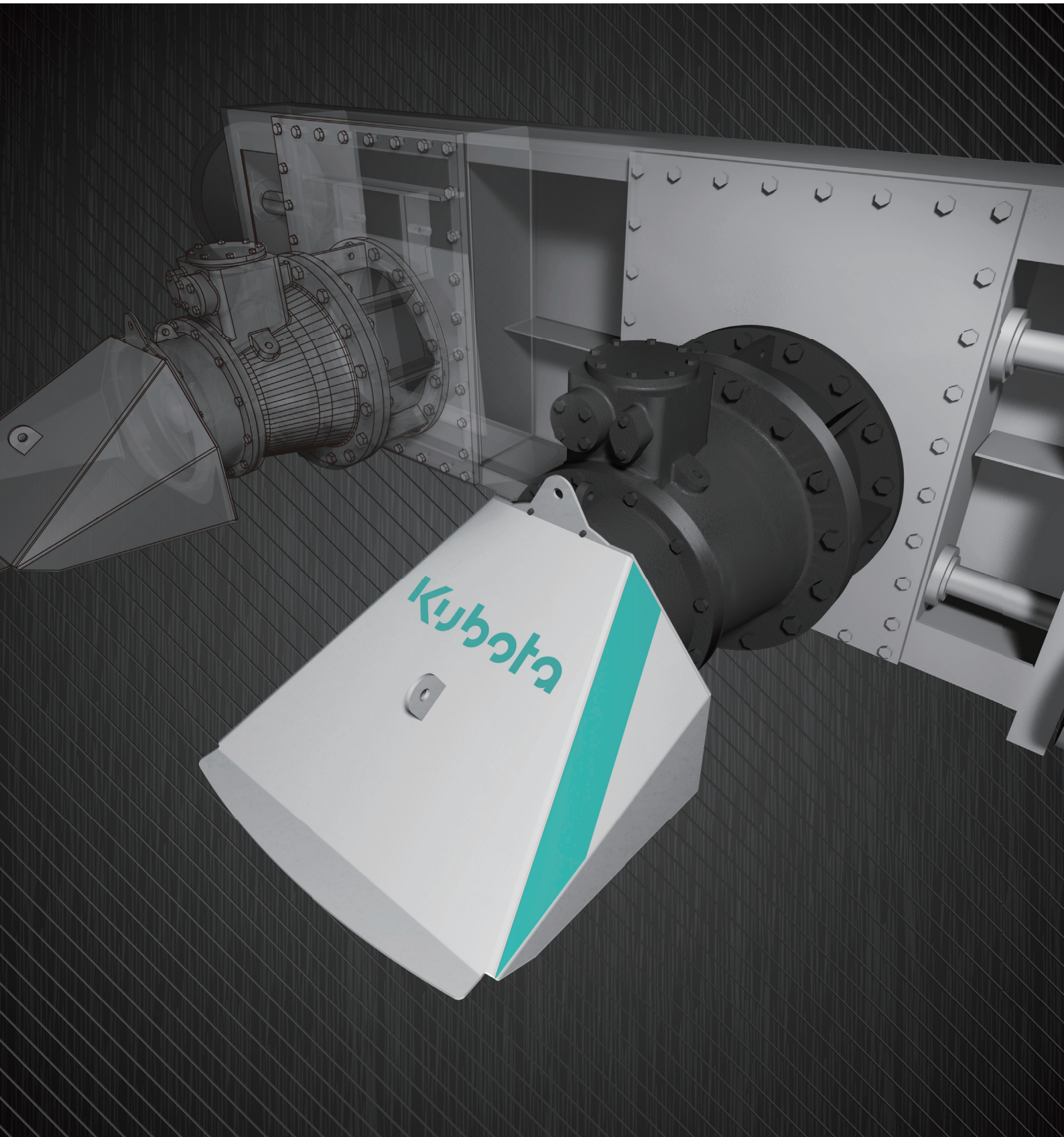


KUBOTA PUMP GATE

Smart Operation and Intelligent System



Evolution of PUMP GATE

Smart Operation
and Intelligent System

Reborn

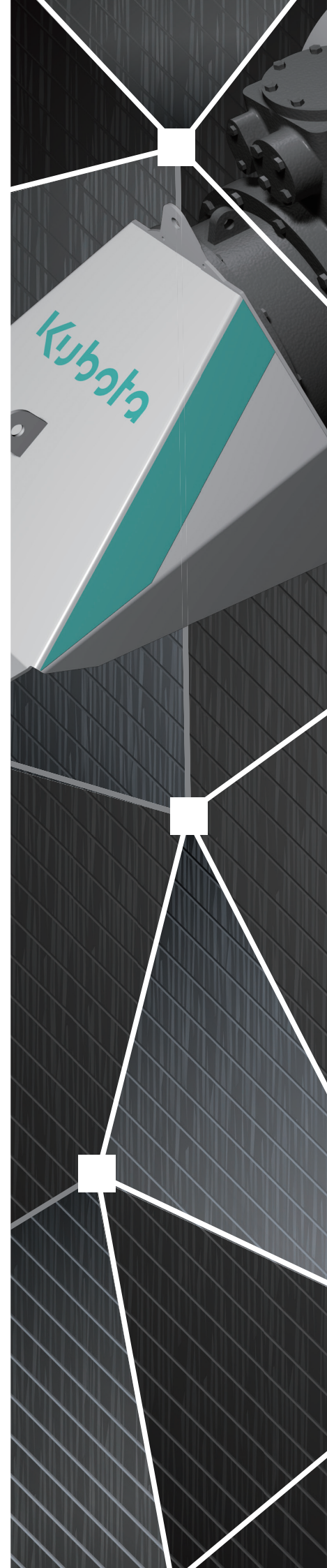
Achieving Smart Operation and Intelligent System of PUMP GATE

Inundation damage due to sudden torrential rain, which has increased in recent years. In the process of seeking emergency countermeasures, there are various barriers which are being overcome such as the limited budget, installation location, and time to complete measures.

In order to solve various constraints, we propose to realize more accurate drainage operation through the intelligentization of PUMP GATE and the combination of "Full Speed Operation in Any Water Level" and more efficient operation management through "Cloud Monitoring" and "Meteorological Forecasting" that contribute to risk reduction.

We want to be a company that constantly challenges issues and continues to propose solutions through products. See what Kubota thinks.

* "Cloud Monitoring" and "Meteorological Forecast" are optional and subject to available information source in each country.





Smart

-Improved Smart Operation-
"Full Speed
Any Water Level"

Intelligent

-Intelligent System by ICT-
"Cloud Monitoring" and
"Meteorological Forecasting"

"Operability" and "Operation Management"
achieved by Smart and Intelligent PUMP
GATE.

