P-0225 LH+RH
OPERATION & MAINTENANCE MANUAL

DOCUMENT DETAILS	
Production Release:	September 2022
Revision:	1
Original Language:	English
Customer:	Fuel Service As
Sales Order Number:	SOP047587
Serial Number:	A33088, A33089

Contents

Exclusion of Liability

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The Manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all **IMPORTANT**, **WARNING** and **CAUTION** statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

Caution

Prior to any maintenance or service work, the system pressure should be released.

The operator should ensure that they are fully familiar with the contents of the manual before carrying out any operational or maintenance procedures.

If in any doubt, contact IPU using the contact details on the front cover of this document.

Risk Assessment

A full risk assessment has been carried out on this equipment by IPU Group Ltd.

The assessment was carried out according to the requirements and guidelines set out in BS EN ISO 12100:2010.

INTRODUCTION

Scope and Definition

This manual provides operation and maintenance instructions for the Diesel Polishing Unit. You must use the unit as described in this manual. Read this manual before you install, operate and maintain the unit.

IMPORTANT: The unit is available in various forms which include stainless steel or mild steel enclosures, frame mounted or wall mounted without enclosures. The images included in this manual are representative of the unit only, and the final unit may differ to the images shown. However, the operational instructions remain the same for every variant of the unit.

Important safety information is highlighted as **WARNING** and **CAUTION** instructions. Warnings are given where failure to observe the instruction could result in injury or death to people. Cautions are given where failure to observe the instructions could result in damage to the equipment, associated equipment or process.

Warning Labels

Labels are located on the unit to identify potential hazards as well as help identify safe working procedures. The below examples are some of the labels located on this unit. Please note other labels other than what is shown below may be present. It is the end user's responsibility to ensure the unit is used in a safe way.

SPECIFICATIONS

SPECIFICATION	DETAIL
Dimensions	RH - (H) 1,333 mm (W) 1,991 mm (D) 640 mm LH – (H) 1,304m (W) 1,991 mm (D) 640 mm
Weight (unpacked)	240 Kg
Finish	Powder Coated: RAL 5004 Blue Black
Voltage	230V
Nominal Frequency	50Hz
Nominal Motor Wattage	1.5kW
Nominal Motor Current (Amp)	9.2 A
Motor Protection	Automatic Thermal Protection Switch
Outdoor Use	When used outdoors, a suitable RCD “Residual Current Device” must be used in conjunction with the power supply (Not for 110V)
Pump Type	Self-Priming Centrifugal
Duty Cycle	Continuous
Noise Level	<85dB @ 1 Metre
Fluid Compatibility	Diesel
Filtration	Particulate - 1, 5, 10 or 25 Micron Water Absorbing – Filtasorb 2 Stainless Steel Mesh – 10, 20 Micron
Filter Blocked Indicator	Electronic via Panel and Volt Free Output
Pressure	Nominal Working Pressure - 1 Bar (14.5 psi) Maximum Working Pressure - 6 Bar (87 psi)
Fluid Temperature	0°C to 50°C
Ambient Operating Temperature	0°C to 50°C
Flow	Up to 250 Litres/min
Maximum Humidity	90% relative humidity, non-condensing
Environment	Control Box IP66
Inlet/Outlet Connections	2” BSPP Male/ 2” BSPP Male

*Specifications above indicate the version shown – DDF3. Other variants will differ depending on configuration.

**If in doubt, please contact your IPU Representative.

Typical Applications

Typical applications for the filtration unit include:

- Filtering the fluid in a diesel storage tank periodically as a supplement to continuous filtration by system filters.
- Cleaning heavily contaminated fuel to eliminate water, solid particulate and tank sludge.
- Cleaning your fuel system before restarting the system following component failure.
- Providing clean fuel when re-filling and adding fuel to storage tanks.
- Reclaiming contaminated diesel fuel.
- Transferring diesel fuel from one storage location to another.
- Emptying waste fuel quickly.

Best Efficiency

When used for recirculation filtration (as opposed to transfer filtration) position the ends of both the inlet and outlet standpipe as far apart as possible inside the reservoir in order to ensure proper recirculation and cleaning.

Operate the filtration cart until the total volume of the system fluid passes through the filtration cart. For recirculation filtration, cycle the reservoir fluid through the filter cart six to eight times to ensure the total system fluid is filtered completely.

Precautionary Measures

- Never start up or run a dry pump. This will cause galling, seizing or destructive wear between the rotors, end plates and casing.
- The filtration unit is designed for diesel fuel only.
- It is not to be used for highly volatile fluids, such as gasoline, paint thinners etc.

General System Requirements

Positioning	The unit may be placed higher than the fuel storage tank. However, with an empty suction tube and the pump wetted with fluid, the electric pump unit is capable of suctioning the liquid to a maximum of 2 meters (7 Feet), without a non-return valve. If a non-return valve is installed, it will be 4 meters (14 Feet). The difference in height between the pump and the fluid level must be kept as small as possible and, at any rate within the above-mentioned parameters anticipated for the priming phase. If this height is exceeded, it will always be necessary to install a foot valve to allow for the filling of the suction tube and provide tubing of a wider diameter.
Pump Inlet Pressure	When the unit is functioning, the pump can work with a maximum pressure at the inlet of 0.5 bar. Pump inlet pressure beyond this value will lead to cavitation, a consequent reduction in system flow rate and an increase in system noise
Permitted Use	Diesel fuel at a viscosity of between 2 and 5.35 cSt (@ 37.8°C) Minimum Flash Point (PM): 52°C
NOT PERMITTED	**RELATED DANGERS**
Gasoline	Fire - explosion
Inflammable Liquids with Flash Point >55°C	Fire - explosion
Liquids with Viscosity >20cSt	Motor overload
Water	Pump oxidation
Food Liquids	Contamination of the same
Corrosive Chemical Products	Pump corrosion
Solvents	Injury to persons Fire - explosion Damage to gasket seals

Health, Safety & Environmental Considerations

Caution/Warning

WARNING: Inappropriate use of this equipment can cause serious injury. Only competent and authorised persons should be permitted to operate this equipment. Children/minors should NEVER be permitted to operate or move this equipment.

WARNING: This product should only be used for its intended purpose. Using this product for any other than its intended purpose could result in serious injury or death.

Always use appropriate safety equipment e.g. safety glasses, protective gloves, safety shoes etc. Observe local health and safety requirements.

Prolonged contact with diesel fuel can damage the skin. The use of safety glasses and protective gloves is recommended.

ONLY use this product with **DIESEL FUELS** having a viscosity of between 2 & 5.35 cSt (@ 37.8°C) and a minimum Flash Point (PM) of 55°C. It must **NOT** be used for any other liquids.

Never start or stop the pump by connecting or disconnecting the unit from the mains power supply or any other plugs or switches that will isolate the power supply to the unit.

DO NOT run the pump dry, this can cause serious damage to its components.

WARNING: Always disconnect the equipment from the mains electrical supply before carrying out any routine maintenance or repairs.

DO NOT operate switches with wet hands.

Periodically check the power supply cable for damage.

Observe local environmental requirements and ensure there is appropriate equipment available to clear up any accidental diesel fuel spills.

Special consideration should be given when this equipment is used in a marine environment.

Appropriate equipment should be available to clean up any accidental diesel fuel spills and always ensure that any used filters or coalesced water removed from the filter bowl are disposed of according to local environmental requirements.

WARNING: Do not open, or attempt to open, the control panel unless you are qualified to do so – increased risk of electric shock and death.

Unit Identification

Basic Description

Diesel fuel is known to be inherently unstable. Particulate contamination such as rust and dirt enters the fuel, condensation introduces water and this in turn encourages microbial growth. These 3 forms of contamination will eventually clog engine filters and potentially damage fuel injection equipment leading to unplanned maintenance and potential engine failure.

The on-tank Fuel Polishing System is designed to be used for the "polishing" of diesel fuels having a viscosity between 2 and 5.35 cSt (@ 37.8°C) and a minimum Flash Point (PM) of 52°C. It must NOT be used for any other liquids.

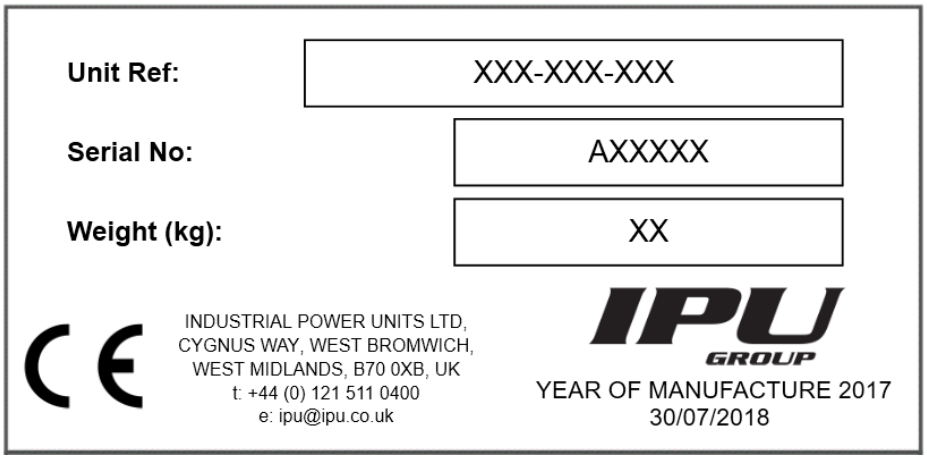
The on-tank fuel polishing system can be used in conjunction with a suitable biocide and a rigorous fuel management program. The system will condition and stabilise the fuel, remove water and solid particulates.

WARNING: The unit is designed to be used as a static "on-tank" polishing system and should be permanently mounted either on a suitable wall or stand within the bund of the tank to which it is operating on. The system is NOT designed to be mobile and should not be used as such. It should only be installed by suitably qualified personnel.

Unit Identification

Each unit carries a unique serial number together with a model part number. This can be found on the front of the electrical panel inside the cabinet.

Always quote the Part number and serial number when requesting spare parts, service or warranty assistance.



