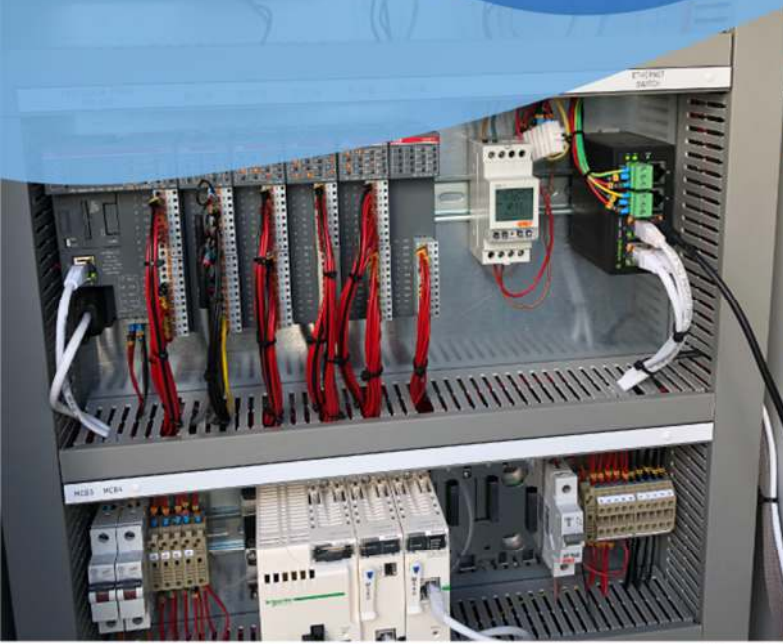


MES3535 KILNAP HOUSES

Whitechurch Rd, Co. Cork

FOUL WATER PUMP SUMP – PROPOSAL

Shane Fox BEng PhD MIEI



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1 Introduction

This report details a proposal for the installation of a foul water pump sump for a proposed housing development in Whitechurch Rd, Co. Cork. This pump sump is designed as per part 5 of the Irish Water Code of Practice for wastewater infrastructure.

2 Design Criteria

The design conditions are as follows:

Hydraulic load:	96 housing units @ 446litres/unit = 42,816 litres
Rising main length:	310m
Static head:	10.6m (inc. pump sump)
Total head:	14.2m
Flow rate:	5.77 l/s
Rising main:	110mm HDPE SDR17
Inlet pipe:	225mm
Inlet invert	3.380m below ground level

*Assumes 2.7 persons per house with a load of 150 l/person/day and a 10% allowance for infiltration

3 Hydraulic Calculation

Please see attached friction loss calculation sheet and pump datasheet for pump details. The velocities were maintained between 0.75 and 1.8m/s within the rising main.

The levels within the pump sump are set to pump approximately 920 litres per discharge (250mm between cut in and cut out levels with a surface area of 3.68m²). Assuming the daily hydraulic load is concentrated over a 10-hour period the hourly flow rate would be 4,282 litres per hour. This would equate to approximately 5 starts per hour. This pump will run for approx. 2.65 minute per discharge (920 litres/cycle/ 5.77l/s = 159 seconds; or 2.65 minute).

4 Proposed Tankage

This proposal consists of approximately 45,200 litres of emergency storage (>24hr capacity), which is made up of the available capacity in the holding tank and pump sump and isolation chamber. The entire emergency storage is created between the pump's cut in level and the inlet invert level. In general, day-to-day operation influent enters the pump sump and is pumped via the rising main into the receiving sewer line. Flow is prevented from entering the holding tank by a flap valve. In the event of power or equipment failure the pump sump overflows into the holding tank. When the system returns to normal operation flow moves from the holding tank into the pump sump via the flap valve by gravity. A summary of the tankage is as follows:

- 1 no. isolation chamber
- 1 no. precast concrete pump sump
- 1 no. holding tank
- 1 no. precast concrete valve chamber
- 1 no. precast concrete meter chamber

4.1 Buoyancy check

The below buoyancy check includes for a water table at ground level and empty tanks. Density of materials are as follows:

Material	Density (kN/m ³)	Legend
Concrete	24	D _c
Stone	20	D _{st}
Soil	18	D _s
Water	10	D _w

PUMP SUMP

Component		Total Volume (m³)		Weight (kg)	Provided Force (kN)
Tank		39.32		23,510.4	230.637
Risers		1.21		1,231	12.08
Overburden (stone)		1.47		2,940	28.84
Total	V _p	42.00		27,681	271.55
Minimum required force to prevent floatation (FOS of	F _r =	494.45	kN	F _r =V _p X1.2X9.81	
Difference between req. and provided force	F _d =	222.89	kN	F _d =F _r -F _p	
Required volume of concrete to prevent flotation	C _v =	15.92	m³	C _v =(F _d /(D _c -D _w))	
Comments	16m³ of concrete should be placed evenly around the toe of the tank.				

HOLDING TANK

Component		Total Volume (m³)	Weight (kg)	Provided Force (kN)
Tank		48.69	27,400	268.79
Risers		4.25	3,423	33.58
Overburden (stone)		36.57	73,141	717.51
Total	V _p	89.51275	103,964	1019.89
Minimum required force to prevent floatation (FOS of	F _r =	1053.74 kN	F _r =V _p X1.2X9.81	
Difference between req. and provided force	F _d =	33.85 kN	F _d =F _r -F _p	
Required volume of concrete to prevent flotation	C _v =	2.42 m³	C _v =(F _d /(D _c -D _w))	
Comments	4.5m3 of concrete should be placed equally about the joint and top of the tank.			

VALVE CHAMBER

Component		Total Volume (m³)		Weight (kg)	Provided Force (kN)
Tank		7.30		7,709	75.63
Risers		0.29		344	3.37
Overburden (stone)		1.04		2,497	24.50
Total	V _p	8.623		10,550	103.50
Minimum required force to prevent floatation (FOS of	F _r =	101.51	kN	F _r =V _p X1.2X9.81	
Difference between req. and provided force	F _d =	-1.99	kN	F _d =F _r -F _p	
Required volume of concrete to prevent flotation	C _v =	-0.14	m³	C _v =(F _d /(D _c -D _w))	
Comments	Sufficient force is available to counteract uplift, therefore no anti-flotation measures are required.				

METER CHAMBER

Component		Total Volume (m³)		Weight (kg)	Provided Force (kN)
Tank		3.41		3,410	33.45
Risers		0.12		190	1.86
Overburden (stone)		0.58		1,395	13.68
Total	V _p	4.11		4,995	49.00
Minimum required force to prevent floatation (FOS of	F _r =	48.38	kN	F _r =V _p X1.2X9.81	
Difference between req. and provided force	F _d =	-0.62	kN	F _d =F _r -F _p	
Required volume of concrete to prevent flotation	C _v =	-0.04	m³	C _v =(F _d /(D _c -D _w))	
Comments	Sufficient force is available to counteract uplift, therefore no anti-flotation measures are required.				

ISOLATION CHAMBER

Component		Total Volume (m³)	Weight (kg)	Provided Force (kN)
Tank		2.32	3,846	37.73
Risers		4.61	3,681	36.11
Total	V _p	6.9286	7,527	73.84
Minimum required force to prevent floatation (FOS of	F _r =	81.56 kN	F _r =V _p X1.2X9.81	
Difference between req. and provided force	F _d =	7.73 kN	F _d =F _r -F _p	
Required volume of concrete to prevent flotation	C _v =	0.55 m³	C _v =(F _d /(D _c -D _w))	
Comments	0.55m³ of concrete should be placed evenly around the toe of the tank.			

4.2 Isolation Chamber

This isolation chamber houses a penstock valve connected to the inlet.

- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. Joints shall provide equivalent water resistance as required in IS EN1992 – Part 3 (2006). The tank joints should be surrounded with not less than 150mm thickness of C20/25 to IS EN 206, 20mm aggregate size to IS EN 12620

4.3 Pump Sump

The pump sump should follow the following specifications:

- Precast concrete 6m deep 2.4m diameter pump sump
- Precast concrete 45-degree benching
- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers.
- For odour control should be installed as per STD-WW-34 (to be supplied and installed by others)
- The proposed pumps are 2 no. 4 pole Flygt NP 3102 foul submersible pumps (or similar)
- Pumps to be equipped with an automatic decoupling arrangement complete with twin stainless steel guide rails, easy lift, etc
- Automatic selection rotation of the duty/standby to be provided on an hours run basis with manual over-ride
- Pumps to be ex rated in accordance to hazardous area classification for foul wastewater
- Pumps to be operated as duty/standby
- The proposed pumps have an 80mm discharge connection
- The design should limit the number of starts to 10 per hour
- Pumps to be labelled at the top of pump sump and in kiosk
- Pumps to be equipped with certified stainless-steel lifting chain (IS EN 818-Part 7 (2009), suitably sized, with large links at 1m centres
- DN100/DN80 EN598 ductile iron pipework within the wet well to be bracketed using stainless steel brackets
- Motors to include stator over temperature protection which automatically re-set when temperature returns to normal
- High level float switch
- An ultrasonic level sensor is used to communicate adjustable set points for pump unit cut in and cut out as well as top level liquid level cut in and low-level over-ride cut out to the control panel (Pulsar Ultra Lite with snore function)

4.4 Emergency Overflow and Storage

A separate precast concrete emergency overflow tank (holding tank) is required to create 24 hours emergency storage. This together with the storage above the cut in level is used to create this storage.

- 1 no. 38m³ precast concrete tank
- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. Joints shall provide equivalent water resistance as required in IS EN1992 – Part 3 (2006). The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers.
- A 250mm dia. high level overflow is to be provided

- A 250mm dia. return pipe feeding back to the pump sump fitted with a proprietary flap valve within the wet well chamber

4.5 Valve Chamber

A separate valve chamber is required and should have the following specifications:

- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers. Ductile iron pipework complete with bends, valves, fittings, etc. to link all fittings
- A gate valve for each pump mounted horizontally
- A non-return valve for each pump mounted horizontally
- A gate valve mounted vertically equipped with a Bauer coupling linked to the rising main for pumping out of the rising main
- The chamber should be equipped with a drain to allow draining of the chamber into the pump sump

4.6 Meter Chamber

A separate meter chamber is required and should have the following specifications:

- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers. 1 no. magnetic flow meter (DN80 Siemens Mag 5100)
- Ductile iron pipework complete with fittings, etc. to link valve chamber to rising main

4.7 Control Kiosk

Control kiosk measuring 2.2m wide by 1.2m deep by 2m high shall be installed. This kiosk will have multiple locks to LPS 1175, SR3 or IS EN16257. An isolation station shall be provided within 2m of the pump sump to house connections. A small, galvanised steel kiosk shall be installed next to the control kiosk to house a 15m hose reel.

4.8 Control Panel

The following will be provided on the main control panel and within the control kiosk.

Control panel to be constructed to Form 2 in line with WIMES Electrical Specification and incorporate the following:

- | | |
|--|------------------|
| • Separate distribution board for an electrical heater, light, 220v and 110v waterproof socket | • Trip Indicator |
| • Soft Start operation | • Control Relays |

• Duty standby assist operation	• Terminal Block
• 16amp 220v socket – sockets to be wall mounted	• Ammeters
• MCCBs with door interlocks	• Hour run meters
• Contactor	• Generator change-over switch
• Ventilation Fan, Filter and Stat	• Ultrasonic
• Hand/Off/Auto Selector Switch	• Flow meter
• Start Switch	• Dial out GSM for – high water, pump trip, power loss
• Stop Button	• Separate to the GSM please include for terminals for the above alarms (for future connection to a telemetry system)
• Run Indicator	• Adequate 3 phase power supply to be provided by others

5 Access

C250 galvanised steel lift assist covers will be provided for the following components:

Pump sump: 1 no. 1,400 X 800mm clear opening

Valve chamber: 1 no. 1,400 X 800mm clear opening

All covers should be as follows:

- lockable, fabricated from steel, galvanised to IS EN 1461 (2009) with non-slip surface and finished flush with roof slab of chamber
- Hinged with recessed padlock
- Each leaf to have assistance to ensure a lifting effort of 25kg
- Double, hinged access covers to be provided with inert gas charged or hydraulic operated springs suitable for solo lift

The meter chamber & holding tank is to be equipped with D400 800mm by 700mm ductile iron hinged cover.

6 System Guarantee

Molloy Environmental Systems provides a 2-year warranty to remedy any fault in products provided:

- That the fault is due to defects in design, materials or workmanship
- That the fault is reported to Molloy Environmental Systems during the guarantee period
- That the product has been used only under the conditions described in the care and maintenance instructions, and in applications for which it is intended
- That all service and repair is carried out by Molloy environmental personnel as per the maintenance requirements
- Therefore, this warrantee does not apply to faults resulting from lack of maintenance, inadequate civil works, repair works carried out improperly or normal wear and tear
- Furthermore, Molloy Environmental Systems disclaims any liability in case of physical injuries, material or economic damages for those mentioned above.

7 Maintenance Requirements

Operator's Inspection and maintenance duties

It is the responsibility of the owner to:

- Ensure the pump sump is operated and maintained in proper order
- Familiarise himself/herself with this operation and maintenance manual
- Familiarise himself/herself with operation safety instructions
- Ensure the system is serviced
- Ensure any faults are dealt with in a timely manner

The operation of the pump sump is the owner's responsibility. The general duties would involve.

Daily

- General visual check to see if alarm beacon is flashing

Annually

- Arrange for tests and a full service of pump and control equipment by Molloy Environmental System

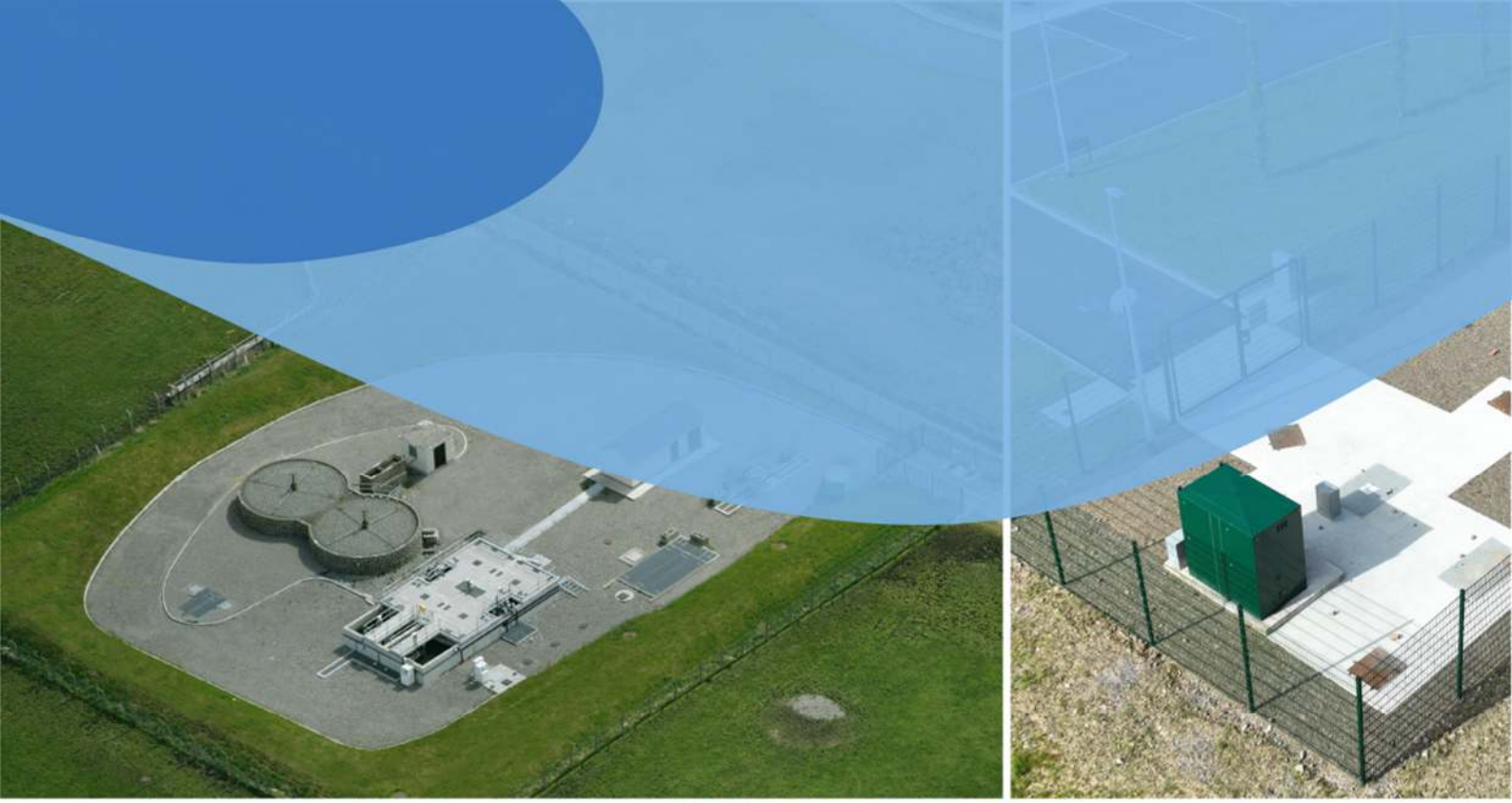
Please contact me if you require any additional information.

Yours sincerely,

A handwritten signature in purple ink that reads "Shane Fox".

Shane Fox BEng PhD MIEI
Environmental Process Engineer

Molloy Environmental Systems



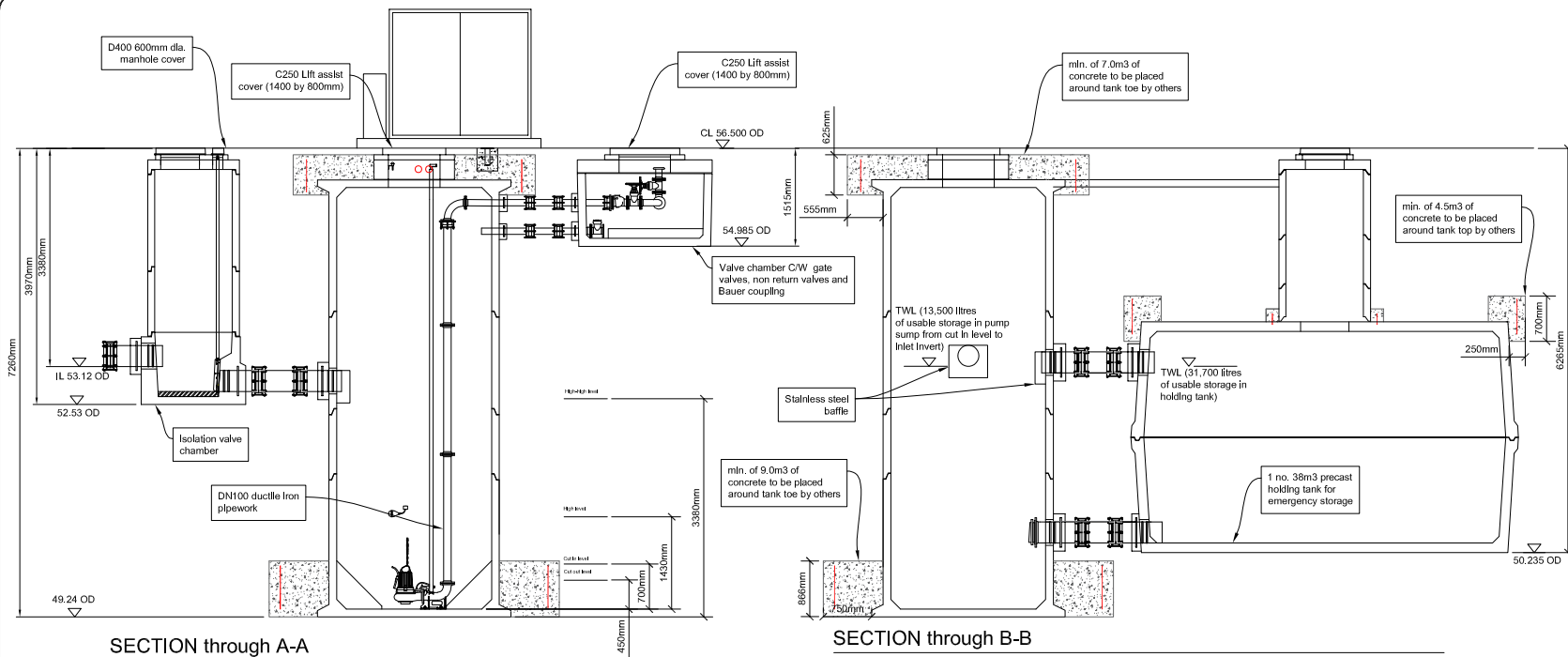


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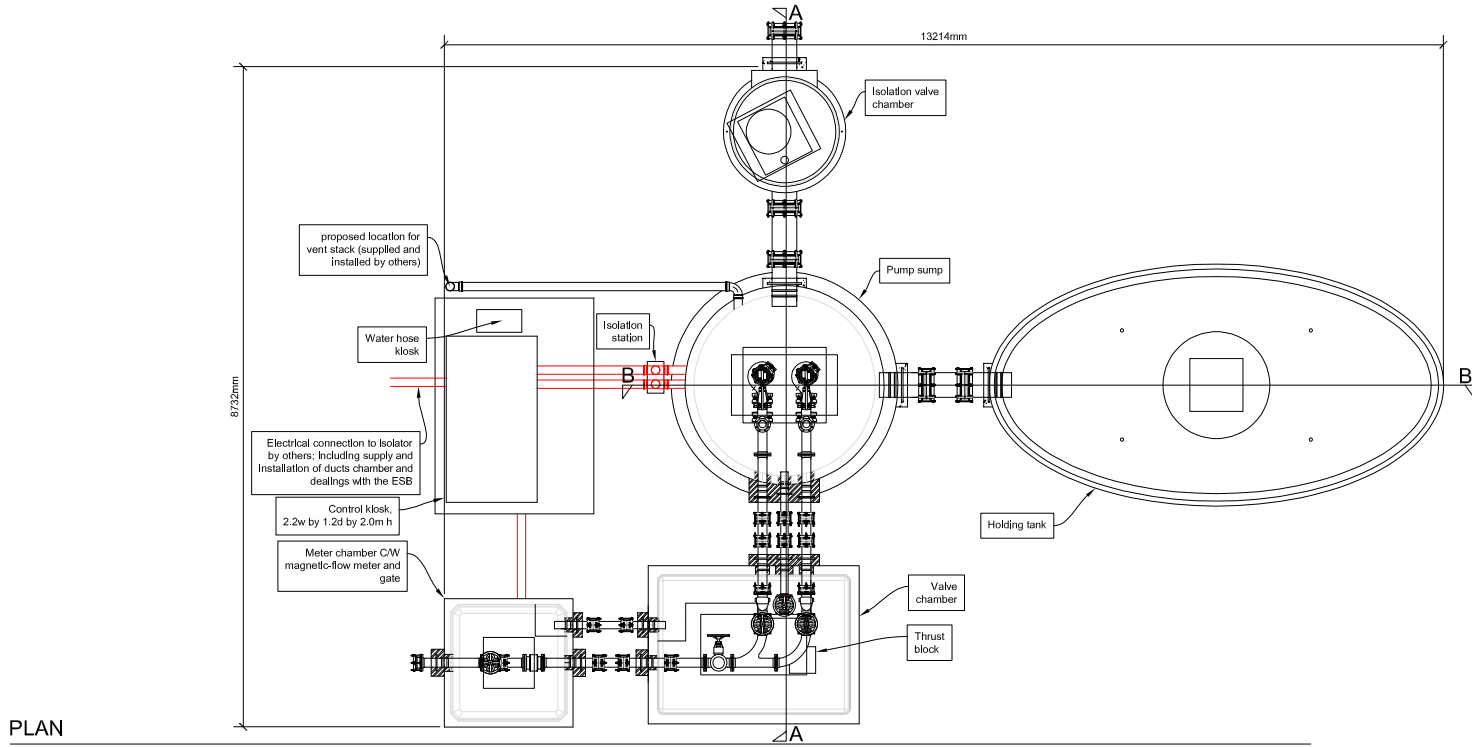


Tank lifting limitations:
Max chain angle < 60°

< 60° > 60°

Damage caused by Incorrect lifting is the responsibility of others

- Notes:**
- Backfill around each precast concrete component shall be placed so that a 500mm width of Clause 808 material, compacted in 300mm layers is provided to ensure adequate support beneath any structures or structural surrounds.
 - Free draining granular material, 500mm wide, shall be provided round the wet well close to ground level of the unit
 - Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time
 - Specify any specific requirements prior to ordering. All civil works by customer
 - Do not scale from this drawing. Only for illustration purposes



MOLLOY
ENVIRONMENTAL SYSTEMS

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T: 057 9326000 E: info@molloyprecast.com
F: 057 9326060 W: www.molloyprecast.com

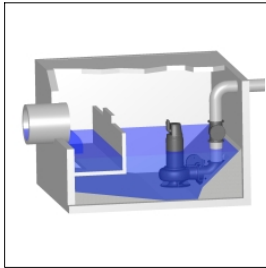
ISO 9001:2015
ISO 14001:2015
CIRI
ENGINEERS IRELAND

Title: Kilnap Houses proposed foul water pumping station

Drp. no.: MES3535 FPS_151223

Date: 15/12/2023

Drawn by: SF



Friction loss calculation

Pumped fluid Water, pure	Static head 10.1	Layout Wet well installation
Flow 6.37 l/s	Number of pumps 1	Calculation model Colebrook-White
Viscosity 1.569 mm ² /s	Nature of system Single head pump	

Type	Ø (mm)	? or L	Qty.	v (m/s)	k (mm)	ΔH (m)
------	-----------	--------	------	------------	-----------	-----------

Ø = Diameter v = Velocity k = Pipe roughness ΔH = Head loss

Common discharge side pipe - Metal / Ductile iron cement lining PN 16 / DN 100 (118x4x4 mm) / K factor for Wastewater acc. DWA-A110

Pipe length	102	14 m	1	0.7796	0.25	0.1167
Discharge Connection	102	0.3	1	0.7796		0.009292
Elbows	102	0.9	3	0.7796		0.02788
Inlet	102	1	1	0.7796		0.03097
Non-return valves	102	0.9	1	0.7796		0.02788
Outlet	102	1	1	0.7796		0.03097
T-piece	102	0.4	1	0.7796		0.01239
Valve	102	0.3	1	0.7796		0.009292
Total friction head						0.2654

Common discharge side pipe - GB / HPPE (PE100) SDR17 / DN 110 (110) / K factor for Wastewater acc. DWA-A110

Pipe length	96.3	310 m	1	0.8746	0.25	3.467
Discharge Connection	96.3	0.3	1	0.8746		0.0117
Elbows	96.3	0.6	2	0.8746		0.02339
Inlet	96.3	1	1	0.8746		0.03898
Outlet	96.3	1	1	0.8746		0.03898
Valve	96.3	0.3	1	0.8746		0.0117
Total friction head						3.592

Friction loss head						3.857 m
Total static head						10.1 m
Total head						13.96 m

Project	Created by	Last update	12/15/2023
Block	Created on	12/15/2023	

NP 3102 MT 3~ Adaptive 460

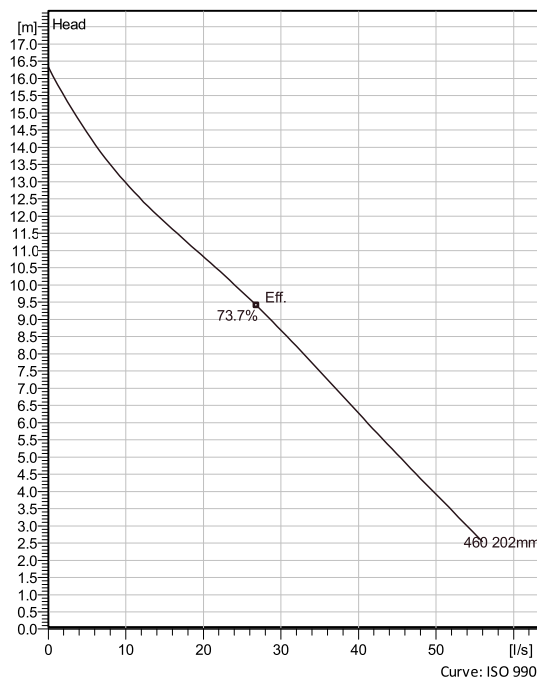
Patented self cleaning semi-open channel impeller, ideal for pumping in most waste water applications. Modular based design with high adaptation grade.



