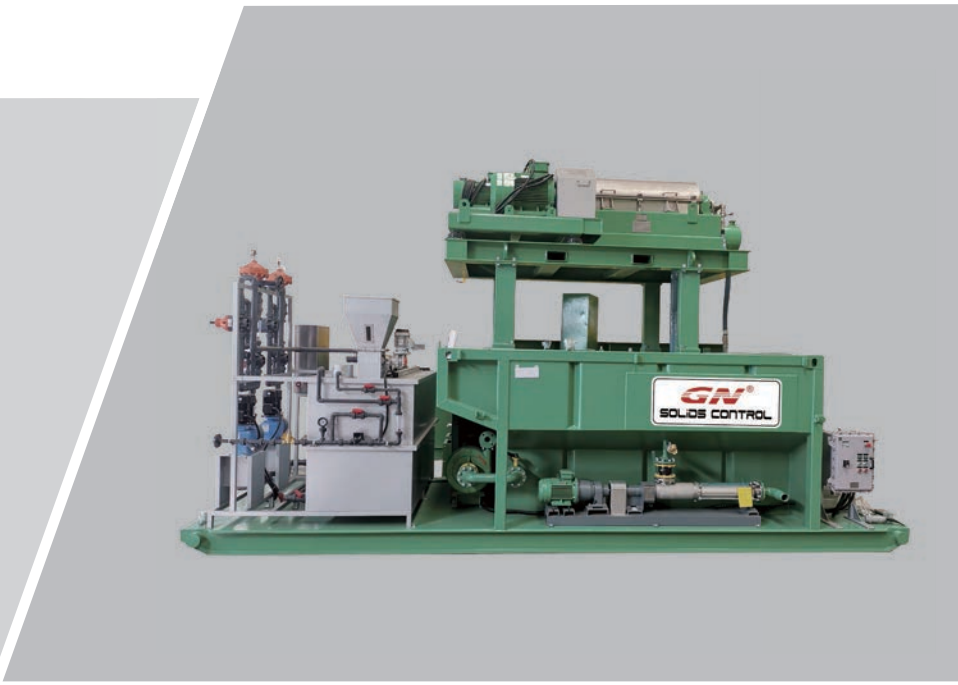
GN®
SOLIDS CONTROL



Mud Recycling System

Trenchless / Piling / TBM

Hebei GN Solids Control Co.,Ltd.

Content

Part 1: Company Profile

1.1 Company Introduction

Hebei GN Solids Control Co., Ltd. has specialized in solids control and mud recycling equipment for more than 15 years. GN stands as one of the largest manufacturers of solids control equipment globally. We operate three factories spanning a total area of 110,000 square meters in China and maintain branch offices with service capabilities in both the United States and Australia. Designated as a National High-Tech Enterprise, GN boasts a robust management system. Since 2010, we have consecutively held the American API Quality Management System Certification for 14 years and maintained China Classification Society certifications for ISO9001, ISO14001, and ISO45001 over many years. Our solids control equipment bears certifications from EU CE, ATEX, and International IECEx. GN employs an ERP Cloud + CRM Cloud management system for seamless production and operation, ensuring digital control over the production process and quality traceability. Approximately 70% of our products are exported internationally, reaching over 70 countries worldwide.

1.2 GN Solids Control Strength

Rich Experience :

Since 2007, GN has accumulated over 16 years of expertise in researching, developing, and manufacturing solids control equipment. GN is recognized as both a National High-Tech Enterprise and a nationally renowned specialized, innovative Small Giant Enterprise.

Robust Manufacturing Capabilities :

Occupying a total area of 110,000 square meters, GN Solids Control boasts three primary manufacturing facilities equipped with cutting-edge machinery, including Automatic Welding Robot Workstations, Large Laser Cutting Machines, Advanced CNC Machining Centers, and Large Automatic Injection Molding Machines for shaker screens.

Well-established Management System :

GN has earned certifications for ISO 9001, ISO 14001, ISO 45001, as well as the American API Q1 Quality Management System. Additionally, GN's products have secured EU CE and ATEX certifications. GN utilizes an ERP Cloud+CRM Cloud management system.

Extensive Market Share :

Our products are exported to more than 70 countries and regions globally, gaining wide recognition from both domestic and international customers. Furthermore, we have established branches in Houston, USA, and Brisbane, Australia.

1.3 GN Tangshan Factory

1

Area of 80,000 ㎡
(860,000SF)

2

Office Size of 10,000 ㎡
(107,000SF)

3

Available for
equipment and
Package
Mud System

1.4 GN USA Facility

GN Solids America is a branch company of GN Solids Control China. GN Solids America is located in Houston, Texas. With our professional team and workshop and warehouse in Houston, TX, we can offer better service to the North and South American customers. In our Houston office, we have employees speaking Chinese, English and Spanish which help us to communicate with customers more smoothly.

1.5 GN Solids Australia

GN Solids Control Australia branch: GN Solids Australia is the first sub-company of a Chinese solid control equipment manufacturer registered within Australia domestically. The company is located in Brisbane, Australia. It has the functions of equipment and accessory storage, equipment maintenance and assembly, and office. GN Australia company provides equipment sales and leasing businesses.

1.6 GN Factory

1.6.1 Blanking Workshop

Large CNC Laser Pipe Cutting Machine

Large CNC Laser Plate Cutting Machine

1.6.2 Welding Workshop

Robot Welding Production Lines for Solids Control Equipment

1.6.3 CNC Machining Workshop

Centrifuge and Pumps Production by CNC lathe, CNC machining center and Balance Machine etc.

1.6.4 Coating Workshop

Include Sand and Ball Blasting Machine, Painting and Powder Coating Production Line (Control Ambient Air for High quality)

1.6.5Assembly Shop

Available for Individual Equipment or Package Mud System Assembly

1.6.6 GN Langfang Factory

Langfang No.1 Factory

Langfang No.2 Factory

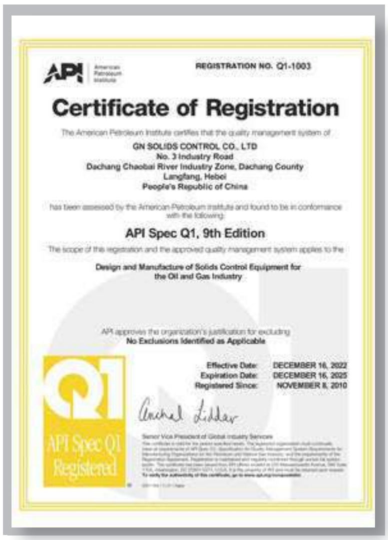
1.7 GN Certificates

- ISO9001 Quality Management Certificate
- ISO14001 Environment Management Certificate
- ISO45001 HSE Certificate
- America API Q1 Certificate
- Russia EAC Certificate
- Europe CE Certificate
- China Explosion Proof Certificate
- International IECEX certificate
- Europe ATEX certificate
- National Small Giant Enterprise


质量管理体系认证证书
QUALITY MANAGEMENT SYSTEM CERTIFICATE
HEBEI GN SOLIDS CONTROL CO., LTD.


环境管理体系认证证书
ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE
HEBEI GN SOLIDS CONTROL CO., LTD.


职业健康安全管理体系认证证书
OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATE
HEBEI GN SOLIDS CONTROL CO., LTD.


API American Petroleum Institute

REGISTRATION NO. Q1-1003

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

GN SOLIDS CONTROL CO., LTD
No. 3 Industry Road
Dachang Chaobai River Industry Zone, Dachang County
Langfang, Hebei
People's Republic of China

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Spec Q1, 9th Edition

The scope of this registration and the approved quality management system applies to the

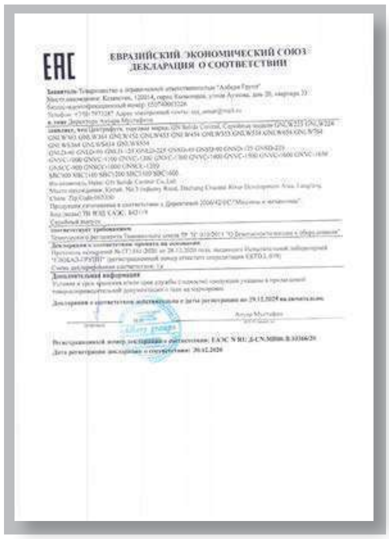
Design and Manufacture of Solids Control Equipment for the Oil and Gas Industry

API approves the organization's justification for excluding:
No Exclusions Identified as Applicable

Effective Date:	DECEMBER 16, 2022
Expiration Date:	DECEMBER 16, 2025
Registered Since:	NOVEMBER 8, 2010

Senior Vice President of Global Industry Services

API Spec Q1 Registered


EAC

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ
ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ


SZUTEST

CERTIFICATE
ATTESTATION OF CONFORMITY


TÜV NORD

EU-Type-Examination Certificate


cml B.V.

eurofins

Certificate of Receipt of Technical Documentation

Number: CML 20ATEXT310 Issue 0


IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

National Small Giant Enterprise


SZUTEST

CERTIFICATE
ATTESTATION OF CONFORMITY


UDEM

CERTIFICATE
ATTESTATION
CERTIFICATE OF MACHINERY DIRECTIVE

Part 2: Economy Mud Recycling System

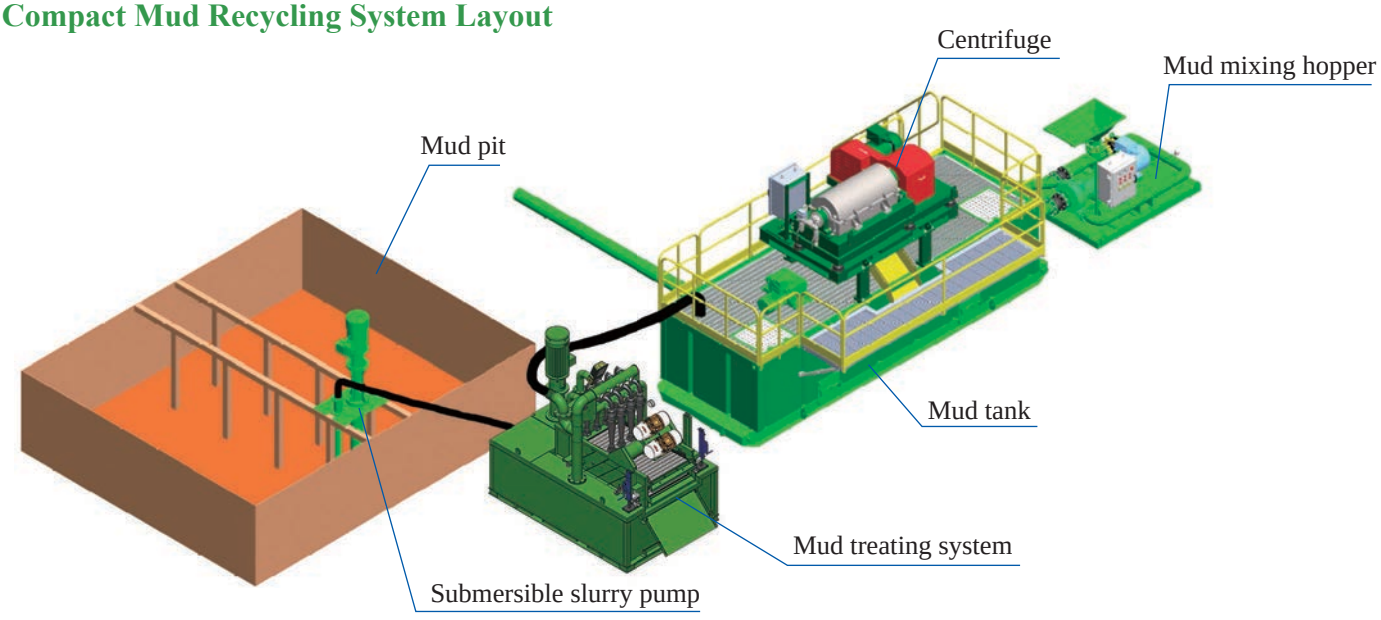
2.1 GN Economy Mud Recycling System Brief Introduction

GN Solids Control manufactures 2 main series of mud recycling systems: K series are economy mud recycling systems and B series are self contained mud recycling systems. GN K series are largely used in mud cleaning and recycling without mud storage and mixing function, an extra storage tank and a mixing unit are needed.GN B series mud system integrated with the function of mud recycling, mud storage and mud mixing, it meet the demands of middle to large drilling rigs with excellent multiple stages separation feature.

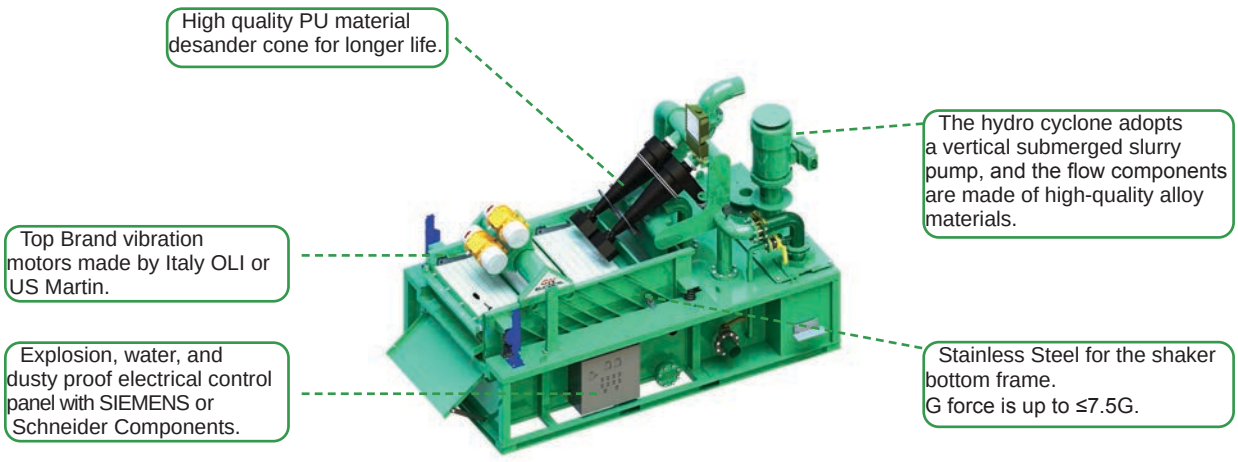
Here are K series brief introduction:

K Series Mud Recycling Models:	K Series Product Main Applications:
• GNMS-200K Capacity:200GPM, 50m^3/h • GNMS-500K Capacity:500GPM, 120m^3/h • GNMS-1000K Capacity:1000GPM, 240m^3/h • Other models should be customized	• Trenchless HDD Project • Bored Pile Project • Micro TBM(Tunnel Boring Machine) • Diamond Drilling, Water Well Drilling etc

