



NET4GAS, s.r.o

**COMPRESSOR STATION JIRKOV
73 BAR
Scope of Supply and Interface Matrix
for EMCS**

24.11.2017

**Annex 1
Attachment 1.16**

ILF CONSULTING ENGINEERS

Werner-Eckert-Strasse 7, 81829 München, DE
Jirsíkova 5, 186 00 Praha 8, CZ

Phone: +49 89 255 594-0
+420 255 091 420
E-mail: info.muc@ilf.com
info.prg@ilf.com
Website: www.ilf.com



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Content

1 Scope of the Document

2 References

3 Abbreviation

4 Scope of Supply and Interface Matrix

5 Scope of Site Activities and Responsibilities

1. Scope of the Document

The purpose of this document is to summarize the Scope of Supply for EMCS and define responsibilities for Engineering, Supply, Installation and Commissioning.

Responsibilities for each component for engineering, supply, installation and commissioning are indicated in the Scope of Supply Matrix. The matrix is divided into the disciplines Civil, Mechanical, Electrical and Instrumentation & Controls and Telecom and covers the EMCS package as well as all auxiliary systems.

2. References

The following tender documents are referenced:

Annex 1 - doc. C4G-JI73-ILF-KS007-STR-SPC-800 Specification for Electro Motor Compressor Set (EMCS)

Annex 1, Attachment 1.10 - doc. C4G-JI73-ILF-KS007-STR-DIA-130-Mechanical Interfaces for EMCS - Schematics

Annex 1, Attachment 1.11 - doc. C4G-JI73-ILF-KS007-GEN-DIA-100-Schematic Interfaces (M, E, I&C) for EMCS

C4G-JI73-ILF-KS007-GEN-TZP-010-Interface Report

3. Abbreviations

see Annex 1 - doc. C4G-JI73-ILF-KS007-STR-SPC-800 Specification for Electro Motor Compressor Set (EMCS)

EMCS, SU

Scope of the EMCS Supplier

EPC

Scope of the station Contractor for

Engineering, Procurement and Construction

OWNER

Scope of NET4GAS

US

Ultra-sonic

4. SCOPE OF SUPPLY AND INTERFACE MATRIX FOR:

Electric Motor Compressor Sets:

- EMCS 1
- EMCS 2
- EMCS 3

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
1	CIVIL					
2	FOUNDATION DESIGN					
3	3x EMCS COMPRESSOR SKIDS					Annex 1
4	Foundation of EMCS compressor skid including grout holes / pockets and leveling pads for jacking screws	EPC	EPC	EPC	EMCS	
5	Anchor Bolts	EMCS	EMCS	EMCS	EMCS	
6	Jacking Screws	EMCS	EMCS	EMCS	EMCS	
7	Foundation Grouting	EMCS	EMCS	EMCS	EMCS	
8	3x ANTI-SURGE VALVE					Annex 1
9	Foundation of the Anti-surge valve including grout holes / pockets	EPC	EPC	EPC	EMCS	
10	Anchor Bolts	N/A	N/A	N/A	N/A	
11	Foundation Grouting	N/A	N/A	N/A	N/A	
12	Civil Design/Civil Works required for pit construction and compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	
13	3x HOT-BYPASS VALVE					Annex 1
14	Foundation of the Hot Bypass valve including grout holes / pockets	N/A	N/A	N/A	N/A	
15	Anchor Bolts	N/A	N/A	N/A	N/A	
16	Foundation Grouting	N/A	N/A	N/A	N/A	
17	Civil Design/Civil Works required for pit construction and compacting and consolidation of foundation underground	N/A	N/A	N/A	N/A	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
18	3x SUCTION ESD VALVE					Annex 1
19	Foundation of the suction ESD valve including grout holes / pockets	EPC	EPC	EPC	EMCS	
20	Anchor Bolts	N/A	N/A	N/A	N/A	
21	Foundation Grouting	N/A	N/A	N/A	N/A	
22	Civil Design/Civil Works required for pit construction and compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	
23	3x DISCHARGE ESD VALVE					Annex 1
24	Foundation of the discharge ESD valve including grout holes / pockets	EPC	EPC	EPC	EMCS	
25	Anchor Bolts	N/A	N/A	N/A	N/A	
26	Foundation Grouting	N/A	N/A	N/A	N/A	
27	Civil Design/Civil Works required for pit construction and compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	
28	3x RECIRCULATION LINE ISOLATION VALVE					Annex 1
29	Foundation of the recirculation line isolation valve including grout holes / pockets	EPC	EPC	EPC	EMCS	
30	Anchor Bolts	N/A	N/A	N/A	N/A	
31	Foundation Grouting	N/A	N/A	N/A	N/A	
32	Civil Design/Civil Works required for pit construction and compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	
33	3x DISCHARGE LINE ISOLATION VALVE					Annex 1
34	Foundation of the discharge line isolation valve including grout holes / pockets	EPC	EPC	EPC	EMCS	
35	Anchor Bolts	N/A	N/A	N/A	N/A	
36	Foundation Grouting	N/A	N/A	N/A	N/A	
37	Civil Design/Civil Works required for pit construction and compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
38	3x UCS					Annex 1
39	Steel frame of the UCS cabinets, if required	EPC	EPC	EPC	EMCS	
40	Anchor Bolts, if required	EMCS	EMCS	EMCS	EMCS	
41	3x UPS CABINET (ACTIVE MAGNETIC BEARINGS)					Annex 1
42	Steel frame of the UPS cabinets, if required	EPC	EPC	EPC	EMCS	
43	Anchor Bolts, if required	EMCS	EMCS	EMCS	EMCS	
44	3x MCC					Annex 1
45	Steel frame for the MCC cabinets, if required	EPC	EPC	EPC	EMCS	
46	Anchor Bolts, if required	EMCS	EMCS	EMCS	EMCS	
47	3x VSD					Annex 1
48	Steel frame for the VSD MV, VSD LV and EMCS circuit breaker cabinets	EPC	EPC	EPC	EMCS	
49	Anchor Bolts, if required	EMCS	EMCS	EMCS	EMCS	
50	3x VSD COOLER					Annex 1
51	Foundation of VSD Cooler and walking platforms / walkways including grout holes / pockets	EPC	EPC	EPC	EMCS	
52	Anchor Bolts	EMCS	EMCS	EMCS	EMCS	
53	Foundation Grouting, if required	EMCS	EMCS	EMCS	EMCS	
54	Civil Design/Civil Works required for compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	Annex 1
55	3x VSD TRANSFORMERS (DRY TYPE)					
56	Foundation of the VSD Transformers including grout holes / pockets	EPC	EPC	EPC	EMCS	
57	Transformer flat-rim wheels	EMCS	EMCS	EMCS	EMCS	
58	Wheel rails	EPC	EPC	EPC	EMCS	
59	Civil Design / Civil Works required for compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
60	CABLE TRENCH / CABLE WAY DESIGN					Annex 1
61	3x cable trenches at EMCS compressor skid for the MV power cables, LV power cables, I&C cables, telecommunication cables, earthing cables, etc.: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
62	3x cable ways / cable trenches at VSD MV, VSD LV and EMCS circuit breaker cabinets including cable transitions at electrical building walls, double floor inside the electrical building: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
63	Cable trenches at VSD Transformer: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
64	Cable trenches at VSD Cooler: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
