



TURBINE STEAM CONDENSERS



PRODUCT OFFER

The Turbine Steam Condensers – sometimes called as Surface Condensers - are used to condense of turbine outlet steam under vacuum conditions.

The steam condensation heat is absorbed by cooling water flowing into tubes of tube bundle.

The type of condenser depends on electric power output. Up to 100 MW the round shell condenser are used where for bigger electric power output the rectangular (box type) condensers are applied.

The biggest condenser manufactured by FAMET was intended for 1075MW steam turbine.

The steam is flowing from turbine via neck welded to steam turbine and transition piece to the tube bundle which is main component of condenser. Usually condenser has modular design i.e. few tube bundles are built in.

The tube bundle is equipped with air cooler to continuously vent of air and inert gases. The first rows of external tubes opposite to inlet of steam have increased thickness to prevent the tubes against steam shock damages. For smaller condensers the impingement rods can be used. In the transition piece of big steam condensers the LP heaters and extraction pipes are built in. The steam is condensing on external surface of tubes. The condensate is collected in lower part of condenser called hotwell, where the level of condensate is controlled.

The condenser is supported on spring supports or directly fixed to concrete fundament. In this case expansion joint between neck and turbine is inserted.

The cooling water used as coolant is taken from the water cooling tower system or directly from sea, lake or river, depending on local conditions.

Depending on quality of cooling water and Client requirements different materials of tubes and tubesheets can be adopt: stainless steel, duplex/superduplex, titanium or brass for tubes and respectively carbon steel clad with stainless steel, duplex or titanium or brass for tubesheets.

Shell of condensers are made usually from carbon steel.

The water chambers can be made from carbon steel and protected by epoxy or rubber lining. To avoid corrosion in case of potential damages of lining, the sacrificial anodes are mounted inside chamber.

The tubes are expanded into tubesheet. To have longer life time of T/TS connection, the seal welding or special protection lining is used.

The water chambers are equipped with maintenance manholes to revision of tubeside inside surface.

The condensers are designed by FAMET according to HEI or VGB standards and detailed mechanical requirements. Whenever tube bundle configuration for box condenser has to be agreed with Client in detail. There is also possible to fabricate condenser according to Client documentation.

The reference list of turbine steam condensers fabricated by FAMET are to be found on www.famet.com.pl



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EXEMPLARY DELIVERIES

TURBINE STEAM CONDENSERS

Plant Customer	Year	Quantity [pcs]	Weight PC. [tons]	Number of Tubes [pc]	Tubes ODxTHK [mm]	Base Material		Tubes/Tubesheets connection	
						Tubes	Tubesheets	Expanding	Welding
Mitsubishi Hitachi Power Systems/ Ptolemais 660 MW Greece	2017	1	546	21 916	28,58 x 0,5/0,7	stainless steel	stainless steel	+	+
Mitsubishi Hitachi Power Systems/ Turów 450 MW Poland	2016	1	535	15 264	34,93 x 0,5/0,7	titanium	carbon steel, titanium clad	+	+
Balcke Dürr GmbH Power Plant Opole, POLAND	2016	2	1 065	41 766	18x0,5	X2CrNi-MoN17-13-5 (1.4439)	P355NH (1.0565)/ clad X2CrNiMo 18-15-4 (1.4438)	+	-
Siemens AG, Amager DENMARK	2015	1	86	2686	23x0,7	stainless steel	carbon steel	+	-
Siemens AG, Tiger Guauqxi CHINA	2015	1	71	5005	22,22 x 0,5	stainless steel	carbon steel	+	-
HITACHI KOZIENICE, POLAND	2015	1	1 030	31 220 1 996	31,75 x 0,5 31,75 x 0,7	Titane Gr2	CS clad Ti Gr1	+	+
PKN ORLEN PŁOCK POLAND	2012	2	25,6 31,6	2080 2628	19,05 x 1,25 19,05 x 1,25	Cooper Nickel 90/10 Aluminium Brass	CS clad naval brass	+	-
SIEMENS AG NANTONG, CHINA	2012	1	55	4287	22,2 x 0,5	stainless steel	carbon steel	+	-
SIEMENS AG RIGA, LATVIA	2011	3	110 102 103	4523 4210 4931	25,4x 0,7 25,4x0,7 25,4 x0,5	stainless steel stainless steel stainless steel	carbon steel carbon steel stainless steel	+	- + +
Siemens AG Hannover Linden Power Plant GERMANY	2011	1	67	5874	16x0,7	stainless steel	12CrMo9-10	+	-
Siemens AG Power Plant SAICA SPAIN	2011	1	68	6528	19,05 x 0,5	titanium	carbon steel	+	-
Siemens AG Solar Power Plant SPAIN	2009	1	30	2890	23x0,5	stainless steel	carbon steel	+	-
ALSTOM POWER Power Plant ŁAGISZA POLAND	2007	1	327	31.922	24x0,7	stainless steel	stainless steel	+	-
Power Plant CA MAU 2 SIEMENS VIETNAM	2006	1	378	7.830	19x0,5	titanium	carbon steel, titanium clad	-	+
HERDECKE SIEMENS	2006	1	360	22.400	22,2x0,5	stainless steel	carbon steel, stainless steel clad	+	+
HAMM UENTROP SIEMENS	2006	1	260	15.000	21x0,5	stainless steel	carbon steel, stainless steel clad	+	+
SUMGAIT SIEMENS	2006	1	155	10.020	25,4x0,5	titanium	carbon steel, titanium clad	+	+
SAGUNTO SIEMENS	2005	1	245	15.000	21x0,5	titanium	carbon steel, titanium clad	+	+
TERMOLI SIEMENS	2004	1	360	16.170	28,4x0,5	stainless steel	carbon steel, stainless steel clad	+	+
KOELN-NIEHL II SIEMENS	2003	1	295	15.065	24x0,5	stainless steel	carbon steel	+	-
ALSTOM POWER Turów POLAND	2003	1	242	15.600	24x0,7	stainless steel	carbon steel, stainless steel clad	+	-