Smart -Improved Smart Operation-
"Full Speed Operation in Any Water Level"

Intelligent -Intelligent System by ICT-
"Cloud Monitoring" and "Meteorological
Forecasting" Not only operating data, but also
meteorological information is collected and
accumulated.

Advantages of Kubota PUMP GATE Features of Full Speed Any Water Level

1 Ultra-Low Water Level

By lowering the operable water level compared to conventional products, the drainage capacity has been improved.

2 No Chattering Phenomenon

Because the pump always runs at full speed and automatically switches the operating mode according to the water level, the chattering phenomenon caused by frequent start-stops is fundamentally eliminated, realizing highly reliable equipment.

3 Inverter-Free

Since Full Speed Operation in Any Water Level is possible, there is no need for complicated equipment and operation such as an inverter. By realizing a simple pump facility, high reliability (the risk of failure and operating errors is reduced) and cost reduction are achieved.

4 Efficient Operation and Eco-Friendly Products

By developing new suction nozzle that optimizes two-phase flow of water and air, Full Speed Operation in Any Water Level is realized. Low suction loss, low vibration and low noise have been achieved.

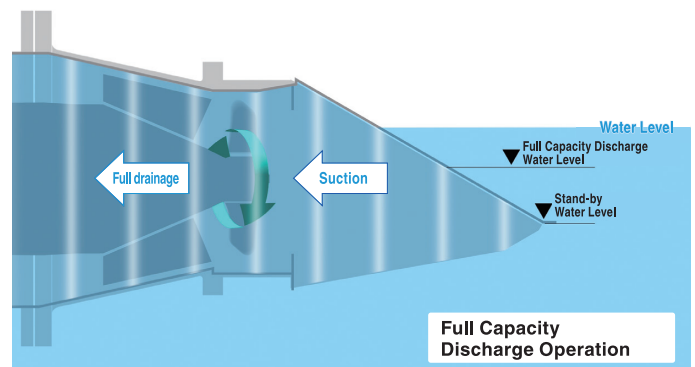
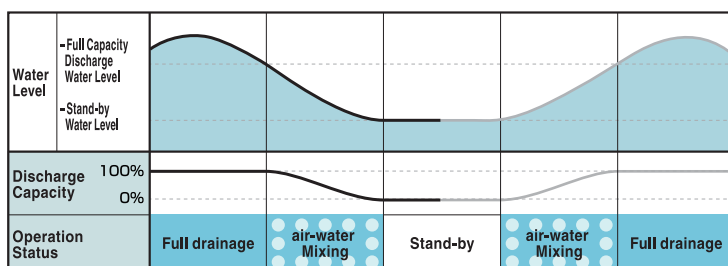
5 Integration of hardware and software

