

- **Reliable on/off liquid level control**
  - for alarms or pump control
- **Suitable for most conductive liquids**
  - including water, sewage, dilute acids and beer
- **Durable construction**
  - keep costs down, fit and forget
- **High, low or latching level control**
  - selectable to your requirements
- **Weatherproof to IP56**
  - suitable for use in wet or humid environments
- **Two sets of DPDT contacts**
  - duplicate contacts for direct control and visual alarm



*Noflote — designed for control of conductive liquids*



## DATUM Noflote

A complete Noflote system comprises one or more **81NE Sensing Electrodes** of the type described on page 4, and an **81NC Noflote Controller** containing switching circuitry and control relays, either in chassis-only form for cabinet mounting (multipoint applications), or in a die-cast aluminium, IP56, weatherproof case.

A **Noflote system** detects the electrical resistance between a Noflote **electrode** and an **earth electrode**. The earth reference connected to the controller may be the walls of a metal vessel, pipework within the vessel, the earth rod of a multiple sensor or another Noflote electrode.

When the liquid rises to touch the Noflote electrode an internal relay energizes (or de-energizes) to operate an alarm, pump etc. Complex processes can be controlled automatically by means of two or more Noflote systems.



DATUM 81NC Noflote Controller

## 81NC Noflote Controller

There are three control options:

### Single Trip

Used with a single Noflote sensing electrode. It contains one relay with two sets of changeover contacts. In controllers supplied for fail-safe high, the relay is de-energized when the liquid falls away from the electrode.

### Double Trip

Comprises two single trip controllers in one housing, each of which operates independently of the other in conjunction with its own Noflote sensing electrode. Each control channel has one control relay with two sets of changeover contacts.

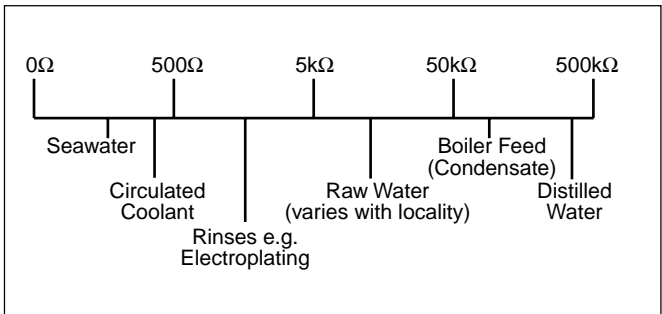
### Latching Trip

Used with two Noflote sensing electrodes. It contains one relay which is energized at one electrode level and is de-energized when the level has risen, or fallen, to the second electrode.

## Resistance of Typical Conductive Liquid

In view of the wide range of resistance values of conductive solutions, four ranges of immersion resistance are available on the DATUM 81NC Noflote controller.

By selecting the lowest immersion resistance range within which the solution falls, the possibility of false switching due to splashing or tracking on the electrode is eliminated.



Typical Resistance Ranges

## Specification – Controller

### Operating temperature limits

–10° to +55°C

### Operating humidity limits

0 to 80%RH

### Power supply

110V and 230V nom., 50/60Hz

### Relay contact rating

Double pole changeover contacts

First pole (with arc suppression)

250V a.c. 5A a.c. 1250W (non-inductive)

250V d.c. 5A d.c. 50W (non-inductive)

Second pole (without arc suppression)

250V a.c. 2A a.c. 500VA (non-inductive)

250V d.c. 2A d.c. 20W (non-inductive)

### Safety on failure

Fail-safe at high or low level is set by link on printed circuit board

### Response time

5s or 0.5s (by on-site removal of capacitor)

### Indication of relay operation

Internal I.e.d. in parallel with relay coil

External none, or with lamps mounted on front of case or remote lamps across relay contacts

### Cable run

Max. length between electrode and controller – 300m (975 ft), dependent on immersion resistance range and cable used

### Housing

Die-cast aluminium alloy, weatherproof case with screw-on gasketed cover, finished in dark grey epoxy resin-based paint

### Protection

IP56

### Chassis housing

ABS plastic dust cover with terminals top and bottom.

