




inpro[®]
research & development

HIGHLIGHTED PROJECTS

TABLE OF CONTENTS

INPRO's solutions to technological challenges.

Telefónica Data Processing Center

Hospital 12 de Octubre boiler supply

Monitoring Immediate and Total consumption of ship engines

Supply of power generators in the Torre Espacio skyscraper

Automatic kerosene supply for testing bench of JET-A1 aircraft engines

Supply to generator units and pump for snow groomers in Valdezcaray ski resort

Multiple supply to individual boilers with pressure unit

Projects in airports

Defrosting and frost protection for aircraft in runway headings

Supply of gas oil to Boilers (Barcelona airport)

Supply to Power Generator Units with Pressure Unit (Palma de Mallorca airport)

Supply of Power Generator Units with ATAM - GET pumping system for Power Station
(Valencia airport)

Methanol dosage for thermal treatment of metals helicopter factory in Yeovil - England

Other Projects



SOME OF OUR CUSTOMERS



A Member of The Linde Group



INPRO'S SOLUTIONS TO TECHNOLOGICAL CHALLENGES

We have developed solutions for fuel pumping, control and measuring, adapted to the needs of each customer.

We have faced consultancy and engineering challenges with the expertise of our professionals, the experience acquired along many years and the use of state-of-the-art technology.

All our solutions come from our factories, verified and tested for a fast installation in their final location and with a warranty of proper operation.

QUALITY, RELIABILITY and WARRANTY: this is why our customers choose us.

PROJECT

TELEFÓNICA DATA PROCESSING CENTER

TYPE: SUPPLY / GAS OIL CONTROL / ANTI-SPILL

Telefonica

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The project consisted of automating and controlling the Gas Oil supply needs of 25 Emergency Power Generator Units from two main tanks, one for each line, and a reserve tank for the daily service tanks of each power generator unit.

The project had to be done in compliance with the indications of Uptime Institute, the certification body, to obtain a Tier IV score in project and installation with the goal of becoming the first Data Processing Center (DPC) in Europe to obtain that certificate in both fields: project and installation.

One of the condition was having two independent gas oil supply lines (A and B) to provide 100% of power at each side.

The required amount of gas oil had to allow operation for 12 hours at maximum load.

The power increase expectations of the installation posed the challenge of performing calculations on the dimensions of the pipes and achieving proper operation at all power levels. As well as designing the pumping and control units taking into account a gradual increase up to the maximum power level of the project, without hindering normal operation.

The increased environmental requirements posed another challenge

regarding management of possible spills. The first solution presented in the project suggested using meters at the point of use and propulsion meters. To make this solution feasible, all meters -and therefore their deviation- had to be adjusted to the outlet meter, which would waste a lot of time at commissioning and could compromise long-term reliability. After scratching this solution, a leak detector spill protocol is implemented.



SOLUTION ADOPTED BY INPRO TANKS

Two 80 m³ oil storage tanks were planned and installed, buried inside a concrete bund in the area stated in the installation plans with easy access for filling the bund. A 30 m³ gas oil storage tank was planned, meant to provide a reserve tank to supply the others.

PIPE NETWORK

The gas oil distribution pipe lines were installed with double plastic skin and rigid and flexible couplings. The pipe was buried in a single, independent trench for side A and B. They were installed with inclines leading to the planned leak drain basins. The basins included a gas oil leak detector that would notify the central control system and close and isolate the different areas required via the relevant panels.

Pipes were selected according to the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between 1

and 1.5 m/s and in suction pipes between 0.2 and 0.5m/s.

ANTI-SPILL SYSTEMS

The adopted solution neutralizes the pressure in the line when the system is idle. Operation without pressure limits the possibility of spills, so a leak detection, containment and management system was installed in the entire facility, which allowed communication with the management system and a verification option.

In the pump rooms, the collector trays of the pump systems are controlled with infrared sensors.

Both the pump room and the perimeter of the pipe have basins that can contain both water and gas oil, so detectors for both types of fluids are installed in order to prevent false alarms.

Any spillage in valve connections or supply filters of the generators would go to the collector trays, which would include a leak



detector connected to the leak detection system and the DPC control.

Due to the presence of multiple points to control, a spillage control central was installed, capable of handling up to 5 spillage probes with independent relays and locating the specific location of the leak.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

Double-skin detection can be done in several ways: with pressure, vacuum, fluid...

We opted to place vacuum detectors with regenerative pump in the supply tank as well as in the main tanks, thus preventing false alarms. Controlling and installing a vacuum system is more effective than installing a pressure or fluid system. In conclusion, we chose to install a DDP-25 double-skinned detector according to standard EN 13160-1, Class 1.

CONTROL OF MAIN TANKS

The purpose is knowing the amount of gas oil in these tanks at all times, opening the solenoid valves meant for suction protocols as well as low-level and high-level alarms.

Thus, EDM-40 continuous analog gauging probes will be placed to control the tank levels, which serves to obtain their measurements. As a redundant safety measure, SMMR2 probes were installed with 2 digital contacts: a high-level and a low-level one. Local reading of tank capacity was done with EDM-40 digital displays, as well as alarm systems to prevent overflowing upon unloading the tanker; the alarms will trigger due to the high levels of each tank.

PUMP SYSTEMS

Given that the simultaneity coefficient required by the consumption needs of the system is extremely variable, pump systems were provided with speed adjustment control according to demand. These units must be



able to pump 4000 L/h to 12/13 points of use and adjust to provide flow for a single point of use.

With this in mind, two pump systems were designed to supply sides A and B independently, consisting of: Two 4000 L/f self-priming motor pumps, each with flow adjustment, double-filtering collector, safety valves, retention valves, pressure transducer and spillage collector tray with infrared detector. To verify the defined operation and safety protocols, they have a self-checking system consisting of recirculation lines located on the main tank and controlled by solenoid valves and meters that can simulate the demand of several tanks and the generated flow and thus check the actual input of each flow under certain circumstances. All the aforementioned elements were mounted on a steel frame, producing a modular system that were integrated in the installation after undergoing all adequate operation tests in the testing bench in our facilities.

An additional pump system was placed between the main tanks and the reserve supply tank meant to increase the operation time of the installation via this pump system. Consisting of: Two 10,000 L/h motor pumps with independent filtering, safety and retention valves and controlled by the suction panel.

The design of the systems included the dimensions and additional connections to fulfill the real-time growth needs required in the project.

Solenoid N.C. valves were placed in the suction points of the pump units to automate the suction protocol of the tank to suction.

All pump systems were controlled by the control panels with a programmable automaton.

CONTROL PANELS

To control the pump systems and collecting all the signals required to know the status of the installation and possible alarms, control

panels with touch screen automatons were installed in each main pump room and each generator room, as well as a general control panel for the main tanks and the pump system of the reserve supply tank. The main problem occurred when collecting all the signals from each area and centralizing them in one point to make appropriate system operation decisions and manage possible protocol and spillage alarms.

Communications work via a Mod-bus RTU. This protocol was selected due to the problem posed by the distance among the different panels, which exceeds 1,000 meters in some cases. Communication with the main management system was established with this same protocol.

The design of the systems conditioned their dimensions and included additional components to comply with the real-time growth needs of the project.

DAILY SERVICE TANK FILLING

The primary issue when filling was providing service with an appropriate level of safety. This is always a conflictive issue: an increase in safety against spilling decreases the certainty of adequate fuel supply, and vice-versa. Before installing the daily service tanks, N.O. solenoid valves were installed in each basin, so if spilling or excessive tank levels were detected in them, these solenoid valves and the previous ones would close, being able to supply the rest of the installation even after closing this area.

Daily service tank filling is conducted via the control and safety systems (filter, N.C. solenoid valve, flow container, N.O. solenoid valve, filling safety control). Solenoid valves are managed with the control and management panel, which receives the corresponding tank status signals from the level probes, one for operation and one for safety, as well as an overfilling safety flow switch in the vents.

ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

OIL PUMP SYSTEM "INPRO" ATAM-GE

Oil pump systems ATAM-GET are synonyms for adaptation. They are designed to fulfill pumping and redundancy needs and to comply with the safety protocols of installations controlled by centralized control panels, with touch screen automatons and Mod-bus communication. A perfect combo for every installation. Control panels for filling motor pumps, overflow, solenoid valves, alarms, etc., as well as possible operating management inputs.

- Compact units with all the elements required for gas oil pumping, joined in an aluminum collector on a furnace-painted plate bench.
- Flows of up to 70 Liters/hour, with the possibility of on-demand pumping via speed variation.
- With a flow meter to instantly check the operating conditions.



COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.





SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.



LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.

METER

Meters for gas oil, fuel, kerosene, gasoline and lubricants

- Flow meter for hydrocarbons and co-generation in burners, ships, vehicles and fixed facilities.
- Metrological certificates and calibrations available based on regulatory needs.
- The whole model range provides the best solutions to measure fuel consumption.
- State-of-the-art designs in electronic meters, with analog and digital outputs with parametrizable values.
- Propulsion or suction assembly.
- Independent from viscosity and temperature.
- System monitoring and control simplifies the configuration of the burner and the optimization of consumption.
- Maximum safety in shipbuilding and automotive industry.



PUMP WITH RETENTION VALVE

Eccentric motor pump with self-adjusting blades for oil transfer with an approximate flow of 50 liters per minute IRON-50 with retention valve for maintenance of

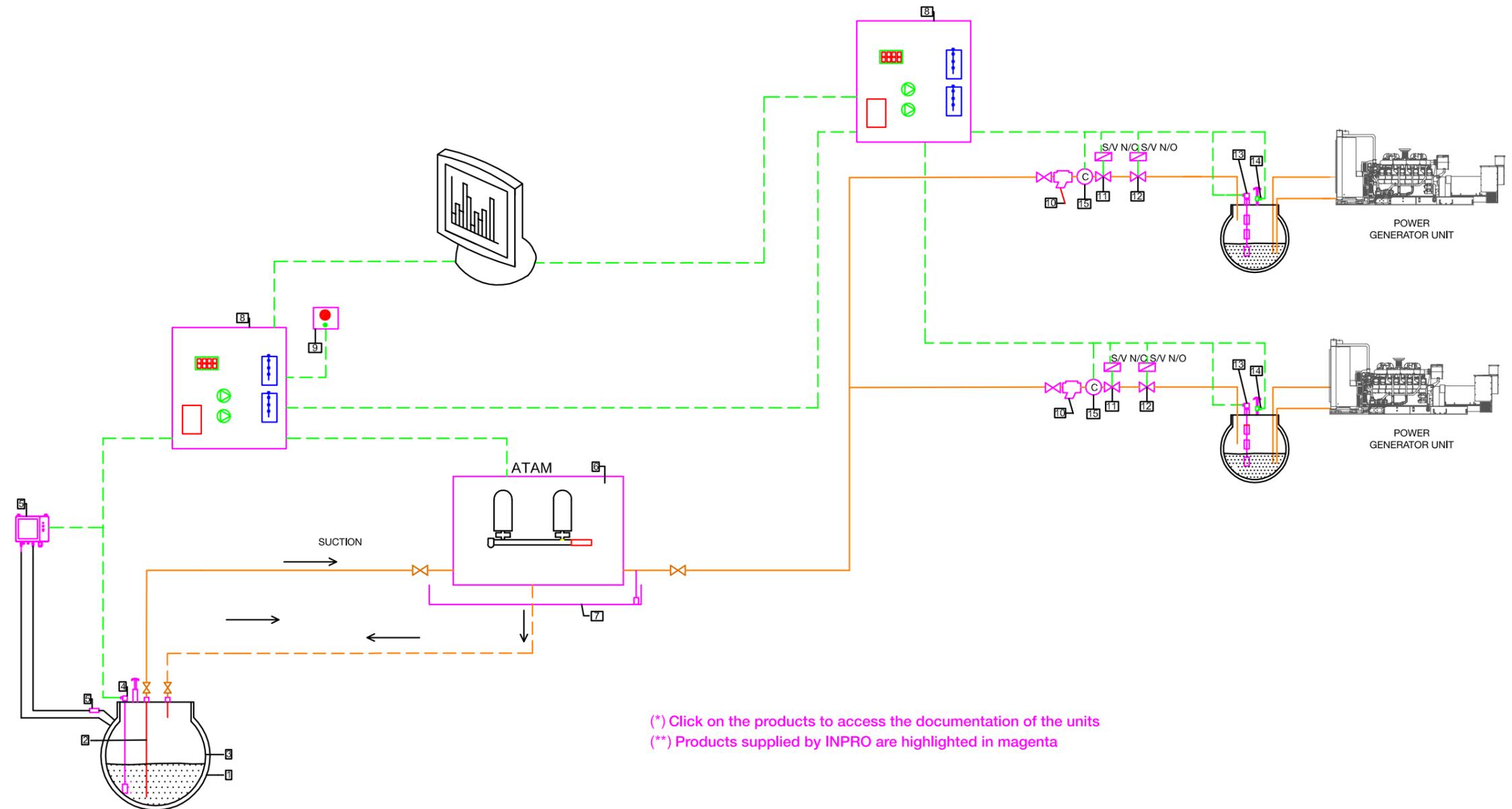
- With re-circulation by-pass valve and pre-filter.
- Free outlet flow: 50 L/min
- Consumption: 1.2-2 A
- Motor: 0.25 kW 230 VCA 50/60 Hz mono-phase, self-ventilated with thermal protection
- Continuous operation S1
- IP55 Protection



INSTALLATION DIAGRAM

FIRST DIAGRAM OF PUMPING UNIT TO POWER GENERATOR UNITS WITHOUT PRESSURE AND TOUCH SCREEN PANEL

1. MAIN GAS OIL TANK
2. SUCTION
3. INTERSTITIAL CHAMBER
4. [PROBE EDM40](#)
5. [INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE](#)
6. [PUMP SYSTEM "INPRO" ATAM GET](#)
7. [COLLECTOR TRAY WITH SPILLAGE PROTECTION](#)
8. [CONTROL PANEL, TOUCH SCREEN AUTOMATION](#)
9. [OVERFILLING ALARM](#)
10. [FILTER](#)
11. [SOLENOID VALVE N/C](#)
12. [SOLENOID VALVE N/A](#)
13. [SERVICE PROBE WITH OPEN / CLOSE CONTACTS, N.C. S.V. AND N.O. S.V. OPERATION ATAM](#)
14. [VENTILATION FLOW SWITCH](#)
15. [METER](#)



PROJECT

HOSPITAL 12 DE OCTUBRE BOILER SUPPLY

TYPE: SUPPLY / GAS OIL CONTROL / ANTI-SPILL

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The next project was building a technical building next to the Doce de Octubre Hospital (Madrid) to cover the needs of all general services regarding heating, sanitary hot water and steam generation.

The purpose was covering the Gas Oil supply needs of 6 heating boilers and 2 steam generators with mixed, modulating burners.

The installation would include 4 main gas oil tanks for the supply of their corresponding burners. The presence of a single pump system forced to plan an automatic suction protocol system via level probes.

On the other hand, modulating burners required pumping parameters in which flow, temperature and pressure were constant.



SOLUTION ADOPTED BY INPRO

MAIN TANK INTERSTITIAL CHAMBER DETECTION

Double-skin detection can be done in several ways: with pressure, vacuum, fluid..., with automatic regeneration or without it...

We opted to place vacuum detectors with regenerative pump in the supply tank as well as in the main tanks, thus preventing false alarms. Controlling and installing a vacuum system is more effective than installing a pressure or fluid system. In conclusion, we chose to install a DDP-25 double-skinned detector according to standard EN 13160-1, Class 1.

CONTROL OF MAIN TANKS

Given the need for suctioning from 4 main tanks with a single ring pumping system, the suction of each tank must be controlled with a control panel with the ability to differentiate which tanks need suction and which ones need returns. The suction protocol consists of carrying out the suction process of one

tank until it is at reserve levels; then, the next tank will undergo suction and the process will be repeated in all tanks. This process provides the longest operation time and correct management of even the oldest types of gas oil.

A control panel that carried out the operations below was designed, consisting of 4 EDM-40 meters that thanks to their flexibility can check the level of the tanks and control the opening and closing of the solenoid valves and, at the same time, send the analog signals corresponding to the management system, trigger the filling warning kits upon unloading the truck in order to prevent spillage and in compliance with the applicable regulations regarding fuel storage IP-04.

PIPE LINE

Steel gas oil distribution piping was installed. Pipes were selected according to the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between



1 and 1.5 m/s and in suction pipes between 0.2 and 0.5m/s.

ANTI-SPILL SYSTEMS

Any leaks in the connections of the pumping system will be detected by an infrared spillage detector that will interrupt the operation of the unit, thus preventing an increased rate of incidents and triggering the alarm in the management system via a digital spillage signal.