65	Cable ways / cable trenches at the Anti-surge Valve: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
66	Cable ways / cable trenches at the Hot Bypass Valve: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
67	Cable ways / cable trenches at the venting valve in the vent line: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
68	Cable ways / cable trenches at the ESD valve and filling / pressurization valve on the suction line: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
69	Cable ways / cable trenches at the ESD valve and filling / pressurization valve on the discharge line: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
70	Cable ways / cable trenches at the isolation valve (MOV) in the recirculation line: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
71	Cable ways / cable trenches at the isolation valve (MOV) in the discharge line: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
72	Cable ways / cable trenches to all field instrumentation included in the EMCS Scope of Supply: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
73	Cable ways / cable trenches for all interconnecting cabling included in the EMCS Scope of Supply: -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EPC	EPC	EPC	EMCS	
74	Cable trenches to all facilities required to comply with the technical connection conditions of the electrical power grid operator (e.g. filter systems & compensation equipment on the main side), if required	EPC	EPC	EPC	EMCS	
75	Civil Design/Civil Works required for compacting and consolidation of cable trench underground	EPC	EPC	EPC	EMCS	
76	FOUNDATION DESIGN FOR THE INTERCONNECTING PIPING					
77	Foundations for the piping supports of the VSD cooling system including grout holes / pockets	EPC	EPC	EPC	EMCS	Annex 1
78	Piping Supports	EMCS	EMCS	EMCS	EMCS	
79	Anchor Bolts	EMCS	EMCS	EMCS	EMCS	
80	Foundation Grouting, if required	EMCS	EMCS	EMCS	EMCS	
81	Civil Design/Civil Works required for compacting and consolidation of foundation underground	EPC	EPC	EPC	EMCS	
82	Foundations for the piping supports of the EM cooling gas extraction and return lines including grout holes / pockets, if required	EPC	EPC	EPC	EMCS	
83	Piping Supports, if required	EMCS	EMCS	EMCS	EMCS	
84	Anchor Bolts, if required	EMCS	EMCS	EMCS	EMCS	
85	Foundation Grouting, if required	EMCS	EMCS	EMCS	EMCS	
86	Foundations for the piping supports of local vents including grout holes / pockets, if required	EPC	EPC	EPC	EMCS	
87	Piping Supports	EMCS	EMCS	EMCS	EMCS	
88	Anchor Bolts	EMCS	EMCS	EMCS	EMCS	
89	Foundation Grouting, if required	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
90	LOCAL EARTHING PIT DESIGN					Annex 1
91	Earthing pits to EMCS 1	EPC	EPC	EPC	EMCS	
92	Earthing pits to EMCS 2	EPC	EPC	EPC	EMCS	
93	Earthing pits to EMCS 3	EPC	EPC	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
94	MECHANICAL					
95	3x EMCS COMPRESSOR SKIDS					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
96	All on-skid mechanical equipment including CU, TAG nameplates, Hazardous Area designation plate nameplate, Pressure Equipment Directive compliance nameplate, Machinery Directive compliance nameplate, etc.	EMCS	EMCS	EMCS	EMCS	
97	Compressor unit tie-in flanges to the station process piping including all materials required for connection (bolts, nuts, washers, gaskets, etc.)	EMCS	EMCS	EPC	EMCS	
98	Counter flanges for the suction and discharge flanges of each CU including all consumables (bolts, nuts, washers, gaskets, etc.)	EMCS	EMCS	EPC	EMCS	
99	Instrument air tie-in to the station instrument air supply line	EMCS	EMCS	EPC	EMCS	
100	Drain tie-in to the station drain system	EMCS	EMCS	EPC	EMCS	
101	Local vents for each EMCS including all required vent valves, piping, restriction orifice, bursting discs, flame arrestors, noise silencer, etc.	EMCS	EMCS	EMCS	EMCS	
102	3x SUCTION STRAINER FOR THE NATURAL GAS COMPRESSOR UNIT					Annex 1, Attachment 1.10
103	Suction strainer	EMCS	EMCS	EPC	EMCS	
104	Pipe spooling including interface flanges to compressor suction piping	EMCS	EMCS	EPC	EMCS	
105	Counter flanges for welding onto compressor suction piping including all consumables (bolts, nuts, washers, gaskets, etc.)	EMCS	EMCS	EPC	EMCS	
106	Spacer for installation in the compressor suction piping after removal of the suction strainer	EMCS	EMCS	EPC	EMCS	
107	3x COMMISSIONING SUCTION STRAINER FOR THE NATURAL GAS COMPRESSOR UNIT (if required)	EMCS	EMCS	EPC	EMCS	Annex 1, Attachment 1.10

