



RF ADMITTANCE TYPE LEVEL SWITCH SERIES 116

The R.F. admittance type level switch, series 116, is an instrument with electrode, transducer & switching electronics integrated in one weatherproof / flameproof housing. It can be installed directly on the vessel, thus minimising the cost of installation.

FEATURES

- ❑ Compact size due to integrated switch and electrode.
- ❑ Wide range of electrodes to suit a variety of applications.
- ❑ Transducer operation at radio frequency minimises the effect of moisture variation in material.
- ❑ Available in weatherproof and flameproof enclosures.
- ❑ Optional adjustable time delay.
- ❑ High Temperature Stand Off (HTSO) for high temperature applications.

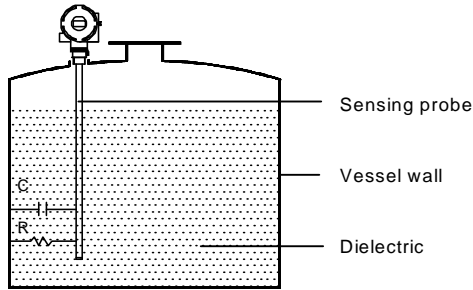
SPECIFICATIONS

- ❑ Input :
DC voltage from built in transducer
- ❑ pf range :
200/1000/3000 pf (selectable through DIP switch settings on transducer)
- ❑ Local indication :
Mains - Green LED
Alarm - Red LED
Level above setpoint - Yellow LED
(for version B and H only)
- ❑ Sensitivity :
0.5% of maximum probe output
- ❑ Calibration :
By physically changing level in the vessel
- ❑ Set points :
user adjustable over entire range with 20 turn potentiometer
- ❑ Failsafe features :
Fail Safe High (FSH) or Fail Safe Low (FSL)
- Selectable through DIP switch
- ❑ Time delay :
User adjustable 0-120 sec with 20 turn potentiometer (for version B and H only)
- Delay on rising or falling level selectable through DIP switch



- ❑ Contact output :
1 C/O rated 5 Amp @ 230 VAC / 28 VDC (Resistive) - (for versions A, B & C)
2 C/O rated 5 Amp @ 230 VAC / 28 VDC (Resistive) - (for versions A,B & C)
- ❑ Power consumption :
< 4 VA (230/115 VAC \pm 10%)
< 5 W (24 VDC)
- ❑ Cable entries (2 Nos) :
3/4" UNF (ET) - standard
1/2" NPT - optional
- ❑ Termination :
Suitable for conductor size 2.5 mm²
- ❑ Environmental conditions :
Temperature - 0 to 55°C
Humidity - 95% RH maximum
(Non condensing)
- ❑ Enclosure :
Weatherproof, Cast Aluminium Polyurethane painted, conforming to IP-65 as per IS:2147-1962.
OR
Flameproof, cast aluminium polyurethane painted, suitable for Gr-IIA & IIB as per IS:2148-1981 vide certificate No. CMRS/TC/1481 dtd. 17/11/92 issued by CMRS Dhanbad.
- ❑ Weight :
3 Kgs. (approx.) without electrode & process connection
- ❑ Electrode & Process connection :
As per "Electrode Selection Guide"

PRINCIPLE OF OPERATION



RF admittance is inferential method for level measurement of liquids and solids. While computing the level, it takes both properties i.e. dielectric constant and conductivity of product into account. The transducer operation at Radio Frequency minimizes effect of change in conductance, thus making the measurement immune to change in moisture contents of material.

ORDERING CODE

The total excitation current (I_T) that flows from the electrode to earth consists of a resistive current (I_R) and a capacitive current (I_C).

$$I_T = I_R + I_C$$

If the conductivity of product varies over a large range (depending on moisture variation) and excitation frequency is low, these two currents are comparable in deciding I_T .

By exciting the electrode with a Radio Frequency signal, the resistive current becomes negligible as compared to capacitive current i.e.

$$I_C \gg I_R$$

hence $I_T \cong I_C$

This gives consistency in setpoint inspite of varying moisture contents.

