

Amarinth Automatic Top Up Units (ATUs) enable the automatic refilling or topping up of Plan 53B barrier systems to maintain a constant barrier fluid supply through the seal system to the shaft seal.

Why has Amarinth designed its own ATUs?

ATUs are available from other suppliers and although Amarinth has used these in the past, the long lead-times (typically 32 to 40 weeks) on these units has caused issues on some contracts. Amarinth ATUs are designed and manufactured in-house to be scalable, configurable and completed to suit the short lead-time contracts, which can be under 22 weeks, that we often deliver our pumps to, whilst still meeting stringent customer specifications and restrictive customer vendor lists for all instrumentation, valves and controls.

Requirements of API 682

API 682, shaft sealing systems for rotary pumps, is the API standard for safe and reliable operation of mechanical seals and auxiliary piping systems and is usually referenced in the procurement of equipment. However, API 682 does not refer to ATU systems so specific end-user specifications will define design, construction and test. For example, in recent projects the Shell DEP standard has a clause for an ATU utilising a duty only supply pump (see Figure 1), whereas in the case of ADCO its specification overwrites the Shell DEP standard with further specific requirements for the ATU to include both duty and standby supply pumps (see Figure 2).

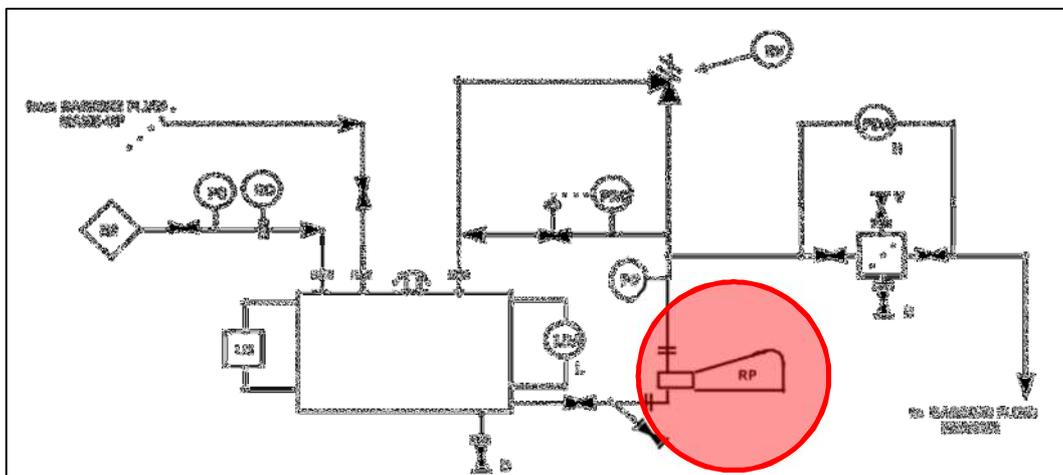


Figure 1 – Shell DEP P&ID for ATU with duty only supply pump

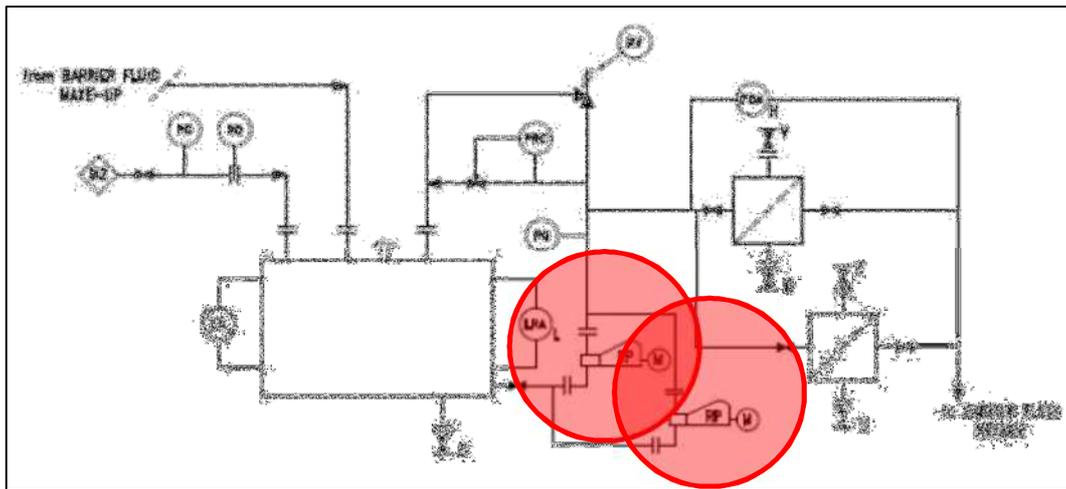


Figure 2 – ADCO P&ID for ATU with duty and standby supply pumps

Amarinth's ATU goes beyond both the Shell DEP and ADCO standards and applying ADCO instrumentation, piping and isolation and drain philosophy provides a comprehensive, modular system suitable for a broad range of applications (see Figure 3).

