

# OPERATING MANUEL

Model : **ELS-tx**  
LEVEL TRANSMITTER

**enSim**  
sensors

Information in this manual is reviewed and completely reliable. Responsibility is not assumed due to any typing error. Products in this manual are available only for information purpose and they may be changed without notice.



Models :  
**ELS-tx**



## Important Notes:

### Used Symbols :












: Caution



: Note



: Disposal

-  Please read this manual carefully before installation of the **level transmitter**. User is responsible for accidents and losses arising from failure to comply with the warnings in this manual.
-  In the event that **level transmitter** is broken, take measures in order to prevent accidents and losses which can occur in its system.
-  There is not any fuse and circuit breaker on the instrument; they should have been added to the system by the user.
-  This manual should be stored in an easily accessible place for subsequent use.
-  The manufacturer's liability cannot exceed the purchase price of the device according to the law.
-  Do not make any modification on the instrument and do not try to repair it. Reparation should be made by authorized service staff.
-  Do not operate the system before making assembly in compliance with the assembly chart related to the instrument.
-  Products which do not contain label and serial number are considered to be excluded from the warranty scope.
-  The instrument's useful life, determined and announced by the ministry, is 10 years.

## Table of Contents :

1.	General Information.....	2
2.	Installation .....	6
3.	Failure Detection.....	15
4.	Disassembly of Instrument .....	15
5.	Service .....	15
6.	Recalibration.....	15
7.	Repair.....	15
8.	Disposal .....	15
9.	Terms of Warranty .....	15
10.	Terms of Return .....	15

## 1. General Information :

### 1.1. Material Acceptance

Check that there is no damage on the packages during the transportation immediately after the material acceptance. If packages are damaged, open the packages immediately and check whether products are affected or not, if there is any damage, send your complaint report to the transporter company and its photocopy to the address of our company.

### 1.2. Information about Areas of Use

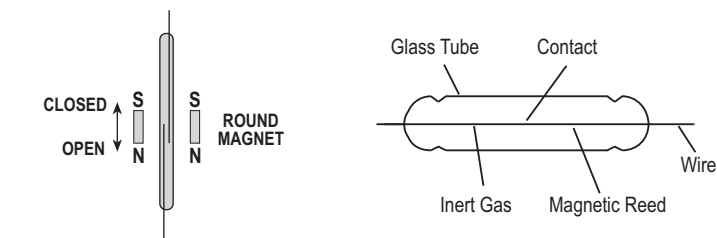
It should be used in allowed using medium and application areas! It is not used in the corrosive mediums, ambient with explosive and flammable material. Conformity with medium to be measured should be also taken into consideration. Responsibility is not assumed in case of inappropriate use, modification and injury, and such cases are not covered by warranty.

**Ambient Conditions: Relative Humidity:** 5-95 %RH **Ambient temperature:** 60 °C (It is not used under -20 °C)

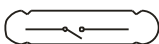
### 1.3. Working Principle

Level sensors are used for tank level and control. When magnetic field of magnet within the buoy moving along tube according to liquid level comes up to the reed sensor, it opens or closes the electric circuit. Continuous type serial aligned resistance and reed relays are engaged and disengaged. Such changes of reed sensors and alarm or level information can be assessed through a relay circuit or control device. Precision of reed sensor increases according to lowness of its placement range. It is preferred by the users due to the advantages of providing analogue output within the housing. Furthermore, it is possible to follow and to control the process in the field through UDS indicator.

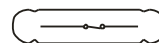
### Reed Relay and Operation Conditions



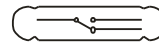
SPST-NO  
Single Pole-Single Throw  
Normally Open



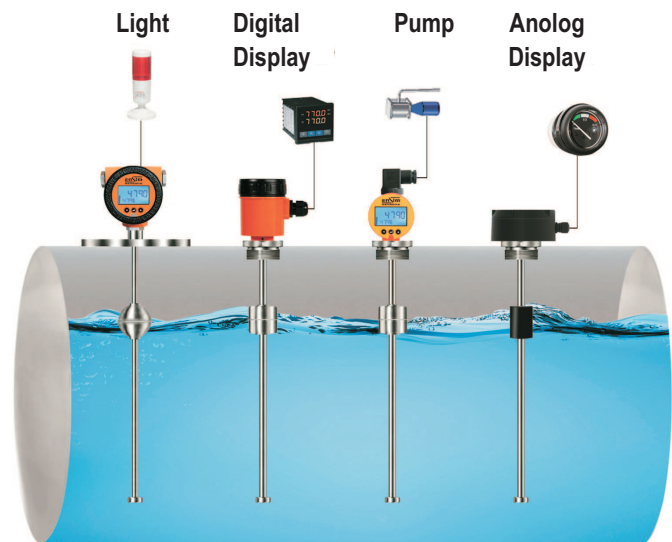
SPST-NC  
Single Pole-Single Throw  
Normally Closed



SPDT-NO/NC  
Single Pole-Double Throw  
Open / Closed Contact

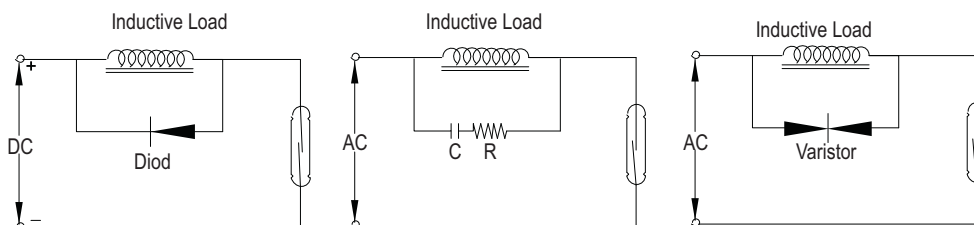


### Example of application :



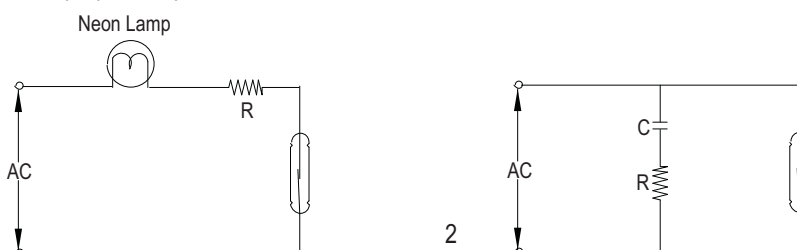
### Inductive Load

When reed switch is used for loads such as electromagnetic relay ,contactor or solenoid, reed switch may be exposed to very high voltage depending on value of inductive load. This causes either failure of switch or shortening its service life. Therefore, it is recommended to be used as follows depending on used voltage, for the purpose of protection of switch.



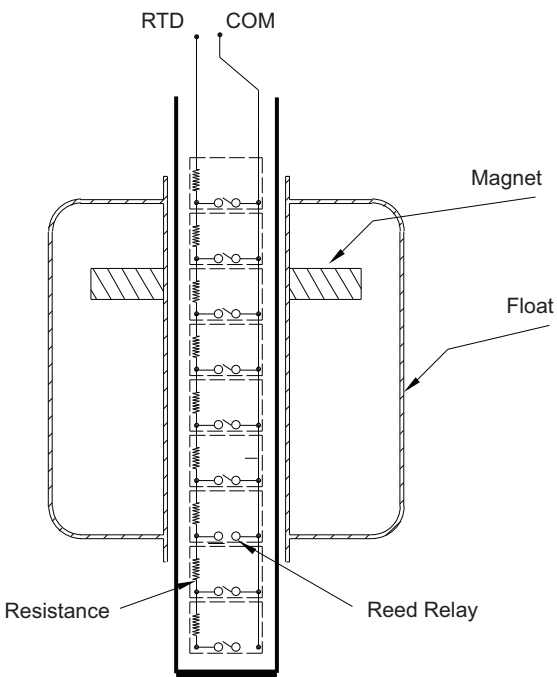
### Capacitive Load

When reed switch is used with capacitive load, it may cause that high current passes over reed switch, depending on value of capacity during Charge -'96 Discharge of capacity. So this may cause failure of switch. It is recommended to be used as follows depending on used voltage, for the purpose of protection of switch.