In actual operation, a change in level will cause a change in the admittance value. The admittance value when the probe is covered will be different than when it is uncovered. This change in admittance is sensed, demodulated, amplified & causes the output relay to changeover.

L = mm.

1 1 6

PROBE HEAD

H

PROCESS CONNECTION

ELECTRODE

0 6

SAFETY CLASS
H - Non Intrinsically Safe

VERSIONS
A - Single point switch (1 C/O)
B - Single point switch with time delay (1 C/O)
C - Two point switch
G - Single point switch (2 C/O)
H - Single point switch with time delay (2 C/O)

ENCLOSURE (NOTE 1 & 2)
1 - WEATHER PROOF (W/P)
2 - FLAME PROOF (FLP)
5 - W/P with HTSO in SS316

POWER SUPPLY
1 - 115VAC ±10%, 50HZ, 1 φ
2 - 230VAC ±10%, 50HZ, 1 φ
3 - 24VDC

PROCESS CONNECTION TYPE (NOTE 3)
T - Threaded
I - Integral flange

PROCESS CONNECTION SIZE
01 - 1" BSP (M)

FLANGE TABLE
Pressure rating = 150 # (10 Kg/cm²)

	ANSI	BS	DIN	IS
1"	1 1	1 2	1 3	1 4
1 1/2"	1 6	1 7	1 8	1 9
2"	2 1	2 2	2 3	2 4
2 1/2"	2 6	2 7	2 8	2 9
3"	3 1	3 2	3 3	3 4
4"	4 1	4 2	4 3	4 4
5"	5 1	5 2	5 3	5 4
6"	6 1	6 2	6 3	6 4

PROCESS CONNECTION MATERIAL
2 - CS (for flanges only)
4 - SS304
6 - SS316

COATING / LINING
0 - No coating
4 - Rubber Natural (lining)
8 - PVDF (coating)

TRANSDUCER
0 - STD.

ELECTRODE CODE (NOTE 4)
XX - As per electrode selection guide

MATERIAL OF ELECTRODE
6 - SS316

SHEATHING / COATING
3 - PTFE (sheathing)
8 - PVDF coating)

MATERIAL OF OUTER PIPE
0 - No outer pipe
4 - SS304
6 - SS316

MATL. OF COUNTER WT. (NOTE 5)
0 - No counter weight
1 - Glass leadshot filled
6 - SS316
8 - SS316 PVC coated

NOTE :

1. Please specify cable entry size.
2. High Temperature Stand Off is recommended for process temperature above 60°C.
3. Slip on flanges of appropriate size can be supplied as an accessory for electrodes with threaded process connections.
4. All combinations are not possible. Please refer " Electrode Selection Guide " for compatible options.
5. Counter weight is applicable for flexible electrode (Code No. 29) only.