No internally mounted signal lamps

Protection IP20

Dimensions

128mm (5.0 in.) high x 128mm (5.0 in.) wide x 85mm (3.35 in.) deep

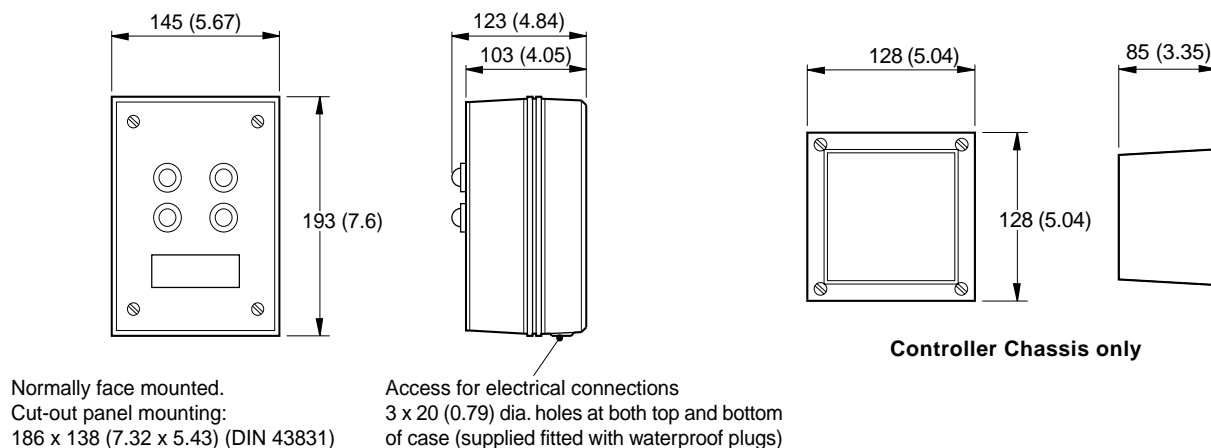
### Weight

2.2kg (4.84 lb) in die-cast case

1.0kg (2.2 lb) chassis only

## Overall Dimensions – Controller

Dimensions in mm (in.)



**81NC Controller**

**Controller Chassis only**

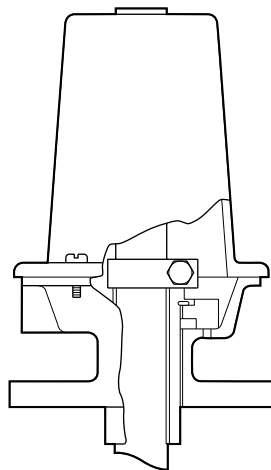
## Noflote Electrodes

The five basic types of Noflote electrode are shown below. Noflote level systems require an earthing electrode extending below the lowest Noflote sensing electrode. In many cases this earth is provided by pipework, a rising main or the largest electrode of a multiple type sensor. Where there is no convenient earthing electrode, an additional Noflote electrode, longer than the longest sensing electrode, must be installed.



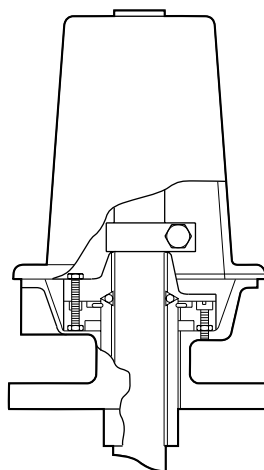
### 81NEB Borehole Electrode

Comprises a stainless steel electrode rod with an insulating shroud to prevent earthing against the side of the borehole or rising main. It is connected to the controller by a strong rubber-covered suspension cable, which contains five stainless steel and two copper conductors.



