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JAPANESE INDUSTRIAL STANDARD

Glossary of terms for turbopumps

JIS B 0131-1983

(Reaffirmed: 1989)

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Translated

by

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JAPANESE INDUSTRIAL STANDARD

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Glossary of Terms for Turbopumps

B 0131-1983
(Reaffirmed: 1989)1. Scope

This Japanese Industrial Standard specifies the main terms generally used for turbopumps, their parts and the hydraulic terms relating thereto (hereafter referred to as "terms") and their definitions.

2. Classification

The terms shall be classified as follows:

- | | |
|------------------------------|--------------------------------------|
| (1) Types | (5) Portions |
| (2) Performances and designs | (6) Accessories |
| (3) Operation and tests | (7) Relating to machine placing site |
| (4) Parts | (8) Hydraulic powers |

3. Terms, readings and definitions

Terms, readings and definitions shall be as follows:

Further, for informative reference, the idioms, English equivalent, quantity symbols and unit symbols are shown.

- Remarks
1. In the case where a part of term is shown in (), the term including the letters in () and the term omitted with the letters in () of such two terms exist.
 2. In the case where two or more terms are listed in the same column, these shall be used preferably in this order.
 3. In the definition column, the calculation formula and unit symbol indicated in { } are in accordance with the gravitational system of units.
 4. In the informative reference column, the unit symbol shown in { } are in accordance with the gravitational system of units.

(1) Types

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol

(1.1) Main classification

101	ターボポンプ	TĀBOPONPU	The machine to give energy to liquid by rotating the impeller in the casing. It is the generic name of centrifugal pump, mixed flow pump, axial flow pump. etc. Remarks: The liquid to give energy according to pump is called lifting liquid.		turbopump, rotodynamic pump		
102	遠心ポンプ	ENSIN PONPU	The pump in which the discharged liquid flows from impellers are mainly in the vertical surface to pump shaft (Refer to Attached Figs. 1 to 15 and Attached Fig. 27).		centrifugal pump, radial flow pump		
103	渦巻ポンプ	UZUMAKI PONPU	The centrifugal pump having a direct volute type casing at the discharge side of the impeller (Refer to Attached Figs. 1 to 7, Attached Fig. 10, Attached Figs. 12 to 15 and Attached Fig. 27). That having double volute type casing is called double volute pump.		volute pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
104	ディフューザポン プ	DIFYŪZA PONPU	The centrifugal pump having the diffuser of guide vane type at the discharge side of impeller. Remarks: Even if it has volute at its outside, it is called as this (Refer to Attached Figs. 8, 9, 11, 23, 24 and 26).		diffuser pump		
105	斜 流 ポ ン プ	SYARYUUPONPU	The pump in which the discharged liquid flows from impeller are in a conical surface having the central line of pump shaft as the axis. Generally, it has the diffuser of guide vane type at the discharge side of impeller (Refer to Attached Figs. 16, 17, 20 and 21).		mixed flow pump		
106	渦 巻 斜 流 ポ ン プ	UZUMAKI SYARYUU PONPU	The mixed flow pump having direct volute casing at the discharge side of the impeller (Refer to Attached Fig. 22).		volute type mixed flow pump		
107	軸 流 ポ ン プ	ZIKURYUU PONPU	The pump in which the liquid flow discharged from impeller is in the cylinder surface of the same center as that of pump shaft (Refer to Attached Figs. 18, 19, and 25).		axial flow pump		

(1.2) Designations indicating the general types(a) Designation according to direction of pump shaft

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
108	横 軸 (形)	YOKOZIKU (GATA)	The type of which pump shaft is arranged horizontally (Refer to Attached Figs. 1 to 13, and 16 to 19).		horizontal (shaft type)		
109	立 軸 (形)	TATEZIKU (GATA)	The type which the pump shaft is arranged vertically (Refer to Attached Figs. 14, 15, and 20 to 27).		vertical (shaft type)		
110	斜 軸 (形)	SYAZIKU (GATA)	The type which the pump shaft is arranged at a certain inclined angle to the horizontal surface.		inclined (shaft type)		

(b) Designation according to split of casing

111	軸垂直割り形	ZIKUSUITYOKU-WARI GATA	The structure to split the casing with a plane vertical to pump shaft (Refer to Attached Figs. 1, 2, and 5 to 9).		radially split type		
112	輪 切 形	WAGIRI GATA	The structure of multi-stage pump of radially split type to be split in one stage each (Refer to Attached Figs. 6 to 9).		sectional type		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
113	サイドカバー形	SAIDOKABĀ GATA	The structure of single stage pump of radially split type in which the one side surface of casing is made the cover (Refer to Attached Figs. 1, 2, 5, 14 and 15).		side cover type		
114	両カバー形	RYO KABĀ GATA	The structure of single stage pump of radially split type in which both side surfaces of casing are made the cover (Refer to Attached Fig. 13).				
115	中央割り形	TYUOUWARI GATA	The structure of radially split type in which the casing is split at the volute middle section surface.				
116	軸平行割り形	ZIKU HEIKOU WARIGATA	The structure of casing split by axial plane (Refer to Attached Figs. 4 and 10).		axially split type		
117	水平割り形	SUIHEI WARIGATA	The axially split type of which the split surface is horizontal (Refer to Attached Figs. 4 and 10).		horizontally split type		
118	鉛直割り形	ENTYOKU WARIGATA	The axially split type of which the split surface is vertical.		vertically split type		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
119	斜め割り形	NANAME WARIGATA	The axially split type of which the split surface is inclined at a certain angle to the horizontal plane.		diagonally split type		

