GEM Pump

(Green Engineering and Management Co.,Ltd)

CATALOGUE

Submersible Axial, Mixed Flow Propeller Pump

APPLICATION

For Handling Pure, Raw and Waste Water as well as Seawater in

- Water Works
- Irrigation and Drainage
- Pumping Stations
- Power Stations
- Industrial Water Supply
- Fire Fighting Systems





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Series description

Product series

Submersible axial flow pump, mixed flow pump in discharge tube

Main applications

- Water Works
- Irrigation and Drainage
- Pumping Stations
- Power Stations
- Industrial Water Supply
- Fire Fighting Systems
- Raw and clean water pumps in waterworks and waste water treatment plants

Fluids handled

- Waste water
- Sludge
- Surface water
- Stormwater
- Grey water
- Seawater
- Brackish water

Design

- Fully floodable submersible pump in discharge tube (submersible motor pump)
- Not self-priming
- Close-coupled design
- Single-stage
- Vertical installation

Series Code

Example:
350SG-50D
350 : Nominal diameter of the pump outlet (mm)
SG : Submersible axial-flow pump(submersible mixed-flow pump)
50 : 1/10 of the specific number of revolution
D : The impeller diameter is bigger than the standard diameter; the standard diameter is not marked.

Operating properties		
Caracteristic value		
Flow	Q	Up to 12000 l/s
Head	H	Up to 21 m
Motor rating	P2	Up to 1400 kW
Fluid temperature	t	Up to +40°C
Column pipe	Dia.	300 – 1400 mm

Operating data

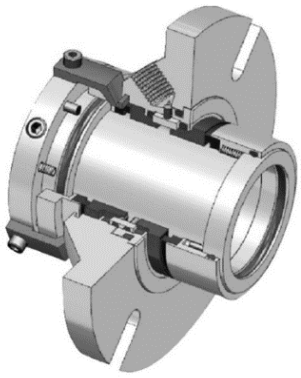
Drive

Submersible Motor : Three-phase asynchronous squirrel-cage motor

- Protection class : IP68
- Basic installation type : IM3013
- Voltage : up to 355kw, 380V 400V
- Insulation class : H (Up to 180°C/356°F)
- Rated power : 50Hz
- Length of cable : 10m

Shaft seal

This type has two or three mechanical seals. The first seal, which contacts water, is usually made of carbon silicon and tungsten carbide. The second and third are usually made of graphite and tungsten carbide.



Seal	Material
Inner	Corrosion resistant silicon carbide (Sic)
	Corrosion resistant Ceremic
Outer	Corrosion resistant silicon carbide (Sic)
	Corrosion resistant Ceremic

Impeller type

One piece axial-flow propeller with Self cleaning technique blade for low clogging performance, The pump housing are available, The propeller are machined to match the selected duty point. The wear ring between the pump housing and propeller is easily removable and can be adjusted to provide a high effciency.

Bearings

Used rolling bearings, which can bear all the axial and radial loads and be isolated from pumped medium.

Coating and preservation Paint

- Surface treatment: SA 2.5 (ISO 8501-1)
- Primer: Solvent - free 2 Component epoxy
- Top coat: Solvent free 2 Component epoxy total dry film thickness 400 - 600 µm