PUMP SYSTEM

The selected pump system consisted of 2 self-priming 10,000 L/h motor pumps, with double filter, safety and retention valves, spill collection trays with infrared detectors as well as minimum pressure switch to avoid no-load operation. Everything mounted on a steel frame, producing a modular system that arrived to the installation after undergoing all adequate operation tests in the testing bench in our facilities. The unit has alarm digital

outputs for the management system.

The flow required to supply all the burners is 8000 L/h with an extremely variable simultaneity. This fact, along with the operating needs of the modulating burners (constant flow, temperature and pressure) made RL (Ring Supply System) the most appropriate pumping system. Pressure variations from start-up needs of the different burners and the increased temperature cause an inadequate pressure differential. A battery consisting of 2 parallel 10,000 L/h stabilizer valves was placed at the return, in order to decrease the aforementioned P-Delta, thus ensuring control over the pressure increase between maximum and minimum demand.

CONTROL SYSTEM

Pyrometers were installed to control the smoke outlet temperature of the boiler chimneys, which complemented the data required to ensure proper energy efficiency of the installation.

All units will provide status signals and/or alarms, as well as analog signals that are collected by the SCADA of the technical building.



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO

PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



OIL PUMP SYSTEM "INPRO" ATAM-GE

Oil pump systems ATAM-GET are synonyms for adaptation. They are designed to fulfill pumping and redundancy needs and to comply with the safety protocols of installations controlled by centralized control panels, with touch screen automatons and Mod-bus communication. A perfect combo for every installation. Control panels for filling motor pumps, overflow, solenoid valves, alarms, etc., as well as possible operating management inputs.

- Compact units with all the elements required for gas oil pumping, joined in an aluminum collector on a furnace-painted plate bench.
- Flows of up to 70 Liters/hour, with the possibility of on-demand pumping via speed variation.
- With a flow meter to instantly check the operating conditions.

SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.



LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.



COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.



PUMP WITH RETENTION VALVE

Eccentric motor pump with self-adjusting blades for oil transfer with an approximate flow of 50 liters per minute IRON-50 with retention valve for maintenance of

- With re-circulation by-pass valve and pre-filter.
- Free outlet flow: 50 L/min
- Consumption: 1.2-2 A
- Motor: 0.25 kW 230 VCA 50/60 Hz mono-phase, self-ventilated with thermal protection
- Continuous operation S1
- IP55 Protection



PRESSURE REGULATOR VALVE

Constant pressure and flow regulator valve according to consumption variations

- For gas oil, lubricant and hydraulic oils.
- Maximum temperature of the fluid: 250°C.
- Hydraulic cast iron. Piston, needle and tempered steel spring.

PYROMETER

With regulation for temperature cut-off

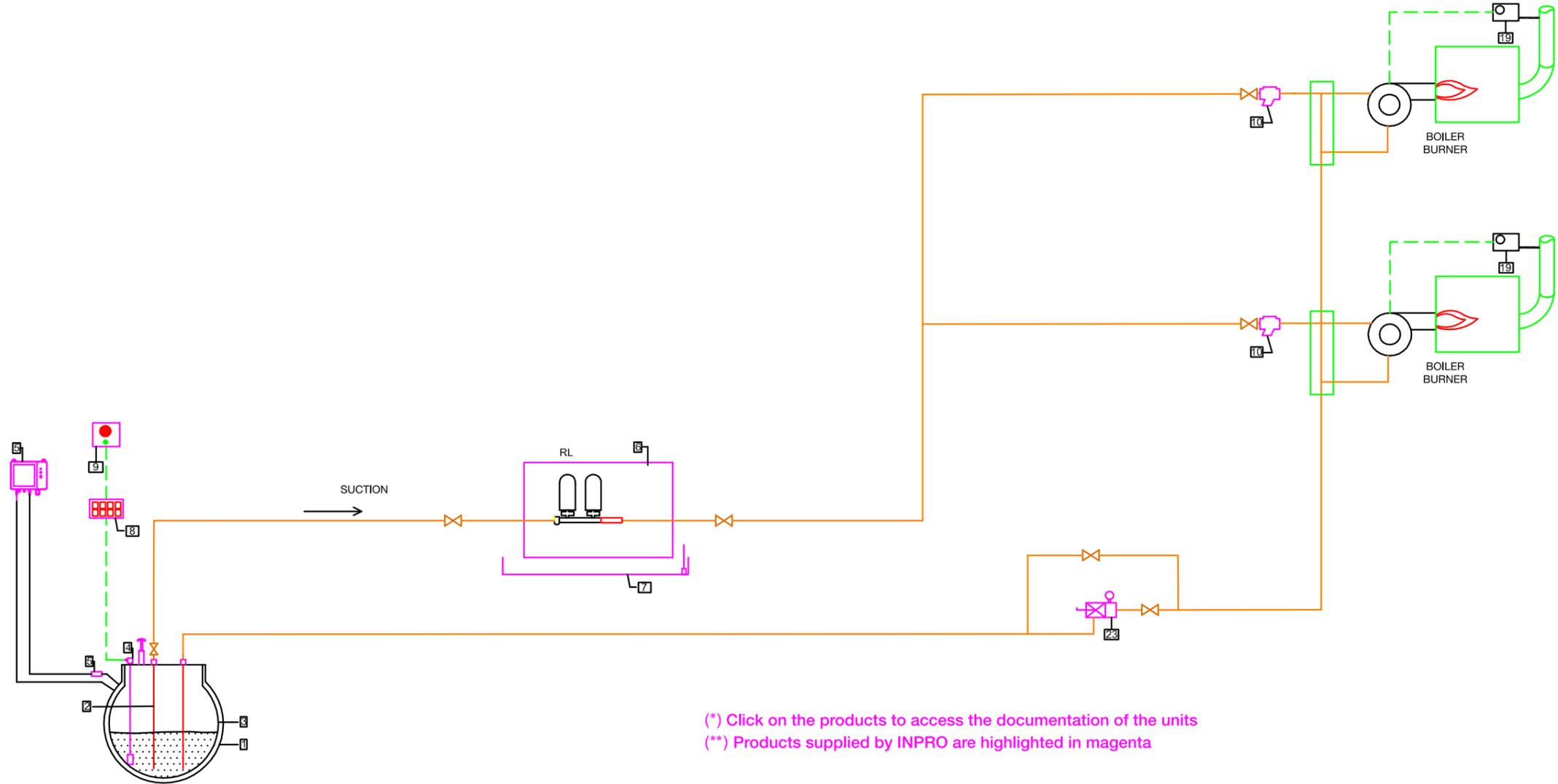
- To control combustion gases in the boiler chimney.
- When outlet gases reach the maximum legal temperature (240°C) the heat generator (boiler) is shut off.
- Note: The boiler does not work correctly over 240°C and the emission of polluting agents increases.
- With adjustable thermostat up to 300°C, thermometer and manual, local and remote reassembly.
- With 1 and 3 m capillaries with a 200 mm stainless steel case.
- Voltage free output relay with the option of performing additional operations.



INSTALLATION DIAGRAM

FIRST DIAGRAM SUPPLY TO MODULATING BURNERS VIA RL RING UNIT

- 1. MAIN GAS OIL TANK
- 2. SUCTION
- 3. INTERSTITIAL CHAMBER
- 4. [PROBE EDM40](#)
- 5. [INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE](#)
- 6. [TRANSFER UNIT RL "INPRO" GET](#)
- 7. [COLLECTOR TRAY WITH SPILLAGES PROTECTION](#)
- 8. [LEVEL DISPLAY EDM-40 WITH RELAYS AND ANALOG OUTPUT](#)
- 9. [OVERFILLING KIT ALARM](#)
- 10. [FILTER](#)
- 23. [PRESSURE STABILIZER VALVE](#)



(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta

PROJECT

MONITORING IMMEDIATE AND TOTAL CONSUMPTION OF SHIP ENGINES

TYPE: MONITORING IMMEDIATE AND TOTAL CONSUMPTION OF SHIP ENGINES



REQUIREMENTS AND NEEDS OF THE CUSTOMER

The following project ordered by DRAVOSA consisted of monitoring the immediate flow of all engines of a dredging ship, as well as the total consumption of both travel and specific works of the ship.

Consumption charts had to be exported to Excel format to be analyzed.

Using computers or remote management systems was impossible for

P3 different reasons.



SOLUTION ADOPTED BY INPRO

After analyzing the combustion engines and determining the required flow, as well as their supply method (mono-pipe), the installation of 3 volume meters was decided, with propulsion outlets which sent information to a touch screen automaton on used gas oil.

This automaton is in charge of displaying the immediate flow as well as generating updated records of the used flow within a defined time range. In this case, the customer asked for a record with a one-minute frequency.

These records are stored in a flash storage device in CSV format; afterwards, they can be exported to a computer in Excel format as stated in the requirements and analyzed by the corresponding department.

	Date	Time	(LX1000) C1	(L) C1	(LX1000) C2	(L) C2	(LX1000) C3	(L) C3
9	13/02/2015	2:15:44	0	30	0	61	0	111
10	13/02/2015	2:16:44	0	61	0	122	0	222
11	13/02/2015	2:17:45	0	91	0	183	0	333
12	13/02/2015	2:18:45	0	122	0	244	0	444
13	13/02/2015	2:19:45	0	152	0	305	0	554
14	13/02/2015	2:20:45	0	183	0	366	0	666
15	13/02/2015	2:21:45	0	213	0	427	0	776
16	13/02/2015	2:22:46	0	244	0	488	0	887
17	13/02/2015	2:23:46	0	274	0	549	0	998
18	13/02/2015	2:24:46	0	305	0	610	1	109
19	13/02/2015	2:25:46	0	335	0	671	1	220
20	13/02/2015	2:26:47	0	366	0	732	1	331
21	13/02/2015	2:27:47	0	396	0	793	1	442
22	12/02/2015	14:16:26	0	432	0	866	1	574
23	12/02/2015	14:17:26	0	463	0	927	1	685
24	12/02/2015	14:18:26	0	493	0	988	1	796



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO

VZF DIGITAL GAS OIL METER

Meters for gas oil, fuel, kerosene, gasoline and lubricants

- Flow meter for hydrocarbons in heating systems and co-generation in burners, ships, vehicles and fixed facilities.
- Metrological certificates and calibrations available based on regulatory needs.
- Four different data output options:
 - Pulse emitter with programmable pulse value (for external totalizer)
 - 4...20 mA analog output, according to the flow
 - 0..100 Hz output frequency, according to the flow
 - Commuting function (limits the value of the switch) determined by upper and lower programmable flows.
- Meter with threaded connectors or flanges. According to standard ANSI, JIS, etc.
- Horizontal or vertical assembly.



DISPLAY:

- Totalizer, total and partial volume
- Actual flow
- Other parameters

OUTPUT SIGNALS FOR:

- Volume pulses
- Actual flow
- Limiting values (Qmin, Qmax)

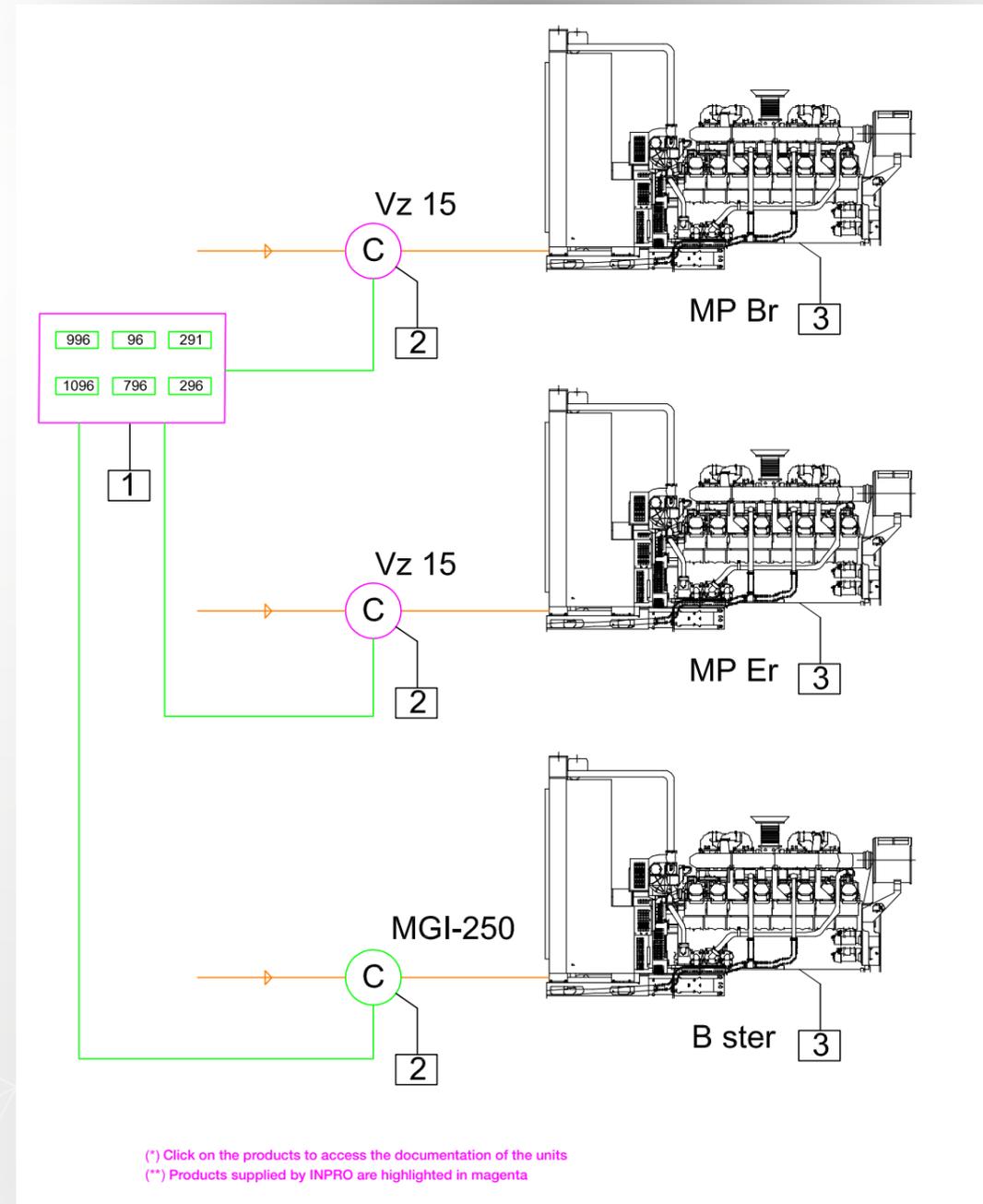
MAIN DATA CHARACTERISTICS:

- Flow range of 10 ... 30,000 L / h
- Temperature ranges between 130 and 180 ° C
- Nominal pressure PN 16 and 25 bar (PN 40 upon request)

INSTALLATION DIAGRAM

BOAT ENGINES CONSUMPTION CONTROL

1. CONTROL AND DISPLAY PANEL
2. VOLUME METERS WITH OUTPUT PULSES
3. SHIP ENGINES



(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta

PROJECT

SUPPLY OF POWER GENERATORS IN THE TORRE ESPACIO SKYSCRAPER

TYPE: SUPPLY TO POWER GENERATORS AT HIGH ALTITUDES

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The following project was an immense challenge, not only because of the height of the systems but also due to the requirements of the project regarding fire protection and fuel spillage in such a singular building: a unique installation.

It required automation and control of the gas oil supply needs from the main tank to the daily service tanks in all three power generators located at different altitudes. One on the roof, 270 m high, and the other two at 198 m from the propulsion unit of the pressure unit.

The area for the main tank is classified as ATEX, which conditions the manufacture of the system -it must comply with the applicable regulations. Other conditions required anti-spillage safety measures due to the increased requirements regarding environmental control, being a public access building.





SOLUTION ADOPTED BY INPRO PIPE LINE

The gas oil distribution piping was made from carbon steel.

Pipes were selected according to the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between 1 and 1.5 m/s and in suction pipes between 0.2 and 0.5 m/s.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

To detect leaks in the double skin of the main tank, we chose a DDP-25 vacuum system with regenerative pump and fluid separation valve. This significantly decreases the possibility of false alarms, which occur more often with other detection methods. That detection system complies with standard EN 13160-1, Class 1.

MAIN TANK CONTROL

A digital level display is installed, with EDM-40 continuous analog probe for local reading of

the capacity of the tanks and analog outputs (0-10V - 4/20 mA) as well as a 95 dB alarm to prevent overfilling while unloading the truck.

PUMP SYSTEMS

A "split" pressure group is installed, consisting of two bodies (benches). The body with control elements (pressure switch, manometer, expansion tank and alternative remote control) is installed on the roof due to the pressure required to pump the gas oil up to that altitude. The propulsion body (motor pumps, filter, retention valves and vacuometer) is installed inside the building. The installation areas in the lower part of the building are classified as ATEX, so the propulsion body of the pressure unit has protection degree IP-55/ EExelIBT4.

