Promethean Particles®

Pilot-scale System Fabrication, Sorbent Production and Site Integration

CCUS Innovation 2.0

Key Knowledge Deliverable 3.3

May 2025

Key Knowledge Deliverable Cover Sheet

This Key Knowledge Deliverable (KKD) has been produced by Promethean Particles Ltd. as part of the Department for Energy Security and Net Zero £1bn Net Zero Innovation Portfolio (NZIP) - CCUS Innovation 2.0 programme. The document is reflective of the status of the project at the time of writing. The material presented could have been subject to change as the project matured. These documents should not be considered a full representation of the final project.

Summary of KKD D3.3 – Build of CCS Rig

This deliverable report demonstrates the successful build of the MONET testing unit, through a variety of post-construction verification checks and factory acceptance testing (FAT) evidence.

Final output will be documents demonstrating the successful build of the rig, including test data demonstrating theoretical operation in line with design specification, and detailing a plan for Drax integration.

KKDs to be released in full:

D6.4 - Marketing Material Creation

D6.5 - Conference Presentations and Trade-Show Exhibitions

KKDs to be released after redaction:

D3.2 - Control and Safety System Manufacturing

D3.3 - Build of Capture Rig

D4.1 - Installation of Capture Rig

D4.3 - Rig Operation and Decommissioning

D5.1 - CAPEX Technoeconomic Analysis (TEA)

D5.2 - OPEX TEA

D5.3 - Life Cycle Analysis (LCA)

D6.6 - Stakeholder Analysis

Contents

Attached Documents Annex List

All installation and verification operations were conducted by outsourced external contractors. The details of each contractor has been redacted from the appendices below. Instrument verification check documents are proceeded by a cover sheet indicating that the tests have been completed. An excerpt from the testing has been included in each appendix for reference.

Appendix 1 - D3.3 MONET Equipment Verification Checks

Appendix 2 - D3.3 MONET Instrument Verification Checks

Appendix 3 - D3.3 MONET Piping Verification Checks

Appendix 4 - D3.3 MONET Cable Installation Sheet 1

Appendix 5 - D3.3 MONET Cable Installation Sheet 2

Appendix 6 - D3.3 MONET Cable Installation Sheet 3

Appendix 7 - D3.3 MONET Pipework Conformity Certificate

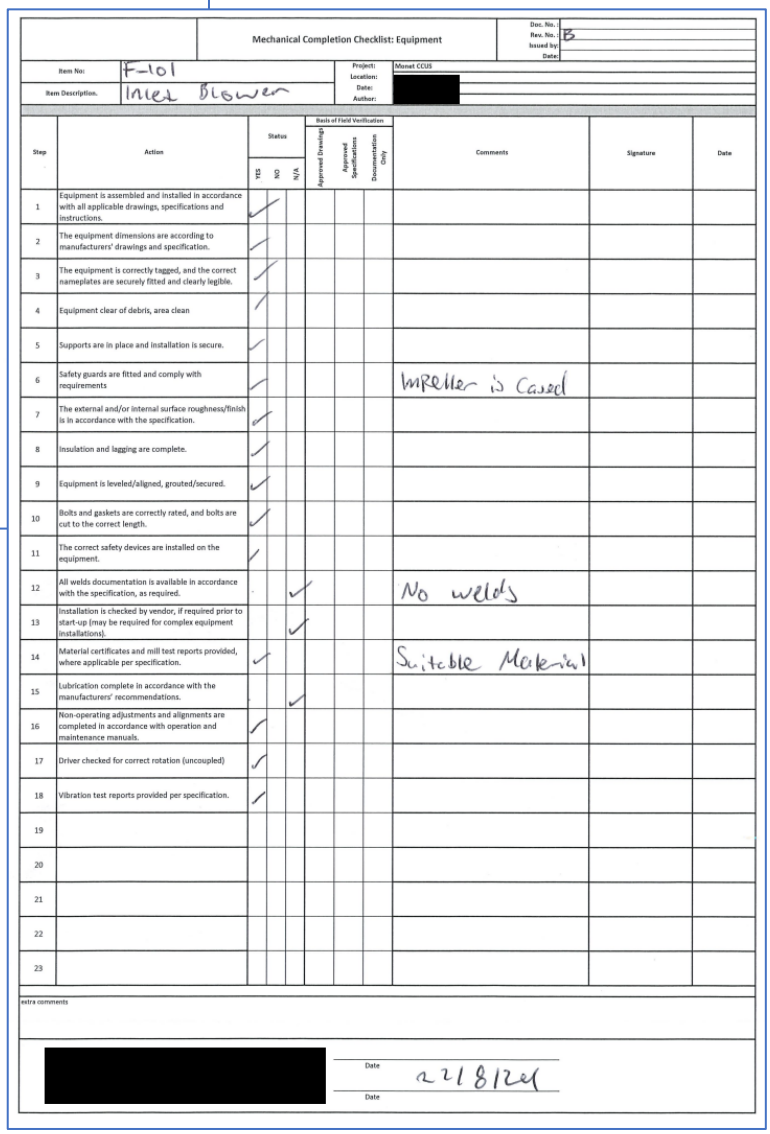
Appendix 8 - D3.3 MONET Hydrostatic Testing

