Issan is the core member of a group employing 1,000 people and active in steel, energy and food industries.

Issan was established in 1968 for producing hot water boilers, then focused to the pressure vessels business by 1980’s. Issan has grown up to be a major manufacturer especially on transport and storage tanks for LPG, cryogenics, CO\textsubscript{2} and LNG. Today Issan is working on a massive 46,000 m\textsuperscript{2} area and exports 50% of its products to more than 60 countries.

Issan has a proactive, dynamic and progressive approach to keep its leader position and international reputation. Our R&D professionals follow the global developments and adapts to our designs and key processes. We benefit the advantages of high technology to create value for our customers.

**Quality Management**

Total quality is our primary concept while forming our production; covering all aspects from technology to human. We have accomplished all employees to feel themselves as a part of our quality management system.

**Inspection:** A brief list of inspection methods and equipment Issan uses are as follows:

- X-Ray
- Ultrasonic Test
- Magnetic Particle Test
- Industrial Endoscopy
- Leak Test with Helium Detector
- Vacuum Measurement
- Hygrometry for Dew Point
- UV Lamp

**Approval:** Issan has achieved the level of international quality standards and has been awarded international quality certificates.

- ISO 9001
- ASME STAMPS (U, U2, S)
- GOST TR
- GOST RTN
- UKR SEPRO
- DIRECTIVE 2007/46/EC
- 2010/35/EU (TPED)

**Standards:** Issan is capable to design and manufacture pressure vessels and submit certificates according to the following design codes and standards.

- AD 2000
- ASME Div.1, Div.2
- BS 5500
- CODAP
- EN STANDARDS
- ADR, ADR Part 9

**After Sales Service**

Our approach is to offer service in time, without compromising high quality standards and never leave our customers with unsolved problems. Our services include the following and we offer more comprehensive, location and product specific service packages upon agreement:

- Engineering services to analyze customer’s requirements and advice the best solution
- Announcing system upgrades and improvements through the entire service life of the product
- Providing commissioning, operating and maintenance instructions
- Remote help and technical support for in-site repair or requalification
- Training programs for operators, maintenance personnel and engineers

**Some References**

- ADNOC
- AKPET GAZ
- ARÇELİK
- AYGAZ DOĞALGAZ
- BARİT MADEN / BOZKAR
- BASİ GAS
- BİZİMGAZ / SHV GROUP
- BUZWAIR
- COCA COLA
- EFES PILSEN
- GASCO
- GEMIQAYA
- GLOBAL GAS
- GLOBAL GYPSUM CO.
- GULF CRYO
- HABAŞ
- HAFFMANS - PENTAIR
- HİSAR DOĞALGAZ / ÜLKER
- İPRAGAZ / SHV GROUP
- LINDE GAS
- LUKOIL
- MEGAŞ
- MESSER
- NAFTAL
- OMV GAZ VE ENERJİ A.Ş.
- PEPSI
- PETROL OFİSİ
- SOHAR GASES CO. LLC.
- ÜLKER
- VIKING SODA AB

**Suppliers**

- BPW
- CRYOSTAR
- ENDRESS HAUSER
- FISCHER
- HEMPEL
- HEROSE
- JOTUN
- KNORR-BREMSE
- MEGA-INOX
- REGO
- SAMSON
- SMITH
- WABCO
- WHESSOE
Cryogenic

ISISAN cryogenic tanks are designed and manufactured for all types of cryogenic applications with the requirements for safe, easy and economical operation.

The highlights of ISISAN tanks are:

• Storage tanks are equipped by economizer circuit, routing the boil off gas into the main system, which prevents wastage of gas. The mono-bloc pressure building economizer-regulator offers easy pressure adjustment and maintains operational reliability.

• Storage tanks are designed and manufactured in accordance with and conforming to EC directives and EN standards. Other national pressure vessel codes, or standards are applicable upon customer’s requirement.