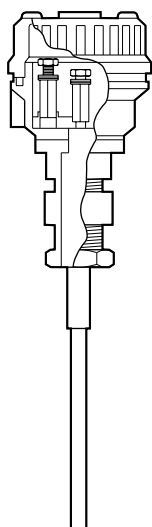
### 81NEO Standard Electrode

Comprises a cast-iron electrode holder and a conical-shaped head which is fastened to the holder by means of four screws. The electrode tube is normally manufactured by the customer from standard  $\frac{3}{4}$  in. gas pipe, or 27mm o.d. tube but can be supplied with the head when required.



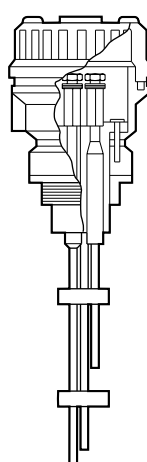
### 81NEW Waterproof Electrode

Similar to the standard type. Internal seals and an insulating tube round the electrode tube make the head waterproof. In addition, the electrode tube is plugged at its lower end.



### 81NEL Light Electrode

Comprises a die-cast aluminium alloy head with mild steel or stainless steel boss and a stainless steel electrode rod. The rod is partially covered with PTFE.



### 81NEM Multiple Electrode

Similar to the light type but with one or two measuring rods and a single earth rod.

## Specification – Electrodes

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### 81NEO and 81NEW Electrodes

#### Insulation resistance

20MΩ min.

#### Insulant materials

Acetal and rigid polythene

#### Insulant tube length

81NEO	25mm (0.98 in.)
81NEW	760mm (29.92 in.)

#### Electrode tube

Standard  $\frac{3}{4}$  in. (27mm) o.d. galvanized gas pipe or stainless steel.

Customer normally supplies electrode tube to fit the electrode head. Tube must be plugged at bottom end in type 81NEW. Mild steel or stainless steel tube can be supplied on request [200mm (7.87 in.) min., 4500mm (177.1 in.) max. in 100mm (3.93 in.) steps].

#### Electrode head

Manufactured in cast-iron, conical shape, fastened by four stainless steel screws. A Langite gasket is used for the waterproof type.

#### Range of adjustment within the head

120mm (4.72 in.)

#### Minimum rod length below lower face of mounting face

200mm (7.87 in.)

#### Mounting

65mm (2.56 in.) steel flange (160mm o.d.) (6.3 in.) to BS4504 Table 6/8 with 60mm (2.36 in.) clearance hole

#### Protection

81NEO	IP56
81NEW	IP66

#### Weight (without tube)

81NEO	5.5kg (13.75 lb)
81NEW	6kg (13.2 lb)

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### 81NEL and 81NEM Electrodes

#### Insulation resistance

20MΩ min.

#### Insulant materials

Type 81NEL PTFE  
Type 81NEM Acetal and PVC moulding and heat-shrunk PVC (6mm o.d.)

#### Insulant length

Type 81NEL 80mm from boss, or as specified  
Type 81NEM none on earth rod, 20mm (0.79 in.) from tips of upper and lower rods

#### Electrode rod

Type 81NEL 6mm (0.24 in.) o.d. stainless steel  
Type 81NEM 5mm (0.19 in.) o.d. stainless steel

#### Rod length

100mm (3.93 in.) to 2500mm in 20mm (0.78 in.) steps  
Earth rod on type 81NEM is 60mm (2.36 in.) longer than lower rod

#### Electrode head

Die-cast aluminium alloy with threaded cover, waterproof with silicone rubber 'O' ring

#### Range of adjustment within head

None

#### Mounting

Type 81NEL	stainless steel boss screwed $\frac{1}{2}$ in. BSP with nut and washer
Type 81NEM	stainless steel boss screwed $1\frac{1}{4}$ in. BSP with nut and washer, or mild steel mounting bracket

#### Maximum working pressure

Type 81NEL 10 bar at 20°C (145 psi at 68°F)  
Type 81NEM 6 bar at 20°C (87 psi at 68°F)

#### Electrical connection

Threaded for 20mm conduit entry

#### Protection

IP56

#### Weight

Type 81NEL 0.7kg (1.54 lb) – 500mm rod length  
Type 81NEM 0.8kg (1.76 lb) – with 3 rods approx. 500mm long

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### 81NEB Borehole Electrode

#### Insulation resistance

20MΩ min.

