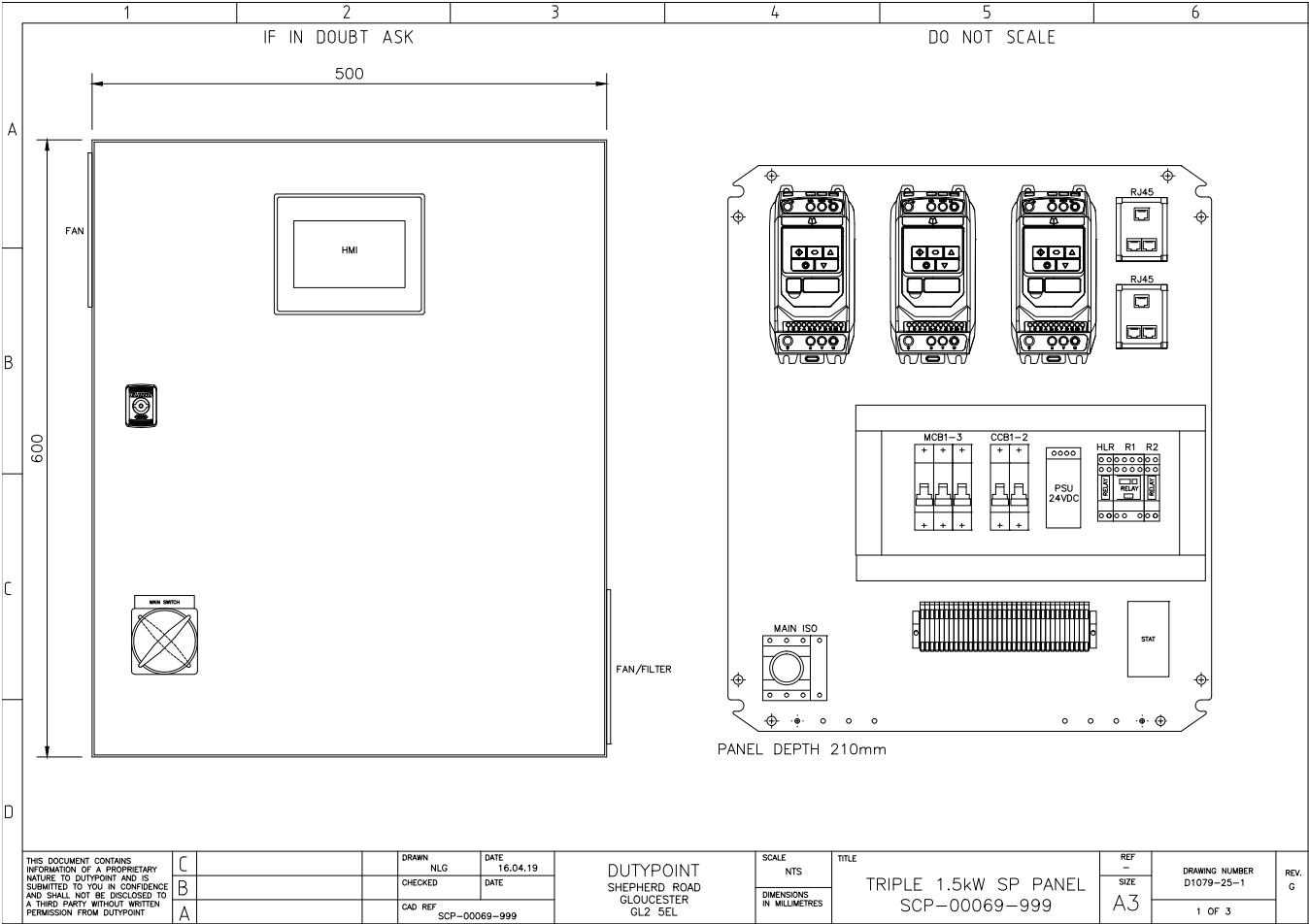


Figure 9.58: Sheet 2 of 3

