Scope of Supply

ME-GI Pump Vaporizer Unit

- Hydraulic driven cold-end pumps – 3 pieces
- Compact vaporizer heated by glycol water
- Cold return line for continued circulation (no suction drum needed)
- Blow-off valve and safety valve
- Electrical cabinet with 3 x MPC
- Hydraulic power supply (optional)
- Sensors for control and supervision
- Pump strainer (standard 160my)
- NG filter after vaporizer (10my)
- Filter for glycol water (200my)
- Fully automated PVU control system including supervision, all operational conditions
- Class approval certificate for PVU (ABS/IMCA submission to class societies)
- Installation and operation manuals via MDT documentation system
- List of capacities etc.

Not included – Yard/LFSS supplier scope:

Main components
- LNG tanks
- Bunkering station
- Low pressure feed pump
- Glycol water system
- Nitrogen supply system
- Master gas valve
- Low pressure vaporizer (if needed)
- Gas compressor (if needed)
- Piping and cabling

Installation
- Installation of PVU, electrical cabinet, HPS unit, glycol water system, MOP screen.
- Piping LNG pipes, HP gas pipes, Glycol water pipes, control air etc.
- Hydraulic hose between PVU and HPS unit incl. heat tracing.
- Electrical cabling e.g. between PVU and electrical cabinet

Approval
- LFSS class approval including PVU
- Overall IACS

Control and safety system
- LFSS safety system with input/output from PVU control system, e.g. NG outlet temperature and pressure
The pump vaporizer unit – dedicated supply system for ME-GI engines

The MAN B&W ME-GI pump vaporizer unit (PVU) is a compact, high quality pump unit for supply of LNG to MAN B&W two-stroke ME-GI engines. The pump unit includes pump, vaporizer, filters and a control system with safety functions and a high degree of integration with the MAN B&W ME-GI engine.

Working principle

The PVU is designed to pressurize and vaporize the LNG to the pressure and temperature required by the MAN B&W two-stroke ME-GI engine.

The PVU receives subcooled LNG supplied by a cryogenic centrifugal pump and the LNG is pressurized by a high pressure reciprocating pump, consisting of three cylinders actuated by linear hydraulic pistons. The pressurized LNG flows through a compact printed circuit heat exchanger, where it is heated by a warm glycol water. Fine particles present in the gas are caught by the high pressure filter, before the gas is directed towards the gas valve train (GVT) and the engine. The gas pressure is controlled by control of hydraulic flow to the pump. The separate control of the three pump heads provide 100% redundancy.

Benefits

Low cost with embedded redundancy

With a compact and intelligent design, the PVU introduces a considerable saving in the complete low flash-point fuel supply system (LFSS). This is because of the simplifications implemented in the design, resulting in a reduced number of sub-systems and components and due to the cryogenic pumps being actuated individually, enabling embedded redundancy. This means that one pump-cylinder can be taken out of service for overhaul, while the remaining two are fully operational, and can supply 100% of the required capacity. In comparison, traditional crankshaft driven pumps require two complete units to allow system redundancy. By choosing hydraulic supply for the PVU from the ME-engine HPS, the installation cost is further reduced significantly.

Engine control integration

The PVU control system is designed based on knowledge of the ME-GI engine and the PVU mechanics. This ensures dedicated control integration between the systems, and high gas supply control accuracy and condition monitoring features. The engine gas pressure and flow demands are quickly transferred to the PVU, resulting in a stable gas pressure control, in which it secures efficient ramp up and ramp down in all operating conditions. Further, the GVT downstream of the PVU is controlled by the ME-GI engine control system, ensuring integrated control with the ME-GI engine. The PVU control system is based on the same hardware platform as the ME engine control system, which means that no extra spares parts are required.

Compact, lightweight design

Compared to conventional systems, the PVU offers a significant reduction in weight and size. This offers a further cost benefit considering installation costs.

Easy maintenance and spare parts

The PVU skid is designed with the operators in mind. This means that all components are easily accessible for easy and effective maintenance. There is also a limitation of required spares parts, seeing that both the control system, pilot valves, and other components, are the same as on the engine, and therefore already a part of the ships spares. The PVU can also be included in MAN’s EMC contracts.