#### Insulator shroud material

Polypropylene

#### Electrode rod

8mm o.d. stainless steel

#### Electrical connection

Gland for suspension cable

#### Weight

0.6kg (1.32 lb)

#### Suspension cable

Comprises five strands of stainless steel and two strands of copper in 5mm (0.19 in.) o.d. rubber cover  
Length 10m (32.5 ft.) min. in 1m (3.25 ft.) steps up to 300m max.

#### Resistance

0.122Ω/m

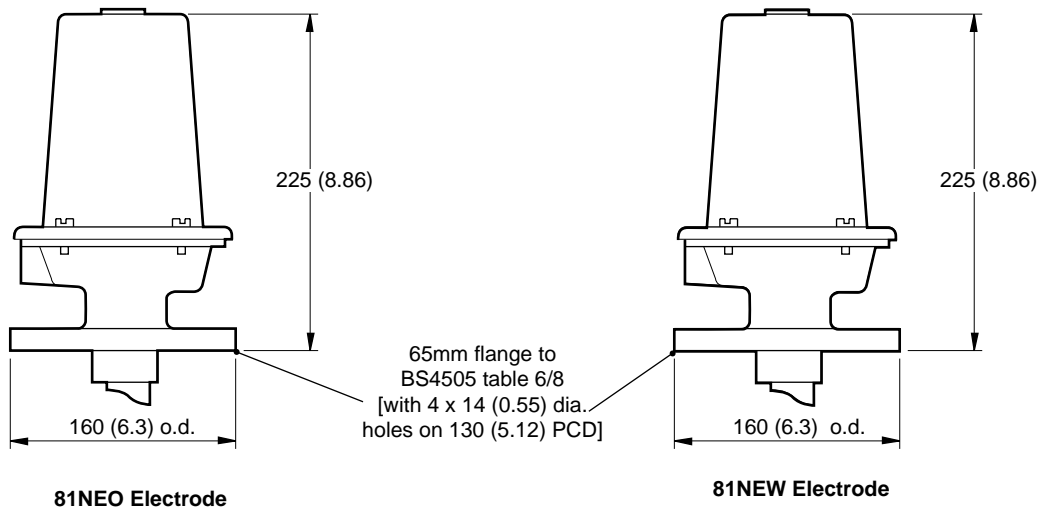
#### Weight

2.8kg/100m

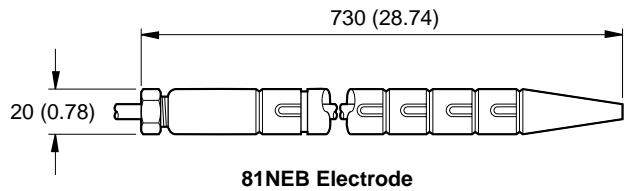
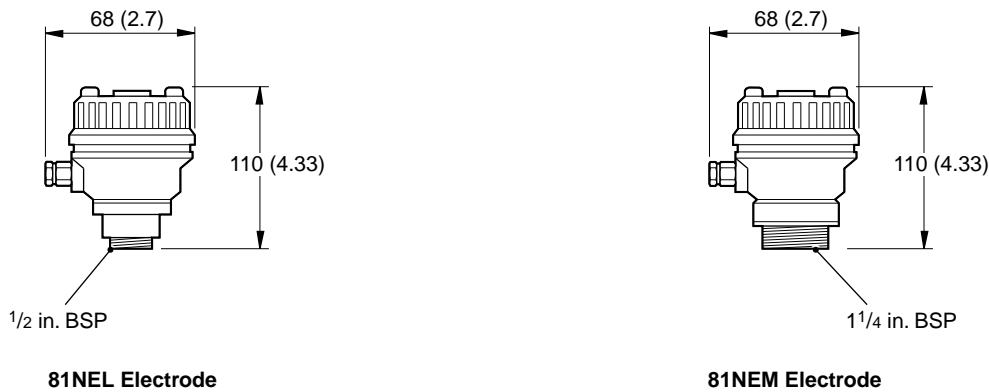
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Overall Dimensions

