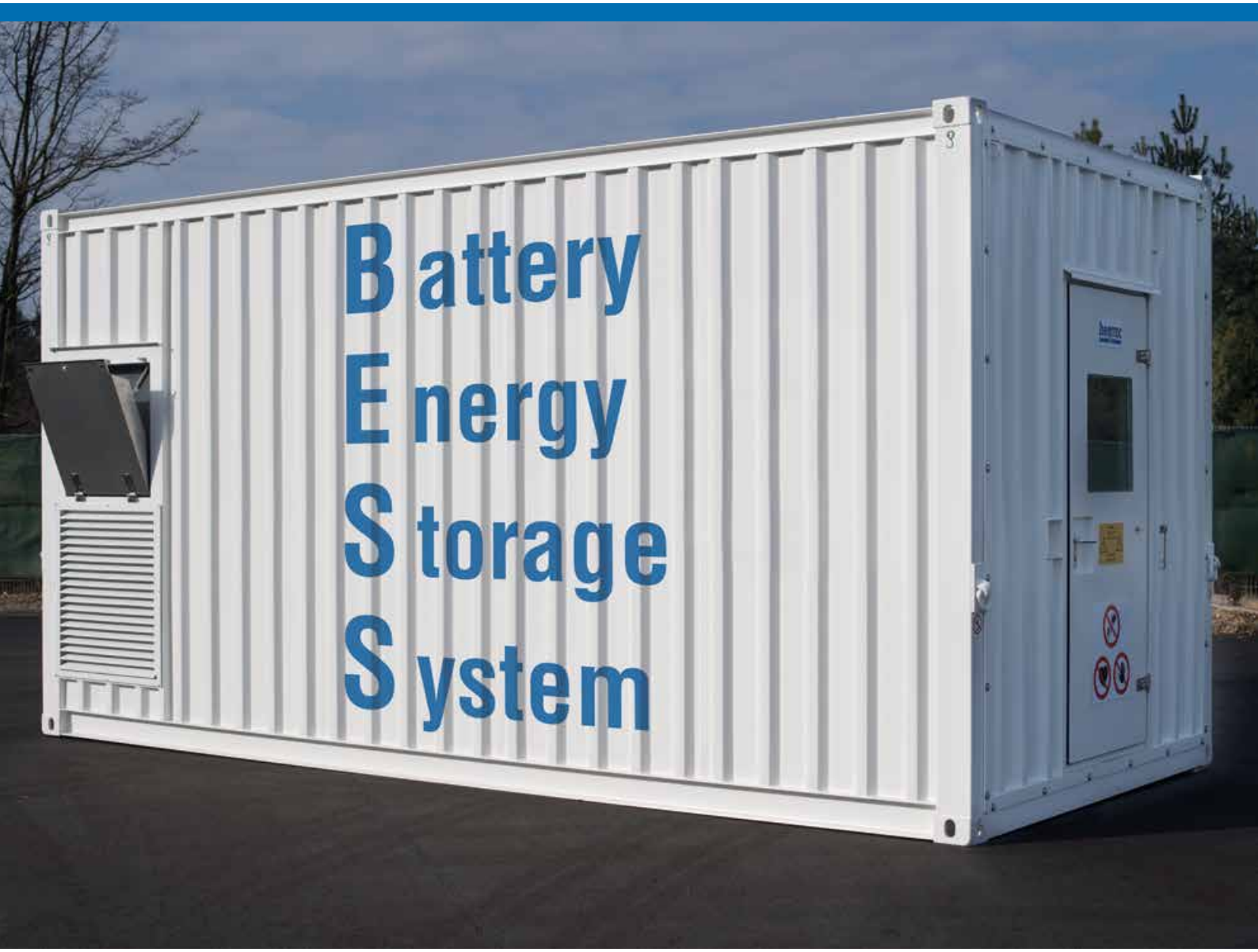
benTEC

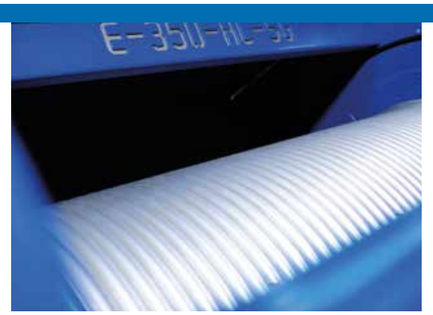
reliable. safe. efficient.