Appendix 9 - D3.3 MONET Completed FAT Procedure

Appendix 1 - D3.3 MONET Equipment Verification Checks

PrometheanParticles
Nanomaterials reimagined

COMPLETED EQUIPMENT VERIFICATION



Mechanical Completion Checklist: Equipment

Doc. No.:
Rev. No.: B
Issued by:
Date:

Item No: F-101
Item Description: Inlet Blower

Project: Monet CCUS
Location:
Date: [redacted]
Author:

Step	Action	Status: YES	Status: NO	Status: N/A	Basis of Field Verification: Approved Drawings	Basis of Field Verification: Approved Specifications	Basis of Field Verification: Documentation Only	Comments	Signature	Date
1	Equipment is assembled and installed in accordance with all applicable drawings, specifications and instructions.	✓								
2	The equipment dimensions are according to manufacturers' drawings and specification.	✓								
3	The equipment is correctly tagged, and the correct nameplates are securely fitted and clearly legible.	✓								
4	Equipment clear of debris, area clean	✓								
5	Supports are in place and installation is secure.	✓								
6	Safety guards are fitted and comply with requirements	✓						Impeller is Cased		
7	The external and/or internal surface roughness/finish is in accordance with the specification.	✓								
8	Insulation and lagging are complete.	✓								
9	Equipment is leveled/aligned, grouted/secured.	✓								
10	Bolts and gaskets are correctly rated, and bolts are cut to the correct length.	✓								
11	The correct safety devices are installed on the equipment.	✓								
12	All welds documentation is available in accordance with the specification, as required.			✓				No welds		
13	Installation is checked by vendor, if required prior to start-up (may be required for complex equipment installations).			✓						
14	Material certificates and mill test reports provided, where applicable per specification.	✓						Suitable Material		
15	Lubrication complete in accordance with the manufacturers' recommendations.			✓						
16	Non-operating adjustments and alignments are completed in accordance with operation and maintenance manuals.	✓								
17	Driver checked for correct rotation (uncoupled)	✓								
18	Vibration test reports provided per specification.	✓								
19										
20										
21										
22										
23										

extra comments

[redacted]

