TClarke

Technical Submission Document

Tech Sub Doc No:	LON12-AVK-ZZ-GA-TS-X-500108	Project Ref:	VIRTUS LONDON12	Rev:	P03
Sub Contractor / Supplier	AVK-SEG	Contract No:	011508		
Description of Submission:	SCR TECHNICAL SUBMITTAL				

To: CC ☑ M&E Consultant ☐ Other (Define Below)
☐ Architect
☐ Structural Engineer

Comment of the following document is required

Equipment Specifying Schedule	☐	Builderswork Requirements	☐
Manufacturer's Data	☑	Assembly/ Installation Details	☐
Design Check Calculations	☐	O & M Manuals	☐
Certified Performance Data	☐	Reports	☐

Additional Submission Details

Signed:	T. Harvey	Date Issued:	13/03/2025	Comments Required By:	27/03/2025

Status of the above

Status **A** = No comment, can be incorporated into the scheme
Status **B** = Minor discrepancies found as listed below. Submission can be incorporated
Status **C** = Submission unacceptable (as listed below), Resubmission required

Comments on Submission

Signed:		Position:		Date:	
Name:		Representing:			

Main Contractors Review

Comment:

Signed:		Name:		Date:	

cc ☐ Contract Manager ☐ M & E Design Co-ord / Manager ☐ Surveyor ☐ M & E S/C / Originator

AVK

Powering tomorrow's data

SCR and Silencer Technical Submittal

Virtus LON12 - DS3100

1.0 Technical submission front page

Trade contractor:	AVK-SEG (UK) Ltd	**From:**	Ian Brewin
Trade Contractor sub no:		**Date:**	12.03.2025
Revision:	P03		
Reason for revision:	N/A		

Approval of the following equipment is required:

Equipment:	SCR Reactor & Silencer	**Make:**	AVK-SEG
Equipment references:	DS3100 Diesel Generator	**Areas used:**	Containerised Generator
Description:	Supply and installation of Selective Catalytic Reduction System (SCR) for use on DS3100 – 20V4000G74F – NEA Singapore		
Planned on site date:	See project schedule		

Attached detail documents:

(Tick if included and Insert references within boxes identifying supporting documentation included within this submission)

Description	Tick	Section	Description	Tick	Doc ref
Technical submission front sheet	✓	1.0	Interfaces & dependencies schedule	✓	6.0
Equipment description	✓	2.0	Builders work requirements	X	7.0
List of exceptions & clarifications	✓	3.0	Schedule of comments	✓	8.0
Manufacturers documents	✓	4.0	Appendices	✓	9.0
Certified drawings	X	5.0			

Signed by trade contractor:	
Date:	12.03.2025

Approval:

Company	Sign	Date	Status	Comments
Client				

Note: If client sign off and/or comments have not been received within 2 weeks of the date stated on this technical submission then early warning notices or an extension of time will be required. If these are not received then the products and/or services detailed in the technical submission are deemed to be acceptable and final technical submission from AVK Projects will be based upon the scope covered within this document.

2.0 Equipment Description

2.1 Overview

To supply and install a Selective Catalytic Reduction system sized to provide a reduction from 3576mg/Nm3@5% oxygen (the NOx reduction target is taken from the Not To Exceed NOx figure provided by MTU) down to less than 100mg/Nm3@5% oxygen to exceed the MCPD requirements for the MTU 20V4000G74F NEA diesel generator.

The Not To Exceed value is an absolute value that the engine will not be able to exceed under any circumstances. In reality, we have recorded values that are between the Raw Emission values and the Not To Exceed figures. Using this probable value, we would expect to see an increase in autonomy due to the lower levels of engine out NOx.

The design is closed loop and in conjunction with the use of Ammonia slip catalyst we ensure that an average of less than 10ppm and a peak of 20ppm of ammonia emissions.

The after-treatment system will operate at full emissions reduction within 10 minutes of the engine starting and being put under at least 40% load, or 330c continuous exhaust gas temperature.

The SCR reactor housing to be supplied with an exhaust silencer to achieve a noise level of 75dBA +/-3 dBA at 1m from the silencer termination in free field conditions.

The SCR and silencer design conditions.

Engine exhaust gas flow rate:	12872 Kg/Hr
Exhaust gas temperature after ETC:	528.1 C
Maximum engine back pressure:	30 Millibar
NOx concentration at 100% load, based on Engine Raw Emissions:	3576mg/Nm3@5% oxygen.

See the following appendices for further details:
Appendix 9.01 – Generator Data Sheet
Appendix 9.02 – Engine Emissions Data Sheet

2.2 Silencer

The SCR design includes a silencer to reduce the engine exhaust noise in line with required levels. The acoustically treated absorptive silencer is designed to produce the required acoustic performance within the desired operating range of the engine. The silencer targets high frequency insertion loss and will achieve 25 dBA reduction. The MCERTS test points will be installed directly onto the silencer.

The silencer is constructed from carbon steel with a black paint finish.

Acoustic target of 75dBA@1m

Achievable acoustic reduction: 78dBA@1m +/- 3 dBA

Silencer back pressure: 3 millibar

See the following appendices for further details:
Appendix 9.03 – Silencer calculations

2.3 Urea Injection

The urea injectors are directly mounted into the low back pressure stainless steel collector, which then feeds into the 304 stainless steel mixing pipe which will be installed inside the container.

The urea is delivered via electrically operated micro dosing pumps providing precise delivery of the ammonia solution to the solenoid operated injectors. Each pump generates a delivery pressure of 7 bar. This provides homogenous mixing of the aqueous urea and exhaust gases.

The urea is feed from a 7-litre maximum capacity tank, with a working capacity of 5-litres.

The injectors have their own water and glycol cooling circuit which protects the injector from exhaust heat. The tank has a maximum capacity of 7-litres with a working capacity of 5-litres.

Both the urea feed tank and the glycol and water coolant tanks are fabricated from 304 stainless steel. They are single skinned tanks, with a wall thickness of 2mm. Both are housed within the dosing cabinet. There is a drip tray below both tanks. No leak detection.

The urea injector pump is located within the dosing cabinet.

The dosing cabinet is located within the plant room.

In operation the cooling circuit recirculates through the injectors and returns to tank. The urea feed circuit connects to a manifold which allows a percentage of the urea to pass through the cooling tank before being returned to the urea bulk tank. This facilitates additional cooling within the coolant tank.

We use a synthetic thermoplastic polymer PA12 for all the urea and coolant pipe work, this provides high resistance to wear, oils, aliphatic hydrocarbons and alkalis. The tube measures 10mm outer diameter and 8mm internal diameter.

See the following appendices for further details:
Appendix 9.04 – Injector Data Sheet.
Appendix 9.05 – Urea Dosing and Coolant Level Sensors

2.4 Catalyst Housing

The catalyst housing is fabricated from 4003 Stainless Steel and supplied with DN600 inlet and outlet connections. Inside the reactor are located 30 No. catalyst substrates, each secured to the internal structure of the housing providing a gas tight seal.

Located to the inlet of the mixing pipe are the NOx[1] , Temperature[1] and back pressure sensors.

Located to the outlet of the SCR reactor are the NOx[2] and Temperature[2] sensors.

The MCERTS test points are located post the SCR reactor.

Reactor and mixing tube back pressure: 19.6 millibar

See the following appendices for further details:
Appendix 9.06 – Reactor Housing and Mixing Tube

2.5 Dosing Unit and Control System

The dosing cabinet is fabricated from carbon steel with a powder coat finish and rated to IP54. To the front of the panel is a 5" touch screen panel providing visualisation of the operating parameters of the system as well as indicating any fault alarms.

The system also includes a range of sensors, these include temperature, back pressure and NOx providing information to the control panel. Mounted prior to the carbon steel mixing pipe, which has a stainless-steel mixing and injector section. We have 1 x NOx, 1 x Temperature and 1 x back pressure, mounted to the SCR reactor outlet we have 1 x NOx, 1 x temperature. The data is updated every second during operation.

The control panel has a built-in data logger (250 hours) which records pre and post SCR NOx values, exhaust gas temperatures, and reactor back pressure, along with urea consumption, and daily average values. All this data can be downloaded onto an external storage device such as a USB stick.

The control panel is provided with Modbus converter which converts the CANbus signals from the SCR control system into Modbus. These can be connected to the PMS. A full list of the fault codes available has been included in the Appendices under 9.10

A centralised London 12 monitoring system is being investigated and will be submitted on a separate Technical Submission.

Power supply would be 230v single phase 50Hz rated at 16 amps being feed to the UPS cabinet. We then take a 24v feed to the Dosing Panel.

Included is a battery UPS providing additional resilience of 7 Amp hours, or approximately 30 minutes operational time in the event of a mains failure.

The UPS cabinet is located within the container.

Reduction Required	97%									
Safe Coef. (extra dosing)	15%									
Engine	Power									
MTU20V4000G74F DS3100	2670									
NOx Not To Exceed Emission @ 100% Load						***AUS FLOW RATE***				
NOx [g/h]	**Nox [g/s]**	**Nox[mol/s]**	**Urea [mol/sec]**	**Urea [g/sec]**	**AUS conc [%]**	**AUS [g/s]**	**AUS [kg/h]**	**AUS [ul/sec]**	**AUS [l/h]**	**g/kWh**
26566.1	7.379	0.160	0.089	5.349	32.5%	16.458	59.249	15057.699	54.21	9.95

See the following appendices for further details:
Appendix 9.07 – Dosing Control Panel, Tank Assembly Enclosure, UPS Panel and Marshalling Panel.

2.6 Urea Tank

The urea tank is constructed from UV stabilised high density polyethylene (HDPE) and supplied fully bunded. Operational temperature range for the urea tank will be 0-45c ambient. The tank measures 8600mm wide by 1800mm deep and 1800mm in height. Empty weight will be approximately 180 Kilos.

Complete with 2" stainless steel dry break fill point, overfill alarm and contents gauge.

Working capacity of 2,000 litres.

At 100% load the diesel generator is producing 3576 mg/Nm3@5% oxygen, and we are reducing down to 100mg/Nm3@5% oxygen. This is an 97% NOx reduction requiring 54.21 litres of (AUS32) urea per hour.

Please see below a detailed table as an indicative guide demonstrating Raw NOx figures against Not To Exceed with real world test data.

Generator Output kVA	Generator Output kWe	Power (engine rating) kWm	Site Emissions Test Power n2 kWm	Velocity (m/s)	Temperature (C)	VOC mg/m3	NOx emission rate (g/h) (actual)	DATA SHEET 100% load n1 (Lab Conditions) NOx emissions (mg/Nm3) (normalised)@ 5%	DATA SHEET (Not to exceed) 100% load n1 NOx emissions (mg/Nm3) (normalised)@ 5%	REAL WORLD (as tested) 100% load n1 NOx emissions (mg/Nm3) (normalised)@ 5%
2800	2240	2850	2138	31.1	447	8	6644.00	2155.00	4530.00	2802.00
2800	2240	2850	2138	29.6	453	28	6234.00	2155.00	4530.00	2704.00
2800	2240	2850	2138	27.1	465	1	6383.00	2155.00	4530.00	2837.00
2800	2240	2850	2138	29.0	452	38	6496.00	2155.00	4530.00	2848.00
2800	2240	2850	2138	28.80	463	13	6056.00	2155.00	4530.00	2714.00
2800	2240	2850	2138	29.50	459	24	6371.00	2155.00	4530.00	2836.00

The urea tank capacity will provide 48 hrs continuous operation at 65% load based upon the Not To Exceed NOx figure of 3576mg/Nm3@5% Oxygen.

Urea tanks supplied with a 10-year warranty and a suggested operational life of 20 years.

The urea tanks will need to be manually filled. The tanks are supplied with a 2" stainless steel fill point. To re-fill the tanks a chemically compatible hose (1" outer diameter) will be required complete with stainless steel fittings to allow connection to the urea tank. The hose to be run from ground level to urea tank height. Delivery of the urea will be from a 1,000 litre IBC complete with stainless steel or PTFE double diaphragm pump providing sufficient positive pressure to reach the bulk urea storage tanks.

Urea tanks are situated on the mezzanine floor above the containers, and they will be sited between or next to their individual outlet riser flues. The flue riser is acoustically lined and will limit thermal transfer, the tanks have sufficient air gaps around them to reduce any further heat transfer.

• Maximum Constant storage temperature in ℃	• Shelf Life of AdBlue - AUS 32 • Months	• Effect of temperature on Urea
• Below ≤ −11℃	• Not usable while frozen	• AdBlue -AUS32 frozen
• -10℃ ≥ 0℃	• Urea not impaired	• AdBlue-AUS32 reduced Nox reduction
• Above 0℃ - <10℃ (a) •	• >36m	• Most Optimal storage temperature
• 11 ≥ 25 ℃ (a)(f)	• >24m	• Slight reduction of shelf life
• 25 ≥30 ℃ (b)(f)	• 18m	• Less optimal conditions
• 30≥35℃ (c)(f)	• 12m	• Only possible with High consumption
• Above 36℃ (c)(d)(e)(f)	• 6 m---	• Only possible if Urea consumption is high

a) Ideal operating temperatures to prevent chemical decomposition of AdBlue
b) Reduced storage due to thermal chemical decomposition
c) Accelerated thermal chemical degradation of AdBlue
d) Storage only in continuous high consumption operation
e) Limited storage at high temperatures, addition of new AdBlue advised
f) Urea quality sensor allows for extended shelf life

• Maximum Constant storage temperature in ℃	• Shelf Life of AdBlue - AUS 40 • Months	• Effect of temperature on Urea
• Below ≤ −11℃	• Not usable while frozen	• AdBlue -AUS40 frozen
• -10℃ ≥ 0℃	• Not usable while frozen	• AdBlue-AUS40 frozen
• Above 0℃ - <10℃ (a) •	• >24m	• Most Optimal storage temperature
• 11 ≥ 25 ℃ (a)(f)	• >18m	• Slight reduction of shelf life
• 25 ≥30 ℃ (b)(f)	• 12m	• Less optimal conditions
• 30≥35℃ (c)(f)	• 6m	• Only possible with High consumption
• Above 36℃ (c)(d)(e)(f)	• Not advised	• Not Advised

The AVK Emissions reduction has been designed in such a way that it's able to operate with both AUS 32 AdBlue and AUS 40. The urea dosing system has a urea quality sensor installed in the buffer tank that detects the concentration of the urea. Using this sensor to detect the concentration of the urea we are able to extend the shelf life of the stored AdBlue. When the system is filled with AUS 32 -AdBlue the maximum

concentration of the urea is 37.5% after this a service alarm will be raised as a fault condition, the user display show faults locally.
When operating on AUS 40 the fault condition will be raised when the concentration of the urea increases above 42%.
The AVK system has been designed to operate with Urea Concentrations up to 42% without interruption or systematic faults.
AUS 32 ISO 22241 DIN 70070 Specifies the Urea content of between 31.8-33.2% by weight
AUS 40 ISO 18611 Specifies the Urea content of between 39-41% by weight

Hydrolysation of AdBlue
AdBlue or AUS 32 starts the hydrolysation process from 30℃, at these temperatures the distilled water starts to evaporate, increasing the concentration of Urea (Ammonia NH3), This process is limited by the use of a positive pressure being maintained in the tank, the pressure is held at 0.1 barg, this pressure limits the loss of water at higher storage temperatures.
During the injection phase the increasing the temperature of the Urea or AdBlue has a positive effect, speeding up the duration of the hydrolysis when being introduced into the exhaust gas stream. The elevated temperatures of Urea or AdBlue is a desired effect during the process, reducing the mixing time and ensuring utmost efficiency with minimum secondary emission of Ammonia NH3. This process is employed with in the dosing strategy, pre-heating the AdBlue to elevate the temperature to around 30℃ before injection reducing the time taken to hydrolyse the urea in the gas flow.

Urea (Adblue) technical data sheet added. See appendices 9.11

See the following appendices for further details:
Appendix 9.08 – Urea Tank

3.0 List of exceptions & clarifications

Issued Separately.

4.0 Manufacturers documents

See list of appendices in section 9.

5.0 Certified drawings

To be issued separately following completion of detailed design.

6.0 Interfaces and dependencies schedule

Auxiliary supply required	Detail	Quantity required	Provided by	Final connection by
1 x 230v 50Hz 16 Amps. This will be taken from the AVK distribution board within the generator container.	SCR Control Panel	One per generating set	Others	Others

Note: The above list is based on initial design information and may be subject to change as the project progresses.

7.0 Builders work requirements

None associated with the SCR System

8.0 Schedule of comments

The following table provides a schedule of all comments required against this document and details the AVK response and status of each comment.

Item	Client comment	AVK response	Status
1	Medium Combustion Plant Directive (MCPD), the NOx emission limit for diesel engines is 190 mg/Nm^3 at 15% oxygen1. Therefore, the proposed reduction appears to comply with MCPD requirements. This directive also for generators thermal output to be in the 1-50MWth range, in England and Wales. which we are not seeking here.	The figure indicated, 3576mg/Nm3 at 5% Oxygen is the engines Not To Exceed NOx figure provided by MTU. We use this as the worst case scenario when sizing the Selective Catalytic Systems (SCR). This ensures that the provided system will exceed the required emissions target of 190mg/Nm3 at 15% Oxygen.	
2	(1) Ensure that the catalyst design, monitoring system accuracy, and long term ammonia slip control capabilities are robust, maintainable, and verifiable. (2) Are there any transient load issues during startup? Will the results differ between cold starts and hot starts? (3) Acoustic performance must be consistent with the specifications provided. 78dbA@1m+/-3dBA will result in high noise when all running together and in installed condition.	As detailed, we use a closed loop design that has a both a NOx and temperature sensor both pre and post the SCR reactor. There is also a back pressure sensor installed on the inlet to the SCR reactor to monitor any potential air flow restrictions. These sensors report back to the control panel every second during engine operation. This allows the system to react and precisely control the amount of urea being injected into the mixing pipe, the dosing regime is controlled down to micro litres (SCR has no effect on engine operation). The temperature sensors monitor the	

		exhaust gas temperature and will only begin dosing urea once the exhaust gas is stable at a minimum of 330c. This forms part of our ammonia slip strategy. As standard we include ammonia slip catalyst that polices any erroneous urea levels during rapid load changes. Due to the inherent plant room limitations the silencer is provided to fit the space available. The noise limit of 75 dBA will be achievable as the SCR reactor housing reduces the low frequency and the absorbative silencer with deal with the high frequency. The acoustic plenum which exhausts 17 metres above ground will provide the additional 3 dBA level of noise reduction required.	
3	Assume the local 7lt injector tank is filled from a dedicated bulk tank per generator.	Yes, it will be filled from the 2000 litre urea bulk tank supplied.	
4	Is this because there is not risk of leaking or? Drip Tray is provided, which means there is a risk of leakage.	Both the 7-litre urea buffer tank and the 7-litre coolant tank are fabricated tanks. They are constructed from 304 stainless steel to provide long term corrosion resistance. The drip tray is provided for the initial filling of the coolant tank, which is undertaken during commissioning. Additionally, the drip tray has been added for maintenance tasks during for the full life cycle of eth equipment.	
5	I understand 304 stainless steel lacks the necessary resistance to the corrosive environment created by urea and ammonium carbamate. Please advise. Typically, we see 316L for such applications.	We use 304 stainless steel as its corrosive resistance to urea (AUS32) is suitable for the application. 316L is predominantly used in marine applications as this provides superior corrosion resistance to the saline environment.	
6	How long a 5 Litre tank can run generator at full load, what would be refilling? process? share with us a historic data. of the impact on the reliability/availability of the generator system with SCR fixed on it?	The 5-litre urea tank is used as a buffer / urea conditioning tank that directly feeds the injectors. Based upon 100% load the contents of the tank would last approximately 6 minutes. The urea buffer tank is constantly being replenished during SCR operation from the primary 2000 litre urea tank. Additionally, the continuous flow of urea acts as a cooling circuit. Our SCR system does not impact the generator availability or reliability in any way. The engine can be operated without load, although due to the low exhaust gas	

		temperature the system will not become operational, as the AUS32 will not hydrolyse. Should the SCR system for example run out of urea during operation then it will shut down and alarm. The engine performance will not be impacted apart from the lack of NOx reduction.	
7	CANBus to Modbus conversion list to be issued.	Added to Appendices 9.10 Simple no volt contacts available.	
8	PMS.	Corrected.	
9	can be taken from generator DB, within AVK scope?	Corrected under section 6. Part of AVK-SEG scope.	
10	What would be refilling process? Share with us a historic data of the impact on the reliability/availability of the generator system with SCR fixed on it. Is this tank only for storage? If not, this statement says urea. Tank is HDPE and statement above states it is stainless. steel, which one is correct?	The 2000 litre urea tank is supplied with a 2” stainless steel fill point. Urea will need to be transported to each tank and filled manually. The 2000 litre bulk urea tank is for storage. This feeds directly into the 5 litre stainless steel buffer tank. There are two urea tanks. The HDPE tank is the 2000 litre bulk storage tank. The 5-litre stainless steel tank is the buffer tank that feeds the two injectors. Both are correct.	
11	highlight which of the values are matching with the particular engine set?	Highlighted are the Engine Raw Emissions values (these values are strictly controlled engine test cell based) provided in mg/Nm3 at 5% Oxygen. We do not use any of these values when sizing the SCR system. Instead, we use the Not To Exceed Emissions Values table, and we use the worst case value, which in this case is 3576mg/Nm3 at 5% Oxygen (n1). The n5 value is discredited as the exhaust gas temperature is insufficient for the SCR system to operate.	
12	to be agreed with the Client.	Due to the gantry steel limitations the silencer is provided to fit the space available. The noise limit of 75 dBA will be achievable as the SCR reactor housing reduces the low frequency and the absorbative silencer with deal with the high frequency. The acoustic plenum which exhausts 17 metres above ground will provide the additional level of noise reduction required.	

NOTE: Client to advise status of comments from the following list.

Accepted (No further action)

Rejected (refer to comments)

9.0 Appendices

Item	Client comment
9.01	Generator Data Sheet
9.02	Emissions Data Sheet
9.03	Silencer Calculations
9.04	Injector Data
9.05	Urea Dosing and Coolant Level Sensors
9.06	Reactor Housing
9.07	Dosing Unit and Control System, Tank Assembly Enclosure, and UPS Panel
9.08	Urea Tank & Fittings
9.09	Electrical Drawings For The SCR System
9.10	CANBus to Modbus conversion list
9.11	Urea (Adblue) Technical Data Sheets.

Appendices 9.01

Generator Data Sheet

Diesel Generator Set

mtu 20V4000 DS3100

380V – 11 kV/50 Hz/standby power/NEA (ORDE) optimized
20V4000G74F/water charge air cooling

Optional equipment and finishing shown. Standard may vary.

Product highlights

Benefits
- Low fuel consumption
- Optimized system integration ability
- High reliability
- High availability of power
- Long maintenance intervals

Support
- Global product support offered

Standards
- Engine-generator set is designed and manufactured in facilities certified to standards ISO 2008:9001 and ISO 2004:14001
- Generator set complies to ISO 8528
- Generator meets NEMA MG1, BS 5000, ISO, DIN EN and IEC standards
- NFPA 110

Power rating
- System ratings: 3080 kVA - 3180 kVA
- Accepts rated load in one step per NFPA 110*
- Generator set complies to G3 according to ISO 8528-5
- Generator set exceeds load steps according to ISO 8528-5*

Performance assurance certification (PAC)
- Engine-generator set tested to ISO 8528-5 for transient response
- 85% load factor
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

Complete range of accessories available
- Control panel
- Power panel
- Circuit breaker/power distribution
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical and electrical driven radiators
- Medium and oversized voltage alternators

Emissions
- NEA (ORDE) optimized

Certifications
- CE certification option
- Unit certificate acc. to VDE-AR-N 4110

Application data [1)]

Engine	
Manufacturer	*mtu*
Model	20V4000G74F
Type	4-cycle
Arrangement	20V
Displacement: l	95.4
Bore: mm	170
Stroke: mm	210
Compression ratio	16.4
Rated speed: rpm	1500
Engine governor	ECU 9
Max power: kWm	2670
Air cleaner	dry

Fuel system	
Maximum fuel lift: m	5
Total fuel flow: l/min	27

Fuel consumption [2)]	l/hr	g/kwh
At 100% of power rating:	633.7	197
At 75% of power rating:	494.6	205
At 50% of power rating:	345.8	215

Liquid capacity (lubrication)	
Total oil system capacity: l	390
Engine jacket water capacity: l	205
Intercooler coolant capacity: l	50

Combustion air requirements	
Combustion air volume: m³/s	2.6
Max. air intake restriction: mbar	50

Cooling/radiator system	
Coolant flow rate (HT circuit): m³/hr	80
Coolant flow rate (LT circuit): m³/hr	32.5
Heat rejection to coolant: kW	1030
Heat radiated to charge air cooling: kW	490
Heat radiated to ambient: kW	105
Fan power for electr. radiator (40°C): kW	70

Exhaust system	
Exhaust gas temp. (after turbocharger): °C	550
Exhaust gas volume: m³/s	8.6
Maximum allowable back pressure: mbar	85
Minimum allowable back pressure: mbar	30

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	NEA (ORDE) optimized					
		without radiator			with mechanical radiator		
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
Leroy Somer LSA53.2 M9 (Low voltage Leroy Somer standard)	380 V	2512	3140	4771	2472	3090	4695
	400 V	2512	3140	4532	2472	3090	4460
	415 V	2512	3140	4368	2472	3090	4299
Marathon 1030FDL7094 (Low voltage Marathon)	380 V	2536	3170	4816	2464	3080	4680
	400 V	2536	3170	4576	2464	3080	4446
	415 V	2536	3170	4410	2464	3080	4285
Marathon 1030FDH7101 (Medium volt. marathon)	11 kV	2536	3170	166	2472	3090	162
Leroy Somer LSA53.2 ZL14 (Medium volt. Leroy Somer)	11 kV	2544	3180	167	2472	3090	162

* cos phi = 0.8

Standard and optional features

Engine

- ■ 4-cycle
- ■ Standard single stage air filter
- ■ Oil drain extension & shut-off valve
- ■ Closed crankcase ventilation
- ■ Governor-electronic isochronous
- ■ Common rail fuel injection
- ■ NEA (ORDE) optimized engine

Generator

- ■ 4 pole three-phase synchronous generator
- ■ Brushless, self-excited, self-regulating, self-ventilated
- ■ Digital voltage regulator
- ■ Anti condensation heater
- ■ Stator winding Y-connected, accessible neutral (brought out)
- ■ Protection IP23
- ■ Insulation class H, utilization acc. to H
- ■ Radio suppression EN 55011, group 1, cl. B
- ■ Short circuit capability 3xIn for 10sec
- ■ Winding and bearing RTDs (without monitoring)
- ■ Excitation by AREP
- ■ Mounting of CT´s: 2 core CT´s
- ■ Winding pitch: 2/3 winding
- ■ Voltage setpoint adjustment ± 10%
- ■ Meets NEMA MG-1, BS 5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS 1359 and ISO 8528-3 requirements
- ■ Leroy Somer low voltage generator
- □ Marathon low voltage generator
- □ Oversized generator
- □ Medium voltage generator

Cooling system

- ■ Jacket water pump
- ■ Thermostat(s)
- ■ Water charge air cooling
- □ Mechanical radiator
- □ Electrical driven front-end cooler
- □ Jacket water heater

Control panel

- ■ Unit cabling with coded plugs for easy connection of customer-specific controls (V0)
- □ Pre-wired control cabinet for easy application of customized controller (V1+)
- □ Island operation (V2)
- □ Automatic mains failure operation with ATS (V3a)
- □ Automatic mains failure operation incl. control of generator and mains breaker (V3b)
- □ Island parallel operation of multiple gensets (V4)
- □ Automatic mains failure operation with short (< 10s) mains parallel overlap synchronization (V5)
- □ Mains parallel operation of a single genset (V6)
- □ Mains parallel operation of multiple gensets (V7)
- □ Basler controller
- □ Deif controller
- □ Complete system metering
- ■ Digital metering
- ■ Engine parameters
- ■ Generator protection functions
- ■ Engine protection
- ■ SAE J1939 engine ECU communications
- ■ Parametrization software
- ■ Multilingual capability
- ■ Multiple programmable contact inputs
- ■ Multiple contact outputs
- ■ Event recording
- □ IP 54 front panel rating with integrated gasket
- □ Different expansion modules
- □ Remote annunciator
- □ Daytank control
- □ Generator winding temperature monitoring
- □ Generator bearing temperature monitoring
- □ Modbus TCP-IP

Connectivity

The engine system automatically collects and transfers engine data to the manufacturer from time to time. The data is used by the manufacturer for the purposes of product development and improvement as well as service optimization. Users can log in or register via https://mtu-go.com and also gain insight into the data.

Standard and optional features

Power panel

- ☐ Supply electrical driven radiator from 45kW – 75kW

Circuit breaker/power distribution

- ☐ 3-pole circuit breaker
- ☐ 4-pole circuit breaker
- ☐ Electrical-actuated circuit breaker
- ☐ Base frame mounted GCB, pre-wired with generator, ready for commissioning

Fuel system

- ■ Flexible fuel connectors mounted to base frame
- ☐ Fuel filter with water separator
- ☐ Fuel filter with water separator heavy-duty
- ☐ Switchable fuel filter with water separator
- ☐ Switchable fuel filter with water separator heavy-duty
- ☐ Seperate fuel cooler
- ☐ Fuel cooler integrated into cooling equipment

Starting/charging system

- ■ 24V starter
- ☐ Redundant starting system
- ☐ Starter batteries, cables, rack, disconnect switch (lockable)
- ☐ Battery charger
- ☐ Alternator

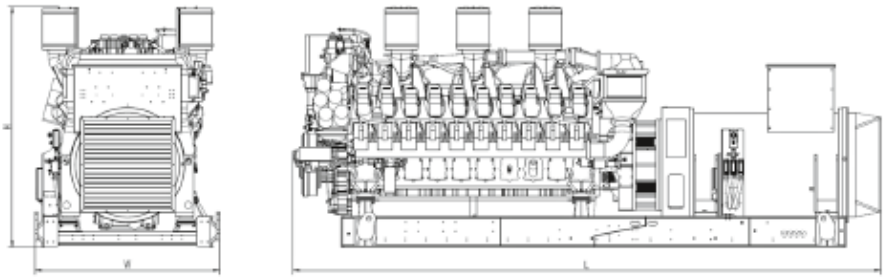
Mounting system

- ■ Welded base frame
- ■ Resilient engine and generator mounting
- ■ Modular base frame design
- ☐ Base frame mounting on foundation/base plate with using clamping brackets

Exhaust system

- ☐ Exhaust bellows with connection flange
- ☐ Exhaust silencer with 10 dB(A) sound attenuation
- ☐ Exhaust silencer with 30 dB(A) sound attenuation
- ☐ Exhaust silencer with 40 dB(A) sound attenuation
- ☐ Y-connection-pipe

Weights and dimensions



Drawing above for illustration purposes only, based on a standard open power 400 Volt engine-generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry/less tank)
Open power unit (OPU)	5760 x 1810 x 2348 mm	16920 kg

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific engine-generator set.

Sound data

— Consult your local ***mtu*** distributor for sound data.

Emissions data

— Consult your local ***mtu*** distributor for emissions data.

Rating definitions and conditions

— Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514 and AS 2789. Average load factor: ≤ 85%. Operating hours/year: max. 500.
— Consult your local ***mtu*** distributor for derating information.

Subject to change. | 3237861 | Edition 02/22 | BMC 2022-03.

Appendices 9.02

Emissions Data Sheet

A Rolls-Royce solution

Contents

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G74F				
Rated power [kW]	2670				
Rated speed [rpm]	1500				
Application Group	3D				
Legislative body	NEA Singapore for ORDE				
Test cycle	D2				
Data Set No.	XZ59654100932				
Data Set Basis	NEA Singapore for ORDE				
Fuel sulphur content [ppm]	5				

Content **Page**

PDF	Name	Project no.	Size
		Virtus Lon 12	A4
Configurator	Lenhof, Torsten (TA/RC)	Order no. 1122206	
Approver1	Schmid, Tobias (TSLE)	EDS-ID	
Approver2	Breuer, Joerg (TVA)	3149-05.12.2023	
Approver3			
Approver4			
User	FN2N382678		

Engine model: 20V4000G74F

Title: Emission data sheet

Description of Revision	Frequency
Data generated by EDS Creator version 1.0 and uniplot. Ref.-dataset: 420893_003_tes_D2.nc for 269 in EDS platform.	

Emissionstage: NEA Singapore for ORDE

Sheet: 1 of 6

Configuration-ID	Documentation
269	

Emissionstage basis: NEA Singapore for ORDE

ROLLS ROYCE

mtu A Rolls-Royce solution

General Disclaimers (valid for Measured and NTE values)

Please note that these data are physical and/or technical values only referring to and representing a normative defined operating condition. Any change in operating time and conditions will have impact on physical values and engine behavior, which must be considered and assessed within the complete propulsion system especially in regard to emission compliance and product safety.

Measurements listed in this EDS are representative of the listed engine rating at the time of testing. These measurements and results can change according to instrumentation, boundary condition, and engine to engine variability. In addition - changes to the engine family hard or software may occur which could result in changes to some of the listed values.

Emissions data measurement procedures are conducted according to applicable rules and standards as per "Emission Stage/Optimization". Potential deviations from these procedures are documented internally.

The listed emission values relate to the corresponding certification data. Seller doesn't take any responsibility or liability neither out or in connection with the contract nor on any other basis
- beyond these specified operating conditions of the engine
- and for any installation/modification of the entire propulsion system by the customer itself or any third party
and the customer will indemnify MTU on first demand for any third party claim out or in connection with this.

Seller reserves the right to amend specifications and information without notice and without obligation or liability. No liability for any errors, facts or opinions is accepted. Customers must satisfy themselves as to the suitability of this product for their application. No responsibility for any loss as a result of any person placing reliance on any material contained in this data sheet will be accepted.

Seller reserves all rights in the information contained in this data sheet. It shall not be reproduced, made available to a third party or otherwise used in any way whatsoever.

When applicable, emission values are measured after combined exhaust streams.

Measured Emissions data is based on single operating points and thus cannot be used to compare to regulations which use values based on a weighted cycle.

Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures, and instrumentation. Over time deterioration may occur which may have an impact on emission levels.

The SO2 emission rates comprehend exclusively the SO2 content as found in the fuel source, oil consumption effects are not included. Variation of sulfur content in the fuel changes only the stated SO2 emissions, cross sensitivity to other emissions (e.g. particulates) is not possible.

All values based on metric units, inaccuracies for non metric values can occur, values are not binding.

Specific to gas engines: The listed emission values are based on gas composition at the time of certification measurement. Gas composition is as displayed in the EDS-document. Carbon dioxide and methane concentrations have direct influence on the corresponding displayed carbon dioxide and methane emissions.

EAT Specific Disclaimers (valid for EDS values)

NH3 emissions levels measured with AVL SESAM i60/ 4 FT Multi Component Exhaust Measurement System (FTIR) including EPA 40 CFR 1065 legislation compliant automated checks for linearity.
Generators or engines with exhaust after-treatment systems require a stabilization period of approximately 1 hour to ensure stable temperatures across SCR prior to performing an emissions test. Performing emissions measurements before a stable temperature has been achieved can result in inconsistent emission values. NOx Values only applicable if temperatures across SCR reached for DEF Dosing.

NTE Disclaimers (valid for NTE calculated values)

Calculated not to exceed values (NTE) are not proven by tests and therefore the accuracy is not guaranteed.

All emission data shown in chapters Emission Data Sheet, Not to Exceed Values, and Type Approval were gathered from a corresponding certification engine under test conditions shown above and complying to corresponding TEN data.

		PDF	Name	Project no. Virtus Lon 12	Size A4
		Configurator	Lenhof, Torsten (TA/RC)	Order no. 1122206	
		Approver1	Schmid, Tobias (TS/LE)	EDS-ID	
		Approver2	Breuer, Joerg (TV/A)	3149-05.12.2023	
		Approver3			
		Approver4			
Description of Revision	Frequency	User	FNZ\D02678		
Data generated by EDS Creator version 1.0 and unipiot. Ref.-dataset: 420893_003_tes_D2.nc for 269 in EDS platform.		Engine model 20V4000G74F		Title Emission data sheet	
		Emissionstage NEA Singapore for ORDE			Sheet 2 of 6
Configuration-ID 269	Documentation	Emissionstage basis NEA Singapore for ORDE			

ROLLS ROYCE

mtu A Rolls-Royce solution

Engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				

Engine model	20V4000G74F
Application Group	3D
Legislative body	NEA Singapore for ORDE
Test cycle	D2
Fuel sulphur content [ppm]	5
mg/mN³ values base on residual oxygen value of [%]	5

Engine raw emissions*

Cycle point	[-]	n1	n2	n3	n4	n5
Power	kW	2670	2002	1335	667	267
Power relative	[-]	1	0.75	0.5	0.25	0.1
Engine speed	1/min	1500	1500	1500	1500	1500
Engine speed relative	[-]	1	1	1	1	1
Filter smoke number	FSN	0.17	0.31	0.65	0.8	0.14
Exhaust temperature after ETC	grdC	528.1	497.8	462.7	365.9	223.9
Exhaust back pressure after ETC (static)	mbar	84	58	30	12	6
Exhaust mass flow wet	kg/h	12872	11019	8525	5859	4658
NOX-Emissions specific	g/kWh	7.65	5.49	4.33	4.89	9.52
CO-Emissions specific	g/kWh	0.46	0.58	0.77	1.53	4.29
HC1-Emissions specific	g/kWh	0.15	0.18	0.27	0.58	2
NMHC-Emissions specific	g/kWh	0.15	0.18	0.27	0.57	1.96
NOX+HC1-Emissions specific	g/kWh	7.8	5.68	4.61	5.47	11.51
NOX+NMHC-Emissions specific	g/kWh	7.8	5.67	4.6	5.46	11.47
CO2-Emissions specific	g/kWh	618.7	638.3	669.8	717.2	871.2

PDF	Name	Project no.	Size
		Virtus Lon 12	A4
Configurator	Lenhof, Torsten (TA/RC)	Order no. 1122206	
Approver1	Schmid, Tobias (TSLE)	EDB-ID	
Approver2	Breuer, Joerg (TVA)	3149-05.12.2023	
Approver3			
Approver4			
User	FNZ\D302678		

Engine model: 20V4000G74F

Title: Emission data sheet

Description of Revision	Frequency
Data generated by EDB Creator version 1.0 and unipiot. Ref.-dataset: 420893_003_tes_D2.nc for 269 in EDB platform.	

Emissionstage: NEA Singapore for ORDE

Sheet: 3 of 6

Configuration-ID	Documentation	Emissionstage basis
269		NEA Singapore for ORDE

ROLLS ROYCE

mtu A Rolls-Royce solution

PM-Emissions specific (Meas.)	g/kWh	0.042	0.047	0.097	0.241	0.77
NOX-Emissions (based on 5% O2)	mg/m3N	2751	1907	1435	1507	2390
NOX+HC1-Emissions (based on 5% O2)	mg/m3N	2805	1972	1526	1686	2891
NOX+NMHC-Emissions (based on 5% O2)	mg/m3N	2804	1971	1524	1683	2881
CO2-Emissions (based on 5% O2)	mg/m3N	224171	223768	223275	222139	218788
CO-Emissions (based on 5% O2)	mg/m3N	168.2	203.1	256.4	474.6	1077
HC1-Emissions (based on 5% O2)	mg/m3N	54.5	64.7	90.8	179.8	500.4
PM-Emissions (based on 5% O2)	mg/m3N	15.2	16.3	32.2	74.7	193.3
Oxygen (O2)	%	8	9.3	10.5	12.9	16.1

PDF	Name	Project no. Virtus Lon 12	Size A4
Configurator	Lenhof, Torsten (TA/RC)	Order no. 1122206	
Approver1	Schmid, Tobias (TS/LE)	ED6-ID 3149-05.12.2023	
Approver2	Breuer, Joerg (TVA)		
Approver3			
Approver4			
User	FNZN382678		

Engine model: 20V4000G74F

Title: Emission data sheet

Description of Revision	Frequency
Data generated by ED6 Creator version 1.0 and unipiot. Ref.-dataset: 420893_003_tes_02.nc for 269 in ED6 platform.	

Emissionstage: NEA Singapore for ORDE			Sheet 4 of 6
Configuration-ID 269	Documentation	Emissionstage basis: NEA Singapore for ORDE	

ROLLS ROYCE

mtu A Rolls-Royce solution

Engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G74F				
Application Group	3D				
Legislative body	NEA Singapore for ORDE				
Test cycle	D2				
Fuel sulphur content [ppm]	5				
mg/mN^3 values base on residual oxygen value of [%]	5				

Not to exceed emission values*

Cycle point	[-]	n1	n2	n3	n4	n5
Power	kW	2670	2002	1335	667	267
Power relative	[-]	1	0.75	0.5	0.25	0.1
Engine speed	1/min	1500	1500	1500	1500	1500
Engine speed relative	[-]	1	1	1	1	1
NOX-Emissions specific	g/kWh	9.95	7.14	5.63	7.33	18.08
CO-Emissions specific	g/kWh	0.79	0.99	1.46	3.07	8.58
HC1-Emissions specific	g/kWh	0.26	0.31	0.52	1.16	5.79
NMHC-Emissions specific	g/kWh	0.25	0.31	0.51	1.14	
NOX+HC1-Emissions specific	g/kWh	10.21	7.46	6.15	8.5	23.87
NOX+NMHC-Emissions specific	g/kWh	10.2	7.45	6.14	8.47	
PM-Emissions specific (Meas.)	g/kWh	0.063	0.074	0.145	0.362	2.848
NOX-Emissions (based on 5% O2)	mg/m3N	3576	2479	1865	2260	4541
NOX+HC1-Emissions (based on 5% O2)	mg/m3N	3669	2589	2038	2620	5992
NOX+NMHC-Emissions (based on 5% O2)	mg/m3N	3667	2587	2034	2612	

PDF	Name	Project no.	Size
		Virtus Lon 12	A4
Configurator	Lenhof, Torsten (TARC)	Order no. 1122206	
Approver1	Schmid, Tobias (TSLE)	EDS-ID	
Approver2	Breuer, Joerg (TVA)	3149-05.12.2023	
Approver3			
Approver4			
User	FNZ\D92678		

Engine model: 20V4000G74F

Title: Emission data sheet

Description of Revision	Frequency
Data generated by EDS Creator version 1.0 and uniplot. Ref.-dataset: 420893_003_tes_D2.nc for 269 in EDS platform.	

Emissionstage: NEA Singapore for ORDE

Sheet: 5 of 6

Configuration-ID	Documentation
269	

Emissionstage basis: NEA Singapore for ORDE

ROLLS ROYCE

mtu A Rolls-Royce solution

CO-Emissions (based on 5% O2)	mg/m3N	285.9	345.2	487.2	949.2	2155
HC1-Emissions (based on 5% O2)	mg/m3N	92.6	110	172.5	359.7	1451
PM-Emissions (based on 5% O2)	mg/m3N	22.9	26.1	48.3	112.1	715.2

PDF	Name	Project no. Virtus Lon 12		Size A4
Configurator	Lenhof, Torsten (TARC)	Order no. 1122206		
Approver1	Schmid, Tobias (TSLE)	EDS-ID 3149-05.12.2023		
Approver2	Breuer, Joerg (TVA)			
Approver3				
Approver4				
User	FNZ\D02678			

Engine model: 20V4000G74F

Title: Emission data sheet

Description of Revision	Frequency
Data generated by EDS Creator version 1.0 and uniplot. Ref.-dataset: 420893_003_tes_02.nc for 269 in EDS platform.	

Emissionstage: NEA Singapore for ORDE

Sheet: 6 of 6

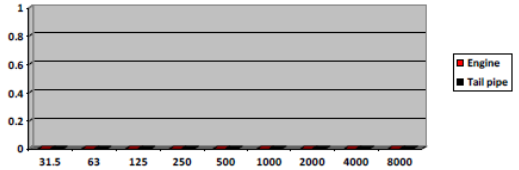
Configuration-ID	Documentation
269	

Emissionstage basis: NEA Singapore for ORDE

Appendices 9.03

Silencer Calculations

INDUSTRIAL & MARINE SILENCERS
Unit 8 Bankfield Court Commercial Road, Bromborough, Cheshire CH62 3NN
Mobile - 07852 304195 | Landline - 0151 638 5599
Email = info@mlindustrialsilencers.co.uk | www.mlindustrialsilencers.co.uk



Project VIRTUS LON 12 - Stage 4 REF 78.0 dB(A) at 1.0 meter
Engine 20V4000G63/G74F.(be) 2,670.0kW(m) @ 1500.0 F Required Insertion Loss

f	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
LpF	92	111.8	112.5	112.1	117.1	109.3	119.9	109.9	114.4	102.6	101.2	102.2	103.6	102.4	98.8	100.8	100.9	97.1	89.5	85.8	78.4	71.2	61.3	52.2	
Lp (Ave)		115.2			118.8			121.3			106.8			106.8			104.7			91.3			71.7		124.1
Lw (Ave)		126.2			129.8			132.3			117.8			117.8			115.7			102.3			82.7		135.1

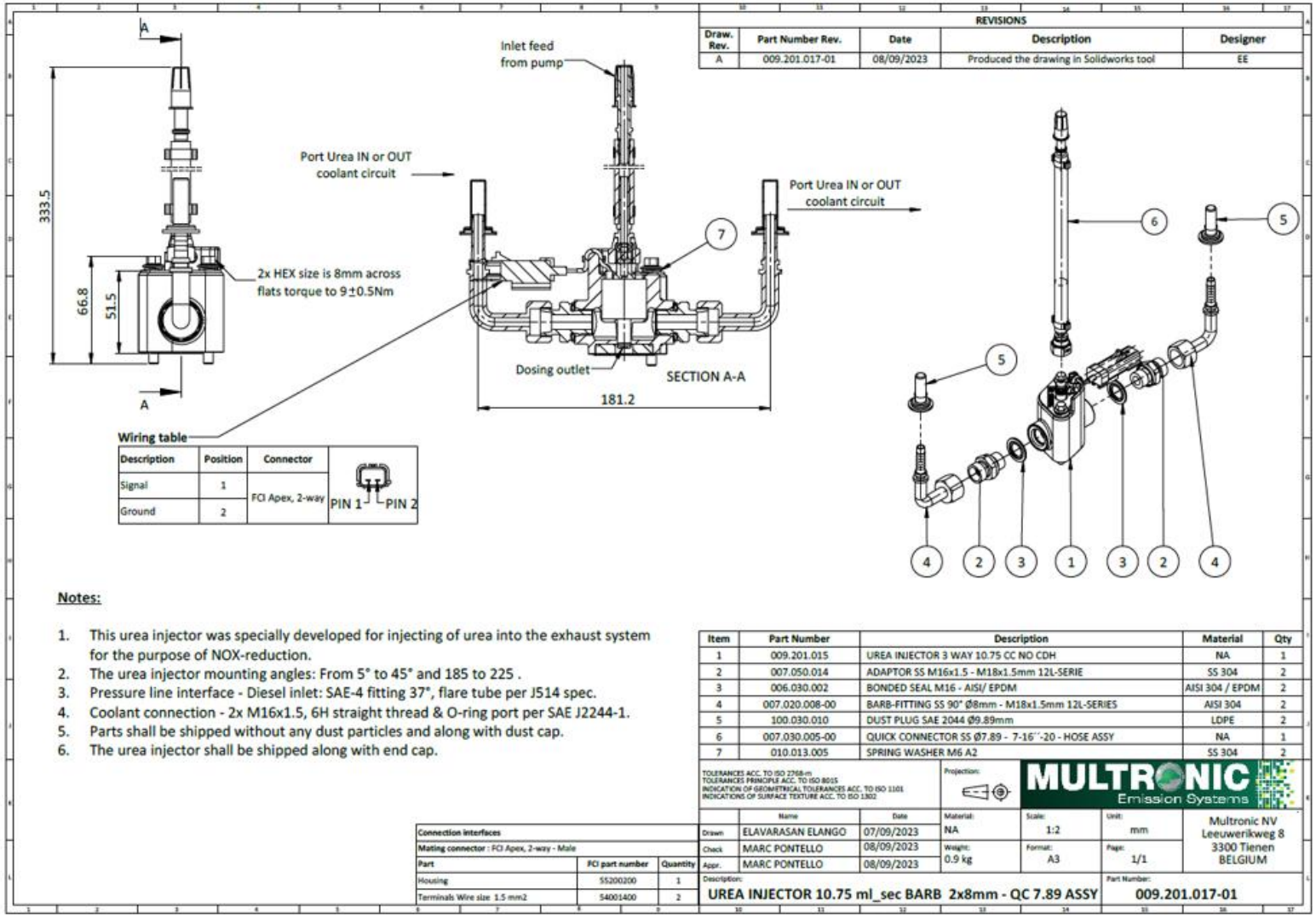
Exhaust

f	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
LpF	101.6	86.3	92.6	92	111.8	112.5	112.1	117.1	109.3	119.9	109.9	114.4	102.6	101.2	102.7	102.2	103.6	102.4	98.8	100.8	100.9	89.5	85.8	78.4	71.2	61.3	52.2	
Lp (Ave)		102.2			115.2			118.8			121.3			107.0			107.5			105.0			91.3			71.7		124.1
Lw (Ave)		113.2			126.2			129.8			132.3			118.0			118.5			116.0			102.3			82.7		135.1
A Weight		-39.0			-26.0			-16.0			-9.0			-3.0			0.0			1.0			1.0			-1.0		
Lp(A)		63.2			89.2			102.8			112.3			104.0			107.5			106.0			92.3			70.7		115.0
Lw(A)		74.2			100.2			113.8			123.3			115.0			118.5			117.0			103.3			81.7		126.0
Ins Loss		6.0			18.0			31.0			41.0			41.0			38.0			38.0			28.0			26.0		49.20
Lw(A)		68.2			82.2			82.8			82.3			74.0			80.5			79.0			75.3			55.7		88.9
Lp(A)		57.2			71.2			71.8			71.3			63.0			69.5			68.0			64.3			44.7		78.0

Managing Director
Michael Lamb
ML Industrial & Marine Silencers Ltd
Mobile - 07852 304195 | Landline - 0151 638 5599
Email – info@mlindustrialsilencers.co.uk | www.mlindustrialsilencers.co.uk
Unit 8 Bankfield Court, Commercial Road, Bromborough, Wirral CH62 3NN

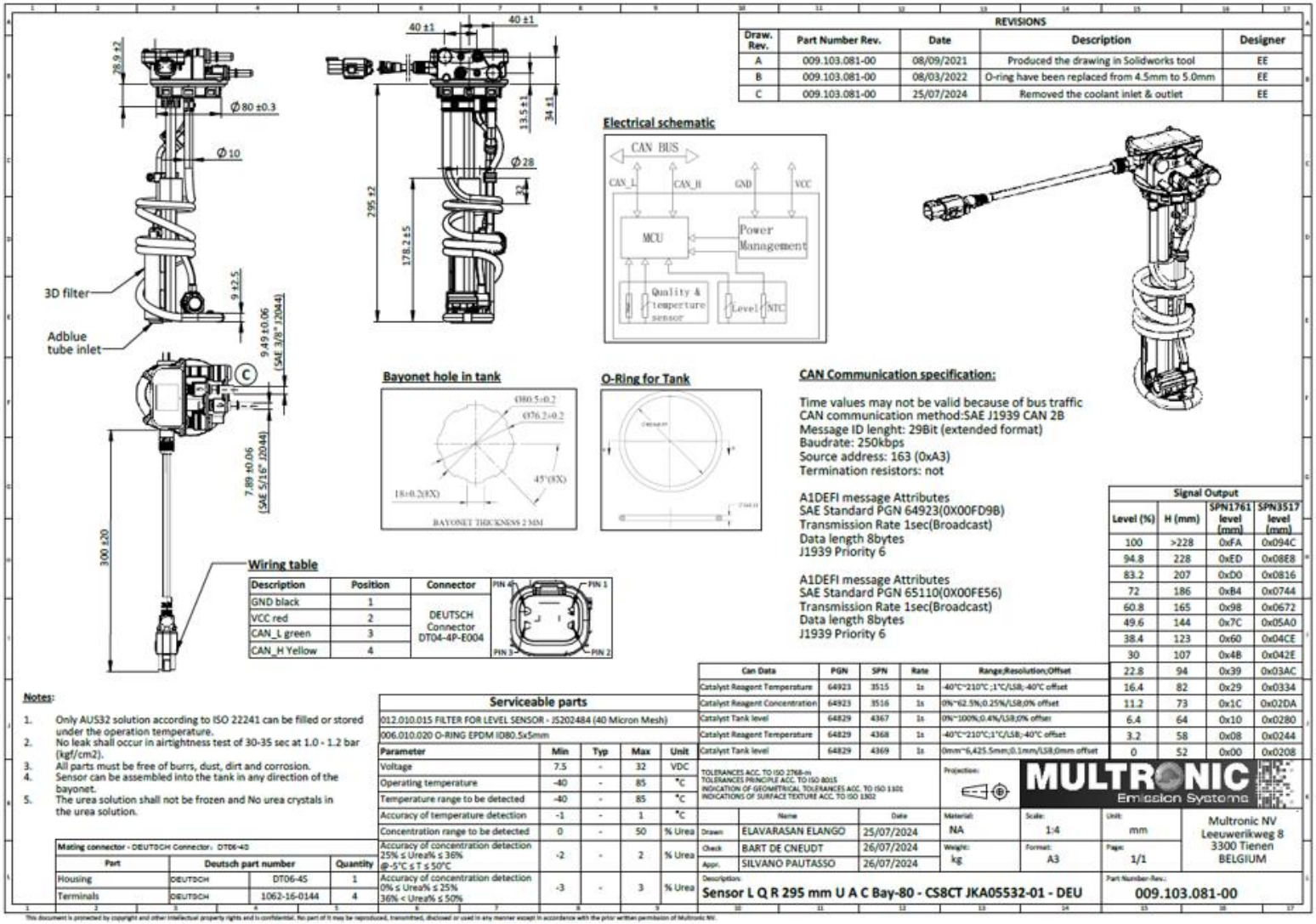
Appendices 9.04

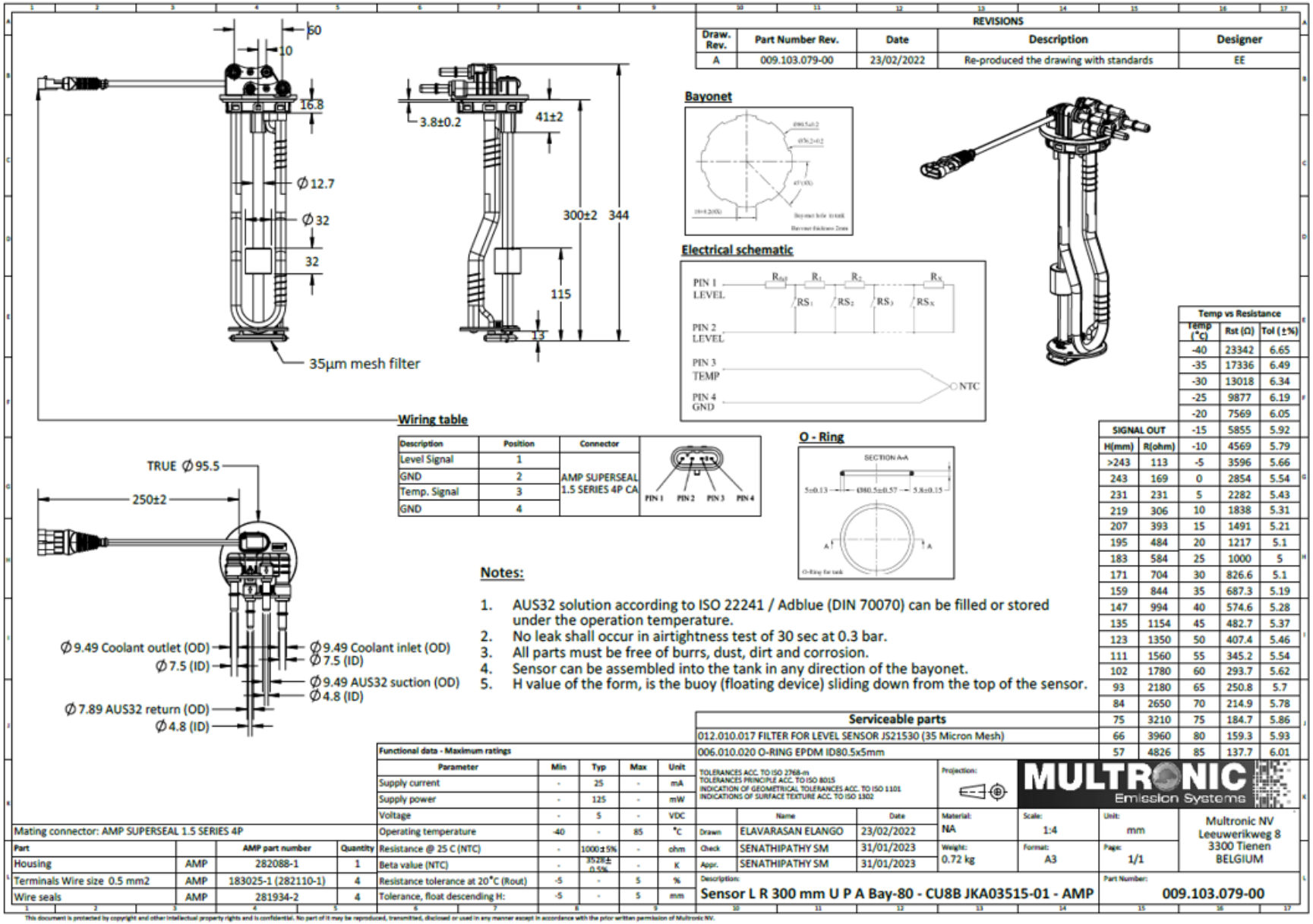
Injector Data



Appendices 9.05

Urea Dosing and Coolant Level Sensors





REVISIONS

Draw. Rev.	Part Number Rev.	Date	Description	Designer
A	009.103.079-00	23/02/2022	Re-produced the drawing with standards	EE

Wiring table

Description	Position	Connector
Level Signal	1	AMP SUPERSEAL 1.5 SERIES 4P CA
GND	2	
Temp. Signal	3	
GND	4	

Notes:

1. AUS32 solution according to ISO 22241 / Adblue (DIN 70070) can be filled or stored under the operation temperature.
2. No leak shall occur in airtightness test of 30 sec at 0.3 bar.
3. All parts must be free of burrs, dust, dirt and corrosion.
4. Sensor can be assembled into the tank in any direction of the bayonet.
5. H value of the form, is the buoy (floating device) sliding down from the top of the sensor.

