Assembly Instruction
for BEDIA LEVEL MONITORING SENSORS
CLS 20/25, CLS 40/45 and CLS 50/55

General Description
BEDIA sensors, type CLS, are installed in engines, commercial vehicles, ships, power engines, etc. to monitor the fill level of aqueous and oily liquids. For engines these are used to monitor the levels of cooling water, oil and fuel for example. The sensors are installed safely for automatic filling and refilling of liquids, i.e.: engine and fuel tank. In maritime applications, they are also used to monitor the holding tank, waste tanks and bilge in addition to monitoring the engine.
BEDIA Standard – Surveillance Sensors are distinguished from floating switches by their compact design and resilience against vibrations. The sensors contain no mechanical moving parts and they are not affected by mechanical wear. BEDIA-Sensors also do not conduct electricity via an electrode into the medium. Thus, electrolysis is not possible in the system through the measuring process.

Function Description
The operation of the sensors is based on the capacity principle. A capacity change is detected which occurs when an isolated electrode surrounded by air is immersed into a liquid medium. The frequency of an oscillator is impacted through this capacity change. This frequency change is evaluated and further processed through a micro controller located in the sensor case.

Licences
CLS 20/25 tested according to DIN EN 50155
CLS 40/45 e1 035459
CLS 50/55 Licences of classification societies: ABS, BV, CCS, DNV, GL, KRS, LR, NKK, RINA, RMRS

ATEX Licences for CLS 20/25, CLS 40/45 and CLS 50/55 with cable connection and 10SL -, 12S -, Fine pitch thread 5/8"-24 UNEF –Connector

Ex II 3D Ex tc IIIC T 120°C Dc X
Ex II 3G Ex nA IICX T4 Gc X
-40°C<= to<= +110°C

Suitable only for operation in Zone 2 and Zone 22 with atmospheres containing gas and dust up to a max. ambient temperature of 110°C. The impact resistance test was conducted with 4J. Therefore the sensors must be protected against impact damage.
The 500V insulation test was abandoned because the electronic system is protected against transients. If the sensor cable is connected within Zone 2, a suitable terminal box must be used and labeled with "Do not disconnect when in operation".

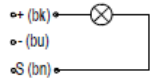
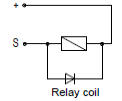
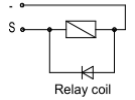
The usage of BEDIA sensors in applications with potentially explosive atmosphere (explosion-prone areas) and/or where product properties according to the ATEX regulations are required is allowed only if the respective sensor is explicitly labeled with the ATEX information !
Please take note of the declaration of conformity no. 1006

Technical Data

Medium	Water/Oil
Function	Minimum – Maximum Surveillance
Operating Voltage	9-36VDC (for CLS 20, CLS 40 and CLS 50); 4,5-18VDC (for CLS 25, CLS 45 and CLS 55)
Quiescent current intake	< 8mA
Output	Minus switch, plus switch, analogue switch <= 1A short-circuit proof and overload proof across entire temperature range. For inductive loads a free-wheeling diode, i.e.1N4007 is required on the load as a protective circuit
Casing Material CLS20/25	Standard brass, CuZn38Pb2, EN12146; CW608N
Casing Material CLS40/45	Standard brass, CuZn38Pb2, EN12146; CW608N
Casing Material CLS50/55	Stainless steel X5CrNi 1810, EN 10088-3, 1.4301
Detector Casing	Tefzel ETFE
Protection Type	IP67 – IP69k (depending on type of connection)
Mounting Position	any
Inverse-polarity protection	between operating voltage plus and minus
Temperature Medium	-40°C to +110°C
Ambient Temperature	-40°C to +110°C
Storage Temperature	-40°C to +110°C
Standards	EN 60079-0 EN 60079-15 EN 60079-31

A suitable seal ring must be used for the individual mounting!

Connection Diagrams

	Minus Switching Sensors		Plus Switching Sensors	
Cable / Connector	Within the Ex Zone	Outside the Ex Zone	Within the Ex Zone	Outside the Ex Zone
Circuit RTFRO				
Cable FLR	+(bn) -(wh) S(gn)			
Connector 10SL	+(A) -(B) S(C)			
Connector 12S	+(A) - (B) S(C) -(D)			
Connector Fine Thread 5/8-24 UNEF	+(A) -(B) S(C)			

The following must be observed during installation:

For the monitoring of mediums, the thread type sensors must be installed in a steady zone so that the medium does not consistently dampen the medium through splashing or mixing which can cause error messages.
Generally this point applies to the installation into a gear box or direct installation into an engine oil pan. Here, a correct measurement of the fill level is only possible during downtime.
During installation it must be observed that the clearance from the sensing device to the wall is at least 7mm.

For further technical details please see the technical datasheet of the individual part number.

Note for Water Sensors
If the sensor is assembled from the top to a plastic container, error messages could occur if the medium does not possess reference potential.
When installing in all other positions, the housing will come in contact with the medium. This guarantees that reference potential exists.

Created: 09.04.2013 Version: 1.1