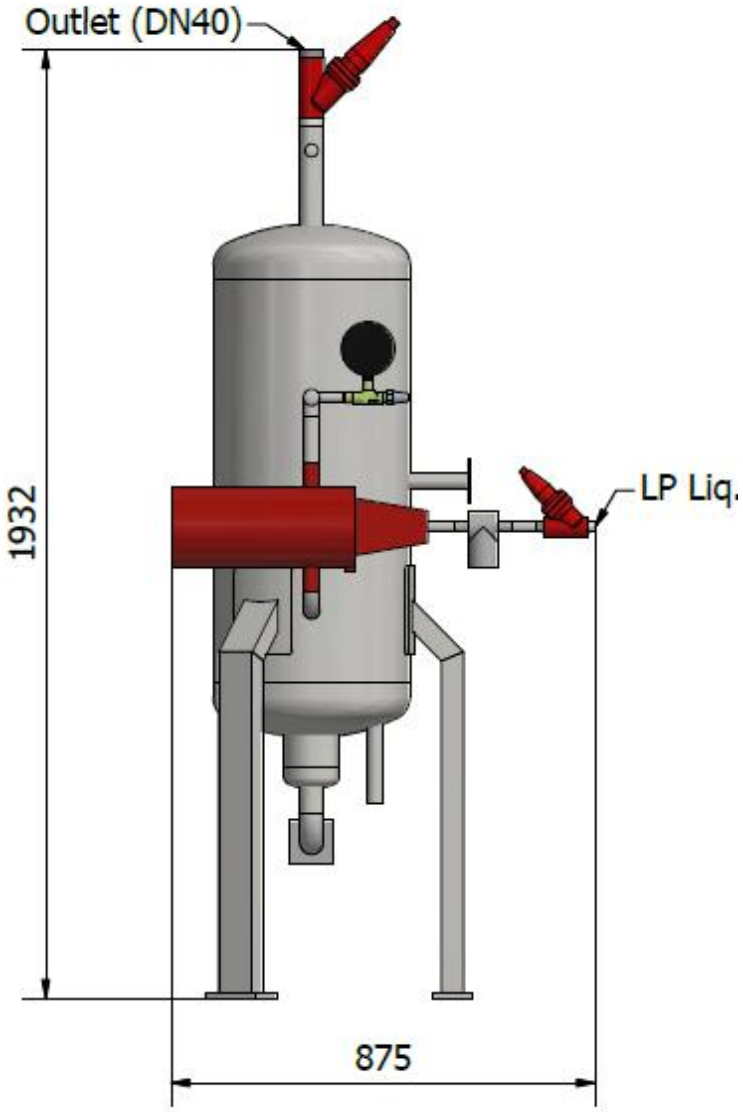
User Manual

CPW15



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Index

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1 Introduction and description

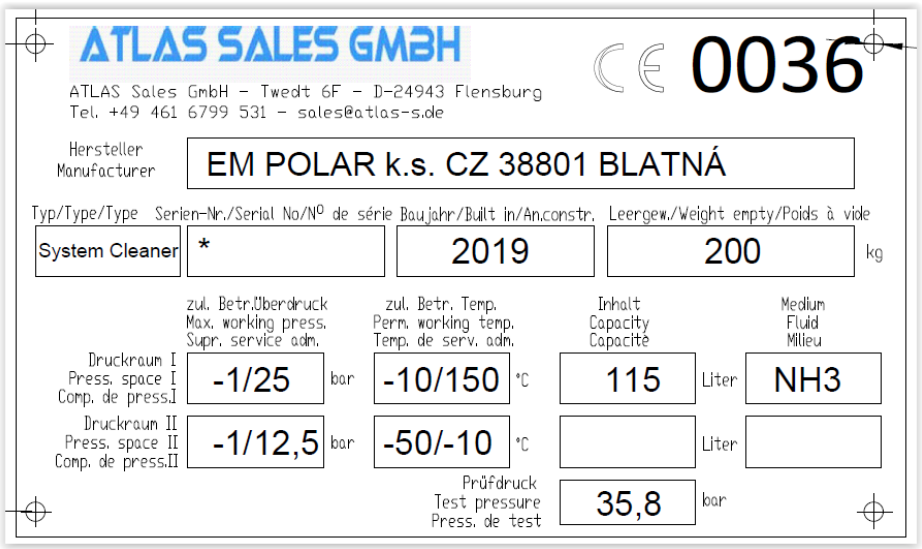
CPW15 is a water purger for large Industrial ammonia refrigeration systems.

Water purging function:

The LP liquid containing water is fed to the water purger through a float valve, where it is evaporated in a very accurate controlled way by the build in regulation system. The controlled evaporation allows the ammonia to evaporate and keeps as much water (and other contaminants) as possible in the water purger at the given pressure / temperature. The heat is generated by the coil in the water purger and the evaporation is controlled by the automatic special regulation device placed over the coil. The water purger has a water / ammonia reservoir in the bottom part of the unit. During operation the water content in the water purger and its water reservoir will rise over time and the evaporating temperature of the water-ammonia mixture will rise.

2 System type

The system is equipped with name plates:



2.1 Technical specifications:

Water purger nominal ammonia evaporating capacity: approx. 15 kW

2.2 The intended use of the system

The plant may only be used according to documentation. It is expected that the plant will be used in accordance with Cool Product's instructions. Special care must be taken following the instructions that have a safety significance.