Temp vs Resistance		
Temp (°C)	Rst (Ω)	Tol (±%)
-40	23342	6.65
-35	17336	6.49
-30	13018	6.34
-25	9877	6.19
-20	7569	6.05
-15	5855	5.92
-10	4569	5.79
-5	3596	5.66
0	2854	5.54
5	2282	5.43
10	1838	5.31
15	1491	5.21
20	1217	5.1
25	1000	5
30	826.6	5.1
35	687.3	5.19
40	574.6	5.28
45	482.7	5.37
50	407.4	5.46
55	345.2	5.54
60	293.7	5.62
65	250.8	5.7
70	214.9	5.78
75	184.7	5.86
80	159.3	5.93
85	137.7	6.01

SIGNAL OUT	
H(mm)	R(ohm)
>243	113
243	169
231	231
219	306
207	393
195	484
183	584
171	704
159	844
147	994
135	1154
123	1350
111	1560
102	1780
93	2180
84	2650
75	3210
66	3960
57	4826

Serviceable parts

012.010.017 FILTER FOR LEVEL SENSOR JS21530 (35 Micron Mesh)

006.010.020 O-RING EPDM ID80.5x5mm

Mating connector: AMP SUPERSEAL 1.5 SERIES 4P

Part		AMP part number	Quantity
Housing	AMP	282088-1	1
Terminals Wire size 0.5 mm2	AMP	183025-1 (282110-1)	4
Wire seals	AMP	281934-2	4

Functional data - Maximum ratings	Min	Typ	Max	Unit
Supply current	-	25	-	mA
Supply power	-	125	-	mW
Voltage	-	5	-	VDC
Operating temperature	-40	-	85	°C
Resistance @ 25 C (NTC)	-	1000±5%	-	ohm
Beta value (NTC)	-	3528±0.5%	-	K
Resistance tolerance at 20°C (Rout)	-5	-	5	%
Tolerance, float descending H:	-5	-	5	mm

TOLERANCES ACC. TO ISO 2768-m
TOLERANCES PRINCIPLE ACC. TO ISO 8015
INDICATION OF GEOMETRICAL TOLERANCES ACC. TO ISO 1101
INDICATIONS OF SURFACE TEXTURE ACC. TO ISO 1302

Projection:

MULTRONIC Emission Systems

	Name	Date
Drawn	ELAVARASAN ELANGO	23/02/2022
Check	SENATHIPATHY SM	31/01/2023
Appr.	SENATHIPATHY SM	31/01/2023

Material: NA | Scale: 1:4 | Unit: mm

Weight: 0.72 kg | Format: A3 | Page: 1/1

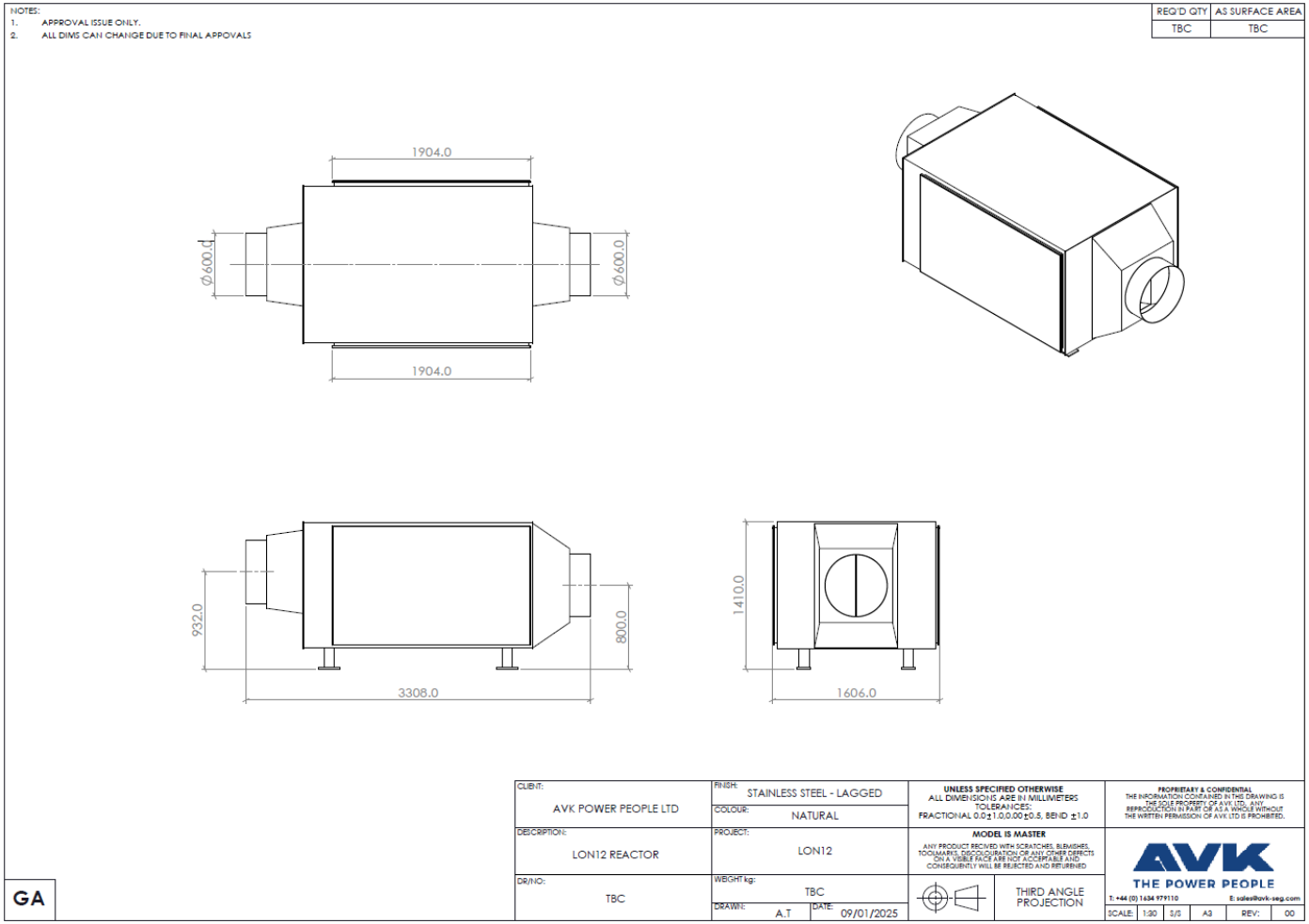
Multronic NV
Leeuwerikweg 8
3300 Tienen
BELGIUM

Description: Sensor L R 300 mm U P A Bay-80 - CU8B JKA03515-01 - AMP

Part Number: 009.103.079-00

Appendices 9.06

SCR Reactor



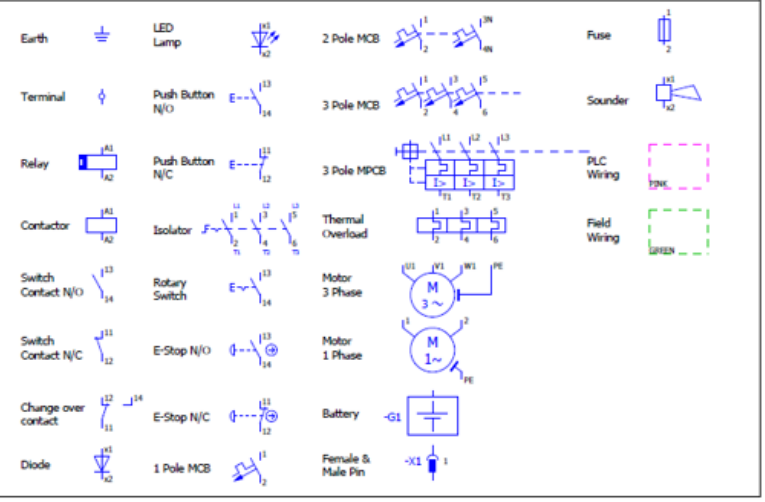
Appendices 9.07

Dosing Unit and control System, Tank Assembly Enclosure, and UPS Panel

Dosing cabinet with integral injector cooling system

TECHNICAL DATA AND CONSTRUCTION DETAILS

IEC SYMBOLS



WIRE COLOURS WITHIN ENCLOSURE

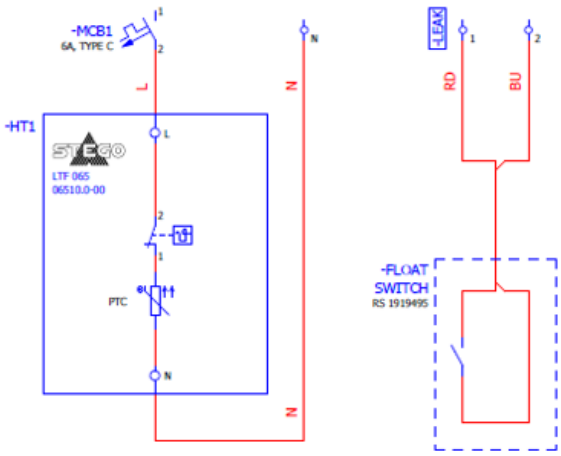
400VAC POWER	L1,L2,L3	Brown, Black, Grey
110VAC/230VAC POWER	L	Brown
Neutral Wire	N	Blue
Protective Earth	PE	Green/Yellow
Control Voltage+	24VDC/AC	Red
Control Voltage-	0V	Blue
Volt Free Contacts		Orange
Switching Contacts		White
Digital Signals		White
Analogue Signals		Grey

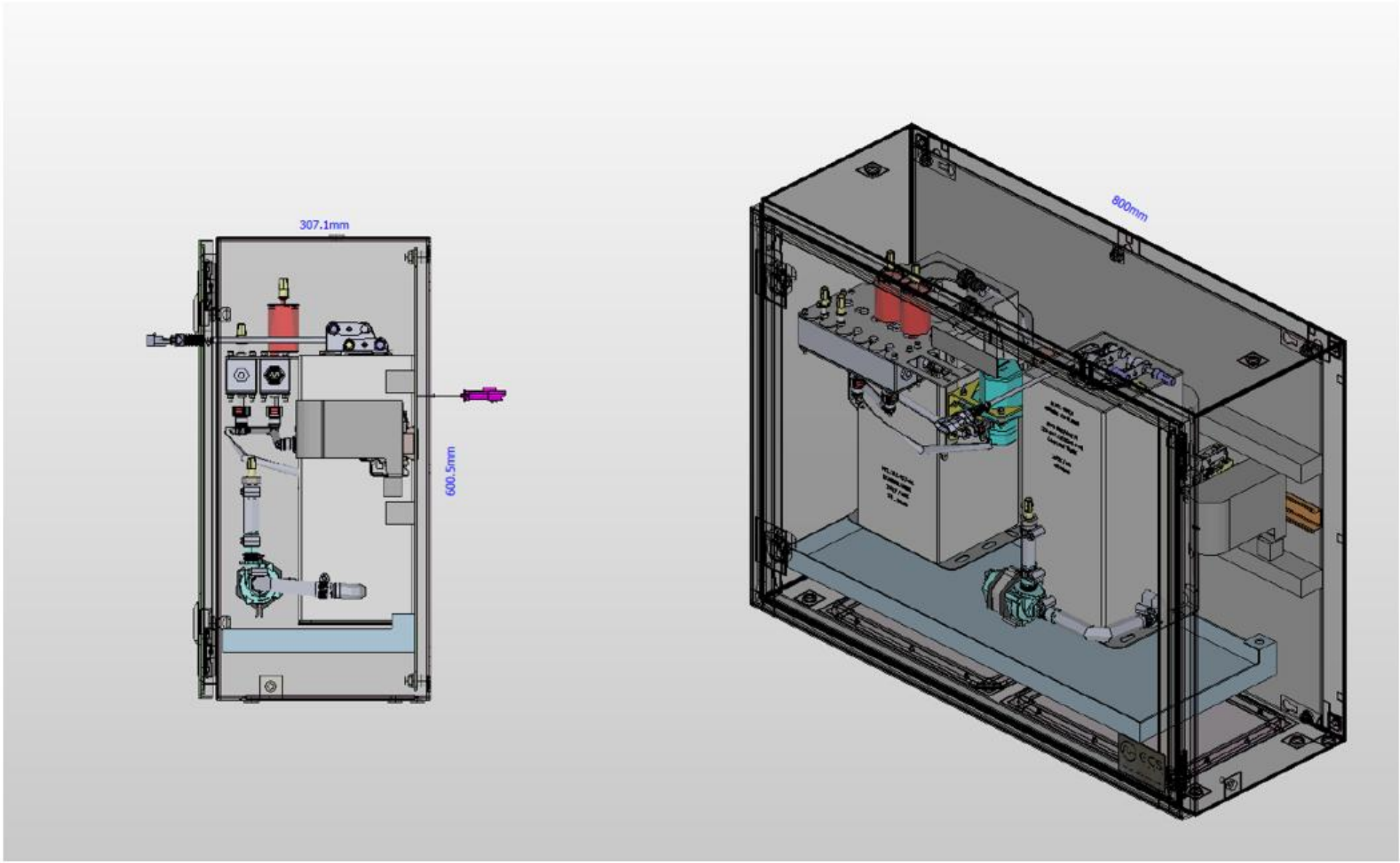
CLASS 8.8 BOLT TORQUES

SIZE	Torque (Nm)
M6	13
M8	30
M10	60
M12	110
M14	174
M16	274

ADDITIONAL WIRING REQUIREMENTS

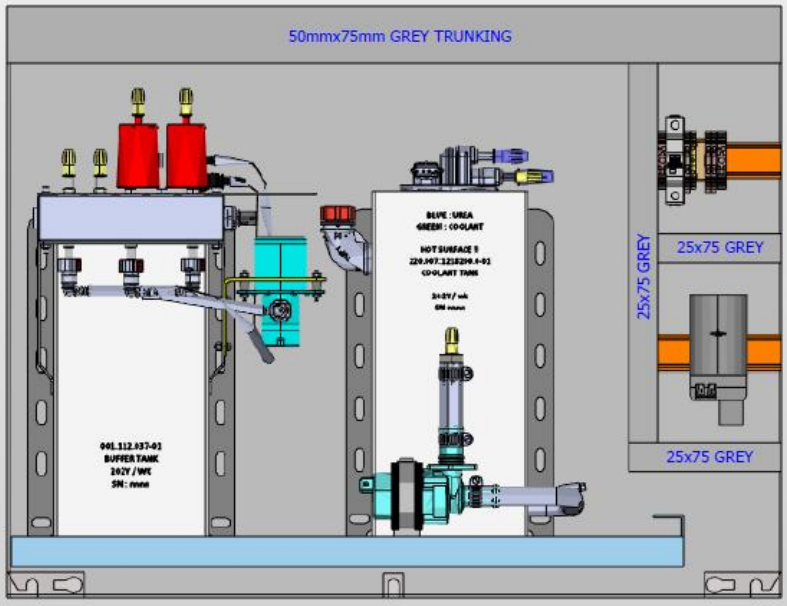
- Ferrules required on all wires
- Single Core Identification (Partex colour coded core idents / GRaffoplast)
- All 230VAC 1.5mm² tri-rated unless otherwise stated
- All 24VAC/DC 0.5mm² tri-rated unless otherwise stated




307.1mm
600.5mm
800mm

RITTAL 1055000
800Wx600.5Hx307.1D

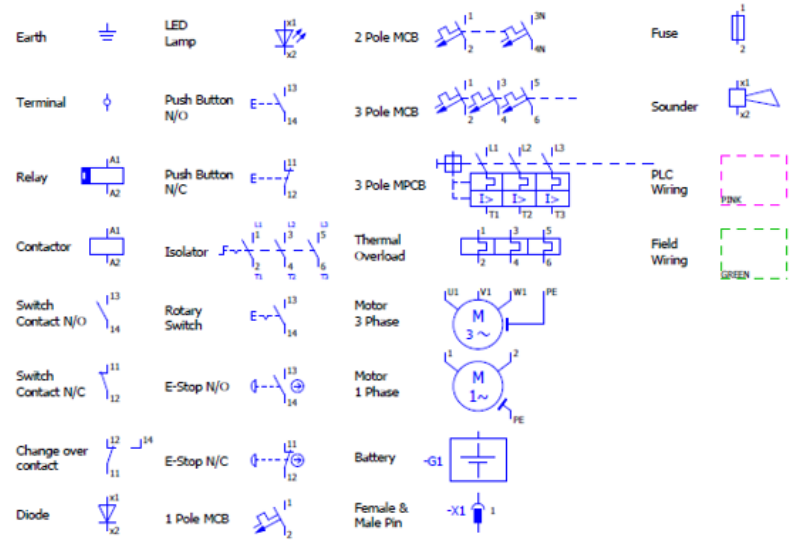
TOP ENTRY



No	Description	Part Number	Manufacturer	Supplier	Quantity
1	Mild Steel RAL 7035 Enclosure 800W x 380H x 300D	1055000	Rittal	Routeco	1
2	304 Stainless Steel Drip Tray	-	Metal Workshop	Metal Workshop	1
3	Buffer Tank	901.112.037.01	-	AVK	1
4	Buffer Pump	-	-	AVK	1
5	Urea Coolant Tank	220.007.1218200.0.063	-	AVK	1
6	Urea Coolant Pump	-	-	AVK	1
7	6A 1 Pole Type C MCB	1492-SPM1C060	Allen Bradley	Routeco	1
8	WDU 2.5 Single Deck Through Terminal	1020000000	Weidmuller	Routeco	3
9	WAP WDU 2.5 End Plate	1050000000	Weidmuller	Routeco	2
10	WPE 2.5 Earth Terminal	1010000000	Weidmuller	Routeco	1
11	SCHT5 S Terminal Marker	1631930000	Weidmuller	Routeco	1
12	WEW 35/2 End Stop	1061200000	Weidmuller	Routeco	2
13	230V 50W Panel Heater c/w Thermostat	06510.0-00	Stego	Ilecsys	1
14	SPST Float Switch	1919495	RS Pro	RS Components	1
15	Grey Open Slot Trunking 50H x 75W (Metre)	10470073Y	Betaduct	Ilecsys	0.747
16	Grey Open Slot Trunking 50H x 25W (Metre)	10470023Y	Betaduct	Ilecsys	0.612
17	TS35 Plain Top Hat Rail (Metre)	TS35	Profilati	Ilecsys	0.12
18	TS35 Deep Plain Top Hat Rail (Metre)	TS35/C	Profilati	Ilecsys	0.12
19	Door Labels	-	Partex	Partex	1

TECHNICAL DATA AND CONSTRUCTION DETAILS

IEC SYMBOLS



WIRE COLOURS WITHIN ENCLOSURE

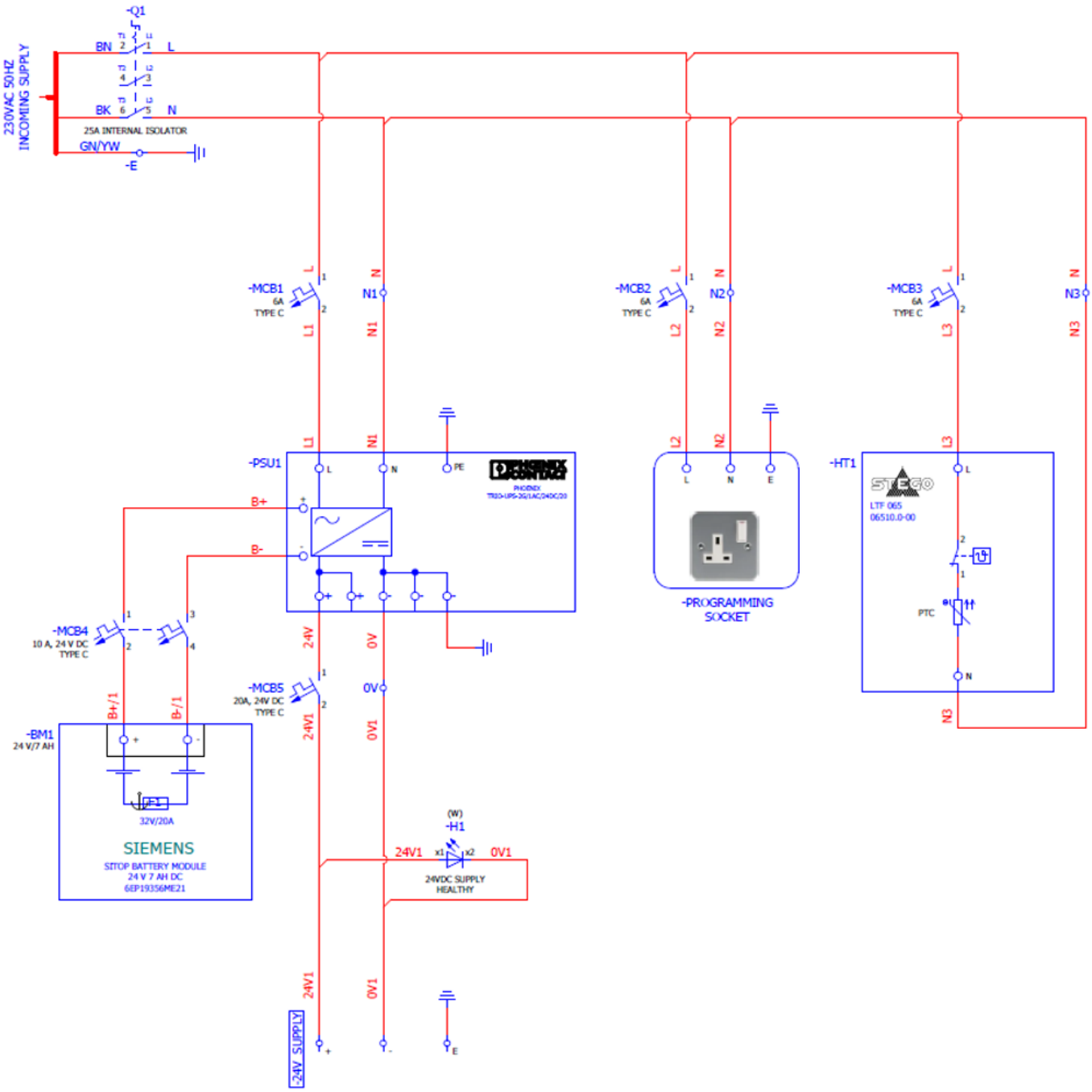
400VAC POWER	L1,L2,L3	Brown, Black, Grey
110VAC/230VAC POWER	L	Brown
Neutral Wire	N	Blue
Protective Earth	PE	Green/Yellow
Control Voltage+	24VDC/AC	Red
Control Voltage-	0V	Blue
Volt Free Contacts		Orange
Switching Contacts		White
Digital Signals		White
Analogue Signals		Grey

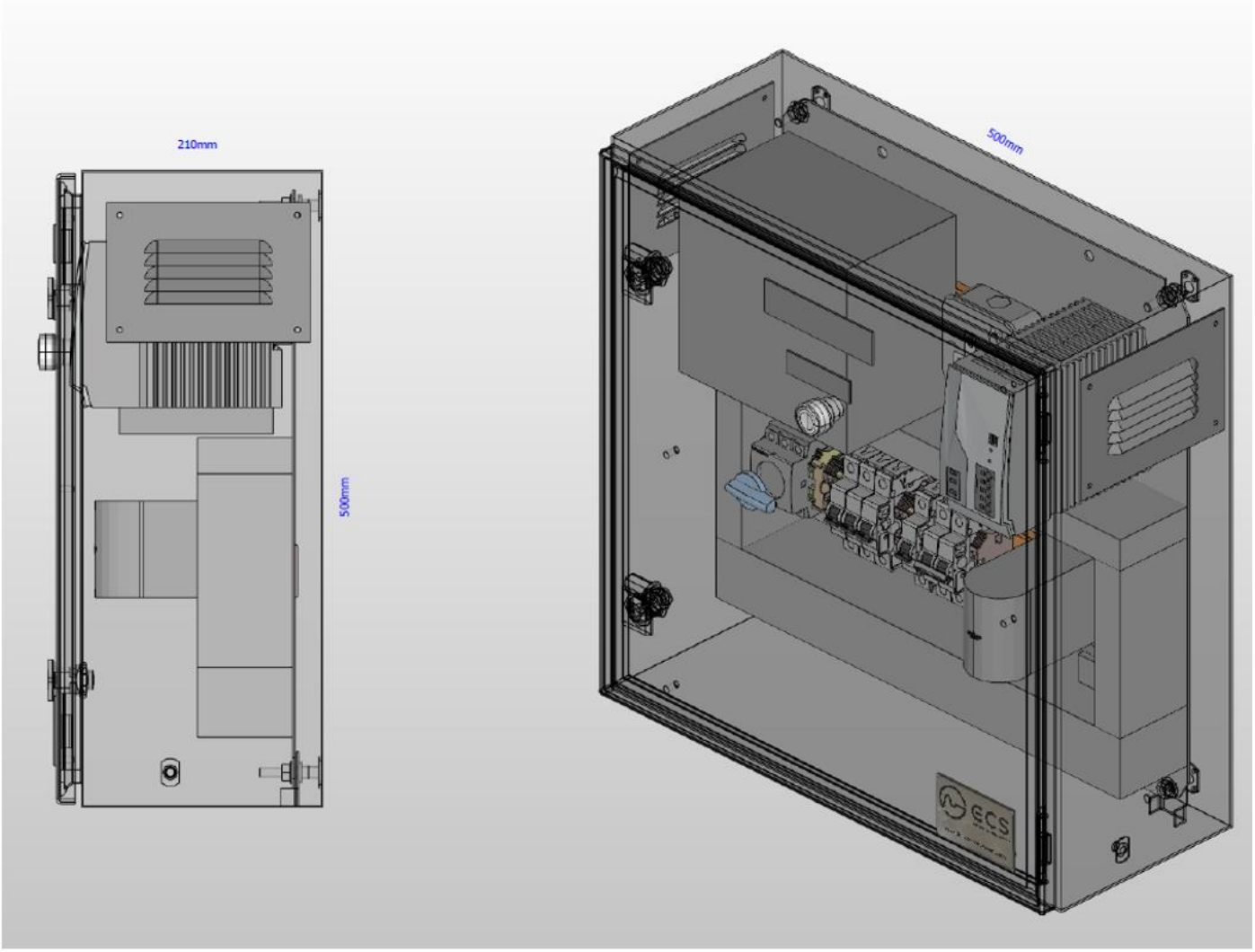
CLASS 8.8 BOLT TORQUES

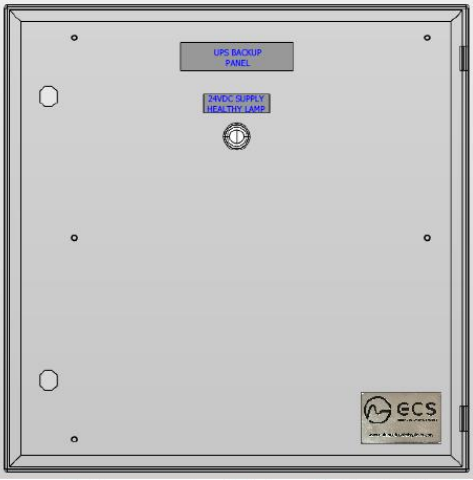
SIZE	Torque (Nm)
M6	13
M8	30
M10	60
M12	110
M14	174
M16	274

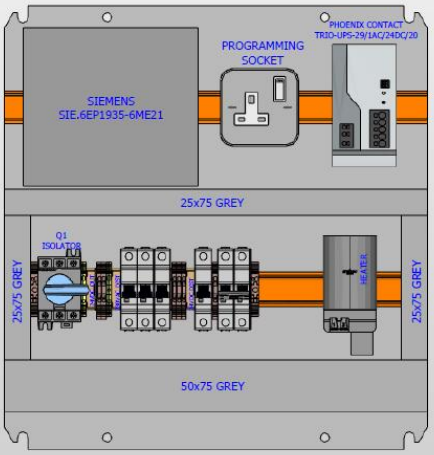
ADDITIONAL WIRING REQUIREMENTS

- Ferrules required on all wires
- Single Core Identification (Partex colour coded core idents / GRaffoplast)
- All 230VAC 1.5mm² tri-rated unless otherwise stated
- All 24VAC/DC 0.5mm² tri-rated unless otherwise stated


-Q1
230VAC 50HZ
INCOMING SUPPLY
BN
BK
L
N
25A INTERNAL ISOLATOR
GN/YW
-E
-MCB1
6A
TYPE C
-MCB2
-MCB3
-PSU1
PHOENIX CONTACT
B+
B-
-MCB4
10 A, 24 V DC
TYPE C
-MCB5
20A, 24V DC
TYPE C
-BM1
24 V/7 AH
32V/20A
SIEMENS
SITOP BATTERY MODULE
24 V 7 AH DC
6EP1935-6ME21
-PROGRAMMING
SOCKET
-HT1
STEGO
LTF 065
06510.0-00
PTC
(W)
-H1
24VDC SUPPLY
HEALTHY
24V SUPPLY


210mm
500mm
500mm

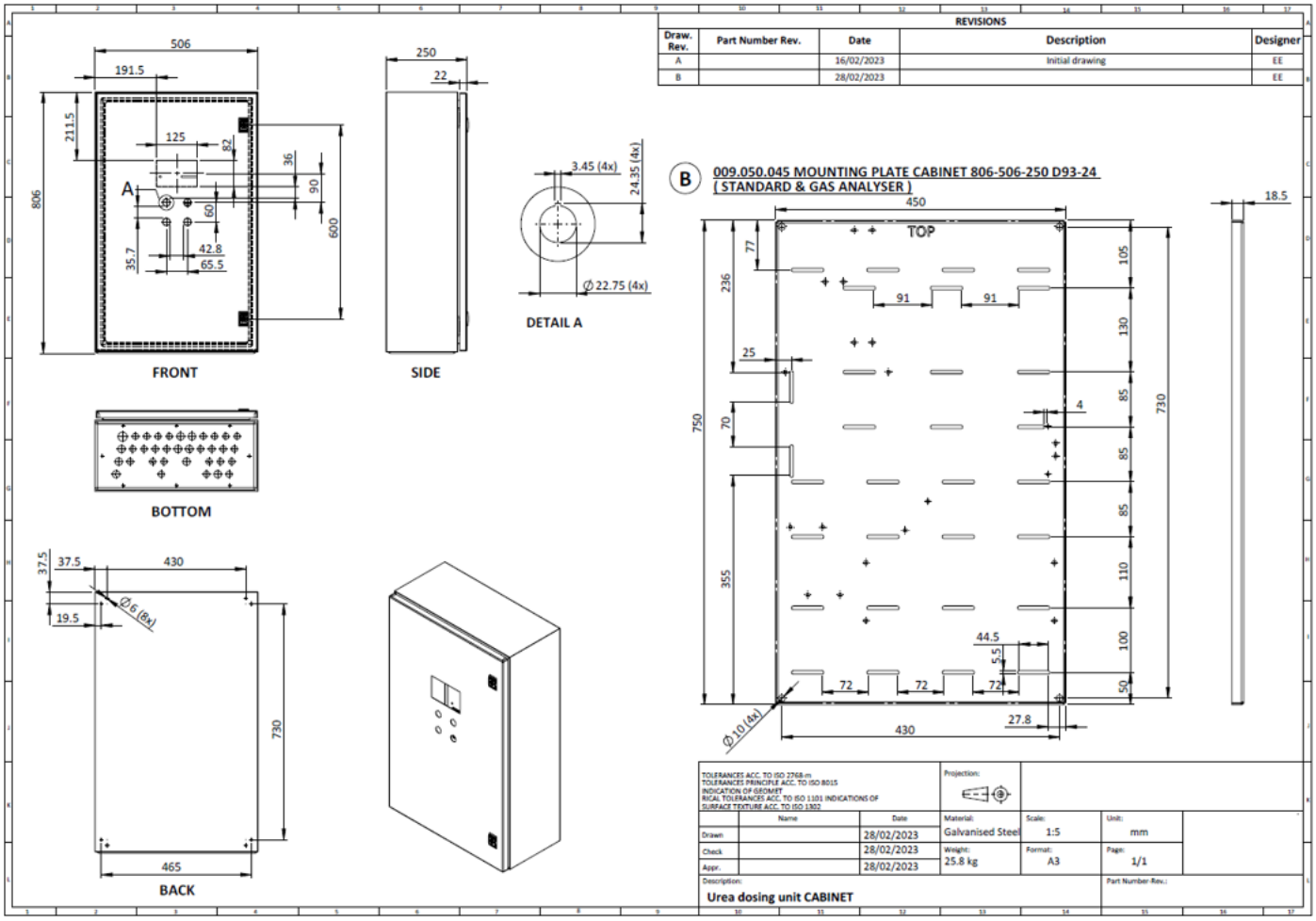


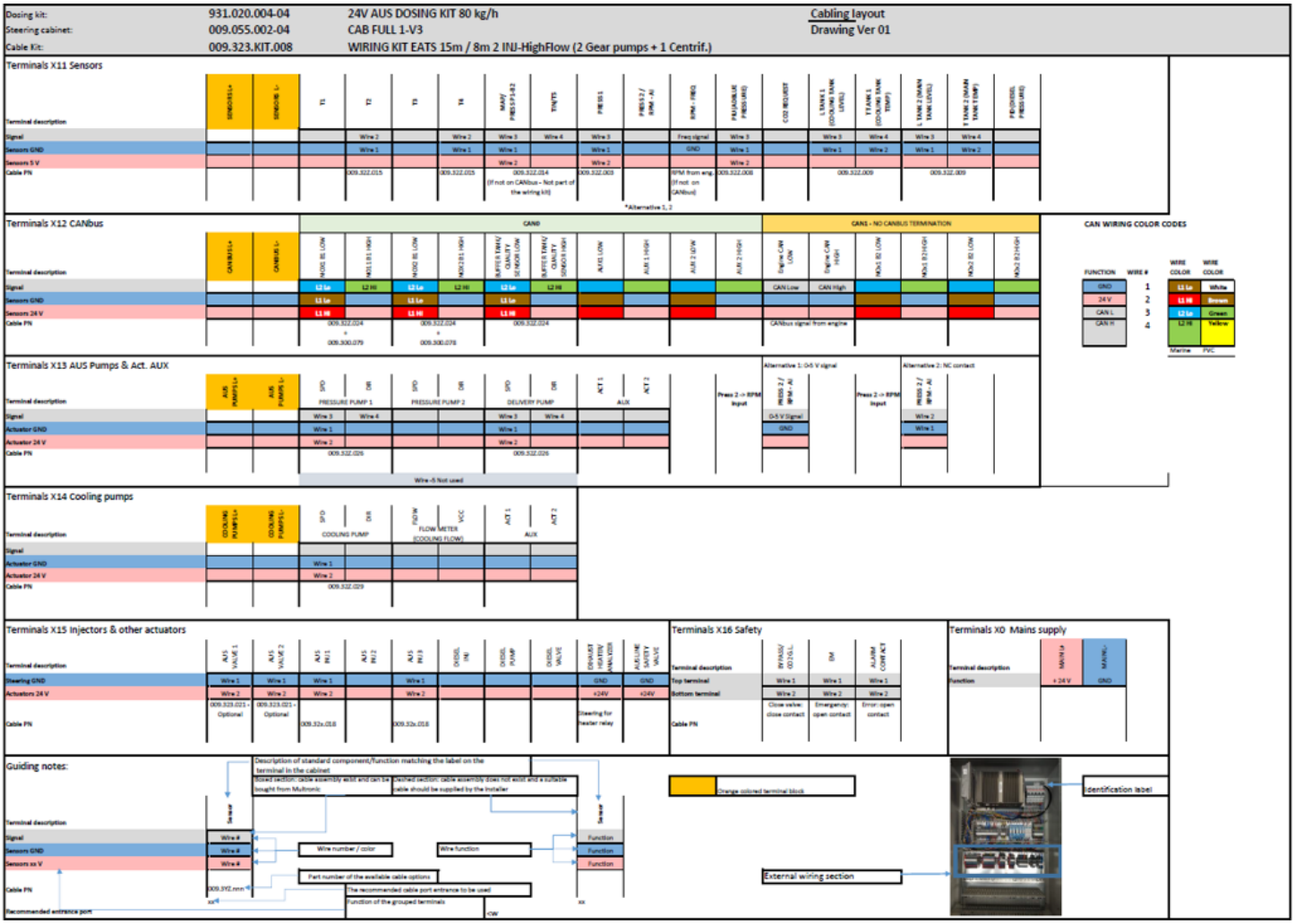


No	Description	Part Number	Manufacturer	Supplier	Quantity
1	Mild Steel RAL 7035 Enclosure 500W x 500H x 210D	1050000	Rittal	Routeco	1
2	Mild Steel RAL 7035 Panel Louvre	2541235	Rittal	Routeco	2
3	White 24VDC Supply Healthy Lamp	AD22-W24	-	Ilecsys	1
4	25A 3 Pole Isolator	22003902	Socomec	PES	1
5	Isolator Direct Handle	22995012	Socomec	PES	1
6	Isolator Terminal Shroud	22943905	Socomec	PES	2
7	24V 7Ah Battery Pack	6EP1935ME21	Siemens	PES	1
8	6A 1 Pole Type C MCB	1492-SPM1C060	Allen Bradley	Routeco	3
9	20A 1 Pole Type C MCB	1492-SPM1C200	Allen Bradley	Routeco	1
10	10A 2 Pole Type C MCB	1492-SPM2C100	Allen Bradley	Routeco	1
11	WDU 2.5 Single Deck Through Terminal	1020000000	Weidmuller	Routeco	6
12	WAP WDU 2.5 End Plate	1050000000	Weidmuller	Routeco	3
13	WPE 2.5 Earth Terminal	1010000000	Weidmuller	Routeco	2
14	SCHT5 5 Terminal Marker	1631930000	Weidmuller	Routeco	3
15	WEW 35/2 End Stop	1061200000	Weidmuller	Routeco	2
16	230V 50W Panel Heater c/w Thermostat	06510.0-00	Stego	Ilecsys	1
17	24VDC, 20A UPS Battery Charger	TRIO-UPS-2G/1AC/24DC/20	Phoenix Contact	Phoenix Contact	1
18	Programming Socket	AA3346	Knights Bridge	TLC	1
19	Grey Open Slot Trunking 75H x 50W (Metre)	10470054Y	Betaduct	Ilecsys	0.447
20	Grey Open Slot Trunking 75H x 25W (Metre)	10470024Y	Betaduct	Ilecsys	0.777
21	TS35 Plain Top Hat Rail (Metre)	TS35	Profilati	Ilecsys	0.623
22	Door Labels	-	Partex	Partex	2

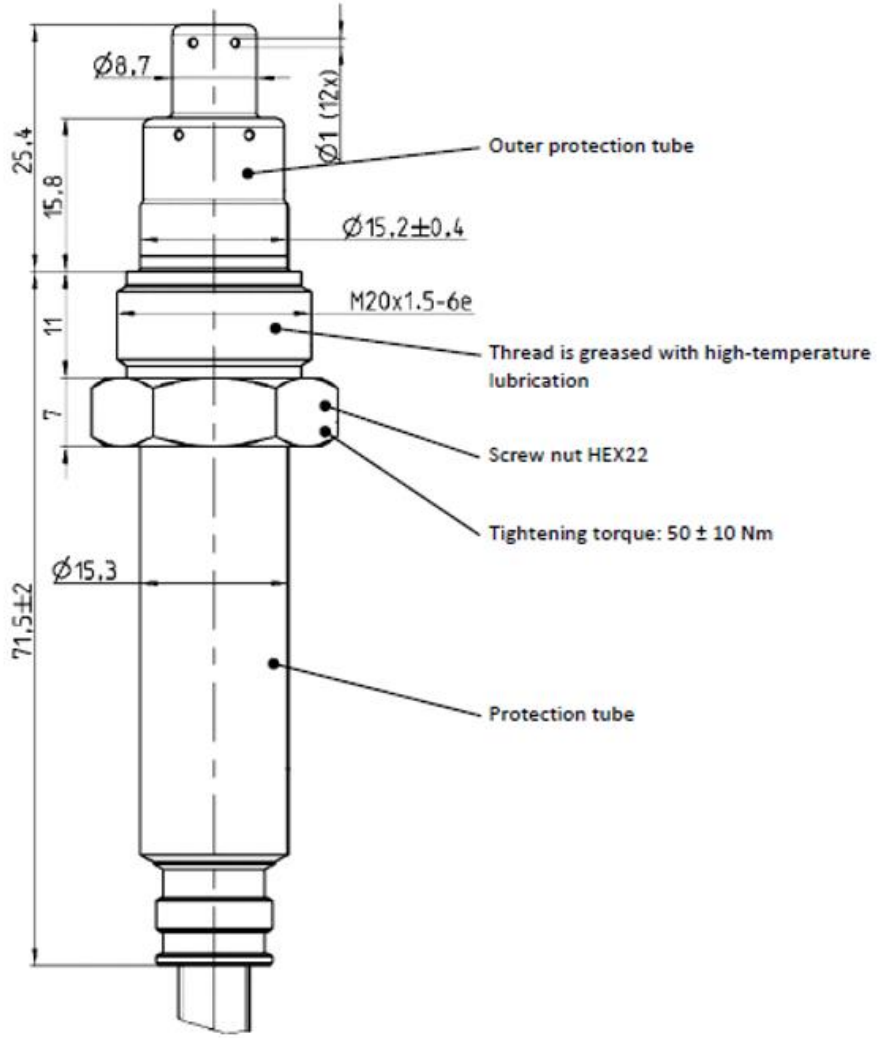
BOTTOM ENTRY

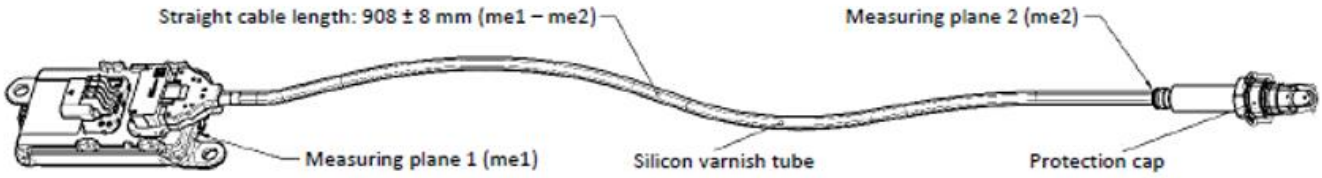
Control Panel IP54 Rated




Dosing kit: 931.020.004-04
24V AUS DOSING KIT 80 kg/h
Cabling layout
Steering cabinet: 009.055.002-04
CAB FULL 1-V3
Drawing Ver 01
Cable Kit: 009.323.KIT.008
WIRING KIT EATS 15m / 8m 2 INJ-HighFlow (2 Gear pumps + 1 Centrif.)
Terminals X11 Sensors
Terminals X12 CANbus
Terminals X13 AUS Pumps & Act. AUX
Terminals X14 Cooling pumps
Terminals X15 Injectors & other actuators
Terminals X16 Safety
Terminals X0 Mains supply
CAN WIRING COLOR CODES
Guiding notes:
External wiring section
Identification label

View without protection cap





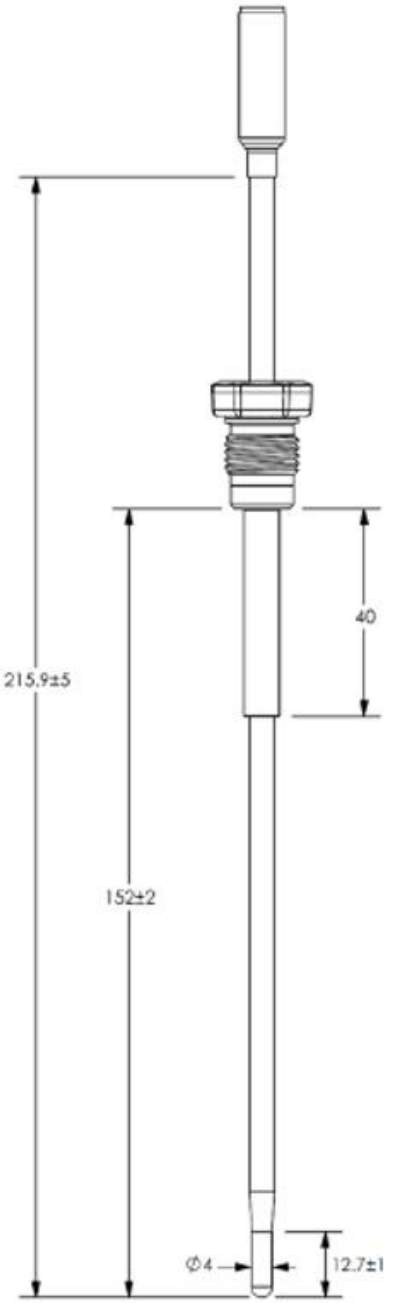
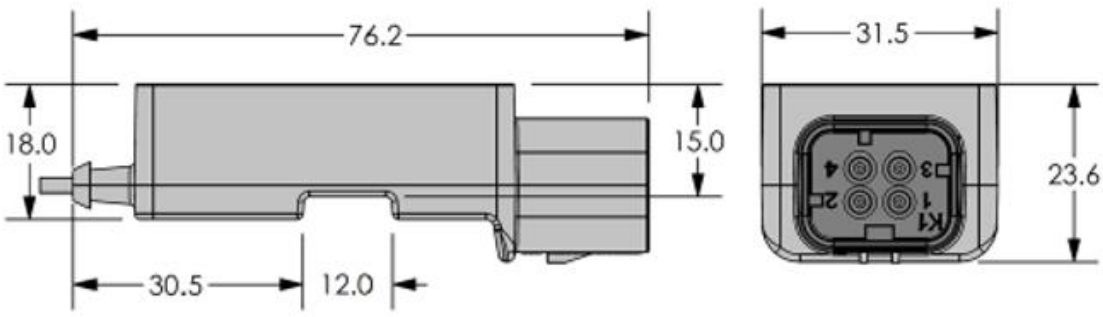
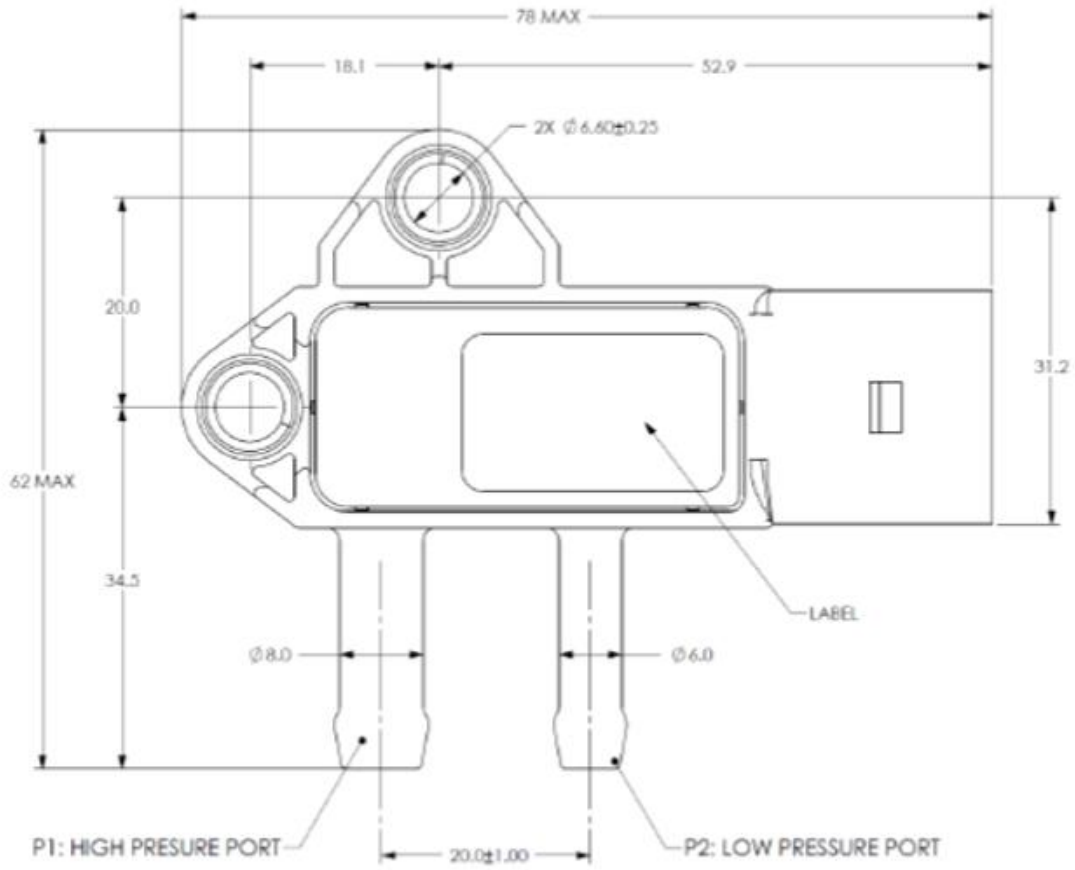
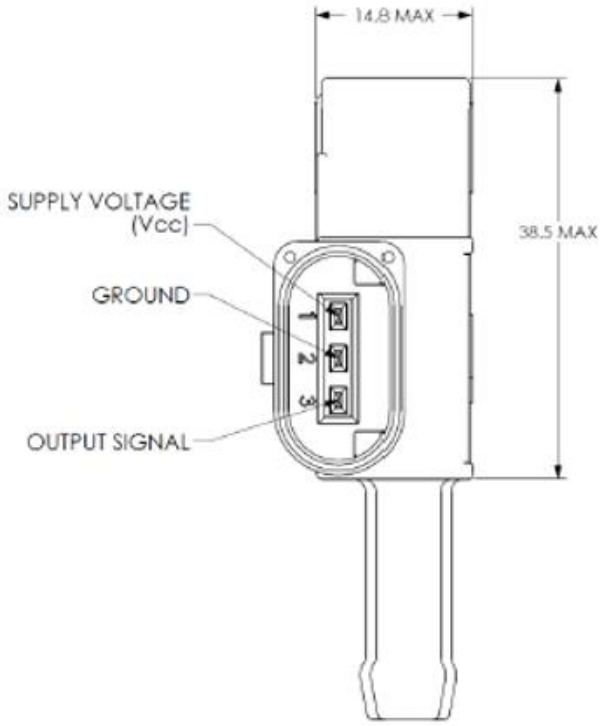


Figure 5. Probe



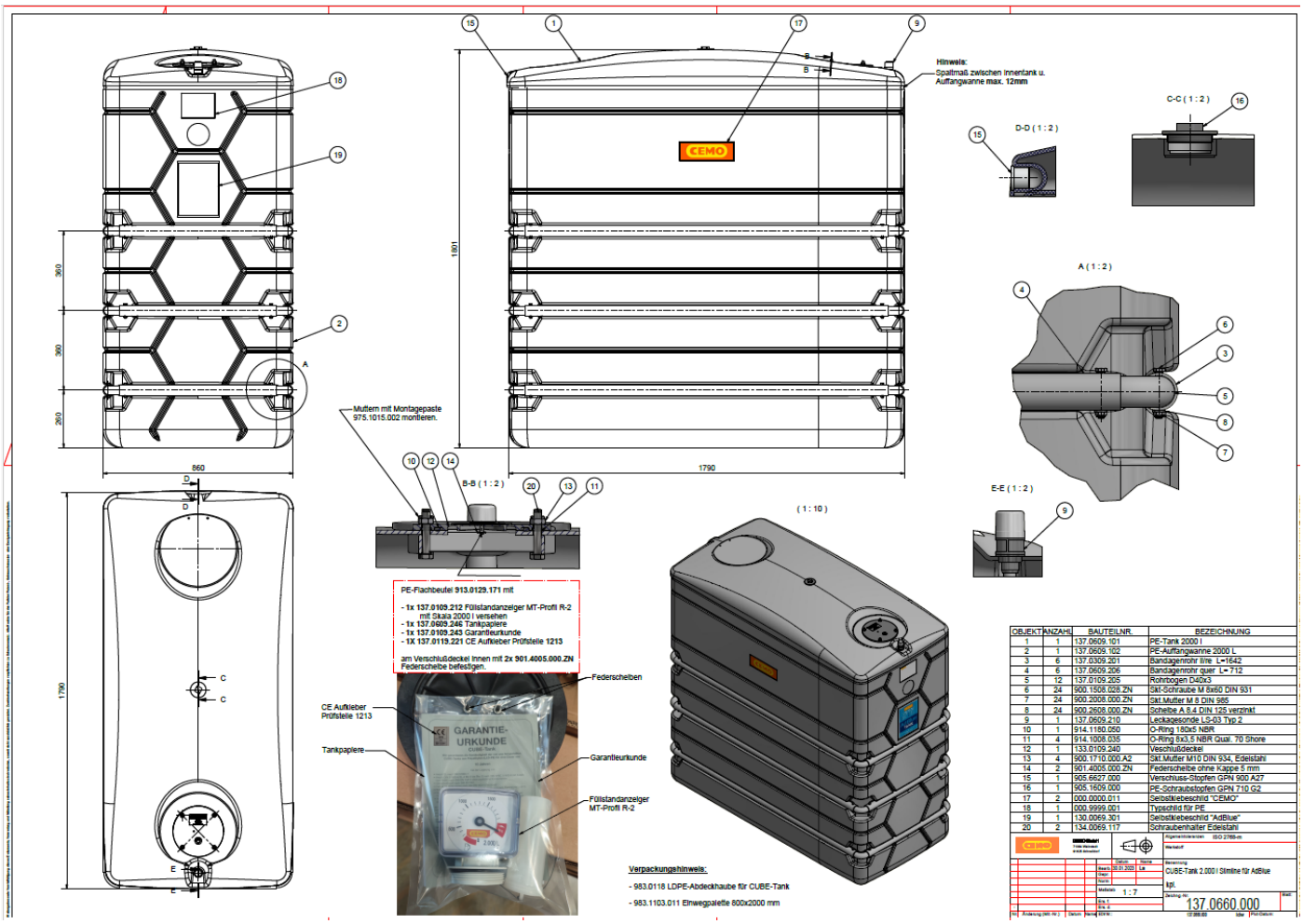

78 MAX
18.1
52.9
2X Ø 6.60±0.25
20.0
31.2
62 MAX
34.5
LABEL
Ø 8.0
Ø 6.0
P1: HIGH PRESURE PORT
20.0±1.00
P2: LOW PRESSURE PORT


14.8 MAX
38.5 MAX
SUPPLY VOLTAGE
(Vcc)
GROUND
OUTPUT SIGNAL
1
2
3

Appendices 9.08

Urea Tank & Fittings

Urea Tank Capacity 2,000 litres



OBJEKT	ANZAHL	BAUTEILNR.	BEZEICHNUNG
1	1	137.0609.101	PE-Tank 2000 l
2	1	137.0609.102	PE-Auffangwanne 2000 L
3	6	137.0309.201	Bandagenrohr lfre L=1642
4	6	137.0609.206	Bandagenrohr quer L=712
5	12	137.0109.205	Rohrbogen D40x3
6	24	900.1608.028.ZN	Skt-Schraube M 8x60 DIN 931
7	24	900.2006.000.ZN	Skt.Mutter M 8 DIN 985
8	24	900.2608.000.ZN	Scheibe A 8.4 DIN 125 verzinkt
9	1	137.0609.210	Leckagesonde LS-03 Typ 2
10	1	914.1180.050	O-Ring 180x5 NBR
11	4	914.1008.035	O-Ring 8x3,5 NBR Qual. 70 Shore
12	1	133.0109.240	Verschlußdeckel
13	4	900.1710.000.A2	Skt.Mutter M10 DIN 934, Edelstahl
14	2	901.4005.000.ZN	Federscheibe ohne Kappe 5 mm
15	1	905.6627.000	Verschluss-Stopfen GPN 900 A27
16	1	905.1609.000	PE-Schraubstopfen GPN 710 G2
17	2	000.0000.011	Selbstklebeschild "CEMO"
18	1	000.9999.001	Typschild für PE
19	1	130.0069.301	Selbstklebeschild "AdBlue"
20	2	134.0069.117	Schraubenhalter Edelstahl

CUBE-Tank 2.000 l Slimline für AdBlue
kpl.
1 : 7
137.0660.000

HYTEK
FUEL & LUBRICATION EQUIPMENT

Technical Data

HYTEK TANK MONITOR

Applies to the following models **only**:

- TGE.T5020A -TGE.T5020A1 - TGE.T5020A2

Please read carefully before commencing installation

Registered Office: HYTEK (GB) LIMITED, Delta House, Green Street, Elsenham, Bishop's Stortford CM22 6DS UK. Registered in England No. 1915382
Tel: +44 (0) 1279 815 600 Fax: +44 (0) 1279 812 978 email: info@hytekgb.com
Web: www.hytekgb.com

ENVIRONMENTAL INFORMATION

European Directive 2012/19/EU requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product must be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities.

PRODUCT DESCRIPTION

The Hytek Tank Monitor is a simple, electronic gauge for monitoring the fluid level inside fuel storage tanks of any shape or size up to 10m in height. It is designed to be used on diesel, AdBlue®, bio fuels and oils with a specific gravity between 0.6 – 1.4. The System utilises a precision electronic pressure sensor to give a consistent and accurate reading. Optional bund alarm probe and water sensing probe available.

ATEX ZONE RISK ASSESSMENT QUESTIONS:

1. Is the product in this storage vessel likely to ever reach or exceed its flash point?
2. What is the likelihood that there will be a misting leak for more than 10 hours per year in the area that you are considering for zone control?
3. Are there any other stored products that require ATEX control zone areas nearby?

If the answer is **YES** to either question 1, 2 or 3 then the area will require ATEX zone considerations. Please see our range of ATEX certified gauges or contact Hytek GB Ltd for advice.

If the answer is **NO** for **ALL** questions 1, 2 & 3 then your risk assessment results in the area being classified as ZONE 2 or possibly safe area. (Please note that ZONE 2 cannot guarantee leaks cannot occur in this area.)

IMPORTANT WARNING NOTES

1. This gauge must only be used with diesel or other liquids classed as category 3 in accordance with European Regulation No. 1272/2008. It must not be used to dispense petrol or any other liquid with a similar flash point.
2. It must not be sited adjacent to a petrol dispenser or in any other hazardous zone.
3. Installation of this equipment and its associated tank fittings should only be carried out by qualified fuel installation engineers.
4. The installation must conform to the latest relevant electrical and local authority regulations and standards.

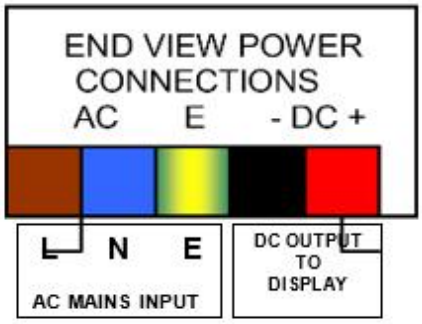
INSTALLATION INSTRUCTIONS

The tank gauge kit comes supplied with the following items:

- Metal tank connector - 1" BSPT fitting.
- Plastic tank connector – 30mm.
- Junction box for extending the cable.

FITTING THE GAUGE

1. The gauge can be mounted outside directly on the tank or in the immediate vicinity. The gauge can be mounted up to 1000m from the tank top if the supplied probe cable is extended using suitable shielded data cable. A junction box is supplied.
2. Remove the casing and mount the gauge onto a suitable surface using the supplied M4 bolts. Mounting-hole positions are shown on the rear of the case. See mounting diagram on page 10.
3. Supply the transformer with a suitable mains power supply. Check model for voltage. See photo and diagram below. The transformer mounting rail can be temporarily removed to allow easier access to the power connection terminals.



FITTING THE PROBE

1. Ensure that there is an opening (with a cap or flange) on the top of the tank wide enough for the probe to go through.
2. The metal tank connector is a 1" BSPT fitting. The optional plastic tank connector is a 30mm compression fitting, which requires a 30mm hole to be cut into the plastic tank.
3. Carefully slide the probe into the tank.
4. **IMPORTANT**: Ensure that the probe is suspended 50mm from the bottom of the tank before tightening the gland on the tank top fitting. This will ensure that water or sludge does not affect the probe sensor.
5. If you need to cut the probe cable to a shorter length then strip back 250 mm of the outer sheathing, and use the nylon cords to tie and support the weight of the probe. Cut the vent tube to around 30 mm long, and cut the cores to 170 mm long.
6. If the junction box assembly is to be used to extend the cable then allow for some height adjustment when the probe is in the tank.
7. Using the terminal block provided, connect the wires to the interconnecting cabling. This should be twisted screened pairs, back to the display. The enclosures glands are such to allow atmospheric pressure equalisation. **IMPORTANT**: Ensure that the breather tube for the probe is not obstructed, sealed or kinked in any way as this will affect the accuracy of the tank gauge.