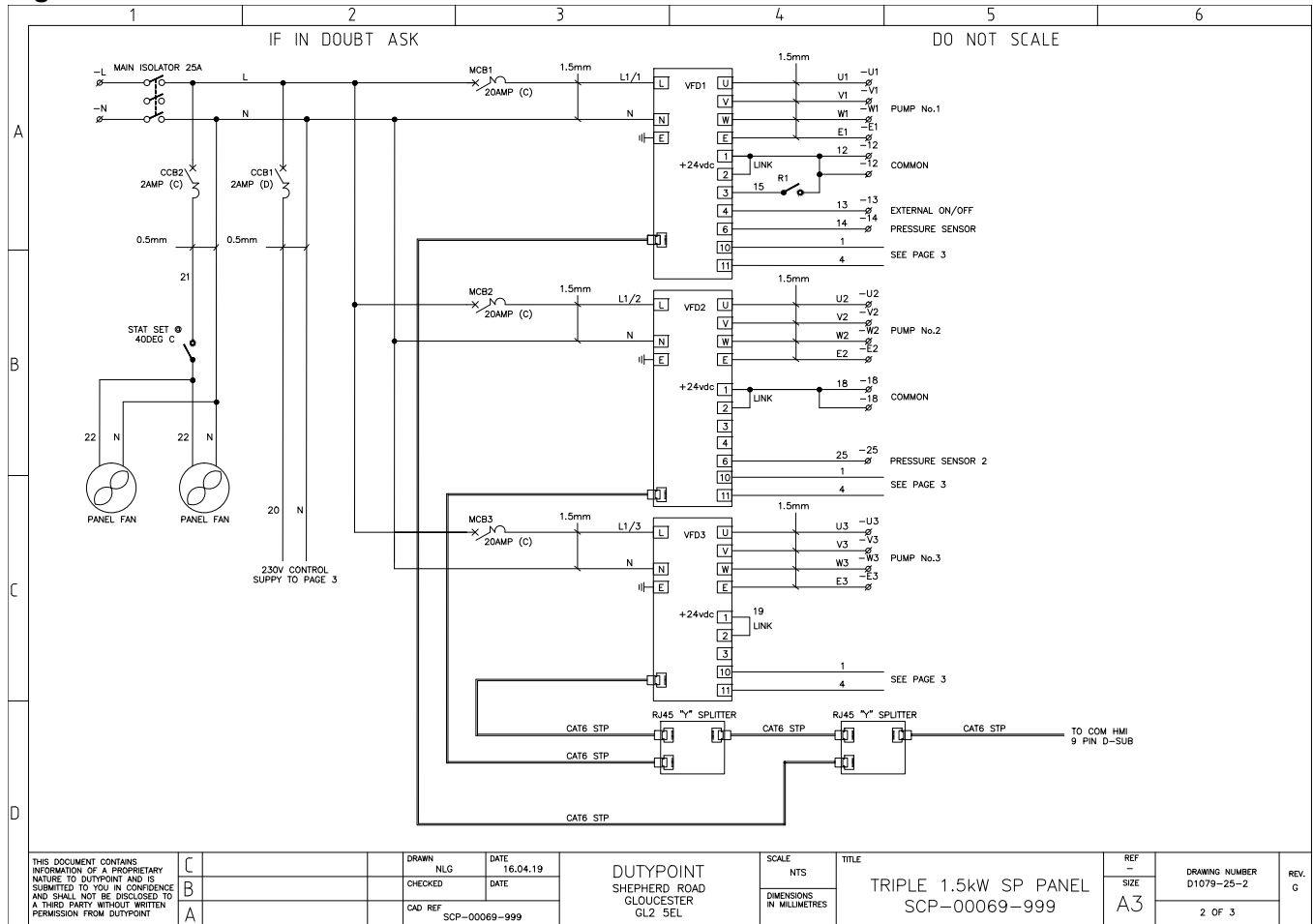


Figure 9.59: Sheet 3 of 3