POWER TECHNOLOGIES



Power Distribution • Power Control • Container Solutions






BENTEC

Advanced Technology for Comprehensive Drilling Solutions.

With years of experience, Bentec is one of the world's leading manufacturers of high-quality drilling and workover rigs. In addition, our portfolio includes mechanical and electrical drilling equipment and control systems.
Bentec designs and manufactures a wide range of durable, cost effective and trouble free drilling rigs and provides comprehensive drilling solutions that include technically advanced, field proven equipment integrated into existing systems. Our products increase drilling efficiency, enhance health, safety and environmental (HSE) programs and maximize our customers' life cycle economics.
Bentec possesses an unparalleled capability in the design, manufacture, installation, commissioning and aftermarket service for a wide variety of systems and equipment.
We deliver high grade mechanical drilling equipment like Top Drives, Drawworks, Iron Roughnecks, Mud Pumps, Pipe Handling Equipment and BOP Closing Units.
Our electrical product are mainly: Certified Main Switchboards up to 5000A, Frequency and SCR Converters up to 2400A, Distribution Boards and PLC based control systems like infoDRILL, Anti Collision Systems, Soft Torque Rotary Systems, Soft Pump Systems and Energy Monitoring systems.
Our electrical equipment includes Power Control Rooms which integrate different products to a complete and fully tested system.

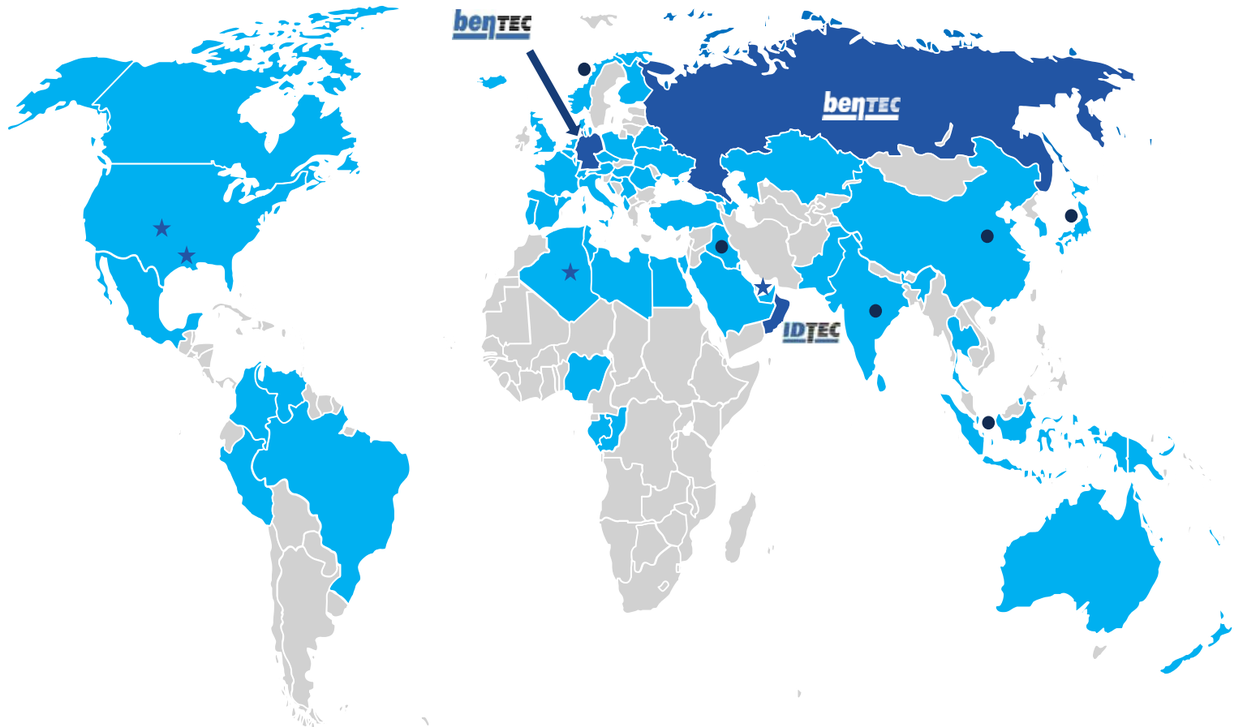
We are specialized in designing and manufacturing customized solutions tailored to your individual requirements.
Our engineers continue to develop innovative customer based systems that can withstand any environmental challenge.