Technical specification



Curves according to: Water, pure Water, pure [100%], 4 °C, 999.9 kg/m³, 1.5692 mm²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Configuration

Motor number N3102.900 18-11-4AS-W IE3 3.5KW	Installation type P - Semi permanent, Wet
Impeller diameter 202 mm	Discharge diameter 100 mm

Pump information

Impeller diameter 202 mm
Discharge diameter 100 mm
Inlet diameter 100 mm
Maximum operating speed 1500 rpm
Number of blades 2

Max. fluid temperature
40 °C

Material

Impeller Grey cast iron
Stator housing material Grey cast iron

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NP 3102 MT 3~ Adaptive 460

Technical specification



Motor - General

Motor number N3102.900 18-11-4AS-W IE3 3.5KW	Phases 3~	Rated speed 1500 rpm	Rated power 3.5 kW
Approval No	Number of poles 4	Rated current 6.1 A	Stator variant 62
Frequency 50 Hz	Rated voltage 400 V	Insulation class H	Type of Duty S1
Version code 900			

Motor - Technical

Power factor - 1/1 Load 0.91	Motor efficiency - 1/1 Load 90.9 %	Total moment of inertia 0.0315 kg m ²	Starts per hour max. 30
Power factor - 3/4 Load 0.86	Motor efficiency - 3/4 Load 91.4 %	Starting current, direct starting 38 A	
Power factor - 1/2 Load 0.75	Motor efficiency - 1/2 Load 89.5 %	Starting current, star-delta 12.7 A	

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NP 3102 MT 3~ Adaptive 460

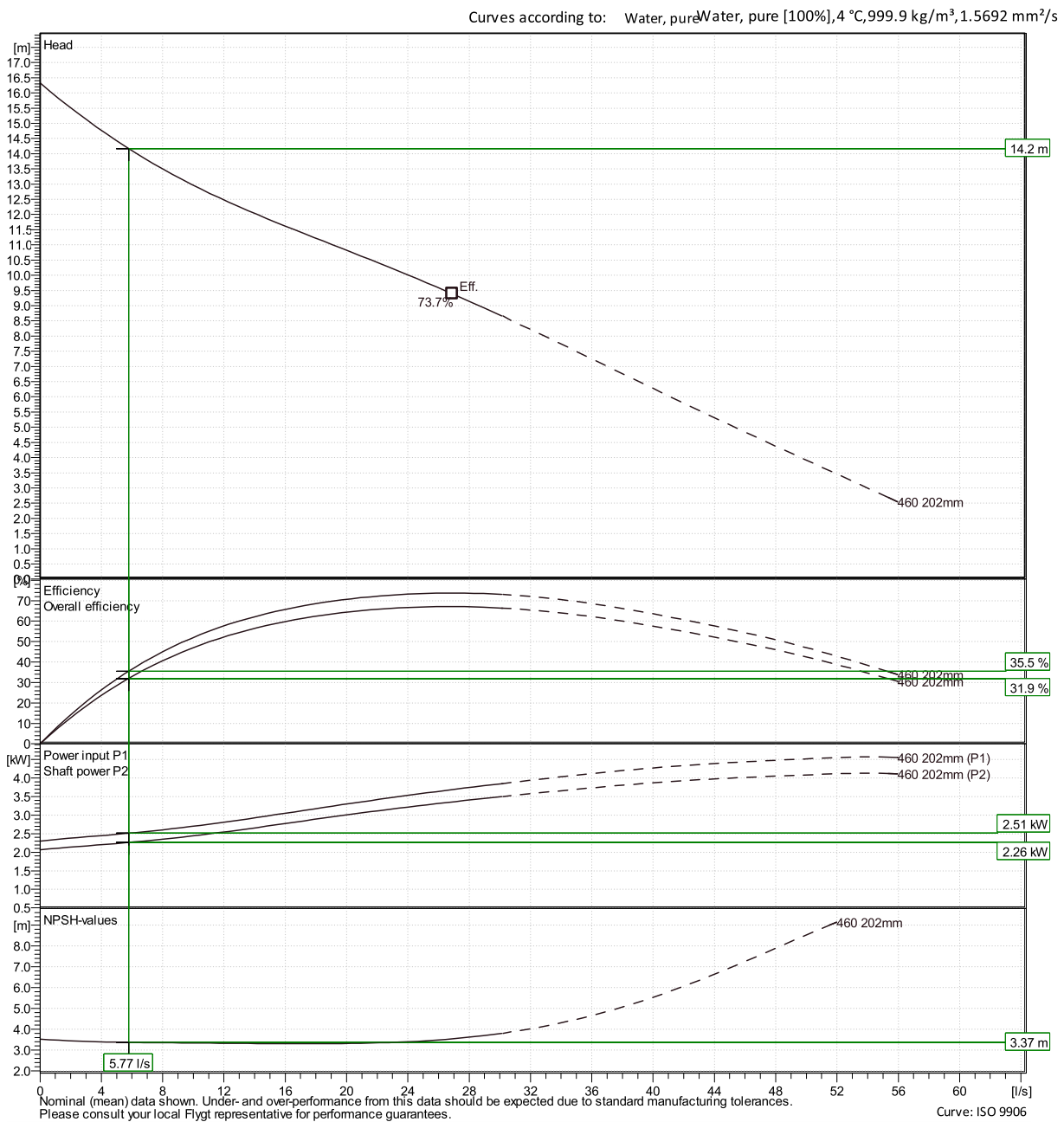
Performance curve



Duty point

Flow
5.77 l/s

Head
14.2 m



Xylect-21591198

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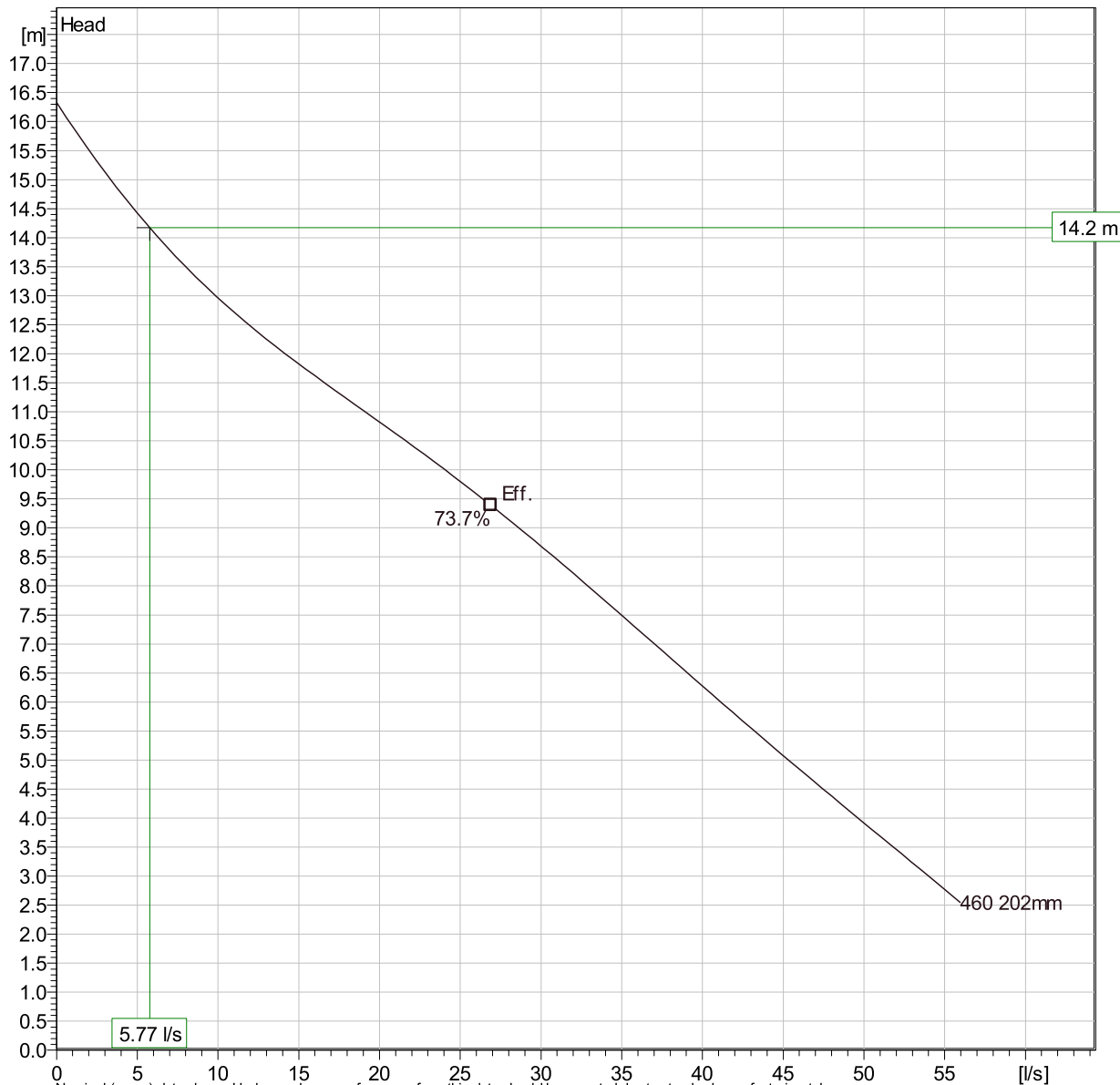
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NP 3102 MT 3~ Adaptive 460

Duty Analysis



Curves according to: Water, pure [100%] ; 4°C; 999.9kg/m³; 1.5692mm²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Operating characteristics

Pumps / Systems	Flow l/s	Head m	Shaft power kW	Flow l/s	Head m	Shaft power kW	Hydr.eff.	Spec. Energy kWh/m³	NPSHre m
1	5.77	14.2	2.26	5.77	14.2	2.26	35.5 %	0.121	3.37

Project

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Last update

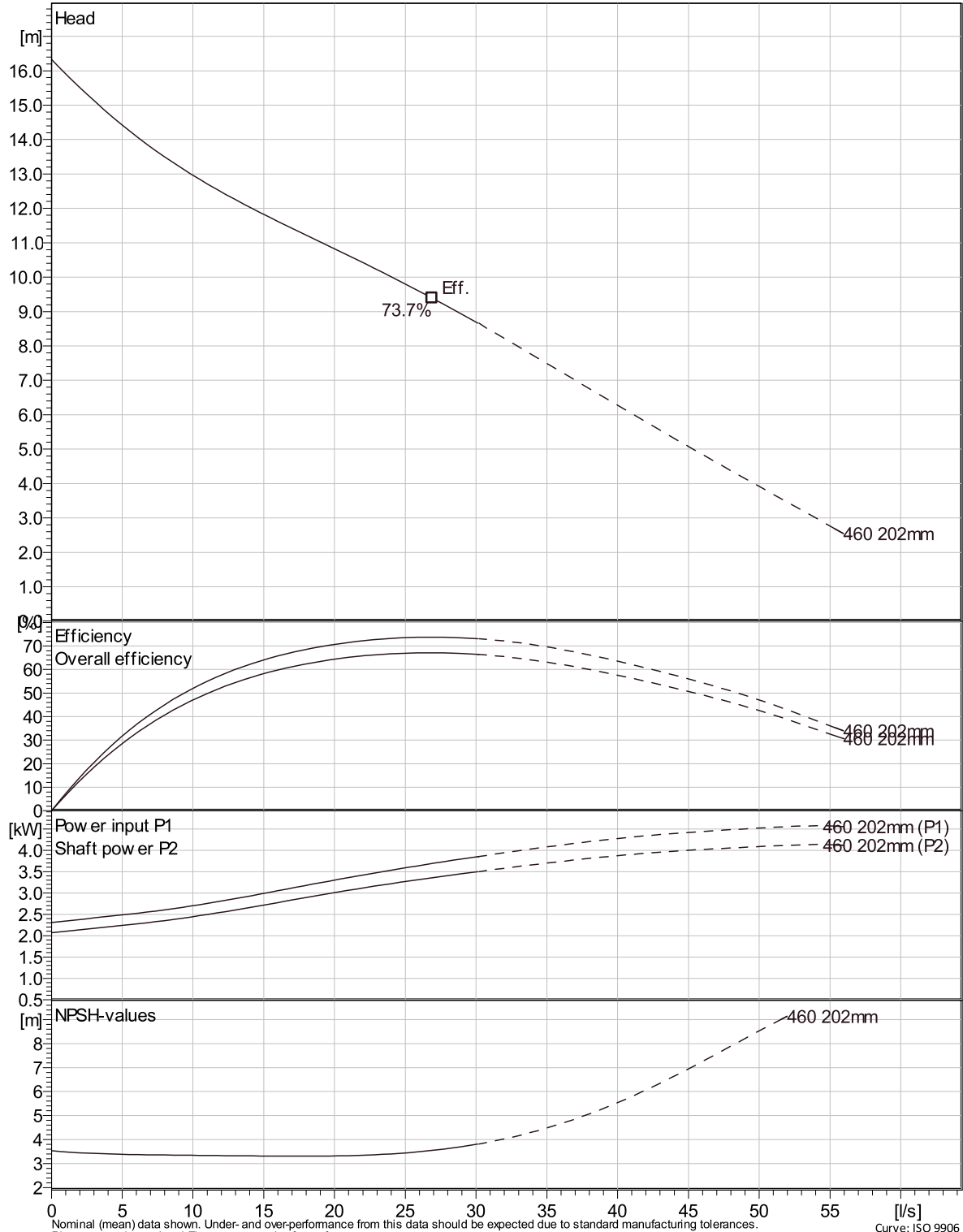
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NP 3102 MT 3~ Adaptive 460

VFD Curve



Curves according to: Water, pure, 4 °C, 999.9 kg/m³, 1.5692 mm²/s



Project Xylect-21591198

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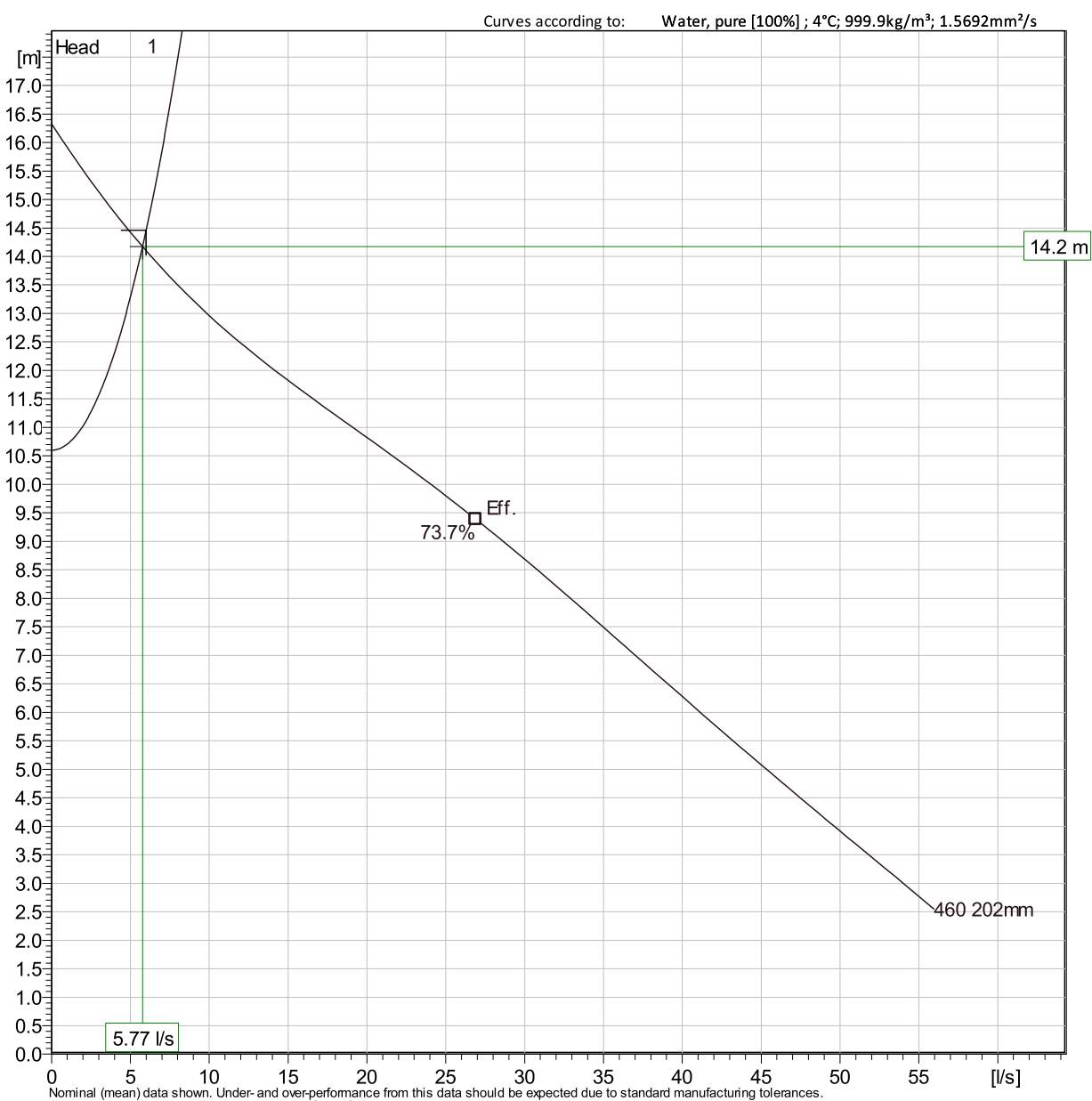
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NP 3102 MT 3~ Adaptive 460

VFD Analysis



Operating Characteristics

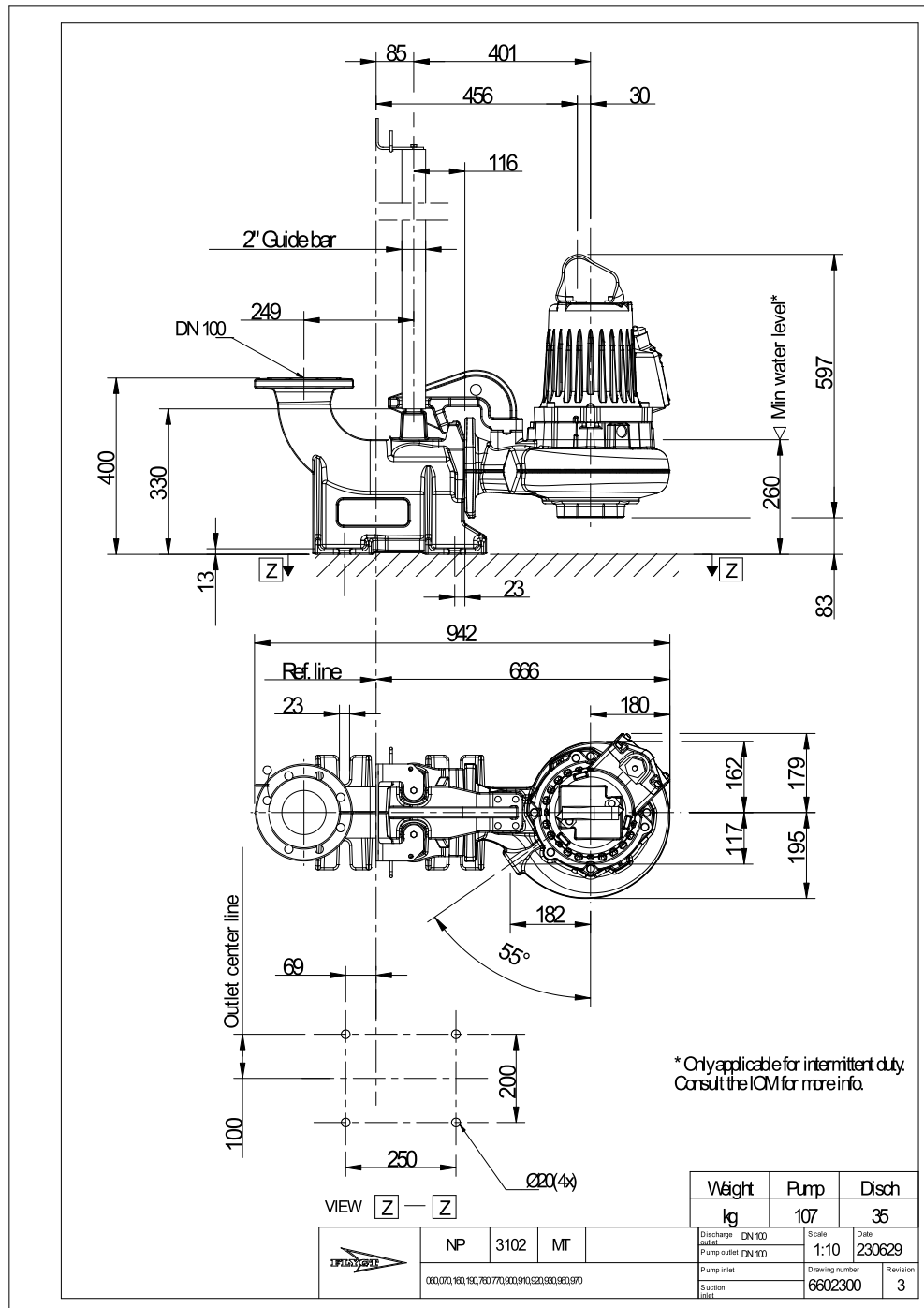
Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr. eff.	Specific energy	NPSHre
		l/s	m	kW	l/s	m	kW		kWh/m³	m
1	50 Hz	5.77	14.2	2.26	5.77	14.2	2.26	35.5 %	0.121	3.37

Project Xylect-21591198
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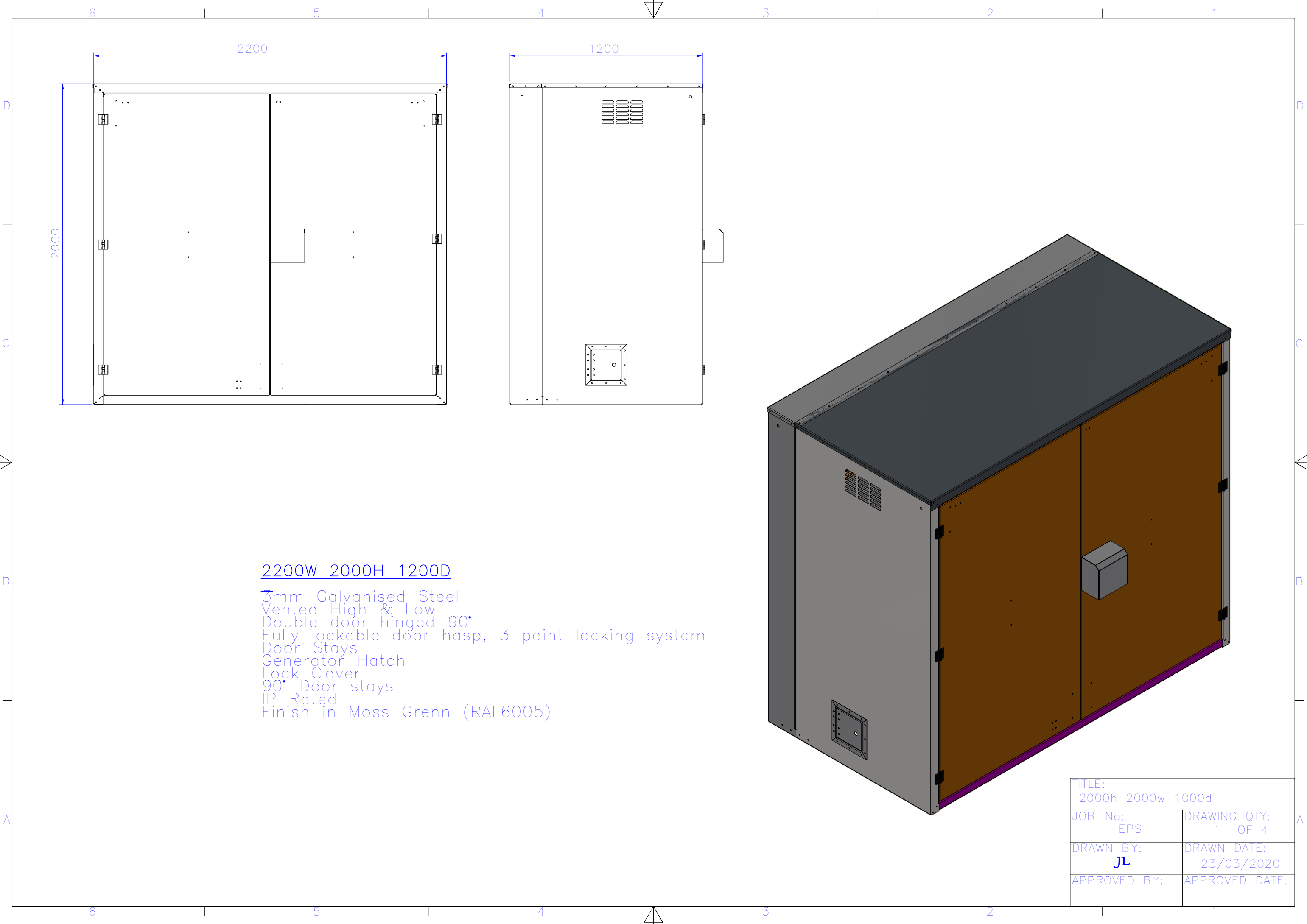
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Dimensional drawing



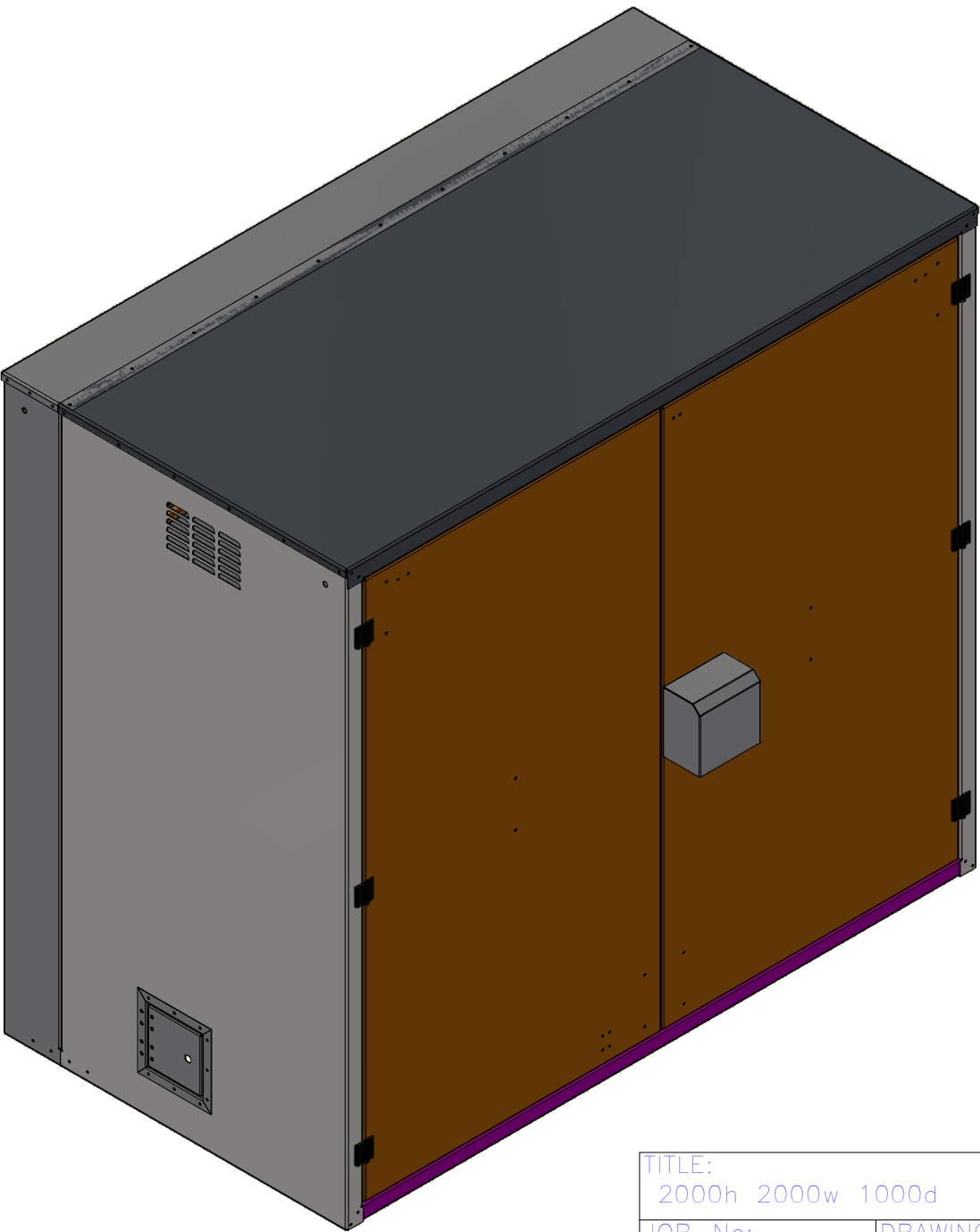
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2200W 2000H 1200D

- 3mm Galvanised Steel
- Vented High & Low
- Double door hinged 90°
- Fully lockable door hasp, 3 point locking system
- Door Stays
- Generator Hatch
- Lock Cover
- 90° Door stays
- IP Rated
- Finish in Moss Grenn (RAL6005)



TITLE: 2000h 2000w 1000d	
JOB No: EPS	DRAWING QTY: 1 OF 4
DRAWN BY: JL	DRAWN DATE: 23/03/2020
APPROVED BY:	APPROVED DATE:

Product Update



Ultra Lite

Features

- Level measurement
- Volume measurement including linearisation for tank shapes
- Advanced pump control
- Open Channel Flow
- 5 control/alarm relays plus 4-20mA output
- Solids or liquids level measurement
- Data logging option
- Wall or fascia mount
- easy installation, simple menu-driven setup
- RS232 standard with optional RS485 Modbus and Profibus
- DATEM echo processing
- AC or DC supply as standard
- No special interconnection cable
- Up to 1000m (3280ft) separation from transducer
- Use dB transducer family, 0 to 50m range
- Comprehensive LCD display
- Microprocessor and self diagnosis function unit

Ultra sophisticated and versatile non-contacting ultrasonic measurement and control

Pulsar's Ultra range has set the standard in non-contacting level and volume gauging, pump control and open channel flow measurement for many years, with thousands of installations world-wide. Ultra Lite includes Pulsar's unique DATEM echo processing algorithm for rock-solid performance, and incorporates a full suite of high-performance control, monitoring and measurement features.

Ultra Lite offers complete flexibility in ultrasonic control and measurement, being user-configurable via the intuitive and straightforward prompt-led ULTRA WIZARD menu system to measure level, volume or open channel flow, or provide advanced pump control.

There are five assignable relays for alarm, control or totalisation functions, with built-in alarm functions including: high and low level, in and out of band, rate of change and pump efficiency. Pump control functions include fixed and alternate duty, FOFO etc, plus advanced options such as pump run-on, storm control and pump exercising. Open Channel Flow is measured in simple exponential, flumes and thin-plate weirs, selected primary elements to BS3680, ISO 1438 and 4359. For volume measurement, Ultra Lite includes 12 pre-loaded tank shapes and the option of 32-point linearisation.

Ultra Lite introduces a new multi-function LCD display so, at a glance, level or flow measurement, a bar indication of percentage of maximum and relay states are easily visible.

Ultra Lite - the perfect choice for robust, reliable, in-depth control and monitoring, backed up by Pulsar's superb world-wide service.



UK CERTIFICATIONS



011
sira
ISO 9001:2008
Registered Company
Cert No. 950136-1



011
sira
ISO 14001:2004
Registered Company
Cert No. 072570-1



pulsar[®]
PROCESS MEASUREMENT

Ultra Lite:

Technical Information

• Relay Alarm Functions

- High/Low Level
- In band/out of band
- Rate of fill and empty
- High/Low temperature
- System fail (Loss of Echo)
- Pump efficiency
- Fill/empty control (initiate/stop)

• Pump Control Functions

- Fixed duty assist/backup
- Alternate duty assist/backup
- Duty backup and assist
- Service ratio duty/assist & duty/backup
- FOFO (first on, first off)
- Standby
- Pump by time

-2 pump sets (4 pumps total)

• Advanced Pump control functions

- Pump run-on
- Power on/off delay
- Pump start/stop delay
- Pump exercising
- Pump start variation
- Storm control feature
- Aeration control
- Flush valve control

• Open Channel Flow

- Simple exponential
- Selected primary elements to BS3680, ISO1438 & 4359
- Flumes: rectangular, u-throated
- Thin plate weirs: v-notch (standard, 60° and 90°, plus other types)

- Universal flow calculation (32 setpoints)

- Penstock control using step time

• Data logs

- Pump running, run-on hours
- Number of pump starts
- Maximum and minimum recorded temperatures
- Optional datalogging board for expanded logging capacity and Modbus or Profibus DP connectivity.

Pulsar Process Measurement Limited operates a policy of constant development and improvement and reserves the right to amend technical details as necessary

ULTRA LITE CONTROLLER

Accuracy:	0.2% of the maximum measured range
Resolution:	0.1% of the measured range or 1mm dependent on transducer
Range:	Depending upon transducer, from 125mm to 50m (0 to 2.5m dBMAH3 for open channel flow)
Volt free contacts:	5 form C (SPDT) 5A, 250V ac
Outside dimensions:	240 x 184 x 118mm (9.45" x 7.24" x 4.65")
Cable entry:	10 cable entries - 5 x M20, 1 x M16 underside, 4 x 18mm at rear
Weight:	Nominal 1kg (2.2lbs)
Case material:	Polycarbonate, flame resistant to UL94-5V
IP rating:	IP65
Temperature Compensation:	From all dB transducer internal temperature sensor or fixed temperature by menu input
Max and min temp. (electronics):	-20°C to +60°C
Flammable atmosphere approval:	Safe area: compatible with approved dB transducers (see transducer specification sheet)
CE Approval:	EMC approval to BS EN 50081-1:1992 for emissions and BS EN 50082-2:1995 for immunity, and to BS EN 61010-1:1993 for low voltage directive.
Echo processing:	Patented DATEM (Digital Adaptive Tracking of Echo Movement)
Analogue output:	Isolated output 4-20mA or 0-20mA into 750Ω (user programmable), 0.1% resolution
Serial output:	Full duplex RS232 via RJ11 port
Digital output (optional):	RS485 conn for Modbus with Profibus DP V0 or V1 options
Display:	Dedicated two-row 16 digit LCD display showing level or flowrate & totaliser at programmed scale, plus indication of percentage of maximum level and relay status. showing Temperature / mA / Date & Time / Echo Noise / Echo Strength by Hot keys
Data logging (optional):	Via RJ11 port has 256kb giving 1 year at 15 min intervals (uses PC Suite software)
Programming:	Integral keypad. Also PC Programming via RS232 (RJ11 port) or RS485
Programming security:	Via password (user selectable and adjustable)
Programmed data integrity:	Via non-volatile RAM, plus backup
Power supply:	85 - 264V ac, 50/60Hz, 22-28V dc
Transducer cable:	Three core screened, can be extended with 2 or 3 core screened
Maximum separation:	1000m (3280 feet) from transducer to control unit

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MODEL

MU

GENERAL DESCRIPTION

The ORBINOX model MU is a flush bottom 4 sided sealing penstock. The gates are suitable for different types of applications with a highly versatile flow control for waste water treatment plants, irrigation, hydraulic works and hydro-electric power plants.

From sizes 150 mm x 150 mm to 1200 mm x 1200 mm, the MU model has a unique self adjusting seal design that can achieve minimal equal seating and unseating (bidirectional) leakage rates. Sizes 1300 mm x 1300 mm up to 4000 mm x 4000 mm are available in both uni-directional (only suitable for seating water heads) and bi-directional configurations. The maximum leakage rate is lower than the maximum allowable recommended by DIN 19569-4 (class 5) and AWWA C561 under normal conditions.

ORBINOX also designs and manufactures the MU model penstock in larger sizes and for more demanding service conditions.

For more information please contact an ORBINOX representative.