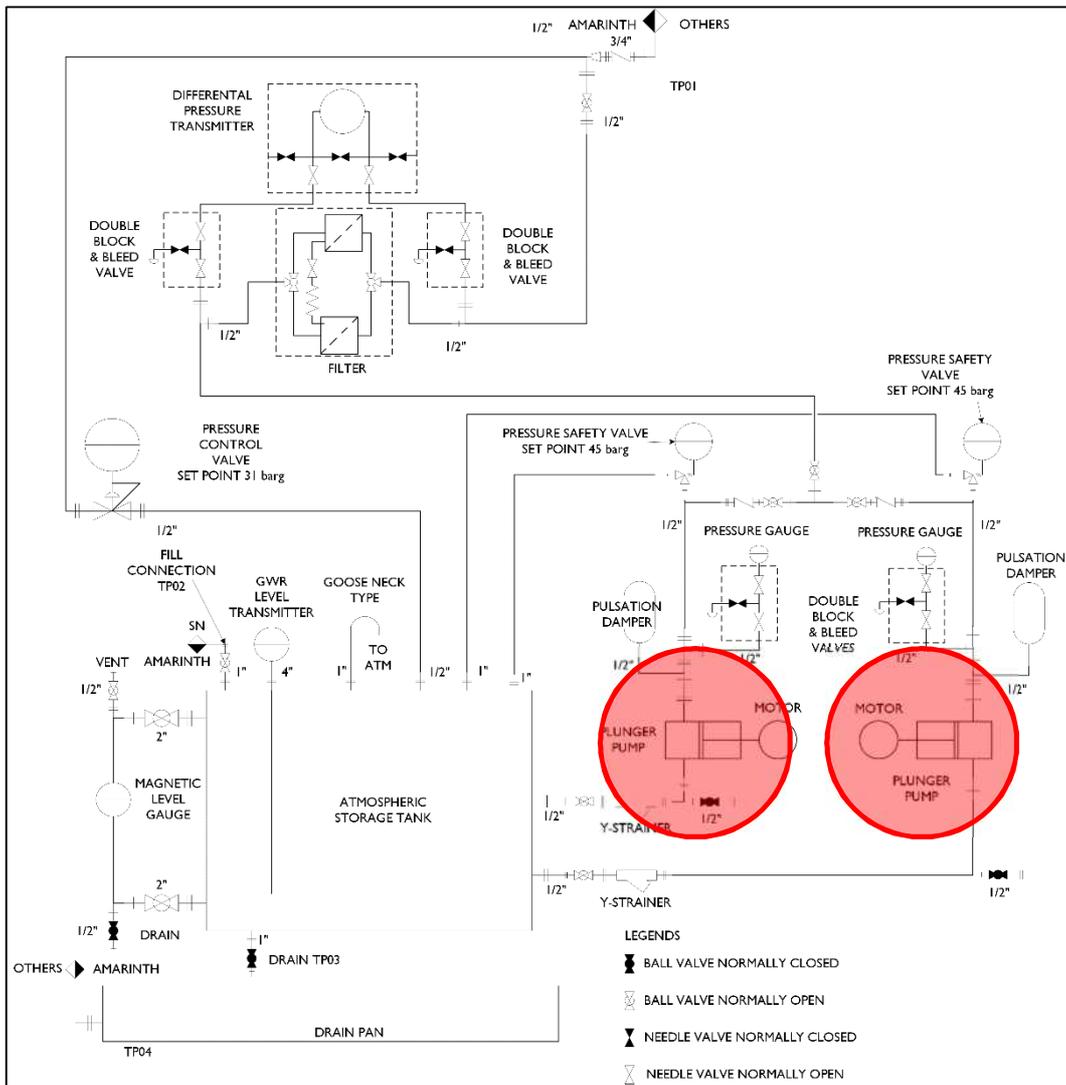


Figure 3 – Amarinth P&ID for ATU to suit anything from a single to multiple charging pumps

Sizing the ATU

When specifying an ATU it is important to understand the mechanical sealing that the ATU is supporting. The leakage rate determines the ATU volume and requirements but a single ATU may support one or more pumps. In the latter case, the pumps may not all be working at the same pressure and so leakage could be different for each. In addition, since the pipework system from the ATU to the pump controls the pressure, then for multiple pumps the pipework from the ATU to each may be different depending on the pressure in each. Pumps may also be run intermittently or constantly, which again has an impact on the leakage that the ATU must support and hence its volume.

End-user specifications only give the pumps and their duties and do not give the ATU requirements. Amarith's specialist knowledge and experience must then be used to understand and determine the ATU requirements and design the pipework to support the particular installation.

Shell DEP and ADCO specifications provide typical arrangements. These are generally utilised if the equipment supported is in continuous service. Alternative arrangements with the appropriate control systems can be designed and agreed with the EPC / end-user based on specific applications. Amarith's technical team are on hand to provide suitable proposals.