(c) Designation according to number of stages of impeller

120	単 段 (形)	TANDAN (GATA)	Such structure that the liquid entering into the pump passes through the impeller only once (Refer to Attached Figs. 1, 2, 4, 5, 13 to 18 and 20 to 22).		single stage		
121	多 段 (形)	TADAN (GATA)	Such structure that the liquid entered in the pump passes through the impeller in series twice or more. According to the number of times it passes through impeller, it is called two stages, three stages,.... (Refer to Attached Figs. 6 to 12, 23, 24 and 26).		multi-stage		

(d) Designation according to attaching method of vanes

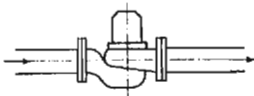
122	可 動 羽 根	KADOU BANE	Such structure that the vanes of the impeller are movable.		adjustable vane, movable vane		
123	固 定 羽 根	KOTEI BANE	Such structure that the vanes of the impeller are fixed.		fixed vane		

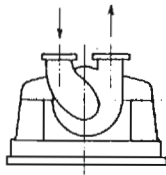
(e) Designation according to suction type

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
124	片吸込(形)	KATASUIKOMI (GATA)	The centrifugal pump having a suction opening of impeller at only a single side (Refer to Attached Figs. 1, 2 and 13 to 15).		single suction		
125	両吸込(形)	RYOUSUIKOMI (GATA)	The centrifugal pump having suction opening of impeller at both sides (Refer to Attached Figs. 4 and 5).		double suction		

(1.3) Designation indicating special type

(a) Designation to indicate installing and supporting system of pump

126	インライン形	INRAIN GATA	The structure capable of attaching simply to a part of a pipe line (Fig. 1). Fig. 1. Inline type 		inline type		
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No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
127	中心支持形	TYUUSIN SIZIGATA	The horizontal pump for high temperatures of such structure that in order to prevent error of axial center due to thermal expansion to driving part, the horizontal plane including the axial center or that near there is made the pump leg under surface (Fig. 2). Fig. 2. Centerline support type 		centerline support type		
128	一床式	ISSYOU SIKI	The vertical pump of such structure that the driving part is attached directly at the upper part of the casing of pump [Refer to Attached Fig. 30(a)].		single-floor type		
129	二床式	NISYOUSIKI	The vertical pump of such structure that the pump and driving part are installed on separate upper and lower floors [Refer to Attached Fig. 30 (b)].		double-floor type		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
130	可 搬 式	KAHAN SIKI	Such structure that the pump and the prime mover are not set and capable of being used by transporting to the desired place.		portable type		

(b) Designation to indicate the driving system of pump

131	直 結 式	TYOKKETUSIKI	The system to couple the prime mover and pump with a shaft coupling.		direct coupled type		
132	歯 車 駆 動 式	HAGURUMA KUDOUSIKI	The system to drive by setting the gear between the prime mover and the pump.	HAGURU- MA- GAKE	gear driven type		
133	ベルト駆動式	BERUTO KUDOUSIKI	The system to drive by setting a belt apparatus between the prime mover and the pump.	BERUTO- GAKE	belt driven type		
134	(原動機)直動式	(GENDOUKI) TYOKUDOUSIKI	Such system that the prime mover and the pump have a common single shaft (Refer to Attached Fig. 27).		close coupled type		

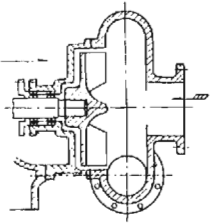
(c) Designation to indicate special structure of pump