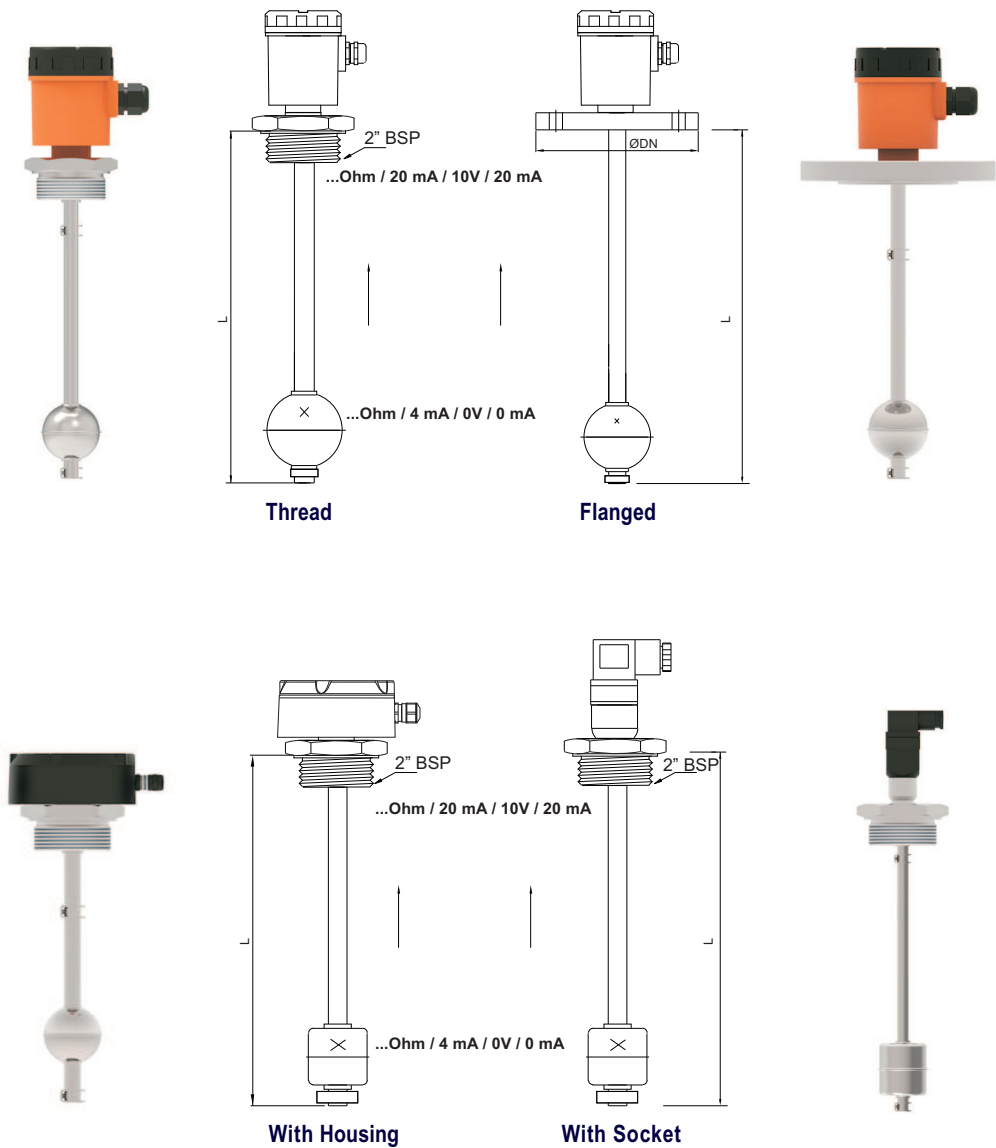


1.4. Technical Specifications :

ELS-tx	
Float Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Wetted Parts Material	304 Stainless Steel
Pipe Material	304 Stainless Steel
Float Type	S4A or S40A (Std.) Selectable from Table
Working Temperature	Max. 125 °C
Mechanical Connection	2" BSP (Std.) Opt. (eligible)
Electrical Connection	Terminal , With Cable , With Socket
Number of Float	1 (Std.)
Stem Length	Max. 6000 mm <b>(Thread Including)</b>
Power Supply	12....36 VDC
Output	4.20 mA Std. Two wire Opt. 4-20 mA , 0-20 mA , 0-10 V , Three wire , Ohm
Frequency of Detection	Std. 15 mm / 10 mm / 5 mm
Protection Class	IP 65 (Std.) , IP 66



Sample Models :