DAILY SERVICE TANK FILLING

Daily service tank filling on the roof is controlled by an overfilling control and safety system

consisting of: filter, N.C. filling control solenoid valve, flow limiter, N.O. filling control solenoid valve. The solenoid valves are managed with the SMMR-2 control panel that receives signals from the two level monitoring probes in the daily service tanks, one for operation and one for safety. For overfilling spillage safety redundancy, a flow switch is installed in the vent.

At the inlet of the daily service tanks for the intermediate power generators located 72 m under the roof, a control unit is installed, consisting of: Filter, pressure reducer, N.C. solenoid valve and N.O. solenoid valve 230 Vca. Due to spillage safety reasons, a pressure valve is installed after the reducer, connected to the return pipe to the main tank.

ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.



SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.



PRESSURE REDUCING VALVE

Adjust the propulsion pressure to the burner or pump line operating needs.

- Output pressure adjustable with manometer or fixed, depending on the model.
- Flow between 20 and 3,000 L.





LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.



PRESSURE UNIT GP-GEMT

Split gas oil pressure unit that allows automatic supply to burners and pumping to emergency generators via pressure adjustment, at heights of over 60 meters. The start-up and stop operations with a pressure switch are conducted in the control body located at the highest part of the installation, using the pumping power of the gear pumps at high pressure that allows reaching great heights. Control cables must be laid.

Propulsion Body

- Gear electric pumps with three-phase or mono-phase supply.
- Vacuometer.
- Aluminum filter, retention valves and safety valve with exhaust line.
- Motor protection IP-55
- Alternative electronic control management system
- Vacuometer
- Aluminum filter, retention valves and safety valve with exhaust line.

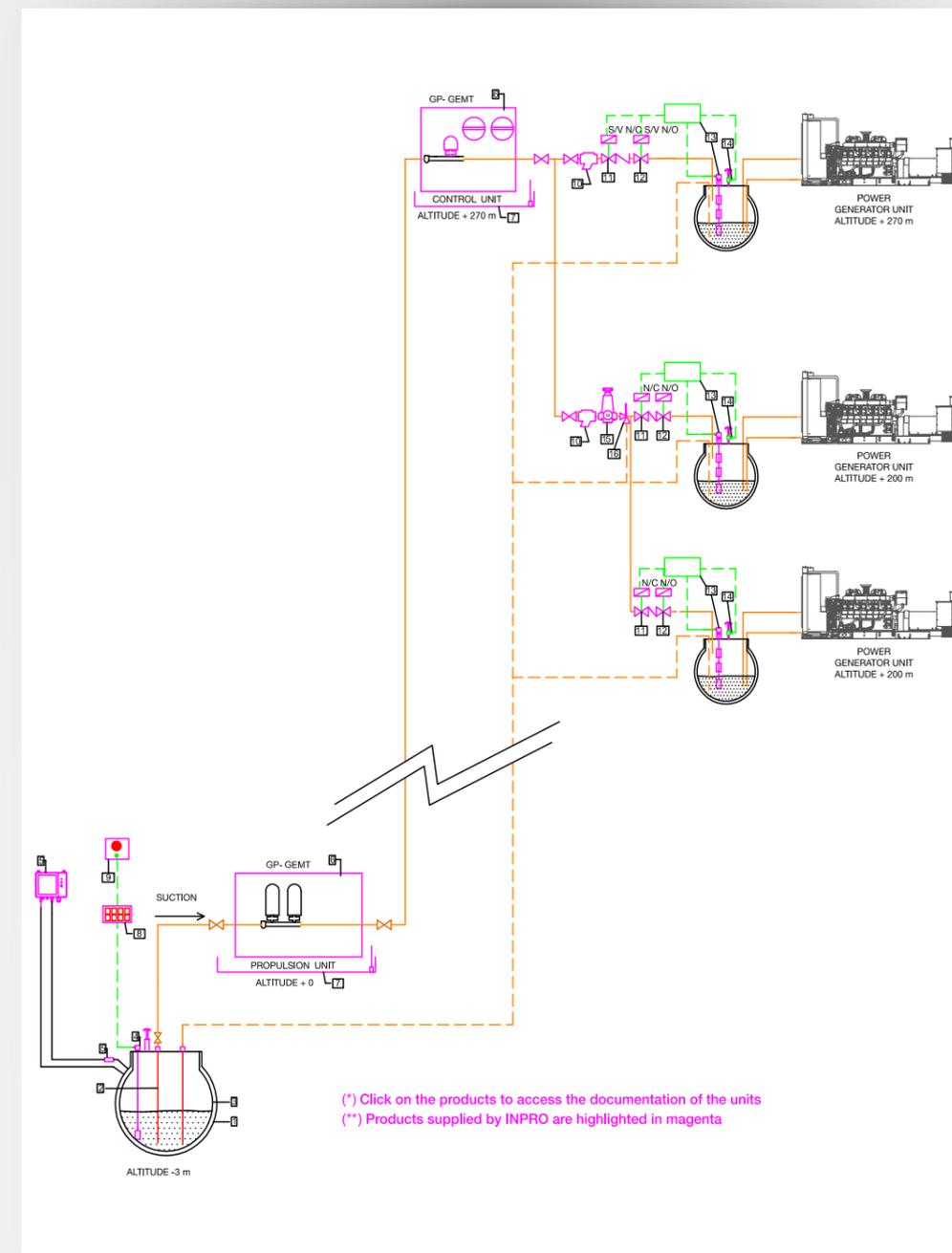
Control Body

- Expansion vessel with membrane.
- Operation and minimum safety pressure switch
- Possibility of all-or-nothing outputs for incident control from central control with 3, 4 or 6 signals. GSM alarm system via SMS messages or modem connection.

INSTALLATION DIAGRAM

FIRST DIAGRAM OF SPLIT UNIT PRESSURE TO POWER GENERATOR UNITS

1. MAIN GAS OIL TANK
2. SUCTION
3. INTERSTITIAL CHAMBER
4. PROBE EDM-40
5. INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE
6. "INPRO" PRESSURE UNIT GP-1500 (PROPULSION AND CONTROL UNIT)
7. COLLECTOR TRAY WITH SPILLAGE PROTECTION
8. LEVEL DISPLAY EDM-40 WITH RELAYS AND ANALOG OUTPUT
9. OVERFILLING KIT ALARM
10. FILTER
11. SOLENOID VALVE N/C WITH FLOW LIMITER
12. SOLENOID VALVE N/A
13. SERVICE PROBE WITH OPEN / CLOSE CONTACTS, N.C. S.V. AND NO. S.V. OPERATION ATAM
14. VENTILATION FLOW SWITCH
15. GAS OIL PRESSURE REDUCER 1500 LTS/H O-2.5 BAR
16. SAFETY VALVE WITH EXHAUST LINE 3/4" - 4.5 BAR.



PROJECT

AUTOMATIC KEROSENE SUPPLY FOR TESTING BENCH OF JET-A1 AIRCRAFT ENGINES

TYPE: SUPPLY / CONTROL / ANTI-SPILL

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The next project required automated supply of JET-A1 aircraft fuel for testing engines in bench.

In this process, the unloading process of the tanker to the main tank had to be monitored and managed, with the help of an unloading pump.

P5 But the main challenge of the project were the operating supply requirements in aircraft engines. The most important condition for a proper operation of the bench, located 100 meters away and with a height difference of 15 meters, was supplying fuel at constant pressure, flow and temperature. A 3000 L/h flow with a constant pressure of 8 bars regardless of the number of operating engines, maintaining stable flow and pressure at all times.

Due to the characteristics of the fuel, the installation had to comply with Area-1 classification standards, so all electric elements had to comply with the requirements to work in areas at high risk of explosions, in compliance with current regulations. Moreover, shut-off valves were installed every 20 meters along the perimeter of the pipe for safety reasons.

JET A-1

SOLUTION ADOPTED BY INPRO**PUMP SYSTEMS****• Tanker unloading system:**

Consisting of a 20,000 L/h motor pump with a three-phase motor III x 400Vca - 50 Hz of 3 KW and P55 - EExellBT4 protection, by-pass, gearbox at 430 r.p.m.; filter and retention valve. Everything was mounted on a steel frame.

• Pump supply system:

Supply to the engine bench is done by a pump system consisting of two explosion-proof motor pumps with three-phase motor III x 400Vca - 50Hz at 2.2 KW and EExellBT4 - IP55 protection capable of supplying 4,500 L/h each at a 7.5 bar pressure. These motor pumps were mounted on a steel frame with spill tray and detection by capacitance probe. The unit has: Filter, by-pass, retention valves, minimum pressure switch to block the unit and avoid no-load operation, manometer, safety valve with exhaust lines and shut-off valves.

On the return line, a regulation and

stabilization valve is installed, adapted to the operating conditions.

CONTROL PANELS

The control panel manages both the unloading system of the tanker and the pump system for the fuel ring; this is installed outside the danger zone.

Operations:

• Tanker unloading system:

- The system is operated with a go - stop switch (local and remote)
- As overfilling protection, a maximum level pump stop was planned as well as the required thermal protection in the engine.

• Pump system - Ring system:

- A rotating commutator serves to select the operation mode of the system. (Off - Automatic - Manual Pump 1 - Manual Pump 2)
- In Automatic mode the pumps alternate, so each pump works for 10 minutes. If the thermal protection of one of the engines

is triggered, the other motor pump starts operating automatically.

- In Manual mode, Pump 1-2, this does not happen.
- If pressure drops below the established value in the minimum pressure switch regulator for any reason, the system gets locked to protect the pumps from no-load operation. Pumps keep working during those 5 seconds, in case the issue was an occasional excessive consumption; if pressure does not go up, the unit stops and must be manually reassembled.
- The pump system is fastened with the testing benches, so the pumping process only occurs if there are operating reactors.
- System interruption due to spillage is planned for (intrinsic safety), so if any leak is detected on the tray, the pump system stops.



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO

LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.



TRANSFER PUMP

Pump with self-adjusting blades, with positive movement and constant flow. Silent, robust and high-performance. Particularly recommended for transfer of all kinds of liquid -as long as they are not abrasive nor contain suspended solid particles.

- Blade adjustment is due to three variables. Centrifugal force, fluid pressure and push rods, so losses and turbulence are greatly decreased.
- Adjustable safety valve included in pump body.
- Pump body in cast or stainless steel, based on needs.
- Bench from gray cast iron.
- Three-phase engine with Atex certificate.
- Possibility of 2 rotation directions by placing an inverter.
- The power of the associated motor prevents possible problems at launch with low temperature fuel.



PUMP UNIT "INPRO" FP GET

Compact pump unit for gas oil pumping. Contains all the elements required for the proper operation of motor pumps in one bench.

- Gear electric pumps with three-phase or mono-phase supply.
- Motor protection IP-55
- System to interrupt no-load operation in case of lack of fuel
- Alternative electronic control management system
- Vacuometer
- Aluminum filter, Retention valves.
- Safety valve with exhaust line.



KEROSENE UNIT

- Digital output for incidence control from central position in kit 3, 4 and 6 signals (2-thermal, 2-motors OK, low pressure and spillage).
- Launch scheduling kit due to lack of current.
- GSM alarm system via SMS messages or modem connection.
- Line pressure switch for low pressure signal.
- Modifications for adapting tropicalized and ATEX units.
- Spill collector trays with infrared detectors.
- There are supply system versions for other fluids such as light fuel, methanol, gasoline, etc...





COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.



PRESSURE REGULATOR VALVE

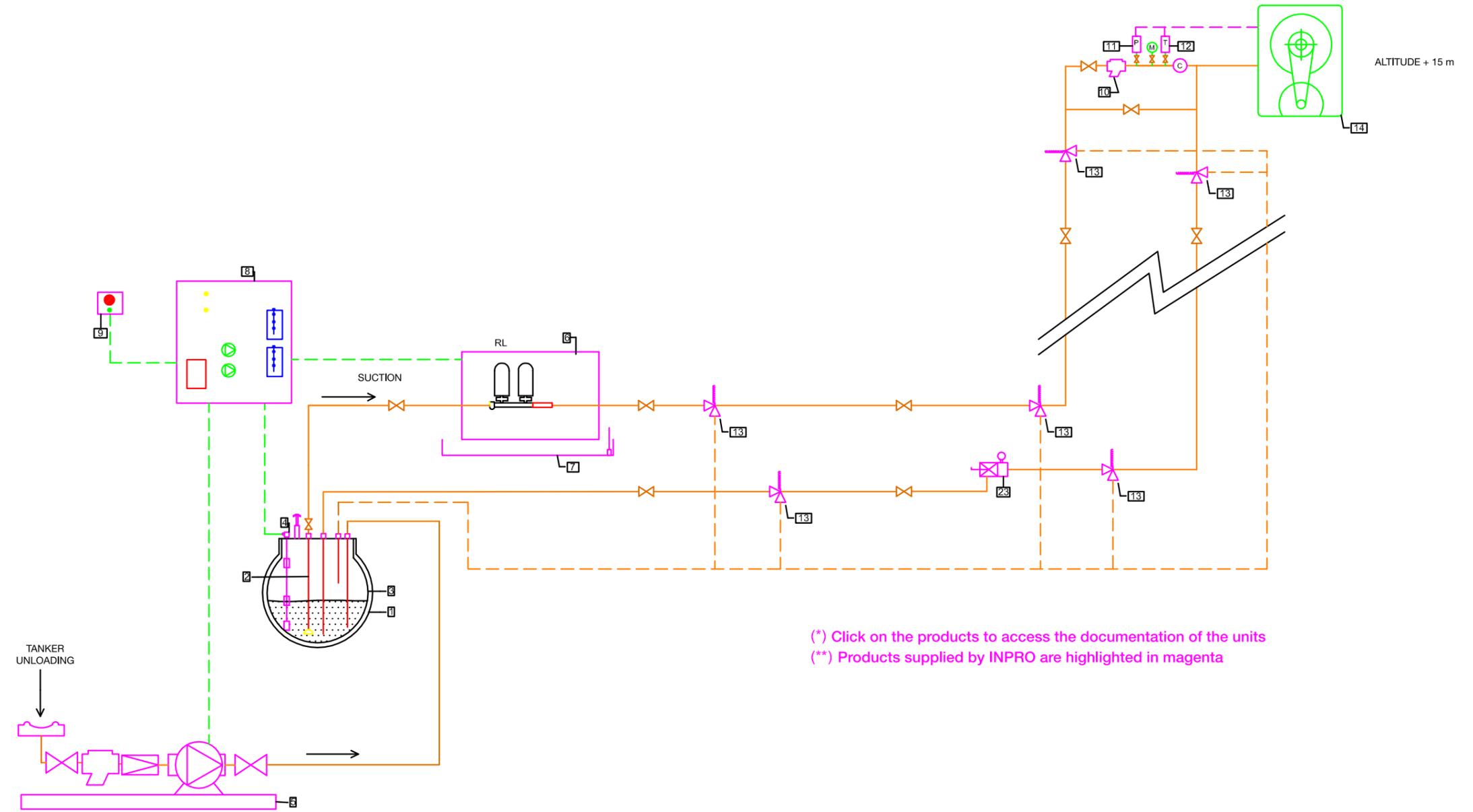
Constant pressure and flow regulator valve according to consumption variations

- For gas oil, lubricant and hydraulic oils.
- Maximum temperature of the fluid: 250°C.
- Hydraulic cast iron. Piston, needle and tempered steel spring.

INSTALLATION DIAGRAM

FIRST DIAGRAM OF SUPPLY TO
JET-1 KEROSENE TESTING BENCH

1. MAIN GAS OIL TANK
2. SUCTION WITH FOOT VALVE
3. INTERSTITIAL CHAMBER
4. LEVEL PROBE XX EXPLOSION PROOF (VERY HIGH / HIGH / LOW & VERY LOW)
5. UNLOADING UNIT XX JET 1 KEROSENE
6. KEROSENE TRANSFER UNIT 3.000 L/H
7. COLLECTOR TRAY WITH SPILLAGE DETECTOR
8. CONTROL PANEL AND PUMP SYSTEM REGULATION
9. OVERFILLING KIT ALARM
10. FILTER
11. PRESSURE TRANSDUCER
12. TEMPERATURE K PROBE
13. SAFETY VALVE 1-1/4" (10 BAR)
14. MOTOR TESTING BENCH
23. PRESSURE STABILIZER VALVE



PROJECT

SUPPLY TO GENERATOR UNITS AND PUMP FOR SNOW GROOMERS IN VALDEZCARAY SKI RESORT

TYPE: SUPPLY TO POWER GENERATOR UNITS AND GAS OIL PUMP FOR MACHINERY

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The next project was aimed at automating and controlling the Gas Oil supply needs of 2 Emergency Power Generators and one tank that feeds a pump to supply gas oil to snow groomer cat trucks.

