

Customer: GAZPROMNEFT

Project: HH300

DOC. N.

ER21-1206  
ID#14\*

# Presentation of mud system - layout, appearance, winterization, equipment, environmental waste

Презентация по ЦС (схема, внешний вид, утепление, оборудование, экологические сбросы)

\*Annex 1A - AMD#4

| Rev. | DATE       | REVISION DESCRIPTION   | PREPARED By CONTRACTOR | CHECKED By CONTRACTOR | APPROVED By CONTRACTOR |
|------|------------|------------------------|------------------------|-----------------------|------------------------|
| 1    | 04/11/2021 | ISSUED FOR INFORMATION | ZiL                    | RiM                   | LaU                    |
| 0    | 23/09/2021 | ISSUED FOR INFORMATION | ZiL                    | RiM                   | LaU                    |

## MUD GENERAL DESCRIPTION

### MUD SYSTEM PHILOSOPHY / LAYOUT

RUSSO

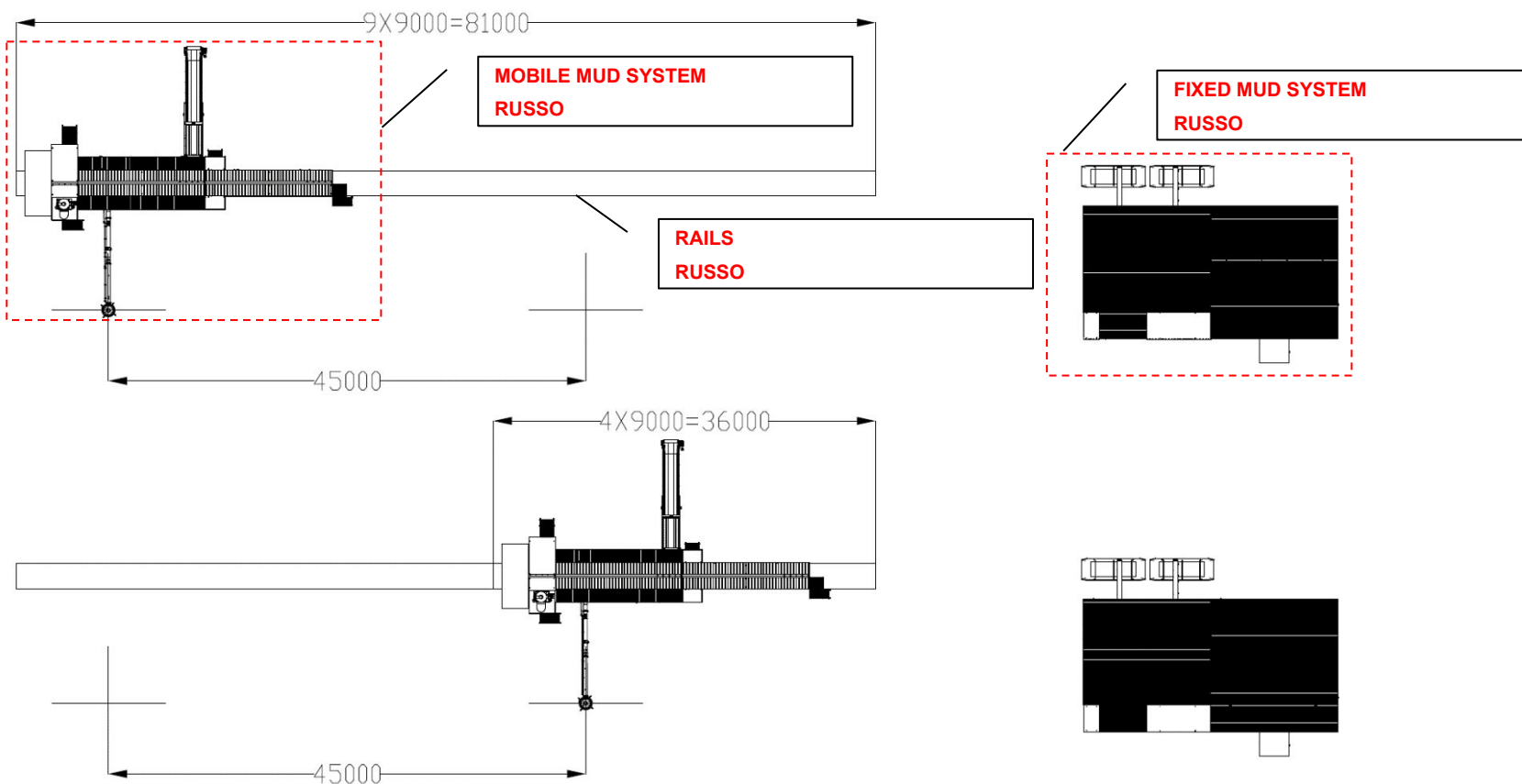
The mud system is split in two main group:

- Fixed mud tank with reserve and mixing functionality
- Mobile tank with mud treatment and first cleaning

RUSSO

The mud system is designed to match with drilling rig able to skid along a cluster well. The Mobile tanks are designed to move together with rig and keep the mud treatment section nearest to the rig.

RUSSO



## MUD GENERAL DESCRIPTION

## MUD TANK VOLUME SUMMARY

**RUSSO**

The table below shows the tank volume of each, calculated on the real dimension from 3D model.  
In the table are summarized also the overall dimension of tanks in transport configuration.  
Total volume of 407 cum divided in total number of 10 tanks

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| Расчет полезного объема емкостей ЦС400 / Calculation of CS400 useful volume |                               |                                |                                |                                 |  |                                 |  |  |   |   |   |                                      |   |
|---|-------------------------------|--------------------------------|--------------------------------|---------------------------------|--|---------------------------------|--|--|---|---|---|--------------------------------------|---|
| Название емкости / Tank name  | Номер отсека / Section number | Длина внутри / Internal length | Ширина внутри / Internal width | Высота внутри / Internal height | Объем внутри отсеков / Section internal volume | Общий объем / Tank total volume | Ширина уклона дна / Bottom inclin. Width | Длина уклона дна / Bottom inclin. Length | Высота уклона дна / Bottom inclin. Height | Объема уклона дна / Bottom inclin. volume | Внутр. объем отсеков / Final section volume | Объем пере-токов / Cross-flow volume | Полезный объем емкости / Tank useful volume |
| Дополнительная емкость / Trip tank  | 1                             | 6,83                           | 1,01                           | 2,19                            | 15,10  | 15,10                           |  |  |   |   | 15,10                                       |                                      | 15,1  |
| Емкость выбросит / Shakers tank   | 1                             | 4,92                           | 2,33                           | 2,19                            | 18,08  | 49,51                           |  |  |   |   | 18,08                                       |                                      | 49,0  |
|   | 2                             | 3,15                           | 2,33                           | 2,19                            | 16,08  |                                 | 1,71                                     | 3,15                                     | 0,10                                      | 0,27                                      | 15,81                                       |                                      |   |
|   | 3                             | 1,14                           | 2,33                           | 2,19                            | 5,85   |                                 | 1,71                                     | 1,14                                     | 0,10                                      | 0,10                                      | 5,75  |                                      |   |
|   | 4                             | 1,86                           | 2,33                           | 2,19                            | 9,50   |                                 | 1,71                                     | 1,86                                     | 0,10                                      | 0,16                                      | 9,34  |                                      |   |
| Передаточная емкость / Transfer tank  | 1                             | 4,11                           | 2,33                           | 2,19                            | 20,99  | 20,99                           | 1,65                                     | 4,11                                     | 0,10                                      | 0,34                                      | 20,65                                       | 0,75                                 | 21,4  |
| Промежуточная емкость / Intermediate tank                                   | 1                             | 2,45                           | 2,39                           | 2,20                            | 12,88  | 40,18                           | 1,98                                     | 2,45                                     | 0,10                                      | 0,24                                      | 12,64                                       | 0,40                                 | 39,8  |
|   | 2                             | 2,69                           | 2,39                           | 2,20                            | 14,17  |                                 | 1,98                                     | 2,69                                     | 0,10                                      | 0,27                                      | 13,90                                       |                                      |   |
|   | 3                             | 2,50                           | 2,39                           | 2,20                            | 13,14  |                                 | 1,98                                     | 2,50                                     | 0,10                                      | 0,25                                      | 12,89                                       |                                      |   |
| Резервная емкость №1 / Reserve tank #1                                      | 1                             | 9,16                           | 2,44                           | 2,20                            | 49,30  | 49,30                           | 2,44                                     | 8,38                                     | 0,10                                      | 1,02                                      | 48,27                                       | 0,23                                 | 48,5  |
| Резервная емкость №2 / Reserve tank #2                                      | 1                             | 9,16                           | 2,44                           | 2,20                            | 49,30  | 49,30                           | 2,44                                     | 8,38                                     | 0,10                                      | 1,02                                      | 48,27                                       | 0,23                                 | 48,5  |
| Приемная емкость / Suction tank   | 1                             | 9,16                           | 2,44                           | 2,20                            | 49,30  | 49,30                           | 2,44                                     | 8,38                                     | 0,10                                      | 1,02                                      | 48,27                                       | 0,23                                 | 48,5  |
| Водяная емкость №1 / Water tank #1  | 1                             | 7,84                           | 2,39                           | 2,20                            | 41,22  | 41,22                           | 0,00                                     | 7,84                                     | 0,10                                      | 0,00                                      | 41,22                                       |                                      | 41,2  |
| Водяная емкость №2 / Water tank #2  | 1                             | 7,84                           | 2,44                           | 2,20                            | 42,21  | 42,21                           | 0,00                                     | 7,84                                     | 0,10                                      | 0,00                                      | 42,21                                       |                                      | 42,2  |
| Смесительная емкость / Mixing tank  | 1                             | 10,14                          | 2,44                           | 2,20                            | 54,59  | 54,59                           | 2,44                                     | 9,24                                     | 0,10                                      | 1,13                                      | 53,46                                       |                                      | 53,5  |
| <b>ИТОГО:</b>   |                               |                                |                                |                                 |  | <b>411,69</b>                   |  |  |   |   | <b>405,86</b>                               |                                      | <b>407,7</b>                                |

| Сравнение с требованиями ТЗ<br>Comparison with Technical Requirements |                            |                        |
|---|----------------------------|------------------------|
| растворный объем / mud reserve volume                                 | объем по ТЗ / volume in TR | отклонение / deviation |
| 227,3   | 240,0                      | -12,7                  |
| резервный объем / mud reserve volume                                  | объем по ТЗ / volume in TR | отклонение / deviation |
| 97,0  | 80,0                       | 17,0                   |
| объем воды / water volume   | объем по ТЗ / volume in TR | отклонение / deviation |
| 83,4  | 80,0                       | 3,4                    |
| общий объем / total volume  | объем по ТЗ / volume in TR | отклонение / deviation |
| 407,7   | 400,0                      | 7,7                    |

**MUD GENERAL DESCRIPTION – SKIDDING SYSTEM 1 of 3**

**SKIDDING RAILS SYSTEM**

**RUSSO**

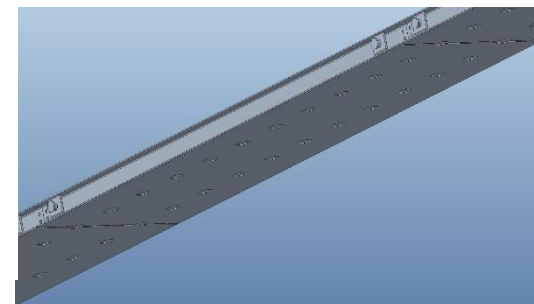
The mobile section of mud system is installed on rails composed by various section.  
 Each section of rails is 9 m length, for a total length of 81m.  
 Each rail is built with steel structure and three runner I beam of 300mm height  
 The bottom side of rails are closed with steel plate to permit a better load bearing distribution.  
 The mobile tanks are installed on the counter frame that it permit to move the tanks with hydraulic jack system.

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RUSSO

Each mud system rail section is closed with 10 mm steel plate this it permit to have a contact surface area of rails of 20 sqm for each rail  
 Total height of skidding rails of 310 mm from ground level to top flange

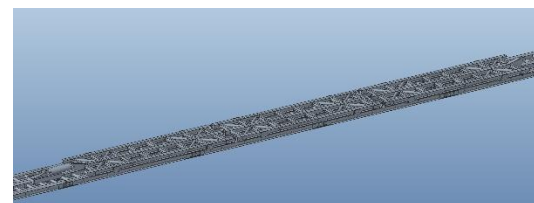
RUSSO



The mobile mud system is installed on counter frame that it permit to move the following macro item:

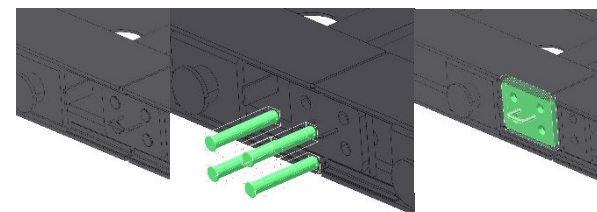
- Choke manifold module ( supplied by customer )
- Trip tank + Atmospherical degasser ( Poor Boy )
- Shaker tank + top module
- Transfer tank + top module
- Belt conveyor

RUSSO



The skidding rail connection are designed to be removed also not using a crane but with a truck or similar, they are designed with female connection pinned with link plate, that after that pins are disconnected the link plate can slide to unlink the rails and permit lateral movement.  
 Link plate is driven by steel guide to permit to keep it in the position during transport.

RUSSO



### MUD GENERAL DESCRIPTION – SKIDDING SYSTEM 2 OF 3

RUSSO

### SKIDDING HYDRAULIC SYSTEM AND GRIPPER

RUSSO

The skidding jack system of mud system is designed to move the following weight:

RUSSO

- Trip tank filled of mud
- Shaker tank filled of mud
- Transfer tank filled of mud
- Top Module of trip tank
- Top Module of shaker tank
- Top Module of transfer tank
- Poor Boy
- Choke manifold module / container

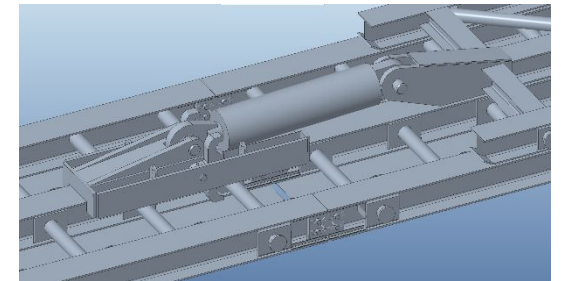
The movement for east – west direction of counter frame with all equipment above is performed with a hydraulic jack. The hydraulic jack is the same of the skidding system of drilling rig ( it could be replaced in case of any failure)

The skidding system actuator is composed by the hydraulic cylinder double effect.

Gripper system with anchors hook for the transversal tubular of rails, the anchors hook it could be rotated of 180° to permit the change of rotation for the movement from west-east to east-west.

The cylinder has a stroke of 850 mm and the anchors points on the rails they have a distance of 750 mm. Each single shot of movement it will have a stroke of 750 mm

RUSSO



The hydraulic cylinder of skidding system is feed by a electrical power unit installed on the mud mobile system, above the transfer tank.

The hydraulic cylinder is a double effect jack. It's interchangeable with the skidding cylinder of rig skidding system.

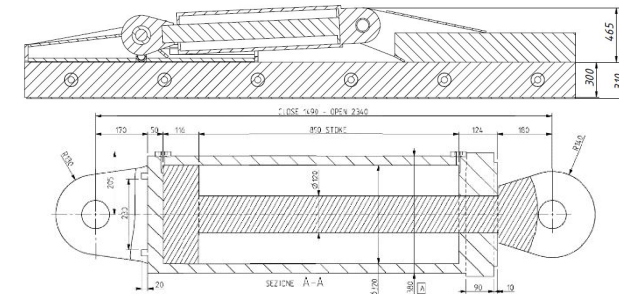
Stroke :850mm

Piston diameter: 380 mm

Rod diameter :120 mm

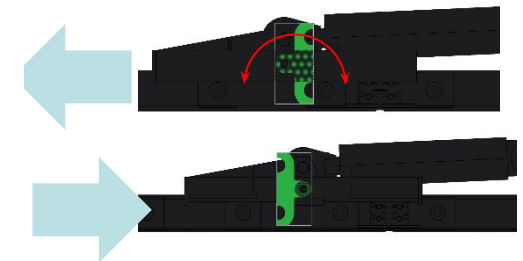
Max working pressure of cylinder: 210 bar

RUSSO



The gripper system is designed to permit the movement of entire mud system in two direction To change the direction it's need to rotate the anchor of 180°, only when you have to change the rotation. During the normal travelling the anchors in automatic mode it will be jump the rails and it goes automatically for next stroke

RUSSO



**MUD GENERAL DESCRIPTION – SKIDDING SYSTEM 3 OF 3**

**HYDRAULIC POWER UNIT**

**RUSSO**

The skidding system is feed by HPU installed on the transfer tank into the enclosed shelter as showed on the previous slide

RUSSO

RUSSO

The hydraulic power unit is feed electrically from drag chain of rig. This HPU is used only to skid the mud system, without any other purpose.

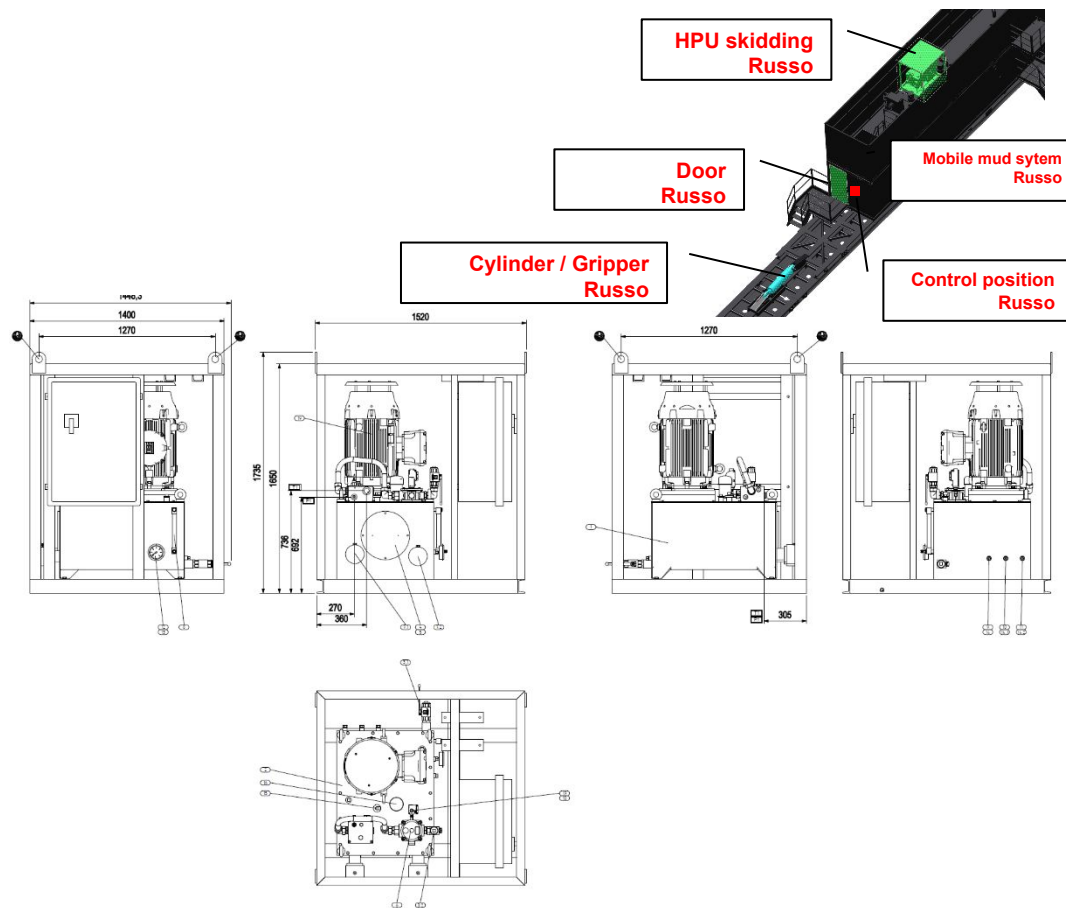
The HPU is designed to be installed in Hazardous area

Main data:

- Power: 30 kW
- Voltage: 400V – 50Hz
- Oil Cooling system electrical radiator: 0,55 kW – 400V-50Hz
- Oli tank: 250 liter
- On board electrical panel
- Hydraulic control of skidding jack remotely, they will be installed outside near the accesso door for a good visibility on the rig and mud skidding system