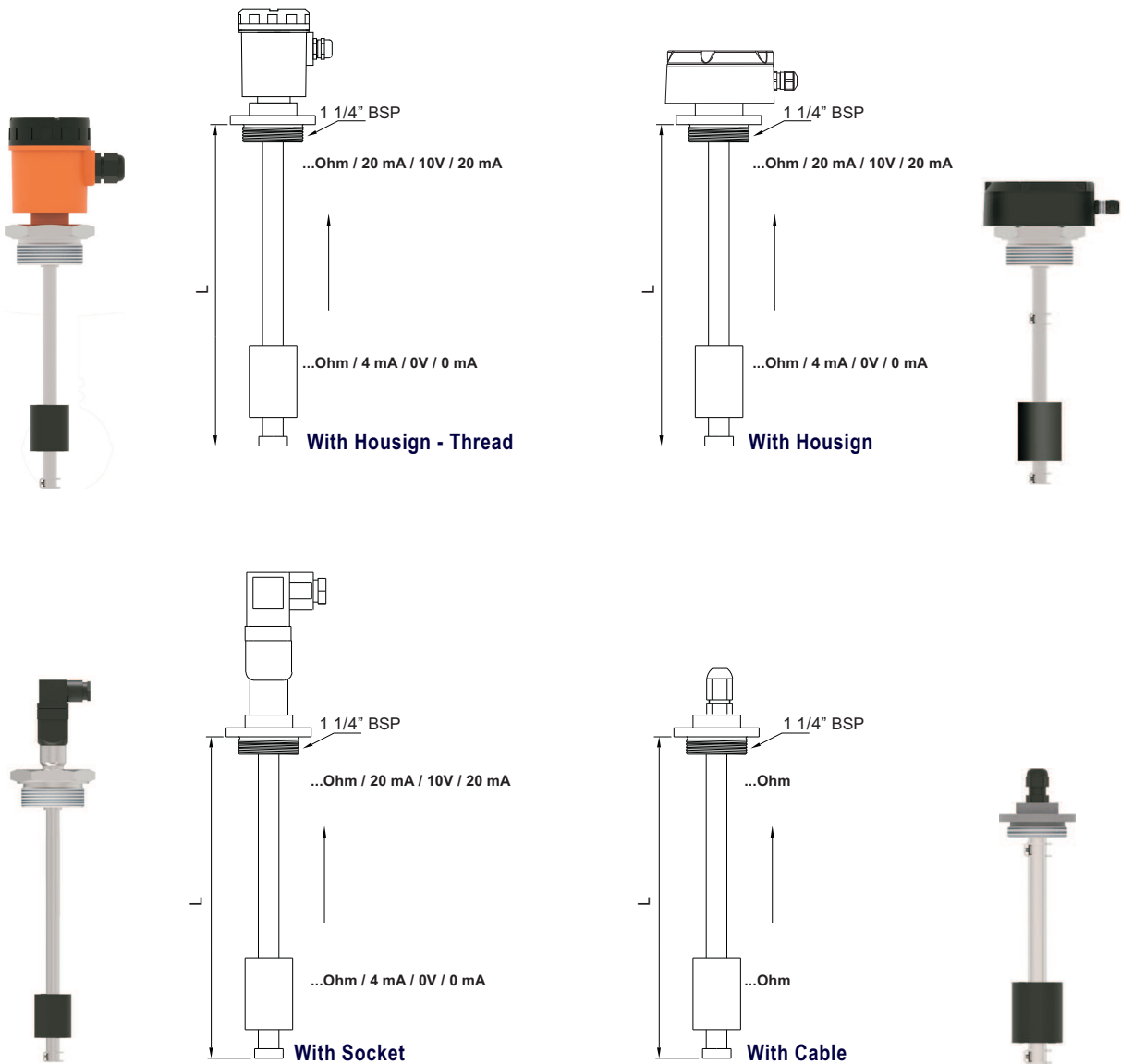


Technical Specifications :

ELSy-tx

Float Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Wetted Parts Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Pipe Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Float Type	S4A or S40A (Std.) Selectable from Table
Working Temperature	Max. 125 °C
Mechanical Connection	1 1/4" BSP (Std.) Opt. (eligible)
Electrical Connection	Terminal , With Cable , With Socket
Number of Float	1 (Std.)
Stem Length	Max. 6000 mm <b>(Thread Including)</b>
Power Supply	12....36 VDC
Output	4.20 mA Std. Two wire Opt. 4-20 mA , 0-20 mA , 0-10 V, Three wire , Ohm
Frequency of Detection	Std. 15 mm / 10 mm / 5 mm
Protection Class	IP 65 (Std.) , IP 66

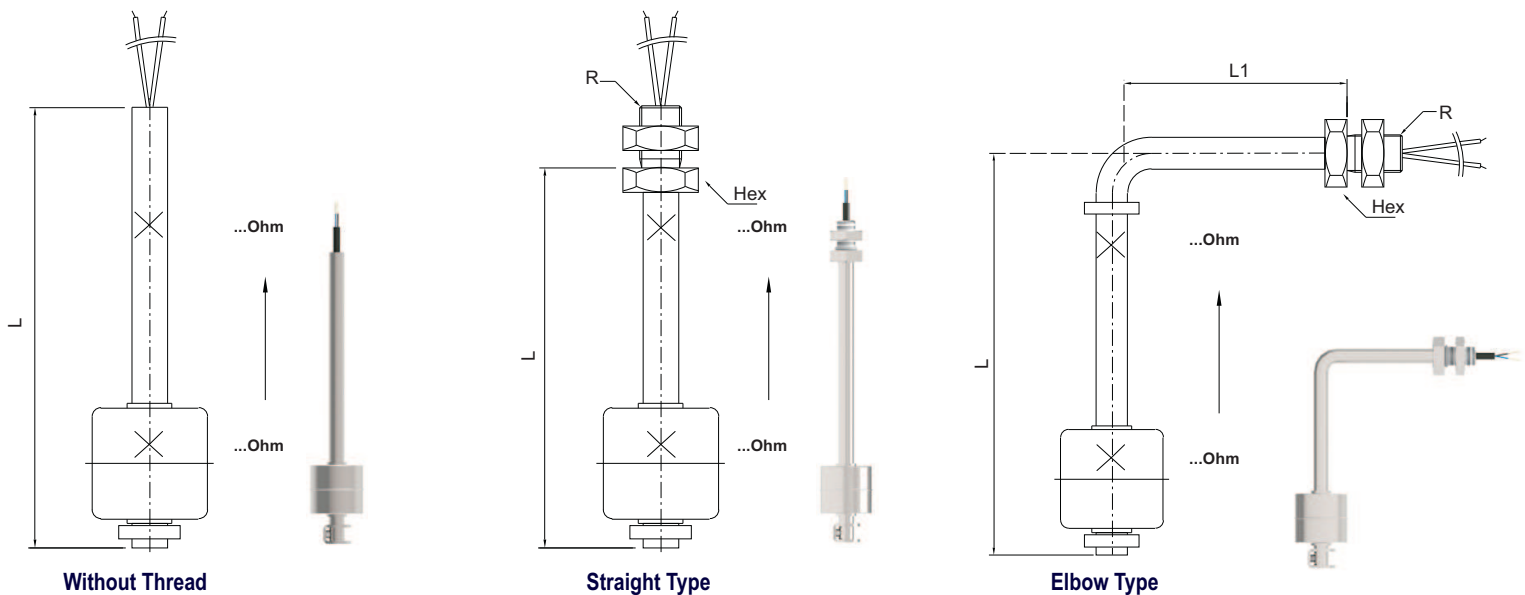
Sample Models :



Technical Specifications :

ELSm-tx	
Float Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Wetted Parts Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Pipe Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Float Type	S4A or S40A (Std.) Selectable from Table
Working Temperature	Max. 125 °C
Mechanical Connection	3/8" BSP or 1/2" BSP (Std.) Opt. (eligible)
Electrical Connection	With Cable
Number of Float	1 (Std.)
Stem Length	Max. 2000 mm (Hex Including)
Power Supply	12....36 VDC
Output	Ohm
Frequency of Detection	Std. 15 mm / 10 mm / 5 mm
Protection Class	IP 67

Sample Models :



Test Rod:

Rod Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel
Arm Material	304 Stainless Steel (Std.) Opt. 316 Stainless Steel

It has been manufactured as spring-operated. Optionally, the handle can be put inside the housing.



Standard Box

Protection Case :

**Material :** 304 Stainless Steel  
Welded manufacturing  
Opens - Closes Hinged  
To Protect Against external conditions.



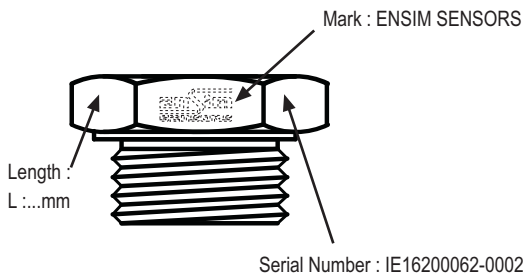
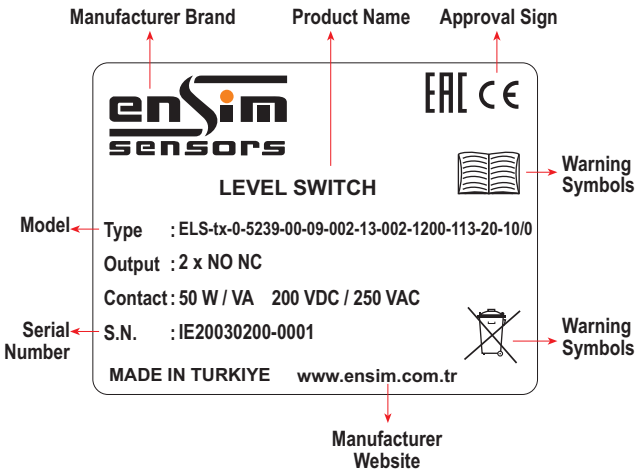
Digital Control Device (On / Off, PID)

Power Supply	100-240 VAC or 24 VAC / DC
Output	4-20 mA, Two Contact Opt. Rs485 ModBus RTU
Working Temp.	0 / +50 °C
Dimensions	72 mm x 72 mm
Input	Universal (mA, mV, V, RT, TC)