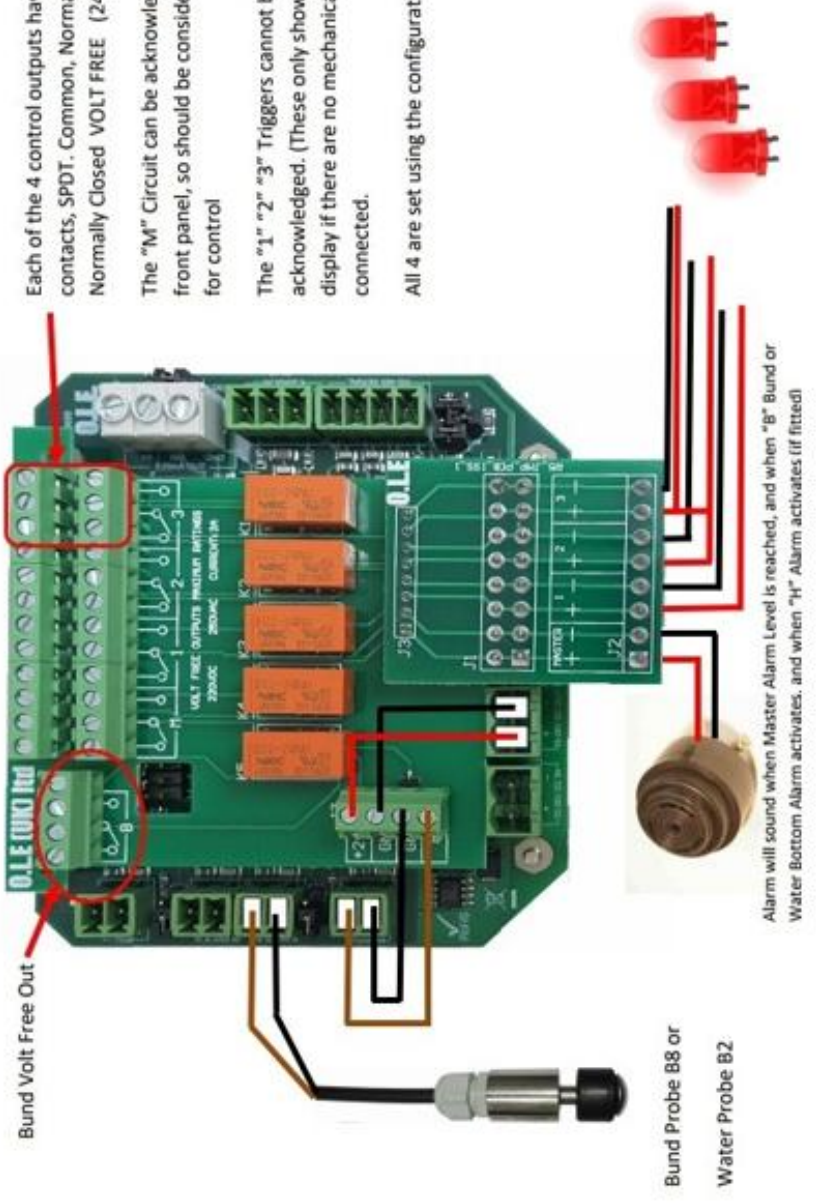
   BROWN = Pressure sensor +24vdc
   GREEN = Pressure sensor –ve
   WHITE = Not used

8. Silica gel packs are fitted to absorb any moisture. (Air flow is minimal)
9. Power up the gauge and ensure that the reading is accurate. The gauge is supplied pre-configured by Hytek so no further calibration or set up is required on site.

FITTING MECHANICAL BUND OR HIGH LEVEL ALARM (OPTIONAL)

1. If a mechanical bund probe is supplied then wire this onto the PCB as shown in the diagram on page 8. Note PCB jumper position.
2. If a mechanical high level probe is supplied then wire this onto the PCB as shown in the diagram on page 8. Note PCB jumper position.

EXTERNAL DEVICE CONNECTION DIAGRAM



5

S648/12

EXTERNAL DEVICE CONNECTION

1. If the optional TGE.R relay board is supplied then connect the required external devices to the relay output(s) shown in the diagram below:
2. The pre-set alarm settings can be found on the sticker on the underside of the gauge lid. These alarm settings cannot be adjusted on site.

The default alarm settings are as follows:

MASTER ALARM =	95% High Level Alarm
ALARM 1 =	90% High Level Alarm
ALARM 2 =	20% Low Level Alarm
ALARM 3 =	05% Low Level Alarm

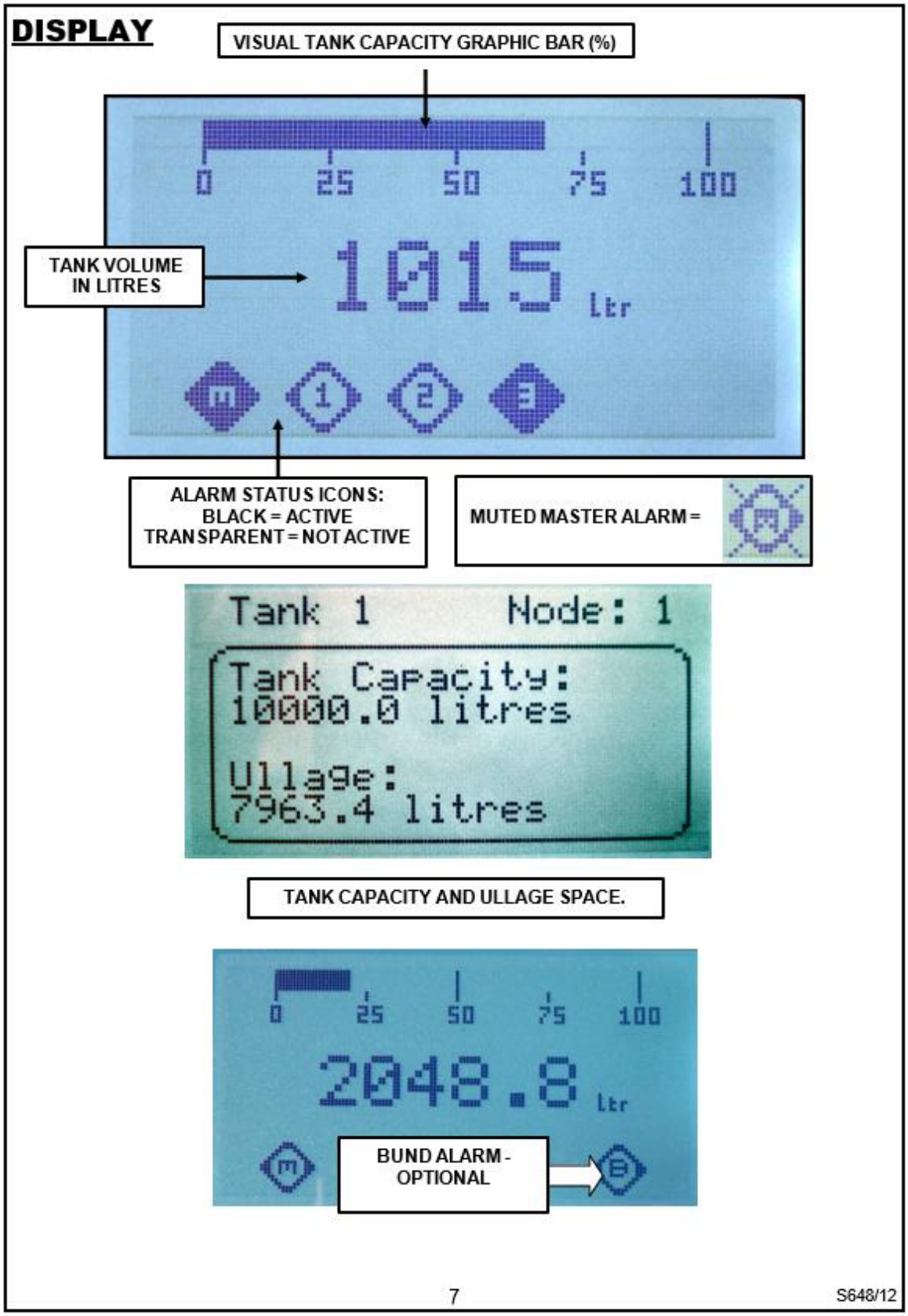
OPERATION

The gauge is very easy to operate and has the following buttons:

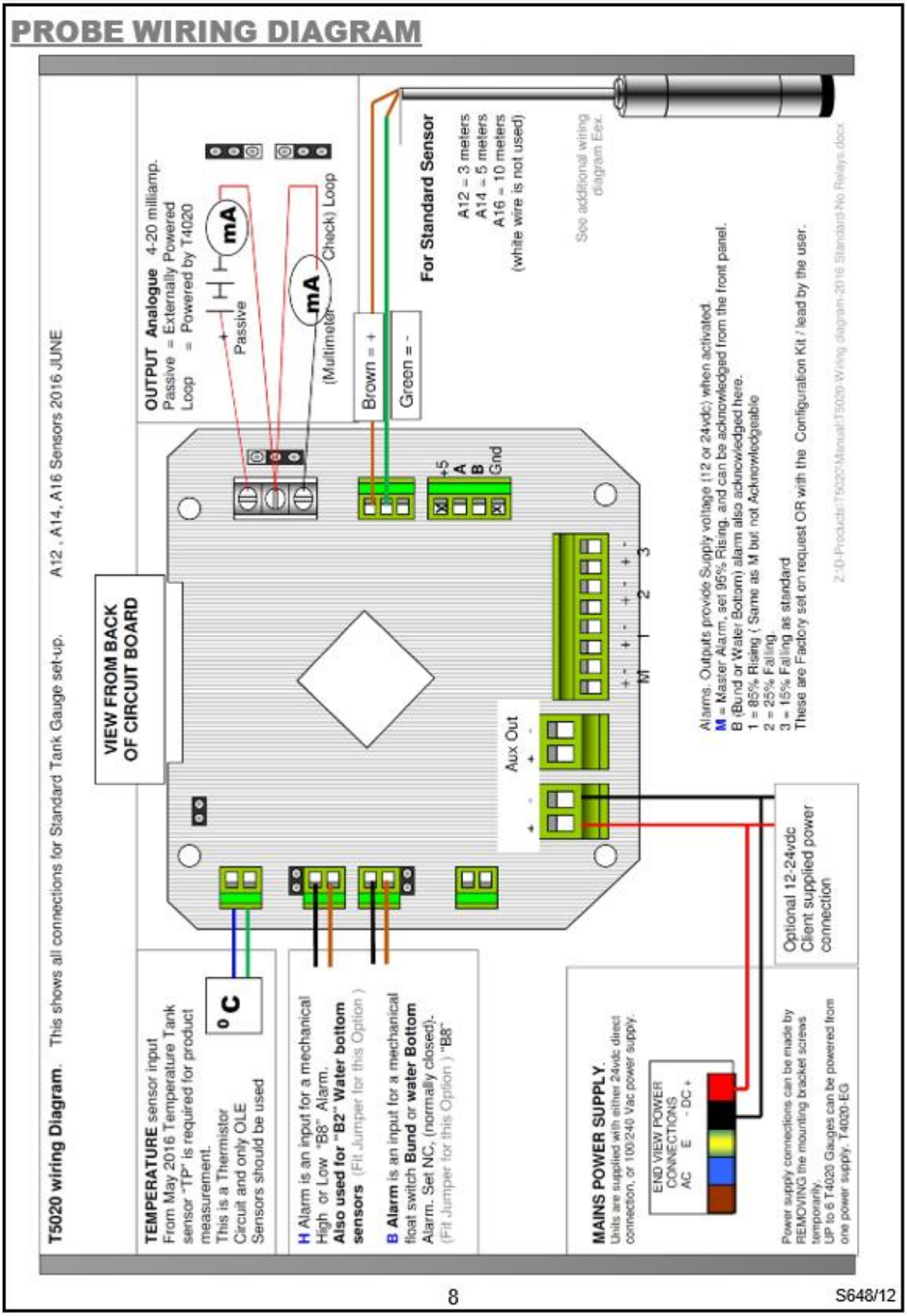
TEST BUTTON: This is an Alarm / Test-Mute button. Press and hold for 5 seconds to test the alarm. Press again to mute the alarm. If an alarm has been 'Muted' the Alarm symbol shows a crossed-out image. If a bund alarm is incorporated, this shows as a 'B' on the bottom line of the display.

SCROLL BUTTON: There is a Scroll button, which shows Tank Name, Capacity and Ullage space. This will show for 5 seconds before reverting to the standard display.

DISPLAY

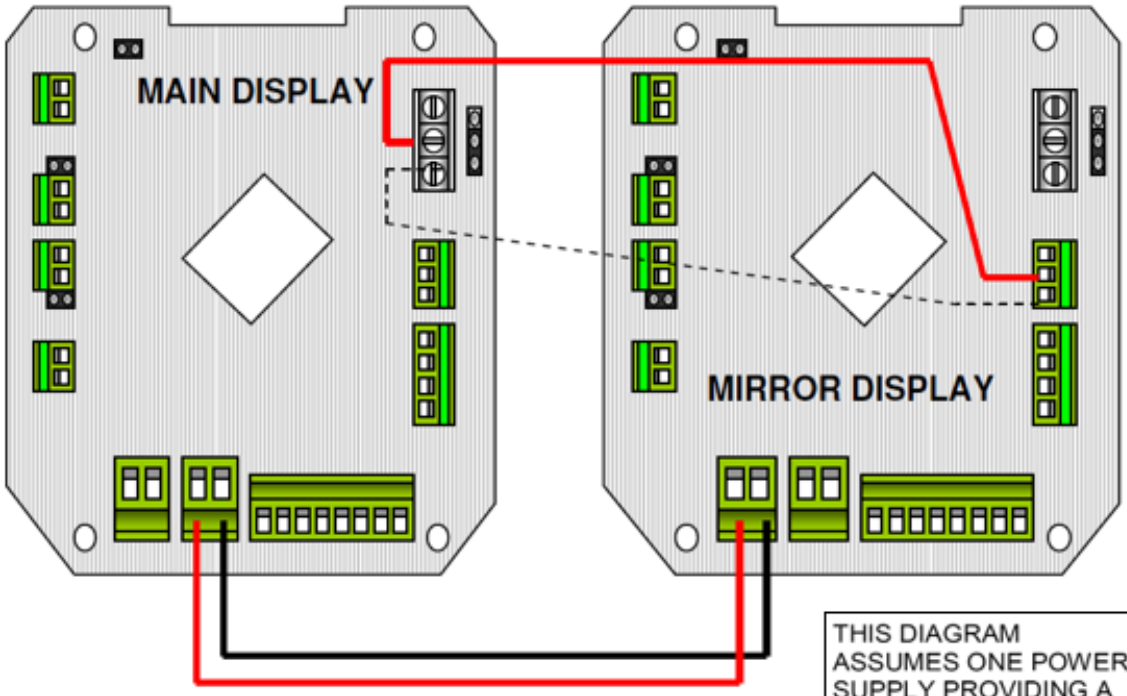

VISUAL TANK CAPACITY GRAPHIC BAR (%)
0
25
50
75
100
TANK VOLUME IN LITRES
1015
ltr
ALARM STATUS ICONS:
BLACK = ACTIVE
TRANSPARENT = NOT ACTIVE
MUTED MASTER ALARM =
Tank 1
Node: 1
Tank Capacity:
10000.0 litres
Ullage:
7963.4 litres
TANK CAPACITY AND ULLAGE SPACE.
0
25
50
75
100
2048.8
ltr
BUND ALARM - OPTIONAL
7
S648/12

PROBE WIRING DIAGRAM



MIRRORED SLAVE DISPLAY

There is an option to fit a slave display that can act as a remote readout. This slave display mirrors the reading from the master display and does not require its own PSU as it takes its power from the master gauge. Please note the master display will need to be re-programmed by Hytek if a slave display is not part of the original installation and is added at a later date. The connection diagram is below.



THIS DIAGRAM ASSUMES ONE POWER SUPPLY PROVIDING A COMMON NEGATIVE TO BOTH BOARDS.
FIT THE DOTTED WIRE IF THE DEVICE DOES NOT OPERATE.

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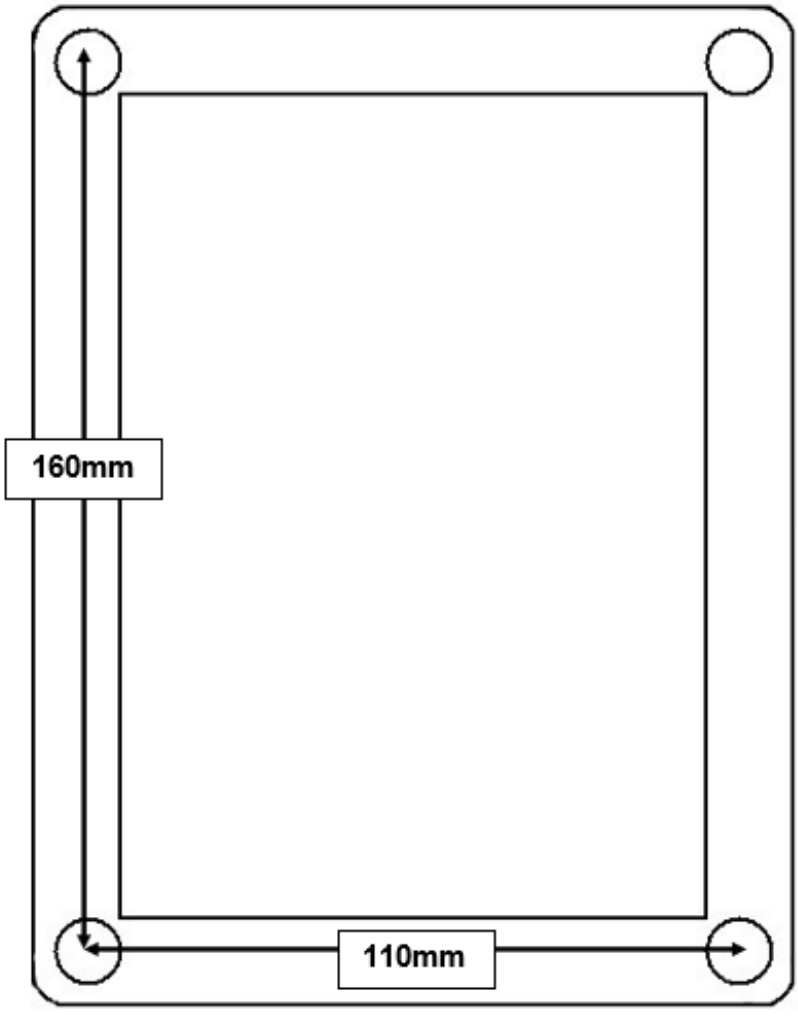
DIMENSIONS

The display may be mounted on walls or panels by utilising the displays own mount holes and using these will retain the IP66 integrity. Allen cap or cross head M4 bolts are ideal for this. The mounting dimensions are shown in the diagram below.



SPECIFICATIONS

- Power supply: 110/230V AC 50/60Hz
- IP66 Fully weatherproof enclosure
- Accuracy: +/- 0.25%
- -5 to +60 Degree operating temperature
- Optional mirrored display output
- Display enclosure is RoHS and CE compliant.
- **Alarm Functions**
  4 x Programmable alarm/ trigger set-points, (see outputs).
  E.g. High Level Local alarm with acknowledge circuit.
  Pump / valve control, Flashing Beacon alarm, Bund Alarm.
  Optional Integrated Bund Alarm with Acknowledge circuit.
- **Cable connections**
  Weatherproof cable glands are provided for power supply and signal inputs. Screw down & plug in Terminal strips are provided within the enclosure
- 4-20 mA output for BMS + Modbus as standard
- M= Master alarm % Settable provides 110 dB at 1 meter, and has a front panel acknowledge button. Test and Mute function supplied as factory standard
- H = Additional Contact Alarm, such as Low level or Mechanical High Switch (NC)
- B = BUND Contact Alarm, for mechanical Switch (NC)

E.U. DECLARATION OF CONFORMITY

Company Name:	Hytek (GB) Ltd
Address:	Delta House, Green Street. Elsenham, Bishops Stortford, Hertfordshire, CM22 6DS, UK
Date of Issue:	14th June 2016
Equipment Details:	**Electronic Tank Gauge Kit (Fuel Monitor)** TGE.T5020A, TGE.T5020A1, TGE.T5020A2
Applicable Directives: & Standards	**2004/108/EC EMC Directive &** **2014/30/EU EMC Directive** (effective date 20th April 2016) EN 61000-6-3:2007 (+A1) Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments **2014/35/EU Low Voltage Directive** **2006/42/EC Machinery Directive** **2012/19/EU Waste Electrical & Electronic Equipment Regulations** **2011/65/EU Restriction of Hazardous Substances Directive (RoHS2)**
Declaration Number:	EU095/3

On behalf of the above named company, I declare under our sole responsibility that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives.

Clive Wellings

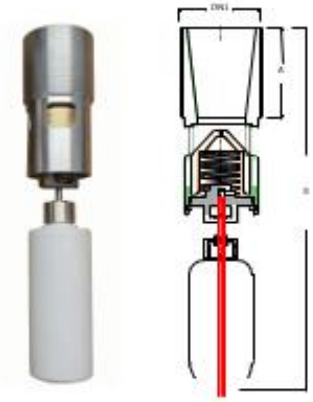
Clive Wellings, Technical Manager

HYTEK
FUEL & LUBRICATION EQUIPMENT

OVERFILL PREVENTION VALVE

CE
EN 13616:2004

AOFILL.ABR



APPLICATION

Overfill prevention valves are designed to avoid overflow of liquid during filling operations of underground (UST) and aboveground (AST) storage fuel tank to prevent environmental hazards.

CHARACTERISTICS

Housing	Stainless steel AISI 316L
Thread	BSP ISO 228-1
Type of filling	Gravity or pumped
Float	High density polyethylene
Max static pressure	4 bar
Seal	Viton
Filling capacity	60 l/min-850 l/min
Product	All hydrocarbons, chemicals, AD BLUE

DIMENSIONS

Article No.	DN 1	A	B
AOFILL.AB	2" BSP Male	68 mm	335 mm

HYTEK
UEL & LUBRICATION EQUIPMENT

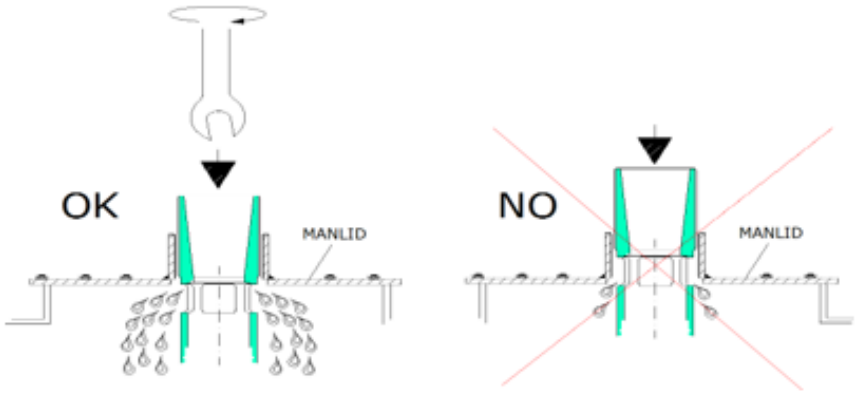
CE
EN 13616:2004

INSTALLATION

The valve can be installed under the manhole lid of the tank through BSP threaded flange or sleeve, there is no need to remove the manlid.

The valve has to be screwed up with a wrench 22 mm and blocked with the teflon sealing, pastes or retaining compounds normally used for this purposes.

It is necessary to pay attention that the openings of the valve are not obstructed.



USER INSTRUCTIONS

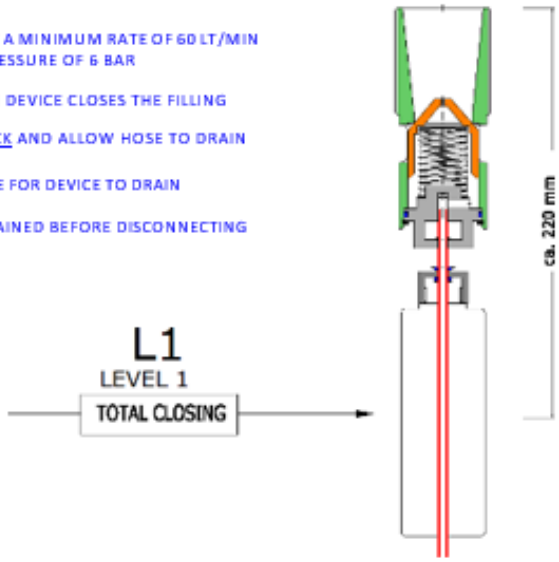
FILLING OPERATION AT A MINIMUM RATE OF 60 LT/MIN AND AT MAXIMUM PRESSURE OF 6 BAR

HOSE WILL KICK WHEN DEVICE CLOSES THE FILLING

CLOSE VALVE ON TRUCK AND ALLOW HOSE TO DRAIN

WAIT FURTHER MINUTE FOR DEVICE TO DRAIN

ENSURE HOSE HAS DRAINED BEFORE DISCONNECTING



MAINTENANCE

The overfill prevention valve must be properly stored, handled and kept in good condition to prevent the entry of particles or the deposit of dust in the moving parts.

Any maintenance activities must be carried out solely by specialized staff and according to the procedures defined by the general instruction manual and only with tools in conformity with the provisions of Appendix A of the EN 1127-1 or by ensuring the absence of an explosive atmosphere.

Atkinson EQUIPMENT LTD

Part Number:

DBC-1000-AB

Atkinson AdBlue Dry-Break Coupling

The Atkinson dry break coupling for ADBLUE is designed to open and close automatically when the delivery hose is connected and disconnected. The valve insures minimal liquid loss on disconnection even if connected or disconnected whilst filling is in progress.

The Atkinson DBC-1000-AB was designed and manufactured in Westbury England and is 100% tested before shipment. Atkinson Equipment is an ISO Quality Assured Firm.

Using the Atkinson Dry-Break coupling minimizes the possibility of contamination.

Specifications

Connection Size: 2" BSPP Thread

Material: 304 Stainless Steel

Seal Material: EPDM

Working Pressure: 10 Bar

Capacity: For tanks up to 10,000 litres

Quality British Product 100% Tested

Atkinson Equipment Limited, West Wilts Trading Estate, Westbury, Wiltshire. BA13 4JF
Telephone: 01373 822220 – Email: sales@atkinsonequipment.com
www.atkinsonequipment.com

*LV 6200 ¼" to 2" only

LV 6200 LV 6220

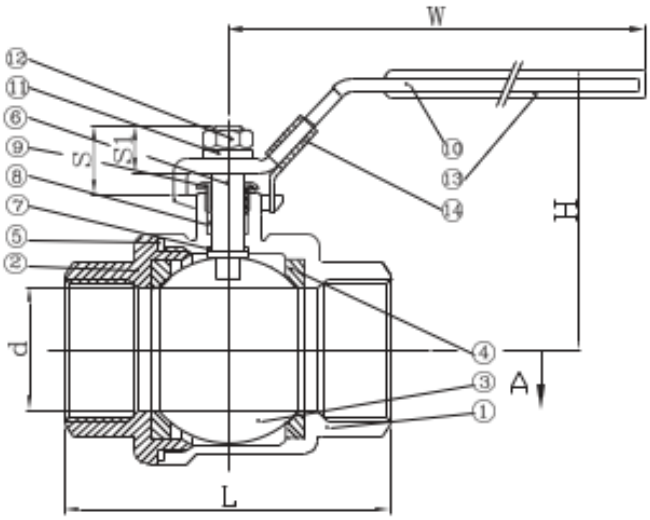
Stainless Steel 2-piece Ball Valve - BSPP (LV6200) or NPT (LV6220)

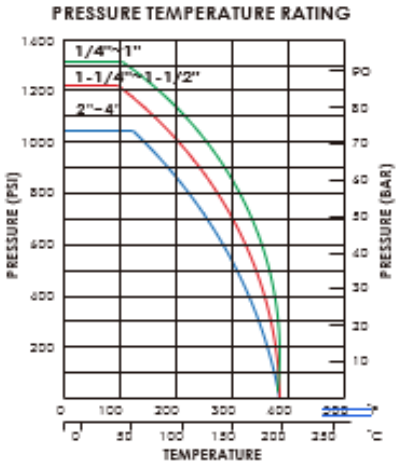
Full Bore, Stainless Steel Body, Ball & Stem, PTFE Seats & Seals, Anti-blowout Stem, Locking Device

Pressure / Temperature	
Pressure	PN63
Temperature	-10°C to 180°C

Material List			
1. Body	A351 CF8M Stainless Steel	8. Stem Packing	PTFE
2. Cap	A351 CF8M Stainless Steel	9. Gland Nut	304 Stainless Steel
3. Ball	A351 CF8M Stainless Steel	10. Handle	430 Stainless Steel
4. Ball Seat	PTFE	11. Spring Washer	304 Stainless Steel
5. Joint Gasket	PTFE	12. Stem Nut	304 Stainless Steel
6. Stem	316 Stainless Steel	13. Handle Sleeve	Plastic
7. Thrust Washer	PTFE	14. Locking Device	430 Stainless Steel

Dimensions						
Size	d	L	H	W	S	S1
¼"	11.6	50	48	91	16.5	10.2
⅜"	12.5	50	48	91	16.5	10.2
½"	15	60	52	91	16.5	10.2
¾"	20	65	61	111	20	13.5
1"	25	80	65	111	23.5	16
1¼"	32	92	79	154	23.5	16
1½"	38	105	83	154	25.5	17
2"	50	125	97	192	25.5	17
2½"	64	155.6	129	246	41	29.5
3"	76	183	138	246	41	29.5
4"	96	240	175	317	51.2	37





Appendices 9.10

Urea CANBus to Modbus

Message Name	Name J1939-71	Repetition Rate [ms]	Detail - Description	Detail - Parameter
Message 0 J1939	AT1GP	500	P1 OR P2	Press P1, Press P2 OR Disable
Message 1 J1939	AT1IMG	500	ΔDPF	DeltaP Mon
Message 1 J1939	AT1IMG	500	T2	TempT2 OR Not Used
Message 2 J1939	A1DOC	500	T1, T2, T3 OR T4	TempT1, TempT2, TempT3 OR TempT4
Message 2 J1939	A1DOC	500	T1, T2, T3 OR T4	TempT1, TempT2, TempT3 OR TempT4
Message 3 J1939	AT1OG2	500	T3	TempT3
Message 3 J1939	AT1OG2	500	T1, T2, T3 OR T4	TempT1,TempT2,TempT3 OR TempT4
Message 5 J1939	AT1IG2	500	T1	TempT1
Message 5 J1939	AT1IG2	500	T1, T2, T3 OR T4	TempT1, TempT2, TempT3 OR TempT4
Message 6 J1939	A1SCREGT1	500	T1, T2, T3 OR T4	TempT1, TempT2, TempT3 OR TempT4
Message 6 J1939	A1SCREGT1	500	T1, T2, T3 OR T4	TempT1, TempT2, TempT3 OR TempT4
Message 7 J1939	IC1	500	P1	Press P1
Message 7 J1939	IC1	500	Engine Intake Manifold #1 Pressure	MAP OR Not Used
Message 7 J1939	IC1	500	TIn	TIn OR Not Used
Message 7 J1939	IC1	500	MAP	MAP OR Not Used
Message 8 J1939	EEC1	50 (fixed timing rate)	Engine Speed	RPM
Message 9 J1939	A1SCRDSR1	50	Aftertreatment 1 Diesel Exhaust Fluid Dosing Requested Quantity	IUQ

Message 9 J1939	A1SCRDSR1	50	Aftertreatment 1 Diesel Exhaust Fluid Dosing Requested Quantity (High Range)	IUQ OR Not Used
Message 11 J1939	AT1T1I	1000	Aft1 Diesel Exhaust Fluid Tank Level	Level Urea
Message 11 J1939	AT1T1I	1000	Aft1 Diesel Exhaust Fluid Tank Temperature	Urea Temp Calculated
Message 11 J1939	AT1T1I	1000	Aft 1 Selective Catalytic Reduction Operator Inducement Active	
Message 11 J1939	AT1T1I	1000	Aft SCR Operator Inducement Severity	
Message 11 J1939	AT1T1I	1000	Aft1 Diesel Exhaust Fluid Tank Heater	
Message 12 J1939	AT1S	500 (request not implemented)	DPF Soot Load Percent	
Message 12 J1939	AT1S	500 (request not implemented)	Diesel Particulate Filter 1 Ash Load Percent	
Message 12 J1939	AT1S	500 (request not implemented)	Diesel Particulate Filter 1 Time Since Last Active Regeneration	ContLastReg
Message 13 J1939	A1DEFSI	1000	Aft1 Diesel Exhaust Fluid Pump Percentage	DCPU

Message 14 J1939	VEP1	1000	Battery Potential / Power Input 1	VBatt
Message 14 J1939	VEP1	1000	Keyswitch Battery Potential	VCh
Message 16 J1939	AT1FC1	500	Aftertreatment 1 Fuel Rate	IDQ
Message 16 J1939	AT1FC1	500	Aftertreatment 1 Fuel Injector 1 Heater Control	
Message 17 J1939	A1SCRDSI1	50	Aftertreatment 1 Diesel Exhaust Fluid Actual Dosing Quantity	IUQ
Message 17 J1939	A1SCRDSI1	50	Aftertreatment 1 SCR System State	
Message 17 J1939	A1SCRDSI1	50	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Press PI U
Message 18 J1939 (multi packet Messages)	AT1H	On request	Aftertreatment 1 Total Number of Active Regenerations	TotReg
Message 18 J1939 (multi packet Messages)	AT1H	On request	Aftertreatment 1 Diesel Particulate Filter Total Number of Passive Regenerations	
Message 19 J1939	SEP1	1000	Sensor Supply Voltage 1	VSensors
Message 20 J1939	AT1OG1	50	Aftertreatment 1 Outlet NOx	NOx2
Message 20 J1939	AT1OG1	50	Aftertreatment 1 Outlet O2	O2_2
Message 21 J1939	AT1IG1	50	Aftertreatment 1 Intake NOx	NOx1
Message 21 J1939	AT1IG1	50	Aftertreatment 1 Intake O2	O2_1
Message 25 J1939	LFE1	500	Engine Fuel Rate	FuelRate
Message 27 J1939	VH	On request	Total Vehicle Hours	WorkTime
Vehicle Identification	VI	On request (multipacket answer)	Vehicle Identification	
Message 28 J1939	SOFT	On request (multipacket answer)	Number Of Software Identification Fields	
Message 28 J1939	SOFT	On request (multipacket answer)	Software Identification	

Message 28 J1939	SOFT	On request (multipacket answer)	System Configuration ID	
Message 33 J1939	A1DEFI1	1000	Aftertreatment 1 Diesel Exhaust Fluid Concentration	UQ Conc
Message 33 J1939	A1DEFI1	1000	Aftertreatment 1 Diesel Exhaust Fluid Property	
Message 35 J1939	ASI1	1000	Aftertreatment System Information 1	SCR Dosing Mode
Message 36 J1939	A1SCRRT2I	1000	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Tank Volume	Level U BuffT
Message 36 J1939	A1SCRRT2I	1000	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Tank Temperature	Temp U BuffT
Message 0 custom		TimCANBroadcast_E	SLI	SLI
Message 0 custom		TimCANBroadcast_E	SLI60	SLI60
Message 0 custom		TimCANBroadcast_E	SLI300	SLI300
Message 1 custom		TimCANBroadcast_E	This message is also asynchronous in according to errors events. In synchronous message only Total Error is valid (Code Error and Event set to 0x00). In asynchronous message all variables present.	
Message 1 custom		TimCANBroadcast_E	Code Error	
Message 1 custom		TimCANBroadcast_E	Total Error	
Message 1 custom		TimCANBroadcast_E	Event	
Message 1 custom		TimCANBroadcast_E	DTC activation	
Message 1 custom		TimCANBroadcast_E	DTC activation	
Message 1 custom		TimCANBroadcast_E	DTC activation	
Message 1 custom		TimCANBroadcast_E	DTC activation	
Message 1 custom		TimCANBroadcast_E	DTC activation	
Message 2 custom		TimCANBroadcast_E	QIn	QIn
Message 2 custom		TimCANBroadcast_E	QEx	QEx
Message 4 custom		TimCANBroadcast_E	VBatt	VBatt
Message 4 custom		TimCANBroadcast_E	VCh	VCh
Message 4 custom		TimCANBroadcast_E	WorkTime	Worktime
Message 9 custom		TimCANBroadcast_E	RPM	RPM
Message 9 custom		TimCANBroadcast_E	MAP	MAP
Message 9 custom		TimCANBroadcast_E	QIn MAP	QIn MAP
Message 10 custom		TimCANBroadcast_E	TempT1	TempT1

Message 10 custom		TimCANBroadcast_E	TempT2	TempT2
Message 10 custom		TimCANBroadcast_E	TempT3	TempT3
Message 10 custom		TimCANBroadcast_E	TempT4	TempT4
Message 11 custom		TimCANBroadcast_E	Press P1	Press P1
Message 11 custom		TimCANBroadcast_E	Press P2	Press P2
Message 11 custom		TimCANBroadcast_E	DeltaP SLI	DeltaP SLI
Message 11 custom		TimCANBroadcast_E	DeltaP Mon	DeltaP Mon
Message 13 custom	EPA0	500	Time counter (countdown) time to clear counters - For incorret DEF	
Message 13 custom	EPA0	500	Time counter (countdown) time to clear counters - For SCR low efficiency	
Message 13 custom	EPA0	500	Time counter (countdown) time to clear counters - For anti tamper	
Message 13 custom	EPA0	500	Time counter (countdown) time to clear counters - For stop dosing	
Message 14 custom	EPA1	500	Restriction level according to DEF tank level	
Message 14 custom	EPA1	500	DEF-Tank level	Level Urea
Message 14 custom	EPA1	500	EGR Safety: Close/Open	
Message 14 custom	EPA1	500	Restriction level of interruption of dosing	
Message 14 custom	EPA1	500	Time counter (countdown) for interruption of dosing	
Message 14 custom	EPA1	500	Restriction level of incorrect Reducing Agent (DEF)	
Message 14 custom	EPA1	500	Time counter (countdown) for incorrect Reducing Agent (DEF)	
Message 14 custom	EPA1	500	Actual engine speed Limit (according inducement)	

Message 15 custom	EPA2	500	Restriction level according to SCR efficiency rate	
Message 15 custom	EPA2	500	Time counter (countdown) for restriction level according to SCR	
Message 15 custom	EPA2	500	SCR fault status	
Message 15 custom	EPA2	500	Empty	
Message 15 custom	EPA2	500	Restriction level according to anti tamper	
Message 15 custom	EPA2	500	Time counter (countdown) for restriction level according to anti tamper	
Message 15 custom	EPA2	500	actual EAT Power reduction value (according inducement)	
Message 16 custom	EPA3	500	Aftertreatment SCR Operator Inducement Reason	
Message 16 custom	EPA4	500	State warm-up mode	Urea Heating
Message 16 custom	EPA5	500	DEF Total Consumption	UreaTotal l
Message 17 custom		TimCANBroadcast_E	Aftertreatment 1 Total Number of Active Regenerations	

Message 17 custom	TimCANBroadcast_E	Aftertreatment 1 Diesel Particulate Filter Total Number of Passive Regenerations	
Message 19 custom	500	Cumulative inducement counter	
Message 19 custom	500	General Status	
Message 19 custom	500	OBD Operating Status	
Message 19 custom	500	OBD Operating Atm Status	
Message 22 custom	500	NOx2SP_km	NOx2SP_km
Message 22 custom	500	NOx2SP New	NOx2SP New
Message 23 custom	500	NOx2Mass_Sec	NOx2Mass_Sec
Message 26 custom	500	Actual Torque	ActTorque
Message 26 custom	500	Friction Torque	FriTorque
Message 26 custom	500	Reference Torque	RefTorque
Message 26 custom	500	Flywheel	Torque Fwheel
Message 27 custom	500	Engine Load	Engine Load
Message 30 custom	500	Total Dosing Quantity [ul]	UreaTotal l
Message 30 custom	500	Total Dosing Quantity [ml]	UreaTotal ml
Message 30 custom	500	Total Dosing Quantity [l]	UreaTotal ul
Message 31 custom	500	NOx1Mass	NOx1Mass_Sec
Message 31 custom	500	NOx1Mass Average Cumulative	NOx1Mass_Cum
Message 33 custom	500	NOx2 concentration	NOx2 Conc
Message 33 custom	500	NOx1 concentration	NOx1 Conc
Message 36 custom	500	Timer Urea Quality DTCs Stage V	
Message 36 custom	500	Timer Urea Level Stage V	
Message 37 custom	500	Timer Severe Inducement Stage V	
Message 37 custom	500	Timer Urea Defreeze Stage V	
Message 38 custom	500	Timer DPF DTCs Stage V	
Message 38 custom	500	Occurrence Events Urea Quality Stage V	
Message 38 custom	500	Occurrence Events DPF DTCs Stage V	
Message 39 custom	500	Urea Buffer Tank Level	Level U BuffT
Message 39 custom	500	Urea Buffer Tank Temperature	Temp U BuffT
Message 39 custom	500	Delivery Pump Status	StDeliveryPump
Message 41 custom	TimCANBroadcast_E	Level Coolant EATS	Level Cool EATS

Message 41 custom	TimCANBroadcast_E	Temperature Coolant EATS	Temp Cool EATS
Message 41 custom	TimCANBroadcast_E	NOx Reduction Percentage	NOx Reduction
Message 42 custom	TimCANBroadcast_E	NOx1 Mass Flow	NOx1 Mass Flow
Message 42 custom	TimCANBroadcast_E	NOx2 Mass Flow	NOx2 Mass Flow
Message 43 custom	TimCANBroadcast_E	NOx1 SP	NOx1 SP
Message 43 custom Available only on V3 ECU	TimCANBroadcast_E	NOx1 Bank2	NOx1 Bank2
Message 43 custom Available only on V3 ECU	TimCANBroadcast_E	NOx2 Bank2	NOx2 Bank2

Fixed/Selectable Parameter	PGN [DEC]	PGN [HEX]	Priority [#]	ID [HEX]	SPN [DEC]
Selectable	64908	FD8C	6	18FD8C3D	3609
Fixed	64946	FDB2	6	18FDB23D	3251
Fixed	64946	FDB2	6	18FDB23D	3249
Selectable	64800	FD20	6	18FD203D	4765
Selectable	64800	FD20	6	18FD203D	4766
Fixed	64947	FDB3	6	18FDB33D	3245
Selectable	64947	FDB3	6	18FDB33D	3246
Fixed	64948	FDB4	6	18FDB43D	3241
Selectable	64948	FDB4	6	18FDB43D	3242
Selectable	64830	FD3E	5	14FD3E3D	4360
Selectable	64830	FD3E	5	14FD3E3D	4363
Fixed	65270	FEF6	6	18FEF63D	81
Fixed	65270	FEF6	6	18FEF63D	102
Selectable	65270	FEF6	6	18FEF63D	105
Fixed	65270	FEF6	6	18FEF63D	106
Fixed	61444	F004	3	0CF0043D	190
Fixed	61476	F024	3	0CF0243D	4348

Fixed	61476	F024	3	0CF0243D	6593
Fixed	65110	FE56	6	18FE563D	1761
Fixed	65110	FE56	6	18FE563D	3031
Fixed	65110	FE56	6	18FE563D	5245
Fixed	65110	FE56	6	18FE563D	5246
Fixed	65110	FE56	6	18FE563D	3363
Fixed	64891	FD7B	6	18FD7B3D	3719
Fixed	64891	FD7B	6	18FD7B3D	3720
Fixed	64891	FD7B	6	18FD7B3D	3721
Fixed	64828	FD3C	6	18FD3C3D	4375

Fixed	65271	FEF7	6	18FEF73D	168
Fixed	65271	FEF7	6	18FEF73D	158
Fixed	64929	FDA1	6	18FDA13D	3481
Fixed	64929	FDA1	6	18FDA13D	4301
Fixed	61475	F023	3	0CF0233D	4331
Fixed	61475	F023	3	0CF0233D	4332
Fixed	61475	F023	3	0CF0233D	4334
Fixed	64920	FD98	6	18EBFF3D	3525
Fixed	64920	FD98	6	18EBFF3D	3726
Fixed	64925	FD9D	6	18FD9D3D	3509
Fixed	61455	F00F	6	18F00F3D	3226
Fixed	61455	F00F	6	18F00F3D	3227
Fixed	61454	F00E	6	18F00E3D	3216
Fixed	61454	F00E	6	18F00E3D	3217
Fixed	65266	FEF2	6	18FEF23D	183
Fixed	65255	FEE7	6	18FEE73D	246
Fixed	65260	FEEC	6	18FEEC3D	237
Fixed	65242	FEDA	6	18FEDA3D	965
Fixed	65242	FEDA	6	18FEDA3D	234

Fixed	65242	FEDA	6	18FEDA3D	234
Fixed	64923	FD9B	6	18FD9B3D	3516
Fixed	64923	FD9B	6	18FD9B3D	3521
Fixed	64561	FC31	6	18FC313D	9176
Fixed	64829	FD3D	6	18FD3D3D	4367
Fixed	64829	FD3D	6	18FD3D3D	4368
Fixed	65520	FFF0	7	1CFFF03D	
Fixed	65520	FFF0	7	1CFFF03D	
Fixed	65520	FFF0	7	1CFFF03D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65521	FFF1	7	1CFFF13D	
Fixed	65522	FFF2	7	1CFFF23D	
Fixed	65522	FFF2	7	1CFFF23D	
Fixed	65524	FFF4	7	1CFFF43D	
Fixed	65524	FFF4	7	1CFFF43D	
Fixed	65524	FFF4	7	1CFFF43D	
Fixed	65526	FFF6	7	1CFFF63D	
Fixed	65526	FFF6	7	1CFFF63D	
Fixed	65526	FFF6	7	1CFFF63D	
Fixed	65530	FFFA	7	1CFFFA3D	

Fixed	65530	FFFA	7	1CFFFA3D
Fixed	65530	FFFA	7	1CFFFA3D
Fixed	65530	FFFA	7	1CFFFA3D
Fixed	65531	FFFB	7	1CFFFB3D
Fixed	65531	FFFB	7	1CFFFB3D
Fixed	65531	FFFB	7	1CFFFB3D
Fixed	65531	FFFB	7	1CFFFB3D
Fixed	65357	FF4D	6	18FF4D3D
Fixed	65357	FF4D	6	18FF4D3D
Fixed	65357	FF4D	6	18FF4D3D
Fixed	65357	FF4D	6	18FF4D3D
Fixed	65358	FF4E	6	18FF4E3D
Fixed	65358	FF4E	6	18FF4E3D
Fixed	65358	FF4E	6	18FF4E3D
Fixed	65358	FF4E	6	18FF4E3D
Fixed	65358	FF4E	6	18FF4E3D
Fixed	65358	FF4E	6	18FF4E3D
Fixed	65358	FF4E	6	18FF4E3D

Fixed	65359	FF4F	6	18FF4F3D
Fixed	65359	FF4F	6	18FF4F3D
Fixed	65359	FF4F	6	18FF4F3D
Fixed	65359	FF4F	6	18FF4F3D
Fixed	65359	FF4F	6	18FF4F3D
Fixed	65359	FF4F	6	18FF4F3D
Fixed	65359	FF4F	6	18FF4F3D
Fixed	65326	FF2E	6	18FF2E3D
Fixed	65326	FF2E	6	18FF2E3D
Fixed	65326	FF2E	6	18FF2E3D
Fixed	65353	FF49	6	18FF493D

Fixed	65353	FF49	6	18FF493D	
Fixed	65354	FF4A	6	18FF4A3D	
Fixed	65354	FF4A	6	18FF4A3D	
Fixed	65354	FF4A	6	18FF4A3D	
Fixed	65354	FF4A	6	18FF4A3D	
Fixed	65377	FF61	6	18FF613D	
Fixed	65377	FF61	6	18FF613D	
Fixed	65378	FF62	6	18FF623D	
Fixed	65381	FF65	6	18FF653D	
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Fixed	65381	FF65	6	18FF653D	
Fixed	65381	FF65	6	18FF653D	
Fixed	65382	FF66	6	18FF663D	
Fixed	65386	FF6A	6	18FF6A3D	
Fixed	65386	FF6A	6	18FF6A3D	
Fixed	65386	FF6A	6	18FF6A3D	
Fixed	65387	FF6B	6	18FF6B3D	
Fixed	65387	FF6B	6	18FF6B3D	
Fixed	65389	FF6D	6	18FF6D3D	
Fixed	65389	FF6D	6	18FF6D3D	
Fixed	65390	FF6E	6	18FF6E3D	
Fixed	65390	FF6E	6	18FF6E3D	
Fixed	65391	FF6F	6	18FF6F3D	
Fixed	65391	FF6F	6	18FF6F3D	
Fixed	65393	FF71	6	18FF713D	
Fixed	65393	FF71	6	18FF713D	
Fixed	65393	FF71	6	18FF713D	
Fixed	65394	FF72	6	18FF723D	
Fixed	65394	FF72	6	18FF723D	
Fixed	65394	FF72	6	18FF723D	
Fixed	65409	FF81	6	18FF813D	-

Fixed	65409	FF81	6	18FF813D	-
Fixed	65409	FF81	6	18FF813D	-
Fixed	65410	FF82	6	18FF823D	-
Fixed	65410	FF82	6	18FF823D	-
Fixed	65411	FF83	6	18FF833D	-
Fixed	65411	FF83	6	18FF833D	516248
Fixed	65411	FF83	6	18FF833D	516249

Start Position [byte]	Length [byte]	Name/Comments	Standard
1	2	DPF Intake Pressure 1 0.1 kPa per bit, 0 offset Not available with related active DTC	1
5	2	Aftertreatment 1 DPF Differential Pressure 0.1 kPa per bit, 0 offset Not available with related active DTC	1
1	2	Aftertreatment 1 Exhaust Gas Temperature 2 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
1	2	Aftertreatment 1 DOC Intake Gas Temperature 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
3	2	Aftertreatment 1 DOC Outlet Gas Temperature 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
1	2	Aftertreatment 1 Exhaust Gas Temperature 3 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
3	2	Aftertreatment 1 DPF Outlet Gas Temperature 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
1	2	Aftertreatment 1 Exhaust Gas Temperature 1 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
3	2	Aftertreatment 1 DPF Intake Gas Temperature 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
1	2	Aftertreatment 1 SCR Intake Gas Temperature 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
4	2	Aftertreatment 1 SCR Outlet Gas Temperature 0.03125 deg C per bit, -273 deg C offset Not available with related active DTC	1
1	1	Engine DPF intake pressure 0.5 kPa per bit, 0 offset Not available with related active DTC	1
2	1	2 kPa/bit, 0 offset	1
3	1	Engine Intake Manifold 1 Temperature 1 deg C per bit, -40 deg C offset	1
4	1	MAP 2 kPa per bit, 0 offset Not available with related active DTC	1
4	2	0.125 rpm per bit	1
1	2	0.3 g/h per bit	1

6	2	0.05 g/min per bit	1
1	1	0.4 % per bit, 0 offset (0% = Empty; 100% = Full) Not available with related active DTC.	1
2	1	1 deg C per bit, -40 deg C offset Not available with related active DTC	1
5	bits 8-6	0b000 - Normal Level - No restriction 0b001 - Low Level - No restriction 0b001 - Low Level 1 - No restriction 0b100 - Low Level 2 - Warning inducement 0b100 - Low Persistent Level - Low level inducement 0b100 - Injector Stop Level - Severe inducement 0b100 - Pump Stop Level - Severe inducement 0b111 - If SCR module is OFF or temp urea < -7°C	1
6	bits 8-6	0b000 - All OK 0b001 - Inducement Level 1 - OBD warning 0b010 - Inducement Level 2 - OBD warning present. Counter to low level inducement present and advancing 0b011 - Inducement Level 3 - Low level inducement applied 0b100 - Inducement Level 4 - OBD warning: counters for severe inducement present and advancing 0b101 - Inducement Level 5 - Severe inducement applied 0b110 - Not managed by DEC 0b111 - NA	1
7	1	0.4 % per bit, 0 offset	1
1	1	1 % per bit, 0 offset	1
2	1	Fixed at 0xFF	1
3	4	1 s per bit, 0 offset	1
3	1	0.4 % per bit, 0 offset	1

5	2	0.05 V per bit, 0 offset	1
7	2	0.05 V per bit, 0 offset	1
3	2	0.05 l/h per bit, 0 offset	1
8	1	0xFF. Not available	1
1	2	0.3 g/h per bit	1
3.1	bits 4-1	0b0000 SCR DORMANT 0b0001 SCR PREPARING DOSING 0b0010 SCR NORMAL DOSING 0b0011 SCR SYSTEM ERROR 0b0110 SCR PROTECT MODE COLD 0b0111 SCR SHUNTOFF 0b1111 SCR NOT AVAILABLE	1
6	1	8 kPa per bit, 0 offset	1
1 (13)	4	# of regenerations	1
4 (21)	4	# of regenerations (all set to 0xFF)	1
1	2	0.05 V per bit, 0 offset	1
1	2	0.05 ppm per bit, -200 ppm offset	1
3	2	0.000514 % per bit, -12 % offset	1
1	2	0.05 ppm per bit, -200 ppm offset	1
3	2	0.000514 % per bit, -12 % offset	1
1	2 bytes	0.05 L/bit, 0 offset	1
1	4	0.05 hr/bit, 0 offset	1
1	up to 21 bytes	Example VIN123456789 (ASCII code) followed by an "*" delimiter	1
1	1	Start byte 0x02	1
2	Variable – up to 200 bytes	Example BA.03.A0 (ASCII code) followed by an "*" delimiter	1

Variable – up to 200 bytes	Variable – up to 200 bytes	Example XXYYZZ (ASCII code) followed by an "*" delimiter	1
2	1 byte	0.25 %/bit, 0% offset	1
6.1	4 bits	0000b Urea concentration too high 0001b Urea concentration too low 0011b Diesel exhaust fluid is proper mixture 1101b Not able to determine fluid property (fluid type unknown, DTC 84 Urea quality not proper) 1110b Error with diesel exhaust fluid property detection (DTC 83 Urea quality sensor - concentration sensor)) 1111b Not available (DTC 86 Urea quality sensor disconnection or urea sensor non enable on ECU)	1
4.5	3 bits	000b Standard SCR Dosing Mode 001b Reduced SCR Dosing Mode 111b Not Available	1
1	1 byte	0.4% per bit, 0 offset	1
2	1 byte	1 °C/bit, -40 °C offset	1
1	2	1 per bit (no unit)	1
3	2	1 per bit (no unit)	1
5	2	1 per bit (no unit)	1
1	2	1 per bit (no unit)	1
3	1	1 per bit (no unit)	1
4	1	1 per bit (no unit)	1
8	bit 1	Monitoring paired ECU error	1
8	bit 2	EGR module paired ECU error	1
8	bit 3	DPF module paired ECU error	1
8	bit 4	SCR module paired ECU error	1
8	bit 5	HW paired ECU error	1
1	2	0.1 l/s per bit	1
5	2	0.1 l/s per bit	1
1	2	0.05 V per bit (SPN 168)	1
3	2	0.05 V per bit (SPN 158)	1
5	4	0.05 hr per bit (SPN 246)	1
1	2	1 rpm per bit	1
3	2	1 mBar per bit	1
5	4	0.01 l/s per bit	1
1	2	0.03125 deg C per bit -273 deg C offset (SPN 3241)	1

3	2	0.03125 deg C per bit -273 deg C offset (SPN 3241)	1
5	2	0.03125 deg C per bit -273 deg C offset (SPN 3241)	1
7	2	0.03125 deg C per bit -273 deg C offset (SPN 3241)	1
1	2	0.1 kPa per bit, 0 offset	1
3	2	0.1 kPa per bit, 0 offset	1
5	2	0.1 kPa per bit, 0 offset	1
7	2	0.1 kPa per bit, 0 offset	1
1	2	1 min per bit, 0 offset. 0xFFFF means no time counter available. The timer indicates the count down.	1
3	2	1 min per bit, 0 offset. 0xFFFF means no time counter available. The timer indicates the count down.	1
5	2	1 min per bit, 0 offset. 0xFFFF means no time counter available. The timer indicates the count down.	1
7	2	1 min per bit, 0 offset. 0xFFFF means no time counter available. The timer indicates the count down.	1
1	bits 1-2	0b00 - Normal Level - No restriction 0b00 - Low Level - No restriction 0b00 - Low Level 1 - No restriction 0b01 - Low Level 2 - Warning inducement 0b10 - Low Persistent Level - Low level inducement 0b11 - Injector Stop Level - Severe inducement 0b11 - Pump Stop Level - Severe inducement	1
1	bits 3-4	0b00 - Normal Level 0b01 - Low Level 0b10 - Low Level 1 0b11 - Low Level 2 0b11 - Low Persistent Level 0b11 - Injector Stop Level 0b11 - Pump Stop Level	1
1	bits 5-6	0b00 - EGR to be closed 0b01 - All OK	1
1	bits 7-8	0b00 - No restriction 0b01 - Level 1 - Warning inducement 0b10 - Level 2 - Early inducement 0b11 - Level 3 - Severe inducement	1
2	2	running time to next restriction level 1 min / bit, 0 offset counter not running value 0xFFFF means no time counter available	1
4	bits 1-2	0b00 - No restriction 0b01 - Level 1 - Warning inducement 0b10 - Level 2 - Early inducement 0b11 - Level 3 - Severe inducement	1
5	2	running time to next restriction level 1 min / bit, 0 offset counter not running value 0xFFFF means no time counter available	1
7	2	actual engine speed limit caused by system 0,125 rpm per bit, 0 offset	1

1	bits 1-2	0b00 - No restriction 0b01 - Level 1 - Warning inducement 0b10 - Level 2 - Early inducement 0b11 - Level 3 - Severe inducement	1
2	2	running time to next restriction level 1 min per bit, 0 offset counter not running value 0xFFFF means no time counter available	1
4	bits 1-4	0b0000 - System is working without problems 0b0001 - SCR System faults but SCR is working (details see error codes) 0b0010 - SCR System faults but SCR works in limp home mode (details see error codes) 0b0100 - SCR System fatal error, SCR function disabled because of faults (details see error codes) 0b1000 - SCR System disabled by application	1
4	bits 5-8	empty - fixed value: 0b00	1
5	bits 1-2	0b00 - No restriction 0b01 - Level 1 - Warning inducement 0b10 - Level 2 - Early inducement 0b11 - Level 3 - Severe inducement	1
6	2	running time to next restriction level 1 min per bit, 0 offset counter not running value 0xFFFF means no time counter available	1
8	1	actual power reduction caused by the SCR or DPF functions 1 % per bit, 0 offset 0 % = engine stop or start protection	1
1	1	0b000 - No inducement active 0b001 - Reagent Level Low 0b010 - Incorrect Quality 0b011 - Incorrect Consumption/SCR 0b100 - Tampering 0b101 - DPF Back Pressure 0b110 - Error (Hardware –Failure, Failure DEF Level- or Quality Sensor) 0b111 - Not Available / Not Supported	1
4	bits 1-2	0b00 - Not Active 0b01 - Active 0b11 - Not Available	1
5	4	Total DEF consumption in engine lifetime 1 l per bit, 0 offset	1
1	4	# of regenerations	1

5	4	# of regenerations (all set to 0xFF)	1
1	2	running time to next restriction level 1 min / bit, 0 offset counter not running value 0xFFFF means no time counter available (minimum value for all inducement)	1
3	bits 1-3	0b000 - No restriction 0b001 - Level 1 - Warning inducement 0b010 - Level 2 - Early inducement 0b011 - Level 3 - Severe inducement 0b111 - Not Available / Not Supported	1
4	bit 1	0b0 - Not active 0b1 - Active	1
5	bit 1	0b0 - Not active 0b1 - Active	1
1	4	0.001 g/km per bit, 0 offset	1
5	4	0.01 g/kWh per bit, 0 offset	1
1	4	0.1 mg per bit, 0 offset	1
1	1	1 % per bit, 0 offset	1
2	1	1 % per bit, 0 offset	1
3	2	1 Nm per bit, 0 offset	1
5	4	0.1 Nm per bit, 0 offset (negative two's complement representation)	1
1	4	0.01 kW per bit, 0 offset (negative two's complement representation)	1
1	2	1 ul per bit, 0 offset	1
3	2	1 ml per bit, 0 offset	1
5	2	1 l per bit, 0 offest	1
1	4	0.1 mg per bit, 0 offset	1
5	4	0.1 mg per bit, 0 offset	1
1	4	0.1 mg/Nm^3 per bit, 0 offset	1
5	4	0.1 mg/Nm^3 per bit, 0 offset	1
1	4	1 s per bit, 0 offset	1
5	4	1 s per bit, 0 offset	1
1	4	1 s per bit, 0 offset	1
5	4	1 s per bit, 0 offset	1
1	4	1 s per bit, 0 offset	1
5	2	1 # per bit, 0 offset	1
7	2	1 # per bit, 0 offset	1
1	2	1 % per bit, 0 offset	1
3	2	1 deg C per bit, 0 offset (negative two's complement representation)	1
5	1	1 # per bit, 0 offset	1
1	1	0.4% per bit, 0 offset	1

2	1	1 °C/bit, -40 °C offset	1
3	2	1% per bit, 0 offset	1
1	4	0.01 g/h per bit, 0 offset	1
5	4	0.01 g/h per bit, 0 offset	1
1	4	0.01 g/kWh per bit, 0 offset	1
5	2	0.05 ppm per bit, -200 ppm offset	1
7	2	0.05 ppm per bit, -200 ppm offset	1

Technical Leaflet

BASF
We create chemistry

AdBlue®

Very pure NO_x-reduction agent for Diesel engines equipped with SCR catalysts.