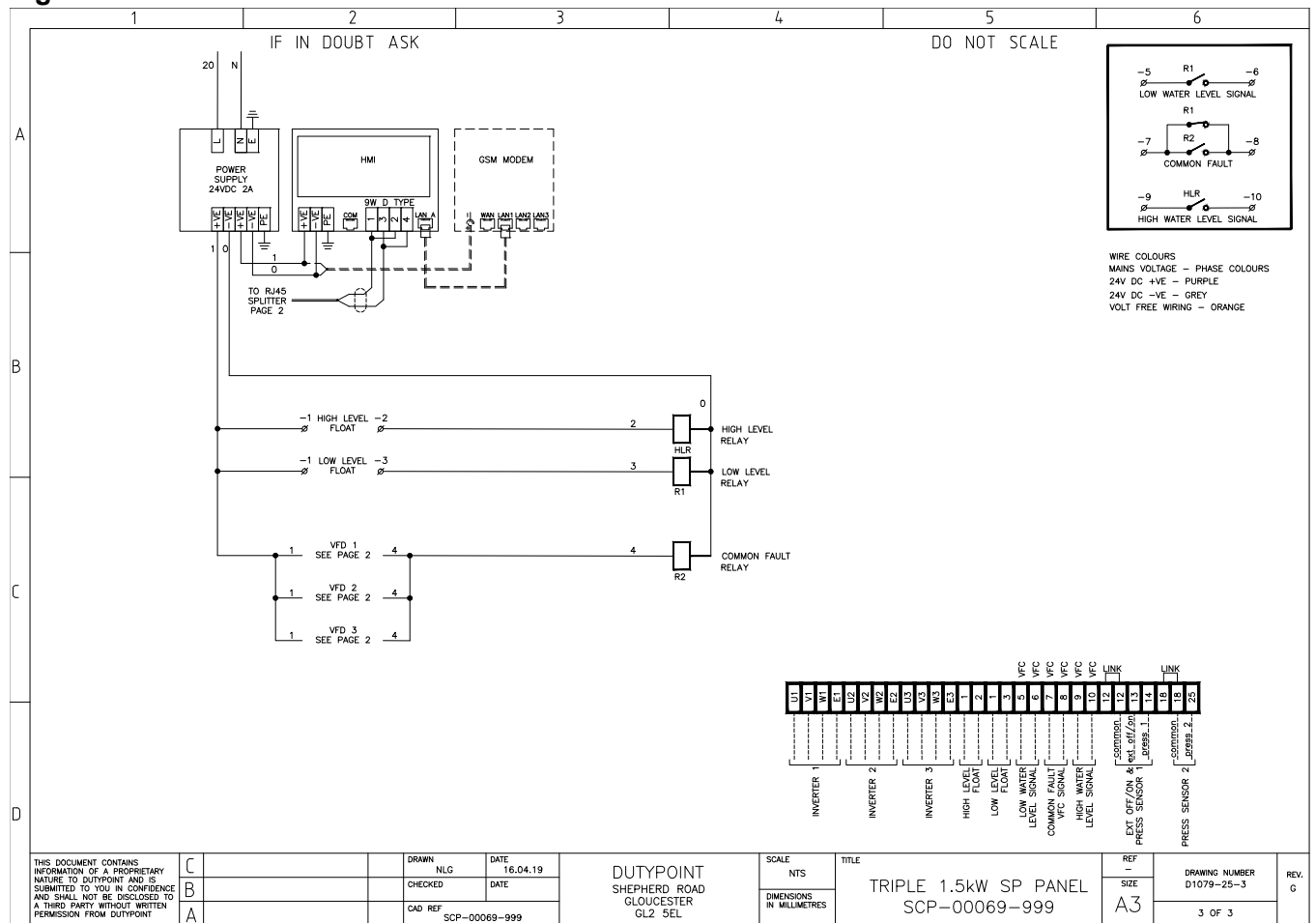
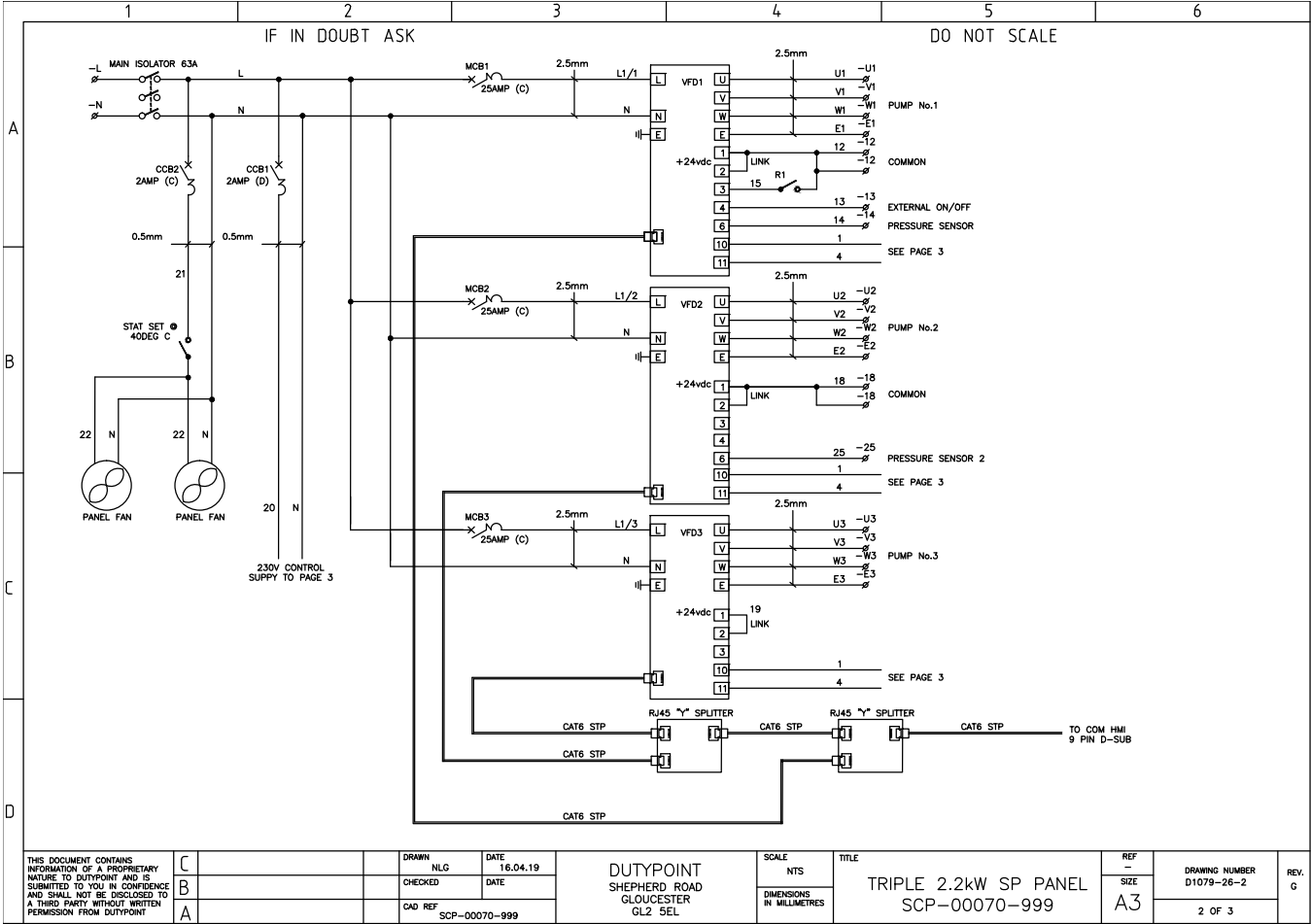