The main tanks consist of a battery of 25 double skinned tanks with a capacity of 1,000 Liters each at a 1,500 m height. The daily service tanks of each power generator unit are located at a height of 1,850 m and 1,800 m respectively. The third supply point consists of two batteries of double skinned tanks with a 1,000 Liter capacity, one battery with 8 tanks, one with 16, which in turn supply the pump, at a 1,600 m height.





SOLUTION ADOPTED BY INPRO PIPE LINE

Double piping is used. The total distance of the pipe is 2,000 m. Pipes were selected according to the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between 1 and 1.5 m/s and in suction pipes between 0.2 and 0.5m/s.



MAIN TANK CONTROL

A continuous measurement analog probe is installed. It provides local reading of tank capacity via digital displays EDM-40 as well as an alarm system to prevent overfilling when unloading the tanker.

PUMP SYSTEMS

The reason behind using "mixed" units, separating those units into two bodies, is that they have an operating pressure limit and if that limit is surpassed they break down; this happens with the pressure switch, the manometer and the expansion vessels. This is why these components are mounted on a



bench along with the alternative control and we call it "control body"; it's always located at the highest pumping height. The other part of the unit contains the motor pumps, filter, retention valves and vacuumeter and we call it "propulsion body"; it is always located at the lowest pumping height, near the main tank. In this case, due to the high pumping altitude, two "split" pressure units are placed in cascade, to supply both power generator units.

The propulsion body of the first unit is located at the lowest altitude (1500 m) in an area with the two main tanks. The control body of the unit is mounted on the same bench near the propulsion body of the second unit. That control unit, in the first stage, automatically pumps the gas oil to two batteries of double-skinned tanks, with a capacity of 1,000 L each (16 + 8) located at a 1,600 m altitude. At this height, a pump that suctions from the 16 tank battery is installed to provide gas oil to the snow grooming cat trucks.

In the second stage, the "propulsion body" of the second unit suctions the gas oil from the tanks located at this altitude (1,600 m) and distributes it to both power generator units. The "control body" of the second unit is located at the highest altitude, 1,850 m, where one of the power generator units is located. The second one is at a lower height, 1,800 m. For this reason, we place a filter in the supply pipe as well as a pressure reducer (1 bar), taking into account that we need a higher pressure to pump up to 1,850 m.

DAILY SERVICE TANK FILLING

Daily service tank filling is performed via the control and safety systems (filter, N.C. solenoid valve, flow container, N.O. solenoid valve, filling safety control). Solenoid valves are managed with the control panel SMMR2, which receives the corresponding tank status signals from the level probes, one for operation and one for safety, as well as an overfilling safety flow switch in the vents.

SUPPLY PUMP FOR TECHNICAL VEHICLES OF THE RESORT.

Gas oil is supplied from one of the tank batteries at a 1,600 m altitude to the different vehicles of the ski resort. A pump with an automatic hose and a mono-phase motor pump with a flow of 100 L/min. is controlled by a DSSG-1 pressure switch that detects pressure drop upon refueling. An expansion vessel is placed for line accumulation.

ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".

PRESSURE UNIT GP-GEMT

Mixed gas oil pressure unit that allows automatic supply to burners and pumping to emergency generators via pressure adjustment, at heights of over 60 meters. The start-up and stop operations with a pressure switch are conducted in the control body located at the highest part of the installation, using the pumping power of the gear pumps at high pressure that allows reaching great heights. Control cables must be laid.

Propulsion Body

- Gear electric pumps with three-phase or mono-phase supply.
- Vacuometer.
- Aluminum filter, retention valves and safety valve with exhaust line.
- Motor protection IP-55
- Alternative electronic control management system
- Vacuometer
- Aluminum filter, retention valves and safety valve with exhaust line.

Control Body

- Expansion vessel with membrane.
- Operation and minimum safety pressure switch
- Possibility of all-or-nothing outputs for incident control from central control with 3, 4 or 6 signals. GSM alarm system via SMS messages or modem connection.





COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.



SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.

LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.



PRESSURE SWITCH

Adjustable pressure switch for start-up in pressure unit according to the defined adjustment. Independent operation and safety micro switches.

- Connection by 10 mm crimp fitting for compression coupling.
- Adjustable operation pressure between 1.5 and 6.5 bar.
- Adjustable safety pressure between 0.5 and 2 bar.



EXPANSION VESSEL FOR OIL

Expansion vessel for oil with membrane to store fuel during the operation of the unit and absorbing possible water hammers.

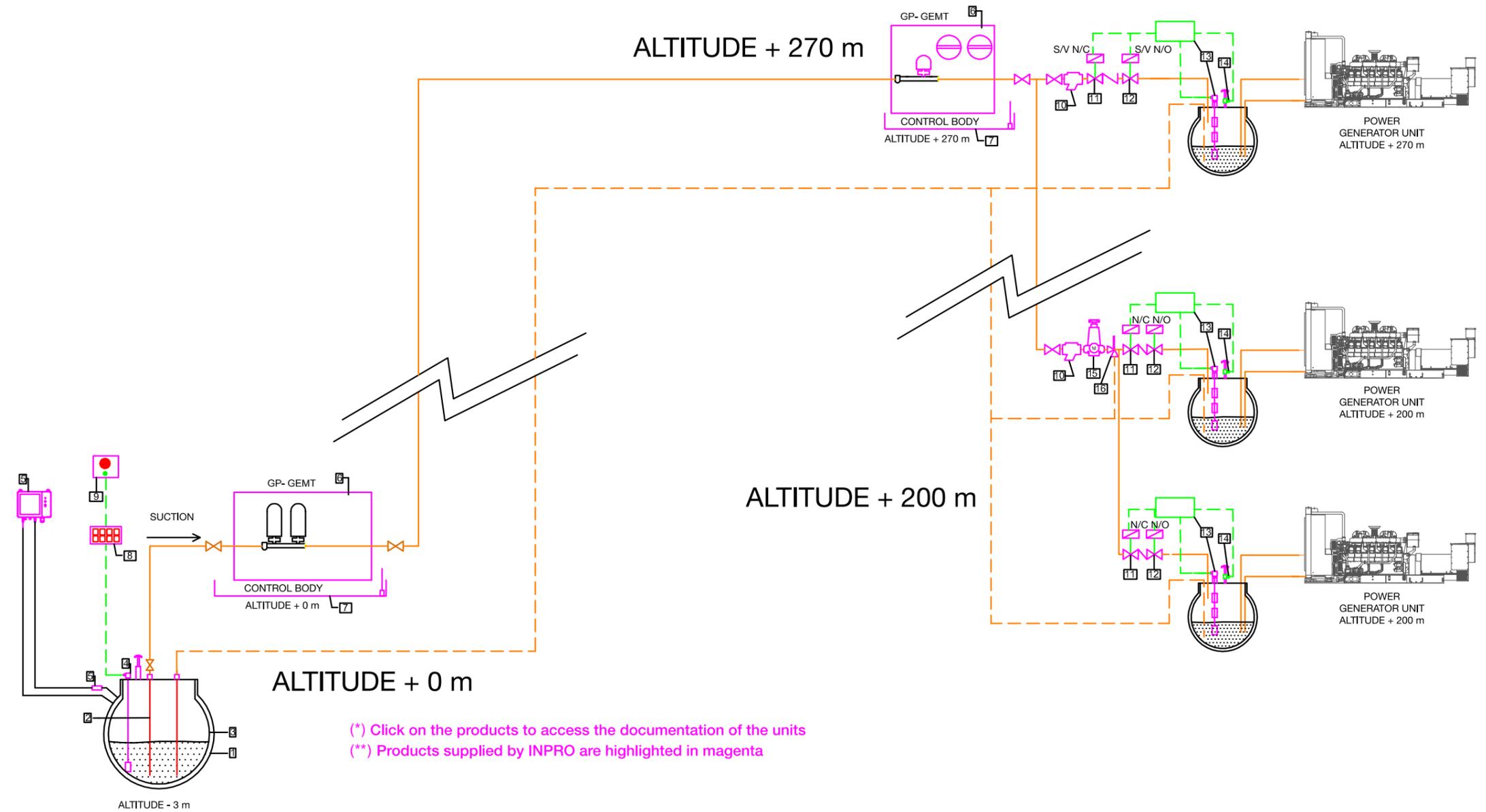
- Max. Pressure 8-10 Bar
- Available capacity between 1 and 25 L.
- Temperature -10°C and +100°C
- Pre-load 1.5 Bar.



INSTALLATION DIAGRAM

FIRST DIAGRAM OF SPLIT UNIT PRESSURE TO POWER GENERATOR UNITS AND PUMPS

1. MAIN GAS OIL TANK
2. SUCTION
3. INTERSTITIAL CHAMBER
4. PROBE EDM-40
5. INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE
6. PRESSURE UNIT "INPRO" GP-1500 GEMT (PROPULSION AND CONTROL BODY)
7. COLLECTOR TRAY WITH SPILLAGE PROTECTION
8. LEVEL DISPLAY EDM-40 WITH RELAYS AND ANALOG OUTPUT
9. OVERFILLING KIT ALARM
10. FILTER
11. SOLENOID VALVE N/C CON DETENTOR
12. SOLENOID VALVE N/A
13. SERVICE PROBE WITH CONTACT AT LEVEL: NC SV AND NO SV OPEN/CLOSE
14. VENTILATION FLOW SWITCH
15. GAS OIL PRESSURE REDUCER 1500 LLS/H D-2,5 BAR
16. SAFETY VALVE WITH EXHAUST LINE 3/BAR 4" - 4,5 BAR.



(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta

PROJECT

MULTIPLE SUPPLY TO INDIVIDUAL BOILERS WITH PRESSURE UNIT

TYPE: SUPPLY / GAS OIL CONTROL / ANTI-SPILL

Gas oil must be automatically supplied to multiple individual boilers meant for heating and hot water production in each home.

REQUIREMENTS AND NEEDS OF THE CUSTOMER

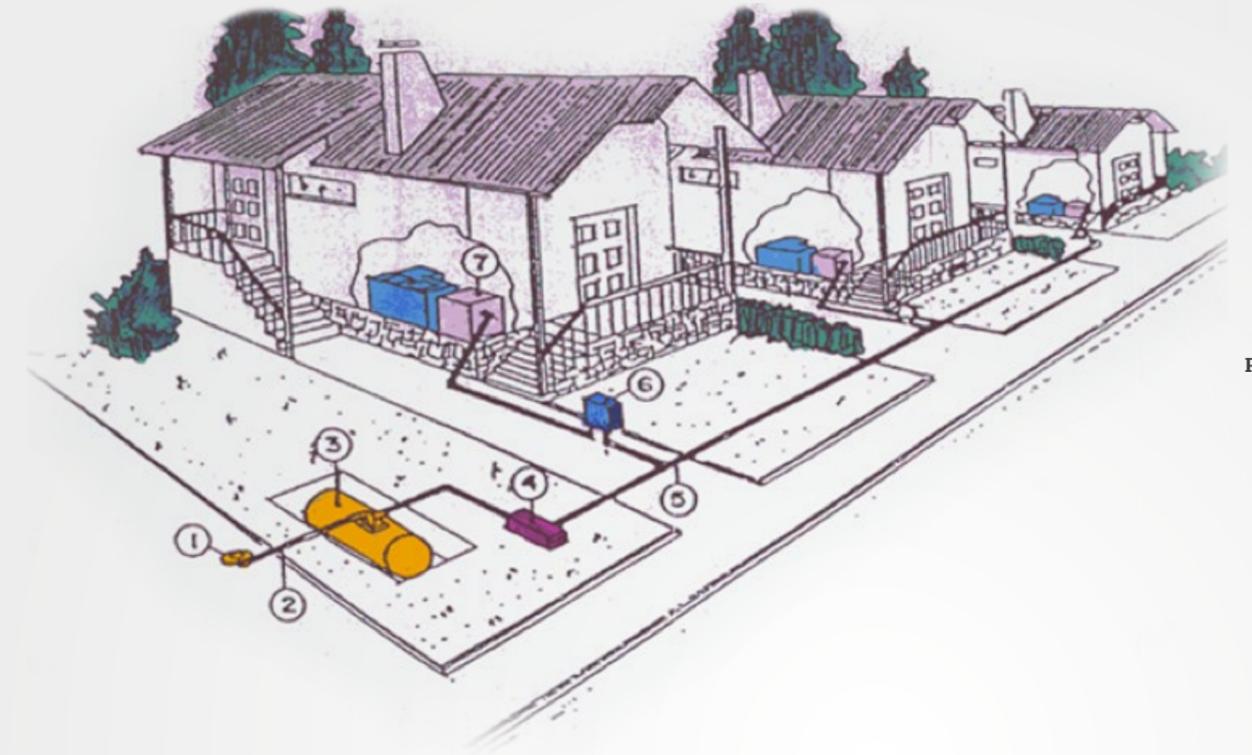
P7

To supply the burners, two double-pump, automatically alternating pressure units are assembled. They are able to suction from either main tank, according to the gas oil level available in each of them. The main condition and precaution to be taken into account when designing the installation is preventing air from entering into the supply pipes and the burners for maintenance reasons or emptying of the line due to a fault. If this happens, purging all boilers would take a lot of work. For this reason, our goal is automatically isolating each burner in case of pressure drop.

To ensure supply after all incidents, the second parallel pressure unit starts operation. Its suction pipe is independent, so if a unit is out of service, the second unit takes care of the entire flow. This operation is managed with the control panel.

Other condition to consider was controlling consumption in each burner with a gas oil meter, with the disadvantage of having to do the

readings remotely, without creating a need of accessing each home for periodical consumption readings.



P7

1

SOLUTION ADOPTED BY INPRO
PIPE LINE

Pipe recommendations are made according to the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between 1 and 1.5 m/s and in suction pipes between 0.2 and 0.5 m/s.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

To detect leaks in the double skin of the main tank, we recommend a DDP-25 vacuum system with regenerative pump and fluid separation valve. The possibility of generating the vacuum again greatly decreases the incidence of false alarms and is compliant with standard EN 13160-1, Class 1.

MAIN TANK CONTROL

The available fuel level in each tank is controlled by digital displays EDM-40 with analog probes. The reading is displayed as an integer percentage, with a 4-20 mA output for communication with the central control of

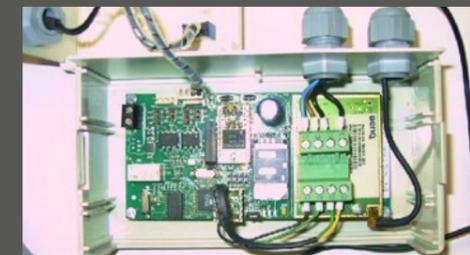
the airport technical building. The 90% and 20% relay outputs control the alarm systems to prevent overfilling when unloading the tanker and provide a reserve local signal.

PUMP SYSTEMS

Twin pressure units with two alternating motor pumps carry out the supply process. These units are designed in such a manner that if any problem occurs in the motor pumps, an alarm signal will trigger and operation will automatically switch to the other pump, thus guaranteeing continuous pumping. Specifically, the GP-1500 GET with a 1500 L/h flow is selected. Each one has a collector tray with a spillage detection system by infrared sensors which sends a locking signal in case of spillage or leaking. The start-up and stop operation is conducted by the regulated pressure differential in the pressure switch, so the propulsion line is pressurized while the burner is turned off. When one of the burners is turned on, the pressure of the

line decreases. When the level set as start-up is reached, the pumping process starts to recover the stop pressure. During each start-up, the pumps alternate automatically. The pressure switch has a third regulation point: minimum safety pressure. When reaching that point, usually 1 bar, the unit is blocked and sends a low pressure alarm signal. This prevents breaks or water tightness lost in the suction line and prevents no-load operation, along with a pressure transducer and a N.O. (normally open) solenoid valve in the propulsion pipe of each pressure group, which sends a signal to the control panel for it to manage their start-up and stop. Blocking the system in case of pressure drop and closing the solenoid valve.

The compact design of pressure units contains in one plate bench the other elements required for the operation of the unit. Expansion tank, filter with retention and safety valves, operation panel with thermal protection and vacuometer in suction and



manometer in propulsion. To comply with the pressure requirements at the inlet of the burners and knowing their consumption, adjustable pressure reducing valves are placed along with meters with a protective filter before them; the oil returns to the propulsion line with a retention valve. Moreover, an inverter pressure switch is placed at the inlet of each burner, set below the operating pressure. If pressure drops below this point, it sends a stop signal to the burner, preventing the propulsion pipe from emptying.

CONSUMPTION CONTROL

For measuring consumption in each home, a volume meter is installed at each point of use with an output signal linked to a radio frequency emitter, programmed to periodically send a data packet with the weekly consumption log. A data concentrator is installed in the technical building of the facility, linked to a computer with the

software required to receive and manage the individual consumption data individually and thus erasing the need of accessing the homes. The system has anti-fraud alarms that trigger if there are inconsistencies in the readings.

ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

PRESSURE UNIT GP GET

Gas oil pressure unit for automatic supply to burners and pumping to emergency generators via pressure adjustment. Start-up and stop operations via an adjusted pressure switch, which allows planning the installation without control wiring.

- Gear electric pumps with three-phase or single-phase supply.
- Motor protection IP-55
- System to interrupt no-load operation in case of lack of fuel
- Alternative electronic control management system
- Vacuometer
- Aluminum filter, retention valves and safety valve with exhaust line.
- Possibility of digital outputs for incident control from central control with 3, 4 or 6 signals. GSM alarm system via SMS messages or modem connection.
- Adaptation of the Units for high pressure, operating conditions up to 8 Kg/cm².
- Modifications for adapting tropicalized and ATEX units.
- Assembly process in sound-proof sheet cabinets with UNE-25 poly-pyramid foam and lock. Manufactured with no back and IP-55 cabinets for outdoors installation.





COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.



SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.



PRESSURE REDUCING VALVE

Adjust the propulsion pressure to the burner or pump line operating needs.

- Output pressure adjustable with manometer or fixed, depending on the model.
- Flow between 20 and 3,000 L.

PRESSURE SWITCH

Adjustable pressure switch for start-up in pressure unit according to the defined adjustment. Independent operation and safety micro switches.

- Connection by 10 mm crimp fitting for compression coupling.
- Adjustable operation pressure between 1.5 and 6.5 bar.
- Adjustable safety pressure between 0.5 and 2 bar.



METER

Meters for gas oil, fuel, kerosene, gasoline and lubricants

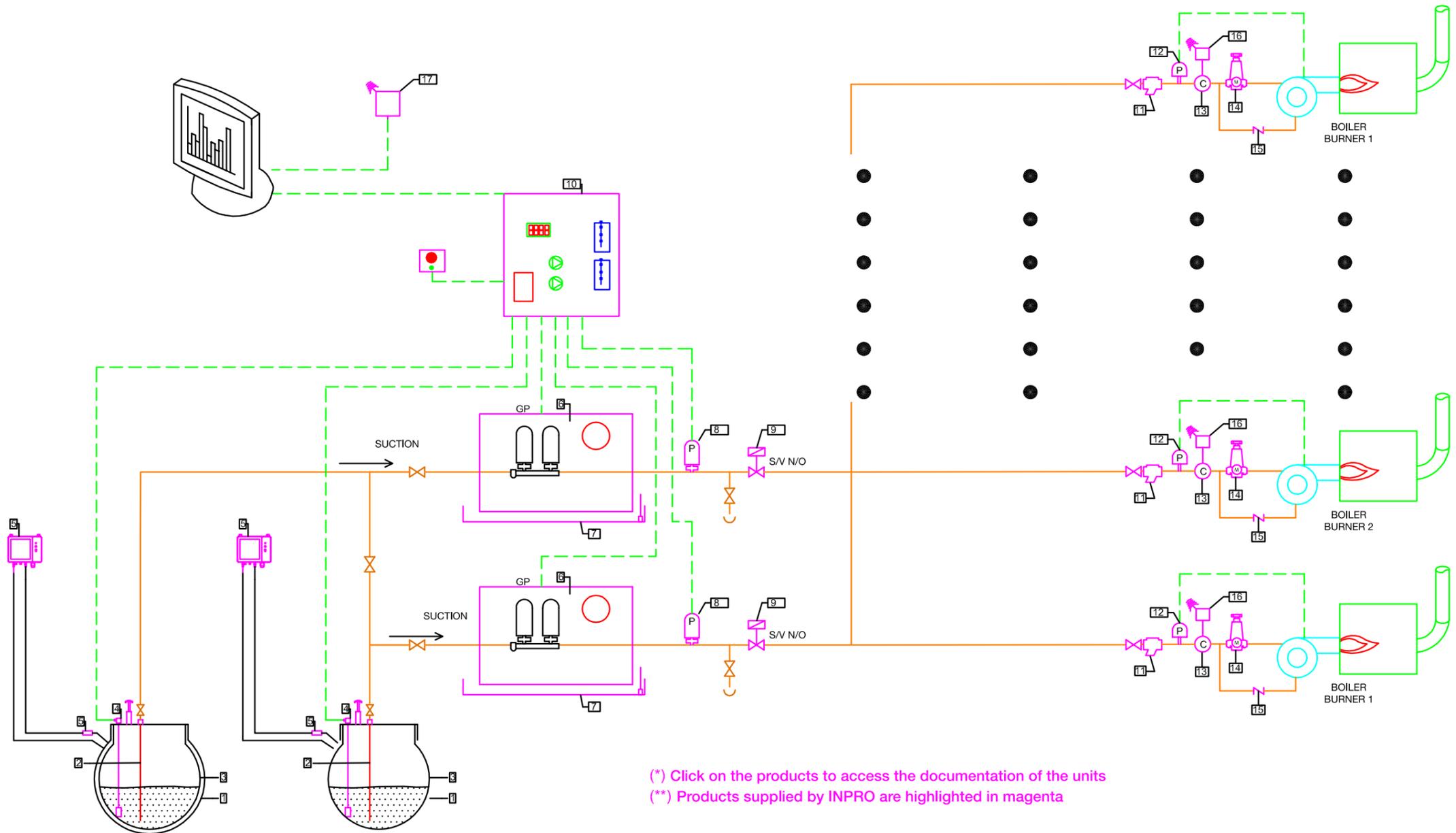
- Flow meter for hydrocarbons and co-generation in burners, ships, vehicles and fixed facilities.
- Metrological certificates and calibrations available based on regulatory needs.
- The whole model range provides the best solutions to measure fuel consumption.
- State-of-the-art designs in electronic meters, with analog and digital outputs with parametrizable values.
- Propulsion or suction assembly.
- Independent from viscosity and temperature.
- System monitoring and control simplifies the configuration of the burner and the optimization of consumption.
- Maximum safety in shipbuilding and automotive industry.



INSTALLATION DIAGRAM

FIRST DIAGRAM SUPPLY TO SEVERAL INDIVIDUAL BOILERS VIA PRESSURE UNIT

- 1. MAIN GAS OIL TANK
- 2. SUCTION
- 3. INTERSTITIAL CHAMBER
- 4. [PROBE EDM40](#)
- 5. [SAFETY VALVE 3/BAR 4" - 4,5 BAR.](#)
- 6. [PRESSURE UNIT GP "INPRO" GET](#)
- 7. [COLLECTOR TRAY WITH SPILLAGE DETECTOR](#)
- 8. [PRESSURE TRANSDUCER 0-10 BAR](#)
- 9. [SOLENOID VALVE N/A](#)
- 10. [CONTROL AND AUTOMATION PANEL](#)
- 11. [FILTER](#)
- 12. [INVERTER PRESSURE SWITCH SSP 1](#)
- 13. [METER WITH PULSE OUTPUT](#)
- 14. [PRESSURE REDUCING VALVE](#)
- 15. [RETENTION VALVE](#)
- 16. [EMITTER METER](#)
- 17. [EMITTER METER TO MANAGEMENT PC](#)



PROJECTS IN AIRPORTS

Along the years we've had the opportunity of developing and installing many projects for airports. Our close collaboration with public company AENA when planning each of them has given us the opportunity of adapting our proposals to the punctual needs of each one and complying with the requirements of all the fields related to aviation.

From all the projects we have worked on, we have selected some examples and we would like to share some of their details.



PROJECT

DEFROSTING AND FROST PROTECTION FOR AIRCRAFT IN RUNWAY HEADINGS

REQUIREMENTS AND NEEDS OF THE CUSTOMER

Ethylene glycol, along with other compounds diluted in water at high temperatures, are used for defrosting and frost protection of planes before starting the flight, when required due to weather and temperature. Tankers with hoisting platforms spray the entire aircraft, mainly the wings, the rudder and the tail stabilizers.

P8



P8 | 1



SOLUTION ADOPTED BY INPRO

A main 25,000 Liter tank is available for storing the fluid. The spray tanker is loaded from this tank with a high flow pumping motor pump, along with a motorized valve to control the filling process. The system is managed by a control panel and manual start-up is done with a go - stop switch. A maximum level stop pump is used as overfilling protection, as well as the necessary thermal protection in the engine. An overpressure valve with return to the main tank prevents overpressurization in case the solenoid valve does not open and the pump keeps running.

The ethylene glycol used to spray the aircraft, along with other impurities, is filtered by the platform grid and drops directly to a drain. A 2 1/2" motorized solenoid valve serves to carry out the unloading process to a 75,000 Liter collecting tank. A blade motor pump is used to empty that tank; it has a 15 h.p. motor and a 25,000 L/h flow potential and serves to pump the ethylene glycol to a tanker for it to be recycled in a processing plant. It also

has an overpressure valve with return to the contaminated fluid tank and filters before the pumping systems. The loading process of the tanker is managed by the control panel and follows the same procedure as the manual start-up.

Given its location and possible presence of fuel from the aircraft, the installation is classified as ATEX Zone-1, so the motor pumps have an IP-55/ExellBT4 protection level, except for the control panel, which is located outside the classified zone.

TANKS

A main 25,000 ethylene glycol storage tank is planned, as well as another 75,000 tank for contaminated fluid, both double-skinned with water tightness control.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

To detect leaks in the double skin of the main tanks, we recommend DDP-25 vacuum

system with regenerative pump and intrinsic safety mechanism and fluid separation valve according to standard EN 13160-1, Class 1.

CONTROL OF MAIN TANKS

To control the level and the overfilling operations in the tanks, continuous measuring analog probes EDM-40 are placed, with explosion-proof heads, which will provide the readings in the panel displays of the control panel outside the classified area. The reserve signal and the overfilling warning are controlled by a 90 dB alarm.

ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

TRANSFER PUMP

Pump with self-adjusting blades, with positive movement and constant flow. Silent, robust and high-performance. Particularly recommended for transfer of all kinds of liquid -as long as they are not abrasive nor contain suspended solid particles.

- Blade adjustment is due to three variables. Centrifugal force, fluid pressure and push rods, so losses and turbulence are greatly decreased.
- Adjustable safety valve included in pump body.
- Pump body in cast or stainless steel, based on needs.
- Bench from gray cast iron.
- Three-phase engine with Atex certificate.
- Possibility of 2 rotation directions by placing an inverter.
- The power of the associated motor prevents possible problems at launch with low temperature fuel.



SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.





OIL PUMP SYSTEM “INPRO” ATAM-GE

Oil pump systems ATAM-GET are synonyms for adaptation. They are designed to fulfill pumping and redundancy needs and to comply with the safety protocols of installations controlled by centralized control panels, with touch screen automatons and Mod-bus communication. A perfect combo for every installation. Control panels for filling motor pumps, overflow, solenoid valves, alarms, etc., as well as possible operating management inputs.

- Compact units with all the elements required for gas oil pumping, joined in an aluminum collector on a furnace-painted plate bench.
- Flows of up to 70 Liters/hour, with the possibility of on-demand pumping via speed variation.
- With a flow meter to instantly check the operating conditions.

TECHNICAL CHARACTERISTICS

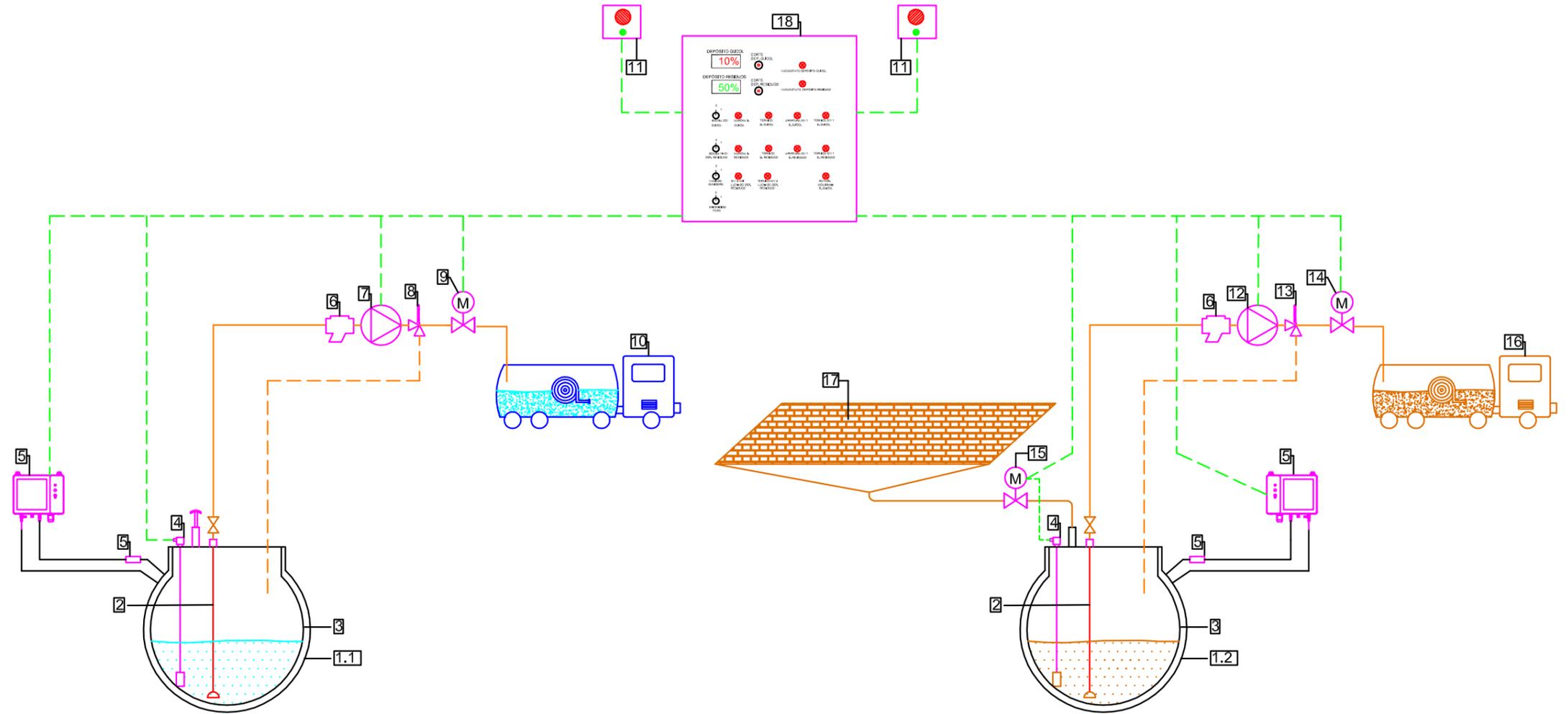
- The system is capable of controlling 1, 2 or 3 filling areas depending on its settings.
- The panel shows the level of the daily service tanks, the status of the motor pumps, solenoid valves, etc., providing the possibility of manual and automatic filling processes as well as different maintenance tests, very useful for having a fine tuned installation.
- It contains a 5.7” monochrome touch screen with Mod Bus communication with SCADAS. There are different options.

INSTALLATION DIAGRAM

FIRST DIAGRAM OF DEFROSTING SYSTEM FOR AIRCRAFT WITH ETHYLENE GLYCOL

- 1.1 MAIN TANK 25000 L CLEAN GLYCOL UNLOADING
- 1.2 COLLECTOR TANK 75.000 L CONTAMINATED GLYCOL
- 2. SUCTION WITH FOOT VALVE
- 3. INTERSTITIAL CHAMBER
- 4. [PROBE EDM-40 ATEX](#)
- 5. [INTERSTITIAL CHAMBER DETECTOR DDP-25NTRINSIC SAFETY](#)
- 6. [FILTER](#)
- 7. [SPRAY TANKER LOADING MOTOR PUMP 10000 L TSLH 2 CV](#)
- 8. SAFETY VALVE 1-1/2" 2 BAR
- 9. ANTI-EXPLOSION MOTORIZED VALVE 1-1/2"
- 10. AIRCRAFT SPRAYER ETHYLENE GLYCOL TANKER
- 11. [OVERFILLING KIT ALARM](#)
- 12. [DISPOSABLE GLYCOL SUCTION MOTOR PUMP 25.000 L/H 15 CV](#)
- 13. SAFETY VALVE 2" 2 BAR
- 14. ANTI EXPLOSION MOTORIZED VALVE 2-1/2"
- 15. ANTI EXPLOSION MOTORIZED VALVE 2-1/2" CONTAMINATED GLYCOL FILLING
- 16. POLLUTING PRODUCTS REMOVAL TRUCK
- 17. COLLECTOR DRAIN FOR SPRAYED GLYCOL
- 18. AUTOMATION CONTROL PANEL

(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta



PROJECT

SUPPLY OF GAS OIL TO BOILERS. (BARCELONA AIRPORT)

TYPE SUPPLY OF GAS OIL TO BURNERS / PUMPING TO GENERATORS

REQUIREMENTS AND NEEDS OF THE CUSTOMER

In the installation, three boilers for heating and clean hot water in parts of the airport must be supplied. That installation would consist of two main motors from which the pressure units would suction, each unit from each tank. The suction line could be modified manually if required. Each pressure unit would supply a circuit with two burners; one of them would be a reserve burner. Both circuits would be designed in a way that, if one of the burners stops working, the operation of the installation could be guaranteed with manual operation valves.