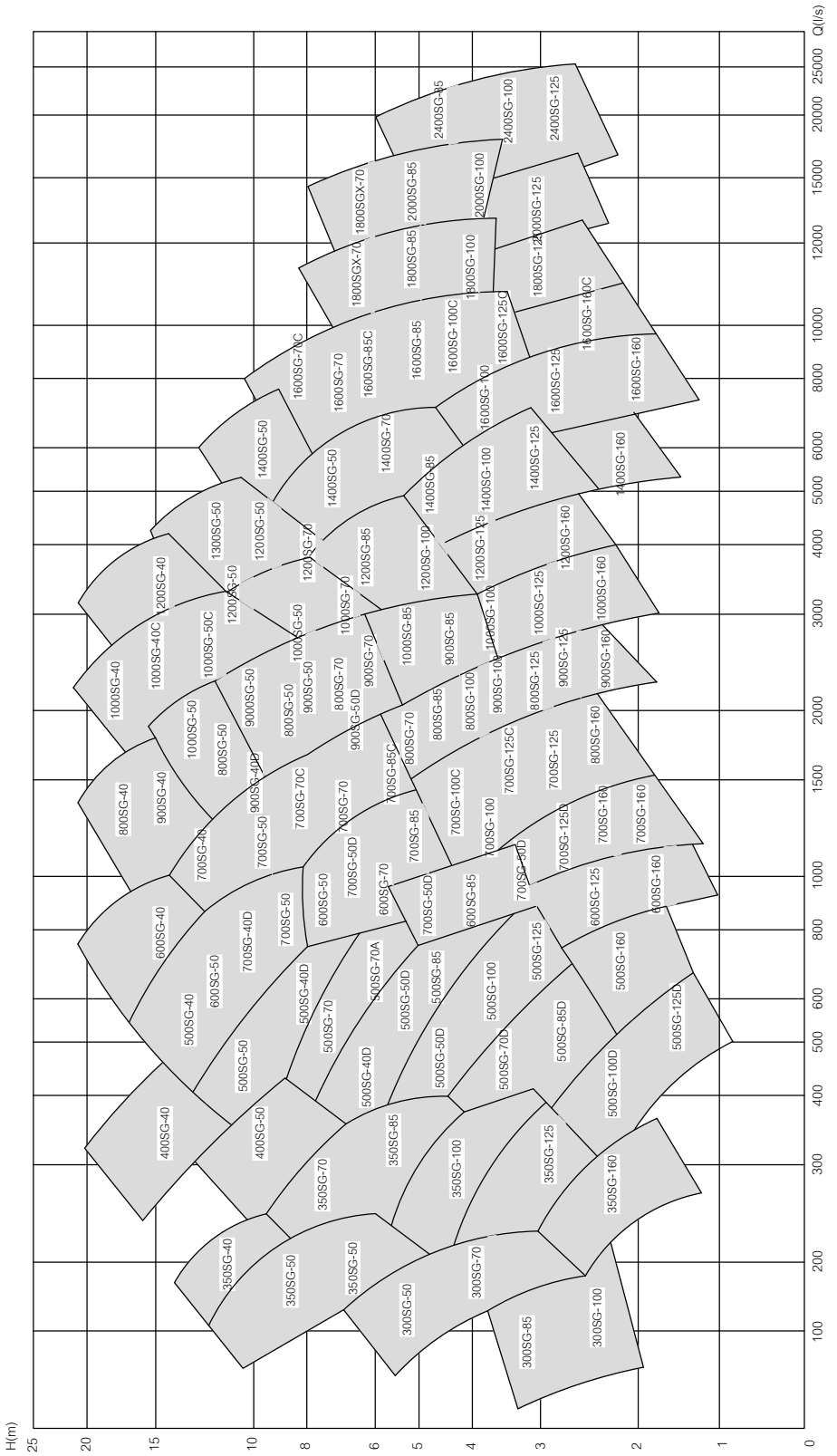
Special coating

The special coating on request.

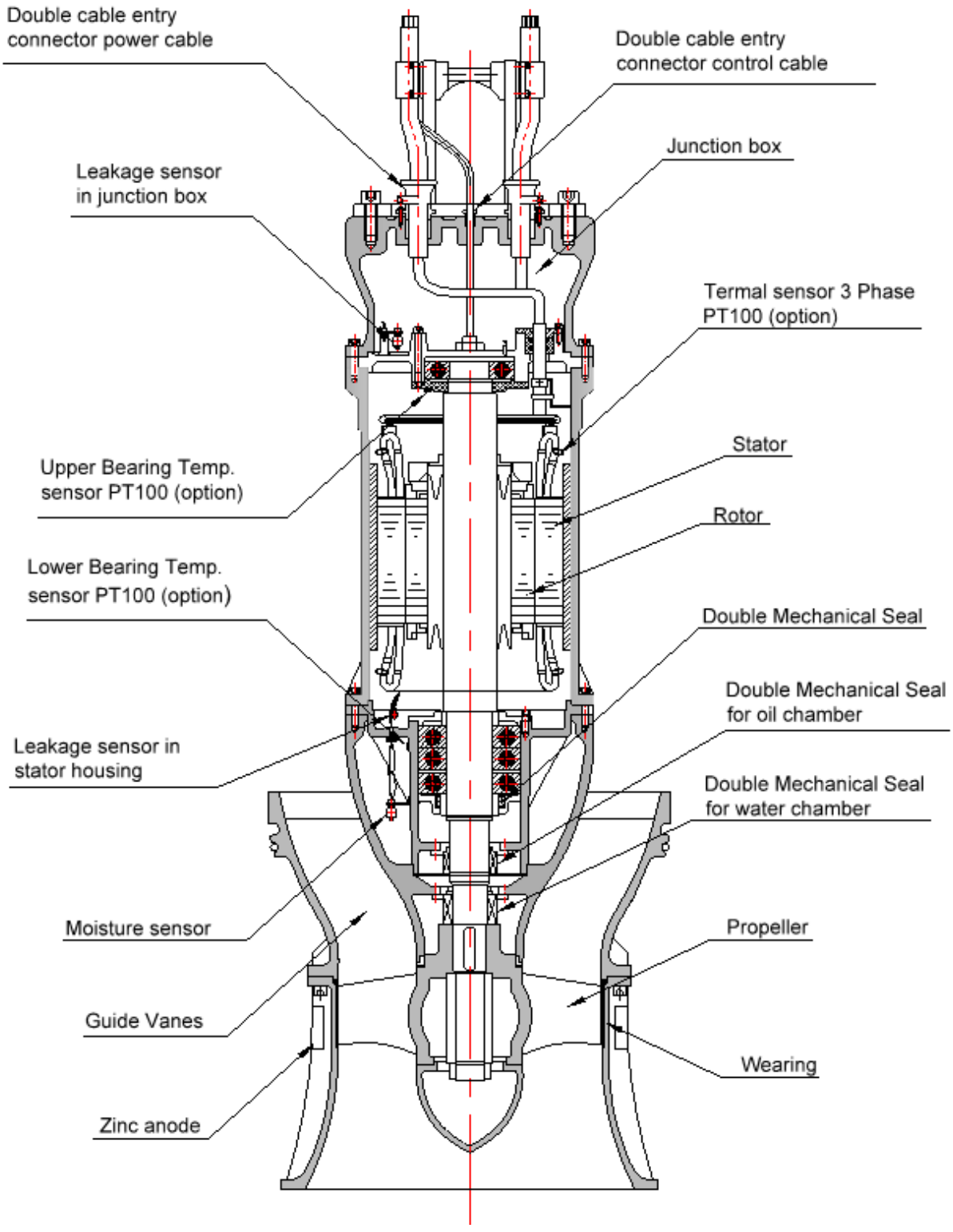
Order Data

- Designation of the pump
- Flow Q
- Head H_{total}
- Type and temperature of the fluid pumped
- Voltage, frequency, starting method, cable length
- Quantity and language of operating manuals