UNIT OPERATION

Basic Description

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The system is designed to be used for the “polishing” of diesel fuels having a viscosity between 2 and 5.35 cSt (@ 37.8°C) and a minimum Flash Point (PM) of 55°C. It must **NOT** be used for any other liquids.

The system can be used in conjunction with a suitable biocide and a rigorous fuel management program. The system will condition and stabilise the fuel, remove water and solid particulates.

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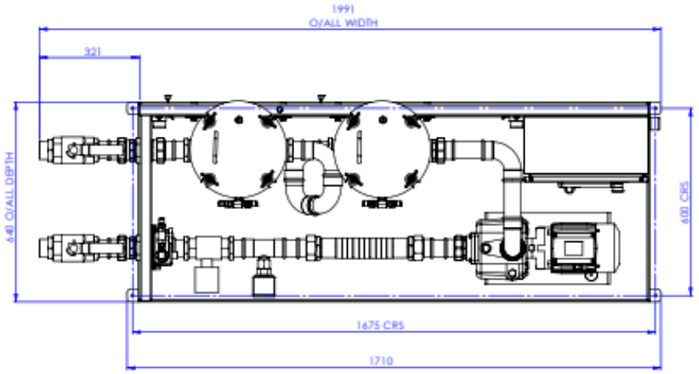
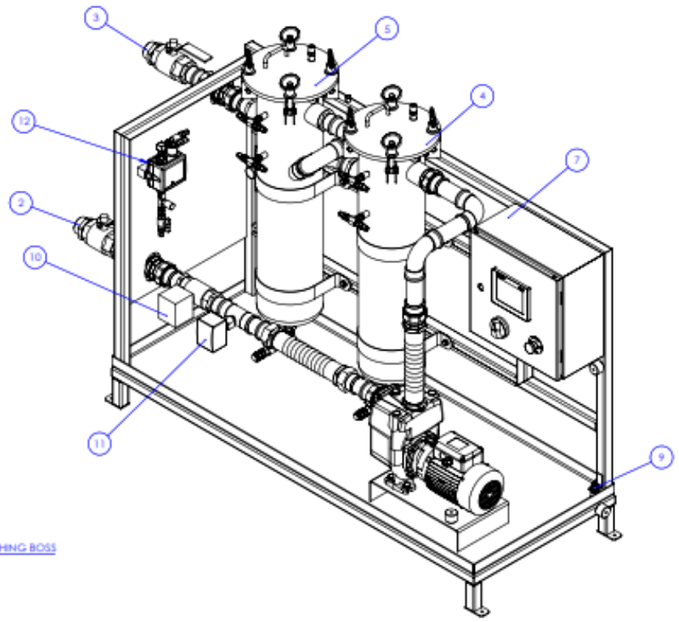
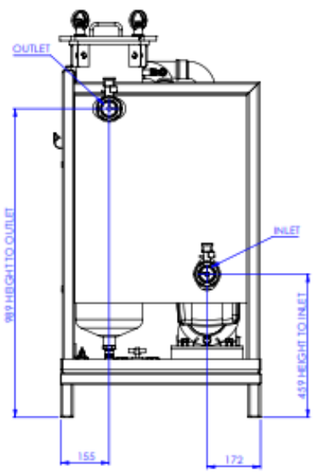
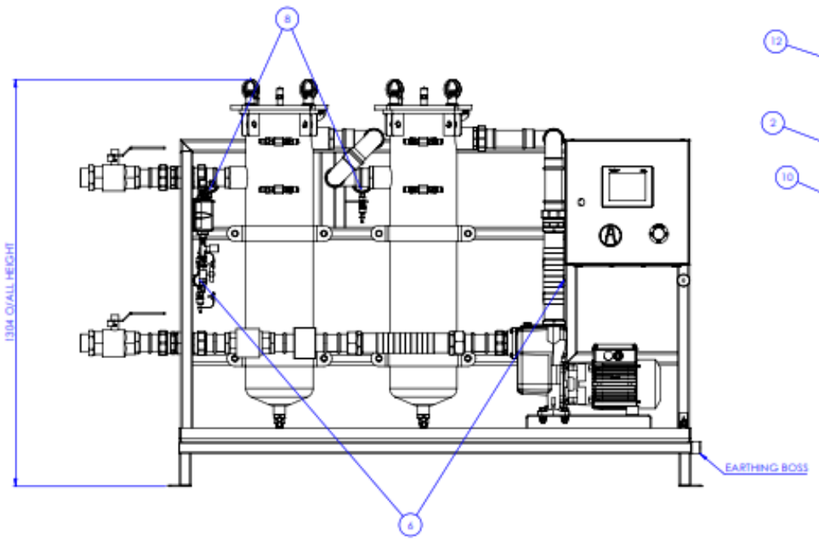
GENERAL ARRANGEMENT DRAWING-LH

Item No	PART DESCRIPTION
1	250LPM 230V PUMP
2	2" BSPP M INLET
3	2" BSPP M OUTLET
4	STAGE 1 FILTERATION - SIZE 2 FILTER
5	STAGE 2 FILTERATION - SIZE 2 FILTER
6	2 x DIFFERENTIAL PRESSURE SWITCH
7	CONTROL PANEL
8	2 x TOTAL PRESSURE GAUGE
9	BUND FLOAT SWITCH
10	MOTORISED BALL VALVE
11	FLOW SWITCH
12	PARTICLE COUNTER









ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	INITIAL ISSUE	25/05/2020	MD

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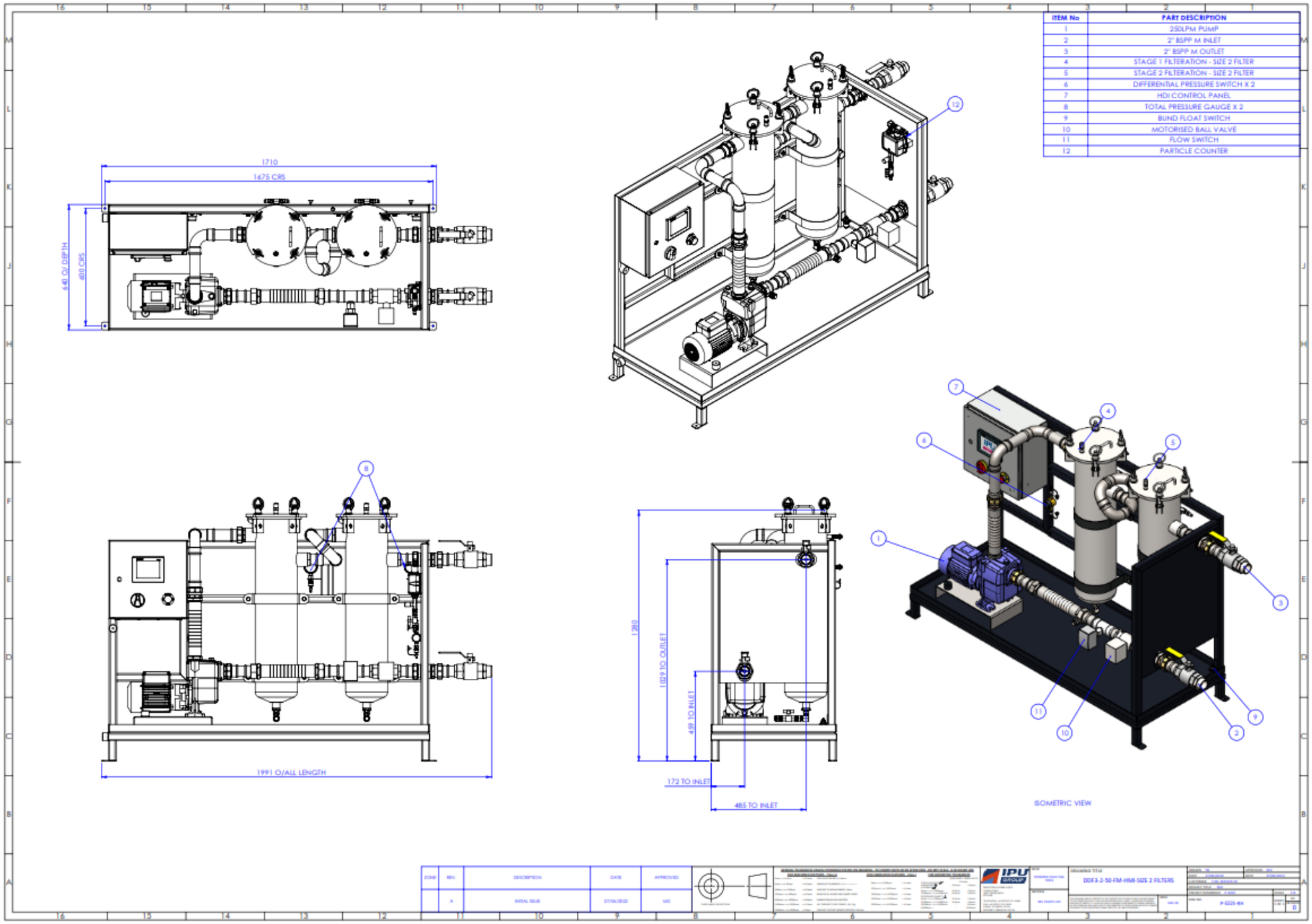
GENERAL ARRANGEMENT DRAWING-RH



