Specification

Aker BP Additional Requirements to Norsok Z-015 - Temporary Equipment

Document no.: 53-000769
Rev. no.: 5.0
Date: 2019-07-04
# About this document

## Purpose

The purpose of this document is to state the Company's additional requirements to NORSOK Z-015 and ensure that temporary and 3rd party equipment used on any Aker BP ASA assets are:

- Technically and certified in compliance with regulatory requirements and Aker BP technical standards and specification
- Ordered, transported, installed, hooked-up, operated, maintained and taken out of service in accordance with BMS requirements and specifications described in APOS.

## Valid for

This procedure applies to all organizational units and geographical locations within Company. The procedure is applicable to the following classes of equipment, owned by Aker BP or hired directly/provided by a contractor as part of his offshore service:

- Containers for use as offices, workshops, storage, well logging and other purposes but does not include containers/baskets for transportation.
- Equipment not permanently installed, with engines or motors, electrical equipment, or equipment for high pressure applications.
- Electrical equipment used for adapting transformers, generators, converters, batteries or local UPS.

## Revision Period

2 Years

## Non-conformity/Deviations

If unable to comply with requirements stated in this document, process for deviations and non-conformity applies.

## Role

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>Narvestad, Ole Jørgen</td>
</tr>
<tr>
<td>Verifier</td>
<td>Haga, Livar</td>
</tr>
<tr>
<td>Coordinator</td>
<td>Myklebust, Harry</td>
</tr>
</tbody>
</table>

## Revision History

<table>
<thead>
<tr>
<th>Rev.no.</th>
<th>Date</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>2019-07-04</td>
<td>Included Electrical and Instrument for Valhall flanke west</td>
</tr>
<tr>
<td>4.0</td>
<td>2019-05-24</td>
<td>Section 4.4.1 &amp; 4.7 – Hook-up interface changed to be in accordance with upgraded F&amp;G systems on ULA &amp; Valhall</td>
</tr>
<tr>
<td>3.0</td>
<td>2019-05-20</td>
<td>Included overview of old and new colour codes for hoses in Section 4.7.3</td>
</tr>
<tr>
<td>2.0</td>
<td>2018-12-11</td>
<td>Replaced reference to BP with Aker BP on page 7. Section 4.8 - Removed reference to checklist. Included new requirement in Annex I.</td>
</tr>
<tr>
<td>1.0</td>
<td>2018-10-31</td>
<td>First issue. Content is based on information in documents superseded during the BMS implementation process (Implemented in APOS)</td>
</tr>
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</table>
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1 Scope
This document contains Aker BP additional requirements to NORSOK Standard Z-015 Edition 4.
A reference to norms and standards applicable to the different existing assets, and a general overview of the basic norms and standards for any new asset, can be found in Section 2.1.
It is therefore of vital importance that the paragraphs are read and understood in conjunction with the appropriate NORSOK paragraphs. All provisions of the above standard which are not revised remain in force
The document is structured in the same way as the NORSOK standards except that sections with no additional requirements are removed.
The specification defines the minimum requirements for design and operation of Temporary Equipment for offshore installations operated by Aker BP located on the Norwegian Continental Shelf.
Any deviation from this standard shall be addressed in accordance with BMS process 77-03-04 Handle Deviation.

2 Normative and Informative References

2.1 Normative references
As systems unit the SI system shall be applied for all electrical applications including control and monitoring components.

2.2 Informative references
None

3 Terms, definitions and abbreviations

3.1 Definitions
For the purposes of the NORSOK standard and “Aker BP Additional Requirements to IEC and NORSOK”, the following terms and definitions apply.

3.1.1 NORMATIVE REFERENCES
Mean normative (a requirement) in the application of the NORSOK standard and “Aker BP Additional Requirements to NORSOK”

3.1.2 INFORMATIVE REFERENCES
Mean informative in the application of the NORSOK standard and “Aker BP Additional Requirements to NORSOK”
3.2 Abbreviations

ABP  Aker BP ASA  
CAP  Critical Action Panel  
ESD  Emergency Shut Down  
FSE  Forskrift om sikkerhet ved arbeid i og drift av elektriske anlegg (Based on EN 50110-1 Regulation for safety in work and operation of electrical plants)  
ICAO  International Civil Aviation Organization  
IEC  International Electrical Commission  
IEEE  Institute of Electrical and Electronics Engineers  
MEI  Manuel Electrical Isolation  
OS  Operator Station  
SCMS  Switchboard Control and Maintenance System  
VSD  Variable Speed Drive

The numbering of the following items below corresponds to paragraph numbering of the mentioned standard and reflects additions, deletions, modifications and decisions. All provisions of the above-mentioned standards that are not revised remain in force.