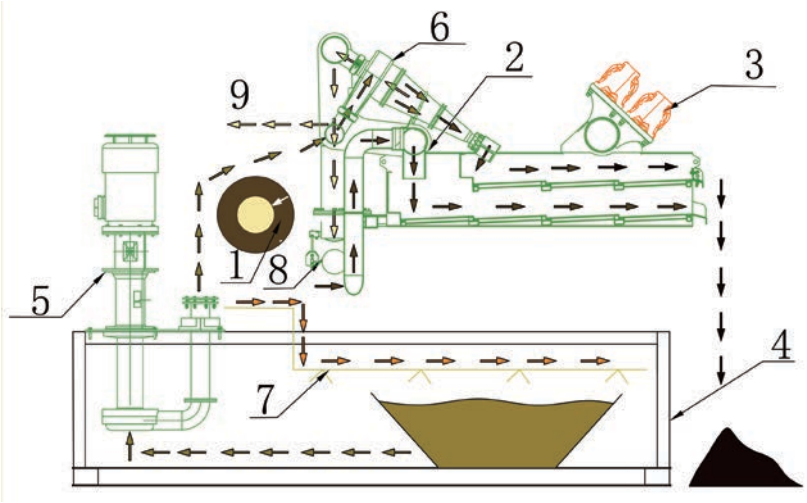
Compact Mud Recycling System Layout



2.2 GN Economy Mud Recycling System Features



2.3 GN Economy Mud Recycling System Working Principle



1.Mud Pit
2.Buffer Box
3.Shale Shaker
4.Mud Tank
5.Slurry Pump
6.Hydrocyclone
7.Flushing Line
8.Float Ball Level Switch
9. Output to system

Mud treatment process:

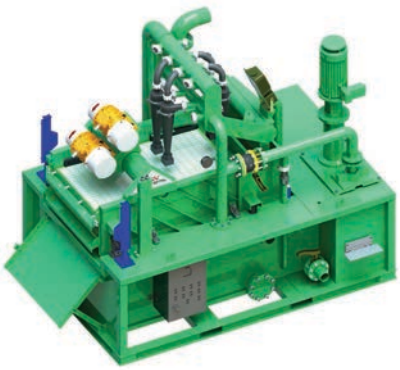
The slurry with a large amount of sediment from the No. 1 mud pit is pumped into the No.2 buffer box by an external pump. It is then led from the No. 2 box to the lower screen of the No. 3 shale shaker for screening. Large sediment particles are discharged out of the system, and the slurry with small solid particles passes through the lower screen and falls into the No. 4 mud tank. The slurry in the No. 4 tank is powered by the No. 5 slurry pump and sent from the inlet of the No. 6 hydrocyclone into it. After the vortex centrifugal separation in the No. 6 hydrocyclone, the sediment is discharged from its bottom outlet, falls onto the upper screen of the No. 3 shaker for drying and discharging. The clean slurry after separation overflows from the top outlet of the No. 6 hydrocyclone into the No. 4 tank. When the liquid level in the No. 4 tank is below the designed closing height of the No. 8 float ball level switch, the device is open and the clean slurry enters the No. 4 tank, forming an internal self-circulation. When the liquid level reaches the designed height, the device closes and the clean slurry overflows from the upper outlet of the No. 4 tank into the onsite slurry storage tank.

When sedimentation occurs at the bottom of the No. 4 slurry tank, the valve can be switched to open the No. 7 flushing line. The slurry is sprayed through the flushing nozzles to circulate and stir, realizing the cleaning of the sediment in the tank.

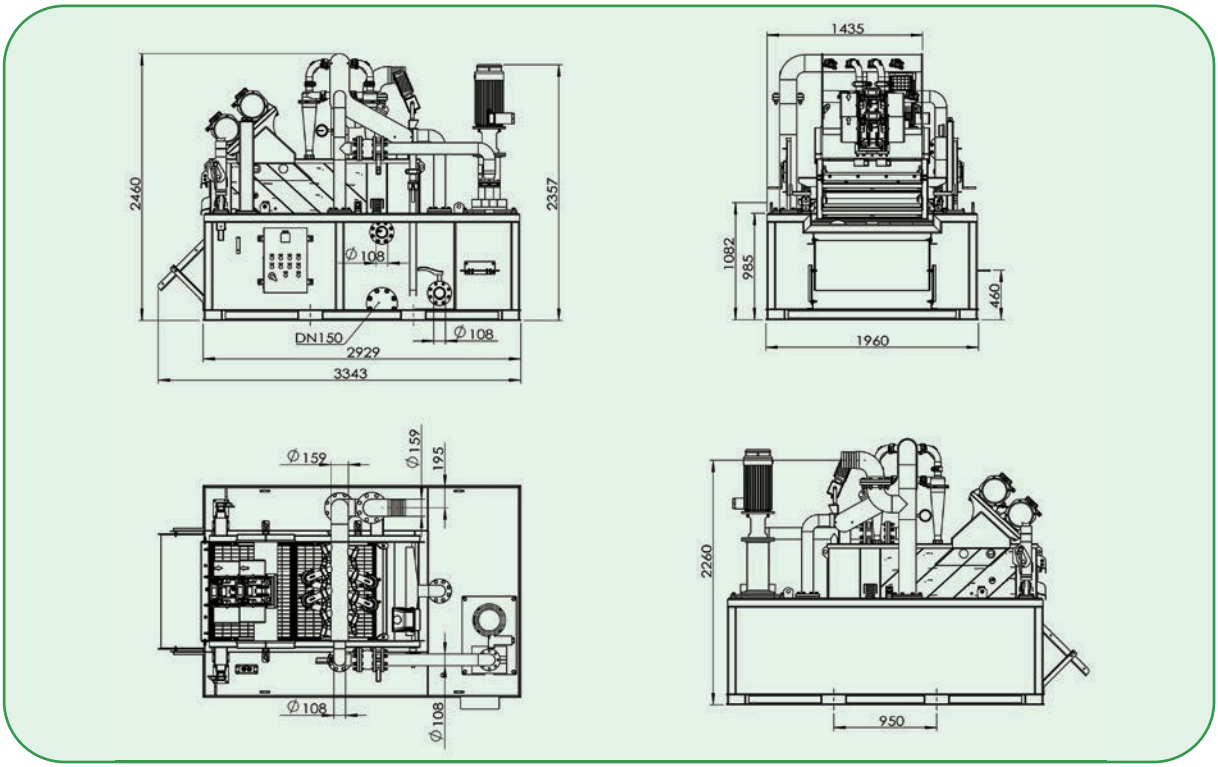
2.4 GNMS-200K Economy Mud Recycling System

GNMS-200K Technical Specifications

Model	GNMS-200K
Capacity	45 m^3/h(200GPM)
Cutting Point	25 microns
Mud Cleaner	GNZS754K-Y4N
Vibration Strength	≤ 7.5 G(Adjustable)
Bottom Screen Area	1.4 m^2
Upper Screen Area	1.4 m^2
Desilter Size	4 inches
Cone Quantity	4 pcs
Desilter Feeding Pump	GN80YZ50-20J
Transfering Tank Volume	3.4 m^3
Total Power	10.58 kw
backwash device	Include
Remote Control	Include
Inland Transport Dimension(mm)	L2929xW1960xH2460 mm
Operation Dimension(mm)	L3343xW2067xH2460 mm
Total Weight	3000 kg



GNMS-200K Dimensional Drawing(mm)

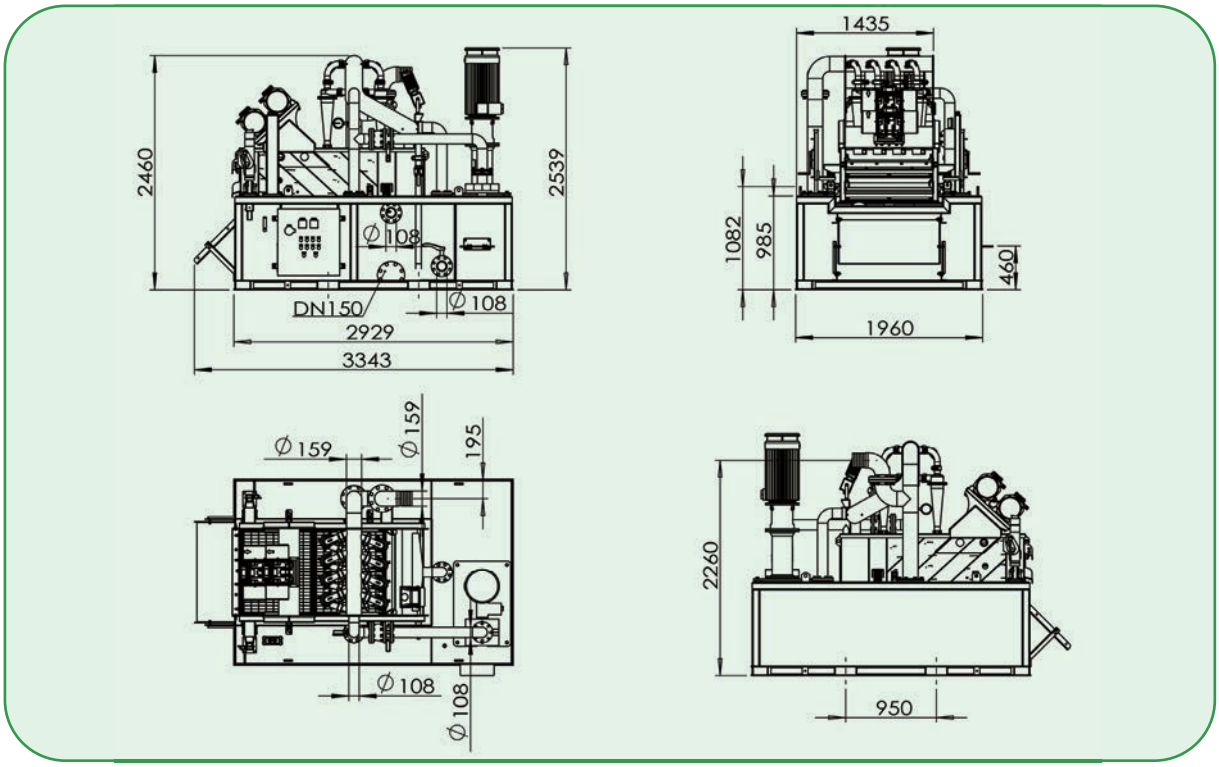


2.5 GNMS-500K Economy Mud Recycling System

GNMS-500K Technical Specifications

Model	GNMS-500K
Capacity	120 m^3/h (500GPM)
Cutting Point	25 microns
Mud Cleaner	GNZS754K-Y10N
Vibration Strength	≤7.5 G(Adjustable)
Bottom Screen Area	1.4 m^2
Upper Screen Area	1.4 m^2
Desilter Size	4 inches
Cone Quantity	10 pcs
Desilter Feeding Pump	GN100YZ100-30J
Transfering Tank Volume	3.4 m^3
Total Power	25.08 Kw
backwash device	Include
Remote Control	Include
Inland Transport Dimension	L2929xW1960xH2539 mm
Operation Dimension	L3343xW2067xH2539 mm
Total Weight	3165 kg

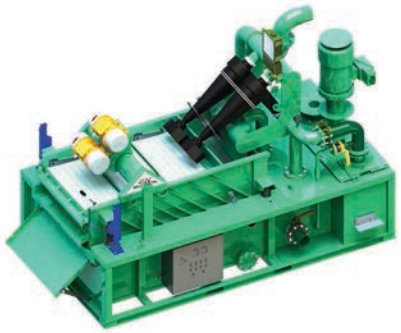
GNMS-500K Dimensional Drawing(mm)



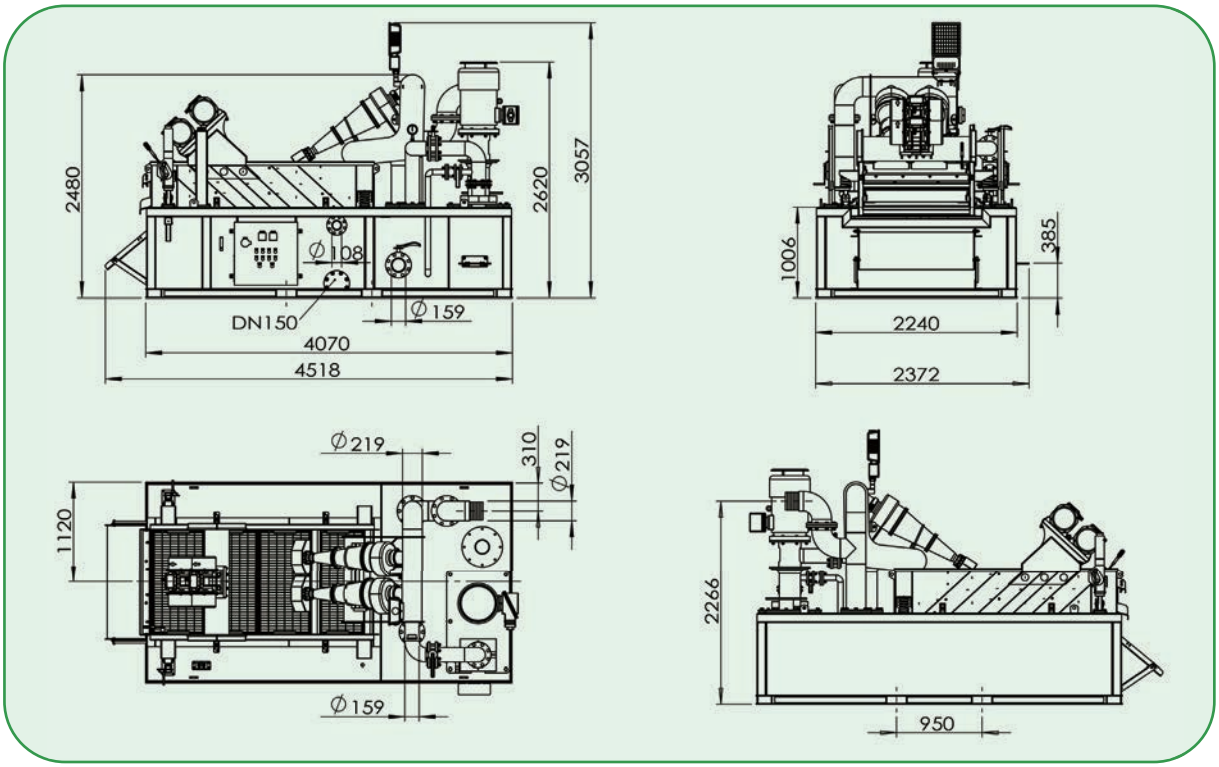
2.6 GNMS-1000K Economy Mud Recycling System

GNMS-1000K Technical Specifications

Model	GNMS-1000K
Capacity	240 m^3/h (1000GPM)
Cutting Point	40 microns
Mud Cleaner	GNZS597K-Y2S
Vibration Strength	≤7.5 G(Adjustable)
Bottom Screen Area	2.73 m^2
Upper Screen Area	2.05 m^2
Desander Size	10 inches
Cone Quantity	2 pcs
Desilter Feeding Pump	GN150YZ250-40BJ
Transfering Tank Volume	5 m^3
Total Power	48.96 KW
backwash device	Include
Remote Control	Include
Inland Transport Dimension	L4070xW2240xH2480 mm
Operation Dimension(microns)	L4518xW2372xH3057 mm
Total Weight	3750 kg



GNMS-1000K Dimensional Drawing(mm)



