

Technical request form

For

EP Ztorque implementation

SOFT TORQUE

软扭矩技术协议

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List of abbreviations: 简写明细

Abbreviation	Description
BHA	Bottom Hole Assembly 井底钻具组合
EP	ElectroProject 公司简称为 EP
Ztorque	Ztorque
Ex	Hazardous area classification zone 危险区域使用资质
HMI	Human Machine Interface 人机界面
PLC	Programmable Logic Controller 参数控制器
PO	Purchase Order 订单
SCR	Silicon Controlled Rectifier 可控硅整流器
STRS	Soft Torque Rotary System 软扭矩旋转系统
TD	Top Drive 顶驱
TDS	Top Drive System 顶驱系统
VFD	Variable Frequency Drive 变频器

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Introduction

简介

This document will help ElectroProject to gather as much as possible information of an existing Top Drive System at a drilling rig to be able to find out if it is possible to implement an EP Ztorque system.

此文件帮助 EP 收集整理钻机顶驱系统信息，从而解决并实施 EP 的软扭矩系统。

Process

过程

The process to implement an EP Ztorque system, into an existing Top Drive system, needs to be well prepared. The below high level process overview (figure 1) shows how each EP Ztorque project is handled. The information collected with this document is mostly enough to determine if an EP Ztorque implementation is possible and to be able to provide our customers with a final quotation.

对于现有的顶驱系统，实施 EP 软扭矩的过程，必须准备充分。下图（图一）显示了我们 EP 处理每一套系统项目的高水准过程。收集的信息填入此文件，EP 就能为客户提供相应的最合适的报价方案。

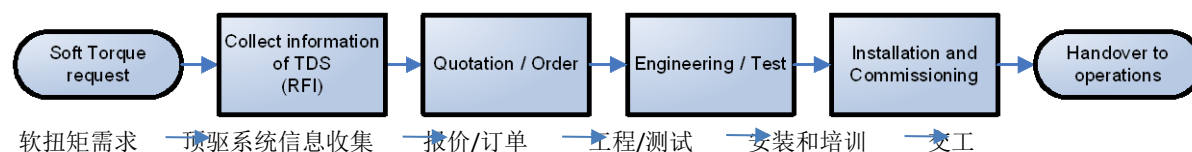


Figure 1 - High Level EPST process overview 图一：高水准 EP 软扭矩过程图

Management of Change

交换管理

How an EP Ztorque controller can be implemented into an existing TD system (Figure 2) is shown in below figure 3. Only the common Management Of Change is shown in this document. Practically there are different interfaces possible. Normally, other interfaces than showed need a site survey first, to be able to develop an appropriate interface.

对现有的顶驱系统（图 2），EP 软扭矩系统如何实施，如下图 3 所示。此文件仅仅显示了通用的交换管理，实际中还会有很多不同种类的界面可能性。一般地，相比于显示界面的其他界面，首先需要现场调查，然后开发合适的界面。

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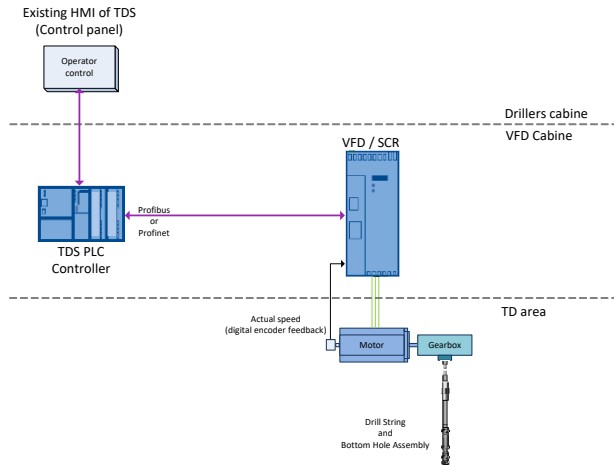


