



# ELS 300+

Multi point level detection system



**Levelstate**

*Solution at all levels*

# RELIABLE AND CONVENIENT

Reliable detection of water level is essential for the safe operation of any water containing device. Very high level may lead to an overflow whereas very low level may cause overheating resulting in damage to collateral equipments as well.

Levelstate Electronic Level Switch (ELS) 300+ provides a reliable and cost effective means of sensing water level in high pressure applications. Levelstate ELS is based on the conductivity probe principle where resistivity discrimination between steam and water is used to provide the required indication.

The principle of resistance discrimination between water and steam is well established and accepted as the most reliable, convenient and maintenance free method of detecting alarm levels and initiating protective actions. The system consists of an Electronic Unit, a conductivity Probe, a Probe Insert/Water Column and a length of Probe Cable. The conductivity Probe can be mounted directly on the vessel through a Probe Insert or a side-arm Water Column. With detection upto 4 channels (optional upto 8 channels) in one electronic unit, the installed cost per detection point is appreciably lower.

## Applications

- Equipment drains (Control valves, Soot blower)
- Receiver tanks (Condenser, Water tank, Deaerator)
- Flash tanks, Feedwater heaters
- Steam line drain pots
- Mainstream header drains
- Hot and cold reheat drains
- Turbine water intrusion protection (TWIP)
- High pressure systems, where float type level switches are not feasible

## Distinctive Features

- Choice of 1 to 8 channels
- Available for pressure ratings upto 207 bar (3000 psi)
- Dual power supply with 100% redundancy and power supply failure indication
- Self-diagnostic features to detect open circuit/short circuit/contamination/ground failure
- DPCO high capacity relays at each channel
- Adjustable time delay output
- Both horizontal and vertical validation available
- Remote Display Unit available (optional)
- Explosion proof (optional)

## Approvals

- Quality system accredited to ISO 9001
- Design approval of pressure parts, operational and field testing of the system
- Third party inspection, testing and certification by approved international agencies
- Certification of explosion proof to international standard for use in hazardous area



# STATE OF THE ART ELECTRONIC UNIT

## Type 300+

**Enclosure:** Wall mounted FRP enclosure with IP65/NEMA 4X protection; Size (mm): 320H x 200W x 120D

**Rating:** -10°C to 70°C; Relative Humidity: Upto 100%

**No. of channels:** 1 - 4 channels (optional upto 8 channels), independent of each other and configurable through handheld programmer

**Power supply:** Two independent sources - 85-264V AC, 47-63 Hz / 120-370V DC

**Discrimination threshold:** The discrimination threshold may be selected for a conductivity of 0.5, 1 or 2  $\mu\text{S}/\text{cm}$  (optional: 0.1  $\mu\text{S}/\text{cm}$ )

**Display:** Green LED for water, Red LED for steam and two Yellow LEDs for process/system fault

**Process fault (Alarm/Trip):** Upto 4 DPCO sealed relays are used, one relay for each channel. Relays can be configured for normally water/steam i.e. energised/de-energised condition of the particular channel with time delay action for 1-20 seconds.

**Process fault discrimination:** Respective channel and yellow LED flashing at 2 Hz

### System fault:

System fault is activated through one DPCO sealed relay for the following abnormalities:

- Any of the power supply/internal power pack failure
- Short circuit/open circuit
- Probe contamination
- Ground failure

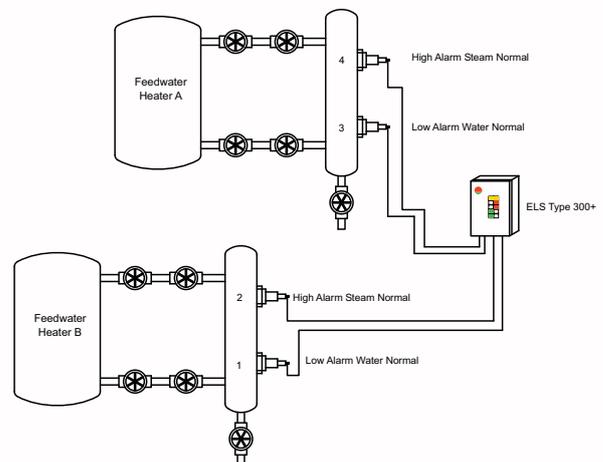
**System fault discrimination:** Respective channel and yellow LED flashing at 1 Hz

**Relay contact rating:** DPCO - 8 Amps; 250V AC / 30V DC

**Switching power:** 2000VA / 240W

**Remote display unit (optional):** Remote Display Unit indication is identical to the main display unit. Two Remote Display Units can be powered by the Electronic Unit upto 500 meters. Additional Remote Display Unit with length exceeding 500 meters also available on request.