Part 3: Self Contained Mud Recycling System

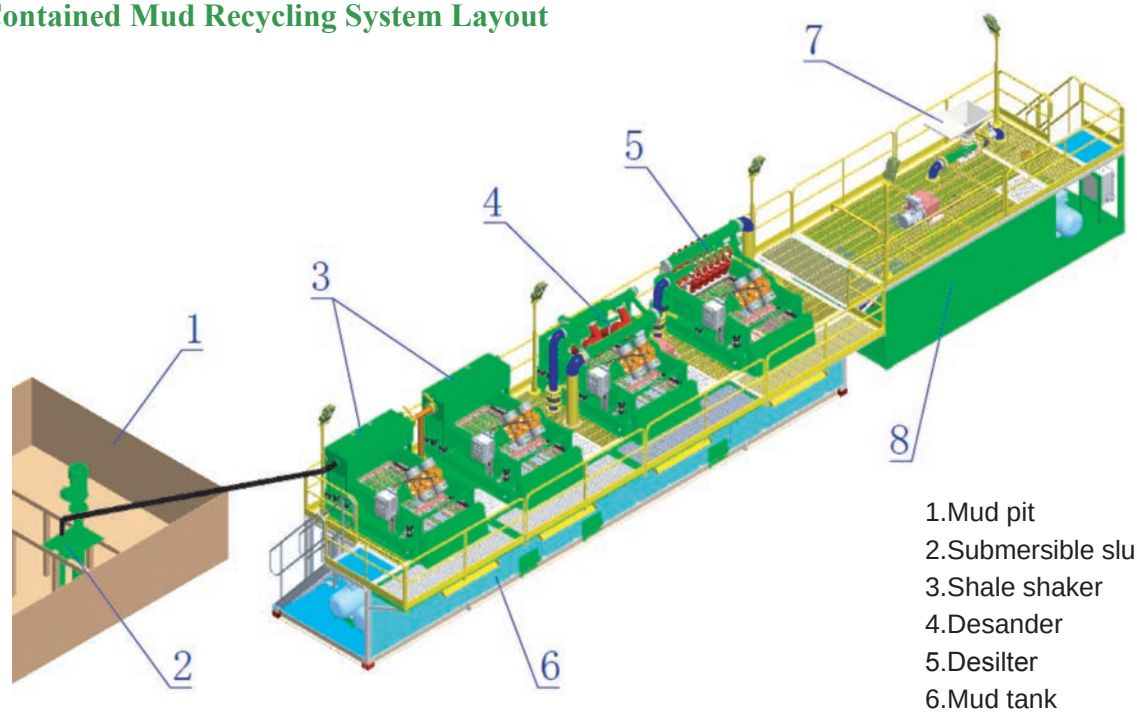
3.1 B Series Self Contained Mud Recycling System

GN Solids Control manufactures 2 main series of mud recycling systems: K series are economy mud recycling systems and B series are self contained mud recycling systems. GN K series are largely used in mud cleaning and recycling without mud storage and mixing function, an extra storage tank and a mixing unit are needed.GN B series mud system integrated with the function of mud recycling, mud storage and mud mixing, it can meet the demands of middle to large drilling rigs with excellent multiple stages separation feature.

Here are B series brief introduction:

B Series Mud Recycling System:	B Series Product Main Applications
• GNMS-200B Capacity:200GPM, 50m^3/h • GNMS-400B Capacity:400GPM, 100m^3/h • GNMS-600B Capacity:600GPM, 150m^3/h • GNMS-1000B Capacity:1000GPM, 200m^3/h • Other models should be customized	• Trenchless HDD Project • CBM Drilling, or Geothermal Well Drilling • Tunnel Boring Machine or Bored Pile Project • Water Well Drilling • Diamond Drilling, etc.

Self Contained Mud Recycling System Layout



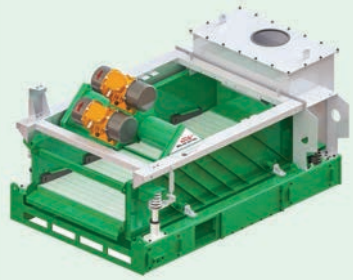
1.Mud pit
2.Submersible slurry pump
3.Shale shaker
4.Desander
5.Desilter
6.Mud tank
7.Mixing hopper
8.Storage tank

3.2 B Series Self Contained Mud Recycling System Models

Model	Capacity	Screen Area	Separation Stage	Tank Volume	Total Power	Total Weight	Land Transport Dimension(mm)
GNMS-200B	45 m^3/h(200GPM)	2.8 m^2	2	5 m^3	24.11 kw	5.3 T	L4000×W2268×H2612
GNMS-400B	100 m^3/h(400GPM)	4.78 m^2	2	8.5 m^3	46.7 kw	8.3 T	L6000×W2268×H3075
GNMS-600B	150 m^3/h(600GPM)	4.78 m^2	2	15 m^3	71.71 kw	10 T	L8000×W2268×H3278
GNMS-1000B	240 m^3/h(1000GPM)	9.56 m^2	3	19.5 m^3	150.7 kw	23.4 T	L11500×W2267×H3597

Dimensions above are main equipment without disassemble. However, some equipment might need to be disassembled to meet inland shipping requirements if over height.

3.3 B Series Self Contained Mud Recycling System Features

General Description	●Standardized design from many years experience for reliable operation. ●Multi-function self-contained unit for mud cleaning, storage, and mud mixing. ●Self cleaning design with compact layout for easy tank cleaning. ●All the electrical control panels are made for explosion proof, water proof, and dust proof. ●Walkways with handrails can be fold down at tank side for transportation.
	●Linear motion shale shaker with adjustable G force up to 7.5G ●Shaker bottom frame is made from stainless steel with rubber sealing protection. ●Top brand vibration motors from Italy OLI or US Martin Brand. ●Rubber covered dumping spring for less noise and long life. ●Wedge type pretensioned screen for fast screen change.
	●Clamp type PU material cyclones for long life and easy maintenance. ●10 inch desander cone for cut point 40-50 microns. ●4 inch desilter cones for cut point 20-25 microns.
Other Products	●All centrifugal pumps are mechanical seal for long life and easy maintenance. ●C Face flange connection mud agitator with FAG bearing. ●Anti-abrasive PU material mud gun Nozzle and venture hopper Nozzle for long life. ●Zinc rich epoxy coating from top brand Japan Kansai. ●Pump inlet with lug type valve for easy maintenance.

3.4 Skid Mounted GN Mud Recycling System

GN B series self-contained mud recycling system can be customized with a skid mounted tank, hydraulic jackup tank or trailer mounted tank. GN is one of the first companies who developed the fast hydraulic jackup mud system.

Skid Mounted Mud System

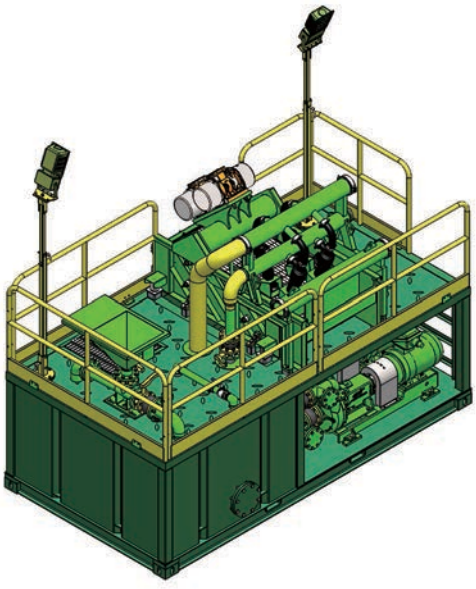
Hydraulic Jackup Mud System

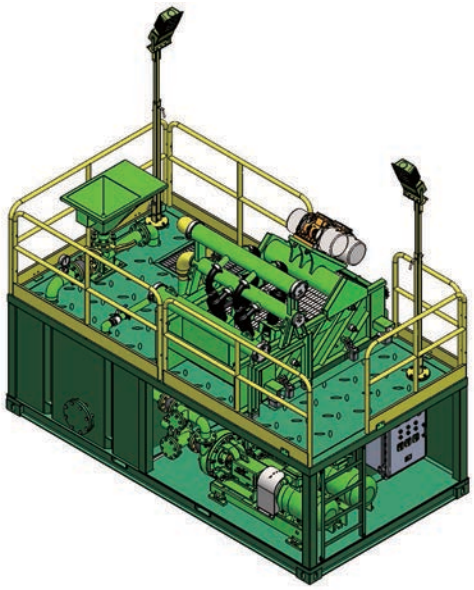
Trailer Mounted Mud System

3.5 GNMS-200B Self-Contained Mud Recycling

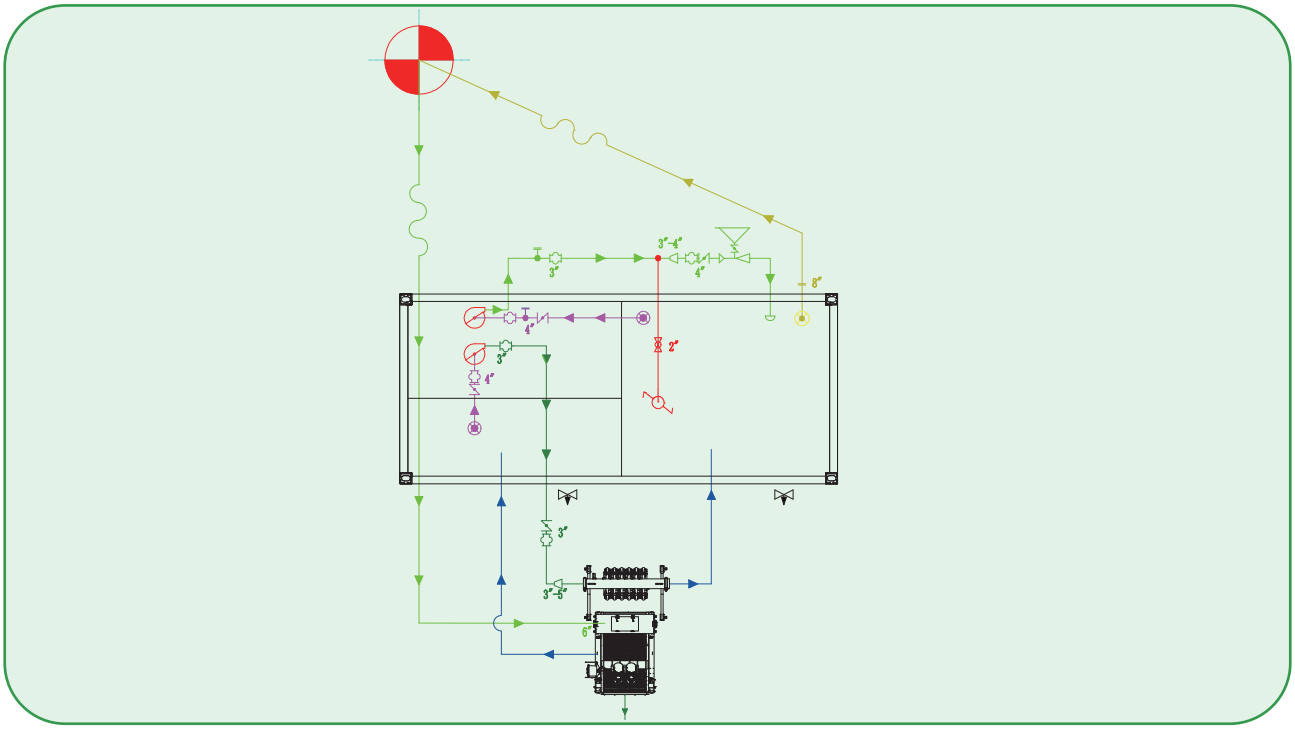
GNMS-200B Technical Specifications

Model	GNMS-200B
Capacity	45 m^3/h(200GPM)
Cut Point	25 microns
Mud Cleaner	GNZJ754K-4N
Vibration Strength	7.3 G(adjustable)
Bottom Screen Area	1.4 m^2
Upper Screen Area	1.4 m^2
Desilter Size	4 inches
Cone Number	4 pcs
Desilter Feeding Pump	50Hz: GNSB4×3C-11J 60Hz: GNSB4×3C-9.5J
Mixing Pump	50Hz: GNSB4×3C-11J 60Hz: GNSB4×3C-9.5J
Mixing Hopper	GNSLDMB
Mud Gun(1)	GNNJQ50-3GA
Lighting System (Three)	2×GNLZM110A+1×GNXZM11A
Total Power	24.27 kw
Total Volume	5 m^3
Inland Shipping Dimension	L4000×W2268×H2612 mm
Operation Dimension	L4000×W2779×H3808 mm
Total Weight	5300 kg



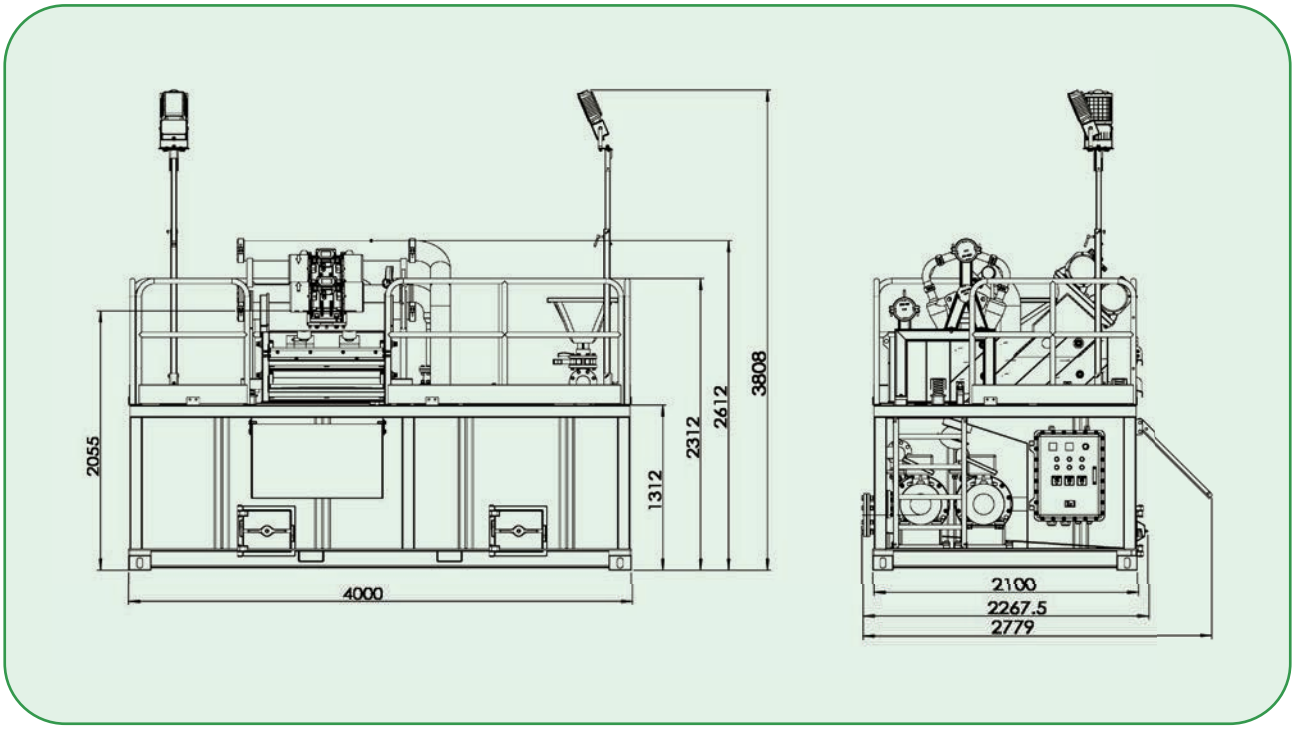


GNMS-200B Working Process



GNMS-200B Dimensional Drawing (In mm)

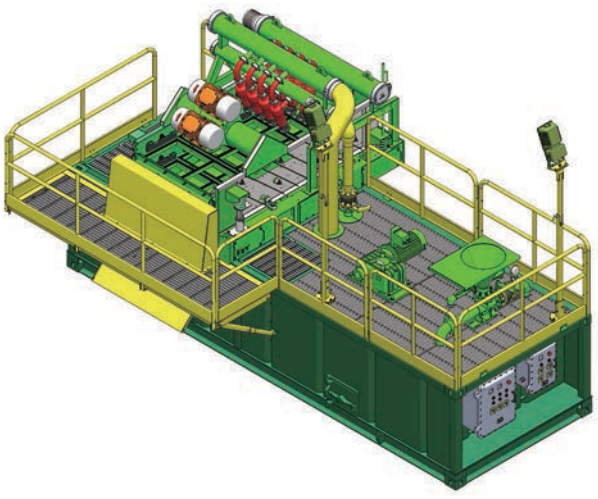
Compact structure suitable for inland shipping in most of countries without removing the equipment from tank. After disassembling equipment on tank top, can be fit in standard ISO container by sea.