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
135	槽 内 形	SOUNAI GATA	The vertical pump of such structure that the pump body is set by suspending in suction-sump liquid (Refer to Attached Figs. 14, 20, 21, 23, 25 and 30).		wet pit type		
136	槽 外 形	SOUGAI GATA	Such vertical pump that the pump body is set at the dry pit of outside of suction sump, and the pump suction opening and the sump are coupled by a pipe line (Refer to Attached Fig. 15).		dry pit type		
137	バ レ ル 形	BARERU GATA	Such structure that at the outside of the internal casing, furthered provided with a cylindrical outside casing to maintain the discharge pressure. This is used mainly for high-pressure multi-stage pumps (Refer to Attached Fig. 12).		barrel type		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
138	二重ケーシング形	NIZYUKEISINGU GATA	Such structure that in order to make the maintenance and exchange of casing due to wear, corrosion, etc., easy, the casing is made double. Mainly, the strength is kept by the outside casing and the inside casing is composed of wear-resistant material or corrosion resistant material.		armoured type		
139	ビットバレル形	PITTO BARERU GATA	Such structure that in a vertical pump, as the measures mainly for taking the effective suction head to be large, its pit forms a part of the casing. This is used for condensate pumps or the like (Refer to Attached Fig. 24).		pit barrel type, vertical barrel type, caisson type		
140	プルアウト形	PURUAUTO GATA	Such structure that in a large vertical pump, in order to make the decomposition and check easy, with the suspended tube as set as it is, the required parts for checking such as impeller, guide vane, etc. can be pulled-out (Refer to Attached Fig. 21).		pull-out type, withdrawable type		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
141	バックプルアウト 形	BAKKU PURU- AUTO GATA	Such structure that in a horizontal single-suction centrifugal pump having the casing cover at the bearing side, the rotary part together with the bearing box can be detached without detaching the suction tube and discharge tube.		back pull-out type		
142	自 吸 ポ ン プ	ZIKYUU PONPU	The pump of such structure that the impeller for lifting liquid can perform the priming action also.		self-priming pump		
143	チューブラポンプ	TYŪBURA PONPU	The axial flow or mixed flow pump to be placed outside of the tank, having the driving part inside of the cylindrical casing (Refer to Attached Fig. 29).		tubular pump		
144	水中モータポンプ	SUITYUU MŌTA PONPU	The pump to be used by immersing the whole body of pump together with the electric motor into liquid. For electric motors to be used for this purpose, there are those of which the inside is water sealed, oil sealed or gas sealed (Refer to Attached Figs. 26 and 27).		submergible motor pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
145	着脱式水中モータ ポンプ	TYAKUDATU SIKI SUIITYUU MŌTA PONPU	The pump made of such structure that in the in-water motor pump for sewage sludge, only by moving up and down the pump, the attaching and detaching of discharge opening and discharge tube of pump in the sump can be performed (Refer to Attached Fig. 28).		detachable submersible motor pump		
146	キャンドモータボ ンプ	KYANDO-MŌTA- PONPU	The pump to be driven by the electric motor having a can for tight-sealing at inside of stator. Because the inside of can is connected with inside of the pump and a shaft sealing part does not exist, the leak of lifting liquid is not generated. There are such pumps made to prevent corrosion of rotor by providing the can also at the outside of rotor.		canned motor pump		
147	ブレードレスポン プ	BURĒDORESU- PONPU	The pump made of such structure that the impeller is formed by one channel and the solids flown-in from the suction opening do not clog the inside part.		bladeless pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
148	ボルテックスポン プ	BORUTEKKUSU- PONPU	The pump of such structure that the open impeller of single-suction type pump is retreated to the chamber provided at bearing side of casing. It generates swirl flow in the casing by impeller and lifts water according to the centrifugal force. Because the impeller does not exist in running water, even the solids are mixed-in lifting water, those can pass through (Fig. 3). Fig. 3. 		vortex pump		

(d) Designation indicating the balancing system of pump shaft thrust

149	バランスピストン 形, 釣合いピストン形	BARANSU PISUTON GATA, TURIAI PISUTON GATA	The type to balance the thrusts of pump shaft by using the balancing piston (Refer to Attached Fig. 7).		balancing piston type, balancing drum type		
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No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
150	バランスディスク形, 釣合いディスク形	BARANSU DISUKU GATA, TURIAI DISUKU GATA	The type to balance the thrusts of pump shaft by using the balancing disc (Refer to Attached Figs. 6 and 8).		balancing disc type		
151	自己釣合い形	ZIKO TURIAI GATA	The type in multi-stage pump to balance the shaft thrusts according to the arranging method of the impeller (Refer to Attached Figs. 9 to 12).		self-balancing type		
152	釣合い穴形	TURIAI ANAGATA	The type to balance the shaft thrusts by providing the balancing hole in impeller (Refer to Attached Figs. 1, 2, 14, 15, 23, 24 and 26).		balancing hole type		

(1.4) Designation of pump in division of uses

(a) Pumps to be used mainly for clean water conduit

153	取水ポンプ	SYUSUI PONPU	The pump to intake river water into water purification plant.		intake pump		
154	送水ポンプ	SOUSUI PONPU	The pump to convey clean water from the water purification plant.		conveying pump		
155	配水ポンプ	HAISUI PONPU	The pump to distribute clean water to final using person.		service pump, distributing pump		

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No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
156	表洗ポンプ	HYOUSEN PONPU	The pump to wash-in the sludge accumulated on the surface of a clean water reservoir.		surface wash pump		
157	逆洗ポンプ	GYAKUSEN PONPU	The pump to wash-in the sludge accumulated in a clean water reservoir by back flowing water from the under side.		back wash pump		
158	増圧ポンプ, ブースタポンプ	ZOOUTU PONPU, BŪSUTA PONPU	The pressurizing pump having the purpose to increase the conveying-water quantity or the like by attaching at the midway of conveying water pipe line.		booster pump		
159	原水ポンプ	GENSUI PONPU	The pump to convey river water as it is.		raw water convey pump		
160	予圧ポンプ	YOATU PONPU	The pump to be set at the suction side mainly for the purpose to give the effective suction head required for pump.		suction booster pump		