• Transport tanks are designed and manufactured in accordance with ADR, EC directives and EN standards. All models have \( \pi \) mark and European approvals are provided. Other national pressure vessel codes, or standards are applicable upon customer’s requirement.

• ISISAN can provide a wide range of tailor made solutions; with sizes, design pressures and other specifications as required by the customer.

• ISISAN’s cryogenic tank manufacturing facility is ISO 9000 approved, to assure the best quality in all aspects of our operation.

• The support legs are calculated according to UBC, Eurocode standards to resist high wind and seismic loads.

• Standard equipment includes dual safety relief valves with diverter valve, stainless steel pressure gauge and differential pressure contents gauge; with optional switches, transmitters and/or telemetry unit. Horizontal storage tanks can be equipped with load cells.

• Carefully designed stainless steel pipe work reduces operation time. Appropriate bending of stainless steel pipe work means fewer connections, minimizing potential leaks, higher operability and less servicing.

• Rugged internal supports to resist loads and stresses during transportation.

• Ergonomic design of valves, outlets, lifting lugs and other components enables safe and easy installation, operation, maintenance and servicing.

• Air gas tanks and their components are cleaned for oxygen service.
Cryogenic LIN/LOX/LAR AIR GAS STORAGE TANKS

DESIGN CODE
EN 13458 - PED 97/23/EC

MAX. ALLOWABLE WORKING PRESSURE
19 bar / 37 bar

DESIGN TEMPERATURE
-196°C

INNER VESSEL MATERIAL
Stainless Steel (According to EN 10028-7)

OUTER VESSEL MATERIAL
Carbon Steel (According to EN 10025/EN 10028-3)

INSULATION
Perlite & Vacuum

Air Gas Standard Storage Tanks Dimensions

19 BAR CRYOGENIC LIN/LOX/LAR STORAGE TANKS

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<th>MAWP</th>
<th>Gross Capacity</th>
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Data given on the table are nominal volumes and actual capacity may vary from these due to manufacturing tolerances.

37 BAR CRYOGENIC LIN/LOX/LAR STORAGE TANKS

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<th>Empty Weight</th>
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</tbody>
</table>

Data given on the table are nominal volumes and actual capacity may vary from these due to manufacturing tolerances.
Air Gas Standard Storage Tanks P&ID

NOMENCLATURE

1. Fill connection
2. Bottom fill valve
3. Top fill valve
4. Try cock valve
5. Top fill isolating valve
6. Bottom fill isolating valve
10. Pressure building coil
13. Economizer isolating valve
14. Combine valve (Filter, Regulator, Economizer, Non return valve)
20. Liquid withdrawal valve
30. Three way valve
31. Inner vessel safety relief valve (a/b)
34. Vapor vent valve
35. Thermal relief valve
40. Level indicator
41. Equalizer valve
42. Low pressure shut off valve
43. High pressure shut off valve
44. Pressure indicator
51. Evacuation connection
52. Vacuum safety device
55. Overfilling protection device

Option-1 Overfilling protection
18. Thermal relief valve
19. Purge valve

Option-2 Liquid withdrawal line
15. Liquid withdrawal valve
28. Liquid withdrawal connection

Option-3 Thermosyphon
53. Pump feed valve
54. Pump return valve

ISISAN reserves the right to change above specifications without prior notice.
Cryogenic LIN/LOX/LAR AIR GAS TRANSPORT TANKS

<table>
<thead>
<tr>
<th>DESIGN CODE</th>
<th>EN 13530 - ADR</th>
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<td>Super Insulation &amp; Vacuum</td>
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### HIGH PRESSURE SERIES AIR GAS TRANSPORT TANK

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### LOW PRESSURE SERIES AIR GAS TRANSPORT TANK

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Air Gas Transport Tanks P&ID High Pressure Series

