process measurement solutions

Mobrey total dissolved solid control

for the control of TDS on steam boilers

Data sheet
BP501

Description

The TDS 880 is a new generation of Total Dissolved Solids control for applications onto steam boilers bringing together innovative design, exotic materials of construction, a new level of long term accuracy and design parameters only found on the highest pressure boilers.

The system comprises 4 major component parts:

1. Control unit
2. Probe
3. Control valve
4. 'T' piece attachment device

Features

- Probe manufactured from exotic materials (Titanium and Zirconia)
- Probe designed to withstand 200 bar at saturated steam
- Direct readout of TDS from the probe sensor
- Temperature compensation built-in
- All component parts used and tested in other process environments
- 4 – 20mA programmable output
- Totally glandless construction of the probe
- An instrument for use in boilers giving precise readout of TDS
- Commercially competitive price

TDS880 Total Dissolved Solids controller

Operation

The TDS 880 system is a wholly new concept in the analysis and control of Total Dissolved Solids in steam boilers. The equipment measures the TDS at the actual probe tip and does not rely on the boiler components to act as part of the electrical circuit, thereby significantly improving long term accuracy.

The central part of the system is the construction of the probe which is developed from Solartron Mobrey's Hydrastep system. This is used extensively all over the world on high pressure power boiler in excess of 50bar and up to 200bar saturated steam. This equipment has been in existence and used on these boiler types for over 25 years.
The probe construction also follows the long history of Mobrey by bringing a probe to the steam boiler market which has no glanding, the unit is a fully welded construction ensuring no possible leakage.

The presence of TDS in water is detected by measuring the conductivity. In less precise equipment this measurement is made using the boiler components as one of the measuring electrodes (firetubes, boilershell etc.), these are normally contaminated with oxides and deposits leading to significant inaccuracies and long term drift.
The TDS 880 measures the conductivity within the probe construction using inoxidisable materials to ensure long term accuracy. (The equipment can even measure TDS in an inert vessel).
The probe works with an A.C. current operating at very high frequency to ensure non contamination of the electrical components.

Temperature is a major factor when measuring TDS and without temperature compensation the actual reading can vary by approximately 2% for every 1°C change. With its integral platinum resistance temperature sensor the TDS 880 will precisely measure the TDS whether the boiler is cold or at its normal operating condition.

TDS is a notoriously difficult reading to take on steam boilers. The hostile environment of the boiler water is not conducive to accuracy of conductivity measurement and therefore the materials of construction and the probe design are of prime consideration.
However no instrument can fully accommodate for poor water treatment. If the instrument is subjected to consistent water hardness then the performance will be compromised, however this instrument will announce this situation is occurring.
The presence of hardness in steam boilers is both dangerous and inefficient because it will cause contamination of heating surfaces with consequences for the boilers integrity as well as the operating costs involved. Good water quality management will ensure long term accuracy of the instrument.

Where the presence of hard water may be expected, additional measures may be required. Consult factory for details.

TDS Controller

Description

The TDS controller is a microprocessor system, which detects the electrical conductivity of boiler water via the probe and calculates the level of TDS present. The unit comes in two versions: wall mounted and panel mounted.

Features

- On/Off, control with adjustable hysterisis
- 4-20mA Output
- Drives control valve directly
- Programmable alarm output
- IP66 wall mounted and panel mounted options
- Displays TDS or conductivity in ppm or microsiemens
- Large back-lit multifunctional display
- Isolated and fully configurable output for monitoring TDS and boiler temperature
- Secondary display shows control point, alarm points or boiler temperature
- Two levels of password protection
- Simple intuitive programming

Operation

The large backlit display continuously shows either the boiler TDS in ppm or conductivity in microsiemens/cm. The display also simultaneously shows either the TDS set point, the alarm points, or the boiler temperature. Each may be accessed by scrolling up and down using the arrow keypad without need to enter the password. The panel shows operation of the blowdown valve and alarm point activation via red LEDs on the front panel.

Configuration and commission of the system is effected by entering the structured menus on the system once access has been gained.
The TDS 880 has been pre-programmed with default settings so the system can be just switched on and allowed to operate. The system is however, significantly more capable than just using the default settings and the unit can be easily configured to fine tune its performance using both the on screen menus and the step by step instructions accompanying the controller.

The controller has a configurable 4 to 20 mA output whch may be allocated to either the TDS readout or to the boiler water temperature. The TDS output is easily configurable to show neutralised or raw water TDS, depending on the customer requirement.