Through the integration of cloud monitoring and meteorological forecast systems with PUMP GATE equipment, the operation management of the equipment and the optimization of the gate operation timing are promoted. Reduced management and operation load.

* Optional

Description of Operation Mode (Water Level / Operation Status)

Operation Mode



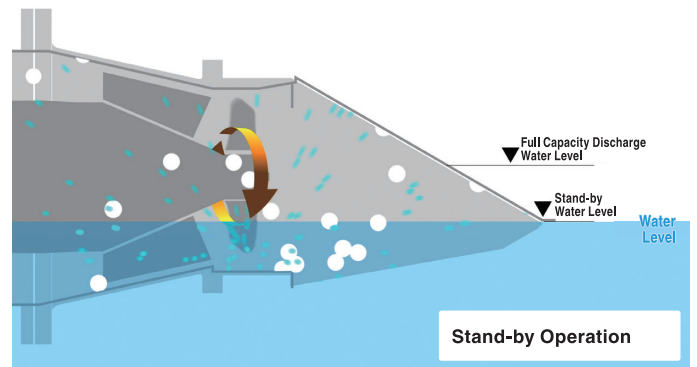
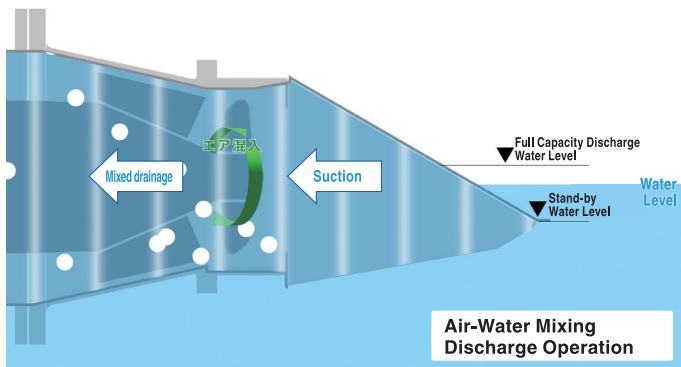
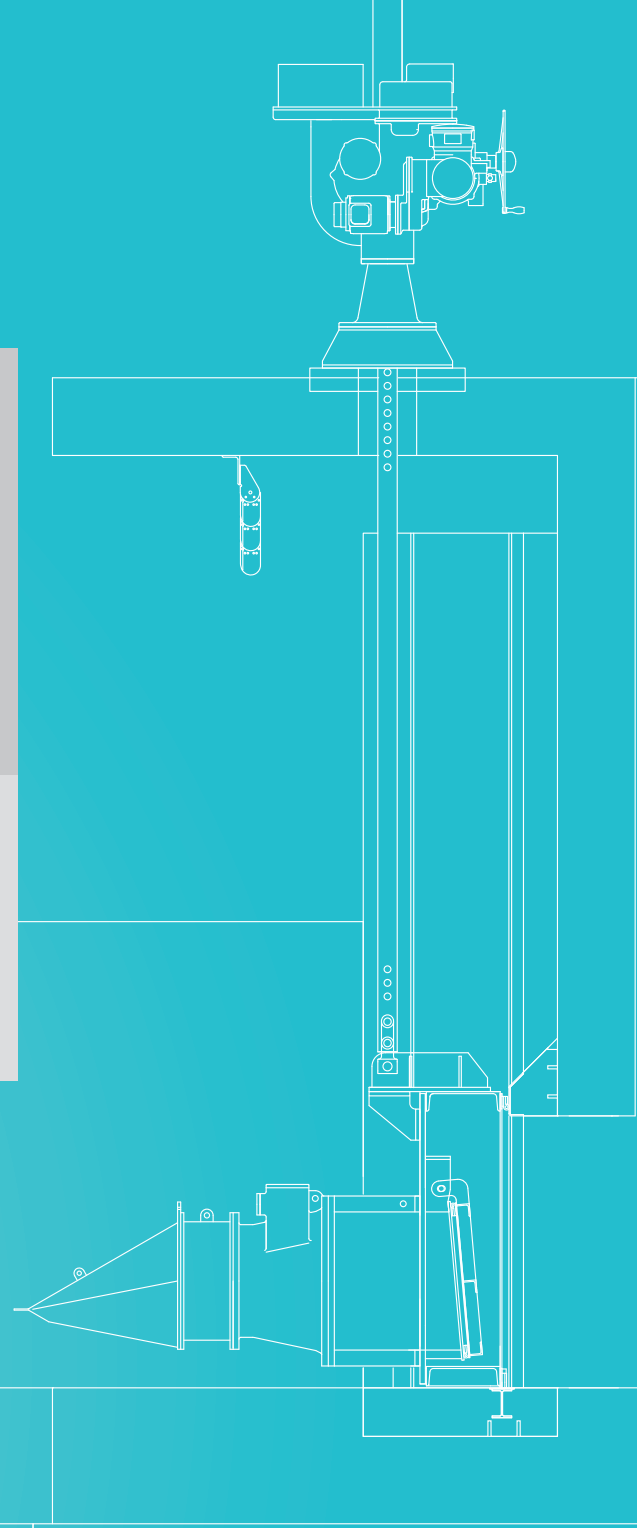
Issues of PUMP GATE