Modular modern design

The Amarith ATUs are manufactured from 316L stainless steel, meeting or exceeding all standard requirements (such as Shell and ADCO) and are fully ATEX compliant. Safety is paramount, with a non-return valve on the feed line to the seal system, pressure control valves to relieve excess pressure and a level transmitter in the tank to warn of low fluid levels.

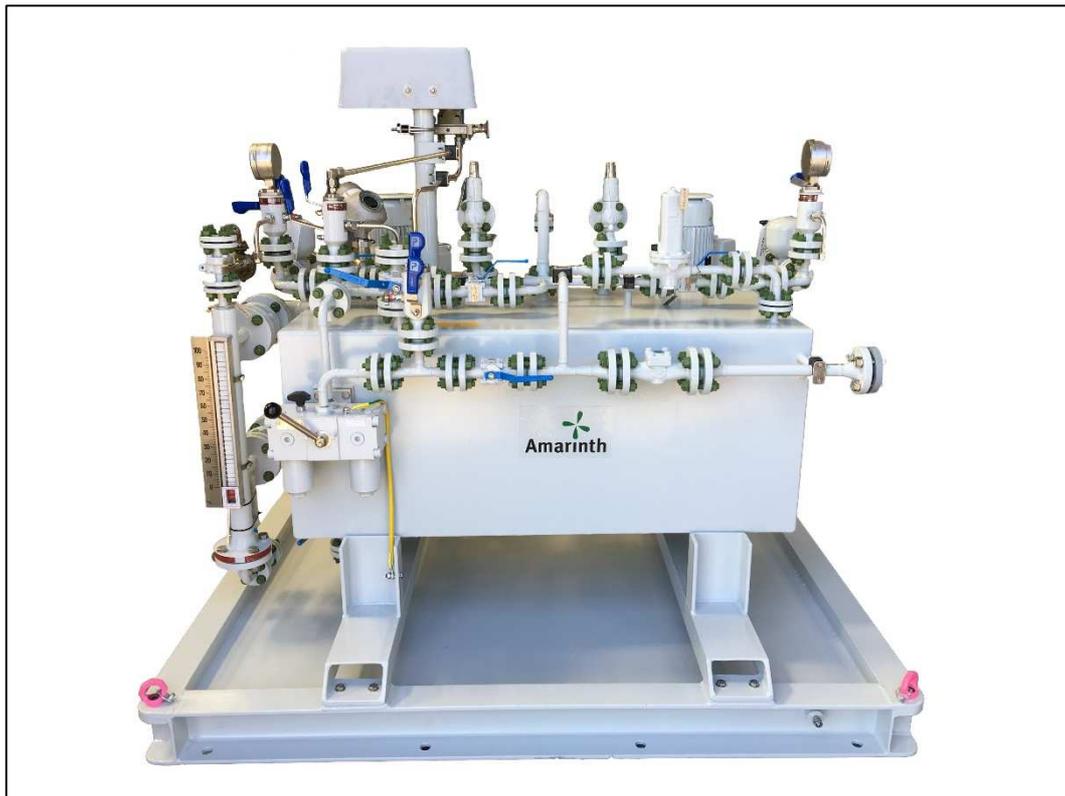
The system is fully modularised and units can be assembled to suit anything from a single pump to multiple charging pumps. In addition to the number of pumps, the system is readily scalable to suit the length of time the pumps are run. Amarith has already provided ATUs with tanks of working capacities in excess of 300 litres and greater capacities can be achieved within a scaled footprint.

The layout of the Amarith ATU is designed with function and maintainability as the key parameters with carefully organised and consistent venting and drains throughout. An easily accessible basket strainer is provided with a differential pressure alarm to remind that filter cleaning is required. There is also an integral instrumentation sunshade to assist readability in bright conditions and to protect from solar temperatures. Safety equipment such as safety relief valves can also be included within the same layout allowing flexibility to suit a particular contract.

Short lead-time

Drawing on its proven agility and sound business processes, Amarith is working with a select group of suppliers to achieve a lead-time of under 22 weeks if the contract requires it. All components are from approved vendors ensuring the whole system is fully compliant with the customer's requirements.

Amarinth Automatic Top Up Unit



Example installations

Amarinth has successfully manufactured its ATUs for a number of customers, including:

Siirtec Nigi:

Amarinth ATUs were supplied for the API 610 OH2 pumps with Plan 53B seal support systems for a gas dehydration and glycol regeneration package destined for the ADCO Al Dabb'iya Facilities Development Phase III project, Abu Dhabi. They had to be manufactured to coincide with the 27-week delivery schedule for the supply of pumps for the project.

Fjords Processing:

Amarinth ATUs were supplied for the API 610 OH2 recycling pumps with bespoke Plan 53B seal support systems for the critical and highly corrosive duties of the crude oil desalting system at the ADCO Al Dabb'iya Facilities Development Phase III project, Abu Dhabi. These pumps and seal support systems had to be delivered on an aggressive 24-week delivery schedule.