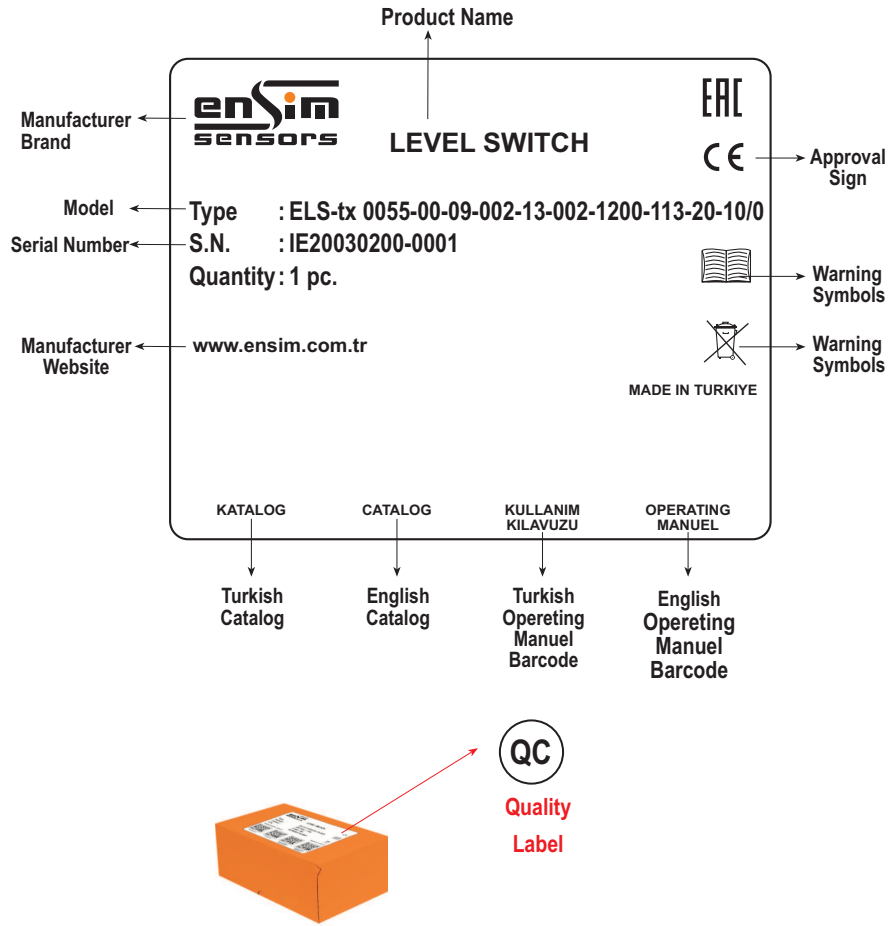


## 1.5. Product Label :

### Product Label



### Box Label



## 1.6. Content of Package

Please check whether you have taken delivery of below listed content completely or not and check its conformity with criterions in your order:

- \*Level transmitter
- \*This operating manual

## 1.7. Target Group

This operating manual has been prepared for qualified technical personnel.

## 1.8.Security Notes



Following notes should be taken into consideration in order to avoid dangers which can occur on the operator and around the ambient:

Installation, operation and maintenance of this instrument should be made only by people who have read the operating manual and who are knowledgeable about work safety!

It should be complied with work safety, accident prevention regulations and national installation standards.

Product should be used only within the scope of stated specifications!

You can assemble the instrument only when pressure is not available!

## 2. Installation :

### 2.1. General Notes

Installation of the instrument should be made only by authorized personnel.

Do not apply force to the instrument during the installation!

Do not use the level indicator with a greater pressure than recommended pressure.

Do not forget that instrument is precise, carry it carefully and prevent to be damaged.

It should be guaranteed that there are not any magnetic particles.

### 2.2. General Installation Stages

\*Remove level indicator from the box carefully

\*Check whether gasket is appropriate for fluid or not. If is not appropriate, contact with the producer.

\*Then, apply below mentioned explanations according to structure of the design.

## 2.3. Special Notes

\*Please ensure that there is no mechanical stress on the shaft following installation.

Such case will cause slipping in the characteristic curve.

\*Level transmitter should be placed in completely vertical position on the line.

\*Allocate valve certainly in the process connection while instrument is used.

\*Allocate blowdown valve under bottom flange for blowdown.

\*If instrument is mounted outside and if there is any danger of lightning or excessive pressure, take preventive measures by taking necessary measures.

\*In the operating conditions, level indicator may be hot according to situation of fluid, in this case, do not touch the indicator, otherwise your skin is damaged.

## 2.4. Installation For Mechanical Connections

\*Use appropriate O-Ring or gasket for tightness.

\*Ensure that its surface is clean and smooth.

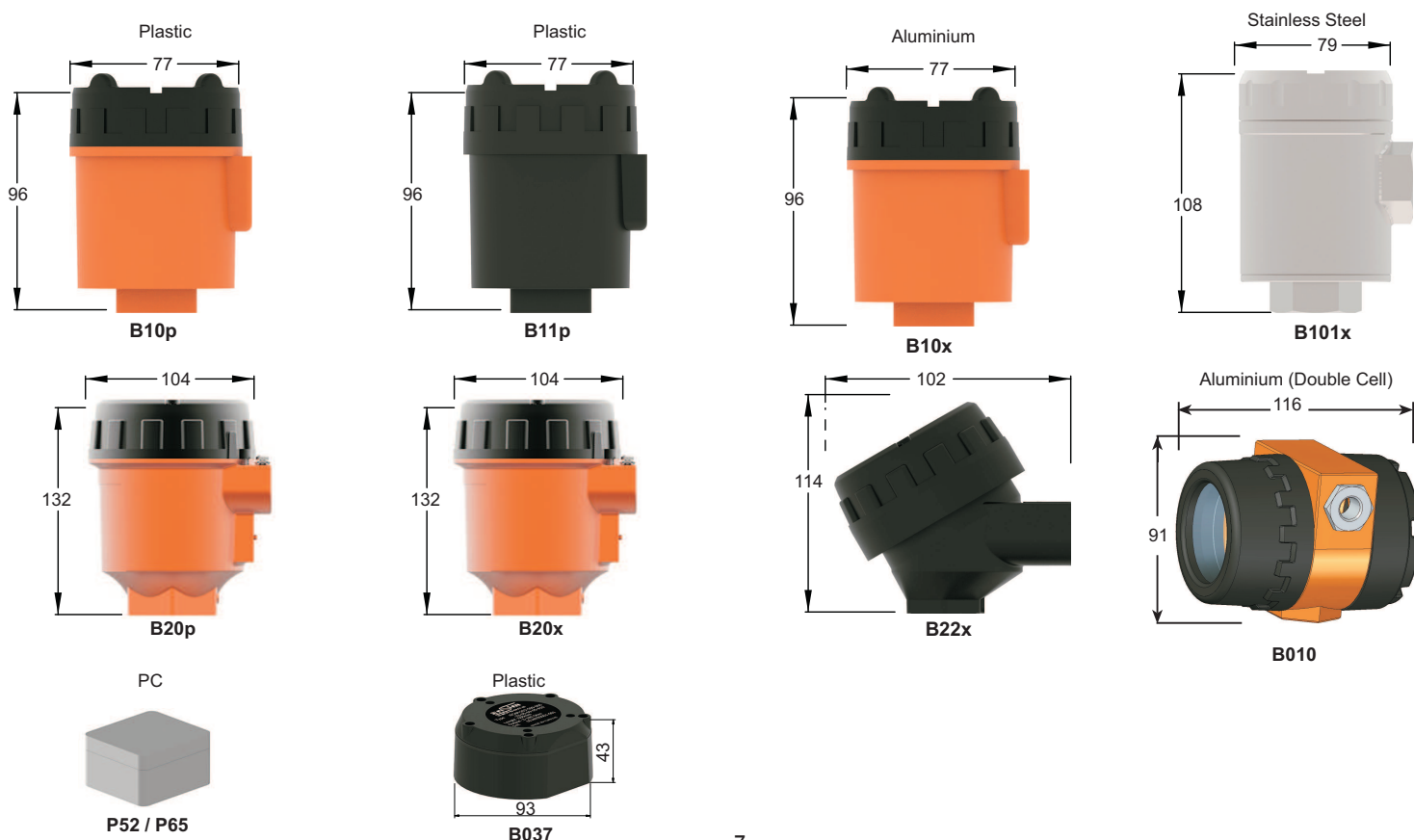
\*Assemble the instrument manually.