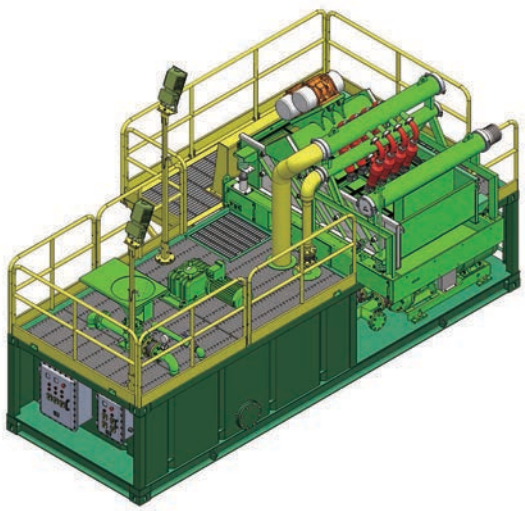


3.6 GNMS-400B Self-Contained Mud Recycling

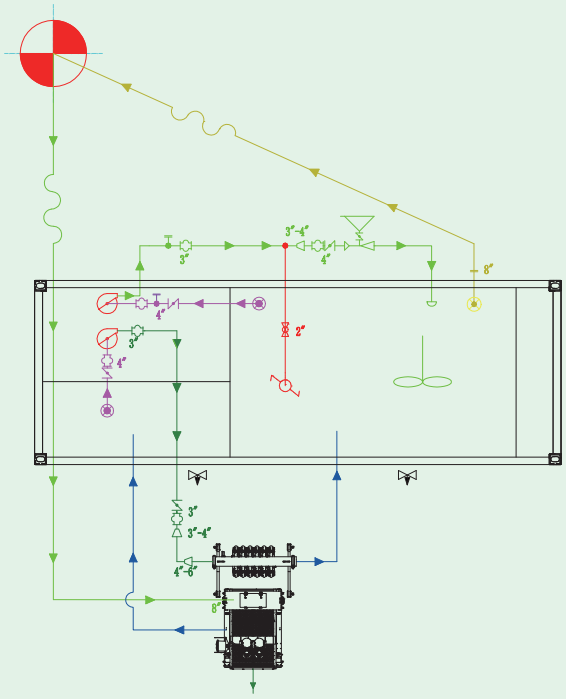
GNMS-400B Technical Specifications

Model	GNMS-400B
Capacity	100 m^3/h(400GPM)
Cut Point	25 microns
Mud Cleaner	GNZJ597K-8N
Vibration Strength	7.3 G(Gadjustable)
Bottom Screen Area	2.73 m^2
Upper Screen Area	2.05 m^2
Desilter Size	4 inch
Cone Number	8 pcs
Desilter Feeding Pump	50Hz: GNSB4×3C-13J 60Hz: GNSB4×3C-12J
Mixing Pump	50Hz: GNSB4×3C-13J 60Hz: GNSB4×3C-12J
Mixing Hopper	GNSLDMB
Agitator(One)	GNJBQ055G(5.5KW)
Mud Gun(One)	GNNJQ50-3GA
Lighting System (Three)	2×GNLZM110A+1×GNXZM11A
Total Power	46.7 kw
Total Volume	8.5 m^3
Inland Shipping Dimension	L6000×W2268×H3075 mm
Operation Dimension	L6000×W3632×H3808 mm
Total Weight	8300 kg



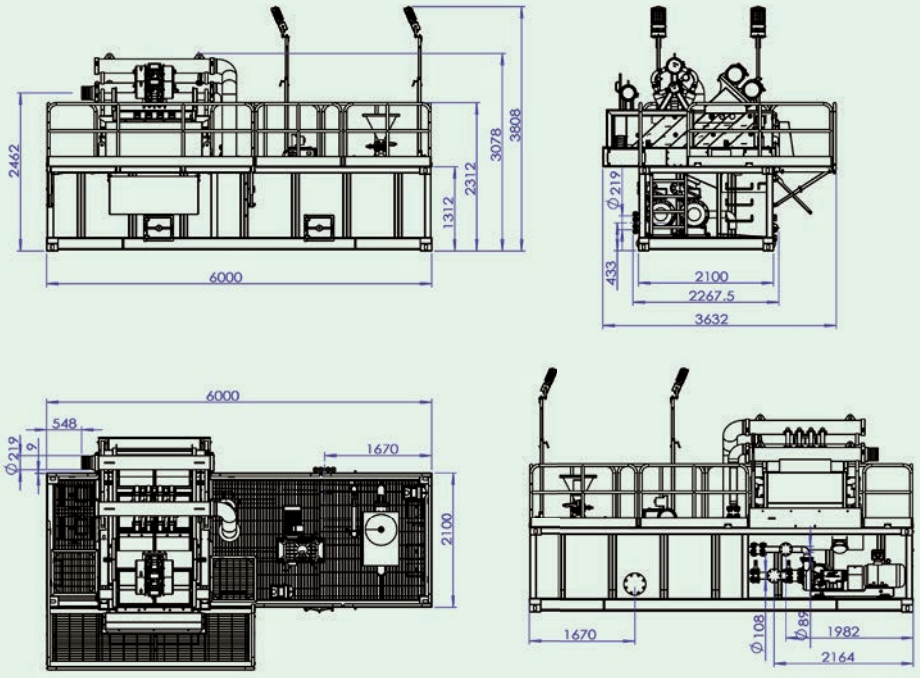


GNMS-400B Working Process



GNMS-400B Dimensional Drawing (In mm)

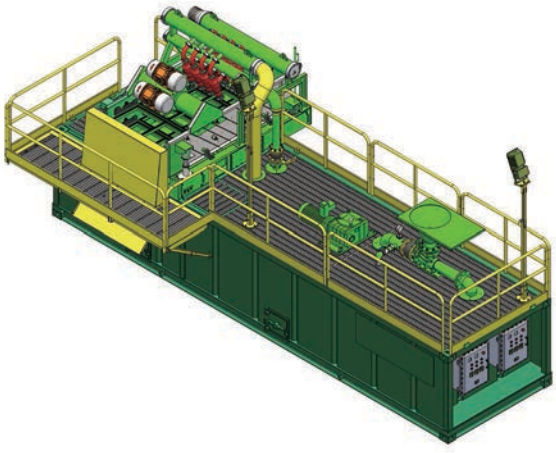
Compact structure suitable for inland shipping in most countries without removing the equipment from tank. After disassembling equipment on tank top, can fit in standard ISO container and ship by sea.

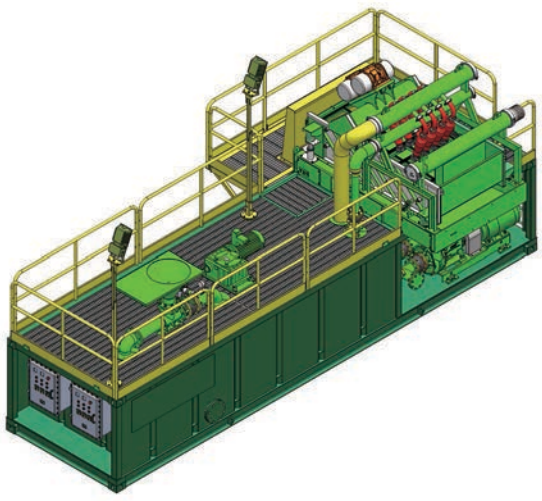


3.7 GNMS-600B Self-Contained Mud Recycling

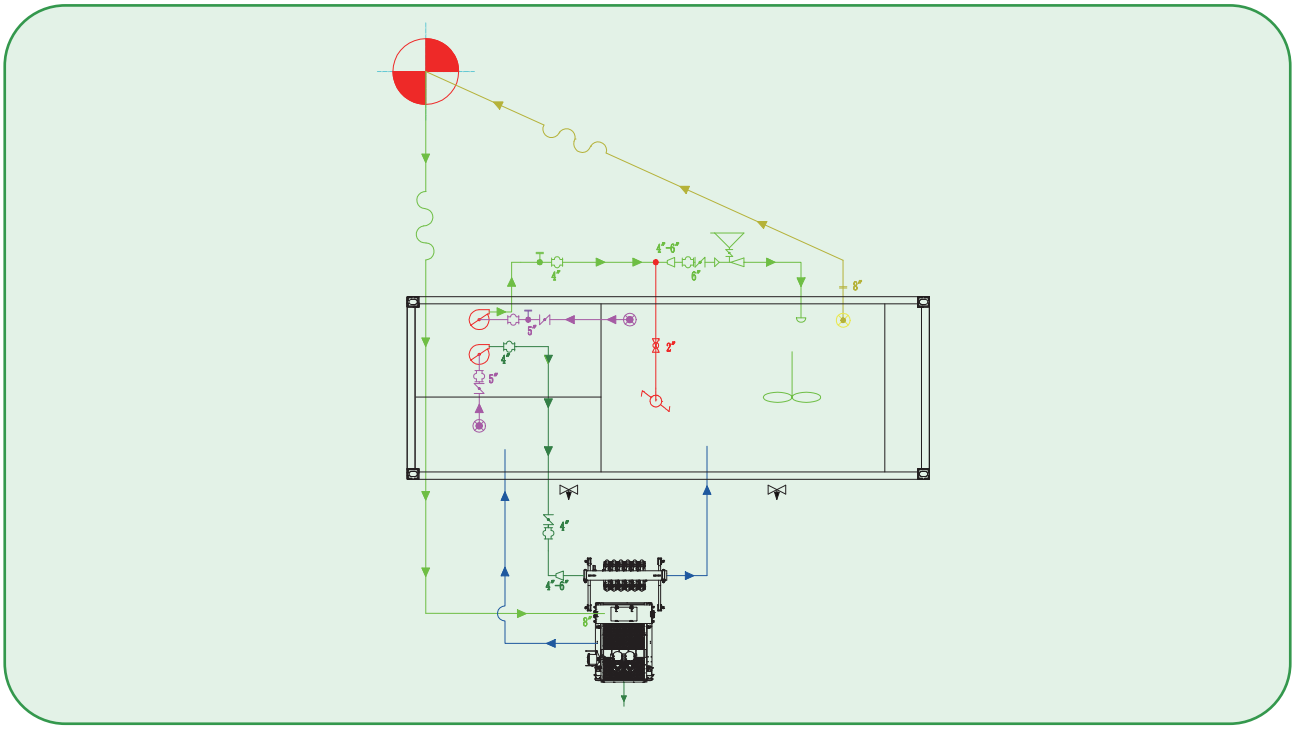
GNMS-600B Technical Specifications

Model	GNMS-600B
Capacity	150 m^3/h(600GPM)
Cut Point	25 microns
Mud Cleaner	GNZJ597K-12N
Vibration Strength	7.3 G(adjustable)
Bottom Screen Area	2.73 m^2
Upper Screen Area	2.05 m^2
Desilter Size	4 inch
Cone Number	12 pcs
Desilter Feeding Pump	50Hz: GNSB5×4C-13J 60Hz: GNSB5×4C-11J
Mixing Pump	50Hz: GNSB5×4C-13J 60Hz: GNSB5×4C-11J
Mixing Hopper	GNSLDSB
Agitator(One)	GNJBQ075G(7.5Kw)
Mud Gun(One)	GNNJQ50-3GA
Lighting System (Three)	2×GNLZM110A+1×GNXZM11A
Total Power	71.65 kw
Total Volume	15 m^3
Inland Shipping Dimension	L8000×W2268×H3278 mm
Operation Dimension	L8000×W3675×H4008 mm
Total Weight	10000 kg



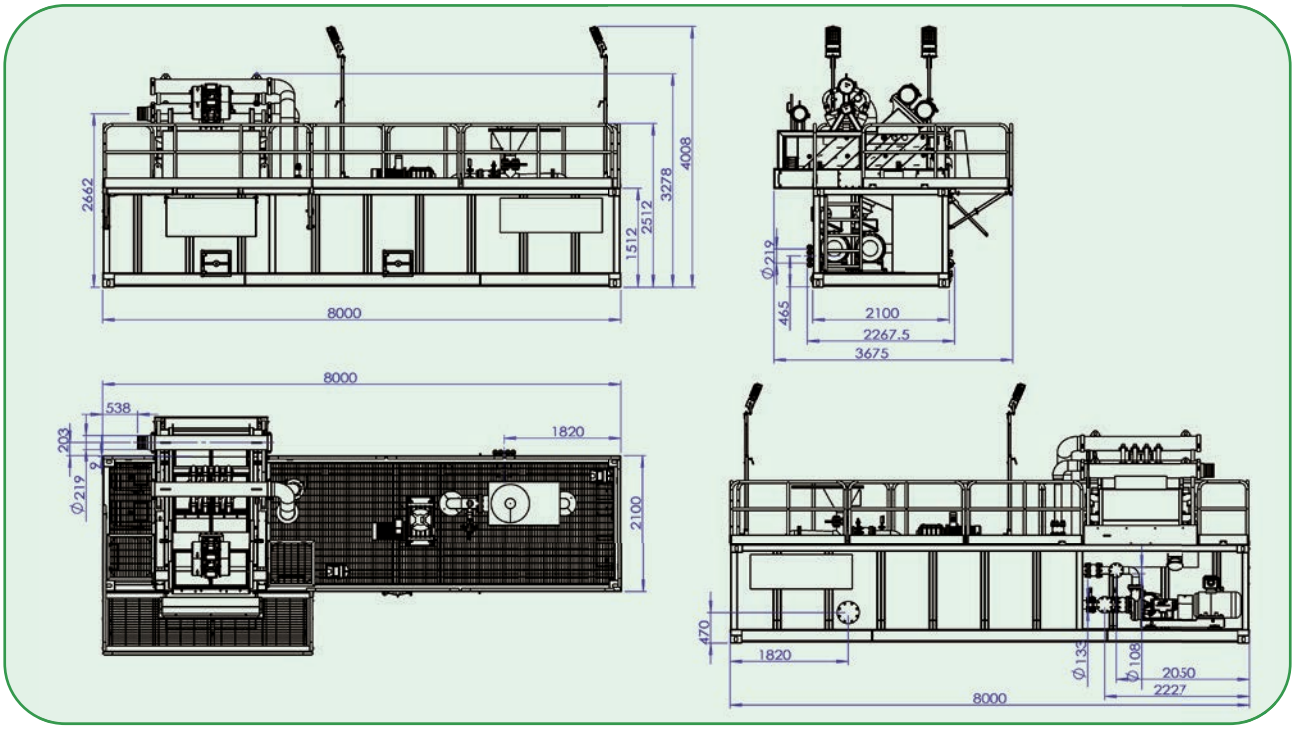


GNMS-600B Working Process



GNMS-600B Dimensional Drawing (In mm)