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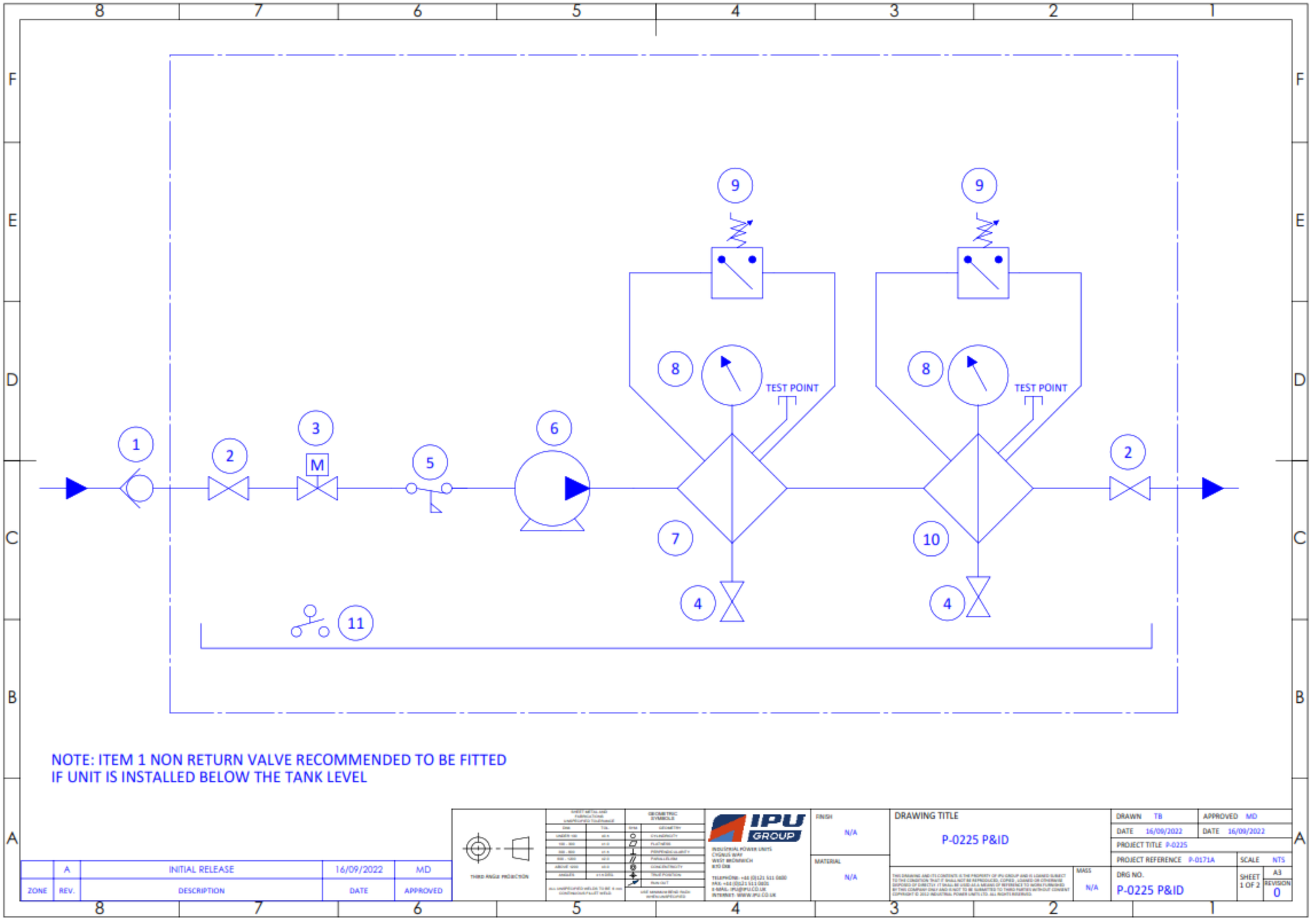
8
7
6
5
4
3
2
1
F
E
D
C
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9
9
8
TEST POINT
8
TEST POINT
1
2
3
M
5
6
2
7
10
4
4
11
NOTE: ITEM 1 NON RETURN VALVE RECOMMENDED TO BE FITTED
IF UNIT IS INSTALLED BELOW THE TANK LEVEL
IPU GROUP
INDUSTRIAL POWER UNITS
CYGNUS WAY
WEST BROMWICH
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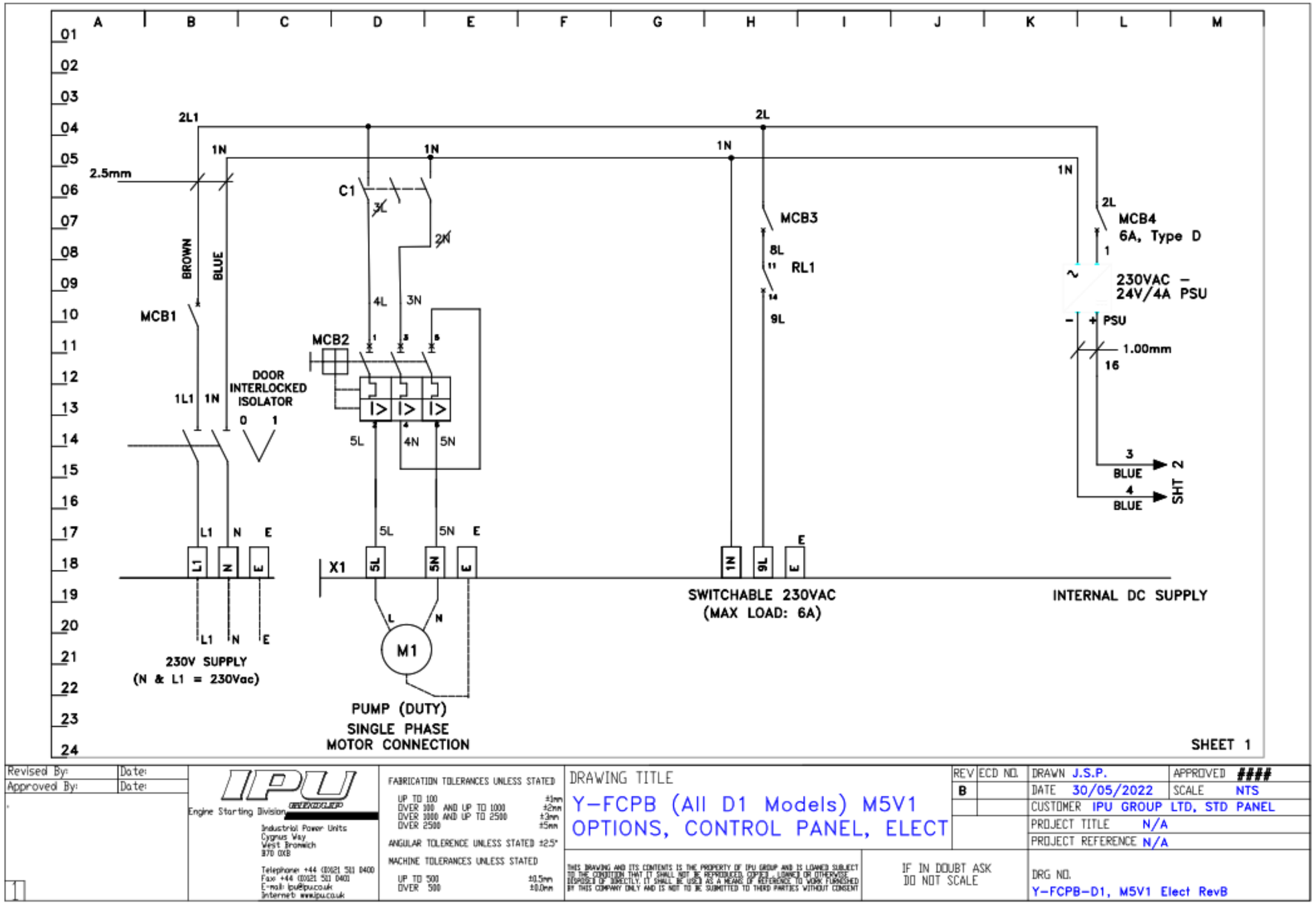
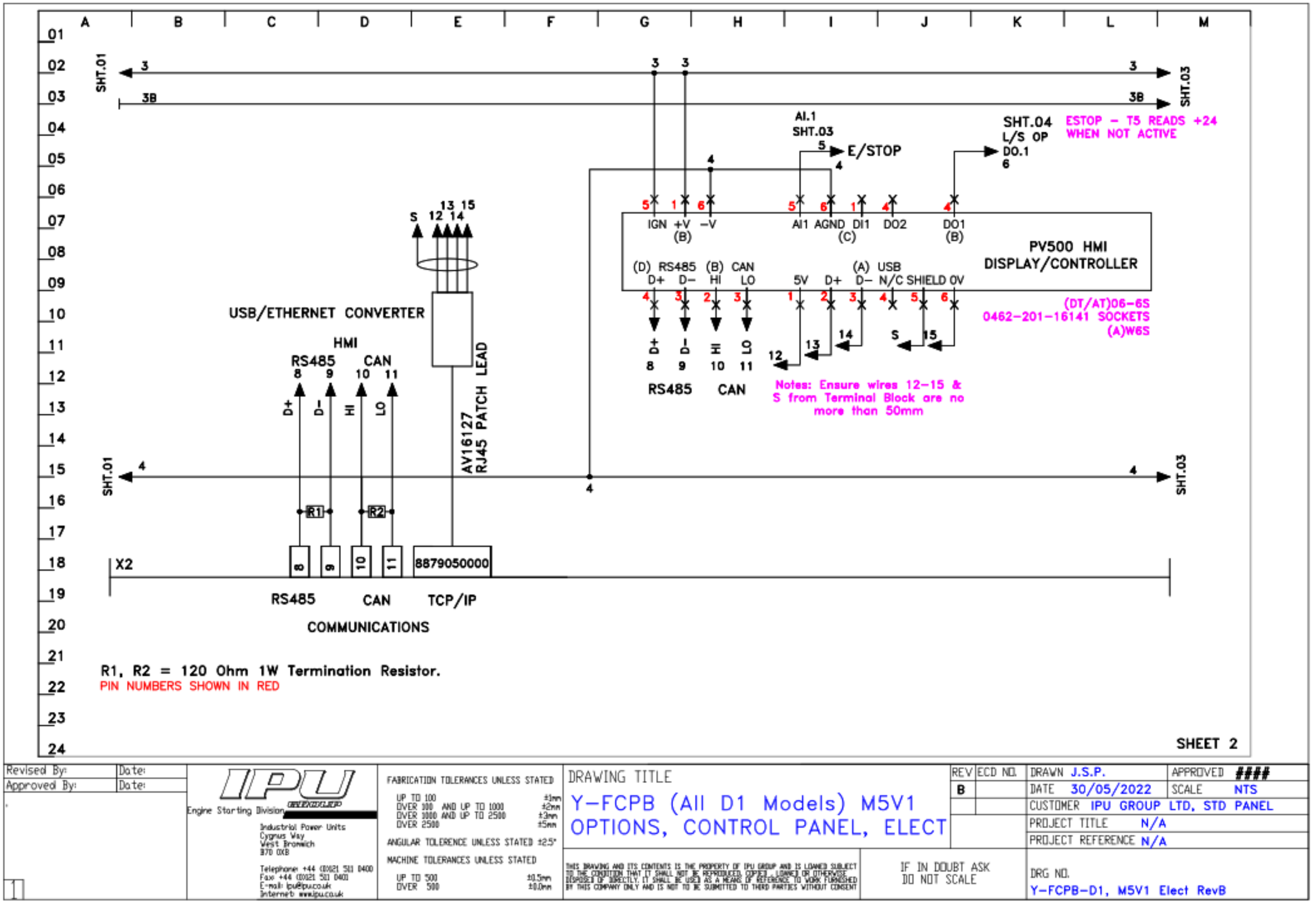
TELEPHONE: +44 (0)121 511 0600
FAX: +44 (0)121 511 0601
E-MAIL: IPU@IPU.CO.UK
INTERNET: WWW.IPU.CO.UK
THIRD ANGLE PROJECTION
FINISH
N/A
MATERIAL
N/A
MASS
N/A
DRAWING TITLE
P-0225 P&IH
DRAWN TB
DATE 16/09/2022
APPROVED MD
DATE 16/09/2022
PROJECT TITLE P-0225
PROJECT REFERENCE P-0171A
SCALE NTS
DRG NO.
P-0225 P&IH
SHEET 1 OF 2
A3
REVISION 0
ZONE
REV.
DESCRIPTION
DATE
APPROVED
A
INITIAL RELEASE
16/09/2022
MD