ELECTRODE SELECTION GUIDE FOR CONDUCTIVE LIQUIDS

CODE NO.	ELECTRODE DESCRIPTION	PROCESS CONNECTION			MATERIAL OF SENSING ELECTRODE	MTG. V H	ELECTRODE LENGTH		HYS IN Mm TYP	OPERATING CONDITION		SERVICE
		THD.	INTEGRAL FLANGE SIZE MIN	COATING /LINING			MIN	MAX		TEMP IN °C MAX	PRES IN kg/cm² MAX	
16	RIGID PTFE SHEATHED, Ø 16mm	01	1"	0,8	6	V H	350 200	3000 500	30	60	ATM	WATER, CORROSIVE/ NON CORROSIVE LIQUIDS IN METALLIC TANKS
17	RIGID PTFE SHEATHED, Ø 16mm	01	1"	0,8	6	V H	350 200	3000 500	30	180	10	WATER, CORROSIVE/ NON-CORROSIVE LIQUIDS IN METALLIC TANKS
29	DOUBLE LOOP FLEXIBLE PTFE SHEATHED	01	1 1/2"	0,4	6	V	1000	5000	30	60	ATM	WATER, CORROSIVE LIQUIDS IN NON-METALLIC /LINED TANKS
77	RIGID Ø16 PTFE SHEATHED WITH Ø6 BARE EARTHING ELECTRODE	-	4"	0	6	V H	350 200	3000 500	30	60	ATM	WATER BOUND SOLUTION / NON CORROSIVE LIQUIDS IN NON METALLIC TANKS
80	RIGID Ø16 PTFE SHEATHED WITH Ø6 BARE EARTHING ELECTRODE	-	4"	0	6	V H	350 200	3000 500	30	180	10	WATER BOUND SOLUTION / NON CORROSIVE LIQUIDS IN NON METALLIC TANKS
78	RIGID Ø16 PTFE SHEATHED WITH Ø10 PTFE SHEATHED EARTHING ELECTRODE	-	4"	0,8	6	V H	350 200	3000 500	30	60	ATM	WATER BOUND SOLUTION / CORROSIVE LIQUIDS IN NON METALLIC /LINED TANKS
81	RIGID Ø16 PTFE SHEATHED WITH Ø10 PTFE SHEATHED EARTHING ELECTRODE	-	4"	0,8	6	V H	350 200	3000 500	30	180	10	WATER BOUND SOLUTION / CORROSIVE LIQUIDS IN NON METALLIC/ LINED TANKS
79	RIGID Ø16 PTFE SHEATHED WITH Ø6 BARE EARTHING ELECTRODE	-	2 1/2"	0	6	V	350	3000	30	60	ATM	WATER BOUND SOLUTION / NON CORROSIVE LIQUIDS IN NON METALLIC TANKS
82	RIGID Ø16 PTFE SHEATHED WITH Ø6 BARE EARTHING ELECTRODE	-	2 1/2"	0	6	V	350	3000	30	180	10	WATER BOUND SOLUTION / NON CORROSIVE LIQUIDS IN NON METALLIC TANKS

ELECTRODE SELECTION GUIDE FOR NON-CONDUCTIVE LIQUIDS

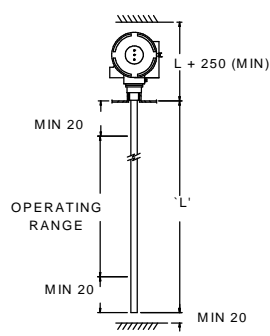
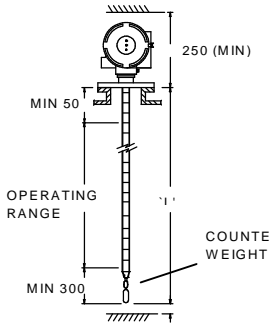
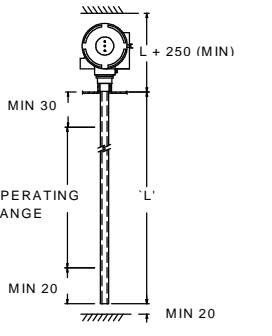
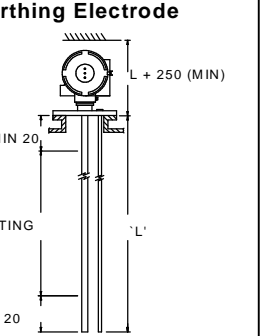
CODE NO.	ELECTRODE DESCRIPTION	PROCESS CONNECTION		MATERIAL OF CONSTRUCTION		MTG. V H	ELECTRODE LENGTH		HYS IN mm TYP	OPERATING CONDITIONS		SERVICE
		THD.	INT. FLANG MIN	SENSING ELECTRODE	OUTER PIPE		MIN	MAX		TEMP IN °C MIN.	PRES IN kg/cm² MAX.	
31	RIGID CONCENTRIC, PVDF COATED, 1/4" OUTER PIPE	0 1	1"	6	4,6	V H	350 100	800 500	20	140	10	EDIBLE OILS, TURBINE OIL, KEROSENE, SYNTHETIC OILS & OTHER PETROLEUM PRODUCTS
33	RIGID CONCENTRIC, PTFE SHEATHED, 1/2" OUTER PIPE	0 1	1"	6	4,6	V H	500 100	2000 500	40	60	ATM	
34	RIGID CONCENTRIC, PTFE SHEATHED, 1/2" OUTER PIPE	0 1	1"	6	4,6	V H	500 100	2000 500	40	180	10	
32	RIGID CONCENTRIC, PTFE SHEATHED, 3/4" OUTER PIPE	0 1	1 1/2"	6	4,6	V H	1000 100	3000 500	60	60	ATM	
35	RIGID CONCENTRIC, PTFE SHEATHED, 3/4" OUTER PIPE	0 1	1 1/2"	6	4,6	V H	1000 100	3000 500	60	180	10	