P9



P9

1



SOLUTION ADOPTED BY INPRO

PIPE LINE

The recommended pipes to install followed the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between 1 and 1.5 m/s and in suction pipes between 0.2 and 0.5 m/s.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

To detect leaks in the double skin of the main tank, we recommended a DDP-25 vacuum system with regenerative pump and fluid separation valve. The possibility of generating the vacuum again greatly decreases the incidence of false alarms and is compliant with standard EN 13160-1, Class 1.

MAIN TANK CONTROL

The available fuel level in each tank was controlled by digital displays EDM-40 with analog probes. The reading is displayed as an integer percentage, with a 4-20 mA output for communication with the central control of

the airport technical building. The 90% and 20% relay outputs control the alarm systems to prevent overfilling when unloading the tanker and provide a reserve local signal.

PUMP SYSTEMS

A twin pressure unit was mounted on each circuit with two alternating motor pumps. Specifically, we selected GP-70 GET with a flow of 70 L/h. These units are designed in such a manner that if any problem occurs in the motor pumps, an alarm signal will trigger and operation will automatically switch to the other pump, thus guaranteeing continuous pumping. Each one has a collector tray with a spillage detection system by infrared sensors which sends a locking signal in case of spillage or leaking. The start-up and stop operation was carried out via the regulated pressure differential in the pressure switch, so the propulsion line is pressurized while the burner is turned off. When one of the burners is turned on, the

pressure of the line decreases. When the level set as start-up is reached, the pumping process starts to recover the idle pressure. During each start-up the pumps alternate automatically. The pressure switch has a third regulation point: minimum safety pressure. When reaching that point, usually 1 bar, the unit is blocked and sends a low pressure alarm signal. This prevents breaks or water tightness loss in the suction line and prevents no-load operation of the pump. The compact design of pressure units contains in one plate bench the other elements required for the operation of the unit. Expansion tank, filter with retention and safety valves, operation panel with thermal protection and vacuometer in suction and manometer in propulsion.

To comply with the pressure requirements at the inlet of the burners and knowing their consumption, adjustable pressure reducing valves are placed along with meters with a protective filter before them; the oil returns

to the propulsion line with a retention valve. In the inlet chimney for combustion gases, a temperature limiter pyrometer is placed and set at a 240°C limit to control the efficiency of the installation.

The regulation unit and the burner body are on a spillage collector tray with an infrared sensor. The system is blocked in case of spillage or leaking and an alarm is issued to central control.

ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

PRESSURE UNIT GP GET

Gas oil pressure unit for automatic supply to burners and pumping to emergency generators via pressure adjustment. Start-up and stop operations via an adjusted pressure switch, which allows planning the installation without control wiring.

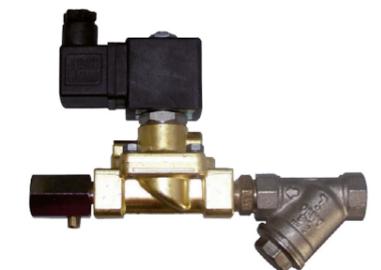
- Gear electric pumps with three-phase or single-phase supply.
- Motor protection IP-55
- System to interrupt no-load operation in case of lack of fuel
- Alternative electronic control management system
- Vacuometer
- Aluminum filter, retention valves and safety valve with exhaust line.
- Possibility of digital outputs for incident control from central control with 3, 4 or 6 signals. GSM alarm system via SMS messages or modem connection.
- Adaptation of the Units for high pressure, operating conditions up to 8 Kg/cm².
- Modifications for adapting tropicalized and ATEX units.
- Assembly process in sound-proof sheet cabinets with UNE-25 poly-pyramid foam and lock. Manufactured with no back and IP-55 cabinets for outdoors installation.



SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.





COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.

LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.

PRESSURE SWITCH

Adjustable pressure switch for start-up in pressure unit according to the defined adjustment. Independent operation and safety micro switches.

- Connection by 10 mm crimp fitting for compression coupling.
- Adjustable operation pressure between 1.5 and 6.5 bar.
- Adjustable safety pressure between 0.5 and 2 bar.

METER

Meters for gas oil, fuel, kerosene, gasoline and lubricants

- Flow meter for hydrocarbons and co-generation in burners, ships, vehicles and fixed facilities.
- Metrological certificates and calibrations available based on regulatory needs.
- The whole model range provides the best solutions to measure fuel consumption.
- State-of-the-art designs in electronic meters, with analog and digital outputs with parametrizable values.
- Propulsion or suction assembly.
- Independent from viscosity and temperature.
- System monitoring and control simplifies the configuration of the burner and the optimization of consumption.
- Maximum safety in shipbuilding and automotive industry.



PYROMETER

With Regulation for Temperature Cut-off

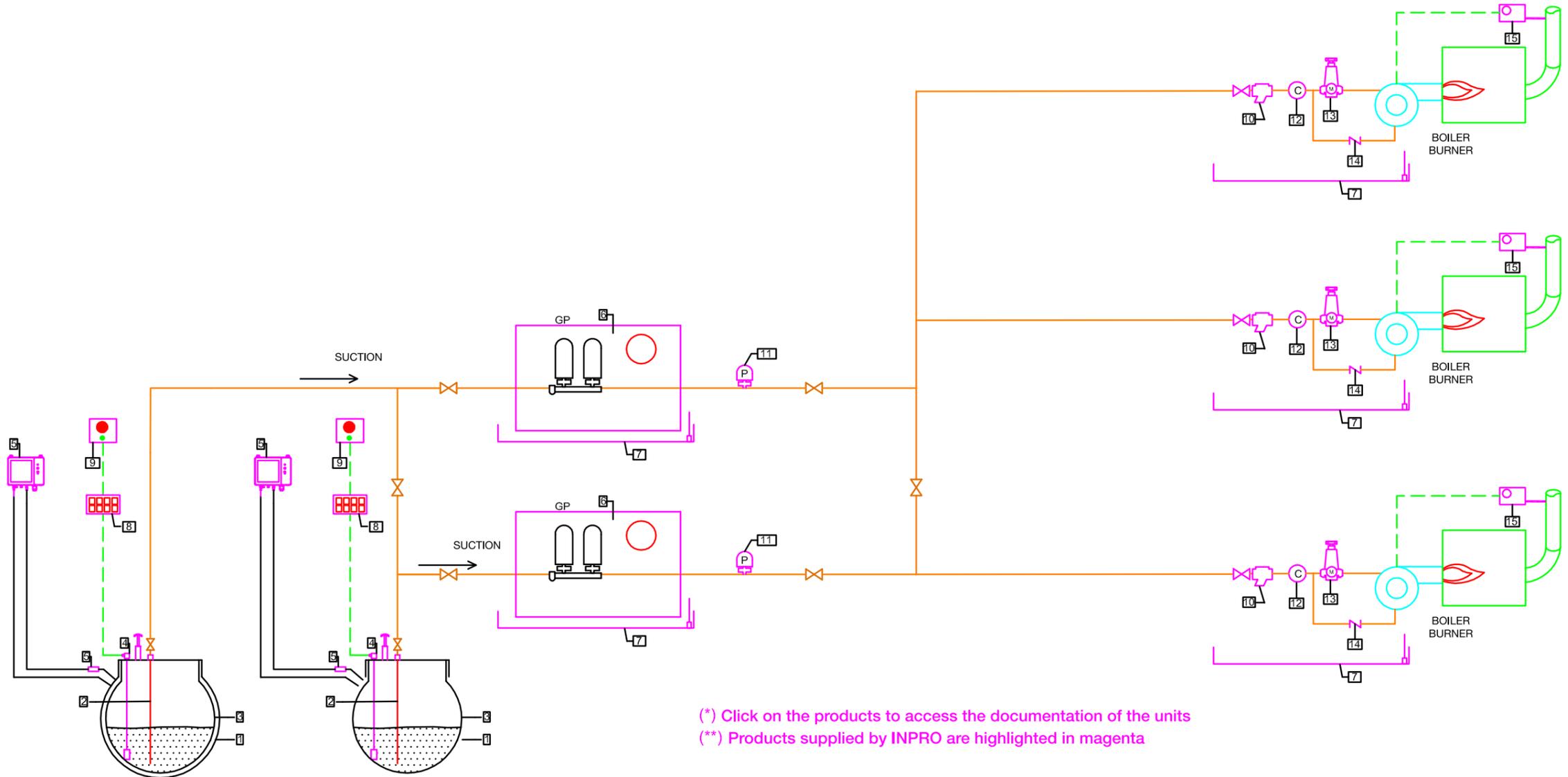
- To control combustion gases in the boiler chimney.
- When outlet gases reach the maximum legal temperature (240°C) the heat generator (boiler) is shut off.
- Note: The boiler does not work correctly over 240°C and the emission of polluting agents increases.
- With adjustable thermostat up to 300°C, thermometer and manual, local and remote reassembly.
- With 1 and 3 m capillaries with a 200 mm stainless steel case.
- Voltage free output relay with the option of performing additional operations.



INSTALLATION DIAGRAM

FIRST DIAGRAM OF SUPPLY TO BOILERS WITH PRESSURE UNIT (AIRPORT AUXILIARY SERVICES)

1. MAIN GAS OIL TANK
 2. SUCTION
 3. INTERSTITIAL CHAMBER
 4. [PROBE EDM40](#)
 5. [INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE](#)
 6. [PRESSURE UNIT GP "INPRO" GET](#)
 7. [COLLECTOR TRAY WITH SPILLAGES PROTECTION](#)
 8. [LEVEL DISPLAY EDM-40 WITH RELAYS AND ANALOG OUTPUT](#)
 9. [OVERFILLING KIT ALARM](#)
 10. [FILTER](#)
 11. [INVERTER PRESSURE SWITCH SSPI](#)
 12. [METER VZ-O WITH PULSE OUTPUT](#)
 13. [PRESSURE REDUCING VALVE](#)
 14. [RETENTION VALVE](#)
 15. [PYROMETER](#)
- 11-13-14: PART OF THE SUPPLY RAMP TO BURNER



(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta

PROJECT

SUPPLY TO POWER GENERATOR UNITS WITH PRESSURE UNIT (PALMA DE MALLORCA AIRPORT)

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The customer requested gas oil pumping to the daily service tanks of the emergency or normal operation power generator units. This could be done in several ways; in each case, we would assess the redundancy and safety needs and requirements in order to provide the method with a higher warranty of complying with the needs of the installation concerned, without forgetting any details that could simplify and reduce the costs of the assembly and future maintenance tasks.

In this case, pumping to both circuits would be done via two twin pressure units with two alternating motor pumps. Both circuits are designed in such a manner that if one of them stops working, the fuel can be redirected manually with manual shut-off valves. The pumping flow of each pressure unit is calculated so a single unit can provide the total flow of the system.



SOLUTION ADOPTED BY INPRO**PIPE LINE**

Pipes were selected according to the criteria of standard DIN 4755 indicating that gas oil speed in propulsion pipes must be between 1 and 1.5 m/s and in suction pipes between 0.2 and 0.5m/s.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

Leak detection in the double skin of the main tanks is done with a DDP-25 vacuum system with re-generator pump and fluid separation valve. This greatly decreases the incidence of false alarms and is compliant with standard EN 13160-1, Class 1. Installation in daily service tanks is not recommended, as they do not have double skin.

CONTROL OF MAIN TANKS

EDM-40 continuous level measurement digital displays with analog output (0-10V - 4/20 mA) are installed for local reading of

the tank capacity, as well as a 95 dB alarm to prevent overfilling during the unloading process of the tanker.

PUMP SYSTEMS

A twin pressure unit is mounted on each circuit with two alternating motor pumps. Specifically, we selected GP-800 GET with a flow of 800 L/h. These units are designed in such a manner that if any problem occurs in the motor pumps, an alarm signal will trigger and operation will automatically switch to the other pump, thus guaranteeing continuous pumping. Each one has a collector tray with a spillage detection system by infrared sensors which sends a locking signal in case of spillage or leaking. The start-up and stop operation is carried out via the regulated pressure differential in the pressure switch, so the propulsion line is pressurized while the N.C. operation valve is closed. When one of the tanks drops below the minimum

level set in the probe, the N.C. solenoid valve opens, which decreases the pressure of the line and the pumping process starts until recovering stop pressure. During each start-up the pumps alternate automatically. The pressure switch has a third regulation point: minimum safety pressure. When reaching that point, usually 1 bar, the unit is blocked and sends a low pressure alarm signal. This prevents breaks or water tightness loss in the suction line and prevents no-load operation of the pump. The compact design of pressure units contains in one plate bench the other elements required for the operation of the unit. Expansion tank, filter with retention and safety valves, operation panel with thermal protection and vacuometer in suction and manometer in propulsion. The possible pressure drop in the propulsion line is controlled via inverter pressure switches installed at the outlet of the pressure unit.

DAILY SERVICE TANK FILLING

Daily service tanks will be filled with a control and safety system consisting of: Filter, N.C. (normally closed) solenoid valve for filling control, N.O. (normally open) solenoid valve for maximum level safety and a flow limiter. The solenoid valves are managed by a control panel consisting of a touch screen panel automaton on the front of the operation panel with the analog and digital signals corresponding to tank control and status via level probes, overfilling safety flow switch in the vents and spillage protection systems.

Operation is conducted via a level differential in the daily service tank. When the level drops down to 70%, the level switch issues an opening order to the N.C. solenoid valve, the line pressure drops down to the start-up point of the pumping unit and start-up and stop operations are performed until reaching 90%; a closing

order is then issued to the N.C. valve. The unit remains in standby after reaching the maximum operating pressure.

If due to a failure of the N.C. valve or the pressure unit operation the level exceeds 90%, there is a high level safety milestone at 95% that launches the return pump to the main tank, until reaching 75%.

All operation and safety protocols are managed by the automaton, as well as communication with the airport central control with Mod-bus.



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

PRESSURE UNIT GP GET

Gas oil pressure unit for automatic supply to burners and pumping to emergency generators via pressure adjustment. Start-up and stop operations via an adjusted pressure switch, which allows planning the installation without control wiring.

- Gear electric pumps with three-phase or single-phase supply.
- Motor protection IP-55
- System to interrupt no-load operation in case of lack of fuel
- Alternative electronic control management system
- Vacuometer
- Aluminum filter, retention valves and safety valve with exhaust line.
- Possibility of digital outputs for incident control from central control with 3, 4 or 6 signals. GSM alarm system via SMS messages or modem connection.
- Adaptation of the Units for high pressure, operating conditions up to 8 Kg/cm².
- Modifications for adapting tropicalized and ATEX units.
- Assembly process in sound-proof sheet cabinets with UNE-25 poly-pyramid foam and lock. Manufactured with no back and IP-55 cabinets for outdoors installation.





COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.



PRESSURE SWITCH

Adjustable pressure switch for start-up in pressure unit according to the defined adjustment. Independent operation and safety micro switches.

- Connection by 10 mm crimp fitting for compression coupling.
- Adjustable operation pressure between 1.5 and 6.5 bar.
- Adjustable safety pressure between 0.5 and 2 bar.

METER

Meters for gas oil, fuel, kerosene, gasoline and lubricants

- Flow meter for hydrocarbons and co-generation in burners, ships, vehicles and fixed facilities.
- Metrological certificates and calibrations available based on regulatory needs.
- The whole model range provides the best solutions to measure fuel consumption.
- State-of-the-art designs in electronic meters, with analog and digital outputs with parametrizable values.
- Propulsion or suction assembly.
- Independent from viscosity and temperature.
- System monitoring and control simplifies the configuration of the burner and the optimization of consumption.
- Maximum safety in shipbuilding and automotive industry.



PRESSURE REDUCING VALVE

Adjust the propulsion pressure to the burner or pump line operating needs.