4 Technical Requirements

4.1 Introductions

The contractor is responsible for providing equipment fulfilling the requirements stated in this document.

NORSOK Declaration of Conformity, NORSOK Checklist for temporary Equipment, and approval of any deviations shall be electronically filed and available in accordance with BMS process 53-03-02 and 53-03-03. Required hook-up and safety related documentation shall be electronically attached. Equipment shall be tested, inspected and approved by contractor’s qualified personnel, to ensure that all rules and regulations and internal requirements to equipment and documentation are fulfilled.

After this inspection and before shipment to supply base, an approved 3rd party verification of the equipment shall be performed. The 3rd party verification approval is valid for 6 months providing:

- Equipment has only been on Aker BP installations  
- NORSOK checklist is attached  
- Latest verification report is available

Any dispensations require approval from either the 3rd part verifier or Aker BP Onshore Support Personnel or Asset OIM.

For some types of electrical equipment and electrical power requirements not provided for by the actual installation distribution network, actions must be agreed with Aker BP Onshore Support Personnel.

If compliance to all requirements are not possible, the contractor shall contact the TE requester/Job Officer to agree on further actions as:

A. Stop the delivery  
B. Issue an application for dispensation
C. Agree to accept a delay and repair/modify the equipment

4.2 Containers
No further requirements

4.3 Other types of temporary equipment
4.3.1 Type U07: Well service equipment
Hydraulic oil reservoir for temporary equipment used to operate X-mas tree valves or down hole safety valves, shall have cleanliness according to NAS 6.

4.4 Special technical requirements for temporary equipment
4.4.1 Gas and explosion protection
The Fire and Gas Panel shall have the following alarms connected to the platform F&G detection system:
Loss of overpressure (only applicable for containers with overpressure system)
Fire detected
Gas detected
Common fault

Ref chapter 4.7 for detailed hook up details.

4.4.2 Signals to/from CCR and local alarms
Cause & effect requirements

<table>
<thead>
<tr>
<th>Detection type</th>
<th>Close non EX-equip.</th>
<th>Local Alarm</th>
<th>Alarm in CCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas detection in vent intake</td>
<td>Yes, at Low Alarm*</td>
<td>Yes, at Low Alarm*</td>
<td>Yes, at Low Alarm*</td>
</tr>
<tr>
<td>Loss of overpressure</td>
<td>Yes, after maximum 3 min</td>
<td>Yes, after maximum 30 sec</td>
<td>Yes, after maximum 3 min</td>
</tr>
<tr>
<td>(Containers in classified area only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke or heat detection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Manual</td>
<td>Yes, maximum 10 sec delay</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* Alarm limits in accordance with NORSOK S-001, low alarm.

4.4.3 Telecommunication
Aker BP will provide PA speakers, telephones, telecoms, junction boxes and any associated equipment. These will be free issued to the contractor to install at his works. They will remain the property of AKER BP and must be returned at the end of the hire period.

4.4.4 Electrical
For general electrical requirements reference is made to NORSOK Z-015, 4.4.6
Equipment shall be protected by short-circuit and overload relays for each individual unit. If local starters are used, electrical motors above 1 kW needs thermal protection pre-set to maximum motors current. Motors to have star-coupling and/or internal thermistor protection in windings.

Ex e motors shall be star connected

Multi-voltage starter systems shall be possible to either lock or block for actual installation voltage or have installed an adjustable over under voltage protection system. Actual test showing reliability and correct functionality shall be documented.

One phase of single phase control transformers shall be directly earthed on the secondary side and be protected by fuse up to nominal rating, to prevent overload, in the other.

Platform alarms and safety shutdown signals. Normal power on all assets will be disconnected automatically upon detection of single gas.

For the following design/equipment types it is required that the supplier contacts relevant Aker BP Onshore personnel before any Purchase Order is signed:

1. Any power requirements not listed as available.
2. Applications/requests for sub-division of power distribution.
3. All use of transformers above 1 kVA. In order du enable Aker BP to evaluate that the distribution system downstream the transformer is designed and built in accordance with IEC 61892 and NORSOK E-001, the following document needs to be made available: Schematic/ Wiring Diagrams, calculations (Fibdok or equal) including min. short circuit level which as a minimum shall be 10X upstream fuse/ protective device rating. For multi voltage transformers a complete set of calculations and design documents must be available.
4. Use of generators
5. All use of local emergency power, including batteries. NB: Batteries with a maximum rating of 500VA, for backup of PC or equal, located inside certified EXd enclosures can be accepted, any other design needs to be clarified. A certification containing both batteries and battery box shall be provided. All equipment after the batteries shall be zone 1 certified.
6. If there is a request for change involving the automatic gas detection shut-down system.
7. If there is a request for UPS or emergency power (IT system)
8. Use of variable frequency drives and motors (shall be certified together for Exe motors)

If the equipment may be used on different installations, especially locations using different voltage levels, this should be facilitated by choosing equipment that can be easily changed or comes approved and marked for all actual voltages levels and start currents.