ELECTRODE SELECTION GUIDE FOR SOLIDS

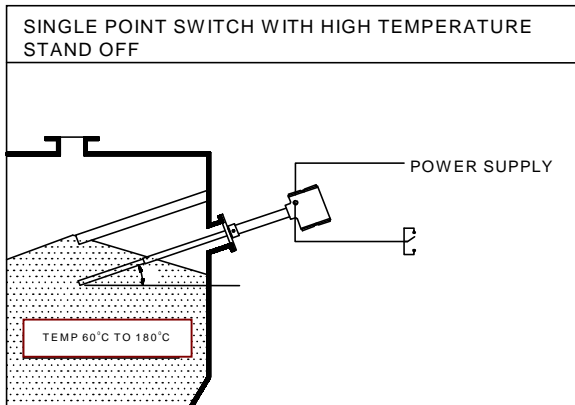
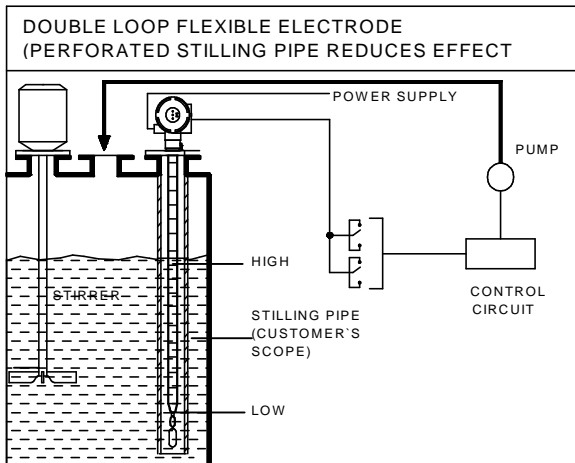
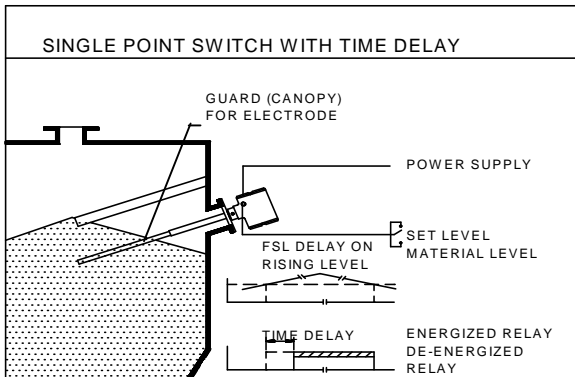
CODE NO.	ELECTRODE DESCRIPTION	PROCESS CONNECTION		MATERIAL OF SENSING ELECTRODE	MTG. V H	ELECTRODE LENGTH		HYS (NOTE)	OPERATING CONDITIONS		SERVICE
		THD.	INT. FLANG MIN			MIN	MAX		TEMP IN °C MAX.	PRES IN kg/cm² MAX.	
36	RIGID BARE PARTIALLY PTFE INSULATED, φ12mm	0 1	1"	6	V H	350 200	3000 500	-	180	10	DRY SOLIDS, POWDERS, GRANUALS

- NOTES : 1. V/H indicates mounting orientation : V = Vertical; H = Horizontal.
 2. These are commonly used electrodes. For special applications, please contact factory.
 3. High temperature stand off is recommended for process temperature above 60°C.
 4. For food industries PVDF coated electrodes are recommended.
 5. For corrosive duties, only integral flanged process connections are recommended as threaded process connections are prone to deterioration in corrosive atmosphere.
 6. Hysteresis is measured for i) Conductive liquid - Water; ii) Non conductive liquid - Kerosene. It varies as per medium. In case of solids it depends on dryness of material.
 7. For horizontal mounted electrodes, 15° downward inclination is recommended.