(b) Pumps to be used mainly for sewage conduit

161	雨水(排水)ポンプ	USUI (HAISUI) PONPU	The pump to discharge mainly rain water to the river, sea, etc.		storm sewage pump		
162	汚水(排水)ポンプ	OSUI (HAISUI) PONPU	The pump to convey the city sewage (rain water and sewage) to treating plant.		sanitary sewage pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
163	汚 泥 ポ ン プ	ODEI PONPU	The pump to convey sludge.		sludge pump		
164	汚 物 ポ ン プ	OBUTU PONPU	The pump to suck-up sewage mixed with sludges, solids, residues, etc. It is used in sewerage, water purification sump of building, etc., having been made a non-clogging type (Refer to No. 430-3).		non-clogging (type) sewage pump		

(c) Pumps to be used mainly for agriculture

165	か ん が い ポ ン プ	KANGAI-PONPU	The pump to suck-up water from rivers for irrigation. The pump to suck up water directly to farms is called "using water pump" and the pump to convey water up to a storing reservoir for irrigation at a high place is called a "lifting water pump" in some cases.		irrigation pump		
166	排 水 ポ ン プ	HAISUI PONPU	The pump to discharge water from comparatively small rivers to large rivers, seas, etc. for the purpose to prevent flooding of farms due to heavy rains. This is the pump of low lifting and large water quantity in many cases.		drainage pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
167	ビートポンプ	BĪTO-PONPU	The pump to convey beets for sugar making. It is a non-clogging type in many cases (Refer to No. 430-3).				

(d) Pumps to be used mainly for power generation

168	ボイラ給水ポンプ	BOIRA-KYUUSUI PONPU	The pump to feed water into a pressurized boiler. It is the high pressure pump in many cases.	BOIRA- FIDO- PONPU	boiler feed pump		
169	復水ポンプ	HUKUSUI PONPU	The pump to extract condensate in condenser. Because the suction side has high vacuum, the high suction performance is required.	KONDEN- SETO PONPU	condensate pump		
170	循環水ポンプ	ZYUNKANSUI PONPU	The pump to feed cooling water (mainly sea water) to condenser. It is the large type vertical type in many cases.		circulating water pump		
171	ボイラ循環ポンプ	BOIRA ZYUNKAN PONPU	The pump to be used for circulation of boiler water.	KANSUI- ZYUNKAN PONPU	boiler circulation pump		
172	復水ブースタポン プ	HUKUSUI BŪSTA PONPU	The pump to raise pressure up to the pressure requiring condensate, being at the under flow side of condensate desalting apparatus.	HUKUSUI SYŌUATU PONPU	condensate booster pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
173	主冷却材ポンプ	SYUREIKYAKU- ZAI PONPU	The pump to circulate coolant (water) of nuclear reactor in a pressurizing water type nuclear power station.		reactor coolant pump		
174	(原子炉冷却材) 再循環ポンプ	(GENSIRO REIKYAKUZAI) SAIZYUNKAN PONPU	The pump to circulate coolant (water) of nuclear reactor in a boiling water type nuclear power station.		reactor recirculation pump		
175	熔融金属ポンプ, 液体金属ポンプ	YOUYUUKINZOKU PONPU, EKITAI KINZOKU PONPU	The pump to feed liquid metal (of sodium or the like). These are pumps and the like to circulate coolant in nuclear power plants with high speed breeder reactors.		liquid metal pump		

(e) Pumps to be used mainly for ships

176	カーゴオイルポンプ	KAGO-OIRU- PONPU	The pump to feed mainly crude oil in a ship to outside of the ship in an oil tanker.		cargo oil pump		
177	バラストポンプ	BARASUTO-PONPU	The pump to keep the suitable draught by putting in and out the sea water to a water tank corresponding to ship load.		ballast pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
178	ヒーリングポンプ	HĪRINGU-PONPU	The pump to move water between the water tanks of port and starboard provided for balancing of ship.		heeling pump		
179	ビルジポンプ	BIRUZI-PONPU	The pump to discharge water accumulated in a ships bottom.		bilge pump		

(f) Pumps to be used mainly for mining and iron-steel operations

180	採炭ポンプ	SAITAN PONPU	The high pressure pump to feed pressurized water to a monitor for water-power coal extraction.		monitor pump		
181	坑内排水ポンプ	KOUNAIHAISUI PONPU	The pump to exhaust spring water in a mine to outside of the mine.		mine dewatering pump		
182	石炭輸送ポンプ	SEKITAN YUSOU PONPU	The pumps to convey the coal in mine mixing with water to the outside of mine.		coal conveying pump		
183	デスケーリングポンプ	DESUKĒRINGU- PONPU	The high pressure pump to be used for removing scales on the steel material surface during manufacturing in a steel mill.		descaling pump		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol

(g) Pumps to be used mainly for civil engineering and buildings

184	ドレッシポンプ	DOREZZI-PONPU	The pump to convey by sucking up mainly sediments in water bottom together with water. There are many pumps of large power made of wear resistant material (Refer to Attached Fig. 13).		dredging pump		
185	サンドポンプ	SANDO-PONPU	The pump made of wear resistant material, to convey water containing sediments.		sand pump		
186	ボアホールポンプ	BOA-HÖRU-PONPU	The pump for sucking up from a deep bore hole, of which the prime mover exists on the ground. It is used for the purpose of air cooling in buildings or the like.		bore hole pump		
187	消火ポンプ	SYOUKA PONPU	The pump to be used against fire at a chemical factory, buildings, etc. There are also fire pumps of portable type.		fire pump		

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No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol

(k) Pumps to be used mainly for chemical industries

188	プロセスポンプ	PUROSESU-PONPU	Generic term of pumps to convey raw materials in the manufacturing process according to chemical industrial apparatus.		process pump		
189	パルプポンプ	PARUPU-PONPU	The pump to feed paper pulp for paper making.		pulp pump		
190	ブラインポンプ	BURAIN-PONPU	The pump to feed refrigerant.		brine pump		
191	熱媒ポンプ	NETUBAI PONPU	The pump to feed heat medium.				
192	熱油ポンプ	NETUYU PONPU	The pump to feed high temperature oil in petroleum refining or the like.		hot oil pump		
193	L.P.G. ポンプ	ERU PĪ ZĪ PONPU	The pump to feed liquefied petroleum gas.		L.P.G. pump		
194	L.N.G. ポンプ	ERU ENU ZĪ PONPU	The pump to feed liquefied natural gas.		L.N.G. pump		
195	スラリポンプ	SURARI-PONPU	The pump to convey slurry.		slurry pump		

(2) Performance and design

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
201	運 転 点	UNTEN-TEN	In the performance curve diagram, the point to indicate the condition where the pump is actually operated. It becomes the intersecting point of head curve and system head curve at that time.		operating point		
202	仕 様 点, 規 定 点	SIYOUTEN, KITEITEN	The intersecting point of the specified pump head and the specified discharge quantity indicated in the performance curve diagram.		specified point		
203	二 点 仕 様, 二 点 要 求	NITEN SIYOU, NITEN YOUKYUU	The specification specified with two specification points.		specification with two requirements		
204	設 計 点	SEKKEI-TEN	The intersecting point of the design pump head and design discharge quantity indicated in performance curve diagram.		design point		
205	最 高 効 率 点	SAIKOU-KOURITU-TEN	The point where the pump efficiency becomes maximum on the head curve.		maximum efficiency point, best efficiency point		
206	揚 程	YOUTEI	Generic name of heads generated by pump operation.		(pump) head	H	m

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
207	全 揚 程	ZEN YOUTEI	The difference of total heads at discharge opening and suction opening of pump.		total (pump) head	H	m
208	実 揚 程	ZITU YOUTEI	The difference of total heads between the discharge liquid surface and the suction liquid surface in pump apparatus. It becomes the actual height added with pressure head difference between the discharge liquid surface and the suction liquid surface.		actual (pump) head	H_a	m
209	理 論 揚 程	RIRON YOUTEI	The total head given the flowing liquid by impeller in the case where assumed that there is no loss head. It is the total head to be obtained by applying the theory of angular motion to the flows before and after the impeller, and to be given according to the following formula. $H_{th} = \frac{1}{g} (u_2 c_{2u} - u_1 c_{1u})$ where, H_{th} : theoretical head (m) u_1 : peripheral velocity at vane inlet end of impeller (m/s)		theoretical pump head	H_{th}	m

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
			u_2 : peripheral velocity at vane outlet end of impeller (m/s) c_{1u} : peripheral direction component of absolute velocity of fluid at directly before the vane inlet of impeller (m/s) c_{2u} : peripheral direction component of absolute velocity of fluid at directly after the vane outlet of impeller (m/s) g : acceleration of free fall (m/s ²)				
210	締切揚程	SIMEKIRI YOUTEI	The total head at the time of shut off operation.		shutoff head, no-discharge head	H_o	m
211	規定揚程	KITEI YOUTEI	The total head at the speci- fied discharge quantity determined by contract between the parties concerned with delivery.		specified pump head	H_{sp}	m
212	設計揚程	SEKKEI YOUTEI	The total head to be set at the time of design of pump.		design head	H	m

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
213	ポンプ基準面	PONPU KIZYUN- MEN	The horizontal plane to be reference of position head when calculating the discharge head, suction head, etc. It is specified as the horizontal plane containing the central point of circle passing the outer peripheral end of vane inlet of impeller (Fig. 4). However, (1) In the case of a multi-stage pump, relating to the first stage impeller, the abovementioned specifications apply. (2) In the case of vertical both suction type, to the vane part to be upper side the abovementioned specifications apply. Fig. 4. Pump reference plane 		reference plane		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
214	吐出し全ヘッド	HAKIDASI ZENHEDDO	The total head of discharge opening at pump reference plane.		total discharge head	H_d	m
215	吸込全ヘッド	SUIKOMI ZENHEDDO	The total head of suction opening at pump reference plane.		total suction head	H_s	m
216	吐出し(圧力)ヘッド	HAKIDASI (ATURYOKU) HEDDO	The pressure head of discharge opening at pump reference plane.		discharge head		m
217	吸込(圧力)ヘッド	SUIKOMI (ATURYOKU) HEDDO	The pressure head of suction opening at pump reference plane.		suction head		m
218	吐出し圧力	HAKIDASI ATURYOKU	The static pressure at discharge opening of pump.		discharge pressure	p_d	MPa { kgf/cm ² }
219	吸込圧力	SUIKOMI ATURYOKU	The static pressure at suction opening of pump.		delivery pressure, suction pressure	P_s	MPa { kgf/cm ² }
220	押込圧力	OSIKOMI ATURYOKU	The suction pressure not less than the atmospheric pressure.		boost pressure	p_s	MPa { kgf/cm ² }