AdBlue fulfills the quality requirements drafted in the international standard ISO 22241-1:2019(E).

April 2019 | **Data Sheet** | **Replaced Version November 2010** **TI/EVO 6221e / Page 1 of 2**

Chemical nature	Urea, carbamide, in ultra pure water
CAS No.	57-13-6
EINECS-No.	200-315-5
Physical form and packaging	AdBlue is supplied in road tankers,IBC's and cans.
Shelf life	At product temperatures between -11 and 25 °C AdBlue has a shelf life of 18 months after production (maximum product temperature 30 °C, average product temperature 25 °C).

Properties

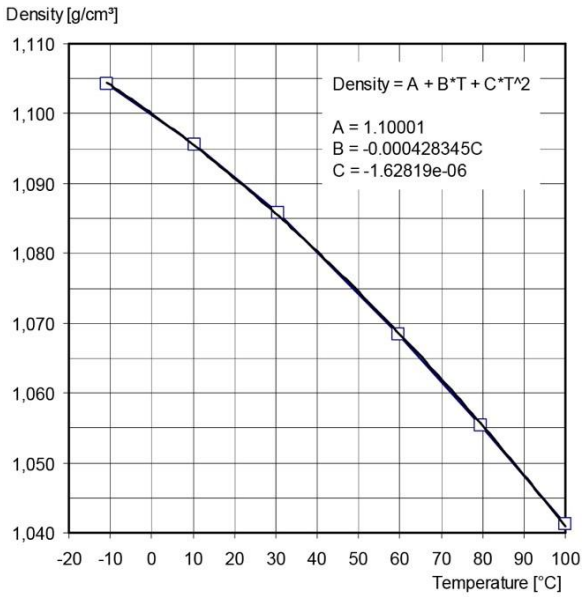
Delivery specification

Test Item	Unit	Limits	Test method
Urea content	% (m/m)	31.8 – 33.2	ISO 22241-2 Ann. C
Refractive index at 20 °C	–	1.3814 – 1.3843	ISO 22241-2 Ann. C
Alkalinity as NH3	% w/w	0.2 max.	ISO 22241-2 Ann. D
Biuret	% w/w	0.3 max.	ISO 22241-2 Ann. E
Aldehydes	mg/kg	5 max.	ISO 22241-2 Ann. F
Insolubles	mg/kg	20 max.	ISO 22241-2 Ann. G
Phosphate	mg/kg	0.5 max.	ISO 22241-2 Ann. H
Calcium	mg/kg	0.5 max.	
Iron	mg/kg	0.5 max.	
Copper	mg/kg	0.2 max.	
Zinc	mg/kg	0.2 max.	
Chromium	mg/kg	0.2 max.	ISO 22241-2 Ann. I
Nickel	mg/kg	0.2 max.	
Aluminium	mg/kg	0.5 max.	
Magnesium	mg/kg	0.5 max.	
Sodium	mg/kg	0.5 max.	
Potassium	mg/kg	0.5 max.	
Identity	–	Identical to reference	ISO 22241-2 Ann. J

These specification will be amended as soon as there are changes in the standards ISO 22241-1:2019(E) and ISO 22241-2:2019(E) to maintain compliance with the most actual standard.

Physical properties

Density p(T)



Source: Exp. data, BASF

Density of frozen AdBlue approx. 1,03 g/cm^3 *Source: Exp. data, BASF*

Melting enthalpy of frozen AdBlue

Specific heat capacity Cp(T) of liquid AdBlue

T [°C]	Cp. exp. [J/g*K]
25.04	3.51
45.04	3.57
65.02	3.64

Cp(T) = 8E-06*T2 + 0.0027*T + 3.4345

Source: Exp. data, BASF

Specific heat capacity Cp(T) of frozen AdBlue

T [°C]	J/(g*T)
- 42.0	1.49
- 36.0	1.53
- 30.0	1.59

Source: Exp. data, BASF

Vapour pressure above liquid AdBlue

T [°C]	$Pressure_{exp.}$ [hPa]
20.08	23.0
30.26	41.1
40.19	70.6
55.18	150.3
70.26	306.9
85.21	609.8
100.21	1182.2

ln (p/bar) = 13.9461 - 5198.36/(273.15 + T)

T [Celsius]

Mean dev., est.: 3%

ln (p/Pa) = 25.45899 - 5198.351/T

Mean dev., est.: 3%

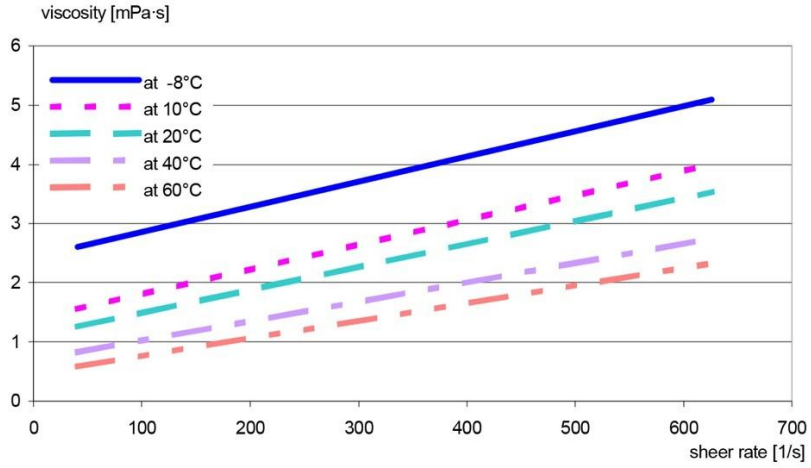
Source: Exp. data, BASF

Thermal conductivity

approx. 0.570 W/m·K at 25 °C

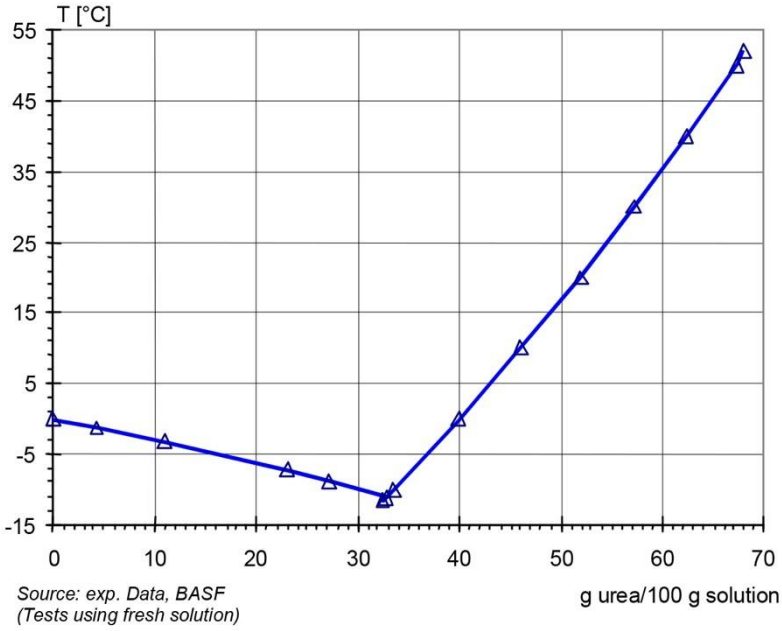
Viscosity

approx. 1.4 mPa·s at 25 °C



Surface tension min. 65 mN/m at 20 °C

Freezing point f (T, m) of urea solution



Chemical properties

AdBlue has a faint alkaline reaction. The pH of a freshly prepared solution is of the order of 9.0 to 9.5. During storage a pH value of approx. 10 might be reached.

The dissolved urea decomposes slowly even at room temperature, generating ammonia and carbon dioxide. The rate of this reaction increases if the solution is heated. Above approx. 70 °C biuret is formed additionally at a significant rate.

Materials resistance

Equipment coming into contact with AdBlue can be made of alloyed austenitic Cr-Ni-steels or Cr-Ni-Mo-steels according to EN 10088-1 to -3 (e.g. 1.4541 and 1.4571). Steels of an equivalent quality (e.g. according to US standards) can be used without any restriction.

Non alloyed steels, zinc coated steels, copper, and alloys containing copper are not suitable due to their poor resistance towards urea, urea solution, or the ammonia dissolved therein.

Polymers, e.g. polyethylene, polypropylene and polyoxymethylene are suitable at temperatures up to 60 °C.

For sealings e.g. PTFE is suited.

However, the properties of parts made of polymeric materials depend to a considerable extent on blending and processing during the manu-facturing process. Therefore, for material made from polymers the supplier should be requested to submit written resistance data towards AdBlue for both mechanical and chemical properties, which are tailored for the intended use as well as for the intended operating temperature.

Any other material not cited above must be tested regarding corrosion resistance and possible influences on the product specification given in ISO 22241-1:2019(E).

Safety

Physiological data

AdBlue is not a hazardous substance in the sense of the German Gefahr- stoffverordnung

When using this product, the information and advice given in our **Safety Data Sheet** should be observed. Due attention should also be given to the **precautions** necessary for handling chemicals.

Storage and Transportation

AdBlue is not a dangerous substance for transportation. Owing to its chemical nature, however, it must be transported and stored separately from nitrites. Transportation should be made in insulated tanks or on plastic tank pallets (IBC).

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many Factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given here in may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

Appendices 9.11

Urea (Adblue) Technical Leaflet for AUS 40

PRODUCT SPECIFICATION

Product Name	Greenox® AUS40
Synonyms	Marine Urea ®, AUS40/ Carbamide, Carbonlydiamide
Specification Reference	GRAUS40/1 (20/07/IHADBL)

SALES SPECIFICATION

Property	**Value**
Urea Content	39.0 – 41.0% m/m
Density at 20°C	1105 – 1177 kg/m^3
Refractive Index at 20°C	1.3947 – 1.3982
Alkalinity as NH_3	< 0.5% (m/m)
Biuret	< 0.8 mg/kg
Aldehydes	< 100 mg/kg
Insoluble Matter	< 50 mg/kg
Phosphate(PO_4)	< 1.0 mg/kg
Calcium	< 1.0 mg/kg
Iron	< 1.0 mg/kg
Magnesium	< 1.0 mg/kg
Sodium	< 1.0 mg/kg
Potassium	< 1.0 mg/kg

Reference: ISO 18611 – Marine NOx Reduction Agent AUS 40

NOTES

Exclusion of Liability

Information contained in this publication is accurate to the best of the knowledge and belief of Tennants.

Any information or advice obtained from Tennants otherwise than by means of this publication and whether relating to Tennants materials or other materials, is also given in good faith. However, it remains at all times the responsibility of the customer to ensure that Tennants materials are suitable for the particular purpose intended.

Tennants accepts no liability whatsoever (except as otherwise provided by law) arising out of the use of information supplied, the application, adaptation or processing of the products described herein, the use of other materials in lieu of Tennants materials or the use of Tennants materials in conjunction with such other materials.

Health and Safety

A Material Safety Data Sheet has been issued describing the health, safety and environmental properties of this product, identifying the potential hazards and giving advice on the handling precautions and emergency procedures. This must be consulted fully before handling, storage and use.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product Name	Greenox® AUS40
Synonyms	Marine Urea ®, AUS40, Carbamide, Carbonlydiamide
Molecular formula	CH_4N_2O
CAS Number	57-13-6
EINECS Number	200-315-5
REACH Registration Number	01-2119463277-33-xxxx (Urea)
Relevant Identified Use(s)	Additive for reduction of NOx emission from marine diesel engine exhausts

Details of the supplier of the safety data sheet

TENNANTS DISTRIBUTION LIMITED
Hazelbottom Road
Cheetham
Manchester
M8 0GR
Tel No. +44(0)161 205 4454
Fax No. +44(0)161 203 4298

Emergency telephone number
Tel: +44(0)844 335 0001 (24 hours)

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
Not classified as dangerous according to Directive 98/24/EC, Regulation {EC) No 1272/2008, Directive 1999/45/EC
2.2. Label elements
Not classified
Precautionary statements
Not classified
2.3. Other hazards
Urea is neither a PBT or vPvB substance

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures
Product containing urea as a main ingredient.

4. FIRST AID MEASURES

Inhalation
Remove injured from exposure area. In severe cases, or if recovery is not rapid or complete seek medical attention.

Skin contact
Rinse contaminated area with plenty of water. Remove any contaminated clothing and wash before reuse. If irritation persists, seek medical attention.

Eye contact
Wash thoroughly with water for at least 10 minutes. Obtain medical attention

Ingestion
Wash out mouth with water. Do not induce vomiting. If patient is conscious, give water to drink. If patient feels unwell seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed
Inhalation
Inhalation of gases created by thermal decomposition may cause irritation and caustic action for the respiratory system. Influence on lungs may occur over some time.

4.3. Indication of any immediate medical attention and special treatment needed
Medical assistance needed in case of inhalation of large amounts of dust.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Extinguishing media: Use an extinguishing agent suitable for surrounding fire

5.2. Special hazards arising from the substance or mixture

When urea decomposes it produces ammonia. In case of fire toxic gases containing ammonia, carbon dioxide and nitric oxides-NOx may be released.

5.3. Advice for fire-fighters

Irritating substances may be emitted upon thermal combustion so self-contained breathing apparatus will be required. Avoid inhaling of vapours (they are toxic). Stand with a face towards fire, always back to a wind.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation. Put on appropriate personal protective equipment

6.2. Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if product has caused environmental pollution.

6.3. Methods and material for containment and cleaning up

Any spillage of urea should be immediately cleaned and placed in a clean, labelled container.
Depending on the degree and type of pollution, a collected product may be used as fertilizer for agricultural purposes or may be transferred to a specialized company for neutralisation purposes.

6.4. Reference to other sections

See section 1 for emergency contact information and section 13 for waste disposal.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid contact with eyes. Avoid repeated or prolonged contact with skin and clothing. Avoid dust inhalation. Wear suitable protective clothing.
Avoid excessive accumulations of dust. Avoid unnecessary exposure to atmospheric air to prevent moisture retention. When handling the product for a longer time, wear protective clothes and gloves.

7.2. Conditions for safe storage, including any incompatibilities

Store in a closed, dry room with good ventilation at temperature not below +5ºC and not above +25ºC. Avoid temperatures below 0°C and above 30°C. Entrance of any materials will pollute the substance and it will be impossible to use the substance for intended purpose.

7.3. Specific end use(s)

No further data available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Workplace exposure limits: No data available.

8.2. Exposure controls

When handling the product for a longer period of time, wear proper protective gloves. At high concentrations of dust, wear proper dust masks. Avoid excessive accumulation of dust and install local exhaust ventilation system where necessary.

Engineering measures

Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limits

Respiratory protection

Respirators

Hand protection

Protective gloves

Eye protection

Wear protection glasses

Skin and body protection

Work footwear and protective clothing.
Hygiene measures
Wash at end of shift and change clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state at 20ºC and 1013hPa: Liquid, clear
Melting/freezing point: 0°C
Boiling point (1013 hPa): 103°C
Relative density: 1110 kg/m^3
Vapour pressure: 80 Pa at 20ºC
Water solubility: 624 g/l at 20ºC
Partition coefficient n-octanol/water: Log Kow (Pow): -1.73 at 20ºC
Surface tension: Not applicable
Flammability: Not flammable
Flash point: No data available
Self-ignition temperature: No evidence of self-ignition

Explosive properties: No explosive properties
Oxidising properties: No oxidising properties
Stability in organic solvents: Not a critical property
Granulometry: Fraction 1-3 mm (min. 90%)
Dissociation constant: Above 0.6 (pkb)
Viscosity: 1.38 mPa-s (1,38 cP) [@25°C]

9.2. Other information
No further information

10. STABILITY AND REACTIVITY

10.1. Reactivity
Non-reactive during storage, handling and application under normal conditions.

10.2. Chemical stability
Stable during storage, handling and application under normal conditions.

10.3. Possibility of hazardous reactions
Unknown

10.4. Conditions to avoid
Heating above melting point.
Welding or heat treatment of equipment installation, where urea may be present without earlier thorough washing to remove all residue of a fertiliser

10.5. Incompatible materials
Strong oxidants, acids, alkalis, nitrates, calcium hypochlorite or sodium hypochlorite.

10.6. Hazardous decomposition products
Urea reacts with calcium hypochlorite or sodium hypochlorite forming explosive nitrogen trichloride.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
LD50 (Oral)
Low acute toxicity – LD50 (rat) =8471mg/kg
Irritation
Skin
Not irritating-Human, rabbit (New Zealand white), mouse (Nude M F l hr)
Eye
Not irritating (Vienna white)
Corrosivity
Human and animal data show that urea is not corrosive.
Sensitisation
Skin
Not sensitising-naturally present at the relatively high concentrations
Respiratory
Not sensitising
Repeated dose toxicity
NOAEL 4 (oral) 2250mg/kg bw/day (rat, mouse)
Mutagenicity
No known significant effects or critical hazards
Carcinogenicity
NOAEL (oral) No known significant effects or critical hazards
Toxicity for reproduction
LOAELS No known significant effects or critical hazards

12. ECOLOGICAL INFORMATION

Toxicity
Urea does not fulfil the T criteria.
Short-term toxicity to fish
LC50 for freshwater fish: 6810mg/l
Long-term toxicity to fish
Urea is of inherently low toxicity to fish species: it is a normal
Short-term toxicity to aquatic invertebrates
EC50/LC50 for freshwater invertebrates: 10000mg/l (Daphnia, freshwater snails and aedes egypti larvae)
Long-term toxicity to aquatic invertebrates
Urea is of inherently low toxicity to species of aquatic invertebrates and exposure will be limited by the action of micro-organism
Algae and aquatic plants
EC10/LC10 or NOEC for freshwater algae: 47mg/l-Blue-green

Persistence and degradability
Urea does not fulfil the P or vP criteria.

Bioaccumulation potential
Urea does not fulfil the B or vB criteria.

Mobility in soil
Highly biodegradable in soil and water

Results of PBT and vPvB assessment
Urea is neither a PBT nor a vPvB substrate

Other adverse effects
No further information

13. DISPOSAL CONSIDERATIONS

Dispose of product and waste packaging in accordance with local and national regulations.

14. TRANSPORT INFORMATION

This product is non-hazardous for transportation

15. REGULATORY INFORMATION

Regulation (EC) No 1307/2006 of the European Parliament and of the council of 18th December 2006 concerning registration, evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European chemicals Agency, amending directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EEC and 2000/21/EC. {Official Journal of the European Union of 30.12.2006, L 396 and amendments
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. (Official Journal of the European Union of 30.12.2006, L 353 and amendments

16. OTHER INFORMATION

Source of information
Supplier

Modification from last revision:
First Issue
Date: 28/07/2020

Dosing kit:	**931.020.004-04**	**24V AUS DOSING KIT 80 kg/h**	**Cabling layout**
Steering cabinet:	**009.055.002-04**	**CAB FULL 1-V3**	**Drawing Ver 01**
Cable Kit:	**009.323.KIT.008**	**WIRING KIT EATS 15m / 8m 2 INJ-HighFlow (2 Gear pumps + 1 Centrif.)**	

Terminals X11 Sensors

Terminal description	SENSORS L+	SENSORS L-	T1	T2	T3	T4	MAP/ PRESS P1-B2	TIN/T5	PRESS 1	PRESS 2 / RPM - AI	RPM - FREQ	PIU(ADBLUE PRESSURE)	CO2 REQUEST	L TANK 1 (COOLING TANK LEVEL)	T TANK 1 (COOLING TANK TEMP)	L TANK 2 (MAIN TANK LEVEL)	T TANK 2 (MAIN TANK TEMP)	PID(DIESEL PRESSURE)
Signal				Wire 2		Wire 2	Wire 3	Wire 4	Wire 3		Freq signal	Wire 3		Wire 3	Wire 4	Wire 3	Wire 4	
Sensors GND				Wire 1		Wire 1	Wire 1		Wire 1		GND	Wire 1		Wire 1	Wire 2	Wire 1	Wire 2	
Sensors 5 V							Wire 2		Wire 2			Wire 2						
Cable PN				009.32Z.015		009.32Z.015	009.32Z.014 (If not on CANbus - Not part of the wiring kit)		009.32Z.003		RPM from eng. (If not on CANbus)	009.32Z.008		009.32Z.009		009.32Z.009		

*Alternative 1, 2

Terminals X12 CANbus

			CAN0										CAN1 - NO CANBUS TERMINATION					
Terminal description	CANBUS L+	CANBUS L-	NOX1 B1 LOW	NO11 B1 HIGH	NOX2 B1 LOW	NOX2 B1 HIGH	BUFFER TANK/ QUALITY SENSOR LOW	BUFFER TANK/ QUALITY SENSOR HIGH	AUX1 LOW	AUX1 HIGH	AUX 2 LOW	AUX 2 HIGH	Engine CAN LOW	Engine CAN HIGH	NOx1 B2 LOW	NOx1 B2 HIGH	NOx2 B2 LOW	NOx2 B2 HIGH
Signal			L2 Lo	L2 Hi	L2 Lo	L2 Hi	L2 Lo	L2 Hi					CAN Low	CAN High				
Sensors GND			L1 Lo		L1 Lo		L1 Lo											
Sensors 24 V			L1 Hi		L1 Hi		L1 Hi											
Cable PN			009.32Z.024 + 009.300.079		009.32Z.024 + 009.300.078		009.32Z.024						CANbus signal from engine					

CAN WIRING COLOR CODES

FUNCTION	WIRE #	WIRE COLOR	WIRE COLOR
GND	1	L1 Lo	White
24 V	2	L1 Hi	Brown
CAN L	3	L2 Lo	Green
CAN H	4	L2 Hi	Yellow
		Marine	PVC

Terminals X13 AUS Pumps & Act. AUX

Terminal description	AUS PUMPS L+	AUS PUMPS L-	SPD	DIR	SPD	DIR	SPD	DIR	ACT 1	ACT 2	Press 2 -> RPM input	Alternative 1: 0-5 V signal: PRESS 2 / RPM - AI	Press 2 -> RPM input	Alternative 2: NC contact: PRESS 2 / RPM - AI
			PRESSURE PUMP 1		PRESSURE PUMP 2		DELIVERY PUMP		AUX					
Signal			Wire 3	Wire 4			Wire 3	Wire 4				0-5 V Signal		Wire 2
Actuator GND			Wire 1				Wire 1					GND		Wire 1
Actuator 24 V			Wire 2				Wire 2							
Cable PN			009.32Z.026				009.32Z.026							

Wire -5 Not used

Terminals X14 Cooling pumps

Terminal description	COOLING PUMPS L+	COOLING PUMPS L-	SPD	DIR	FLOW	VCC	ACT 1	ACT 2
			COOLING PUMP		FLOW METER (COOLING FLOW)		AUX	
Signal								
Actuator GND			Wire 1					
Actuator 24 V			Wire 2					
Cable PN			009.32Z.029					

Terminals X15 Injectors & other actuators

Terminal description	AUS VALVE 1	AUS VALVE 2	AUS INJ 1	AUS INJ 2	AUS INJ 3	DIESEL INJ	DIESEL PUMP	DIESEL VALVE	EXHAUST HEATER/ ANALYZER	AUS LINE SAFETY VALVE
Steering GND	Wire 1	Wire 1	Wire 1		Wire 1				GND	GND
Actuators 24 V	Wire 2	Wire 2	Wire 2		Wire 2				+24V	+24V
Cable PN	009.323.021 - Optional	009.323.021 - Optional	009.32x.018		009.32x.018				Steering for heater relay	

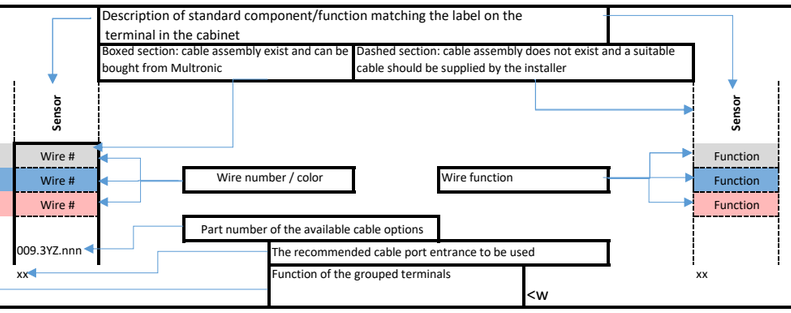
Terminals X16 Safety

Terminal description	BYPASS/ CO2 G.L.	EM	ALARM CONTACT
Top terminal	Wire 1	Wire 1	Wire 1
Bottom terminal	Wire 2	Wire 2	Wire 2
Cable PN	Close valve: close contact	Emergency: open contact	Error: open contact

Terminals X0 Mains supply

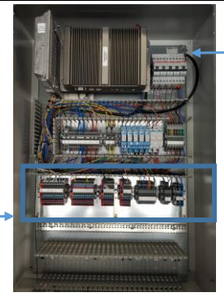
Terminal description	MAIN L+	MAIN L-
Function	+ 24 V	GND

Guiding notes:



Orange colored terminal block

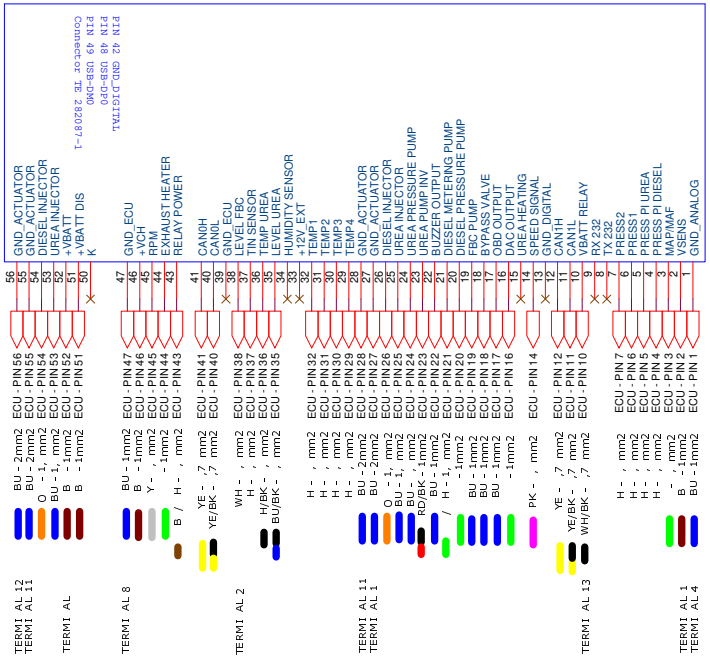
External wiring section



Identification label

BK	BLACK
BN	BROWN
BU	BLUE
GN	GREEN
GY	GREY
LBU	LIGHT BLUE
OG	ORANGE
PK	PINK
RD	RED
TQ	TURQUOISE
VT	VIOLET
WH	WHITE
YE	YELLOW

ECU CONN1
W/H ECU V3 - FULL VER 02



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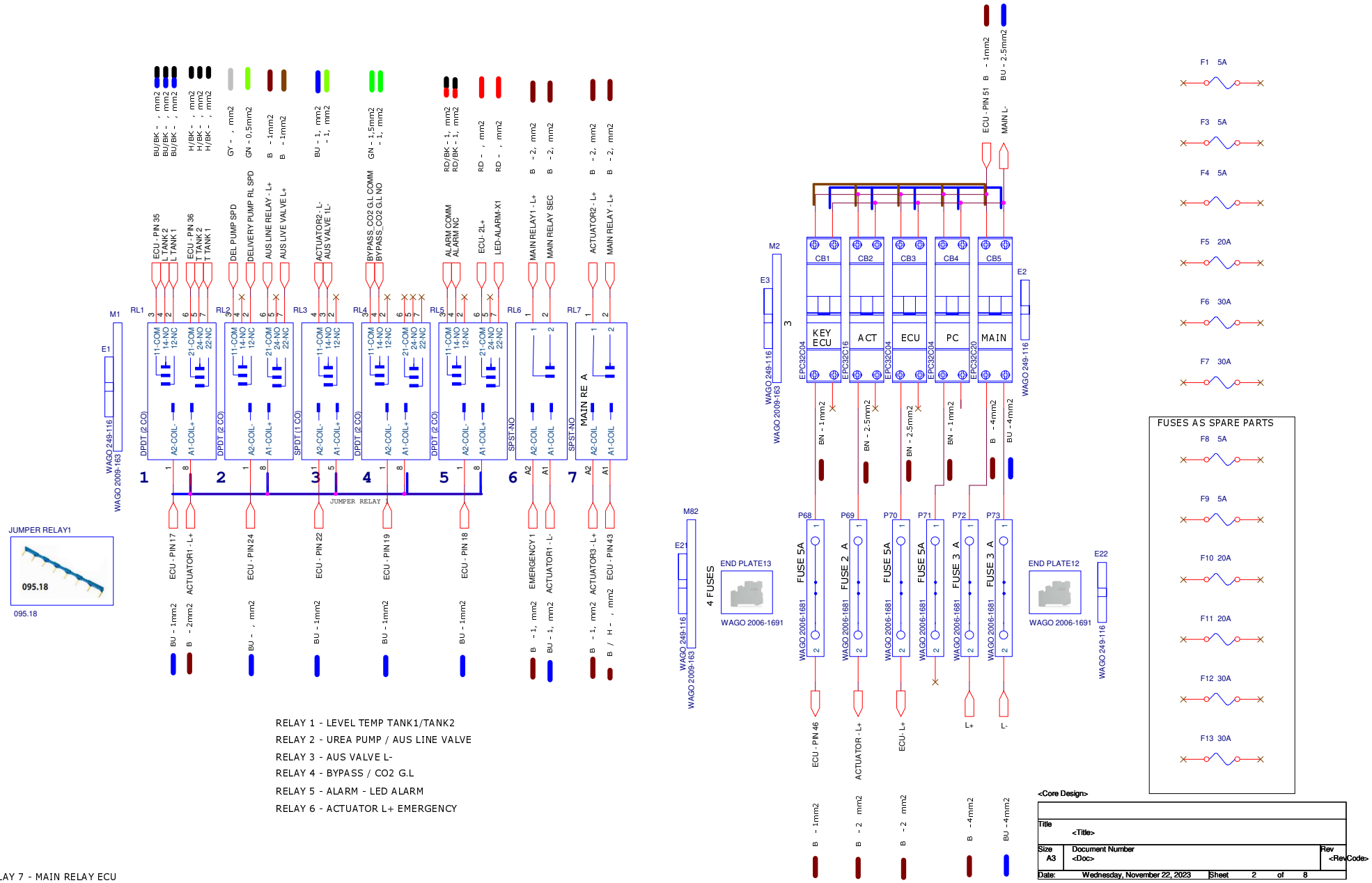
MULTRONIC Emission Systems

Product Name: ECU SIDE - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 01



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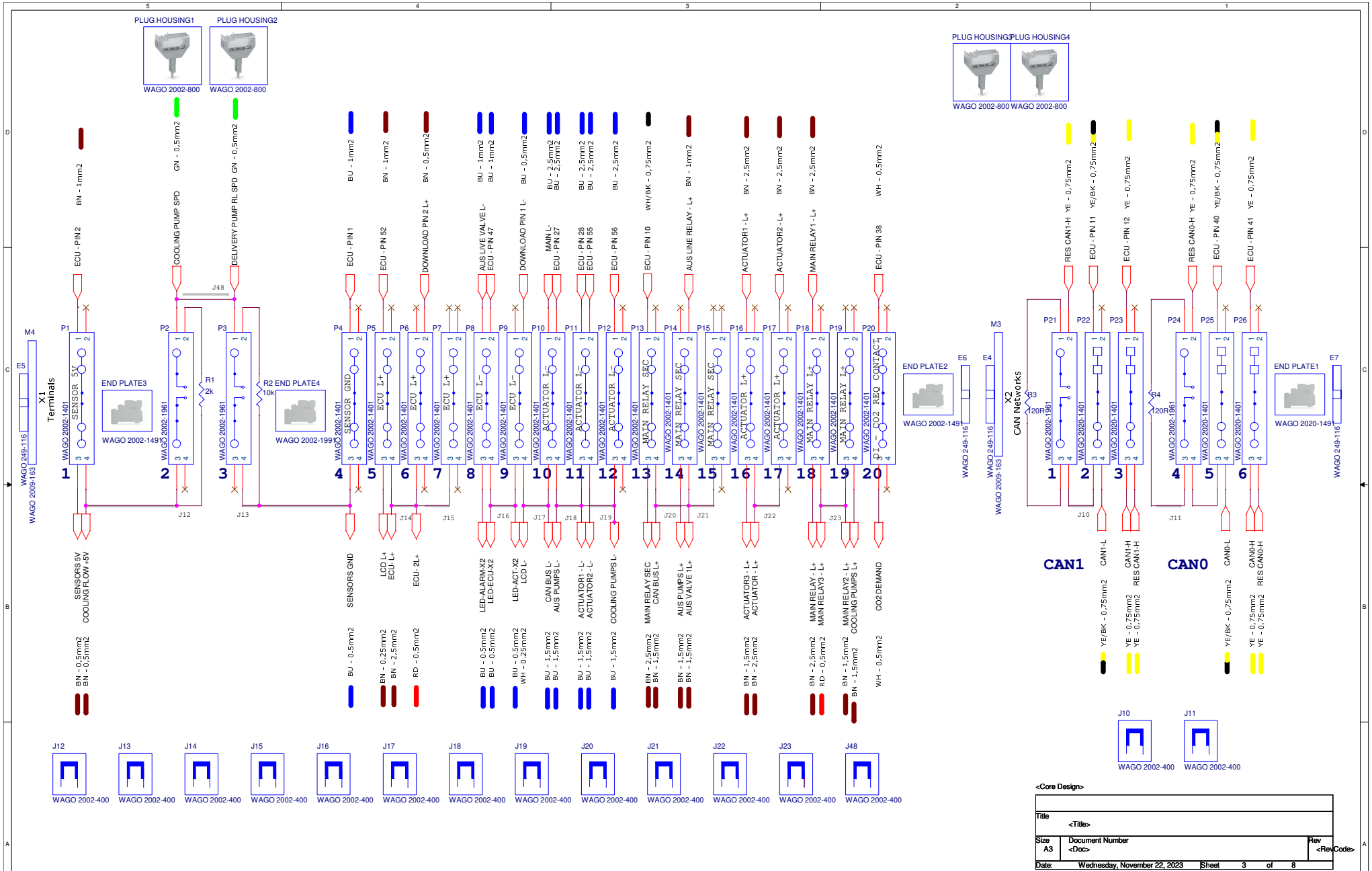
MULTRONIC Emission Systems

Product Name: RELAYS CB - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 02



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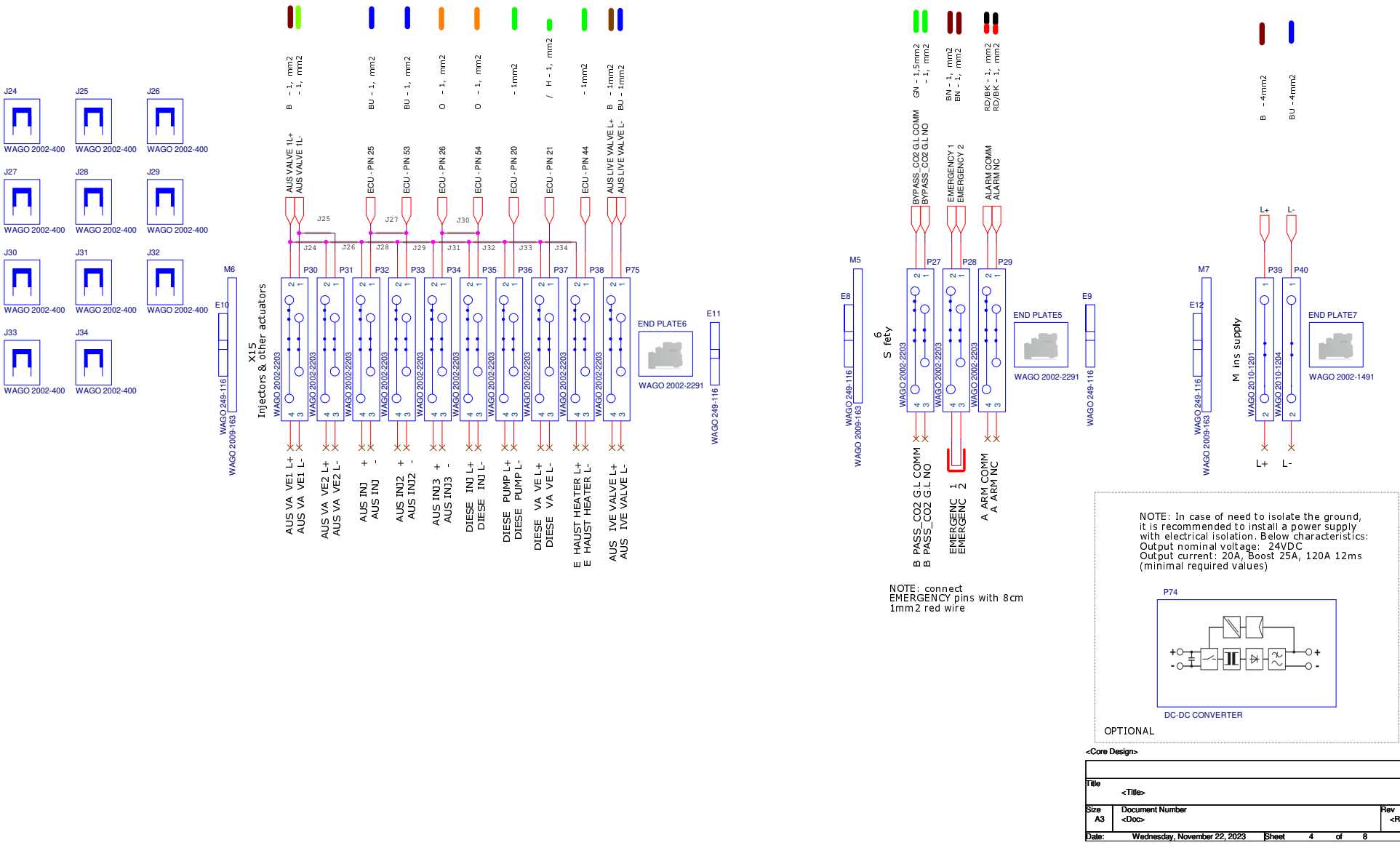
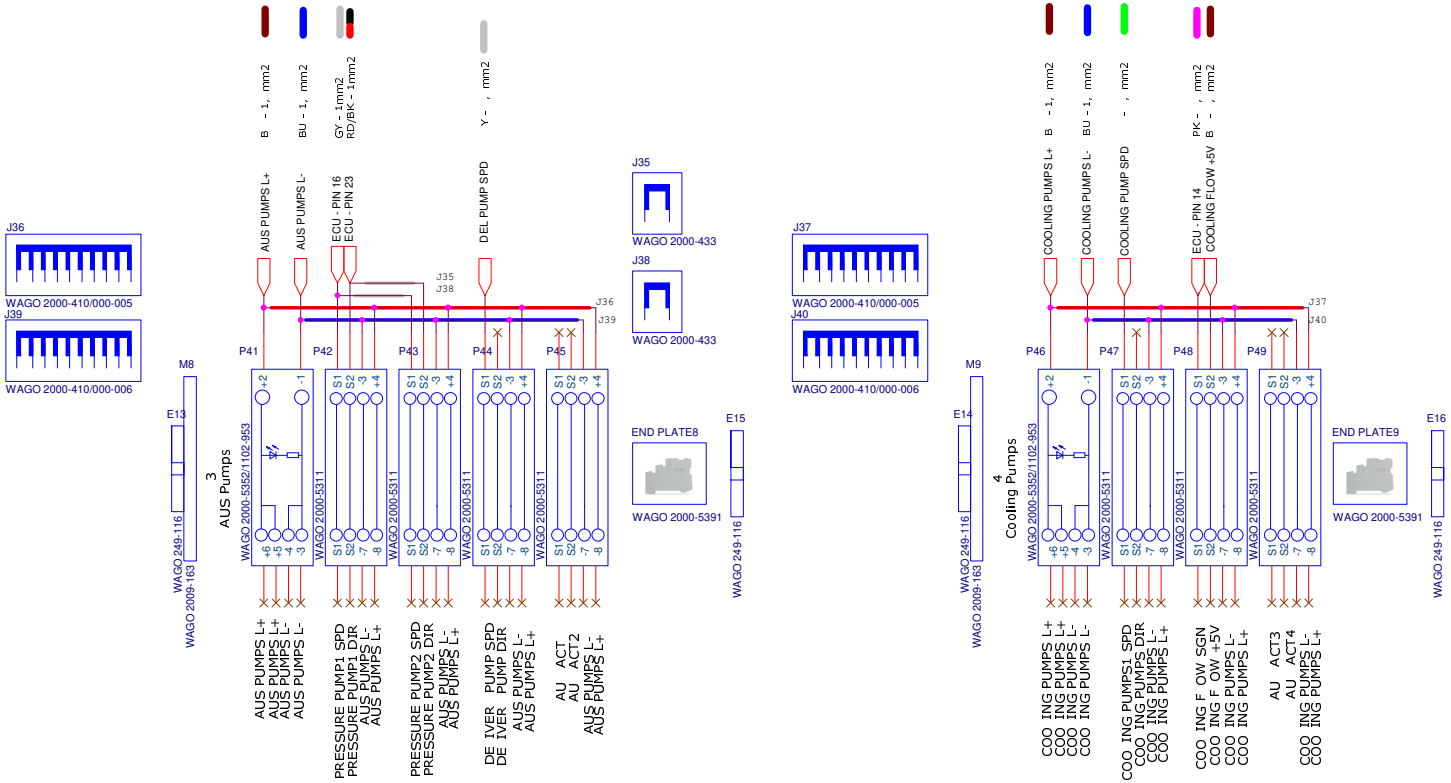
MULTRONIC Emission Systems

Product Name: TERMINALS - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 03



MULTRONIC Emission Systems

Product Name: ACTUATORS 1 - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 04



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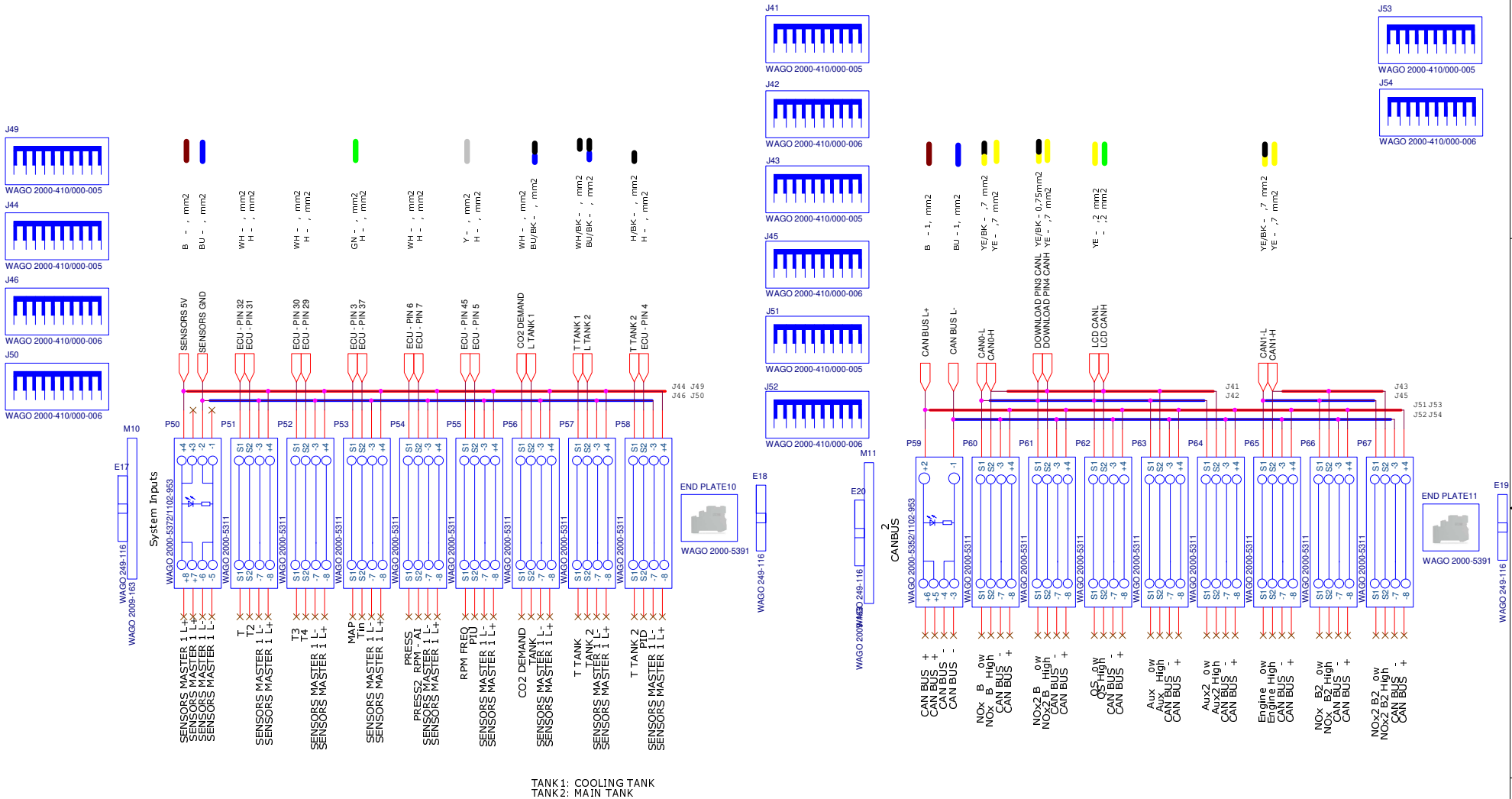
MULTRONIC Emission Systems

Product Name: ACTUATORS2 - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 05



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MULTRONIC Emission Systems

Product Name: SENSORS - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 06

EMERGENCY STOP1

EATON M22-PV

GUARD RING1

EATON M22-XGPV-E

FRONT MOUNT4

EATON M22-A

CONTACT BLOCK1
EATON M22-K01

SYSTEM ON

LIGHT HEAD1

EATON M22-L-G

FRONT MOUNT1

EATON M22-A

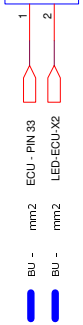
PLATE HOLDER1

EATON M22S-ST-X

LEGEND PLATE2

EATON M22S-XST

CONTACT BLOCK4
EATON M22-LED-G



PUMPS ON

LIGHT HEAD2

EATON M22-L-G

FRONT MOUNT2

EATON M22-A

PLATE HOLDER2

EATON M22S-ST-X

LEGEND PLATE1

EATON M22S-XST

CONTACT BLOCK2
EATON M22-LED-G

ALARM

LIGHT HEAD3

EATON M22-L-R

FRONT MOUNT3

EATON M22-A

PLATE HOLDER3

EATON M22S-ST-X

LEGEND PLATE3

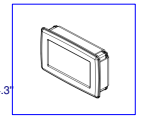
EATON M22S-XST

CONTACT BLOCK3
EATON M22-LED-R

S1

STICKER DISPLAY TOUCH SCREEN 4.3"

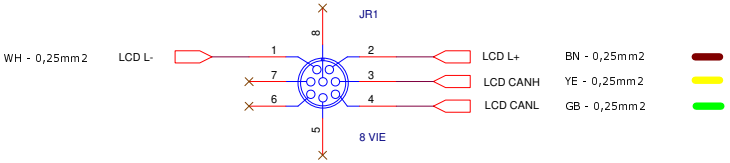
DISPLAY1



4.3" 480x272

CABLE1

CABLE ADAPTOR USB



NOTE: CABLE LENGTH 1 METER

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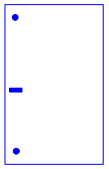
MULTRONIC Emission Systems

Product Name: DOOR - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 07

CABINET1



806-506-250 D93/24.35

CABLE DUCT1

CABLE DUCT 60 x 80 mm

DIN RAIL1

DIN RAIL 7.5 x 35 x 1 mm

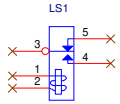
CARRIER RAIL1

WAGO 790-145

BUSBAR4

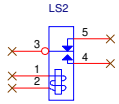
WAGO 210-133

LS1



SPDT-NO

LS2



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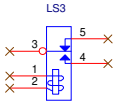
LS3



SPDT-NO

BUSBAR1

WAGO 790-302

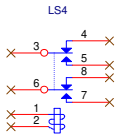
BUSBAR2

WAGO 790-302

BUSBAR3

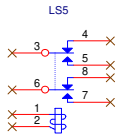
WAGO 790-302

LS4



DPDT-NO

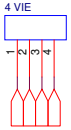
LS5



DPDT-NO

DOWNLOAD CONNECTOR

J51
4 VIE



BU - , mm2 DOWNLOAD PIN 1 L-
B - , mm2 DOWNLOAD PIN 2 L+
YE/BK - ,? mm2 DOWNLOAD PIN3 CANL
YE - ,? mm2 DOWNLOAD PIN4 CANH

J1

PIN

J2

PIN

J44

PIN

J48

PIN

J45

PIN

J49

PIN

J46

PIN

J50

PIN

M34 M35 M36 M37 M38 M39 M40

CABLE GLAND PG16 CABLE GLAND PG16 CABLE GLAND PG16 CABLE GLAND PG16 CABLE GLAND PG16 CABLE GLAND PG16 CABLE GLAND PG21

M12 M13 M14 M15 M16 M17 M18 M19 M20 M21 M22

CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11

M23 M24 M25 M26 M27 M28 M29 M30 M31 M32 M33

CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11 CABLE GLAND PG11

M41 M42 M43 M44 M45 M46

CABLE GLAND BLANKING PLUG PG11 CABLE GLAND BLANKING PLUG PG11 CABLE GLAND BLANKING PLUG PG11 CABLE GLAND BLANKING PLUG PG16 CABLE GLAND BLANKING PLUG PG16 CABLE GLAND BLANKING PLUG PG16

M47 M48 M49 M50 M51 M52 M53 M54 M55 M56 M57 M58 M59 M60 M61

LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11

M62 M63 M64 M65 M66 M67 M68 M69 M70 M71

LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11 LOCKNUT PG11

M72 M73 M74 M75 M76 M77 M78 M79 M80 M81

LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG16 LOCKNUT PG21

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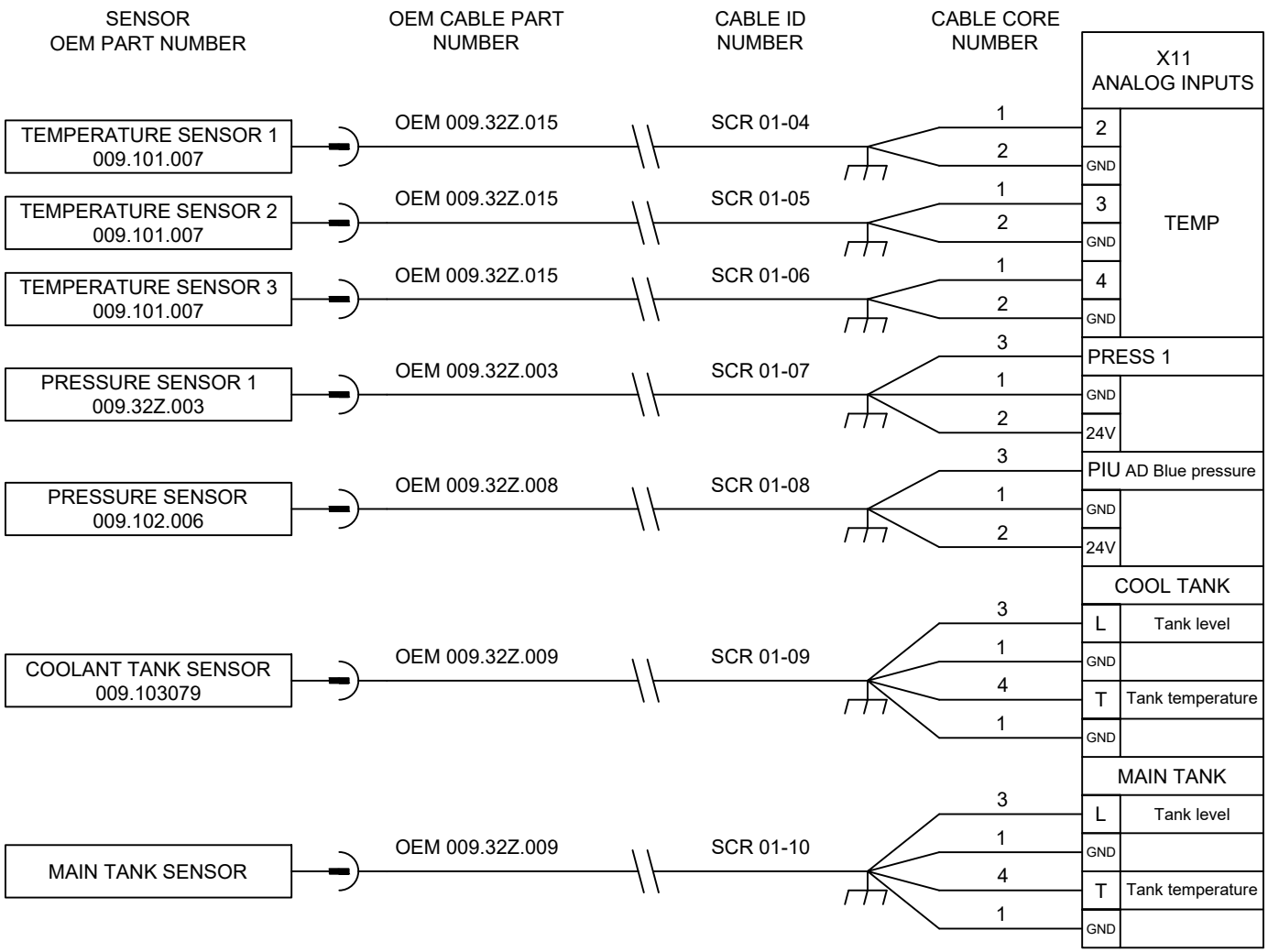
MULTRONIC Emission Systems

Product Name: MECHANICAL - CABINET FULL 1-V3	Date: 20/11/2023	Doc.: 22003-2
Part Number: 009.055.002-04	Rev.: 00	Pag.: 08



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

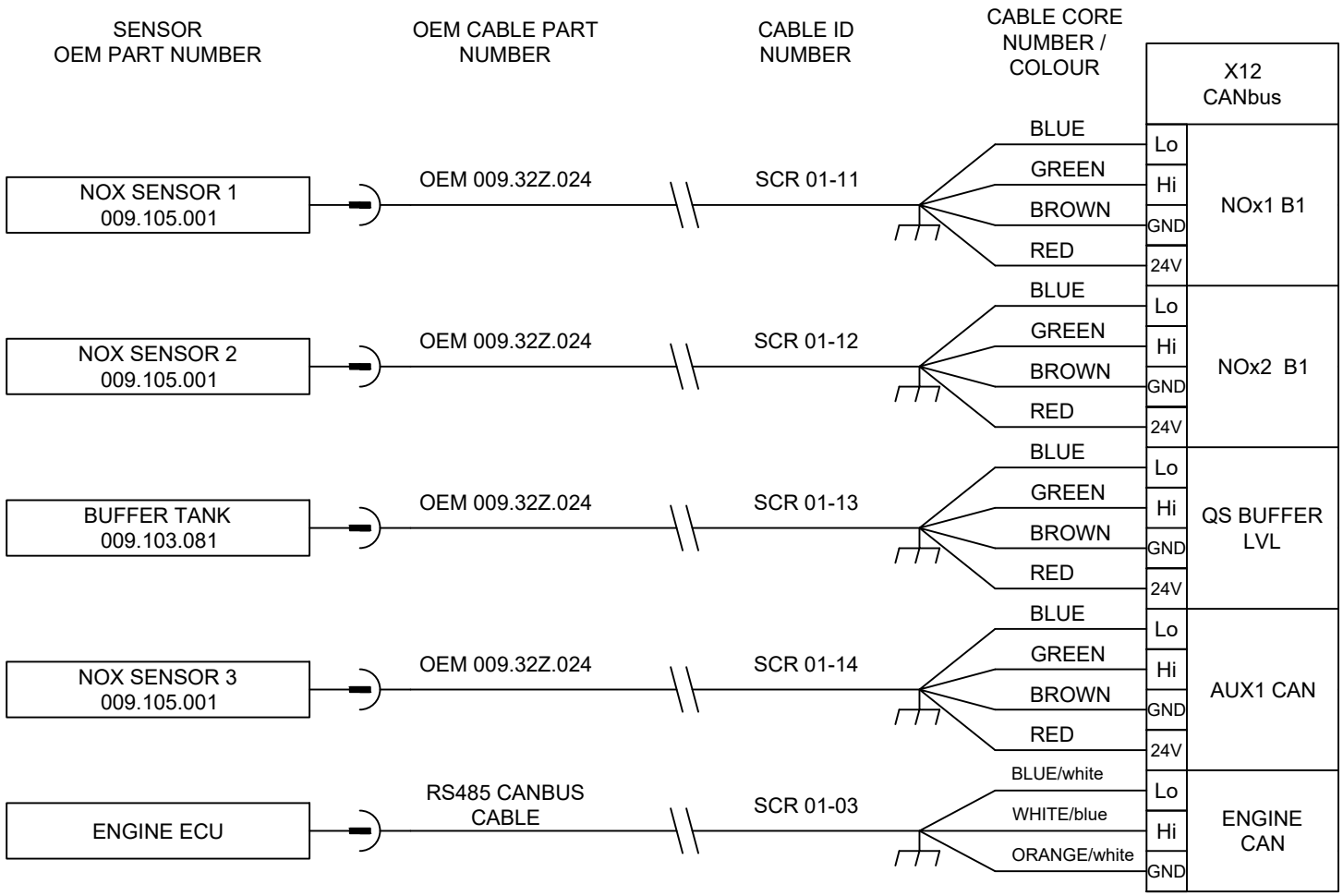
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X11 terminals. external cable identification.