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3 Safety information

Read these instructions carefully before installing, operating, maintaining or inspecting the system. In this manual, a number of pictograms for safe operation are classified as "Warning" or "Information" as shown below.

This instruction provides a brief overview of the most important safety conditions when setting up, maintaining and using the equipment. Attention is drawn to the fact that it is the responsibility of the end user that the entire plant is maintained and inspected according to the regulations for the individual installation parts.
Use that violates the instructions contained in this manual and which causes injury to persons, animals and equipment, voids any warranty from Cool Products.

Modifications to the equipment that affect the safety of the equipment are not permitted. Before using the equipment, check that the equipment is undamaged and installed as directed by Cool Products.

Attention is especially drawn to:

- National safety rules
- National health and safety requirements at work
- National installation rules for the type of installation concerned
- Recognized standards
- The safety information in this guide
- Data and information about permissible installation and operating conditions on the equipment label plate
- Instructions for and any type certificates for equipment installed on the plant.

Failure to follow these instructions can result in loss of warranty on the system!

3.1 Use of the operating instructions and other instructions

- It is the responsibility of the owner to maintain the system, so that it meets the requirements in relation to the installation of refrigeration systems at all times.
- The operating instructions and associated instructions, plans and other documentation provided are considered as part of the installation.
- Operating instructions, etc. must be stored, maintained and updated throughout the life of the plant.
- The operating instructions should be stored at the plant.
- If the unit is transferred to another owner or user, the user manual must transferred with the unit.

4 Users

The plant may only be used, serviced and repaired by instructed / trained personnel, who are at least 18 years of age.

4.1 Requirements for users

Users	Description of education level
Assembly or disassembly	Persons who carry out assembly or disassembly must read and understand the operating instructions for this area, as well as the information available at the plant. The person must also be in possession of the necessary professional education for the area in question.
Service / Maintenance	Persons who carry out Service / Maintenance must read and understand the operating instructions for this area, as well as the information available at the plant. The person must also be in possession of the necessary professional education for the area in question.

5 Compliance with

This system complies with the following directives:

- PED

Declarations of Conformity for this system are found in the supplied documentation.

6 Installation

6.1 Description of the system

P&I diagrams of CPW15 with pos. no.

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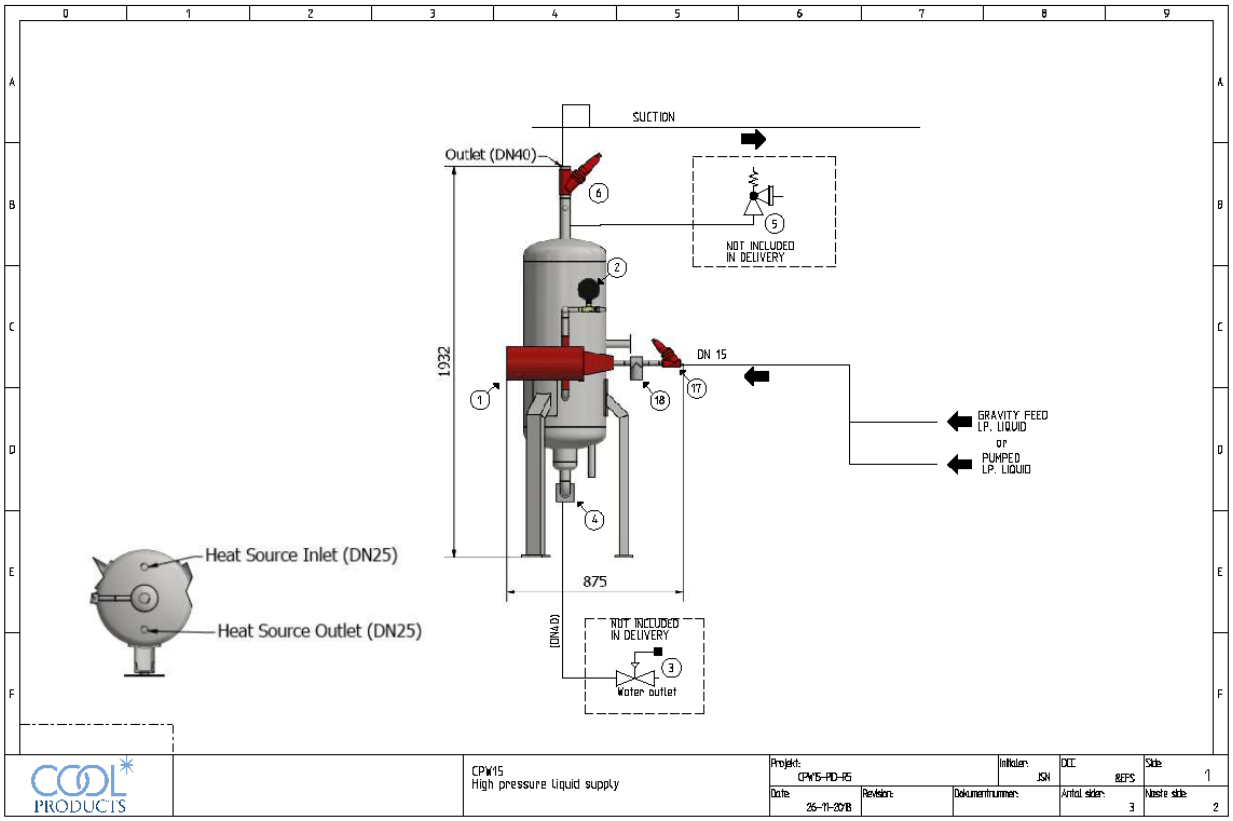