Date 22/8/24

Date

Appendix 2 – D3.3 MONET Instrument Verification Checks

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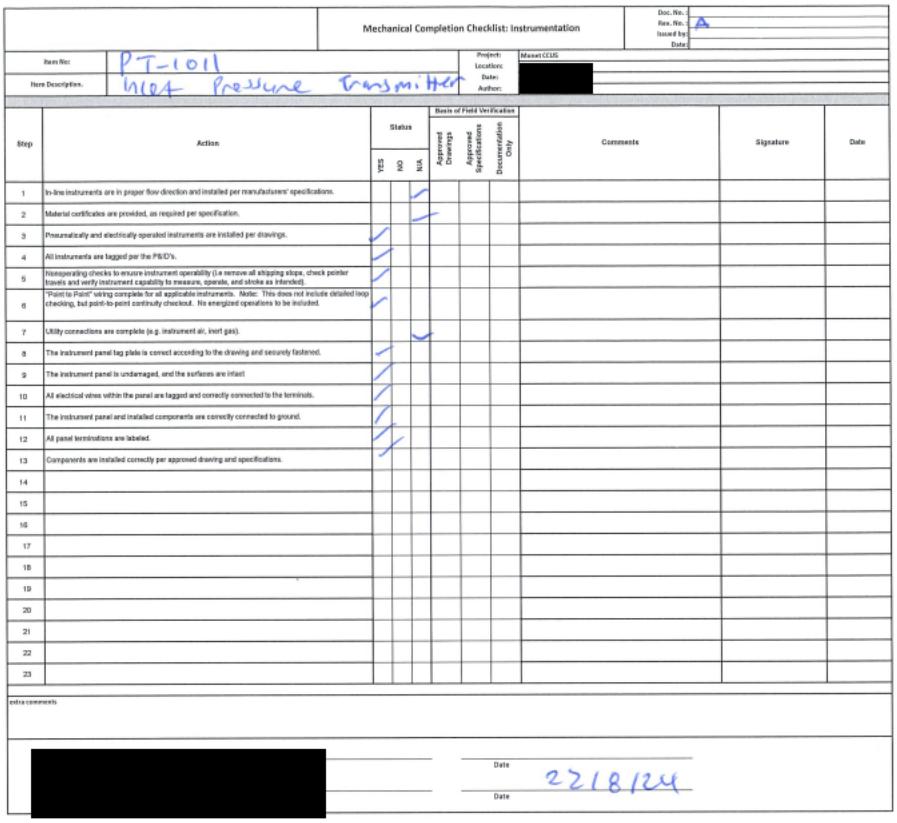
Nanomaterials **reimagined**

COMPLETED INSTRUMENT VERIFICATION



Mechanical Completion Checklist: Instrumentation

Doc. No.:
Rev. No.: A
Issued by:
Date:

Item No: PT-101
Item Description: Inlet Pressure Transmitter
Project:
Location:
Date:
Author: [redacted]

Step	Action	Status			Basis of Field Verification			Comments	Signature	Date
		YES	NO	N/A	Approved Drawings	Approved Specifications	Documentation Only			
1	In-line instruments are in proper flow direction and installed per manufacturers' specifications.			✓						
2	Material certificates are provided, as required per specification.			✓						
3	Pneumatically and electrically operated instruments are installed per drawings.	✓								
4	All instruments are tagged per the P&ID's.	✓								
5	Nonoperating checks to ensure instrument operability (i.e remove all shipping stops, check pointer travels and verify instrument capability to measure, operate, and stroke as intended).	✓								
6	"Point to Point" wiring complete for all applicable instruments. Note: This does not include detailed loop checking, but point-to-point continuity checkout. No energized operations to be included.	✓								
7	Utility connections are complete (e.g. instrument air, inert gas).			✓						
8	The instrument panel tag plate is correct according to the drawing and securely fastened.	✓								
9	The instrument panel is undamaged, and the surfaces are intact	✓								
10	All electrical wires within the panel are tagged and correctly connected to the terminals.	✓								
11	The instrument panel and installed components are correctly connected to ground.	✓								
12	All panel terminations are labeled.	✓	✓							
13	Components are installed correctly per approved drawing and specifications.									
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										