\*Connect the contacts as shown in the figure.

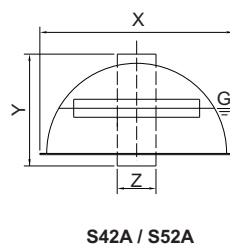
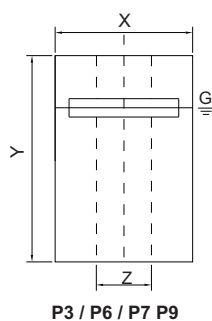
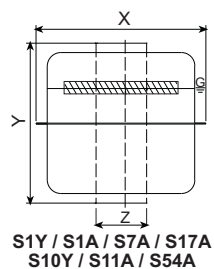
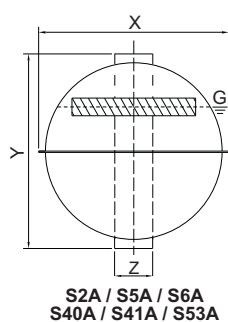
(G1/8" ve G 1/4" for max. 10 Nm , G1/2" or max. 15 Nm , G1"or max. 20 Nm, G2"or max. 30Nm)

## 2.5. Housing

ORDER CODE	TYPE	MATERIAL	PROTECTION CLASS	TEMPERATURE (°C)	SIZE a x b x c (mm)
5030	B10p	Plastic (PBT)	IP 65	(-) 40 °C ... (+) 150 °C	96 x 77
5310	B11p	Plastic (PVDF)	IP 65	(-) 40 °C ... (+) 120 °C	96 x 77
5046	B20p	Plastic (PBT)	IP 65	(-) 40 °C ... (+) 150 °C	132 x 104
5023	B037	Plastic (PBT)	IP 65	(-) 30 °C ... (+) 100 °C	93 x 43
5109	B10x	Aluminium	IP 65	(-) 40 °C ... (+) 150 °C	96 x 77
5150	B20x	Aluminium	IP 66	(-) 40 °C ... (+) 200 °C	132 x 104
5308	B22x	Aluminium	IP 66	(-) 40 °C ... (+) 150 °C	114x102
5081	B010	Aluminium (Double Cell)	IP 68	(-) 40 °C ... (+) 100 °C	91 x 116
5265	B101x	Stainless Steel	IP 65	(-) 40 °C ... (+) 150 °C	108 x 79
5062	P52	PC Grey	IP 65	(-) 20 °C ... (+) 125 °C	52 x 50 x 36
5294	P65	PC Grey	IP 65	(-) 20 °C ... (+) 125 °C	65 x 58 x 36



## 2.6. Float :



## Minimum Distances



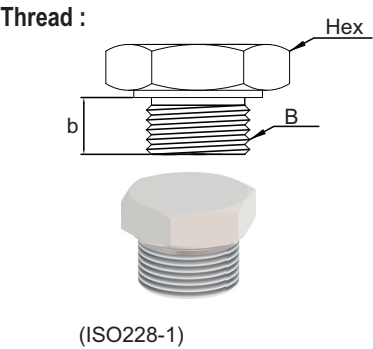
Order Code	Type	Material	X	Y	Z	Pipe Dia.	Max. Pressure (bar)	Max. Temp. (°C)	Density (g/cm³)	A	B	C
0102	S2A	316 St. St.	43	43	11	10	15	150	0.80	34	68	34
0104	S5A	316 St. St.	73	73	20	16	30	150	0.65	50	99	50
0105	S6A	316 St. St.	73	73	17	15	30	150	0.65	50	99	50
0106	S7A	316 St. St.	43	52	15	13	30	150	0.88	34	68	34
0111	S17A	316 St. St.	52	35	15	13	30	150	0.85	39	78	39
0113	S40A	316 St. St.	55	55	15	13	30	150	0.80	42	82	42
0114	S41A	316 St. St.	55	55	15	13	30	150	0,9	42	82	42
0115	S42A	316 St. St.	55	30	15	13	20	150	1,2	42	55	42
0118	S52A	316 St. St.	73	40	20	16	20	150	0,9	50	65	50
0119	S53A	316L St. St.	52,5	50,2	15,5	14	10	200	0,6	42	82	42
0120	S54A	316L St. St.	51	61,2	15,5	14	10	200	0,47	50	90	50

Order Code	Type	Material	X	Y	Z	Pipe Dia.	Max. Pressure (bar)	Max. Temp. (°C)	Density (g/cm³)	A	B	C
0201	P3	PU	30	45	12	10	1	80	0.76	28	60	40
0203	P6	PU	35	42	15	13	1	80	0.65	35	65	40
0204	P7	PU	44	50	18	15	1	80	0.40	38	70	50
0213	P9	PP	46	44	17	15	5	80	0.65	38	76	38
0207	P13	PU	30	32	12	10	1	80	0.90	28	75	40

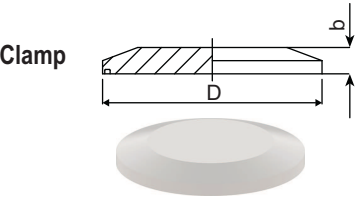
All dimensions are stated as mm.



2.7. Installation For Mechanical Connection :



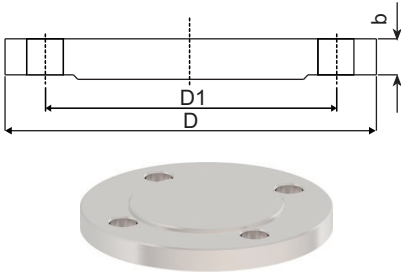
Order Code	Dimension B	Hex (mm)	Thread Size b (mm)
0001	1/8" BSP	17	12
0002	1/4" BSP	17	12
0003	3/8" BSP	24	20
0004	1/2" BSP	27	14
0005	3/4" BSP	32	14
0006	1" BSP	41	23
0008	1 1/4" BSP	51	23
0009	1 1/2" BSP	60	23
0012	2" BSP	70	23



Order Code	(ISO2852) Dimension	D (mm)	b (mm)
1501	DN 32	50,5	15
1502	DN 50	64	17
1503	DN 65	91	17

Flanged

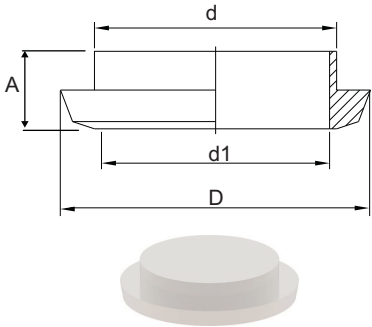
Order Code	(ISO1092-1) PN 16	D (mm)	D1 (mm)	b (mm)
0502	DN 25	165	85	16
0503	DN 32	140	100	16
0505	DN 50	165	125	18
0507	DN 80	200	160	20
0508	DN 100	220	180	20