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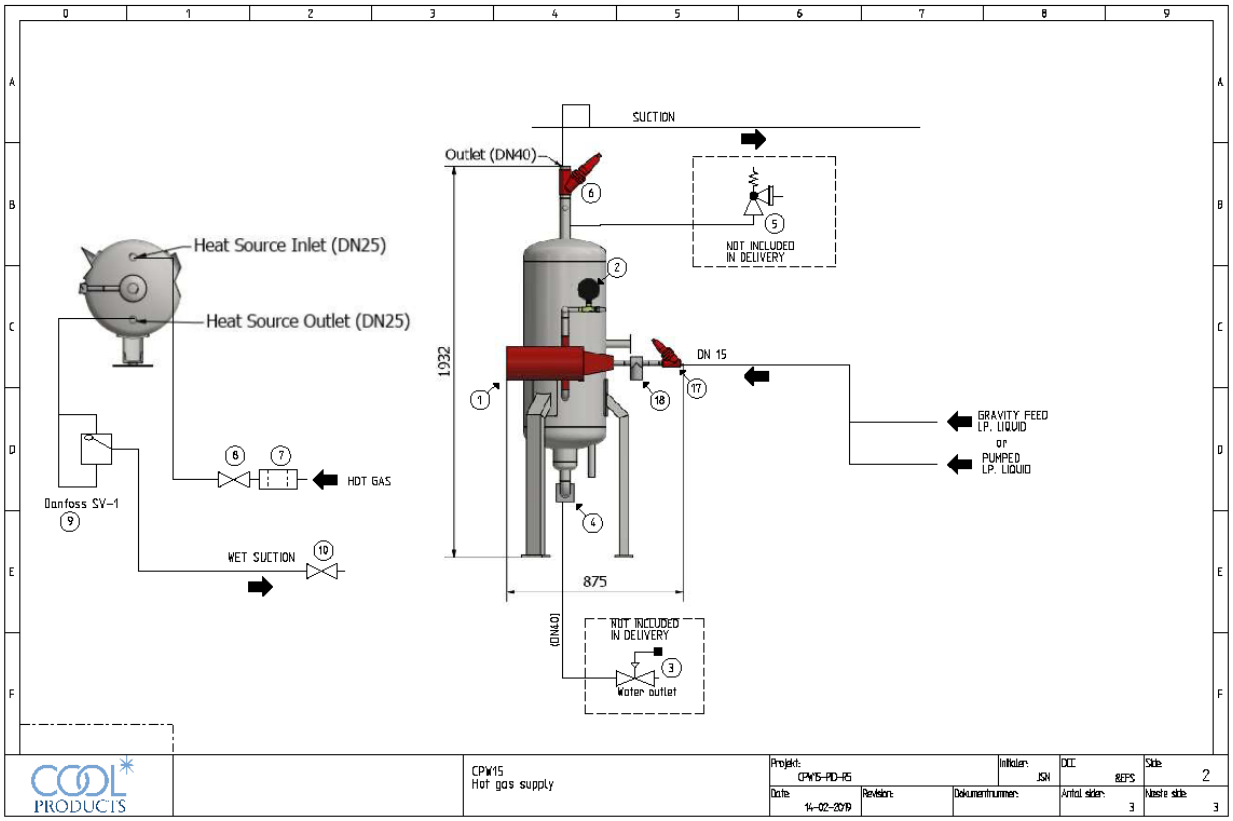

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Pos. No. explanation:

1) Float valve
2) Pressure gauge
3) Quick closing drain valve Note: not included in delivery
4) Water drain valve (ball valve)
5) Safety valve Note: not included in delivery
6) Suction stop / service valve
7) Filter in hot gas heat supply line. Note: not included in delivery and only to be used when heat supply to the coil is done with hot gas.
8) Stop / service valve in hot gas heat supply line. Note: not included in delivery and only to be used when heat supply to the coil is done with hot gas.
9) High-pressure float valve (Danfoss SV1 or similar). Note: not included in delivery and only to be used when heat supply to the coil is done with hot gas.
10) Stop / service valve in liquid drain line to “wet” suction line. Note: not included in delivery and only to be used when heat supply to the coil is done with hot gas.

17) Stop /service valve in LP liquid supply line.

18) Filter in LP liquid supply line

6.2 Assembly and installation

Installation environment

The area where the equipment is installed must be chosen or arranged so the parts of the plant are not unnecessarily exposed to mechanical impacts from the surrounding area, which can cause damage to the equipment, especially the electrical parts of the system.

Ambient temperature

To ensure compliance with the equipment's temperature (TS), the ambient temperature range interval (indicated on the name plate) must not be exceeded. Therefore, when installing the system, it is necessary to consider any external heat sources that could affect the ambient temperature in the area, where the equipment is installed.

Assembly and disassembly

The equipment must be assembled as indicated in drawings provided by Cool Products (see the supplied drawings). This also applies when replacing spare parts. It is not permitted to use spare parts that are not approved / directed by Cool Products, as this may affect the safety of the system.

6.2.1 Mounting

The foundations and anchoring points to which the system is attached must be able to withstand

the physical conditions to which the plant can be exposed, including;

- The weight of the installations
- Impacts / loads during use
- Vibrations
- Heat dissipation Conditions

7 Commissioning

7.1 Before commissioning

Before commissioning, make sure that the following are correctly performed:

- Leak test

8 Operation of the system

Water purger:

The water purger will in a very controlled way evaporate liquid ammonia and hold back the water dissolved in the ammonia liquid in the water purger.