DESIGN STANDARD

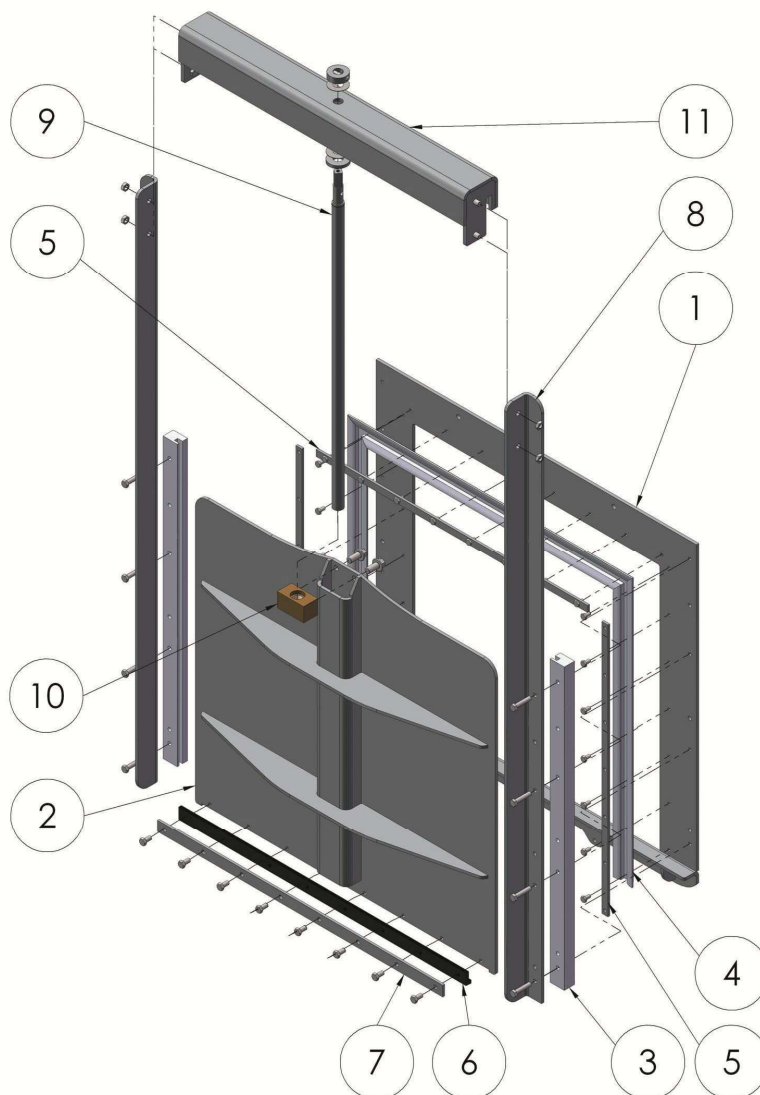
The MU penstock is manufactured in general accordance to DIN 19569-4. Other standards such as AWWA C561 and BS 7775 are also available.

The standard MU model is manufactured in stainless steel which has a higher corrosion resistance in many applications which results into a longer life cycle with little or no maintenance. Other materials of construction are available upon request, such as AISI 904L, Duplex stainless, etc.



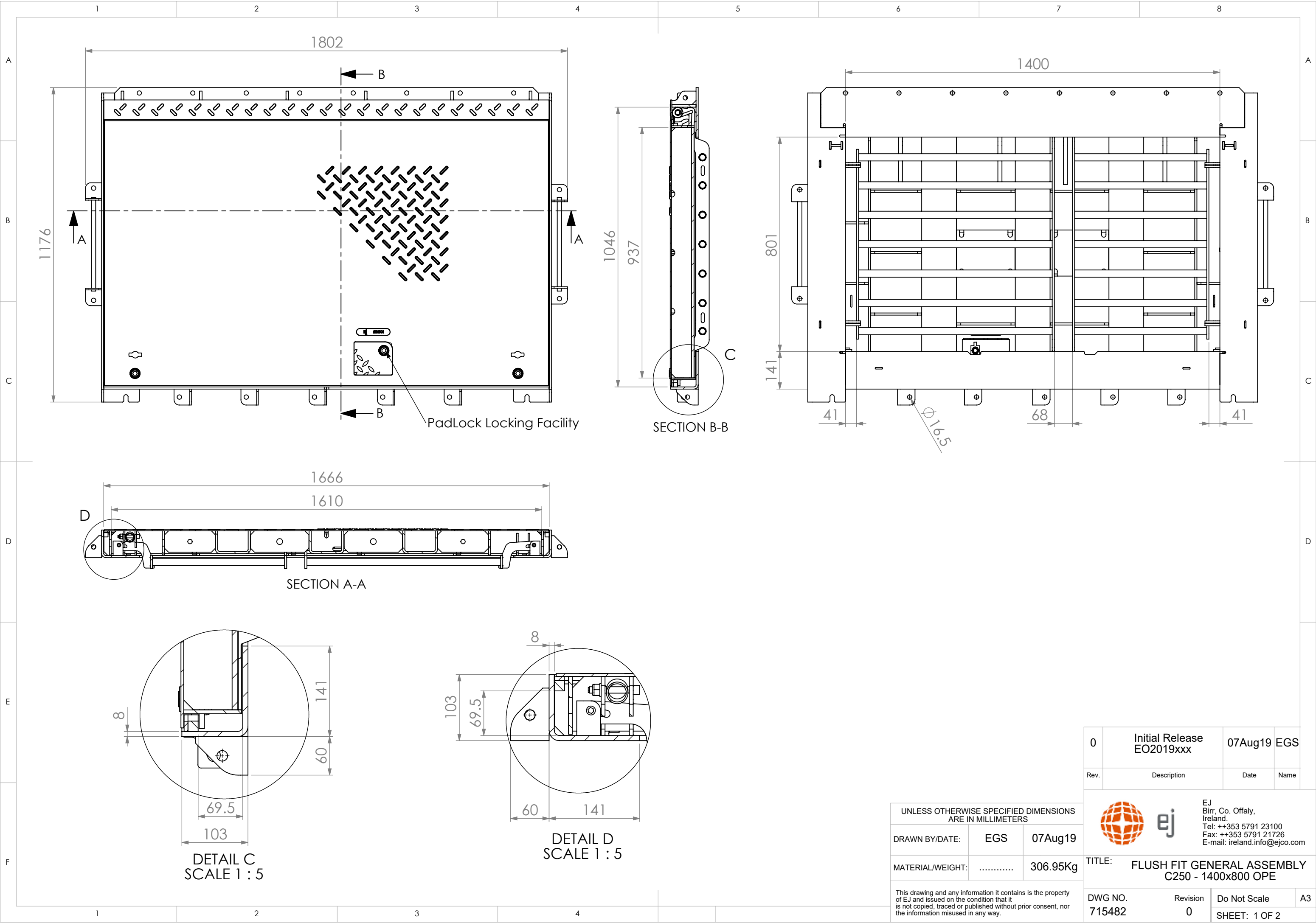
STANDARD MATERIALS OF CONSTRUCTION

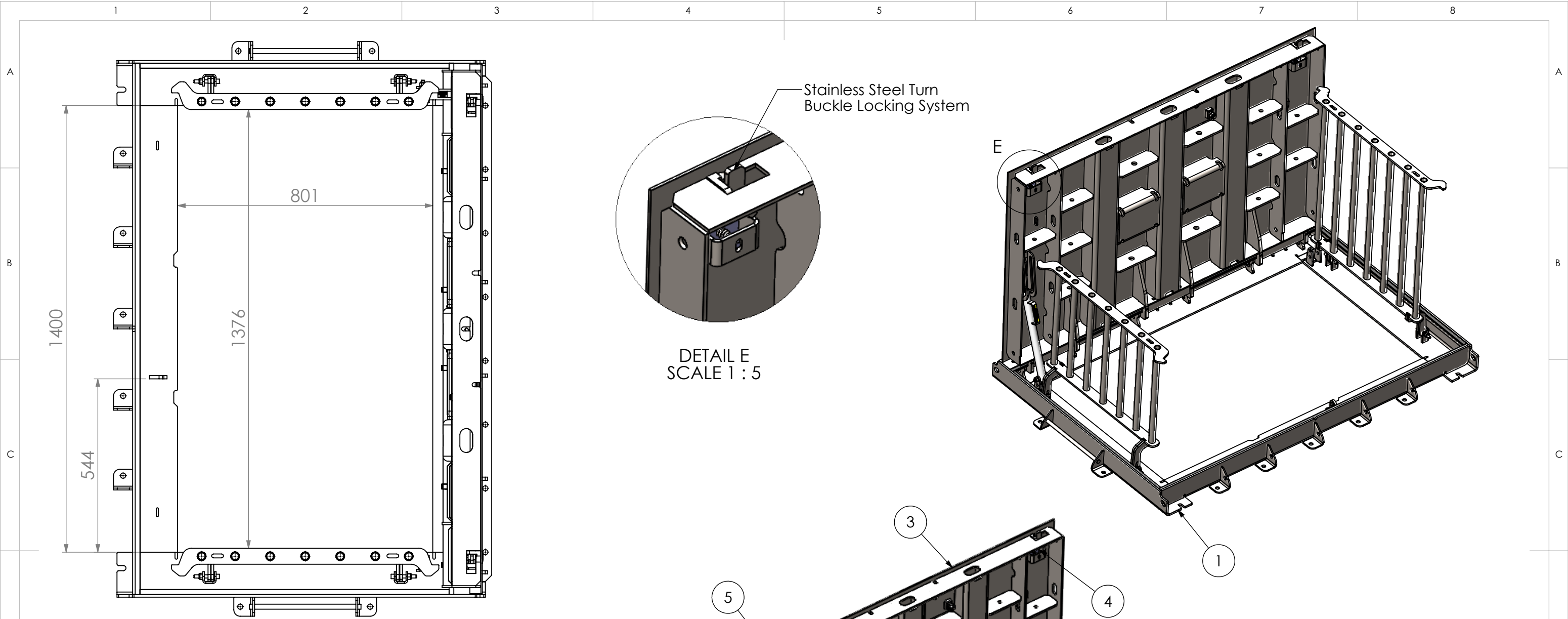
From 150 mm x 150 mm to 1200 mm x 1200 mm



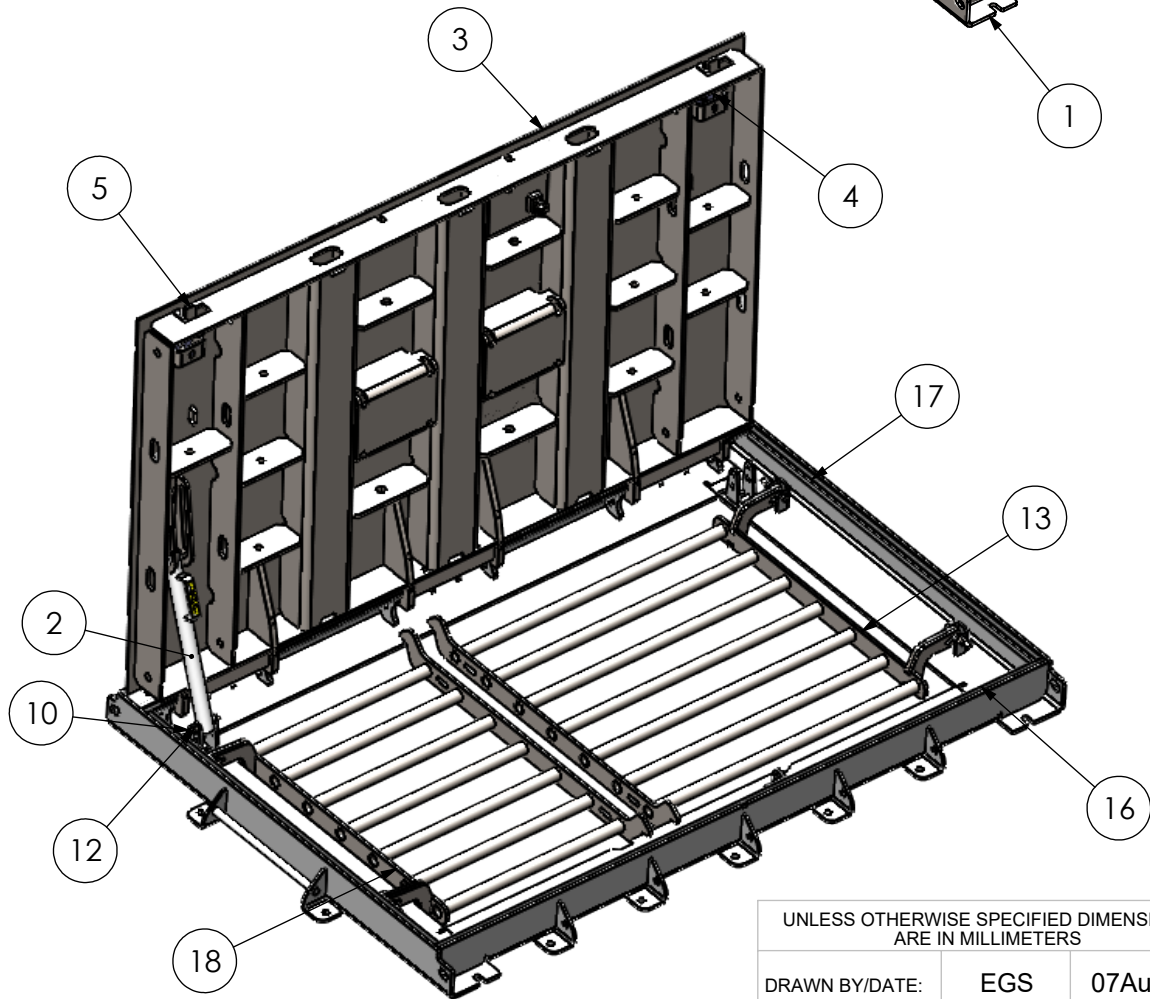
ITEM	DESCRIPTION	MATERIAL (standard)
1	Frame	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
2	Slide	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
3	Guides	High Molecular Weight Polyethylene (HMWPE)
4	Seal	EPDM
5	Seal Retainer	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
6	Bottom Seal	EPDM
7	Bottom Seal Retainer	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
8	Frame Guide	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
9	Stem	Stainless Steel
10	Stem Nut	Bronze
11	Yoke	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)

NOTE: For materials other than the above, please consult an ORBINOX representative





ITEM NO.	PART NUMBER	DESCRIPTION	covers open/QTY.
1	715482-001_0	Fabricated Frame	1
2	711470-350	Stay Bar Assembly	1
3	715482-035_0	Fabricated Cover	1
4	CA 740-0020	BS Keyway blanking plate assembly	2
5	712431_0	Stainless Turnbuckle Cam	2
6	M16_Nylon	Nylon Washer	2
7	shcs_SS_M16_065	M16 Socket Head Cap Screw	2
8	M16_SS_half	M16 Stainless Half Nut	4
9	CA 270-0018	Turn Buckle Plate	1
10	shcs_SS_M10_070	Socket Head Cap Screw	5
11	M10_SS_Flat	M10 Stainless Steel Flat washer	1
12	M10_SS_Nyloc	M10 Stainless Nyloc	5
13	715482-020_0	Safety Grid	1
14	712654-003_1	spring assembly qty 3 springs	2
15	712654-003_1	spring assembly qty 3 springs	1
16	8115-15x6_1666	Odour Seal	2
17	8115-15x6_970	Odour Seal	2
18	715482-021_0	Safety Grid	1



UNLESS OTHERWISE SPECIFIED DIMENSIONS
ARE IN MILLIMETERS

DRAWN BY/DATE: EGS 07Aug19

MATERIAL/WEIGHT: 306.95Kg

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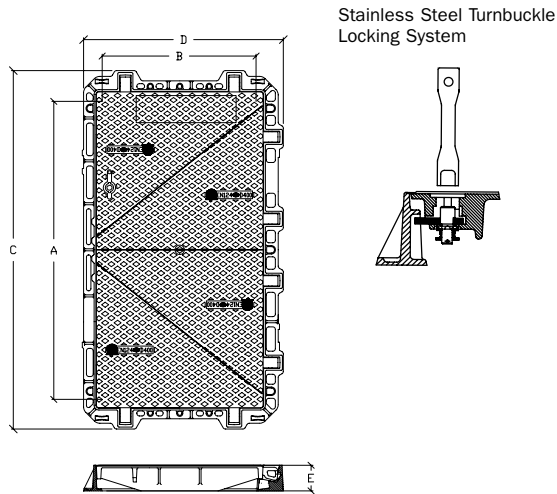
0	Initial Release EO2019xxx	07Aug19	EGS
Rev.	Description	Date	Name

 **ej**

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TITLE: FLUSH FIT GENERAL ASSEMBLY
C250 - 1400x800 OPE

DWG NO. 715482	Revision 0	Do Not Scale	A3
SHEET: 2 OF 2			



GROUP 4

Carriageways of roads, hard shoulders and parking areas, for all types of road vehicles



FEATURES

- Material - ductile iron cover and frame
- Double triangular (2 or 4) hinged covers with mono-block frame, welded frame on the 1200 x 600 and 1300 x 800 covers and frames
- Covers are prevented from closing by a restriction at the hinge
- Cover parts hinge back to 110° and lock at 90° which prevent it from freely closing
- Covers are removable from the frame vertically
- Non-rock covers by means of 3 point suspension
- Covers interlock with the last cover being locked by a stainless steel turnbuckle locking mechanism
- Opening effort < 30kN (except B0848)
- Can be opened by one operator
- Large access point to underground services
- Ergonomic friendly
- Used for the NDP regional broadband rollout



Weights and dimensions are subject to change and foundry tolerances

OPTIONS

- Customised cover markings e.g. company logo or local authority crest
- Unique locking and handling keys for specific requirements

TO SPECIFY

Multileaf Covers and Frame or similar approved to be manufactured in ductile iron and in compliance with EN124 D400. Overall dimension (C x D x E – refer to table)mm. Frame opening (A x B – refer to table)mm. Unit shall consist of hinged triangular covers that are locked into position when closed. When the covers are in the open position they should be prevented from freely closing by incorporating a restriction at the hinge. When the covers are in an open position clear access must be given to the frame opening from two adjacent sides of the frame. Unit shall be locked by means of a stainless steel turnbuckle locking mechanism. A third party test report showing compliance with the full requirements of EN124 shall be provided.

TECHNICAL DATA

Frame Opening (mm) A x B	Frame Overall (mm) C x D	Frame Height (mm) E	No. of Covers	Total Kg	Ref
600 x 450	745 x 600	100	2	73	B0822
600 x 600	745 x 770	100	2	85	B0818
1200 x 600	1400 x 780	100	4	162	B0841
800 x 700	945 x 872	100	2	130	B0846
900 x 600	1102 x 764	100	4	135	B0859
1060 x 700	1255 x 884	100	4	192	B0820.5
1200 x 750	1400 x 930	120	4	260	B0830
1300 x 800	1500 x 980	100	4	247	B0845
900 x 900	1084 x 1100	150	2	208	B0848

PRODUCT
STANDARD

EN124

LOADING
CLASS

D400

GROUP 4
INSTALLATION



HINGED

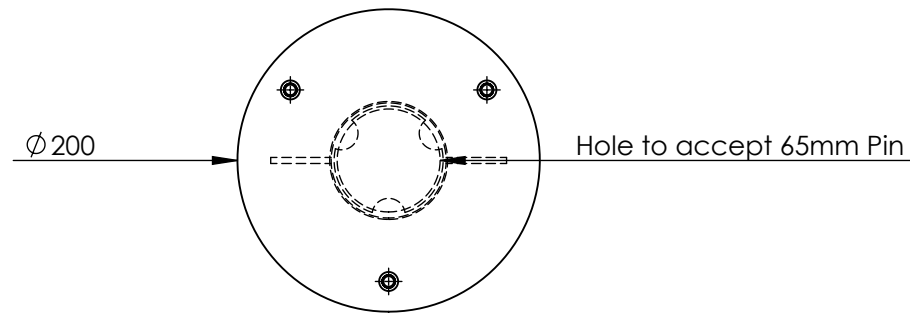


SECURITY

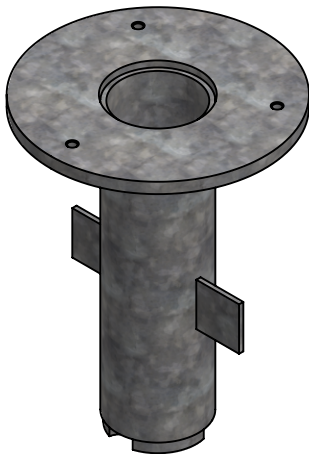


"500kg WLL Flush Mounted Davit Socket"

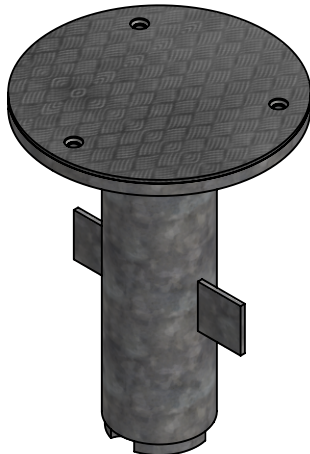
Finish Ref; Galvanised



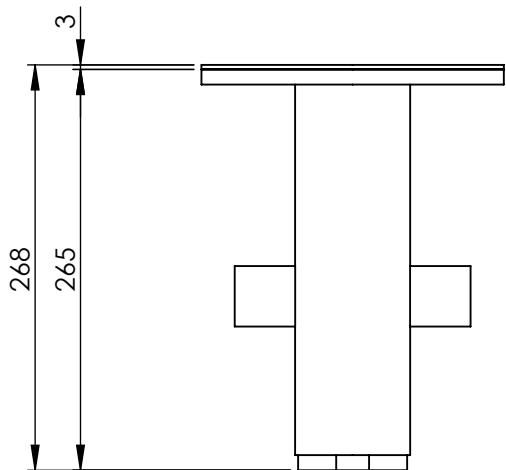
Plan View



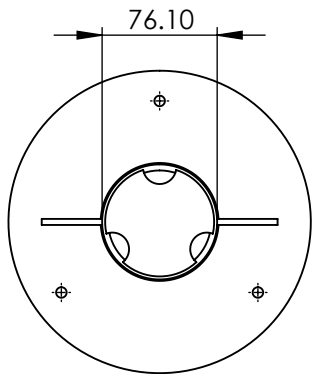
Isometric View
(Cover Plate Removed)



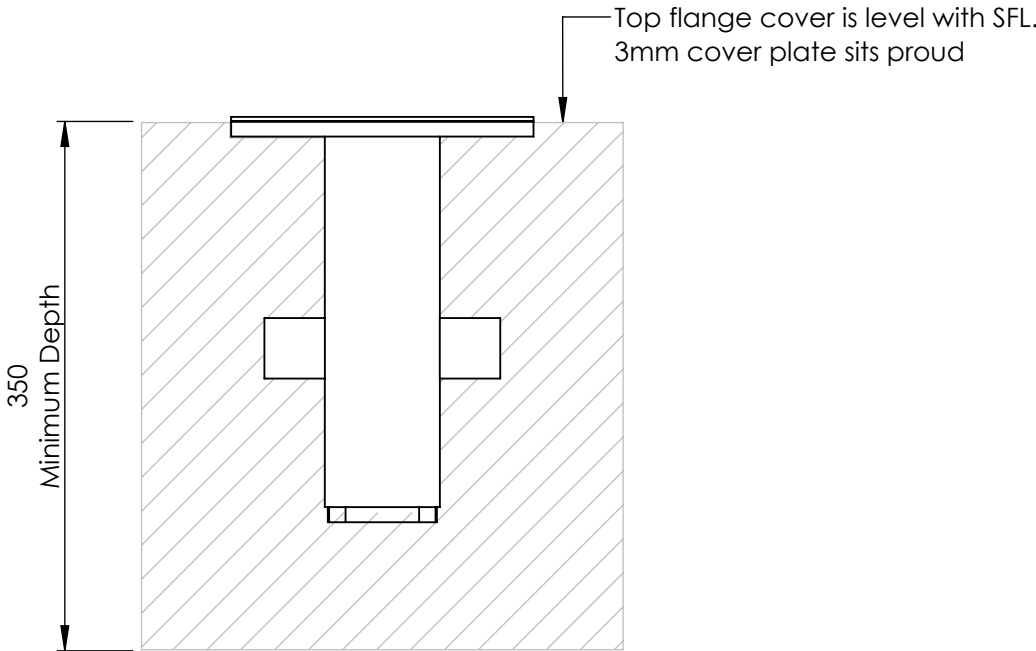
Isometric View



Front Elevation



Underside Elevation



General Notes / Revisions

Mild Steel construction with a galvanised finish to BSEN 1461

Supplied with cover plate

DRAWING APPROVAL

Drawing reviewed and approved ☐
Drawing reviewed with comments ☐
Drawing reviewed and rejected ☐

Name; _____

Signed; _____ Date; _____

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DO NOT SCALE OFF THIS DRAWING

Drawing No.	TAE-100-01		
Description	500kg WLL Davit Socket		
Revision	B		
Drawn By	C.Hannant		
Scale	1:5 @ A3	Sheet	1 of 1
Date	02/03/2020		

Client Information
Core Product
T Allen Engineering Services Ltd
Stonebroom
DE55 6LQ



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Unit 11 Stonebroom Industrial Estate
Stonebroom, Alfreton, DE55 6LQ
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E: engineering@t-allen.co.uk
www.t-allen.net

Resilient Seated Gate Valve, EcoValve

Zasuwa klinowa z miękkim uszczelnieniem, EcoValve

DN40 - DN300 (EPDM)

PN 10/16



Pressure tests

Water tests according to standard:
EN 1074-1, 2:2002
EN 12266-1:2012
- leak tightness 1,5 x PN
- seat tightness 1,1 x PN

Testy ciśnieniowe

Próby wodą zgodnie z normą:
PN-EN 1074-1, 2:2002
PN-EN 12266-1:2012
- wytrzymałość korpusu 1,5 x PN
- szczelność zamknięcia 1,1 x PN

Application

Drinking water, wastewater treatment plants and other non-aggressive media with temp. max 70 °C

Zastosowanie

Woda pitna, ścieki komunalne oczyszczone i inne nieagresywne media o temp. max 70°C

Technical Details

Face to Face in accordance to:
BS 5163 (EN 558-1 Series 3)
Maximum Working Pressure PFA:
16 bar / PN16
Working temperature:
Maximum +70°C
Construction complies to:
EN 1074-1&2, EN 1171
Certification:
WRAS, Hygienic Certificate PZH
Flange Type:
EN 1092-2 PN10 & PN16
Coating:
250 µm FBE coating, external and internal

Dane techniczne

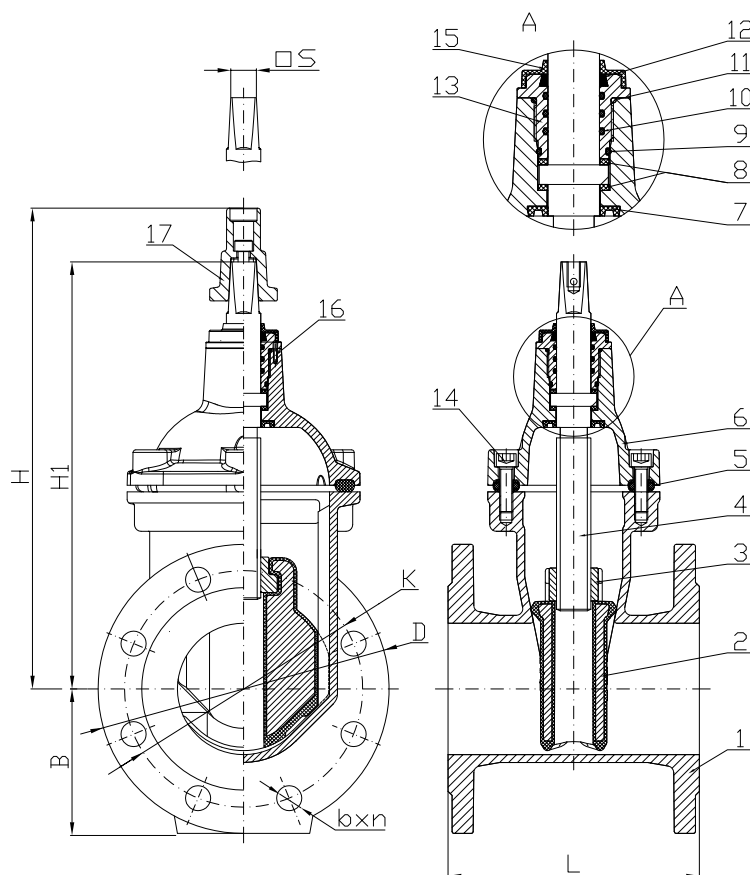
Długość zabudowy:
BS 5163 (EN 558-1 Series 3)
Dopuszczalne ciśnienie robocze PFA:
16 bar / PN16
Temperatura robocza:
Maksymalnie +70°C
Konstrukcja zgodna z:
PN-EN 1074-1&2, PN-EN 1171
Certyfikaty:
WRAS, Atest higieniczny PZH
Kołnierze:
PN-EN 1092-2 PN10 & PN16
Powłoka ochronna:
Farba epoksydowa nakładana elektrostycznie o min. grubości 250 µm

Design features

- Integral ductile iron wedge, fully EPDM encapsulated
- Superior stem packing with three O-rings and a dust seal
- Rugged construction of ductile iron with stainless steel stem SS316 and nut wedge made of aluminum bronze
- Special seal in the bonnet achieving perfect top seal when valve is full open.
- Integrated guide shoes on the Wedge

Cechy konstrukcyjne

- W pełni ogumowany (EPDM) klin pełno przelotowy z żeliwa sferoidalnego
- Trzy pierścienie uszczelniające na trzpieniu oraz uszczelka przeciwpływowa
- Wzmocniona konstrukcja z żeliwa sferoidalnego z trzpieniem ze stali nierdzewnej SS316 oraz nakrętką klina z brązu aluminiowego.
- Profilowane główne uszczelnienie zasuw
- Wkładki ślizgowe w klinie.



Notes: - Lifting eye-bolts standard from DN300

Uwagi: - Dla DN300 i powyżej – śruby z uchem dla ułatwienia transportu i montażu w standardzie

No	Part Name Nazwa części	Material Materiał
1	Body Korpus	Ductile Iron EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7
2	Wedge Klin	D.I., EPDM encapsulated EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7 guma EPDM
3	Wedge Nut Nakrętka klina	Aluminium-Bronze CuAl10Ni5Fe4 Brąz aluminiumowy CuAl10Ni5Fe4
4	Stem Trzpień	Stainless Steel X5CrNiMo17-12-2 / 1.4401 / 316 Stal nierdzewna X5CrNiMo17-12-2 / 1.4401 / 316
5	Bonnet Gasket Uszczelka pokryw	Elastomer EPDM Elastomer EPDM
6	Bonnet Pokrywa	Ductile Iron EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7
7	Main seal Profilowane uszczelnienie zasuw	Elastomer EPDM Elastomer EPDM
8	Bottom Washer Łożysko ślizgowe	Plastic PTFE Tworzywo sztuczne PTFE
9	Bush O-ring Seal Pierścień uszczelniający O-ring	Elastomer EPDM Elastomer EPDM
10	Stem O-ring Seal Pierścień uszczelniający O-ring	Elastomer EPDM Elastomer EPDM
11	O-ring Seal Pierścień uszczelniający O-ring	Elastomer EPDM Elastomer EPDM
12	Dust Seal Uszczelka czyszcząco-zgarniająca	Elastomer NBR Elastomer NBR
13	Gland Bush Wymienna tuleja uszczelniająca	H.T. dezincification resistant Brass Mosiądz odporny na odcynkowanie
14	Bonnet Screws Śruby pokryw	Stainless Steel X5CrNiMo17-12-2 / 1.4401 / 316 Stal nierdzewna X5CrNiMo17-12-2 / 1.4401 / 316
15	Bonnet Dust Seal Główna uszczelka przeciwpływowa	Elastomer NBR Elastomer NBR
16	Set Screw Śruba montażowa	Stainless Steel X5CrNiMo17-12-2 / 1.4401 / 316 Stal nierdzewna X5CrNiMo17-12-2 / 1.4401 / 316
17	Cap-Top Nasadka na trzpień	Ductile Iron EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7

Dimension (mm & kg)

Wymiary (mm & kg)

Group	DN	50	80	100	150	200	250	300
AW55	*PN16 CC	AD0892	AD0894	AD0895	AD0897	AD0898	AD0899	AD0900
	**PN16 ACC	AD0905	AD0907	AD0908	AD0910	AD0911	AD0912	AD0913
L		178	203	229	267	292	330	356
H1		218	277	325	395	482	572	662
H		264	319	367	437	552	642	732
B		75	95	102	134	165	196	225
K PN16		125	160	180	240	295	355	410
b x n PN16		19x4	19x8	19x8	23x8	23x12	27x12	27x12
D		165	200	220	285	340	405	460
Stem Top Square Kwadrat trzpienia □ S		14,3	17,3	19,3	19,3	24,3	27,3	27,3
Turns to open/close Liczba obrotów		6,5	8,5	10,5	15,5	17	21,5	25,5
Weight kg Waga kg		9,6	13,4	18,2	32,2	57,1	79	110,8

Notes:
- *Clockwise or **anti-clockwise to close

Uwagi:
- Zamykanie w *prawo lub w **lewo

Overview



The SITRANS F M MAG 5100 W is an electromagnetic flow sensor designed to meet ground water, drinking water, waste water, sewage or sludge applications.