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
108	3x ANTI-SURGE VALVE					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
109	Anti-surge valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate, etc.	EMCS	EMCS	EPC	EMCS	
110	Process gas intake and outtake tie-in flanges to the compressor recirculation piping including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EMCS	EMCS	EPC	EMCS	
111	Instrument air tie-in to the station instrument air supply line	EMCS	EMCS	EPC	EMCS	
112	3x HOT BYPASS VALVE					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
113	Hot Bypass valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EMCS	EMCS	EPC	EMCS	
114	Process gas intake and outtake tie-in flanges to the compressor hot bypass recirculation piping including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EMCS	EMCS	EPC	EMCS	
115	Instrument air tie-in to the station instrument air supply line	EMCS	EMCS	EPC	EMCS	
116	3x PRESSURIZATION / FILLING VALVE					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
117	Filling valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EMCS	EMCS	EPC	EMCS	
118	Process gas intake and outtake tie-ins to the compressor suction piping including all materials required for connection	EMCS	EMCS	EPC	EMCS	
119	Instrument air tie-in to the station instrument air supply line	EMCS	EMCS	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
120	3x SUCTION ESD VALVE					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
121	ESD valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EPC	EPC	EPC	EPC, EMCS	
122	Process gas intake and outtake tie-in flanges including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EPC	EPC	EPC	EPC, EMCS	
123	Instrument air tie-in to the station instrument air supply line	EPC	EPC	EPC	EPC, EMCS	
124	3x DISCHARGE ESD VALVE					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
125	ESD valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EPC	EPC	EPC	EPC, EMCS	
126	Process gas intake and outtake tie-in flanges including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EPC	EPC	EPC	EPC, EMCS	
127	Instrument air tie-in to the station instrument air supply line	EPC	EPC	EPC	EPC, EMCS	
128	3x VENT ESD VALVE					Annex 1, Attachment 1.10 Materials, size and rating of the station instrument air line tie-ins will be defined during detail engineering
129	ESD valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EPC	EPC	EPC	EPC, EMCS	
130	Process gas intake and outtake tie-ins to the compressor vent piping including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EPC	EPC	EPC	EPC, EMCS	
131	Instrument air tie-in to the station instrument air supply line	EPC	EPC	EPC	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
132	3x RECIRCULATION LINE ISOLATION VALVE					Annex 1, Attachment 1.10
133	Valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EPC	EPC	EPC	EPC, EMCS	
134	Process gas intake and outtake tie-ins to the compressor vent piping including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EPC	EPC	EPC	EPC, EMCS	
135	3x DISCHARGE LINE ISOLATION VALVE					Annex 1, Attachment 1.10
136	Valve body, pneumatic actuator, TAG nameplates, Hazardous Area designation plate	EPC	EPC	EPC	EPC, EMCS	
137	Process gas intake and outtake tie-ins to the compressor vent piping including all materials required for connection (flanges, counter flanges, bolts, washers, gaskets etc.)	EPC	EPC	EPC	EPC, EMCS	
138	3x VSD PUMP CABINET					Annex 1, Attachment 1.10
139	Pump cabinet including all mechanical equipment and all required block, vent and drain valves, etc.	EMCS	EMCS	EMCS	EMCS	
140	Cooling medium intake and outtake tie-in flanges to the interconnecting piping / outdoor VSD cooler including all materials required for connection	EMCS	EMCS	EMCS	EMCS	
141	3x VSD COOLER					Annex 1, Attachment 1.10
142	VSD cooler including all mechanical equipment and all required block, vent and drain valves, etc.	EMCS	EMCS	EMCS	EMCS	
143	Supporting structure, walking platforms / walkways	EMCS	EMCS	EMCS	EMCS	
144	Cooling medium intake and outtake tie-in flanges to the interconnecting piping / VSD pump cabinet including all materials required for connection	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
145	INTERCONNECTING PIPING					Annex 1, Attachment 1.10
146	Cooling medium input and return interconnecting piping between VSD pump cabinet and outdoor heat exchanger including TAG nameplates, vent valves, block valves, drain valves including all required instrumentation and materials for installation (pipe supports, anchor bolts, flange bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EMCS	EMCS	
147	Cooling medium input and return interconnecting piping between VSD pump cabinet and VSD MV part including TAG nameplates, vent valves, block valves, drain valves including all required instrumentation and materials for installation (pipe supports, anchor bolts, flange bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EMCS	EMCS	
148	EM cooling gas extraction and return lines including TAG nameplates, vent valves, block valves, drain valves and all materials required for installation (flanges, counter flanges, pipe supports, anchor bolts, flange bolts, nuts, washers, gaskets, etc.): -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EMCS	EMCS	EPC	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
149	EMCS PIPING INCL. HOT RECIRCULATION LOOP					
150	Compressor suction and discharge process piping between the compressor suction line ESD valve, compressor discharge line ESD valve, compressor suction and discharge flanges with all tie-ins to instrumentation hook-ups incl. blind plugs / flanges, all ESD valve by-pass lines, compressor hot-bypass piping loop, compressor vent line: -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10 EPC installs the temperature thermowells supplied by others
151	Counter flanges to the compressor suction strainer / commissioning suction strainer including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EPC	EPC, EMCS	Annex 1, Attachment 1.10
152	Counter flange to the suction ESD valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10
153	Counter flange to the discharge ESD valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
154	Counter flange to the compressor suction flange including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EPC	EPC, EMCS	Annex 1, Attachment 1.10
155	Counter flanges to the compressor discharge flange including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EPC	EPC, EMCS	Annex 1, Attachment 1.10
156	Counter flanges to the hot-bypass valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EPC	EPC, EMCS	Annex 1, Attachment 1.10
157	Counter flange to the compressor EM cooling gas return line including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EPC	EPC, EMCS	Annex 1, Attachment 1.10
158	Counter flanges to the vent ESD valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
159	EMCS COLD RECIRCULATION LOOP					
160	EMCS recirculation piping loop between the compressor discharge line ESD valve and compressor suction line ESD valve with all tie-ins to instrumentation hook-ups incl. blind plugs / flanges	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10 EPC installs the temperature thermowells supplied by others
161	Counter flanges to the anti-surge valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EMCS	EMCS	EPC	EPC, EMCS	Annex 1, Attachment 1.10
162	Counter flanges to the isolation valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1 -1x Lot for EMCS 2 -1x Lot for EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10
163	Counter flanges to the process gas cooler including all required positive isolation pipe spooling / spectacles and all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1, EMCS 2 and EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10
164	Counter flange to the process gas cooler bypass valve including all materials required for connection (bolts, nuts, washers, gaskets, etc.): -1x Lot for EMCS 1, EMCS 2 and EMCS 3	EPC	EPC	EPC	EPC, EMCS	Annex 1, Attachment 1.10