RUSSO

|    |     |                       |  |
|----|-----|-----------------------|--|
| 20 | 1   | PUMP CONTROL MANIFOLD |  |
| 19 | 1   | 30KW PUMP SYSTEM      |  |
| 18 | 1   | PRESSURE SWITCH       |  |
| 17 | 1   | CLOGGING INDICATOR    |  |
| 16 | 1   | DESSICANT BREATHER    |  |
| 15 | 1   | LEVEL SWITCH          |  |
| 14 | 4   | THERMOWELL            |  |
| 13 | 1   | THERMOWELL            |  |
| 12 | 1   | TEMP. GAUGE           |  |
| 11 | 1   | TEMP SWITCH           |  |
| 10 | 1   | TEMP SWITCH           |  |
| 9  | 1   | TEMP SWITCH           |  |
| 8  | 1   | LEVEL INDICATOR       |  |
| 7  | 2   | HEATER                |  |
| 6  | 1   | FILTER                |  |
| 5  | 1   | SEAL                  |  |
| 4  | 1   | INSPECTION DOOR       |  |
| 3  | 2   | BALL VALVE            |  |
| 2  | 1   | TANK COVER            |  |
| 1  | 1   | OIL TANK              |  |
| ID | QTY | DESCRIPTION           |  |





**MUD SYSTEM  
TREATMENT  
EQUIPMENT ON MUD  
SYSTEM MOBILE  
SECTION**

**RUSSO**

**SHALE SHAKER**

**DESCRIPTION**

**RUSSO**

**RUSSO**

Модель: RSD/BS203 / Model: RSD/BS203

Производительность: 41л/с (р-р 1,2 кг/дм<sup>3</sup>, вязк.41с, сита 120меш) / Performance capacity: 41 l/s (1.2 dens., 41s visc., API120 mesh screen)

Можность электромоторов: 1,7 кВт / Electric motor power: 1.7 kW

Сита: 40-360 меш / Screen mesh: 40~360

Размер ситовых панелей: 1165\*585\*40 (в рамках) преднатянутые / Screen size: 1165\*585\*40 (frame grid) pretensioned

Количество ситовых панелей: 3 / Quantity of screens: 3

Регулировка наклона: механическая винтовая / Deck angle adjustment: mechanical screw adjustment

Диапазон регулировки наклона: -3 ° ~ +3 ° / Deck angle: -3 ° ~ +3 °

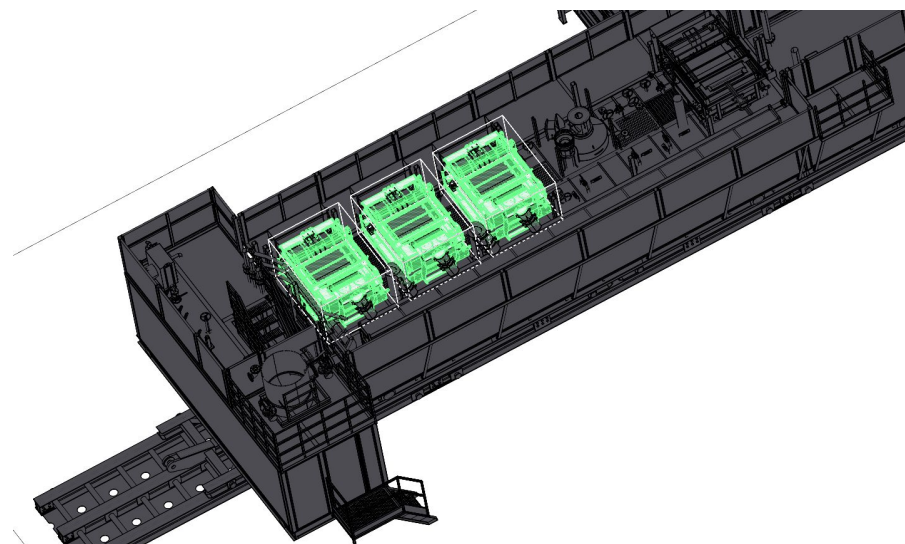
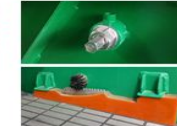
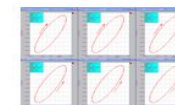
Механическая траектория движения: двойная эллиптическая / Mechanical trajectory: double elliptic

Оборудовано защитой из нержавеющей стали от разбрызгивания бурового раствора / Equipped with stainless steel anti-mud splash cover

Фиксация ситовых панелей клиньями с зубчатым механизмом / Installing and tensioning of the screen panels with gear wheel type wedge

Вес: 1700 кг / Weight: 1700 kg

Габариты (ДхШхВ), мм: 2400×1801×1440 / Dimensions (L\*W\*H), mm: 2400×1801×1440



## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM MOBILE SECTION

RUSSO

### CENTRIFUGAL DEGASSER

RUSSO

Модель: RSD/CD1500 / Model: RSD/CD1500

Производительность: 280м3/час / Performance capacity 280 m3/h

Мощность мотора насоса опущенного в буровой раствор: 22 кВт / Motor power for the mud pump under the fluid: 22 kW

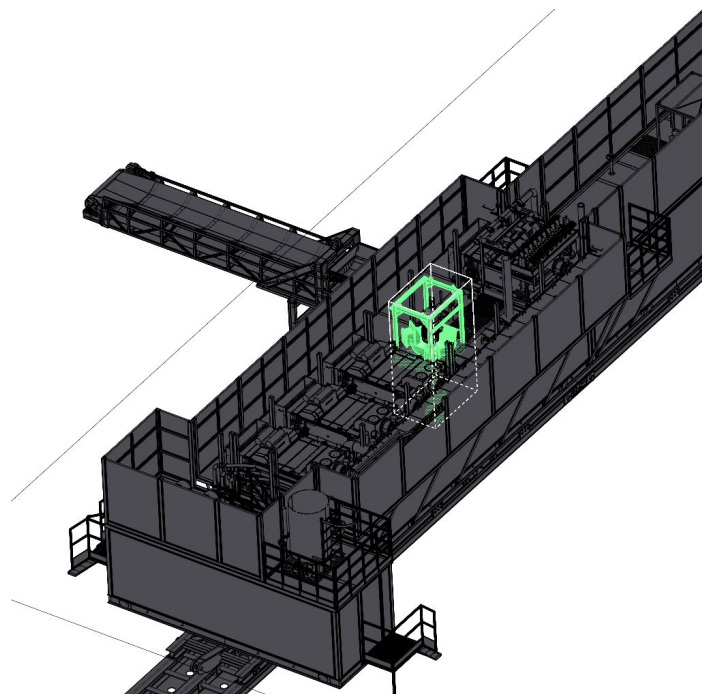
Мощность мотора наддува воздуха: 0,37 кВт / Motor power for the air blower: 0.37 kW

Размеры выходного окна для жидкости: 432\*244 мм / Fluid outlet opening size: 432\*244 mm

Диаметр трубопровода выхода газа: 115 мм / Diameter of the gas outlet opening: 115 mm

Вес: 1600 кг / Weight: 1600 kg

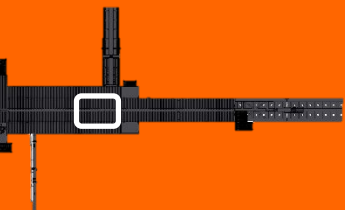
Габариты (ДхШхВ), мм: 1150\*1450\*3450 / Dimensions, mm: 1150\*1450\*3450





## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM MOBILE SECTION

RUSSO



## MUD CLEANER

RUSSO

Модель СГУ: RSD/BS203Y / Mud cleaner model: RSD/BS203Y

Модель вибросита: / Shale shaker model: RSD/BS203

Движение вибросита: двойное эллиптическое (прямо или обратно сбалансированное / Shaker motion: dual ellipse (forward or reverse balanced)

Производительность вибросита: 41л/с (р-р 1,2 кг/дм<sup>3</sup>, вязк.41с, сита 120меш) / Shaker capacity: 41 l/s (1.2 dens., 41s visc., API120 mesh screen)

Можность электромоторов: 1,7 кВт / Electric motor power: 1.7 kW

Сита: 40-360 меш / Screen mesh: 40~360

Размер ситовых панелей: 1165\*585\*40 (в рамках) преднатянутые / Screen size: 1165\*585\*40 (frame grid) pre-tensioned

Количество ситовых панелей: 3 / Quantity of screens: 3

Регулировка наклона: механическая винтовая / Deck angle adjustment: mechanical screw adjustment

Диапазон регулировки наклона: -3 ° ~ +3 ° / Deck angle: -3 ° ~ +3 °

Оборудовано защитой из нержавеющей стали от разбрызгивания бурового раствора / Equipped with stainless steel anti-mud splash cover

Механическая траектория движения: двойная эллиптическая / Mechanical trajectory: double elliptic

Фиксация ситовых панелей клиньями с зубчатым механизмом / Installing and tensioning of the screen panels with gear wheel type wedge

Диаметр гидроциклонов пескоотделителя: 10" / Diameter of the desander hydroclone: 10"

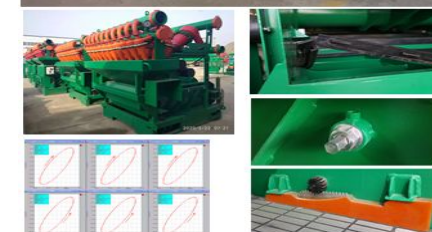
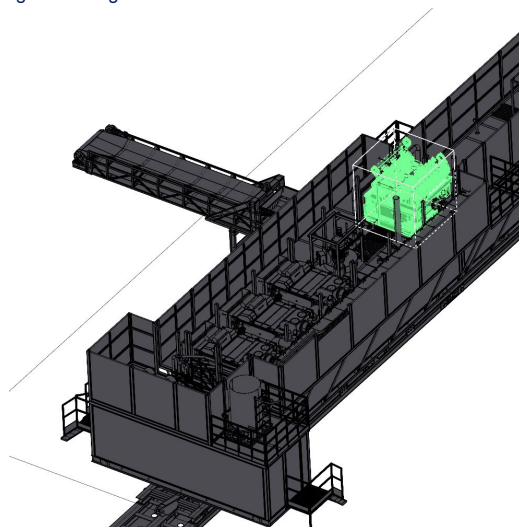
Число гидроциклонов пескоотделителя: 3 / Number of the desander hydroclone: 3

Диаметр гидроциклонов илоотделителя: 4" / Diameter of the desilter hydroclone: 4"

Число гидроциклонов илоотделителя: 20 / Number of the desilter hydroclone: 20

Максимальные общие габариты (ДхШхВ), мм: 2406\*2361\*2520 / Maximum overall dimension (L\*W\*H), mm: 2406\*2361\*2520

Общий вес: 3200 кг / Total weight: 3200 kg



**MUD SYSTEM  
TREATMENT  
EQUIPMENT ON MUD  
SYSTEM MOBILE  
SECTION  
RUSSO**

**CENTRIFUGAL PUMP OF MOBILE MUD SYSTEM**

**RUSSO**

- Centrifugal pump 4x3x13 15Kw Qty(2) Trip tank
- Centrifugal pump 8x6x14 75Kw Qty(2) Transfer tank ( for mud treatment )
- Centrifugal pump 8x6x14 75Kw Qty(2) Transfer tank ( for mud transfer )

RUSSO

Each centrifugal pump is equipped with local station of push button with start / stop control

Модель: RSD/SB8x6 / Model: RSD/SB8x6

Входной фланец - DN200; выходной фланец - DN150 / Fluid inlet - DN200, fluid outlet - DN150

Производительность: не менее 240 м3/час / Flow: not less than 240 m3/h

Напор: не менее 37 м / Pressure: not less than 37 m

Мощность привода: 75 кВт / Power: 75 kW

Диаметр крыльчатки: 14" или 13" / Diameter of impeller: 14" or 13"

Вес: 830 кг / Weight: 830 kg

Габариты (ДхШхВ), мм: 1932\*600\*880 / Dimensions (L\*W\*H), mm: 1932\*600\*880



Модель: RSD/SB4x3 / Model: RSD/SB4x3

Производительность: не менее 80 м3/час / Flow: not less than 80 m3/h

Напор: не менее 23 м / Pressure: not less than 23 m

Мощность привода: 15 кВт / Power: 15 kW

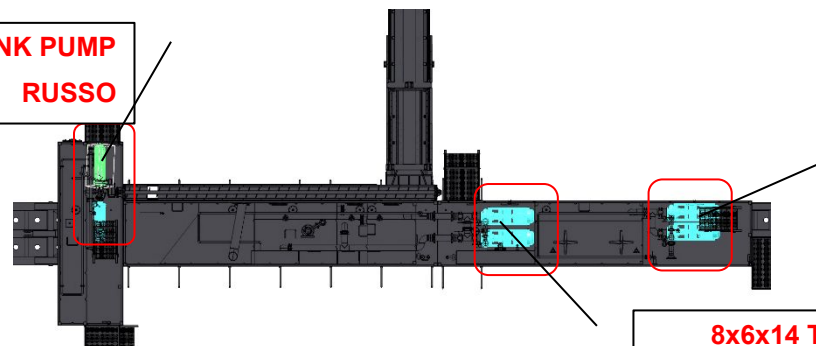
Диаметр крыльчатки: 13" или 12" / Diameter of impeller: 13" or 12"

Вес: 395 кг / Weight: 395 kg

Габариты (ДхШхВ), мм: 1531\*386\*674 / Dimensions (L\*W\*H), mm: 1531\*386\*674



**4X3X13 TRIP TANK PUMP  
RUSSO**



**8x6x14 TRANFER PUMP  
RUSSO**

**8x6x14 TREATMENT PUMP  
RUSSO**

## MUD SYSTEM TREATMENT EQUIPMENT

### ATMOSPHERIC MUD GAS SEPARATOR

RUSSO

Модель: СРБ-2 / Model: SRB-2

Производительность по газу (жидкости): 6000м3 (200м3) / Capacity for gas (water): 6000m3 (200m3)

Давление рабочее, не менее: 0,07 Мпа / Working pressure, not less than: 0.07 Мpa

Рабочий объем сосуда: 2,5м3 / Working volume: 2.5m3

Габариты (ДхШхВ), мм: 2200х2100х3100 / Sizes (LxWxH), mm: 2200x2100x3100

Вес: 2000 кг / Weight: 2000 kg

RUSSO

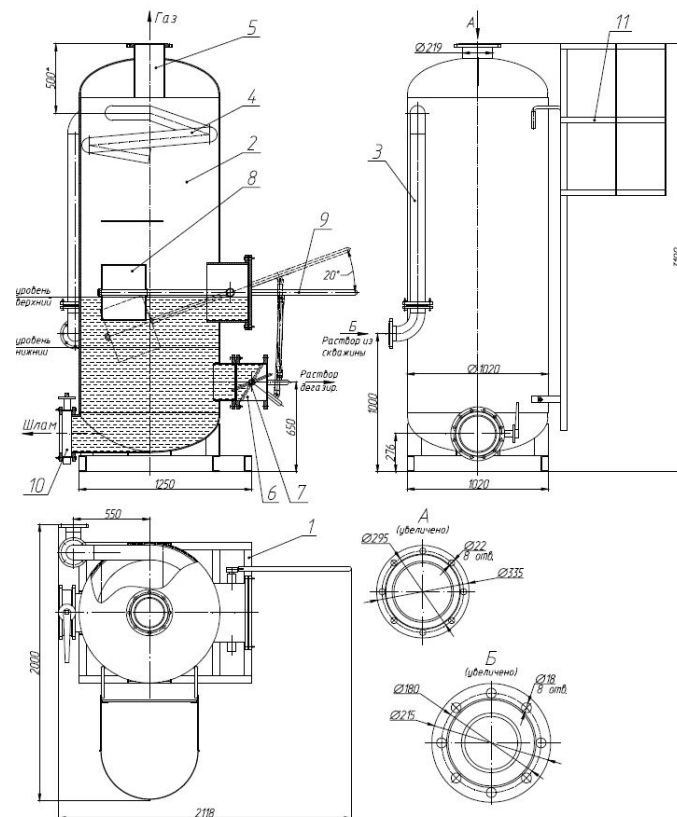
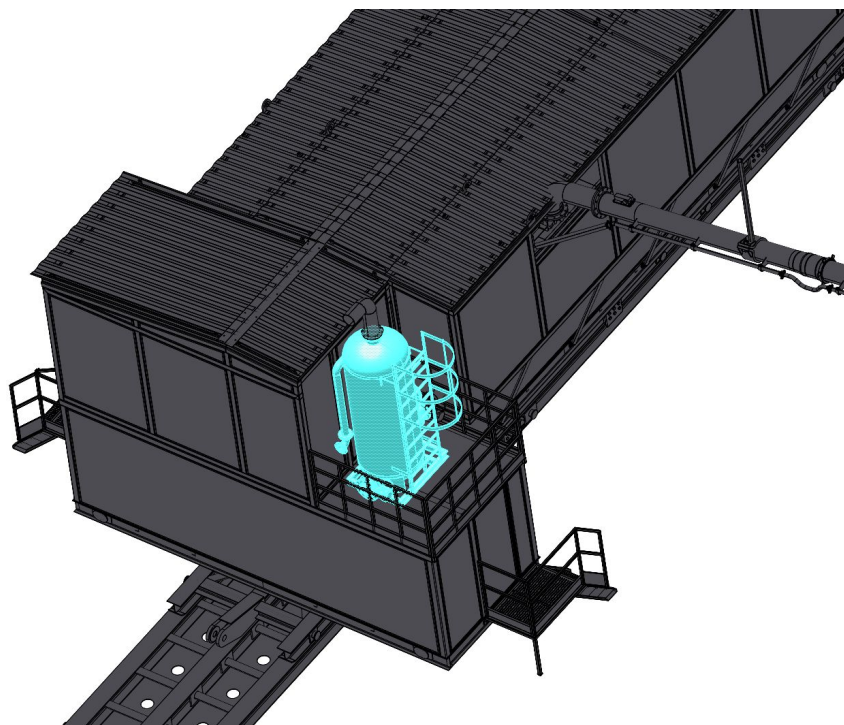


Рисунок 1 – Сепаратор бурового раствора СРБ-2

### MUD SYSTEM FLUID MANAGING ON MUD SYSTEM MOBILE SECTION

RUSSO

### MUG GUN AND AGITATOR

RUSSO

RUSSO

- Centrifugal pump 4x3x13 15Kw Qty(2) Trip tank
- Centrifugal pump 8x6x14 75Kw Qty(2) Transfer tank ( for mud treatment )
- Centrifugal pump 8x6x14 75Kw Qty(2) Transfer tank ( for mud transfer )

Each centrifugal pump is equipped with local station of push button with start / stop control

Модель: RSD/NJQ-80 / Model: RSD/NJQ-80

Угол поворота: 0-330° / Range of rotation 0-330°

Рабочее давление: 1,6 МПа / Working pressure: 1.6 MPa

Номинальный диаметр: DN80 / Nominal diameter: DN80

Производительность: 20 м<sup>3</sup>/час / Performance capacity: 20 m<sup>3</sup>/h

Диаметр сопла: 4-20мм / Nozzle diameter: 4-20 mm

Вес: 60 кг / Weight: 60 kg



Модель: ПБРТ-75-ГК-1500-22-900-Turbo / Model: PBRT-75-GK-1500-22-900-turbo

Скорость вращения крыльчаток: 66 об./мин / Rotational speed of the impeller: 66 rpm

Можность привоного мотора: 7,5 кВт / Power of the electric motor is 7.5 kW

Диаметр крыльчаток (число лопастей): 900 мм (4) / Impeller diameters (number of blades): 900 mm (4)

Глубина установки крыльчаток: 500 ~ 2125 мм / Height of the impeller installation: 500 ~ 2125 mm

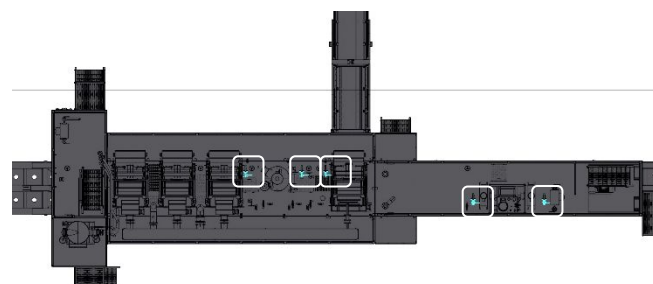
Диаметр вала крыльчаток: 73 мм / Diameter of the impeller shaft: 73 mm

Вес: 245 кг / Weight: 245 kg

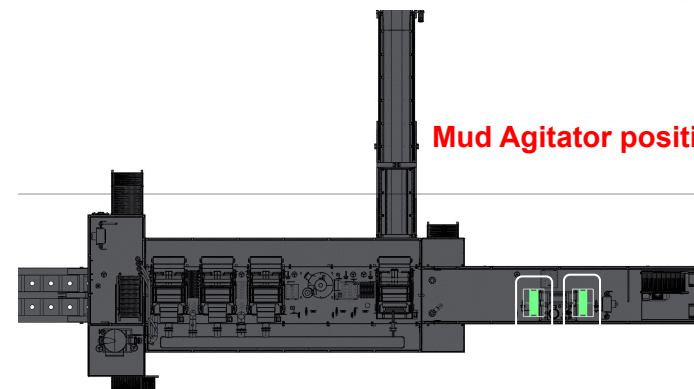
Установочные габариты (ДxШ), мм: 1200\*352 / Installation dimensions (L\*W), mm: 1200\*352