Figure 9.61: Sheet 2 of 3



[illegible]

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

Figure 9.63: Sheet 1 of 3

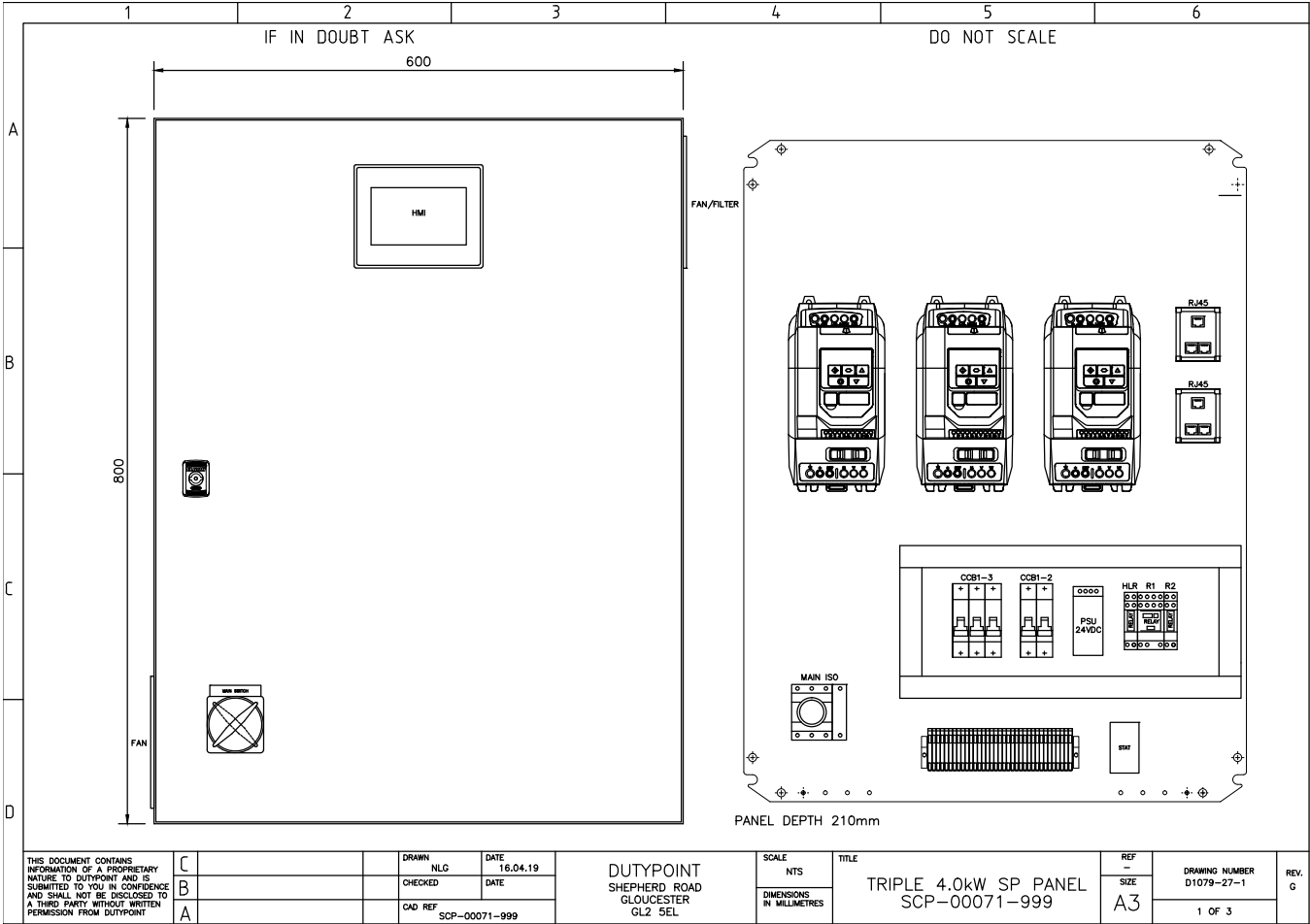


Figure 9.64: Sheet 2 of 3