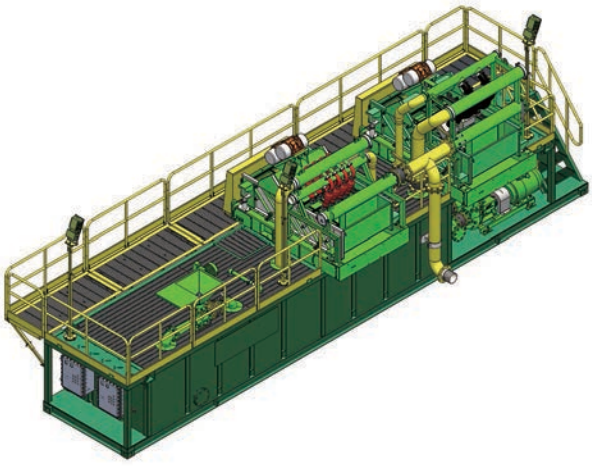
Compact structure suitable for inland shipping in most of countries without removing the equipment from tank. After disassembling equipment on tank top, can be fit in standard ISO container by sea.

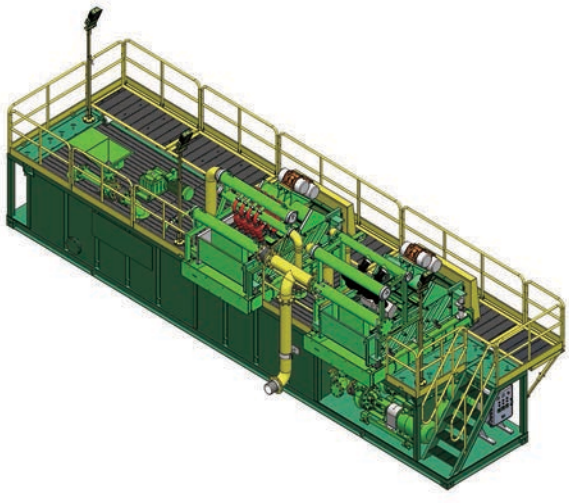


3.8 GNMS-1000B Self-Contained Mud Recycling

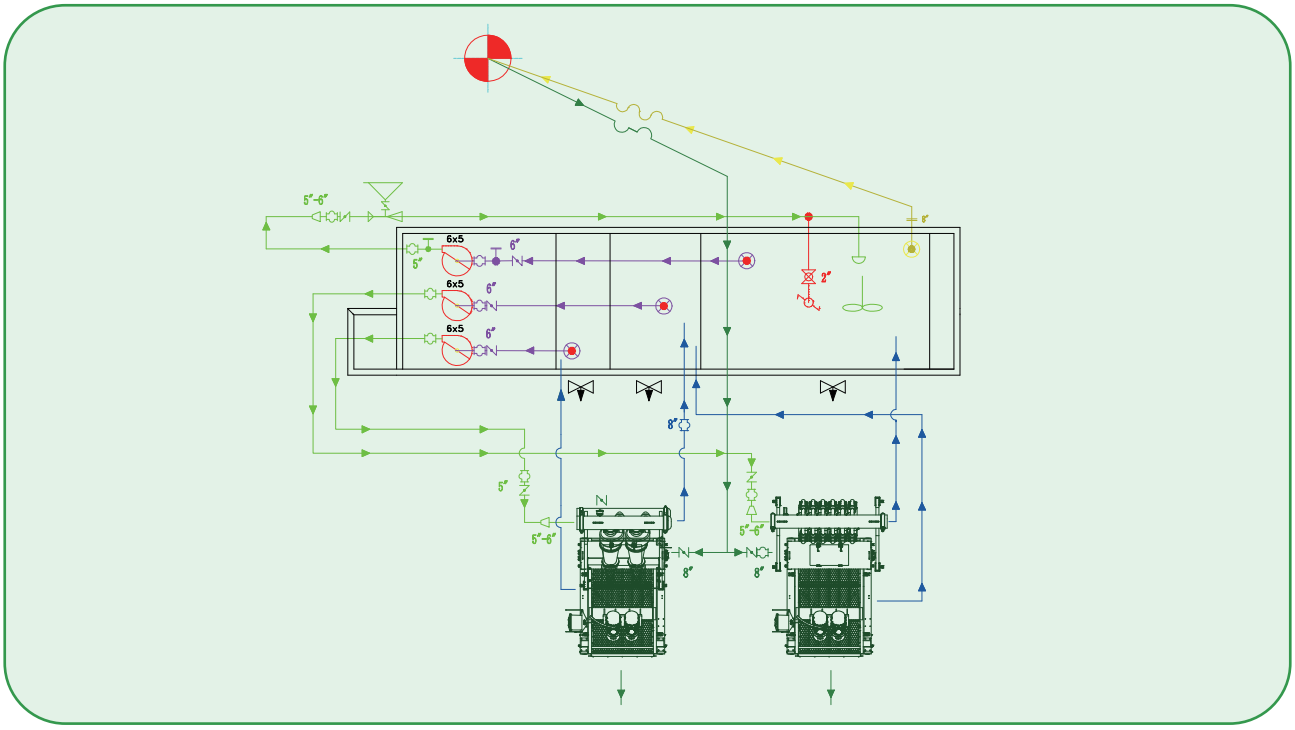
GNMS-1000B Technical Specifications

Model	GNMS-1000B
Capacity	240 m^3/h(1000GPM)
Cut Point	25 microns
Desander Cleaner	GNZJ597K-2S
Desilter Cleaner	GNZJ597K-16N
Vibration Strength	7.3 G(adjustable)
Desander Screen Area	4.78 m^2
Desilter Screen Area	4.78 m^2
Desander Cone	10 inch×2 pcs
Desilter Cone	4 inch×12 pcs
Cleaner Feeding Pump(Two)	50Hz: GNSB6×5C-13J 60Hz: GNSB6×5C-10J
Mixing Pump	50Hz: GNSB6×5C-13J 60Hz: GNSB6×5C-10J
Mixing Hopper	GNSLDSB
Agitator(One)	GNJBQ075D(7.5Kw)
Mud Gun(One)	GNNJQ50A-3G
Lighting System (Four)	3×GNLZM110A+1×GNXZM11A
Total Power	150.7 kw
Total Volume	19.5 m^3
Inland Shipping Dimension	L11500×W2267×H3564 mm
Operation Dimension	L11500×W3738×H4058 mm
Total Weight	23400 kg



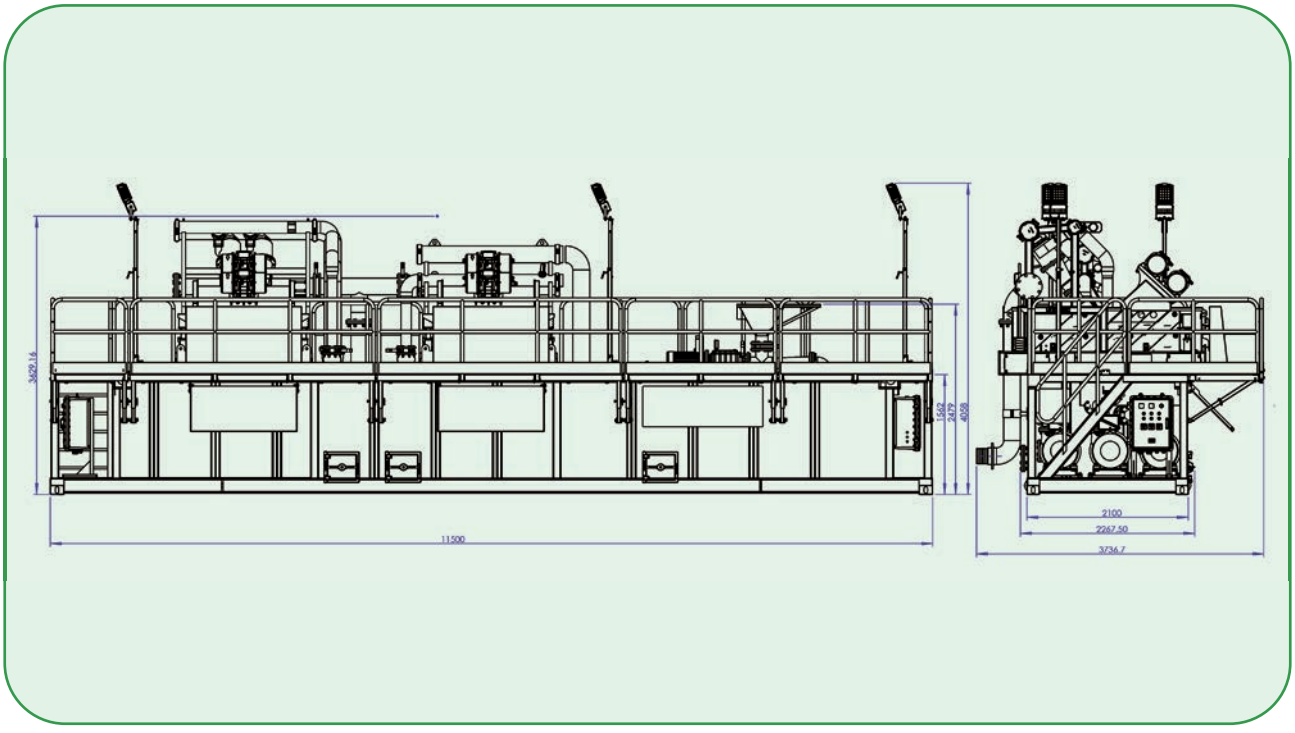


GNMS-1000B Working Process



GNMS-1000B Dimensional Drawing (In mm)

Compact structure suitable for inland shipping in most countries without removing the equipment from tank. After disassembling equipment on tank top, can fit in standard ISO container and ship by sea.



3.9 Project in different countries

• Australia

• Russia

• China CPP

• Thailand

• India

Part 4: TBM Slurry Separation Plant

4.1 TBM Slurry Separation Plant Brief Introduction

During the construction of TBM and Pipe Jacking, a large number of slurry contains sand and stones will be produced. In order to protect the environment and save water, it is necessary to separate the TBM mud. GN provides a complete product line of slurry separation plants, main equipment includes: shale shaker, desander, desilter, bottom drying shaker, feed pump and mud tank etc.

TBM and Pipe Jacking are often used in urban construction, which usually requires small working area and high treatment efficiency. GN TBM Slurry Separation Plant is specially designed to meet the above demands with a very compact foundation by optimal designing this treating system at different height levels. In order to meet the diversified operation requirements, GN TBM Slurry Separation Plant can be assembled by multiple modular units to achieve both small flow rate and large flow rate slurry treating. Besides, fast and easy disassemble guarantee GN TMB Slurry Separation Plant to move conveniently among different work sites.

GN TBM Slurry Separation Plant Features

1) Complete Package design for Turnkey Solutions
2) Modular, pre-assembled and small footprint units for easy and fast handling
3) 5-Phase Separation System for finer solids and more clear water

GN TBM Slurry Model

Model	Application
GNTBM-260 (260m^3/h) GNTBM-360 (360m^3/h) GNTBM-500 (500m^3/h)	Middle/Large TBM Construction

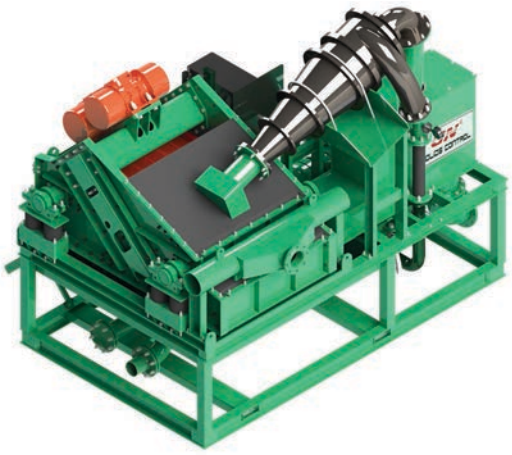
By using modular units to assemble GN TBM Slurry Separation Plant, GN is able to provide the varieties of systems:

1. GNTBM-800B (800m^3/h)=GNTBM360+GNTBM500
2. GNTBM-1000B (1000m^3/h)=GNTBM500+GNTBM500
3. GNTBM-1500B (1500m^3/h)=3xGNTBM500

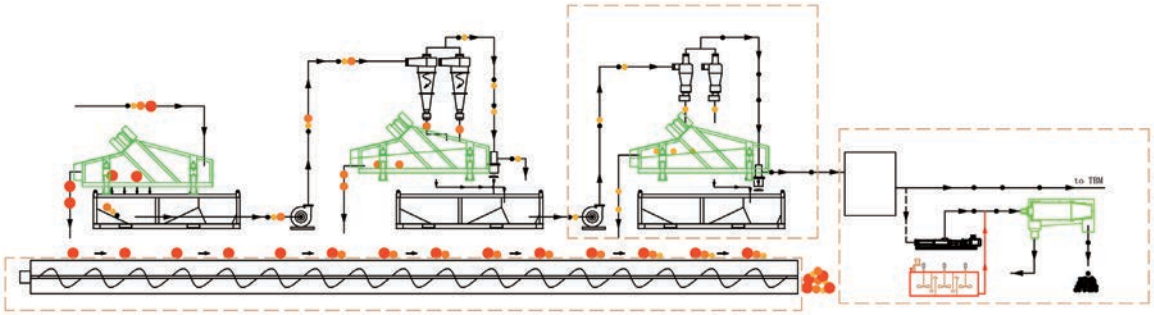
4.2 GNTBM-260B Slurry Separation Plant

4.2.1 GNTBM-260B Technical Specifications

Model	GNTBM-260B
Capacity	260 m^3/h(1145GPM)
Cut Point	60 μm
Desander Cleaner	GNZS1218-2A (4.7KW)
Vibration Amplitude	4-8 mm
Deck Angle	±3 °
Lower Deck Screen Area	2 m^2
Upper Deck Screen Area	1 m^2
Desander Cone	20 ”
Desander Quantity	1 pcs
Feeding Pump of the De-sander	CVL-100TZSAPD-4-55kW
Effective Volume of the Tank	1.76 m^3
Total Power	59.7 kw
Backwash Device	include
Remote Control	Optional
Shipping Dimension	L3688×W2442×H2911 mm
Operation Dimension	L3688×W2789×H2911 mm
Gross Weight	6700 kg