Order Code	(ISO1092-1) PN 40	D (mm)	D1 (mm)	b (mm)
0702	DN 25	115	85	18
0703	DN 32	140	100	20
0705	DN 50	165	125	20
0707	DN 80	200	160	20
0708	DN 100	235	190	24

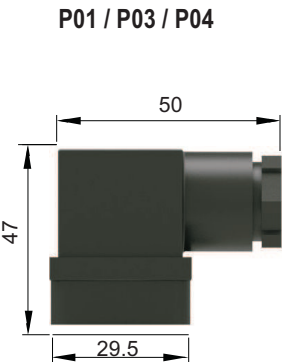
Order Code	(ANSI B16.5) 150 LBS	D (mm)	D1 (mm)	b (mm)
1005	DN 50	152,4	121	19
1006	DN 65	177,8	139,7	22,2
1007	DN 80	190,5	152,4	23,8
1008	DN 100	228,6	157,2	23,8

Dairy



Order Code	Dimension	Dimension	D (mm)	d1 (mm)	A (mm)
1600	DN 40	DN 40	56	48	15
1601	DN 50	DN 50	68	61	16
1602	DN 100	DN 100	121	114	20

Electrical Connection Type:



K01 / K02 / K03				
Order Code	Material	Protection Class	AA	L
01	Metal	PG7	14 AA	22
02	Metal	PG9	17 AA	22
03	Metal	PG11	20 AA	25
24	Plastic	PG13.5	24 AA	31
05	Metal-Ex 1/2" NPT	IP66/68 CESI 03ATEX	22 AA  305 X	25
06	Metal	R1/2"	22 AA	21



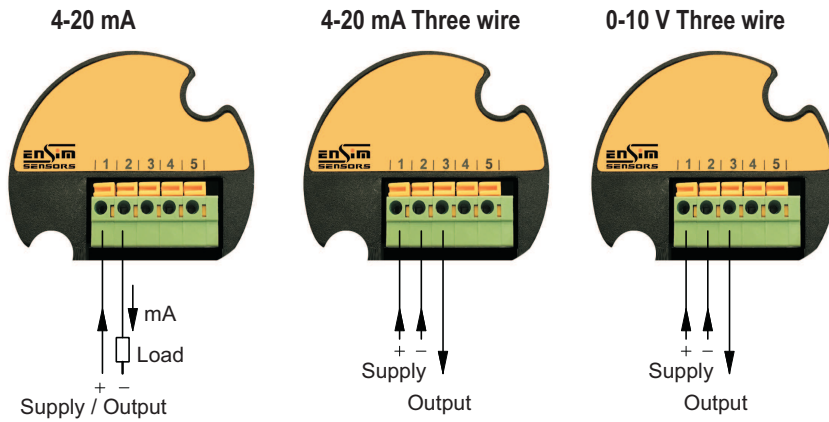
All dimensions are stated as mm.

## 2.8. Electrical Installation

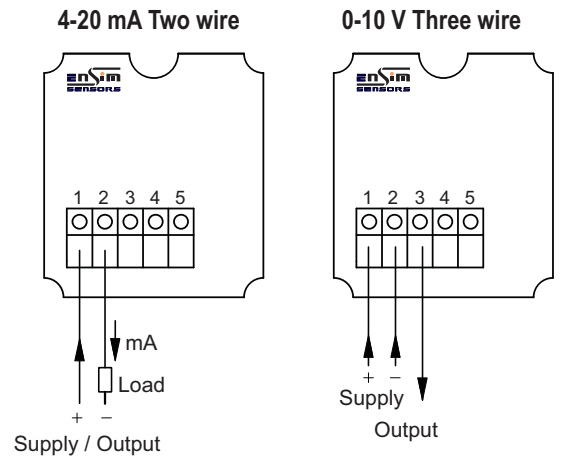
Make the electrical connection of the instrument according to details on its label, table and cable figures in this manual