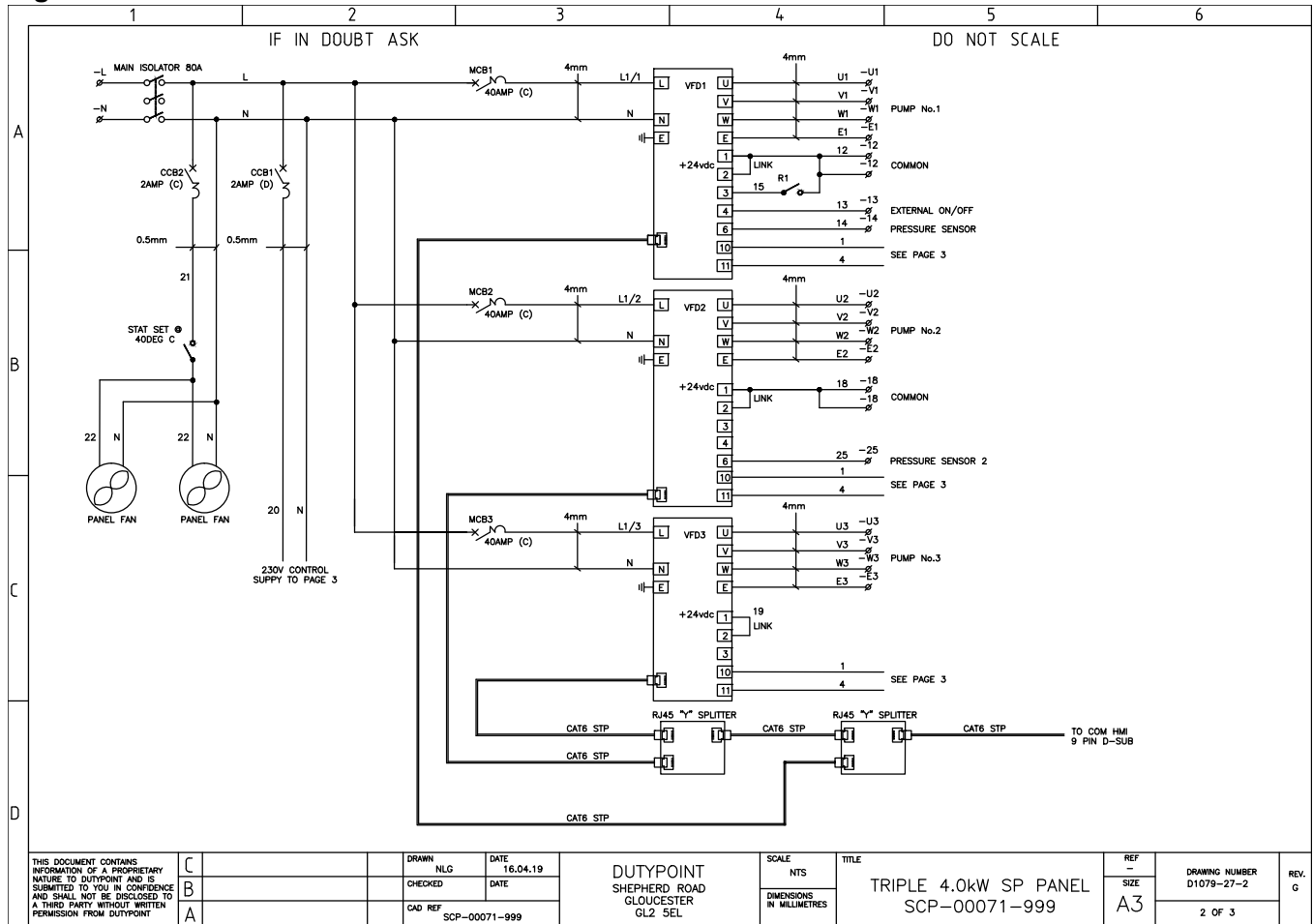
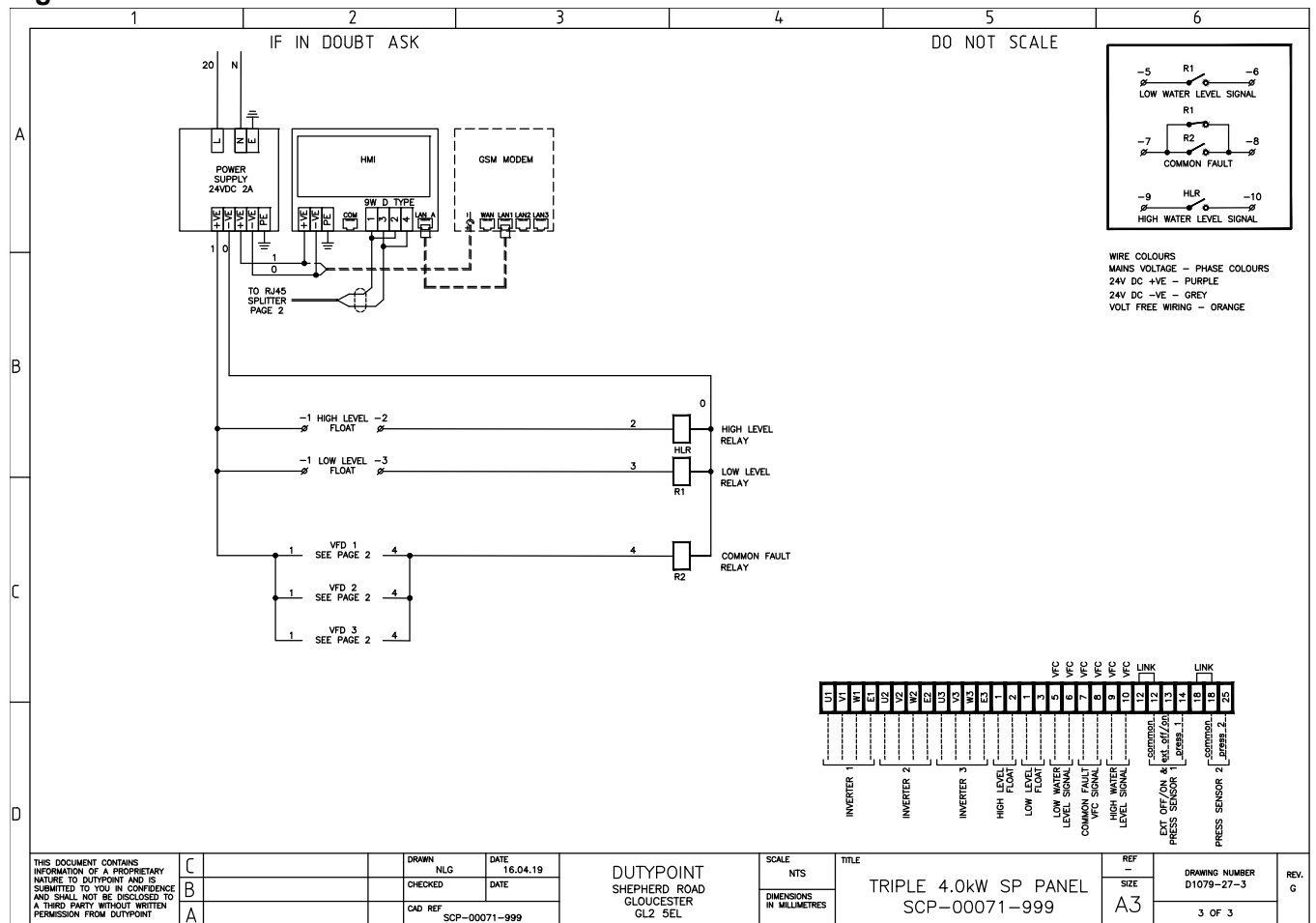