Specification

Range of conductivity measurement	0 - 9999 microsiemens/cm
Range of TDS measurement	0- 9999ppm
Range of temperature measurement	-50°C to +300°C
Cell constant adjustment	0.009 to 19.99
Relays	2 Fully configurable relays with volt free contacts Rated at 5amp 250V non inductive
Operating modes	On/off, with adjustable hysterisis
Switches	Four tactile feedback push buttons
Supply voltage	80 – 250V ac (Optional 18-36vdc)

Ordering Information

Controller TDS880 panel mounted 240V ac	TDS880/P
Controller TDS880 panel mounted 24V dc	TDS880/P/24V
Controller TDS880 wall mounted 240V ac	TDS880/W
Controller TDS880 wall mounted 24V dc	TDS880/W/24V

Cable

Cable ER539	For connection between controller and probe

TDS probe

Features

- Exotic materials of construction Titanium and Zirconia oxide
- No glanding, all welded construction
- Conductivity measurement made with in-cell tip requiring no conductivity to boiler shell.
- Calibrated measuring cell giving high accuracy and minimal commissioning
- Temperature compensated for accuracy from cold to working temperature
- Construction of probes used for over 25 years on high pressure power boilers
- Easily adjustable probe length to compensate for on-site dimension variations
- Unit works at low current and high frequency
- May be mounted horizontally or vertically

Specification

- 316 Stainless steel, Zirconia Oxide, Titanium
- Maximum pressure 200Bar
- Maximum temperature 250°C

Ordering Information

EDS880/1	Conductivity probe 400mm long
EDS880/2	Conductivity probe 500mm long
EDS880/3	Conductivity probe 600mm long
EDS880/4	Conductivity probe 700mm long

For other lengths please contact Solartron Mobrey

Tee piece

Description

The TDS probe is positioned below the lowest water level with the probe continuously in the boiler water. This will enable the boiler water to be monitored continuously with a real time TDS read out. The Tee piece enables a single entry into the boiler for both the probe and the blowdown connection which allows water blowdown from the same connection.

Features

- Carbon steel casting
- Range of mounting flanges available for different boiler setups

Ordering information

TDSM1/1	T piece, boiler flange DN25/PN40
TDSM1/2	T piece, boiler flange DN50/PN40
TDSM1/3	T piece, boiler flange 1 inch BS10 table F
TDSM1/4	T piece, boiler flange 11/2 inch BS10 table F
TDSM1/5	T piece, boiler flange 1 inch BS10 table H
TDSM1/6	T piece, boiler flange 11/2 inch BS10 table H

TDS Blowdown control valves

The TDS level in the boiler is controlled using TDS Blowdown control valves which are positioned after the stop valve on the T piece. The valve opens in response to a high TDS signal from the controller and closes when the TDS level reaches its low setting. The valves are actuated by a signal from the controller operating either the selected Pneumatic or Electro hydraulic valve. If existing valves are already in place these can be accommodated into the system without the need to purchase new valves.

Electro hydraulic valve

Specification

- DN25/PN25 Flange for 12 bar operation
- DN25/PN25 Flange for 30 bar operation
- DN25/PN40 Flange for 36 bar operation
- Valve body 316 stainless steel
- Internal components 316 stainless steel
- 230V ac, 24V dc available as an optional extra

Ordering information

ER605	Electrically actuated valve for 12 bar working, flanged DN25/PN25
ER606	Electrically actuated valve for 30 bar working, flanged DN25/PN25
ER548	Electrically actuated valve for 36 bar working, flanged DN25/PN40

Pneumatically operated valve

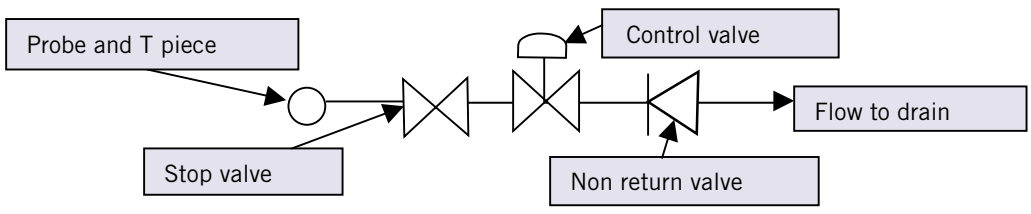
Specification

- DN25/PN25 flange for 21 bar operation
- Valve body 316 stainless steel
- Internal components 316 stainless steel
- Maximum direct air supply 6 bar

Ordering information

ER547	Pneumatically actuated valve for 21 bar working, flanged Dn25/PN25

Note
Standard practice dictates that the control valve should be accompanied with a stop valve and a non return valve. These are freely accessible in the market and can normally be purchased locally. If this causes a problem, Solartron Mobrey will be pleased to help through their UK maintenance and installation division Bestobell Service in the UK and the Republic of Ireland. Their agent will advise locally in other countries.