Benefits

- DN 15 to DN 1200 / 2000 (½" to 48"/78")
- Stock program of MAG 5100 W secures short delivery time
- Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA, AS and JIS.
- NBR Hard Rubber and Ebonite Hard Rubber liner for all water applications
- EPDM liner with drinking water approvals
- Hastelloy integrated grounding and measuring electrodes
- Increased low flow accuracy for water leak detection, due to coned liner design (Article No. 7ME6520, DN 15 to 300 mm (½" to 12")).
- Drinking water approvals
- Suitable for direct burial and constant flooding
- Custody transfer approvals
- Build-in length according to ISO 13359; the standard includes sizes up to DN 400.
- Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings.
- Designed so patented in-situ verification can be conducted. Using SENSORPROM fingerprint.
- Custody Transfer option for water billing, with type approval after OIML R 49 and verified according to MI-001
 - pattern approval OIML R 49 (Denmark, Germany)
 - conforms to ISO 4064 and EN 14154 for mechanical flowmeters
 - PTB K7.2
- FM Fire Service Meter (Class Number 1044) for automatic fire protection systems
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges
- Simple onsite or factory upgrade to IP68/NEMA 6P of a standard sensor
- MCERTS approval for UK environmental market

Application

The main applications of the SITRANS F M electromagnetic flow sensors can be found in the following fields:

- Water abstraction
- Water treatment
- Water distribution network (leak detection management)
- Custody transfer water meters
- Irrigation
- Waste water treatment
- Filtration plant (e.g. reverse osmosis and ultra filtration)
- Industrial water applications

Mode of operation

The flow measuring principle is based on Faradays law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Integration

The complete flowmeter consists of a flow sensor and an associated transmitter SITRANS F M MAG 5000, MAG 6000 or MAG 6000 I.

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems, e.g. HART, DeviceNet, PROFIBUS DP and PA, FOUNDATION Fieldbus H1 or Modbus RTU/RS 485.

Technical specifications

Product characteristic	MAG 5100 W (7ME6520) Mainly for the European market EPDM or NBR lining	MAG 5100 W (7ME6580) Mainly for the non-European market Ebonite lining
Design and nominal size	Coned sensor: DN 15 ... 300 (½" ... 12") Full bore sensor: DN 350 ... 1200 (14" ... 48")	Full bore sensor: DN 25 ... 2000 (1" ... 78")
Measuring principle	Electromagnetic induction	Electromagnetic induction
Excitation frequency (Mains supply: 50/60 Hz)	DN 15 ... 65 (½" ... 2½"): 12.5 Hz/15 Hz DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz DN 200 ... 300 (8" ... 12"): 3.125 Hz/3.75 Hz DN 350 ... 1200 (14" ... 48"): 1.5625 Hz/1.875 Hz	DN 25 ... 65 (1" ... 2½"): 12.5 Hz/15 Hz DN 80 ... 150 (3" ... 6"): 6.25 Hz/7.5 Hz DN 200 ... 1200 (8" ... 48"): 3.125 Hz/3.75 Hz DN 1400 ... 2000 (54" ... 78"): 1.5625 Hz/1.875 Hz
Process connection		
Flanges ⁶⁾		
• EN 1092-1	PN 10 (145 psi): DN 200 ... 300 (8" ... 12") Flat face PN 10 (145 psi): DN 350 ... 1200 (14" ... 48") Raised face ¹⁾ PN 16 (232 psi): DN 50 ... 300 (2" ... 12") Flat face ²⁾ PN 16 (232 psi): DN 350 ... 1200 (14" ... 48") Raised face PN 40 (580 psi): DN 15 ... 40 (½" ... 1½") Flat face	Raised face ²⁾ (EN 1092-1, DIN 2501 and BS 4504 have the same mating dimensions) PN 6 (87 psi): DN 1400 ... 2000 (54" ... 78") PN 10 (145 psi): DN 200 ... 2000 (8" ... 78") PN 16 (232 psi): DN 65 ... 600 (2½" ... 24") PN 40 (580 psi): DN 25 ... 50 (1" ... 2")
• ANSI B16.5	Class 150: ½" ... 12" flat face; 14" ... 24" raised face	Class 150: 1" ... 24"; raised face
• AWWA C-207	Class D: 28" ... 48", flat face	Class D: 28" ... 78", flat face
• AS4087	PN 16 (DN 50 ... 1200), (2" ... 48") 16 bar (232 psi)	PN 16 (DN 50 ... 1200), (2" ... 48") 16 bar (232 psi)
• JIS B 2220:2004	-	K10 (1" ... 24")
Rated Operation conditions		
Ambient temperature		
• Sensor	-40 ... +70 °C (-40 ... +158 °F)	-20 ... +70 °C (-4 ... +158 °F)
• With compact transmitter MAG 5000/6000 ³⁾	-20 ... +60 °C (-4 ... +140 °F)	-20 ... +60 °C (-4 ... +140 °F)
Operating pressure (Abs) [abs. bar] (Maximum operating pressure depending on flange standard, decreases with increasing operating temperature)	DN 15 ... 40 (½" ... 1½"): 0.01 ... 40 bar (0.15 ... 580 psi) DN 50 ... 300 (2" ... 12"): 0.03 ... 20 bar (0.44 ... 290 psi) DN 350 ... 1200 (14" ... 48"): 0.01 ... 16 bar (0.15 ... 232 psi)	DN 25 ... 50 (1" ... 2"): 0.01 ... 40 bar (0.15 ... 580 psi) DN 65 ... 1200 (2½" ... 48"): 0.01 ... 16 bar (0.15 ... 232 psi) DN 1400 ... 2000 (54" ... 78"): 0.01 ... 10 bar (0.15 ... 145 psi)
Enclosure rating		
• Standard	IP67 to EN 60529/NEMA 4X/6 (1 mH ₂ O for 30 min)	IP67 to EN 60529/NEMA 4X/6 (1 mH ₂ O for 30 min)
• Option	IP68 to EN 60529/NEMA 6P (10 mH ₂ O continuously)	IP68 to EN 60529/NEMA 6P (10 mH ₂ O continuously)
Pressure drop	DN 15 and 25 (½" and 1"): Max. 20 mbar (0.29 psi) at 1 m/s (3 ft/s). DN 40 ... 300 (1½" ... 12"): Max 25 mbar (0.36 psi) at 3 m/s (10 ft/s) DN 350 ... 1200 (14" ... 48"): Insignificant	Insignificant
Test pressure	1.5 x PN (where applicable) FM Fire Service: 2 x PN	1.5 x PN (where applicable)
Mechanical load (vibration)	18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 Sensor: 3.17 grms Sensor with compact MAG 5000/6000 mounted transmitter: 3.17 grms Sensor with compact MAG 6000 I mounted transmitter: 1.14 grms	18 ... 1000 Hz random in x, y, z, directions for 2 hours according to EN 60068-2-36 Sensor: 3.17 grms Sensor with compact MAG 5000/6000 mounted transmitter: 3.17 grms Sensor with compact MAG 6000 I mounted transmitter: 1.14 grms

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

Product characteristic	Mainly for the European market (7ME6520)	Mainly for the non-European market (7ME6580)
	EPDM or NBR lining	Ebonite lining
<u>Medium conditions</u>		
Temperature of medium		
• NBR	-10 ... +70 °C (14 ... 158 °F)	-
• EPDM	-10 ... +70 °C (14 ... 158 °F)	-
• EPDM/NBR (MI-001)	0.1 ... 30 °C (32 ... 76 °F)	-
• Ebonite	-	-10 ... +70 °C (14 ... 158 °F)
EMC	2004/108/EC	2004/108/EC
Design		
Material		
• Housing and flanges	Carbon steel ASTM A 105, with corrosion-resistant two-component epoxy coating (min. 150 µm) Corrosivity category C4, according to ISO 12944-2	Carbon steel ASTM A 105, with corrosion-resistant two-component epoxy coating (min. 150 µm) Corrosivity category C4, according to ISO 12944-2
• Measuring pipe	Stainless steel AISI 304/1.4301	Stainless steel AISI 304/1.4301
• Electrode	Hastelloy C	Hastelloy C
• Grounding electrode	Hastelloy C	Hastelloy C
• Terminal box	Fibre glass reinforced polyamide	Fibre glass reinforced polyamide
Certificates and approvals		
Calibration		
• Standard production calibration, calibration report shipped with sensor	Zero-point, 2 x 25 % and 2 x 90 % (default)	Zero-point, 2 x 25 % and 2 x 90 % (default)
Custody Transfer (only together with MAG 6000 CT)	OIML R 49 pattern approval cold water (Denmark and Germany): DN 50 ... 300 (2" ... 12") MI-001 cold water (EU): DN 50 ... 300 (2" ... 12") PTB K7.2: Chilled water energy metering DN 50-300 (order as special) Certificate number: 22 76.10 02	
Drinking water approvals	EPDM liner: NSF/ANSI Standard 61 ⁵⁾ (Cold water, US) WRAS (WRc, BS6920 cold water, GB) ACS (F), DVGW W270 (D) Belgaqua (B)	NSF/ANSI Standard 61 ⁵⁾ (Cold water, US) WRAS (WRc, BS6920 cold water, GB)
Other approvals	MCERTS PED conforming: All EN1092-1 flanges and ANSI Class 150 (< DN 300 (< 12")) – 97/23/EC ⁴⁾ CRN (DN 50 - DN 1200 (2" ... 48")) CSA Class I, Div 2 FM Class I, Div 2 FM Fire Service Approval according to class 1044 ⁷⁾ VdS: Extinguishing systems DN 50 ... 300	PED conforming: All EN1092-1 flanges (< DN 600 (< 24")) – 97/23/EC ⁴⁾ CRN CSA Class I, Div 2 FM Class I, Div 2

¹⁾ Type 01 (SORF)

²⁾ DN ≤ 600 type 01 (SORF); DN > 600 type 11

³⁾ With compact transmitter MAG 5000 CT/6000 CT -20 ... +50 °C (-4 ... +122 °F); with compact MI-001 approved transmitter -25 ... +55 °C (-13 ... +131 °F)

⁴⁾ For sizes larger than 600 mm (24") in PN 16 PED conformity is available as a cost-added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval. All products sold outside of EU and EFTA are excluded from the directive, also products sold into certain market sectors are excluded. These include:

a) Meters used in networks for the supply, distribution and discharge of water.

b) Meters used in pipelines for the conveyance of any fluid from offshore to onshore.

c) Meters used in the extraction of petroleum or gas, including Christmas tree and manifold equipment.

d) Any meter mounted on a ship or mobile offshore platform. For further information on the PED standard and requirements see page 9/6.

⁵⁾ Including Annex G

⁶⁾ DN 750, DN 1050 and DN 1100 (30", 42" and 44") not available with EN 1092-1 (PN 10 and PN 16) and AS4087 flanges

⁷⁾ DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

MAG 5100 W (7ME6520) with MAG 6000 CT (Revenue program) MI-001

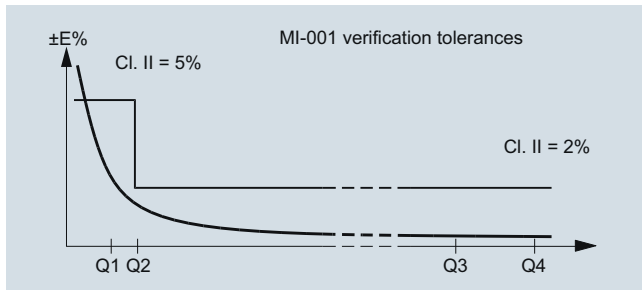
MAG 5100 W CT program is type approved according to international water meter standard OIML R 49. Since the first November 2006 the MI-001 water meter directive is in force, which means that all water meters can be sold across the EU borders if the water meters contain a MI-001 label.

The MAG 5100 W MI-001 verified and labeled products are a Class II approval according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-001 in the sizes from DN 50 to DN 300 (Article No. 7ME6520).

The MID certification is obtained as a modul B + D module approval according to the above mentioned directive.

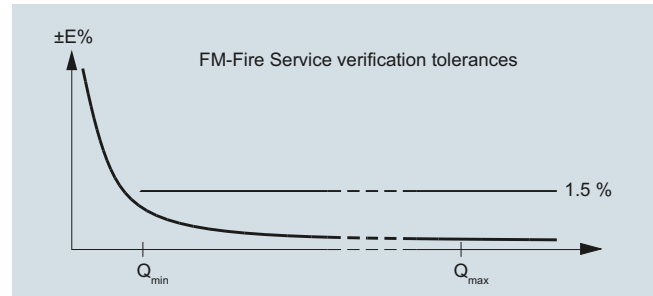
Module B : Type approval according to OIML R 49

Module D : Quality insurance approval of production



MAG 5100 W (7ME6520) with MAG 5000/MAG 6000 or MAG 6000 CT for Fire Service applications

MAG 5100 W (7ME6520) is FM Fire Service approved for automatic fire protection systems. The approval is applicable for the sizes DN 50, DN 80, DN 100, DN 150, DN 200, DN 250 and DN 300 (2", 3", 4", 6", 8", 10" and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

MAG 5100 W (7ME6520) MI-001 verified and labeled products at a given Q3 and Q3/Q4 = 1.25 and Q2/Q1 = 1.6 measuring ranges see table below:

Order code: P11	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
„R“ Q3/Q1	25	25	25	25	25	25	25	25	25
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	787.5
Q3 [m³/h]	16	25	40	63	100	160	250	400	630
Q2 [m³/h]	1.02	1.6	2.6	4.03	6.4	10.24	16	25.6	40.32
Q1 [m³/h]	0.64	1.00	1.60	2.52	4.0	6.4	10.0	16.0	25.2

Order code: P12	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
„R“ Q3/Q1	63	63	63	63	63	63	63	63	63
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	787.5
Q3 [m³/h]	16	25	40	63	100	160	250	400	630
Q2 [m³/h]	0.41	0.63	1.02	1.6	2.54	4.06	6.35	10.2	16.0
Q1 [m³/h]	0.25	0.40	0.63	1.00	1.59	2.54	3.97	6.35	10.0

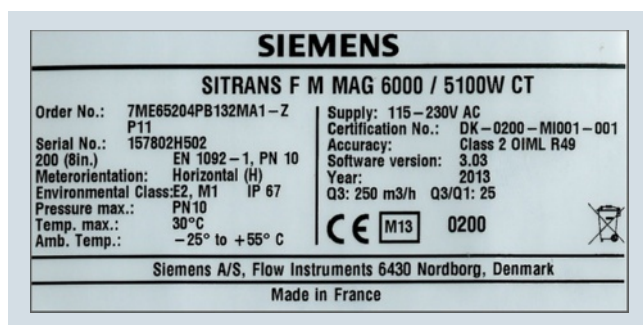
Order code: P13	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
„R“ Q3/Q1	80	80	80	80	80	80	80	80	80
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	787.5
Q3 [m³/h]	16	25	40	63	100	160	250	400	630
Q2 [m³/h]	0.32	0.50	0.80	1.20	2.00	3.20	5.0	8.0	12.6
Q1 [m³/h]	0.20	0.31	0.50	0.75	1.25	2.00	3.13	5.0	7.90

Order code: P16	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
„R“ Q3/Q1	160	160	160	160	160	160	160	160	160
Q4 [m³/h]	50	78.75	125	200	312.5	500	787.5	1250	2000
Q3 [m³/h]	40	63	100	160	250	400	630	1000	1600
Q2 [m³/h]	0.40	0.63	1.00	1.60	2.50	4.00	6.3	10.0	16.0
Q1 [m³/h]	0.25	0.39	0.63	1.00	1.56	2.50	3.94	6.3	10.0

Order code: P17	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
„R“ Q3/Q1	200	200	200	200	200	200	200	200	200
Q4 [m³/h]	50	78.75	125	200	312.5	500	787.5	1250	2000
Q3 [m³/h]	40	63	100	160	250	400	630	1000	1600
Q2 [m³/h]	0.32	0.50	0.80	1.28	2.00	3.20	5.0	8.0	12.8
Q1 [m³/h]	0.20	0.32	0.50	0.80	1.25	2.00	3.15	5.0	8.0

Order code: P18	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")
„R“ Q3/Q1	250	250	250	250	250	250	250	250	250
Q4 [m³/h]	50	78.75	125	200	312.5	500	787.5	1250	2000
Q3 [m³/h]	40	63	100	160	250	400	630	1000	1600
Q2 [m³/h]	0.26	0.40	0.64	1.02	1.60	2.56	4.0	6.4	10.24
Q1 [m³/h]	0.16	0.25	0.40	0.64	1.00	1.60	2.52	4.0	6.4

The Label is placed on the side of the encapsulation. An example of the product label is shown below:



OIML R 49/MI-001 approvals valid for:

- DN 50 to 300 mm (2" to 12")
- Horizontal installation
- Compact or remote with max. 3 m cable
- Power supply 115/230 V AC

Other restrictions may apply (see certificate).

Special OIML / MI-001 settings:

- Unit: m³
- Qmax: Q3
- CutOff: 0.1 %
- Digital output: Frequency

For other factory settings, see Operating Instructions.

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

Selection and Ordering data	Article No.
Sensor SITRANS F M MAG 5100 W	7 ME 6 5 2 0 -
Hastelloy electrodes, carbon steel flanges, EU water markets and low flow applications	
Diameter	
DN 15 (½")	1 V
DN 25 (1")	2 D
DN 40 (1½")	2 R
DN 50 (2")	2 Y
DN 65 (2½")	3 F
DN 80 (3")	3 M
DN 100 (4")	3 T
DN 125 (5")	4 B
DN 150 (6")	4 H
DN 200 (8")	4 P
DN 250 (10")	4 V
DN 300 (12")	5 D
DN 350 (14")	5 K
DN 400 (16")	5 R
DN 450 (18")	5 Y
DN 500 (20")	6 F
DN 600 (24")	6 P
DN 700 (28")	6 Y
DN 750 (30")	7 D
DN 800 (32")	7 H
DN 900 (36")	7 M
DN 1000 (40")	7 R
(42")	7 U
(44")	7 V
DN 1200 (48")	8 B
Flange norm and pressure rating	
to <u>EN 1092-1</u>	
PN 10 (DN 200 ... 1200/8" ... 48")	B
PN 16 (DN 50 ... 1200/2" ... 48")	C
PN 16, non PED (DN 700 ... 1200/28" ... 48")	D
PN 40 (DN 15 ... 40/½" ... 1½")	F
to <u>ANSI B16.5</u>	
class 150 (½" ... 24")	J
to <u>AWWA C-207</u>	
Class D (28" ... 48")	L
to <u>AS 4087</u>	
PN 16 (DN 50 ... 1200/2" ... 48")	N
Liner material	
EPDM	2
NBR Hard Rubber	3
Transmitter	
Sensor for remote transmitter (Order transmitter separately)	A
MAG 6000 I, Aluminum, 18 ... 90 V DC, 115 ... 230 V AC	C
MAG 6000, Polyamid, 11 ... 30 V DC/11 ... 24 V AC	H
MAG 6000, Polyamid, 115 ... 230 V AC	J
MAG 5000, Polyamid, 11 ... 30 V DC/11 ... 24 V AC	K
MAG 5000, Polyamid, 115 ... 230 V AC	L
MAG 6000 CT, Polyamid, 115 ... 230 V AC	M

Selection and Ordering data	Article No.
Sensor SITRANS F M MAG 5100 W	7 ME 6 5 2 0 -
Hastelloy electrodes, carbon steel flanges, EU water markets and low flow applications	
Communication	
None	A
HART	B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	F
PROFIBUS DP Profile 3 (only MAG 6000/MAG 6000 I)	G
Modbus RTU/RS 485 (only MAG 6000/MAG 6000 I)	E
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	J
Cable glands/terminal box	
Metric/Polyamid terminal box or 6000 I compact	1
½" NPT/Polyamid terminal box or 6000 I compact	2

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

Selection and Ordering data	Order code
Additional information	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	C14
Factory certificate according to EN 10204-2.1	C15
FP2E marking (only France)	C17
Approval/Verification ²⁾ (MI-001 : DN 50-300 compact, EN 1092-1 PN10 and PN16 flanges with MAG 6000 CT) ³⁾	
• Without verification according to OIML R 49	P10
• MI-001 Q3/Q1 = 25	P11
• MI-001 Q3/Q1 = 63	P12
• MI-001 Q3/Q1 = 80	P13
• MI-001 Q3/Q1 = 160	P16
• MI-001 Q3/Q1 = 200	P17
• MI-001 Q3/Q1 = 250	P18
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)	
• DN 50, DN 80 and DN 100 (2", 3" and 4")	P20
• DN 150 and DN 200 (6" and 8")	P21
• DN 250 and DN 300 (10" and 12")	P22
Tag name plate, stainless steel fixed with SS wire (add plain text)	Y17
Tag name plate, plastic (self-adhesive)	Y18
Customer-specific converter setup	Y20
Sensor cables wired (specify cable Article No.)	Y40
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable Article No.)	Y41
Other postproduction requirements (add desired text)	Y99
Additional Calibrations	
Accredited Siemens Flow Instruments matched pair Calibration acc. to ISO/IEC 17025:2005	On request¹⁾
Customer-witnessed calibration Any of above calibration	On request¹⁾

¹⁾ Ordering On request as dedicated information from the customer on the individual sensors is required. Please fill in the calibration form found on <http://pi.khe.siemens.de/index.aspx?Nr=17460> and send together with the order. (Size dependent restriction on maximum flow rates may apply)

²⁾ For more details and references of the ranges please see the tables on page 3/96.

³⁾ For remote version submit Product Variation Request.

Operating instructions for SITRANS F M MAG 5100 W

Description	Article No.
• English	A5E03063678
• German	A5E03376527
• Spanish	A5E00376529
• French	A5E03376521
• Chinese	A5E03376501

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
<http://www.siemens.com/flowdocumentation>

Accessories

Description	Article No.
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆ FDK:085U0220



◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I transmitters and sensors are delivered compact mounted from factory.

Communication module will be pre-mounted in the transmitter.

Please use online Product selector to get latest updates.

Product selector link:

www.pia-selector.automation.siemens.com

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

Selection and Ordering data	Article No.
Sensor SITRANS F M MAG 5100 W	7 ME 6 5 8 0 -
Hastelloy electrodes, carbon steel flanges, Non EU water markets	
Diameter	
DN 25 (1")	2 D
DN 40 (1½")	2 R
DN 50 (2")	2 Y
DN 65 (2½")	3 F
DN 80 (3")	3 M
DN 100 (4")	3 T
DN 125 (5")	4 B
DN 150 (6")	4 H
DN 200 (8")	4 P
DN 250 (10")	4 V
DN 300 (12")	5 D
DN 350 (14")	5 K
DN 400 (16")	5 R
DN 450 (18")	5 Y
DN 500 (20")	6 F
DN 600 (24")	6 P
DN 700 (28")	6 Y
DN 750 (30")	7 D
DN 800 (32")	7 H
DN 900 (36")	7 M
DN 1000 (40")	7 R
(42")	7 U
(44")	7 V
DN 1200 (48")	8 B
DN 1400 (54")	8 F
DN 1500 (60")	8 K
DN 1600 (66")	8 P
DN 1800 (72")	8 T
DN 2000 (78")	8 Y
Flange norm and pressure rating	
to EN 1092-1	
PN 6 (DN 1400 ... 2000 (54" ... 78"))	A
PN 10 (DN 200 ... 2000 (8" ... 78"))	B
PN 16 (DN 65 ... 600 (2½" ... 24"))	C
PN 16, non-PED (DN 700 ... 2000 (28" ... 78"))	D
PN 40 (DN 25 ... 50 (1" ... 2"))	F
to ANSI B16.5	
class 150 (1" ... 24")	J
to AWWA C-207	
Class D (28" ... 78")	L
to AS 4087	
PN 16 (DN 50 ... 1200 (2" ... 48"))	N
to JIS	
B 2220:2004 K10 (1" ... 24")	R
Flange material	
Carbon steel flanges ASTM A 105	1
Liner material	
Ebonite Hard Rubber	4
Electrode material	
Hastelloy	2

Selection and Ordering data	Article No.
Sensor SITRANS F M MAG 5100 W	7 ME 6 5 8 0 -
Hastelloy electrodes, carbon steel flanges, Non EU water markets	
Transmitter with display	
Sensor for remote transmitter (Order transmitter separately)	A
MAG 6000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	H
MAG 6000, Polyamid, 115 ... 230 V AC	J
MAG 5000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	K
MAG 5000, Polyamid, 115 ... 230 V AC	L
Communication	
No communication, add-on possible	A
HART	B
PROFIBUS PA Profile 3 (only MAG 6000)	F
PROFIBUS DP Profile 3 (only MAG 6000)	G
Modbus RTU/RS 485 (only MAG 6000)	E
FOUNDATION Fieldbus H1 (only MAG 6000)	J
Cable glands/terminal box	
Metric	1
½" NPT	2

Selection and Ordering data	Order code
Additional information	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
Factory certificate according to EN 10204-2.2	C14
Factory certificate according to EN 10204-2.1	C15
Tag name plate, stainless steel fixed with SS wire	Y17
Tag name plate, plastic (self-adhesive)	Y18
Customer-specific converter setup	Y20
Sensor cables wired (specify cable Article No.)	Y40
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable Article No.)	Y41
Other postproduction requirements (add desired text)	Y99

- ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

Operating instructions for SITRANS F M MAG 5100 W

Description	Article No.
• German	A5E03376527
• English	A5E03063678
• French	A5E03376521
• Spanish	A5E03376529
• Chinese	A5E03376501

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
<http://www.siemens.com/flowdocumentation>

Accessories

Description	Article No.
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	 FDK:085U0220

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

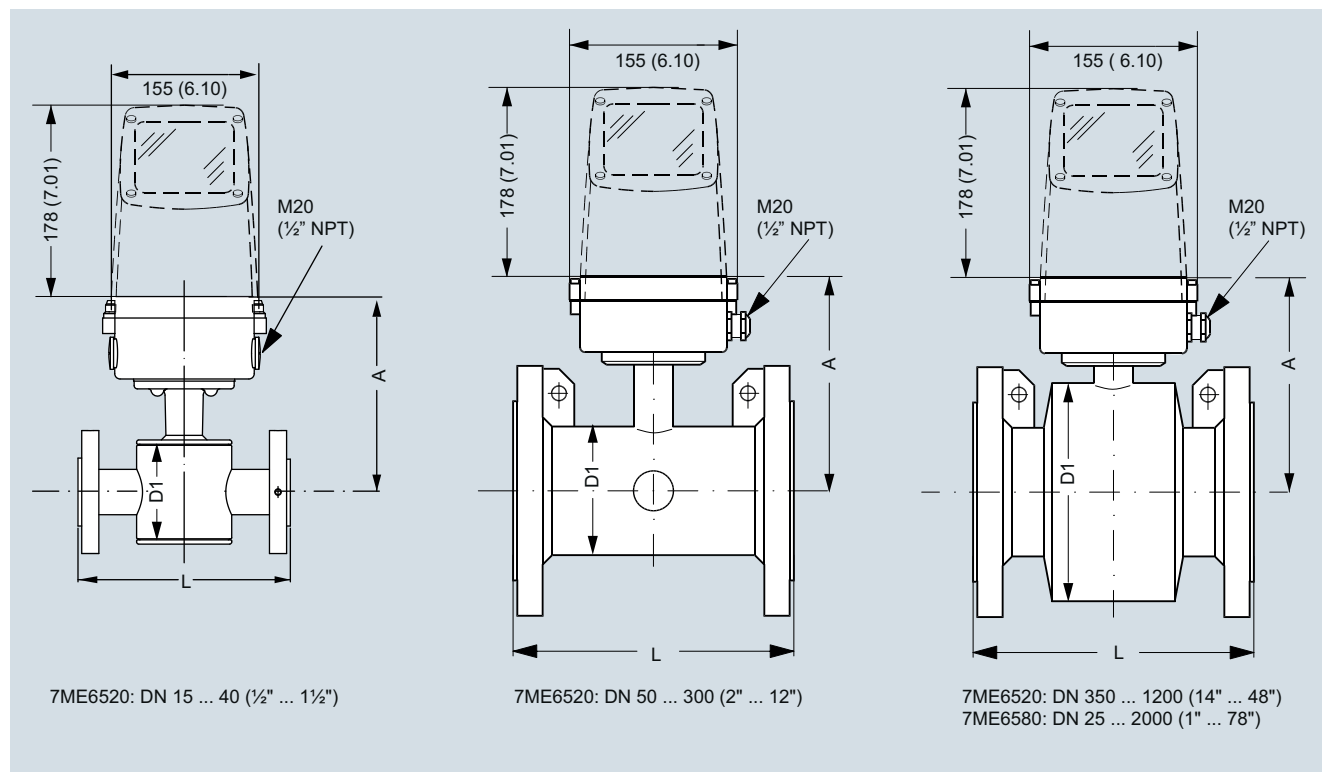
MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place.

Communication module will be pre-mounted in the transmitter.

Please use online Product selector to get latest updates.