NOTES:

DWG NO	01, 1of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

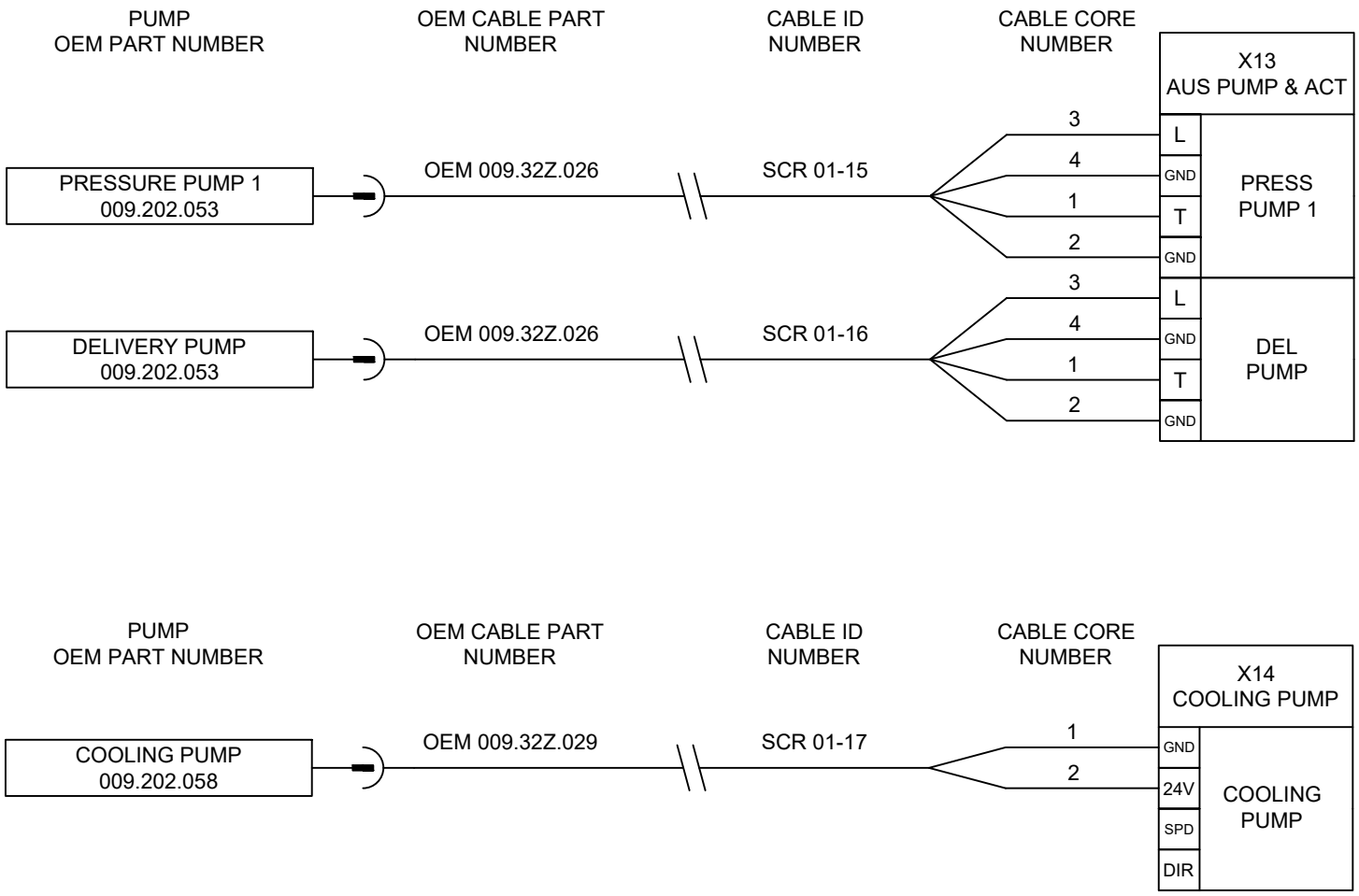
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X12 terminals. external cable identification.

NOTES:

DWG NO	02, 2of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

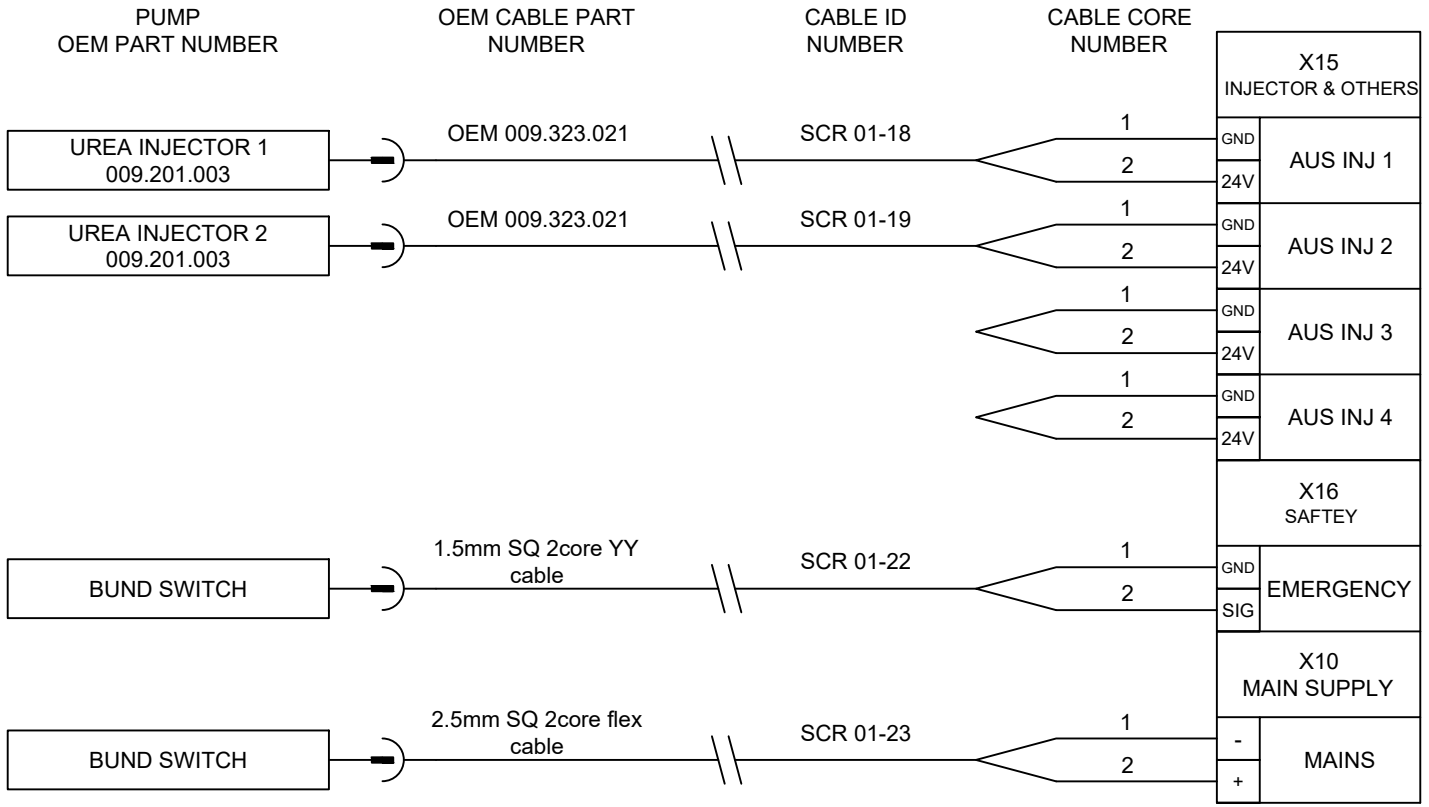
SITE ADDRESS:

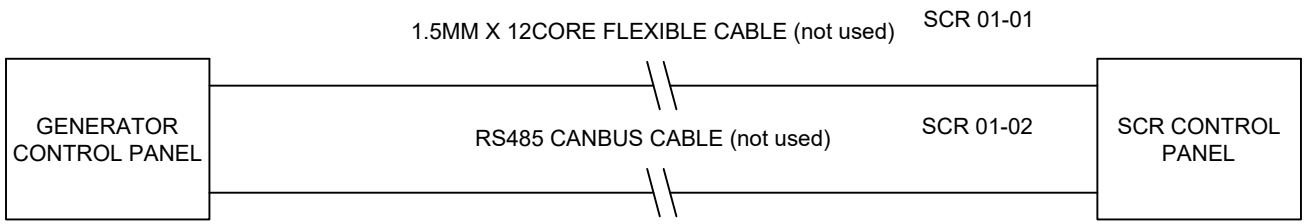
DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X13 & X14 terminals.
external cable
identification.

NOTES:

DWG NO	03, 3of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24





REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

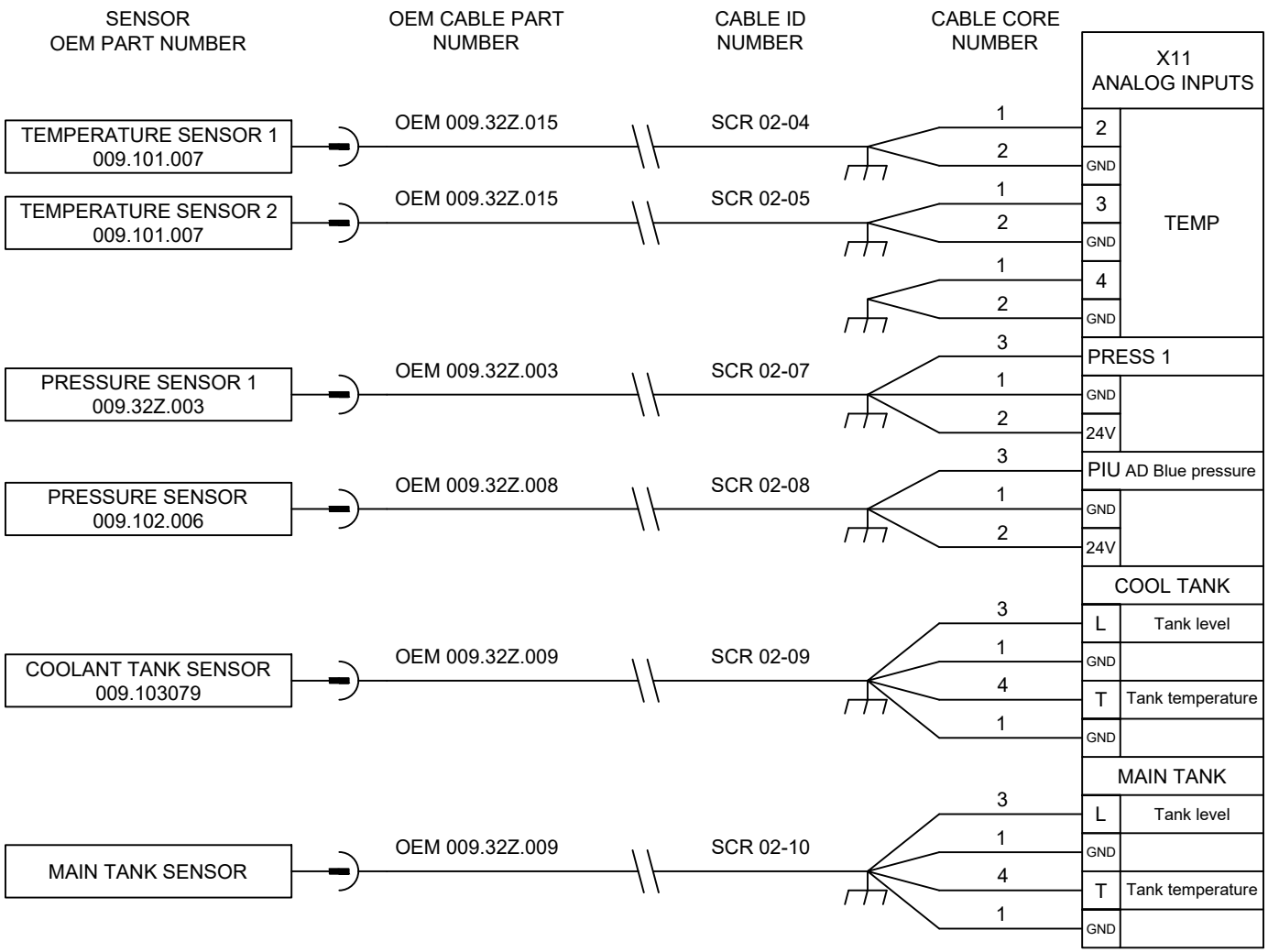
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X15,X16,X10 terminals.
external cable
identification.

NOTES:

DWG NO	04, 4of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

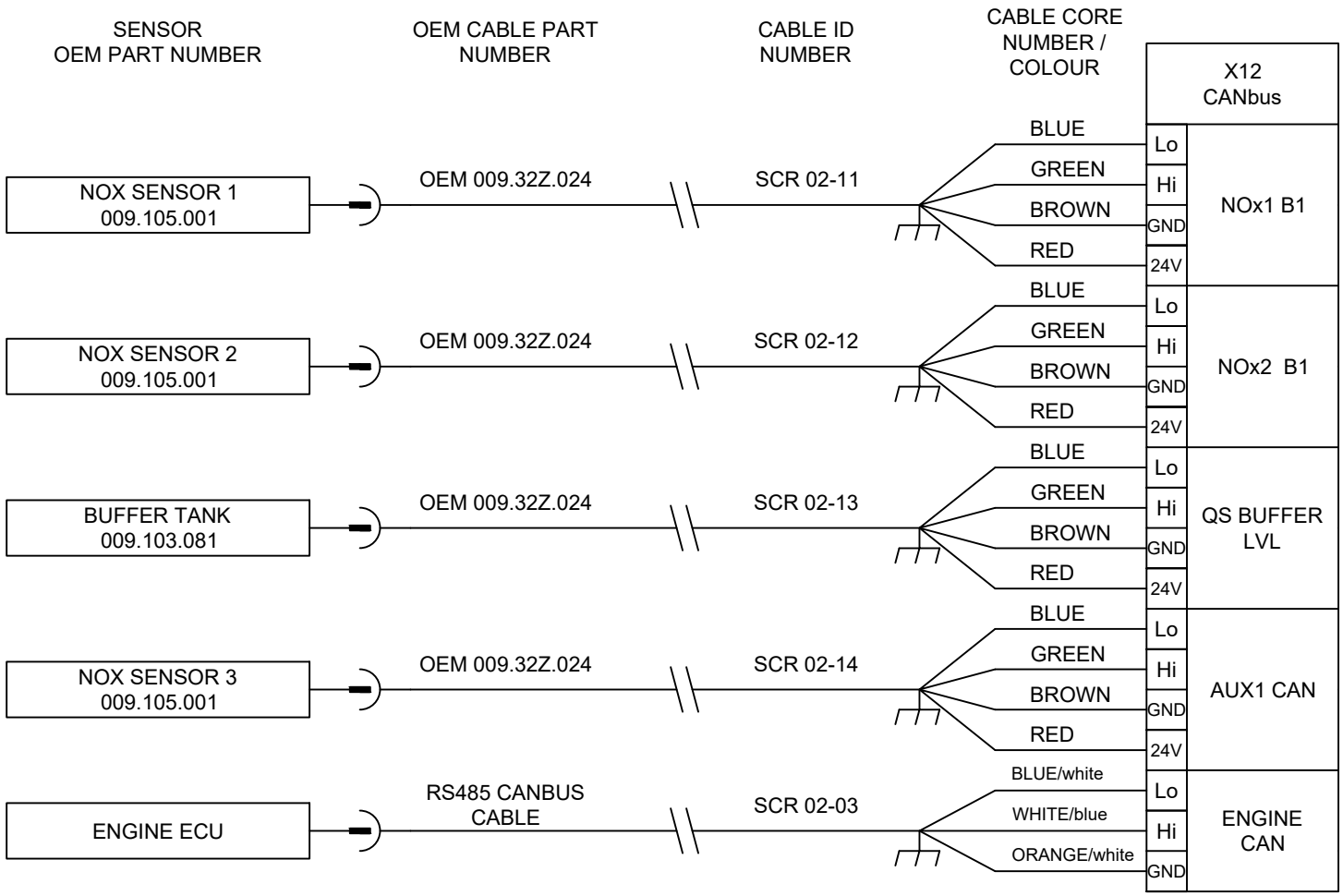
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 2
X11 terminals. external cable identification.

NOTES:

DWG NO	01, 1of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

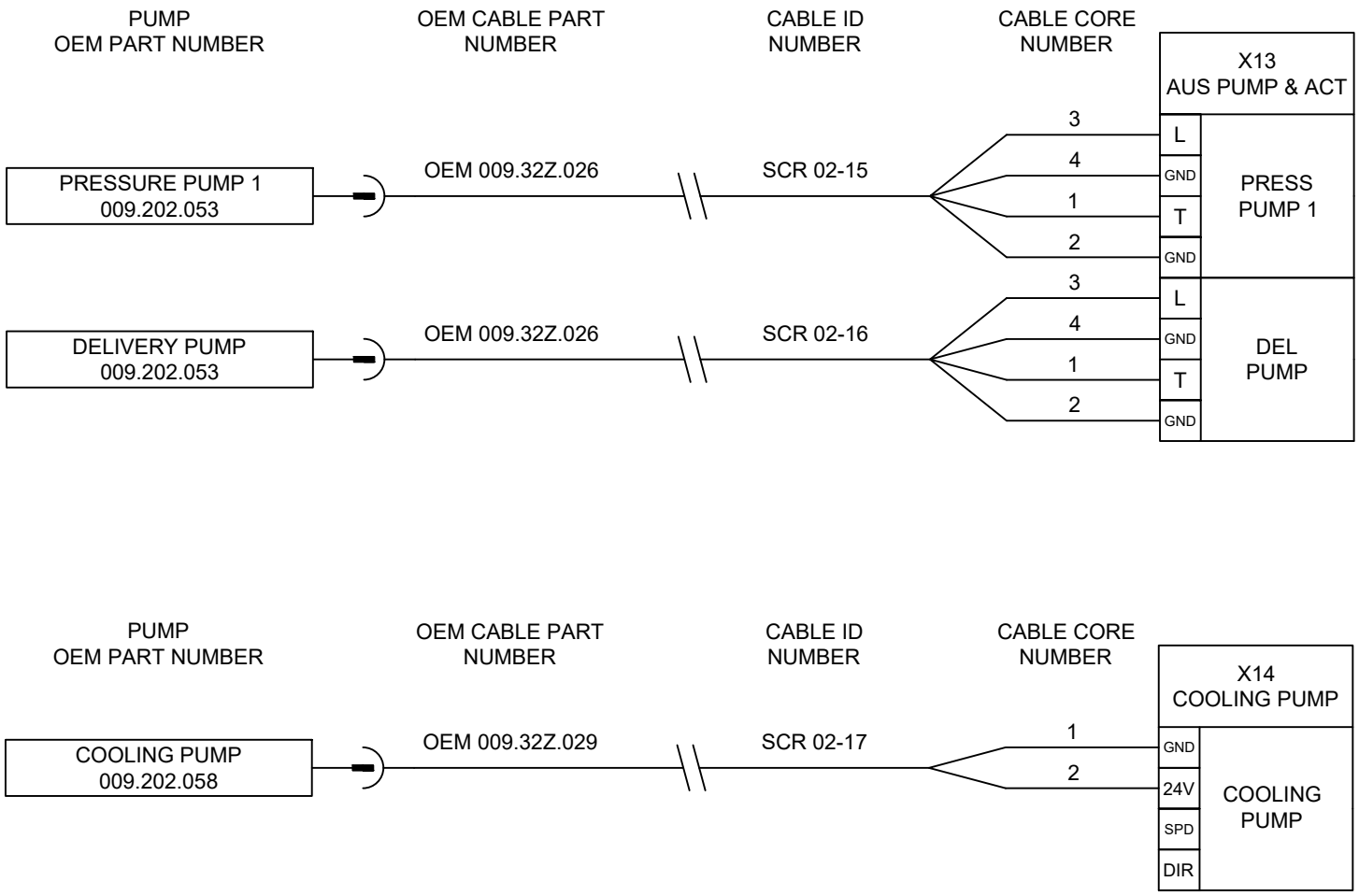
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 2
X12 terminals. external cable identification.

NOTES:

DWG NO	02, 2of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

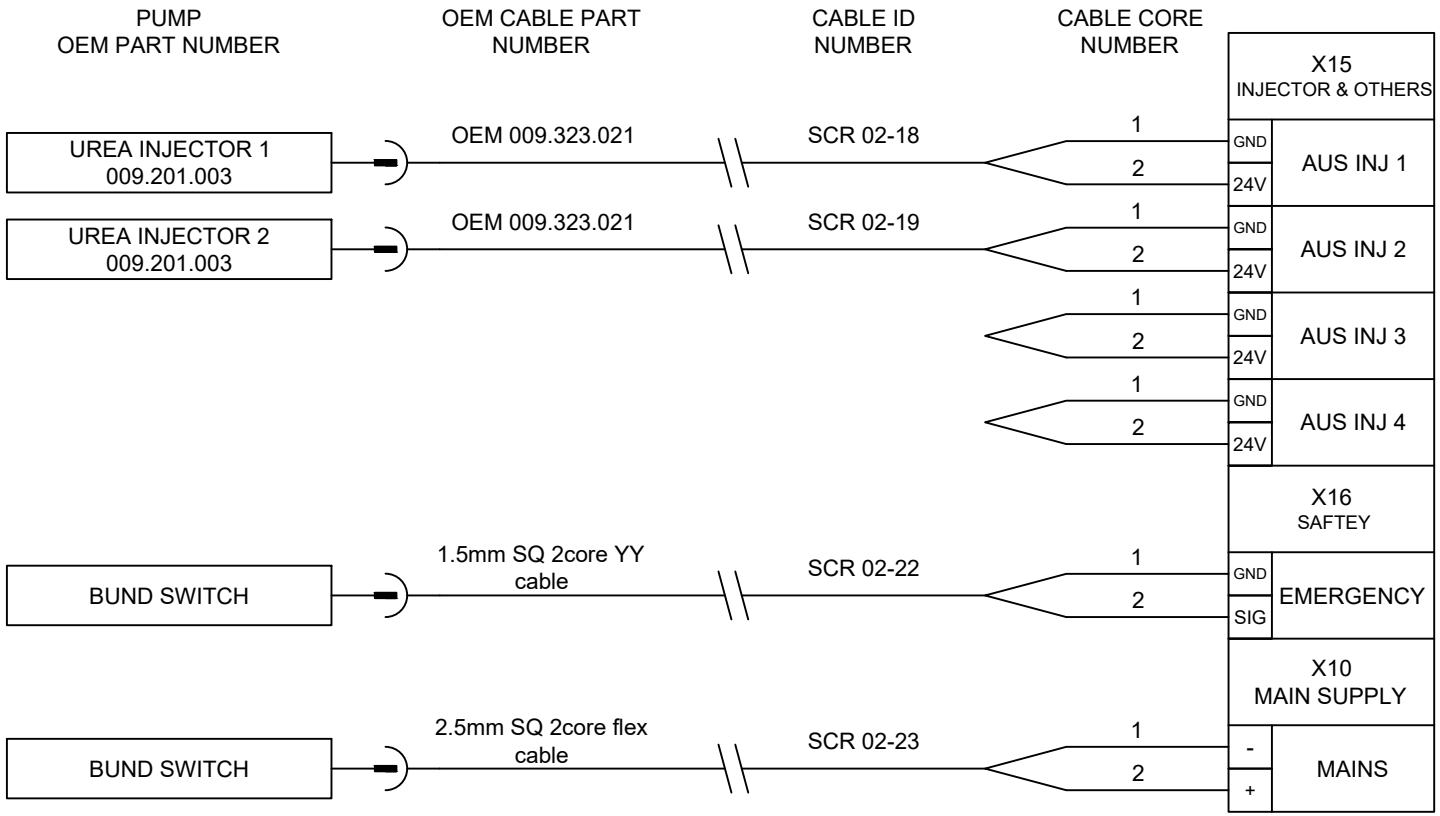
SITE ADDRESS:

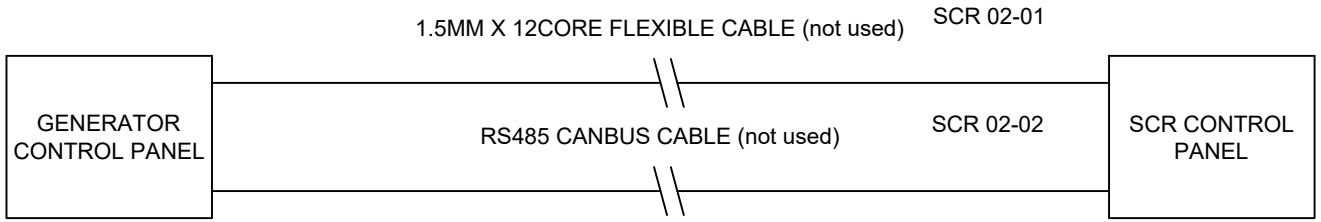
DESCRIPTION:

SCR SYSTEM
GENERATOR 2
X13 & X14 terminals.
external cable
identification.

NOTES:

DWG NO	03, 3of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24





REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

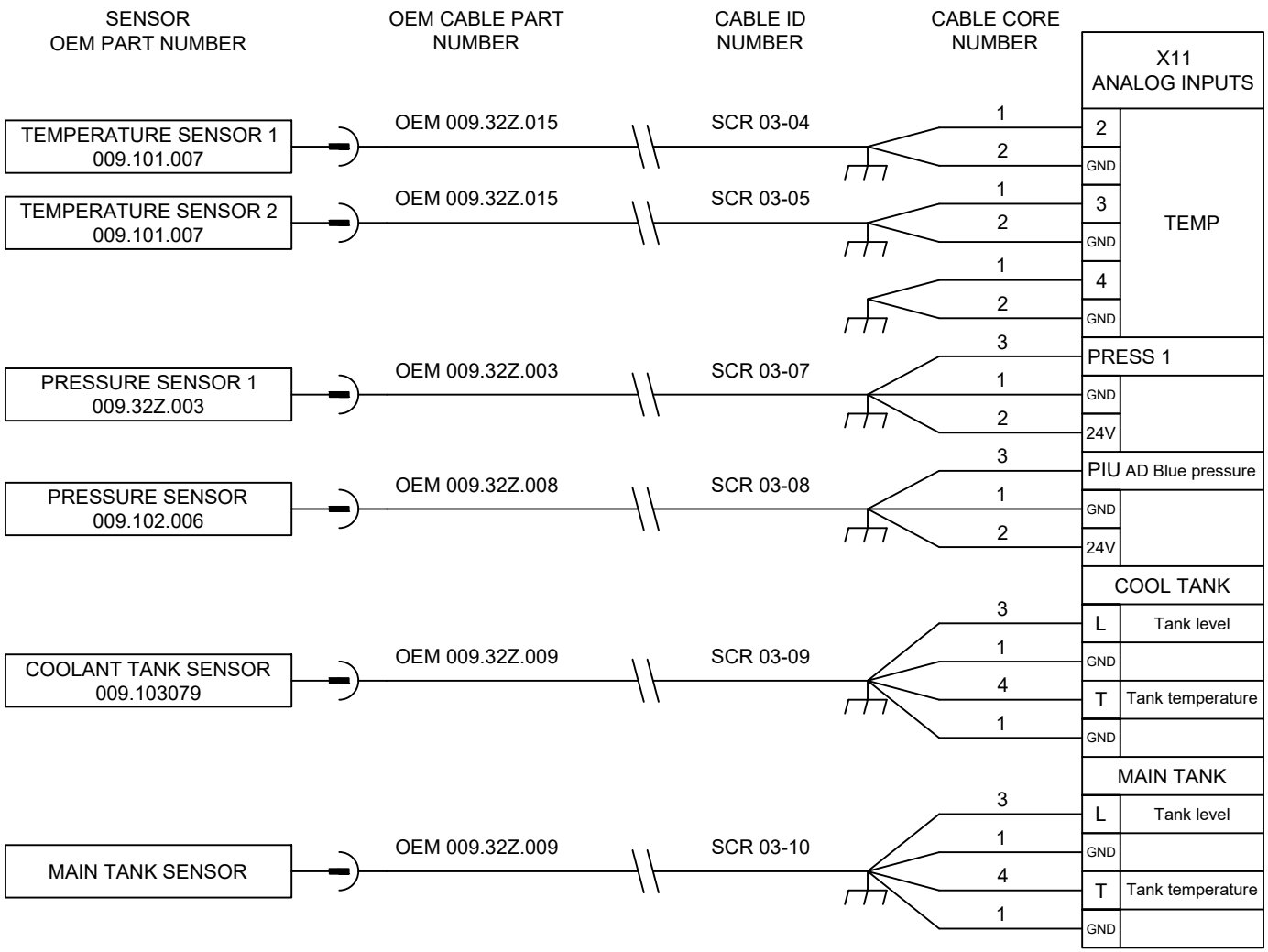
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X15,X16,X10 terminals.
external cable
identification.

NOTES:

DWG NO	04, 4of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

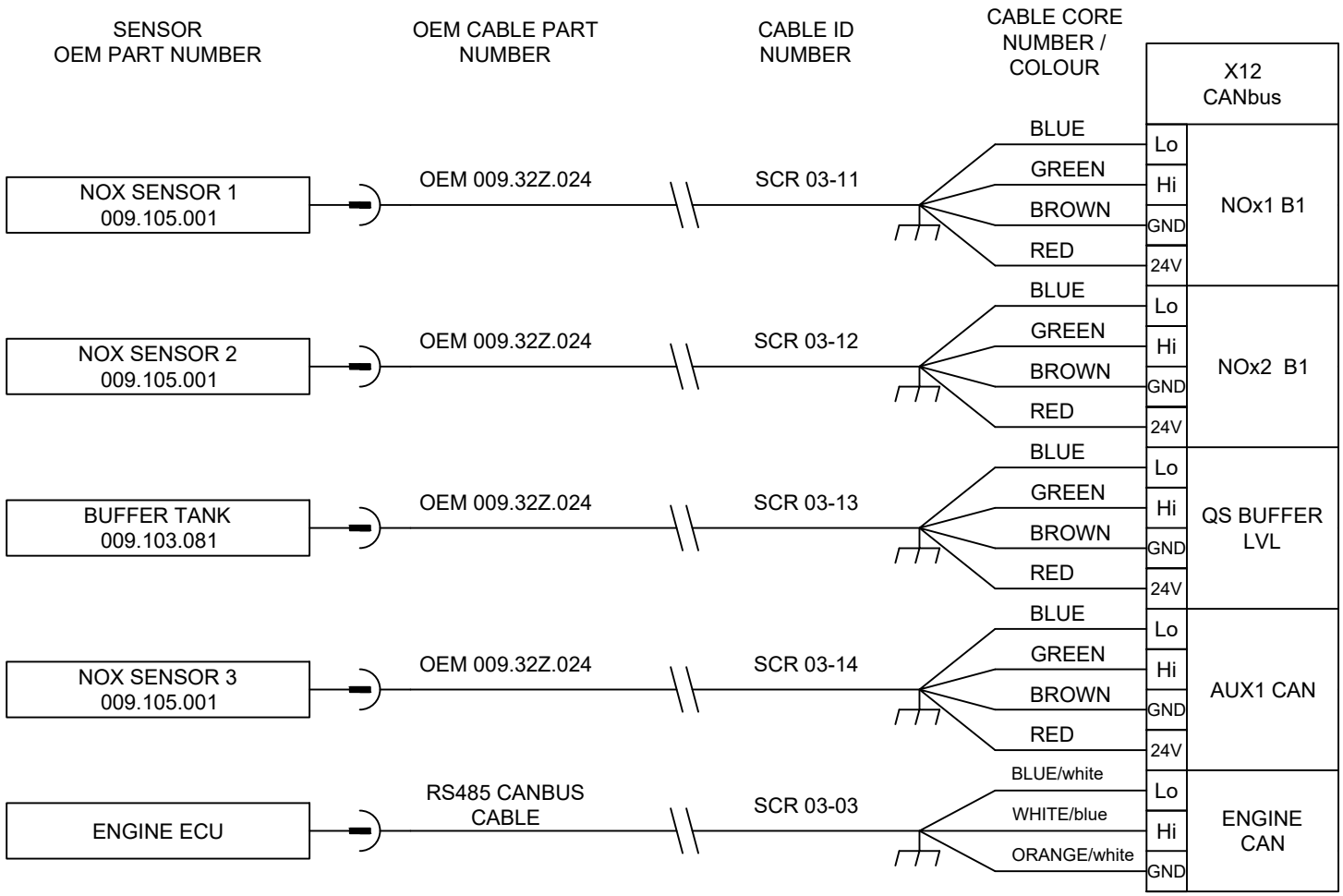
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 3
X11 terminals. external cable identification.

NOTES:

DWG NO	01, 1of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

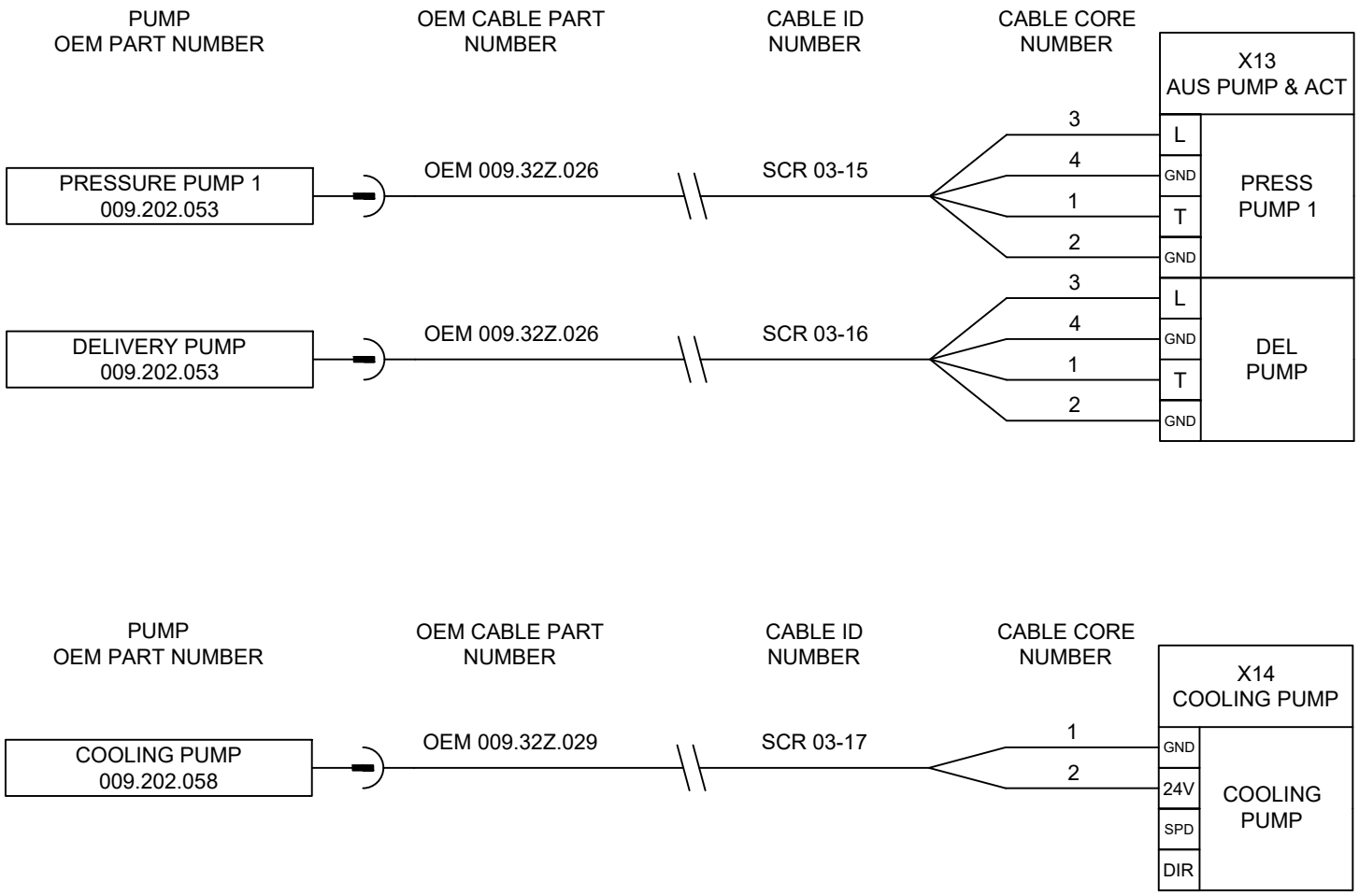
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 3
X12 terminals. external cable identification.

NOTES:

DWG NO	02, 2of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

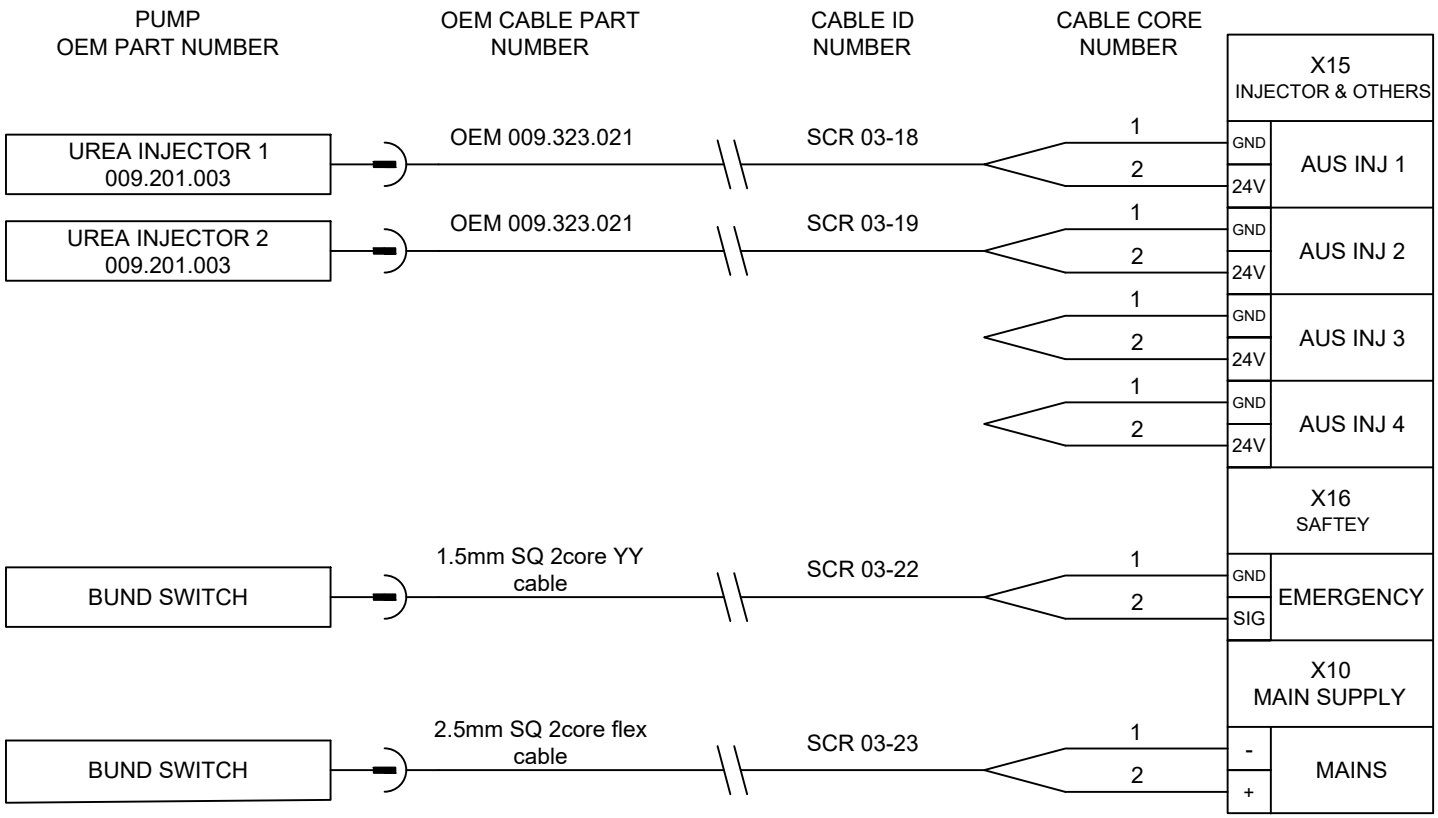
SITE ADDRESS:

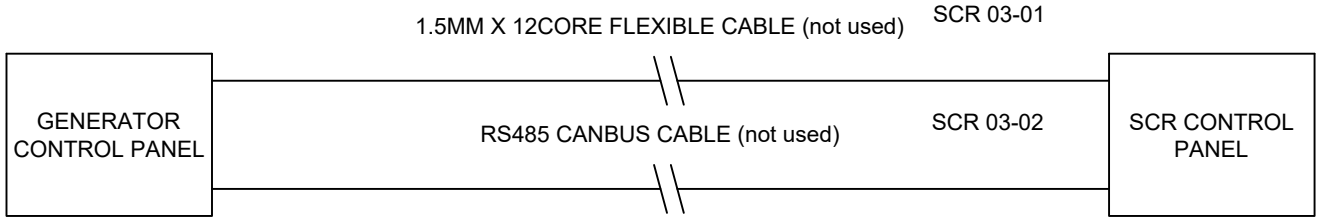
DESCRIPTION:

SCR SYSTEM
GENERATOR 3
X13 & X14 terminals.
external cable
identification.

NOTES:

DWG NO	03, 3of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24





REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

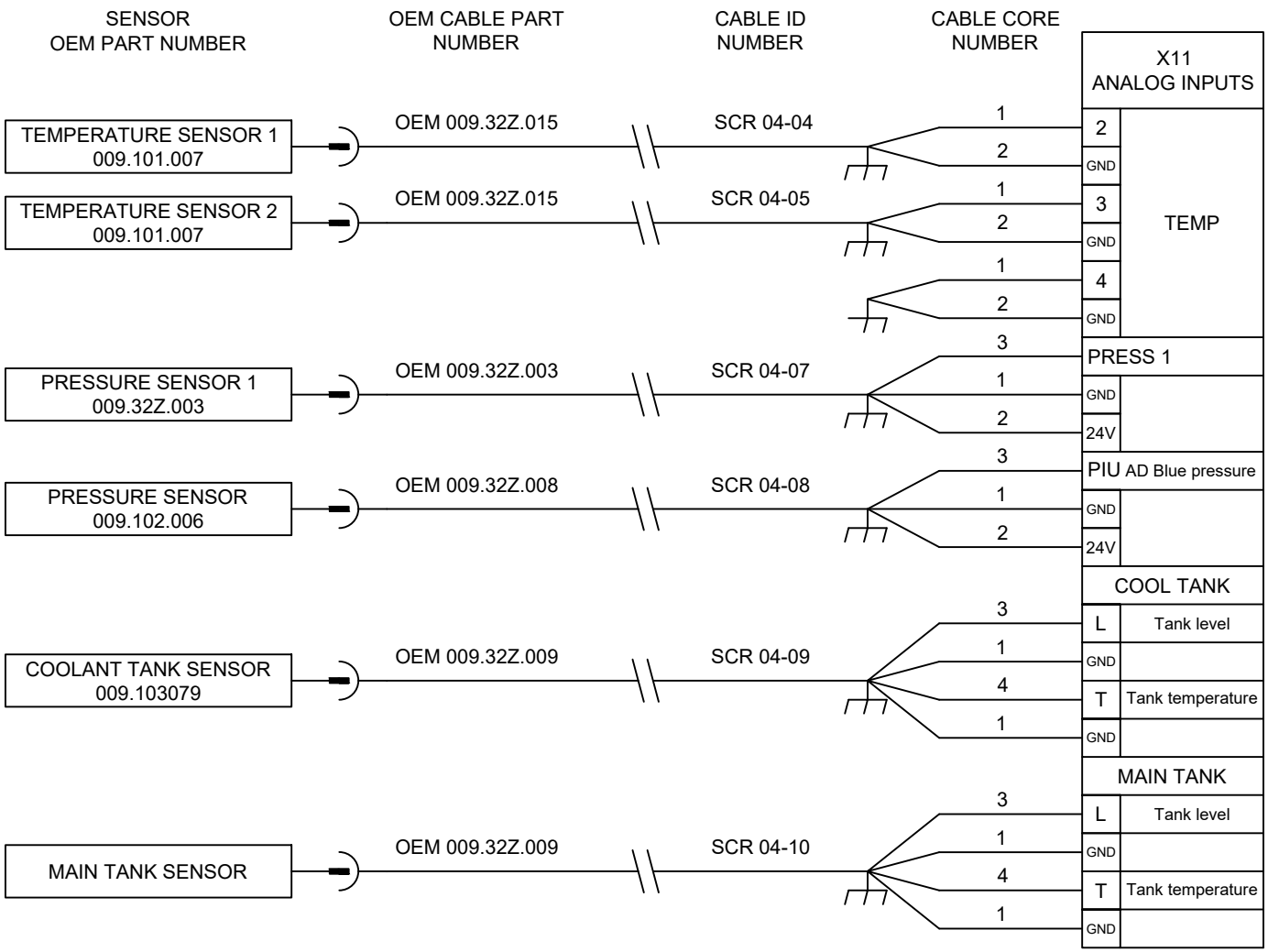
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X15,X16,X10 terminals.
external cable
identification.

NOTES:

DWG NO	04, 4of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

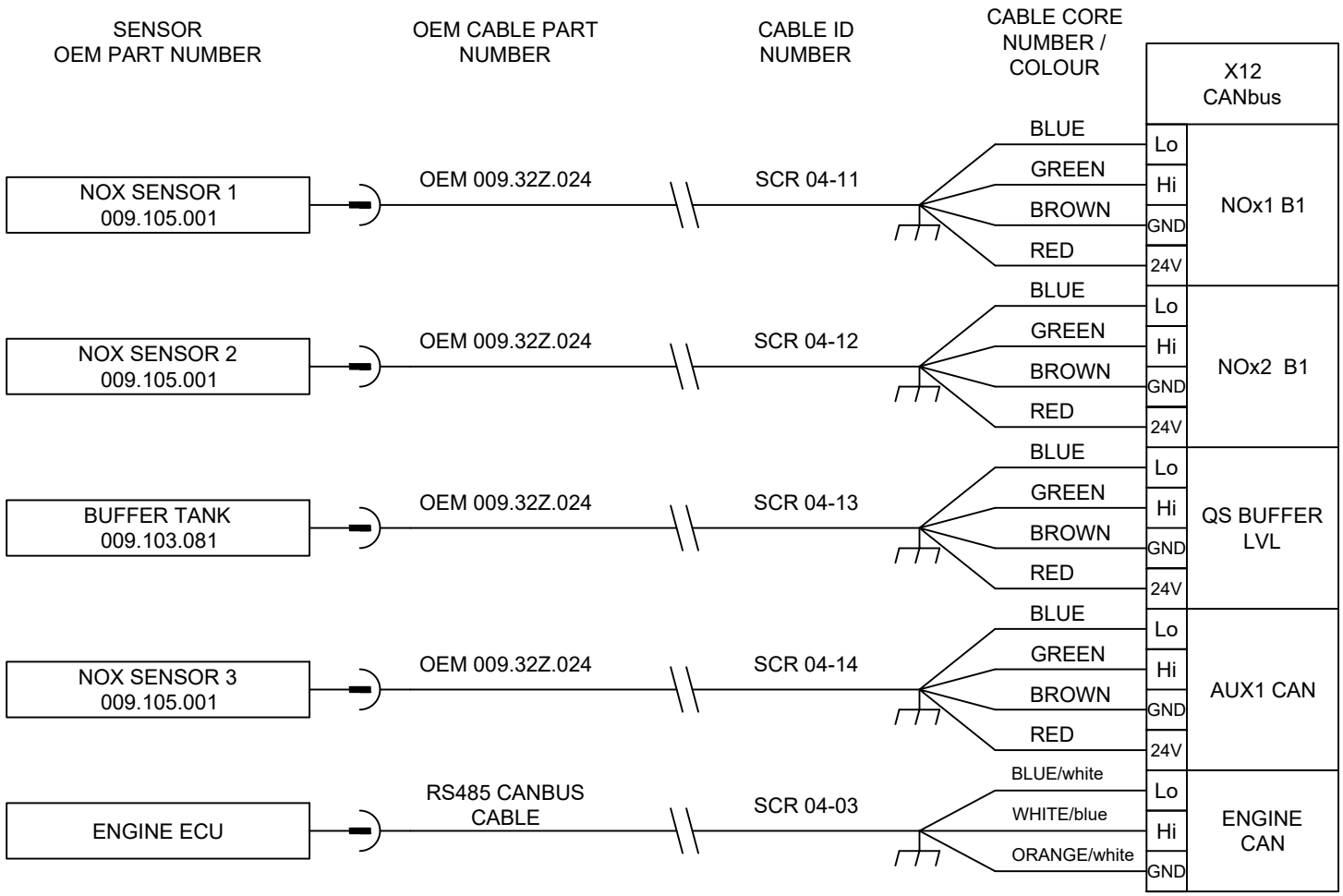
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 4
X11 terminals. external cable identification.

NOTES:

DWG NO	01, 1of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

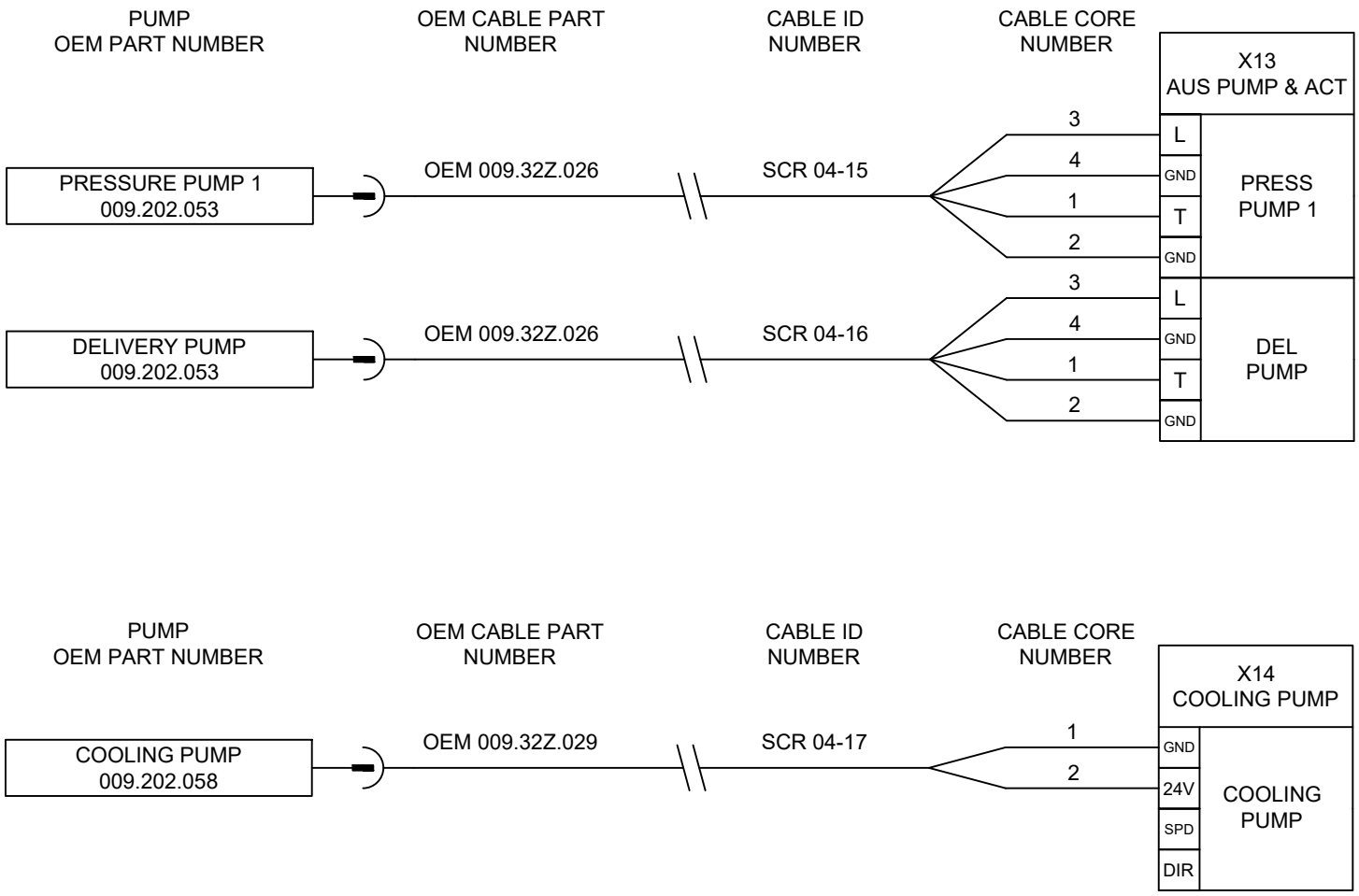
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 4
X12 terminals. external cable identification.

NOTES:

DWG NO	02, 2of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

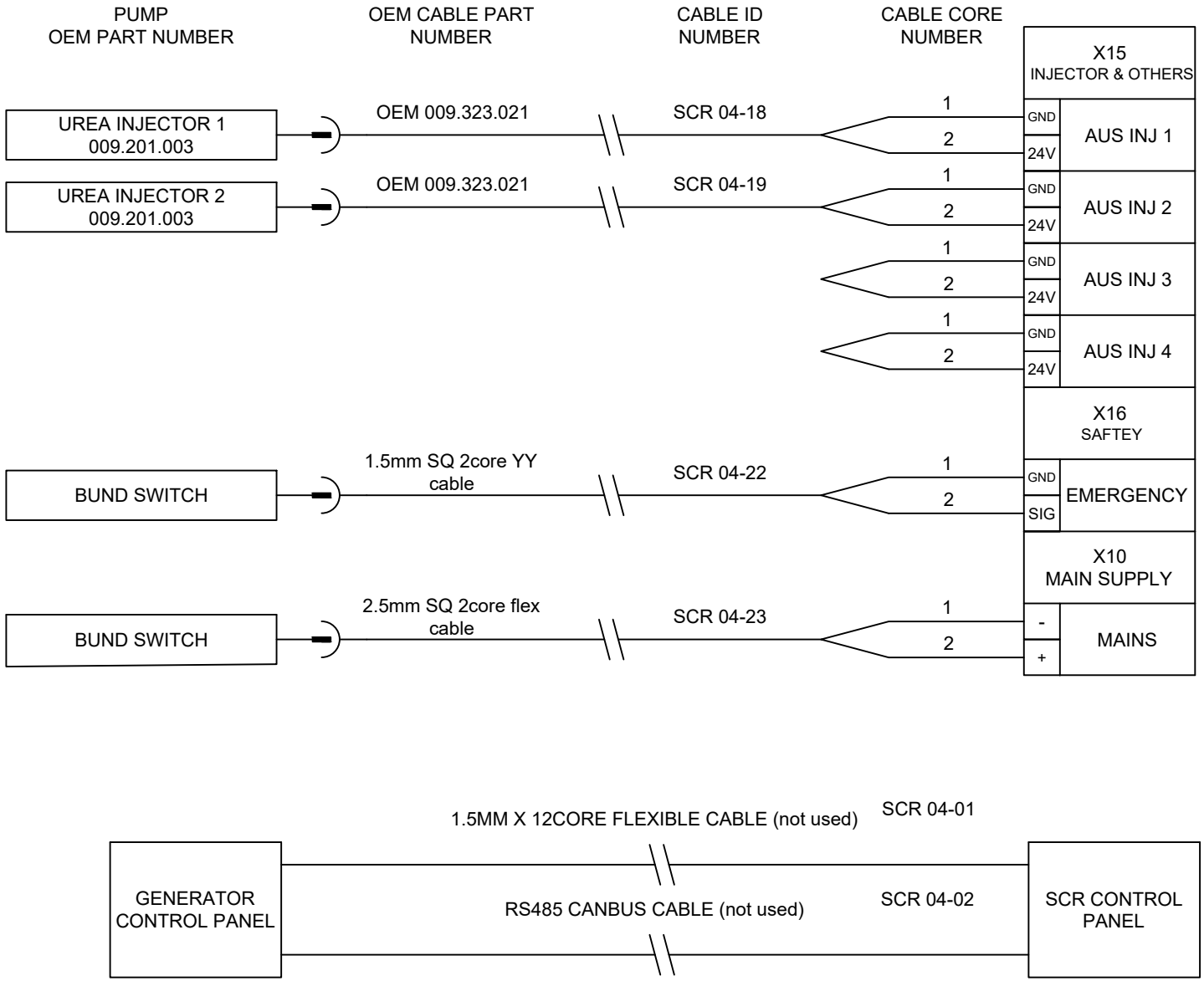
SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 4
X13 & X14 terminals.
external cable
identification.

NOTES:

DWG NO	03, 3of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24



REV	DATE	NOTES
1		
2		
3		

CLIENT:

AVK

SITE ADDRESS:

DESCRIPTION:

SCR SYSTEM
GENERATOR 1
X15,X16,X10 terminals.
external cable
identification.