BENTEC SOLUTIONS - MADE IN GERMANY

- **design and manufacture of drilling rigs for worldwide use**
- **manufacture of mechanical and electrical main equipment and systems**
- **After Sales Service**
- **service, repair and overhaul**
- **spare parts supply and logistics**
- **upgrades**
- **recertification**
- **system integration and commissioning**
- **global project management**

Bentec Headquarters and Subsidiaries

Bentec is headquartered in Bad Bentheim, Germany, where it maintains production facilities of more than 100,000 m², including its Training Centre. Additionally, we have production and service facilities in Tyumen, Russia and Nizwa, Sultanate of Oman. Furthermore Bentec got a wide range of operational hubs in North America, Algeria and United Arab Emirates as well as an extensive agent network.



★ Operational Hub ● Agent Network

Bentec – Proven Around the World.

Bentec designs, manufactures and delivers reliable, safe and efficient electrical systems, rigs and equipment for oil, gas and geothermal drilling in the harshest and most hostile environments all around the world. By combining these prime solutions with extensive services ranging from 24/7 field support to a sophisticated training Bentec is a true vertically integrated system supplier.
Everything we do is oriented to our core values, above all to our strict health, safety and environment (HSE) policies.

DNV-Certified Management System

ISO 9001:2015
OHSAS 18001

Licensed by API

API 4F - masts & substructures, crown blocks
API 6A - flanged Connections tees & crosses
API 7-1 - drill stem and threaded connections
API 7K - mud pumps & drawworks components
API 8C - hoisting equipment
API 16A - Adapters & Drilling Spools
API 16D - Diverter Control Systems and Control Systems for Surface mounted BOP Stacks

4F-0044
6A-0373
7-1-0221
7K-0313
8C-0033
16A-0539
16D-0119

Certified implementation of ATEX Directive 2014/34/EU

Certified welding quality standards (DIN EN ISO 3834-2)

Certified welding process (EN 1090-2 EXC3)

Germany

Bad Bentheim

Property: 100.000 m²
Established 1994

Oman

Nizwa

Property: 91.000 m²
Established 2005

Russia

Tyumen

Property: 100.000 m²
Established 2006

Our Portfolio




Rig Solutions



Drilling Equipment



After Sales & Services



Power Technologies


Power Distribution

power distribution systems up to 5000A
frequency inverters, active front end inverter & soft starters
PLC control & automation systems
customized solutions


Battery Energy Storage System

containers for a wide range of energy applications
batch production of standardized concepts
customized container solutions
turnkey solutions


Engineering, Project Management & Manufacturing

electrical and mechanical engineering
strategic project partners
steel construction
contract manufacturing


• Power Distribution

Power Distribution Systems

low voltage systems up to 5000A / 690V / Form 4b
shock current Ip up to 220kA
short-time current resistance Icw to 100kA