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
221	吸込高さ	SUIKOMI TAKASA	The height of reference plane of pump measured from the suction liquid surface. In the case where the pump reference plane is above the suction liquid surface, take it as positive (+), and in the case where it is under, take it as negative (-).		static suction head	h_s	m
222	吐出し高さ	HAKIDASI TAKASA	The height of discharge liquid surface measured from the pump reference surface. When the discharge liquid surface is above the reference surface of the pump, take as positive (+) and when it is under it, take as negative (-).		static discharge head	h_d	m
223	実高さ	ZITU TAKASA	The height of discharge liquid surface measured from the suction liquid surface.		total static head	h_a	m

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
224	有効吸込ヘッド, NPSH	YUUKOUSUIKOMI HEDDO, ENU PĪ ESU ETTI	The expression of the fact that the total pressure (absolute pressure) of the liquid on the reference plane of directly before the vane of impeller is how much higher than the saturated steam pressure (absolute pressure) at that temperature according to the type of head. It is used when cavitation is discussed. It is expressed according to the following formula. $h_{sv} = \frac{P_s}{\rho g} - \frac{p_v}{\rho g}$ where, h_{sv} : effective suction head (m) P_s : total pressure (absolute pressure) on the reference plane directly before the impeller vane (Pa){kgf/m²} p_v : saturated steam pressure (absolute pressure) (Pa){kgf/m²} ρ : density of liquid (kg/m³) g : acceleration of free falling (m/s²)		NPSH (net positive suction head), available NPSH	h_{sv}	m

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
225	必要有効吸込ヘッド, 必要NPSH	HITUYOU YUUKOU SUIKOMI HEDDO, HITUYOU ENU PI ESU ETTI	The effective suction head required as pump so as not to generate cavitation under a certain operation condition of pump. It is to be obtained from suction specific speed, Thoma's cavitation coefficient or experiment.		required NPSH	H_{sp}	m
226	吐出量	HAKIDASI RYOU	The volume of liquid discharged by pump in unit time.	RYUU- RYOU	capacity, discharge, discharge quantity	Q	$\text{m}^3/\text{s},$ l/s $\{\text{m}^3/\text{min}\}$
227	規定吐出量	KITEI HAKIDASIRYO	The discharge quantity specified according to contract between the parties concerned with delivery.	KITEI- RYUU- RYOU	specified capacity	Q_{sp}	$\text{m}^3/\text{s},$ l/s $\{\text{m}^3/\text{min}\}$
228	設計吐出量	SEKKEI HAKIDASI RYOU	The discharge quantity to be set at designing of pump.		design capacity	Q	$\text{m}^3/\text{s}, \text{l}/\text{s}$ $\{\text{m}^3/\text{min}\}$
229	回転数	KAITEN SUU	Number of rotations of rotor in unit time.		speed of rotation	n	$1/\text{s} \{\text{rpm}\}$
230	規定回転数	KITEI KAITENSUU	The speed of rotation specified according to contract between the parties concerned with delivery.		specified speed	n_{sp}	$1/\text{s} \{\text{rpm}\}$
231	水動力	MIZU-DOURYOKU	The effective energy given to the liquid by pump in unit time. It is expressed according to the following formula.		liquid power, water power, pump output (power)	P_w	kW

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
			$P_w = 10^{-3} \rho g QH \{ = 0.163 \gamma QH \}$ where, P_w : water power (kW) ρ : density of fluid (kg/m³) g : acceleration of free fall (m/s²) Q : discharge quantity (m³/s) {m³/min} H : total pump head (m) γ : weight of liquid per unit volume {kgf/l}.				
232	軸 動 力	ZIKU DOURYOKU	The power which the prime mover transmits to pump shaft.		shaft power, pump input (power)	P	kW { kgf·m/s }
233	締 切 軸 動 力	SIMEKIRI-ZIKU DOURYOKU	The pump shaft power when performing shutoff operation.		shutoff power	P_o	kW
234	ポ ン プ 効 率	PONPU KOURITU	The ratio of water power to pump shaft power. It is expressed according to the following formula. $\eta = \frac{P_w}{P} \times 100$ where, η : pump efficiency (%) P_w : water power (kW) P : pump shaft power (kW)		pump efficiency	η	%