This will make it possible to move equipment directly between platforms.

Connections for:
- Water supplies for sprinkler system
- Water supply for other use.
- Drain connections.
- Plant air at 7 bar gauge pressure.
- Instrument air at 7 bar gauge pressure, dew point -20°C

The contractor is required to interface his own equipment to the above listed services.

It is not permitted to start or connect equipment to any of the systems on the installations before permission has been granted by responsible personnel on the relevant installation. Responsible senior el. technician on the relevant installation provides instructions on electrical connections.
If this requires work to be carried out by BP personnel, a work order is required. Aker BP will supply services local to the container and/or equipment, as indicated in this Section 4.7.

4.4.5 HVAC
For Containers type B and C in hazardous area, the following features shall be provided in the containers HVAC system: Maintain positive pressure not uncomfortable to personnel (5 mm water gauge/50Pa.) Double door air lock system.
For containers located in hazardous area reference is made to Clause 4.5.2 in NORSOK Z-015.

4.4.6 Process Safety
Equipment (eq for leak –and pressure testing) that potential can
- supply higher pressure than rated design for connected facility system
  AND/OR
- supply higher rate than capacity of PSV on connected facility

shall be equipped PSV to prevent overpressure of facility. PSV shall have capacity to handle rated maximum flow from equipment without exceeding maximum allowable accumulated pressure of connected facility. This also applies if PSV on connected facility system can be isolated from the connection point of the temporary equipment, typically by closing a valve.

For equipment that
- can supply higher pressure than rated design for connected facility system containing hazardous media
  AND
- with a continuous supply rate of more than 0.1 m³/hr,
the equipment shall have an independent shut-down function preventing overpressurisation of connected facility system.

Equipment that have a lower rated design than the connected facility system shall have PSV installed with sufficient rated capacity to prevent overpressure of equipment unless administrative procedures ensures that overpressurisation cannot occur. Check valve is not considered sufficient. Discharge from PSV must be routed to a safe location.

PSV shall be tested and certified prior to shipment of temporary equipment.
Shut-down functions shall be tested prior to start-up of temporary equipment.
For injection into connected facility, check valve shall be installed at the injection point to minimize potential backflow in case of leakage.

4.5 Ex-rating requirements for temporary equipment
No further requirements
4.6 Marking and tagging

4.6.1 General

All contractors’ tools and equipment to be marked with company logo/identification or equivalent. Individual equipment identification (ID) shall be clear and visible. This ID shall be also found on the Statement of Compliance and inspection reports.

Hoses, shackles and sockets to be individually marked.

4.7 Hook-up interfaces

4.7.1 Alvheim Temporary Equipment Information

Interface for temporary equipment and 3rd party equipment for Alvheim FPSO according to NORSOK Z-015

4.7.1.1 Instruments

<table>
<thead>
<tr>
<th>Function</th>
<th>Signal type</th>
<th>Connection platform</th>
<th>Connection temp. equip.</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire (Heat/Smoke/Manual Alarm Callpoint)</td>
<td>N.O. (Digital Input-Open contact for alarm)</td>
<td>Socket: CEAG GHG 511 4906 R0001 6h KU. Pin 1,2</td>
<td>Plug: CEAG GHG 591 2201 R0002 6h pin 1,2</td>
<td>TU20, TU25, TU30</td>
</tr>
<tr>
<td>Gas</td>
<td>N.O. (Digital Input-Open contact for alarm)</td>
<td>Socket: CEAG GHG 511 4906 R0001 6h KU. Pin 3,4</td>
<td>Plug: CEAG GHG 591 2201 R0002 6h pin 3,4</td>
<td>TU20, TU25, TU30</td>
</tr>
<tr>
<td>Loss of pressure</td>
<td>N.O. (Digital Input-Open contact for alarm)</td>
<td>Socket: CEAG GHG 511 4906 R0001 6h KU. Pin 5,6</td>
<td>Plug: CEAG GHG 591 2201 R0002 6h pin 5,6</td>
<td>TU20, TU25, TU30</td>
</tr>
<tr>
<td>Common fault</td>
<td>N.O. (Digital Input-Open contact for alarm)</td>
<td>Socket: CEAG GHG 511 4906 R0001 6h KU. Pin 7,8</td>
<td>Plug: CEAG GHG 591 2201 R0002 6h pin 7,8</td>
<td>TU20, TU25, TU30</td>
</tr>
</tbody>
</table>
Pin allocation, contact sense and line monitoring for Fire, Gas and Loss of Pressure Alarms (Shown in healthy state or loss of power to skid P&G panel), use N.O. contacts from P&G panel.