4.2.2 GNTBM-260B System Composition and Working Process



1.Shale shaker

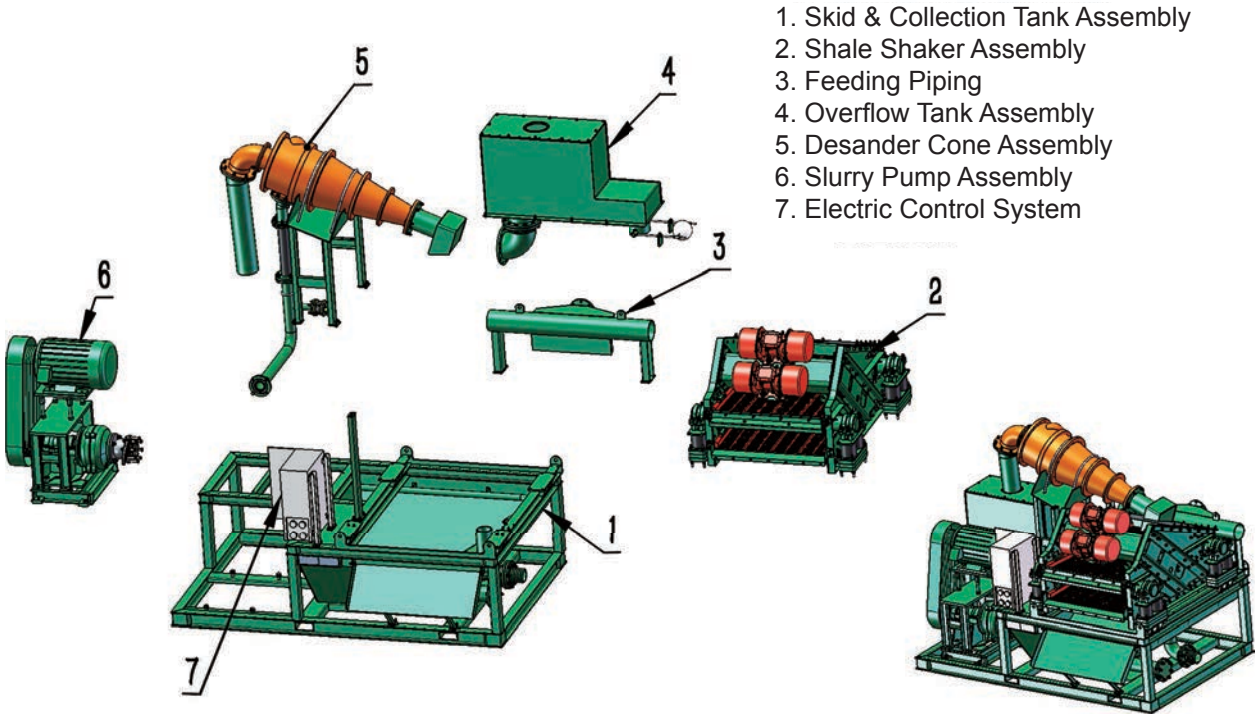
The slurry to be processed enters the lower deck of the double-deck shaker through the system inlet pipe assembly for coarse screening, removing large solid particles such as stones and gravel from the slurry. Mud containing small particles falls into the system collection tank through the sieve holes and is temporarily stored there.

2.Slurry Pump

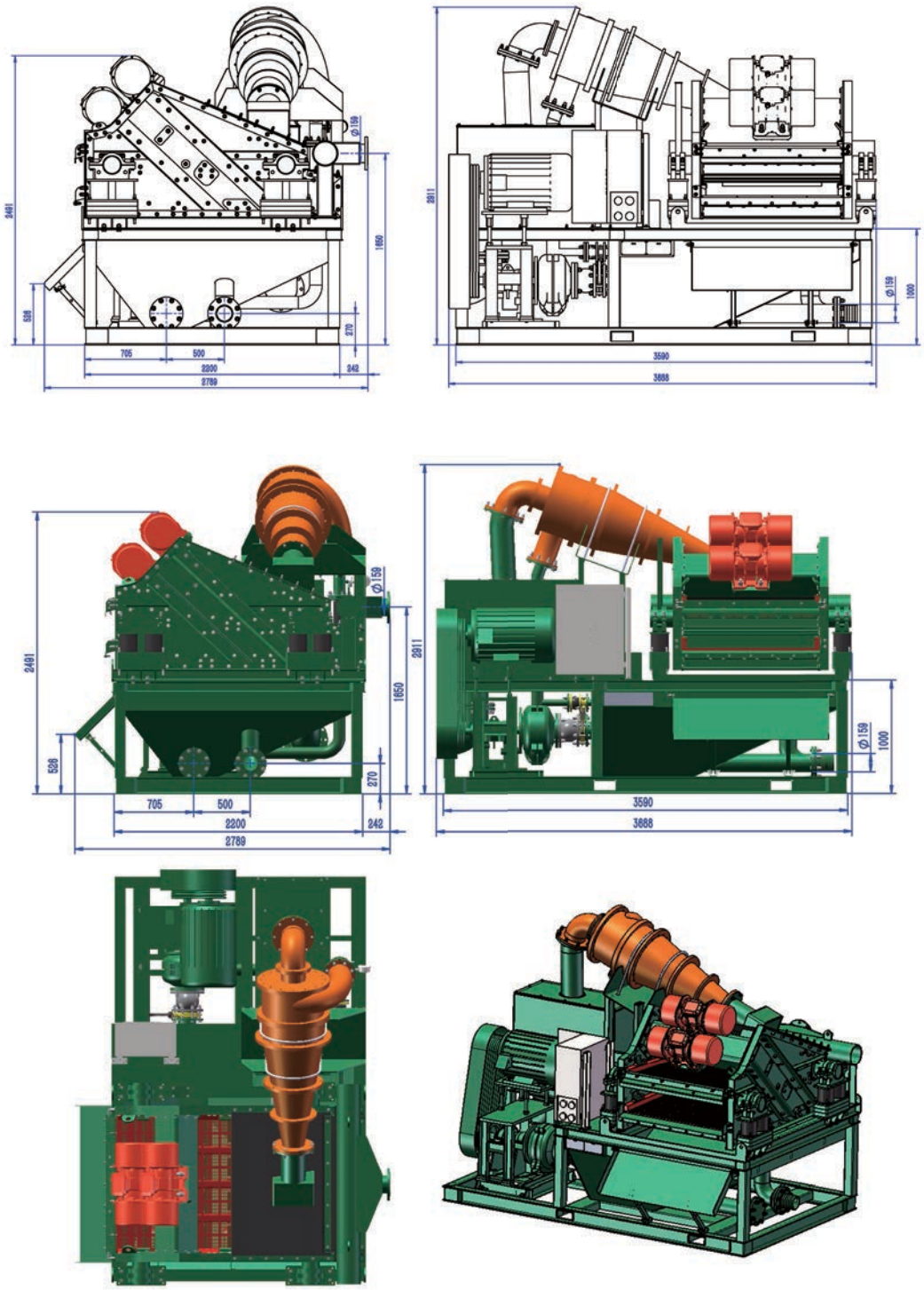
By using the built-in slurry pump of the system, the slurry that has been roughly screened in the collection tank is sucked in, and then injected into the tangential from the inlet of the desander along the pipeline.

3.Desander Cone

After being separated by a desander, clean mud flows out from the overflow port on the upper part of the desander (discharged for use outside the system). Mud containing solid particles is discharged from the bottom of the desander and falls on the upper sieve plate of the double-layer vibrating screen in the system. The solid particles are dehydrated and dried before being discharged from the system.



4.2.3 GNTBM-260B Dimensional Drawing

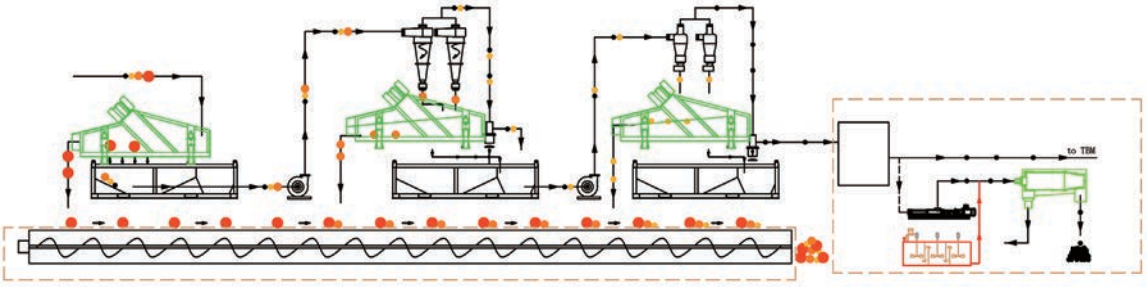


4.3 GNTBM-360B Slurry Separation Plant

4.3.1 GNTBM-360B Technical Specifications

Model	GNTBM-360B
Capacity	360 m^3/h(1600GPM)
Cut Point	30 μm
Desander Cleaner	GNZS1536-2A(14KW)
Vibration Amplitude	4-8 mm
Deck Angle	±3 °
Lower Deck Screen Area	5.4 m^2
Upper Deck Screen Area	5.4 m^2
Desander Cone	16 inches
Desander Quantity	2 pcs
Desilter Cone	6 inches
Desilter Quantity	8 pcs
Feeding Pump of the De-sander & Desilter	CVL-100TZSAPE-4-75kW
Effective Volume of the Tank	24 m^3
Total Power	164 kw
Shipping Dimension(mm)	L6058×W2438×H3115(Tank Unit)
Operation Dimension	L8557×W4503×H6535 mm
Gross Weight	23000 kg

4.3.2 GNTBM-360B System Composition and Working Process



1.Shale shaker

The slurry to be processed enters the lower Deck of the double-deck shaker through the system inlet pipe assembly for coarse screening, removing large solid particles such as stones and gravel from the slurry. Mud containing small particles falls into the system collection tank through the sieve holes and is temporarily stored there.

2. 1# Slurry Pump

By using the built-in 1# slurry pump of the system, the slurry that has been roughly screened in the collection tank is sucked in, and then injected into the desander tangential from the inlet of the desander along the pipeline.

3.Desander Cone

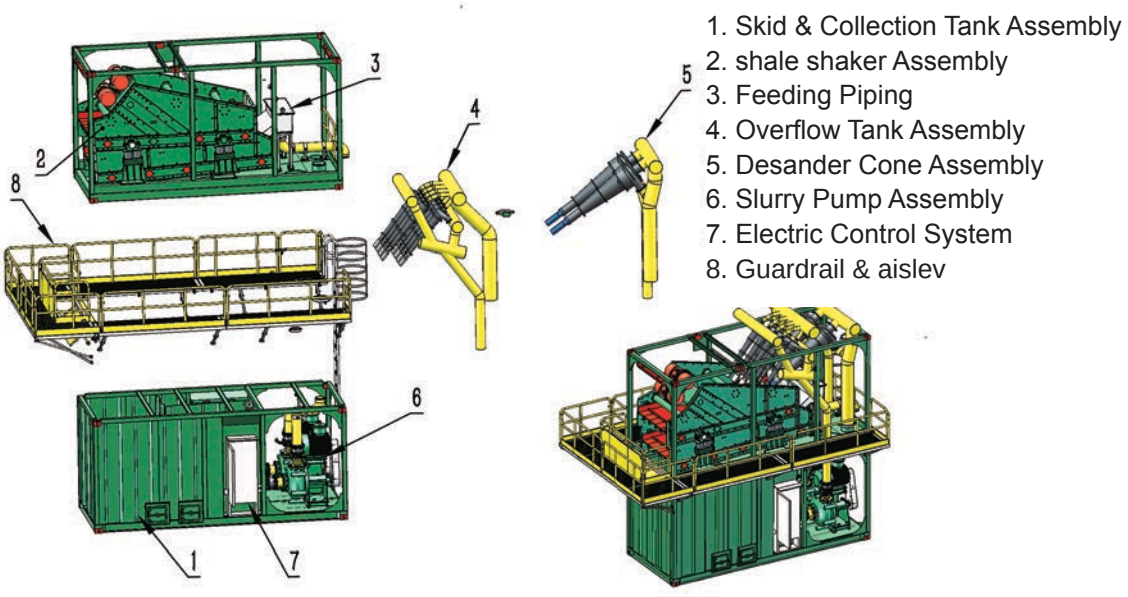
After being separated by a desander, clean mud flows out from the overflow port on the upper part of the desander (discharged for use outside the system). Mud containing solid particles is discharged from the bottom of the desander and falls on the upper sieve plate of the double-layer vibrating screen in the system. The solid particles are dehydrated and dried before being discharged from the system.

4. 2# Slurry Pump

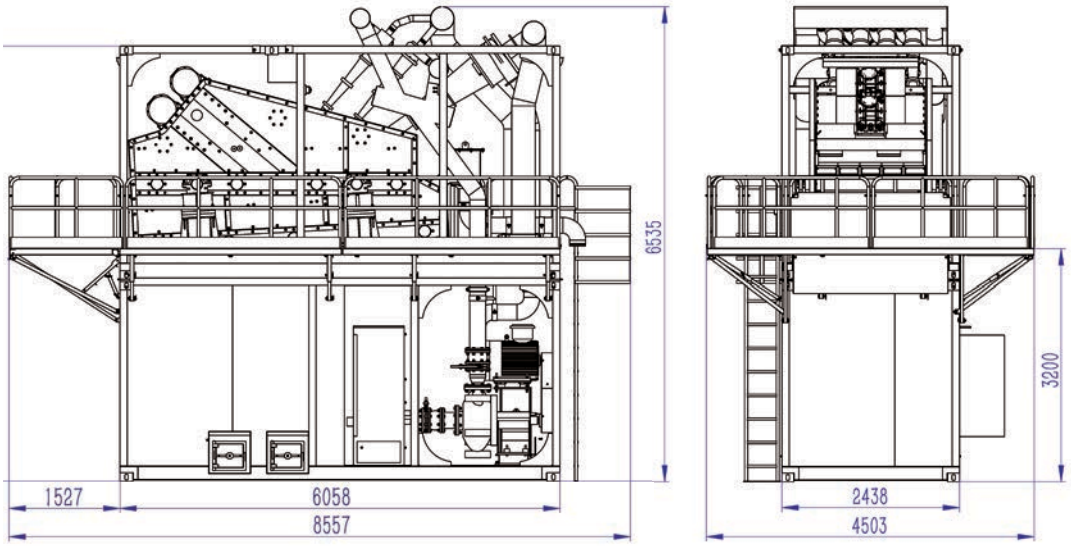
By using the built-in 2# slurry pump of the system, the slurry that has been roughly screened in the collection tank is sucked in, and then injected into the tangential from the inlet of the desilter along the pipeline.

