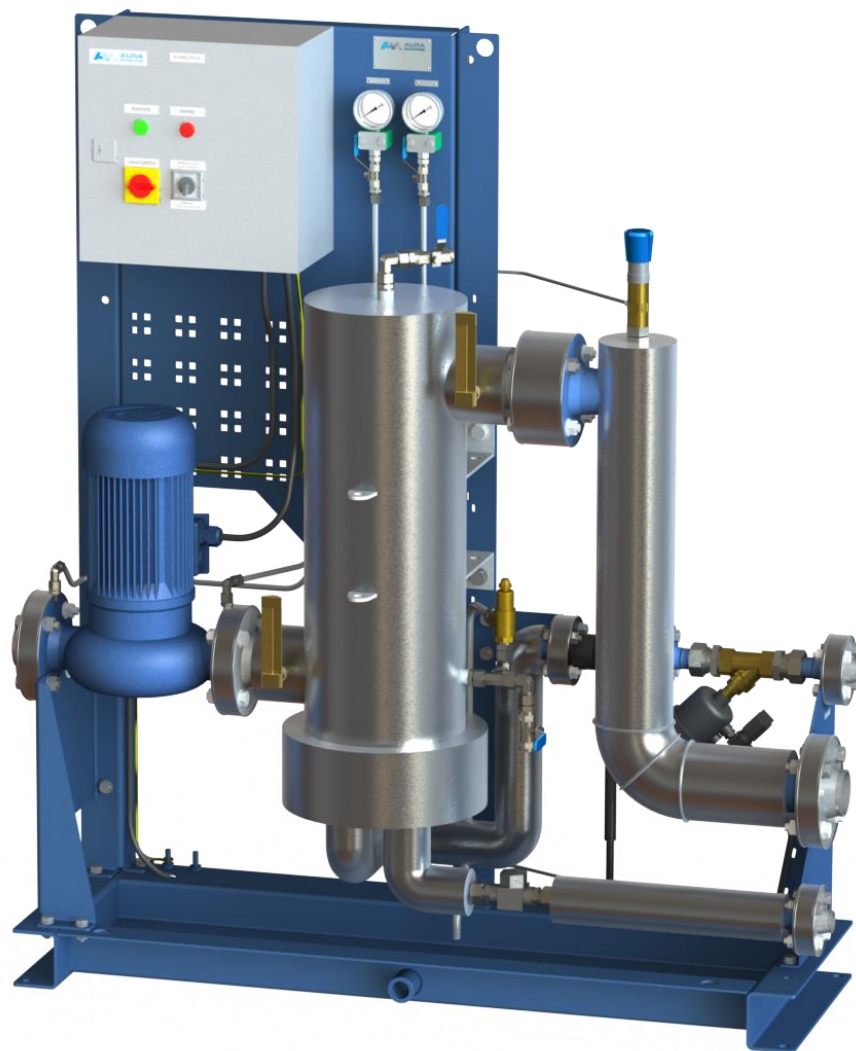


Auramarine Preheating Units (APU)



1 General

1.1 APU operating principle

The APU unit is designed to heat engine HT-water. The heating media of the heater (HM1B) can be steam or thermal oil. The APU unit is equipped with built on HT-water circulation pump (PM1), which provides flow of continuously heated water. The water temperature is kept constant by built-in self-actuating thermostatic controller (V004) located in the unit.

The APU unit can be controlled from a control cabinet mounted on the unit locally or remotely from another location. Additional pressure gauges and thermometer available as an option (Option 1).