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
165	PIPING FOR THE STATION PERMANENT US FLOW MEASUREMENT (EMCS SITE PERFORMANCE TESTING)					
166	1x tie-in to process hook-up of pressure transmitter including blind plug / flange required to close the pipe before and after installation of the measurement device with all materials required for connection (bolts, nuts, washers, gaskets, etc.)	EPC	EPC	EPC	EPC	
167	1x tie-in for the thermowell of the temperature transmitter including blind plug / flange required to close the pipe before and after the installation of the measurement device with all materials required for connection (bolts, nuts, washers, gaskets, etc.)	EPC	EPC	EPC	EPC	
168	2x DN50 weldolets for 1x set of active transducers	EPC	EPC	EPC	EPC	
169	2x DN50 blind flanges including all materials required for installation (bolts, washers, gaskets etc.) required to close the pipe before and after the dismantling of the US active transducers					
170	1x flow straightener including all materials required for connection (pipe spooling, flanges, counter flanges, bolts, nuts, washers, gaskets, etc.)					
171	1x pipe spooling required for installation in the station piping after removal of the flow straightener including all materials required for connection (flanges, counter flanges, bolts, nuts, washers, gaskets, etc.)					

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
172	ELECTRICAL					
173	3x EMCS COMPRESSOR SKIDS					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
174	All on-skid electrical equipment including EM, EM cooling gas system, TAG nameplates, Hazardous Area designation plate nameplate, etc.	EMCS	EMCS	EMCS	EMCS	
175	All on-skid LV and MV electrical cabling including cable terminal boxes, cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
176	MV electric motor power interface terminal box	EMCS	EMCS	EMCS	EMCS	
177	Magnetic bearing signal and power interface terminal boxes	EMCS	EMCS	EMCS	EMCS	
178	All on-skid LV and I&C interface junction boxes	EMCS	EMCS	EMCS	EMCS	
179	All earthing interfaces at skid baseframe	EMCS	EMCS	EPC	EMCS	
180	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
181	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
182	3x ANTI-SURGE VALVE					
183	All on-package electrical equipment	EMCS	EMCS	EPC	EMCS	
184	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EPC	EMCS	
185	All on-package electrical junction boxes including interface junction boxes for external wiring	EMCS	EMCS	EPC	EMCS	
186	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
187	Equipotential bonding for earth protection	EMCS	EMCS	EPC	EMCS	
188	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
189	3x HOT BYPASS VALVE					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
190	All on-package electrical equipment	EMCS	EMCS	EPC	EMCS	
191	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EPC	EMCS	
192	All on-package electrical junction boxes including interface junction boxes for external wiring	EMCS	EMCS	EPC	EMCS	
193	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
194	Equipotential bonding for earth protection	EMCS	EMCS	EPC	EMCS	
195	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
196	3x PRESSURIZATION / FILLING VALVE					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
197	All on-package electrical equipment	EMCS	EMCS	EPC	EMCS	
198	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EPC	EMCS	
199	All on-package electrical junction boxes including interface junction boxes for external wiring	EMCS	EMCS	EPC	EMCS	
200	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
201	Equipotential bonding for earth protection	EMCS	EMCS	EPC	EMCS	
202	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
203	3x SUCTION ESD VALVE					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
204	All on-package electrical equipment	EPC	EPC	EPC	EPC, EMCS	
205	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
206	All on-package electrical junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
207	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
208	Equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
209	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	
210	3x DISCHARGE ESD VALVE					
211	All on-package electrical equipment	EPC	EPC	EPC	EPC, EMCS	Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
212	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
213	All on-package electrical junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
214	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
215	Equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
216	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	
217	3x VENT ESD VALVE					
218	All on-package electrical equipment	EPC	EPC	EPC	EPC, EMCS	Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
219	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
220	All on-package electrical junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
221	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
222	Equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
223	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
224	3x RECIRCULATION LINE ISOLATION VALVE					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
225	All on-package electrical equipment	EPC	EPC	EPC	EPC, EMCS	
226	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
227	All on-package electrical junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
228	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
229	Equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
230	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	
231	3x DISCHARGE LINE ISOLATION VALVE					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
232	All on-package electrical equipment	EPC	EPC	EPC	EPC, EMCS	
233	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
234	All on-package electrical junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
235	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
236	Equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
237	Wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
238	3x UCS					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
239	All on-package electrical equipment	EMCS	EMCS	EMCS	EMCS	
240	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
241	All on-package cable terminal boxes including cable interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
242	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
243	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
244	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
245	3x UPS CABINET (ACTIVE MAGNETIC BEARINGS)					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
246	All on-package electrical equipment	EMCS	EMCS	EMCS	EMCS	
247	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
248	All on-package cable terminal boxes for LV power cabling including cable interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
249	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
250	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
251	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
252	3x MCC					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
253	All on-package electrical equipment	EMCS	EMCS	EMCS	EMCS	
254	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
255	All on-package cable terminal boxes for LV power cabling including cable interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
256	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
257	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
258	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
259	3x VSD INCLUDING VSD PUMPS, VSD CONTROLS AND EMCS CIRCUIT BREAKER CABINETS					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
260	All on-package electrical equipment	EMCS	EMCS	EMCS	EMCS	
261	All on-package LV and MV electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
262	All on-package cable terminal boxes for MV and LV power cabling including cable interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
263	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
264	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
265	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
266	3x VSD COOLER					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
267	All on-package electrical equipment	EMCS	EMCS	EMCS	EMCS	
268	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
269	All on-package cable terminal boxes for LV power cabling including cable interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
270	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
271	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
272	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
273	3x VSD TRANSFORMER					Annex 1, Annex 1, Attachment 1.8 Annex 1, Attachment 1.11
274	All on-package electrical equipment	EMCS	EMCS	EMCS	EMCS	
275	All on-package electrical cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
276	All on-package cable terminal boxes for MV and LV power cabling including cable interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
277	Equipment bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
278	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
279	Wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
280	All facilities for ensuring compliance with the technical connection conditions of the electrical power grid operator (e.g. filter systems & compensation equipment on the main side), if required	EMCS	EMCS	EMCS	EMCS	Annex 1, Annex 1, Attachment 1.8