Failure Risk Due to Chattering Phenomenon

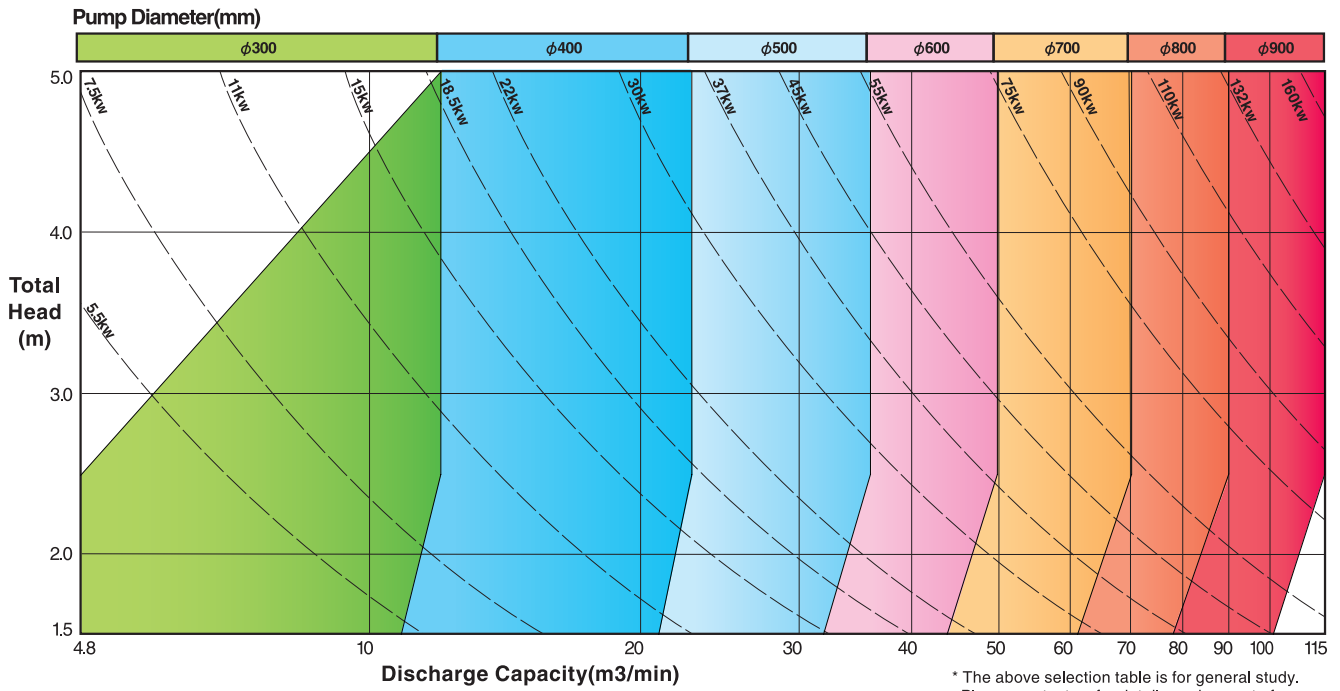
As a feature of PUMP GATE, "Installation in Existing Waterways" and "Installation in Narrow Spaces", the water level changes greatly and rapidly through the operation of the pump, causing repeated start and stop of the pump operation (chattering phenomenon), so there is a great concern over the failure risk at electrical side.