ELECTRICAL SCHEMATICS

Touch Screen Variant





Revised By:	Date:
Approved By:	Date:

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Fax +44 (0)121 501 0401
E-mail: ipu@ipu.co.uk
Internet: www.ipu.co.uk

FABRICATION TOLERANCES UNLESS STATED

UP TO 100	±1mm
OVER 100 AND UP TO 1000	±2mm
OVER 1000 AND UP TO 2500	±3mm
OVER 2500	±5mm

ANGULAR TOLERENCE UNLESS STATED ±2.5°

MACHINE TOLERANCES UNLESS STATED

UP TO 500	±0.5mm
OVER 500	±0.0mm

DRAWING TITLE
Y-FCPB (All D1 Models) M5V1
OPTIONS, CONTROL PANEL, ELECT

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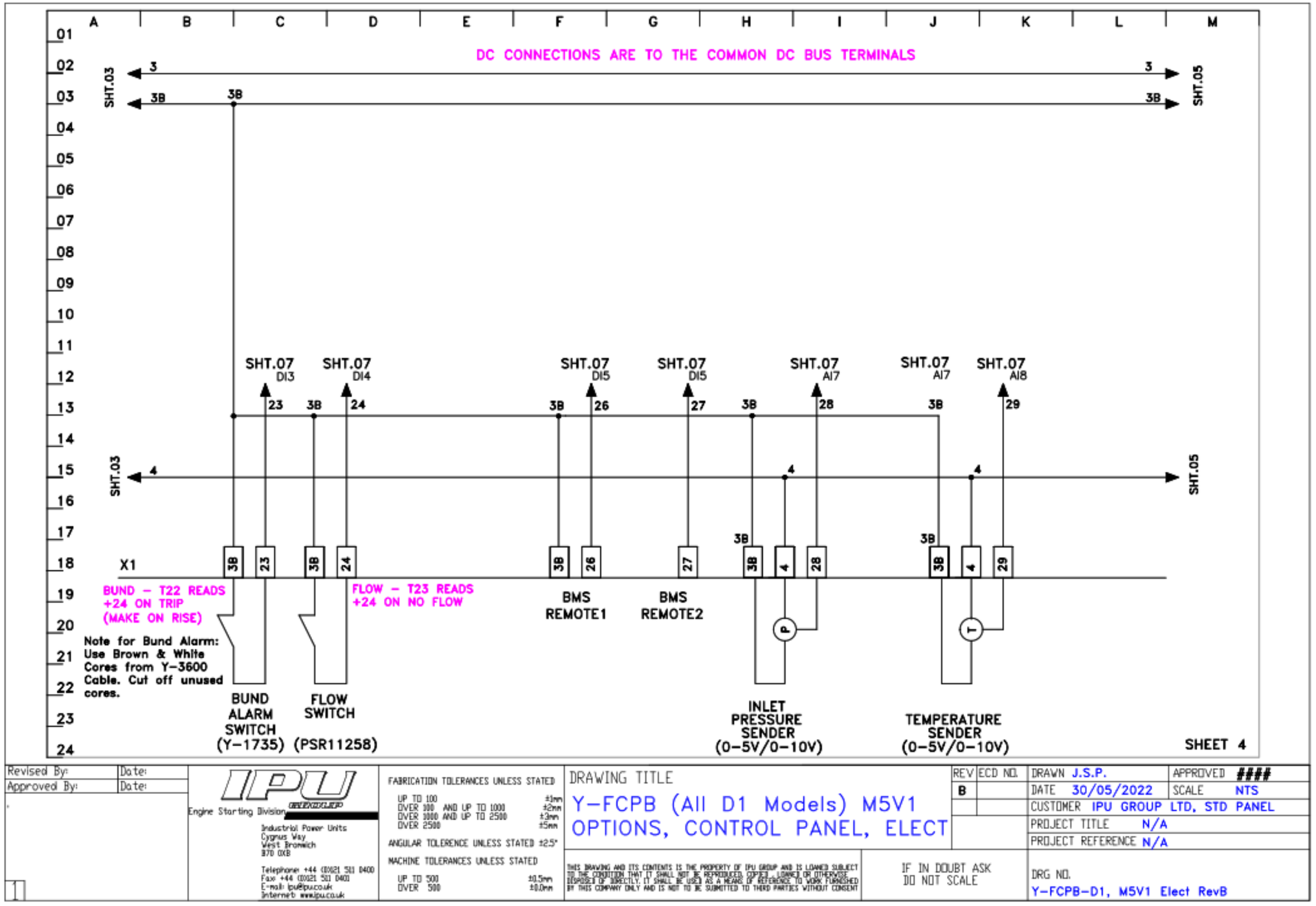
REV	ECO NO.
B	

DRAWN J.S.P.	APPROVED ####
DATE 30/05/2022	SCALE NTS
CUSTOMER IPU GROUP LTD, STD PANEL	
PROJECT TITLE N/A	
PROJECT REFERENCE N/A	

DRG NO.
Y-FCPB-D1, M5V1 Elect RevB



Revised By:	Date:	IPU Engine Starting Division	FABRICATION TOLERANCES UNLESS STATED	DRAWING TITLE	REV	ECD NO.	DRAWN J.S.P. / APPROVED ####
Approved By:	Date:	Industrial Power Units, Cygnus Way, West Bromwich, B70 0XB Telephone: +44 (0)121 501 0400 Fax: +44 (0)121 501 0401 E-mail: ipu@ipu.co.uk Internet: www.ipu.co.uk	UP TO 100 ±1mm OVER 100 AND UP TO 1000 ±2mm OVER 1000 AND UP TO 2500 ±3mm OVER 2500 ±5mm ANGULAR TOLERENCE UNLESS STATED ±2.5° MACHINE TOLERANCES UNLESS STATED UP TO 500 ±0.5mm OVER 500 ±0.0mm	Y-FCPB (All D1 Models) M5V1 OPTIONS, CONTROL PANEL, ELECT	B		DATE 30/05/2022 / SCALE NTS
							CUSTOMER IPU GROUP LTD, STD PANEL
							PROJECT TITLE N/A
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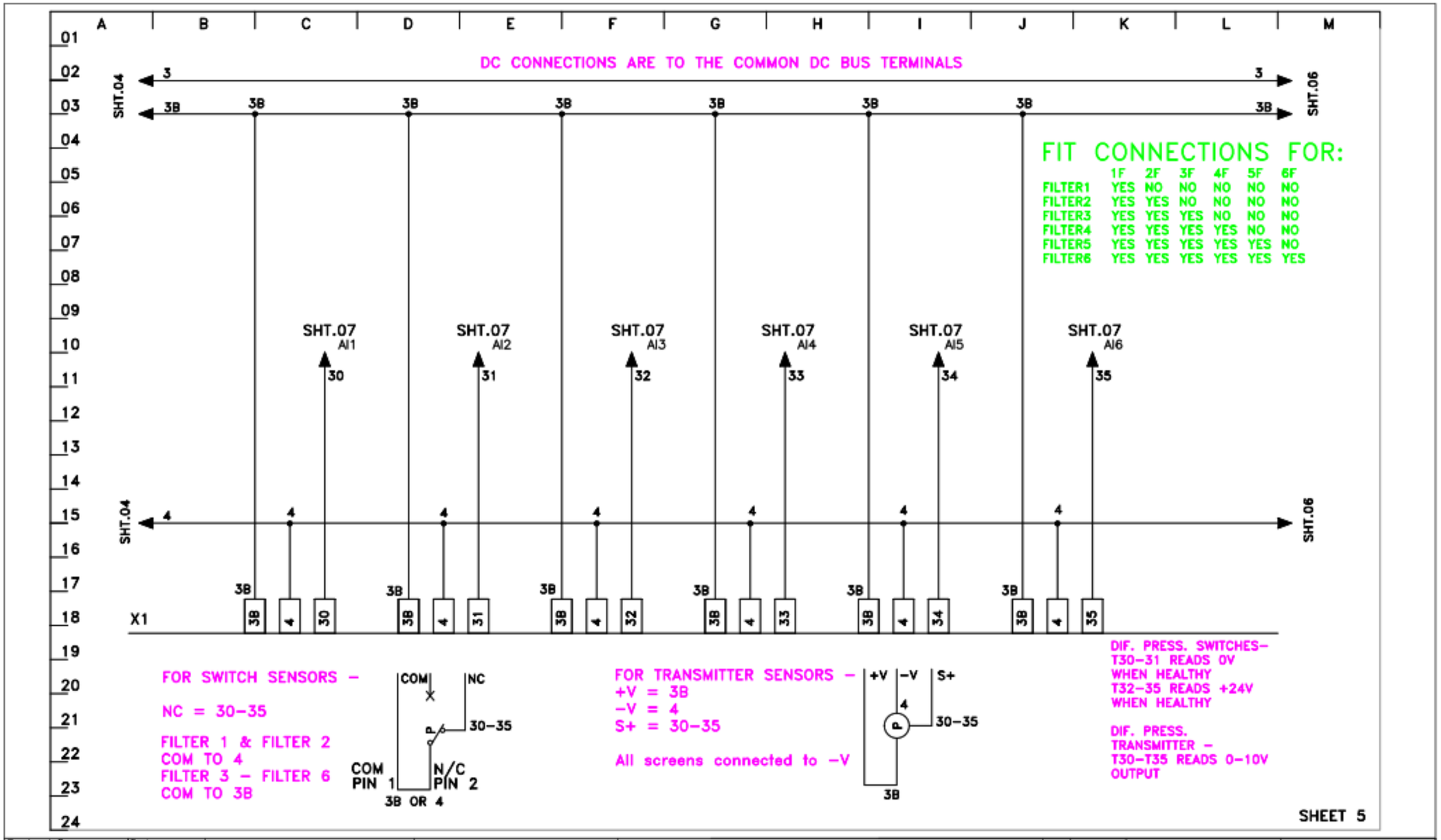