Protection class: IP20 (panel mounting) or IP65 (wall mounting)



Levelstate ELS Type 300+ Installation at Feedwater Heater

# ROBUST DESIGN WATER COLUMN

Water Columns are designed to promote condensation of saturated steam with minimum drop in temperature. Circulating condensate in the Water Column flushes the vessel and Probes continuously. This prevents build up of sediment and eliminates the need for periodic blowdown.

The design and fabrication meets the requirement of ASME B31.1 Power Piping Code. Water Columns are hydro-tested at 1.5 times the rated pressure at ambient temperature.

Stainless steel guards/inserts are provided for Probe protection.



## Type 501

**Rating:** 150 bar at 341°C (2175 psi at 645°F)

**Material:** Carbon steel extruded section conforming to ASTM A105 or thick wall seamless carbon steel pipe conforming to ASTM A106

**Probe installation:** Screwed with gasket seal

**No. of ports:** 1 to 8

**Minimum pitch:** 25mm

**Sight range:** As per plant requirement

**Steam/water connection:** 25NB x Sch. 160  
(custom size available on request)

**Drain connection:** 15NB x Sch. 80  
(custom size available on request)



## Type 502

**Rating:** 207 bar at 370°C (3000 psi at 698°F)

**Material:** Thick wall seamless carbon steel pipe conforming to ASTM A106

**Probe installation:** Metal to metal compression fitting

**No. of ports:** 1 to 8

**Minimum pitch:** 25mm

**Sight range:** As per plant requirement

**Steam/water connection:** 25NB x Sch. 160  
(custom size available on request)

**Drain connection:** 15NB x Sch. 80  
(custom size available on request)

Optional: Water Column for super-critical applications available on request

# THE HEART OF ELS PROBES

As the primary element in sensing level signals, conductivity Probe is the heart of electronic level switching systems. Probes are made of stainless steel with high purity zirconia/alumina ceramic insulator exhibiting a high degree of chemical inertness at elevated temperature. Pressure sealing is achieved through ceramic to metal vacuum brazing.

Insulation resistance: Greater than 5W at 500V. Hydro tested at twice the rated pressure .

## Type 801

**Rating:** 150 bar at 341°C  
(2175 psi at 645°F)

**Connection:** Screwed type probe with M16 x 1.5 mm thread and metaflex gasket seal

**Optional:** Probe Type 811 with non-wetting PTFE insulator available for pressure upto 23 bar at 220°C (334 psi at 428°F)



## Type 802

**Rating:** 207 bar at 370°C  
(3000 psi at 698°F)

**Connection:** Swagelok type compression fitting with metal to metal seal



Optional: Probes for super-critical applications available on request

## PROBE INSERT Type 701

Probe Insert is used for direct Probe installation on to the existing vessel or Water Column. Type 701 Probe Insert is used for Probe Type 801/811. Material of construction is stainless steel.