Complex Operation Control

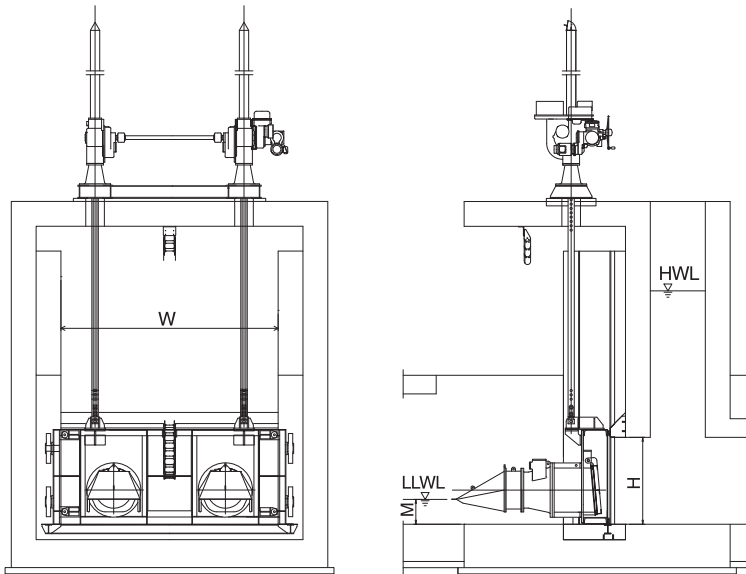
In order to suppress chattering, it is necessary to introduce complicated equipment such as inverters. In addition, the operation needs to be performed according to the situation, resulting in a high risk of failure and human error.



Pump Selection Chart (per 1 pump)



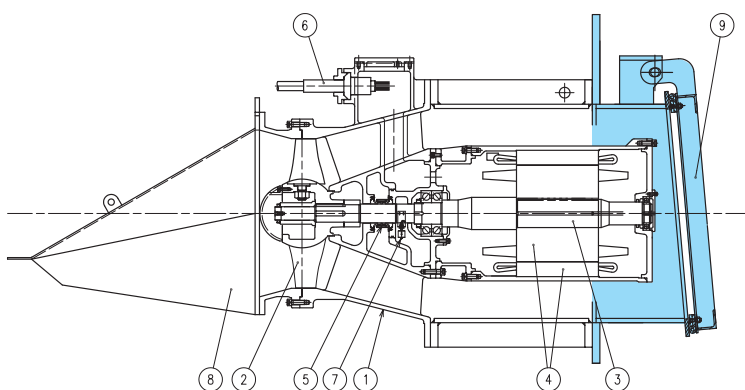
PUMP GATE Installation Drawing



Pump Bore (mm)	Q'ty	Width W(mm)	Height H(mm)	LLWL M(mm)
		300	1	900
	2	1500		
400	1	1000	1250	380
	2	1800		
500	1	1100	1250	400
	2	2100		
600	1	1200	1350	480
	2	2400		
700	1	1400	1500	560
	2	2800		
800	1	1600	1750	640
	2	3200		
900	1	1800	2000	720
	2	3600		

* Please contact us if you have any orders out of the dimension table above.