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
281	I&C, TELECOM					
282	3x EMCS COMPRESSOR SKIDS					Annex 1, Attachment 1.11
283	All on-skid I&C and telecommunication equipment	EMCS	EMCS	EMCS	EMCS	
284	All on-skid I&C and telecommunication cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
285	All on-skid I&C junction boxes including instrumentation interface junction boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
286	All earthing interfaces at skid baseframe	EMCS	EMCS	EPC	EMCS	
287	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
288	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
289	3x ANTI-SURGE VALVE					Annex 1, Attachment 1.11
290	All on-package I&C equipment	EMCS	EMCS	EPC	EMCS	
291	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EPC	EMCS	
292	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EMCS	EMCS	EPC	EMCS	
293	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
294	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EPC	EMCS	
295	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
296	3x HOT BYPASS VALVE					Annex 1, Attachment 1.11
297	All on-package I&C equipment	EMCS	EMCS	EPC	EMCS	
298	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EPC	EMCS	
299	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EMCS	EMCS	EPC	EMCS	
300	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
301	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EPC	EMCS	
302	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
303	3x PRESSURIZATION / FILLING VALVE					Annex 1, Attachment 1.11
304	All on-package I&C equipment	EMCS	EMCS	EPC	EMCS	
305	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EPC	EMCS	
306	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EMCS	EMCS	EPC	EMCS	
307	All earthing interfaces at package limits	EMCS	EMCS	EPC	EMCS	
308	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EPC	EMCS	
309	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
310	3x SUCTION ESD VALVE					Annex 1, Attachment 1.11
311	All on-package I&C equipment	EPC	EPC	EPC	EPC, EMCS	
312	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
313	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
314	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
315	Instrumentation equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
316	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	
317	3x DISCHARGE ESD VALVE					Annex 1, Attachment 1.11
318	All on-package I&C equipment	EPC	EPC	EPC	EPC, EMCS	
319	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
320	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
321	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
322	Instrumentation equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
323	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
324	3x VENT ESD VALVE					Annex 1, Attachment 1.11
325	All on-package I&C equipment	EPC	EPC	EPC	EPC, EMCS	
326	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
327	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
328	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
329	Instrumentation equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
330	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	
331	3x RECIRCULATION LINE ISOLATION VALVE					Annex 1, Attachment 1.11
332	All on-package I&C equipment	EPC	EPC	EPC	EPC, EMCS	
333	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
334	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
335	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
336	Instrumentation equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
337	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
338	3x DISCHARGE LINE ISOLATION VALVE					Annex 1, Attachment 1.11
339	All on-package I&C equipment	EPC	EPC	EPC	EPC, EMCS	
340	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EPC	EPC	EPC	EPC, EMCS	
341	All on-package instrumentation junction boxes including interface junction boxes for external wiring	EPC	EPC	EPC	EPC, EMCS	
342	All earthing interfaces at package limits	EPC	EPC	EPC	EPC, EMCS	
343	Instrumentation equipotential bonding for earth protection	EPC	EPC	EPC	EPC, EMCS	
344	Instrumentation wiring to UCS (see interconnecting cabling)	EMCS	EMCS	EMCS	EPC, EMCS	
345	3x UCS INCLUDING LOAD SHARE					Annex 1, Attachment 1.11
346	All on-package I&C and telecommunication equipment	EMCS	EMCS	EMCS	EMCS	
347	All on-package instrumentation and telecommunication cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
348	All on-package I&C and telecommunication terminal boxes including interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
349	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
350	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
351	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
352	3x UPS CABINET (ACTIVE MAGNETIC BEARINGS)					Annex 1, Attachment 1.11
353	All on-package I&C equipment	EMCS	EMCS	EMCS	EMCS	
354	All on-package instrumentation and telecommunication cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
355	All on-package I&C and telecommunication terminal boxes including interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
356	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
357	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
358	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
359	3x MCC					Annex 1, Attachment 1.11
360	All on-package I&C equipment	EMCS	EMCS	EMCS	EMCS	
361	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
362	All on-package I&C terminal boxes including interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
363	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
364	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
365	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
366	3x VSD INCLUDING VSD PUMPS CABINET, VSD CONTROL CABINET AND EMCS CIRCUIT BREAKER CABINET					Annex 1, Attachment 1.11
367	All on-package I&C equipment	EMCS	EMCS	EMCS	EMCS	
368	All on-package instrumentation and telecommunication cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
369	All on-package I&C and telecommunication terminal boxes including interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
370	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
371	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
372	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
373	3x VSD COOLER					Annex 1, Attachment 1.11
374	All on-package I&C equipment	EMCS	EMCS	EMCS	EMCS	
375	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
376	All on-package I&C terminal boxes including interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
377	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
378	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
379	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
380	3x VSD TRANSFORMER					Annex 1, Attachment 1.11
381	All on-package I&C equipment	EMCS	EMCS	EMCS	EMCS	
382	All on-package instrumentation cabling including cable routes, cable transitions, equipotential bonding, earthing conductors	EMCS	EMCS	EMCS	EMCS	
383	All on-package I&C terminal boxes including interface terminal boxes for external wiring	EMCS	EMCS	EMCS	EMCS	
384	All earthing interfaces at cabinet limits	EMCS	EMCS	EPC	EMCS	
385	Instrumentation equipotential bonding for earth protection	EMCS	EMCS	EMCS	EMCS	
386	Instrumentation wiring to external equipment (see interconnecting cabling)	EMCS	EMCS	EMCS	EMCS	
387	FIELD INSTRUMENTATION					Annex 1, Attachment 1.10 Annex 1, Attachment 1.11 Installation of temperature thermowells by EPC
388	Field instrumentation installed in the compressor suction and discharge piping including process hook-ups (thermowells, etc.), interface junction boxes for external wiring, earthing interfaces, TAG nameplates, Hazardous Area classification etc.: -1x Lot for EMCS 1 including all materials required for installation -1x Lot for EMCS 2 including all materials required for installation -1x Lot for EMCS 3 including all materials required for installation	EMCS	EMCS	EMCS	EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
389	Field instrumentation for the compressor unit suction strainer including process hook-ups, interface junction boxes for external wiring, earthing interfaces, TAG nameplates, Hazardous Area classification etc.: -1x Lot for EMCS 1 including all materials required for installation -1x Lot for EMCS 2 including all materials required for installation -1x Lot for EMCS 3 including all materials required for installation	EMCS	EMCS	EMCS	EMCS	
390	Wiring of field instrumentation included in the EMCS Scope of Supply to UCS (see interconnecting cabling) -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EMCS	EMCS	EMCS	EMCS	
391	Permanent station US flow measurement (for EMCS Site Performance Testing)					
392	1x set ultra-sonic flow measurement including 2x active transducers	EPC	EPC	EPC	EPC	
393	2x ball valves including all materials required for installation (bolts, nuts, washers, gaskets, etc.)	EPC	EPC	EPC	EPC	
394	1x CPU	EPC	EPC	EPC	EPC	
395	1x Measurement PC	EPC	EPC	EPC	EPC	
396	1x application software tool for the measurement PC	EPC	EPC	EPC	EPC	
397	1x pressure transmitter including process hook-ups and all materials required for installation (bolts, nuts, washers, gaskets, etc.)	EPC	EPC	EPC	EPC	
398	1x temperature transmitter including thermowell and all materials required for installation (bolts, nuts, washers, gaskets, etc.)	EPC	EPC	EPC	EPC	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
399	1x set wiring of the ultra-sonic flow measurement, pressure and temperature transmitters	EPC	EPC	EPC	EPC	
400	1x set wiring to Measurement PC	EPC	EPC	EPC	EPC	
401	Operator and engineering workstations: -1x set for all three ECMS including server and KVM-E to be installed in the Electrical Building -1x set for all three ECMS including KVM-E to be installed in the Administration Building	EMCS	EMCS	EMCS	EMCS	Annex 1, Attachment 1.11
402	Serial Modbus Signal Exchange interfaces to SCS: -1x (1x redundancy) for EMCS 1 -1x (1x redundancy) for EMCS 2 -1x (1x redundancy) for EMCS 3	EMCS	EMCS	EMCS	EMCS	Annex 1, Attachment 1.11
403	Hardwired Signal Exchange interfaces to Station ESD (ESD & F&G) -1x for EMCS 1 -1x for EMCS 2 -1x for EMCS 3	EMCS	EMCS	EMCS	EMCS	Annex 1, Attachment 1.11