Mud Gun position/Russo



Mud Agitator position/Russo





**MUD SYSTEM WAISTE HANDLING ON MUD SYSTEM MOBILE SECTION**

**RUSSO**

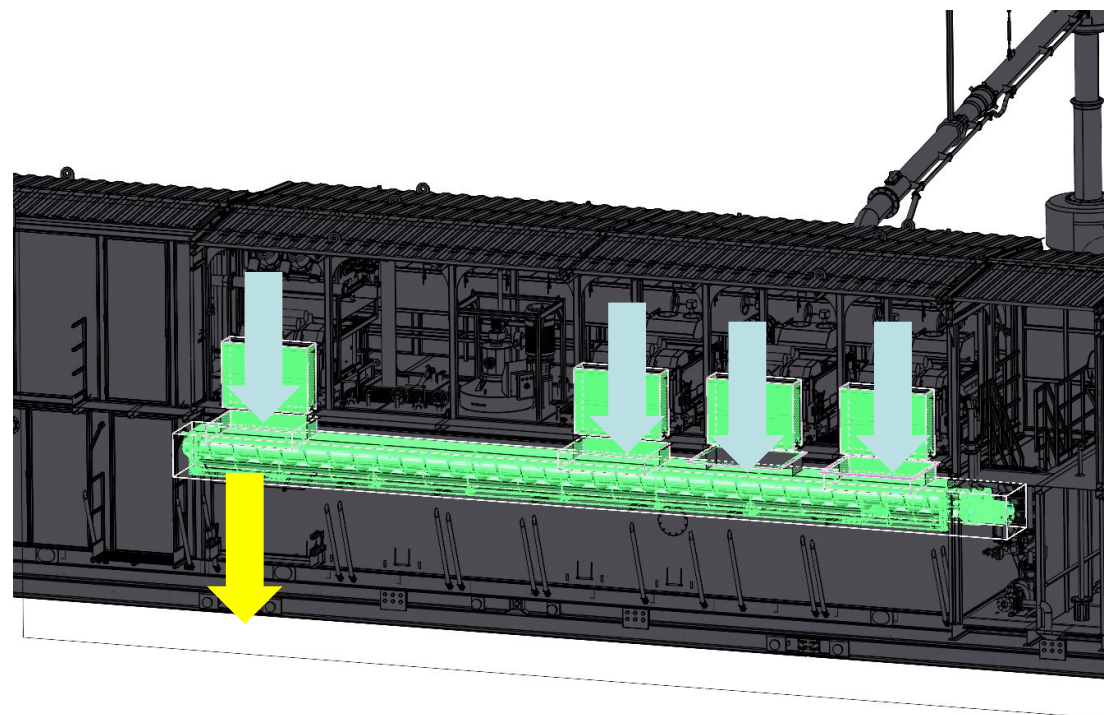
**SCREW CONVEYOR SHAKER TANK**

On mud pit side between the top module, and on side of shaker tanks is installed a screw conveyor to collect the cutting / discharge material from Mud Cleaner and Shale Shaker.  
It's electrica driven screw conveyor that it feed the belt conveyor

**RUSSO**

RUSSO

Модель: RSD/LS400 / Model: RSD/LS400  
 Производительность: 32 т/час / Performance capacity: 32 tons/hour  
 Мощность электропривода: 15 кВт / Electric motor power: 15 kW  
 Длина: 12 м / Length: 12  
 Диаметр шнека: 420 мм / Screw housing size: 420 mm  
 Скорость вращения: 21 об./мин / Rotational speed: 21 RPM  
 Редуктор: FAF107 / Gearbox model: FAF107



**MUD SYSTEM WAIST HANDLING ON MUD SYSTEM MOBILE SECTION**

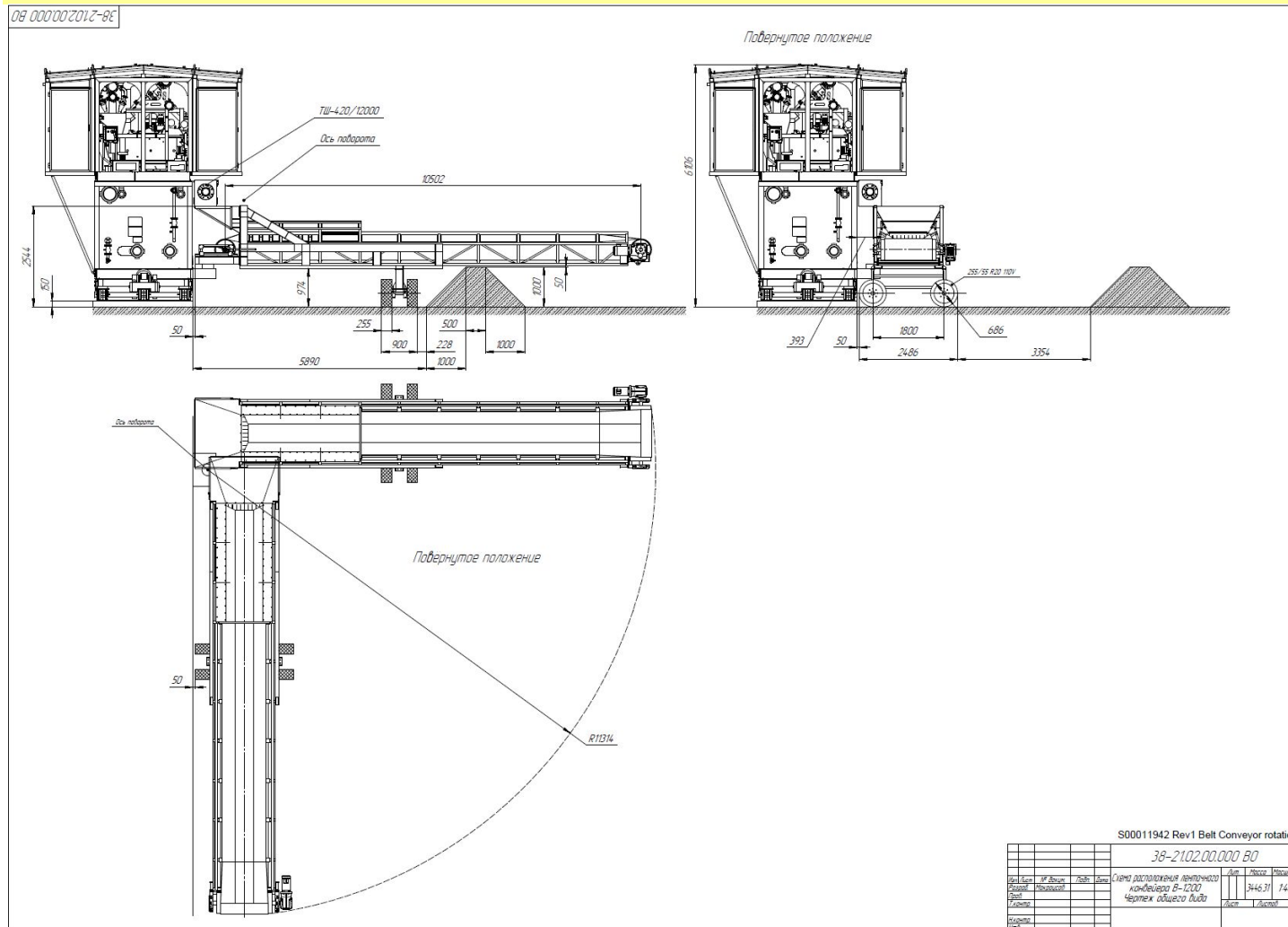
**RUSSO**

**BELT CONVEYOR**

Model: SOTEK KT1200  
 Performance capacity: up to 30 tons/hour  
 Power of the electric motor: 4 kW  
 Linear speed: 1 m/s  
 Length: 10.5m  
 Belt width: 1200 mm

**RUSSO**

Модель: СОТЭК КТ1200  
 Производительность: до 30 т/час  
 Мощность электропривода: 4 кВт  
 Линейная сорость: 1 м/с  
 Длина: 10,5 м  
 Ширина ленты: 1200 мм





**MUD SYSTEM DRAIN PUMP MUD SYSTEM MOBILE SECTION**

**RUSSO**

**DRAINAGE PUMP AND SUCTION SYSTEM**

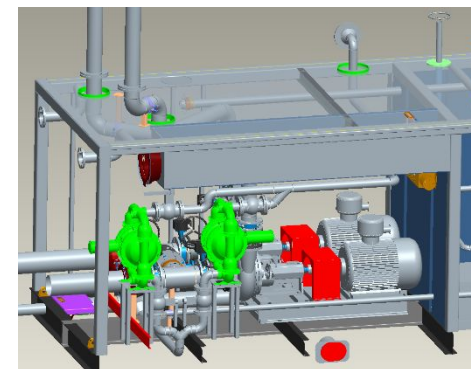
**RUSSO**

The draining pump is equipped with two (2) drain diaphragm pump pneumatic driven  
 This system is able to collect the fluid from the following section:

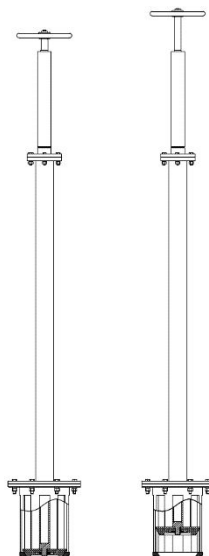
- Shaker tank
- Transfer tank
- Trip Tank
- Centrifugal pump area

Pump model: XPS1520/AAAAA/ZGS/BN/BN/0014  
 Pump flow capacity: 878 l/min  
 Max pressure: 8,6 bar

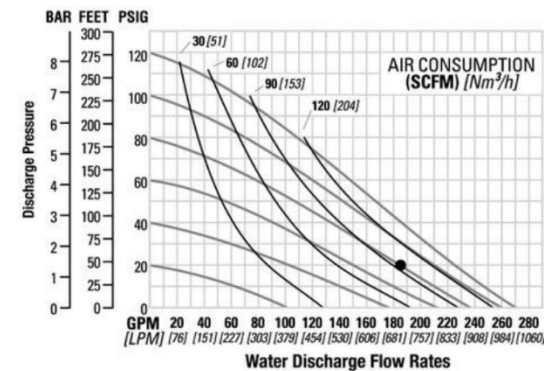
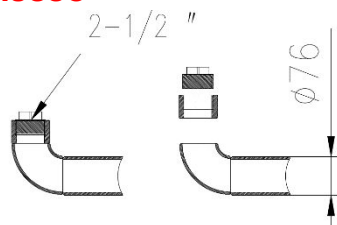
**RUSSO**

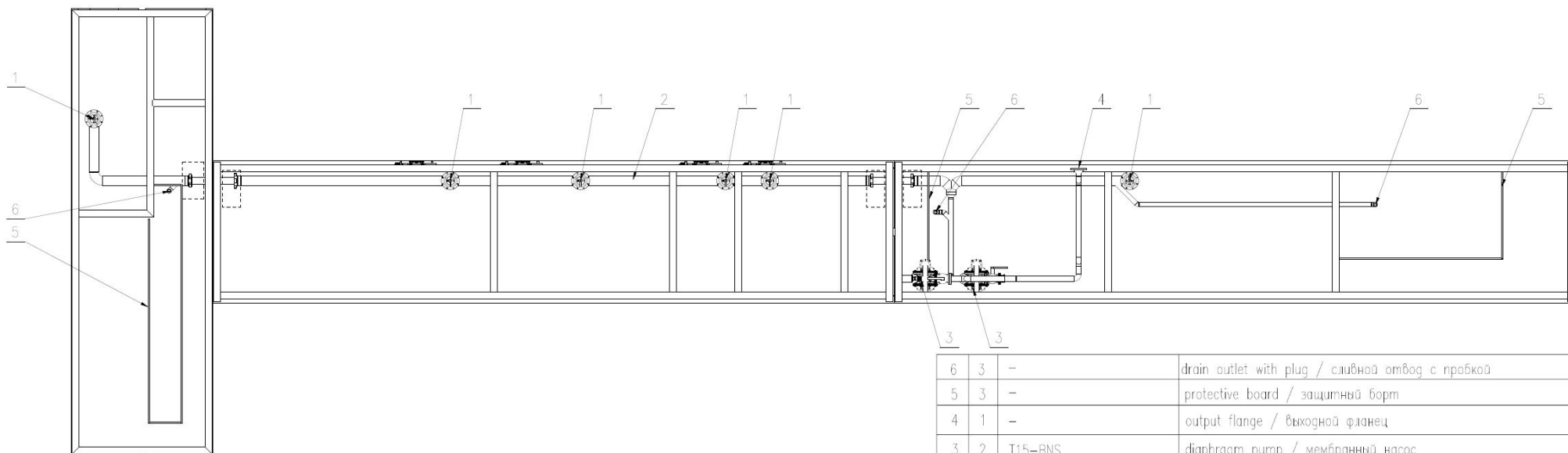
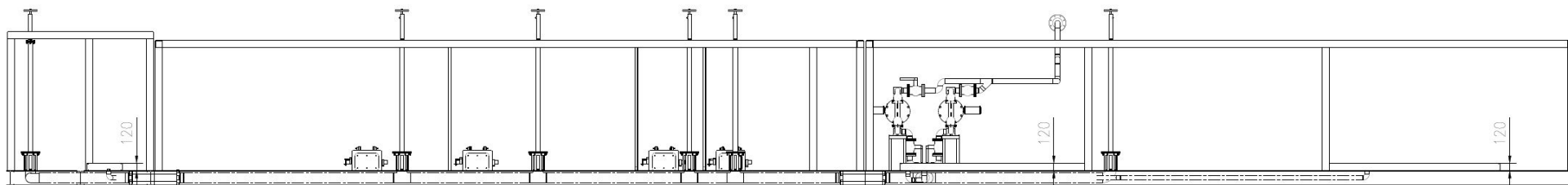



**SUCTION VALVE FROM TANK**  
**RUSSO**



**SUCTION VALVE FROM AREA OF PUMP**  
**RUSSO**





| 6   | 3           | -              | drain outlet with plug / сливной отвод с пробкой                |
|---|-------------|----------------|---|
| 5   | 3           | -              | protective board / защитный борт                                |
| 4   | 1           | -              | output flange / выходной фланец                                 |
| 3   | 2           | T15-BNS        | diaphragm pump / мембранный насос                               |
| 2   | 1           | -              | drainage collector pipeline / трубопровод дренажного коллектора |
| 1   | 6           | HF219          | bottom valve / донный клапан                                    |
| POS   | Q.TY        | CODE           | DESCRIPTION   |
|  | WEIGHT (kg) | PROJECT DESCR. | ASSEMBLY  |
|   |             | HH300 GAZPROM  | STATUS  |
|   |             |                | 0   |
| RSD-SOTEK   | DRAWN DATE  | CHECKED DATE   | REV.  |
|   | 04/11/2021  |                | 2   |
|   | SOLDIERCUI  |                | SHEET   |
|   |             |                | SCALE   |
| DESCRIPTION   |             |                | CODE  |
| Sewage collection drawings of moving part / Дренажная система мобильной части         |             |                | S00011907   |