Dimensions in mm (in.)



All heads are threaded  
for 20 (0.79) conduit entry



## Order Guide – Controller

<b>Noflote Controller</b>		<b>81NC/</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Power Supply</b>						
110/230V 50/60Hz			1			
<b>No. &amp; Type of Trips</b>						
Single trip fail-safe low *			1			
Single trip fail-safe high *			2			
Latching trip fail-safe low *			3			
Latching trip fail-safe high *			4			
Double trip fail-safe low			5			
Double trip fail-safe high			6			
Double trip fail-safe, one fail-safe high, one fail-safe low			7			
One latching trip fail-safe low + single trip fail-safe low			A			
One latching trip fail-safe high + single trip fail-safe high			B			
One latching trip fail-safe low + single trip fail-safe high			C			
One latching trip fail-safe high + single trip fail-safe low			D			
Two latching trips, both fail-safe low			E			
Two latching trips, both fail-safe high			F			
Two latching trips, one fail-safe low, one fail-safe high			G			
<b>Immersion Resistance</b>						
0 to 500Ω	Sewage and ionic solutions				1	
500 to 5kΩ	Sewage and ionic solutions				2	
5k to 50kΩ	Clean water				3	
50k to 500kΩ	Demineralized water				4	
<b>Lamps and Housing</b>						
Case without lamps						0
Case with two lamps (only available with *)						2
Case with four lamps (not available with *)						4
Chassis only (plastic cover — no lamps)						7

## Order Guide – Electrodes

Noflote Electrodes		81NE	X/	X	X	X	X/	XXXX
<b>Electrode type</b>								
	Light single		L					
	Light multiple		M					
	Standard		O					
	Waterproof		W					
	Borehole		B					
<b>Mounting</b>								
	1/2 in. BSP stainless steel boss with nut and washer (Light single type only)			B				
	1 1/4 in. BSP stainless steel boss with nut and washer (Light multiple type only)			B				
	Mild steel mounting bracket (Light multiple type only)			M				
	65mm (2.56 in.) cast iron flange 160mm (6.3 in.) o.d. to BS4504 table 6/8 (not Borehole type)			F				
<b>Insulant material</b>								
	PTFE (Light single type only)				1			
	Acetyl and Polythene (not Borehole type)				3			
	Acetyl and PVC (Light multiple type)				4			
<b>Insulant length</b>								
	80mm (3.15 in.) from boss (Light single type only)					1		
	25mm (0.98 in.) from flange face (Standard type only)					1		
	760mm (29.9 in.) from flange face (Waterproof type only)					1		
	Other specified length (Light single or Standard type only)					X		
<b>Electrode material</b>								
	None (not Light single type)						0	
	Mild steel (Standard and Waterproof types only)						A	
	Stainless steel (Light single , Standard and Waterproof types only)						B	
<b>Electrode length</b>								
	No electrode fitted (not Light or Borehole type)							0
	100mm (3.93 in.) min. in 20mm (0.78 in.) increments (Light type only)							0100
	↓							↓
	2500mm (8.2 ft) max. length							2500
	200mm (7.87 in.) min. in 100mm (3.93 in.) increments (Standard and Waterproof types only)							0200
	↓							↓
	4500mm (14.72 ft) max. length							4500



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