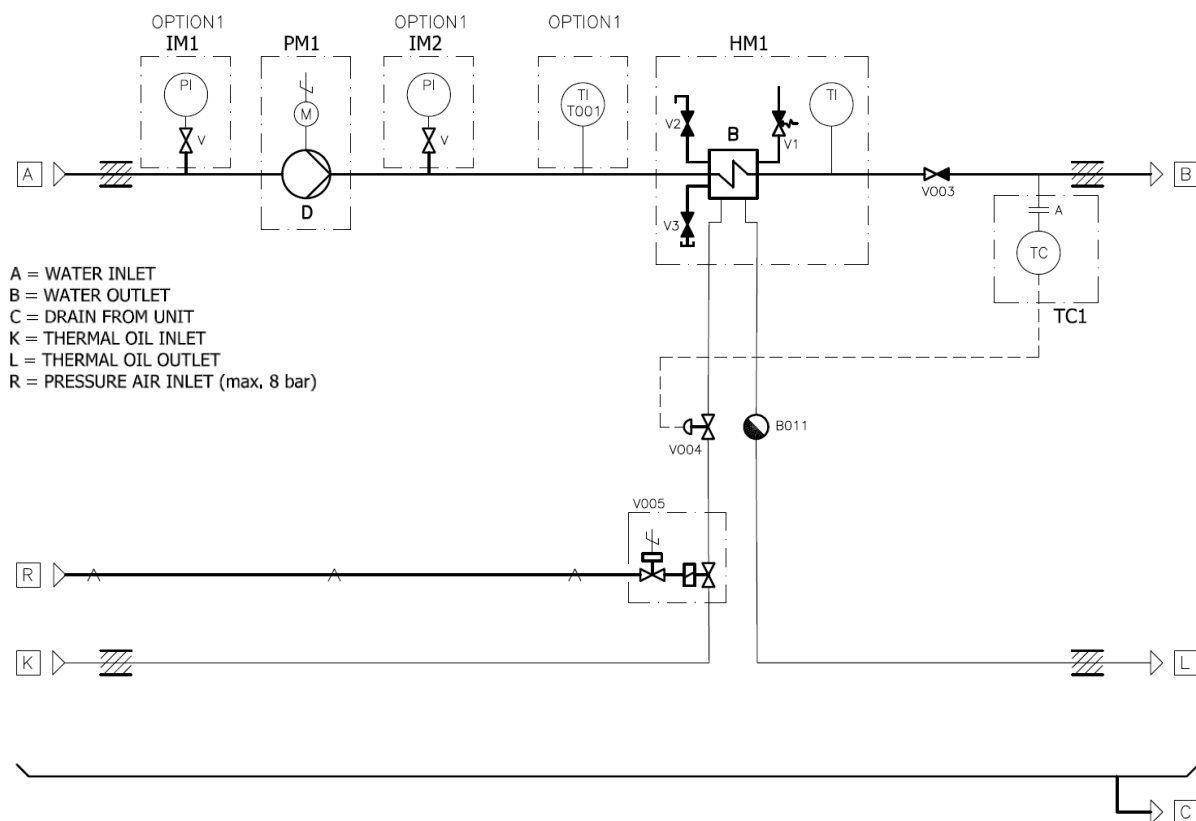


Figure 1. P&ID of the Auramarine Preheating Unit (Steam version).

Description	Pump capacity (m ³ /h, @ 1 bar 400V 50Hz/440V 60Hz)	Heating power max. (kW)	Max. steam consumption/ Thermal oil flow:	Heating media (S=Steam, T=Thermal oil)
APU-M-12-54-S	12	54	91 kg/h	S
APU-M-29-144-S	29	144	254 kg/h	S
APU-M-42-252-S	42	252	443 kg/h	S
APU-M-12-54-T	12	54	5.5 m ³ /h	T
APU-M-29-144-T	29	144	15.1 m ³ /h	T
APU-M-42-252-T	42	252	23.8 m ³ /h	T

Table 1. Available standard APU units.

2 Technical data

Water outlet temperature	80°C (operating temperature set point)
Heating media	Steam (S) / Thermal oil (T)
Input voltage and frequency	400 V 50 Hz , 440 V 60 Hz , 690 V 50/60 Hz
Control voltage	230 VAC, internally transformed
Design pressure max.	10 bar (water, steam and thermal oil side)
Design temperature max.	95°C (water), 180°C (steam) and 200°C (thermal oil)
Pressure head	0.8-1.0 bar
Required compressed air pressure	4-8 bar
Heat transfer capacity max.	54 / 144 / 252 kW
Pump capacity (1 bar, 400V 50 Hz, max)	12 / 29 / 42 m ³ /h

3 Main components

<u>Position</u>	<u>Denomination</u>
PM1	HT-Water preheating pump , for circulating HT-water via preheater at a lower engine load or when the engine is in stand-by mode.
HM1B	HT-water heater , heating media is steam / thermal oil
HM1V1	Safety valve , for heater protection
HM1V2	Vent valve , ball valve
HM1V3	Drain valve , ball valve
HM1TI	Thermometer , liquid pillar type, scale in °C
B011	Steam trap (only for steam versions)
V003	Non-return valve
V004	Temperature control valve -Self actuating thermostatic control valve, setting range :+40-105 °C, set point +80°C
V005	Steam/Thermal oil shut off valve -Valve with electro pneumatic actuator -For closing the steam/thermal oil inlet when pump is stopped
Option 1	
IM1PI, IM2PI	Pressure gauge - Ø 63 mm, glycerine filled scale MPa+kPa/bar/psi
IM1V, IM2V	Hand valve
T001	Thermometer , liquid pillar type, scale in °C