**Heat/Smoke/MAC Alarm**

Plug  
Pin 1  
Pin 2  
Pin 3  
Pin 4  
Pin 5

On skid  
27kΩ  
Smoke detected  
Manual Alarm Override

**Gas Alarm**

Plug  
Pin 1  
Pin 2  
Pin 3  
Pin 4

On skid  
8200  
Gas detected

**Loss of Pressure Alarm**

Plug  
Pin 1  
Pin 2  
Pin 3  
Pin 4

On skid  
8200  
27kΩ  
Fault contact

Pin allocation, contact sense and line monitoring for Common Alarm (Shown in alarm state or loss of power to skid, use N.C. contacts).

**Common Alarm**

Plug  
Pin 1  
Pin 2  
Pin 3  
Pin 4

On skid  
8200  
27kΩ  
Fault contact
Fire detection cabinet output relays (shown in healthy state i.e. no alarm)

Example: Supplier wiring providing loop monitoring and socket pin/associated loop configuration.
## 4.7.1.2 Telecoms

<table>
<thead>
<tr>
<th>Function</th>
<th>Signal type</th>
<th>Connection platform</th>
<th>Connection temp. equip.</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Desc./ Type</td>
<td>Desc./ Type</td>
<td></td>
</tr>
<tr>
<td>PA &quot;A&quot;</td>
<td>110 V system</td>
<td>Socket outlet: STAHL 8575/11-404 4h (yellow)</td>
<td>Plug: STAHL: 8575/12-404 (yellow) (1475 R – kl.4)</td>
<td>TU20, TU25, TU30</td>
</tr>
<tr>
<td>PA &quot;B&quot;</td>
<td>110 V system</td>
<td>Socket outlet: STAHL 8575/11-404 4h (yellow)</td>
<td>Plug: STAHL: 8575/12-404 (yellow) (1475 R – kl.4)</td>
<td>TU20, TU25, TU30</td>
</tr>
<tr>
<td>Telephone</td>
<td>48 V Analogue</td>
<td>Socket outlet: STAHL 8575/11-402 2h (green)</td>
<td>Plug: STAHL: 8575/12-402 (green) (1483 R – kl.2)</td>
<td>TU20, TU25, TU30</td>
</tr>
</tbody>
</table>
### 4.7.1.3 Electrical

<table>
<thead>
<tr>
<th>Power</th>
<th>Volt</th>
<th>Freq</th>
<th>Phase</th>
<th>Current</th>
<th>Neutral</th>
<th>System</th>
<th>Short circuit level</th>
<th>Distribution protection</th>
<th>Connection FPSO</th>
<th>Connection from temporary equipment</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>[V]</td>
<td>[Hz]</td>
<td>[A]</td>
<td>[S/I/R]**</td>
<td>min [kA]</td>
<td>max [kA]</td>
<td>Fuse [A]</td>
<td>Earth fault [mA]</td>
<td>Desc./Type</td>
<td>Desc./Type</td>
<td>Module / Room No.</td>
</tr>
<tr>
<td>Main</td>
<td>220</td>
<td>60</td>
<td>16</td>
<td>No</td>
<td>S</td>
<td></td>
<td>16</td>
<td></td>
<td>Socket: STAHL 8570/11-306</td>
<td>Plug: STAHL 8570/12-306</td>
<td>All Areas and Utility stations in area</td>
</tr>
<tr>
<td>Main</td>
<td>400</td>
<td>60</td>
<td>63</td>
<td>Yes</td>
<td>S</td>
<td></td>
<td>63</td>
<td></td>
<td>Socket: STAHL 8579/11-506</td>
<td>Plug: STAHL 8579/12-506</td>
<td>All Areas and Utility stations in area</td>
</tr>
</tbody>
</table>

* Main - Main Power  
  Emerg - Emergency Power  
  Ess - Essential power  
  UPS - UPS power  