Revised By:	Date:
Approved By:	Date:

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Internet: www.ipu.co.uk

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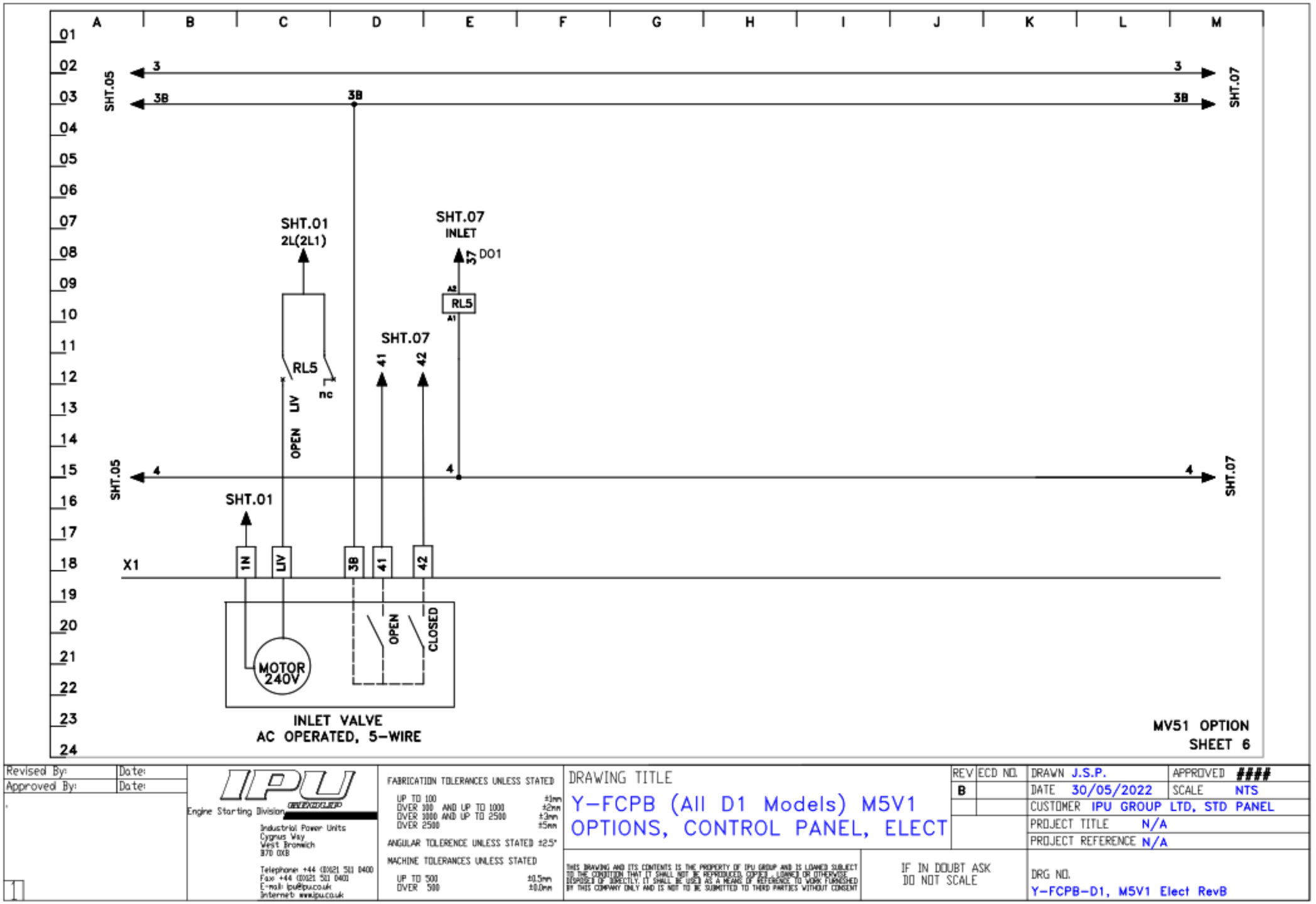

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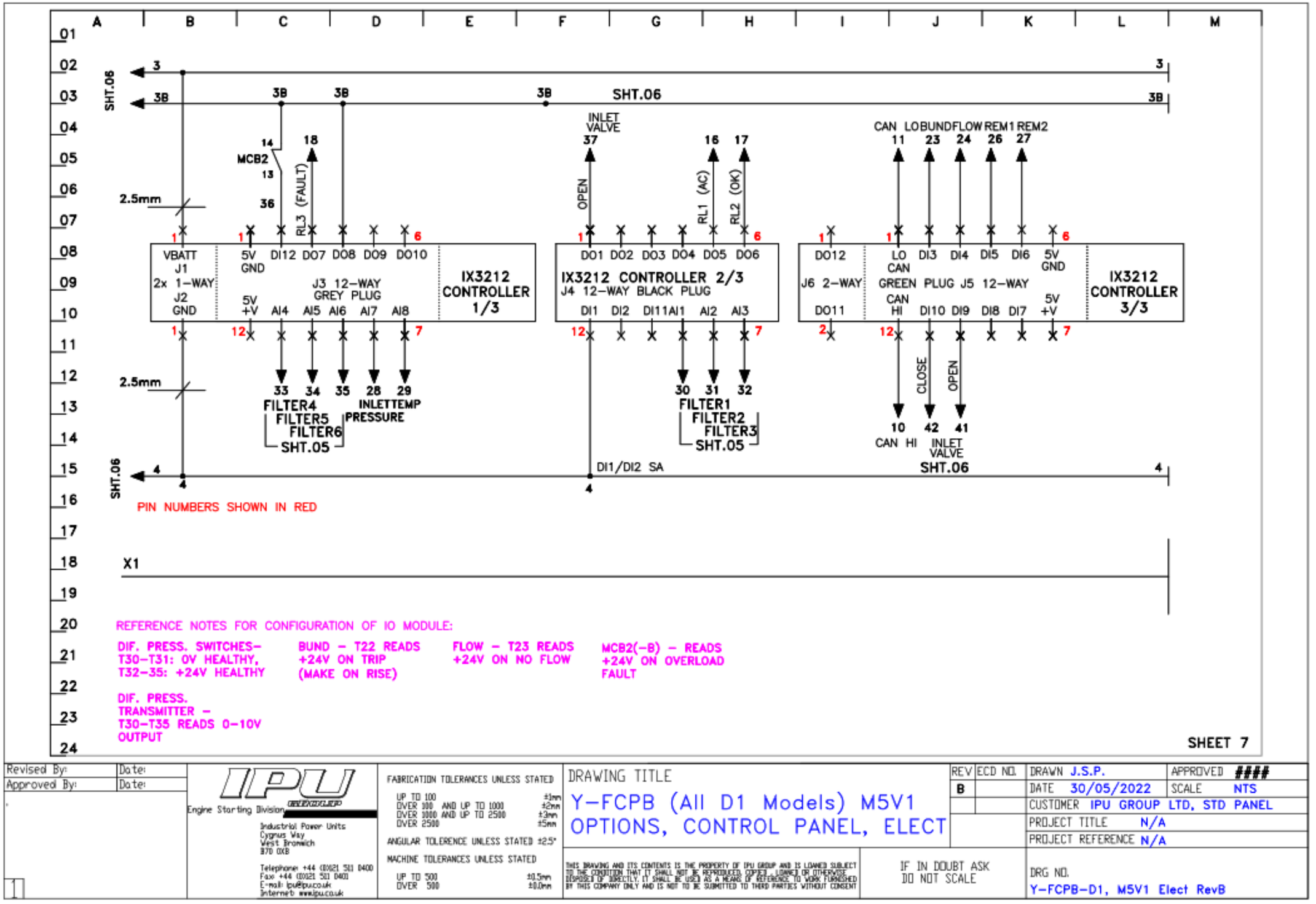