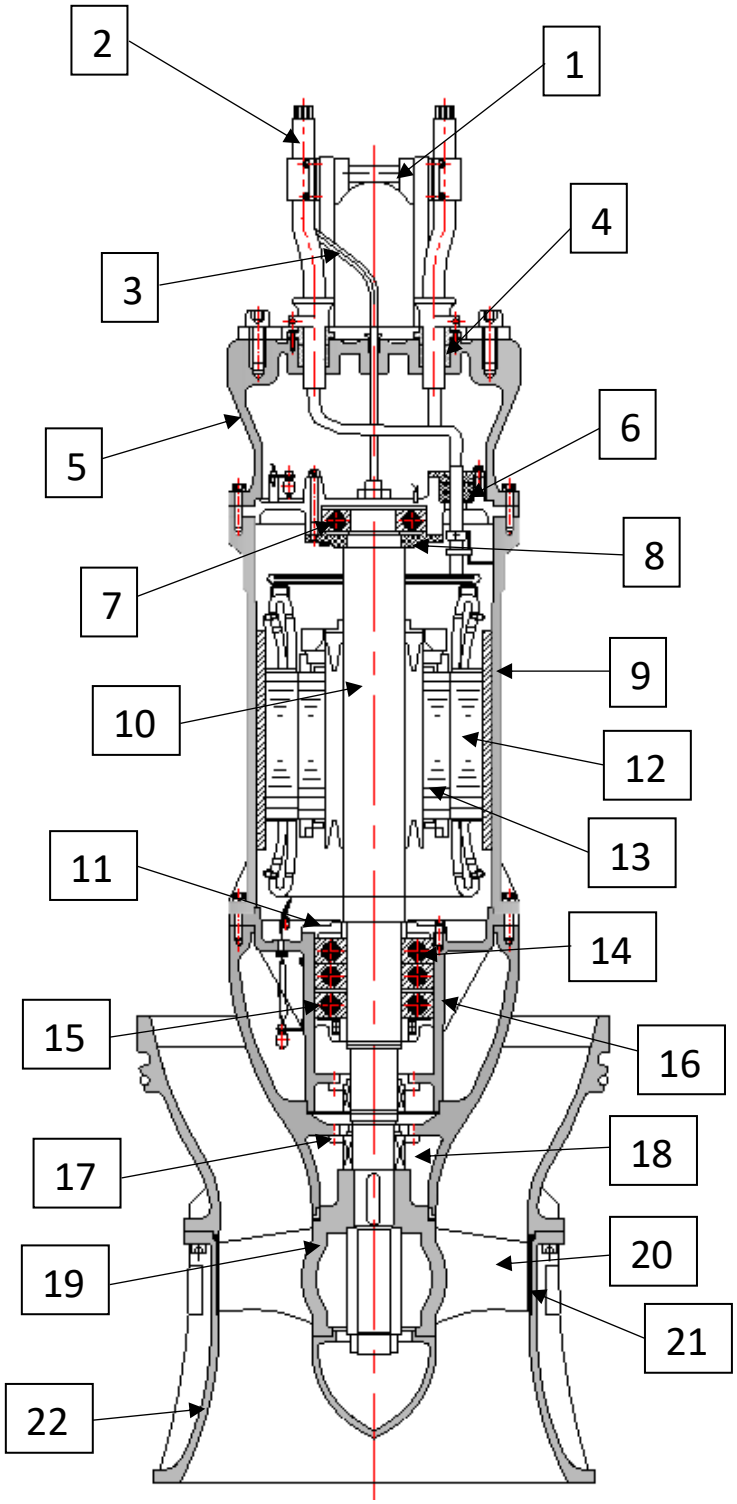
Performance range



SG Monitoring and Protective Sensors



Structure Profile



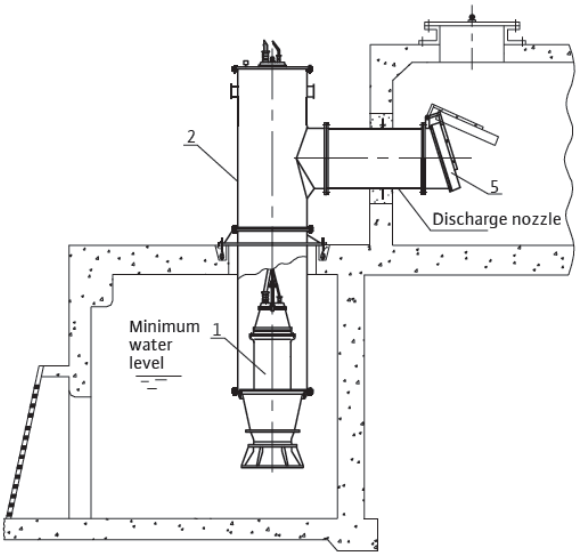
No.	Description	Qt.
1	Lifting Ring	1
2	Power Cable	10 m.
3	Control Cable	10 m.
4	Main Cable Sealing	2
5	Upper Cover	1
6	Seal Grand	2
7	Ball Bearing	1
8	Upper Bearing Cover	1
9	Motor Housing	1
10	Pump Shaft	1
11	Down Bearing Cover	1
12	Stator	1
13	Rotor	1
14	Trust Bearing	2
15	Ball Bearing	1
16	Bearing Housing	1
17	Seal Shamber	1
18	Anti-Winding Design	1
19	Propeller Hub	1
20	Propeller	1
21	Wearing	1
22	Bell Mouth	1