When the water purgers water reservoir temperature is approx. 10 to 15 °C or more higher than the evaporation temperature the water purger should be drained for water after a pump down.

Normal operation:

The stop valve (pos. 6) in the suction line is open.

The stop valve (pos.17) in the liquid supply line to the float valve is open.

Drain valves (quick closing drain valve (pos. 3) and stop valve (pos. 4)) are closed.

Hot liquid supply or hot gas or hot brine through the coil is open. (This must always be open, both at normal running conditions and during pump down and drainage)

In normal operation the build in regulation device will automatically take care of the regulation and continually optimization of the unit under all running conditions.

The regulation device secures the capacity is always correct for separation of water droplets, droplets of water and ammonia mixtures, and pure ammonia droplets.

Water oil and sludge will accumulate in the System Cleaner.

Please note:

The liquid level in the vessel will vary during normal operation because of the build in regulation

device. During these normal variations the liquid level will rise to a level over the float valve as the build in regulation will force liquid from inside the regulator out in the outer vessel, which can be seen as a liquid level over the float valve. This does not mean the float valve is leaking, but is part of the normal operation of the water purger.

Draining the water purger:

First an ammonia pump down is done. Close the LP liquid supply line to the water purger using stop valve (pos. 17) and let the water purger run for approx. 6 hours.

Before the next steps are carried out, it must be secured there is no access to the area for people without protective gear against ammonia gas like protective glasses, gasmask and gloves.

When the water purgers water reservoir in the bottom is close to or equal to ambient temperature the service stop drain valve (pos. 4) and the quick closing drain valve (pos. 3) can be carefully opened and water with a small content of ammonia liquid can be drained off. Note: There might be a strong smell of ammonia from the water / ammonia mixture drained out. If there is a risk of ammonia alarms going off it is advisable to mount a hose and collect the water/ammonia mixture in a safe area. Note: if the evaporating pressure is below atmospheric pressure the suction stop valve to the water purger must be closed before draining off the water.

After draining the water / ammonia mixture off, close the service stop valve and the quick closing drain valve and open the service stop valve for LP liquid. The water purger is back in operation again.

When should the System Cleaner be drained?

When installed on a very contaminated or dirty system the CPW-15 should be drained every second day for a period of time, until the worst part of the water and dirt is drained out.

Later draining every week will be suitable for a couple of months.

When only small amounts of water and dirt is drained out one draining every third months should be suitable.

The need for draining will be different from system to system depending on many factors such as the seize of the system, the running conditions, amount of leaks (air drawn into the system), if service work has been carried out and the purity of the ammonia charged to the system.

Note:

If the ice starts melting of the non-insulated area (the water reservoir) at the bottom of the CPW15 during normal running condition it is an indication there is something in it, which is not pure refrigerant and it should be drained.

Most likely it will contain oil sludge and water mixed with some ammonia.

9 Servicing the CPW15:

The only parts which can be serviced are the filter (pos 18) and the Float valve on the LP liquid line to the CPW-15. The Danfoss SV-4 float valve has a build in filter which can be serviced according to the service guidelines given in the Danfoss instructions for the product.

The water purger can be evacuated for ammonia by closing all connections to it and draining water and ammonia out through the water drain connection.

Repair, service and maintenance must be done in accordance with the instructions of Cool Products and must be carried out by personnel who possess the necessary qualifications in relation to the handling of the equipment.

Particular attention must be paid to the mechanical parts;

- Lifetime of wearing parts
- Damage to mechanical parts
- Corrosion on mechanical parts
- Tightening of bolts, screws