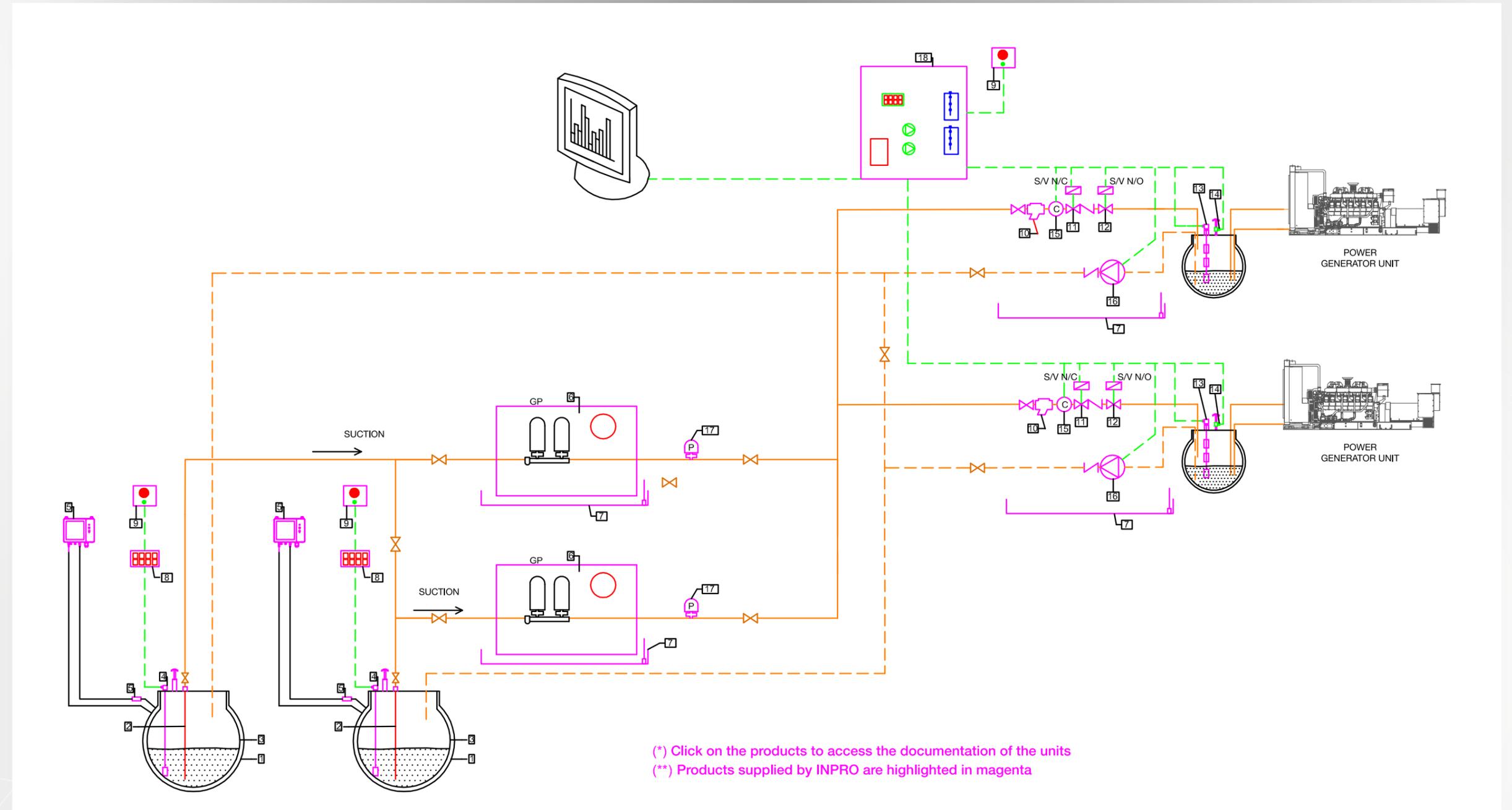
- Output pressure adjustable with manometer or fixed, depending on the model.
- Flow between 20 and 3,000 L.



INSTALLATION DIAGRAM

FIRST DIAGRAM OF SUPPLY TO POWER GENERATORS WITH PRESSURE UNIT (AIRPORT AUXILIARY SERVICES)

1. MAIN GAS OIL TANK
2. SUCTION
3. INTERSTITIAL CHAMBER
4. PROBE EDM40
5. INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE
6. PRESSURE UNIT GP "INPRO" GET
7. COLLECTOR TRAY WITH SPILLAGE DETECTOR
8. LEVEL DISPLAY EDM-40 WITH RELAYS AND ANALOG OUTPUT
9. OVERFILLING KIT ALARM
10. FILTER
11. SOLENOID VALVE N/C WITH FLOW LIMITER
12. SOLENOID VALVE N/O
13. SERVICE PROBE WITH CONTACT AT LEVEL: NC SV AND NO SV OPEN/CLOSE
14. VENTILATION FLOW SWITCH
15. METER
16. BAILING PUMP WITH RETENTION VALVE
17. INVERTER PRESSURE SWITCH SSP1
18. CONTROL PANEL, TOUCH SCREEN AUTOMATION



(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta

PROJECT

SUPPLY OF POWER GENERATOR UNITS WITH ATAM - GET PUMPING SYSTEM FOR POWER STATION (VALENCIA AIRPORT)

REQUIREMENTS AND NEEDS OF THE CUSTOMER

The safety and operation requirements of airport power centrals require adapting safety protocols and having redundancies to ensure constant operation, which foresee possible responses to possible failures with active protocols and status and incident signals. Moreover, current regulations regarding spillage controls, whose consequences not only cause extra expenses and inconveniences, but can also involve waste processing companies that could be able to stop the installation for the duration of cleaning tasks, as well as legal consequences that could lead to administrative and economic fines.

Given the electrical power needs of power stations, they have multiple emergency generators, some of them redundant, which condition the design of operation and safety protocols. Control and distribution of fuel in the entire system has always been planned taking into account the required redundancy in airport power stations.

In this case, the installation had six power generator units coupled as primary and redundant, controlled by three touch screen panel

automatons and with Mod-bus communication among them as well as communication to central control. Daily service tanks are filled with ATAM - GET pump systems, one for each operation line.



SOLUTION ADOPTED BY INPRO PIPE LINE

The criterion of standard DIN 4755 was applied when selecting the pipes. Gas oil pumping speed in propulsion pipes, between 1 and 1.5 m/s and suction speed between 0.2 and 0.5m/s.

MAIN TANK INTERSTITIAL CHAMBER DETECTION

To detect leaks in the double skin of the main tank, we chose a DDP-25 vacuum system with regenerative pump and fluid separation valve. This significantly decreases the possibility of false alarms, which occur more often with other detection methods. That detection system complies with standard EN 13160-1, Class 1.

MAIN TANK CONTROL

There are two main tanks for supply, controlled by panel automatons at the front of the control panels. They monitor measuring and control the unloading process of the

tanker with an overfill alarm; they also have two motor pumps in case pumping between them is required. EDM-40 continuous level reading analog probes for the control of those tanks.

PUMP SYSTEMS

To pump from the main tank to the daily service tank corresponding to each power generator unit, an ATAM - GET pumping system with two alternating motor pumps is installed. Specifically, we selected ATAM 1500 GET with a flow of 1500 L/h. Each pump is capable of producing the total flow required for pumping to two fully loaded generators, as well as recovering the maximum level at the same time. Pumping systems have a collector tray with infrared spillage detection that would send a signal to central control in case of a spill.

DAILY SERVICE TANK FILLING

The daily service tanks will be filled via the



status signal from the level control probes in the daily service tanks. The control and safety system consists of: Filter, N.C. (normally closed) solenoid valve for filling control, N.O. (normally open) solenoid valve for maximum level safety and a flow limiter that controls the proportional flow filling for each tank and blocks the line if it receives an overfilling signal.

The solenoid valves are managed with the control panel consisting of a full color touch screen automaton at the front of the operation panel and provided with the analog and digital signals required in each case for the control and status of the tanks, as well as the 110% safety control via the flow switch in the vents and the other spill-protection systems, for both the return pumps and the pumping stop protocols.

Operation is conducted via a level differential in the daily service tank. When the level drops down to 70%, the level switch issues an order to open the N.C. solenoid valve and start the

ATAM pumping system, performing pumping operations until reaching 90% when an order to stop the pumping system and close the N.C. valve is issued.

If due to a failure of the N.C. valve or the pressure unit operation the level exceeds 90%, there is a high level safety milestone at 95% that launches the return pump with a flow higher than the filling flow to the main tank, until reaching 75%.

Total block of a pumping system, certain spill protocols or interruption of the main generators for reasons directly linked to its proper operation activate the start-up of the entire redundant system, thus ensuring constant power generation.

All operation and safety protocols are managed by the automaton, as well as communication with the airport central control with Mod-bus.



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



PROBE EDM40

Continuous level display and control unit completely adapted to the needs of the installation. Displays the level at all times, expressed as a percentage. All required operations can be done via the relay module and the analog communication output. Customized manufacture makes this unit perfect for all kinds of tanks and a wide array of fluids.

- Standard operating temperature: 40°C that can be adapted to reach up to 125°C.
- Control unit in standardized module (DIN 43700) 96 x 43 x 100, can be mounted with panels.
- Flexible probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts. Mounted with aluminum or standardized flange.
- Overfilling warning alarm triggering with 95 dB acoustic signal, automatic shut-off and reset push button with IP-55 protection. It complies with the requirements of the standard MI-PO3 on "Oil Installations for own consumption".



INTERSTITIAL CHAMBER DETECTOR DDP-25

Vacuum leak detector for interstitial chamber in double-skinned tanks according to EN 13160-1, Class 1.

- Has a regenerative pump controlled with an adjustable vacustat. Thus keeping a -400 mBar pressure between the inner and outer skins of the double-skinned tank. When dropping below 380 mBar, the pump regenerates the vacuum; if there are any holes, the negative pressure does not regenerate; the alarm triggers upon reaching 340 mBar.
- These units are perfect for tanks of up to 3 m of diameter.

OIL PUMP SYSTEM "INPRO" ATAM-GE

Oil pump systems ATAM-GET are synonyms for adaptation. They are designed to fulfill pumping and redundancy needs and to comply with the safety protocols of installations controlled by centralized control panels, with touch screen automatons and Mod-bus communication. A perfect combo for every installation. Control panels for filling motor pumps, overflow, solenoid valves, alarms, etc., as well as possible operating management inputs.

- Compact units with all the elements required for gas oil pumping, joined in an aluminum collector on a furnace-painted plate bench.
- Flows of up to 70 Liters/hour, with the possibility of on-demand pumping via speed variation.
- With a flow meter to instantly check the operating conditions.



COLLECTOR TRAY WITH SPILLAGE DETECTOR

Placing collector trays under certain elements of the installation is recommended. Particularly, equipment that could leak due to its characteristics or during maintenance tasks. Placing a spillage detector for the tray gives the possibility of creating protocols.

- Furnace-painted plate tray with the appropriate size for each circumstance.
- Spillage detector in the control panel and detection probe. Infrared optical sensor for oil and water, conductivity sensor for water or both, mounted on the same probe.
- Standard 1.5 m probe.
- The control unit of the detector is mounted in a box with impact-resistant plastic cover. The control unit contains two voltage free relays, one for commuting and the other one usually open.





SOLENOID VALVES

Set of solenoid valves to control the filling process and safety against spillage due to excessive levels.

- Chrome plated brass Y-shaped filter, with stainless steel 0.05 mm mesh PN16.
- Gas oil N.C. solenoid valve to control the filling process.
- A regulated and sealed container (flow limiter) adapted to the desired flow, consisting of a chrome plated brass valve and nylon seals.
- Gas oil N.O. solenoid valve to control the filling process.



LEVEL SWITCH

SMMR level switches perform the operations required for the filling process and the tank overfilling alarms and protocols. Custom manufacture based on actual needs.

- Probes manufactured from different materials to work with fluids such as gas oil, oil, water, milk, etc.
- Probe with sealed head, can be fastened with 2", 1 1/2" or 1" nuts, mounted with aluminum or standardized flange.
- For controlling pumps, solenoid valves, alarms, etc...
- Control box with relays and power supply.

TRANSFER PUMP

Pump with self-adjusting blades, with positive movement and constant flow. Silent, robust and high-performance. Particularly recommended for transfer of all kinds of liquid -as long as they are not abrasive nor contain suspended solid particles.

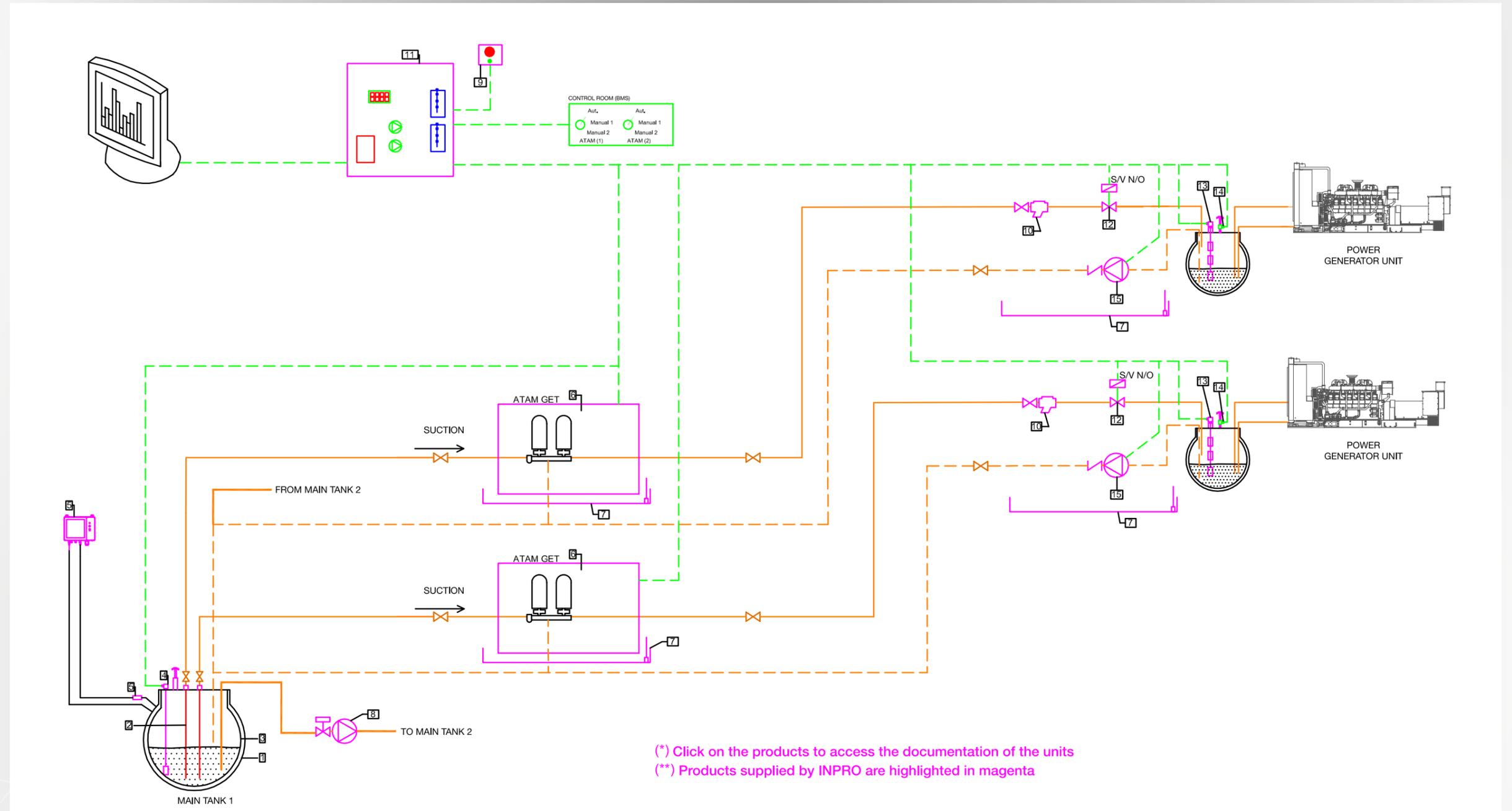
- Blade adjustment is due to three variables. Centrifugal force, fluid pressure and push rods, so losses and turbulence are greatly decreased.
- Adjustable safety valve included in pump body.
- Pump body in cast or stainless steel, based on needs.
- Bench from gray cast iron.
- Three-phase engine with Atex certificate.
- Possibility of 2 rotation directions by placing an inverter.
- The power of the associated motor prevents possible problems at launch with low temperature fuel.



INSTALLATION DIAGRAM

FIRST DIAGRAM OF SUPPLY TO POWER GENERATORS VIA ATAM-GET (AIRPORT POWER PLANT) TRIPLED

1. MAIN GAS OIL TANK
2. SUCTION
3. INTERSTITIAL CHAMBER
4. [PROBE EDM40](#)
5. [INTERSTITIAL CHAMBER DETECTOR DDP-25 WITH FLUID SEPARATOR VALVE](#)
6. [PUMP UNIT "INPRO" ATAM GET](#)
7. [COLLECTOR TRAY WITH SPILLAGE DETECTOR](#)
8. [MOTOR PUMP 100 L/MIN WITH NC SOLENOID VALVE TANK TRANSFER](#)
9. [FILLING KIT ALARM](#)
10. [FILTER](#)
11. [CONTROL PANEL, TOUCH SCREEN AUTOMATION](#)
12. [SOLENOID VALVE N/O](#)
13. [SERVICE PROBE WITH CONTACT AT LEVEL: OPEN / CLOSE NO SV AND ATAM AND OVERFILLING PUMP OPERATION](#)
14. [VENTILATION FLOW SWITCH](#)
15. [BAILING PUMP WITH RETENTION VALVE](#)



PROJECT

METHANOL DOSAGE FOR THERMAL TREATMENT OF METALS HELICOPTER FACTORY IN YEOVIL - ENGLAND

TYPE: METHANOL DOSAGE / CONTROL

REQUIREMENTS AND NEEDS OF THE CUSTOMER

For a thermal treatment process of metals in the manufacture of helicopters, a specific methanol dosage is required at several points of use in the furnaces. The pressure and flow conditions must remain stable.