NOTES:

DWG NO	04, 4of4
DRAWN BY	JW
CHECKED BY	WB
DATE	9/11/24

BK	BLACK
BN	BROWN
BU	BLUE
GN	GREEN
GY	GREY
LBU	LIGHT BLUE
OG	ORANGE
PK	PINK
RD	RED
TQ	TURQUOISE
VT	VIOLET
WH	WHITE
YE	YELLOW

ECU CONN1
W/H ECU V3 - FULL VER 02

Connector TE 2820871-1
PIN 49 USB-DM0
PIN 48 USB-DP0
PIN 42 GND_DIGITAL

			56	GND_ACTUATOR
TERMINAL 12	____ BU - 2mm2	ECU - PIN 56	55	GND_ACTUATOR
TERMINAL 11	____ BU - 2mm2	ECU - PIN 55	54	DIESEL INJECTOR
	____ OG - 1,5mm2	ECU - PIN 54	53	UREA INJECTOR
	____ BU - 1,5mm2	ECU - PIN 53	52	+VBATT
TERMINAL 5	____ BN - 1mm2	ECU - PIN 52	51	+VBATT DIS
	____ BN - 1mm2	ECU - PIN 51	50	K
TERMINAL 8	____ BU - 1mm2	ECU - PIN 47	47	GND_ECU
	____ BN - 1mm2	ECU - PIN 46	46	+VCH
	____ GY - 0,5mm2	ECU - PIN 45	45	RPM
	____ GN - 1mm2	ECU - PIN 44	44	EXHAUST HEATER
	__ BN/WH - 0,5mm2	ECU - PIN 43	43	RELAY POWER
	____ YE - 0,75mm2	ECU - PIN 41	41	CANOH
	__ __ YE/BK - 0,75mm2	ECU - PIN 40	40	CANOL
			39	GND_ECU
TERMINAL 20	WH - 0,5mm2	ECU - PIN 38	38	LEVEL FBC
	WH - 0,5mm2	ECU - PIN 37	37	TIN SENSOR
	__ WH/BK - 0,5mm2	ECU - PIN 36	36	TEMP UREA
	__ __ BU/BK - 0,5mm2	ECU - PIN 35	35	LEVEL UREA
			34	HUMIDITY SENSOR
			33	+12V_EXT
	WH - 0,5mm2	ECU - PIN 32	32	TEMP1
	WH - 0,5mm2	ECU - PIN 31	31	TEMP2
	WH - 0,5mm2	ECU - PIN 30	30	TEMP3
	WH - 0,5mm2	ECU - PIN 29	29	TEMP4
TERMINAL 11	____ BU - 2mm2	ECU - PIN 28	28	GND_ACTUATOR
TERMINAL 10	____ BU - 2mm2	ECU - PIN 27	27	GND_ACTUATOR
	____ OG - 1,5mm2	ECU - PIN 26	26	DIESEL INJECTOR
	____ BU - 1,5mm2	ECU - PIN 25	25	UREA INJECTOR
	____ BU - 0,5mm2	ECU - PIN 24	24	UREA PRESSURE PUMP
	__ __ RD/BK - 1mm2	ECU - PIN 23	23	UREA PUMP INV
	____ BU - 1mm2	ECU - PIN 22	22	BUZZER OUTPUT
	__ GN/WH - 1,5mm2	ECU - PIN 21	21	DIESEL METERING PUMP
	____ GN - 1mm2	ECU - PIN 20	20	DIESEL PRESSURE PUMP
	____ BU - 1mm2	ECU - PIN 19	19	FBC PUMP
	____ BU - 1mm2	ECU - PIN 18	18	BYPASS VALVE
	____ BU - 1mm2	ECU - PIN 17	17	OBD OUTPUT
	____ GN - 1mm2	ECU - PIN 16	16	DAC OUTPUT
			15	UREA HEATING
	____ PK - 0,5mm2	ECU - PIN 14	14	SPEED SIGNAL
			13	GND_DIGITAL
	____ YE - 0,75mm2	ECU - PIN 12	12	CAN1H
	__ __ YE/BK - 0,75mm2	ECU - PIN 11	11	CAN1L
TERMINAL 13	__ WH/BK - 0,75mm2	ECU - PIN 10	10	VBATT RELAY
			9	RX 232
			8	TX 232
	WH - 0,5mm2	ECU - PIN 7	7	PRESS2
	WH - 0,5mm2	ECU - PIN 6	6	PRESS1
	WH - 0,5mm2	ECU - PIN 5	5	PRESS PI UREA
	WH - 0,5mm2	ECU - PIN 4	4	PRESS PI DIESEL
	____ GN - 0,5mm2	ECU - PIN 3	3	MAP/MAF
TERMINAL 1	____ BN - 1mm2	ECU - PIN 2	2	VSENS
TERMINAL 4	____ BU - 1mm2	ECU - PIN 1	1	GND_ANALOG

CLIENT: AVK LTD
DESCRIPTION: EUC SIDE
DR/NO: 009.055.002-04 - PG1
FINISH: N/A
COLOUR: N/A
PROJECT: CAB FULL 1-V3
WEIGHT kg: N/A
DRAWN: A.T
G DWH= 14/05/2024

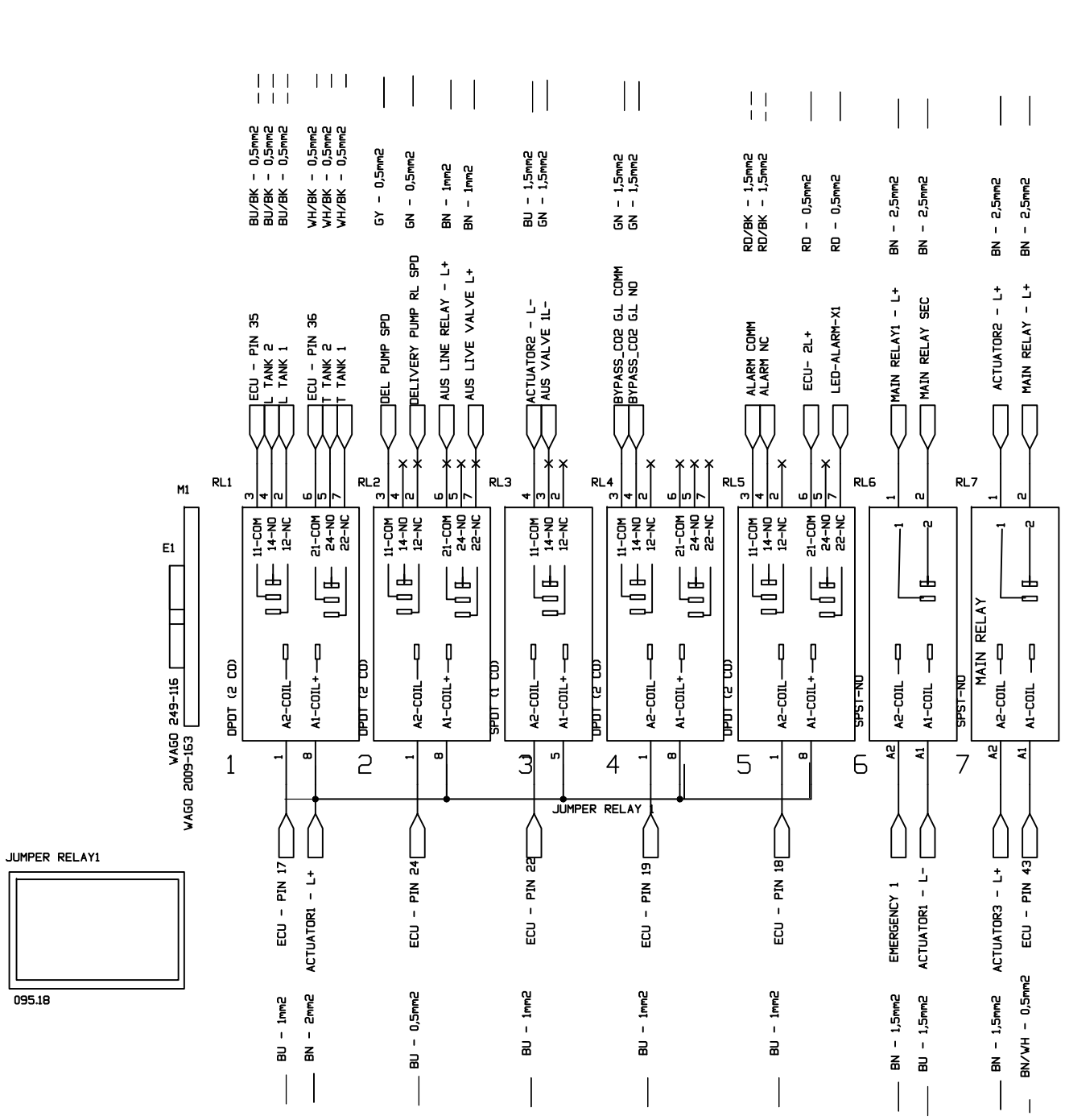
UNLESS SPECIFIED OTHERWISE
ALL DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:
FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0

MODEL IS MASTER
ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURNED

THIRD ANGLE PROJECTION

THE POWER PEOPLE
T: +44 (0) 1634 979110
E: sales@avk-seg.com

SCALE: NTS | S/S | A3 | REV: 00



RELAY 1 - LEVEL TEMP TANK1/TANK2

RELAY 2 - UREA PUMP / AUS LINE VALVE

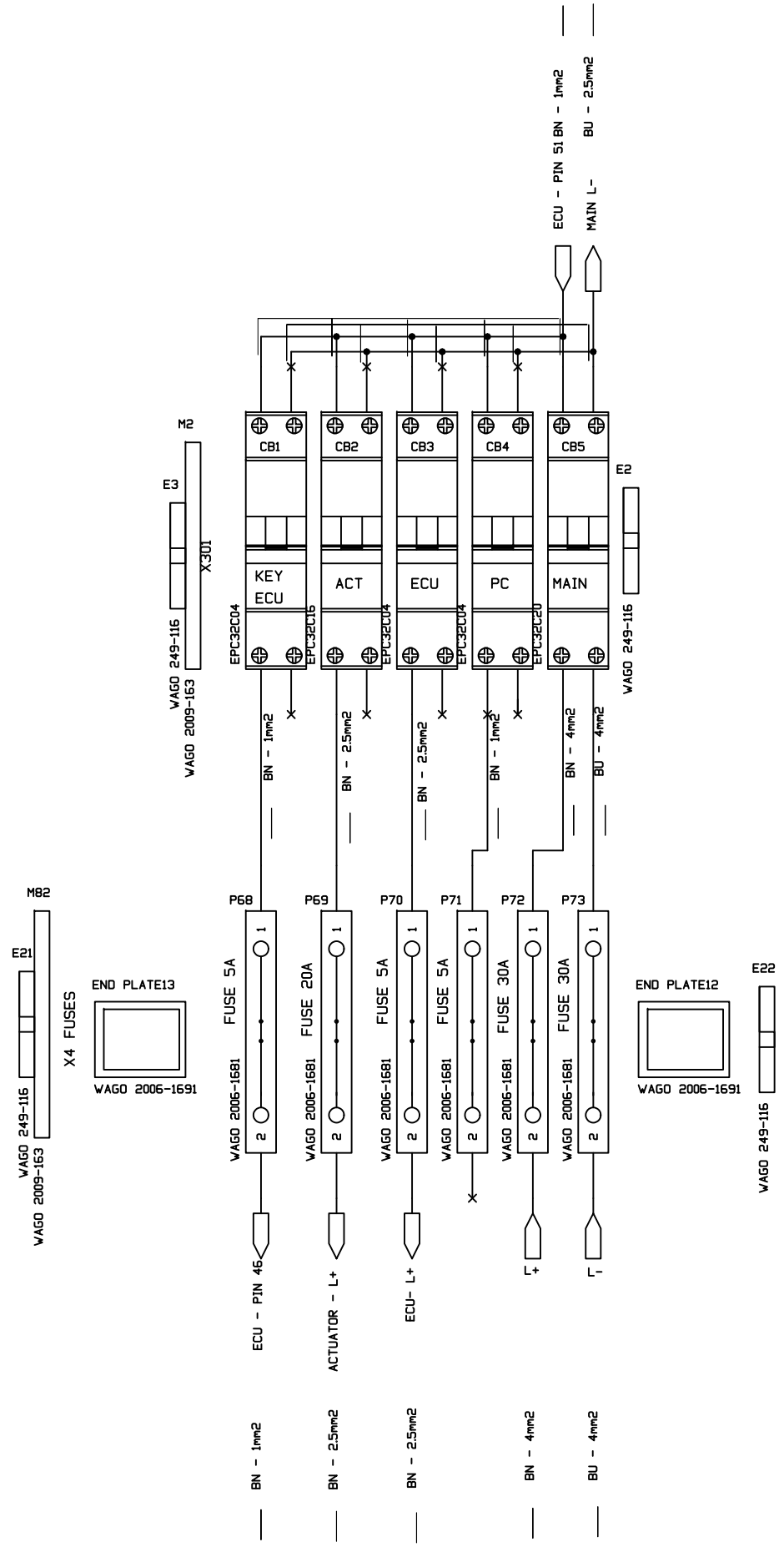
RELAY 3 - AUS VALVE L-

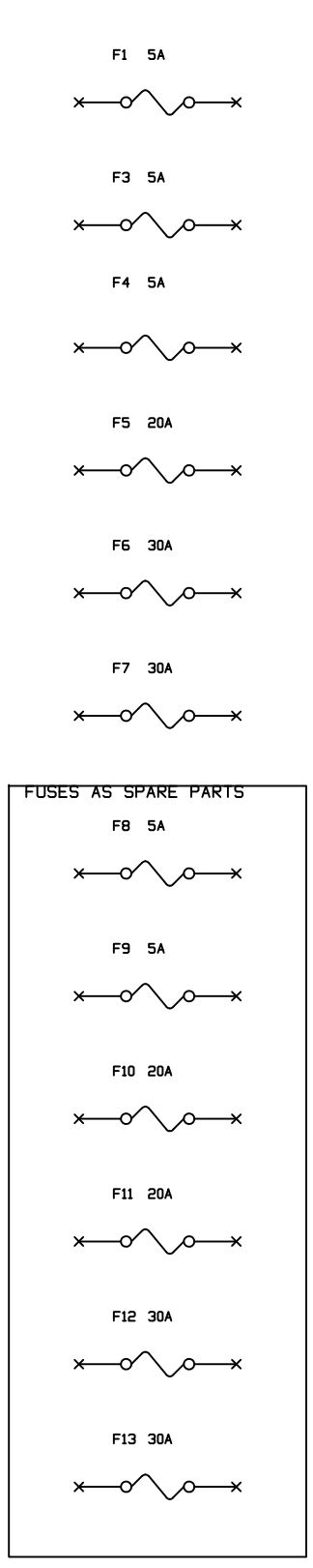
RELAY 4 - BYPASS / CO2 G.L

RELAY 5 - ALARM - LED ALARM

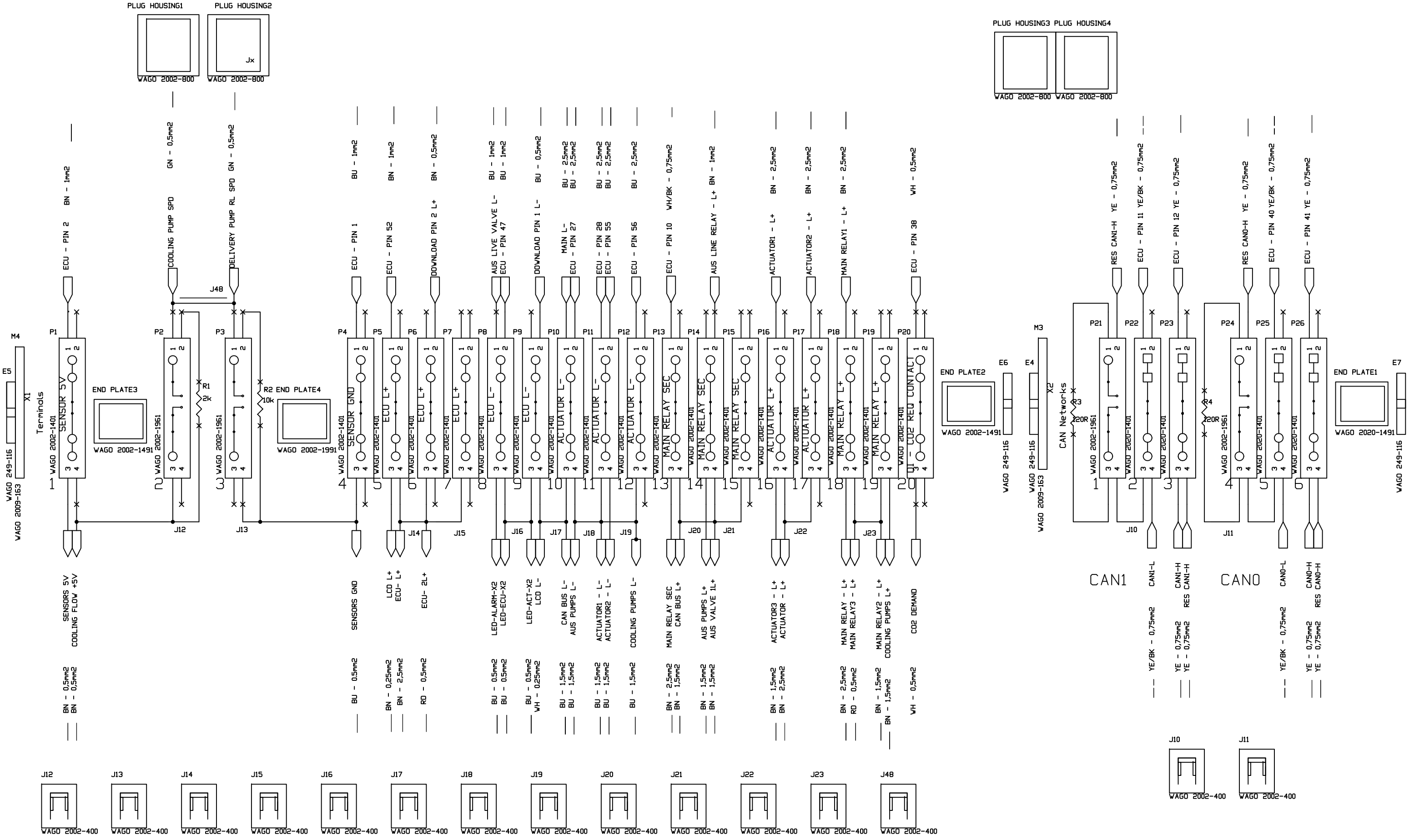
RELAY 6 - ACTUATOR L+ EMERGENCY

RELAY 7 - MAIN RELAY ECU

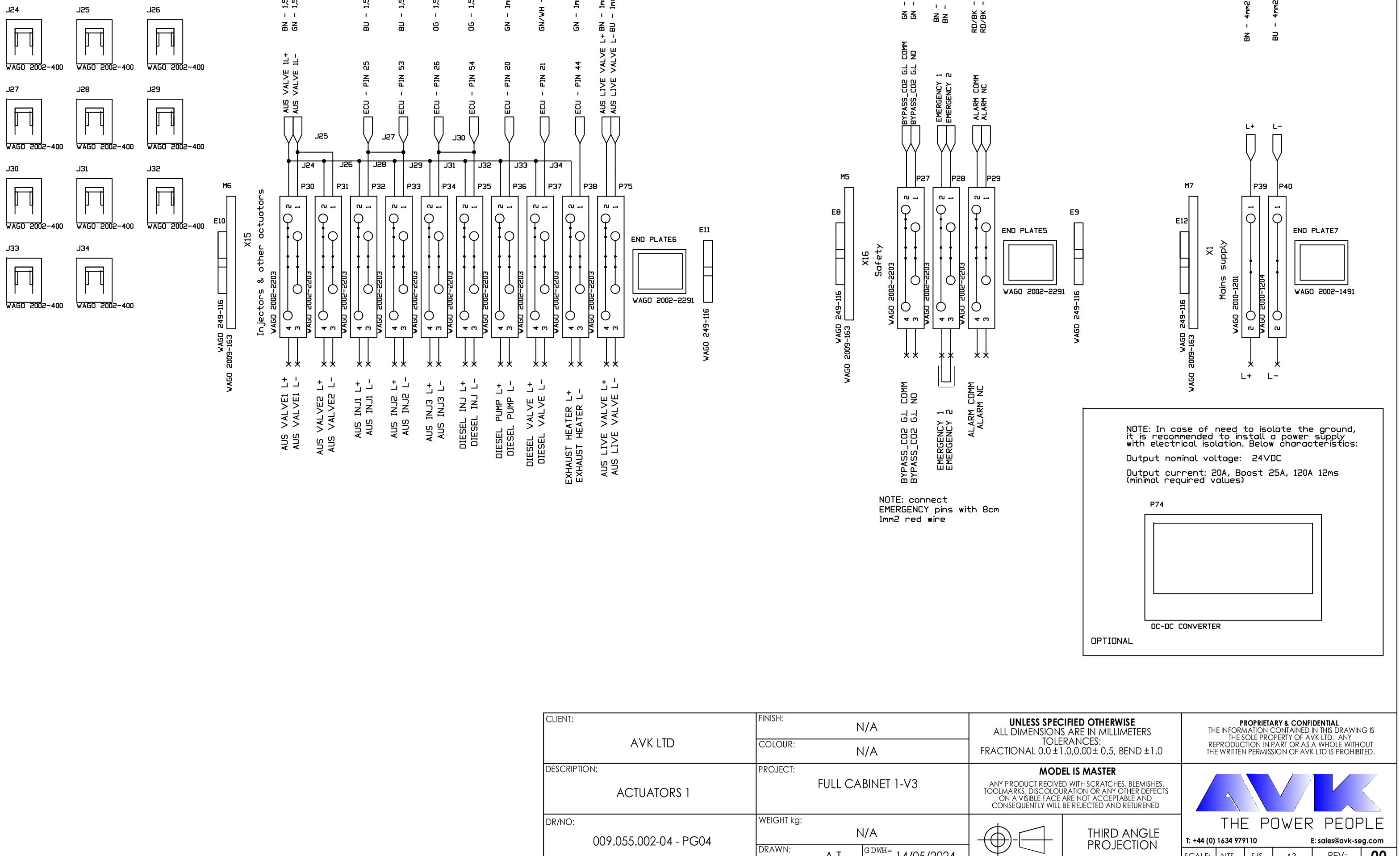




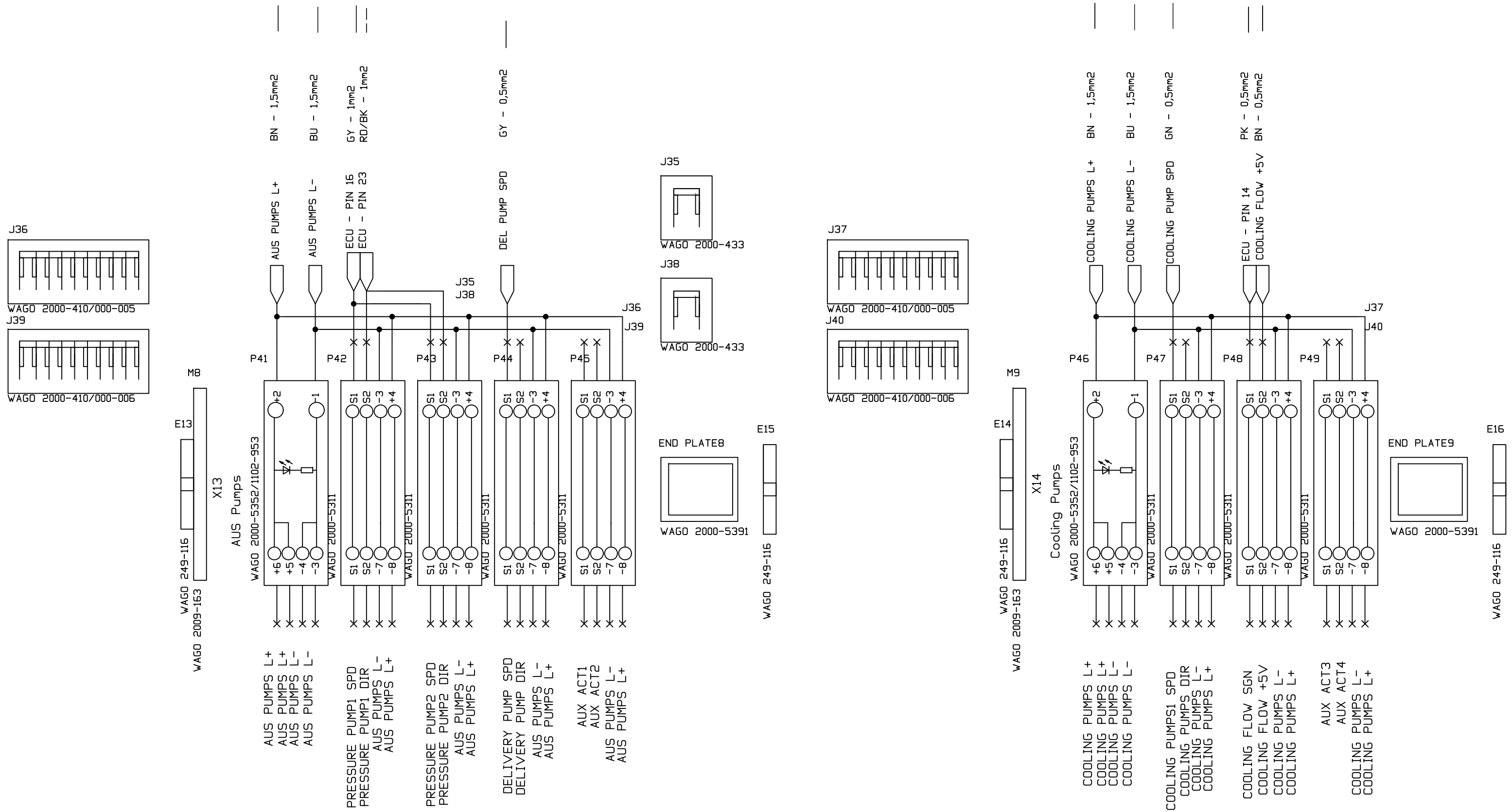
CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: RELAYS CB	PROJECT: CABINET FULL 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	AVK THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.055.002.-04 - PG02	WEIGHT kg: N/A DRAWN: A.T GDWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00



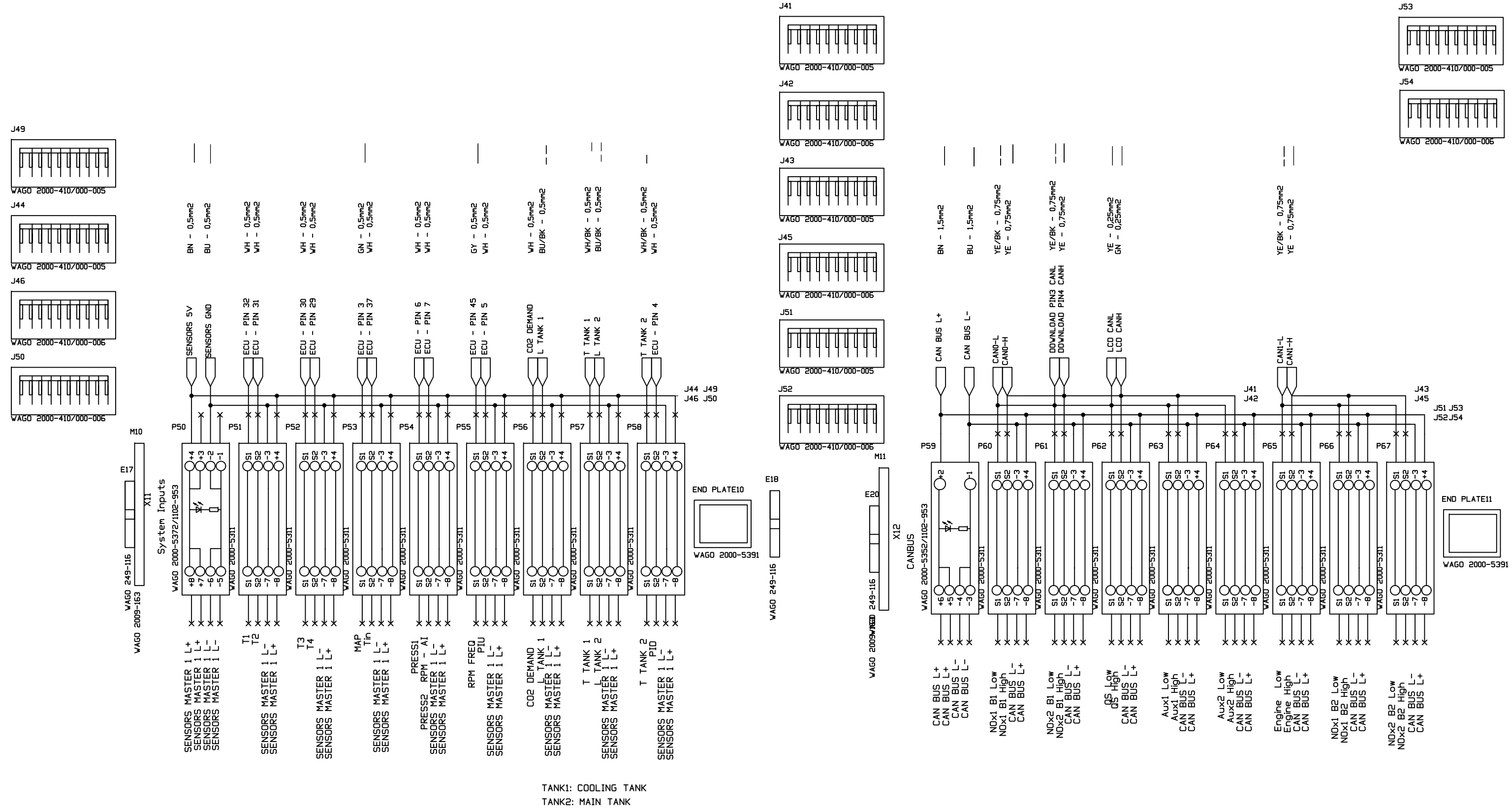
CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: TERMINALS	PROJECT: CABINET FULL 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.055.002-04 - PG03	WEIGHT kg: N/A DRAWN: A.T G DWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00



CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: ACTUATORS 1	PROJECT: FULL CABINET 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	AVK THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.055.002-04 - PG04	WEIGHT kg: N/A DRAWN: A.T G DWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00



CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: ACTUATORS2	PROJECT: CABINET FULL 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	AVK THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.055.002-04 - PG05	WEIGHT kg: N/A DRAWN: A.T G DWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00



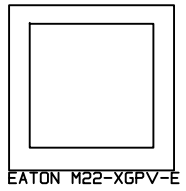
TANK1: COOLING TANK
TANK2: MAIN TANK

CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: SENSORS	PROJECT: CABINET FULL 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.0÷5.002-04 - PG06	WEIGHT kg: N/A DRAWN: A.T GDWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00

EMERGENCY STOP1

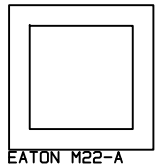
EATON M22-PV

GUARD RING1



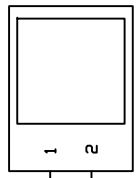
EATON M22-XGPV-E

FRONT MOUNT4



EATON M22-A

CONTACT BLOCK1
EATON M22-K01

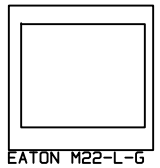


1 — BN - 1,5mm2 — EMERGENCY 2

2 — BN - 1,5mm2 — MAIN RELAY2 - L+

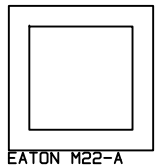
SYSTEM ON

LIGHT HEAD1



EATON M22-L-G

FRONT MOUNT1

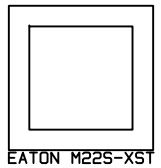


EATON M22-A

PLATE HOLDER1

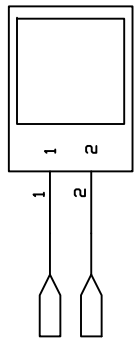
EATON M22S-ST-X

LEGEND PLATE2



EATON M22S-XST

CONTACT BLOCK4
EATON M22-LED-G

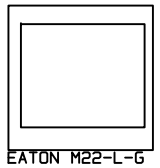


1 — BU - 0,5mm2 — ECU - PIN 33

2 — BU - 0,5mm2 — LED-ECU-X2

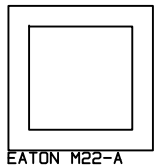
PUMPS ON

LIGHT HEAD2



EATON M22-L-G

FRONT MOUNT2

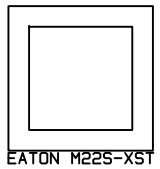


EATON M22-A

PLATE HOLDER2

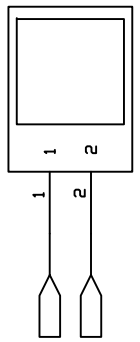
EATON M22S-ST-X

LEGEND PLATE1



EATON M22S-XST

CONTACT BLOCK2
EATON M22-LED-G

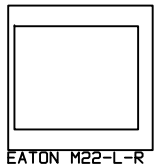


1 — BU - 0,5mm2 — MAIN RELAY3 - L+

2 — BU - 0,5mm2 — LED-ACT-X2

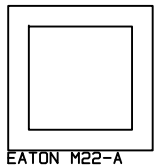
ALARM

LIGHT HEAD3



EATON M22-L-R

FRONT MOUNT3

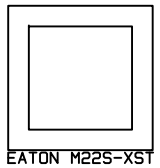


EATON M22-A

PLATE HOLDER3

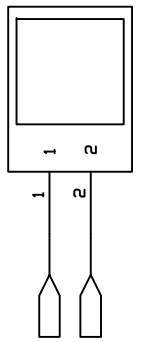
EATON M22S-ST-X

LEGEND PLATE3



EATON M22S-XST

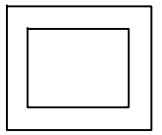
CONTACT BLOCK3
EATON M22-LED-R



1 — RD - 0,5mm2 — LED-ALARM-X1

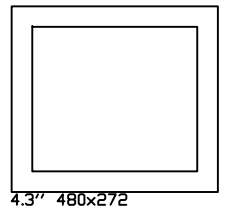
2 — BU - 0,5mm2 — LED-ALARM-X2

S1



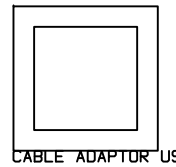
STICKER DISPLAY TOUCH SCREEN 4.3"

DISPLAY1

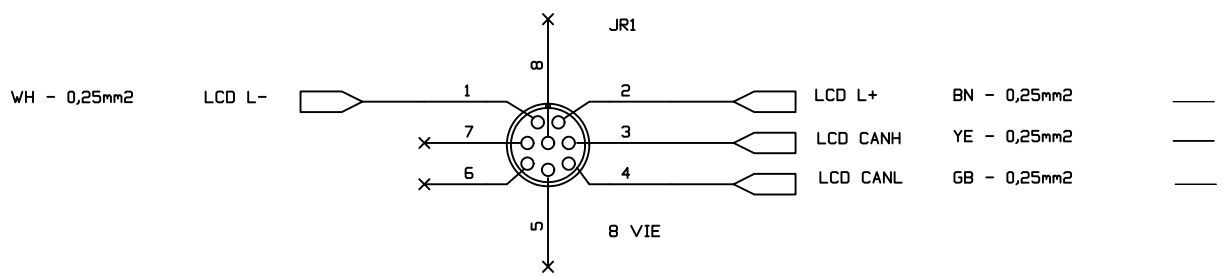


4.3" 480x272

CABLE1



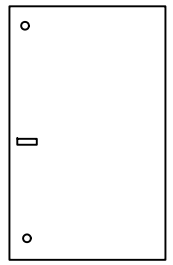
CABLE ADAPTOR USB



NOTE: CABLE LENGTH 1 METER

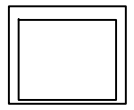
CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: DOOR	PROJECT: CABINET FULL 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	AVK THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.005.002-04 - PG07	WEIGHT kg: N/A DRAWN: A.T G DWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00

CABINET1



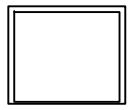
806-506-250 D93/24.35

CABLE DUCT1



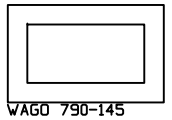
CABLE DUCT 60 x 80 mm

DIN RAIL1



DIN RAIL 7.5 x 35 x 1 mm

CARRIER RAIL1

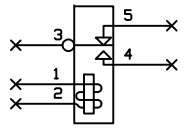


WAGO 790-145

BUSBAR4

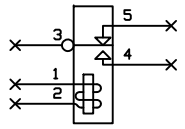
WAGO 210-133

LS1



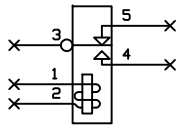
SPDT-NO

LS2



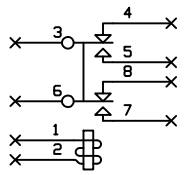
SPDT-NO

LS3



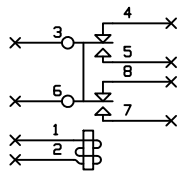
SPDT-NO

LS4



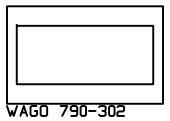
DPDT-NO

LS5



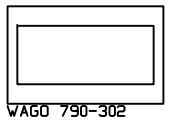
DPDT-NO

BUSBAR1



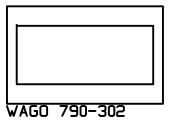
WAGO 790-302

BUSBAR2



WAGO 790-302

BUSBAR3



WAGO 790-302

M34 CABLE GLAND PG16
M35 CABLE GLAND PG16
M36 CABLE GLAND PG16
M37 CABLE GLAND PG16
M38 CABLE GLAND PG16
M39 CABLE GLAND PG16
M40 CABLE GLAND PG21

M12 CABLE GLAND PG11
M13 CABLE GLAND PG11
M14 CABLE GLAND PG11
M15 CABLE GLAND PG11
M16 CABLE GLAND PG11
M17 CABLE GLAND PG11
M18 CABLE GLAND PG11
M19 CABLE GLAND PG11
M20 CABLE GLAND PG11
M21 CABLE GLAND PG11
M22 CABLE GLAND PG11

M23 CABLE GLAND PG11
M24 CABLE GLAND PG11
M25 CABLE GLAND PG11
M26 CABLE GLAND PG11
M27 CABLE GLAND PG11
M28 CABLE GLAND PG11
M29 CABLE GLAND PG11
M30 CABLE GLAND PG11
M31 CABLE GLAND PG11
M32 CABLE GLAND PG11
M33 CABLE GLAND PG11

M41 CABLE GLAND BLANKING PLUG PG11
M42 CABLE GLAND BLANKING PLUG PG11
M43 CABLE GLAND BLANKING PLUG PG11
M44 CABLE GLAND BLANKING PLUG PG16
M45 CABLE GLAND BLANKING PLUG PG16
M46 CABLE GLAND BLANKING PLUG PG16

M47 LOCKNUT PG11
M48 LOCKNUT PG11
M49 LOCKNUT PG11
M50 LOCKNUT PG11
M51 LOCKNUT PG11
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M72 LOCKNUT PG16
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M75 LOCKNUT PG16
M76 LOCKNUT PG16
M77 LOCKNUT PG16
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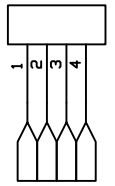
M79 LOCKNUT PG16
M80 LOCKNUT PG16

M81 LOCKNUT PG21

DOWNLOAD CONNECTOR

J51
4 VIE



DOWNLOAD PIN 1 L-
DOWNLOAD PIN 2 L+
DOWNLOAD PIN3 CANL
DOWNLOAD PIN4 CANH

BU - 0,5mm2
BN - 0,5mm2
YE/BK - 0,75mm2
YE - 0,75mm2

J1
PIN

J2
PIN

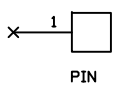
J44
PIN

J48
PIN

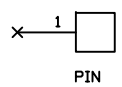
J45
PIN

J49
PIN

J46
PIN



J50
PIN



CLIENT: AVK LTD	FINISH: N/A COLOUR: N/A	**UNLESS SPECIFIED OTHERWISE** ALL DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL 0.0 ±1.0,0.00± 0.5, BEND ±1.0	**PROPRIETARY & CONFIDENTIAL** THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF AVK LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF AVK LTD IS PROHIBITED.
DESCRIPTION: MECHNICAL	PROJECT: CABINET FULL 1-V3	**MODEL IS MASTER** ANY PRODUCT RECIVED WITH SCRATCHES, BLEMISHES, TOOLMARKS, DISCOLOURATION OR ANY OTHER DEFECTS ON A VISIBLE FACE ARE NOT ACCEPTABLE AND CONSEQUENTLY WILL BE REJECTED AND RETURENED	AVK THE POWER PEOPLE T: +44 (0) 1634 979110 E: sales@avk-seg.com
DR/NO: 009.055.002.04 - PG08	WEIGHT kg: N/A DRAWN: A.T GDWH= 14/05/2024	THIRD ANGLE PROJECTION	SCALE: NTS S/S A3 REV: 00

PROJECT DETAILS

Project name:	**PR20102.03X_20200430**
Job number:	**3001298**
Project description:	**009.055.002-CAB FULL 1-V3 VER1**
Engineer:	**Wayne Bint**
Place of installation:	

Place of installation:	
Building year:	**2024**
Project start:	**15/11/2024**
Project end:	**1/04/2025**
Last edit date:	**15/11/2024**
Changed by:	**Wayne Bint**

Dosing part number:	**941.020.001**
Dosing part description:	**24 V AUS DOSING KIT 80 kg**

Revision Overview

Revision	Description	Date	Drawn
0	FROM SHEET VERSION V1.9	30/04/2020	CSW_BVA
1	.	.	.
2	.	.	.
3	.	.	.
4	.	.	.
5	.	.	.
6	.	.	.
7	.	.	.
8	.	.	.
9	.	.	.

Structure identifier overview

Full designation	Labeling	Structure description
++INST01	PLACE OF INSTALLATION	
+MP	MOUNTING LOCATION	MAIN PANEL
+CAB	MOUNTING LOCATION	TO BE ORDERED BY CUSTOMER/LENGTH TO BE DETERMINED
+CUST	MOUNTING LOCATION	PROVIDED BY CUSTOMER
+KIT	MOUNTING LOCATION	PART OF DELIVERY

Part Coding (According to IEC 81346-2)

A	Two or more functions or tasks (Only for objects for wich no main function or task can be identified)	PLC, Controller
B	Converting an input variable (physical property, conditionor event) into a signal for further processing	Pressure switch, measuring resistor, limit switch, flowconvertor, ...
C	Storing material, energy or information	Capacitor, ...
D	(Reserved for future standardisation)	
E	Providing radiant or thermal energy	Lighting, heating, ...
F	Direct protection (self-acting) of a flow of energy, signals, personnel or equipment from dangerous or unwanted conditions. Including systems and equipment for protective purposes	Circuit breaker, fuse, ...
G	Initiating a flow of energy or material. Generating signals used as information carriers or reference source. Producing a new kind of material or product.	Generator, UPS, ...
H	Producing a new type of material / product	
I	Not to be applied	
J	(Reserved for future standardisation)	
K	Processing (receiving, treating and providing) signals or information (excluding objects for protective purposes, see class F)	Relais, tijdrelais, transistor, EMC-filter
L	(Reserved for future standardisation)	
M	Providing mechanical energy (rotational or linear mechanical motion)for driving purposes	Motor
N	(Reserved for future standardisation)	
O	Not to be applied	
P	Informatie voorstellen	Indicator light, flashing lights, horn, measuring devices (meters), …
Q	Controlled switching or varying a flow of energy, of signals or of material (For signals in control circuits, see classes K and S)	Softstarter, solid state relay, power, contactor, isolator, motor protection,…
R	Restricting or stabilising motion or a flow of energy, information or material	Resistor (standard), diode, coil, ...
S	Converting a manual operation into a signal for further processing	Switch, pushbutton, ...
T	Conversion of energy maintaining the kind of energy Conversion of an established signal maintaining the content of information Conversion of the form or shape of a material	Transformer, frequency controller (drive), rectifier, current converter, ...
U	Keeping objects in a defined position	Kast, Montageplaat, kabelrouting...
V	Processing (treating) of material or products (including preparatory and post-treatment)	Electro-filter, ...
W	Guiding or transporting energy, signals, material or products from one place to another	Cables
X	Connecting objects	Terminals, plugs, ...
Y	(Reserved for future standardisation)	
Z	(Reserved for future standardisation)	

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Page	Page description	Date	Edited by	Rev.
&DOC/1	FRONT PAGE	30/04/2020	CSW_BVA	
&DOC/3	REVISION OVERVIEW	30/04/2020	CSW_BVA	
&DOC/4	STRUCTURE IDENTIFIER OVERVIEW	30/04/2020	CSW_BVA	
&DOC/5	PART CODING	30/04/2020	CSW_BVA	
&DOC/10	TABLE OF CONTENTS	30/04/2020	CSW_BVA	
&DOC/11	TABLE OF CONTENTS	30/04/2020	CSW_BVA	
&DOC/12	TABLE OF CONTENTS	30/04/2020	CSW_BVA	
++INST01+MP&SCHEM/1	ARRIVAL	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/2	DISTRIBUTION 24VDC VDC	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/400	CONTROL CIRCUIT SENSORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/401	CONTROL CIRCUIT SENSORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/402	CONTROL CIRCUIT SENSORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/403	CONTROL CIRCUIT SENSORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/404	CONTROL CIRCUIT SENSORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/405	CONTROL CIRCUIT CAN	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/406	CONTROL CIRCUIT CAN	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/408	CONTROL CIRCUIT AUS PUMPS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/409	CONTROL CIRCUIT AUS PUMPS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/410	CONTROL CIRCUIT AUS PUMPS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/411	CONTROL CIRCUIT OTHER ACTUATORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/412	CONTROL CIRCUIT OTHER ACTUATORS	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/413	CONTROL CIRCUIT EMERGENCY STOP / ALARM	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/450	ECU	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/451	ECU CONTROL CIRCUIT	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/452	ECU CONTROL CIRCUIT	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/600	HMI	30/04/2020	CSW_BVA	1
++INST01+MP&SCHEM/601	SETTINGS INTERFACE	30/04/2020	CSW_BVA	1
++INST01+MP&LAY/2	BOARD LAYOUT	30/04/2020	CSW_BVA	1
++INST01+MP&LAY/3	PANEL LAYOUT	30/04/2020	CSW_BVA	1
++INST01+MP&LAY/4	GLAND PLATE	30/04/2020	CSW_BVA	1
++INST01+MP&LAY/5	CONTROL CABINET LEGEND BORDLAYOUT	30/04/2020	CSW_BVA	
++INST01+MP&LAY/6	CONTROL CABINET LEGEND PANELLAYOUT	30/04/2020	CSW_BVA	

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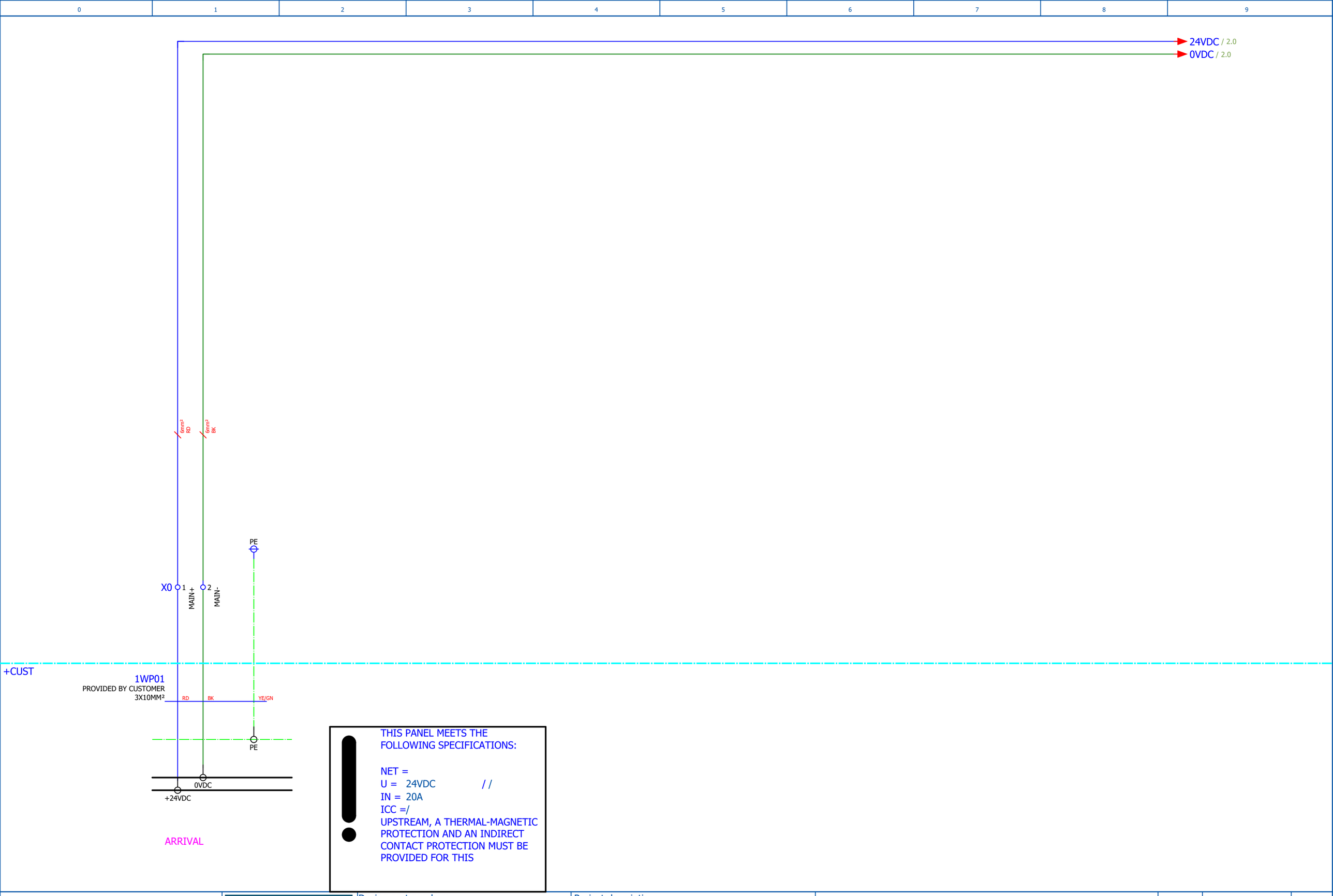

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	ARRIVAL	Prev. Page:	+++&DOC/12
Date:	30/04/2020		ePLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.:	++INST01+MP&SCHEM/1
Revision:	1					Next Page:	2

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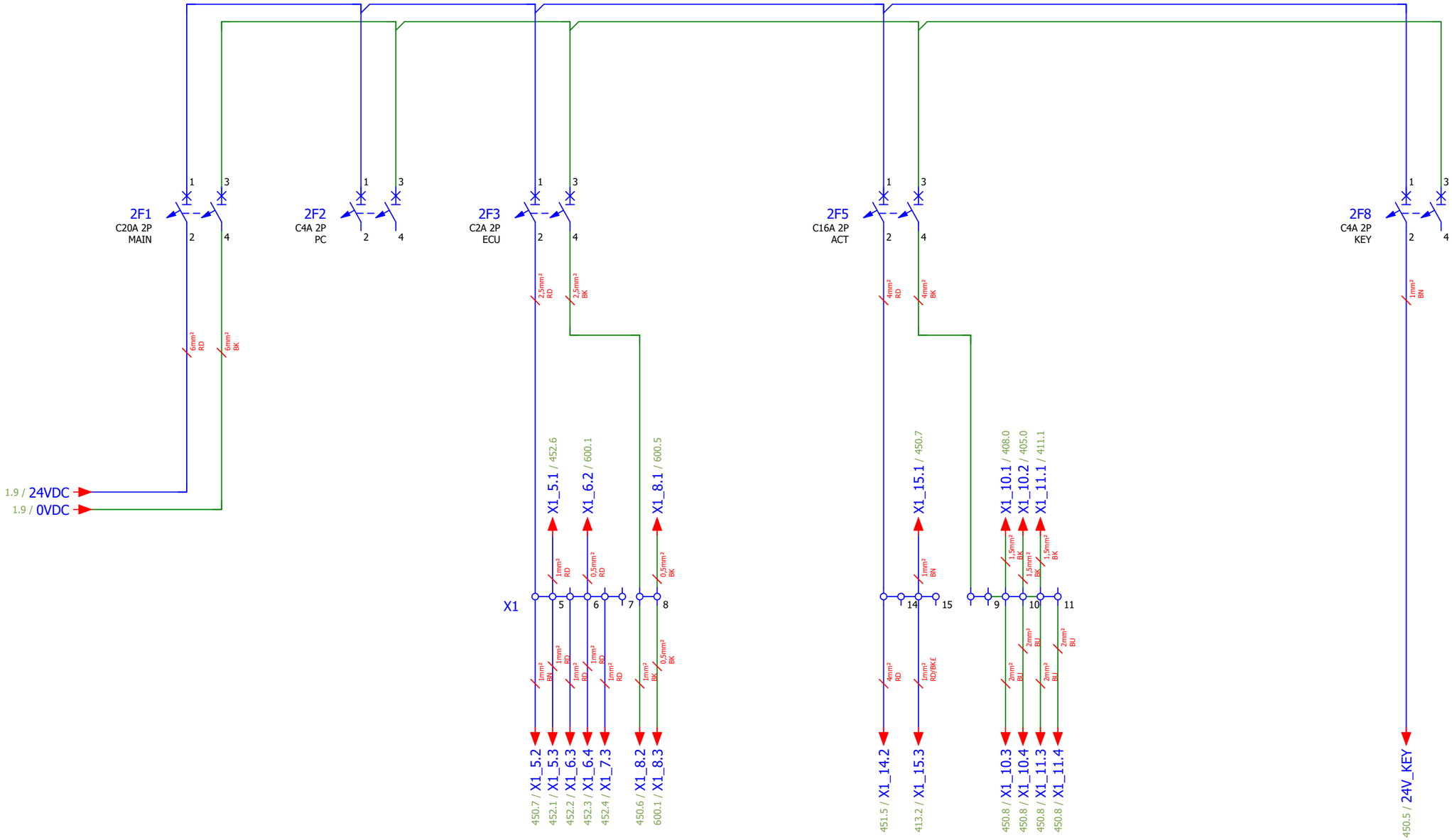


Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	DISTRIBUTION 24VDC VDC	Prev. Page: 1	Page: 2
Date:	30/04/2020		ePLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/2	
Revision:	1					Next Page: 400	

451.0 / X1_1.1
451.2 / X1_4.1

ECU_32 / 450.1
ECU_31 / 450.1
ECU_30 / 450.1
ECU_29 / 450.0

1,5mm² RD
1,5mm² BL
0,5mm² WH

SCR1+
SCR1-
T1
T2
T3
T4

X10 1+ 1+ 1+ 2- 2- 2- 3+ 3- 3 4+ 4- 4 5+ 5- 5 6+ 6- 6

X10_0V / 401.0
X10_5V / 401.0

+CAB

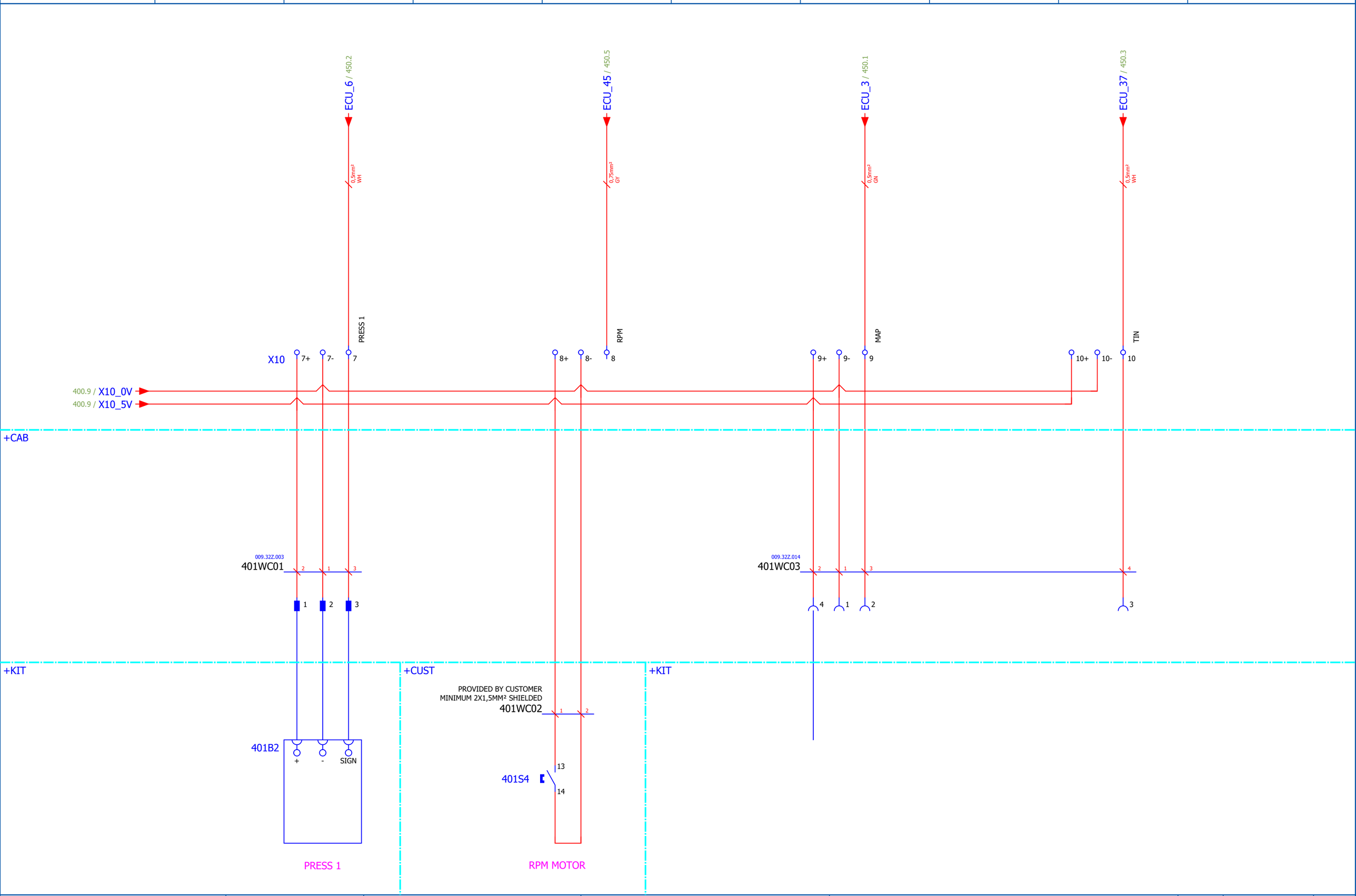
009.32Z.004 400WC01 2 1 3 — 1 2 3
009.32Z.004 400WC02 2 1 3 — 1 2 3
009.32Z.004 400WC03 2 1 3 — 1 2 3
009.32Z.004 400WC04 2 1 3 — 1 2 3

+KIT

400B4 + - SIGN
400B8 + - SIGN

T2
T4

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT SENSORS	Prev. Page: 2	Page: 400
Date:	30/04/2020		ePLAN electric P8 Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/400	
Revision:	1					Next Page: 401	



Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT SENSORS	Prev. Page: 400	Page: 401
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/401	
Revision:	1					Next Page: 402	

451.0 / X1_1.2
451.2 / X1_4.2

ECU_11 / 450.3
ECU_12 / 450.4
ECU_5 / 450.1
ECU_35 / 450.2

0,75mm² YE/BK
0,75mm² YE
1,5mm² RD
1,5mm² BL
0,5mm² WH
0,5mm² BL/BK

452K1
/452.1
11
14
12

R1_NO1 / 403.4

X10
11+ 11- 11 CAN1L
12+ 12- 12 CAN1H
13+ 13+ 13+ SCR2+
14- 14- 14- SCR2-
15+ 15- 15 PIU
16+ 16- 16 L BUFFER

X10_0V / 403.0
X10_5V / 403.0

+CAB

009.32Z.002
402WC03
2 1 3
1 3 2

009.32Z.009
402WC04
1 3
1 2

+CUST

USE J1939 COMPLIANT CABLE
402WC05
BU RD

402B2
CAN L
CAN H

CAN1

+KIT

402B6
+ - SIGN

PIU

402B8
/403.2
- LEVEL

BUFFER

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT SENSORS	Prev. Page: 401	Page: 402
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/402	
Revision:	1					Next Page: 403	

ECU_36 / 450.2
R1_NO1 / 402.9
ECU_7 / 450.2
0,5mm² WH/BK
0,5mm² WH
21
452K1
/452.1
24
22
0,5mm² BL/BK
0,5mm² WH/BK
0,5mm² WH/BK
T BUFFER
L MAIN
T MAIN
PRESS 2
X10
17+ 17- 17
18+ 18- 18
19+ 19- 19
20+ 20- 20
402.9 / X10_0V
402.9 / X10_5V
X10_0V / 404.0
X10_5V / 404.0

+CAB

402WC04
009.32Z.009
403WC03
009.32Z.003
403WC04

+KIT
402B8
/402.8
- TEMP

+CUST
403B6
- LEVEL
- TEMP

+KIT
403B8
+ - SIGN

BUFFER
MAIN LEVEL
PRESS 2

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT SENSORS	Prev. Page: 402	Page: 403
Date:	30/04/2020		ePLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/403	
Revision:	1					Next Page: 404	

ECU_4 / 450.1

0,5mm²
WH

PID

X10 21+ 21- 21

403.9 / X10_0V

403.9 / X10_5V

+CAB

009.32Z.008
404WC02 2 1 3

3 1 2

+KIT

404B4
+ - SIGN

PID

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT SENSORS	Prev. Page: 403	Page: 404
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/404	
Revision:	1					Next Page: 405	