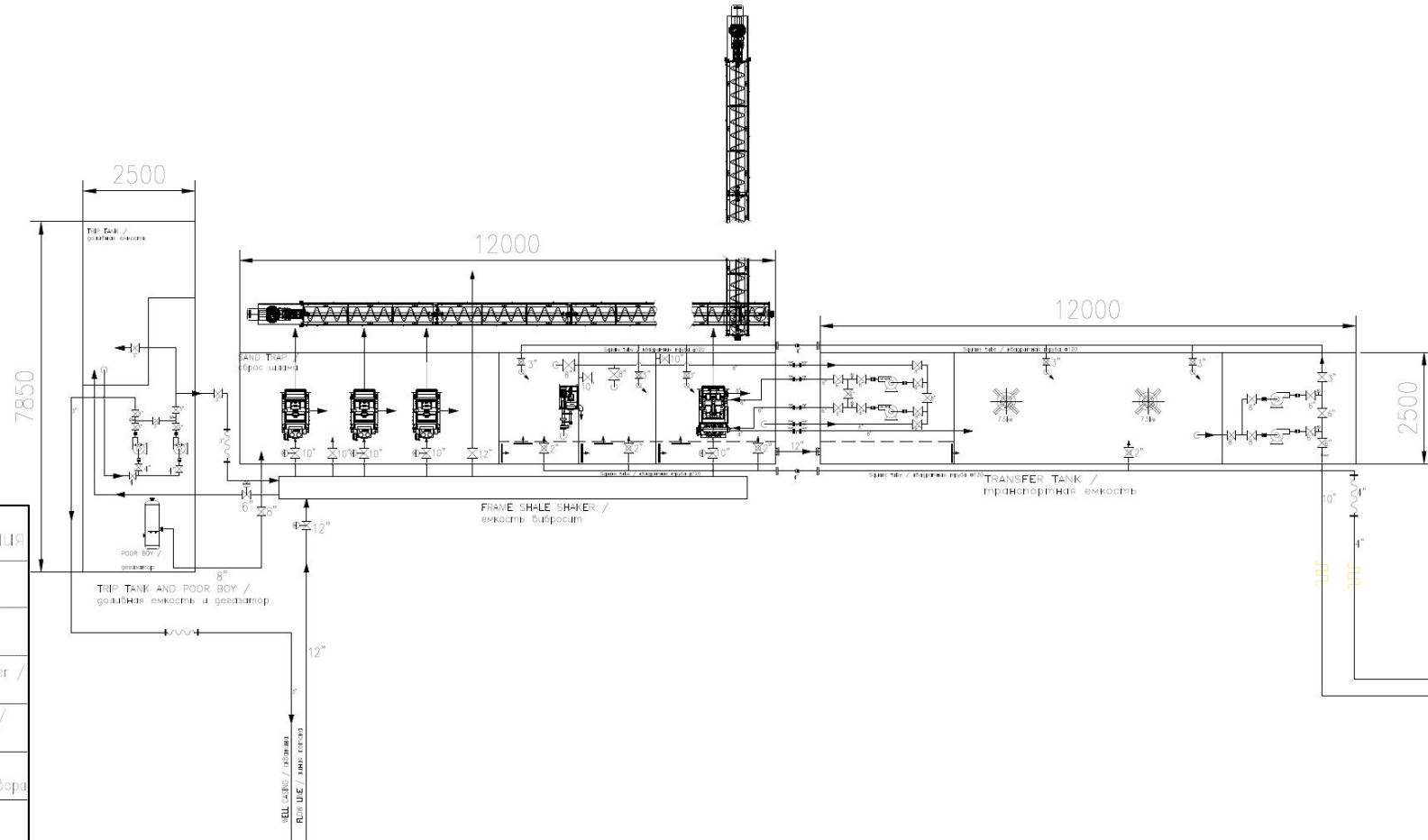
## Hydraulic schematic - Mobile part

russo

### Description

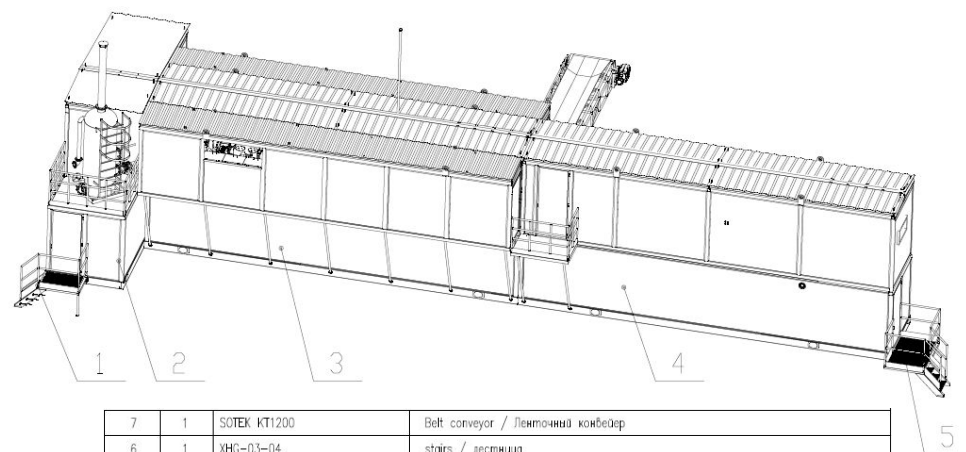
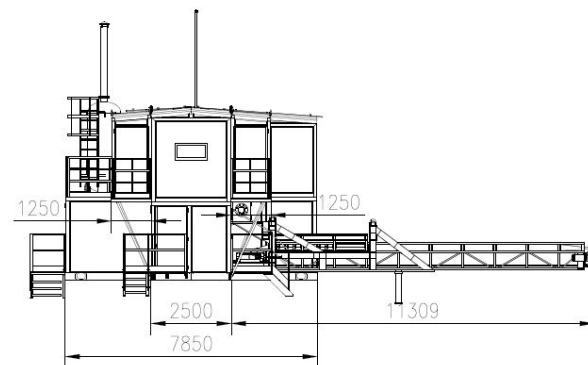
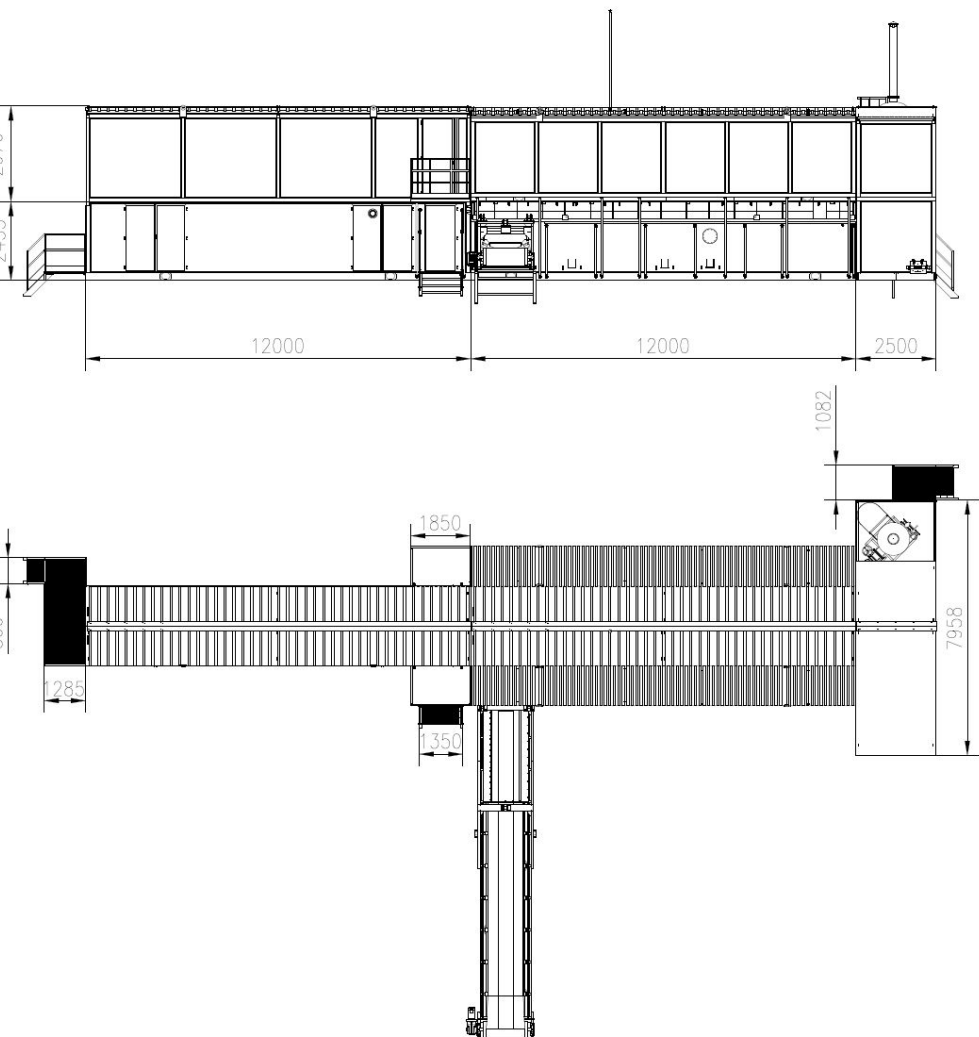
The P&ID shows all circulation lines of the mobile mud system


Russo

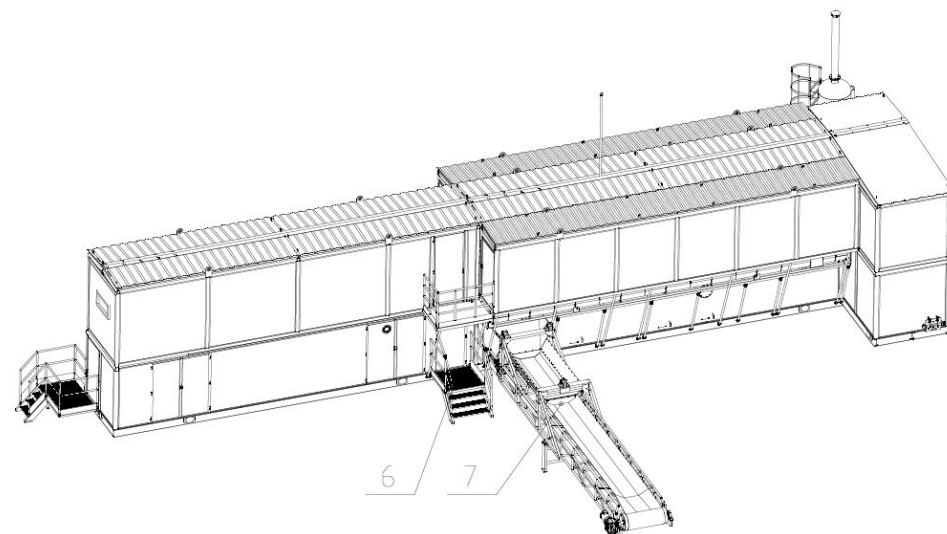
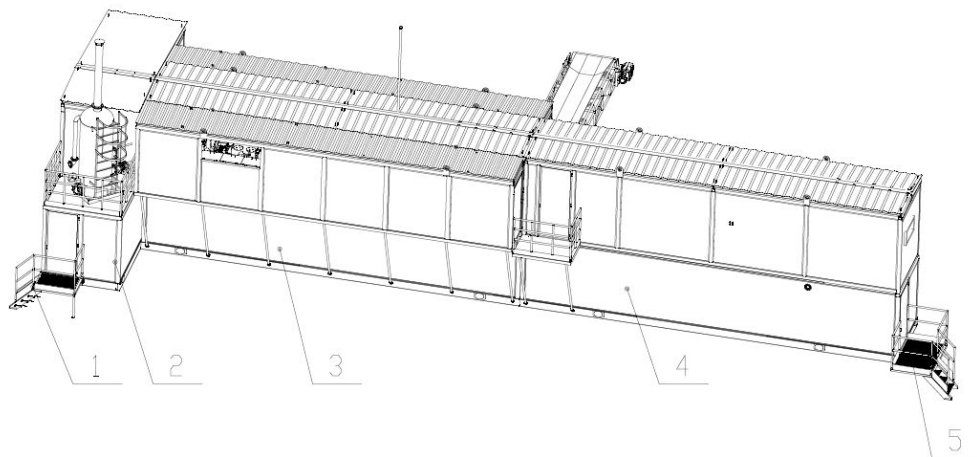
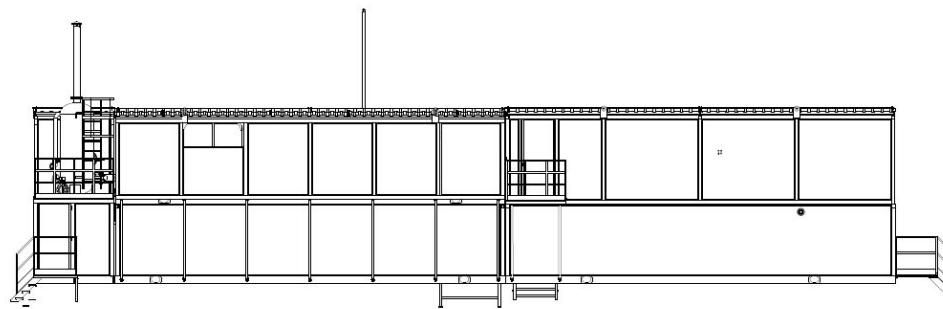
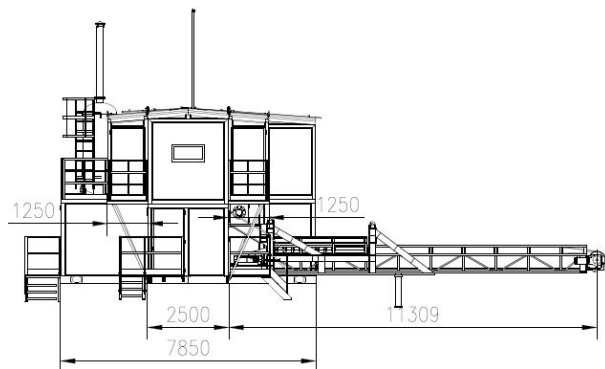


### Graphical Symbols / графические обозначения

| symbol / символ | name / обозначение                       | symbol / символ | name / обозначение                              |
|-----------------|--|-----------------|---|
|                 | Mud agitator / перемешиватель            |                 | Shale shaker / вибросито                        |
|                 | Centrifugal pump / центробежный насос    |                 | Jet flow type mud hopper / приемные воронки     |
|                 | Butterfly valve / задвижка               |                 | Mud degasser / дегазатор                        |
|                 | Center of well / центр скважины          |                 | Mud gate valve / клапан бурового раствора       |
|                 | Mud gun / гидромонитор                   |                 | Mud pump / буровой насос                        |
|                 | Ball valve / шаровый кран                |                 | Screw pump / винтовой насос                     |
|                 | Centrifuge / центрифуга                  |                 | Mud cleaner / СГУ                               |
|                 | Mud gas separator / дегазатор            |                 | Screw conveyor / шнековый конвейер              |
|                 | Pipelines discharge / Слив трубопроводов |                 | Pipelines suction / Всасывающие трубопроводы    |
|                 | Rubber hose / резиновый шланг            |                 | Rotation beam crane / кран-манипулятор          |
|                 | filter / фильтр                          |                 | Pressure gauge / манометр                       |
|                 | Blow down valve / сбросной клапан        |                 | Pneumatic diaphragm pump / пневматический насос |

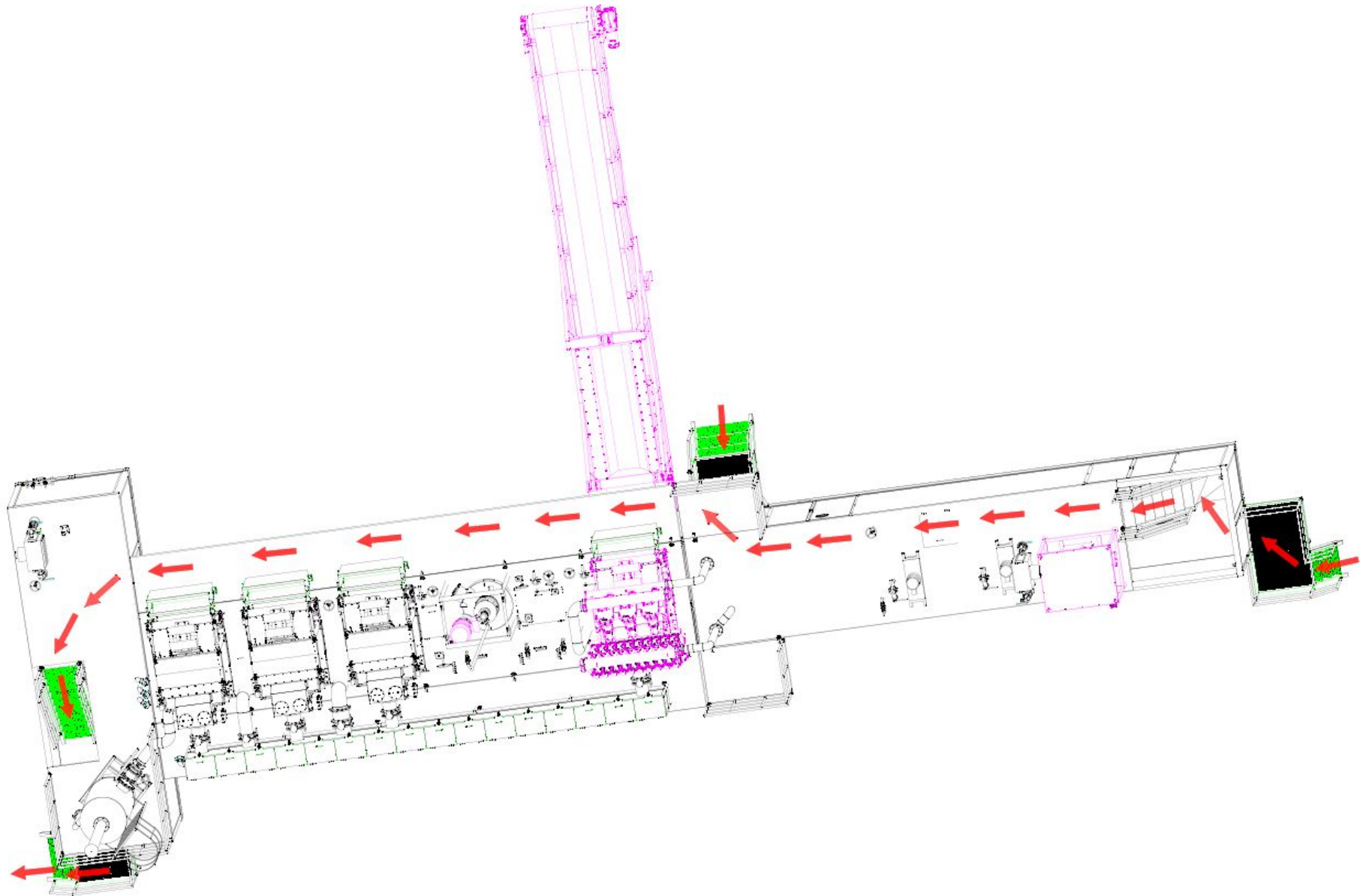


| 7   | 1     | SOTEX KT1200    | Belt conveyor / Ленточный конвейер    |
|---|-------|-----------------|---------------------------------------|
| 6   | 1     | XHC-03-04       | stairs / лестница                     |
| 5   | 1     | XHC-03-03       | stairs / лестница                     |
| 4   | 1     | S00011894_C     | Transfer tank / транспортная емкость  |
| 3   | 1     | S00011894_B     | Shaker tank / емкость для просеивания |
| 2   | 1     | S00011894_A     | Tip Tank / гофрированная емкость      |
| 1   | 1     | XHC-01-03       | stairs / лестница                     |
| POS   | Q.TY  | CODE            | DESCRIPTION                           |
|  | RIGHT | PROJECT DE-CP   | ASSEMBLY                              |
|   |       | HB500 G4 / FPM  | STATUS                                |
|   |       |                 | 0                                     |
|   |       | DR AWN          | CHECKED                               |
|   |       | DATE 16/09/2021 | REV. 1                                |
|   |       | BY S00LEDFCM    | BY                                    |
|   |       |                 | SHEET                                 |
|   |       |                 | SCALE                                 |
| DESCRIPTION   |       |                 | CODE                                  |
| Assembly drawing of moving part / Мобильная часть ЦС                                  |       |                 | S00011902                             |



| 7  | 1           | SOTEK KT1200     | Belt conveyor / Ленточный конвейер   |
|--|-------------|------------------|--------------------------------------|
| 6  | 1           | XHG-03-04        | stairs / лестница                    |
| 5  | 1           | XHG-03-03        | stairs / лестница                    |
| 4  | 1           | S00011894_C      | Transfer tank / транспортная емкость |
| 3  | 1           | S00011894_B      | Shaker tank / емкость вибросит       |
| 2  | 1           | S00011894_A      | Tip Tank / дозирующая емкость        |
| 1  | 1           | XHG-01-03        | stairs / лестница                    |
| POS  | Q.TY        | CODE             | DESCRIPTION                          |
|  | WEIGHT (kg) | PROJECT DE-OF.   | ASSEMBLY                             |
| RSD-SOTEK  |             | DATE: 18/09/2021 | CHECKED: DATE                        |
| DESCRIPTION: Assembly drawing of milling part / Мобильная часть ЦС |             | DATE: 18/09/2021 | REV. 1                               |
|  |             | CODE: S00011902  | STATUS: 0                            |
|  |             |                  | SHEET                                |
|  |             |                  | SCALE                                |







**GENERAL ASSEMBLY  
DRAWING OF MUD  
SYSTEM**

**RUSSO**

**GENERAL ASSEMBLY DRAWING LIST FOR MOBILE  
MUD SYSTEM**

**RUSSO**

| DESCRIPTION                       | RUSSO | NUMBER      |
|-----------------------------------|-------|-------------|
| MUD SYSTEM HYDRAULIC SCHEME       |       | S0011901    |
| TRIP TANK                         |       | S00011894_A |
| SHAKER TANK                       |       | S00011894_B |
| TRASNFER TANK                     |       | S00011894_C |
| DRAINAGE SYSTEM OVERALL           |       | S00011912   |
| DRAINAGE SYSTEM MOBILE MUD SYSTEM |       | S00011907   |

**SEE ANNEX AT THE END OF PDF FILE OF PRESENTATION  
RUSSO**

## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

RUSSO

### DECANTING CENTRIFUGE

#### DESCRIPTION

RUSSO

RUSSO

Модель: RSD/518HV / Model: RSD/518HV

Производительность: 40м3/час / Performance capacity: 40 m3/h

Скорость вращения барабана: 3250/2500/1900 об./мин / Drum rotational speed: 3250/2500/1900 RPM

Фактор разделения: 2100/1243/718 (для 3-х скоростей соответственно) / Separation factor: 2100/1243/718 (for above 3 speeds respectively)

Диаметр барабана: 356 мм / Diameter of the drum: 356 mm

Длина барабана: 1422 мм / Length of the drum: 1422 mm

Мощность приводов: 37/11 кВт (откл. при вибрации и открытии защиты) / Motors power : 37/11 kW (Safety switches for vibration and cover opening)

Материал выходного канала: нерж.сталь с керамической втулкой / Drainage outlet material: stainless steel with durable ceramic bushing

Твердосплавные насадки на шнеке: L-тип, болтовое и сварное крепление / Hard-alloy plates of the screw: L-shaped, screw and weld connected

Взрывозащ. панель управления DIIBT4, в т.ч. с ЧРП винтового насоса / DIIBT4 explosion-proof control cabinet, including VFD control of screw pump

Вес: 3140 кг / Weight: 3140 kg

Габариты (ДхШхВ), мм: 3022\*1780\*1100 / Dimensions (L\*W\*H), mm: 3022\*1780\*1100

Модель: RSD/414 / Model: RSD/414

Скорость вращения барабана: 2500/1900 об./мин / Drum rotational speed: 2500/1900 RPM

Фактор разделения: 243/718 (для 2-х скоростей соответственно) / Separation factor: 243/718 (for above two speeds respectively)

Диаметр барабана: 356 мм / Diameter of the drum: 356 mm

Длина барабана: 860 мм / Length of the drum: 860 mm

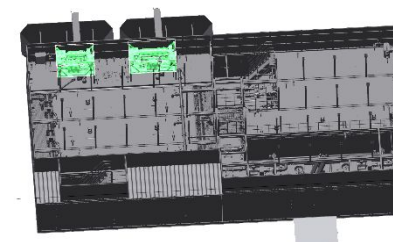
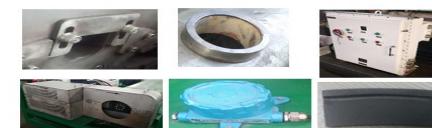
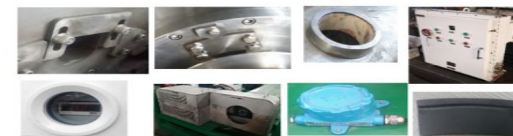
Мощность приводов: 18,5/5,5 кВт (откл. при вибрации и открытии защиты) / Motors power: 18.5/5.5 kW (Safety switches for vibration and cover opening)

Материал выходного канала: нерж.сталь с керамической втулкой / Drainage outlet material: stainless steel with durable ceramic bushing

Твердосплавные насадки на шнеке: L-тип, болтовое и сварное крепление / Hard-alloy plates of the screw: L-shaped, screw and weld connected

Взрывозащ. панель управления DIIBT4, в т.ч. с ЧРП винтового насоса / DIIBT4 explosion-proof control cabinet, including VFD control of screw pump

Габариты (ДхШхВ), мм: 2424\*1780\*1100 / Dimensions (L\*W\*H), mm: 2424\*1780\*1100