Figure 9.65: Sheet 3 of 3



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

Cod e	Required Information	Description
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 to 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"> • 5 x P1-09 • 5 x P1-10 • P2-24 / 16 • 500.0Hz 				
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 (P1-09) 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 is 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	

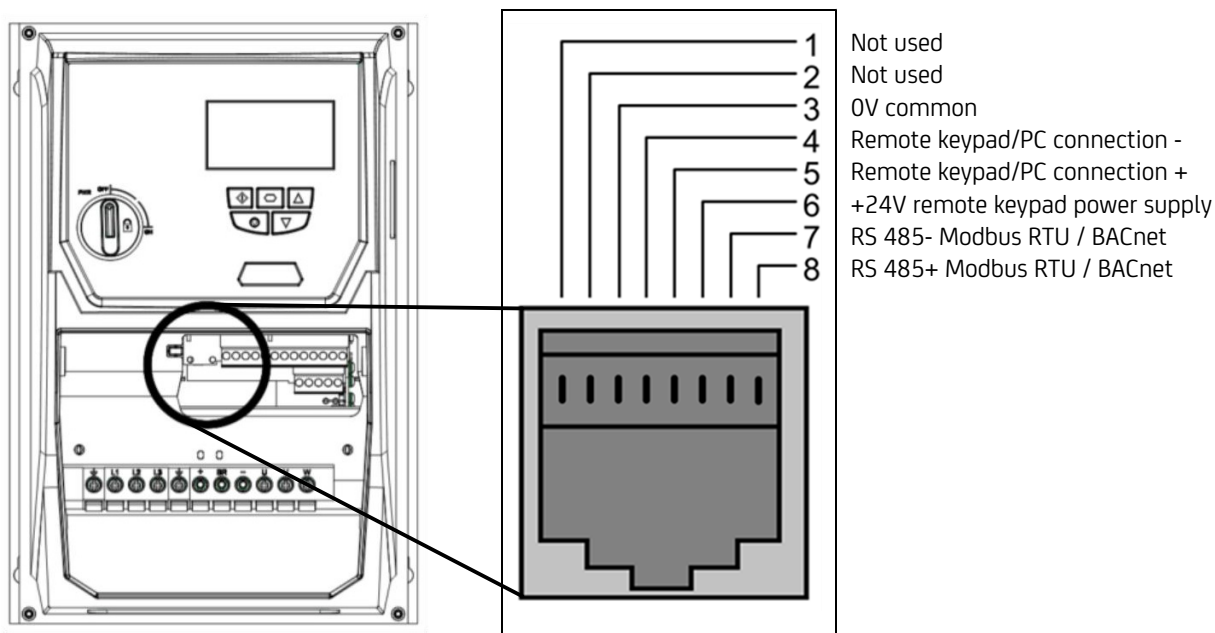
P1-13	Local (Hand) Control Function	Digital Input 2 (Terminal 2)	Digital Input 2 (Terminal 3)	Digital Input 3 (Terminal 4)	Analogue Input 1 (Terminal 6)	Analogue Input 2 (Terminal 10)	Notes
5	Preset Speeds	O: Stop C: Run/Enable	O: Preset speed 1 C: Preset speed 2	O: Remote Control C: Local Control	Analogue 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