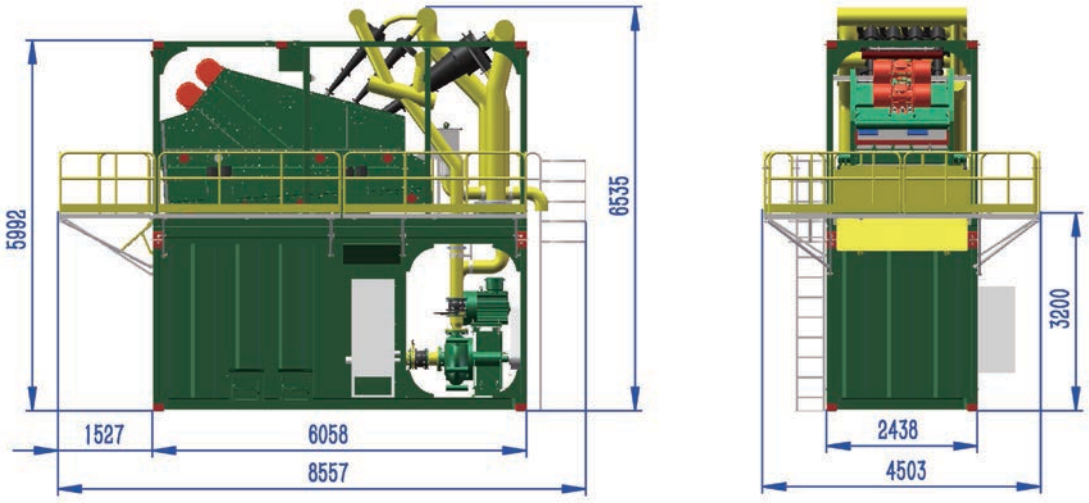
5.Desilter

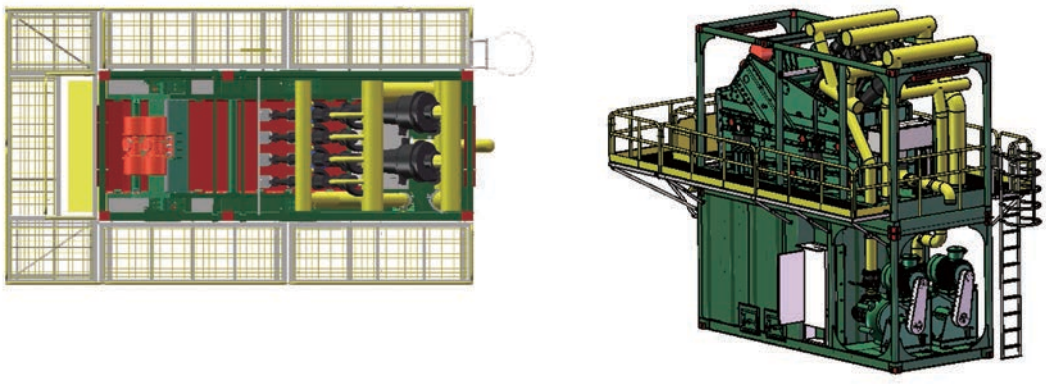
After being separated by a desilter separator, clean mud flows out from the overflow port on the upper part of the desilter and into the finished product warehouse of the collection tank. From the finished product warehouse, it overflows to the outside of the system. Mud containing solid particles is discharged from the bottom of the desilter and falls on the upper sieve plate of the double-layer vibrating screen of the system. The solid particles are dehydrated and dried before being discharged from the system.



4.3.3 GNTBM-360B Dimensional Drawing





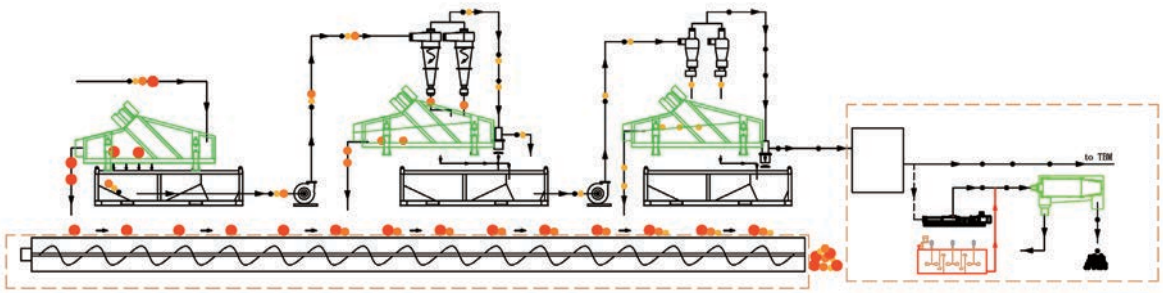


4.4 GNTBM-500B TBM Slurry Separation Plant

4.4.1 GNTBM-500B Technical Specifications

Model	GNTBM-500B
Capacity	500 m^3/h(2200GPM)
Cut Point	30 micron
Desander Cleaner	GNZS1836-2A (14KW)
Vibration Amplitude	4-86 microns
Deck Angle	±3 °
Lower Deck Screen Area	6.48 m^2
Upper Deck Screen Area	6.48 m^2
Desander Cone	20 inches
Desander Quantity	2 pcs
Desilter Cone	6 inches
Desilter Quantity	12 pcs
Feeding Pump of the De-sander & Desilter	CVL-150TZSAPE-4-90kW(2pcs)
Effective Volume of the Tank	25 m^3
Total Power	194 kw
Shipping Dimension(mm)	L6058×W2438×H2800(Tank Unit) L6058×W2438×H3192(Equipment Unit) L4108xW2438xH1541(Cyclone Unit)
Operation Dimension	L8557×W4508×H7533 mm
Gross Weight	297000 kg

4.4.2 GNTBM-500B System Composition and Working Process



1.Shale shaker

The slurry to be processed enters the lower Deck of the double-deck shaker through the system inlet pipe assembly for coarse screening, removing large solid particles such as stones and gravel from the slurry. Mud containing small particles falls into the system collection tank through the sieve holes and is temporarily stored there.

2. 1# Slurry Pump

By using the built-in 1# slurry pump of the system, the slurry that has been roughly screened in the collection tank is sucked in, and then injected into the desander tangential from the inlet of the desander along the pipeline.

3.Desander Cone

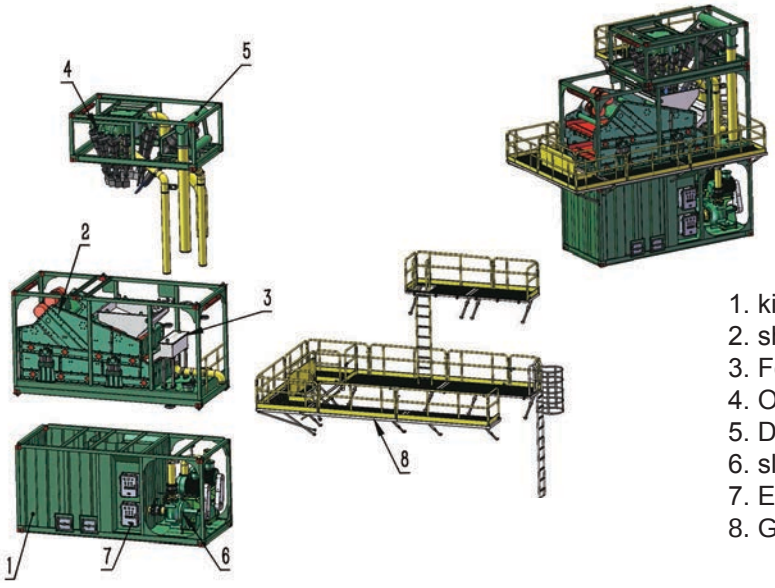
After being separated by a desander, clean mud flows out from the overflow port on the upper part of the desander (discharged for use outside the system). Mud containing solid particles is discharged from the bottom of the desander and falls on the upper sieve plate of the double-layer vibrating screen in the system. The solid particles are dehydrated and dried before being discharged from the system.

4. 2# Slurry Pump

By using the built-in 2# slurry pump of the system, the slurry that has been roughly screened in the collection tank is sucked in, and then injected into the tangential from the inlet of the desilter along the pipeline.

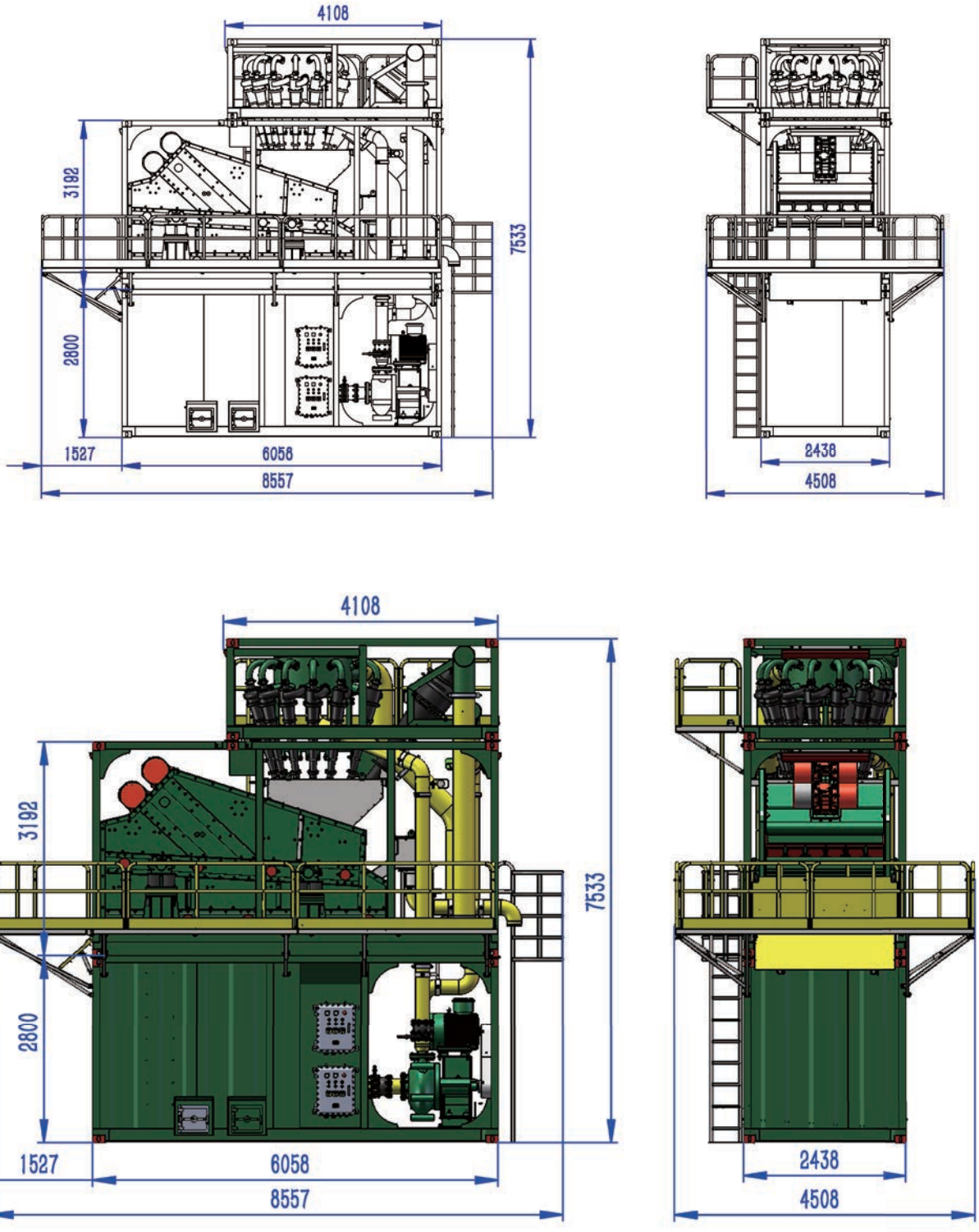
5.Desilter

After being separated by a desilter separator, clean mud flows out from the overflow port on the upper part of the desilter and into the finished product warehouse of the collection tank. From the finished product warehouse, it overflows to the outside of the system. Mud containing solid particles is discharged from the bottom of the desilter and falls on the upper sieve plate of the double-layer vibrating screen of the system. The solid particles are dehydrated and dried before being discharged from the system.



1. kid & Collection Tank Assembly
2. shale shaker Assembly
3. Feeding Piping
4. Overflow Tank Assembly
5. Desander Cone Assembly
6. slurry Pump Assembly
7. Electric Control System
8. Guardrail & aisle

4.4.3 GNTBM-500B Dimensional Drawing



Part 5: Slurry Dewatering System/ Slurry Fine Separation

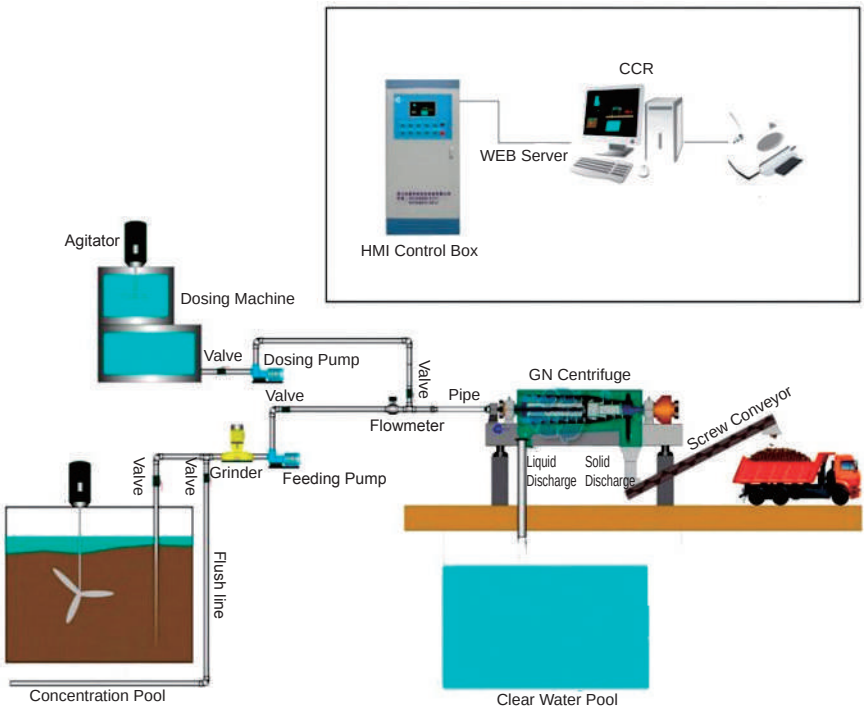
GN Slurry dewatering system is specially developed for fine separation of mud in trenchless, piling and shield engineering. By using GN system, finer particles in the mud can be reduced largely. With the flocculation dosing system, the mud can meet the requirements of environmental protection discharge.

This kind of mud is mainly divided into two categories:

The first one is in the process of large diameter and long-distance construction, a large quantity of finer solids are left in the mud after many times circulation which will bring increased mud weight and degraded performance. The main reason is too many 5-20 micron particles left in the mud, so the most effective way is to use a centrifuge for fine separation. Centrifuge can eliminate particles larger than 5 microns without adding chemicals and restore the mud to the original state.