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
235	ボウル効率	BOURU-KOURITU	The pump efficiency when the discharge casing of vertical diffuser type pump is assumed to be only bowl. This becomes the pump efficiency when considered that the loss heads in the discharge elbow and lifting pipe do not exist.		bowl efficiency	η_{bowl}	%
236	機械損失	KIKAI SONSITU	The power consumed by mechanical frictional resistance acting on bearing, shaft sealing apparatus, etc. and the fluid frictional resistance (disc frictional resistance) acting on the outside surface of impeller shroud.		mechanical loss	P_m	kW
237	機械効率	KIKAI KOURITU	The ratio of power transmitted to liquid by impeller to pump shaft power. It is expressed by the following formula. $\eta_m = \frac{P - P_m}{P} \times 100$ where, η_m : mechanical efficiency (%) P_m : mechanical loss (kW) P : pump shaft power (kW)		mechanical efficiency	η_m	%

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
238	漏 れ 損 失	MORE SONSITU	Out of power given to liquid by impeller, the loss power given to the liquid leaked from the high pressure side to the low pressure side in casing or to the liquid leaked to outside of casing.		leakage loss	P_v	kW
239	体 積 効 率	TAISEKI KOURITU	The ratio of pump discharge quantity to flow quantity passing through the impeller.		volumetric efficiency	η_v	%
240	水 力 効 率	SUIRYOKU KOURITU	The ratio of total pump head to theoretical pump head. It is expressed by the following formula and is coincident with the ratio of water power to the power transmitted to the liquid discharged from the pump by impeller. $\eta_h = \frac{H}{H_{th}} \times 100$ $= \frac{P_w}{(P - P_m) \eta_v} \times 10^4$ $= \frac{\eta}{\eta_m \cdot \eta_v} \times 10^4$ where, η_h : hydraulic efficiency (%) P_w : water power (kW) P : pump shaft power (kW) P_m : mechanical loss (kW) η : pump efficiency (%) η_v : volumetric efficiency (%) η_m : mechanical efficiency (%)		hydraulic efficiency	η_h	%

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
241	総 合 効 率	SOUGOU-KOURITU	The efficiency of the overall pump facility including the pump, transmission apparatus and prime mover. It is expressed by the following formula. In the case of electric motor driving, the ratio of water power to electric motor input. $\eta_{gr} = \frac{P_w}{P_i} \times 100$ $= \eta \cdot \eta_d \cdot \eta_t \cdot 10^{-4}$ where, η_{gr} : overall efficiency (%) P_w : water power (kW) P_i : prime mover input (kW) η : pump efficiency (%) η_d : prime mover efficiency (%) η_t : transmission-apparatus efficiency (%)		overall efficiency, combined efficiency	η_{gr}	%
242	最 高 効 率	SAIKOU-KOURITU	The value indicating the point of maximum efficiency on the efficiency curve (in the case of a movable vane, the value of maximum point in efficiency curve group).		maximum efficiency	η_{max}	%
243	保 証 効 率	HOSYOU-KOURITU	The pump efficiency guaranteed by manufacturer.		guaranteed efficiency		%

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
244	性能	SEINOU	Values of speed of rotation, total pump head, discharge, shaft power, efficiency, etc. when the pump is operated and the mutual relation.		(pump) performance		
245	特性	TOKUSEI	Characteristics and the like on performance of pump determined independent upon the size of pump, if the type and shape of pump is determined.		(pump) characteristics		
246	性能曲線	SEINOUKYOKUSEN	The curve indicating the pump performance on the graph. This graph is called the "performance curve figure".		performance curve		
247	特性曲線	TOKUSEI KYOKUSEN	The curve indicating the characteristics of pump on the graph. There are percentage indication, dimensionless indication, etc. This graph is called "characteristic curve figure".		characteristic curve		
248	裕度	YUUDO	The permissible range of difference between the guaranteed value of pump performance and the test result.		tolerance		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
249	完 全 特 性	KANZEN TOKUSEI	General characteristics over the positive-reverse pump, positive flow-reverse flow ranges. The ordinary pump characteristics are in the range of positive pump-positive flow, the reverse pump-reverse flow is called the water turbine range, positive pump-reverse flow is called braking range, and the reverse pump-positive flow is called the reverse pump range.		complete characteristics		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
250	比 速 度	HISOKUDO	The numerical value expressed by the following formula. $n_s = 60^{\frac{1}{2}} n Q^{\frac{1}{2}} / H^{\frac{1}{2}}$ $\{ = n Q^{\frac{1}{2}} / H^{\frac{1}{2}} \}$ where, n_s : specific speed n : speed of rotation (1/s){rpm} Q : discharge quantity (in the case of both suction impeller, take the half of discharge quantity) (m³/s){m³/min} H : total pump head (in the case of multi-stage pump, take the total pump head per each stage) (m) This formula is introduced from the hydraulic analogy. Usually, the specific speed is obtained to the performance at the maximum efficiency point, and in the similar-type pump, independent of the size, quantity of speed rotation, it becomes approximately constant. Therefore, the specific speed becomes the target for classification of pumps.	n_s (ENU·ESU)	specific speed	n_s	