Product selector link: www.pia-selector.automation.siemens.com

Dimensional drawings



7ME6520 NBR or EPDM liner						7ME6580 Ebonite liner					
Nominal size A				D1		A		D1		L	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
15	½	177	7.0	77	3.0	-	-	-	-	200	7.9
25	1	187	7.4	96	3.8	187	7.4	104	4.09	200	7.9
40	1½	202	8.0	127	5.0	197	7.8	124	4.88	200	7.9
50	2	188	7.4	76	3.0	205	8.1	139	5.47	200	7.9
65	2½	194	7.6	89	3.5	212	8.3	154	6.06	200	7.9
80	3	200	7.9	102	4.0	222	8.7	174	6.85	200	7.9
100	4	207	8.1	114	4.5	242	9.5	214	8.43	250	9.8
125	5	217	8.5	140	5.5	255	10.0	239	9.41	250	9.8
150	6	232	9.1	168	6.6	276	10.9	282	11.1	300	11.8
200	8	257	10.1	219	8.6	304	12.0	338	13.31	350	13.8
250	10	284	11.2	273	10.8	332	13.1	393	15.47	450	17.7
300	12	310	12.2	324	12.8	357	14.1	444	17.48	500	19.7
350	14	382	15.0	451	17.8	362	14.3	451	17.76	550	21.7
400	16	407	16.0	502	19.8	387	15.2	502	19.76	600	23.6
450	18	438	17.2	563	22.2	418	16.5	563	22.16	600	23.6
500	20	463	18.2	614	24.2	443	17.4	614	24.17	600	23.6
600	24	514	20.2	715	28.2	494	19.4	715	28.15	600	23.6
700	28	564	22.2	816	32.1	544	21.4	816	32.13	700	27.6
750	30	591	23.3	869	34.2	571	22.5	869	34.21	750	29.5
800	32	616	24.3	927	36.5	606	23.9	927	36.5	800	31.5
900	36	663	26.1	1032	40.6	653	25.7	1032	40.63	900	35.4
1000	40	714	28.1	1136	44.7	704	27.7	1136	44.72	1000	39.4
	42	714	28.1	1136	44.7	704	27.7	1136	44.72	1000	39.4
	44	765	30.1	1238	48.7	755	29.7	1238	48.74	1100	43.3
1200	48	820	32.3	1348	53.1	810	31.9	1348	53.07	1200	47.2
1400	54	-	-	-	-	925	36.4	1574	65.94	1400	55.1
1500	60	-	-	-	-	972	38.2	1672	65.83	1500	59.1
1600	66	-	-	-	-	1025	40.4	1774	75.39	1600	63
1800	72	-	-	-	-	1123	44.2	1974	77.72	1800	70.9
2000	78	-	-	-	-	1223	48.1	2174	85.59	2000	78.7

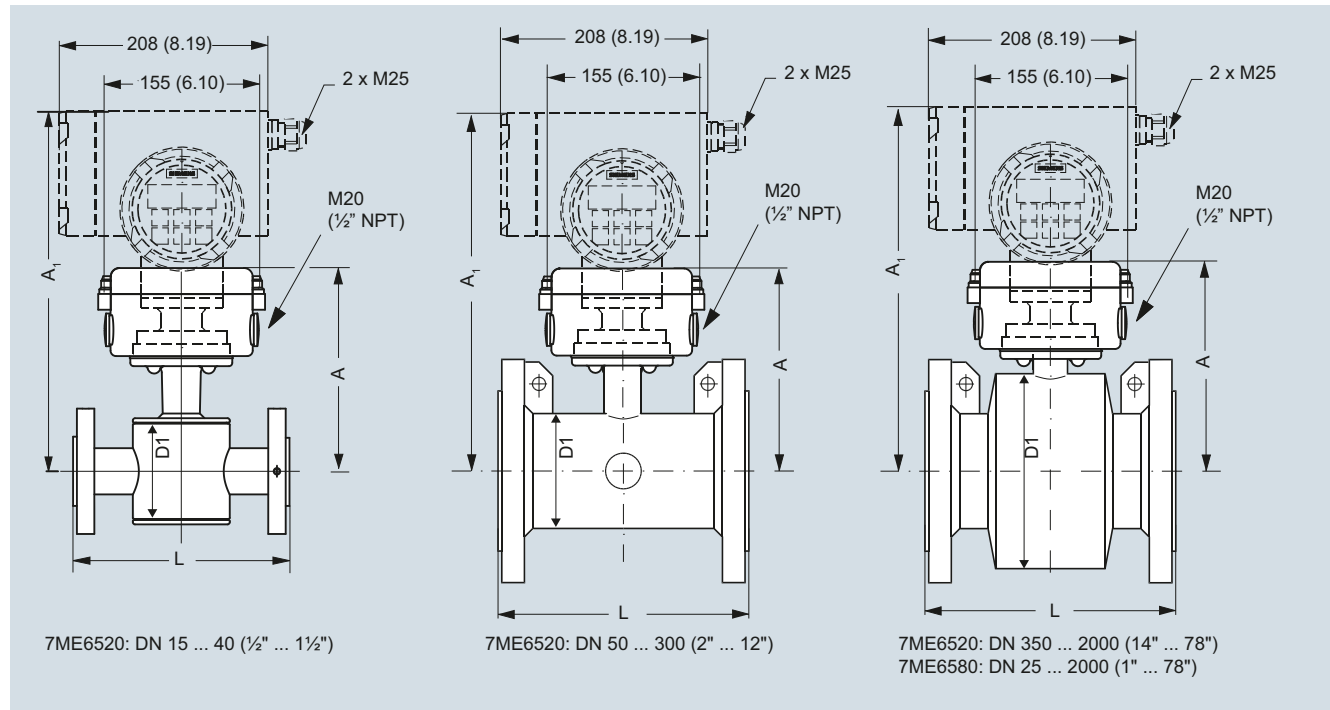
- not available

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

MAG 5100 W/6000 I Compact



7ME6520 NBR or EPDM liner								7ME6580 Ebonite liner							
Nominal size		A		A1		D1		A		A1		D1		L	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
15	½	177	7.0	331	13.0	77	3.0	187	7.4	-	-	-	-	200	7.9
25	1	187	7.4	341	13.4	96	3.8	187	7.4	341	13.4	104	4.09	200	7.9
40	1½	202	8.0	356	14.0	127	5.0	197	7.8	351	13.8	124	4.88	200	7.9
50	2	188	7.4	342	13.5	76	3.0	205	8.1	359	14.1	139	5.47	200	7.9
65	2½	194	7.6	348	13.7	89	3.5	212	8.3	366	14.4	154	6.06	200	7.9
80	3	200	7.9	354	14.0	102	4.0	222	8.7	376	14.8	174	6.85	200	7.9
100	4	207	8.1	361	14.2	114	4.5	242	9.5	396	15.6	214	8.43	250	9.8
125	5	217	8.5	371	14.6	140	5.5	255	10.0	409	16.1	239	9.41	250	9.8
150	6	232	9.1	386	15.2	168	6.6	276	10.9	430	16.9	282	11.1	300	11.8
200	8	257	10.1	411	16.2	219	8.6	304	12.0	458	18.0	338	13.31	350	13.8
250	10	284	11.2	438	17.2	273	10.8	332	13.1	486	19.1	393	15.47	450	17.7
300	12	310	12.2	464	18.3	324	12.8	357	14.1	511	20.1	444	17.48	500	19.7
350	14	382	15.0	536	21.1	451	17.8	362	14.3	516	20.3	451	17.76	550	21.7
400	16	407	16.0	561	22.1	502	19.8	387	15.2	541	21.3	502	19.76	600	23.6
450	18	438	17.2	592	23.3	563	22.2	418	16.5	572	22.5	563	22.16	600	23.6
500	20	463	18.2	617	24.3	614	24.2	443	17.4	597	23.5	614	24.17	600	23.6
600	24	514	20.2	668	26.3	715	28.2	494	19.4	648	25.5	715	28.15	600	23.6
700	28	564	22.2	718	28.3	816	32.1	544	21.4	698	27.5	816	32.13	700	27.6
750	30	591	23.3	745	29.3	869	34.2	571	22.5	725	28.5	869	34.21	750	29.5
800	32	616	24.3	770	30.3	927	36.5	606	23.9	760	29.9	927	36.5	800	31.5
900	36	663	26.1	817	32.2	1032	40.6	653	25.7	807	31.8	1032	40.63	900	35.4
1000	40	714	28.1	868	34.2	1136	44.7	704	27.7	858	33.8	1136	44.72	1000	39.4
	42	714	28.1	868	34.2	1136	44.7	704	27.7	858	33.8	1136	44.72	1000	39.4
	44	765	30.1	919	36.2	1238	48.7	755	29.7	904	35.6	1238	48.74	1100	43.3
1200	48	820	32.3	974	38.3	1348	53.1	810	31.9	964	38.0	1348	53.07	1200	47.2
1400	54	-	-	-	-	-	-	925	36.4	1079	42.5	1574	61.97	1400	55.1
1500	60	-	-	-	-	-	-	972	38.2	1126	44.3	1672	65.83	1500	59.1
1600	66	-	-	-	-	-	-	1025	40.4	1179	46.4	1774	69.84	1600	63.0
1800	72	-	-	-	-	-	-	1123	44.2	1277	50.3	1974	77.72	1800	70.9
2000	78	-	-	-	-	-	-	1223	48.1	1377	54.2	2174	85.59	2000	78.7

- not available

icenta Controls Ltd

Flow Measurement

SITRANS F M

Flow sensor MAG 5100 W

Weight

Nominal size		7ME6520 NBR or EPDM liner										7ME6580 Ebonite liner	
		PN 10		PN 16		PN 40		Class 150/AWWA		AS		PN 16	
[mm]	[inch]	[kg]	[lb]	[kg]	[lb]	[kg]	[lb]	[kg]	[lb]	[kg]	[lb]	[kg]	[lb]
15	½	-	-	-	-	4	9	4	9	4	9	5	11
25	1	-	-	-	-	6	12	5	11	4	9	5	11
40	1½	-	-	-	-	8	18	7	15	7	15	8	17
50	2	-	-	9	20	-	-	8	20	9	20	9	20
65	2½	-	-	10.7	24	-	-	11	24	10.7	24	11	24
80	3	-	-	11.6	26	-	-	13	28	11.6	26	12	26
100	4	-	-	15.2	33	-	-	19	41	15.2	33	16	35
125	5	-	-	20.4	45	-	-	24	52	-	-	19	42
150	6	-	-	26	57	-	-	29	64	26	57	27	60
200	8	48	106	48	106	-	-	56	124	48	106	40	88
250	10	64	141	69	152	-	-	79	174	69	152	60	132
300	12	76	167	86	189	-	-	110	243	86	189	80	176
350	14	104	229	125	274	-	-	139	307	115	254	110	242
400	16	119	263	143	314	-	-	159	351	125	277	125	275
450	18	136	299	173	381	-	-	182	400	141	311	175	385
500	20	163	359	223	491	-	-	225	495	189	418	200	440
600	24	236	519	338	744	-	-	320	704	301	664	287	633
700	28	270	595	314	692	-	-	273	602	320	704	330	728
750	30	-	-	-	-	-	-	329	725	-	-	360	794
800	32	346	763	396	873	-	-	365	804	428	944	450	992
900	36	432	951	474	1043	-	-	495	1089	619	1362	530	1168
1000	40	513	1130	600	1321	-	-	583	1282	636	1399	660	1455
	42	-	-	-	-	-	-	687	1512	-	-	-	-
	44	-	-	-	-	-	-	763	1680	-	-	1140	2513
1200	48	643	1415	885	1948	-	-	861	1896	813	1789	1180	2601
1400	54	1592	3510	-	-	-	-	-	-	-	-	1600	3528
1500	60	-	-	-	-	-	-	-	-	-	-	2460	5423
1600	66	2110	4652	-	-	-	-	-	-	-	-	2525	5566
1800	72	2560	5644	-	-	-	-	-	-	-	-	2930	6460
2000	78	3640	8025	-	-	-	-	-	-	-	-	3665	8080

- not available

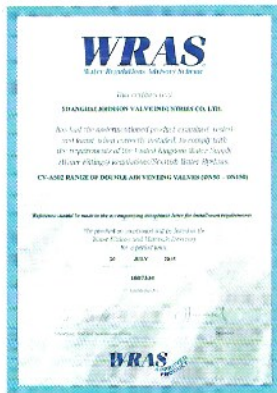
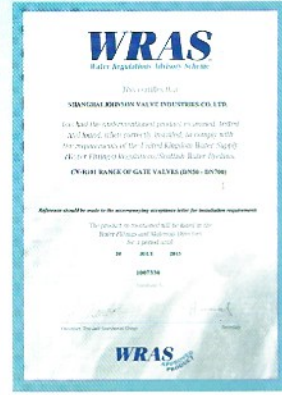
With transmitter MAG 5000 and MAG 6000 compact, weight is increased by approximately 0.8 kg (1.8 lb), with MAG 6000 I, weight is increased by 5.5 kg (12.1 lb).

JOHNSON VALVE

- Water Valves, Fittings, Fire Hydrants & Pipeline Accessories to BS, DIN, AWWA Standards

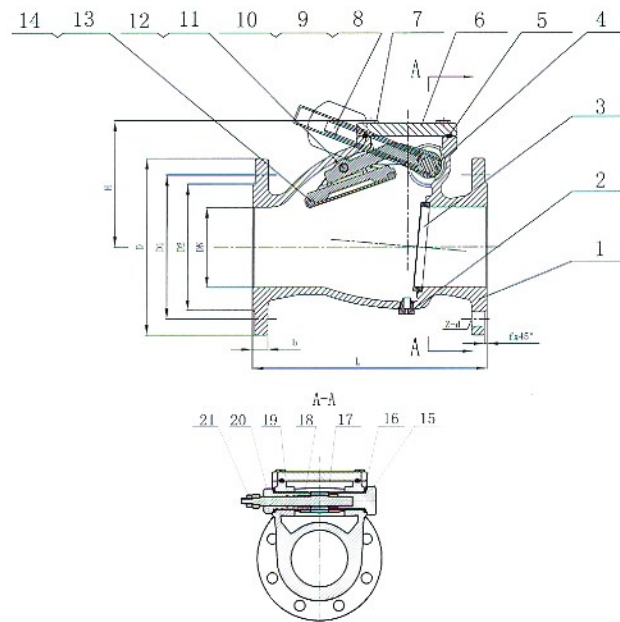


SHANGHAI JOHNSON VALVE
INDUSTRIES CO.LIMITED





Model No. CV-103 for BS5153
CV-303 for DIN3202 F6



Design to BS5153, DIN3202 F6

Face to face dimension to BS5153 (Model CV-103), and
DIN3202 F6 (Model CV-303)

Flange and drilling to BS4504 PN10/PN16, DIN2501
PN10/PN16

Tests: hydraulic test to BS6755 Part 1

Use: for potable water, sewage and neutral liquids to
Maximum 70°C

Coating: fusion bonded epoxy coating internally and
externally minimum 250 microns

Metal Seat Type:

Model No. CV-103MS (CV-303MS) : metal seated without lever and weight

CV-103MS-L (CV-303MS-L): metal seated with lever and weight

CV-103MS-LG (CV-303MS-LG): metal seated with lever/weight and guard

Rubber Seat Type:

Model No. CV-103RE (CV-303RE): rubber seated without lever and weight

CV-103RE-L (CV-303RE-L): rubber seated with lever and weight

CV-103RE-LG (CV-303RE-LG): rubber seated with lever/weight and guard

Components :

No.	Name	Material
1	Body	Ductile Iron, BS EN1563 EN-GJS-500-7
2	Drain Plug	Stainless Steel
3	Body Seal Ring	Brass, BS EN12165 CW617N, or Bronze, BS EN1982 CC491K
4	Hinge	Ductile Iron, BS EN1563 EN-GJS-500-7
5	O-ring	Rubber, EPDM
6	Bonnet	Ductile Iron, BS EN1563 EN-GJS-500-7
7	Bonnet Bolts	Stainless Steel
8	Lever	Ductile Iron, BS EN1563 EN-GJS-500-7
9	Weight	Ductile Iron, BS EN1563 EN-GJS-500-7
10	Lever Screw	Stainless Steel
11	Hinge Pin	Stainless Steel
12	Clip	Stainless Steel
13	Disc	Ductile Iron, BS EN1563 EN-GJS-500-7
14	Disc Seal Ring	Brass, BS EN12165 CW617N, or Bronze, BS EN1982 CC491K
15, 20	Side Plug	Forged Brass, BS EN12165 CW617N, or Ductile Iron, BS EN1563 EN-GJS-500-7
16	Bonnet Gasket	Rubber, EPDM
17	Washer	Stainless Steel
18	Shaft	Stainless Steel, BS EN10088-3
19	O-ring	Rubber, EPDM
21	Nut	Stainless Steel

Dimensions (mm)

DN	L (BS5153)	L (DIN3202 F6)	D	D1	D2	b	f	Z-Φd	H
50	203	200	165	125	102	19	3	4-Φ18	120
65	216	240	185	145	122	19	3	4-Φ18	130
80	241	260	200	160	138	19	3	8-Φ18	140
100	292	300	220	180	158	19	3	8-Φ18	160
125	330	350	250	210	188	19	3	8-Φ18	180
150	356	400	285	240	212	19	3	8-Φ22	200
200	495	500	340	295	268	20	3	12-Φ22	250
250	622	600	405	355	320	22	3	12-Φ26	290
300	698	700	460	410	378	24.5	4	12-Φ26	330

UCT-WMCO-3.5
FOR 0.75 CABLE NOS. FOR LSF CABLE

L1	Brown
L2	Black
L3	Grey
N	Blue
Telemetry	Pink
Intrinsically Safe	Light Blue
24VDC	Yellow
0VDC	Blue
Volt Free	Red
Analogue	Screen

			Project: MES3195 Lisryone 2.4kW pump	Customer: Molloy Precast Products Ltd	 Tredwell Electrical Ltd. Unit 5 Block D, Delta Retail Park, tel: +353-61-423845 Ballysimon Road, email: albert@tredwell.ie Limerick, Ireland website: www.tredwell.ie	PROJECT NAME MES3191		= TITLE
GK	EA	04/07/2023					REVISION	SHEET
DRAWN	APPROVED	DATE					0	2-7

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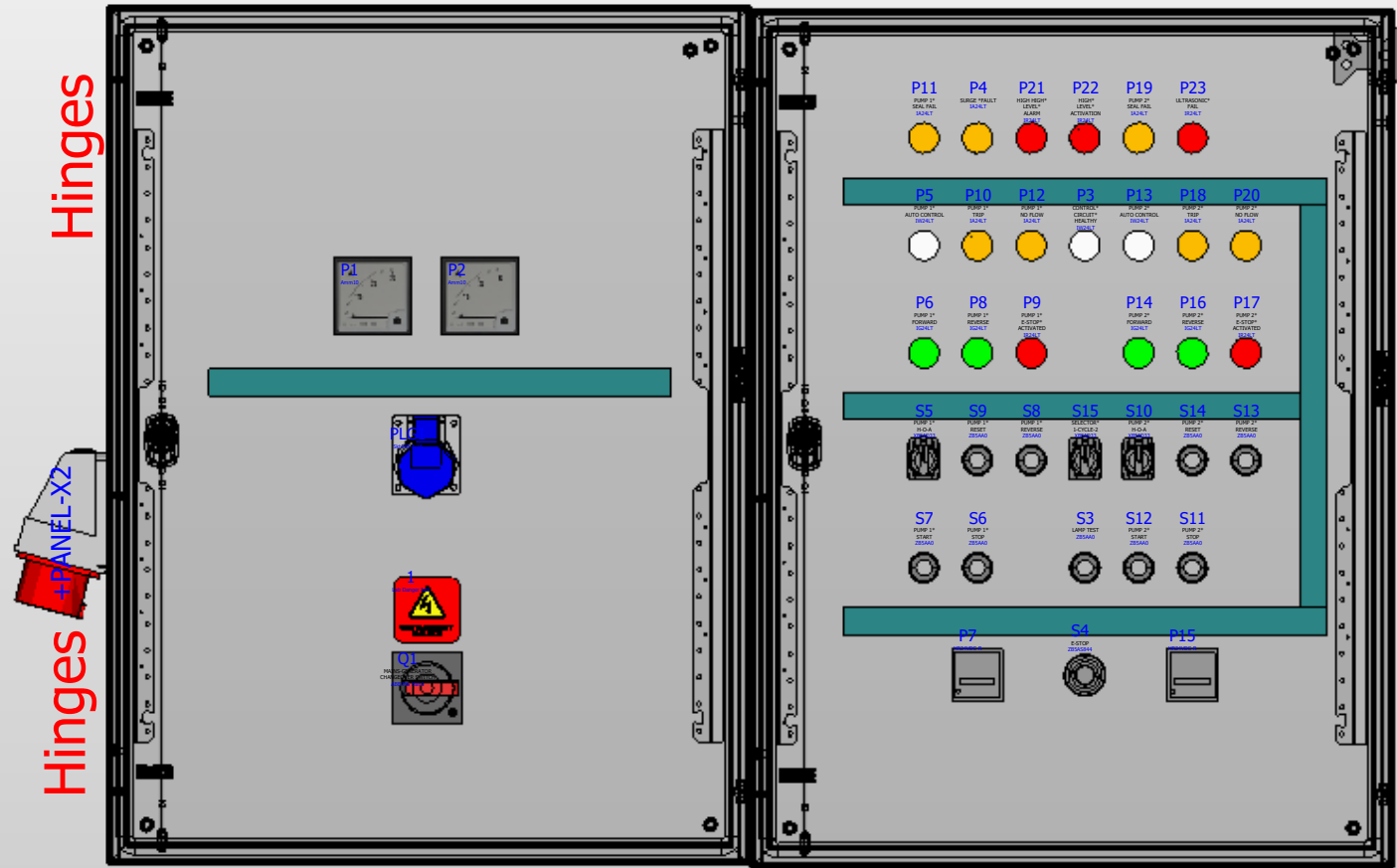
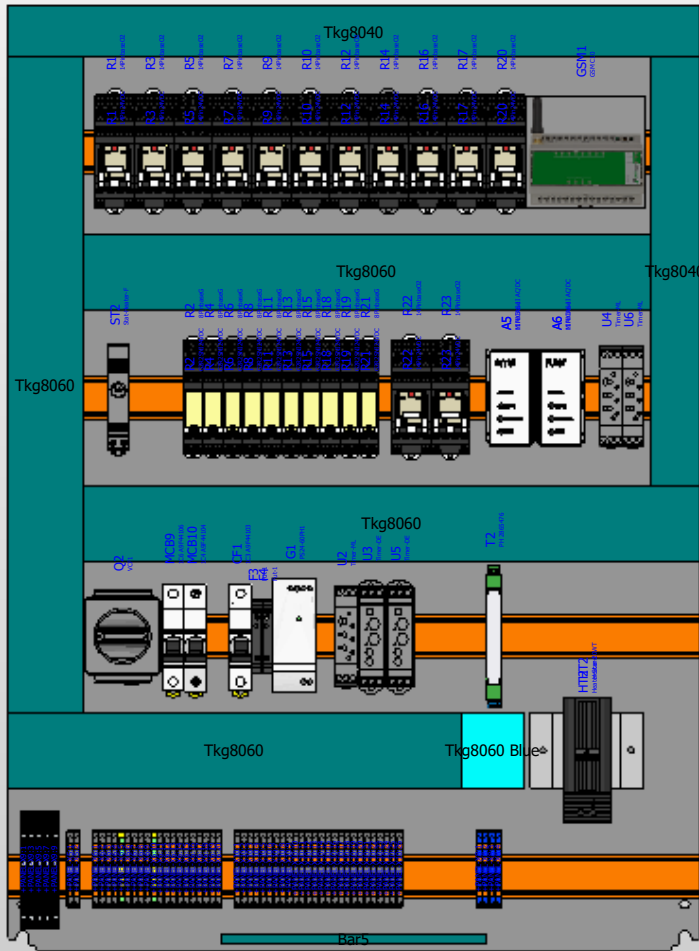
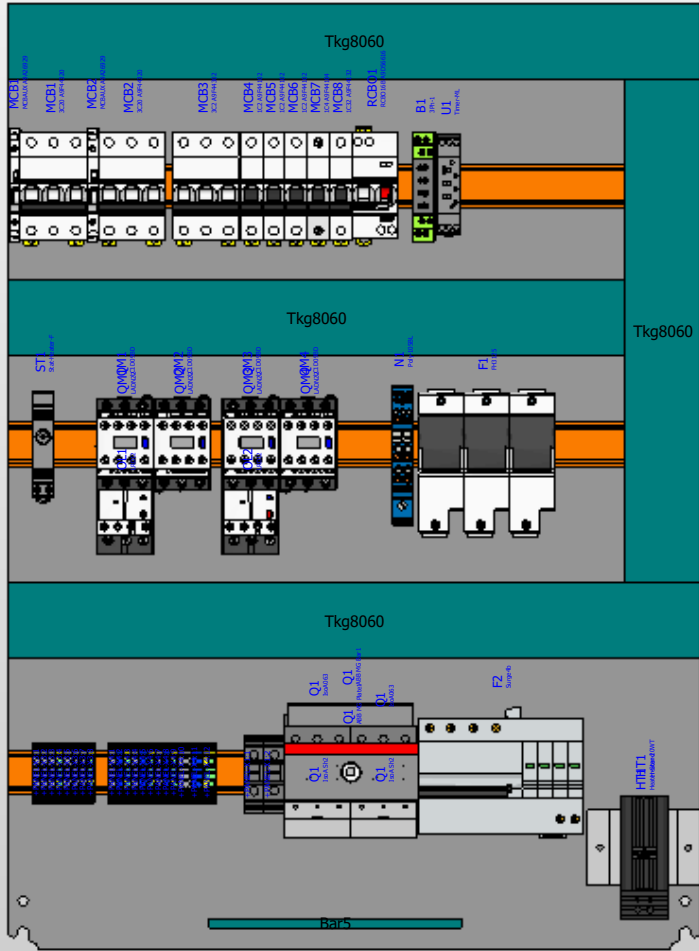
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		EAA	3	Table of contents : =TITLE&EAA/1 - +PANEL/21
		EAA	4	Table of contents : +PANEL/22 - +REPORTS&EPB/4
		EAA	5	Enclosure Layouts
		EAA	6	Enclosure Overview
		EAA	7	Enclosure Views
	PANEL		1	POWER
	PANEL		2	POWER
	PANEL		3	POWER
	PANEL		4	POWER
	PANEL		5	POWER
	PANEL		6	POWER
	PANEL		7	24V DC
	PANEL		8	24VDC GSM
	PANEL		9	24VDC
	PANEL		10	24V DC
	PANEL		11	24V DC
	PANEL		12	24V DC TH1
	PANEL		13	24V DC NO FLOW
	PANEL		14	24V DC
	PANEL		15	24V DC
	PANEL		16	24V DC TH1
	PANEL		17	24V DC NO FLOW
	PANEL		18	24V DC
	PANEL		19	24V DC
	PANEL		20	24V DC
	PANEL		21	24V DC

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	PANEL		22	VFC
	PANEL		23	VFC
	REPORTS	EMA	1	Terminal diagram : +PANEL-X1
	REPORTS	EMA	2	Terminal diagram : +PANEL-X3
	REPORTS	EMA	3	Terminal diagram : +PANEL-X4
	REPORTS	EMA	4	Terminal diagram : +PANEL-X5
	REPORTS	EMA	5	Terminal diagram : +PANEL-X6
	REPORTS	EMA	6	Terminal diagram : +PANEL-X8
	REPORTS	EMA	7	Terminal diagram : +PANEL-X9
	REPORTS	EMA	8	Terminal diagram : +PANEL-X10
	REPORTS	EMA	9	Terminal diagram : +PANEL-X10
	REPORTS	EPB	2	Parts list : DU.Lab Danger Isol - DEM.IG24LT
	REPORTS	EPB	3	Parts list : DEM.IR24LT - SE.A9D56616
	REPORTS	EPB	4	Parts list : OMR.Resistor 1000 Ohm for Minicas Relay - PXC.3209549



BACKPLATE

WHD 1200*800*200 mm

DOOR

GK	EA	04/07/2023
DRAWN	APPROVED	DATE

Project:
MES3195 Lisryone 2.4kW pump

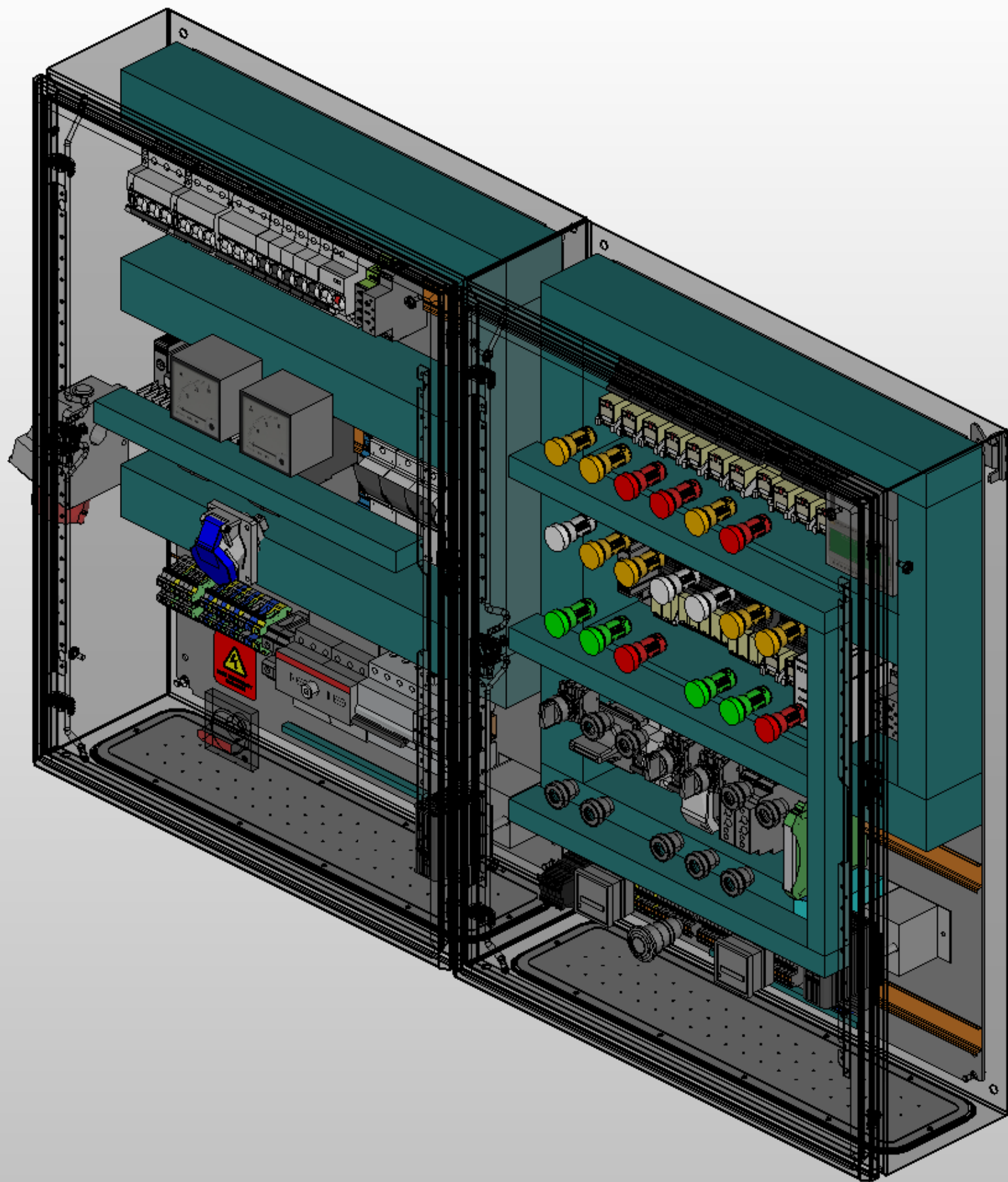
Customer:
Molloy Precast Products Ltd

	Tredwell Electrical Ltd. Unit 5 Block D, Delta Retail Park, tel: +353-61-423845 Ballysimon Road, email: albert@tredwell.ie Limerick, Ireland website: www.tredwell.ie
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PROJECT NAME
MES3191

REVISION
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= TITLE
SHEET 5-7



GK	EA	04/07/2023
DRAWN	APPROVED	DATE

Project:
MES3195 Lisryone 2.4kW pump

Customer:
Molloy Precast Products Ltd

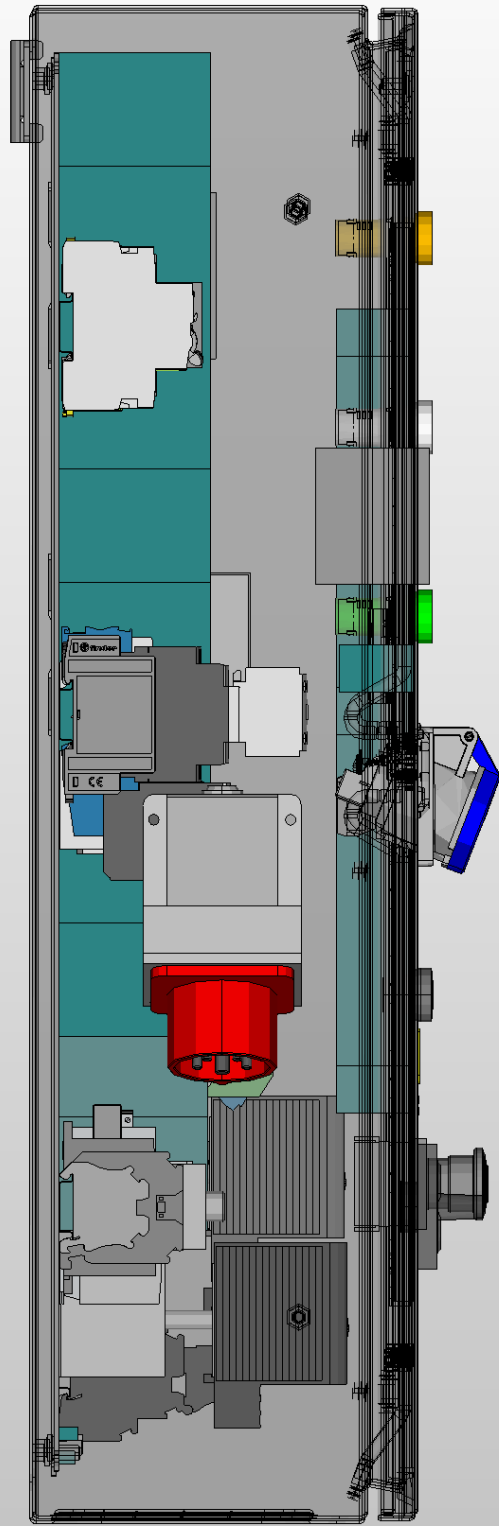


Tredwell Electrical Ltd.
Unit 5 Block D, Delta Retail Park, tel: +353-61-423845
Ballysimon Road, email: albert@tredwell.ie
Limerick, Ireland website: www.tredwell.ie