extra comments

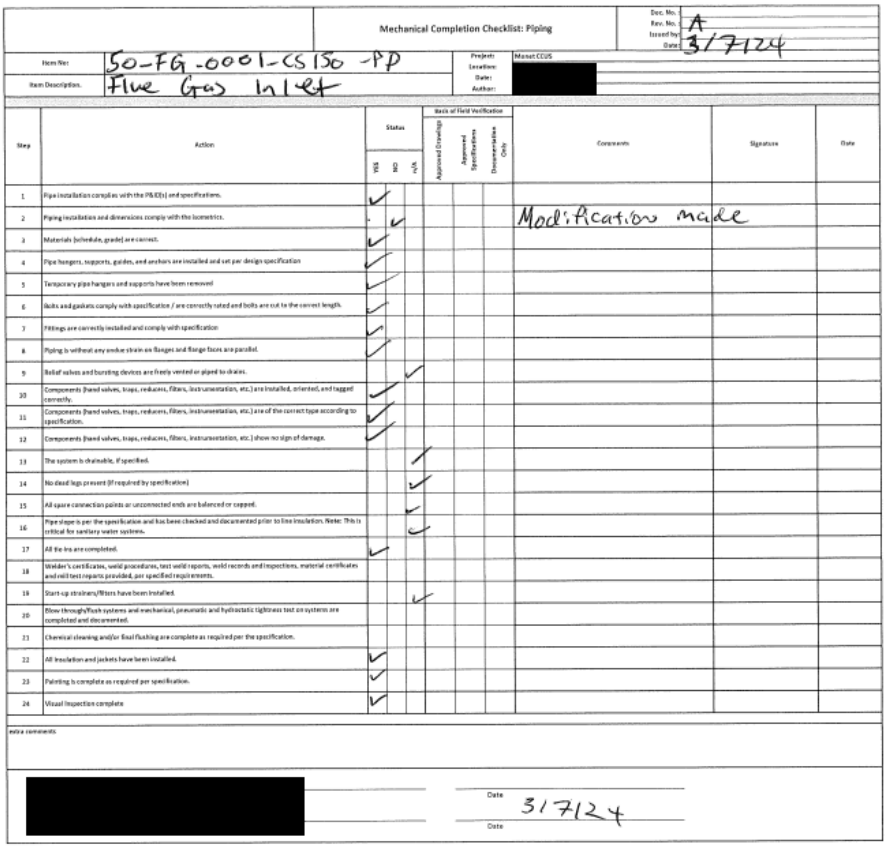
[redacted]

Date
Date 22/8/24

Appendix 3 – D3.3 MONET Piping Verification Checks

PrometheanParticles
Nanomaterials reimagined

COMPLETED PIPING VERIFICATION



Mechanical Completion Checklist: Piping

Doc. No.:
Rev. No.: A
Issued by:
Date: 3/7/24

Item No: 50-FG-0001-CS150-PP
Item Description: Flue Gas Inlet

Project: Monet CCUS
Location:
Date: [redacted]
Author:

Step	Action	Status YES	Status NO	Status n/a	Back of Field Verification: Approved Drawing	Approved Specifications	Documentation Only	Comments	Signature	Date
1	Pipe installation complies with the P&ID(s) and specifications.	✓								
2	Piping installation and dimensions comply with the isometrics.		✓					Modification made		
3	Materials (schedule, grade) are correct.	✓								
4	Pipe hangers, supports, guides, and anchors are installed and set per design specification	✓								
5	Temporary pipe hangers and supports have been removed	✓								
6	Bolts and gaskets comply with specification / are correctly rated and bolts are cut to the correct length.	✓								
7	Fittings are correctly installed and comply with specification	✓								
8	Piping is without any undue strain on flanges and flange faces are parallel.	✓								
9	Relief valves and bursting devices are freely vented or piped to drains.			✓						
10	Components (hand valves, traps, reducers, filters, instrumentation, etc.) are installed, oriented, and tagged correctly.	✓								
11	Components (hand valves, traps, reducers, filters, instrumentation, etc.) are of the correct type according to specification.	✓								
12	Components (hand valves, traps, reducers, filters, instrumentation, etc.) show no sign of damage.	✓								
13	The system is drainable, if specified.			✓						
14	No dead legs present (if required by specification)			✓						
15	All spare connection points or unconnected ends are balanced or capped.			✓						
16	Pipe slope is per the specification and has been checked and documented prior to line insulation. Note: This is critical for sanitary water systems.			✓						
17	All the ins are completed.	✓								
18	Welder's certificates, weld procedures, test weld reports, weld records and inspections, material certificates and mill test reports provided, per specified requirements.									
19	Start-up strainers/filters have been installed.			✓						
20	Blow through/flush systems and mechanical, pneumatic and hydrostatic tightness test on systems are completed and documented.									
21	Chemical cleaning and/or final flushing are complete as required per the specification.									
22	All insulation and jackets have been installed.	✓								
23	Painting is complete as required per specification.	✓								
24	Visual inspection complete	✓								

extra comments:

[redacted] Date 3/7/24

Date

[redacted]

CONTROL CABLE INSTALLATION SHEET

[redacted]

Business/Client:
Reference: 12459 MONET CARBON CAPTURE SKID

Cable ID	CABLE DETAILS					CABLE CORES					INSULATION		CORRECT		Source	Destination
	Cable Designation	Length (m)	CABLE (BSEN)	Cable Part	Cable Type	No. of Cores	Core CSA (mm)	Pair			Core / Core (MΩ)	Core / Screen (MΩ)	Continuity	Polarity		
								Pair Number	Colour-1	Colour-2						
	TT-1021	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.43	✓	MAINS CONTROL PANEL	AIR FAN COOLER DISCHARGE TEMPERTAURE
	TT-3014	15	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.93	✓	MAINS CONTROL PANEL	ABSORBER OUTLET TEMPERATURE
	PT-1011	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.75	✓	MAINS CONTROL PANEL	FLUE GAS BLOWER DISCHARGE PRESSURE
	PT-1013	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.38	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE PRESSURE
	PT-3012	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.32	✓	MAINS CONTROL PANEL	ADSORBER 1 INLET PRESSURE
	PT-3022	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.54	✓	MAINS CONTROL PANEL	ADSORBER 2 INLET PRESSURE
	PT-3023	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.41	✓	MAINS CONTROL PANEL	ADSORBER 2 OUTLET PRESSURE
	FT-1012	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.84	✓	MAINS CONTROL PANEL	FLUE GAS BLOWER DISCHARGE FLOW
	FT-1012		BS5308				0.75	2	BN	GN	>999	>999	0.84	✓	MAINS CONTROL PANEL	FLUE GAS BLOWER DISCHARGE FLOW
	FT-1014	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.42	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE FLOW
	FT-1014		BS5308				0.75	2	BN	GN	>999	>999	0.42	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE FLOW
	FT-3017	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.43	✓	MAINS CONTROL PANEL	ADSORBER OUTLET FLOW
	FT-3017		BS5308				0.75	2	BN	GN	>999	>999	0.44	✓	MAINS CONTROL PANEL	ADSORBER OUTLET FLOW
	QT-3010	10	BS5308	1	1	4	1.50	1	BK	BU	>999	>999	0.15	✓	MAINS CONTROL PANEL	ADSORBER INLET DEW POINT
	QT-3010		BS5308				1.50	2	BN	GN	>999	>999	0.15	✓	MAINS CONTROL PANEL	ADSORBER INLET DEW POINT
	QT-3016	10	BS5308	1	1	4	1.50	1	BK	BU	>999	>999	0.42	✓	MAINS CONTROL PANEL	ADSORBER OUTLET DEW POINT
	QT-3016		BS5308				1.50	2	BN	GN	>999	>999	0.42	✓	MAINS CONTROL PANEL	ADSORBER OUTLET DEW POINT
	QT-1015-C1	10	BS5308	1	1	2	1.50	1	BK	BU	>999	>999	0.38	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE CO2
	QT-1015-C2	10	BS5308	1	1	2	1.50	1	BK	BU	>999	>999	0.27	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE CO2
	QT-1015-C3	10	BS5308	1	1	4	1.50	1	BK	BU	>999	>999	0.28	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE CO2
	QT-1015-C3		BS5308				1.50	2	BN	GN	>999	>999	0.27	✓	MAINS CONTROL PANEL	VACUUM DESORPTION PUMP DISCHARGE CO2

[redacted]

CONTROL CABLE INSTALLATION SHEET

[redacted]