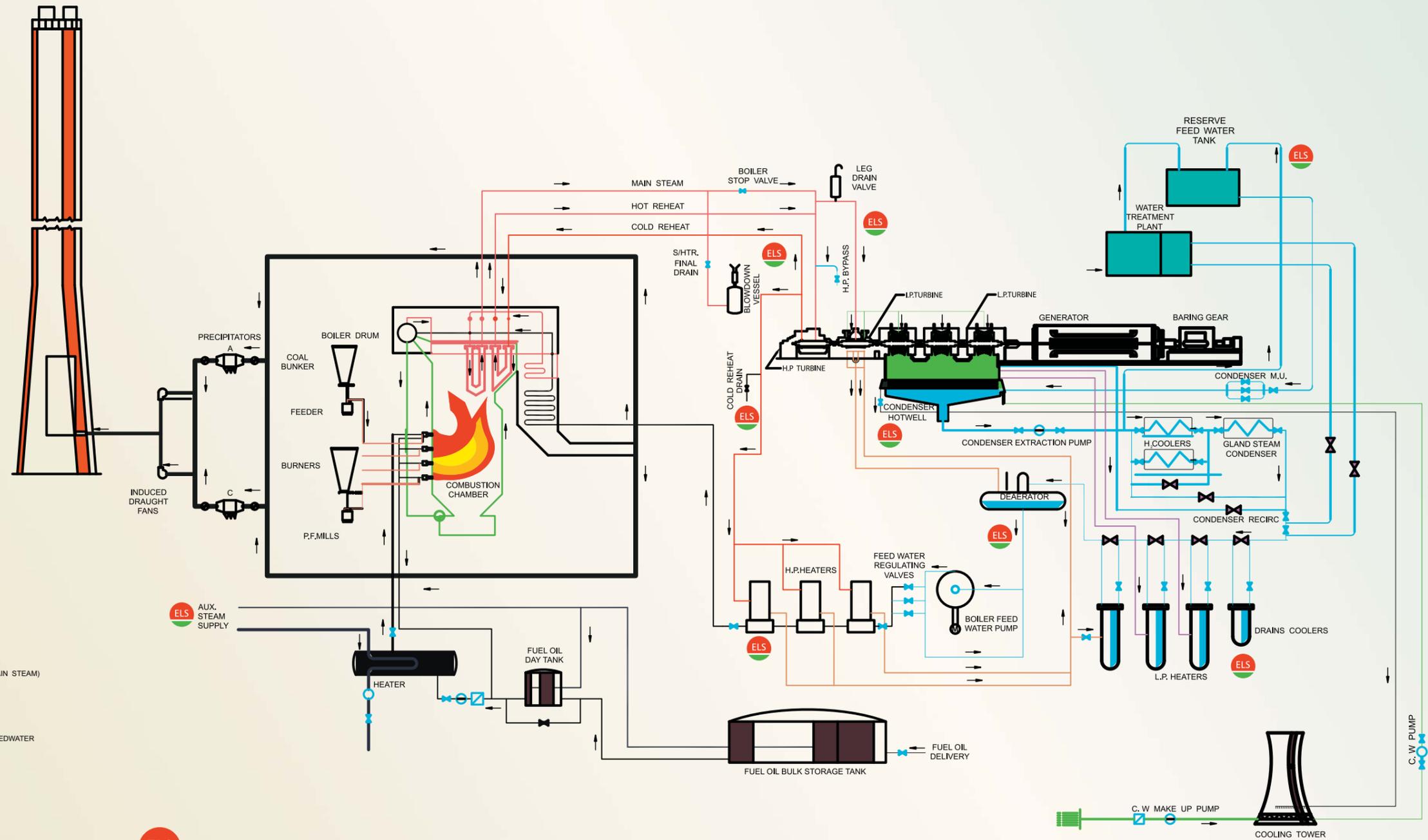
## PROBE CABLE Type 30028

Levelstate provides high temperature resistant PTFE insulated 4 core Probe Cable for individual channel. These are available in 10 meters length as standard. Custom lengths can be supplied maximum upto 30 meters.



**Solution at all levels**

# TYPICAL FOSSIL FUEL FIRED GENERATING UNIT



- SUPERHEATED STEAM (MAIN STEAM)
- HOT REHEAT STEAM
- COLD REHEAT STEAM
- CONDENSATE AND L.P. FEEDWATER
- H.P. FEEDWATER
- FUEL OIL
- L.P. STEAM
- BLEED STEAM
- CIRCULATING WATER
- FLUE GAS

**ELS** LOCATIONS WHERE LEVELSTATE ELS IS NORMALLY RECOMMENDED

# STEAM GENERATING PLANT LEVEL MONITORING SOLUTION

Levelstate provides SOLUTION AT ALL LEVELS for steam generating plants. Products manufactured are Colour Port Type Direct Water Level Gauge (DWLG), Electronic Drum Level Indicator (EDLI) and Electronic Level Switch (ELS).

The guiding philosophy of reliability and user friendly design has made Levelstate a successful business entity. The user base includes power, petrochemicals, refinery, fertiliser, sugar, paper, cement, metallurgical and chemical industries throughout the world.

Various international agencies have approved Levelstate products. The quality system has been accredited ISO 9001. All Levelstate products are also available with the CE mark.

With professional marketing efficiency and on-time service delivery, Levelstate assures its customers value for money. Factory trained engineers are available on call to provide diagnostic assistance, pre-engineering support, installation and commissioning services.



## Direct Level Gauge, Drum Level Indicator and Level Switch



HP Direct Water Level Gauge



MP Direct Water Level Gauge



Electronic Drum Level Indicator



Electronic Level Switch

Levelstate pursues a policy of continuous technical innovation and product development.  
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