

Application and Setting Pressure of Relief Valves for Ship Machinery

1. Scope

This Japanese Industrial Standard specifies the location, where the principal relief valves (exclusive of boiler safety valves) are to be fitted to marine main engines, auxiliary machinery for propelling machinery and their pipe lines, and set pressure of the valves.

Remark: In this standard units and numerical values in [] are in accordance with the conventional system of units, and given for reference only.

2. Location of Valves and Set Pressure

The location of valves and set pressures shall, as a rule, be as given in Table.

Table

Plant	Name of machinery	Location of valve	Set pressure	Remarks
Main engine	Steam turbine	HP casing No.1 stage casing or exhaust casing	120% of max. pressure	Not exceed max. pressure + 0.1 MPa [1 kgf/cm ²], when max. pressure is below 0.5 MPa [5 kgf/cm ²]
		IP steam chest or exhaust casing	120% of max. pressure	
		LP steam chest or exhaust casing	120% of max. pressure	0.15 MPa [1.5 kgf/cm ²] min. for steam chest 0.02 MPa [0.2 kgf/cm ²] min. for exhaust casing
	Diesel engine	Cylinder head	Not exceed 140% or less of max. pressure	Max. relief pressure shall not exceeding 140% of max. pressure. But may be omitted for the engine having cylinders 230mm or less in bore.
		Crank case	0.01 MPa [0.1 kgf/cm ²] or less	For diesel engines with a cylinder bore 200 mm or more, or with the crank case in a volume 0.6 m ³ or more.
Auxiliary machinery and others	Steam turbine for generator	For multi-stage turbine, No. 1 stage casing or exhaust casing.	120% of max. pressure	For exhaust casing of condensing turbine 0.02 MPa [0.2 kgf/cm ²] min. For back pressure turbine 0.15 MPa [1.5 kgf/cm ²] min.
		For single stage turbine exhaust casing.	120% of max. pressure	0.15 MPa [1.5 kgf/cm ²] min.
	Steam turbine for general use	For multi-stage turbine, No. 1 stage casing or exhaust casing.	120% of max. pressure	For exhaust casing of condensing turbine 0.02 MPa [0.2 kgf/cm ²] min. For back pressure turbine 0.15 MPa [1.5 kgf/cm ²] min.
		For single stage turbine exhaust casing.	150% of max. pressure	0.15 MPa [1.5 kgf/cm ²] min.
	Diesel engine	Cylinder head	140% or less of max. pressure	Max. relief pressure shall not exceed 140% of max. pressure. But may be omitted for the engine having the cylinders 230 mm or less in bore.
		Crank case	0.02 MPa [0.2 kgf/cm ²] or less	For diesel engines with a cylinder bore 200 mm or more, or with the crank case in a volume 0.6 m ³ or more.

Plant	Name of machinery	Location of valve	Set pressure	Remarks
Auxiliary machinery and others	Air compressor	Cylinder head or delivery port	—	Max. relief pressure not exceed 110% of design pressure.
	Air reservoir	Valve top or shell	110% of design pressure	May be omitted when the fusible plugs (melting point abt. 150°C) are provided.
	Auxiliary condenser (atmospheric type)	Shell	0.05 MPa [0.5 kgf/cm ²]	Escape valve may be omitted when the air relief valve is fitted.
	Feed heater (Deaerated feed heater included)	Steam side	120% of design pressure	Steam pressure, 0.5 MPa [5 kgf/cm ²]
			150% of design pressure	Steam pressure, below 0.5 MPa [5 kgf/cm ²] and 0.1 MPa [1 kgf/cm ²] or more
			Design pressure +0.05 MPa [0.5 kgf/cm ²]	Steam pressure, below 0.1 MPa [1 kgf/cm ²]
	Oil heater (Fuel oil and lub. oil)	Water side	110% ~ 150% of design pressure	—
		Oil side	Design pressure +0.29 MPa [3.0 kgf/cm ²] or 120% of design pressure, higher one of them	—
	Fresh water heater	Water side	Design pressure +0.05 MPa [0.5 kgf/cm ²]	—
	Fresh water and sea water hydrophore tank	Tank shell	Design pressure +0.05 MPa [0.5 kgf/cm ²]	—
	Fresh water generator	Steam chest of evaporator	Design pressure +0.1 MPa [1 kgf/cm ²]	—
		Steam side of distiller		
	Reducing valve (steam, air and gas)	Outlet	110% of design pressure	—
	Pipe line	Pipe	Design pressure +0.05 MPa [0.5 kgf/cm ²]	To be provided where the pressure may be exceed the design pressure.
	Exhaust receiver or exhaust manifold	Shell or manifold	150% of design pressure	To be applied to exhaust of steam pipe line.
	Reciprocating pump	Pump outlet	110% of design pressure	Not exceed 150% of design pressure.
	Gear pump	Pump outlet	110% of design pressure	Not exceed 132% of design pressure.
	Screw pump	Pump outlet	110% of design pressure	Not exceed 132% of design pressure.

- Remarks:
- 1 Design pressure in the table means the pressure intended at the planning stage.
 - 2 Maximum pressure in the table means the designed pressure at the maximum continuous output for steam engines, and the designed maximum explosion pressure in cylinder for diesel engines.
 - 3 This standard does not cover the relief valves to be fitted on a special machinery (such as hydraulic steering gears).
 - 4 When number of steam chests or exhaust casings of steam turbines differ from those given in this table, it may be reasonably derived from this standard on individual case.
 - 5 Set pressure given in the table is computed on the bases of the gauge pressure and represents the pressure at which the valve begins to open.
 - 6 The construction, blow-off capacity, characteristics, of relief valves shall be the subject of designed consideration to suit the individual requirements based on this standard.