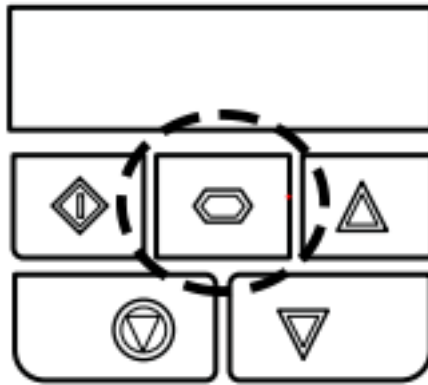
- Do not attempt to implement this procedure unless you understand the implications fully
- The control panel should only be opened by a qualified electrician
- This should only be attempted by a qualified and competent person

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

11. Dutypoint Standard Warranty

Your Dutypoint Systems standard product warranty is valid for a period of 12 months from date of delivery. The full terms and conditions are on the reverse of this certificate.

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

- Tel: +44(0)14523 00 590
- Email: service@dutypoint.com

Once your standard product warranty has expired, you may wish to take out our infinity service contract for an extended amount of cover. For more information visit our website: www.dutypoint.com/infinity

11.1 Terms and Conditions

- 1) The Company warrants that on delivery, and for a period of 12 months from the date of delivery, or such longer period as agreed by the Company in writing, (Warranty Period), the Goods shall:
 - a) conform in all material respects with their description as set out in the Agreement;
 - b) be free from material defects in design, material and workmanship; and
 - c) be of satisfactory quality (within the meaning of the Sale of Goods Act 1979).
- 2) Subject to Clause 3, if:
 - a) the Customer gives notice in writing to the Company during the Warranty Period within a reasonable time of discovery that some or all of the Goods do not comply with the warranty set out in Clause 1; and
 - b) the Company is given a reasonable opportunity to examine such Goods; and
 - c) the Customer (if asked to do so by the Company) returns such Goods to the Company's place of business, the Company shall, at its option, repair or replace the defective Goods, or refund the price of the defective Goods in full.
- 3) The Company shall not be liable for the failure of the Goods to comply with the warranty set out in Clause 1 in any of the following events:
 - a) the Customer makes any further use of such Goods after giving notice in accordance with Clause 2;
 - b) the defect arises because the Customer failed to follow the Company's oral or written instructions as to the storage, commissioning, installation, use and maintenance of the Goods or (if there are none) good trade practice regarding the same;
 - c) the defect arises as a result of the Company following any drawing, design or Specification supplied by the Customer;
 - d) the Customer alters or repairs such Goods without the written consent of the Company;
 - e) the defect arises as a result of fair wear and tear, wilful damage, negligence, or abnormal storage or working conditions; or
 - f) the defect arises as a result of the Customer's negligence or the Customer's breach of the Agreement.
- 4) Clause is the Customer's sole remedy in respect of the matters described therein.
- 5) The terms implied by sections 13 to 15 of the Sale of Goods Act 1979 are, to the fullest extent permitted by law, excluded from the Agreement.
- 6) The terms and conditions of the Agreement apply to any repaired or replacement Goods supplied by the Company.

12. EC Declaration of Conformity

We: Dutypoint Limited

Of: Shepherd Road, Gloucester, GL2 5EL, United Kingdom

In accordance with the following directives:

- 2014/65/EU: The Low Voltage Directive
- 4104/30/EU: The Electromagnetic Compatibility Directive
- 2006/95/EU: The Machinery Directive

Hereby declare that the equipment:

Description	Dutypoint Cold Water Booster Set
Product Range	VG/VR/VM/VT/BS/PS/ES/MS/D/MA/KPPC

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 60204-1:2006: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- EN ISO 12100:2010: Safety of machinery - General principles for design
- EN 61000-6-2:2005: Electromagnetic compatibility (EMC) — Part 6-2: Generic standards
- EN 61000-6-4:2007: 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.



Russell Freeman, Director

DUTYPOINT

SETTING
THE BAR

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