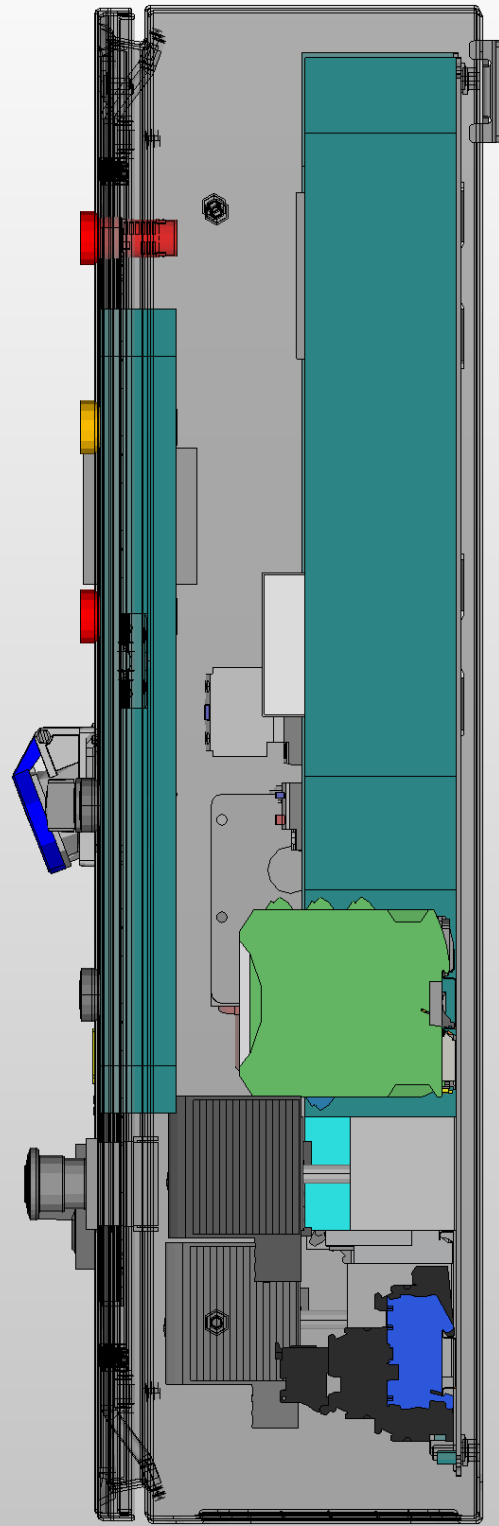
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MES3191

REVISION
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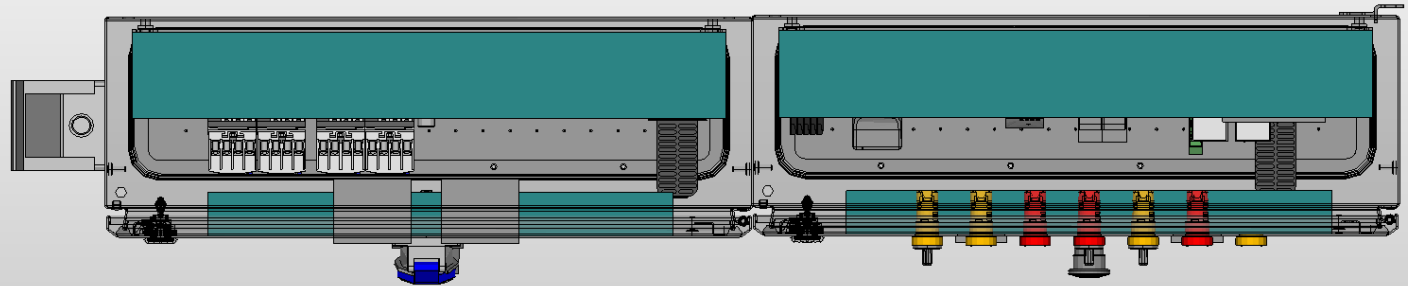
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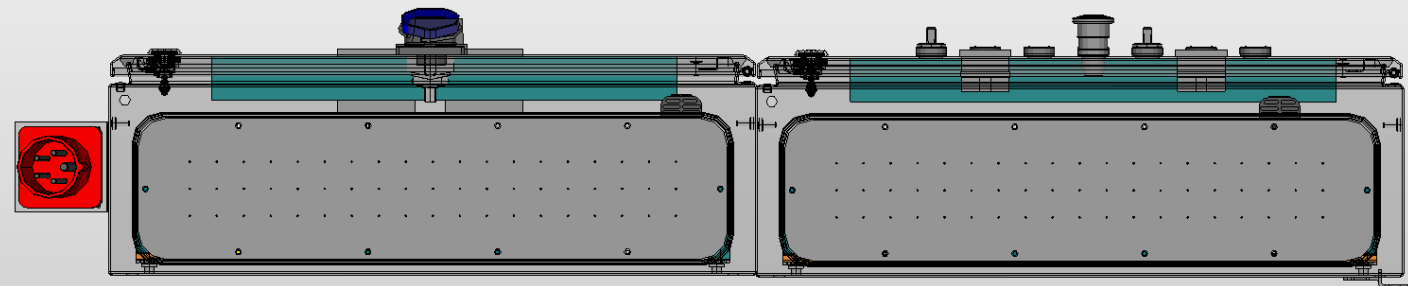
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LEFT VIEW



ENCLOSURE
RIGHT VIEW

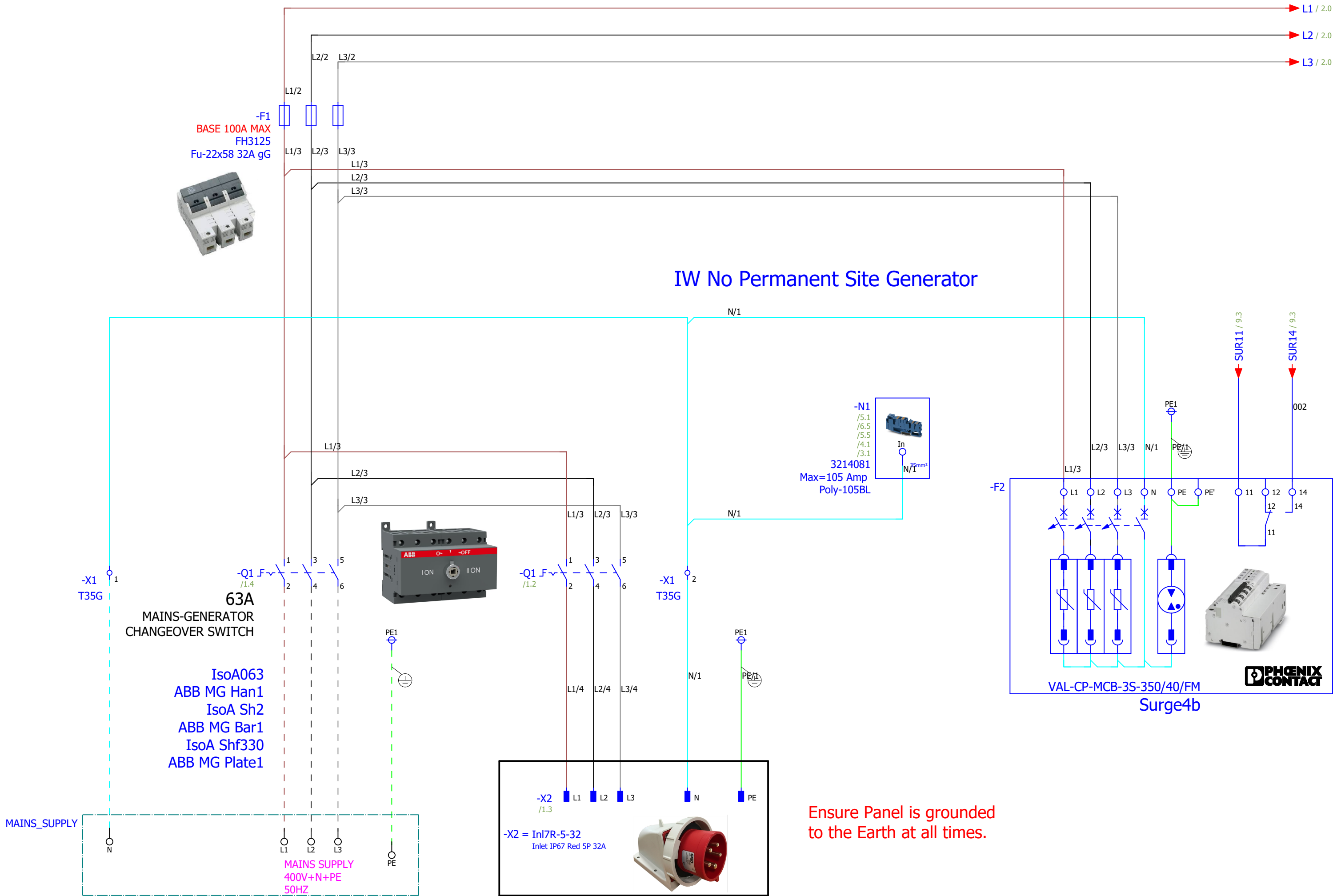


ENCLOSURE
TOP VIEW

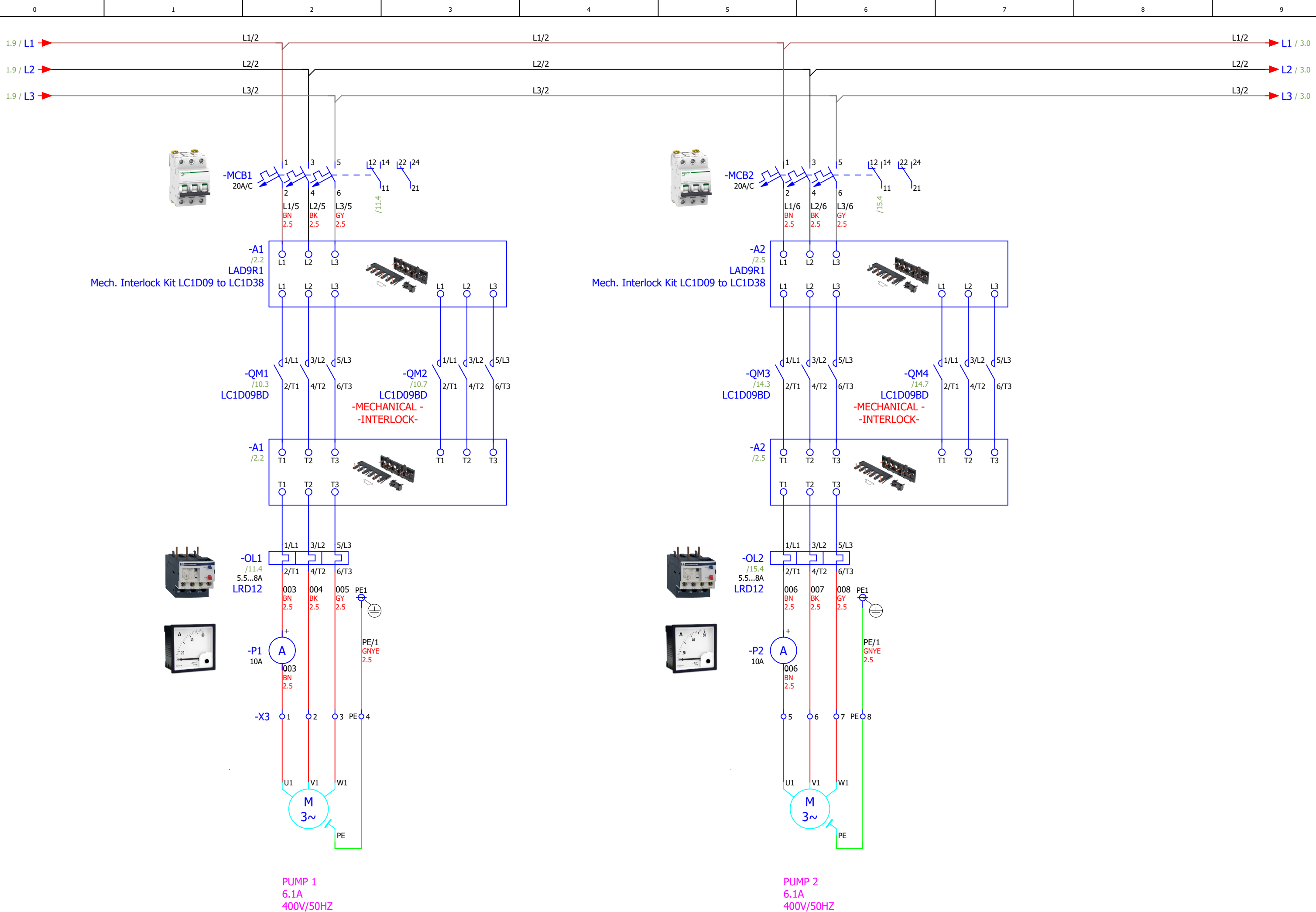


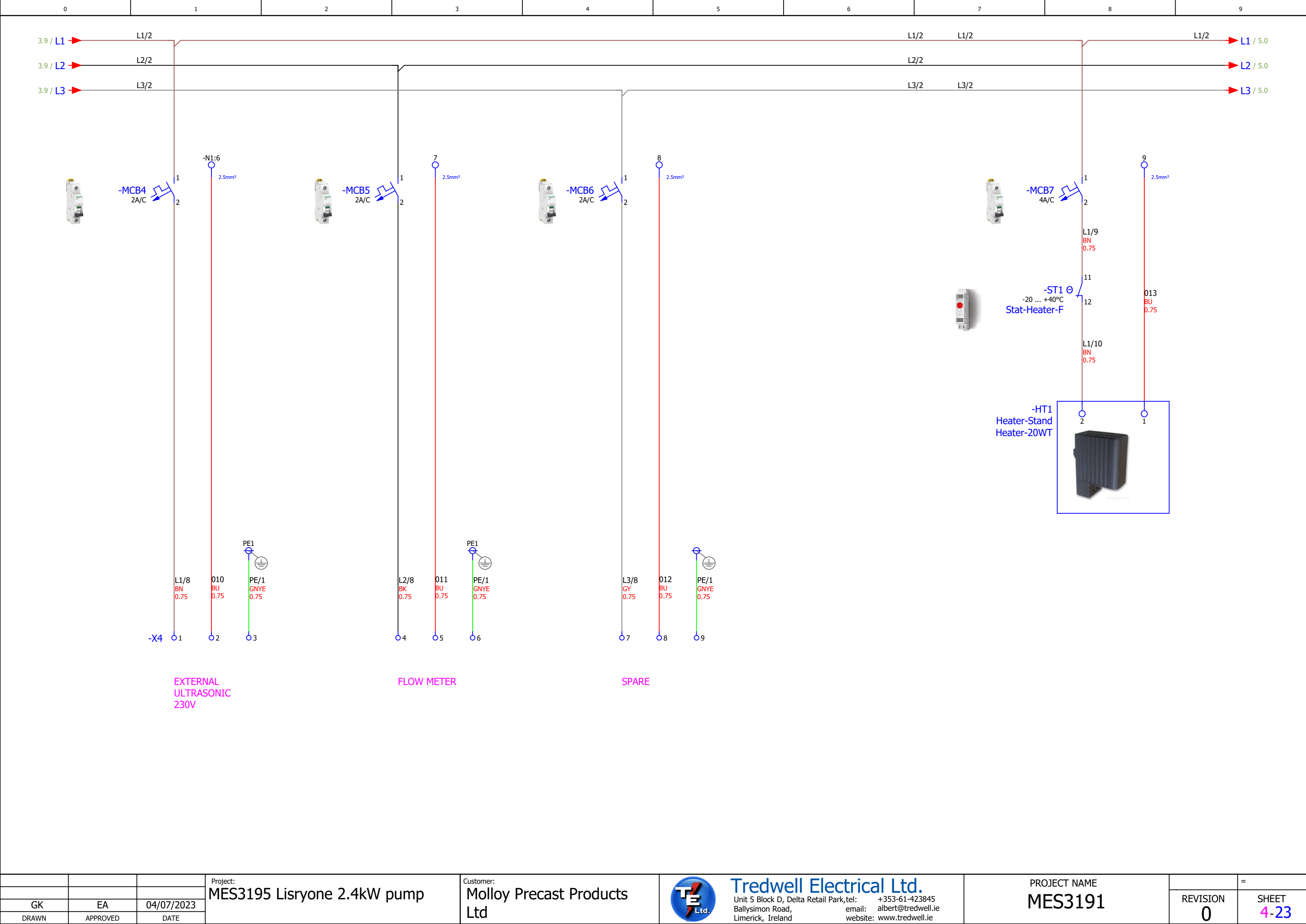
ENCLOSURE
BOTTOM VIEW

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GK	EA	04/07/2023					REVISION 0	SHEET 7-7
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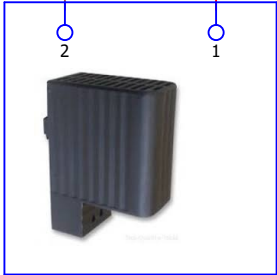
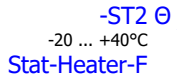
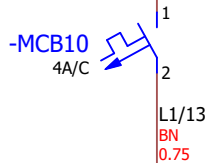
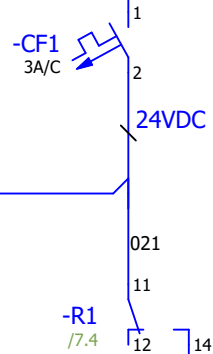
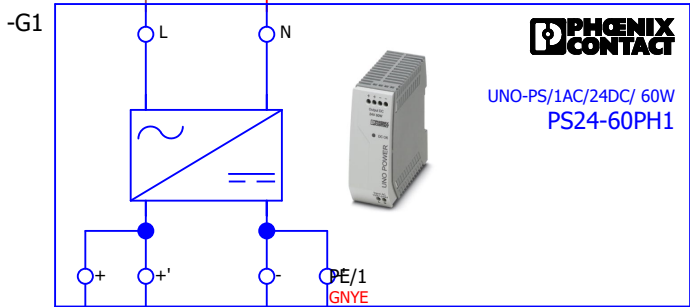
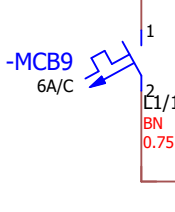
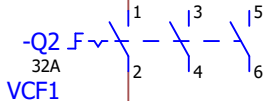
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GK			EA			04/07/2023			0	
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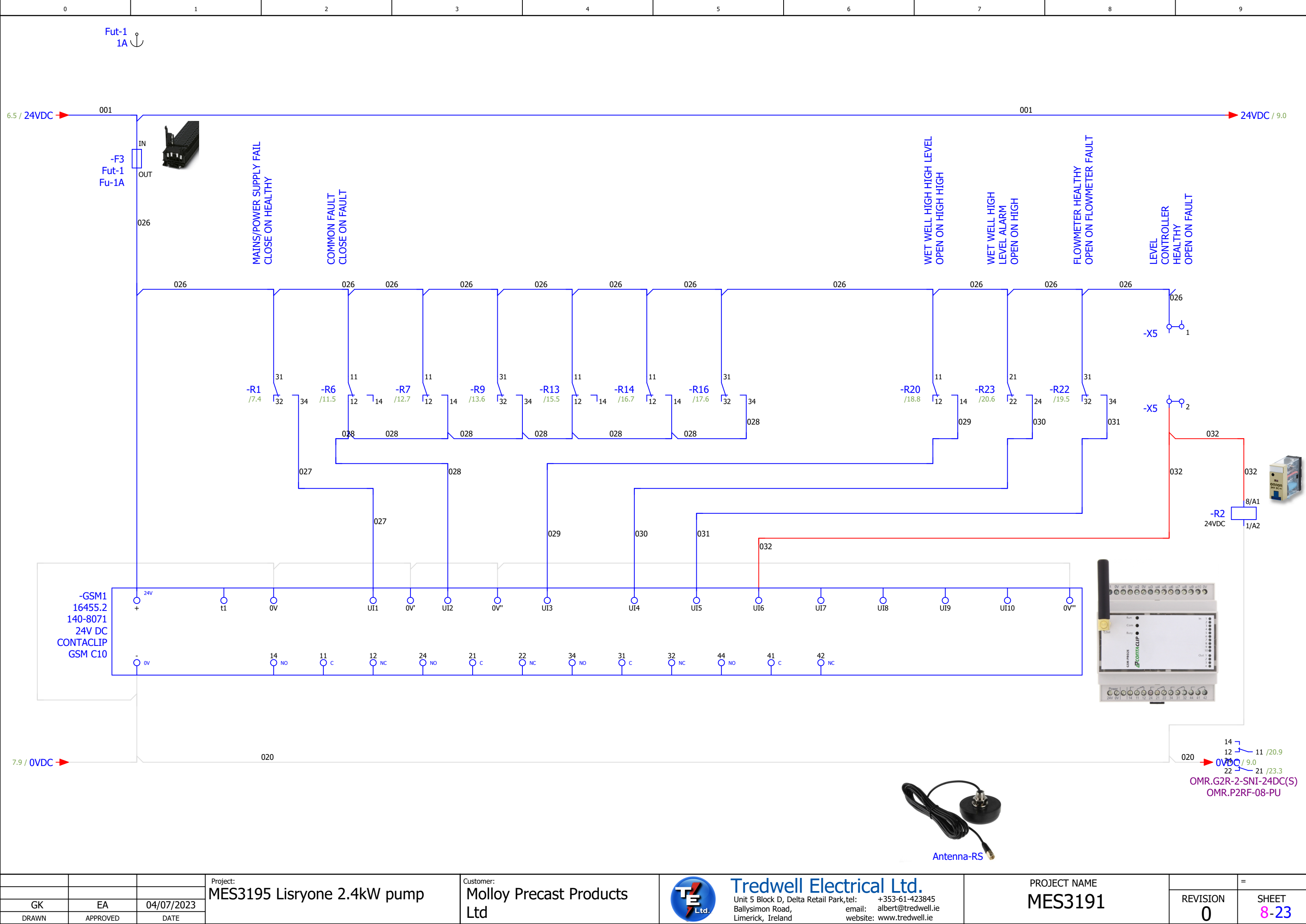
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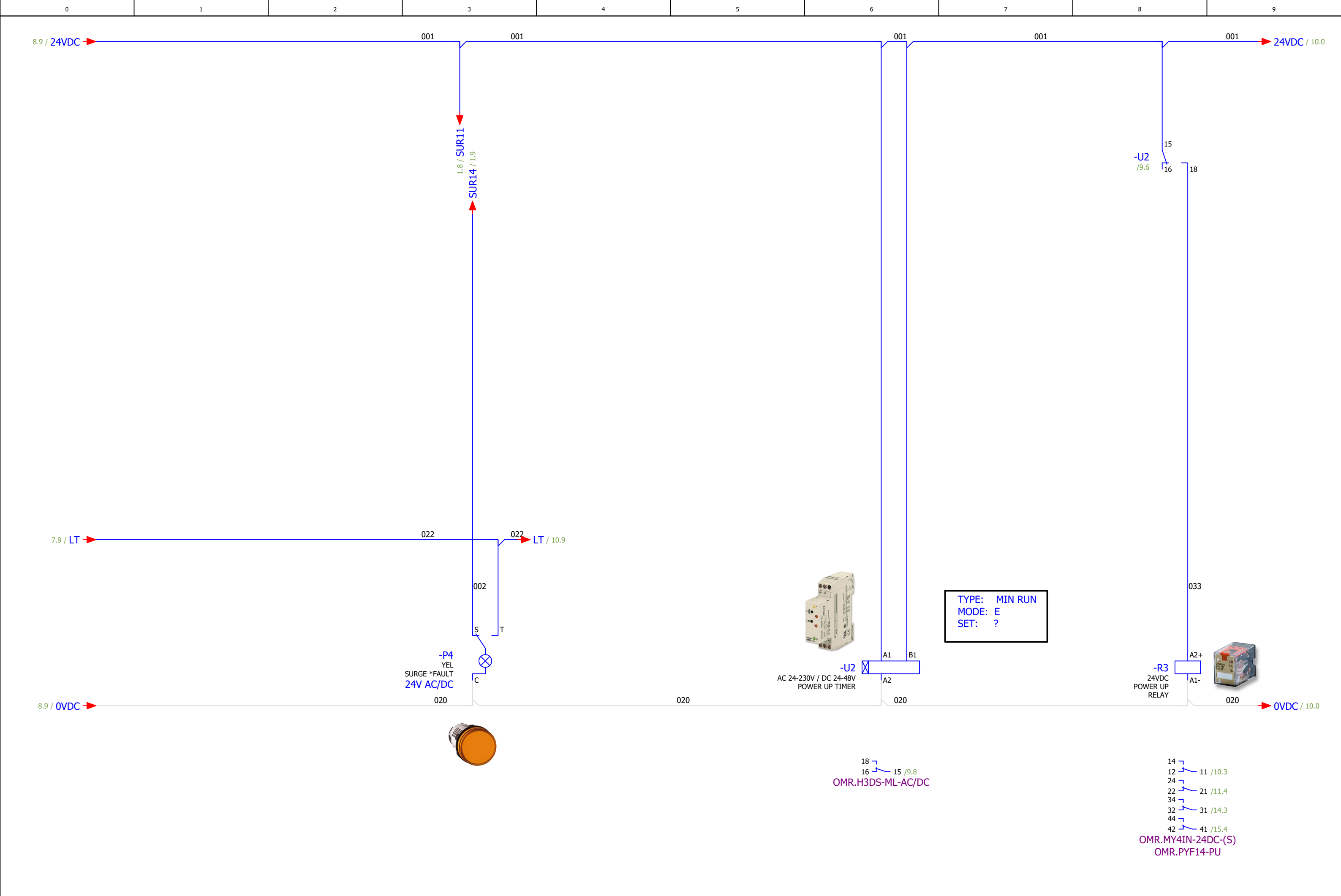


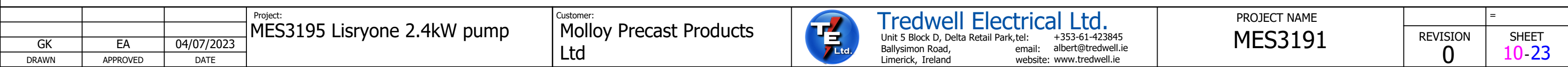
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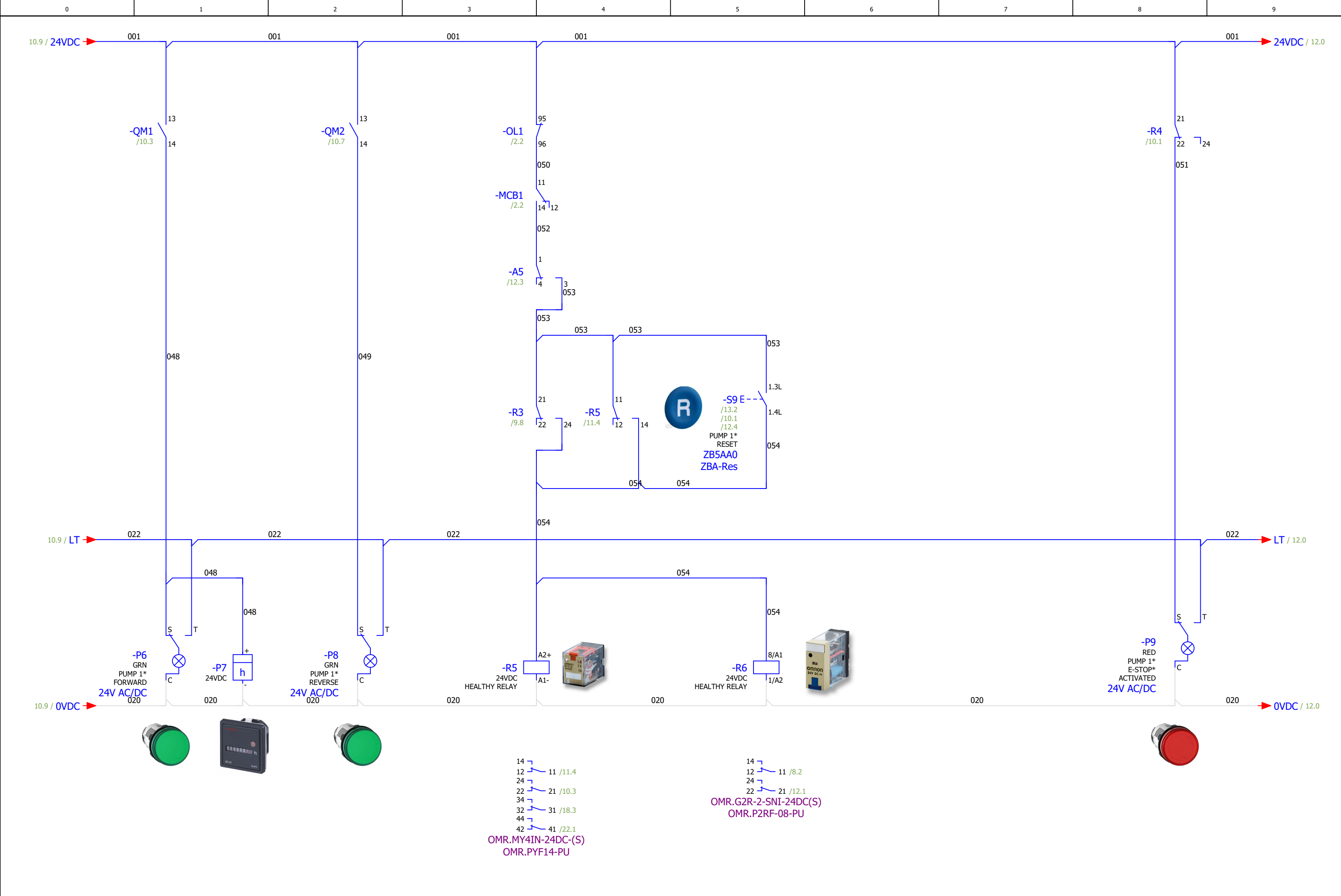
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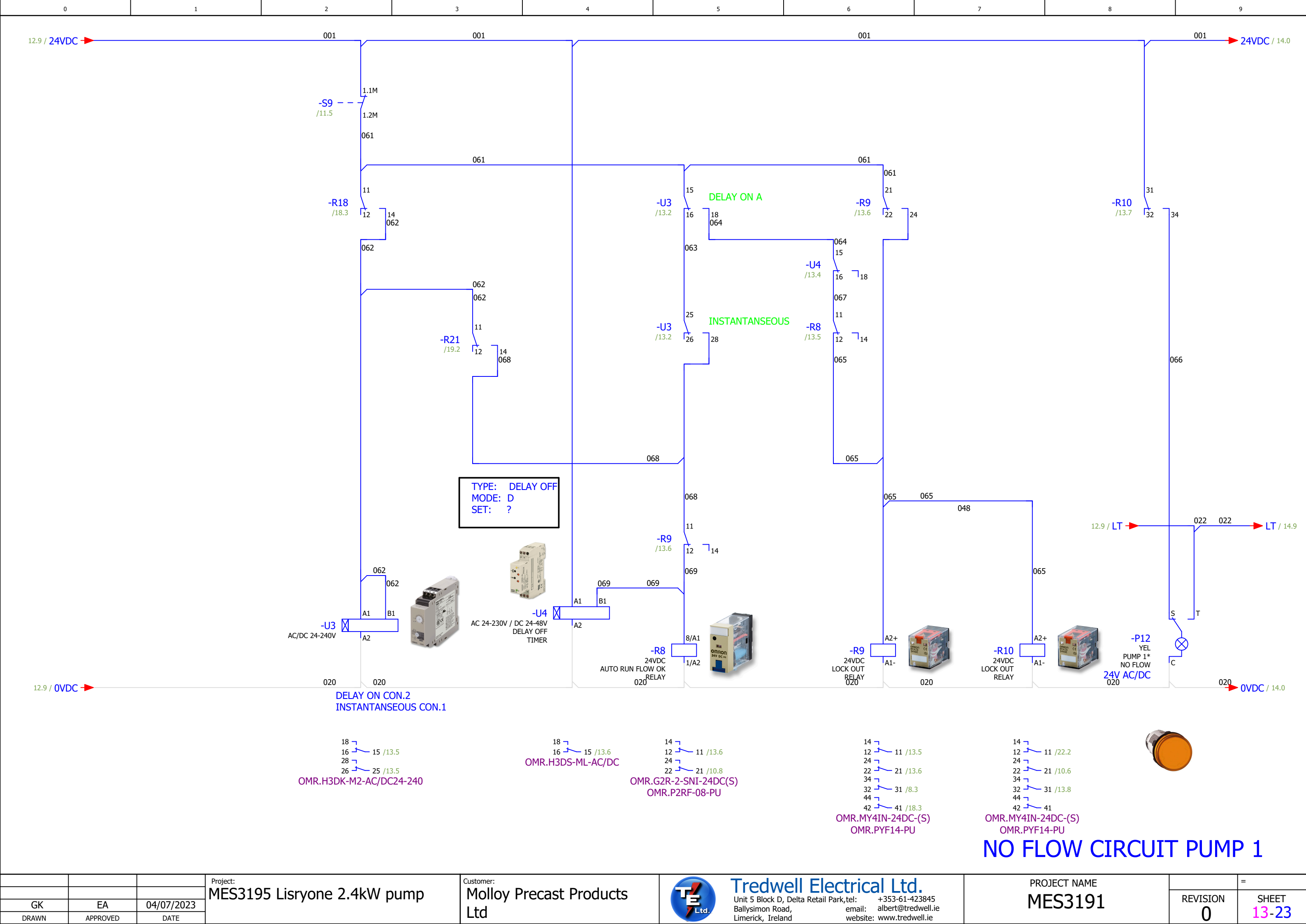
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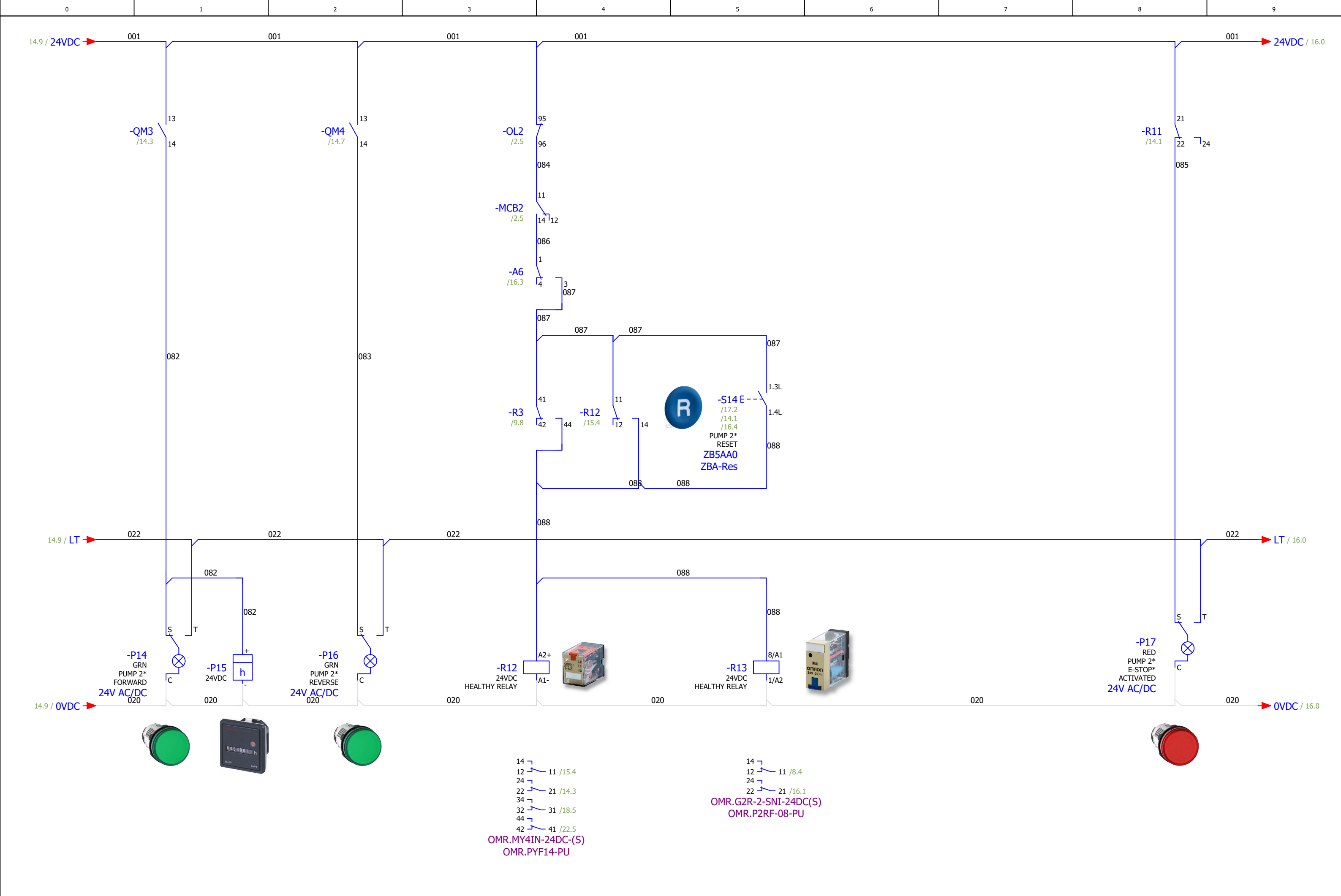