### Electrical Connection Type :

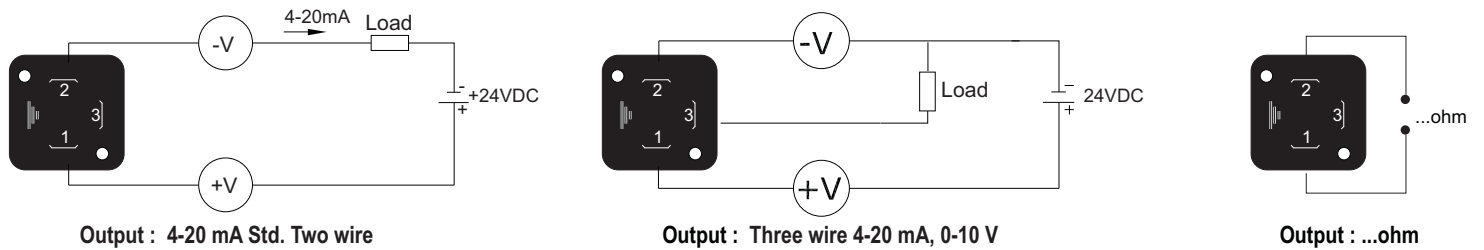
#### B10p , B10x , B101x With Housing



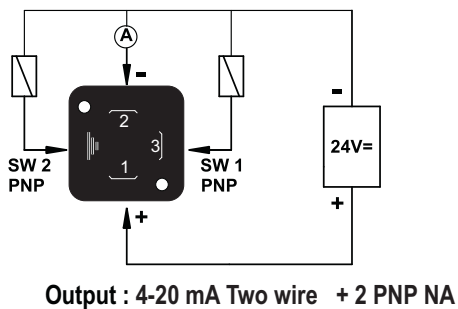
#### B038, P52, P65 With Housing



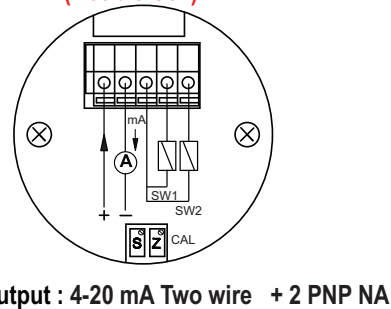
#### DIN43650 With Socket P01



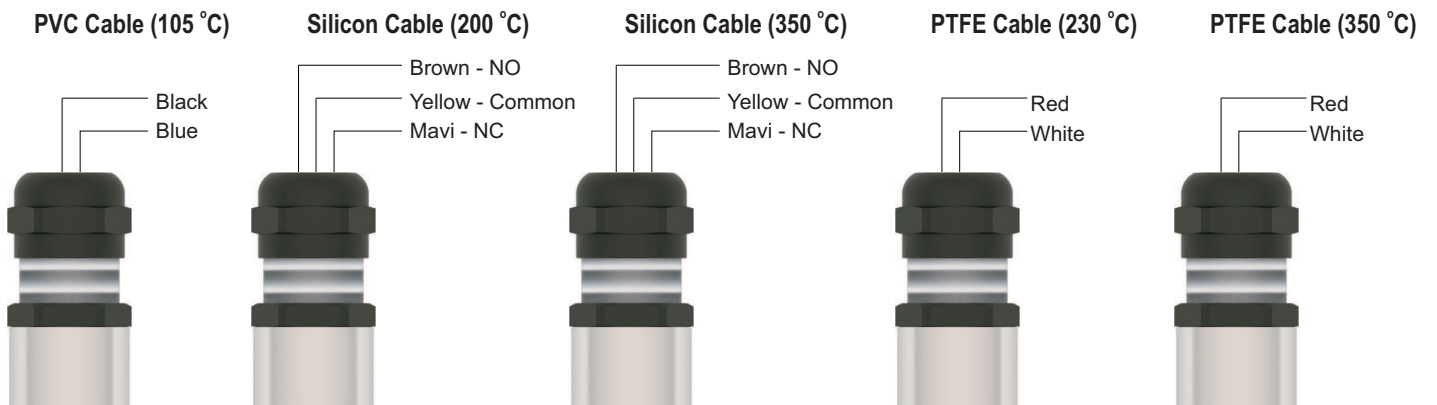
#### EDS 01 For Display



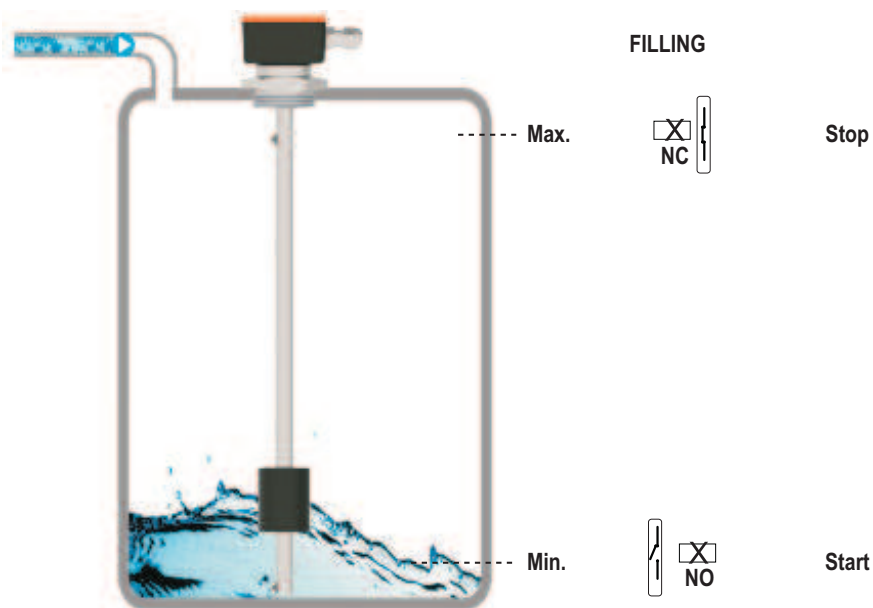
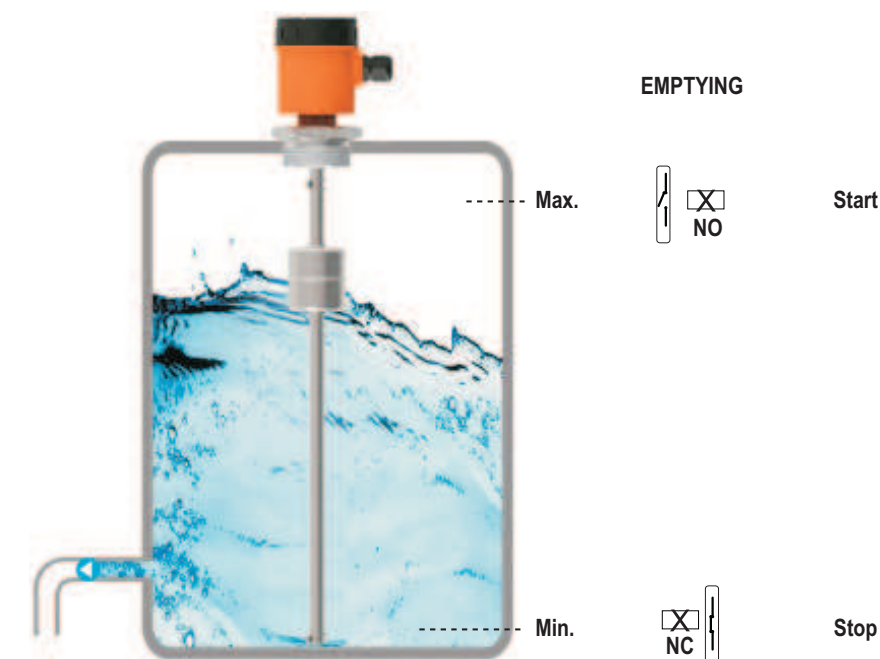
#### B010 Aluminium Housing (Double Cell)



#### PG With Socket or with Cable



Sample Application:



## 2.10. Order Form :

Order Form : **Please consider sample models when coding!..**

### 1 MODEL

Standard Version .....	ELStx	ELSp (For Hydraulic Tanks).....	ELSp-tx
ELSy (For Yacht Industry).....	ELSy-tx	ELSm (For Machinery Manufacturing).....	ELSm-tx

### 2 CERTIFICATE

None.....	0	(EN10204-3-1) Material Certification .....	1
-----------	---	--	---

### 3 HOUSING

None.....	000	Aluminium Housing, B101x.....	851
Plastic Housing , B10p .....	050	Stainless Steel Housing , B101x.....	800
Plastic Housing , B11p .....	053	PC Grey , P52.....	250
Plastic Housing , B20p .....	100	PC Grey , P65.....	252
Plastic Housing , B037 .....	192	Special.....	x
Aluminium Housing , B10x .....	503		
Aluminium Housing , B20x .....	600		
Aluminium Housing , B22x .....	750		

### 4 ELECTRICAL CONNECTION

Terminal (For Housing Models).....	00	M12-2 Pin.....	70
Polyamide Big Socket P01.....	50	M12-5 Pin.....	71
Polyamide Small Socket P02.....	51	M12-8 Pin.....	72
Polyamide Big Socket With Light P03.....	52	PVC Cable (Max. 60 °C).....	80
Military Socket ML-2 , 2 Pin.....	60	PVC Cable (Max. 105 °C).....	81
Military Socket ML-5 , 5 Pin.....	61	Silicon Cable (Max. 200 °C).....	82
		PTFE Cable (Max. 230 °C).....	83
		Steel Shielded Cable (Max. 350 °C).....	48
		Special Cable.....	x
		Special Socket.....	x

### 5 CONNECTION

With Pipe- Without Thread.....	0000	1/8" NPT.....	0200
Thread 1/8"BSP.....	0001	1/4" NPT.....	0201
Thread 1/4"BSP.....	0002	3/8" NPT.....	0202
Thread 3/8" BSP.....	0003	1/2" NPT.....	0203
Thread 1/2" BSP.....	0004	3/4" NPT.....	0204
Thread 3/4" BSP.....	0005	1" NPT.....	0205
Thread 1" BSP.....	0006	1 1/4" NPT.....	0206
Thread 1 1/4" BSP.....	0008	1 1/2" NPT.....	0207
Thread 1 1/2" BSP.....	0009	2" NPT.....	0208
Thread 2" BSP.....	0012		
Thread 1/2" BSP (Moving Type).....	0112	Special.....	x

Thread M10x1 Straight Type.....0113

Thread 1/8" BSP Elbow Type.....0111

Thread M10 x 1 Elbow Type.....0400

Thread 3/8" BSP Elbow Type.....0109

Thread 1/2" BSP Elbow Type .....0110

**Note: Refer to the table for others.**

**6 CONNECTION MATERIAL**

304 Stainless Steel.....	001	Aluminum.....	027
316 Stainless Steel.....	002	PVC.....	061
Brass.....	041	Special.....	x

**7 PIPE SIZE**

8 mm.....	08	12.7 mm / 13 mm.....	13
10 mm.....	10	15 mm.....	15
12,7 mm.....	12	Special.....	x

**8 PIPE MATERIAL**

304 Stainless Steel.....	001	Aluminum.....	027
316 Stainless Steel.....	002	PVC.....	061
		Special.....	x

**9 STEM LENGHT**

.... mm

Note: From the connection, (including thread)

**10 FLOAT TYPE**

Select from table

Note: Proper connection and radius should be selected.