**MUD SYSTEM  
TREATMENT  
EQUIPMENT ON MUD  
SYSTEM FIXED  
SECTION**

**RUSSO**

### SCREW CONVEYOR

DESCRIPTION

**RUSSO**

RUSSO

Модель: RSD/LS315 / Model: RSD/LS315

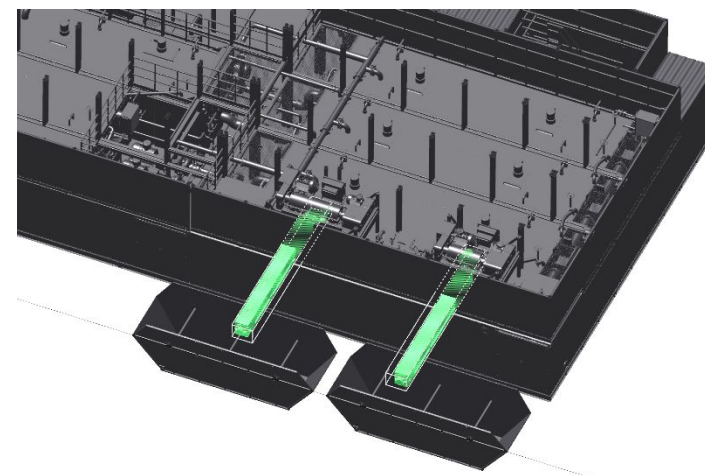
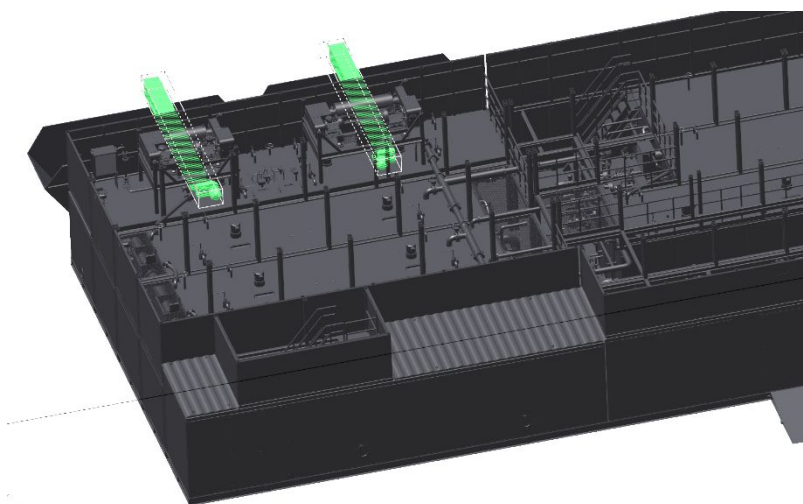
Производительность: 30 т/час / Performance capacity: 30 tons/hour

Мощность электропривода: 7,5 кВт / Power of the electric motor is 7.5 kW

Длина: 5 м / Length: 5 m

Диаметр шнека: 300 мм / Screw housing size: 300 mm

Скорость вращения: 21 об./мин / Rotational speed: 21 RPM



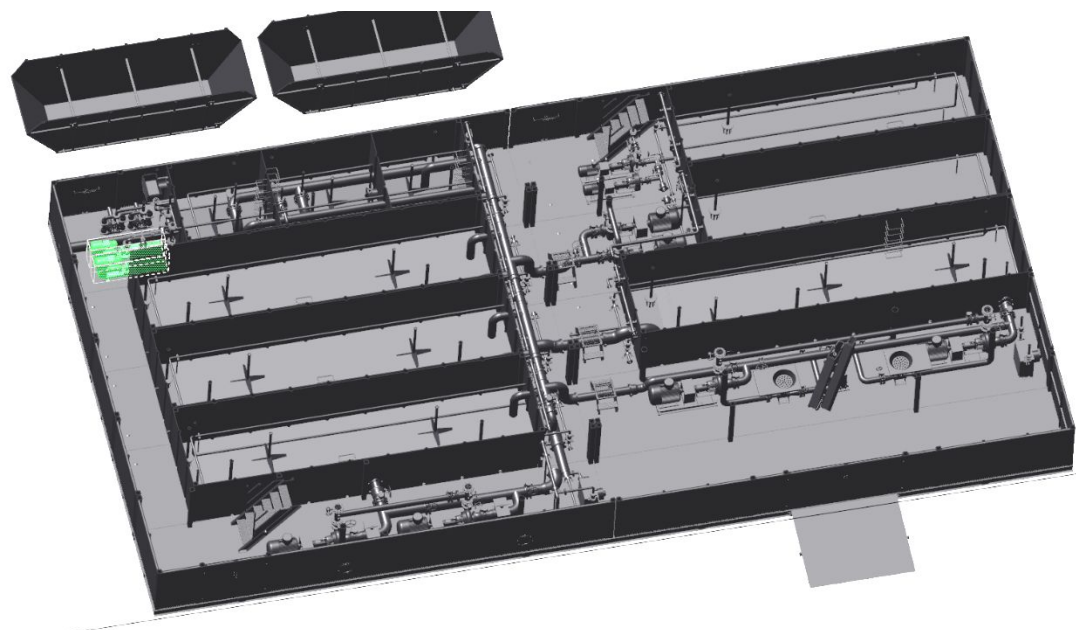
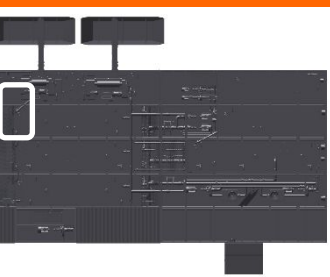
MUD SYSTEM  
TREATMENT  
EQUIPMENT ON MUD  
SYSTEM FIXED  
SECTION

RUSSO

MONO PUMP / SCREW PUMP

RUSSO

Модель: AMS PCP30S6/3 / Model: AMS PCP30S6/3  
Мощность привода: 5,5 кВт / Power of motor: 5.5 kW  
Производительность: 3-22 м3/час / Performance capacity: 3-22 m3/h  
Напор: не менее 10м / Pressure: not less than 10 m  
Регулировка скорости: ременный вариатор / Speed control: belt type variator  
Вес: 300 кг / Weight: 300 kg  
Габариты (ДxШxВ), мм: 1950\*350\*740 / Dimensions (L\*W\*H), mm: 1950\*350\*740



## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

RUSSO

### WATER CENTRIFUGAL PUMP

RUSSO

Модель: RSD/SB3x2 / Model: RSD/SB3x2

Производительность: не менее 55 м<sup>3</sup>/час / Flow: not less than 55 m<sup>3</sup>/h

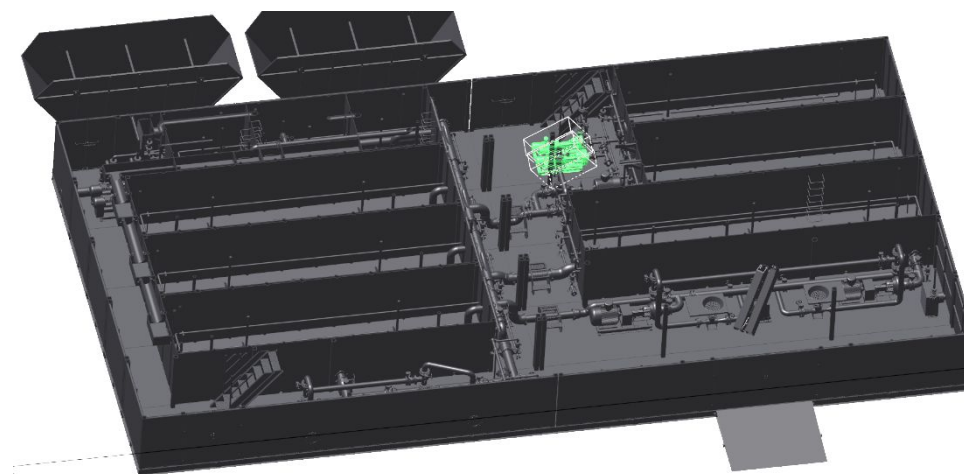
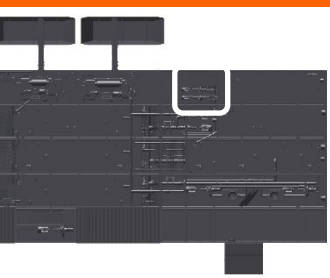
Напор: не менее 26 м / Pressure: not less than 26 m

Мощность привода: 15 кВт / Power: 15 kW

Диаметр крыльчатки: 13" или 12" / Diameter of impeller: 13" or 12"

Вес: 375 кг / Weight: 375 kg

Габариты (ДхШхВ), мм: 1531\*386\*674 / Dimensions (L\*W\*H), mm: 1531\*386\*674



## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

### RUSSO

## BOOSTER / SUPERCHARGING CENTRIFUGAL PUMP

## RUSSO

Модель: RSD/SB8x6 / Model: RSD/SB8x6

Входной фланец - DN200; выходной фланец - DN150 / Fluid inlet - DN200, fluid outlet - DN150

Производительность: не менее 240 м3/час / Flow: not less than 240 m3/h

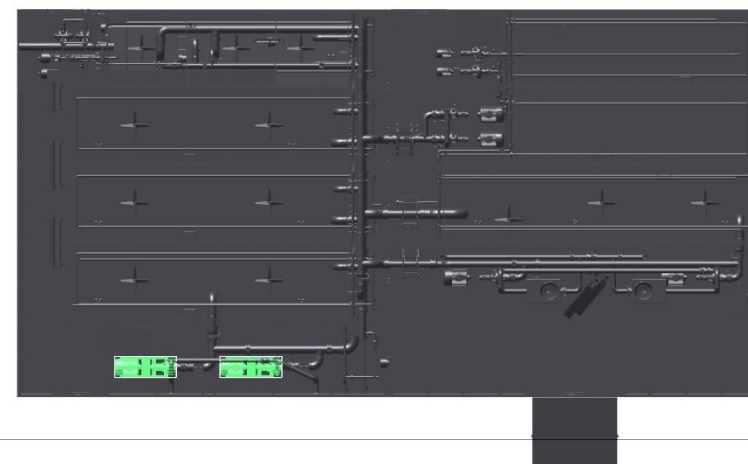
Напор: не менее 37 м / Pressure: not less than 37 m

Мощность привода: 75 кВт / Power: 75 kW

Диаметр крыльчатки: 14" или 13" / Diameter of impeller: 14" or 13"

Вес: 830 кг / Weight: 830 kg

Габариты (ДхШхВ), мм: 1932\*600\*880 / Dimensions (L\*W\*H), mm: 1932\*600\*880





## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

RUSSO

### MIXING CENTRIFUGAL PUMP

RUSSO

Модель: RSD/SB8x6 / Model: RSD/SB8x6

Входной фланец - DN200; выходной фланец - DN150 / Fluid inlet - DN200, fluid outlet - DN150

Производительность: не менее 240 м<sup>3</sup>/час / Flow: not less than 240 m<sup>3</sup>/h

Напор: не менее 37 м / Pressure: not less than 37 m

Мощность привода: 75 кВт / Power: 75 kW

Диаметр крыльчатки: 14" или 13" / Diameter of impeller: 14" or 13"

Вес: 830 кг / Weight: 830 kg

Габариты (ДхШхВ), мм: 1932\*600\*880 / Dimensions (L\*W\*H), mm: 1932\*600\*880



## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

RUSSO

## TRASNFER CENTRIFUAL PUMP

RUSSO

Модель: RSD/SB8x6 / Model: RSD/SB8x6

Входной фланец - DN200; выходной фланец - DN150 / Fluid inlet - DN200, fluid outlet - DN150

Производительность: не менее 240 м3/час / Flow: not less than 240 m3/h

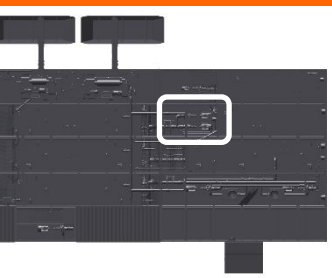
Напор: не менее 37 м / Pressure: not less than 37 m

Мощность привода: 75 кВт / Power: 75 kW

Диаметр крыльчатки: 14" или 13" / Diameter of impeller: 14" or 13"

Вес: 830 кг / Weight: 830 kg

Габариты (ДxШxВ), мм: 1932\*600\*880 / Dimensions (L\*W\*H), mm: 1932\*600\*880



## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

RUSSO

### MONO PUMP / SCREW PUMP

RUSSO

The draining pump is equipped with two (2) drain diaphragm pump pneumatic driven  
 This system is able to collect the fluid from the following section:

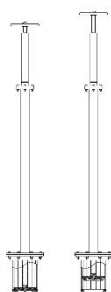
RUSSO

- Reserve tanks
- Water tanks
- Suction Tanks
- Mixing tank
- Centrifugal pump area
- Mud pump room

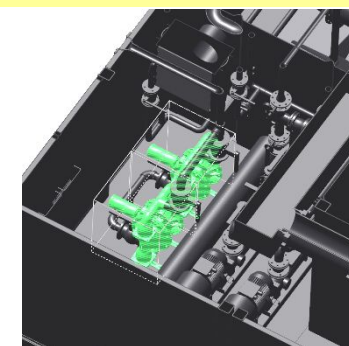
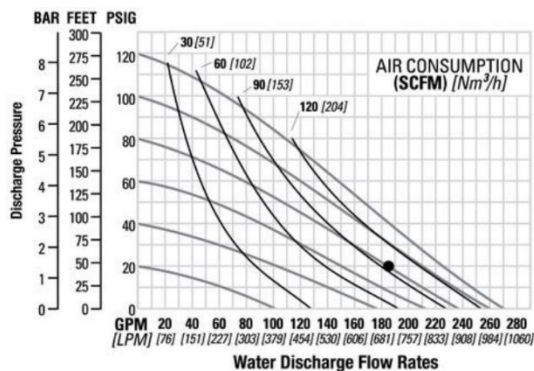


Pump model: XPS1520/AAAAA/ZGS/BN/BN/0014  
 Pump flow capacity: 878 l/min  
 Max pressure: 8,6 bar

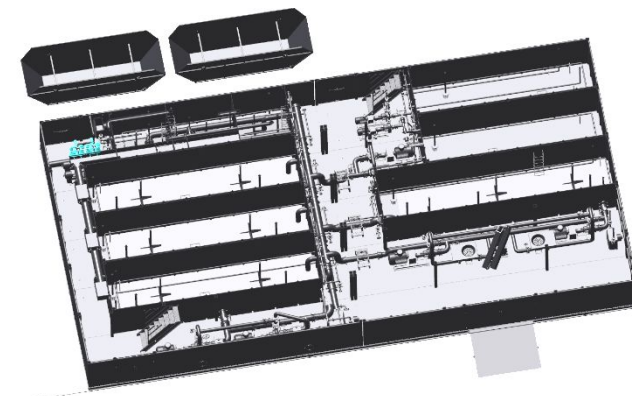
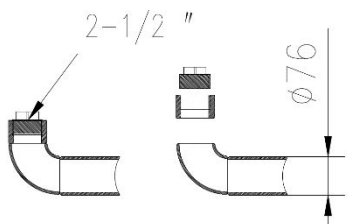
### SUCTION VALVE FROM TANK RUSSO



RUSSO



### SUCTION VALVE FROM AREA OF PUMP RUSSO



## MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION

RUSSO

### MIXING HOPPER

RUSSO

Модель: RSD/SHQ-200 / Model: RSD/SHQ-200

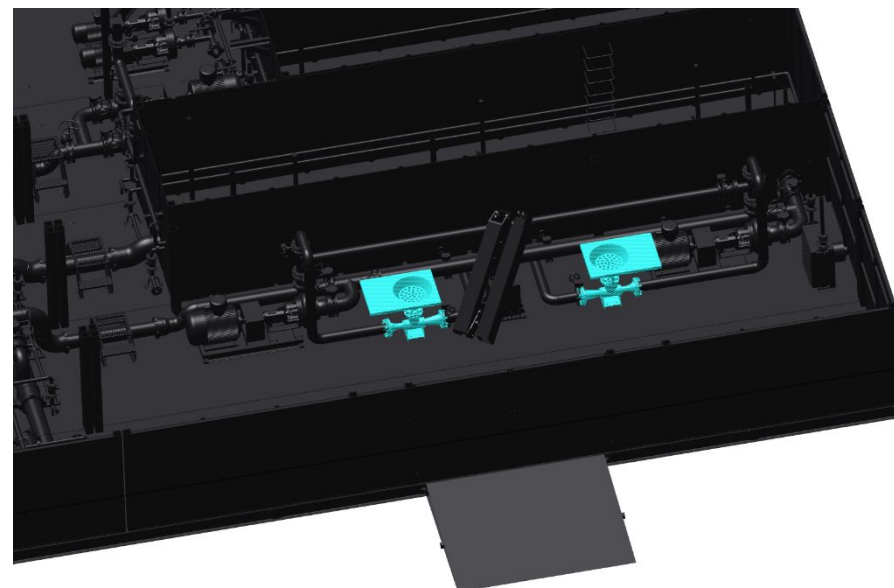
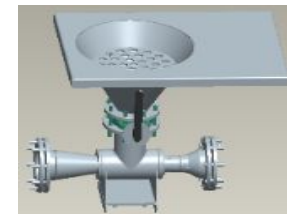
Производительность: 200 м3/час / Performance capacity: 200 м3/h

Проходной диаметр входного и выходного канала: 150 мм / Drift diameter of the input and output channel: 150 mm

Диаметр сопла: 40 мм / Diameter of the nozzle: 40 mm

Вес: 140 кг / Weight: 140 kg

Габариты (ДхШхВ), мм: 1100\*845\*875 / Dimensions (L\*W\*H), mm: 1100\*845\*875



**MUD SYSTEM  
TREATMENT  
EQUIPMENT ON MUD  
SYSTEM FIXED  
SECTION**

**RUSSO**

**MUD AGITATOR**

**RUSSO**

The fixed mud system is equipped with the following mud agitators:

Intermediate tank: three (3)

Reserve tank: three (3)

Mixing tank: three (3)

Suction tank: three (3)

RUSSO

Модель: ПБРТ-75-ГК-1500-22-900-Turbo / Model: PBRT-75-GK-1500-22-900-turbo

Скорость вращения крыльчаток: 66 об./мин / Rotational speed of the impeller: 66 rpm

Можность привоного мотора: 7,5 кВт / Power of the electric motor is 7.5 kW

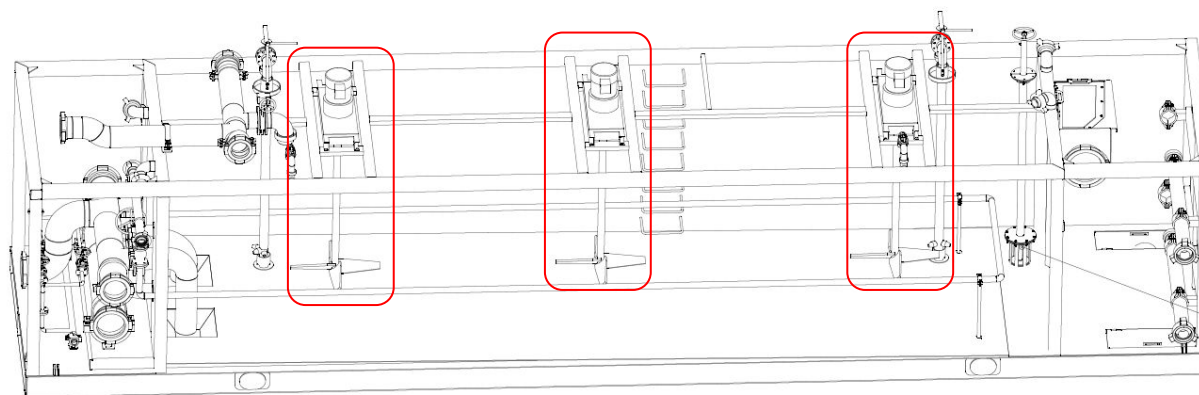
Диаметр крыльчаток (число лопастей): 900 мм (4) / Impeller diameters (number of blades): 900 mm (4)

Глубина установки крыльчаток: 500 ~ 2125 мм / Height of the impeller installation: 500 ~ 2125 mm

Диаметр вала крыльчаток: 73 мм / Diameter of the impeller shaft: 73 mm

Вес: 245 кг / Weight: 245 kg

Установочные габариты (ДxШ), мм: 1200\*352 / Installation dimensions (L\*W), mm: 1200\*352



**MUD SYSTEM  
TREATMENT  
EQUIPMENT ON MUD  
SYSTEM FIXED  
SECTION**

**RUSSO**

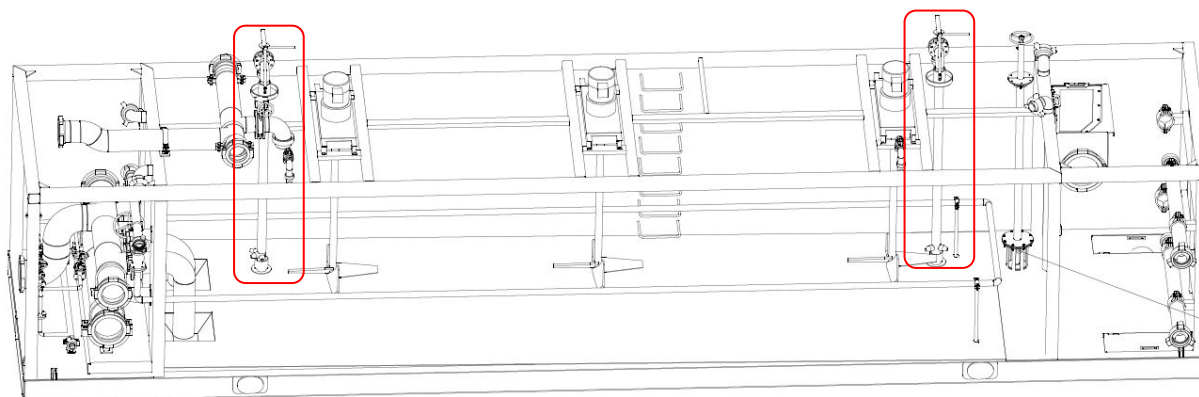
**MUD GUN**

The fixed mud system is equipped with the following mud gun:  
Intermediate tank: Two (2)  
Reserve tank: Two (2)  
Mixing tank: Two (2)  
Suction tank: Two (2)