Material

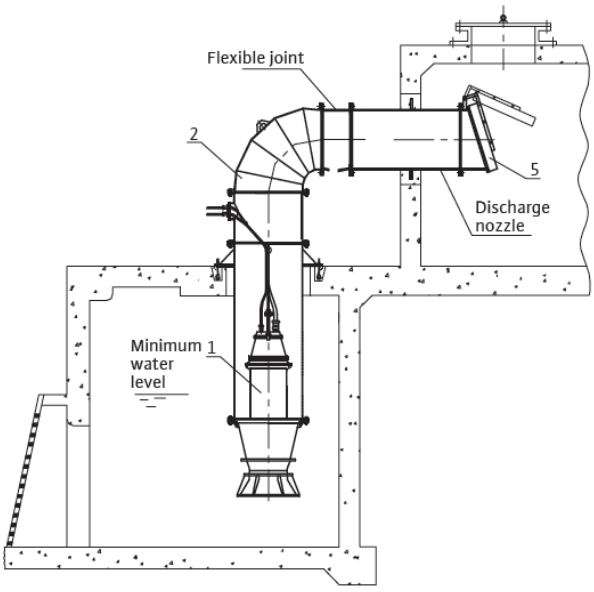
Part	Material	Standards		
		ASTM	**DIN**	**JISS**
Pump bowl and Diffusion vane	Gray iron casing	A-Gr 30	GG 20	FC 200
		A-Gr 35	GG 25	FC 250
		A-Gr 40,45	GG 30	FC 300
		A-Gr 50	GG 35	FC 350
		A-Gr 55,60	GG 40	
Propeller	Stainless steel	A-TYPE 329	1.4460	SUS 304
		A-TYPE 410	1.4006	SUS 316
		A-TYPE 420	1.4021	SUS 316Ti
		A-TYPE 431	1.4028	SUS 329
		A-TYPE CF8	1.4308	SUS 329J3L
		A-TYPE CF8M	1.4408	SUS 410
		A-890 CD4MCun	1.4409	SUS 420
			1.4517	SUS 431
				SCS 13
	Bronze	B 61 Alloy 4A	2.1050.01/G CuSN10	H5111 Gr BC2
		B 62 Alloy 4A	2.1052.01/G CuSn12	H5120 CAC406
		B 584-90500	2.1086.01/G CuSn10Zn	
Pump shaft	Stainless steel	A-TYPE 316	1.4401	SUS 304
		A-TYPE 329	1.4460	SUS 316
		A-TYPE 403	1.4517	SUS 329
		A-TYPE 410	1.4006	SUS 410
		A-TYPE 416	1.4005	SUS 420
		A-TYPE 420	1.4021	SUS 431
		A-TYPE 431	1.4028	SCS 13
			1.4057	SCS 14
Casing wear ring/Liner	Stainless steel	A-TYPE 316	1.4401	SUS 304
		A-TYPE 316Ti	1.4460	SUS 316
		A-TYPE 329	1.4000	SUS 316Ti
		A-TYPE 403	1.4006	SUS 329
		A-TYPE 410	1.4005	SUS 410
		A-TYPE 416	1.4021	SUS 420
		A-TYPE 420	1.4028	SUS 431
		A-TYPE 431	1.4308	SCS 13
		A-TYPE CF8M	1.4408	SCS 14
Motor housing/connection chamber	Gray iron casing	A-Gr 30	GG 20	FC 200
		A-Gr 35	GG 25	FC 250
		A-Gr 40,45	GG 30	FC 300
		A-Gr 50	GG 35	FC 350
		A-Gr 55,60	GG 40	