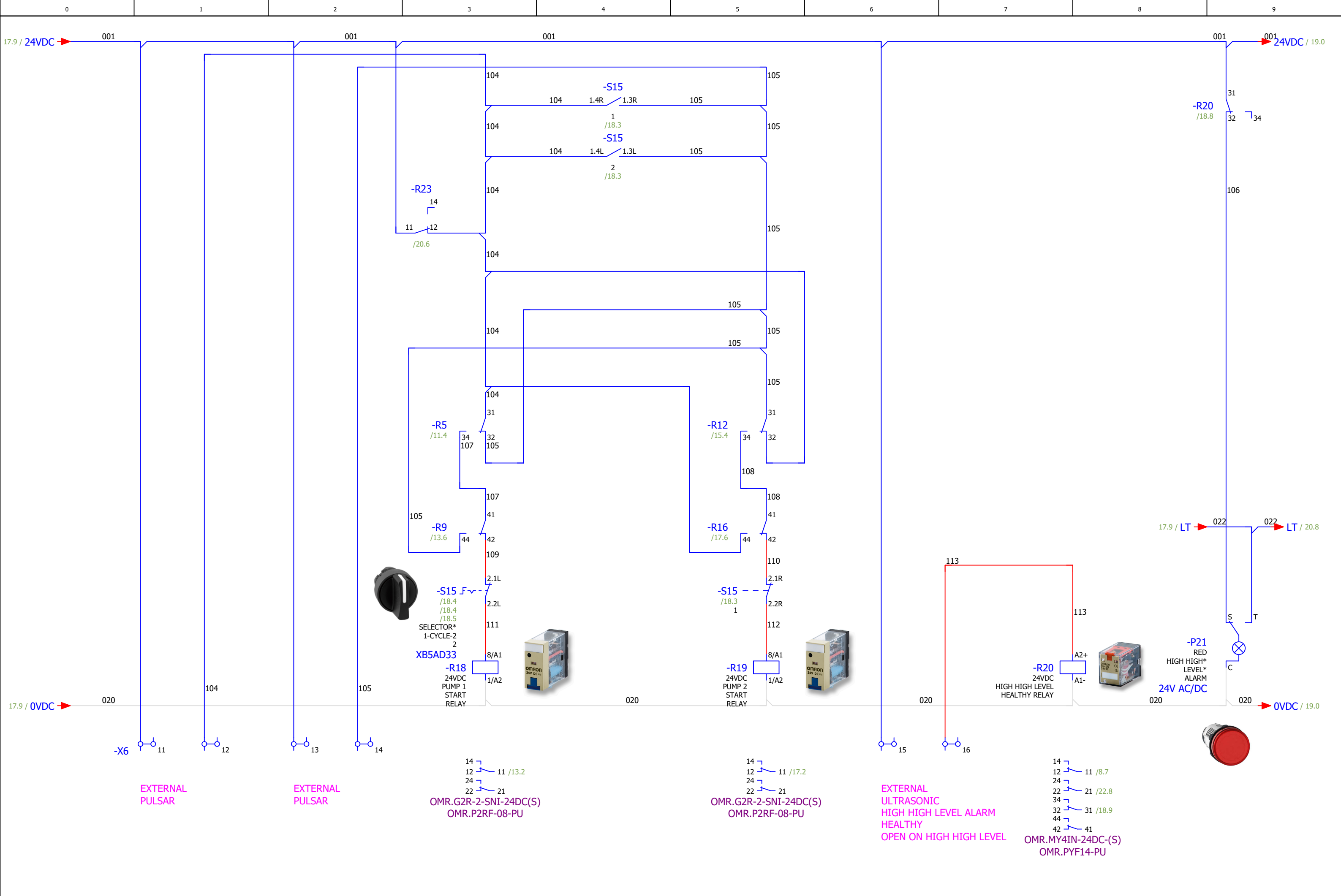


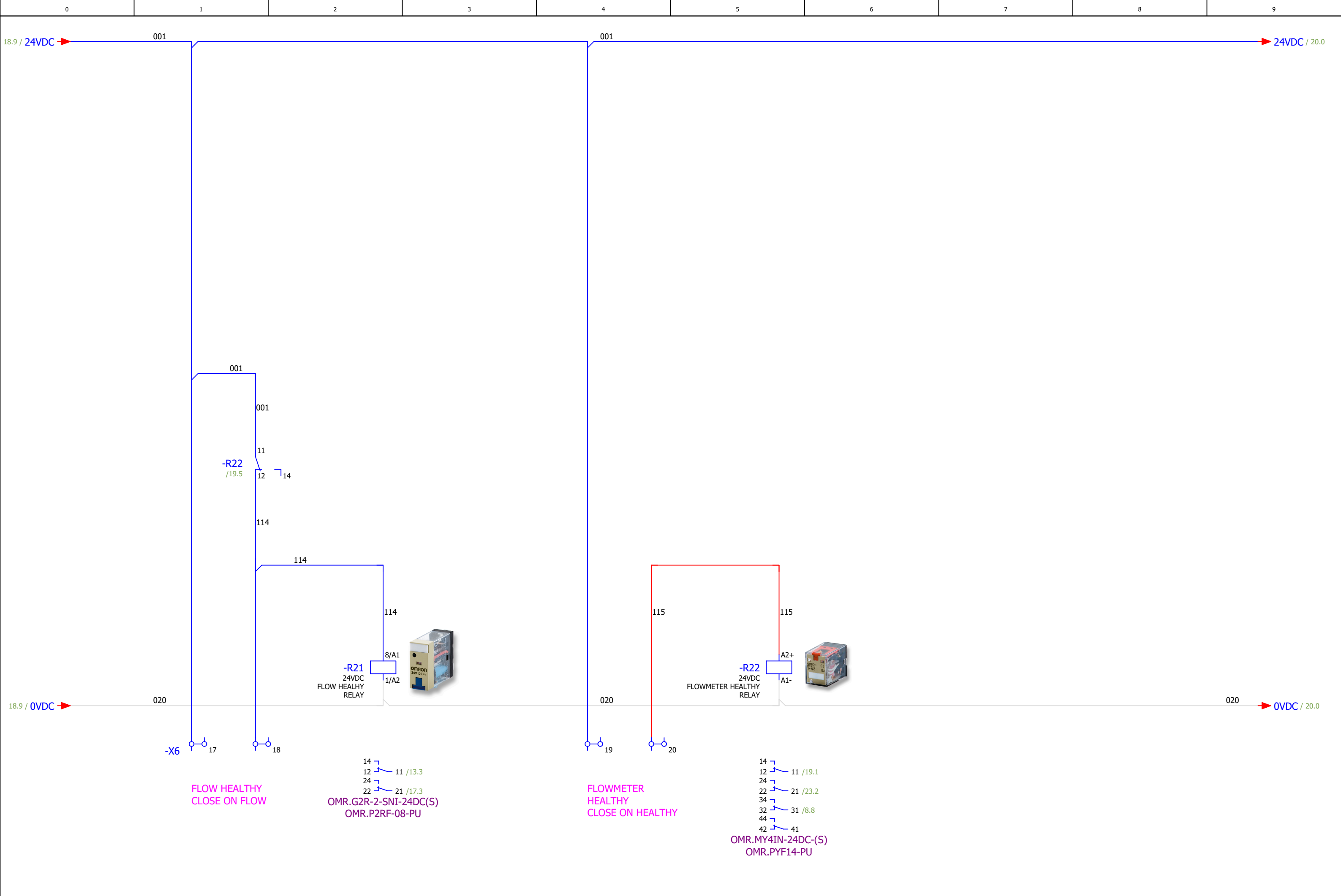


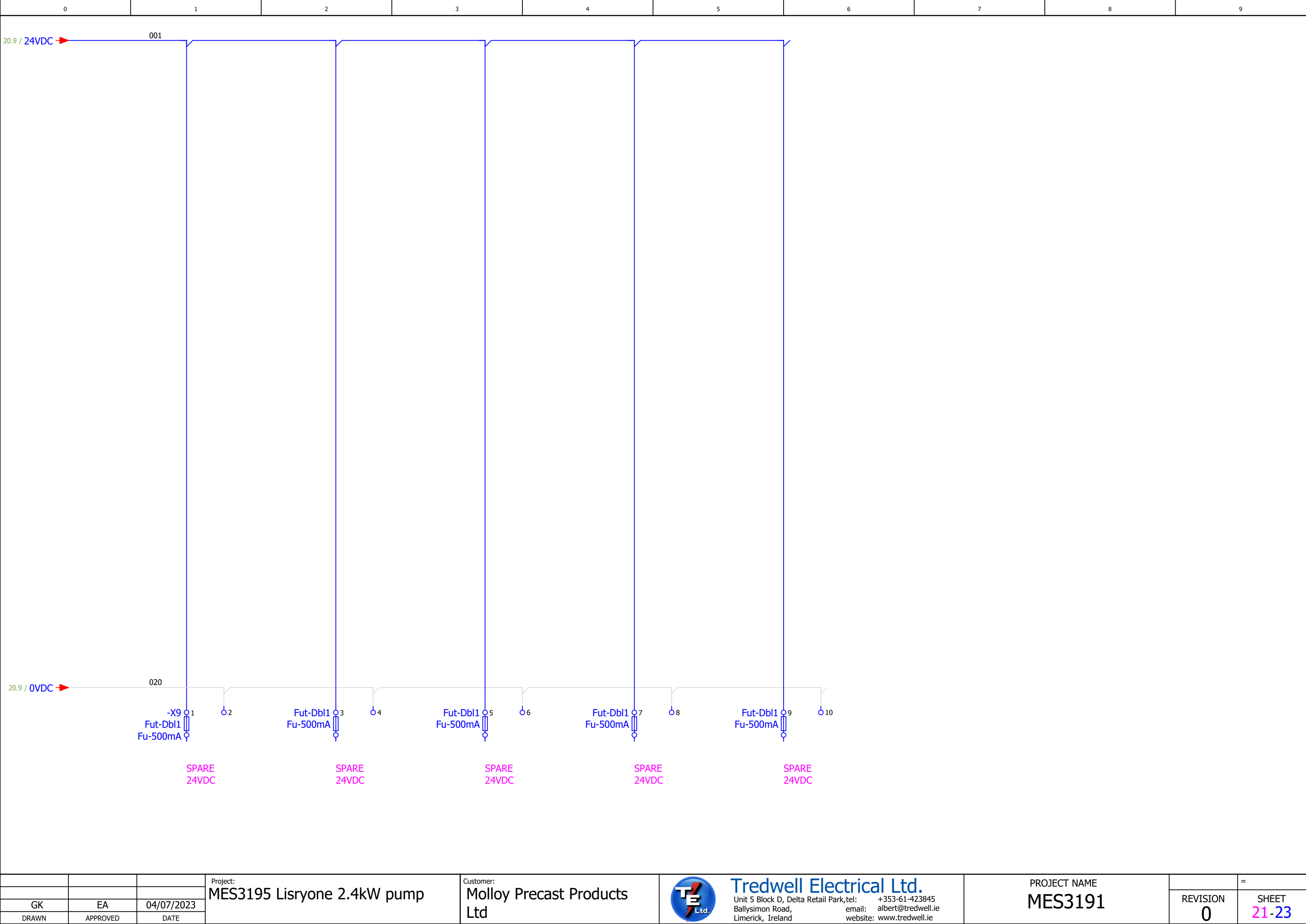


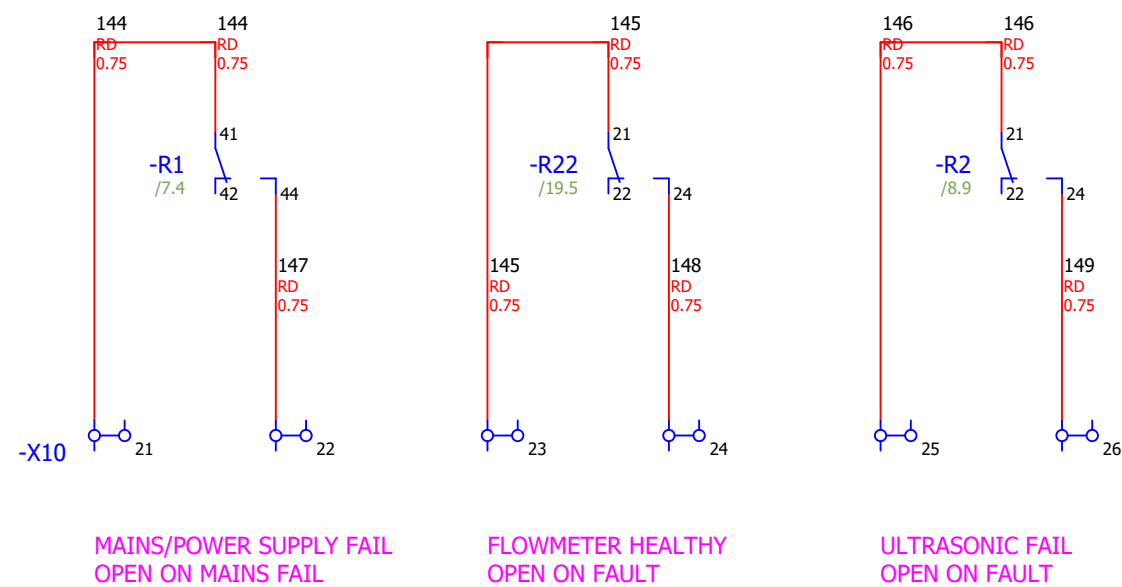


			Project: MES3195 Lisryone 2.4kW pump	Customer: Molloy Precast Products Ltd	 Tredwell Electrical Ltd. Unit 5 Block D, Delta Retail Park, tel: +353-61-423845 Ballysimon Road, email: albert@tredwell.ie Limerick, Ireland website: www.tredwell.ie	PROJECT NAME MES3191		=
GK	EA	04/07/2023					REVISION	SHEET
DRAWN	APPROVED	DATE					0	17-23





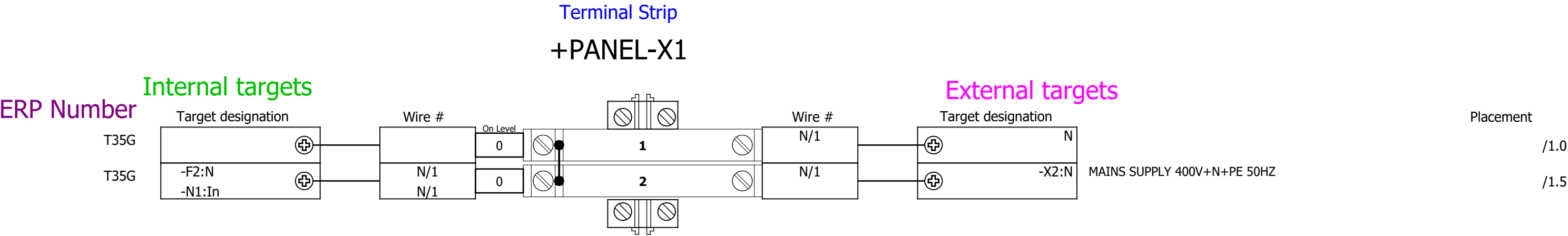




			Project: MES3195 Lisryone 2.4kW pump	Customer: Molloy Precast Products Ltd	 Tredwell Electrical Ltd. Unit 5 Block D, Delta Retail Park, tel: +353-61-423845 Ballysimon Road, email: albert@tredwell.ie Limerick, Ireland website: www.tredwell.ie	PROJECT NAME MES3191		=
GK	EA	04/07/2023					REVISION 0	SHEET 23-23
DRAWN	APPROVED	DATE						