Figure 2 - High Level overview of an existing TD system implemented

图 2—现有顶驱系统示意图

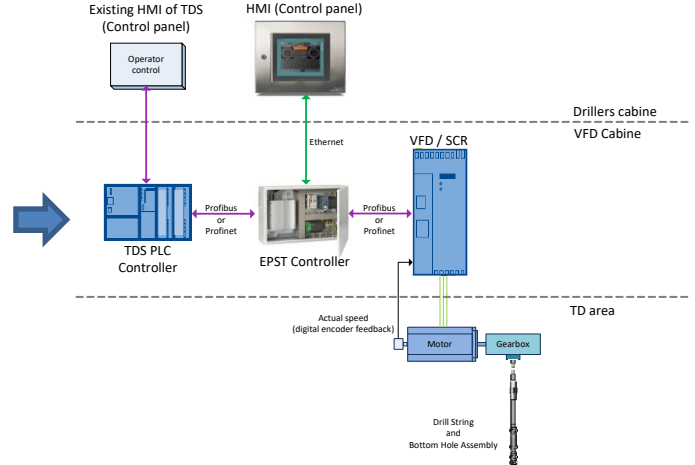


Figure 3 – TDS with Ztorque

图 3—加上软扭矩系统之后的示意图

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Please answer as much as possible the questions in below tables. But minimum questions that need to be answered are marked with a "R" (required) in the question number.

请尽可能回答下表中的问题，带 R 项是必填信息。

1. General

1.1R	Client name 客户名称	
1.2	Rig contractor name 钻机商名称	
1.3R	Operator name 最终用户名称	
1.4R	Rig name 钻机名称	
1.5R	Type of Rig (Land or Off-shore) 钻机类型 (陆地或海洋)	
1.6R	Location of the rig (Country and city nearby) (where Installation and commissioning will take place) 钻机地点 (国家和城市) (软扭矩安装和培训的地点)	
1.7	Coordinates (X,Y) of the location 位置坐标	

2. Safety

安全性

2.1R	Are there known risks in the country or area where the Installation and Commissioning will take place? 安装软扭矩和培训地点会有已知风险吗?	
2.2	Which Safety trainings/certificates/ company safety policy are required to be able to work at the rig? 安全培训类别/资质/公司安全规定对钻机可行吗?	
2.3	Is visa applicable (business or work)? 需要签证吗? (商务或工作签)	

3. Top Drive system

顶驱系统

Top Drive info 顶驱系统信息		
3.1R	Top Drive brand 顶驱品牌	
3.2R	Top Drive type 顶驱类型	
Drilling Motor specification 钻机电机要求		
3.3R	AC or DC motors 交流或直流电机	
3.4	Amount of motors 电机数量	
3.5	Deliverer 货期	
3.6	Type 类型	
3.7R	Speed feedback (i.e. encoder, resolver) 反馈速度 (例如: 编码器、分解器...)	
3.8	Encoder Speed feedback. How many pulses 编码器反馈速度, 多少脉冲?	
Transmission 变速器		

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3.9	High/Low gear applicable (Yes / No) 高/低 传动装置应用 (是/否)	
3.10	Gear ratio High gearing 高传动的齿轮齿数比	
3.11	Gear ratio Low gearing 低传动的齿轮齿数比	
VFD (AC) / SCR (DC) 变频器 (交流) / 可控硅整流器 (直流)		
3.12R	VFD or SCR brand 变频器或可控硅品牌	
3.13R	VFD or SCR type 变频器或可控硅类型	
3.14	Execution: 1 Q or 4 Q 执行: 1 季度或 4 季度	
Communications between PLC (Controls) and VFD/SCR		
3.15R	ProfiBus communications (Yes / No) Profibus 通讯 (是/否) If Yes, provide ProfiBus layout 如果是, 请提供 Profibus 布局	
3.16	Other type of communication 其他类型通讯	Submit drawings 提供图纸

4. Ztorque System

EP 软扭矩系统

The EP Ztorque system consist of the following main components.

EP 软扭矩系统主要由以下元件组成。

- **Control panel (HMI)**

人机控制面板

The Control panel (HMI) needs to be operated by the driller. Therefore it needs to be mounted as close as possible to the driller's (chair). Depending of the Rig type, ElectroProject has several HMI options:

人机控制面板需要由司钻来操作, 因此它必须尽可能安装在司钻 (椅子) 附近。基于不同钻机类型, EP 有几种人机界面可供选择。

- Indoor 10" HMI without enclosure, to be mounted in Drillers cabinet.
10 英寸室内, 无外壳, 装在司钻室
- Indoor 10" HMI in non-Ex enclosure
10 英寸室内, 有非防爆外壳
- Indoor 10" HMI in Ex-zone 2 enclosure (standard delivery)
10 英寸室内, 有 2 区防爆外壳 (标准)
- Outdoor 15" HMI in Ex-zone1 enclosure. (Ambient temperature 55 C max.)
15 英寸户外, 有 1 区防爆外壳 (55 摄氏度下最大安培数)

All enclosures are suitable for wall mounting only and cables are fed into the enclosure by use of glands.