** S = Solidly earthed system  
  I = Isolated system  
  R = Resistor (resistance earth)

Cable length for each plug should as a minimum be 30 meters.
For consumers above 63A no fixed installation is available, hence larger consumers’ needs to be reported to Onshore maintenance supervisor.
### 4.7.1.4 Utilities

<table>
<thead>
<tr>
<th>Function</th>
<th>Pressure</th>
<th>Amount/flow</th>
<th>Connection</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BarG</td>
<td>Max. Capacity</td>
<td>Type</td>
<td>Diameter</td>
</tr>
<tr>
<td>Plant air</td>
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<td></td>
</tr>
<tr>
<td>Instrument air</td>
<td>9.5</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sprinkler</td>
<td></td>
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</tr>
<tr>
<td>Seawater</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Freshwater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 4.7.2 Ivar Aasen Temporary Equipment Information

### 4.7.2.1 Electrical

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>V</td>
<td>Hz</td>
<td>A</td>
<td>Yes/No</td>
<td>S/I/R</td>
<td>Min kA</td>
<td>Max kA</td>
<td>Fuse A</td>
<td>Earth Fault</td>
<td>Module / Utility station</td>
</tr>
<tr>
<td>Main</td>
<td>230</td>
<td>60</td>
<td>16</td>
<td>Y</td>
<td>S</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>Weather deck</td>
</tr>
<tr>
<td></td>
<td>1ph+N+PE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Intermediate deck</td>
</tr>
<tr>
<td>UPS</td>
<td>230</td>
<td>60</td>
<td>16</td>
<td>N</td>
<td>I</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>Weather deck</td>
</tr>
<tr>
<td></td>
<td>L1 +L2 +PE</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Intermediate deck</td>
</tr>
<tr>
<td>Main</td>
<td>400</td>
<td>60</td>
<td>63</td>
<td>Y</td>
<td>S</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
<td>Weather deck</td>
</tr>
<tr>
<td></td>
<td>3ph+ N+PE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Intermediate deck</td>
</tr>
<tr>
<td>Emerg</td>
<td>690</td>
<td>60</td>
<td>125</td>
<td>N</td>
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<td>Weather deck</td>
</tr>
<tr>
<td></td>
<td>3ph+ PE</td>
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<td>Intermediate deck</td>
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<td>200</td>
<td>N</td>
<td>I</td>
<td>200</td>
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<td></td>
<td>Weather deck</td>
</tr>
<tr>
<td></td>
<td>3ph+ PE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Intermediate deck</td>
</tr>
</tbody>
</table>

* Main - Main Power
Emerg - Emergency Power
Ess - Essential power
UPS - UPS power

** S = Solidly earthed system
I = Isolated system
R = Resistor (resistance earth)
### 4.7.2.2 Instrument

<table>
<thead>
<tr>
<th>Function</th>
<th>Signal Type</th>
<th>Connection Platform</th>
<th>Connection Temp. Equipment</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of pressure</td>
<td>NO</td>
<td>GHG 511 4906 R0001 6h Pin 7,8,9</td>
<td>GHG 591 2201 R0002 6h Pin 7,8,9</td>
<td>Weather deck Utility station 1 West: 8 outlets Utility station 2 East: 8 outlets</td>
</tr>
<tr>
<td>Fire</td>
<td>NO</td>
<td>GHG 511 4906 R0001 6h Pin 1, 2, 3</td>
<td>GHG 591 2201 R0002 6h Pin 1,2,3</td>
<td>Weather deck Utility station 1 West: 8 outlets Utility station 2 East: 8 outlets</td>
</tr>
<tr>
<td>Gas</td>
<td>NO</td>
<td>GHG 511 4906 R0001 6h Pin 4, 5, 6</td>
<td>GHG 591 2201 R0002 6h Pin 4,5,6</td>
<td>Weather deck Utility station 1 West: 8 outlets Utility station 2 East: 8 outlets</td>
</tr>
<tr>
<td>General alarm from Container</td>
<td>NO</td>
<td>GHG 511 4906 R0001 6h Pin 10, 11, 12</td>
<td>GHG 591 2201 R0002 6h Pin 10,11,12</td>
<td>Weather deck Utility station 1 West: 8 outlets Utility station 2 East: 8 outlets</td>
</tr>
</tbody>
</table>

21 pins connector for instrument signals:

![Diagram of 21 pins connector](Image)

Install loop resistor in container junction box in accordance with SAS HW typical DI-S-41F (defined in DN02-S09011-I-SP-0002). 10 K ohm in parallel and 1 K ohm in series to provide continuous loop monitoring in SAS.
### 4.7.2.3 Telecom