451.4 / X1_13.1
2.6 / X1_10.2

ECU_40 / 450.4
ECU_41 / 450.4
DOWNL_L / 601.2
DOWNL_H / 601.1

1,5mm² RD
1,5mm² BK
0,75mm² YE/BK
0,75mm² YE
0,75mm² YE/BK
0,75mm² YE

CANBUS+
CANBUS-
NOX1L
NOX1H
NOX2L
NOX2H

X11 1+ 1+ 1+ 2- 2- 2- 3+ 3- 3 4+ 4- 4 5+ 5- 5 6+ 6- 6

X11_CANH / 406.0
X11_CANL / 406.0
X11_0V / 406.0
X11_24V / 406.0

+CAB

009.32Z.006
405WC01
RD BN BU BK GN
1 2 3 5 4

405B2
+ - CAN L - CAN H

NOX1

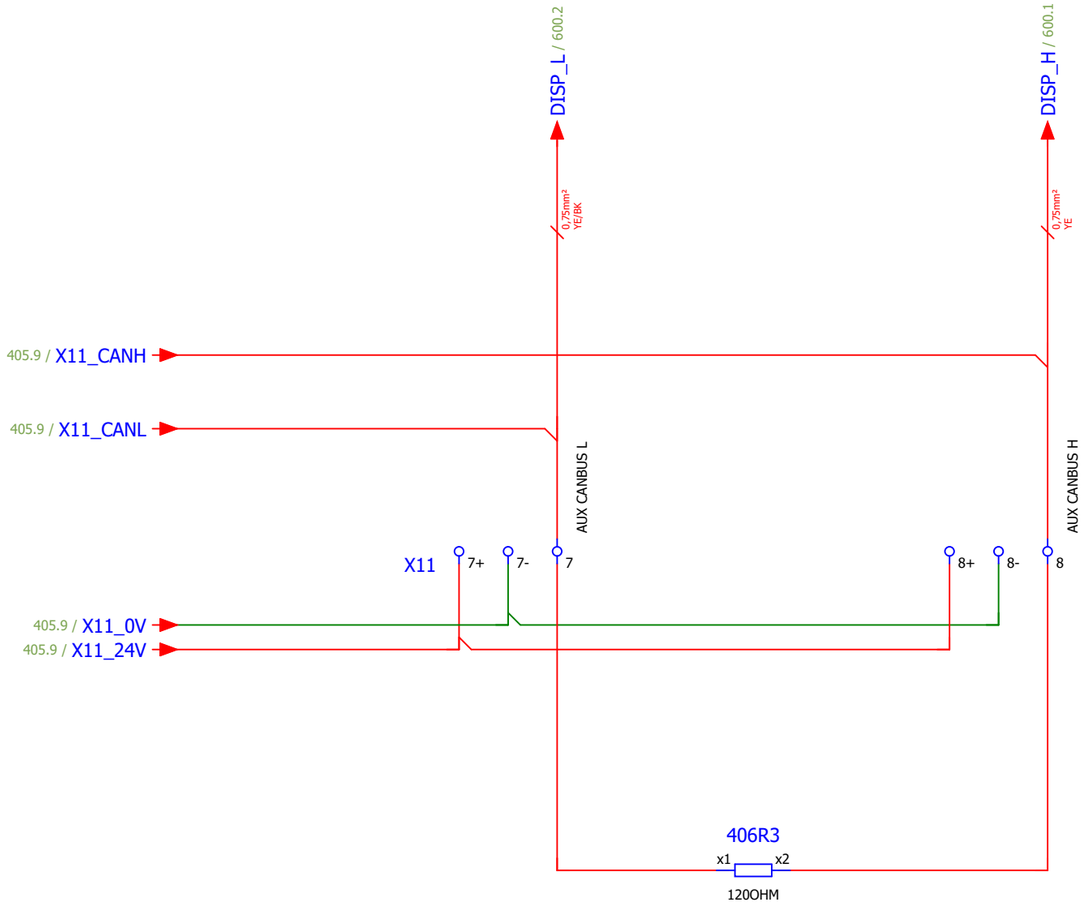
+KIT

009.32Z.005
405WC03
RD BN BU GN
1 2 3 5 4

405B6
+ - CAN L - CAN H

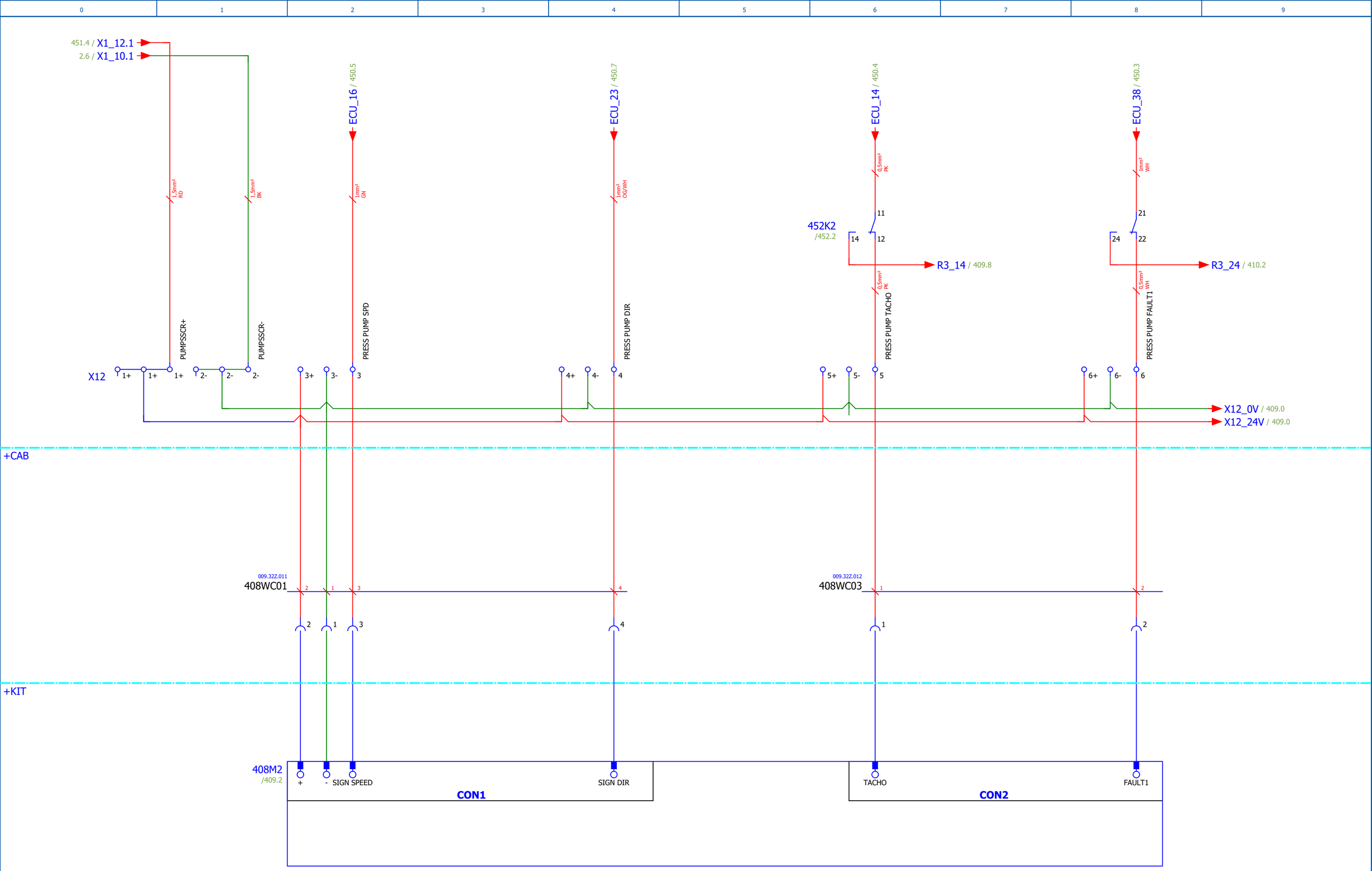
NOX2

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT CAN	Prev. Page: 404	Page: 405
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/405	
Revision:	1					Next Page: 406	



+KIT

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT CAN	Prev. Page: 405	Page: 406
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/406	
Revision:	1					Next Page: 408	



Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT AUS PUMPS	Prev. Page: 406	Page: 408
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/408	
Revision:	1					Next Page: 409	

X1_3.1 / 451.1

R3_14 / 408.6

452K3
/452.3

11
14
12

1mm² GN

1mm² GN

0,5mm² PK

PRES PUMP FAULT 2

DEL PUMP SPD

DEL PUMP DIR

DEL PUMP TACHO

X12 7+ 7- 7 8+ 8- 8 9+ 9- 9 10+ 10- 10

408.9 / X12_0V

408.9 / X12_24V

+CAB

009.32Z.011

408WC03 3

409WC02 2 1 3 4

3

2 1 3 5

+KIT

408M2
/408.2

FAULT1

409M3

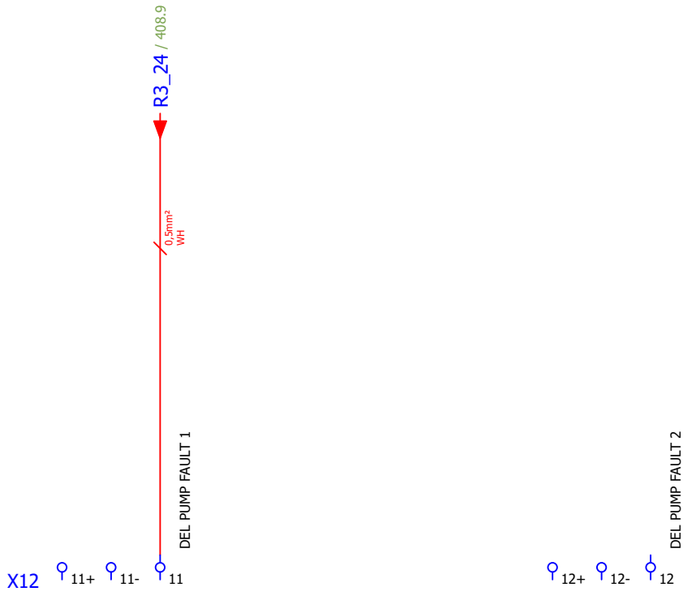
\+ - SIGN SPEED SIGN DIR

CON1

PRESSURE PUMP

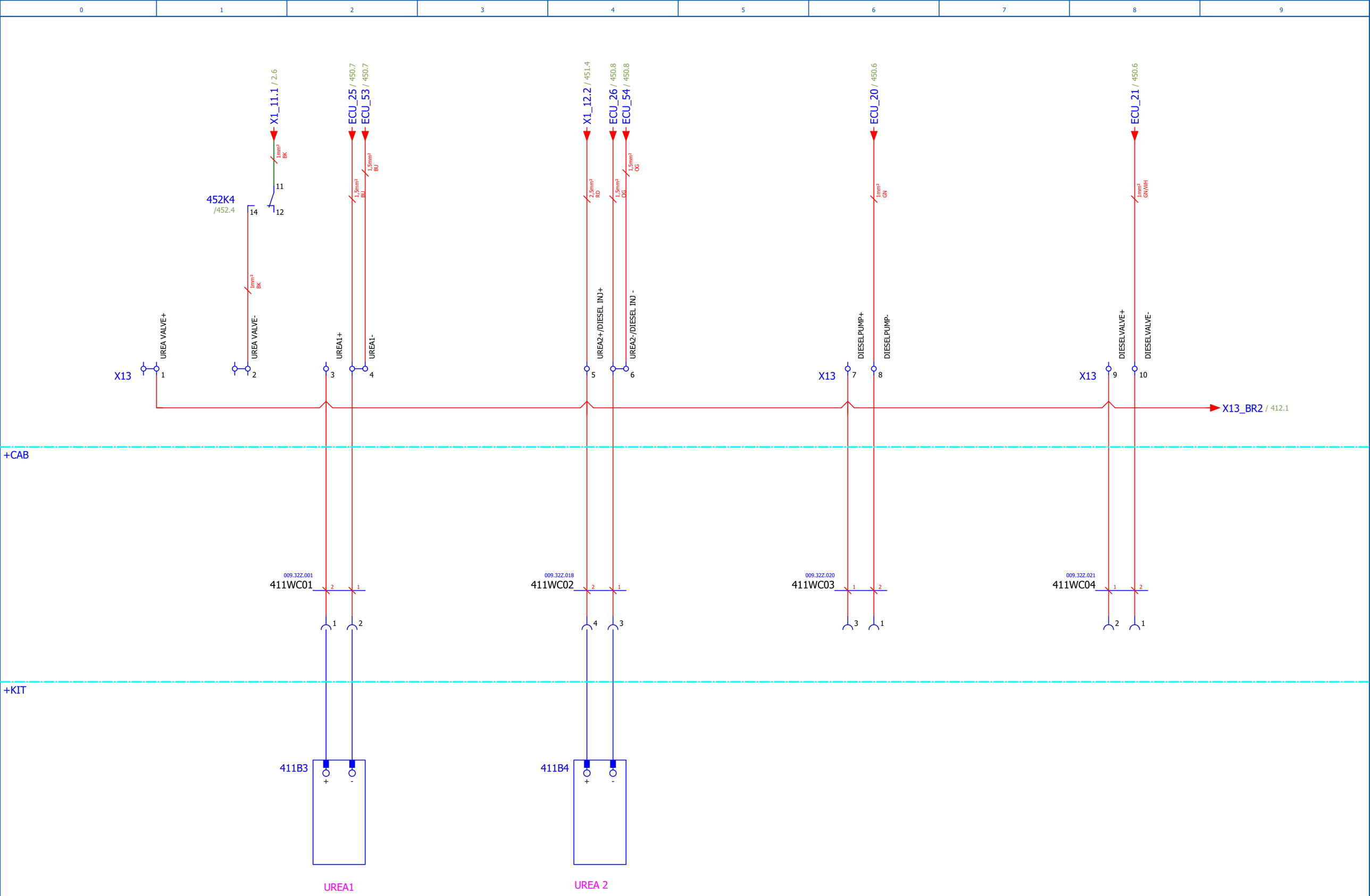
DELIVERY PUMP

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT AUS PUMPS	Prev. Page: 408	Page: 409
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/409	
Revision:	1					Next Page: 410	



+KIT

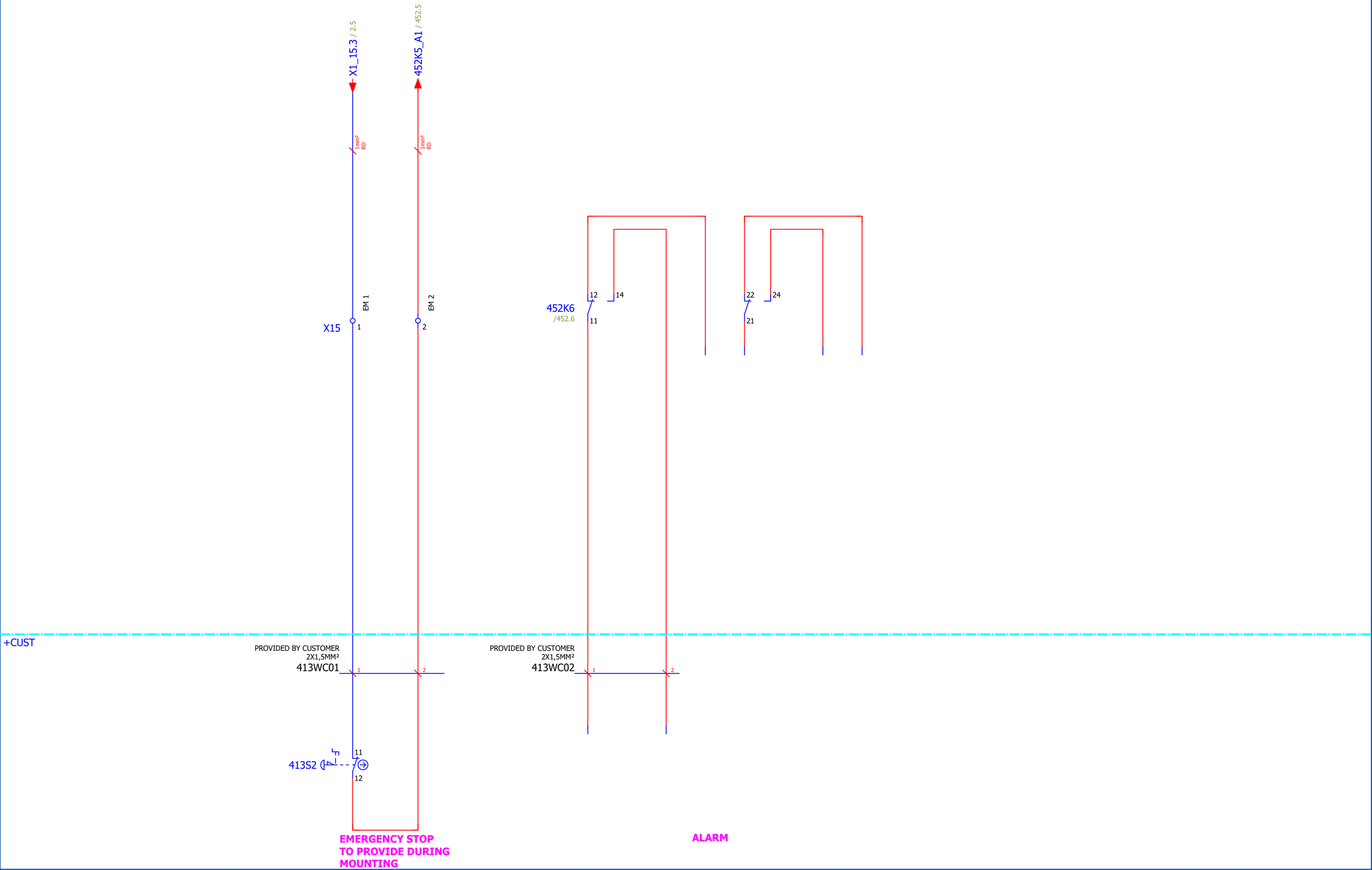
Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT AUS PUMPS	Prev. Page: 409	Page: 410
Date:	30/04/2020		ePLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/410	
Revision:	1					Next Page: 411	



Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	CONTROL CIRCUIT OTHER ACTUATORS	Prev. Page:	410	Page: 411
Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.:	++INST01+MP&SCHEM/411	
Revision:	1					Next Page:	412	

+CAB

+KIT



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Date:	30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/413	
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	ECU_1 / 451.2	ECU_2 / 451.0	ECU_3 / 401.6	ECU_4 / 404.2	ECU_5 / 402.6	ECU_6 / 401.2	ECU_7 / 403.8	ECU_10 / 451.4	ECU_11 / 402.2	ECU_12 / 402.4	ECU_14 / 408.6	ECU_16 / 408.2	ECU_17 / 452.1	ECU_18 / 452.6	ECU_19 / 452.2	ECU_20 / 411.6	ECU_21 / 411.8	ECU_22 / 452.4	ECU_23 / 408.4	ECU_24 / 452.3	ECU_25 / 411.2	ECU_26 / 411.4	X1_10.3 / 2.6	X1_10.4 / 2.6
Wire	1mm² BU	1mm² RD	0,5mm² GN	0,5mm² WH	0,5mm² WH	0,5mm² WH	0,5mm² WH	0,75mm² WH/BK	0,75mm² YE/BK	0,75mm² YE	0,5mm² PK	1mm² GN	1mm² BU	1mm² BU	1mm² WH	1mm² GN	1mm² GN/WH	1mm² BU	1mm² OG/WH	0,5mm² BU	1,5mm² BU	1,5mm² OG	2mm² BU	2mm² BU
450A0 ECU	GND SENS	+5V OUT	AI	AI	AI	AI	AI	RS TX	RS RX	AI	CAN1H	CAN1L	COM GND	FDI	DO	AO	DO	DO	DO	DO	DO	DO	INJ DRIVER	INJ DRIVER	GND	GND
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
450A0 ECU	AI	AI	AI	AI	+12V OUT	AI	AI	AI	AI	DI	GND	CAN0L	CAN0H	COM GND	PWR RLY	DO	FDI	IGN SWT	GND	USB D+	USB D-	K-LINE	F.B.BAT	PWR BAT	INJ 1	INJ 2	GND	GND
Wire	0,5mm² WH	0,5mm² WH	0,5mm² WH	0,5mm² WH			0,5mm² BL/BK	0,5mm² WH/BK	0,5mm² WH	1mm² WH		0,75mm² YE/BK	0,75mm² YE	0,5mm² BK	0,5mm² BN/WH	1mm² GN	0,75mm² GY	1mm² BN	1mm² BK	0,5mm² GN	0,5mm² WH	0,5mm² WH	1mm² BN	1mm² BN	1,5mm² BU	1,5mm² OG	2mm² BU	2mm² BU
	ECU_29 / 400.8	ECU_30 / 400.6	ECU_31 / 400.4	ECU_32 / 400.2			ECU_35 / 402.8	ECU_36 / 403.2	ECU_37 / 401.8	ECU_38 / 408.8		ECU_40 / 405.2	ECU_41 / 405.4	ECU_42 / 601.4	ECU_43 / 452.5	ECU_44 / 412.2	ECU_45 / 401.4	24V_KEY / 2.8	X1_8.2 / 2.4	ECU_48 / 601.4	ECU_49 / 601.5	ECU_50 / 600.5	X1_15.1 / 2.5	X1_5.2 / 2.3	ECU_53 / 411.2	ECU_54 / 411.4	X1_11.3 / 2.6	X1_11.4 / 2.6

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	ECU	Prev. Page: 413
Date:	30/04/2020		ePLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/450
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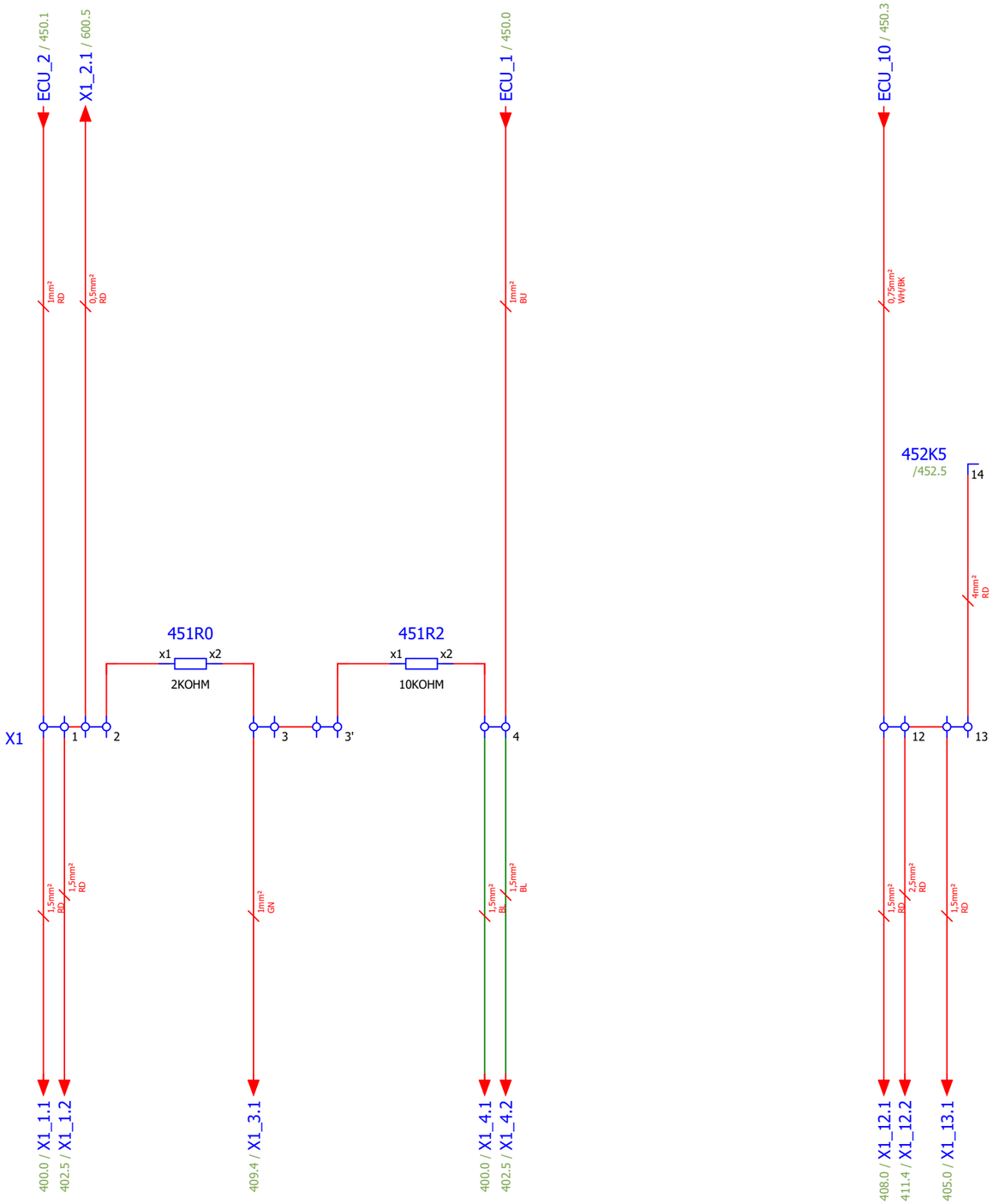

Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number:	Project description:	ECU CONTROL CIRCUIT	Prev. Page:	450
Date:	30/04/2020		941.020.001	009.055.002-CAB FULL 1-V3 VER1		Huidige Pag.:	++INST01+MP&SCHEM/451
Revision:	1		ePLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Next Page:	452

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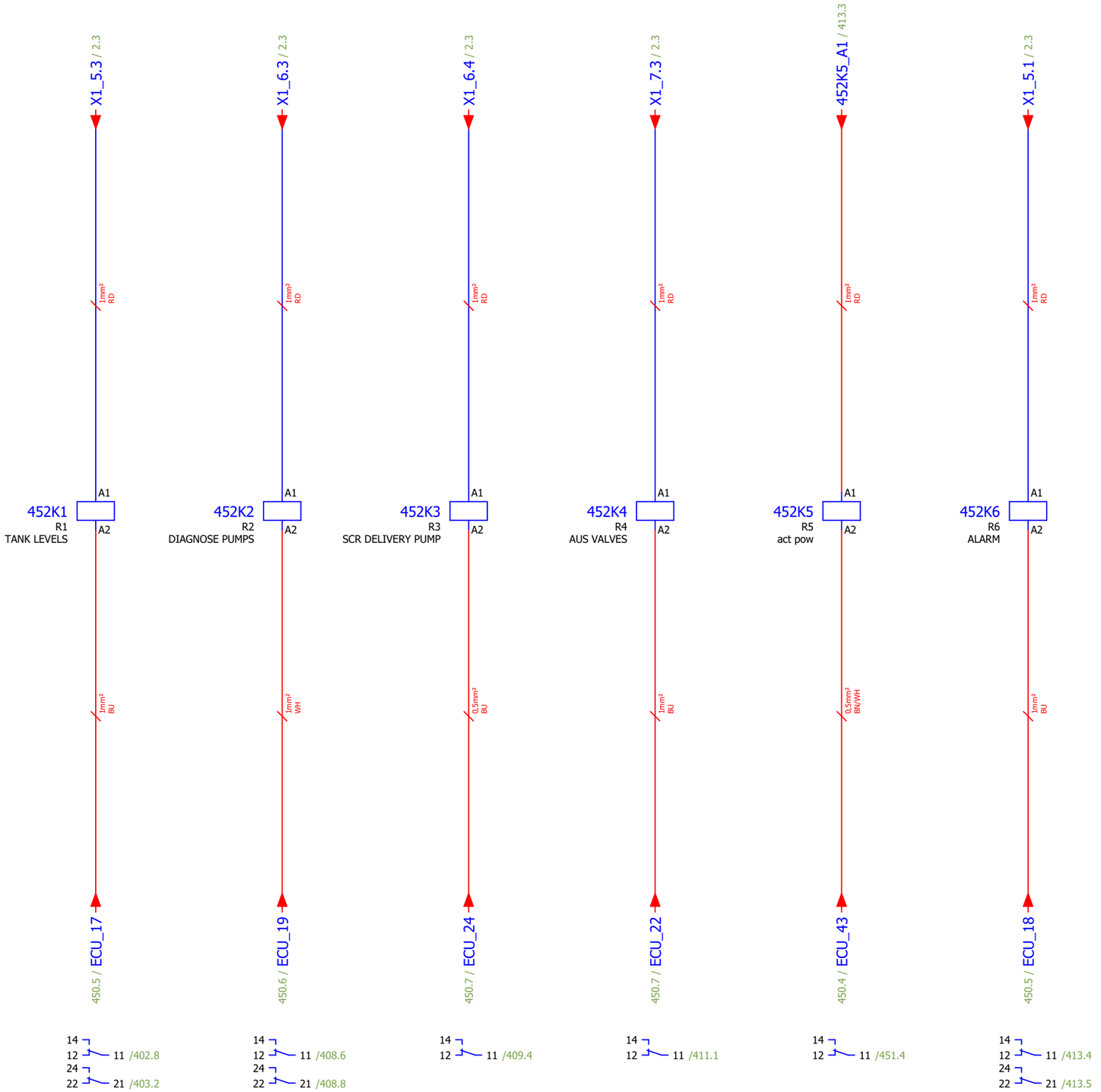

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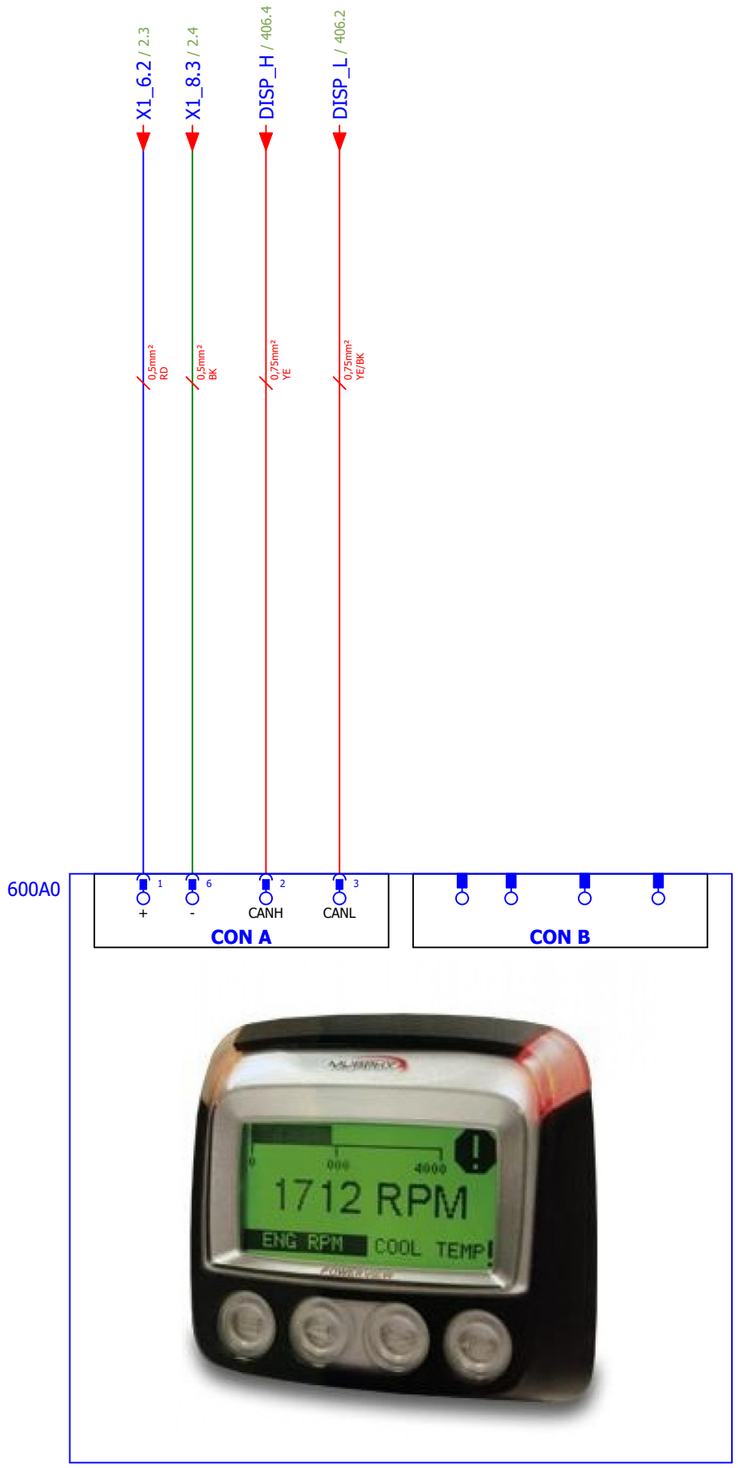
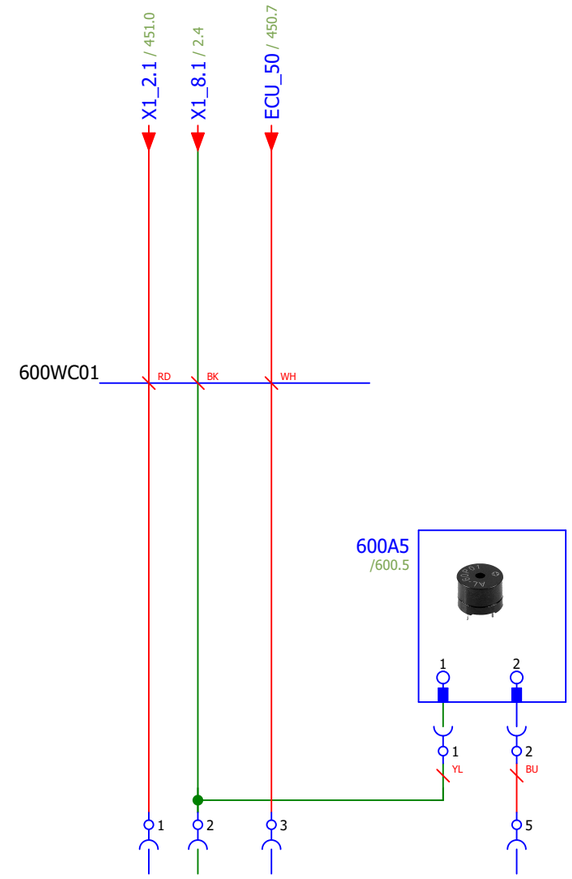
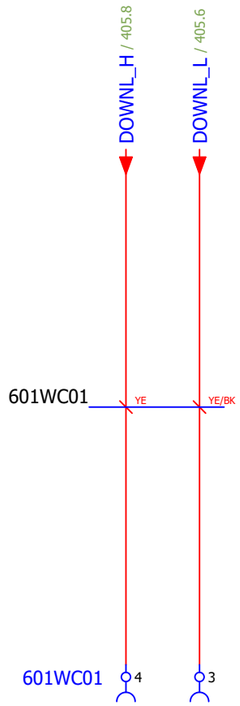
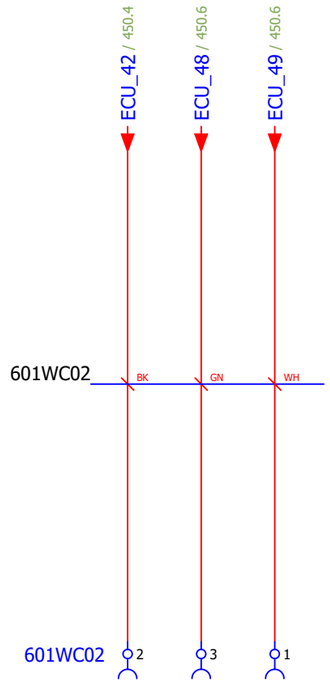
Date: 30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&SCHEM/452	
Revision: 1					Next Page: 600	

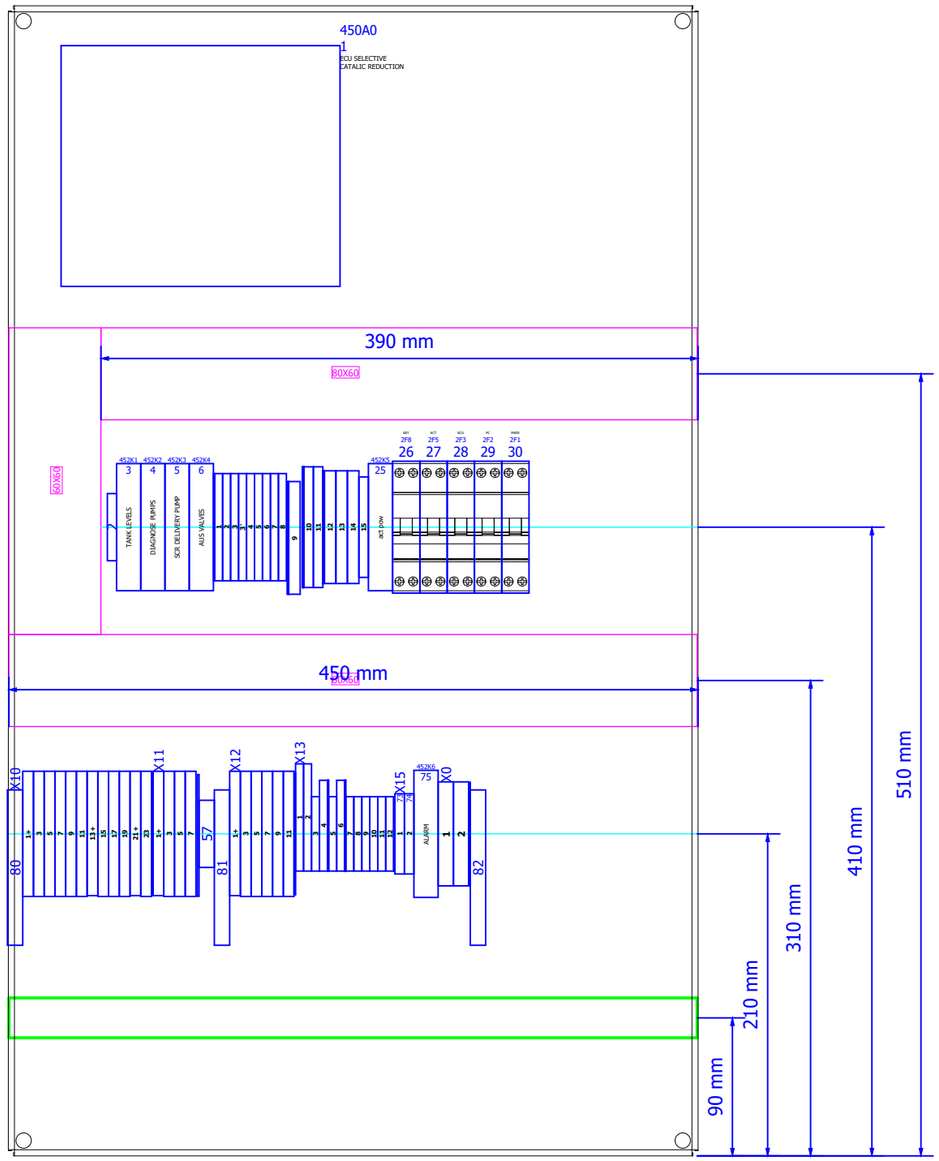




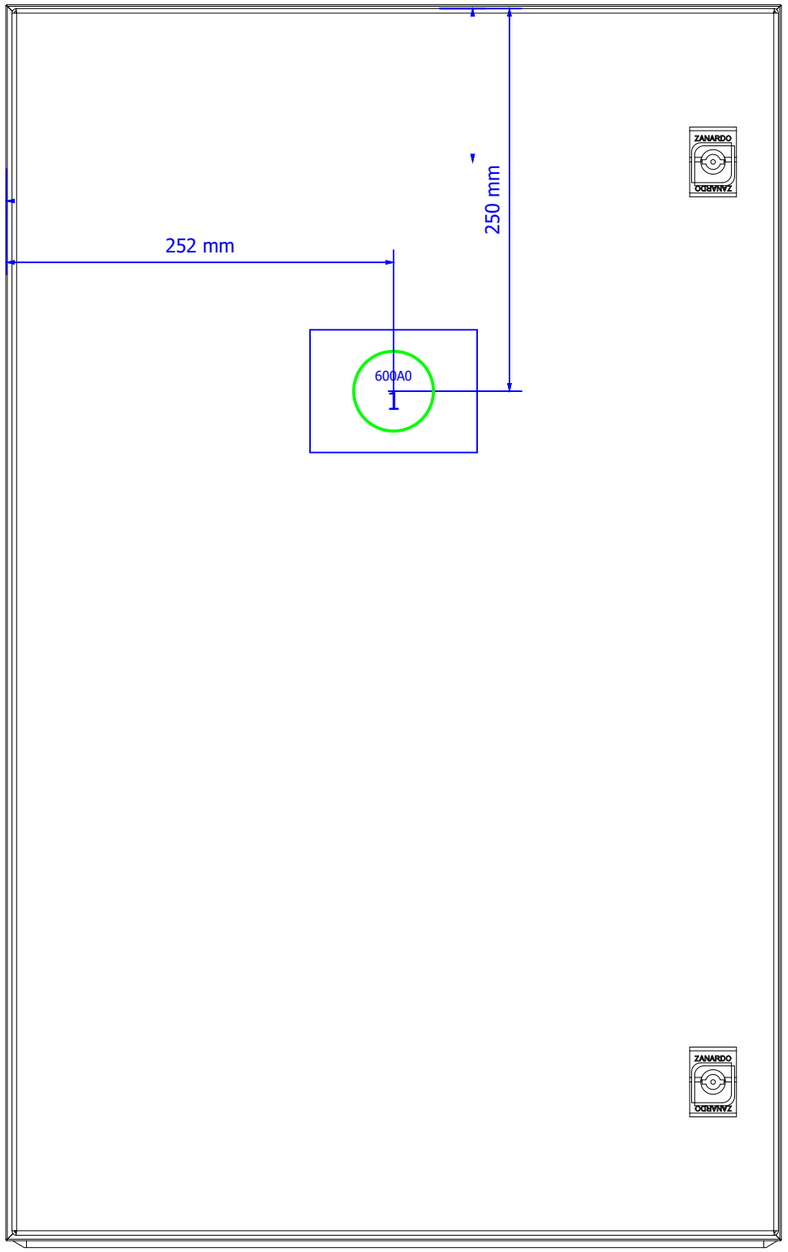
Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	HMI	Prev. Page:	452	Page: 600
Date:	30/04/2020		ePLAN electric P8 Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.:	++INST01+MP&SCHEM/600	
Revision:	1					Next Page:	601	


DOWNL_H / 405.8
DOWNL_L / 405.6
601WC01
YE
YE/BK
601WC01
4
3

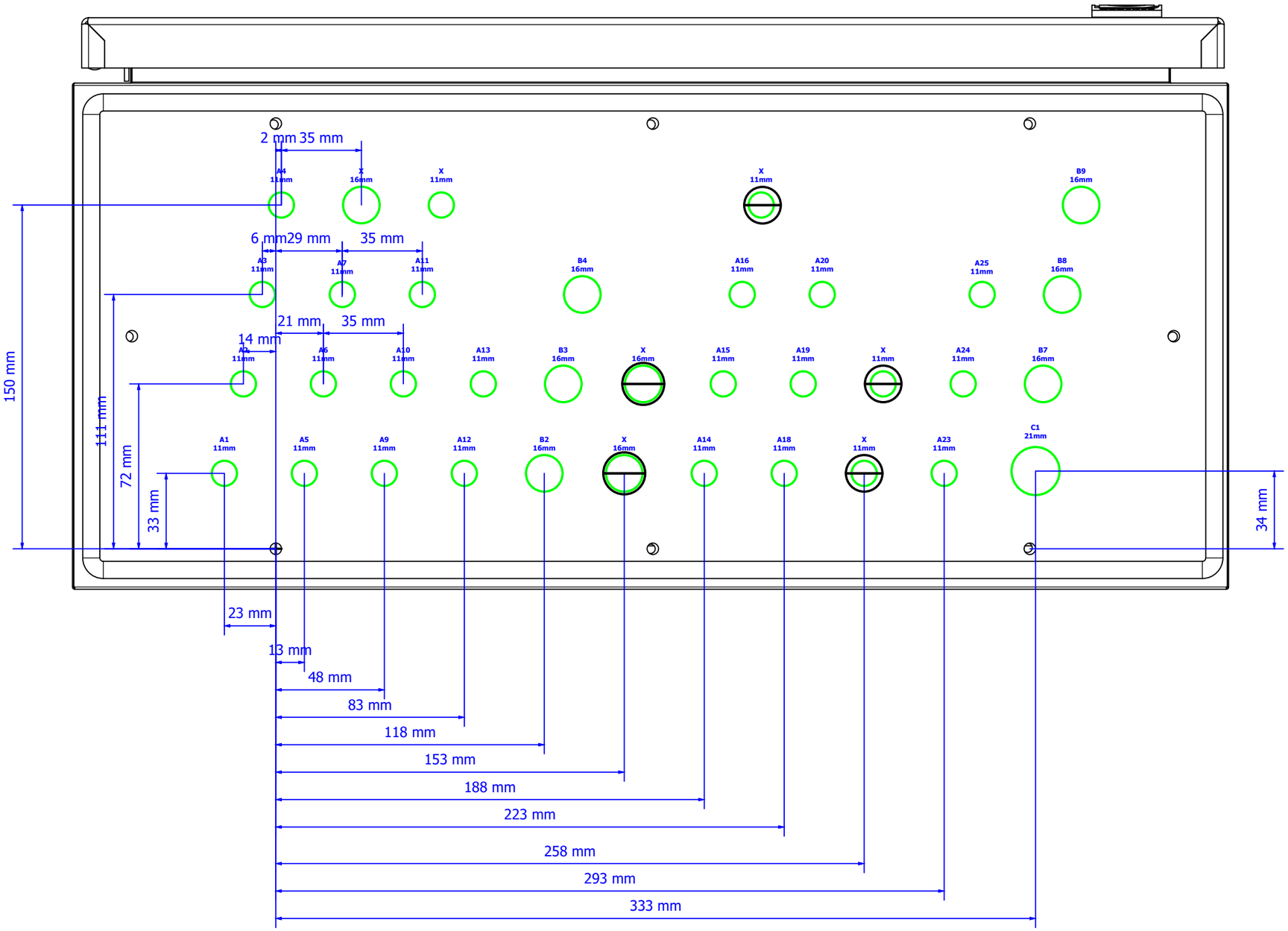

ECU_42 / 450.4
ECU_48 / 450.6
ECU_49 / 450.6
601WC02
BK
GN
WH
601WC02
2
3
1



Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	BOARD LAYOUT	Prev. Page: &SCHEM/1000	Page: 2
Date:	30/04/2020		EPLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&LAY/2	
Revision:	1					Next Page: 3	



Last Edit: CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number: 941.020.001	Project description: 009.055.002-CAB FULL 1-V3 VER1	PANEL LAYOUT	Prev. Page: 2	Page: 3
Date: 30/04/2020		EPLAN electric P Version 2.8.3	Projectname: PR20102.03X_20200430		Huidige Pag.: ++INST01+MP&LAY/3	
Revision: 1					Next Page: 4	



Last Edit:	CSW_BVA	DIESEL EMISSION CONTROL	Dosing part number:	Project description:	GLAND PLATE	Prev. Page: 3	Page:
Date:	30/04/2020		941.020.001	009.055.002-CAB FULL 1-V3 VER1		Huidige Pag.: ++INST01+MP&LAY/4	4
Revision:	1		ePLAN electric Version 2.8.3	Projectname: PR20102.03X_20200430		Next Page: 5	

Control cabinet legend

Item number	Device tag	Description	Order number	Type number	Manufacturer
1	450A0	ECU DE-Tronic FULL V3 CAN 0 T - CAN 1	009.060.004	ECU DE_Tronic FULL V3	MULTRONIC
2	X2	SCREWLESS END-STOP	249-116	249-116	WAGO
3	452K1	INTERFACE RELAY 2CO 24VDC	4C.02.9.024.0050	4C.02.9.024.0050	FINDER
4	452K2	INTERFACE RELAY 2CO 24VDC	4C.02.9.024.0050	4C.02.9.024.0050	FINDER
5	452K3	INTERFACE RELAY 1CO 24VDC	4C.01.9.024.0050	4C.01.9.024.0050	FINDER
6	452K4	INTERFACE RELAY 1CO 24VDC	4C.01.9.024.0050	4C.01.9.024.0050	FINDER
7	X1	END AND INTERMEDIATE PLATE	2002-1491	2002-1491	WAGO
17	X1	END AND INTERMEDIATE PLATE	2004-1491	2004-1491	WAGO
20	X1	END AND INTERMEDIATE PLATE	2006-1391	2006-1391	WAGO
25	452K5	INTERFACE RELAY 1CO 24VDC	4C.01.9.024.0050	4C.01.9.024.0050	FINDER
26	2F8	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 4A	692501	EPC32C04	
27	2F5	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 16A	692504	EPC32C16	
28	2F3	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 2A	692500	EPC32C02	
29	2F2	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 4A	692501	EPC32C04	
30	2F1	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 20A	692505	EPC32C20	
31	X1	END AND INTERMEDIATE PLATE	2006-1391	2006-1391	WAGO
36	X13	ENDPLATE	2002-1391	2002-1391	WAGO
38	X13	ENDPLATE	2002-1391	2002-1391	WAGO
53	X10	END AND INTERMEDIATE PLATE	2000-5391	2000-5391	WAGO
57	X12	SCREWLESS END-STOP	249-117	249-117	WAGO
63	X12	END AND INTERMEDIATE PLATE	2000-5391	2000-5391	WAGO
72	X13	ENDPLATE	2002-1291	2002-1291	WAGO
75	452K6	INTERFACE RELAY 2CO 24VDC	4C.02.9.024.0050	4C.02.9.024.0050	FINDER
78	X0	END AND INTERMEDIATE PLATE	2010-1291	2010-1291	WAGO
79	X11	END AND INTERMEDIATE PLATE	2000-5391	2000-5391	WAGO
80	X10	BUSBAR CARRIER 10mmX3mm	790-300	790-300	WAGO
82	X0	BUSBAR CARRIER 10mmX3mm	790-300	790-300	WAGO

Control cabinet legend

Item number	Device tag	Description	Order number	Type number	Manufacturer
1	600A0	POWERVIEW MODEL PV101-C LCD DISPLAY	PV101-C	PV101-C	MURPHY
2	600A5	DIAGNOSTIC INDICATOR AND BUZZER	009.061.003	009.061.003	MULTRONIC

Article list

Device tag	Quantity	Description	Type number	Supplier	Part number
452K1	1	INTERFACE RELAY 2CO 24VDC	4C.02.9.024.0050	FINDER	4C.02.9.024.0050
452K2	1	INTERFACE RELAY 2CO 24VDC	4C.02.9.024.0050	FINDER	4C.02.9.024.0050
452K3	1	INTERFACE RELAY 1CO 24VDC	4C.01.9.024.0050	FINDER	4C.01.9.024.0050
452K4	1	INTERFACE RELAY 1CO 24VDC	4C.01.9.024.0050	FINDER	4C.01.9.024.0050
452K5	1	INTERFACE RELAY 1CO 24VDC	4C.01.9.024.0050	FINDER	4C.01.9.024.0050
452K6	1	INTERFACE RELAY 2CO 24VDC	4C.02.9.024.0050	FINDER	4C.02.9.024.0050
2F1	1	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 20A	EPC32C20		692505
2F1	1	RAIL 2P PIN FOR UNIBIS 18MOD X 2P	624796		624796
2F2	1	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 4A	EPC32C04		692501
2F3	1	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 2A	EPC32C02		692500
2F5	1	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 16A	EPC32C16		692504
2F8	1	CIRCUIT BREAKER UNIBIS 1MOD 2P 3KA C 4A	EPC32C04		692501
450A0	1	ECU DE-Tronic FULL V3 CAN 0 T - CAN 1	ECU DE_Tronic FULL V3	MULTRONIC	009.060.004
450A0	1	W/H ECU V3 - FULL Ver02	009.300.004	MULTRONIC	009.300.004
600A0	1	DIGITAL CAN DISPLAY PV101-C	009.205.002	MULTRONIC	009.205.002
600A0	1	6 WAY MALE DEUTCH DT SERIES	009.010.022	MULTRONIC	009.010.022
600A0	4	CONTACT PIN DEUTSCH DT SERIES 0.5mm²	009.011.016	MULTRONIC	009.011.016
600A0	1	BLIND PLUG DEUTSCH DT/HDP SERIES	009.012.012	MULTRONIC	009.012.012
600A0	1	STICKER DIGITAL CAN DISPLAY PV101-C	010.040.003	MULTRONIC	010.040.003
600A5	1	STICKER DIGITAL CAN DISPLAY PV101-C	010.040.003	MULTRONIC	010.040.003
600A5	1	DIAGNOSTIC INDICATOR AND BUZZER	009.061.003	MULTRONIC	009.061.003
600WC01	1	DIAGNOSTIC INDICATOR HARNESS	009.300.001	MULTRONIC	009.300.001
601WC01	1	4-WAY AMP SUPERSEAL 1.5 SERIES	009.010.007	MULTRONIC	009.010.007
601WC01	2	CONTACT PIN DEUTSCH DT SERIES 0.5mm²	009.011.016	MULTRONIC	009.011.016
601WC01	2	F CONTACT FOR AMP SUPERSEAL 1.5 SERIES	009.011.038	MULTRONIC	009.011.038
601WC02	1	3-WAY AMP SUPERSEAL 1.5 SERIES	009.010.008	MULTRONIC	009.010.008
601WC02	2	CONTACT PIN DEUTSCH DT SERIES 0.5mm²	009.011.016	MULTRONIC	009.011.016
601WC02	2	F CONTACT FOR AMP SUPERSEAL 1.5 SERIES	009.011.038	MULTRONIC	009.011.038
600A0	1	POWERVIEW MODEL PV101-C LCD DISPLAY	PV101-C	MURPHY	PV101-C
406R3	1	RESISTOR 120OHM 600mW	MBB02070C1200FC100	VISHAY	MBB02070C1200FC100
451R0	1	RESISTOR 10KOHM 600mW	MBB02070C1002FC100	VISHAY	MBB02070C1002FC100
451R2	1	RESISTOR 10KOHM 600mW	MBB02070C1002FC100	VISHAY	MBB02070C1002FC100
451R0	1	EMPTY COMPONENT PLUG 2 POLE	2002-880	WAGO	2002-880
451R2	1	EMPTY COMPONENT PLUG 2 POLE	2002-880	WAGO	2002-880
X0	1	END AND INTERMEDIATE PLATE	2010-1291	WAGO	2010-1291
X0	1	BUSBAR CARRIER 10mmX3mm	790-300	WAGO	790-300
X0	2	2-CONDUCTOR TERMINAL BLOCK 10mm²	2010-1201	WAGO	2010-1201
X1	1	END AND INTERMEDIATE PLATE	2002-1491	WAGO	2002-1491
X1	1	END AND INTERMEDIATE PLATE	2004-1491	WAGO	2004-1491
X1	2	END AND INTERMEDIATE PLATE	2006-1391	WAGO	2006-1391
X1	1	JUMPER BAR	2006-499	WAGO	2006-499
X1	1	JUMPER BAR	2004-402	WAGO	2004-402
X1	3	JUMPER BAR	2002-402	WAGO	2002-402
X1	1	JUMPER BAR	2002-403	WAGO	2002-403
X1	2	JUMPER BAR	2006-402	WAGO	2006-402
X1	9	4-WIRE TERMINAL BLOCK 2.5mm²	2002-1401	WAGO	2002-1401
X1	4	3-CONDUCTOR TERMINAL BLOCK 6mm²	2006-1301	WAGO	2006-1301
X1	2	4-CONDUCTOR TERMINAL BLOCK 4mm²	2004-1401	WAGO	2004-1401
X1	1	3-CONDUCTOR TERMINAL BLOCK	2004-1301	WAGO	2004-1301
X2	1	SCREWLESS END-STOP	249-116	WAGO	249-116
X10	1	BUSBAR CARRIER 10mmX3mm	790-300	WAGO	790-300
X10	2	PUSH-IN TYPE JUMPER 10X RD	2000-410/000-005	WAGO	2000-410/000-005
X10	2	PUSH-IN TYPE JUMPER 10X BL	2000-410/000-006	WAGO	2000-410/000-006
X10	1	PUSH-IN TYPE JUMPER 8X RD	2000-408/000-005	WAGO	2000-408/000-005
X10	1	PUSH-IN TYPE JUMPER 8X BL	2000-408/000-006	WAGO	2000-408/000-006

Article list

Device tag	Quantity	Description	Type number	Supplier	Part number
X10	1	END AND INTERMEDIATE PLATE	2000-5391	WAGO	2000-5391
X10	3	3-WIRE SENSOR TERMINAL BLOCK 1mm² FEED WITH LED	2000-5372/1102-953	WAGO	2000-5372/1102-953
X10	11	3-WIRE SENSOR TERMINAL BLOCK 1mm²	2000-5311	WAGO	2000-5311
X11	1	END AND INTERMEDIATE PLATE	2000-5391	WAGO	2000-5391
X11	1	PUSH-IN TYPE JUMPER 10X RD	2000-410/000-005	WAGO	2000-410/000-005
X11	1	PUSH-IN TYPE JUMPER 10X BL	2000-410/000-006	WAGO	2000-410/000-006
X11	1	3-WIRE SENSOR TERMINAL BLOCK 1mm² FEED WITH LED	2000-5372/1102-953	WAGO	2000-5372/1102-953
X11	3	3-WIRE SENSOR TERMINAL BLOCK 1mm²	2000-5311	WAGO	2000-5311
X12	1	PUSH-IN TYPE JUMPER 10X RD	2000-410/000-005	WAGO	2000-410/000-005
X12	1	PUSH-IN TYPE JUMPER 10X BL	2000-410/000-006	WAGO	2000-410/000-006
X12	1	END AND INTERMEDIATE PLATE	2000-5391	WAGO	2000-5391
X12	1	SCREWLESS END-STOP	249-116	WAGO	249-116
X12	1	BUSBAR CARRIER 10mmX3mm	790-300	WAGO	790-300
X12	1	SCREWLESS END-STOP	249-117	WAGO	249-117
X12	1	3-WIRE SENSOR TERMINAL BLOCK 1mm² FEED WITH LED	2000-5372/1102-953	WAGO	2000-5372/1102-953
X12	5	3-WIRE SENSOR TERMINAL BLOCK 1mm²	2000-5311	WAGO	2000-5311
X13	2	ENDPLATE	2002-1391	WAGO	2002-1391
X13	1	ENDPLATE	2002-1392	WAGO	2002-1392
X13	1	ENDPLATE	2002-1291	WAGO	2002-1291
X13	1	JUMPER BAR	2002-407	WAGO	2002-407
X13	2	4-WIRE TERMINAL BLOCK 2.5mm²	2002-1401	WAGO	2002-1401
X13	8	2-WIRE TERMINAL BLOCK	2002-1201	WAGO	2002-1201
X13	1	3-CONDUCTOR TERMINAL BLOCK 2.5mm²	2002-1301	WAGO	2002-1301
X13	1	3-CONDUCTOR TERMINAL BLOCK 2.5mm² OG	2002-1302	WAGO	2002-1302
X13	1	BUSBAR CARRIER 10mmX3mm	790-300	WAGO	790-300
X15	1	END AND INTERMEDIATE PLATE	2004-1291	WAGO	2004-1291
X15	2	2-CONDUCTOR TERMINAL BLOCK	2004-1201	WAGO	2004-1201
KASTMAT	1	ENCLOSURE BXHXD 500X800X250	D93/24.35	ZANARDO	D93/24.35