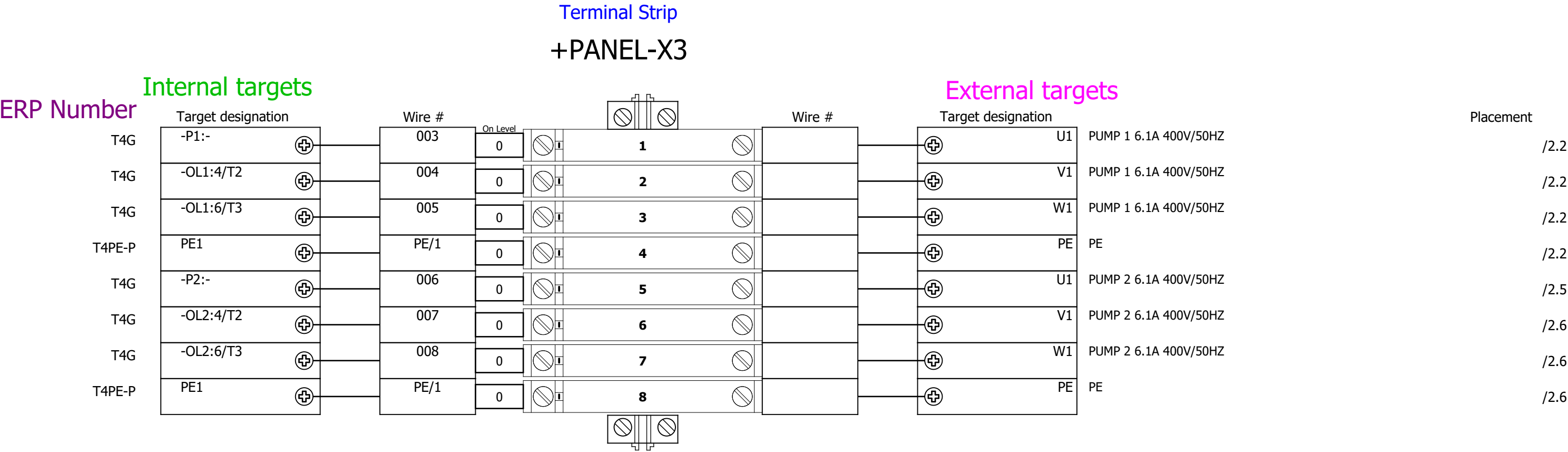
Terminal Diagram

Multilevel_Terminal_v1.0



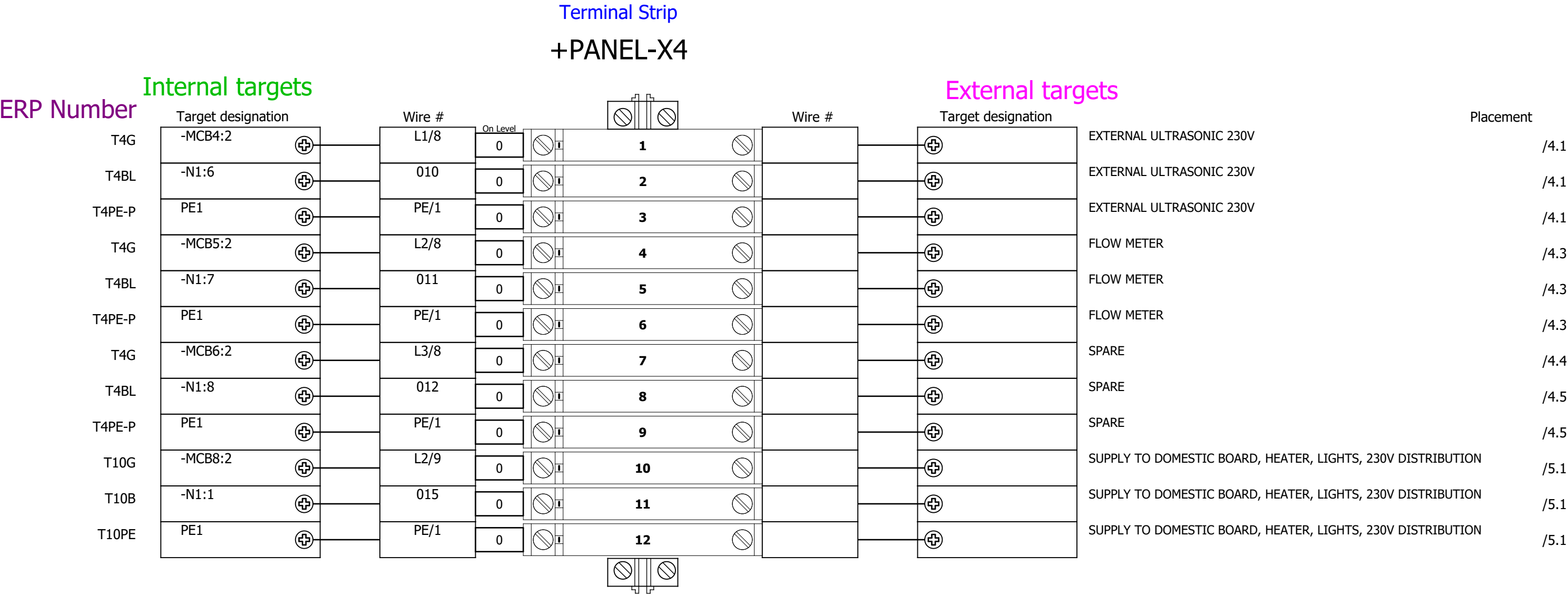
Terminal Diagram

Multilevel_Terminal_v1.0



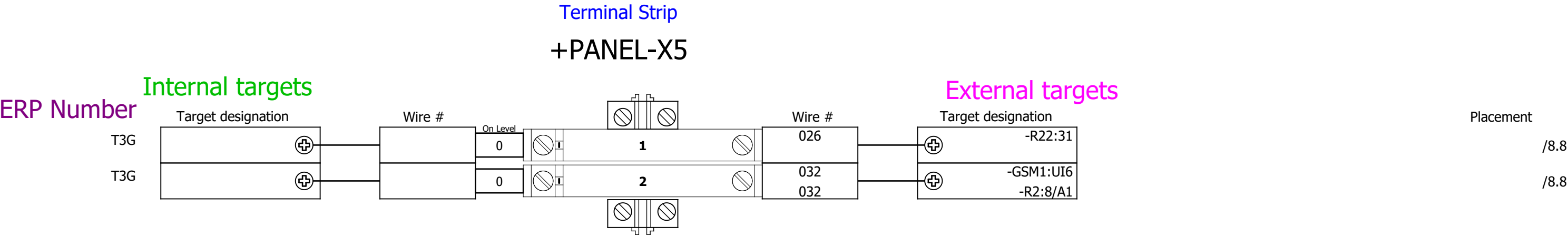
Terminal Diagram

Multilevel_Terminal_v1.0



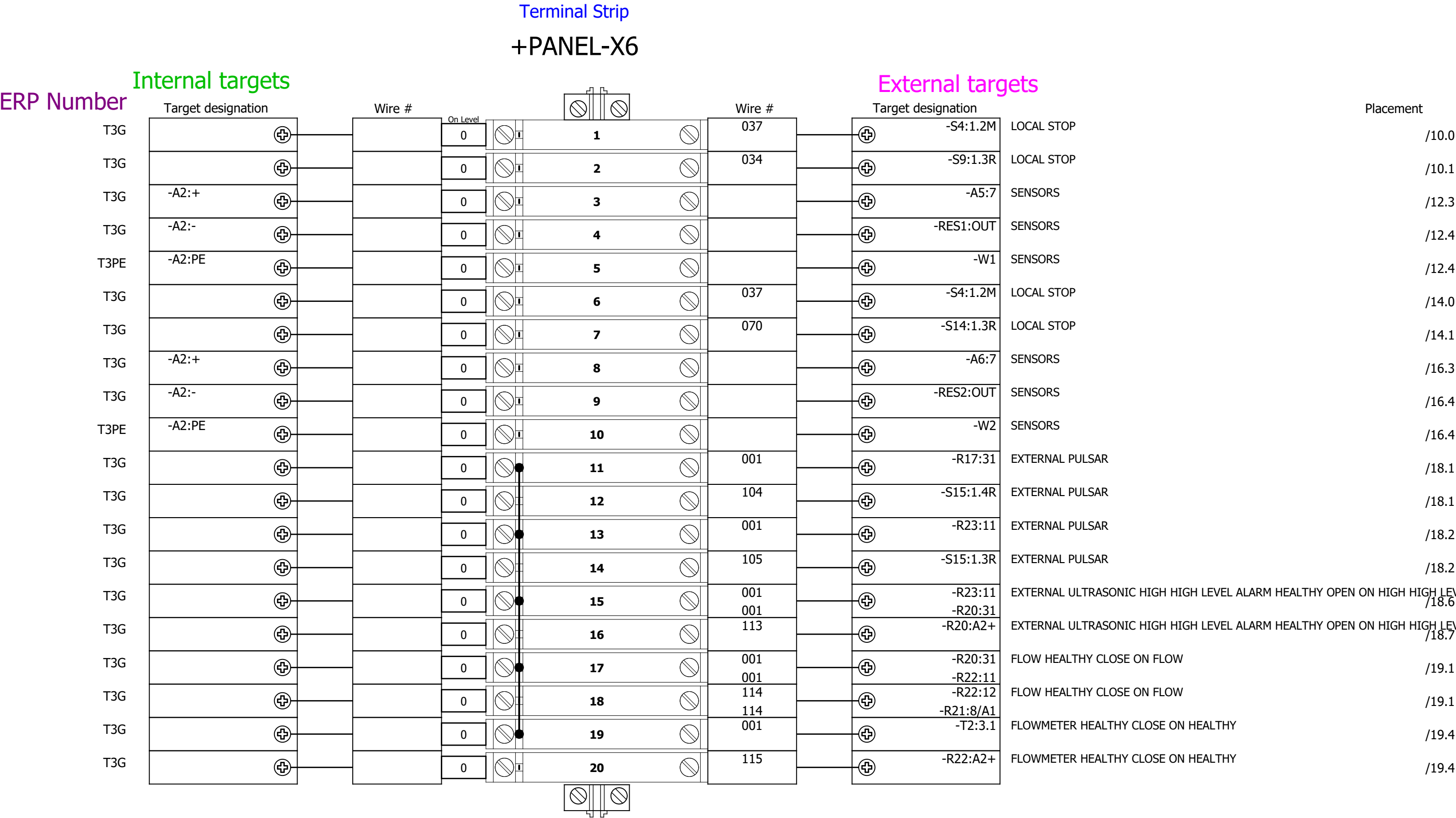
Terminal Diagram

Multilevel_Terminal_v1.0



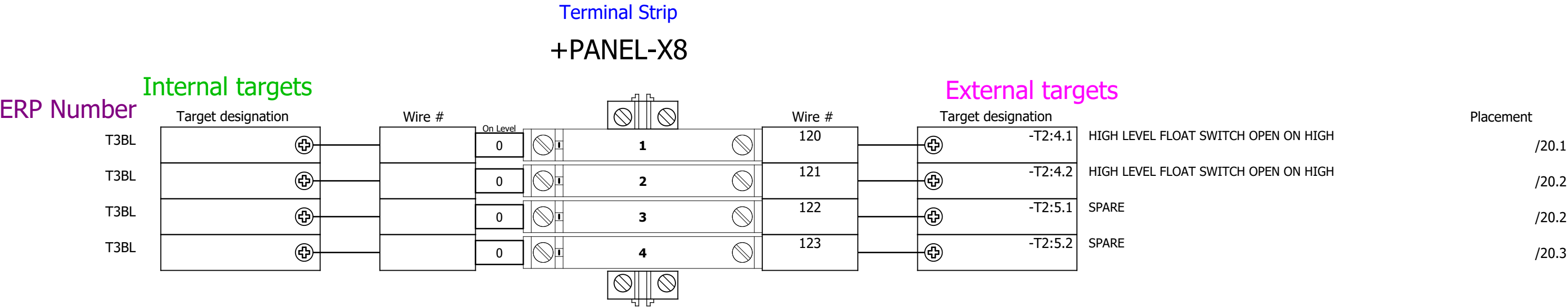
Terminal Diagram

Multilevel_Terminal_v1.0



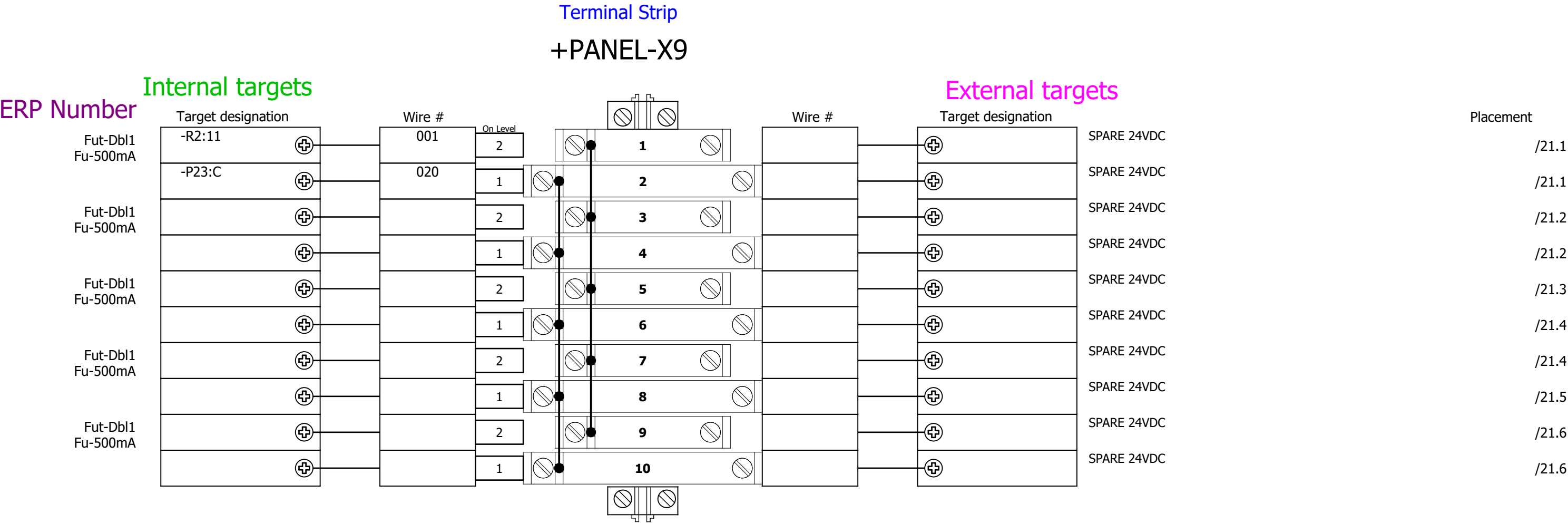
Terminal Diagram

Multilevel_Terminal_v1.0



Terminal Diagram

Multilevel_Terminal_v1.0



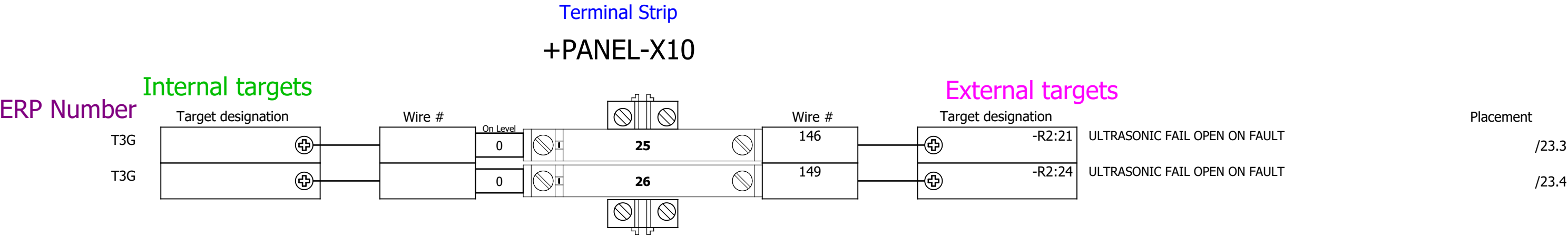
Terminal Diagram

Multilevel_Terminal_v1.0

Terminal Strip									
+PANEL-X10									
ERP Number	Internal targets						External targets		
	Target designation	Wire #	On Level		Wire #	Target designation	Placement		
T3G			0		124	-QM1:83	PUMP NO.1 RUN CLOSE ON PUMP RUN	/22.0	
T3G			0		134	-QM1:84	PUMP NO.1 RUN CLOSE ON PUMP RUN	/22.1	
T3G			0		125	-R5:41	PUMP NO.1 TRIP/OVER TEMP. OPEN ON TRIP	/22.1	
T3G			0		135	-R5:44	PUMP NO.1 TRIP/OVER TEMP. OPEN ON TRIP	/22.1	
T3G			0		126	-R10:11	PUMP NO.1 NO FLOW CLOSE ON NO FLOW	/22.2	
T3G			0		136	-R10:14	PUMP NO.1 NO FLOW CLOSE ON NO FLOW	/22.2	
T3G			0		127	-R7:21	PUMP NO.1 SEAL FAIL CLOSE ON FAULT	/22.3	
T3G			0		137	-R7:24	PUMP NO.1 SEAL FAIL CLOSE ON FAULT	/22.3	
T3G			0		128	-QM3:83	PUMP NO.2 RUN CLOSE ON PUMP RUN	/22.4	
T3G			0		138	-QM3:84	PUMP NO.2 RUN CLOSE ON PUMP RUN	/22.4	
T3G			0		129	-R12:41	PUMP NO.2 TRIP/OVER TEMP. OPEN ON TRIP	/22.5	
T3G			0		139	-R12:44	PUMP NO.2 TRIP/OVER TEMP. OPEN ON TRIP	/22.5	
T3G			0		130	-R17:11	PUMP NO.2 NO FLOW CLOSE ON NO FLOW	/22.6	
T3G			0		140	-R17:14	PUMP NO.2 NO FLOW CLOSE ON NO FLOW	/22.6	
T3G			0		131	-R14:21	PUMP NO.2 SEAL FAIL CLOSE ON FAULT	/22.6	
T3G			0		141	-R14:24	PUMP NO.2 SEAL FAIL CLOSE ON FAULT	/22.7	
T3G			0		132	-R20:21	HIGH HIGH LEVEL ALARM OPEN ON HIGH HIGH LEVEL	/22.8	
T3G			0		142	-R20:24	HIGH HIGH LEVEL ALARM OPEN ON HIGH HIGH LEVEL	/22.8	
T3G			0		133	-R23:31	HIGH LEVEL ALARM OPEN ON HIGH LEVEL	/22.9	
T3G			0		143	-R23:34	HIGH LEVEL ALARM OPEN ON HIGH LEVEL	/22.9	
T3G			0		144	-R1:41	MAINS/POWER SUPPLY FAIL OPEN ON MAINS FAIL	/23.0	
T3G			0		147	-R1:44	MAINS/POWER SUPPLY FAIL OPEN ON MAINS FAIL	/23.1	
T3G			0		145	-R22:21	FLOWMETER HEALTHY OPEN ON FAULT	/23.2	
T3G			0		148	-R22:24	FLOWMETER HEALTHY OPEN ON FAULT	/23.2	

Terminal Diagram

Multilevel_Terminal_v1.0



Parts list

PartsList_V01

Designation	Part number Tredwell ERP No.	Quantity	Device Designation	Schematic / position
Label Red 60x60 Isolator	DU.Lab Danger Isol	1	-1	(PANEL.S1)
	Lab Danger Isol			
		0	PE1	+PANEL&/1.2;+PANEL&/1.8
Enclosure WHD: 600x800x200 mm	SE.NSYS3D8620P	1	-U1	(PANEL.S1)
	NSYS3D8620P			
Enclosure WHD: 600x800x200 mm	SE.NSYS3D8620P	1	-U2	(PANEL.S2)
	NSYS3D8620P			
DIN rail perforated	PXC.1206421	1	-U8	(PANEL.S1)
	Din-Rail			
DIN rail perforated	PXC.1206421	1	-U9	(PANEL.S1)
	Din-Rail			
DIN rail perforated	PXC.1206421	1	-U10	(PANEL.S1)
	Din-Rail			
Trunking 80(H)x40mm 2m Lgth	DE.Tkg8040	1	-U15	(PANEL.S2)
	Tkg8040			
DIN rail perforated	PXC.1206421	1	-U16	(PANEL.S2)
	Din-Rail			
DIN rail perforated	PXC.1206421	1	-U17	(PANEL.S2)
	Din-Rail			
DIN rail perforated	PXC.1206421	1	-U18	(PANEL.S2)
	Din-Rail			
DIN rail perforated	PXC.1206421	1	-U20	(PANEL.S2)
	Din-Rail			
Cable duct 60Wx80H Blue	DE.Tkg8060 Blue	1	-U21	(PANEL.S2)
	Tkg8060 Blue			
Earth Bar 1mtr Pre slotted	DE.Bar5	1	-U22	(PANEL.S1)
	Bar5			
Earth Bar 1mtr Pre slotted	DE.Bar5	1	-U23	(PANEL.S2)
	Bar5			
Cable duct 60Wx80H	DE.Tkg8060	1	-U24	(PANEL.S1)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U25	(PANEL.S1)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U26	(PANEL.S1)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U27	(PANEL.S1)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U28	(PANEL.S2)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U29	(PANEL.S2)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U30	(PANEL.S2)
	Tkg8060			
Cable duct 60Wx80H	DE.Tkg8060	1	-U31	(PANEL.S2)
	Tkg8060			
		0	-U45	(PANEL.S1); (PANEL.S2)
		0	-U46	(PANEL.S1); (PANEL.S2)
		0	-U47	(PANEL.S1); (PANEL.S2)
		0	-U48	(PANEL.S1); (PANEL.S2)
Trunking 80(H)x40mm 2m Lgth	DE.Tkg8040	1	-U49	(PANEL.S2)
	Tkg8040			
Wall mounting bracket Sheet Steel Enc. max 250kg	SE.NSYAEFPFSC	1	-U52	(PANEL.S2)
	NSYAEFPFSC			
Trunking 40(H)x25mm 2m Lgth	DE.TKG2540_Door_No_Holes	1	-U53	(PANEL.S2)
	TKG2540_Door_No_Holes			
Trunking 40(H)x25mm 2m Lgth	DE.TKG2540_Door_No_Holes	1	-U54	(PANEL.S2)
	TKG2540_Door_No_Holes			
Trunking 40(H)x25mm 2m Lgth	DE.TKG2540_Door_No_Holes	1	-U55	(PANEL.S2)
	TKG2540_Door_No_Holes			
Trunking 40(H)x25mm 2m Lgth	DE.TKG2540_Door_No_Holes	1	-U56	(PANEL.S2)
	TKG2540_Door_No_Holes			
Trunking 40(H)x25mm 2m Lgth	DE.TKG2540_Door_No_Holes	1	-U57	(PANEL.S1)
	TKG2540_Door_No_Holes			
Mech. Interlock Kit LC1D09 to LC1D38	SE.LAD9R1	1	+PANEL-A1	+PANEL&/2.2
	LAD9R1			
Mech. Interlock Kit LC1D09 to LC1D38	SE.LAD9R1	1	+PANEL-A2	+PANEL&/2.5
	LAD9R1			
Conductive Sensors	CG.MINICAS II AC/DC	1	+PANEL-A5	+PANEL&/12.3
	MINICAS II AC/DC			
	DEM.11PinBase	1	+PANEL-A5	+PANEL&/12.3
	11PinBase			
Conductive Sensors	CG.MINICAS II AC/DC	1	+PANEL-A6	+PANEL&/16.3
	MINICAS II AC/DC			

	DEM.11PinBase			
	11PinBase		1	+PANEL-A6
				+PANEL&/16.3
ENYA, Voltage monitoring in 3-phase mains, 1 CO	TELE.3Ph-1		1	+PANEL-B1
	3Ph-1			+PANEL&/3.1
Miniature circuit breaker iC60N	SE.A9F44103		1	+PANEL-CF1
	1C3 A9F44103			+PANEL&/6.5
Fuse Holder 3 Pole 125A (22*58 fuse)	DEM.FH3125		1	+PANEL-F1
	FH3125			+PANEL&/1.2
Fuse 22x58mm 32A gG	DEM.Fu-22x58 32A gG		3	+PANEL-F1
	Fu-22x58 32A gG			+PANEL&/1.2
Type 2 surge arrester	PXC.2882750		1	+PANEL-F2
	Surge4b			+PANEL&/1.7
Fuse modular terminal block	PXC.3000539		1	+PANEL-F3
	Fut-1			+PANEL&/8.1
Fuse 1 Amp 5x20mm	DEM.Fu-1A		1	+PANEL-F3
	Fu-1A			+PANEL&/8.1
Fuse modular terminal block	PXC.3000539		1	+PANEL-F4
	Fut-1			+PANEL&/20.4
Fuse 1 Amp 5x20mm	DEM.Fu-1A		1	+PANEL-F4
	Fu-1A			+PANEL&/20.4
Power supply unit	PXC.2902992		1	+PANEL-G1
	PS24-60PH1			+PANEL&/6.5
GSM	CONT.GSM_PRO_16455.2		1	+PANEL-GSM1
	GSM C10			+PANEL&/8.0
Antenna Hockey Puc.	RSR.Antenna-RS		1	+PANEL-GSM1
	Antenna-RS			+PANEL&/8.0
Cabinet Heater 20w self regulating	DEM.Heater_Stand		1	+PANEL-HT1
	Heater-Stand			+PANEL&/4.8
Cabinet Heater 20w self regulating Touch Proof	DEM.Heater-20WT		1	+PANEL-HT1
	Heater-20WT			+PANEL&/4.8
Cabinet Heater 20w self regulating	DEM.Heater_Stand		1	+PANEL-HT2
	Heater-Stand			+PANEL&/6.8
Cabinet Heater 20w self regulating Touch Proof	DEM.Heater-20WT		1	+PANEL-HT2
	Heater-20WT			+PANEL&/6.8
Miniature circuit breaker - 3P	SE.A9F44320		1	+PANEL-MCB1
	3C20 A9F44320			+PANEL&/2.2
Auxiliary contacts iOF/SD+OF, iC60	SE.A9A26929		1	+PANEL-MCB1
	MCBAUX			+PANEL&/2.2
Miniature circuit breaker - 3P	SE.A9F44320		1	+PANEL-MCB2
	3C20 A9F44320			+PANEL&/2.5
Auxiliary contacts iOF/SD+OF, iC60	SE.A9A26929		1	+PANEL-MCB2
	MCBAUX			+PANEL&/2.5
Miniature circuit breaker - 3P	SE.A9F44302		1	+PANEL-MCB3
	3C2 A9F44302			+PANEL&/3.2
Miniature circuit breaker iC60N	SE.A9F44102		1	+PANEL-MCB4
	1C2 A9F44102			+PANEL&/4.1
Miniature circuit breaker iC60N	SE.A9F44102		1	+PANEL-MCB5
	1C2 A9F44102			+PANEL&/4.3
Miniature circuit breaker iC60N	SE.A9F44102		1	+PANEL-MCB6
	1C2 A9F44102			+PANEL&/4.4
Miniature circuit breaker iC60N	SE.A9F44104		1	+PANEL-MCB7
	1C4 A9F44104			+PANEL&/4.8
Miniature circuit breaker iC60N	SE.A9F44132		1	+PANEL-MCB8
	1C32 A9F44132			+PANEL&/5.1
Miniature circuit breaker iC60N	SE.A9F44106		1	+PANEL-MCB9
	1C6 A9F44106			+PANEL&/6.5
Miniature circuit breaker iC60N	SE.A9F44104		1	+PANEL-MCB10
	1C4 A9F44104			+PANEL&/6.8
Potential collective terminal	PXC.3214081		1	+PANEL-N1
	Poly-105BL			+PANEL&/1.6
TOR - 5.5...8 A	SE.LRD12		1	+PANEL-OL1
	LRD12			+PANEL&/2.2
TOR - 5.5...8 A	SE.LRD12		1	+PANEL-OL2
	LRD12			+PANEL&/2.5
Ammeter 10 Amp 2x Overscale	DEM.Amm10		1	+PANEL-P1
	Amm10			+PANEL&/2.2
Ammeter 10 Amp 2x Overscale	DEM.Amm10		1	+PANEL-P2
	Amm10			+PANEL&/2.5
Monolithic pilot light Ø 22 - White - integral LED - 24 V	DEM.IW24LT		1	+PANEL-P3
	IW24LT			+PANEL&/7.6
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT		1	+PANEL-P4
	IA24LT			+PANEL&/9.3
Monolithic pilot light Ø 22 - White - integral LED - 24 V	DEM.IW24LT		1	+PANEL-P5
	IW24LT			+PANEL&/10.9
Monolithic pilot light Ø 22 - green - integral LED - 24 V	DEM.IG24LT		1	+PANEL-P6
	IG24LT			+PANEL&/11.1
Hour Run Counter 10-50VDC	REVALCO.HR24VDC-R		1	+PANEL-P7
	HR24VDC-R			+PANEL&/11.1
Monolithic pilot light Ø 22 - green - integral LED - 24 V	DEM.IG24LT		1	+PANEL-P8
	IG24LT			+PANEL&/11.2

Parts list

PartsList_V01

Designation	Part number Tredwell ERP No.	Quantity	Device Designation	Schematic / position
Monolithic pilot light Ø 22 - Red - integral LED - 24 V	DEM.IR24LT IR24LT	1	+PANEL-P9	+PANEL&/11.8
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT IA24LT	1	+PANEL-P10	+PANEL&/12.1
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT IA24LT	1	+PANEL-P11	+PANEL&/12.8
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT IA24LT	1	+PANEL-P12	+PANEL&/13.8
Monolithic pilot light Ø 22 - White - integral LED - 24 V	DEM.IW24LT IW24LT	1	+PANEL-P13	+PANEL&/14.9
Monolithic pilot light Ø 22 - green - integral LED - 24 V	DEM.IG24LT IG24LT	1	+PANEL-P14	+PANEL&/15.1
Hour Run Counter 10-50VDC	REVALCO.HR24VDC-R HR24VDC-R	1	+PANEL-P15	+PANEL&/15.1
Monolithic pilot light Ø 22 - green - integral LED - 24 V	DEM.IG24LT IG24LT	1	+PANEL-P16	+PANEL&/15.2
Monolithic pilot light Ø 22 - Red - integral LED - 24 V	DEM.IR24LT IR24LT	1	+PANEL-P17	+PANEL&/15.8
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT IA24LT	1	+PANEL-P18	+PANEL&/16.1
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT IA24LT	1	+PANEL-P19	+PANEL&/16.8
Ind. Amber Lamp Test 22mm 24V	DEM.IA24LT IA24LT	1	+PANEL-P20	+PANEL&/17.8
Monolithic pilot light Ø 22 - Red - integral LED - 24 V	DEM.IR24LT IR24LT	1	+PANEL-P21	+PANEL&/18.9
Monolithic pilot light Ø 22 - Red - integral LED - 24 V	DEM.IR24LT IR24LT	1	+PANEL-P22	+PANEL&/20.8
Monolithic pilot light Ø 22 - Red - integral LED - 24 V	DEM.IR24LT IR24LT	1	+PANEL-P23	+PANEL&/20.9
Socket Angled IP44 Blue 3P 16A	GR.SktA4B-3-16 SktA4B-3-16	1	+PANEL-PLG1	+PANEL&/5.5
		0	+PANEL-PLG1	+PANEL&/5.5
Isolator 63/63 Amp 3 Pole	ABB.IsoA063 IsoA063	2	+PANEL-Q1	+PANEL&/1.2
Handle Rotary Max 125 A Amp Main Generator switch	ABB.IE1SCA105220R1001 ABB MG Han1	1	+PANEL-Q1	+PANEL&/1.2
Shroud 3P 63-80 Amp	ABB.IsoA Sh2 IsoA Sh2	2	+PANEL-Q1	+PANEL&/1.2
ABB 63/80 Amp Main Generator switch Common Bar	ABB.ABB MG Bar1 ABB MG Bar1	1	+PANEL-Q1	+PANEL&/1.2
Shaft 330mm for Rotary Handle 6mm	ABB.IE1SCA101661R1001 IsoA Shf330	1	+PANEL-Q1	+PANEL&/1.2
Mains Generator 63/80 Amp common plate	ABB.IE1SCA022865R4630 ABB MG Plate1	1	+PANEL-Q1	+PANEL&/1.2
TeSys Vario - emergency stop switch disconnecter on door	SE.VCF1 VCF1	1	+PANEL-Q2	+PANEL&/6.5
Contactor TeSys LC1-D - 3P - AC-3 440V 9 A, Coil 24 V DC	SE.LC1D09BD LC1D09BD	1	+PANEL-QM1	+PANEL&/10.3
Auxiliary contact block TeSys - 2 NO + 2 NC,screw-clamps terminals	SE.LADN22 LADN22	1	+PANEL-QM1	+PANEL&/10.3
Contactor TeSys LC1-D - 3P - AC-3 440V 9 A, Coil 24 V DC	SE.LC1D09BD LC1D09BD	1	+PANEL-QM2	+PANEL&/10.7
Auxiliary contact block TeSys - 2 NO + 2 NC,screw-clamps terminals	SE.LADN22 LADN22	1	+PANEL-QM2	+PANEL&/10.7
Contactor TeSys LC1-D - 3P - AC-3 440V 9 A, Coil 24 V DC	SE.LC1D09BD LC1D09BD	1	+PANEL-QM3	+PANEL&/14.3
Auxiliary contact block TeSys - 2 NO + 2 NC,screw-clamps terminals	SE.LADN22 LADN22	1	+PANEL-QM3	+PANEL&/14.3
Contactor TeSys LC1-D - 3P - AC-3 440V 9 A, Coil 24 V DC	SE.LC1D09BD LC1D09BD	1	+PANEL-QM4	+PANEL&/14.7
Auxiliary contact block TeSys - 2 NO + 2 NC,screw-clamps terminals	SE.LADN22 LADN22	1	+PANEL-QM4	+PANEL&/14.7
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R1	+PANEL&/7.4
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R1	+PANEL&/7.4
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R2	+PANEL&/8.9
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R2	+PANEL&/8.9
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R3	+PANEL&/9.8
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R3	+PANEL&/9.8
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R4	+PANEL&/10.1

Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R4	+PANEL&/10.1
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R5	+PANEL&/11.4
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R5	+PANEL&/11.4
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R6	+PANEL&/11.5
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R6	+PANEL&/11.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R7	+PANEL&/12.7
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R7	+PANEL&/12.7
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R8	+PANEL&/13.5
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R8	+PANEL&/13.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R9	+PANEL&/13.6
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R9	+PANEL&/13.6
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R10	+PANEL&/13.7
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R10	+PANEL&/13.7
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R11	+PANEL&/14.1
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R11	+PANEL&/14.1
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R12	+PANEL&/15.4
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R12	+PANEL&/15.4
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R13	+PANEL&/15.5
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R13	+PANEL&/15.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R14	+PANEL&/16.7
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R14	+PANEL&/16.7
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R15	+PANEL&/17.5
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R15	+PANEL&/17.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R16	+PANEL&/17.6
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R16	+PANEL&/17.6
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R17	+PANEL&/17.7
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R17	+PANEL&/17.7
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R18	+PANEL&/18.3
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R18	+PANEL&/18.3
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R19	+PANEL&/18.5
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R19	+PANEL&/18.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R20	+PANEL&/18.8
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R20	+PANEL&/18.8
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.G2R-2-SNI-24DC(S) G2R2SNI24VDC	1	+PANEL-R21	+PANEL&/19.2
Electromechanical relays, Industrial plug-in relays, G2R-_-S	OMR.P2RF-08-PU 8PinbaseG	1	+PANEL-R21	+PANEL&/19.2
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R22	+PANEL&/19.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R22	+PANEL&/19.5
Electromechanical relays, Industrial plug-in relays, MY	OMR.MY4IN-24DC-(S) 14Pin24VDC	1	+PANEL-R23	+PANEL&/20.6
Electromechanical relays, Industrial plug-in relays, MY	OMR.PYF14-PU 14PinbaseO2	1	+PANEL-R23	+PANEL&/20.6
N40 Vigi (RCBO)- 1P + N - 16 A - B curve - 240 V - 30 mA	SE.A9D56616 RCBO16B	1	+PANEL-RCBO1	+PANEL&/5.4

Parts list

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Designation	Part number Tredwell ERP No.	Quantity	Device Designation	Schematic / position
Resistor 1000 Ohm	OMR.Resistor 1000 Ohm Resistor 1000	1	+PANEL-RES1	+PANEL&/12.4
Resistor 1000 Ohm	OMR.Resistor 1000 Ohm Resistor 1000	1	+PANEL-RES2	+PANEL&/16.4
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S3	+PANEL&/7.1
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S3	+PANEL&/7.1
Cap Flush Push Button Black	SE.ZBA-Bk ZBA-Bk	1	+PANEL-S3	+PANEL&/7.1
red Ø40 Emergency stop, switching off head Ø22 trigger and	SE.ZB5AS844 ZB5AS844	1	+PANEL-S4	+PANEL&/10.0
Emergency Stop legend	SE.ZBY9330 ZBY9330	1	+PANEL-S4	+PANEL&/10.0
single contact block with body/fixing collar 1NC screw clamp termil	SE.ZB5AZ102 ZB5AZ102	2	+PANEL-S4	+PANEL&/10.0
SELECTOR SWITCH 230VAC 2AMP XB5 +OPTIONS	SE.XB5AD33 XB5AD33	1	+PANEL-S5	+PANEL&/10.3
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S5	+PANEL&/10.3
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S6	+PANEL&/10.3
single contact block with body/fixing collar 1NC screw clamp termil	SE.ZB5AZ102 ZB5AZ102	1	+PANEL-S6	+PANEL&/10.3
Cap Stop (5)	SE.ZBA-Stop ZBA-Stop	1	+PANEL-S6	+PANEL&/10.3
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S7	+PANEL&/10.3
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S7	+PANEL&/10.3
Cap Start (5)	SE.ZBA-Start ZBA-Start	1	+PANEL-S7	+PANEL&/10.3
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S8	+PANEL&/10.7
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S8	+PANEL&/10.7
Cap Flush Push Button Black	SE.ZBA-Bk ZBA-Bk	1	+PANEL-S8	+PANEL&/10.7
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S9	+PANEL&/11.5
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	3	+PANEL-S9	+PANEL&/11.5
Cap Flush Blue "R"	SE.ZBA-Res ZBA-Res	1	+PANEL-S9	+PANEL&/11.5
single contact block with body/fixing collar 1NC screw clamp termil	SE.ZB5AZ102 ZB5AZ102	1	+PANEL-S9	+PANEL&/11.5
SELECTOR SWITCH 230VAC 2AMP XB5 +OPTIONS	SE.XB5AD33 XB5AD33	1	+PANEL-S10	+PANEL&/14.3
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S10	+PANEL&/14.3
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S11	+PANEL&/14.3
single contact block with body/fixing collar 1NC screw clamp termil	SE.ZB5AZ102 ZB5AZ102	1	+PANEL-S11	+PANEL&/14.3
Cap Stop (5)	SE.ZBA-Stop ZBA-Stop	1	+PANEL-S11	+PANEL&/14.3
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S12	+PANEL&/14.3
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S12	+PANEL&/14.3
Cap Start (5)	SE.ZBA-Start ZBA-Start	1	+PANEL-S12	+PANEL&/14.3
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S13	+PANEL&/14.7
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	1	+PANEL-S13	+PANEL&/14.7
Cap Flush Push Button Black	SE.ZBA-Bk ZBA-Bk	1	+PANEL-S13	+PANEL&/14.7
Pushbutton head Ø22 spring return without cap	SE.ZB5AA0 ZB5AA0	1	+PANEL-S14	+PANEL&/15.5
single contact block with body/fixing collar 1NO screw clamp termil	SE.ZB5AZ101 ZB5AZ101	3	+PANEL-S14	+PANEL&/15.5
Cap Flush Blue "R"	SE.ZBA-Res ZBA-Res	1	+PANEL-S14	+PANEL&/15.5
single contact block with body/fixing collar 1NC screw clamp termil	SE.ZB5AZ102 ZB5AZ102	1	+PANEL-S14	+PANEL&/15.5
SELECTOR SWITCH 230VAC 2AMP XB5 +OPTIONS	SE.XB5AD33 XB5AD33	1	+PANEL-S15	+PANEL&/18.3

single contact block with body/fixing collar 1NC screw clamp termil	SE.ZB5AZ102 ZB5AZ102	2	+PANEL-S15	+PANEL&/18.3
Thermostat	FIN.7T.81.0.000.2401 Stat-Heater-F	1	+PANEL-ST1	+PANEL&/4.8
Thermostat	FIN.7T.81.0.000.2401 Stat-Heater-F	1	+PANEL-ST2	+PANEL&/6.8
Isolation amplifier	PXC.2865476 PH 2865476	1	+PANEL-T2	+PANEL&/20.1
Timers, Analog solid state timers, H3DS	OMR.H3DS-ML-AC/DC Timer-ML	1	+PANEL-U1	+PANEL&/7.2
Timers, Analog solid state timers, H3DS	OMR.H3DS-ML-AC/DC Timer-ML	1	+PANEL-U2	+PANEL&/9.6
Timers, Analog solid state timers, H3DK	OMR.H3DK-M2-AC/DC24-240 Timer-DE	1	+PANEL-U3	+PANEL&/13.2
Timers, Analog solid state timers, H3DS	OMR.H3DS-ML-AC/DC Timer-ML	1	+PANEL-U4	+PANEL&/13.4
Timers, Analog solid state timers, H3DK	OMR.H3DK-M2-AC/DC24-240 Timer-DE	1	+PANEL-U5	+PANEL&/17.2
Timers, Analog solid state timers, H3DS	OMR.H3DS-ML-AC/DC Timer-ML	1	+PANEL-U6	+PANEL&/17.4
2 Core screen cable Belden Type	DEM.CBL2Sc CBL2Sc	1	+PANEL-W1	+PANEL&/12.4
2 Core screen cable Belden Type	DEM.CBL2Sc CBL2Sc	1	+PANEL-W2	+PANEL&/16.4
Feed-through terminal block	PXC.3044225 T35G	2	+PANEL-X1	+PANEL&/1.0;+PANEL&/1.5
Inlet IP67 Red 5P 32A	SE.InI7R-5-32 InI7R-5-32	1	+PANEL-X2	+PANEL&/1.3
		0	+PANEL-X2	+PANEL&/1.4;+PANEL&/1.5
Feed-through terminal block	PXC.3044102 T4G	6	+PANEL-X3	+PANEL&/2.2;+PANEL&/2.5;+PANEL&/2.6
Ground modular terminal block	PXC.3044128 T4PE-P	2	+PANEL-X3	+PANEL&/2.2;+PANEL&/2.6
Feed-through terminal block	PXC.3044102 T4G	3	+PANEL-X4	+PANEL&/4.1;+PANEL&/4.3;+PANEL&/4.4
Feed-through terminal block	PXC.3044115 T4BL	3	+PANEL-X4	+PANEL&/4.1;+PANEL&/4.3;+PANEL&/4.5
Ground modular terminal block	PXC.3044128 T4PE-P	3	+PANEL-X4	+PANEL&/4.1;+PANEL&/4.3;+PANEL&/4.5
Feed-through terminal block	PXC.3044160 T10G	1	+PANEL-X4	+PANEL&/5.1
Feed-through terminal block	PXC.3044188 T10B	1	+PANEL-X4	+PANEL&/5.1
Ground modular terminal block	PXC.3044173 T10PE	1	+PANEL-X4	+PANEL&/5.1
Feed-through terminal block	PXC.3209549 T3G	2	+PANEL-X5	+PANEL&/8.8
Feed-through terminal block	PXC.3209549 T3G	18	+PANEL-X6	
Ground modular terminal block	PXC.3209565 T3PE	2	+PANEL-X6	+PANEL&/12.4;+PANEL&/16.4
Feed-through terminal block	PXC.3209552 T3BL	4	+PANEL-X8	+PANEL&/20.1...+PANEL&/20.3
Fuse modular terminal block	PXC.3214325 FuT-DbI1	5	+PANEL-X9	+PANEL&/21.1...+PANEL&/21.4;+PANEL&/21.6
Fuse 500mA 5x20mm	DEM.Fu-500mA Fu-500mA	5	+PANEL-X9	+PANEL&/21.1...+PANEL&/21.4;+PANEL&/21.6
Feed-through terminal block	PXC.3209549 T3G	26	+PANEL-X10	+PANEL&/22.0...+PANEL&/22.9;+PANEL&/23.0...+PANEL&/23.4