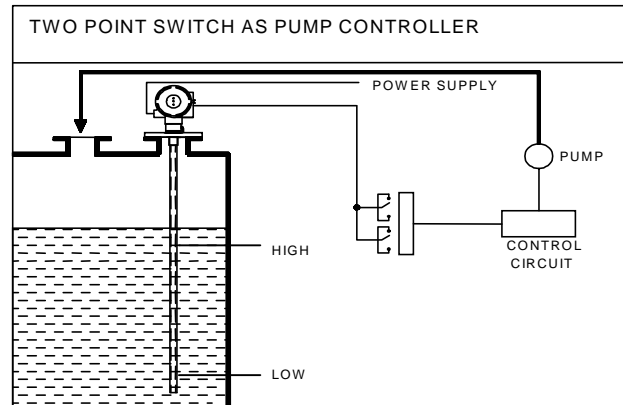
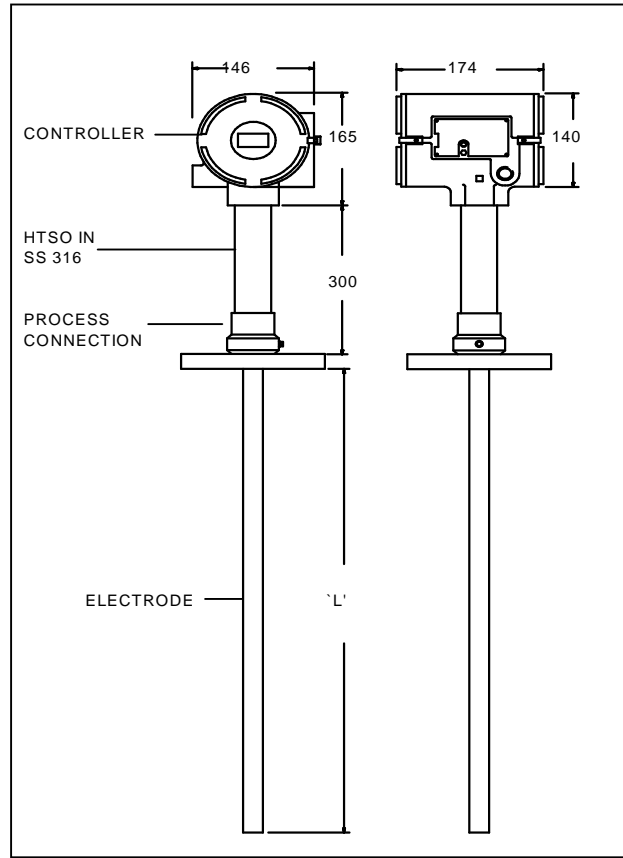
ELECTRODES

 <p>Rigid Electrode</p>	 <p>Flexible Electrode</p>	 <p>Concentric Electrode</p>	 <p>Rigid Electrode with Earthing Electrode</p>
<p>Electrode code 16,17</p>	<p>Electrode code 29</p>	<p>Electrode code 31, 32, 33,34,35</p>	<p>Electrode code 77, 78, 79,80,81,82</p>

APPLICATIONS



MECHANICAL DETAILS



***Continuous developments may necessitate changes without notice

LF-116-0801 R6 03/03



SBEM Pvt. Ltd.

39, Electronic Co-Operative Estate, Pune-Satara Road, Pune – 411 009 (INDIA)

Tel. – 91-20-4220505, 4223375 Fax – 91-20-4215670

Email – sbemsales@sbem.co.in, sbemsales@vsnl.com



Works: Bibwewadi Industrial Estate, 691/A/2, Pune-Satara Road, Pune-411 037(India) Email: mfg@sbem.co.in

Office MUMBAI

Tele. 91-22-5222824, 5242520

Fax 91-22-5230236

Email mumbai@sbem.co.in

CHENNAI

91-44-4451235, 4412947

91-44-4412947

chennai@sbem.co.in

NEW DELHI

91-11-6560647, 6969679

91-11-6969679

newdelhi@sbem.co.in