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
404	INTERCONNECTING CABLING (ELECTRICAL, I&C, TELECOMUNICATION) as per Annex 1, chapter 3.1, items 22), 23) and 24)					
405	Interconnecting cabling between the equipment included in the EMCS Scope of Supply: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation -1x Lot for EMCS 2 including TAG number plates and all materials required for installation -1x Lot for EMCS 3 including TAG number plates and all materials required for installation	EMCS	EMCS	EMCS	EMCS	Annex 1
406	Interconnecting cabling between UCS and the ESD valve installed in the compressor suction line: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)	EMCS	EMCS	EMCS	EMCS	Annex 1

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
407	Interconnecting cabling between UCS and the ESD valve installed in the compressor discharge line: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)	EMCS	EMCS	EMCS	EMCS	Annex 1
408	Interconnecting cabling between UCS and the ESD pressure equalization valve installed in the compressor discharge line: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)	EMCS	EMCS	EMCS	EMCS	Annex 1

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
409	Interconnecting cabling between UCS and the ESD valve installed in the compressor vent line: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)	EMCS	EMCS	EMCS	EMCS	Annex 1
410	Interconnecting cabling between UCS and the isolation valve (MOV) installed in the compressor recirculation line: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)	EMCS	EMCS	EMCS	EMCS	Annex 1

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
411	<p>Interconnecting cabling between UCS and the isolation valve (MOV) installed in the compressor discharge line:</p> <p>-1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p>	EMCS	EMCS	EMCS	EMCS	Annex 1

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
412	<p>Interconnecting cabling between UCS and SCS, Station ESD, Station F&G</p> <p>-1x cable UCS - Station ESD / F&G for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-1x cable UCS - Station ESD / F&G for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-1x cable UCS - Station ESD / F&G for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-2x FOC for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-2x FOC for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p> <p>-2x FOC for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)</p>	EPC	EPC	EPC	EPC, EMCS	

Item No.	Item	Engineering	Supply	Equipment/ package site installation ¹⁾	Site commissioning ²⁾	Reference Documents / Attachments / Remarks
413	Interconnecting cabling between the station circuit breaker and the EMCS circuit breaker: -1x Lot for EMCS 1 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 2 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.) -1x Lot for EMCS 3 including TAG number plates and all materials required for installation (cable trays, conduits, glands, gas sealed cable transitions etc.)	EPC	EPC	EPC	EPC, EMCS	Annex 1 Annex 1, Attachment 1.11
414	TOOLS & SPARE PARTS					
415	1x set of Special Tools required for maintenance and overhaul of all equipment included in the Scope of Supply	EMCS	EMCS	N/A	N/A	Annex 1
416	Safety Special Tools required for maintenance and overhaul (separate tools for VSD, VSD Transformer, MCC, etc.): -1x Set for EMCS 1 -1x Set for EMCS 2 -1x Set for EMCS 3	EMCS	EMCS	EMCS	N/A	Annex 1
417	1x set of Special Tools required for the first inspection	EMCS	EMCS	N/A	N/A	Annex 1
418	Spare parts required for start-up, commissioning, guarantee period and first inspection	EMCS	EMCS	N/A	N/A	Annex 1
Notes:	1) incl. installation of cables and piping as well as all installation certifications required (installation certifications for EMCS as per Annex 1, Attachment 1.3) 2) incl. test procedures and all commissioning certifications / reports required (test procedures and commissioning certifications / reports for EMCS as per Annex 1, Attachment 1.3)					

5. SCOPE OF SITE ACTIVITIES AND RESPONSABILITIES:

Electric Motor Compressor Sets:

-EMCS 1

-EMCS 2

-EMCS 3

SN	ACTIVITY	Performed by		Performed by		NOTES (applies only to Supply with Installation)
		Supply with installation - Works A		Supply without installation - Works B		
		OWNER	SUPPLIER	OWNER	SUPPLIER	
1	COMMISSIONING					
2	Process gas N2 pressure test and leak test	OWNER		OWNER		With SUPPLIER supervision and support for testing on GOODS
3	Authority and Third parties approvals required for the equipment installed		SU	OWNER		The EMCS Supplier is responsible for all Site Authority and Third Party approvals required for the equipment, if the equipment considered is installed by the EMCS Supplier (Base Scope)
4	Authority and Third parties approvals required for gas-in	OWNER		OWNER		
5	Gas-in	OWNER		OWNER		
6	EMCS start-up and control adjustments		SU		SU	
7	Process system clean-up and start-up strainers inspection	OWNER		OWNER		Clean-up by the Owner, strainer inspection by the Supplier
8	Start-Stop testing, 1 week operation until ready for Reliability test		SU		SU	
9	72 hours reliability test		SU		SU	
10	Operator and labour assistance from the Owner to the Supplier during start-up and reliability tests	OWNER		OWNER		
11	600 hours test run	OWNER	SU	OWNER	SU	With SUPPLIER supervisor availability day time, and on-call outside working hours
12	Noise emission test	OWNER	SU	OWNER	SU	With SUPPLIER supervision and support to operate the equipment
13	WASTE MANAGEMENT					
14	Waste containers		SU	OWNER		
15	Waste sorting		SU	OWNER		
16	Waste disposal - not hazardous materials		SU	OWNER		
17	Waste disposal - hazardous materials, if any	OWNER		OWNER		
18	Sanitary and washing facilities discharges disposal	OWNER		OWNER		
19	Construction pre commissioning activities in Supplier scope both for -Supply with Installation and -Supply without Installation					
20	Cooling water systems flushing – Frequency converter		SU		SU	Such activities are applicable to both "Supply with Installation" and "Supply without Installation".
21	Grouting of GOODS		SU		SU	
22	Pre commissioning		SU		SU	
23	GOODS off-loading at site and receiving inspection including provision of lifting equipment		SU		SU	
24	Storage at site		SU		SU	
25	Temporary indoor storage facilities		SU		SU	excepting EMCS skid, VSD, VSD transformer and VSD cooler
26	Air conditioned storage container for instrumentation		SU		SU	