<table>
<thead>
<tr>
<th>Funksjon</th>
<th>Signal type</th>
<th>Plattform tilkobling</th>
<th>Midl. Utstyr tilkobling</th>
<th>Område</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGA</td>
<td>Audio, 100V line</td>
<td>Hawke Instrument 4 pins N-4WAY BR Pin 1 and 2. Locking position 2</td>
<td>Hawke Instrum 4 pins N-4WAY CP Pin 1 and 2. Locking position 2</td>
<td>Weather deck Utility station 1 West: 5 outlets Utility station 2 East: 5 outlets</td>
</tr>
<tr>
<td>Telefon</td>
<td>Audio</td>
<td>Hawke Instrument 4 pins N-4WAY BR Pin 1 and 2. Locking position 1</td>
<td>Hawke Instrum 4 pins N-4WAY CP Pin 1 and 2. Locking position 1</td>
<td>Weather deck Utility station 1 West: 3 outlets Utility station 2 East: 3 outlets</td>
</tr>
<tr>
<td>Data (fiber)</td>
<td>SM Fiber</td>
<td>Q-ODC-4 hex bulkhead connector with 9/125 SM pigtail</td>
<td>Q-ODC-4 plug</td>
<td>Weather deck Utility station 1 West: 3 outlets Utility station 2 East: 3 outlets</td>
</tr>
</tbody>
</table>

### 4.7.2.4 Utilities

<table>
<thead>
<tr>
<th>Funksjon</th>
<th>Normalt trykk</th>
<th>Maks. Trykk</th>
<th>Temp min</th>
<th>Temp maks</th>
<th>Temp normal</th>
<th>Tilkobling</th>
<th>Pipe spek.</th>
<th>Område</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anleggets luftsystem</td>
<td>8</td>
<td>9.5</td>
<td>-7</td>
<td>+60</td>
<td>+35</td>
<td>1&quot; Chicago claw (open ended)</td>
<td>1&quot; 150# RF Flange</td>
<td>Weather deck Utility station 1: 3 outlets Utility station 2: 3 outlets Intermediate deck Utility station 1: 3 outlets Utility station 2: 3 outlets</td>
</tr>
<tr>
<td>Service vann</td>
<td>10</td>
<td>18</td>
<td>-6</td>
<td>+50</td>
<td>+15</td>
<td>1&quot; Snaplock (open ended)</td>
<td>1&quot; 150# RF Flange</td>
<td>Weather deck Utility station 1: 3 outlets Utility station 2: 3 outlets Intermediate deck Utility station 1: 3 outlets Utility station 2: 3 outlets</td>
</tr>
<tr>
<td>HP varmtvann</td>
<td>190</td>
<td>246.4</td>
<td>-7</td>
<td>+100</td>
<td>+80</td>
<td>3/8&quot; BSP (open ended) to fit spray, guns, additional quick coupling</td>
<td>1&quot; 1500# RTJ Flange</td>
<td>Weather deck Utility station 1: 3 outlets Utility station 2: 3 outlets Intermediate deck Utility station 1: 3 outlets Utility station 2: 3 outlets</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>7.5</td>
<td>14</td>
<td>-9</td>
<td>+80</td>
<td>+50</td>
<td>1&quot; Snaplite HST (open ended)</td>
<td>1&quot; 150# RF Flange</td>
<td>Weather deck Utility station 1: 3 outlets Utility station 2: 3 outlets Intermediate deck Utility station 1: 3 outlets Utility station 2: 3 outlets</td>
</tr>
<tr>
<td>Diesel</td>
<td>9.3</td>
<td>13</td>
<td>-6</td>
<td>+50</td>
<td>Amb</td>
<td>1&quot; Snaplite HST (open ended)</td>
<td>2&quot; 150# RF Flange</td>
<td>Weather deck Utility station 1: 3 outlets Utility station 2: 3 outlets Intermediate deck Utility station 1: 3 outlets Utility station 2: 3 outlets</td>
</tr>
</tbody>
</table>
4.7.3 Skarv, Temporary Equipment Information

Frequency: 50Hz
Distribution system: TN-C-S
Voltage level:
- 230V: 16A, 1P+N+PE
- 230V: 16A, 3P+N+PE
- 400V: 63A, 3P+N+PE
- 400V: 125A, 3P+N+PE

Maximum short circuit levels
- 440V Main distribution: 15kA
- 230V Sub distribution: 10kA

Minimum shot circuit level
- 3X440 & 480v: 125A - 2000A
- 3X440 & 480v: 63A - 1000A
- 2X220 & 230V: 16A - 200A

4.7.3.1 Electro

Plugs for connections of 3rd party equipment

Equipment location shall be clarified prior to shipment. This due to different plug on Top side and Hull. Hull/tank top deck does not have 5-pins 400V receptacle with option for 230V for control. This option is only available for Topside.