This type of industrial systems using methanol to their operation are characterized by their constant, uninterrupted operation (24 x 7) without breaks for maintenance tasks. The methanol pumping units are designed with components to comply with the highest safety and reliability requirements, with a redundancy system to avoid single failure points. That redundancy system is managed by a control panel that requires a follow-up of the status of the components and their automatic commutation in case of failure. The control panel can be managed remotely with BMS systems.

Therefore, the design given to the consulting engineers and subcontractors had to focus on improved system diagrams for critically important installations.

 **BOC**
A Member of The Linde Group





THE MAIN CHALLENGES ARE

- Design aimed at a 24-7 operation, with automatic alternating system, providing the possibility of selecting pump 1 or 2 manually.
- Double filter system in parallel. Maintenance tasks can be carried out without shutting off the unit.
- Extremely accurate pressure adjustment, even when one of the furnaces does not need supply.
- High-quality components that are also highly compatible with methanol, compliant with the highest safety and reliability requirements.
- Magnetic coupling between pump and motor to avoid mechanical sealing, decreasing the importance of a sensitive maintenance factor.
- Compatible with protection systems for explosive atmospheres (ATEX) according to Directive 94/9/ CE.

SOLUTION PROVIDED BY INPRO METHANOL PUMPING SYSTEM

An RL 140 D ZW ZY methanol supply unit with double motor pump is used, with a control panel mounted on a cabinet outside the danger zone.

Stainless steel gear pumps with magnetic couplings are used; they provide airtight sealing of the pump and an excellent suction power. Pressure and vacuum displays in a compact unit provide accurate measurement of the installation parameters.

Stainless steel gear pumps with magnetic coupling that provide airtight sealing of the pump and an excellent suction power. Pressure and vacuum displays in a compact unit provide accurate measurement of the installation parameters.

All components will comply with ATEX based on European Directive 94/9/CE if in the zone classified as explosive atmosphere.

DOUBLE-FILTER SYSTEM

The cabinet of the propulsion body must contain a double-filter system, with two parallel filter with their respective shut-off valves; we will choose whether to transfer Methanol from one or the other, so cleaning processes can be done without interrupting the fluid transfer.

PRESSURE REGULATOR VALVE

In the ring main pipe system, a pressure regulator valve is installed consisting of a spring -adjustable with an adjustment screw- that will maintain a stable operating pressure in the line under different flow demands, returning the excess fluid to the main storage tank.

AUTOMATIC CONTROL PANEL

It's placed outside the EX risk zone, as per European Directive 94/9/CE. It manages

the system alarms (low pressure, motor overheating) and automates periodical pump alternation, or alternation if one of the motor pumps fails.



ELEMENTS OF THE INSTALLATION SUPPLIED BY INPRO



RL 140 ME ZUZW

RL 140 ME ZUZW, double motor pump pumping unit for the ring transfer system, special version for methanol, in steel cabinet.

- 2 gear pumps and hermetically sealed magnetic coupling, self-priming, with ATEX protection (Ex 11 z GDC X (I))
 - Maximum flow of 140 L/h, nominal flow 70 L/h
 - 2 230/400 Vca three-phase motors, ATEX protection (11 EX 2G EEx and IP55 T4 11 (I))
 - 2 retention valves mounted on steel pipe
 - 5 shut-off valves
 - Filter with sintered bronze sieve and brass vessel
 - Vacuometer, 6.5 manometer and radial outlet (Glycerin)
 - Overpressure valve (safety)
 - Low pressure shut-off pressure switch, to prevent no-load operation (loss of water tightness during suction or broken pipe). ATEX protection (EX 11 2 GD EEX from 11C T6 IP65(I))
 - Connections (suction, pressure, return): 1/2" F
 - Protection: IP54
 - All parts are assembled in a protection cabinet, dimensions: 800 x 800 x 300 mm
- All ATEX certificates of individual components are supplied with the unit.

DOUBLE-FILTER SYSTEM

Two 1/2" brass filters in parallel, with 40µ shut-off cartridges and 4 shut-off valves.

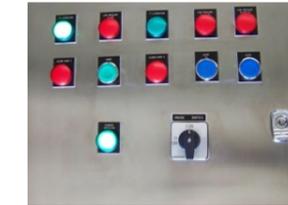
This configuration allows conducting maintenance tasks without interrupting the operation of the unit, using the corresponding shut-off valves.



CONTROL PANEL

Automatic alternation system with internal timer:

- 2 motor thermal protection switches
- start-up button
- Status pilot light (Operation)
- Fault warning pilot light
- Adjustable timer (to determine the operation time of each pump)
- Relay with timer to absorb pressure drops
- Galvanic isolator
- Automatic block in case of fault
- Automatic alternation between pump 1 and pump 2
- Manual selection between pump 1 and pump 2



PRESSURE REGULATOR VALVE

Constant pressure and flow regulator valve according to consumption variations

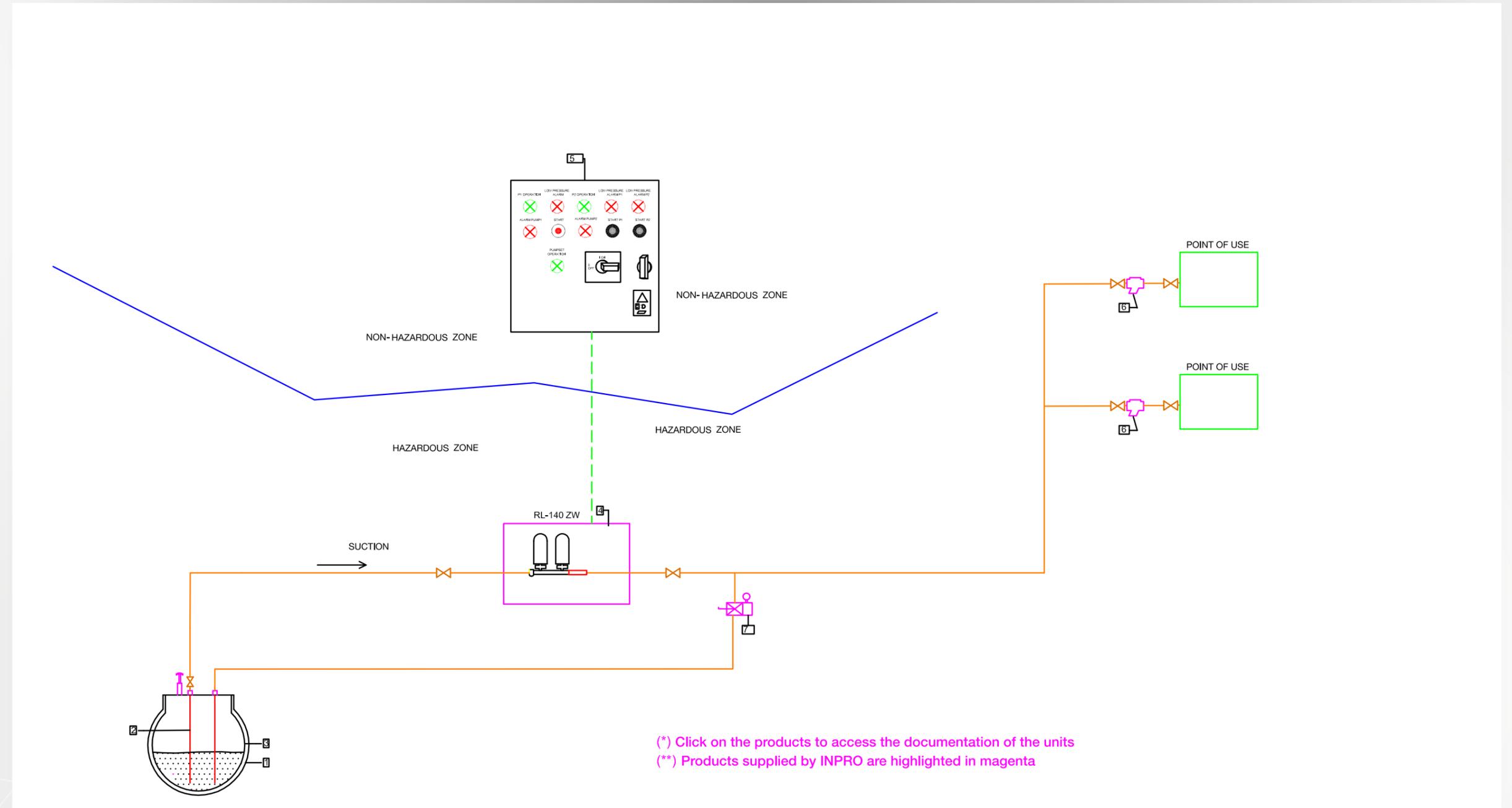
- For gas oil, lubricant and hydraulic oils.
- Maximum temperature of the fluid: 250°C.
- Hydraulic cast iron. Piston, needle and tempered steel spring.



INSTALLATION DIAGRAM

FIRST DIAGRAM SUPPLY TO POINTS OF USE OF METHANOL WITH RL RING UNIT

- 1. MAIN GAS OIL TANK
- 2. SUCTION
- 3. INTERSTITIAL CHAMBER
- 4. [HYDRAULIC BODY RL-140 ZW](#)
- 5. [DUPLEX PUMP CONTROL PANEL RL-140 ZW](#)
- 6. FILTER
- 7. [PRESSURE STABILIZER VALVE](#)



(*) Click on the products to access the documentation of the units
 (**) Products supplied by INPRO are highlighted in magenta

OTHER PROJECTS

OTHER PROJECTS

DATA PROCESSING CENTERS (DPC)

Inditex	Banco Espirito Santo	Acnur and Ebro Building - Zaragoza Expo
BBVA Phase I	ADIF	Oficinas Fuencarral Towers
Enagas	Caixa Catalunya	BBVA Building M-17 and M14
BBVA Lima	BBVA Las Tablas	Office Building B20. Las Tablas. Madrid
Mapfre	Caixa Cedabyola del Valles CPD 1 y CPD2	Ceqma Zaragoza Building
Portugal Telecom	BBVA Phase II	Cnic-Cnio Building (Tragsa)
The Spanish Ministry of Finance	Torre Espacio Building	Castellana 79 Office Building
Interxion	Supply / Gas Oil Control Building	Ingeniería De Minas y Obras Publicas Building In Bilbao
Ciudad Universitaria	Torre de Cristal Building	La Ricarda Building In El Prat De Llob
Yoigo	Mutua Madrileña (Madrid / Castellana)	Zurich Building
Banco Popular (PHASE 1)	Windsor Building	Peugeot Building
Banco Popular (PHASE 2)	Las Tablas Telefónica	Philips Building
BBVA Lima (Perú)	RTVE Prado del Rey	
Banco Sabadell	La Torre Iberdrola	
Banco España	La Torre Sevilla	

POWER STATIONS AND AUXILIARY SERVICES IN AIRPORTS

León Airport	Sevilla Airport	Coruña Airport
Madrid Barajas Airport (Several Phases)	Vigo Airport	Almería Airport
Bilbao Airport (Old / New)	Alicante Airport	Power Supply Reliability Vigo
Granada Airport	Málaga Airport	Luanda (Angola) Airport
Asturias Airport	Cape Verde Airport	Salamanca Airport

RADAR SYSTEMS IN AIRPORTS

Valencia Airport	Asturias Airport	Málaga Airport
Madrid Barajas Airport	Pamplona Airport	Ronda Airport
Bilbao Airport (Old / New)	Sevilla Airport	Burgos Airport
León Airport	Linares Airport	Gibraltar Airport

AIR TRAFFIC CONTROL CENTERS

Valencia	Palma Mallorca	GABA
----------	----------------	------

HOSPITALS

Hospital Doce Octubre	Hospital of Torrejón	South-Southwest Hospital of Tenerife
Hospital San Francisco De Asís	South Tenerife Hospital	University Hospital of Albacete - Phase I
Hospital of Vigo	Hospital in Peru	University Hospital Marqués de Valdecilla
Hospital Alcázar De San Juan	Huca Oviedo	Hospital of Elche
Hospital of Basurto (Vizcaya)	Hospital La Axarquía	Hospital of La Línea
Regional Hospital of Riotinto	Hospital La Mancha - Center	Hospital of Valdecilla
Hospital Costa Del Sol-Marbella	Hospital Madrid, Puerta Del Sur in Móstoles	Hospital of Villalba
Hospital of Arcena	Maternity-Children's Hospital In Torrecardenas de Almería	Hospital of Jerez
Hospital of Collado Villalba	Hospital of Móstoles	Military Hospital of Valladolid
Hospital of Ibiza	National Paraplegic Center (Toledo)	Hospital Sant Joan de Deu
Hospital of Móstoles	Hospital Osuna in Sevilla	Hospital Uribe Kosta Phase II Urduliz (Biscay)
Hospital of Ronda	Hospital of Salamanca	Hospital of Villalba
Hospital of Teruel		

HOTELS AND MALLS

Hotel in Guinea	Hotel Paseo Infanta Isabel	Hotel Park Hyatt Mallorca
Hotel Anfa Plage	Hotel Himalaya In Baqueira Beret	Hotel Hotel Project
Hotel Barajas Madrid	Hotel Oran in Algeria	

PUBLIC BODIES

Congress Palace of Palma	Adequa Business Park	School in Elche
Lorca Police Station	Barcelona Design Center	School Santo Domingo
Infante Don Juan Manuel Palace, Belmonte (Cuenca)	Navalcarnero Social Insertio Center	Public School Font Calent
Palencia Courthouse	Logistic Center El Bañuelo in Fuenlabrada	Carabaña School - Madrid
Multiuse Building of Las Palmas de Gran Canaria	Health Center Belvis de La Jara	Pico de La Miel School in La Cabrera
Water Park Of Madrid	Ceuta Correctional Facility	Iradier/Irun Police Station
Firefighter Station of La Roda	Mahon Correctional Facility	Lorca Police Station
Office Complex of Trens (Luanda)	Málaga II Correctional Facility	Madrid Stadium (Former 'Peineta')
	North Correctional Facility	Primary School Raimundo Lulio
	School Montessori Girona	

SUPPLY FOR ENGINE TESTING BENCHES

Bench for Kerosene Engines Jet 1 Aircraft Engines	Engine bench in University of Murcia
Bench for Military Truck Engines	ATEX Declassification Aircraft Engines Testing
Bench for Tank Engines	Bench INTA
	Bench for INTA Motorcycle Engines

DIRECT GAS OIL SUPPLY TO HIGH PRESSURE FURNACES

High Pressure of 25 Bar 4200 L/h Power

Recovery Plant

High Pressure of 40 Bar 1500 L/h

High Pressure of 25 Bar 500 L/h

Supply of Gas Oil for Heating Muds to

Manufacture Methane

GAS OIL SUPPLY TO SEVERAL DEVICES FROM A SINGLE POINT

Industrial Greenhouses 82 Air Generators

High Performance Greenhouses Industrial Air

Generators

AUTOMATIC FILTERING AND DISPOSAL OF WATER FROM GAS OIL TANKS

Telefónica

University of Murcia

Finanzauto

MISCELLANEOUS PROJECTS

Supply of Methanol to furnaces to harden
geared pieces

Supply / Control B-100 Biodiesel for Burners

Collaboration in Control of Truck Fleets With
Pumps

Collaboration in remote management of
Truck Fleets with different Engineering
Techniques

Measurement / Control / Transmission of Data
for Fire Protection Tanks

Meter for Mobile Tanks Comunidad de Madrid

Dosage of Solvents to Eliminate Wastes from
Boat Engine Pistons

Biodiesel Plant (Rosal De La Frontera)

Collaboration in remote management of
Truck Fleets with differeng Engineering
Techniques

Collaboration in Remote management of
Natural Gas Power Plants



C/ Invierno, 410
28500 Arganda del Rey
Madrid - España
Tel. +34 91 8719294
info@inprogroup.net
www.inprogroup.net



Voltastraße, 10
63457 Hanau
Deutschland
Tel. +49 06181 9587-0
info@simka.de
www.simka.de



3820 Roswell RD NE Suite 901
30342 Atlanta (GA)
United States
Tel. +1 404 364 1800
info@inprogroup.net
www.inprogroup.net