**11 OUTPUT**

4-20 mA Two Wire.....	19	3-180 Ohm.....	23
4-20 mA Three Wire.....	20	10-180 Ohm.....	24
0-10 V Three Wire.....	21	240-33 Ohm.....	25
0-20 mA Three Wire.....	22	0-180 Ohm.....	26
		4-mA two wire HART.....	43
		Special.....	x

**12 SENSITIVITY RANGE**

15 mm.....	15	5 mm.....	05
10 mm.....	10	Special.....	x

**13 OPTIONEL**

None..... / 0	Extamal Tank (Dimensions should be stated)..... / H
pt100 Sensor..... / P	Test Rode..... / T
Analog Display..... / DA	Float Housing..... / M
Local Digital Display..... / EDS01	Shetter (For the outside of the tank) 304 St. St..... / K6
	Special..... x

**SAMPLE**

ELS-tx - 0 - 5239 - 00 - 09 - 002 - 13 - 002 - 1200 - 113 - 20 - 10 / 0

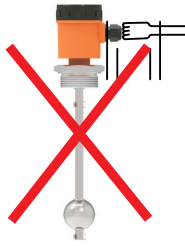
ELS-tx Level Transmitter, Plastic Housing, 2" BSP Male Thread , Connection and Pipe Material 316 Stainless steel ,  
L= 1200 mm, S40A Float , 4-20 mA Three wire output , Sensing point in every 10 mm



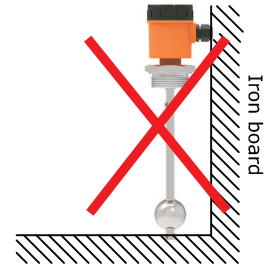
Please pay attention to following matters in order to operate your flow switch properly.



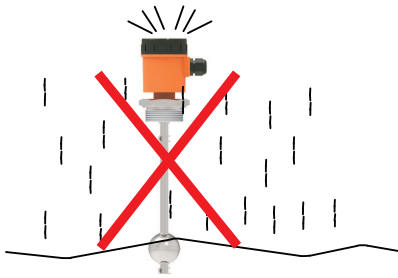
Please do not mount slant way, otherwise switch do not work correctly.



Do not pull the cable strongly, otherwise the characteristics might be changed.



Please keep away from magnetic materials like iron board ; otherwise the characteristics might be affected



Please do not dip cables potting into liquids, otherwise instulation problem may cause.



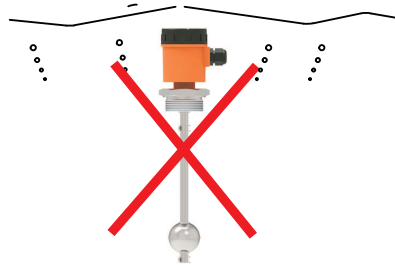
Do not fasten switch reversely , otherwise its characteristics might be changed.



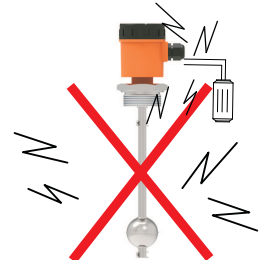
Please do not drop , otherwise the characteristics might be changed.



Vibration might be caused instability.



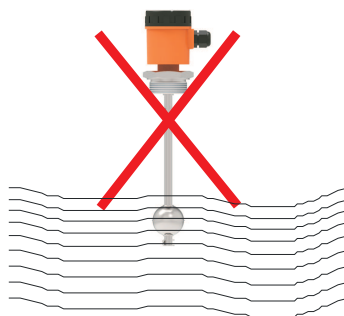
In case vapour splash cable potting points, insulation problem may cause.



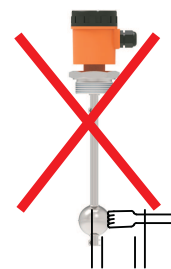
Excess current , to be drawn as a result of direct connection to motor, may burn relay of switch



Do not remove the plastic parts of the bottom of the switch body , do not loosen.



Please avoid using with liquids which damage materials of parts , otherwise quality can not be maintained accurately.



Do not remove the float from connection part. Because its pin might be damaged.

### 3. Failure Delection

Breakdown	Probable cause	Failure detection\correction
Fluid is leaking	There is a hole on the body.	-Check that is worked under appropriate condition and then contact with producer company.
It does not contact or it contacts continuously	-Socket connection is not touched. -Product was exposed to the magnetic field in the ambient. -Connetion angle is not correct. -Contact may have been burned.	-Check for socket connections. -The factor which constitutes the magnetic field should be removed or insulated. -Correct assembly angle. -Inform authorized service.
Body was broken	-Tightening the screws more than adequate during the assembly. -Product falling or taking a blow from outside.	-Inform authorized service.
Unsteady operation in the contact	-Product was exposed to the magnetic field in the ambient. -Product was exposed to vibration. -Product was exposed to high temperature.	-The factor which constitutes the magnetic field should be removed or insulated. -Vibration which will effect the product should be prevented or it should be attached to any place without vibration. -Use in the appropriate operating temperature.

If you find an error, try to eliminate it by using this table or send the instrument to our service address for repair.



The instrument should be repaired only by authorized service!

### 4. Disassembly of Instrument

Instrument should be disassembled while feeding and pressure is not available!

### 5. Service

The instrument does not require maintenance. If it is desired, residue accumulated inside should be blown according to kind of fluid and instrument can be cleaned with soft cleaning solutions. Measures should be taken during the disassembly.

### 6. Recalibration

Calibration is not required during long period useful life of a level switch.

### 7. Repair – Manufacturer Address

If irreparable breakdowns occur, the instrument should be sent to us for repair purpose. Before this, the instrument should be cleaned carefully and packaged so as not to be broken. Furthermore, you should also add a detailed explanation which describes the breakdown while instrument is sent. If your instrument contacts with harmful substances, decontamination report should be also sent additionally. In the event that instrument does not have any decontamination report or our service department has doubts about instrument, repair process will not start until an acceptable report is sent.

If the instrument contacts with hazardous substances, necessary measures should be taken for decontamination!  
Service -Manufacturer Company Name and Address:



LONCA MAK. SAN. TİC. A.Ş. Piyalepaşa Cad. Stad Sokak No: 29/6 Kasımpaşa - İSTANBUL - TÜRKİYE

Tel: +90 212 297 70 14 Fax: +90 212 297 70 32 E-Mail: [lonca@ensim.com.tr](mailto:lonca@ensim.com.tr) Web: [www.ensim.com.tr](http://www.ensim.com.tr)

### 8. Disposal

The instrument should be disposed according to 2002/96/EC and 2003/108/EC European Directives (waste electrical and electronic instruments). Waste electrical and electronic equipment should not be mixed with domestic wastes!



If the instrument has contacted with harmful substances, special attention should be paid for its disposal!



### 9. Terms of Warranty

The instrument has warranty legally for 24 months after delivery date. Warranty demands are not accepted in case of inappropriate operation, damage on the instrument or any modification on the instrument.

### 10. Terms of Return

In the return of materials, user should send an open list related to damage or problem, malfunction of the material to be returned or its operation in the different modification, with the instrument. If it is required to return the material, used in the dangerous, corrosive or toxic fluid, in this case, used part should be cleaned very carefully. Security of personnel should be ensured. All products to be returned should be sent to our company address, which we have stated.