**RUSSO**

RUSSO

Модель: RSD/NJQ-80 / Model: RSD/NJQ-80  
Угол поворота: 0-330° / Range of rotation 0-330°  
Рабочее давление: 1,6 МПа / Working pressure: 1.6 MPa  
Номинальный диаметр: DN80 / Nominal diameter: DN80  
Производительность: 20 м<sup>3</sup>/час / Performance capacity: 20 m<sup>3</sup>/h  
Диаметр сопла: 4-20мм / Nozzle diameter: 4-20 mm  
Вес: 60 кг / Weight: 60 kg

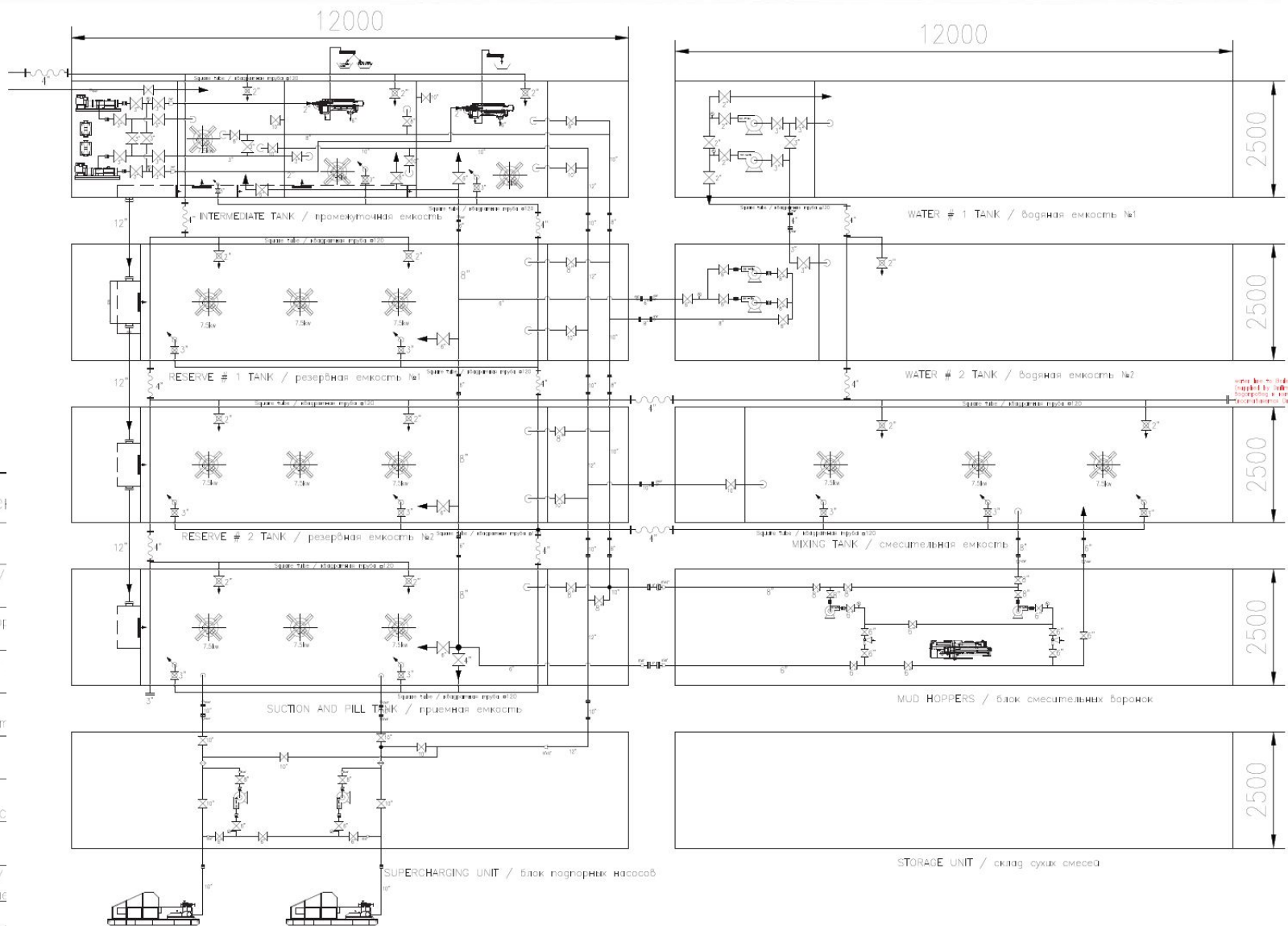




## Hydraulic schematic - Mobile part

### Description

The P&ID shows all circulation lines of the fixed mud system



### Graphical Symbols / графические обозначения

| symbol / символ | name / обозначение                                    | symbol / символ | name / обозначение                            |
|-----------------|---|-----------------|---|
|                 | Mud agitator / перемешиватель                         |                 | Shale shaker / вибросито                      |
|                 | Centrifugal pump / центробежный насос                 |                 | Jet flow type mud hopper / приемные воронки   |
|                 | Butterfly valve / задвижка                            |                 | Mud degasser / дегазатор                      |
|                 | Center of well / центр скважины                       |                 | Mud gate valve / клапан бурового расч         |
|                 | Mud gun / гидромонитор                                |                 | Mud pump / буровой насос                      |
|                 | Ball valve / шаровый кран                             |                 | Screw pump / винтовой насос                   |
|                 | Centrifuge / центрифуга                               |                 | Mud cleaner / СГУ                             |
|                 | Mud gas separator / дегазатор                         |                 | Screw conveyor / шнековый конвейер            |
|                 | Pipelines discharge / Слив трубопровода               |                 | Pipelines suction / Всасывающие трубопрово... |
|                 | Rubber hose / резиновый шланг                         |                 | Rotation beam crane / кран-манипулятор        |
|                 | filter / фильтр                                       |                 | Pressure gauge / манометр                     |
|                 | Electric butterfly valve / электрический шаровый кран |                 | Pneumatic diaphragm pump / мембранная насос   |

**MUD SYSTEM TREATMENT EQUIPMENT ON MUD SYSTEM FIXED SECTION**

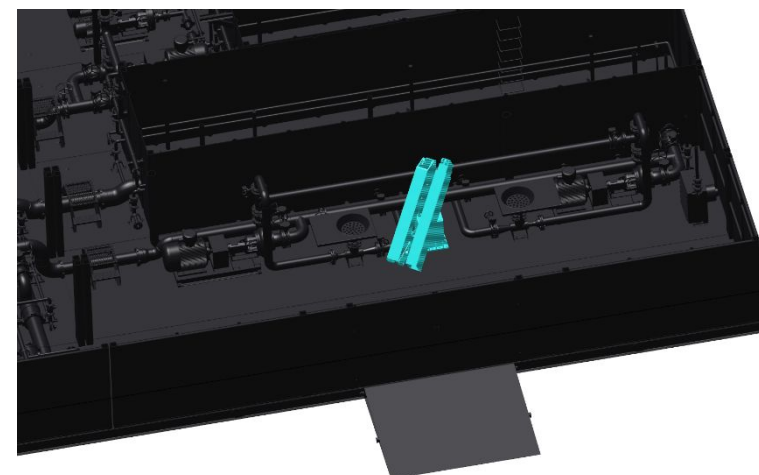
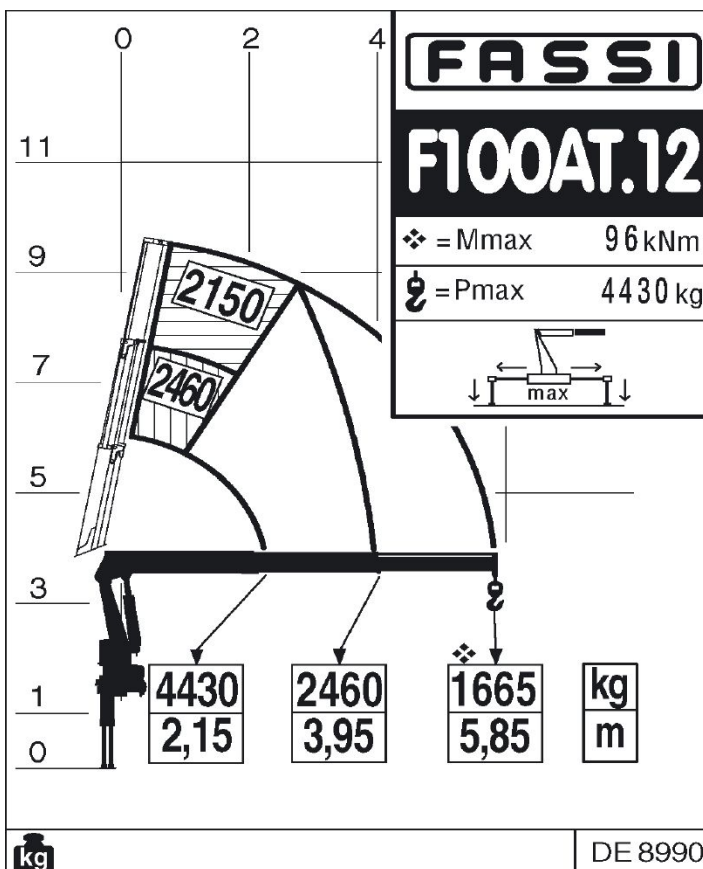
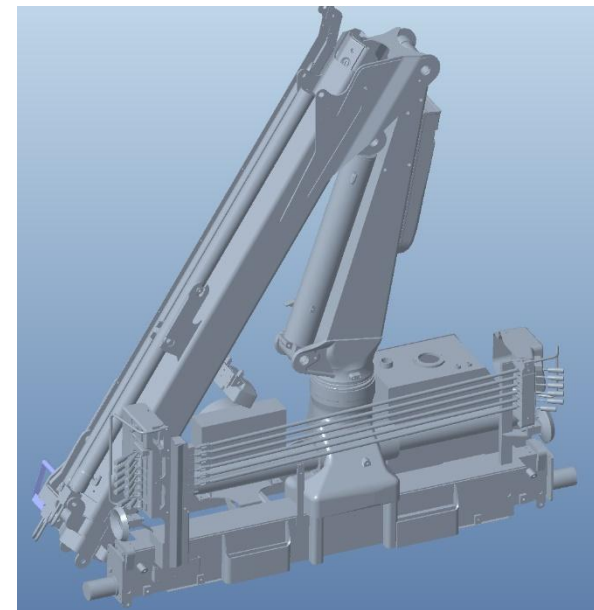
**RUSSO**

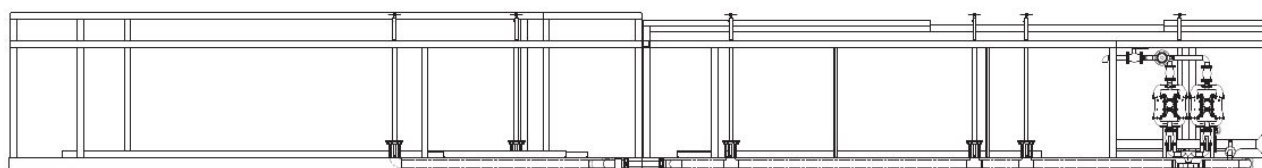
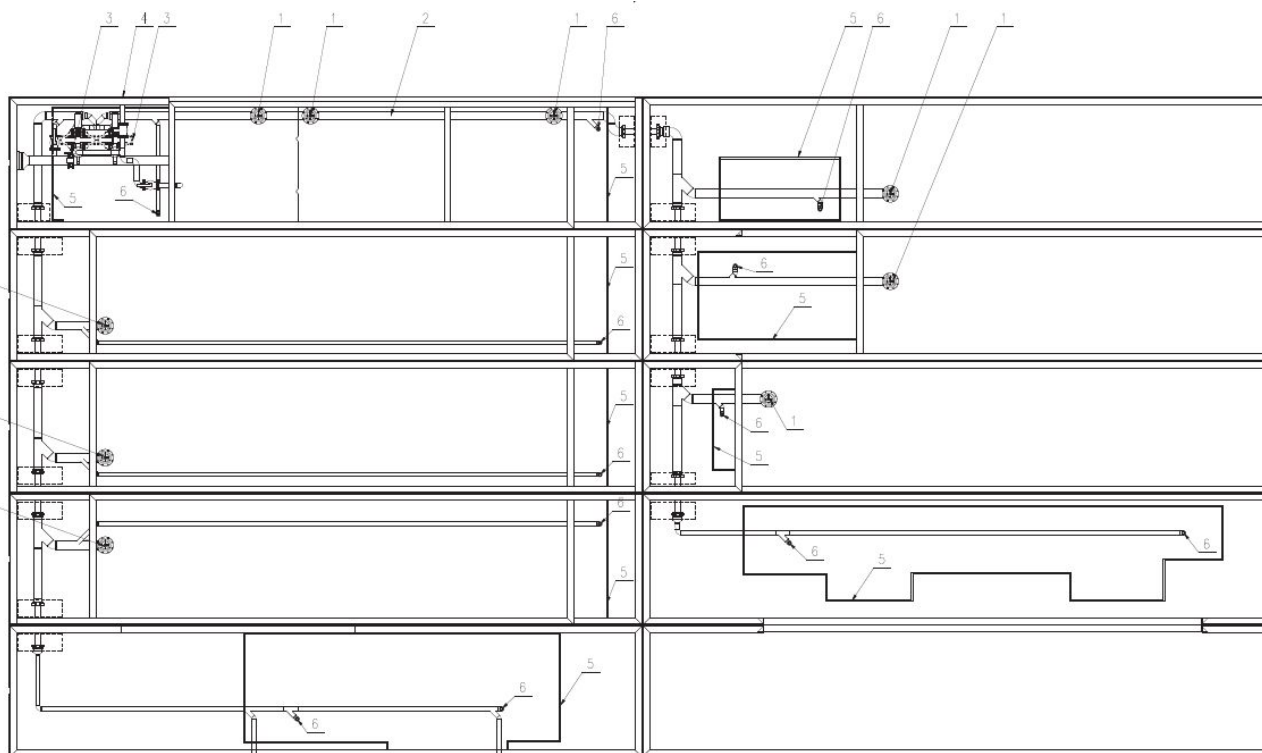
**MIXING HANDLING CRANE**

**RUSSO**




Mixing handling crane installed between the two mud hopper.  
 The scope of this crane is to handle the sacks or other material on the mixing area.  
 The crane is hydraulic driven, by means the electric HPU.  
 The HPU is independent from the other service of the mud system and rig. The crane package need only the electrical power feeding system.  
 The Crane is controlled by local panels  
 Max lifting capacity: 4430 kg  
 Max length handling capacity: 5,85 m  
 The crane during the transport it's on the bottom module of mixing it's not required to remove its

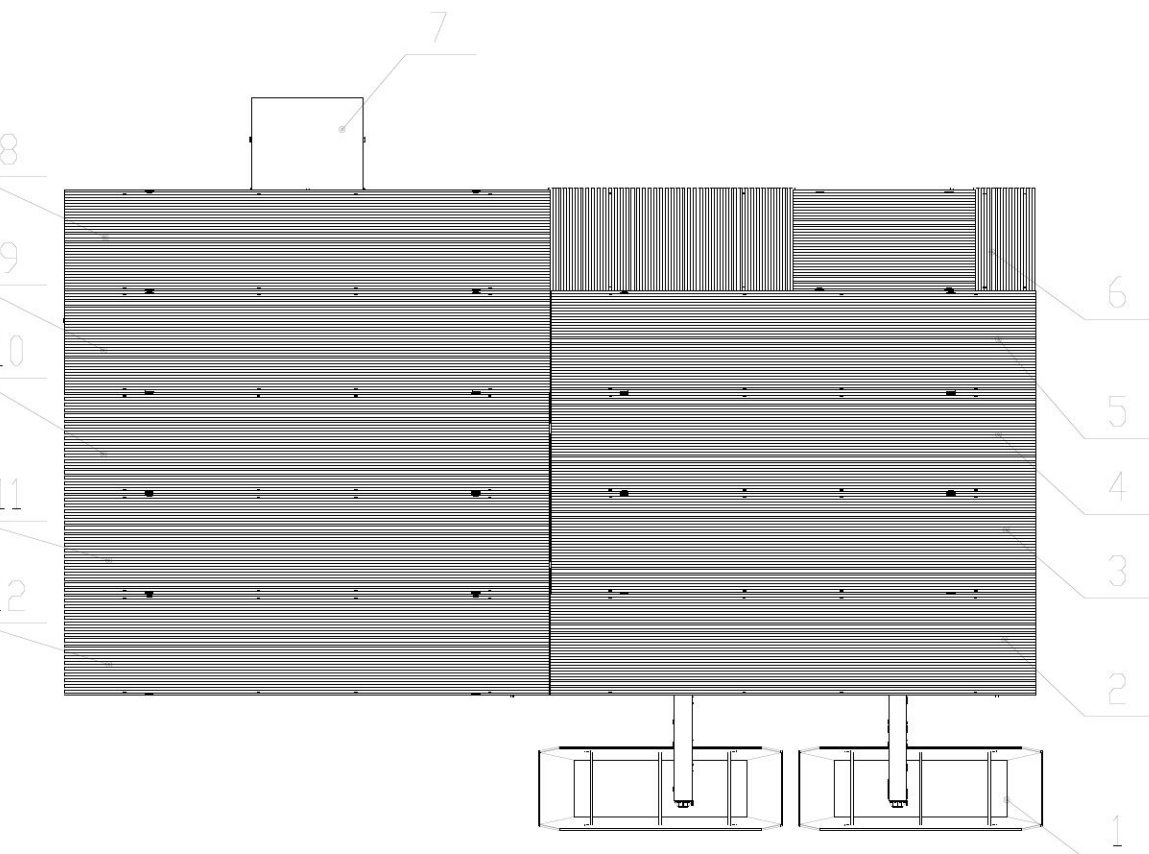
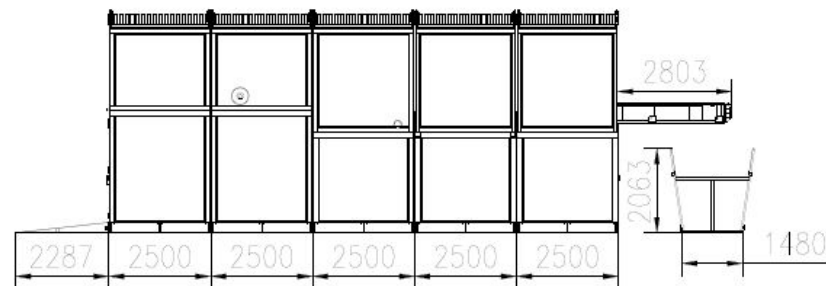
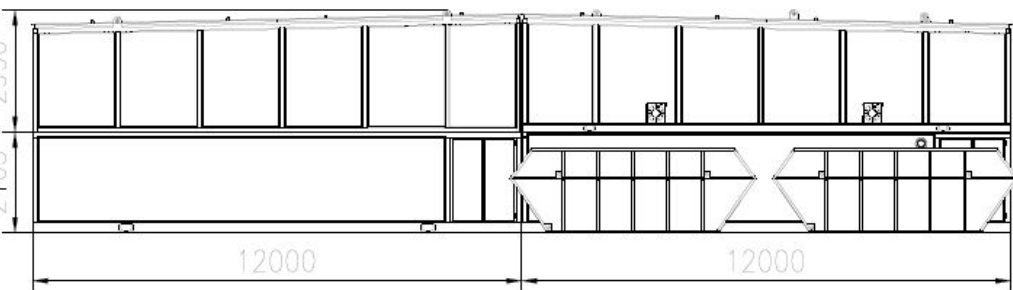
RUSSO