NOMENCLATURE

1. Jacketed pressure vessel
2. Vacuum safety device
3. Evacuation valve
4. Try cock valve
8. Low pressure shut-off valve
10. High pressure shut-off valve
11. Bottom fill isolating valve
12. Top fill valve
13. Bottom fill valve
14. Level indicator
16. Evacuation connection

17/A. Inner vessel safety relief valve
17/B. Inner vessel safety relief valve
19. Equalizer valve
20. Vapor vent valve
25. Fill connection
32. Pressure building coil
33. Pressure indicator
51. Non-return valve
54. Pressure build-up valve
62. Purge valve
70. Thermal relief valve

Option-1
52. Gas analysis valve
53. Gas analysis connection

Option-2
67. Emergency shut-off valve
68. Thermal relief valve

Option-3
69. Liquid analysis valve
72. Liquid analysis connection

Option-4
71. Flowmeter

---

Cryogenic LIN/LOX/LAR
AIR GAS TRANSPORT TANKS
Cryogenic LIN/LOX/LAR AIR GAS TRANSPORT TANKS

Air Gas Transport Tanks P&ID Low Pressure Series

PNEUMATIC CONTROL SYSTEMS
ESB1 Emergency stop button
ESB2 Emergency stop button
TSB1 Transport cruising button
ATS1 Anti-tow away system

VACUUM CONNECTION
5 Vacuum safety device
50 Evacuation valve
51 Evacuation connection

INDICATOR (LEVEL, PRESSURE) LINE
40 Level indicator
41 Equalizer valve
42-G Low pressure shut-off valve
43-L High pressure shut-off valve
44 Pressure indicator
46 Pump pressure gauge
47 Pump high pressure switch
48 Pump vacuum switch
49 Temperature probe safety device

FILL LINE
1 Fill connection
2-L Bottom fill valve
3-G Top fill valve
4-T1 Try cock valve (%95)
4-T2 Try cock valve (optional)
4-T3 Try cock valve (optional)
9 Drain line valve
10 Pressure building coil
11-L Pressure build-up valve
12-G Vapor outlet valve PBC
13-L Pump PBC inlet valve
18-L Emergency shut-off valve (optional)
52 Liquid analysis valve (optional)
53 Gas analysis valve (optional)

CONSUMPTION LINE
21-L Emergency shut-off valve

SAFETY RELIEF LINE EQUIPMENTS
32/A Inner vessel safety relief valve
32/B Inner vessel safety relief valve
35-1 Thermal relief valve
35-2 Thermal relief valve
35-3 Thermal relief valve
35-4 Thermal relief valve
35-5 Thermal relief valve (optional)
34 Vapor vent valve

PUMP SUCTION LINE
60-L Pump suction valve
63 Pump
65 Pump by-pass valve
66-L Pump outlet valve
68-L Pump outlet connection
70 Purge valve
71 Analysis adapter (optional)
72 Flowmeter isolating valve (optional)
73 Flowmeter (optional)

“K” outlets will be connected to collector.
**Cryogenic LNG TANKS**

**STORAGE TANKS**

**DESIGN CODE**
EN 13458 - PED 97/23/EC

**MAX. ALLOWABLE WORKING PRESSURE**
5 bar

**DESIGN TEMPERATURE**
-196°C

**INNER VESSEL MATERIAL**
Stainless Steel (According to EN 10028-7)

**OUTER VESSEL MATERIAL**
Carbon Steel (According to EN 10025/EN10028-3)

**INSULATION**
Perlite & Vacuum

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Data given on the table are nominal volumes and actual capacity may vary from these due to manufacturing tolerances.
Cryogenic LNG TANKS
STORAGE TANKS

LNG Storage Tanks P&ID

ISISAN reserves the right to change above specifications without prior notice.