Installation types

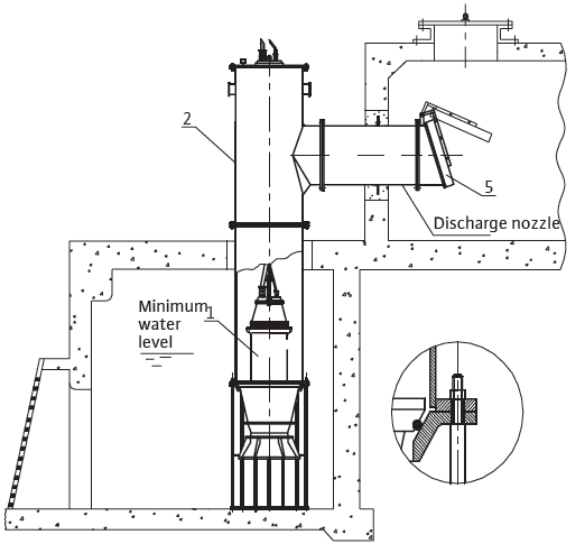
Overview of installation types



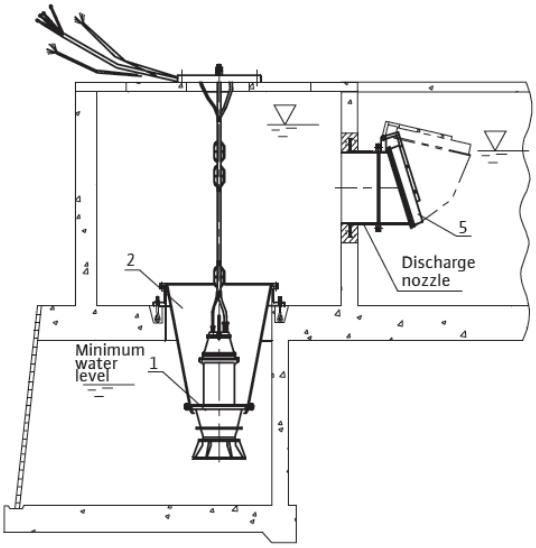
1. Installation with discharge tube



2. Installation with discharge tube and elbow

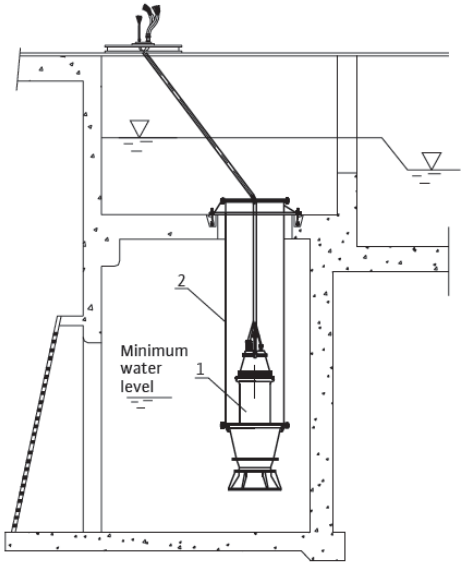


3. Installation with discharge tube and floor support

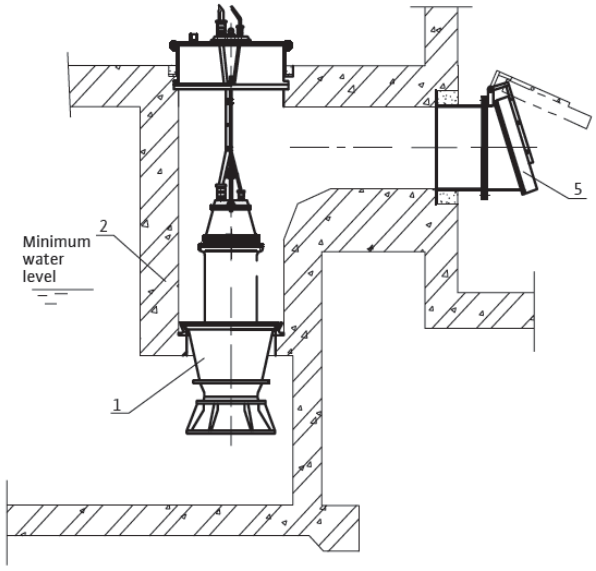


4. Overflow installation in open intake chamber with discharge nozzle

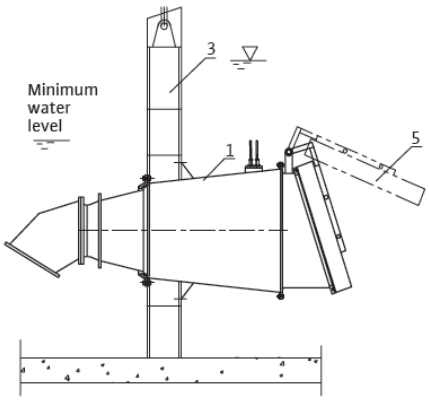
Installation types



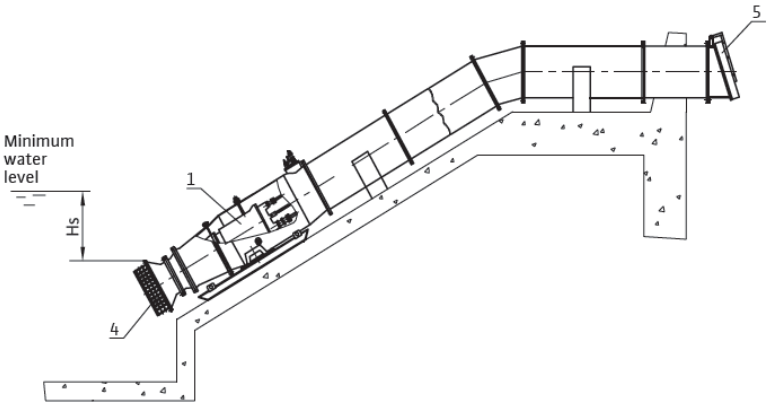
5. Overflow installation in open intake chamber