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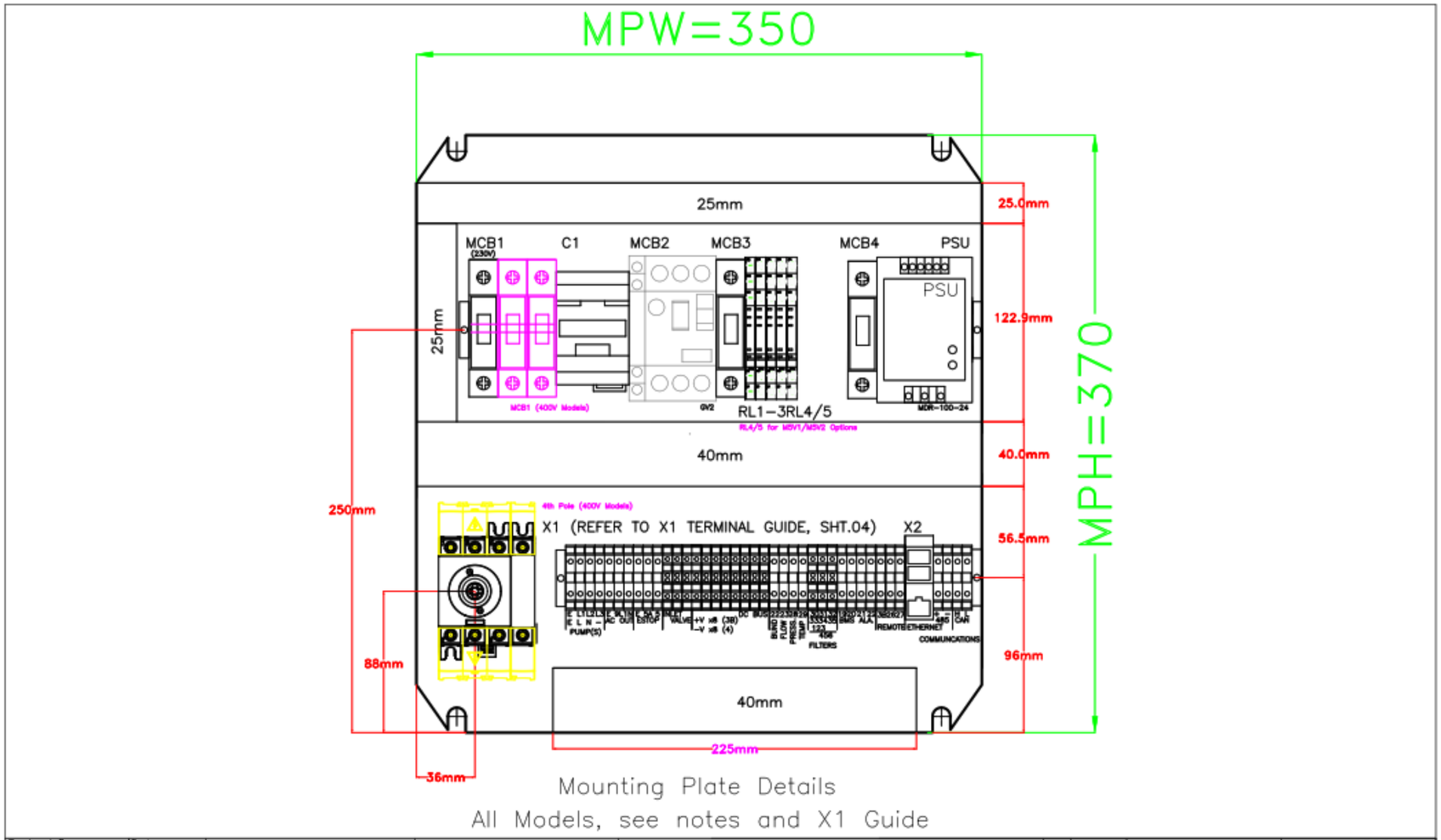
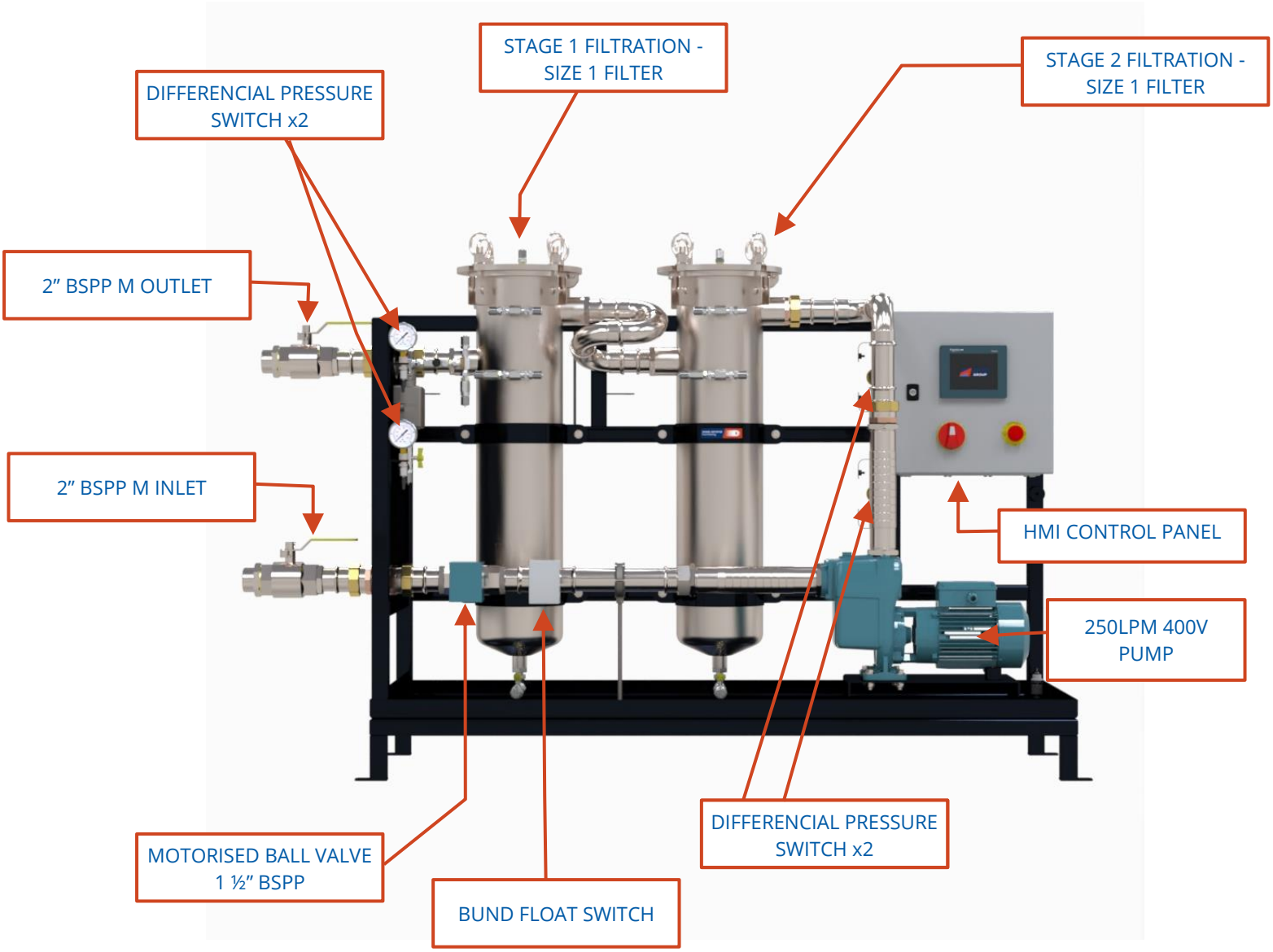
MECHANICAL SCHEMATICS



System Layout



OPERATING INSTRUCTIONS

General Operation

In normal operation when the pump is running, the system will be operating in either HAND mode or AUTO mode. In both modes:

Fuel enters the system via the inlet and is drawn through the pump and is then pushed through the size 1 filter vessel to clean the fuel by removing water and particulates. The fuel then flows out of the machine and back into the tank. This cycle will repeat as defined by the schedule created via the control panel.

Master ON/OFF Switch

The Master On/Off Isolator Switch is located on the Mains Panel. After the unit has been plugged into, or hard wired into, a suitable electrical connection, the unit can be turned on by using the Master On/Off Isolator Switch. The Master On/Off isolator is protected with a Lock Off function. The Master On/Off Isolator should be locked in the Off position to prevent the system from being accidentally powered on during servicing or maintenance.

WARNING: Risk of shock - Electrical connections must only be carried out by qualified, competent persons. Only suitably qualified persons should access the control box.

Before Starting the Unit

Ensure that the unit is standing on or fixed to a firm surface and that it is in a vertical position. Never operate the unit in any position other than vertical. Always double-check the general condition of the unit before use, paying special attention to electrical cables, valve connections and hoses. **WARNING**: If there are any signs of damage or excessive wear, **DO NOT USE IT**.

Before switching on the unit ensure pipework is connected to the inlet and outlet connections. Ensure inlet and outlet isolation valves are in the open position. It is important to check all connections and fittings to ensure they have not become loose in transit. Never run the pump dry, only start after it has been wetted. It is important to point out that the priming time can be as long as one minute.

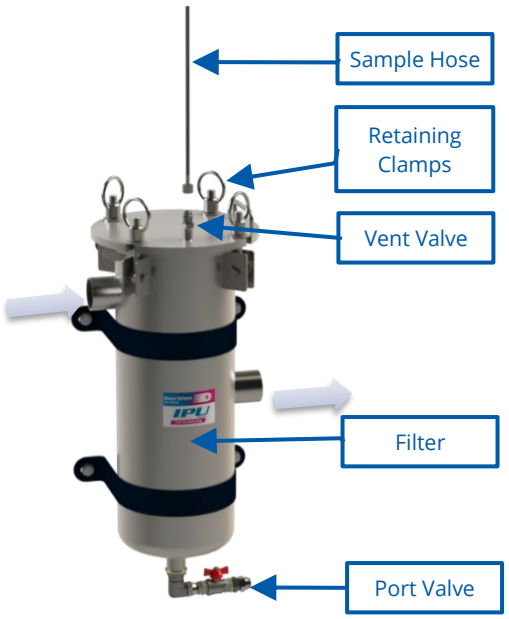
HMI Control Panel – (See Sperate Manual)

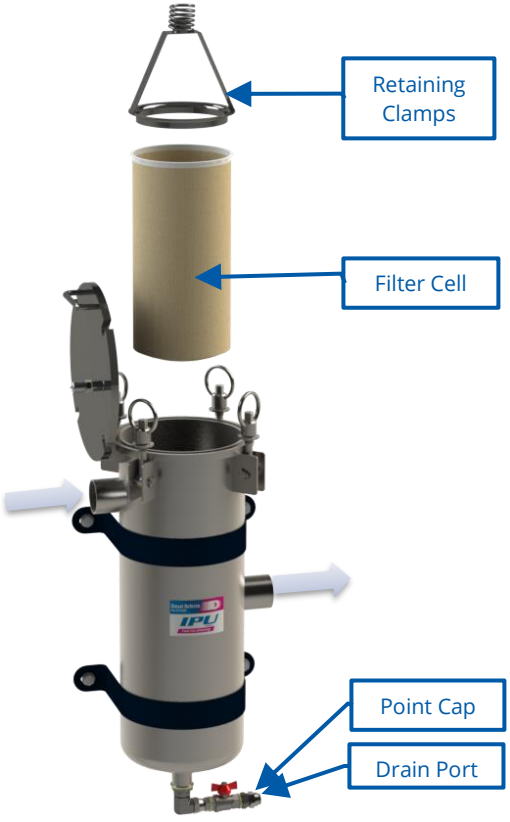
MAINTENANCE

The unit has been designed to require minimal servicing and maintenance. The unit contains one filter unit, which has a replaceable filter element. The filter has a replaceable filter bag that will need to be replaced once the filter alarm detects a blockage. The frequency of this will depend on the condition of the fuel. There will also be a requirement to remove water collected in the filter bowl. **CAUTION**: PPE must be worn at all times when operating or servicing the machine.