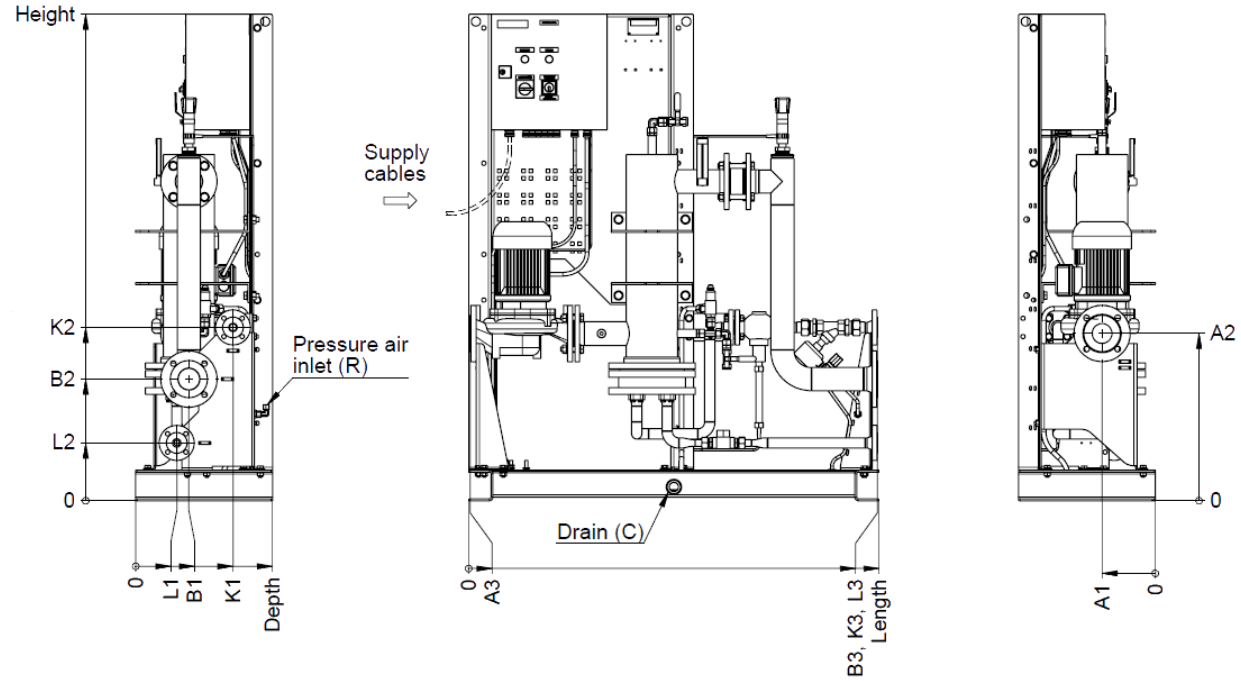
4 Control panel, materials, miscellaneous

Control panel	-Main switch for supply voltage -HT-Water pump starter -On/Off/Remote switch for the pump -Control of steam/thermal oil shut off valve; valve closes when pump is stopped meanwhile the pump stops with short (adjustable) delay -Remote control possibility of the pump and shut off valve -Cable glands for in/out cabling are included
Frame	-Bolted sheet metal construction -1" threaded female connection at frame for draining of leakages
Painting system	-ISO 12944-5; 2007 A2.06 EP120/2-FeSa2½ (frame and pipes)
Pipes	-Seamless carbon steel P235GH, EN10217 or equal -Welding according to ISO 5817 C -Thermal oil/steam pipes and heater insulated with mineral wool covered by galvanized steel sheet
Connecting flanges	-DIN2633 (HT-water inlet) and EN 1092-1 PN16/40, counter flanges, gaskets, bolts and nuts included
Valves	-Globe and ball valves, nominal pressure class min. 16 bar
Name plates	-English, stainless steel, on piping and components

Auramarine Preheating Units

- A WATER INLET DIN 2633
- B WATER OUTLET EN1092-1
- C DRAIN FROM UNIT R1" Female
- K STEAM/THERMAIL OIL INLET EN1092-1
- L STEAM/THERMAIL OIL OUTLET EN1092-1
- R PRESSURE AIR INLET

Unit	Main dimensions			Connections		Unit mass (kg)
	Length	Height	Depth	A/B	K/L	
APU-M-12-54-S	1250	1500	400	DN50	DN20	230
APU-M-29-144-S	1350	1600	450	DN65	DN25	320
APU-M-42-252-S	1450	1700	450	DN80	DN40	380
APU-M-12-54-T	1250	1500	450	DN50	DN25	270
APU-M-29-144-T	1350	1600	450	DN65	DN40	330
APU-M-42-252-T	1450	1700	450	DN80	DN50	400



Unit	A1	A2	A3	B1	B2	B3	K1	K2	K3	L1	L2	L3
APU-M-12-54-S	165	550	65	165	400	1245	270	570	1245	140	190	1245
APU-M-29-144-S	175	550	5	175	400	1345	320	570	1345	135	190	1345
APU-M-42-252-S	175	550	5	175	400	1445	320	570	1443	135	190	1443
APU-M-12-54-T	175	550	65	175	400	1245	320	570	1245	135	190	1245
APU-M-29-144-T	175	550	5	175	400	1345	320	570	1345	135	190	1345
APU-M-42-252-T	175	550	5	175	400	1445	320	570	1443	145	190	1443

