

TECHNICAL DESCRIPTION



LNG SAMPLER

ANALYTICAL SOLUTIONS AND PRODUCTS



LNG SAMPLING AND ANALYSIS



ASAP CP/FP LNG SAMPLER

LNG Sampling Systems are used for collecting samples during the custody transfer of LNG cargo. By offline (lab) analysis of these retained samples, principal proof of the transferred LNG quality can be obtained. Together with the quantity transferred, the commercial value of the cargo can be determined. ASaP has an impressive track record in the development and design of Intermittent LNG Sampling Systems. The systems are in compliance with the ISO 8943, the ISO 10715 and the guidelines stipulated in the GIIGNL: LNG CUSTODY TRANSFER HANDBOOK.

A LNG Sampling System is typically supplied in combination with:

- A combined sample take-off probe with integrated vaporizer/accumulator.
- Sample transport lines.
- Three (3) constant Pressure/Floating Piston (CP/FP) cylinders including associated control equipment.
- A control system

The key feature of our product is that we can obtain representative samples from the cryogenic flow in the main LNG transfer pipeline. The Intermittent CP/FP LNG Sampling System does this by collecting a sample in transportable CP/FP cylinders in accordance with the ISO 8943 paragraph 4.3 Intermittent sampling.

The LNG Sampling System is manufacturer's standard and among others equipped with:

- Three (3) duty sample cylinders (standard SS-316, 1.000/800 cc net). These cylinders include isolation valves, pressure gauges (0 - 10 bar), quick connectors and a safety bursting disk.
- A Helium gas bottle facility (for one (1) bottle) at the back of the sampling cabinet by means of wall mounted clamps or chains to provide pre-charge pressure in the CP/FP cylinders. The gas bottle connection will have a two-stage pressure regulator, complete with pig-tail or flexible hose, relief valve, pressure indicators and isolation valve

SPECIFICATIONS SAMPLER

ASaP supplies this LNG sampling system with auxiliary equipment in accordance with the following technical specifications:

Sampling System wetted parts	: Material SS316
Size (H x W x D) approximately	: 2000 x 1600 x 500 mm
Material	: Glass Reinforced Polyester
Weight Approximately	: 350 kg
Hazardous Area classification	: II 2 G ATEX Ex Zone 1 IIB T3
Ambient temperature range	: -20°C to 50°C
Filling pressure Sample Cylinders	: approximately 8 barg

UTILITIES (REQUIRED)

Power supply	: 230 - 240 VAC - 50 Hz and 24 VDC (from the control system)
Instrument Air Max.	: 130 NI/hr (intermittent per batch) Pressure 5 - 7 barg Dew point < -40°C
Helium Max.	: 15 NI/hr (intermittent per batch)
Connections	: imperial



CONTROL SYSTEM

The control unit is a standard standalone unit suitable for a climate controlled non-hazardous area location and is typically located in a Field Auxiliary Room. It is built into a free standing cabinet with front and back access. Our LNG sampling systems use a dedicated non-redundant controller with touch screen HMI, based on an industrial PLC that monitors and controls the progress of the sampling and the alarm handling as appropriate. The set up and operation of the LNG Sampling System can be done via the interface panel on the Control System. Step control will be based upon the requirements as set forth in the ISO 8943.