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
251	形 式 数	KEISIKISUU	The dimensionless quantity expressed by the following formula. $K = \frac{2\pi n Q^{1/2}}{(g \cdot H)^{3/4}}$ $\left\{ = \frac{2\pi n Q^{1/2}}{60^{3/2} (g \cdot H)^{3/4}} \right\}$ where, <i>K</i> : type number <i>n</i> : speed of rotation (1/s) {rpm} <i>Q</i> : discharge quantity (m³/s) {m³/m} <i>H</i> : total pump head (m) <i>g</i> : acceleration of free fall (m/s²) This formula is introduced from the hydraulic analogy. For the type number there is the case where it is used for the performance per one stage and eye at the point of highest efficiency the same as the specific viscosity and the case where it is used for specification point. Therefore, in the case of describing the type number, the clear indication of condition is required.		type number	<i>K</i>	

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
252	吸込比速度	SUIKOMI HI SOKURO	The numerical value expressed by the following formula. $S = 60 \frac{nQ^{1/2}}{H_{sv}^{3/4}}$ $\{ = nQ^{1/2} / H_{sv}^{3/4} \}$ where, S : suction specific speed n : speed of rotation (1/s) {rpm} Q : discharge quantity (in the case of both suction impeller, take the half of discharge quantity) (m³/s){m³/min} H_{sv} : required effective suction head (m) This value indicates the suction performance and characteristics to cavitation of pump. In the above formula, instead of H_{sv} (m) the effective suction head h_{sv} (m) is used in some cases.		suction specific speed	S	
253	無拘束速度	MUKOUSOKU- SOKUDO	The maximum speed of rotation of pump in reverse pump reverse flow range at the time of shut-off pump input.		runaway speed		1/s{rpm}

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
254	揚程曲線	YOUTEI- KYOKUSEN	In the performance curves, the curve to indicate the relation between the discharge quantity and the total head.		head curve, head-discharge curve, head-capacity curve		
255	効率曲線	KOURITU- KYOKUSEN	In the performance curves, the curve to indicate the relation between the discharge quantity and the efficiency (for efficiency mainly the pump efficiency is taken, but the overall efficiency is taken in some cases).		efficiency curve		
256	軸動力曲線	ZIKUDOURYOKU- KYOKUSEN	In the performance curves, the curve to indicate the relation between the discharge quantity and the shaft power.		shaft power curve		
257	必要有効吸込ヘッド曲線, 必要NPSH曲線	HITUYOU- YUUKOU- SUIKOMI-HEDDO- KYOKUSEN, HITUYOU-ENU- PI-ESU-ETTI KYOKUSEN	In the performance curves, the curve to indicate the relation between the discharge quantity and the required effective suction head.		required NPSH curve		
258	有効吸込ヘッド曲線, NPSH 曲線	YUUKOUSUIKOMI HEDDO KYOKUSEN, ENU-PI-ESU- ETTI KYOKUSEN	The curve to indicate the relation between the discharge quantity and the effective suction head.		available NPSH curve		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
259	等 効 率 曲 線	TOUKOURITU KYOKUSEN	On the several head curves when the speed of rotation of pump, outer diameter of impeller or attaching angle of vane is changed, the curve connected with points of equal values in pump efficiency.		iso efficiency curve		
260	抵 抗 曲 線	TEIKOU- KYOKUSEN	The curve to indicate the relation between the total head difference at the suction pipe inlet and the discharge pipe outlet added with loss head of pipe line, and the discharge quantity.		system head curve		
261	下 降 特 性	KAKOU-TOKUSEI	Such characteristics that as the increasing of discharge quantity the total head decreases.		rising characteristic		
262	山 形 特 性	YAMAGATA- TOKUSEI	Such pump characteristics that the maximum value of total head is larger than the shut-off head.		drooping characteristic		
263	部 分 流 量 域	BUBUN RYUURYOU-IKI	The operation range of the discharge quantity smaller than the maximum efficiency point.		partial capacity range, partial discharge range		

No.	Term (Japanese character)	Reading	Definition	Informative reference			
				Idiom	English equivalent	Quantity symbol	Unit symbol
264	過大流量域	KADAI RYUURYOU IKI	The operation range of discharge quantity larger than the maximum efficiency point.		over capacity range, over discharge range		
265	不安定領域	HUANTEI RYOUIKI	The operation range such as the operation condition of pump to become unstable.		unstable region		
266	予旋回	YOSENKAI	The slewing motion of liquid to flow in the impeller at directly before the impeller.		prerotation, prewhirl		
267	流量係数	RYUURYOU- KEISUU	Among pump characteristics, the dimensionless number to express the discharge quantity. It is expressed according to the following formula. $\phi = \frac{Q}{A_2 u_2} \left\{ = \frac{Q}{60 A_2 u_2} \right\}$ where, ϕ : capacity coefficient Q : discharge quantity (m³/s) {m³/min} A_2 : area of impeller outlet (m²) u_2 : peripheral velocity at representative diameter of vane of impeller (m/s)		capacity coefficient, discharge coefficient	ϕ	