To change the filter cell:

- Ensure that the pump has stopped running.
- Close the inlet & outlet ball valves. (See P&ID)
- Remove the drain point cap.
- Ensure secure connection to filter drain port.
- Place hose into suitable container.
- **CAUTION**: open all valves slowly to ensure fuel is not expelled quickly due to residual pressure in the system.
- Attach the sample hose to the vent valve on the top of the filter housing to allow for the pressure inside the canister to equalize.
- Open the drain port valve to allow for excess fuel to drain from the filter canister.
- Once the filter housing is fully drained, remove the sample hose and loosen the 4 retaining clamps on the filter lid.
- Remove the filter lid with caution it may be heavy and have residual fuel on the inside surface.
- Remove the Retaining Brace.
- Carefully lift out the existing Filter cell.
- Fit the new Filter cell ensuring it has been securely pushed down and seated inside the housing
- Replace the Retaining Brace.
- Replace the Filter Lid
- Secure the filter lid by tightening the 4 retaining swing bolt clamps
- Shut the ½" drain valve and replace the valve cap





General Maintenance

The system has been designed to require a minimum amount of maintenance:

- On a weekly basis, conduct visual check of connections and joints to ensure they have not loosened. Visually check and then manually lift the float switch to ensure it is working correctly
- On a weekly basis, check pressure gauges as this can serve as an early indication of potential blockages
- Once a blockage has been detected, replace filters, as well as check and clean suction filter installed in the pump

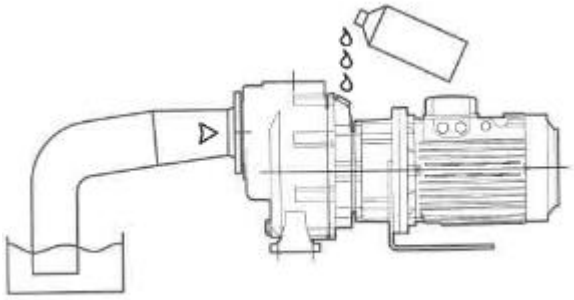
The pump requires minimal maintenance. The following are guidelines outlined by the pump manufacturer for pump the maintenance of the pump:

- On a weekly basis, check that the tubing joints have not loosened, to avoid any leakage.
- On a monthly basis, check the pump body and keep it clean of any impurities.
- On a monthly basis, check and keep the pump filter clean and any other filters installed.
- On a monthly basis, check that the electric power supply cables are in good condition

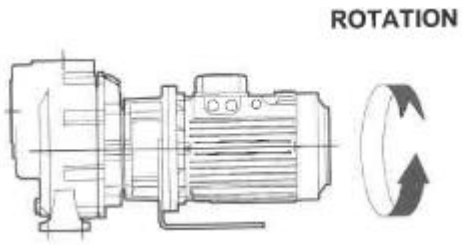
PUMP START-UP BASIC CHECKS

*The pump is suitable for diesel fuels with a viscosity between 2 and 5.35 cSt (@ 37.8°C)

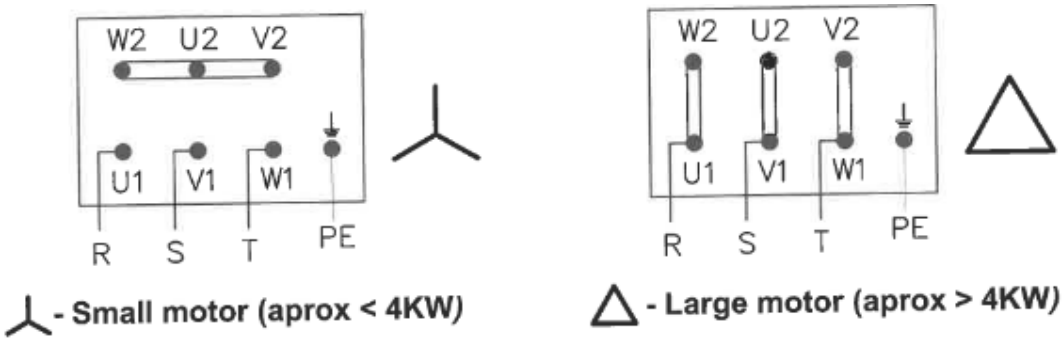
1. Fill with liquid



2. Rotate Clockwise



3. Motor Connection – see plate (Terminal box)



4. Compare pressure gauges and original requirements

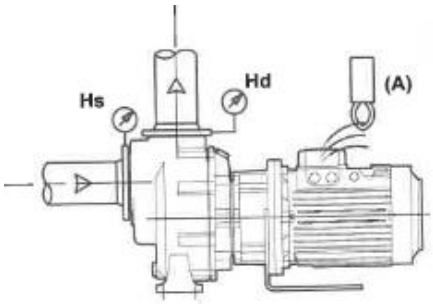
Readings:

-Hd

-Hs — **H(m)**

- A

Total (Hm = Hs-Hd)



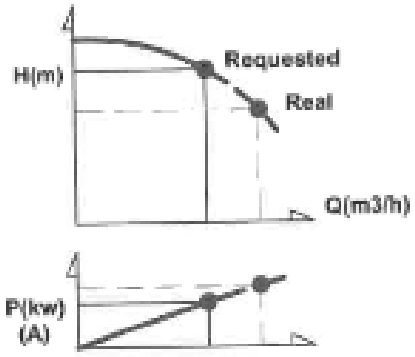
Requested information

Take data from pump and motor plate

Q(m3/h) – kW

H(m) – (A) Amperage

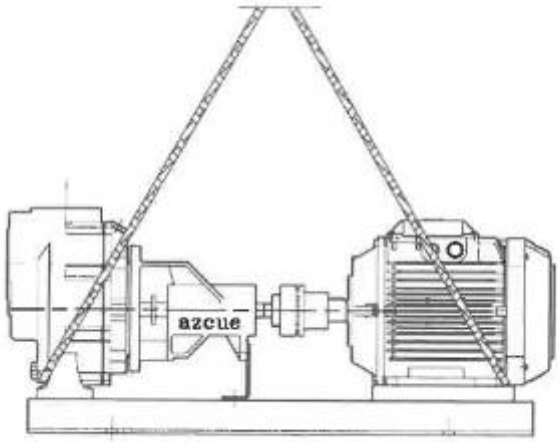
Compare data:



Installation

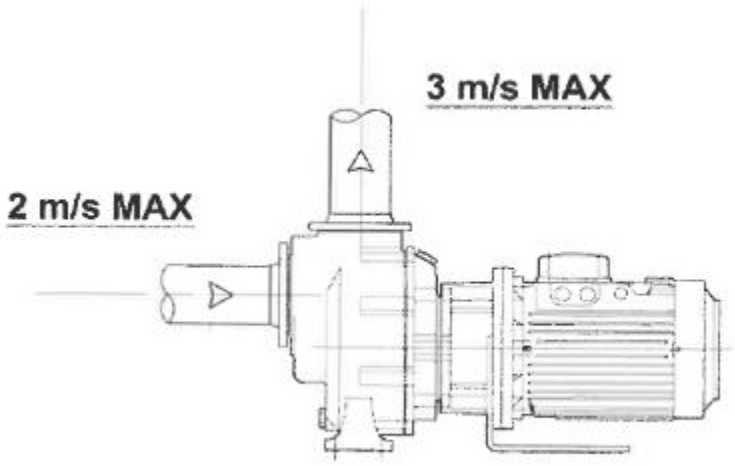
Transport

For transport and material handling, ropes should be fixed as described on the image.



Protecting covers

All pumps are supplied with all inner parts duly lubricated and with protecting covers on suction and discharge flanges. These protections must be removed on the latest possible moment, to avoid foreign matters entrance as weld bits, electrode waste and so, which can put the pump put of operation immediately.



Particle Counter Operation (if fitted)

SPECIFICATION	DETAIL
Technology	Precision LED Based Light Extinction Automatic Optical Particle Analyser
Particle Sizing	>4,6,14,21,25,38,50,70 µm(c) to ISO 4406:1999 Standard
Analysis Range	ISO 4406:1999 Code 0 to 25 NAS1638 Class 00 to 12 AS4059 Rev.E. Table 2 Sizes A-F: 000 to 12 Lower Limits are Test Time dependent.
Reporting Formats	ISO 4406:1999 (ICM Default) NAS1638 AS4059E Table 2 AS4059E Table 1 ISO 11218
Accuracy	±½ ISO code for 4,6,14µm(c) ±1 code for 21,25,38,50,70 µm(c)
Calibration	Each unit individually calibrated with ISO Medium Test Dust (MTD) based on ISO 11171 (1999), on equipment certified by IFTS.
Test Time	Adjustable 10 - 3600 seconds (factory set to 120s)
Moisture & Temperature Measurement	% saturation (RH) and fluid temperature(°C) – Mineral Oil / Diesel version only
Data Storage	Approximately 4000 timestamped tests in the integral ICM memory
Fluid Compatibility	Standard unit: Mineral oil & petroleum-based fluids
Flow Rate	20-400 ml/minute
Viscosity Range	<1000 cSt
Fluid Temperature	-25 to +85 °C (check for viscosity compatibility for low temperature)
Maximum Pressure	420 bar static. For high frequency pressure pulse applications contact MP Filtri UK
Differential (Inlet/Outlet)	Typically 0.5 bar

All ICM versions have a multicolour indicator2 on the front panel, which is used to indicate the status or alarm state. ICM-K versions also have a screen that changes colour. The alarm thresholds can be set from LPA-View via the serial interface.