Frequency Converters and Inverters

frequency converters and inverters up to 2,5 MW / 690V
active front end up to 2,5 MW / 690V
air or water cooled solutions


Control & Automation Systems

control cabinets with PLC
highest technical standard and quality
controls with explosion protection


• *Engineering, Project Management & Manufacturing*

Engineering

MV/LV technology
drive technology in MW range
PLC control and visualization
CAE in E-Plan P8 or Engineering Base / 3D Planning
design of rigs and containers
planning, construction and static calculations

Project Management

QHSE management
quality plan for project management
worldwide delivery


Manufacturing

execution according to customer requirements
serial production
high quality standard
fully tested before delivery


• Test Fields and Load Containers

Test Fields

2x test fields each up to 630 kVa, 24V to 690V AC (50/60Hz)
3x motor test stands for the load of drives up to 1.200KW
test of busbar systems up to 4,000 A
products tested according to test specification and test plan

Container Assembly and Testing Area

3x different assembly areas
2x test areas for container

Load Container

load container up to 2,5 MW at 690V
loading of frequency converters, generators and ups-systems
test of diesel engines, grid & generator parallel operation

• *After Sales & Services*

Installation, Commissioning & Training

rig-up and rig move supervision
field installation & commissioning
first operations technical assistance
on-site & classroom Training

Lifetime Technical Support

24/7 service hotline (+49 5922 72 444)
on-line remote diagnostic,
monitoring & troubleshooting
equipment repairs and major overhauls
rig and equipment re-certifications
on-site maintenance support

Spare Parts

spare parts support and delivery
worldwide consignation stocks
up-front spare part packages
spare part agreements

Siemens eHighway Sweden

26 ft container
woodden surface
20/10 kV grid supply
1000 kVA transformer
DC power supply 560V
UPS 115V

Siemens eHighway Germany

30 ft container
20/10 kV grid supply
1000 kVA transformer
DC power supply 560V
UPS 115V

Energy Storage Container 1.2 MW

20 ft container
1x Active Frond End with 1.2 MW
2x Bentec standalone HVAC 26kW

UPS Container - Datacenter

30 ft container
20/10 kV grid supply
1000 kVA transformer
DC power supply 560V
UPS 115V

BATTERY ENERGY STORAGE SYSTEM (BESS)

General

The Battery Energy Storage System (BESS) using e.g. Lithium-Titanat" battery modules and consists of Battery Power Control Room's (BPCR's) equipped with battery racks, power & auxiliary panels, main circuit breakers and heating/ventilation & air conditioner (HVAC) system. The container will be a specific container for outdoor installation and the connection will be done either with cables and/or plug-in connectors. The battery racks are housed within the containerized BPCR, fully inter-connected and fitted with all the necessary safety and isolation equipment to allow the interface to the a customer's grid.
The battery energy storage system (BESS) will be housed in a fully integrated containerised power control room (BPCR), including all those parts to manage the battery power.
All electrical connection coming from or going outside will partly be done with fast multi pole connectors or with socket-plug, where possible CEE standard type.

Reference Standards and Codes

Built according to the following standards:

- VDE-AR-2510-50 (Stationary battery energy storage systems with lithium batteries - Safety requirements)
- Leitfaden Rahmenanforderungen Lithium-Ionen Großspeicher
- VDE-AR-N-4105(Requirements for energy storage systems on low voltage grid)
- EN & IEC Standards
- EN 50160 Voltage characteristics of electricity supplied to public distribution networks
- G59/3 - Recommendations for connection of embedded plant to public electricity suppliers system
- IEC 60076 - Power transformers

Limit of Supply

The supply will be composed of the following units:

- N. 1 Battery power control room (BPCR) with air conditioning system
- N. xx Battery racks with battery modules & battery management system (BMS)
- N. 2 DC-Switchboards with e.g. 2000A motor operated circuit breakers
- N. 1 Ac-Switchboard & Auxiliary Distribution Panel
- N. 1 lot of Power & Communication cables inside the container
- N. 1 Heating, Ventilation & Air Conditioning Control (HVAC)
- N. 1 Smoke Detection System (Option)

The above units will be assembled by BENTEC, commissioned, tested and completely prearranged for site installation.