所有外壳仅适用于壁式安装, 电缆进入外壳需要密封件。

Control panel (HMI) 控制面板		
4.1R	Does the HMI to be installed either indoor or outdoor? 人机控制是装在室内还是室外?	
4.2	If indoor, has the HMI to be mounted into an enclosure? 如果是室内, 人机控制需要装入外壳吗?	
4.3	Does the enclosure need to be Ex-zone2 approved? 外壳需要 2 区防爆吗?	
4.4	Is a 2 nd HMI, for monitoring purposes, essential?	

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	用于监控的第 2 人机控制界面必须吗?	
4.5	What would be the location of the 2 nd HMI? 第 2 人机控制界面的地点	
4.6	Is a power source, at the rig, for the HMI available? 钻机有人机控制界面可用的电源吗? 100 – 240Vac / >1A or 24Vdc / >4A 100-240 伏/>1 安培或者 24 伏>4 安培	

- **EP Ztorque controller**

EP 软扭矩控制器

The EP Ztorque controller need to be operated by the Control panel. The Ztorque controller communicates with the VFD and need to be installed as close as possible to the VFD.

EP 软扭矩控制器需要由控制面板操作，因为软扭矩控制器是和变频器/可控硅整流器通讯的，它需要尽可能安装在变频器/可控硅整流器附近。

Standard delivery is an EP Ztorque controller in a cabinet but if the EP Ztorque controller has to be installed in an existing cabinet, ElectroProject can deliver separated parts instead.

标准配置是软扭矩系统控制器装于一个盒子里，但是如果软扭矩控制器不得不安装于现存的柜子里，EP 能提供分开独立的部件。

EPST Controller EP 软扭矩控制器		
4.7	Does the EP Ztorque controller need to be delivered into a standard cabinet or as separated components? EP 软扭矩控制器需要安装在标准盒子里，或者分开独立部件?	
4.8	Is a power source 100 – 240Vac / >2A, at the rig, for the EPST controller available? 钻机有软扭矩控制器可使用的电源么（100-240 伏/>2 安培）	
4.9	If ProfiBus communications between the PLC and EP Ztorque controller is applicable, what would be the necessary cable length between these two? 如果可以运用 PLC 和软扭矩控制器之间的 Profibus 通讯，那么这两者之间的电缆长度是多少?	

- **Ethernet communication**

以太网通讯

The Control panel (HMI) and EP Ztorque controller need to communicate with each other to either follow-up actions made by the Driller or display information to the Driller instead.

The maximum cable length that can be used for Ethernet communication is 100 meter. If the distance between the HMI and EP Ztorque controller exceeds 100 meter, special switches need to be installed. The cable is specially designed for EP Ztorque and suitable for on- and offshore use. ElectroProject also delivers Plugs, connectors and panel feedthroughs which are suitable for Ex-zone2 environmental use.

人机控制面板（HMI）和软扭矩控制器互相通讯，要么听从司钻的指令，或者由司钻输出的信息。

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以太网通讯所用的最大电缆长度为 100 米。如果人机控制界面和软扭矩系统控制器之间的距离超出了 100 米，就需要安装特定的开关。设计用于软扭矩系统的特定电缆，适用于陆地和海洋。EP 同时也会提供插头，接头和直通插座，这些都能用于 2 区防爆环境。

Ethernet communication 以太网通讯	
4.13R	What is the distance between the proposed location of the EP Ztorque controller and the HMI 软扭矩控制器位置和人机控制界面之间的距离

5. Additional information (if available)

额外信息（若需要）

To better understand the existing Top Drive System and the locations where the EP Ztorque controller can be installed, it would be of great advantage to provide us the following information:

为了更好地理解现有顶驱系统和软扭矩系统安装位置，若能提供以下信息，将帮助很大。

- Photos of TD 顶驱图
- VFD room 变频房
- Driller room 司钻房
- Place of proposed location of the EPST controller 软扭矩系统控制器的设定位置
- Place of proposed location of the Control Panel (HMI) 人机控制面板的设定位置

Contact persons if additional information of the Rig or TDS is needed: 钻机或者顶驱系统的联系人信息

	Name 姓名	Phone 电话	Email 邮件
Rig Manager 钻机管理者			
Drilling Supervisor 钻采监管			
For technical information 用于技术信息			