Business/Client:
Reference: 12459 MONET CARBON CAPTURE SKID

Cable ID	CABLE DETAILS					CABLE CORES					INSULATION		CORRECT		Source	Destination
	Cable Designation	Length (m)	CABLE (BSEN)	Cable Part	Cable Type	No. of Cores	Core CSA (mm)	Pair			Core / Core (MΩ)	Core / Screen (MΩ)	Continuity	Polarity		
								Pair Number	Colour-1	Colour-2						
	QT-3011-C1	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.35	✓	MAINS CONTROL PANEL	ADSORBER INLET CO2
	QT-3011-C2	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.34	✓	MAINS CONTROL PANEL	ADSORBER INLET CO2
	QT-3011-C3	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER INLET CO2
	QT-3011-C3		BS5308				0.75	2	BN	GN	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER INLET CO2
	QT-3015-C1	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.43	✓	MAINS CONTROL PANEL	ADSORBER OUTLET CO2
	QT-3015-C2	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER OUTLET CO2
	QT-3015-C3	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER OUTLET CO2
	QT-3015-C3		BS5308				0.75	2	BN	GN	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER OUTLET CO2
	CV06	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.22	✓	MAINS CONTROL PANEL	ADSORBER INLET VALVE
	CV06		BS5308				0.75	2	BN	GN	>999	>999	0.22	✓	MAINS CONTROL PANEL	ADSORBER INLET VALVE
	CV-15	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.26	✓	MAINS CONTROL PANEL	ADSORBER 1 DECARBONISED VALVE
	CV-15		BS5308				0.75	2	BN	GN	>999	>999	0.26	✓	MAINS CONTROL PANEL	ADSORBER 1 DECARBONISED VALVE
	CV-14	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.35	✓	MAINS CONTROL PANEL	ADSORBER 1 VACUUM OUTLET VALVE
	CV-14		BS5308				0.75	2	BN	GN	>999	>999	0.35	✓	MAINS CONTROL PANEL	ADSORBER 1 VACUUM OUTLET VALVE
	CV-16	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.35	✓	MAINS CONTROL PANEL	ADSORBER 2 INLET VALVE
	CV-16		BS5308				0.75	2	BN	GN	>999	>999	0.35	✓	MAINS CONTROL PANEL	ADSORBER 2 INLET VALVE
	CV-24	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.50	✓	MAINS CONTROL PANEL	ADSORBER 2 VACUUM OUTLET VALVE
	CV-24		BS5308				0.75	2	BN	GN	>999	>999	0.50	✓	MAINS CONTROL PANEL	ADSORBER 2 VACUUM OUTLET VALVE
	CV-25	10	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER 2 DECARBONISED OUTLET VALVE
	CV-25		BS5308				0.75	2	BN	GN	>999	>999	0.40	✓	MAINS CONTROL PANEL	ADSORBER 2 DECARBONISED OUTLET VALVE

Appendix 6 – D3.3 MONET Cable Installation Sheet 3

CONTROL CABLE INSTALLATION SHEET

[redacted]

Business/Client: [redacted]
Reference: 12459 MONET CARBON CAPTURE SKID

Cable ID	CABLE DETAILS				CABLE CORES			INSULATION		CORRECT		
	Cable Designation	Length (m)	CABLE (BSEN)	Cable Part	Cable Type	No. of Cores	Core CSA (mm)	Pair Number	Colour-1	Colour-2	Core / Core (MΩ)	Core / Screen (MΩ)	Continuity	Polarity	Source	Destination
	P101-E-STOP	15	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.55	✓	MAINS CONTROL PANEL	E-STOP
	P101-E-STOP		BS5308				0.75	2	BN	GN	>999	>999	0.55	✓	MAINS CONTROL PANEL	E-STOP
	F101-E-STOP	15	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.82	✓	MAINS CONTROL PANEL	E-STOP
	F101-E-STOP		BS5308				0.75	2	BN	GN	>999	>999	0.82	✓	MAINS CONTROL PANEL	E-STOP
	H101-E-STOP	15	BS5308	1	1	4	0.75	1	BK	BU	>999	>999	0.28	✓	MAINS CONTROL PANEL	E-STOP
	H101-E-STOP		BS5308				0.75	2	BN	GR	>999	>999	0.28	✓	MAINS CONTROL PANEL	E-STOP
	PT-3013	10	BS5308	1	1	2	0.75	1	BK	BU	>999	>999	0.29	✓	MAINS CONTROL PANEL	ADSORBER 1 OUTLET PRESSURE