10 Further information

For further information about the system, please contact Cool Products

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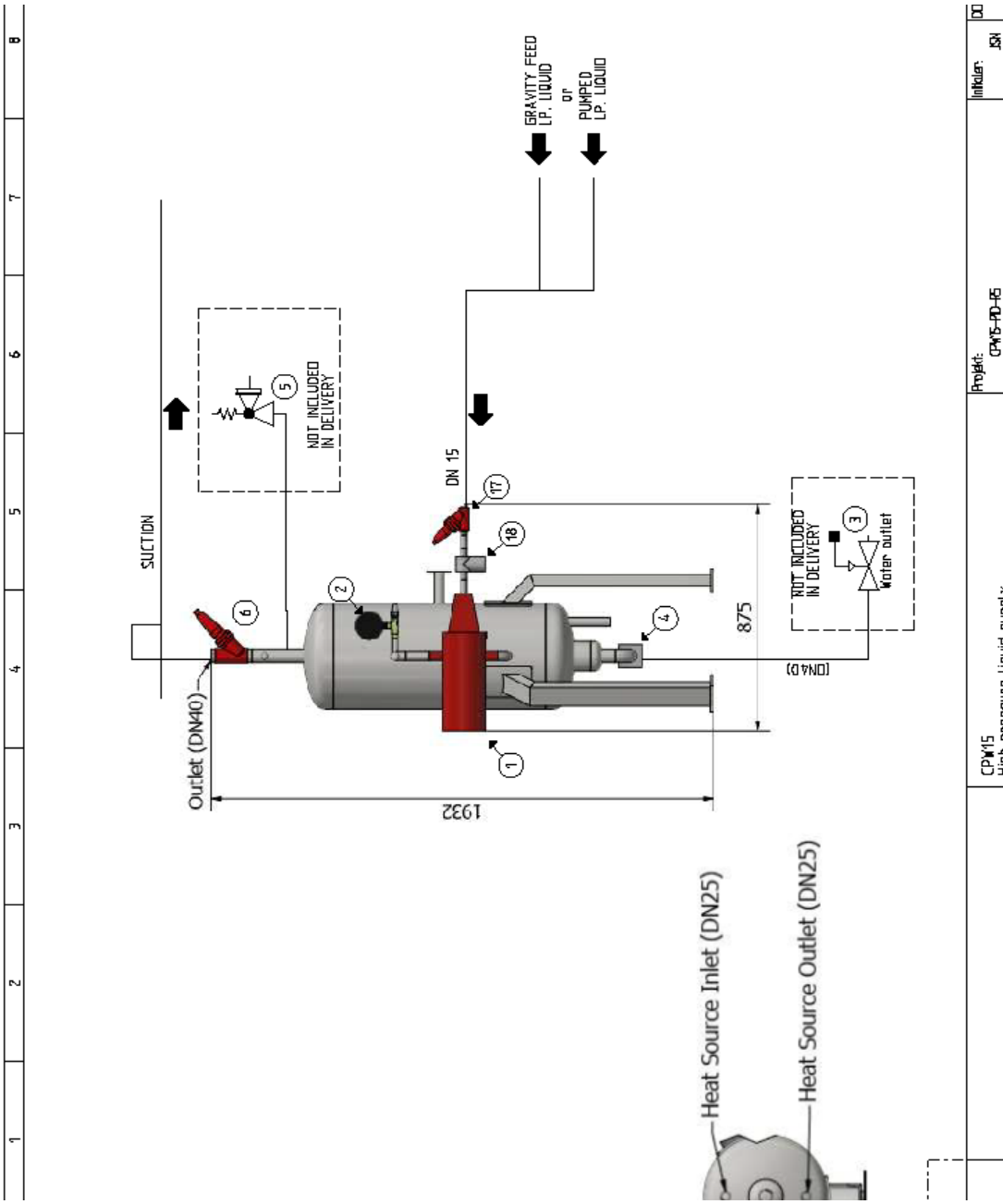
11 PID & drawing



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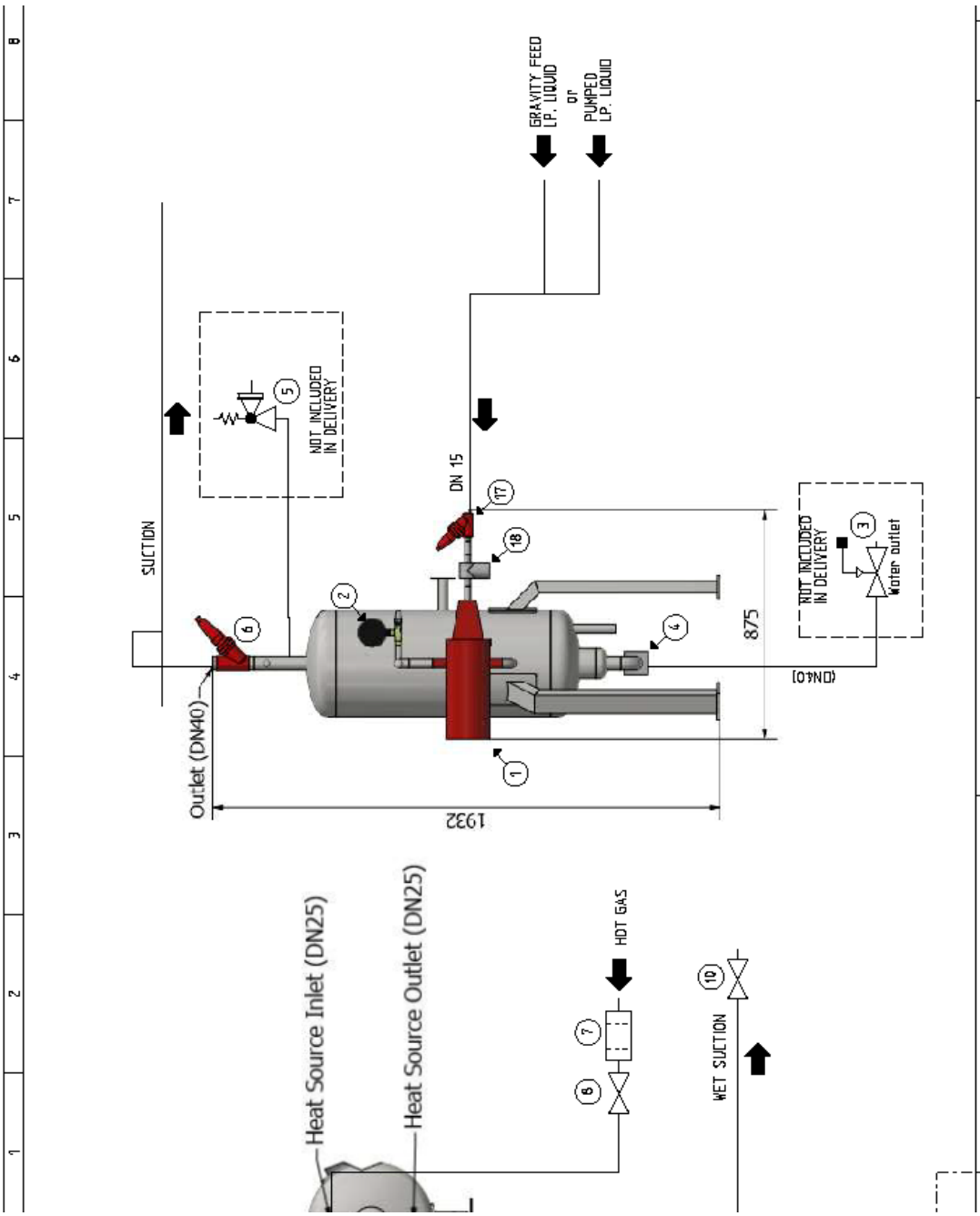