6. Installation with concrete discharge tube

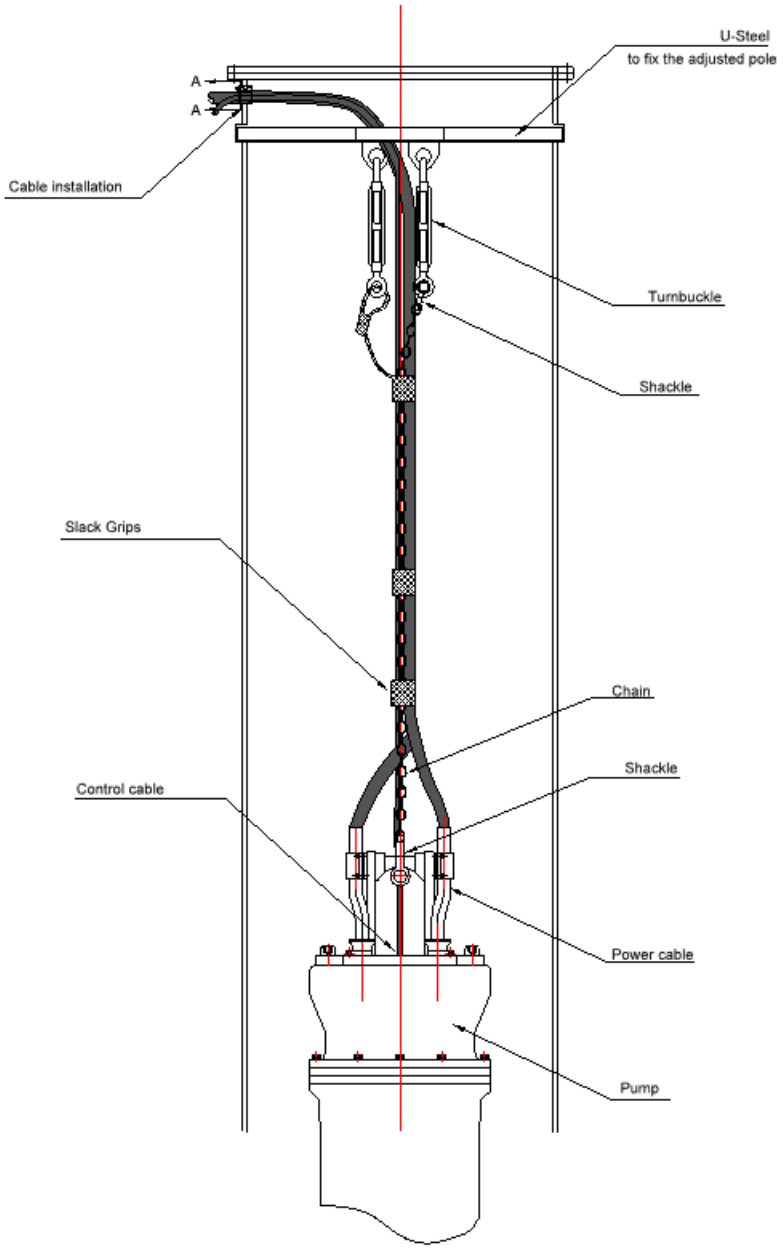


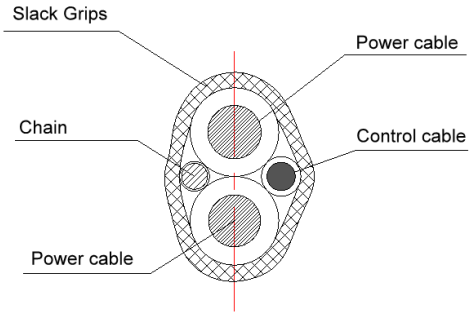
7. Installation in valve



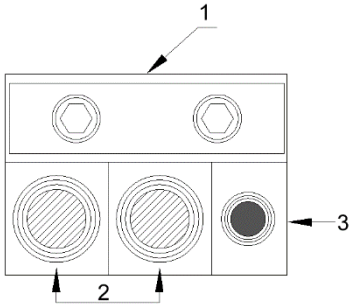
8. Tilted installation

Cable suspension system





Cross-section of cable support



Section A-A



1. Wedge



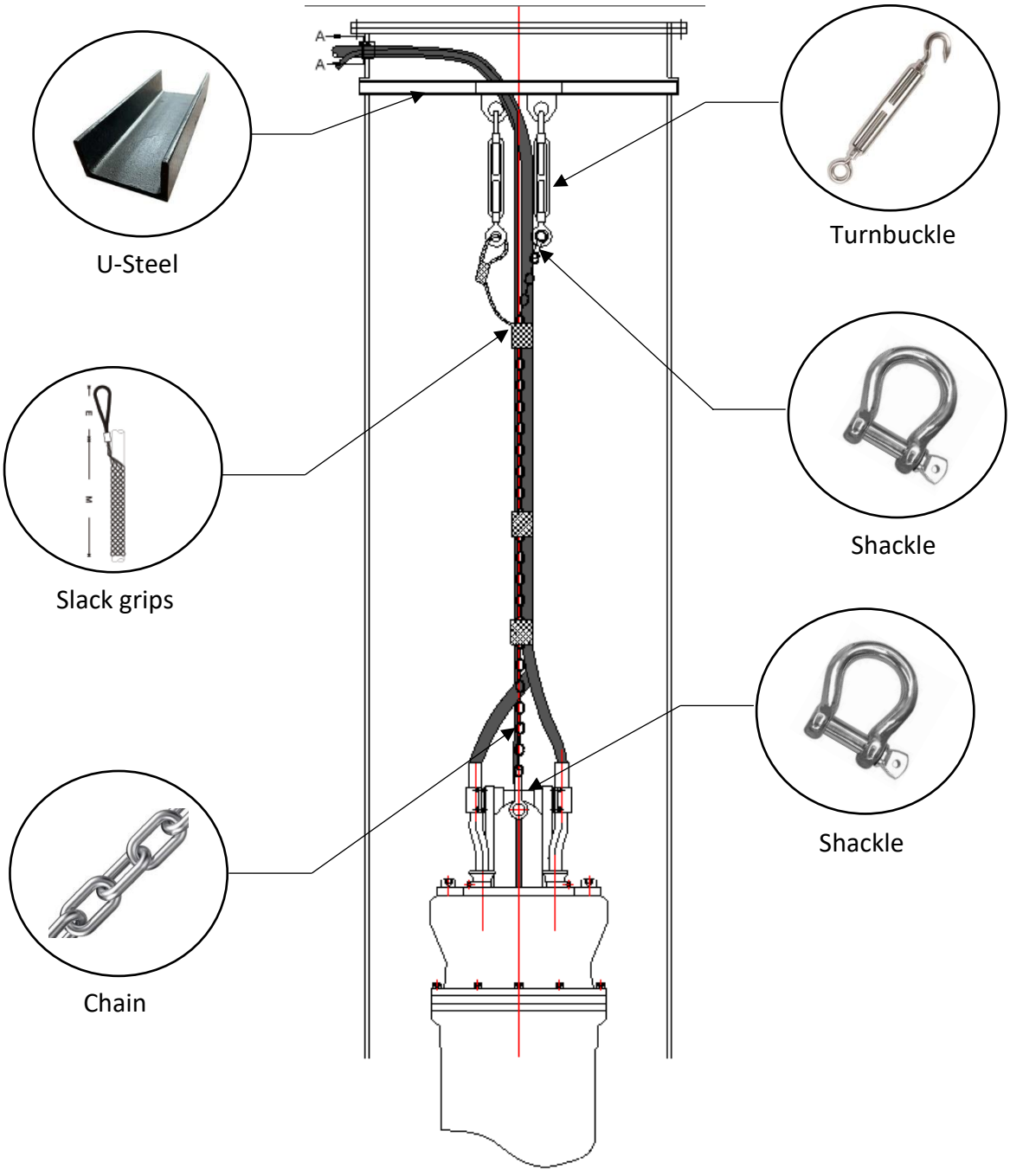
2. Modules for power cable



3. Modules for control cable

No.	Description	Material
1	U-Steel	SS400
2	Cable slack grips	Galvanized
3	Turnbuckle	Stainless steel
4	Shackle	Stainless steel
5	Chain	Stainless steel

