Travelling Block Monitor (TBM) Technical Data Summary

RCP'S TBM is a highly customisable electronic crown and floor saver system. The TBM can be fully tailored to meet specific customer requirements. The TBM system utilises intelligent braking curves, ensuring effective and smooth braking operation, protecting against collisions and excessive equipment wear and tear.

The full TBM specification is agreed between the customer and RCP during the Functional Design Specification (FDS) stage. However, typical TBM system technical specifications are summarised below.

Electrical Data	
Power Supply:	110-240VAC 50/60Hz or 24VDC
Rated Input Current:	1.1A @110VAC 0.5A @240VAC 5A @ 24VDC
UPS:	Optional 3.8Ah, >20min independent operation.
Control and Instrumentation Data	
TBM Control System Inputs:	8 x Digital Input (I.S/Non I.S)
	2 x Analogue Input (I.S/Non I.S)
	4 x Digital Output (I.S/Non I.S)
	3 x High Speed Counter Input (I.S, NAMUR)
	Expandable as per Rig requirements
TBM 3rd Party Tie-In Interfaces:	I.S and Non-I.S interfaces tailored to meet the Rigs Braking systems.
TBM Field Devices:	(All devices rated to at least ATEX Zone 2, -20 to 50oC, IP65)
	1 x 250 Pulse per revolution, I.S NAMUR hollow shaft encoder
	1 x Inductive Proximity Sensor, I.S NAMUR
	1 x Hook load Pressure Sensor (0-5k psi measurement range), I.S
	1 x Solenoid suitable for Hydraulic/Pneumatic control (50-150 psi rating) , 1/2G, I.S,
	1 x Pressure Switch (1-150 psi rating, adjustable)
	1 x Combined Sounder/Beacon I.S
	2 x Control Stations, Ex d
	1 x 7'', Colour, Touchscreen HMI, Ex e
	Tailored to Rig requirements
TBM ACS Field Devices	(All devices rated to at least ATEX Zone 2, -20 to 50oC, IP65) - Optional
	Optional Proximity Sensors, 0-10mm or 0-30mm sensing distance, I.S NAMUR
	Optional Inclination Sensors 0-180 degrees, Ex d,
	Optional Wireless Proximity/Angle sensing solutions available, Ex ib
Optional Equipment:	Plug in socket connectors
	Data-logging server
System Operation Data	
TBM Operation:	Actuating auxiliary and/or main brake and/or cutting throttle when the system determines collision conditions with the crown/rig floor/other drilfloor equipment
TBM system:	<0.5s system action time (brake system dependent)
Reading Accuracy:	+- 0.1ft Block Height Measurement
	+- 0.1ft/s Block speed Measurement
	<+-5% Hookload

	<+-5% Ton Mile
	+-2%, Auxiliary Brake Current
Braking:	Adaptive braking curves ensuring minimal wear and tear on Rigs equipment and minimal disruptions to the Drilling operations.
Drawworks Brake Compatibility:	
Main Brake:	Band Brake, Disc Brake, Other
Auxiliary Brake:	Electromagnetic Brake, Water-Based Brake, Oil Shear-Based Brake, Other
Redundancy:	In the event of the auxiliary brake not providing enough braking force, mainbrake will be actuated. Additional interlocks available upon request
Emergency Operation:	'Soft' E-Stop
Drillers Controls:	Accept, Override, Reset and Emergency Stop, and HMI functions
Maintenance:	Full system maintenance and setup accessible via Drillers' HMI
Braking Parameter Autocalibration:	Yes
Datalogging:	Optional – 6 months FIFO (can be expanded to the required timeframe)
Remote Access:	Optional, as an extension to the Datalogging system.
3rd Party Data Handover:	Available over Profinet, Profibus, TCP/IP, Modbus, Serial, OPC-UA, WITS0, WITSML, Other
TBM HMI Functions:	Aux Brake Current, Block Height, Block Speed, Hookload Data display
	Block Position and upper/lower limit display
	Ton Mile Calculation (resettable)
	User selectable units (imperial/metric)
	Alarms
	Guided reset procedure
	System Maintenance information.
	System Configuration information
	Further Expansion:
	WOB, ROP parameter display
	Wind Sensor Integration
	Drill Bit Protection Operation
	Derrick Loading and Protection
	Collision Zone Management
	Emergency Shut Down Integration
System Supplied As:	
	TBM System + Sensors Option
	TBM System + Sensors + Installation Materials Option
Environmental and Installation Data	
Controller Mounting Dimensions:	Zone 1 Version: 700 x 500 x 275 mm (Height x Width x Depth)
	Zone 2/Safe Area Version: 650 x 600 x 300 mm (Height x Width x Depth)
HMI Mounting Dimensions:	Zone 1 Version: 200 x 250 x 100 mm (Height x Width x Depth)
	Zone 2 Version: 200 x 250 x 100 mm (Height x Width x Depth)
Ambient Controller Installation Temperature:	-20 to 40°C
IP Rating:	Full system can be supplied up to IP66
Hazardous Area Classification:	Option 1 – TBM Field Devices certified for ATEX Zone 2
	Option 2 – TBM Field Devices certified for ATEX Zone 1

	Option 3 – Full TBM system certified for ATEX Zone 2
	Option 4 - Full TBM system certified for ATEX Zone 1
Compatibility:	Compatible with Offshore and Land Drilling Rigs, DC/SCR, and can be designed for compatibility with AC/hydraulic/mast/ram drilling rigs.
Standard Compliance:	Systems Designed to IEC/EN 60079-0, IEC/EN 60079-7, IEC/EN 60079-11, IEC/EN 60079-28, BS 6761
	System recommended for use by API RP54
	Can further comply with API RP551, IEC 61439, IEC 60204-1, IEC 61508, EN 55022, EN 55024, IEC 60950-1, API 554