SN	ACTIVITY	Performed by		Performed by		NOTES (applies only to Supply with Installation)
		Supply with installation - Works A		Supply without installation - Works B		
		OWNER	SUPPLIER	OWNER	SUPPLIER	
27	Material handling					
28	Transportation to site (GOODS)		SU		SU	
29	Transportation from site temporary storage to CONSTRUCTION AREA, and material handling on site		SU	OWNER		
30	Lifting accessories such as ropes, slings, shackles, etc.		SU	OWNER	SU	Installation and commissioning tools required for EMCS installation and commissioning in scope of the Supplier
31	Spreader bars		SU	OWNER		
32	Cranes and operators		SU	OWNER		
33	Fork-lift and telescopic platforms		SU	OWNER		
34	Trucks, trolleys and other transportation equipment		SU	OWNER		
35	Preservation of GOODS		SU	OWNER		
36	Intermediate storage outside construction site (if needed)		SU		SU	
37	Off loading and handling of GOODS if delivered out of construction time (see schedule)		SU		SU	
38	Facilities and storage					
39	Facilities-area	OWNER		OWNER		
40	Outdoor storage-area	OWNER		OWNER		
41	Authorities-approval-for-facilities-installation	OWNER		OWNER		
42	Site-office-facilities		SU		-SU	
43						
44	Sanitary-and-washing-facilities-(Both-for-Contractor-and-Purchaser)		SU	OWNER		
45	Recreation-facilities/canteen/dressing-rooms		SU	OWNER		
46	Site-workshop-facilities		SU	OWNER		
47	Medical-facilities	OWNER		OWNER		
48	First Aid Kits		SU		-SU	
49	Temporary firefighting equipment- (extinguishers etc...) as required by laws		SU	OWNER		
50	Maintenance-and-daily-cleaning-of-facilities		SU	OWNER		
51	Fencing-of-facility-area	OWNER		OWNER		
52	Lighting-of-facility-area	OWNER	-SU	OWNER		
53	Guard-watching/security	OWNER		OWNER		
54	Facilities and storage					
55	Facilities area	OWNER		OWNER		
56	Outdoor storage area	OWNER		OWNER		
57	Authorities approval for facilities installation	OWNER		OWNER		
58	Site office facilities		SU		SU	
59	Sanitary and washing facilities (Both for Contractor and Purchaser)		SU	OWNER		
60	Recreation facilities/canteen/dressing rooms		SU	OWNER		
61	Site workshop facilities		SU	OWNER		
62	Medical facilities	OWNER		OWNER		
63	First Aid Kits		SU		SU	
64	Temporary firefighting equipment (extinguishers etc...) as required by laws		SU	OWNER		
65	Maintenance and daily cleaning of facilities		SU	OWNER		
66	Fencing of facility area	OWNER		OWNER		
67	Lighting of facility area	OWNER	SU	OWNER		
68	Guard watching/security	OWNER		OWNER		

SN	ACTIVITY	Performed by		Performed by		NOTES (applies only to Supply with Installation)
		Supply with installation - Works A		Supply without installation - Works B		
		OWNER	SUPPLIER	OWNER	SUPPLIER	
69	Utilities					
70	Electrical power supply for facilities and construction area, and charges	OWNER		OWNER		Provided at terminal point in facilities and construction area
71	Power distribution to SUPPLIER temporary facilities		SU	OWNER		
72	Water supply for facilities, and charges	OWNER		OWNER		Provided at terminal point in facilities and construction area
73	Water distribution/hoses to SUPPLIER facilities		SU	OWNER		
74	Drink water	OWNER	SU	OWNER		
75	Phone line		SU	OWNER		
76	Phone charges for Supplier calls		SU		SU	
77	Internet	OWNER		OWNER		One cable connection will be provided by the Owner,
78	Construction water and charges	OWNER		OWNER		
79	Compressed air for construction, if needed		SU	OWNER		
80	Scaffolding		SU	OWNER		
81	Site Staff for GOODS installation and commissioning					
82	Site Management	OWNER	SU	OWNER		Note: leading party for Site Management is the Owner
83	EHS management	OWNER	SU	OWNER		
84	QA/QC and planning services	OWNER	SU	OWNER		
85	SUPPLIER Supervision for installation and commissioning of GOODS		SU		SU	
86	OEM (SUPPLIER subvendors) supervision services (motor, Trafo etc... if any)		SU		SU (Note 1)	
87	Manpower for installation		SU	OWNER		
88	Working time	OWNER	SU	Note 1		Each party for it's own personnel and subcontractors
89	Board and Lodging expenses	OWNER	SU			Each party for it's own personnel and subcontractors
90	Travel time	OWNER	SU			Each party for it's own personnel and subcontractors
91	Travel expenses	OWNER	SU			Each party for it's own personnel and subcontractors
92	Overtime	OWNER	SU			Each party for it's own personnel and subcontractors
93	Personnel insurances	OWNER	SU			Each party for it's own personnel and subcontractors