Appendix 7 – D3.3 MONET Pipework Conformity Certificate

[redacted]

Section 5

C.o.C

ISO 9001
REGISTERED FIRM

[redacted]

[redacted]

CERTIFICATE OF CONFORMITY

Customer: [redacted]

Order Number: 18570

Project Description: Monet Carbon Capture Skid Frame in Container for Promethean Particles

Pipe Specification: CS150

Spool Number(s): Spool's 1 to 33

Supplier:
We hereby confirm that the pipework supplied against the above Order Number have been fabricated and tested in accordance with the relevant pipe specification.

Supplier Name: [redacted]

Supplier Address: [redacted]

Supplier Job Number(s): [redacted]

Print: [redacted]

Signature: [redacted]

Date: 05/07/2024

Appendix 8 – D3.3 MONET Hydrostatic Testing

[redacted]

Section 4

Hydrostatic Testing

ISO 9001 REGISTERED FIRM

[redacted]

[redacted]

Customer Order Number:
Addison Job Number:
Gauge Number: CIW63
Test Mediums Used: Towns Water
Duration of test: 30 Minutes
Comments: Good Hold

Hydrostatic Pressure Test Details

Promethian Pipework

Drawing No.	Spool No.	Hydrostatic Pressure	Tested By	Witnessed By	Date Tested
0001-CS150-PP-1	1	2 Bar.G	[redacted]	[redacted]	29/05/2024
	2	2 Bar.G			29/05/2024
0002-CS150-PP-1	3	2 Bar.G			29/05/2024
	4	2 Bar.G			29/02/2024
	5	2 Bar.G			06/06/2024
0003-CS150-NI-1	6	2 Bar.G			31/05/2024
0005-CS150-NI-1	7	2 Bar.G			02/04/2024
0005-CS150-NI-2 & NI-3	8.a	2 Bar.G			11/06/2024
	8.b	2 Bar.G			11/06/2024
	8.c	2 Bar.G			06/06/2024
0007-CS150-NI-1 & NI-2	9	2 Bar.G			23/05/2024
	10	2 Bar.G			n/a
0007-CS150-NI-3	11	2 Bar.G			05/03/2024
0008-CS150-PP	12	2 Bar.G			05/03/2024
0009-CS150-NI-1	13	2 Bar.G			12/03/2024
	14	2 Bar.G			06/06/2024
	15	2 Bar.G			12/03/2024
0010-CS150-NI-1 & NI-2	16	2 Bar.G			23/05/2024
	17	2 Bar.G			n/a
0010-CS150-NI-3	18	2 Bar.G			05/03/2024
0011-CS150-PP	19	2 Bar.G			05/03/2024
0012-CS150-NI-1	20	2 Bar.G			03/06/2024
	21	2 Bar.G			07/06/2024
	22	2 Bar.G			05/03/2024
0013-CS150-PP-1	23	2 Bar.G			31/05/2024
	24	2 Bar.G			07/06/2024
0013-CS150-PP-1	25	2 Bar.G			08/03/2024
	26	2 Bar.G			03/04/2024
	27	2 Bar.G			04/06/2024
0014-CS150-NI-2	28	2 Bar.G			06/03/2024
	29	2 Bar.G			07/06/2024
0015-CS150-NI-1	30	2 Bar.G			03/04/2024
0015-CS150-NI-2	31	2 Bar.G			05/06/2024
	32	2 Bar.G			05/06/2024
0015-CS150-NI-3	33	2 Bar.G			02/04/2024

Tested By			Witnessed By		
Name(s):	Signature	Date	Name(s):	Signature	Date
[redacted]		5/7/24	[redacted]		5/7/24
					5/7/24

ISO 9001 REGISTERED FIRM

[redacted]

ENGINEERING EMPLOYERS' FEDERATION

Appendix 9 – D3.3 MONET Completed FAT Procedure

[redacted]