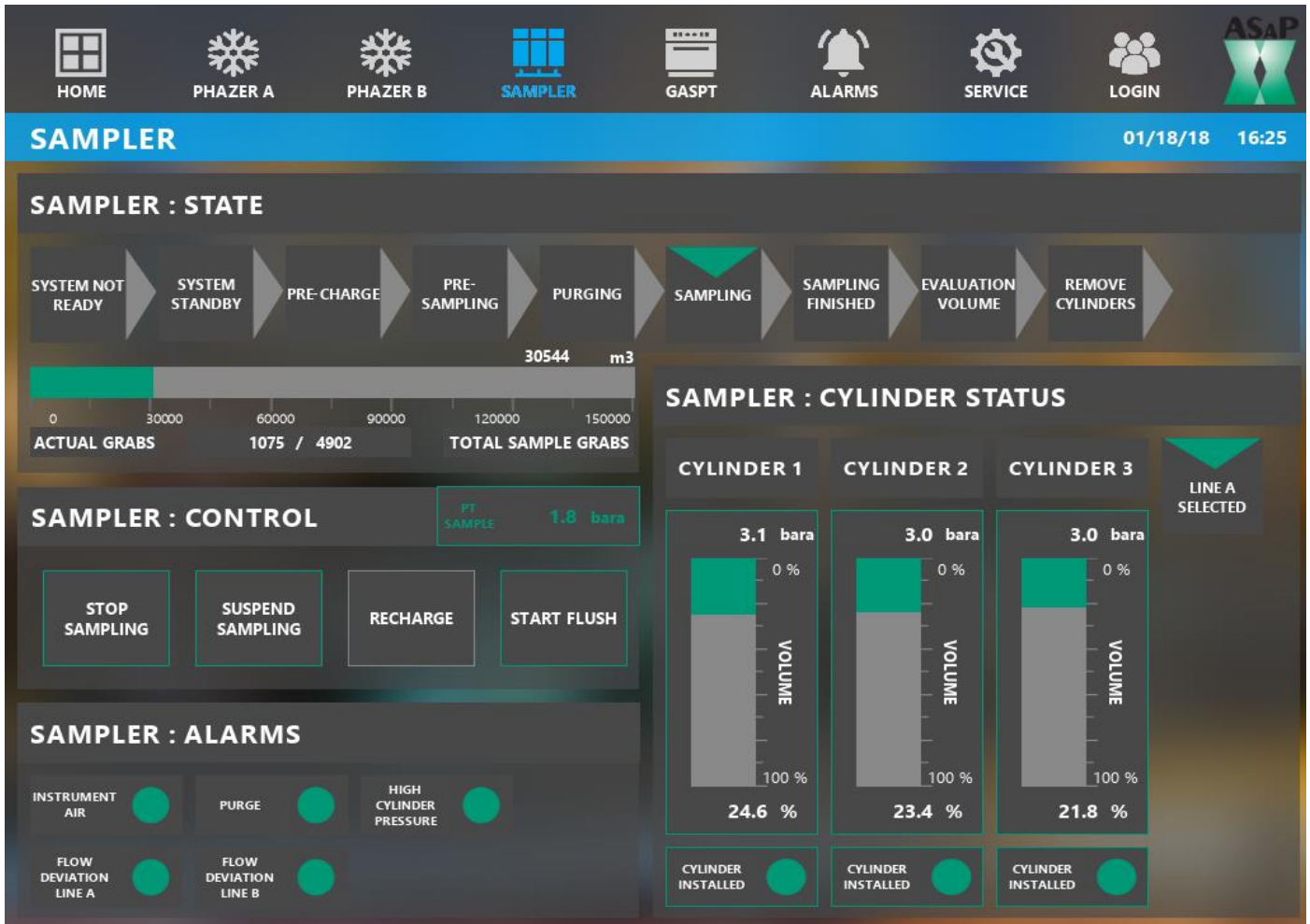


Figure 1 – Screenshot sampler software

A COMMON ALARM WILL BE AVAILABLE TO DCS CONSISTING OF:

- Instrument air pressure low
- Pre-charge pressure low
- Purge flow low
- Sample flow low
- No cylinder present
- Cylinder pressure sensor fail
- Cylinder filling level deviation
- PLC fault



SIGNALS REQUIRED FROM DCS:

- Start/Stop sampling sequence
- Suspend/Continue sampling sequence
- Flow signal LNG Transfer Line
- Batch size

SPECIFICATIONS CONTROL SYSTEM

ASaP supplies this control system in accordance with the following technical specifications:

Control System Specifications:

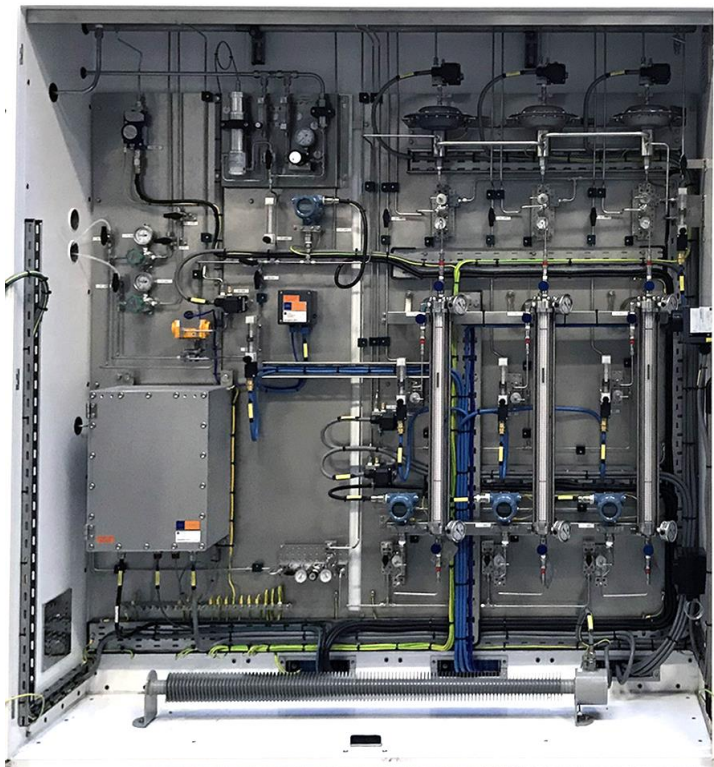
- Material Painted steel : Size (H x W x D) Approx. 2000 x 800 x 800 mm
- Weight Approximately : 300 kg
- Area classification : For use in climate controlled general purpose non-hazardous area

UTILITIES:

- Power supply : 230 - 240 VAC - 50 Hz
- Power Consumption approx. : 1400 VA (Excluding Vaporizer(s))
- ASaP LNG Phazer : 2000 VA /probe-vaporizer

FUNCTIONALITY

- PLC Step control Based upon ISO 8943 requirements
 - DCS Interface MODBUS TCP/IP or RS485
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Figuur 2 - Frontside (doors removed)



Figure 3 - Backside with Zone 2 controller

- LNG Sampling & Control cabinet common alarm,
- Vaporizer common alarm
- Modbus TCP/IP or Modbus RS485 to DCS

OPTIONS

The following options can be quoted upon request:

- Automatic stream selection by means of a pneumatic operated 4-way ball valve to make the sampler suitable for sampling of two (2) main LNG transfer pipelines
- Sulfinert® coating of major sample wetted components including the vaporizer, e.g. sample transport tubing, grab sample pumps, CP/FP sample cylinders to enable client to perform H₂S analysis on the collected samples. Tube connectors, valves etc. will not be Sulfinert® coated.
- Spot Sampling Panel.
- A pressure switch to detect pre-alarm for a changing gas bottle.
- A local ATEX zone 2 certified HMI panel for controlling the LNG sampling system in the field
- IECEx, UL, CSA certification.
- On-line Process Gas Chromatograph (PGC) and/or Gas Property Transmitter (GasPT-LNG) with associated equipment.
- Metric sizes fitting and tubing.



ASaP is situated in the harbor of Amsterdam Westpoort and is near to Schiphol Airport and the Central Station of Amsterdam.

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