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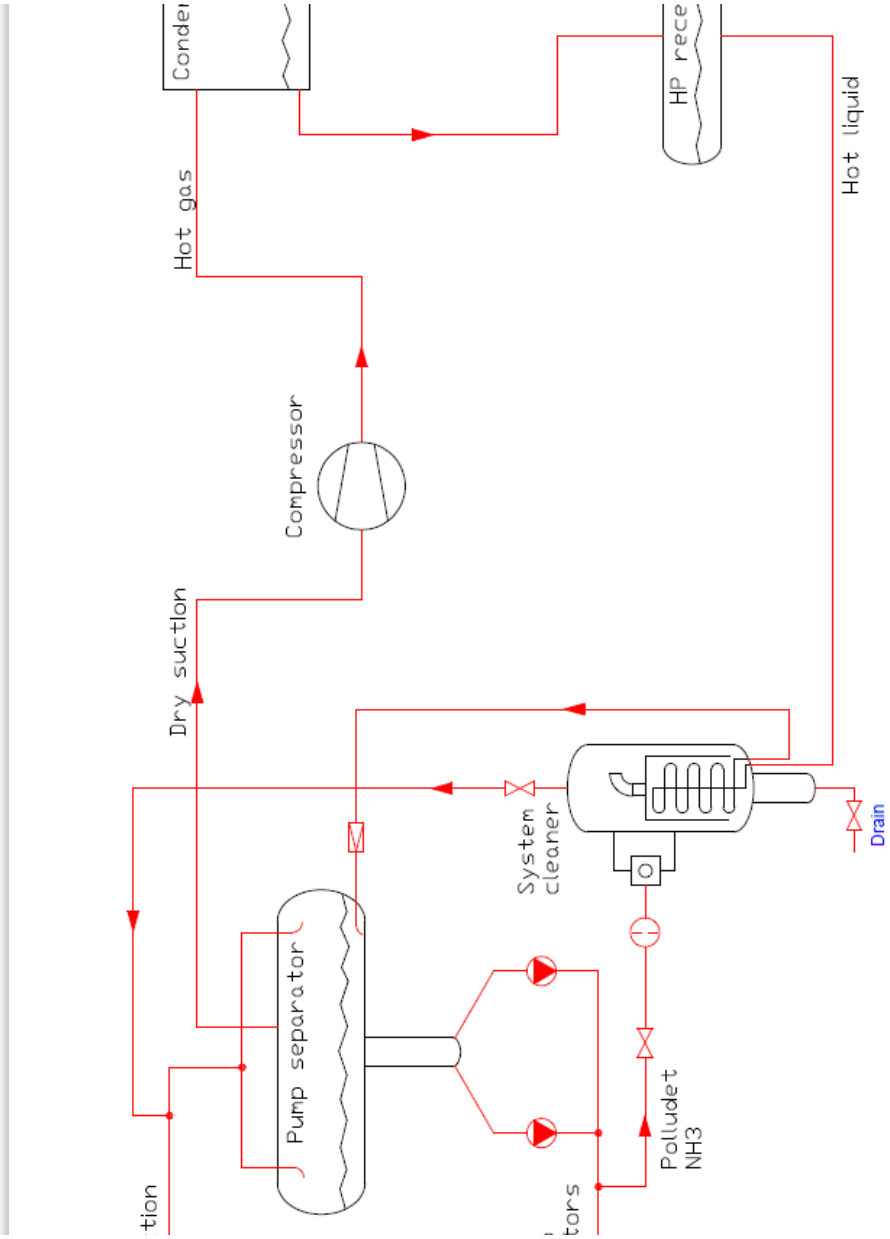