Equipment Design Description

The BPCR (Battery Power Control Room) will be a nominal xx kWh battery system meeting the target requirement of > xx MW – e.g. 8min. [7C]
The characteristics of the e.g. Lithium Titanat battery modules will be documented by battery module manufacture. Each battery rack consists of xx modules Type xx for a total of xx kWh. The battery modules will be installed as shown in the attached documents.

Battery Management Unit

Each battery rack is equipped with a battery management unit (BMU) connected in series. The BMU collects cell voltage, current and temperature, detect any abnormality of the modules, measures the total current flowing through a unit/rack by using current sensor equipment and protect the battery rack system by switching off.

DC Switchboard

The rated dc-voltage will be 460 to 1050V DC and will connect via copper-dc-link to the dc-circuit breakers. Each auxiliary component such as power supply, circuit breakers, cables, fuses, bus bar will be included in the scope of supply of the BESS specification.

AC Switchboard & Auxiliary Panel

The BPCR container is equipped with an auxiliary panel which supplies heating the air-conditioning and other consumers.

Power & Communication Cables

Bus bars (DC & AC), power cables, connectors and communication cables will be designed according to the structural design of the power racks and will be compliant with the necessary schemes for optimisation.

Connection to the customers power plant

Note: These interconnection cables are not part of this quotation and will be quoted separately after final customer information are available.

Battery Power Cables

The battery power cables a/o bus bar arrangement will be included in the scope of work. The bus bars & power cables (positive and negative) will be able to connect the battery modules.

Total Auxiliary Supply

The total auxiliary supply (400V, 50Hz; 3Ph+N) required for the container has been estimated at approximately 45kW at full load which includes the HVAC and lighting (preliminary design). The auxiliary power shall be delivered by customer.

Details of Safety Isolation Procedure "Emergency Shut Down" (ESD)

In case of an emergency, the power supply will be turned off and the circuit breakers are forced to open.
The safety control relays (ESD) comply with the safety requirements:
Manual Push Buttons:

- Pushbutton unit's will be installed outside the doors of the BPCR and clearly identified.
- All cabling associated with the ESD System shall be fire resistant, in accordance with IEC 331, and be suitably protected against mechanical damage and hazardous events.

HVAC System

A proper cooling system, to dissipate the heat produced by the batteries and dc switchboards will be provided. From the bottom trough the board's top, the warmed air will reach a false roof and through it is ducted to the air conditioner units.
The air conditioning system will be at least one unit and will be capable to keep the internal temperature between 21°C and 38 °C.

The normal working condition range of the BPCR will be:

Description	*Value*	*Unit*
Ambient Air Temperature	-45°C to + 55°C	°C
Working Elevation above Sea Level	0 - 1000	m
Relative Humidity	5 to 100	%
Weather Condition	Continental	

Audible Noise

The audible noise from the BPCR-Container will not exceed 60 dB(A) at 5m.

We look forward to discuss your application and develop your benefit.

Bentec GmbH Drilling & Oilfield Systems
Deilmannstraße 1
48455 Bad Bentheim
Germany
Phone: +49 (0)5922 72 80
Fax: +49 (0)5922 72 457
Internet: www.bentec.com
E-Mail: sales@bentec.com

LLC Bentec Tyumen, Russia
2 km from Stary Tobolsky Trakt 8 a
625014 Tyumen
Russia
Phone: +7 (0)3452 6839 00
Fax: +7 (0)3452 6839 26
Internet: www.bentec.ru
E-Mail: tyumen@bentec.com