NOMENCLATURE

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<td>42-G</td>
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<td>11</td>
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Option-1 Vapor equalizing line
Option-2 Emergency shut off system
Option-3 Line purging
Option-4 Emergency shut off system
Option-5 PBC Isolation valve
Option-6 PBC Outlet valve
## Cryogenic LNG Tanks

### Transport Tanks

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<tr>
<th>DESIGN CODE</th>
<th>EN 13530 + ADR</th>
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<tr>
<td>OUTER VESSEL MATERIAL</td>
<td>Carbon Steel (According to EN 10025/ EN10028-3)</td>
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<tr>
<td>INSULATION</td>
<td>Super Insulation &amp; Vacuum</td>
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### BOBTAIL

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<td>LIQUID (0.5 barg)</td>
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### SEMI-TRAILER

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Cryogenic LNG TANKS
TRANSPORT TANKS

LNG Transport Tanks P&ID

NOMENCLATURE

1. Bottom fill isolating valve
2. Bottom fill valve
3. Thermal relief valve
4. Purge valve
5. Vacuum safety device
6. Non return valve
7. Top fill valve
8. Vapor equalizing valve
9. Vapor equalizing connection
10. Emergency shut off valve
11. Pressure building coil
12. Vapour outlet valve for (PBC)
13. Try cock valve
14. Emergency shut-off valve
15. Evacuation valve
16. Inner vessel safety relief valve
17. Evacuation connection
18. High pressure shut off valve
19. Low pressure shut off valve
20. Equalizer valve
21. Level indicator
22. Pressure indicator valve
23. Pressure indicator
24. Fill connection
25. Try cock valve
26. Liquid withdrawal valve
27. Pressure build-up valve
28. Liquid withdrawal connection
29. Isolating valve for PBC
30. Vapor vent valve

Option-1 Pump system
22. Pressure indicator valve
23. Pressure indicator
60. Pump suction valve
61. Pressure build-up valve
62. Filter
63. Pump
64. Expansion joint
65. Gas purge valve
68. Temperature probe safety device

Option-2 Flow meter system
70. Flow meter isolating valve
71. Flow meter

ISISAN reserves the right to change above specifications without prior notice.
Cryogenic
AMBIENT AIR VAPORIZER

Ambient air vaporisers require no external source of energy; and enables vaporization through exchange of heat with the surrounding air. The liquefied gas is vaporized, and warmed to almost the surrounding temperature, and finally led to the users in its gaseous state.

The vaporisers are for use with liquid:

- Nitrogen
- Oxygen
- Argon
- Carbon Dioxide
- Nitrous Oxide
- LNG

**Design Specifications**

ISISAN offers a full range of ambient air vaporizers in different versions and for different applications. Our ambient air vaporisers have the following properties:

- Designed and manufactured according to PED 97/23/EC
- Has CE marking
- Max. allowable working pressure 40 bar
- Cleaned for oxygen service
- Seismic requirements acc. to uniform building code-zone 4
- Low pressure drop
- Efficient fin tube design
- Optimised external and internal surfaces for optimum convection

**Vaporiser options**

Ambient air vaporiser options are:

- fin tube vaporisers
- fan assisted vaporisers

Fin tube vaporisers rely on natural convection while fan assisted models are equipped with an electric motor operated fan to enhance air flow and increase efficiency.
**CO₂ Tanks** FOAM INSULATED

**STORAGE TANKS**

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<th>DESIGN CODE</th>
<th>AD 2000 CODE-PED 97/23/EC</th>
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(*) Design and manufacturing can be done according to ASME, or other design codes upon customer's requirement.