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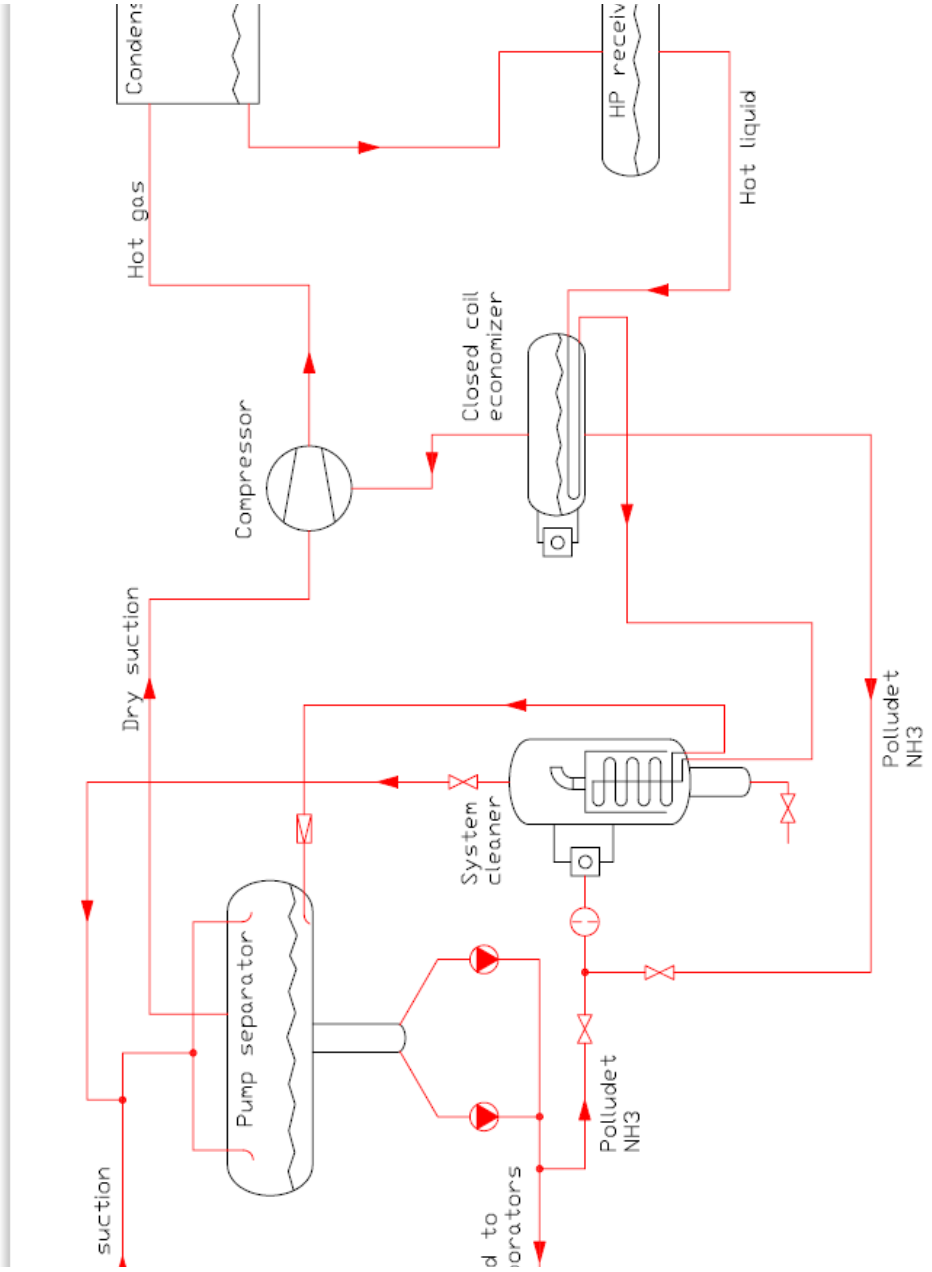

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Standard scope of supply - <u>without accessory</u>

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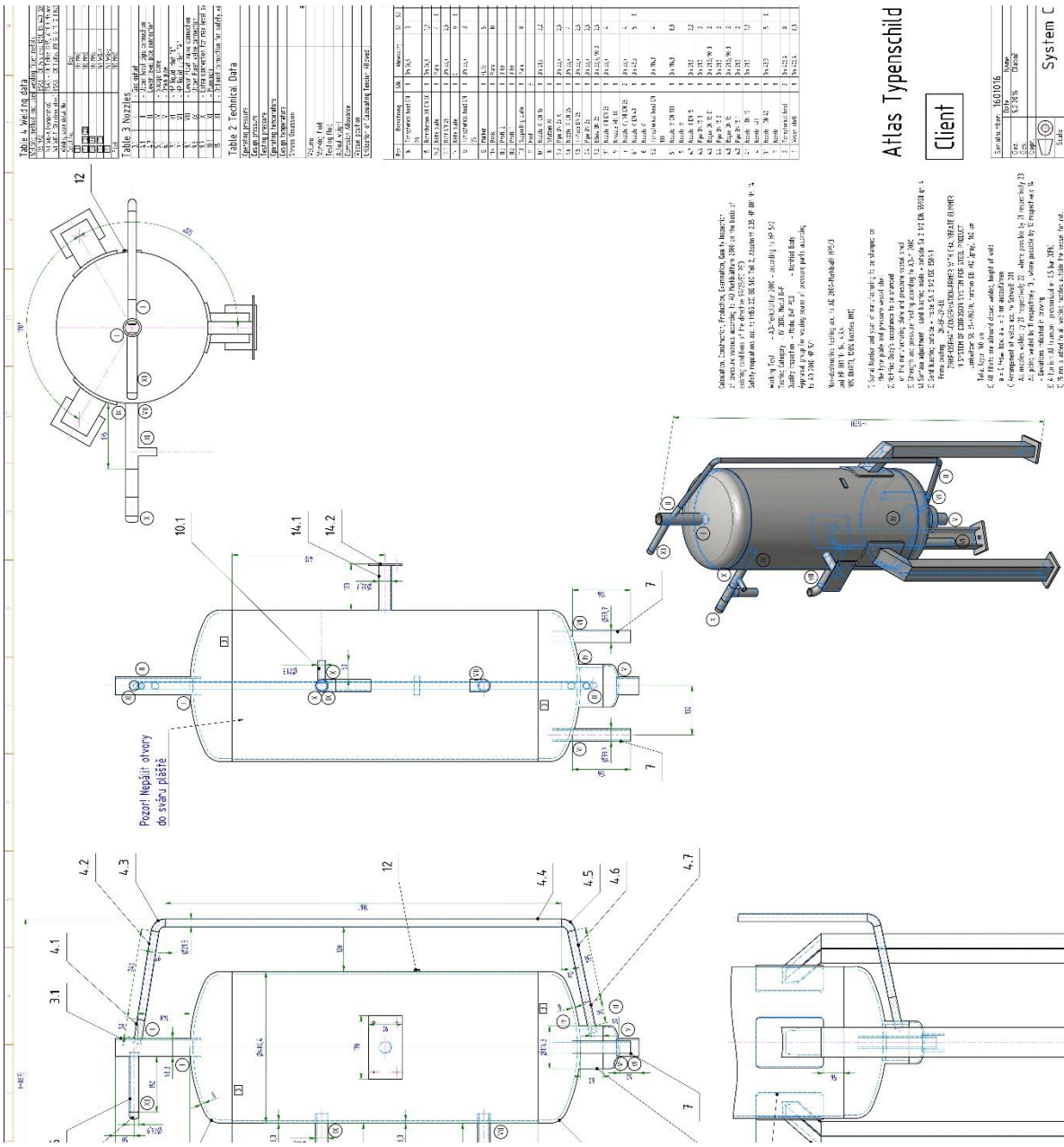