Article list

Device tag	Quantity	Description	Type number	Supplier	Part number
400WC01	1	CA 019 3 0.50mm² M G zm	009.32Z.004	MULTRONIC	009.32Z.004
400WC02	1	CA 019 3 0.50mm² M G zm	009.32Z.004	MULTRONIC	009.32Z.004
400WC03	1	CA 019 3 0.50mm² M G zm	009.32Z.004	MULTRONIC	009.32Z.004
400WC04	1	CA 019 3 0.50mm² M G zm	009.32Z.004	MULTRONIC	009.32Z.004
401WC01	1	CA 012 3 0.50mm² M G zm	009.32Z.003	MULTRONIC	009.32Z.003
401WC03	1	CA 010 4 0.50mm² M G zm	009.32Z.014	MULTRONIC	009.32Z.014
402WC03	1	CA 003 3 0.50mm² M G zm	009.32Z.002	MULTRONIC	009.32Z.002
402WC04	1	CA 007 4 0.50mm² M G zm	009.32Z.009	MULTRONIC	009.32Z.009
403WC03	1	CA 007 4 0.50mm² M G zm	009.32Z.009	MULTRONIC	009.32Z.009
403WC04	1	CA 012 3 0.50mm² M G zm	009.32Z.003	MULTRONIC	009.32Z.003
404WC02	1	CA 028 3 0.50mm² M G zm	009.32Z.008	MULTRONIC	009.32Z.008
405WC01	1	CA 052 5 0.50mm² M DGL zm	009.32Z.006	MULTRONIC	009.32Z.006
405WC03	1	CA 052 4 0.50mm² M DGL zm	009.32Z.005	MULTRONIC	009.32Z.005
408WC01	1	CA 009 4 0.75mm² M G zm	009.32Z.011	MULTRONIC	009.32Z.011
408WC03	1	CA 036 3 0.50mm² M G zm	009.32Z.012	MULTRONIC	009.32Z.012
409WC02	1	CA 009 4 0.75mm² M G zm	009.32Z.011	MULTRONIC	009.32Z.011
411WC01	1	CA 002 2 1.50mm² M G zm	009.32Z.001	MULTRONIC	009.32Z.001
411WC02	1	CA 021 2 1.50mm² M G zm	009.32Z.018	MULTRONIC	009.32Z.018
411WC03	1	CA 027 2 1.50mm² M G zm	009.32Z.020	MULTRONIC	009.32Z.020
411WC04	1	CA 006 2 1.50mm² M G zm	009.32Z.021	MULTRONIC	009.32Z.021

Article list

Device tag	Quantity	Description	Type number	Supplier	Part number
1WP01	1	TO BE PROVIDED BY CUSTOMER	/		/
401WC02	1	TO BE PROVIDED BY CUSTOMER	/		/
402WC05	1	TO BE PROVIDED BY CUSTOMER	/		/
413WC01	1	TO BE PROVIDED BY CUSTOMER	/		/
413WC02	1	TO BE PROVIDED BY CUSTOMER	/		/

Article list

Device tag	Quantity	Description	Type number	Supplier	Part number
400B2	1	SENSOR T TC 1000°C E A 5VDC A M14 180° 150 mm	009.101.007	MULTRONIC	009.101.007
400B4	1	SENSOR T TC 1000°C E A 5VDC A M14 180° 150 mm	009.101.007	MULTRONIC	009.101.007
400B6	1	SENSOR T TC 1000°C E A 5VDC A M14 180° 150 mm	009.101.007	MULTRONIC	009.101.007
400B8	1	SENSOR T TC 1000°C E A 5VDC A M14 180° 150 mm	009.101.007	MULTRONIC	009.101.007
401B2	1	SENSOR DP P 35KPA E A 5VDC A 2XM6	009.102.001	MULTRONIC	009.102.001
401B6	1	SENSOR MAP 450KPA A A 5VDC A M12	009.106.001	MULTRONIC	009.106.001
402B6	1	SENSOR P P 1000KPA U A 5VDC A 2XM5	009.102.004	MULTRONIC	009.102.004
402B8	1	SENSOR L R 180 mm U P A BAYONET CN8B/JKA00479	009.103.005	MULTRONIC	009.103.005
403B8	1	SENSOR DP P 35KPA E A 5VDC A 2XM6	009.102.001	MULTRONIC	009.102.001
404B4	1	SENSOR P P 1000KPA D A 5VDC A M10	009.102.005	MULTRONIC	009.102.005
405B2	1	SENSOR NOx C 1500 ppm E A 24VDC C M20	009.105.001	MULTRONIC	009.105.001
405B6	1	SENSOR NOx C 1500 ppm E A 24VDC C M20	009.105.001	MULTRONIC	009.105.001
408M2	1	PUMP U 12/24V 70W BL 1/8" BSPG 1/8" BESPG IA	009.202.018	MULTRONIC	009.202.018
409M3	1	PUMP U G 24V 48W BL QC 7.89 QC 7.89 IA	009.202.010	MULTRONIC	009.202.010
411B3	1	UREA INJECTOR UREA COOLED B 9kg/h	009.201.002	MULTRONIC	009.201.002
411B4	1	DIESEL INJECTOR 4.5ml_sec QC 2x7.89 -0.6- BARB ASS	009.201.019	MULTRONIC	009.201.019
411B6	1	PUMP D G 24VDC 36W B 5/16" BARB IA	009.202.019	MULTRONIC	009.202.019
411B8	1	ELECTRICAL COIL 24V - 2 WIRES	009.204.002	MULTRONIC	009.204.002

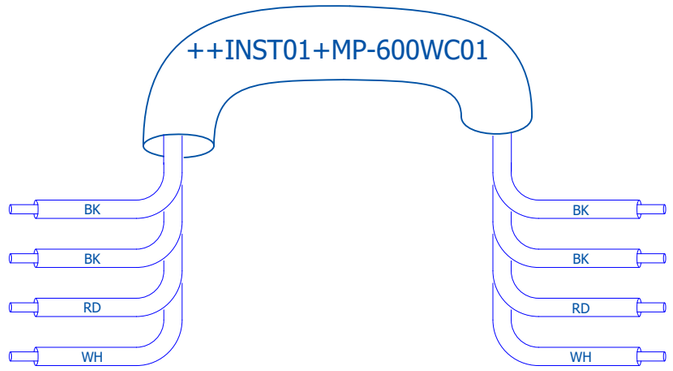
Cable Overview

Cable name	Source (from)	Target (to)	cable type	number of conductors	Conductors used	Cross-section [mm]	Length [m]	function text	Graphical page of cable diagram
+MP-600WC01	=HMI+MP-600WC01	+MP-X1			4				++INST01&CAB/2
		=CON+MP-450A0							
+MP-601WC01	=HMI+MP-601WC01	=CON+MP-X11			2				++INST01&CAB/3
+MP-601WC02	=HMI+MP-601WC02	=CON+MP-450A0			3				++INST01&CAB/4
+CAB-400WC01	=CON+MP-X10	=CON+CAB-400WC01	009.32Z.004	3	3	0,5			++INST01&CAB/5
+CAB-400WC02	=CON+MP-X10	=CON+CAB-400WC02	009.32Z.004	3	3	0,5mm²			++INST01&CAB/6
+CAB-400WC03	=CON+MP-X10	=CON+CAB-400WC03	009.32Z.004	3	3	0,5mm²			++INST01&CAB/7
+CAB-400WC04	=CON+MP-X10	=CON+CAB-400WC04	009.32Z.004	3	3	0,5mm²			++INST01&CAB/8
+CAB-401WC01	=CON+MP-X10	=CON+CAB-401WC01	009.32Z.003	3	3	0,5			++INST01&CAB/9
+CAB-401WC03	=CON+MP-X10	=CON+CAB-401WC03	009.32Z.014	4	4	0,5			++INST01&CAB/10
+CAB-402WC03	=CON+MP-X10	=CON+CAB-402WC03	009.32Z.002		3				++INST01&CAB/11
+CAB-402WC04	=CON+MP-X10	=CON+CAB-403WC01	009.32Z.009		4				++INST01&CAB/12
		=CON+CAB-402WC04							
+CAB-403WC03	=CON+MP-X10	=CON+CAB-403WC03	009.32Z.009	4	4	0,5			++INST01&CAB/13
+CAB-403WC04	=CON+MP-X10	=CON+CAB-403WC04	009.32Z.003	3	3	0,5			++INST01&CAB/14
+CAB-404WC02	=CON+MP-X10	=CON+CAB-404WC02	009.32Z.008	3	3	0,5			++INST01&CAB/15
+CAB-405WC01	=CON+MP-X11	=CON+CAB-405WC01	009.32Z.006	2X2	5	21			++INST01&CAB/16
+CAB-405WC03	=CON+MP-X11	=CON+CAB-405WC03	009.32Z.005	2X2	4	21			++INST01&CAB/17
+CAB-408WC01	=CON+MP-X12	=CON+CAB-408WC01	009.32Z.011	4	4	0,75			++INST01&CAB/18
+CAB-408WC03	=CON+MP-X12	=CON+CAB	009.32Z.012	3	3	0,5			++INST01&CAB/19
		=CON+CAB-408WC03							
+CAB-409WC02	=CON+MP-X12	=CON+CAB-408WC01	009.32Z.011	4	4	0,75			++INST01&CAB/20
+CAB-411WC01	=CON+MP-X13	=CON+CAB-411WC01	009.32Z.001	3	2	1,5			++INST01&CAB/21
+CAB-411WC02	=CON+MP-X13	=CON+CAB-411WC02	009.32Z.018	2	2	1,5			++INST01&CAB/22
+CAB-411WC03	=CON+MP-X13	=CON+CAB-411WC03	009.32Z.020	2	2	1,5			++INST01&CAB/23
+CAB-411WC04	=CON+MP-X13	=CON+CAB-411WC04	009.32Z.021	2	2	1,5			++INST01&CAB/24
+CUST-401WC02	=CON+MP-X10	=CON+CUST-401S4			2			PROVIDED BY CUSTOMER MINIMUM 2X1,5MM² SHIELDED	++INST01&CAB/25
+CUST-402WC05	=CON+MP-X10	=CON+CUST-402B2			2			USE J1939 COMPLIANT CABLE	++INST01&CAB/26
+CUST-413WC01	=CON+MP-X15	=CON+CUST-413S2			2			PROVIDED BY CUSTOMER 2X1,5MM²	++INST01&CAB/27
+CUST-413WC02	=CON+MP-452K6	=CON+CUST-413A5			2			=	++INST01&CAB/28
+CUST-1WP01	+MP-X0	+24VDC			3			PROVIDED BY CUSTOMER 3X10MM²	++INST01&CAB/29
	=ARR+MP-PE	0VDC							
		PE							

Cable diagram

no. of conductors | cable type | cross-section | function text

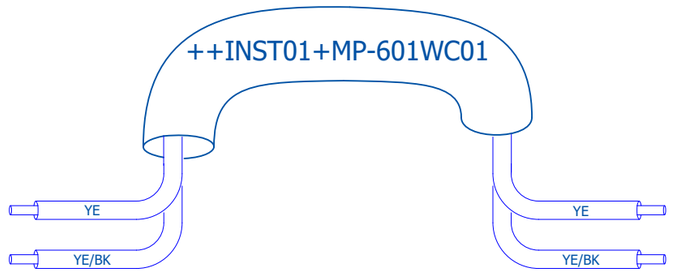
Length



Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP		&SCHEM/600.5	-600WC01:2	-X1:8	&SCHEM/2.4		+MP
=		&SCHEM/600.6	-600WC01:1	-X1:8	&SCHEM/2.4		=
=		&SCHEM/600.5	-600WC01:1	-X1:2	&SCHEM/451.0		=
=		&SCHEM/600.5	-600WC01:3	-450A0:50	&SCHEM/450.7		=

Cable diagram

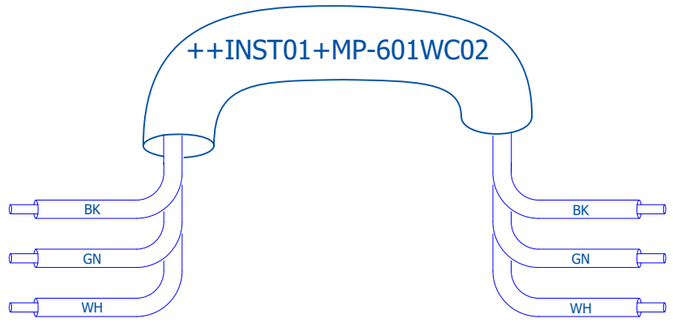
Mounting loc.	function text	X-Ref	Target designation from	no. of conductors	cable type	cross-section	function text	Target designation to	X-Ref	function text	Mounting loc.
						Length					
+MP		&SCHEM/601.1	-601WC01:4		YE			-X11:6:g	&SCHEM/405.8	NOX2H	+MP
=		&SCHEM/601.2	-601WC01:3		YE/BK			-X11:5:e	&SCHEM/405.6	NOX2L	=



Cable diagram

no. of conductors | cable type | cross-section | function text

Length

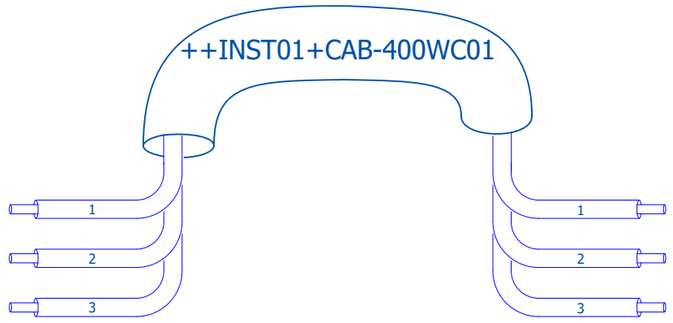


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP		&SCHEM/601.4	-601WC02:2	-450A0:42	&SCHEM/450.4		+MP
=		&SCHEM/601.4	-601WC02:3	-450A0:48	&SCHEM/450.6		=
=		&SCHEM/601.5	-601WC02:1	-450A0:49	&SCHEM/450.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.004	0,5 mm²	

Length

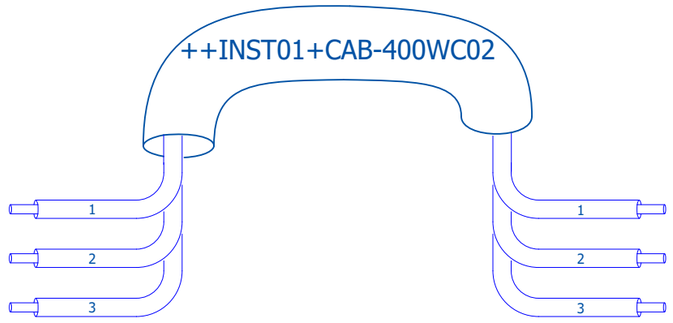


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/400.2	+MP-X10:3-:b	-400WC01:2	+MP&SCHEM/400.2		+CAB
=	+5V	+MP&SCHEM/400.2	+MP-X10:3+:a	-400WC01:1	+MP&SCHEM/400.2		=
=	T1	+MP&SCHEM/400.2	+MP-X10:3:f	-400WC01:3	+MP&SCHEM/400.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.004	0,5mm² mm²	

Length

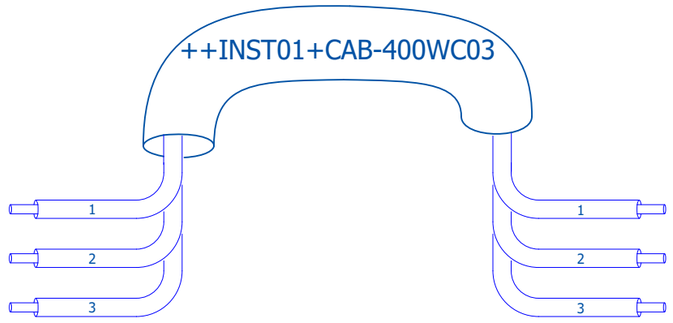


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/400.4	+MP-X10:4-:d	-400WC02:2	+MP&SCHEM/400.4		+CAB
=	+5V	+MP&SCHEM/400.4	+MP-X10:4+:c	-400WC02:1	+MP&SCHEM/400.4		=
=	T2	+MP&SCHEM/400.4	+MP-X10:4:h	-400WC02:3	+MP&SCHEM/400.4		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.004	0,5mm² mm²	

Length

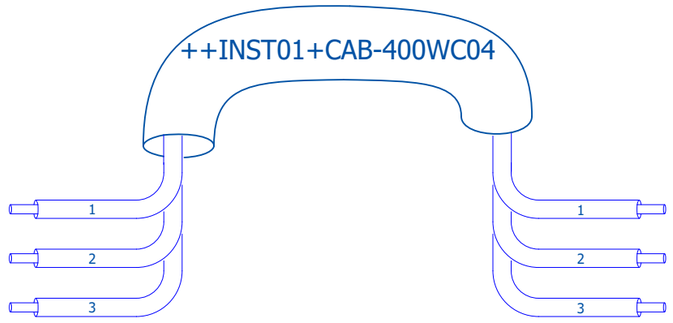


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/400.6	+MP-X10:5-:b	-400WC03:2	+MP&SCHEM/400.6		+CAB
=	+5V	+MP&SCHEM/400.6	+MP-X10:5+:a	-400WC03:1	+MP&SCHEM/400.6		=
=	T3	+MP&SCHEM/400.6	+MP-X10:5:f	-400WC03:3	+MP&SCHEM/400.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.004	0,5mm² mm²	

Length

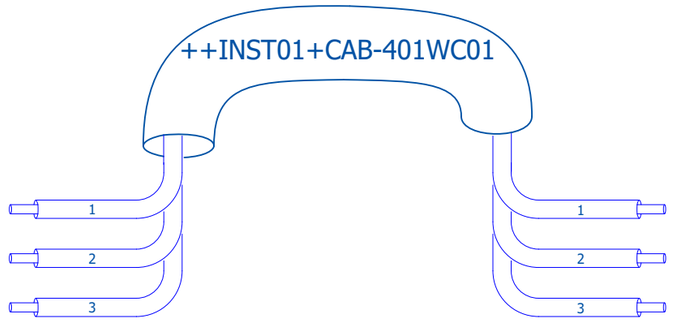


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/400.8	+MP-X10:6-:d	-400WC04:2	+MP&SCHEM/400.8		+CAB
=	+5V	+MP&SCHEM/400.8	+MP-X10:6+:c	-400WC04:1	+MP&SCHEM/400.8		=
=	T4	+MP&SCHEM/400.8	+MP-X10:6:h	-400WC04:3	+MP&SCHEM/400.8		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.003	0,5 mm²	

Length

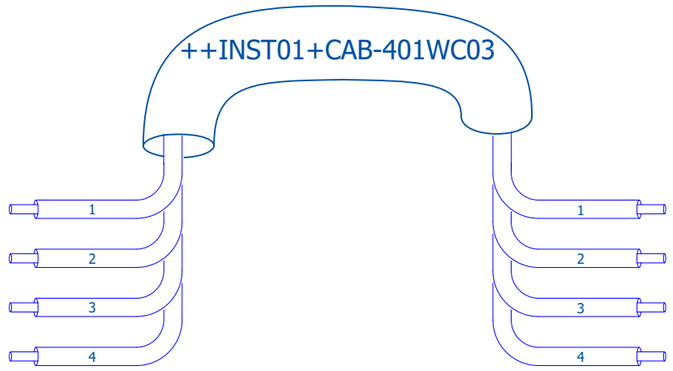


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/401.2	+MP-X10:7-:b	-401WC01:2	+MP&SCHEM/401.2		+CAB
=	+5V	+MP&SCHEM/401.2	+MP-X10:7+:a	-401WC01:1	+MP&SCHEM/401.2		=
=	PRESS 1	+MP&SCHEM/401.2	+MP-X10:7:f	-401WC01:3	+MP&SCHEM/401.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
4	009.32Z.014	0,5 mm²	

Length

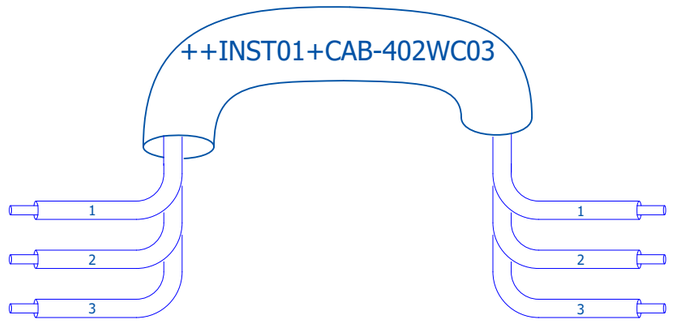


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/401.6	+MP-X10:9-:b	-401WC03:1	+MP&SCHEM/401.6		+CAB
=	+5V	+MP&SCHEM/401.6	+MP-X10:9+:a	-401WC03:4	+MP&SCHEM/401.6		=
=	MAP	+MP&SCHEM/401.6	+MP-X10:9:f	-401WC03:2	+MP&SCHEM/401.6		=
=	TIN	+MP&SCHEM/401.8	+MP-X10:10:h	-401WC03:3	+MP&SCHEM/401.8		=

Cable diagram

no. of conductors	cable type	cross-section	function text
	009.32Z.002		

Length

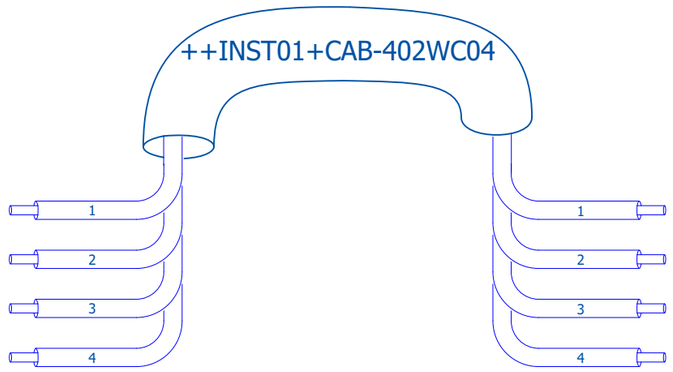


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/402.6	+MP-X10:15-:b	-402WC03:3	+MP&SCHEM/402.6		+CAB
=	+5V	+MP&SCHEM/402.6	+MP-X10:15+:a	-402WC03:1	+MP&SCHEM/402.6		=
=	PIU	+MP&SCHEM/402.6	+MP-X10:15:f	-402WC03:2	+MP&SCHEM/402.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
	009.32Z.009		

Length

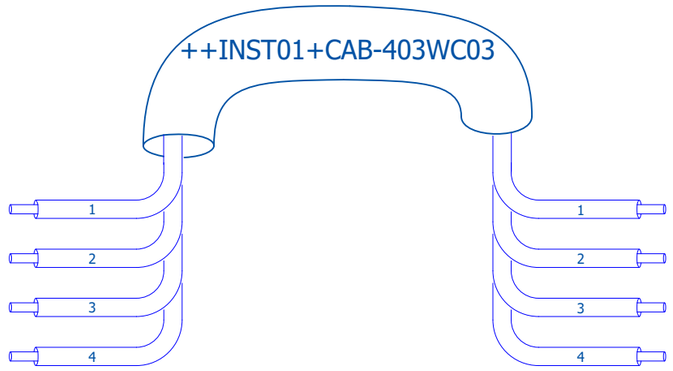


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/402.8	+MP-X10:16-:d	-402WC04:1	+MP&SCHEM/402.8		+CAB
=	=	+MP&SCHEM/403.2	+MP-X10:17-:b	-403WC01:3	+MP&SCHEM/403.2		=
=	L BUFFER	+MP&SCHEM/402.8	+MP-X10:16:h	-402WC04:2	+MP&SCHEM/402.8		=
=	T BUFFER	+MP&SCHEM/403.2	+MP-X10:17:f	-403WC01:4	+MP&SCHEM/403.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
4	009.32Z.009	0,5 mm²	

Length

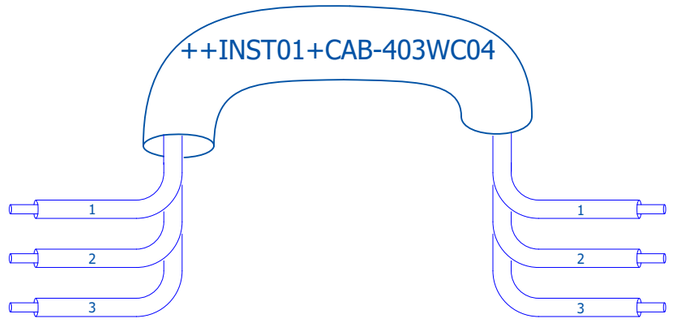


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/403.4	+MP-X10:18-:d	-403WC03:1	+MP&SCHEM/403.4		+CAB
=	=	+MP&SCHEM/403.6	+MP-X10:19-:b	-403WC03:3	+MP&SCHEM/403.6		=
=	L MAIN	+MP&SCHEM/403.4	+MP-X10:18:h	-403WC03:2	+MP&SCHEM/403.4		=
=	T MAIN	+MP&SCHEM/403.6	+MP-X10:19:f	-403WC03:4	+MP&SCHEM/403.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.003	0,5 mm²	

Length

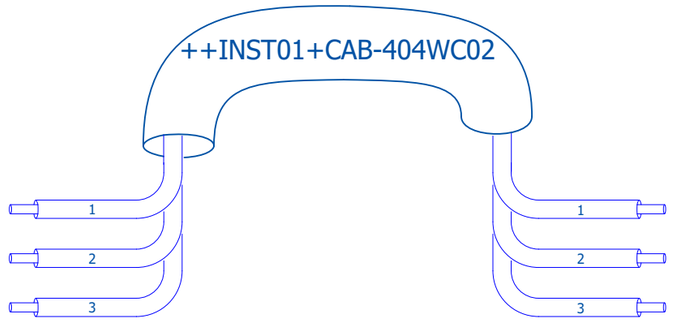


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/403.8	+MP-X10:20-:d	-403WC04:2	+MP&SCHEM/403.8		+CAB
=	+5V	+MP&SCHEM/403.8	+MP-X10:20+:c	-403WC04:1	+MP&SCHEM/403.8		=
=	PRESS 2	+MP&SCHEM/403.8	+MP-X10:20:h	-403WC04:3	+MP&SCHEM/403.8		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.008	0,5 mm²	

Length

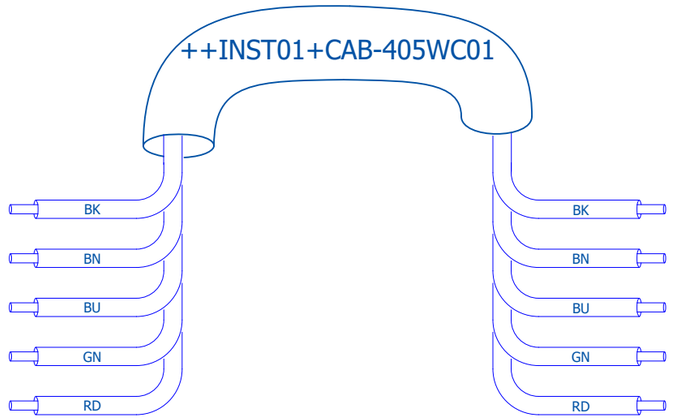


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	SENS GND	+MP&SCHEM/404.2	+MP-X10:21-:b	-404WC02:1	+MP&SCHEM/404.2		+CAB
=	+5V	+MP&SCHEM/404.2	+MP-X10:21+:a	-404WC02:3	+MP&SCHEM/404.2		=
=	PID	+MP&SCHEM/404.2	+MP-X10:21:f	-404WC02:2	+MP&SCHEM/404.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
2X2	009.32Z.006	21 AWG	

Length

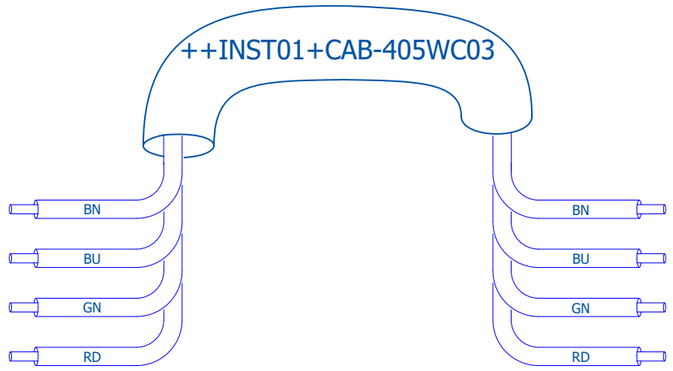


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	GND	+MP&SCHEM/405.2	+MP-X11:3-:b	-405WC01:5	+MP&SCHEM/405.4		+CAB
=	=	+MP&SCHEM/405.2	+MP-X11:3-:b	-405WC01:2	+MP&SCHEM/405.2		=
=	NOX1L	+MP&SCHEM/405.2	+MP-X11:3:f	-405WC01:3	+MP&SCHEM/405.2		=
=	NOX1H	+MP&SCHEM/405.4	+MP-X11:4:h	-405WC01:4	+MP&SCHEM/405.4		=
=	+24V	+MP&SCHEM/405.2	+MP-X11:3+:a	-405WC01:1	+MP&SCHEM/405.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
2X2	009.32Z.005	21 AWG	

Length

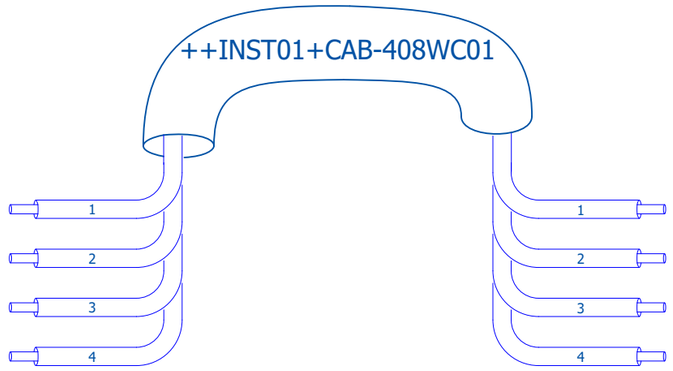


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	GND	+MP&SCHEM/405.6	+MP-X11:5-:b	-405WC03:2	+MP&SCHEM/405.6		+CAB
=	NOX2L	+MP&SCHEM/405.6	+MP-X11:5:f	-405WC03:3	+MP&SCHEM/405.6		=
=	NOX2H	+MP&SCHEM/405.8	+MP-X11:6:h	-405WC03:4	+MP&SCHEM/405.8		=
=	+24V	+MP&SCHEM/405.6	+MP-X11:5+:a	-405WC03:1	+MP&SCHEM/405.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
4	009.32Z.011	0,75 mm²	

Length

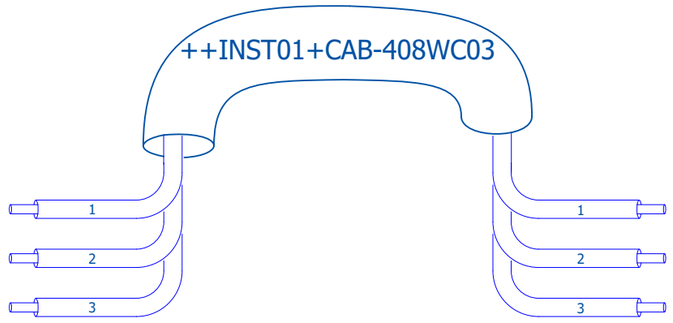


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	GND	+MP&SCHEM/408.2	+MP-X12:3-:b	-408WC01:1	+MP&SCHEM/408.2		+CAB
=	+24V	+MP&SCHEM/408.2	+MP-X12:3+:a	-408WC01:2	+MP&SCHEM/408.2		=
=	PRESS PUMP SPD	+MP&SCHEM/408.2	+MP-X12:3:f	-408WC01:3	+MP&SCHEM/408.2		=
=	PRESS PUMP DIR	+MP&SCHEM/408.4	+MP-X12:4:h	-408WC01:4	+MP&SCHEM/408.4		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.012	0,5 mm²	

Length

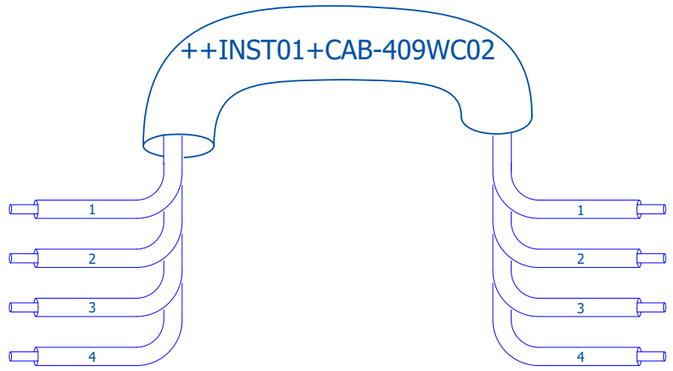


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	PRESS PUMP TACHO	+MP&SCHEM/408.6	+MP-X12:5:f	-408WC03:1	+MP&SCHEM/408.6		+CAB
=	PRESS PUMP FAULT1	+MP&SCHEM/408.8	+MP-X12:6:h	-408WC03:2	+MP&SCHEM/408.8		=
=	PRES PUMP FAULT 2	+MP&SCHEM/409.2	+MP-X12:7:f	3	+MP&SCHEM/409.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
4	009.32Z.011	0,75 mm²	

Length

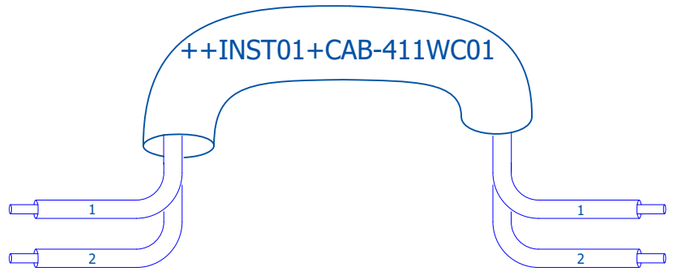


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	GND	+MP&SCHEM/409.4	+MP-X12:8-:d	-408WC01:1	+MP&SCHEM/409.4		+CAB
=	+24V	+MP&SCHEM/409.4	+MP-X12:8+:c	-408WC01:2	+MP&SCHEM/409.4		=
=	DEL PUMP SPD	+MP&SCHEM/409.4	+MP-X12:8:h	-408WC01:3	+MP&SCHEM/409.4		=
=	DEL PUMP DIR	+MP&SCHEM/409.6	+MP-X12:9:f	-408WC01:5	+MP&SCHEM/409.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
3	009.32Z.001	1,5 mm²	

Length

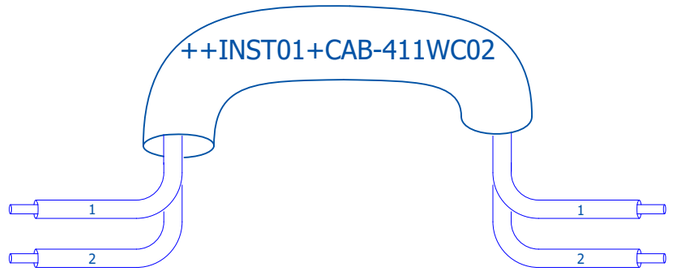


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	UREA1-	+MP&SCHEM/411.2	+MP-X13:4	-411WC01:2	+MP&SCHEM/411.2		+CAB
=	UREA1+	+MP&SCHEM/411.2	+MP-X13:3	-411WC01:1	+MP&SCHEM/411.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
2	009.32Z.018	1,5 mm²	

Length

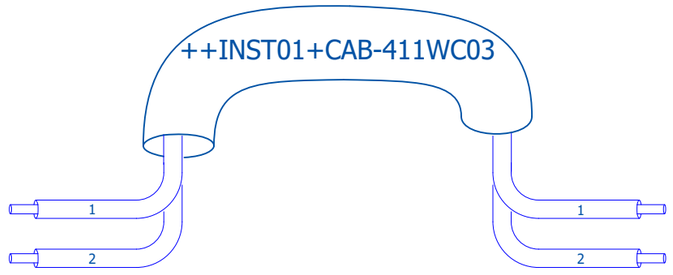


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	UREA2-/DIESEL INJ -	+MP&SCHEM/411.4	+MP-X13:6	-411WC02:3	+MP&SCHEM/411.4		+CAB
=	UREA2+/DIESEL INJ+	+MP&SCHEM/411.4	+MP-X13:5	-411WC02:4	+MP&SCHEM/411.4		=

Cable diagram

no. of conductors	cable type	cross-section	function text
2	009.32Z.020	1,5 mm²	

Length

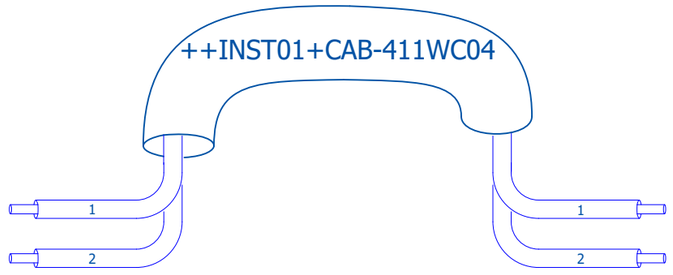


Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	DIESELPUMP+	+MP&SCHEM/411.6	+MP-X13:7	-411WC03:3	+MP&SCHEM/411.6		+CAB
=	DIESELPUMP-	+MP&SCHEM/411.6	+MP-X13:8	-411WC03:1	+MP&SCHEM/411.6		=

Cable diagram

no. of conductors	cable type	cross-section	function text
2	009.32Z.021	1,5 mm²	

Length



Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	DIESELVALVE+	+MP&SCHEM/411.8	+MP-X13:9	-411WC04:2	+MP&SCHEM/411.8		+CAB
=	DIESELVALVE-	+MP&SCHEM/411.8	+MP-X13:10	-411WC04:1	+MP&SCHEM/411.8		=

Cable diagram

no. of conductors

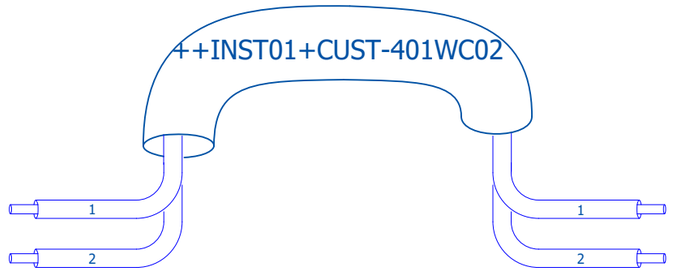
cable type

cross-section

function text

PROVIDED BY CUSTOMER MINIMUM 2X1,5MM² SHIELDED

Length



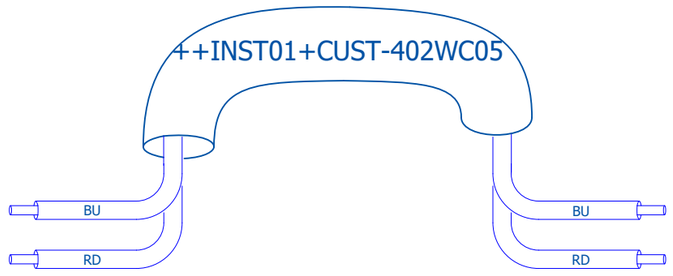
Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	+5V	+MP&SCHEM/401.4	+MP-X10:8+:c	-401S4:13	+MP&SCHEM/401.4	RPM MOTOR	+CUST
=	SENS GND	+MP&SCHEM/401.4	+MP-X10:8-:d	-401S4:14	+MP&SCHEM/401.4	=	=

Cable diagram

no. of conductors | cable type | cross-section | function text

USE J1939 COMPLIANT CABLE

Length



Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	CAN1L	+MP&SCHEM/402.2	+MP-X10:11:f	-402B2:CAN L	+MP&SCHEM/402.2		+CUST
=	CAN1H	+MP&SCHEM/402.4	+MP-X10:12:h	-402B2:CAN H	+MP&SCHEM/402.4		=

Cable diagram

no. of conductors

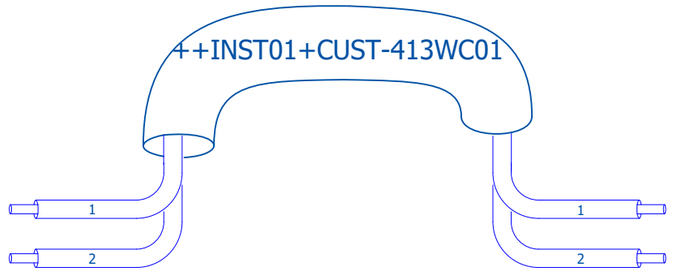
cable type

cross-section

function text

PROVIDED BY CUSTOMER 2X1,5MM²

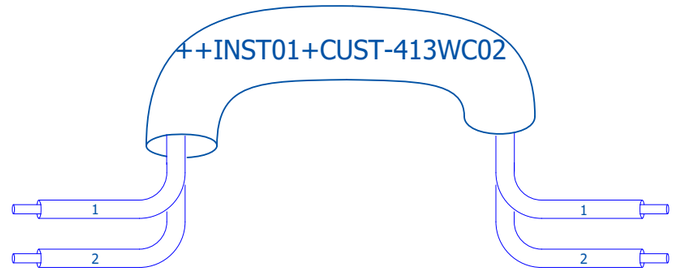
Length



Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	EM 1	+MP&SCHEM/413.2	+MP-X15:1	-413S2:11	+MP&SCHEM/413.2		+CUST
=	EM 2	+MP&SCHEM/413.3	+MP-X15:2	-413S2:12	+MP&SCHEM/413.2		=

Cable diagram

no. of conductors	cable type	cross-section	function text
			PROVIDED BY CUSTOMER 2X1,5MM²
		Length	



Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP		+MP&SCHEM/413.4	+MP-452K6:11	-413A5:1	+MP&SCHEM/413.4		+CUST
=		+MP&SCHEM/413.4	+MP-452K6:14	-413A5:1	+MP&SCHEM/413.4		=

Cable diagram

no. of conductors

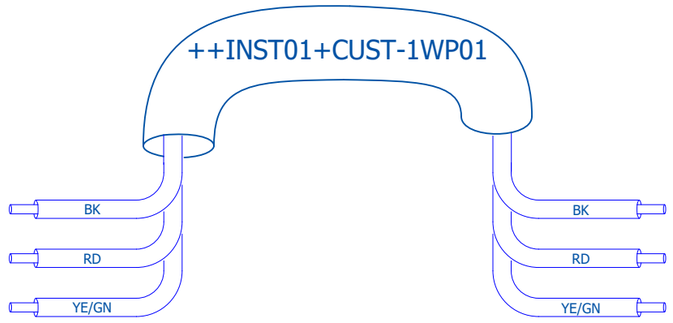
cable type

cross-section

function text

PROVIDED BY CUSTOMER 3X10MM²

Length



Mounting loc.	function text	X-Ref	Target designation from	Target designation to	X-Ref	function text	Mounting loc.
+MP	MAIN-	+MP&SCHEM/1.1	+MP-X0:2	0VDC	+MP&SCHEM/1.1		
=	MAIN+	+MP&SCHEM/1.1	+MP-X0:1	+24VDC	+MP&SCHEM/1.1		
=		+MP&SCHEM/1.1	+MP-PE	PE	+MP&SCHEM/1.1		

Terminal strip overview

terminal strip	Terminal strip definition text	Terminals					Graphic page from the terminal connection list
		first	last	Total PE	Total N	Total number	
+MP-X0	INCOMING SUPPLY	1	2	0	0	2	++INST01&TER/100
+MP-X1	TERMINAL 1	1	15	0	0	16	++INST01&TER/101
+MP-X10	SENSOR INTERFACE	1+	21-	0	0	63	++INST01&TER/102
+MP-X11	CANBUS TERMINALS	1+	8-	0	0	24	++INST01&TER/104
+MP-X12	TERMINAL STRIPS AUS PUMPS	1+	12-	0	0	36	++INST01&TER/105
+MP-X13	TERMINALS OTHER ACTUATORS	1	12	0	0	12	++INST01&TER/107
+MP-X15	EMERGENCY STOP	1	2	0	0	2	++INST01&TER/108

Cable Overview

function text								+CUST+CUST-1WP01	Cable name	Strip ++INST01+MP-X0 INCOMING SUPPLY Target designation	Connection point	terminal	jumper	Target designation	Connection point	Cable name									Page / column	Type number
									cable type							cable type										
MAIN+								RD		+24VDC		1		-2F1	2										&SCHEM/1.1	2010-1201
MAIN-								BK		0VDC		2		-2F1	4										&SCHEM/1.1	2010-1201

Cable Overview

function text	+MP-600WC01	Cable name	Target designation	Strip ++INST01+MP-X1 TERMINAL 1 Connection point	terminal	jumper	Target designation	Connection point	Cable name	+MP-600WC01	Page / column	Type number
		cable type							cable type			
			-X10	1+:g	1		-450A0	2			&SCHEM/451.0	2002-1401
			-X10	13+:g								
			-451R0	x1	2		-600WC01	1		RD	&SCHEM/451.0	2002-1401
			-452K3	11	3		-451R0	x2			&SCHEM/451.1	2002-1401
			-451R2	x1	3'						&SCHEM/451.1	2002-1401
			-X10	2-:e	4		-451R2	x2			&SCHEM/451.2	2002-1401
			-450A0	1								
			-X10	14-:e								
			-450A0	52	5		-2F3	2			&SCHEM/2.3	2002-1401
			-452K6	A1								
			-452K1	A1								
			-452K2	A1	6						&SCHEM/2.3	2002-1401
			-600A0	+								
			-452K3	A1								
			-452K4	A1	7						&SCHEM/2.3	2002-1401
			-450A0	47	8		-2F3	4			&SCHEM/2.4	2002-1401
		BK	-600WC01	2								
		BK	-600WC01	1								
			-600A0	-								
					9		-2F5	4			&SCHEM/2.6	2006-1301
			-450A0	27	10		-X12	2-:e			&SCHEM/2.6	2004-1401
			-X11	2-:e								
			-450A0	28								
			-450A0	55	11		-452K4	11			&SCHEM/2.6	2004-1401
			-450A0	56								
			-X12	1+:g	12		-450A0	10			&SCHEM/451.4	2006-1301
			-X13	5								
			-X11	1+:g	13						&SCHEM/451.4	2006-1301
			-452K5	14								
			-452K5	11	14		-2F5	2			&SCHEM/2.5	2006-1301
			-X15	1	15		-450A0	51			&SCHEM/2.5	2004-1301

Cable Overview

function text	+CUST+CUST-402WC05	+CAB+CAB-401WC03	+CUST+CUST-401WC02	+CAB+CAB-401WC01	+CAB+CAB-400WC04	+CAB+CAB-400WC03	+CAB+CAB-400WC02	+CAB+CAB-400WC01	Cable name	Strip ++INST01+MP-X10 SENSOR INTERFACE: Target designation	Connection point	terminal	jumper	Target designation	Connection point	Cable name	Page / column	Type number
		009.32Z.014		009.32Z.003	009.32Z.004	009.32Z.004	009.32Z.004	009.32Z.004	cable type							cable type		
SCR1+												1+		-X1	1		&SCHEM/400.1	
												1+					&SCHEM/400.0	
												1+					&SCHEM/400.0	2000-5372/1102-953
SCR1-												2-		-X1	4		&SCHEM/400.1	
												2-					&SCHEM/400.1	
												2-					&SCHEM/400.1	
T1								3		+CAB-400WC01	3	3		-450A0	32		&SCHEM/400.2	2000-5311
+5V								2		+CAB-400WC01	1	3+					&SCHEM/400.2	
SENS GND								1		+CAB-400WC01	2	3-					&SCHEM/400.2	
T2							3			+CAB-400WC02	3	4		-450A0	31		&SCHEM/400.4	
+5V							2			+CAB-400WC02	1	4+					&SCHEM/400.4	
SENS GND							1			+CAB-400WC02	2	4-					&SCHEM/400.4	
T3						3				+CAB-400WC03	3	5		-450A0	30		&SCHEM/400.6	2000-5311
+5V						2				+CAB-400WC03	1	5+					&SCHEM/400.6	
SENS GND						1				+CAB-400WC03	2	5-					&SCHEM/400.6	
T4					3					+CAB-400WC04	3	6		-450A0	29		&SCHEM/400.8	
+5V					2					+CAB-400WC04	1	6+					&SCHEM/400.8	
SENS GND					1					+CAB-400WC04	2	6-					&SCHEM/400.8	
PRESS 1				3						+CAB-401WC01	3	7		-450A0	6		&SCHEM/401.2	2000-5311
+5V				2						+CAB-401WC01	1	7+					&SCHEM/401.2	
SENS GND				1						+CAB-401WC01	2	7-					&SCHEM/401.2	
RPM												8		-450A0	45		&SCHEM/401.4	
+5V			1							+CUST-401S4	13	8+					&SCHEM/401.4	
SENS GND			2							+CUST-401S4	14	8-					&SCHEM/401.4	
MAP		3								+CAB-401WC03	2	9		-450A0	3		&SCHEM/401.6	2000-5311
+5V		2								+CAB-401WC03	4	9+					&SCHEM/401.6	
SENS GND		1								+CAB-401WC03	1	9-					&SCHEM/401.6	
TIN		4								+CAB-401WC03	3	10		-450A0	37		&SCHEM/401.8	
+5V												10+					&SCHEM/401.8	
SENS GND												10-					&SCHEM/401.8	
CAN1L	BU									+CUST-402B2	CAN L	11		-450A0	11		&SCHEM/402.2	2000-5311
+5V												11+					&SCHEM/402.2	
SENS GND												11-					&SCHEM/402.2	
CAN1H	RD									+CUST-402B2	CAN H	12		-450A0	12		&SCHEM/402.4	

Cable Overview

function text				+CAB+CAB-404WC02	+CAB+CAB-403WC04	+CAB+CAB-403WC03	+CAB+CAB-402WC04	+CAB+CAB-402WC03	Cable name	Target designation	Strip ++INST01+MP-X10 SENSOR INTERFACE Connection point	terminal	jumper	Target designation	Connection point	Cable name								Page / column	Type number
				009.32Z.008	009.32Z.003	009.32Z.009	009.32Z.009	009.32Z.002	cable type							cable type									
+5V												12+												&SCHEM/402.4	
SENS GND												12-												&SCHEM/402.4	
SCR2+												13+		-X1	1									&SCHEM/402.5	
												13+												&SCHEM/402.5	
												13+												&SCHEM/402.4	2000-5372/1102-953
SCR2-												14-		-X1	4									&SCHEM/402.5	
												14-												&SCHEM/402.5	
												14-												&SCHEM/402.5	
PIU								3		+CAB-402WC03	2	15		-450A0	5									&SCHEM/402.6	2000-5311
+5V								2		+CAB-402WC03	1	15+												&SCHEM/402.6	
SENS GND								1		+CAB-402WC03	3	15-												&SCHEM/402.6	
L BUFFER							3			+CAB-402WC04	2	16		-452K1	12									&SCHEM/402.8	
+5V												16+												&SCHEM/402.8	
SENS GND							1			+CAB-402WC04	1	16-												&SCHEM/402.8	
T BUFFER							4			+CAB-403WC01	4	17		-452K1	22									&SCHEM/403.2	2000-5311
+5V												17+												&SCHEM/403.2	
SENS GND							2			+CAB-403WC01	3	17-												&SCHEM/403.2	
L MAIN						3				+CAB-403WC03	2	18		-452K1	14									&SCHEM/403.4	
+5V												18+												&SCHEM/403.4	
SENS GND						1				+CAB-403WC03	1	18-												&SCHEM/403.4	
T MAIN						4				+CAB-403WC03	4	19		-452K1	24									&SCHEM/403.6	2000-5311
+5V												19+												&SCHEM/403.6	
SENS GND						2				+CAB-403WC03	3	19-												&SCHEM/403.6	
PRESS 2					3					+CAB-403WC04	3	20		-450A0	7									&SCHEM/403.8	
+5V					2					+CAB-403WC04	1	20+												&SCHEM/403.8	
SENS GND					1					+CAB-403WC04	2	20-												&SCHEM/403.8	
PID				3						+CAB-404WC02	2	21		-450A0	4									&SCHEM/404.2	2000-5311
+5V				2						+CAB-404WC02	3	21+												&SCHEM/404.2	
SENS GND				1						+CAB-404WC02	1	21-												&SCHEM/404.2	

Cable Overview

function text							+CAB+CAB-405WC03	+CAB+CAB-405WC01	Cable name	Target designation	Strip ++INST01+MP-X11 CANBUS TERMINALS Connection point	terminal	jumper	Target designation	Connection point	Cable name	+MP-601WC01								Page / column	Type number
							009.322.005	009.322.006	cable type							cable type											
CANBUS+												1+		-X1	13											&SCHEM/405.1	
												1+														&SCHEM/405.0	
												1+														&SCHEM/405.0	2000-5372/1102-953
CANBUS-												2-		-X1	10											&SCHEM/405.1	
												2-														&SCHEM/405.1	
												2-														&SCHEM/405.1	
NOX1L								BU		+CAB-405WC01	3	3		-450A0	40											&SCHEM/405.2	2000-5311
+24V								RD		+CAB-405WC01	1	3+														&SCHEM/405.2	
GND								BN		+CAB-405WC01	2	3-														&SCHEM/405.2	
								BK		+CAB-405WC01	5																
NOX1H								GN		+CAB-405WC01	4	4		-450A0	41											&SCHEM/405.4	
+24V												4+														&SCHEM/405.4	
GND												4-														&SCHEM/405.4	
NOX2L							BU			+CAB-405WC03	3	5		-601WC01	3		YE/BK									&SCHEM/405.6	2000-5311
+24V							RD			+CAB-405WC03	1	5+														&SCHEM/405.6	
GND							BN			+CAB-405WC03	2	5-														&SCHEM/405.6	
NOX2H							GN			+CAB-405WC03	4	6		-601WC01	4		YE									&SCHEM/405.8	
+24V												6+														&SCHEM/405.8	
GND												6-														&SCHEM/405.8	
AUX CANBUS L										-406R3	x1	7		-600A0	CANL											&SCHEM/406.2	2000-5311
+24V												7+														&SCHEM/406.2	
GND												7-														&SCHEM/406.2	
AUX CANBUS H										-406R3	x2	8		-600A0	CANH											&SCHEM/406.4	
+24V												8+														&SCHEM/406.4	
GND												8-														&SCHEM/406.4	

Cable Overview

Strip
++INST01+MP-X12
TERMINAL STRIPS AUS PUMPS

function text	+CAB+CAB-409WC02	+CAB+CAB-408WC03	+CAB+CAB-408WC01	Cable name	Target designation	Connection point	terminal	jumper	Target designation	Connection point	Cable name	Page / column	Type number
	009.32Z.011	009.32Z.012	009.32Z.011	cable type							cable type		
PUMPSSCR+							1+		-X1	12		&SCHEM/408.1	
							1+					&SCHEM/408.0	
							1+					&SCHEM/408.0	2000-5372/1102-953
PUMPSSCR-							2-		-X1	10		&SCHEM/408.1	
							2-					&SCHEM/408.1	
							2-					&SCHEM/408.1	
PRESS PUMP SPD			3		+CAB-408WC01	3	3		-450A0	16		&SCHEM/408.2	2000-5311
+24V			2		+CAB-408WC01	2	3+					&SCHEM/408.2	
GND			1		+CAB-408WC01	1	3-					&SCHEM/408.2	
PRESS PUMP DIR			4		+CAB-408WC01	4	4		-450A0	23		&SCHEM/408.4	
+24V							4+					&SCHEM/408.4	
GND							4-					&SCHEM/408.4	
PRESS PUMP TACHO		1			+CAB-408WC03	1	5		-452K2	12		&SCHEM/408.6	2000-5311
+24V							5+					&SCHEM/408.6	
GND							5-					&SCHEM/408.6	
PRESS PUMP FAULT1		2			+CAB-408WC03	2	6		-452K2	22		&SCHEM/408.8	
+24V							6+					&SCHEM/408.8	
GND							6-					&SCHEM/408.8	
PRES PUMP FAULT 2		3			+CAB	3	7					&SCHEM/409.2	2000-5311
+24V							7+					&SCHEM/409.2	
GND							7-					&SCHEM/409.2	
DEL PUMP SPD	3				+CAB-408WC01	3	8		-452K3	12		&SCHEM/409.4	
+24V	2				+CAB-408WC01	2	8+					&SCHEM/409.4	
GND	1				+CAB-408WC01	1	8-					&SCHEM/409.4	
DEL PUMP DIR	4				+CAB-408WC01	5	9					&SCHEM/409.6	2000-5311
+24V							9+					&SCHEM/409.6	
GND							9-					&SCHEM/409.6	
DEL PUMP TACHO							10		-452K2	14		&SCHEM/409.8	
+24V							10+					&SCHEM/409.8	
GND							10-					&SCHEM/409.8	
DEL PUMP FAULT 1							11		-452K2	24		&SCHEM/410.2	2000-5311
+24V							11+					&SCHEM/410.2	
GND							11-					&SCHEM/410.2	
DEL PUMP FAULT 2							12					&SCHEM/410.4	

Cable Overview

function text									Cable name	Target designation	Strip ++INST01+MP-X12 TERMINAL STRIPS AUS PUMPS Connection point	terminal	jumper	Target designation	Connection point	Cable name									Page / column	Type number
									cable type							cable type											
+24V												12+													&SCHEM/410.4	
GND												12-													&SCHEM/410.4	

Cable Overview

function text					+CAB+CAB-411WC04	+CAB+CAB-411WC03	+CAB+CAB-411WC02	+CAB+CAB-411WC01	Cable name	Target designation	Connection point	Strip ++INST01+MP-X13 TERMINALS OTHER ACTUATORS terminal	jumper	Target designation	Connection point	Cable name	+CAB+CAB-411WC02								Page / column	Type number
					009.32Z.021	009.32Z.020	009.32Z.018	009.32Z.001	cable type							cable type	009.32Z.018									
UREA VALVE+												1													&SCHEM/411.0	2002-1401
UREA VALVE-												2		-452K4	14										&SCHEM/411.1	2002-1401
UREA1+								2		+CAB-411WC01	1	3													&SCHEM/411.2	2002-1201
UREA1-								1		+CAB-411WC01	2	4		-450A0	25										&SCHEM/411.2	2002-1301
														-450A0	53											
UREA2+/DIESEL INJ+							2			+CAB-411WC02	4	5		-X1	12										&SCHEM/411.4	2002-1201
UREA2-/DIESEL INJ -										-450A0	26	6		+CAB-411WC02	3		1								&SCHEM/411.4	2002-1302
										-450A0	54															
DIESELPUMP+						1				+CAB-411WC03	3	7													&SCHEM/411.6	2002-1201
DIESELPUMP-						2				+CAB-411WC03	1	8		-450A0	20										&SCHEM/411.6	2002-1201
DIESELVALVE+					1					+CAB-411WC04	2	9													&SCHEM/411.8	2002-1201
DIESELVALVE-					2					+CAB-411WC04	1	10		-450A0	21										&SCHEM/411.8	2002-1201
EXHAUST HEATER+												11													&SCHEM/412.2	2002-1201
EXHAUST HEATER-												12		-450A0	44										&SCHEM/412.2	2002-1201

Cable Overview

function text								+CUST+CUST-413WC01	Cable name	Target designation	Strip ++INST01+MP-X15 EMERGENCY STOP Connection point	terminal	jumper	Target designation	Connection point	Cable name									Page / column	Type number
									cable type							cable type											
EM 1								1		+CUST-413S2	11	1		-X1	15											&SCHEM/413.2	2004-1201
EM 2								2		+CUST-413S2	12	2		-452K5	A1											&SCHEM/413.3	2004-1201

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