General on Skarv (Hull & Topside):
- 230 V: 16A 1P+N+PE, Type: CEAG, GHG511 7306 R001
- Hull and Tank deck 400V:
  - 63A: 3P+PE, CEAG (4-Pins 3fas without neutral), CHG518 7406 R0001
- Toppside, U800, T700, P100-P600
  - 400V:
    - 63A: 3P+N+PE, Type: CEAG, GHG514 7506 R001 (5-Pins 3fas without neutral)
    - 125A: 3P+N+PE, Type: CEAG, GHG515 7506 R001
4.7.3.2 Instrument

![Diagram](image)

**Line monitoring for Fire & Gas Alarms (shown in healthy state) NO contact set to be used**

4.7.3.3 Utility Systems, Skarv

<table>
<thead>
<tr>
<th>Function</th>
<th>Normal pressure</th>
<th>Max pressure</th>
<th>Temp min</th>
<th>Temp max</th>
<th>Normal temp</th>
<th>Pipe spec</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air System</td>
<td>9,0</td>
<td>9,6</td>
<td>°C</td>
<td>°C</td>
<td>°C</td>
<td>1# 150* COUPLING, QUICK RECTUS, 3/4 IN, NPT INSIDE 3/4 IN, AISI 316 VITON S.38, FEMALE WITH CHECK VALVE, FOR AIR</td>
<td></td>
</tr>
<tr>
<td>Service water</td>
<td>9,5</td>
<td>10,9</td>
<td></td>
<td></td>
<td></td>
<td>1# 150* CAMLOCK</td>
<td></td>
</tr>
<tr>
<td>HP warm water</td>
<td>200 Bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12mm FAST</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>9,0</td>
<td>9,2</td>
<td></td>
<td></td>
<td></td>
<td>1# 150* SNAPTITE</td>
<td></td>
</tr>
<tr>
<td>Diesel</td>
<td>7,0</td>
<td>7,2</td>
<td></td>
<td></td>
<td></td>
<td>JIS TODOMATIC</td>
<td></td>
</tr>
</tbody>
</table>
### 4.7.3.4 Hose Connectors

Connector types have changed for Skarv. In a transition period both old and new connector will be found in the field.

Old and new connector are not interchangeable.

Hoses are color coded according to medium used for.

#### Old and new color coding with associated connector

<table>
<thead>
<tr>
<th>Hose</th>
<th>Old color</th>
<th>New color</th>
<th>Connector Old type</th>
<th>Connector New type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh water</td>
<td>Green</td>
<td>Blue</td>
<td>Glenclok quick connector</td>
<td>Camlock connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Female end: without check-valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male end: without check-valve</td>
</tr>
<tr>
<td>Air</td>
<td>Blue</td>
<td>Yellow</td>
<td>Glenclok quick connector</td>
<td>Rectus/tema Quick link connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Female end: with check-valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male end: without check-valve</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>Yellow</td>
<td>Orange (stripes)</td>
<td>Glenclok quick connector</td>
<td>Snaptite connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Female end: with check-valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male end: with check-valve</td>
</tr>
<tr>
<td>Diesel</td>
<td>Brown</td>
<td>Brown</td>
<td>Glenclok quick connector</td>
<td>Todamatic connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Female end: with check-valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male end: with check-valve</td>
</tr>
</tbody>
</table>

Ref 53-000629 «Management and use of flexible hose assemblies» Table 5 which also include couplings for media beyond these 4, incl N2 High pressure.  
4.7.4 **ULA, Temporary Equipment Information**
Applicable for Ula, Tambar

**Frequency:** 60 Hz

**Distribution system:** All main power is TN-system (TN-C-S/ TN-S) – Solid earthed neutral up to 480V and high resistance earthed neutral for 690V

**Voltage levels:**
- 230V, 1 phase general power (Max 16A) with integrated earth fault trip rated 30mA
- 440V, 3 phase main power:
  - Ula/ Tambar and Valhall (PH, IP and Flank South and North)
  - 480V, 3 phase:
    - Valhall (PCP, DP, QP, WP) and Hod
- 230V, 1 phase emergency power and UPS (max 16A): All Aker BP installations, but only as agreed with Onshore Support personnel

**Max short circuit level:**
- 20 kA on 440/480V
- 5 kA on 220/230V.

**Minimum short circuit level:**
- 3X440 & 480V 125A - 2000A
- 3X440 & 480V 63A - 1000A
- 2X220 & 230V 16A - 200A

4.7.4.1 **Electrical**

**Plugs for Ula, Tambar**

All plugs will be supplied and connected by the contractor.