Standard scope of supply – <u>including accessory</u> – high pressure liquid operation

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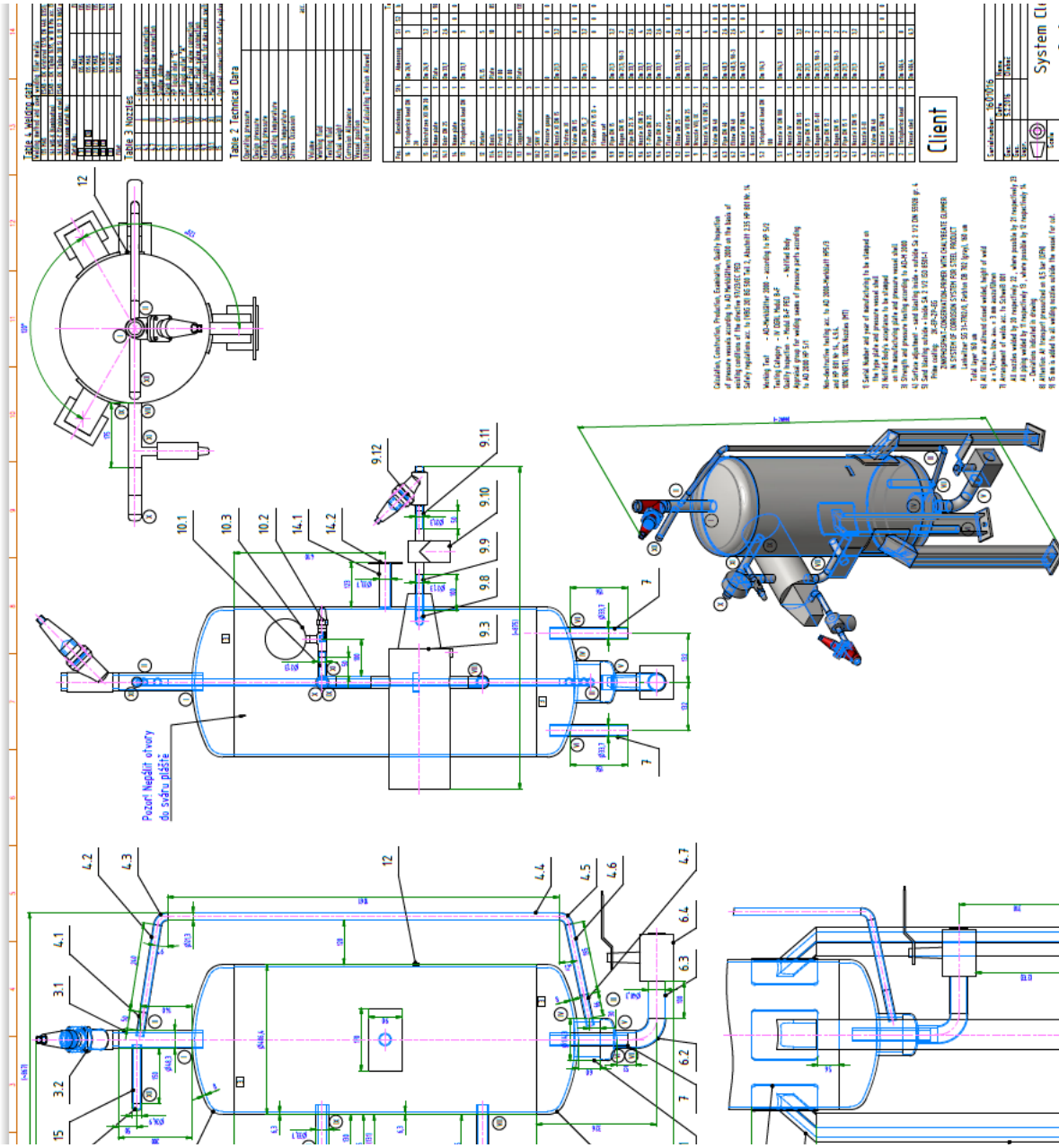

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