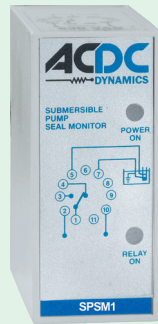




# LEVEL & PUMP CONTROL

# PHASE ANGLE RELAYS



## 2-Level Liquid Level Relay

## 3-Level Liquid Level Relay

## Submersible Pump Seal Monitor

## Pump & Motor Protection Phase Angle Relays

TE101

TE201

DLR

DLRA

SPSM1

SPSM2

SPSM1-5K

TE01 / TE01/S

TE02 / TE03

SPDT

DPDT

DPST

SPDT

DPDT

SPDT

**Filling:** Link 7 & 8. The relay energises when the level drops below the low level probe and de-energises when it reaches the high level probe. Top and bottom probes are interchangeable.

**Emptying:** No link between 7 & 8. The relay energises when the level reaches the high probe and de-energises when it drops below the low probe.

- For single level sensing connect pins 5 & 6 (Probes 5 & 7).
- 1s response time to limit effect of water ripple. Longer times manufactured to order.

**TE101:** Filling or Emptying

**TE202:** Emptying Only

**TE101B:** Dual voltage 230/400V

**TE101LE:** Long Distance Emptying 150-200m 230V and 400V only- For Probes, see Pg. 52

### DLR

#### For alternating pumps

There are two relay outputs with flip-flop action each cycle for alternating duty of pumps. Relay is connected to four probes.

**Filling:** Link 7 & 8. Pump 1 starts when the level drops below the start level probe. Pump 2 will start if the level drops to the second probe. Both pumps run until tank is full. The next cycle pump 2 first then pump 1.

**Emptying:** No link between 7 & 8. Function as above but reversed.

### DLRA

#### For one pump & alarm

Output relay energises and de-energises between 2 levels like **TE101**. When extreme level is reached, the alarm output energises (2nd Relay). Alarm can be used for high or low function.

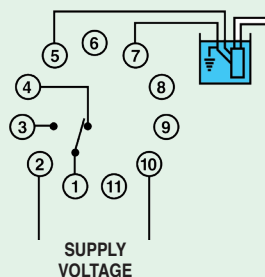
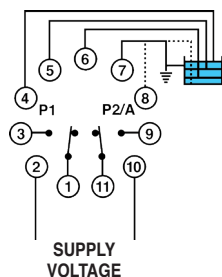
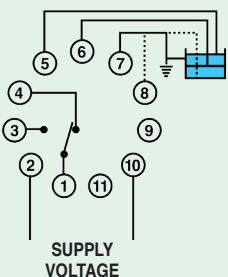
For Probes, see Pg. 52

For protection of submersible motors against damage caused by the ingress of water.

Terminals 5 & 7 connect to the monitoring terminals on the submersible motor.

The output relay energises upon application of power. The relay will de-energise if probe current is more than 20µA or if probe resistance is less than 1Mohm. The relay will energise if probe current is less than 15µA or if probe resistance is more than 1,4Mohm.

**SPM1-5K:** 5KΩ Sensitivity Potentiometer



Level sensor:  
Probe volts 5 VAC @ 1.5mA  
Adjustable sensitivity: 0 - 50 kΩ

Max Voltage on probe = 24VDC  
Max Current through probe = 120µA = 0.12mA.  
LEDs:  
Power on – Red  
Seal healthy – Green

AC: ± 1.5VA DC: 100mA @ 12VDC

Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Isolation test volts 2kV)

12, 24, 48VDC

SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC

- Supply Voltage: Single Phase: 230VAC ±20% Three Phase: 400VAC, 415VAC (**TE02 & TE03**) or 525VAC ±20%
- Power Consumption: ±2VA
- Calibration: Manual or Automatic (Model dependant)
- Dry Trip Level: 10% of calibrated phase angle / current 2s delay
- Dry Restart Delay: 15 minutes to 5 hours adjustable
- Output Relay: SPDT 250VAC/10A
- Voltage Trip Level: 10% of calibrated voltage, 2 second delay (**TE02/TE03**)
- Current Trip Level: 20% of calibrated current, 1 second delay (**TE02/TE03**)
- Rapid start cycle: 3 per 15 minutes maximum (**TE03** only)

### LED Status Indication TE02/TE03

Green	Amber	Red	Condition
ON	OFF	OFF	Normal pumping
FLASH	OFF	OFF	Dry-timing or phase failure/reversal
OFF	ON	OFF	Supply voltage low/high
OFF	FLASH	OFF	Rapid cycle
OFF	OFF	ON	Motor overload or phase failure
ON	ON	ON	<b>TE02/3</b> uncalibrated
FLASH	FLASH	FLASH	<b>TE02/3</b> calibrating
OFF	OFF	OFF	Unable to calibrate

### Selection Guide

Code	TE01*	TE02*	TE03*
11 Pin Plug In	•	•	•
Running dry- Under load blocked in/outlet	•	•	•
Overcurrent		Auto	Auto
Phase Failure / Reversal		•	•
Over / Under voltage		•	•
Star / Delta or Soft Start	•••	•	•
Locked Rotor		•	•
Shunt Required	•		
Rapid pump start protection			•
Cut-out over 12 starts/hour			•
LED Status Indication		•	•
Calibration	Manual	Auto	Auto
Tank Control (float switch)			•

\*Add to Code: 230V (230VAC), 400V (400VAC), 415V (415VAC), 525V (525VAC) \*\*TE01/S version only