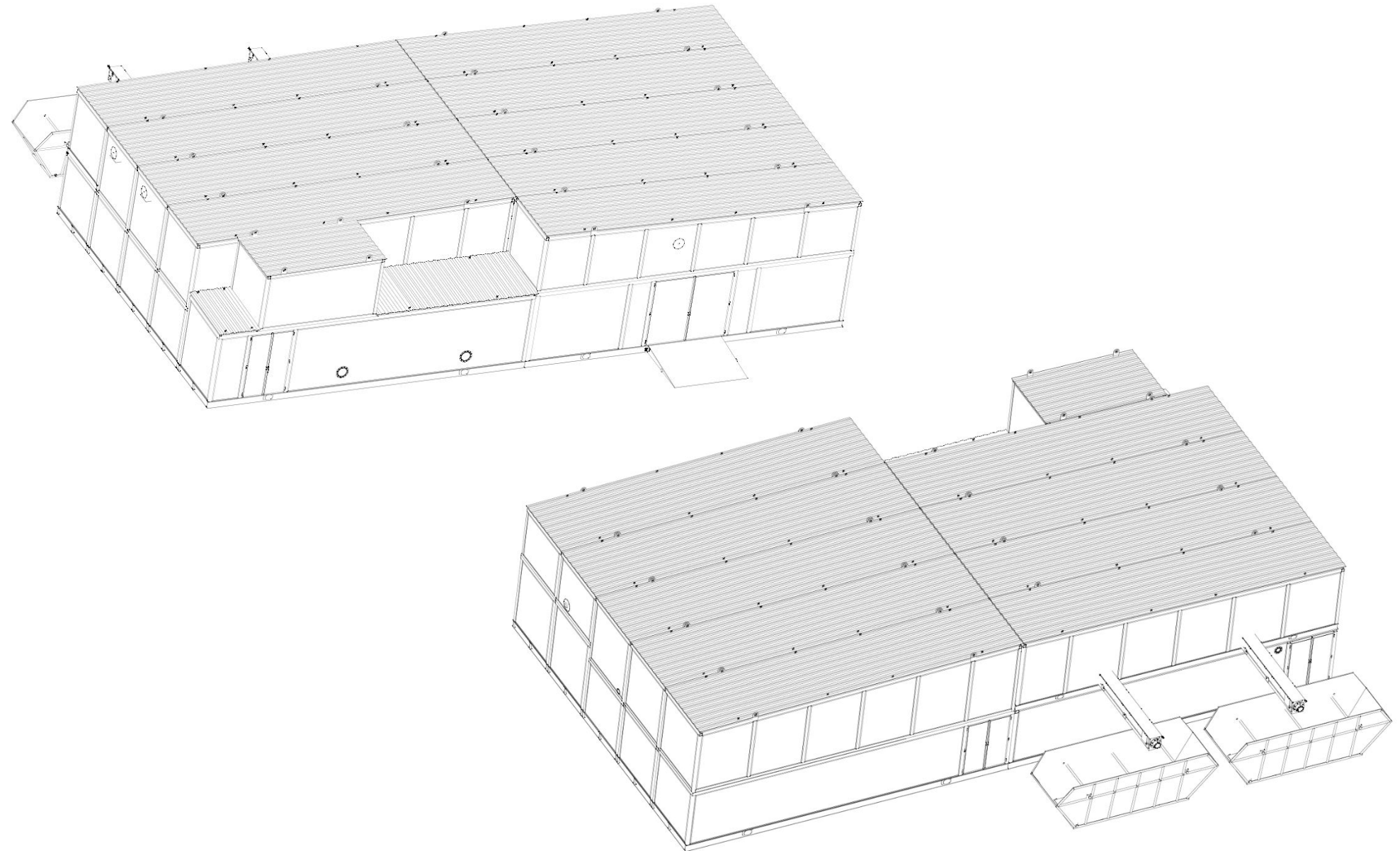
A

|  |             |         |   |
|--|-------------|---------|---|
| 6  | 12          | -       | drain outlet with plug / сливной отвод с пробкой                |
| 5  | 10          | -       | protective board / защитный борт                                |
| 4  | 1           | -       | output flange / выходной фланец                                 |
| 3  | 2           | T15-BNS | diaphragm pump / мембранный насос                               |
| 2  | 1           | -       | drainage collector pipeline / трубопровод дренажного коллектора |
| 1  | 9           | HF219   | bottom valve / донный клапан                                    |
| POS  | Q.TY        | CODE    | DESCRIPTION   |
|           | WEIGHT      | kg      | PROJECT DESCR.<br>HH300 GAZ/PROM                                |
|           | ASSEMBLY    |         | STATUS<br>0   |
|           | DESCRIPTION |         | REV. 2 SHEET SCALE  |
| RSD-SOTEK  |             |         | DATE 04/11/2021   |
| BY SOLDNERCUI  |             |         | DATE  |
| DESCRIPTION<br>Sewage collection drawings of fixed part / Дренажная система стационарной части |             |         | CODE<br>S00011906   |



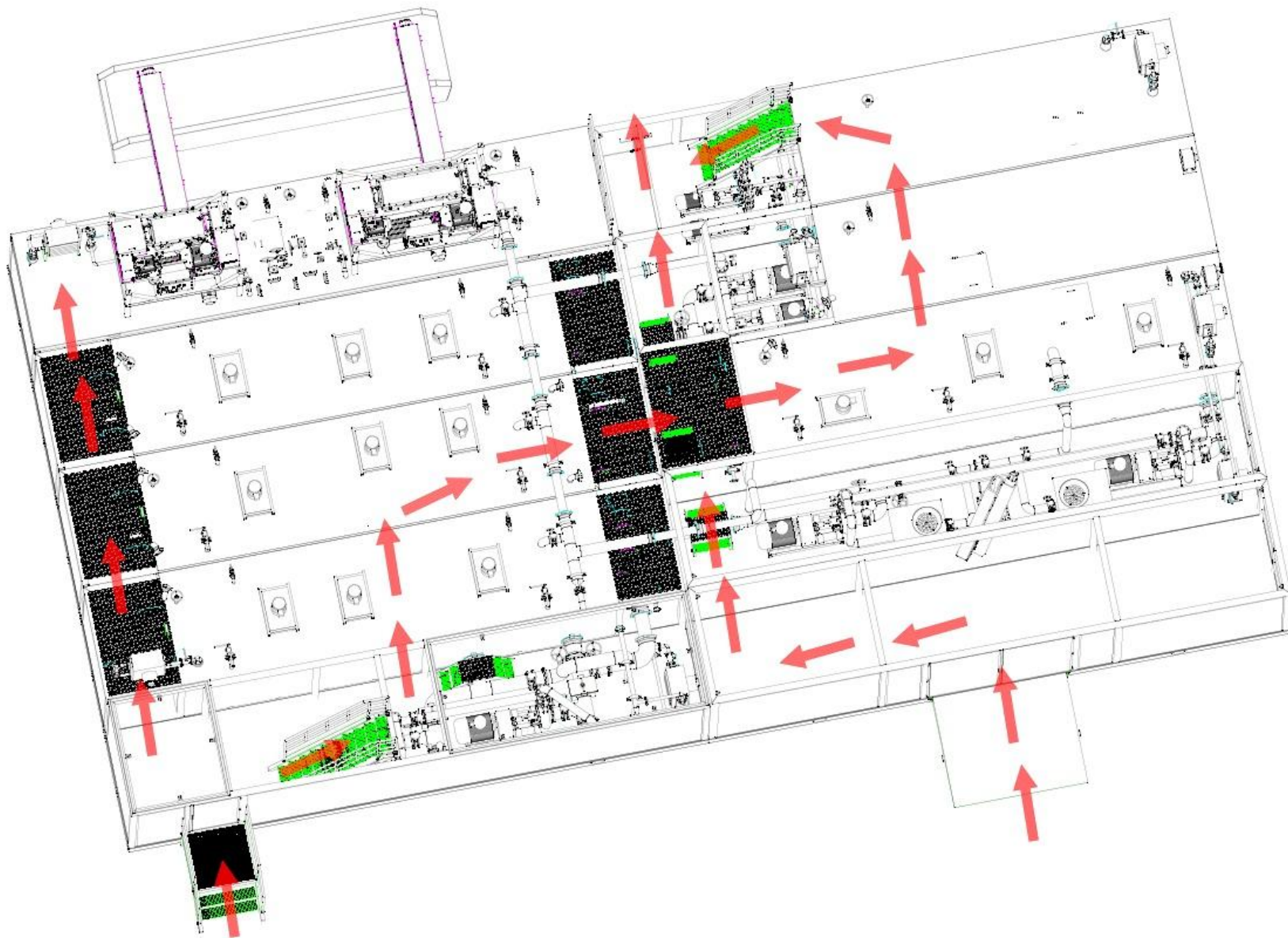
|   |      |                      |  |
|---|------|----------------------|--|
| 12  | 1    | S00011894_H          | Water tank 1 / водяная емкость 1             |
| 11  | 1    | S00011894_I          | Water tank 2 / водяная емкость 2             |
| 10  | 1    | S00011894_L          | Mixing tank / смешивальная емкость           |
| 9   | 1    | S00011897_A          | Mixing unit / блок смешивающих барабанов     |
| 8   | 1    | S00011897_B          | Storage unit / склад сухих смесей            |
| 7   | 1    | XHC-13-03            | Ramp mat / брезент в склад сухих смесей      |
| 6   | 1    | S00011896_A          | Supercharging unit / блок подглерных насосов |
| 5   | 1    | S00011894_G          | Suction tank / приемная емкость              |
| 4   | 1    | S00011894_F          | Reserve Tank 2 / резервная емкость 2         |
| 3   | 1    | S00011894_E          | Reserve Tank 1 / резервная емкость 1         |
| 2   | 1    | S00011894_D          | Intermediate tank / промежуточная емкость    |
| 1   | 2    | XHC-14               | Cutting slip container / шламовая емкость    |
| POS   | Q.TY | CODE                 | DESCRIPTION                                  |
|  |      | WEIGHT kg            | PROJECT DESCR.                               |
|   |      |                      | НН300 GAZPROM                                |
|   |      | DRAWN DATE           | CHECKED DATE                                 |
|   |      | 18/09/2021           |  |
|   |      | BY                   | BY   |
|   |      | SOLDIERCUM           |  |
| DESCRIPTION   |      | CODE                 |  |
| Assembly drawing of fixed part  |      | Стандартная часть ЦС | S00011903                                    |
|   |      | STATUS               | 0  |
|   |      | REV.                 | 1  |
|   |      | SHEET                |  |
|   |      | SCALE                |  |







# Drawing S00011904 Safe exit route on fixed mud system RUSSO



**GENERAL ASSEMBLY  
DRAWING OF MUD  
SYSTEM**

**RUSSO**

**GENERAL ASSEMBLY DRAWING LIST FOR FIXED MUD SYSTEM RUSSO**

| DESCRIPTION                      | RUSSO | NUMBER      |
|----------------------------------|-------|-------------|
| MUD SYSTEM HYDRAULIC SCHEME      |       | S0011901    |
| INERMEDIATE TANK                 |       | S00011894_D |
| RESERVE TAANK #1                 |       | S00011894_E |
| RESERVE TAANK #2                 |       | S00011894_F |
| SUPERCHARGING UNIT               |       | S00011896_A |
| DRAINAGE IN MUP PUMP ROOM        |       | S00011913   |
| DRAINAGE SYSTEM OVERALL          |       | S00011912   |
| DRAINAGE SYSTEM FIXED MUD SYSTEM |       | S00011906   |

**SEE ANNEX AT THE END OF PDF FILE OF PRESENTATION  
RUSSO**

## GENERAL DATA OF PIPING AND CONNECTION OF MUD SYSTEM

RUSSO

## GENERAL EQUIPMENT USED FOR THE BOTH MUD SYSTEM

RUSSO

**Быстроразъемные соединители: / Quick union connections:**

4"  
6"  
8"  
10"  
12"



**Гибкие трубопроводы: / Flexible pipelines:**

Внутренний диаметр 2" - 3,5 м / ID2" - 3.5 m  
Внутренний диаметр 3" - 5 м / ID3"- 5 m  
Внутренний диаметр 4" - 1,5 м / ID4"- 1.5 m

**Механический уровнемер / Mechanical level meter**

Двойная шкала: баррель и м3 / Double scale: BBL and m³

Материал: нержавеющая сталь / Material: SS304

Вес: 18 кг / Weight: 18kg

Устанавливается только на 2-х растворных секциях Доливной емкости (п.6.6 технических требований Покупателя для ЦС400, прилагаемых к настоящему Техническому описанию) /

To be installed on Trip tank 2 mud sections only (clause 6.6 of Mud system technical requirements of the Buyer, attached hereto)



**Донный клапан 8" / Bottom valve 8"**

Устанавливаются в качестве дренажных клапанов на дне растворных и водяных емкостей / To be installed as draining gates in mud and water tanks bottom

Дренажные выходы емкостей соединяются с общим дренажным манифольдом (на подвижной и стационарной частях ЦС400 соответственно), заканчивающимся выходным фланцем, размещенным в габаритах соответствующих емкостей и обращенным в сторону шламового амбара / Draining of tanks to be manifolded in a single line (on skidding and stationary parts of CS400 respectively) with flange on its end placed inside correspondent tank sizes on the side directed to mud pit



## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

### FORCED VENTILATION SYSTEM FIXED MUD SYSTEM RUSSO

The mud system fixed module are insulated and closed in a housing with insulation wall, all this volume it need change or air based on the below data:

| USER (mobile areas) | V <sub>gross</sub> | Air Change Winter | Air Change Summer | VENTILATOR S Q.TY | VENTILATOR S TYPE | AIR FLOW WINTER   | AIR FLOW SUMMER   |
|---------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                     | [m <sup>3</sup> ]  |                   |                   |                   |                   | m <sup>3</sup> /h | m <sup>3</sup> /h |
| GROUP GROUND TANKS  | 677,73             | 8,85              | 17,71             | 4                 | BO 06-300-4       | 6000              | 12000             |
| MUD MIXING UNIT     | 300,00             | 6,67              | 6,67              | 2                 | BO 06-300-4       | 2000              | 2000              |



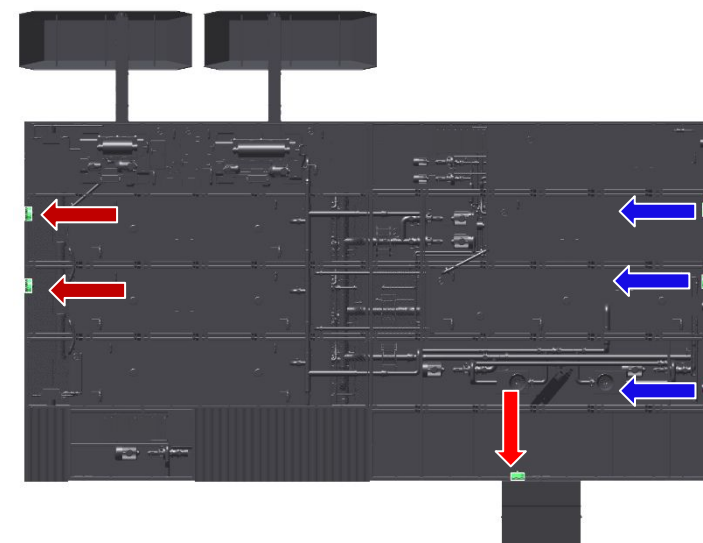
Модель: BO 06-300-4 (в Блоках №4-№7) / Model: BO 06-300-4 (in Blocks No.4-No.7)

Рабочее напряжение: 400 В, 3 фазы / Rated voltage: 400 V, 3 phases

Мощность, скорость вращения: 0,37 кВт; 1500об/мин / Rated power, speed of rotation: 0.37 kW, 1500 RPM

Диаметр прохода: 400мм / Impeller diameter: 400 mm

Производительность по воздуху: 4000-6000 м3/час, при Pv=240-160 Па / Air volume: 4000-6000 m3/h, at Pv=240-160 Pa



## VENTILATION AND HEATING OF FIXED MUD SYSTEM

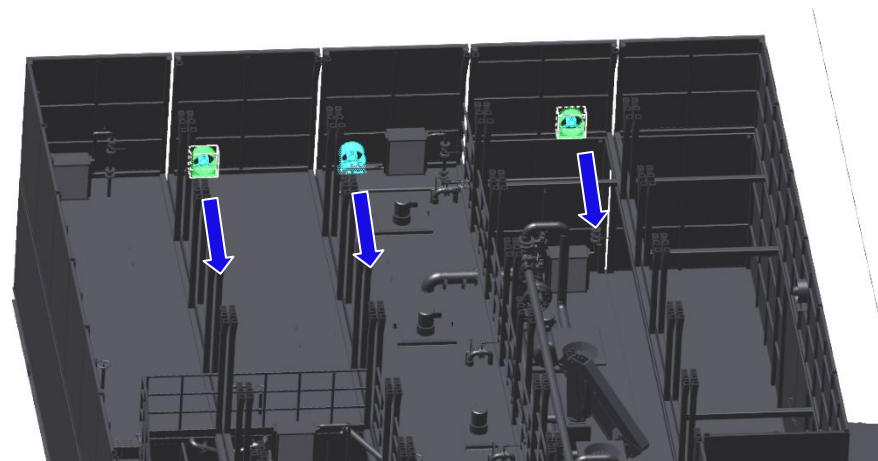
RUSSO

## FORCED VENTILATION SYSTEM FIXED MUD SYSTEM

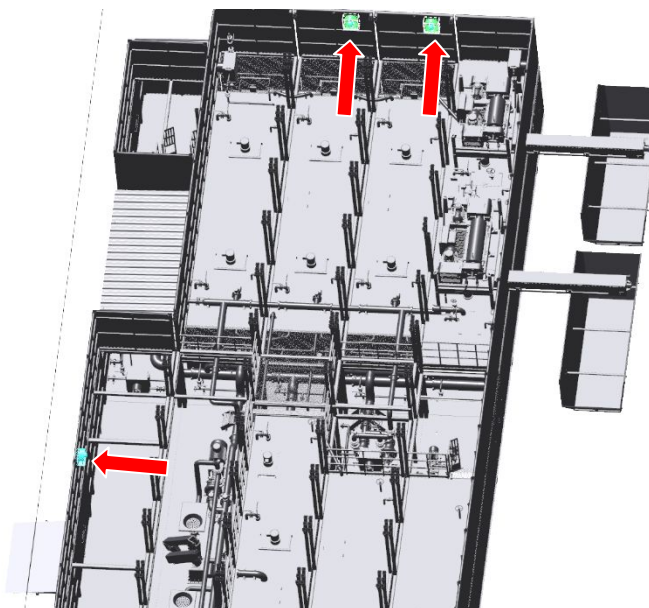
RUSSO

The inlet fan are positioned on the low level on the top module. Approx at the height of floor

## INLET FAN RUSSO



## OUTLET FAN RUSSO



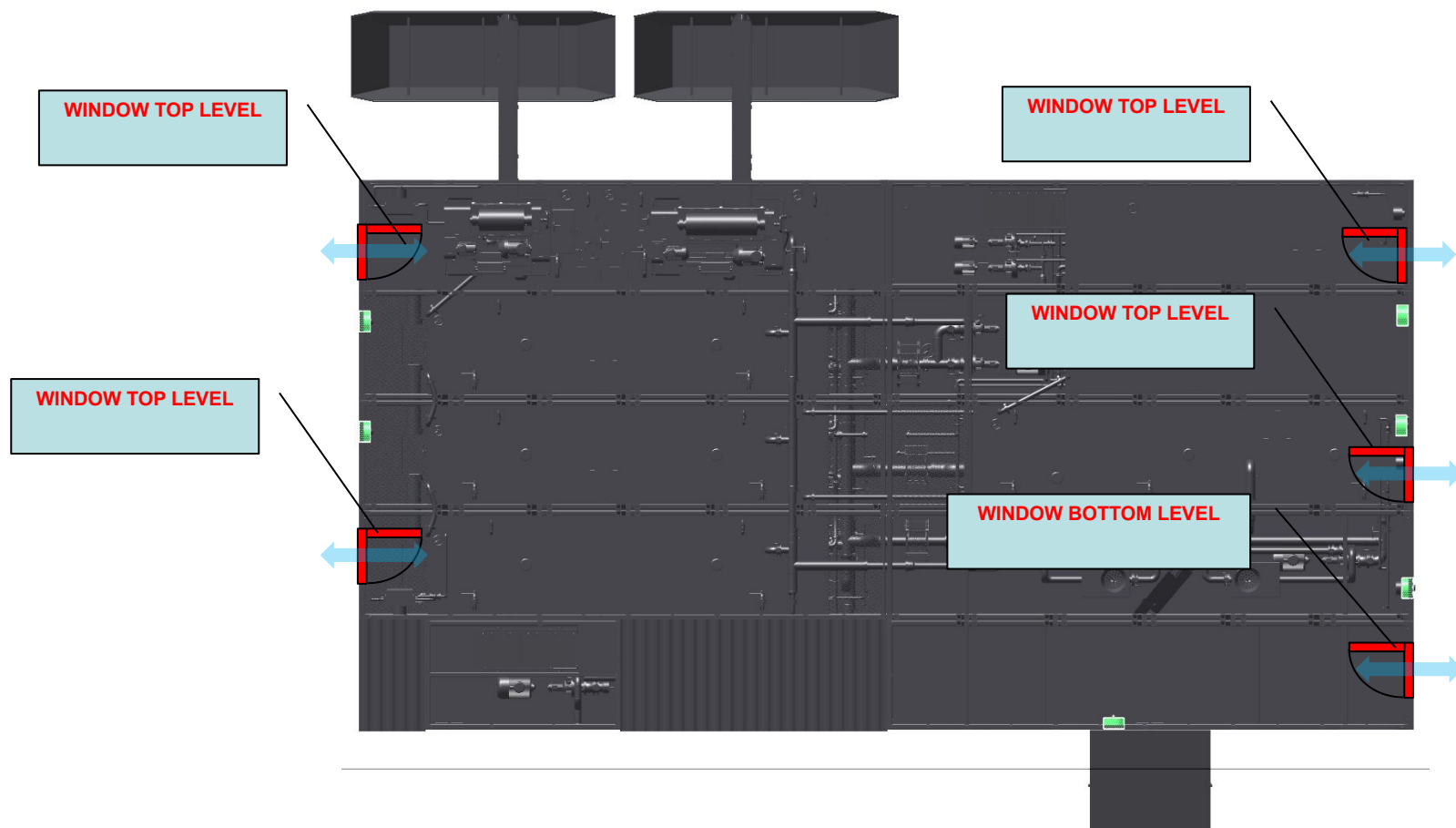


## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

## NATURAL VENTILATION SYSTEM FIXED MUD SYSTEM RUSSO

The mud system fixed module it will be equipped with also windows to permit to the operator to open them and create a natural ventilation



## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

### STEAM HEATING SYSTEM FIXED TOP LEVEL OF MUD SYSTEM RUSSO

The mud system fixed module are insulated and closed in a housing with insulation wall, all this volume it's heated by various system below are showed the steam heaters on the top level

Модель: AO2-5 / Model: AO2-5

Производительность по теплу: 139 кВт (Твх.возд.=10оС; пар Т=170оС, 0,69МПа / Heat output: 139 kW (input air T=10°C; steam T=170°C, 0,69MPa)

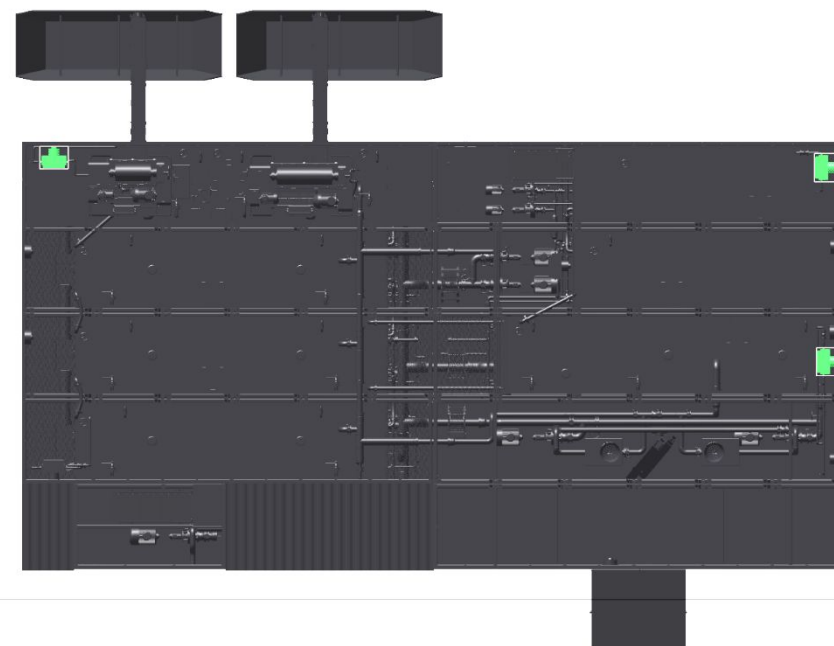
Мощность двигателя: 0,55 кВт, 1500 об./мин., взрывозащищенное исп. / Motor power: 0.55 kW, 1500 rpm, ExProof

Поток воздуха: 5200 м3/час / Air volume: 5200 м3/h, ExProof type

Макс. давление и температура пара: 1,2 Мпа, 190°С / Max. steam pressure & temperature: 1.2 Mpa, 190°C

Габариты (ДхШхВ), мм: 827 x 625 x 825 / Dimention (L\*W\*H), mm: 827 x 625 x 825

Вес: 95кг / Weight: 95 kg



## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

### STEAM HEATING SYSTEM FIXED BOTTOM LEVEL OF MUD SYSTEM RUSSO

The mud system fixed module are insulated and closed in a housing with insulation wall, all this volume it's heated by various system below are showed the steam heaters on the top level

Модель: AO2-5 / Model: AO2-5

Производительность по теплу: 139 кВт (Твх.возд.=10оС; пар Т=170оС, 0,69МПа / Heat output: 139 kW (input air T=10°C; steam T=170°C, 0,69MPa)

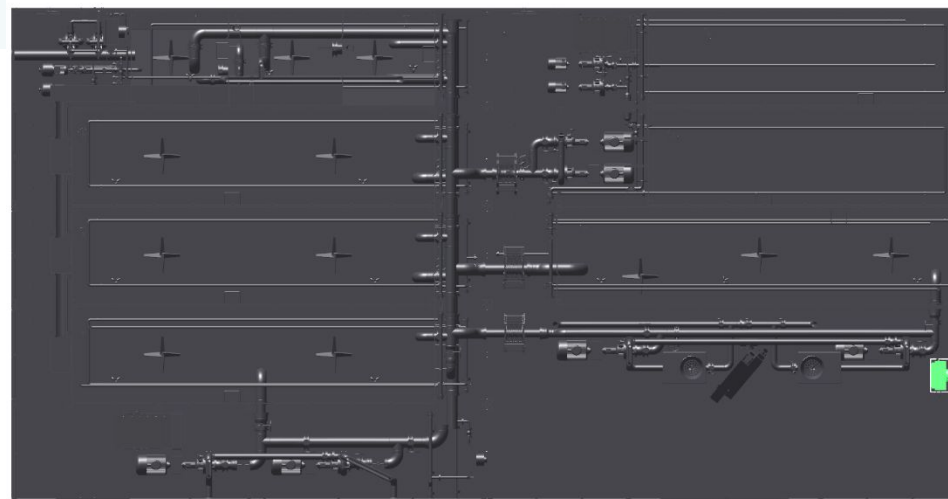
Мощность двигателя: 0,55 кВт, 1500 об./мин., взрывозащищенное исп. / Motor power: 0.55 kW, 1500 rpm, ExProof

Поток воздуха: 5200 м3/час / Air volume: 5200 м3/h, ExProof type

Макс. давление и температура пара: 1,2 Мпа, 190°С / Max. steam pressure & temperature: 1.2 Mpa, 190°C

Габариты (ДхШхВ), мм: 827 x 625 x 825 / Dimention (L\*W\*H), mm: 827 x 625 x 825

Вес: 95кг / Weight: 95 kg



## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

### ELECTRICAL HEATING SYSTEM FOR CENTRIFUGAL PUMP AREA

RUSSO

On the centrifugal pump area are installed a electrical heating system electrical driven to increase the warming on that specified zones

Взрывозащищенные электрообогреватели / ExProof electric heaters

Модель: ОВЭ-4-2,0 ТР / Model: OVE-4-2.0 TR

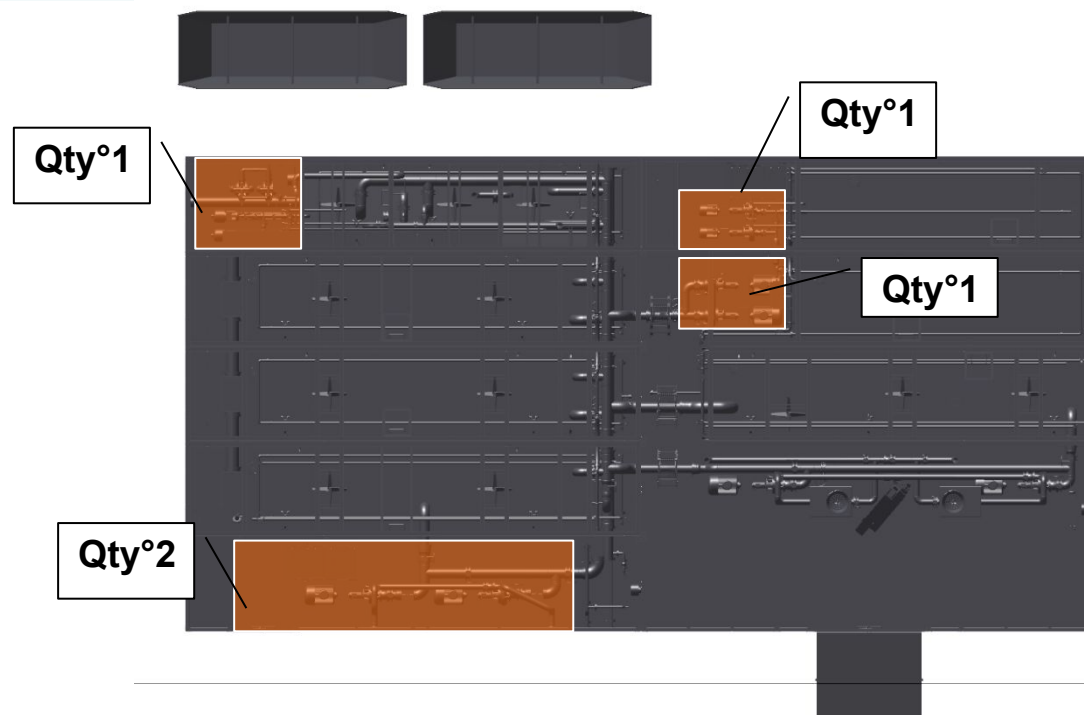
Номинальная мощность : 2,0 кВт / Nominal power: 2.0 kW

Взрывозащищенное исполнение IExbdIIAT3 / Explosion proof type IExbdIIAT3

Габариты (ДхШхВ), мм: 1700 x 185 x 186 / Dimention (L\*W\*H), mm: 1700 x 185 x 186

Вес: 41кг / Weight: 41 kg

[delsot.ru](http://delsot.ru)



## VENTILATION AND HEATING OF MOBILE MUD SYSTEM

RUSSO

### FORCED VENTILATION SYSTEM FIXED MUD SYSTEM RUSSO

The mud system fixed module are insulated and closed in a housing with insulation wall, all this volume it need change or air based on the below data:

| USER (mobile areas) | V <sub>gross</sub> | Air Change Winter | Air Change Summer | VENTILATORS Q. | VENTILATORS TYPE | AIR FLOW WINTER   | AIR FLOW SUMMER   |
|---------------------|--------------------|-------------------|-------------------|----------------|------------------|-------------------|-------------------|
|                     | [m <sup>3</sup> ]  |                   |                   |                |                  | m <sup>3</sup> /h | m <sup>3</sup> /h |
| GROUP MOBILE TANKS  | 358,49             | 11,99             | 23,99             | 4              | BO 06-300-4      | 4300              | 8600              |



Модель: BO 06-300-4 (в Блоках №4-№7) / Model: BO 06-300-4 (in Blocks No.4-No.7)

Рабочее напряжение: 400 В, 3 фазы / Rated voltage: 400 V, 3 phases

Мощность, скорость вращения: 0,37 кВт; 1500об/мин / Rated power, speed of rotation: 0.37 kW, 1500 RPM

Диаметр прохода: 400мм / Impeller diameter: 400 mm

Производительность по воздуху: 4000-6000 м3/час, при Pv=240-160 Па / Air volume: 4000-6000 m<sup>3</sup>/h, at Pv=240-160 Pa





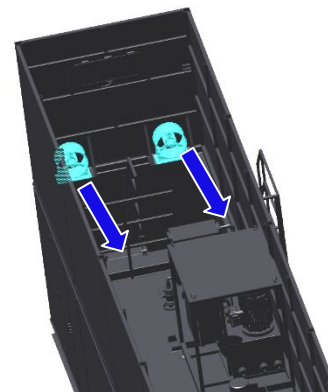
## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

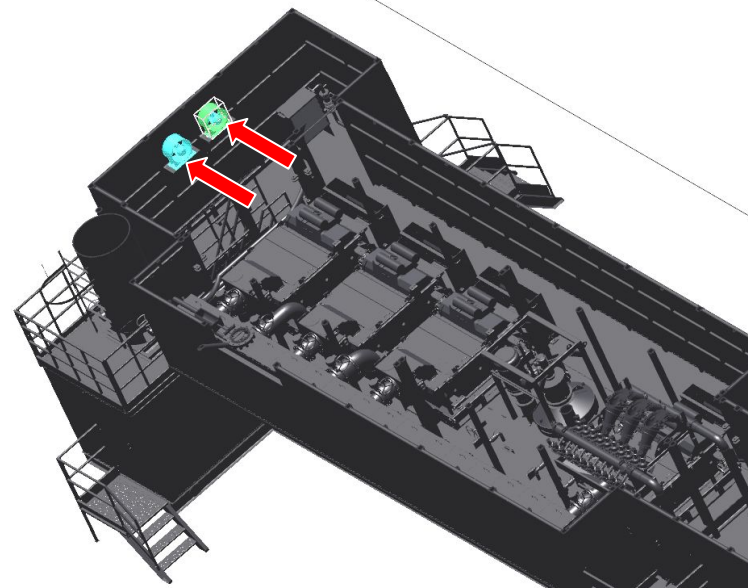
## FORCED VENTILATION SYSTEM MOBILE MUD SYSTEM RUSSO

The inlet fan are positioned on the low level on the top module. Approx at the height of floor

### INLET FAN RUSSO



### OUTLET FAN RUSSO



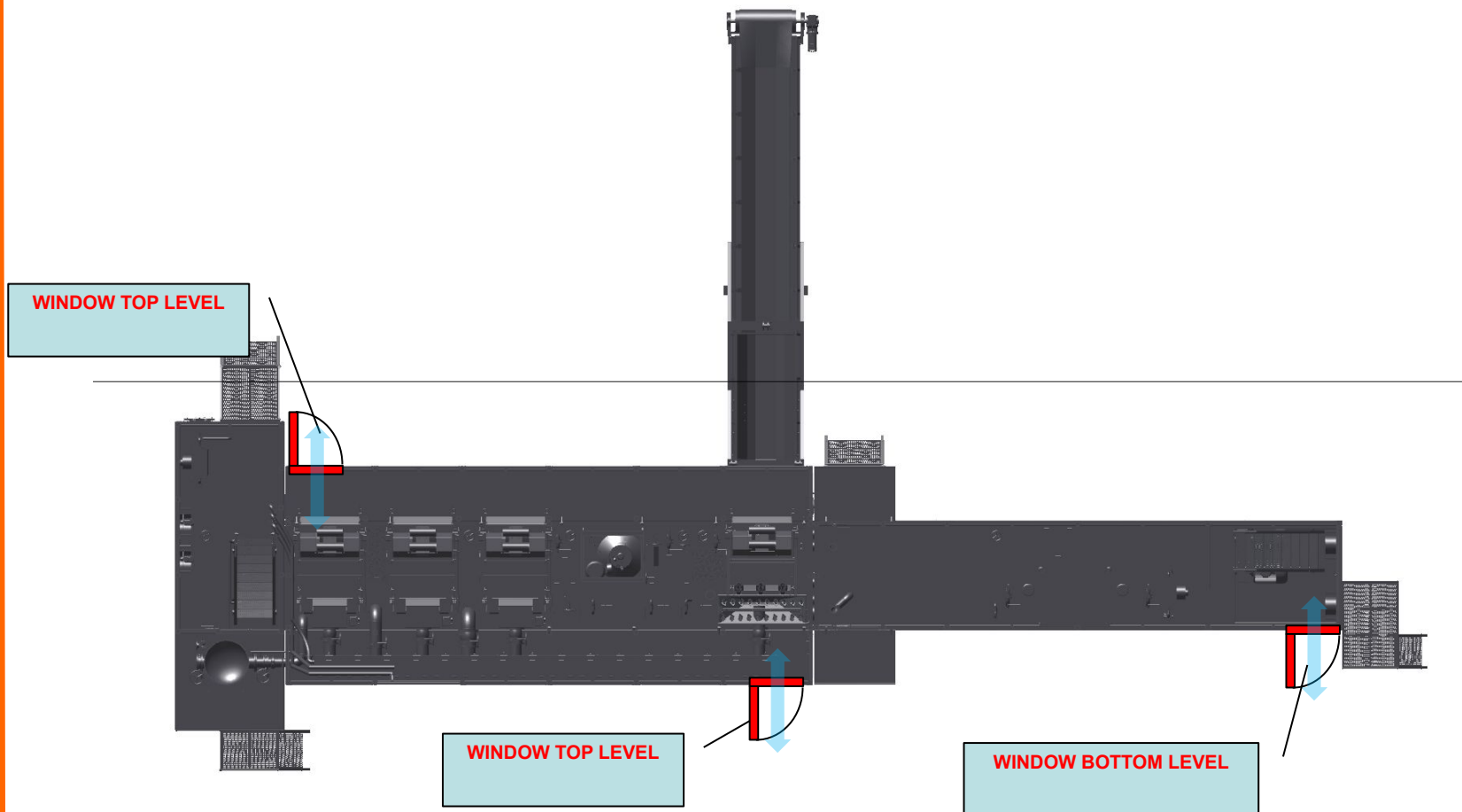
## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

### NATURAL VENTILATION SYSTEM MOBILE MUD SYSTEM

RUSSO

The mud system fixed module it will be equipped with also windows to permit to the operator to open them and create a natural ventilation



## VENTILATION AND HEATING OF MOBILE MUD SYSTEM

RUSSO

## STEAM HEATING SYSTEM MOBILE TOP LEVEL OF RUSSO

The mud system fixed module are insulated and closed in a housing with insulation wall, all this volume it's heated by various system below are showed the steam heaters on the top level

Модель: AO2-5 / Model: AO2-5

Производительность по теплу: 139 кВт (Твх.возд.=10оС; пар Т=170оС, 0,69МПа / Heat output: 139 kW (input air Т=10°С; steam Т=170°С, 0,69МПа)

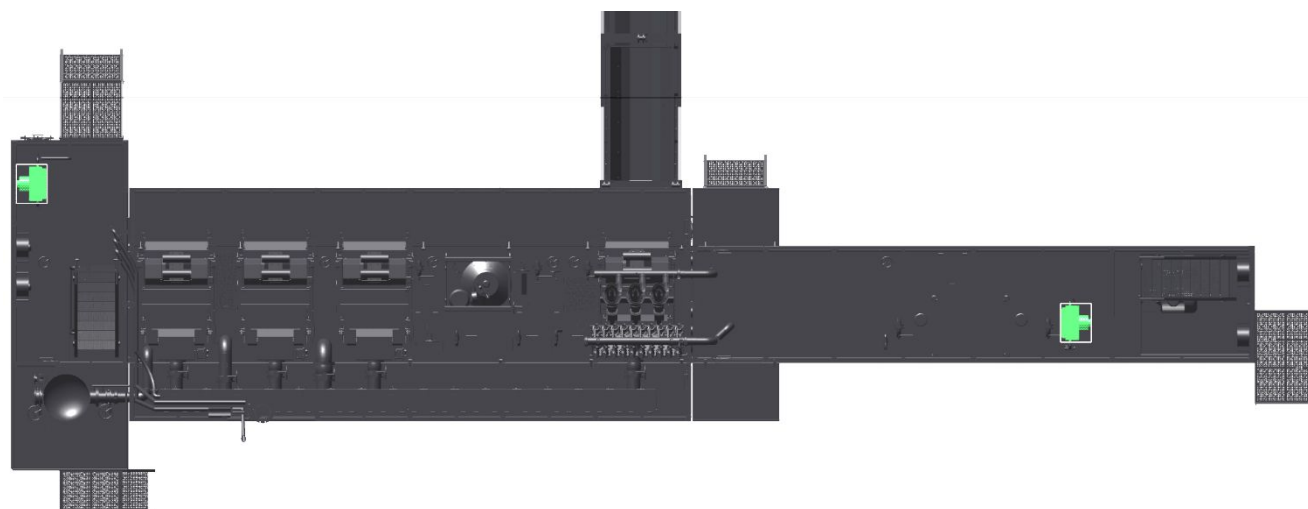
Мощность двигателя: 0,55 кВт, 1500 об./мин., взрывозащищенное исп. / Motor power: 0.55 kW, 1500 rpm, ExProof

Поток воздуха: 5200 м3/час / Air volume: 5200 м3/h, ExProof type

Макс. давление и температура пара: 1,2 Мпа, 190°С / Max. steam pressure & temperature: 1.2 Мпа, 190°С

Габариты (ДхШхВ), мм: 827 x 625 x 825 / Dimention (L\*W\*H), mm: 827 x 625 x 825

Вес: 95кг / Weight: 95 kg



## VENTILATION AND HEATING OF FIXED MUD SYSTEM

RUSSO

## ELECTRICAL HEATING SYSTEM FOR CENTRIFUGAL PUMP AREA

RUSSO

On the centrifugal pump area are installed a electrical heating system electrical driven to increase the warming on that specified zones

Взрывозащищенные электрообогреватели / ExProof electric heaters

Модель: ОВЭ-4-2,0 ТР / Model: OVE-4-2.0 TR

Номинальная мощность : 2,0 кВт / Nominal power: 2.0 kW

Взрывозащищенное исполнение IExbdIIAT3 / Explosion proof type IExbdIIAT3

Габариты (ДxШxВ), мм: 1700 x 185 x 186 / Dimention (L\*W\*H), mm: 1700 x 185 x 186

Вес: 41кг / Weight: 41 kg

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