Project: Promethean MONET (23-239) — **Client:** Promethean Particles

MOF-based Negative Emissions Technology — **Location:** [redacted]

Issue Date: 17/09/2024

Issue No: Rev B

SAT & FAT Testing Procedure

#	Stage	Description	Completed Date	Signed (FAT)	Completed Date	Signed (SAT)	Comments
1a	Functionality Testing	F-101 starts. Run F-101 for 5 minutes to ensure it is functioning correctly.	02-Oct	FM			
1b	Functionality Testing	Witness readings on PT-1011	02-Oct	FM			
1c	Functionality Testing	Witness readings on FT-1012	02-Oct	FM			
1d	Functionality Testing	Check for QT-3011 CO2 readings	02-Oct	FM			
1e	Functionality Testing	Witness "started in manual" alarm.	02-Oct	FM			
1f	Functionality Testing	Throttle the outlet valve towards closed, until a "low flow" alarm is shown	02-Oct	FM			
1g	Functionality Testing	Stop F-101 manually	02-Oct	FM			
1h	Functionality Testing	Start F-101 manually	02-Oct	FM			
1i	Functionality Testing	F-101 stops from E-STOP, Unable to restart on HMI.	02-Oct	FM			
1j	Functionality Testing	Witness low pressure alarm and low flow alarm (SP-04 and SP-05)	02-Oct	FM			
1k	Functionality Testing	F-101 functional testing complete, to undertake further functional testing all E-STOPS will need resetting to proceed with the following steps. Manually twisting and releasing F-101 E-STOP and global e-stop. Using the illuminated push buttons (IPB) on the front of panel, reset F-101 and global E-STOP. Both LEDs should extinguish once these steps are complete. Once all LEDs are not illuminated, use the HMI alarm page on top right hand corner click "accept alarms" and then " reset alarms". All alarms and alerts should disappear.	02-Oct	FM			
2a	Functionality Testing	H-101 blower starts. If testing with ambient air, increase in ambient temperature is expected du compression effects. Once H-101 has operated f reasonable period, a decrease from the initial re H-101 was started are expected. Run H-101 for 5					
2b	Functionality Testing	Witness "started in manual" alarm.					
2c	Functionality Testing	Stop H-101 manually					

SAT & FAT Testing Procedure

#	Stage	Description	Completed Date	Signed (FAT)	Completed Date	Signed (SAT)	Comments
14c	Automatic Control Testing (Normal Operation)	Process Description & Control Philosophy Rev C Table 15: Operator to press 'Enable' on HMI and follow the steps provided on the sequence.	02-Oct	FM			
14d	Automatic Control Testing (Normal Operation)	Witness adsorption and desorption functioning as expected on Adsorber 1 and 2.	02-Oct	FM			
14e	Automatic Control Testing (Normal Operation)	Test Sequence Step 13 (Process Description & Control Philosophy Rev C, 'Shutdown' page 15). Ensure system shuts down in the correct order and operates as expected.	02-Oct	FM			
14f	Automatic Control Testing (Regeneration)	Operator to reference Process Description & Control Philosophy Rev C Table 16 (page 16). 'Enable' CO2 capture skid regeneration sequence. Witness F-101 and H-101 turning off.	02-Oct	FM			
14g	Automatic Control Testing (Regeneration)	Witness full sequence and ensure during switchover to regeneration mode that the relevant equipment has changed to their respective positions/states/.	02-Oct	FM			
14h	Automatic Control Testing (Regeneration)	Shows temperature increase on the local gauge and the vessel feels warmer. Temperature reading to be verified with an IR temperature gun, once vessel has stayed at the set point for at least 15 minutes to allow heat transfer through the metal vessel walls. Accuracy of IR gun to be determined to provide range of temperatures from the setpoint to verify temperature gauge on jacket is functioning as designed.	02-Oct	FM			
15	Automatic Control Testing (Shutdown)	Test Sequence Step 12 (Process Description & Control Philosophy Rev C, 'Shutdown' page 17). Ensure system shuts down in the correct order and operates as expected.	02-Oct	FM			

Final Comments:

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Approved for FAT
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