**Plugs, Ula and Tambar:**
- 230V 16A STAHL - 8570/12-306 h 6 IP66
- 440V 63A STAHL - 8579/12-411
- 440V 125A STAHL - 8581/12-411
4.7.4.2 Instrument
Ula P; D & Q – ABB 800xA

Motstandsverdier ved endeterminaler:
Åpen krets eller tap av overtrykk: $\infty \Omega$
Kortslutning: 0Ω
Normal status uten tap av overtrykk: 3K7Ω
Varme, røyk, gass eller manuell knapp: 1KΩ

Tambar – ABB SafeGuard:
Midlertidig utstyr kobles opp via eksiterende MAC sløyfe.

Motstandsverdier ved endeterminaler:
Åpen krets eller tap av overtrykk: $\infty \Omega$
Kortslutning: 0Ω
Normal status uten tap av overtrykk: 6K8Ω
Varme, røyk, gass eller manuell knapp: 732Ω
4.7.5 Valhall, -HOD Temporary Equipment Information

Applicable for Hod, Valhall (DP, WP, IP and PH), and Valhall Flank North, Valhall Flank South and Valhall Flank West:

**Frequency:** 60 Hz

**Distribution system:** All main power is TN-system (TN-C-S/ TN-S) – Solid earthed neutral up to 480V and high resistance earthed neutral for 690V

**Voltage levels:**
- 230V, 1 phase general power (Max 16A) with integrated earth fault trip rated 30mA
- 440V, 3 phase main power:
  - Ula/ Tambar and Valhall (PH, IP and Flank South and North)
  - 480V, 3 phase:
    - Valhall (PCP, DP, QP, WP) and Hod
- 230V, 1 phase emergency power and UPS (max 16A):
  - All Aker BP installations, but only as agreed with Onshore Support personell

**Max short circuit level:**
- 20 kA on 440/480V
- 5 kA on 220/230V.

**Minimum short circuit level:**
- 3X440 & 480V 125A - 2000A
- 3X440 & 480V 63A - 1000A
- 2X220 & 230V 16A - 200A

4.7.5.1 Electrical

Plugs for Valhall (DP, WP, IP, PH), Flank South and Flank North

All plugs will be supplied and connected by the contractor

**Plugs, Valhall – PH, IP, Flank North, Flank South and Flank West:**
- 230V 16A STAHL - 8575/12-306
- 440V 63A STAHL - 8579/12-411
- 480V 125A STAHL - 8581/12-411

**Plugs, Valhall – DP, WP** og Hod**:
- 220-230V 16A STAHL - 8575/12-306
- 480V 63A BBC GHG 534 2405V**
- 480V 125A BBC GHG 535 2507V*

* Hod does not have 125A available.
Higher consumption than 40 Amp. from 63A socket must be clarified in advance, since this varies somewhat from platform to platform.

In some areas 440/480V can be supplied via a 125A socket.

220-230V, 1phase: socket fuse size 16A

** NB! Valhall Wellhead Platform (WP) have only 125A socket outlets from 3 phase 480V distribution system

### 4.7.5.2 Instrument

HOD, Valhall DP, WP & IP, Valhall Flank South & Flank North – ABB Safeguard System

**Valhall PH - ABB 800Xa system:**
Valhall Flank West

Field Instrument

Line monitoring for Fire & Gas Alarms (shown in healthy state) NO contact set to be used

S1-NO with no Heat, Smoke or MAC detected (closes on alarm)
S2-NO with no Gas detected (closes on alarm)
S3-NO Common fault (closes on alarm)

4.8 Documentation

No further requirements
Annex A (Normative and Informative) Administrative guidelines
No further requirements

Annex B (Normative) Z-015 Data Sheet for installation
No further requirements

Annex C (Normative) Checklist matrices
No further requirements

Annex D (Informative) Equipment not registered as temporary equipment
No further requirements

Annex E (Normative) Qualification requirements for supplier personnel who operate, maintain and repair electrical equipment
No further requirements

Annex F (Normative) Mono cable
No further requirements

Annex G (Normative) Z-015 Declaration of conformity
No further requirements

Annex H (Normative) Z-015 Data sheet for temporary equipment
No further requirements

Annex I (Normative) Maintenance
Pressure Hoses shall be added to list of components requiring documented maintenance program and history