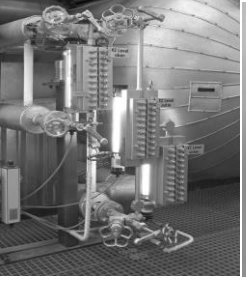



Electronic water level switch

EWLS

System components

The electronic switch consists of the following components:

- Water column with 1 to 4 probes (EL60-IP (>32bar))
- Measuring unit (MU-3); mounted on to the water column housing and fully wired
- NEMA4X/IP66 Control Box with Control unit (CU-3) for up to 4 independent probe channels and LED indication (fully wired)
- connecting cables

Application and function

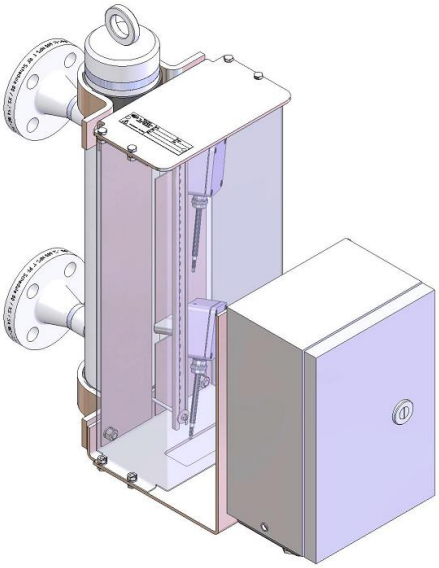
The state-of-the-art electronic level detection is typically used for the following applications and power plant systems:
Typical applications:
- Main steam system, piping and drains (for alarm and drain operation)
- Receiver tanks (Water tank, Deaerator, Condenser)
- Flash Tanks, Feedwater heaters
- TWIP (Turbine water induction prevention)
- Condenser steam and water dumps
- Boiler high/low alarms & trips

Detection is done by conductive measuring principle which can detect even lowest conductivity of condensed steam (0.5 µS/cm or 0.5 micromho).
The measuring unit (MU-3) can be equipped with up to 4 probes. The distance between the individual probes can be determined by the customer. Both the measuring unit and the control unit have two independent electronic circuits with its own processors. All processors carry out regular self-tests for internal faults in the electronic circuit.
The control unit (CU-3) processes the signals recorded and controls the downstream functions. It is built into a steel control box (IP65/NEMA4X). The control box provides local indication of all probes (water=green, steam=red), normal operation (green LED), water alarm (yellow) and system fault (yellow).

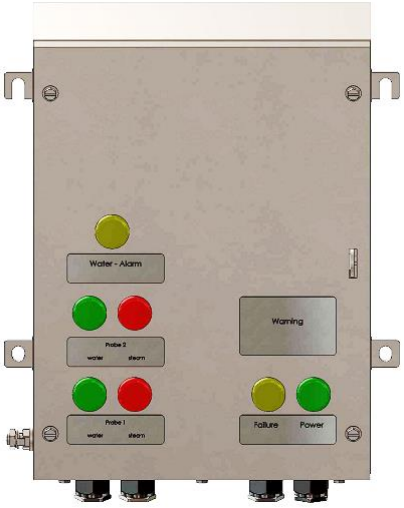
A contact (SPDT) is permanently switched as the signal contact for device error. Each of the 4 probe has an output contact (SPDT, e.g. for a signal to the PLC). Here each processor actuates its own relay per contact whereby the output contacts are only switched when both processors signal normal operation.
In addition, there is a 4mA – 20mA interface output available. The output is increased per submerged probe by the corresponding proportion (16 mA / number of probes). In case of an error the output goes to 2 mA.

The configuration/programming is carried out via 4 buttons and a 2-row illuminated LCD display with 16 characters each. Also the LCD display will show local fault indication such as power supply failure, probe fault, level indication failure (“water over steam failure”), circuit board failure, cable fault or short circuit. The local display provides operators with high visibility of the system status. Should a fault occur within the system or its associated wiring or power supply, a fault is indicated. This fault-detecting design allows continued operation as it reduces the need for routine testing. Fault conditions are also shown on the displays so that remedial action can be undertaken.

The EWLS design and fabrication complies with the ASME boiler code and the EU Directive 2014/68/EU and the applied standards EN 13445, EN 12952, EN 12953, AD2000.



Water column with probes & measuring unit (MU-3)

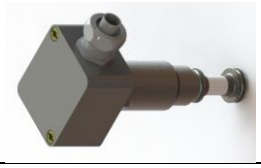


Control box (NEMA 4X) with Control Unit CU-3

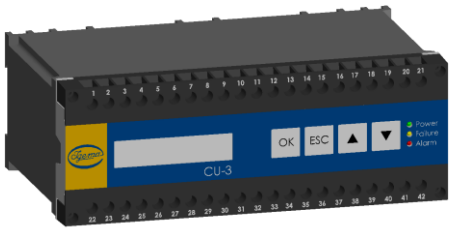
Technical equipment

- materials according to DIN or ASME (water column usually Chrome-Moly P11, P22, P91 or other to accommodate the super-heated steam pressures & temperatures).
- up to 4 probes (EL60-IP)
- 1 separate interface 4 mA – 20 mA for loads up to 500 Ohm
- 1 error contact, permanently interconnected
- 1 alarm contact for each probe
- Optional: Remote Display Unit DU3