Cable suspension system

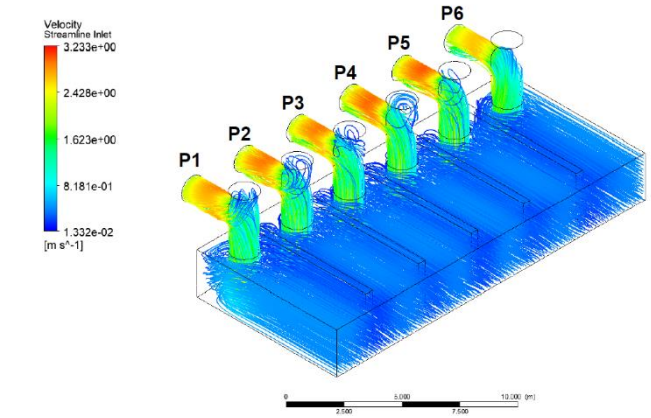


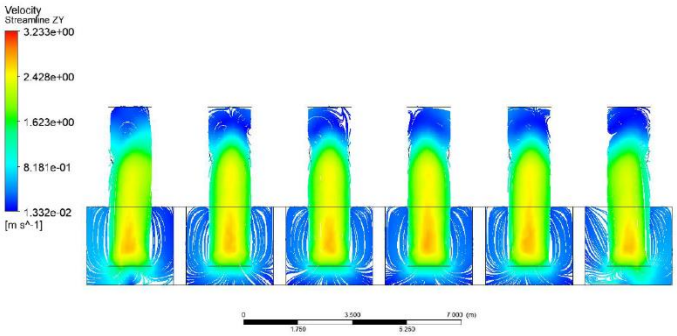
Cable suspension parts

Computational Fluid Dynamics (CFD) Analysis

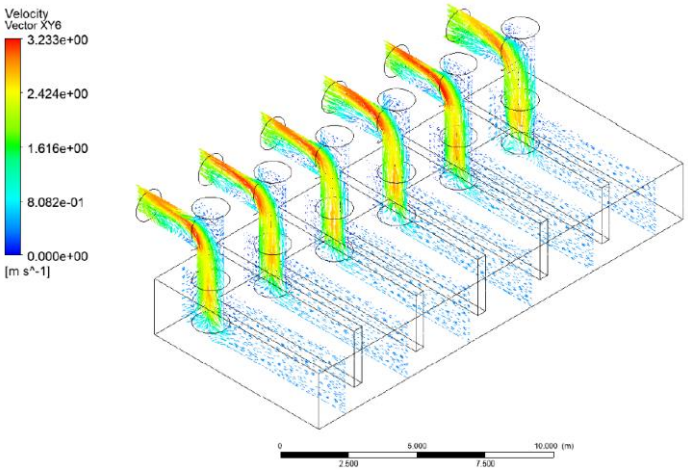
Our Design & Engineering Centre [IDEC] Facility in Thailand focus on continuouns research, development of products & Services with state of art technologies. Key activities carried out are as follows

- Geometric modelling
- In-house hydraulic design
- Computational fluid dynamics
- Finite Element Analysis [FEA]
- Sump model & Intake sump model analysis
- Stress, Torsional & Seismic Analysis





GEM analysis CFD to test the analysis of CFD complies with ANSI HI 9.8 – 2018. Which analyzes the flow pattern at the suction inlet of the pump without vortex or any other flow disturbance. These results can decide whether to modify the shape of the clarifier or install a flow modulator to achieve the desired flow pattern.