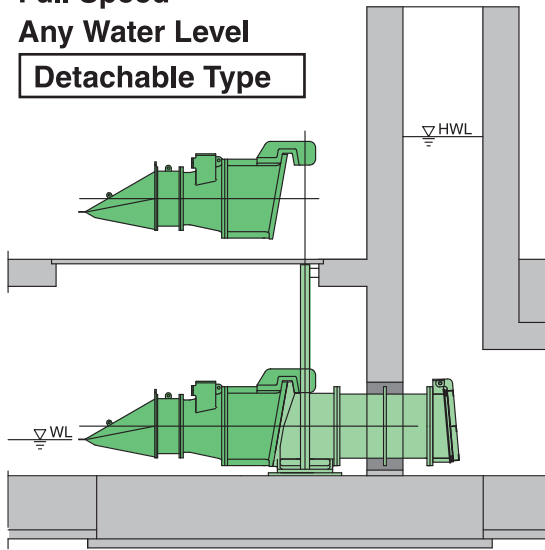
Pump Construction Drawing



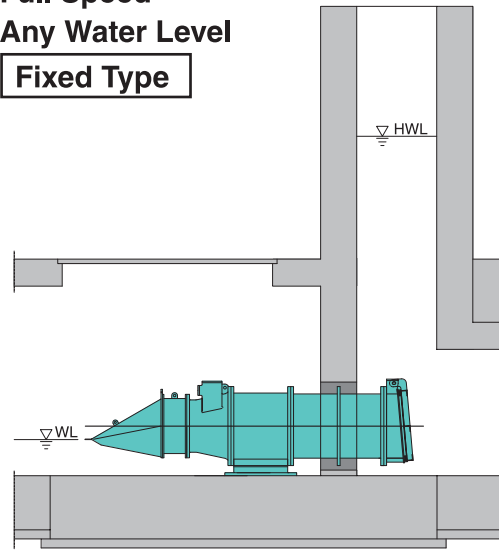
Item No.	Part Name	Material
1	Casing	FC250
2	Impeller	SCS13
3	Shaft	SUS420J2
4	Motor	-
5	Mechanical Seal	-
6	Submersible Electric Cable	-
7	Water Leakage Detector	-
8	Suction Cover	SS400
9	Flap valve body	SUS304

Installation Examples

**Full Speed
Any Water Level
Detachable Type**



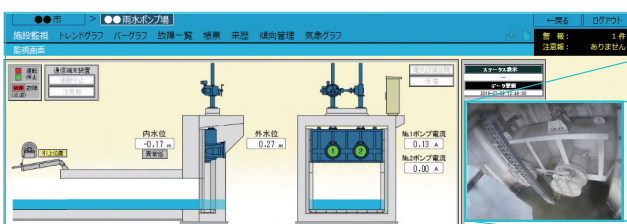
**Full Speed
Any Water Level
Fixed Type**



Cloud Monitoring System and Meteorological Forecast Services [Optional]

Intelligentization of ICT contributes to more efficient operation management and reduces the risk of flooding.

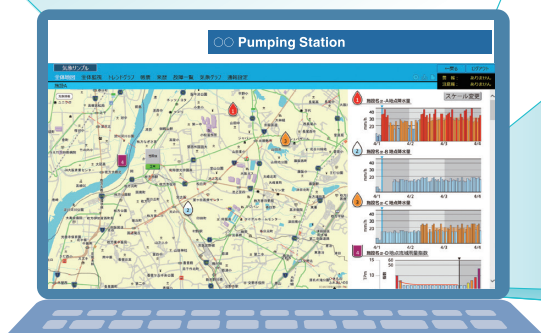
- Using a computer, smart phone, etc. that can access the Internet, the status and abnormal conditions of PUMP GATE can be monitored at any time and at any place. [Cloud Monitoring Service]
- Images of equipment and waterway conditions captured by the camera can be checked, and recorded videos can be referred to and downloaded. [Camera service¹⁾]
- As the guideline of the external water level, "Prediction data of the watershed rainfall index²⁾", the actual value of the water level and the tendency of the water level change are displayed. In addition, as the indication of the internal water level, it is possible to predict the rainfall of 1 km at a representative point in the internal water basin. [Meteorological forecast service¹⁾]
- By using meteorological forecasting services, not only operational data, but also meteorological information is organized and accumulated in chronological order, which can be flexibly used in planning appropriate operation timing of PUMP GATE equipment and preparation of drainage activities.



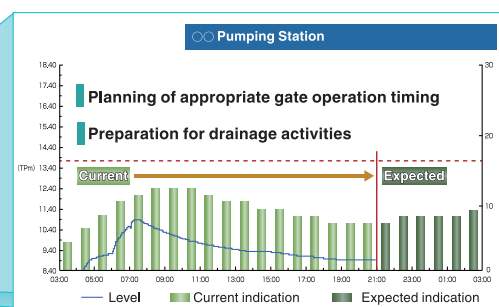
PUMP GATE facility monitoring video image



Camera display image



Meteorological Forecasting Services display image



Watershed rainfall indication display image

*1:Indicates additional features of Cloud Monitoring Service

*2:This is an index by calculating the effect at the measurement point, taking into account the time difference between the current rainfall and the expected rainfall inflow from the river basin. Numerical values used by local meteorological stations for announcement standards such as alarms, etc.

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<https://www.kubota.com/products/pumps/>

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