Associated boiler products

Electronic probes
Solartron Mobrey manufactures a full range of conductive and capacitive probe controls for application on steam boilers. This equipment fully complies with the latest boiler specifications.

Automatic Control Check System
This product has been designed to provide high integrity and self-monitoring to float operated controls in compliance with the latest boiler standards.

Steam and water flow
Flow meters are available for steam, water and fuel flow measurement using orifice and low energy loss averaging pitot tube technology. Non intrusive meters are available for liquid flow.

General level
Solartron Mobrey is a level, flow, pressure, density and viscosity measurement instrument company. If you have a problem we will have the solution.

Smoke density
Self-calibrating, Obscuration Meters available on request.

TDS Control, timed bottom blowdown, remote alarm & shut down panels.

For UK and Republic of Ireland markets only – Full customer service provision

Solartron Mobrey provides a full design, installation, commissioning and maintenance service for their site installed instrumentation through their service division, **Bestobell Service.** This organisation is able to provide a full boiler house installation and maintenance service and provide turnkey installation solutions for all control and instrumentation functions. The following gives a typical list of operations carried out by engineers and technicians directly employed by the company and operating through 5 regional offices throughout the UK

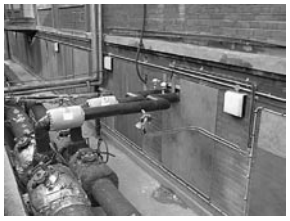
- Total compliance with unmanned boiler regulations, Health and Safety guidance note PM5, SAFed PSG2, and BS prEN12953-9 and BS prEN12952-11 for both existing Mobrey float controls and electronic probe installation
- Steam and water flow monitoring, heat and mass flow calculation using Solartron Mobrey's unique range of products.
- Tank and level monitoring solutions using Solartron Mobrey's unique range of products.
- Complete automation solutions bringing together major manufacturers equipment into a single turnkey solution

Bestobell Service is an engineering company providing engineering solutions and is a full operating division of Solartron Mobrey.

Insurance inspection

High integrity, self-monitoring float controls

Electronic probe installation



Flowmetering

Head Office
Tel: 01753 756634
756622
756623
Fax: 01753 579523

Scotland & N Ireland
Tel : 0141 613 1441
Fax: 0141 613 2093

Midlands
Tel : 0121 730 1900
Fax: 0121 730 3004

Northwest and Eire
Tel : 0161 483 0931
Fax: 0161 483 4145

Southern
Tel : 01474 355976
Fax: 01474 564349

Northeast
Tel : 01924 441960
Fax: 01924 441850

Solartron Mobrey Limited
158 Edinburgh Avenue, Slough
Berks UK SL1 4UE
Tel: 01753 756600
Fax: 01753 823589
e-mail: sales@solartron.com
www.solartronmobrey.com

Solartron Mobrey
19408 Park Row, Suite 320,
Houston, TX 77084 USA
Tel: 281 398 7890
Fax: 281 398 7891
e-mail: sales@solartron.com
www.solartronusa.com

Solartron Mobrey GmbH	Deutschland	tel: 0211/99 808-0
Solartron Mobrey Ltd	China	tel: 021 6353 5652
Solartron Mobrey sp z o o	Polska	tel: 022 871 7865
Solartron Mobrey AB	Sverige	tel: 08-725 01 00
Solartron Mobrey SA	France	tel: 01 30 17 40 80
Solartron Mobrey SA-NV	Belgium	tel: 02/465 3879
Solartron Mobrey	USA	tel: (281) 398 7890

solartron mobrey
a Roxboro Group Company

The right is reserved to amend details given in this publication without notice

LLOYD'S REGISTER QUALITY ASSURANCE · ISO9001 · UKAS QUALITY MANAGEMENT 001

BP501
Aug 04