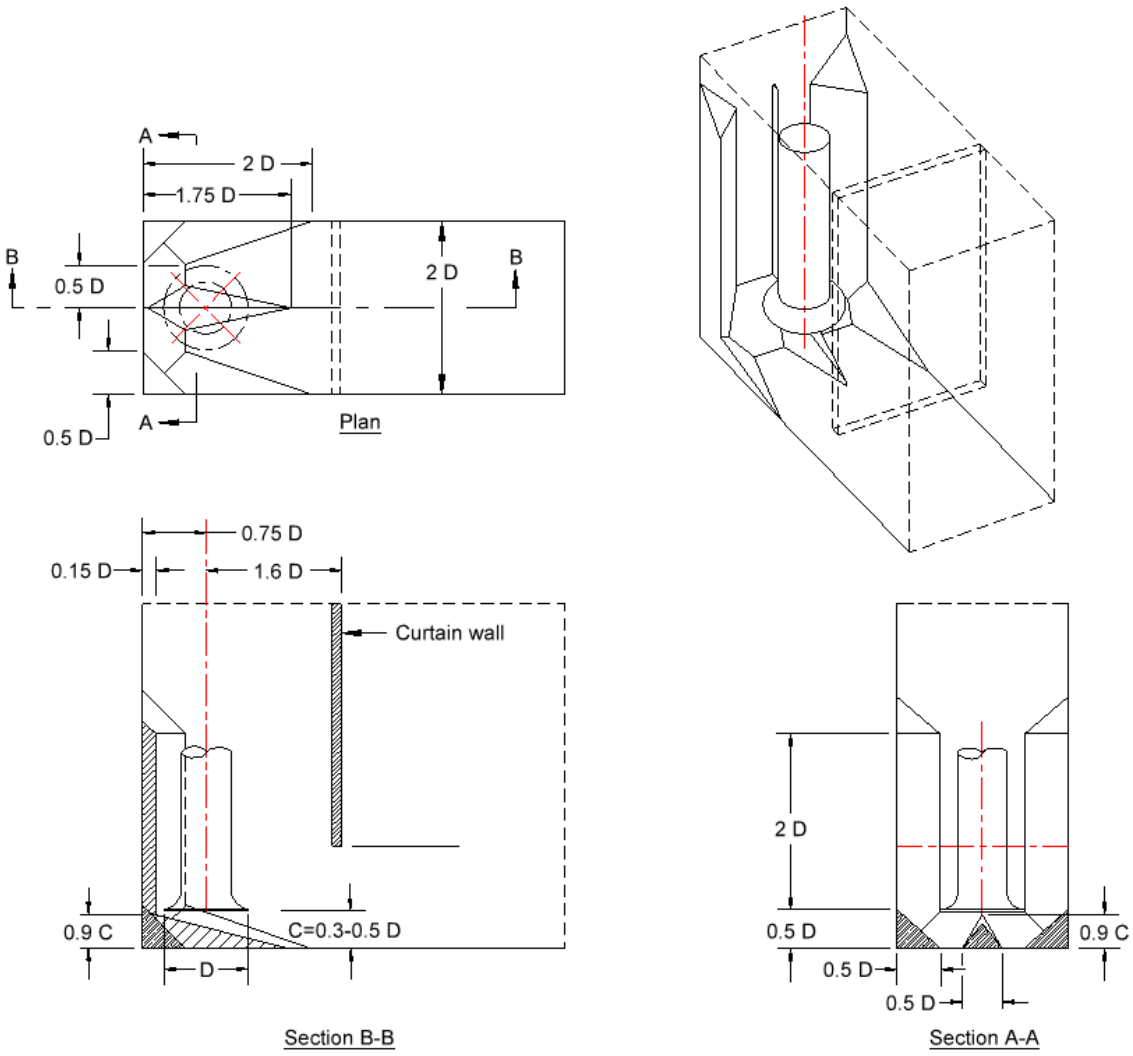


Accessories

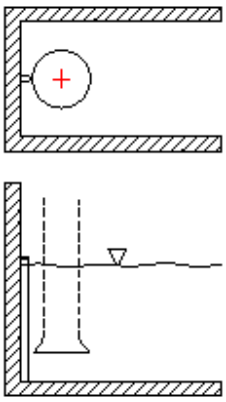
Accessories must be ordered separately. Contact GEM.

Anti-vortex device

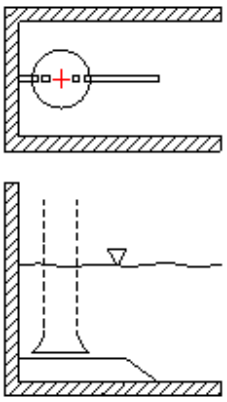
The anti-vortex device provides an optimal inlet flow to a vertically installed **SG** axial-flow pump.The anti-vortex device prevents cavitation, pre-swirls, fluid separation and reduces vortices.



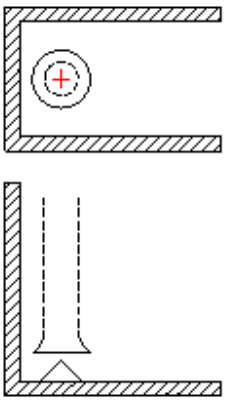
A1. Combination of correction curtain wall



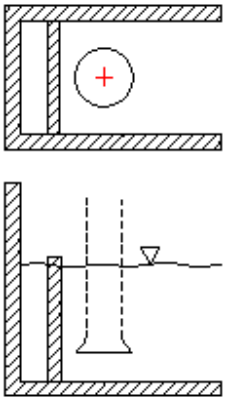
1. Wall splitter plate



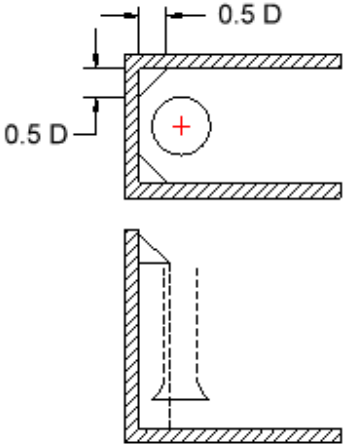
2. Floor splitter plate



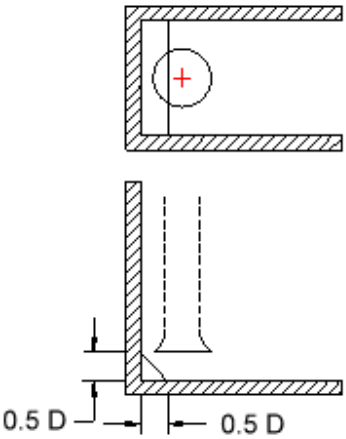
3. Floor cone



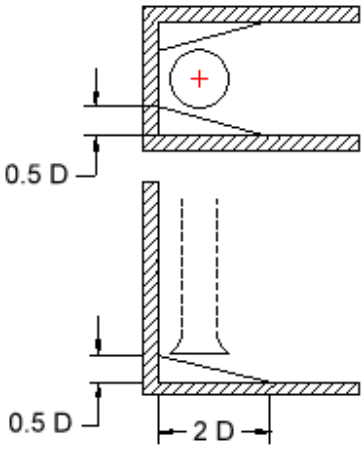
4. Backwall



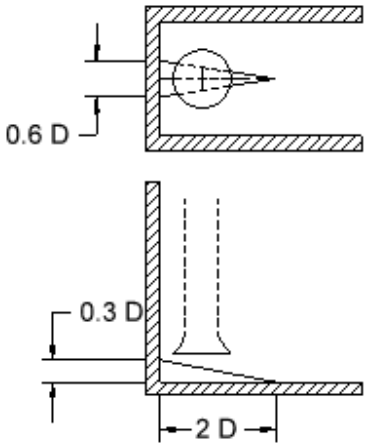
5. Corner fillets



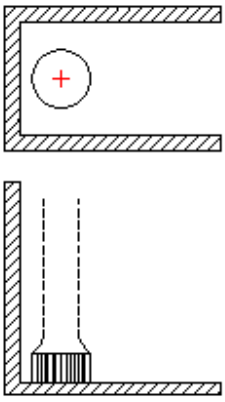
6. Backwall fillets



7. Sidewall fillets



8. Center splitter



9. Strainer with guid vanes

A2. Methods to reduce subsurface vortices (Examples 1-9)

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