Green indicates that the test result passed, i.e. none of the alarm thresholds were exceeded.

Yellow indicates that the lower cleanliness limit was exceeded, but not the upper one.

Red indicates that the upper cleanliness limit was exceeded.

Blue indicates that the upper water content limit was exceeded.

Red/Blue Alternating indicates both cleanliness and water content upper limits exceeded.

Violet indicates that the upper temperature limit was exceeded

Screen and multicolour indicators

The particle counter optional extra is utilized to measure the quantity of particles of a specified size. The display shown above identifies the following.

Quantity of particles between the sizes of >4micron = 21

Quantity of particles between the sizes of >6 micron = 18

Quantity of particles between the sizes of >14micron = 14

O 4406:1999 is the internationally recognised cleanliness code for measuring the solid particulate content of fuel samples and hydraulic fluid. It is also referred to as the ISO cleanliness code. For engines designed to achieve Euro 2, 3, 4 and 5 emission standards, clean fuel is important.

For diesel to be recognised as 'clean' the fuel must contain less than 200ppm of dissolved water (as indicated by EN 590) and a particulate cleanliness level of 18/16/13 (as stated by ISO 4406:1999

The cleanliness code is made up of three numbers that identify the number of particles that are present in one millilitre of fuel:

For the code quoted above:

The first number (18) indicates the level of contamination by particles greater than 4 micron.

The second number (16) indicates the level of contamination by particles greater than 6 micron.

The third number (13) indicates the level of contamination by particles greater than 14 micron.

For the example given above (18/16/13) the following table shows what each of the range number translates to in terms of particle quantities:

RANGE NUMBER	MICRON SIZE	PARTICLE COUNT RANGE
18	4+	1300 – 2500
16	6+	320 – 640
13	14+	40 – 80

TROUBLESHOOTING

TS – TOUCH SCREEN VARIANT

SYMPTOM	RESOLUTION
TS - BLANK DISPLAY SCREEN	• Check power supply to the unit **WARNING**: Risk of shock- this level of check should ONLY be carried out by a suitably qualified person.
CONTROL OFF ALARM	• Alarm condition detected by controls including power failure. Resolve cause of alarm i.e. BUND FAULT ALARM and then press RESET. Press desired mode of operation.
O/LOAD FAULT ALARM	• The circuit breaker has tripped. Only reset the circuit breaker once the fault has been rectified. **WARNING**: Risk of Shock. Only suitable qualified persons should access the control box. To reset the circuit breaker: • Isolate the system from the mains power supply • Shut down the system by ensuring the master isolator is set to the OFF position. Lock out the master isolator in the off position. • Open the control box with the access key • Reset the circuit breaker: move the breaker to the ON position • Close and lock the control panel door • Turn the master isolator to ON • If the circuit breaker trips again immediately after you have reset it, there is an electrical fault in the system. Contact your supplier or IPU for advice.
FLOW OPERATE ALARM	• Check Inlet and outlet Isolation valves are fully open. • Check switch located on pump is set to on. • Check pipe work and connections to the unit to ensure there are no leaks or blockages downstream and upstream. • The placement of the unit from the tank and the length of hose will affect the flow rate coming into the system. • Low level in the suction tank. Refill the tank • Check filters for blockages. • Extreme operating conditions can raise the motor temperature and, consequently, cause the thermal protection switch to stop it. Wait for it to cool before resuming use. The thermal protection automatically turns off when the motor is sufficiently cool.
E/STOP OPERATE ALARM	E-Stop has been pressed. Twist the E-Stop button and press RESET on the home screen. Press the required operation mode if required.
BUND FAULT ALARM	Fluid detected in the bund tray by float switch. (Ensure all fluid is disposed of following local environmental requirements)

FILTER BLOCKED ALARM	Check inlet and outlet valves are fully open. Differential pressure switch has detected a pressure differential (1bar) across the secondary filter indicating a possible blockage. Replace the filter in the secondary filter. It is advised that the primary filter bag is replaced at the same time.
PUMP STOP ALARM	Check if the circuit breaker has tripped. Check the effectiveness of the mains power supply (correct voltage/frequency). A drop in voltage can result in the pump stopping Pump may be faulty, contact IPU for support
THE PUMP WILL NOT SELF PRIME	The priming phase can last from several seconds to a few minutes, as a function of the characteristics of the system. If this phase is prolonged, stop the pump and verify: That the pump is not running completely dry That the suction tubing is not allowing air to seep in That the suction filter is not clogged That the suction height is not greater than 2 meters (if the height is greater than 2 meters, fill the suction tube with fluid) That the delivery tube is allowing the evacuation of the air. The pump has run dry for too long a period/long periods of inactivity. In this case it is advisable to add liquid directly into the pump chamber before start-up. It is also advisable to add a drop of lubricating oil inside the pump only before running the pump. Air leak at the suction pipe due to the following reasons: • Possible cuts in the pipe, inadequate hose clamps, malfunctioning of the filter due to defective/worn seals or filter clogged. Air leak at the pump front plate cover due to the following reasons: • Loose fixing screws or poor effectiveness of the seal. • The presence of obstructions or restrictions in the suction or delivery pipes.
THE MOTOR TURNS SLOWLY WHEN STARTING	Low voltage in the electric power line
INCREASED PUMP NOISE	• Cavitation occurring. Reduce suction pressure • Irregular functioning of the by-pass. Dispense until the air is purged from the circuit • Air present in the diesel fuel. Verify the suction connections
LEAKAGE FROM THE PUMP BODY	• Check and replace the mechanical seals

Revision History

DATE	DESCRIPTION	REVISION
September 2022	First Issue	0
June 2023	Second issue	1

Quality of Goods & Warranty

1.1. The Supplier warrants that on delivery, and for a period of 12 months from the date of delivery (Warranty Period), the Goods shall:

1.1.1. conform in all material respects with their description;

1.1.2. be free from material defects in design, material and workmanship;

1.1.3. be of satisfactory quality (within the meaning of the Sale of Goods Act 1979); and

1.1.4. be fit for any particular purpose expressly held out by the Supplier (but not any implied purpose).

1.2. Subject to clause 1.3, if:

1.2.1. the Customer gives notice in writing 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 1.1;

1.2.2. the Supplier is given a reasonable opportunity of examining such Goods (including, but not limited to permitting the Supplier to examine the Goods at the Customer's premises for the purposes of failure analysis);

1.2.3. the Customer (if asked to do so by the Supplier) returns such Goods to the Supplier's place of business at the Customer's cost; and

1.2.4. such defect shall be attributable to the Supplier,

the Supplier shall, at its option, repair or replace the defective Goods, or refund the price of the defective Goods in part or in full.

1.3. The Supplier shall not be liable for the Goods' failure to comply with the warranty in clause 1.1 if:

1.3.1. the Customer makes any further use of such Goods after giving a notice in accordance with clause 1.2;

1.3.2. the defect arises because the Customer or any third party (other than the Supplier) failed to follow the Supplier's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods or (if there are none) good trade practice;

1.3.3. the Customer cannot provide the Supplier with evidence that the Goods have been maintained in accordance with all of the Supplier's oral and written instructions;

1.3.4. the defect arises as a result of the Supplier following any drawing, design or specification supplied by the Customer;

1.3.5. the Customer alters or repairs such Goods without the prior written consent of the Supplier or uses non-Supplier sourced or approved spares;

1.3.6. the Customer has modified the Goods in any way without the prior written consent of the Supplier, including, but not limited to, being painted;

1.3.7. the defect arises as a result of fair wear and tear, wilful damage, negligence, or abnormal working conditions; or

1.3.8. the Goods differ from their description as a result of changes made to ensure they comply with applicable statutory or regulatory standards.

1.4. Except as provided in this clause, the Supplier shall have no liability to the Customer in respect of the Goods' failure to comply with the warranty set out in clause 1.1.

1.5. Where the Goods' failure to comply with the warranty in clause 1.1 is as a result of the circumstances in 6.3, the Customer shall pay the Supplier's reasonable costs of examining the Goods, including travel costs, accommodation (when required), and labour costs at the prevailing hourly rates of the Supplier at the time the Goods are examined.

1.6. Except as set out in these Conditions, all warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

1.7. The terms of these Conditions shall apply to any repaired or replacement Goods supplied by the Supplier under clause 1.2.

1.8. Where the Supplier repairs or replaces the Goods, the Warranty Period is treated as continuing as if the repaired or replacement Goods were supplied at the original date of delivery set out at clause 4.3.

1.9. Where the Supplier attends the Customer's premises to inspect the Goods, the Customer shall use all reasonable endeavours to ensure that the Supplier's employees, representatives and agents are made aware of all applicable security, safety and other regulations at its premises, and of the relevant safety policy.

1.10. The Supplier shall offer technical support without additional cost via telephone, fax or email during normal business hours in the United Kingdom, for the Warranty Period.

1.11. Outside of the Warranty Period, technical support is provided free of charge via telephone.

1.12. The Supplier shall only be able to provide technical support if the Customer is able to provide it with the following information:

Customer Name;

Customer Contact Details;

Device Type;

Device Serial Number;

Date of Supply; and

A clear description of the issue facing the Customer.

DIRECTIVE PROVISIONS

EC Declaration as defined by Machinery Directive 2006/42/EC:

The equipment described above conforms to The EMC Directive 2014/30/EC, & Machinery Directive 2006/42/EC