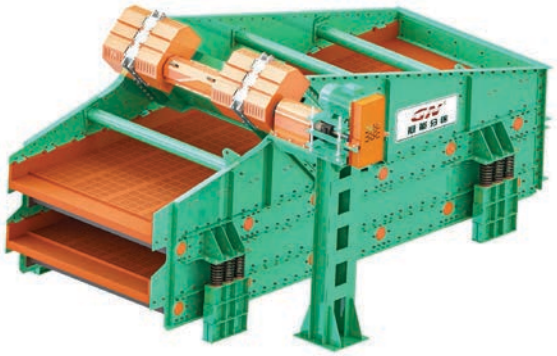
The second type is plenty of mud after construction that can not be discharged directly due to strict environmental protection requirements, and the transportation cost is very high. By using GN Slurry Dewatering System to treat the mud into clear water for direct discharge, and the separated solids can be transported without leakage, which truly achieve zero mud discharge on site.

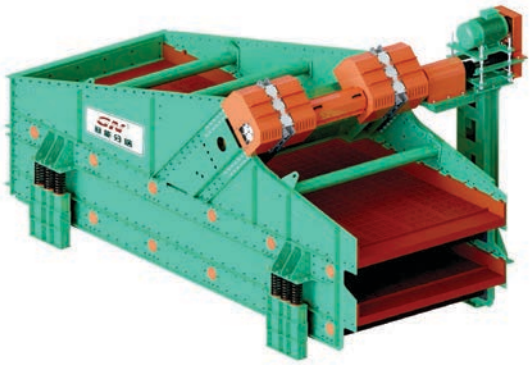
GN Slurry Dewatering System includes: feeding system dosing system module, centrifuge dehydration module, conveying module and electrical control system etc.



5.1 Double Deck linear Vibrating Scree

GN double deck linear vibrating scree is widely used in the screening and dewatering treatment of materials such as pipe jacking engineering, TBM, shield tunneling engineering, and construction mud. The equipment adopts advanced design means such as finite element analysis and anti fatigue analysis to ensure the reasonable structure, low energy consumption and large screening and classification capacity of the machine. It can adapt to various working conditions that are easy to corrode and wear. Large processing capacity, high efficiency and stable performance. The size of the machine can also be customized according to customer requirements.





Parameters of GN double deck linear vibrating screen

Model	GNLMP1236-2B	GNLMP1536-2B	GNLMP1836-2B
Capacity	250 m^3/h	500 m^3/h	1000 m^3/h
Vibrating Motor Power	2×6 kw	2×7 kw	
Amplitude	4-6 microns		
Screening Area	2×4.32 m^2	2×5.4 m^2	2×6.48 m^2
Installation Inclination	±4 °		
Weight	4200 kg	4710 kg	5150 kg
Dimension	4445×1860×2707 mm	4445×2160×2707 mm	4445×2460×2707 mm

Technical characteristics & Advantages :

- the wallboard is not welded. The steel plate with better impact toughness and cold bending is selected, and the imported HUCK rivet is used for hydraulic tension assembly. This advanced design makes the wallboard free of welding residual stress and material defects, so as to avoid the reduction of fatigue strength of the wallboard due to the above defects.
- optimize the structural strength and vibration quality of the screen machine through finite element analysis, reduce stress, and prolong the service life of the equipment.
- The touching parts and easily worn parts are sprayed with polyurea by the spraying machine imported from the United States, which is resistant to corrosion, erosion and wear.
- Post-weld heat treatment process of main components to effectively eliminate welding stress.
- product serialization to meet the production requirements of customers nder different process conditions; Polyurethane screen panel is modular, ore versatile and more convenient to replace.
- Product serialized to meet the production requirements of customers under different process conditions; Polyurethane screens are modular, for stronger versatility and easier replacement.

5.2 GN Industry Decanter Centrifuge

GN design and manufacture different size of decanter centrifuge a for industry separation. Solid bowl decanter centrifuges have been operating according to the same basic principle since the 19th Century. GN centrifuge production line is from 9inch (220mm) bowl to 30inch (760mm) bowl, with bowl length and diameter ration up to 4.2, and the adjustable G force is up to 3000G to meet different industry separation applications.

GN design specific centrifuges according to specific separation tasks and the use of resilient, high-quality materials have improved the performance of the centrifuges.

Moreover, GN owns a branch of designing PLC and electrical control system; this gives GN advantages in electrical components for measuring and control technology. The performance and availability of the decanter centrifuge or three-phase centrifuges are significantly improved by the control system.

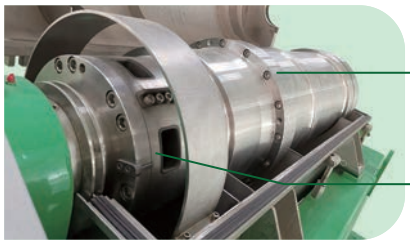
Main Function of GN Industry Centrifuges

- Dewatering sludge / mud and suspensions
- Thickening sludge or mud
- Clarifying different type liquids
- Separating 3-phase mixtures, i.e. two immiscible fluid phases and a solid phase
- Classifying solids in a wet suspension by grain size
- Separation of solids according to various densities

GN Centrifuge Main Application Industry

- Oil Gas Drilling Mud Solids Control
- Drilling Waste Management
- Oil Sludge Treatment
- HDD trenchless mud cleaning
- Bored Pile and TBM mud dewatering
- Waste water treatment
- Chemical and Pharmaceutical separation
- Mining industry separation
- Food and Beverage industry separation

5.3 GN Centrifuge Features

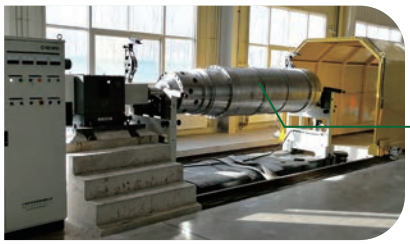


The bowl of GN centrifuge is made from Duplex Stainless Steel SS2205 or SS2304 by centrifugal casting which is better than SS304 or SS316.

The solids discharge port is made from special ceramic or Tungsten carbide inserts, the anti-abrasion will extend the life.

Flexible pond depth adjustment for different material separation.

The air spring assists the opening of the centrifuge cover and gives more safety.

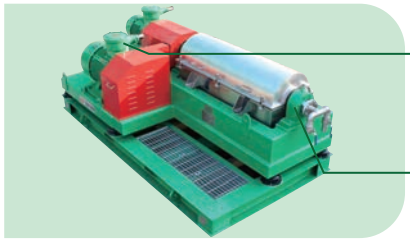


3 Stages balancing processes to maximize the balance of the centrifuge include 1800RPM low speed balancing and real operation high speed balancing as well as the assembly balancing.

The Screw is protected by interchangeable Tungsten Carbide Tiles for longer life and easy maintenance

The mud distribution port is made from special ceramic or Tungsten carbide inserts, the anti-abrasion will extend the life for heavy mud.

The screw is made from stainless steel with heat treatment, and the opening impeller will improve the centrifuge capacity. Single Lead or double lead screw is optional

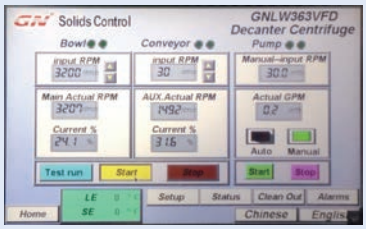


Two motors in one side to give more space for the operator to do maintenance.

The bearings are premium SKF bearings for reliable and longer operation. The automatically lubrication system is available for option.

5.4 GN Centrifuge VFD Control Panel

For the oil gas industry and mining industry, most of the time, the client need to use Explosion proof VFD control panel for hazardous area.GN Developed the pressurized explosion proof VFD control panel to meet the IEC Ex, ATEX, and CNEX zone 1 and zone 2 applications.

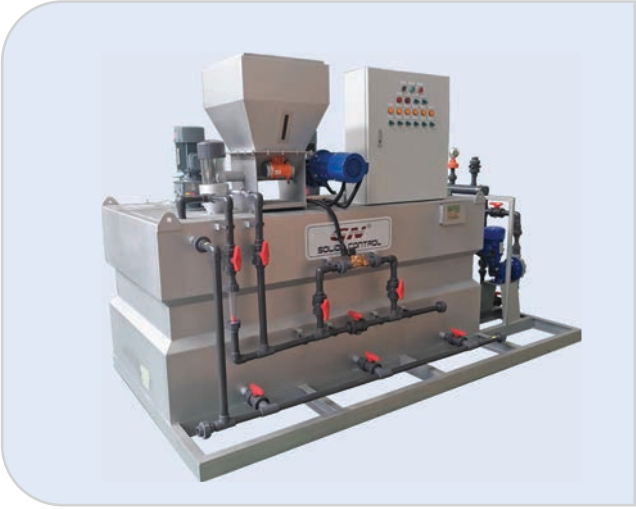
	• 3 VFD for bowl speed, differential speed, and pump capacity. • The VFD brand is ABB or SIEMENS.
	• The positive pressurized VFD panel can be cooling by vertex tube or air conditioner to work for ambient Temp. up to +55 C degree. • The VFD panel is optional for IEC Ex or ATEX or CNEX zone 1 or Zone 2 application.
	• The HMI and PLC system for user-friendly operation and smart control and protection. • It's optional for client to choose bearing temperature protection, vibration switch.

5.5 GN Centrifuge Technical Specifications

Model	GNLW363D	GNLW452D	GNLW632B	GNLW553D	GNLW764A
Bowl Diameter	360 mm	450 mm	630 mm	550 mm	760 mm
Bowl Length	1271 mm	1105 mm	1260 mm	1800 mm	3328 mm
Solids Control Max	30 m^3/h	40 m^3/h	80 m^3/h	90 m^3/h	150 m^3/h
Dewatering	5 m^3/h	N/A	N/A	15-20 m^3/h	40-50 m^3/h
Typical Bowl Speed	0-3200 RPM	1800 RPM	1800 RPM	0-2500 RPM	0-2200 RPM
Max G Force	3063 G	815 G	1142 G	2719 G	3000 G
Typical G Force	0~2062 G	815 G	902 G	0~1888 G	0~2060 G
Cut Point	2-5 μm	5-7 μm	5-7 μm	2-5 μm	2-5 μm
Differential Speed	0~45 RPM	32 RPM	15 RPM	0~45 RPM	5~28 RPM
Gearbox Torque	3500 N·M	3500 N·M	12000 N·M	12000 N·M	25000 N.M
Gearbox Ratio	57:1	57:1	47:1	35:1	38:1
Main Motor	37 kw(50HP)	45 kw(60HP)	75 kw(100HP)	90 kw(120HP)	160 kw(217HP)
Secondary Motor	11 kw(15HP)	N/A	30 kw(40HP)	37 kw(50HP)	90 kw(120HP)

5.6 Chemical Dosing Unit

GNDU2000 series 20ft container chemical dosing equipment is mainly used for mixing of flocculation, coagulation or de-emulsifier. It works together with dewatering centrifuge to separate the ultra-fine solids from the mud or waste water, to get clean water for industry applications; or support the separation of waste sludge.



Chemical Dosing System	Model: GNDU-2000A
	Include 20ft container with decoration, electric control system, exhaust system, lighting system.
Three Chamber Automatic Dosing Unit **Model: GN-2000S**	Max powder adding capacity:1-6 Kg/Hr(Speed Adjustable) Tank Material: SS304 Hopper Volume:45 L Tank Capacity:2000L Output for concentration 0.1%:2000L/Hr, if aging time is 45 Min. Mud agitator: 3 sets Dosing pump: 2 sets, single pump capacity:2000L/h(adjustable) Dimension:2000x1400x1500mm Including Ex liquid level meter, Ex electromagnetic flow meter, Ex solenoid valve, relief valve, buffer, filter and pressure gauge, etc accessories.
Single tank chemical Dosing Unit **Model: GN-2000L**	Tank Material: Outer material is carbon steel, inner material is PE Dissolving Tank Volume: 2000L Dissolving Tank Dimension 1400x2200mm(Agitator included) Mud agitator: 1 set Dosing pump: 2 sets, single pump capacity:530L/h(adjustable) Attached with Magnetism rolling board level meter, relief valve, buffer, filter and pressure gauge, etc accessories.

Part 6: Classical Cases

5.2 KM HDD Trenchless Project for Hong Kong Airport

- Project Time: March, 2016 – March,2018
- Main Equipment

Two packages 1500 GPM Mud Recycling System include 6 sets GNZS703 Shale Shakers, 2 GNZJ703E-3S16N mud cleaners, 2 mud tanks, centrifugal pumps and screw conveyor.

- Applications: HDD Trenchless mud cleaning and recycling
- Customer: Hong Kong Airport 5.2 KM Aviation fuel Pipeline installation

- Project Features

The project is used for the laying of aviation fuel pipeline in Hong Kong airport, which is contracted by Huayuan Company. And the two sets 1500GPM high-end HDD trenchless mud recycling system was made by GN Solids Control. The first HDD aviation fuel pipeline construction project in Hong Kong airport was completed on December 27, 2017. The second HDD aviation fuel pipeline construction project in Hong Kong airport was completed in March 9, 2018. Both of the two HDD crossing project are 5.2km.This success set the world's longest record in directional drilling crossing engineering at that time. The success of the crossing also opened a good situation for the construction of the third runway of Hong Kong International Airport.

China-Russia gas pipeline 5 sets high end mud recycling systems

- Project Time: 2014 – 2019
- Main Equipment

5 sets 500 GPM high end HDD mud recycling systems, include 5 desander shakers, 5 desilter shakers, 10 drilling mud centrifuges, and 5 mud tanks.

- Applications: HDD Trenchless mud cleaning and recycling
- Customer: CHINA PETROLEUM PIPELINE BUREAU China-Russia gas pipeline Trenchless Project
- China Petroleum Pipleline Bureau(CPP) is the largest petroleum pipeline engineering company in China. CPP is the largest contractor for the China-Russia gas pipeline project. CPP owns over 20 packages of mud recycling system made by GN Solids Control. And the 5 sets high end HDD mud recycling system was applied in the China-Russia gas pipeline project.

China and Russia on December 2, 2019 launched a giant gas pipeline linking the countries for the first time.
Presiding by video link-up over an elaborate televised ceremony, Russian leader Vladimir Putin and Chinese counterpart Xi Jinping hailed the "Power of Siberia" pipeline as a symbol of cooperation.




The 3,000-kilometre (1,850-mile) pipeline -- which was called "the world's biggest construction project" -- will supply China with 38 billion cubic meters (1.3 trillion cubic feet) of gas annually when fully operational in 2025.
Russia and China signed the 30-year, $400 billion construction deal in 2014 -- Gazprom's biggest ever contract.

Some Slurry Treating System Projects

US 15 m³ Slurry Treating System

Cnooc 5 m³ Slurry Treating System

Shanghai 5 m³ Slurry Treating System

Singapore 5 m³ Slurry Treating System

Sinopec 5 m³ Slurry Treating System

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