---

### 22 BAR FOAM INSULATED CO₂ STORAGE TANKS

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<th>L₁</th>
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</table>
TRANSPORT TANKS

**DESIGN CODE**
EN 14398 / EN 14025 + ADR

**INNER VESSEL MATERIAL**
- Duplex Stainless Steel
- Carbon Steel (EN 10028-3)

**MAX. ALLOWABLE WORKING PRESSURE**
- 23 bar
- 24 Bar

**DESIGN TEMPERATURE**
- -40 / +50°C

**INSULATION**
- Foam Insulation, with Aluminium Jacket

**SEMI TRAILER**

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*Volume may vary according to local traffic regulations, truck model and capacity.
NOMENCLATURE

1. Liquid fill valve
2. Bottom fill valve
3. Thermal relief valve
4. Purge valve
5. Vapor equalizing valve
6. Vapor equalizing connection
7. Regulator isolating valve
8. Back pressure regulator
9. Inner vessel safety relief valve
10. Inner vessel safety relief valve
11. High pressure shut off valve
12. Low pressure shut off valve
13. Equalizing valve
14. Level indicator
15. Liquid fill valve
16. Bottom fill valve
17. Thermal relief valve
18. Purge valve
19. Vapor equalizing valve
20. Vapor equalizing connection
21. Regulator isolating valve
22. Back pressure regulator
23. Inner vessel safety relief valve
24. Inner vessel safety relief valve
25. High pressure shut off valve
26. Low pressure shut off valve
27. Equalizing valve
28. Level indicator
29. Manometer valve
30. Manometer
31. Fill connection
32. Try cock valve
33. Liquid withdrawal valve
34. Liquid withdrawal connection
35. Analysis liquid valve
36. Pump
37. Filter
38. Automatic by-pass valve
39. Manuel by-pass valve
40. Flow meter isolating valve
41. Flow meter
42. Main liquid valve with actuator instead of 1
43. Internal valve
44. Inner vessel
45. Foam insulation
46. Outer jacket

Option-1 Flow Meter System

Option-2 Main Liquid Valve with Actuator

Option-3 Internal Valve
CO₂ Tanks VACUUM INSULATED STORAGE TANKS

VACUUM INSULATED CO₂ TANKS

**DESIGN CODE**
EN 13458 - PED 97/23/EC

**MAX. ALLOWABLE WORKING PRESSURE**
22 bar

**DESIGN TEMPERATURE**
-196°C

**INNER VESSEL MATERIAL**
Stainless Steel (According to EN 10028-7)

**OUTER VESSEL MATERIAL**
Carbon Steel (According to EN 10025/EN10028-3)

**INSULATION**
Perlite & Vacuum

### 22 BAR VACUUM INSULATED CO₂ STORAGE TANKS

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<th>Net Capacity (%95 Filling)</th>
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</table>
Vacuum Insulated CO₂ Storage Tanks P&ID

NOMENCLATURE

1. Fill connection
2. Bottom fill valve
3. Gas equalizing valve
4. Try cock valve
5. Gas equalizing isolating valve
6. Bottom fill isolating valve
7. Liquid return valve
8. Liquid return connection
9. Pressure building coil
10. Gas equalizing connection
11. Economizer isolating valve
12. Back pressure regulator
13. Pressure regulator
14. Pressure building coil valve
15. Purge valve
16. Liquid withdrawal valve
17. Liquid withdrawal connection
18. Three way valve
19. Inner vessel safety relief valve
20. Thermal relief valve
21. Level indicator
22. Equalizer valve
23. Low pressure shut off valve
24. High pressure shut off valve
25. Pressure indicator
26. Evacuation connection
27. Vacuum safety device

ISISAN reserves the right to change above specifications without prior notice.
Cryogenic ENGINEERED SOLUTIONS

Compact LNG system
LNG storage tank (3 to 10 m³)
Two vaporizers
Fire safety system
Manufactured total 150 pcs.
For Ipragaz, Turkey
Aygaz Doğalgaz, Turkey
OMV, Turkey

Complete LNG system
2 x 95 m³ LNG storage tank
8 pcs. ambient vaporizer

Container mounted transportable system
12 m³ LIN storage tank
450 Nm³/h capacity vaporizer
Liquid transfer equipment
Gas temperature controller
Manufactured for Hussain al Jiboori, Iraq

ISISAN reserves the right to change any of the technical specifications without prior notice.