Technical data

Allowable pressure	PS [bar]	200
Allowable temperature	TS [°C]	348
Electrode	Type	EL60-IP 
	Item no.	15-12982
	Insulator	Ceramic
Conductivity		0,5 µS/cm ≤ æ ≤ 10.000 µS/cm (25°C)

CU-3



Power supply	24 V DC or 110-230 V AC (power converter included)			
Interfaces				
internally	CAN-Bus for supply and internal communication			
Output	1 SPDT output contact permanently assigned to device errors			
	2-4 SPDT output contacts for the probes			
	4 mA – 20 mA output (load < 500Ohm) not galv. isolated e.g. for connection to PLC			
Maximum ratings of potential free contacts	Switching voltage	max. 250 V AC	25 V DS	300 V DC
	Switching current	max. 6 A resistive	6 A	0,1 A
		inductive / higher loads: use contactor		
Connection	Two 21-terminal strips to 2.5 mm²			
Display	Illuminated LCD display with 2 rows, each 16-character			
Input / Programming	4 buttons			
Working temperature	Up to 167°F / 55°C			

Edition 03/2021

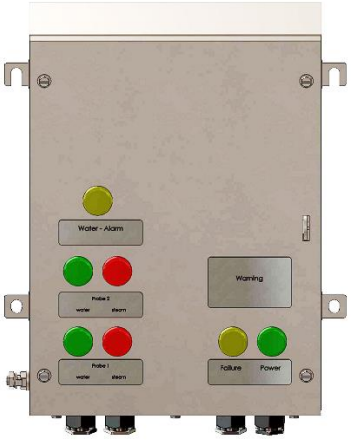
MU-3	
Probe version	
Connection thread	G ½″
Width across flats	AF27
Material screw connection	Niro
Material of electrode tip	Niro
Electrode distance	at least 36 mm with staggered arrangement; smaller distances on request
Protection class	IP65
Housing design	
Materials	Stainless steel
Protection type	IP65
Interface	CAN-bus
Working temperature	0°C bis +85°C (-10°C without condensation) / Up to 185° F

Note:

max. cable length EWLS MU-3 --- EWLS CU-3:
800m
Extension by amplifier possible
Data transmission via fibre optic cable possible

Control box for CU-3

The control cabinet contains the basic functions / devices:
- 1x CU-3
- 1x power supply unit
- 1x 2-pole fuse 6A
- LED indicators for water level, for each probe
- Connection terminals for the mains voltage
- Output terminals for the CAN for connection to the MU-3
- 5 x M20 cable glands MS/NI or adapter M20 to ¾″ NPT MS/NI

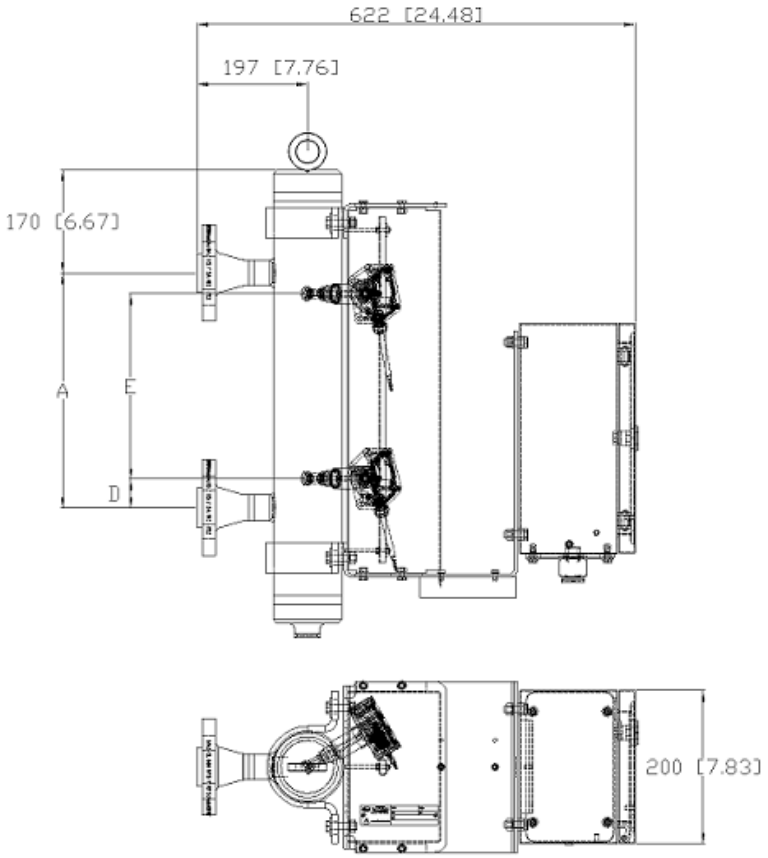


Stainless steel housing
with 5x M20 cable gland

Standards	IEC/EN 60529	
Housing material	Sheet steel housing painted, RAL 7035	stainless steel housing 1.4404 / 316 electrically polished
Protection class	IP66, NEMA 4	IP66, NEMA 4x,
Housing dimensions	400 x 400 x200	
Power supply	110-240 V AC, 47-63HZ	
Power consumption	0,55 A @ 115 V AC resp. 0,35 A @ 230 V AC	

Edition 03/2021

Technical dimensions



The process- and drain connection can be executed as flange, Butt welding or Socket welding end or plug.

Edition 03/2021