

# OPERATING MANUEL

Model : **DX-ELC**  
LEVEL SWITCH - Conductivity Type



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 :

DX-ELC 21 , DX-ELC 31 , DX-ELC 41



Important Notes:

Used Symbols :











-  Please read this manual carefully before installation of the level switch. User is responsible for accidents and losses arising from failure to comply with the warnings in this manual.
-  In the event that level switch. 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.
-  Do not operate the system before making assembly in compliance with the assembly chart related to the instrument.
-  Do not make any modification on the instrument and do not try to repair it. Reparation should be made by authorized service personnel.
-  The instrument's useful life, determined and announced by the ministry, is 10 years.
-  Products which do not contain label and serial number are considered to be excluded from the warranty scope.

Table of Contents :

1. General Information .....	2
2. Installation .....	6
3. Failure Detection .....	13
4. Disassembly of Instrument .....	13
5. Service .....	13
6. Recalibration.....	13
7. Repair.....	13
8. Disposal .....	13
9. Terms of Warranty .....	13
10. Terms of Return .....	13

## 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

**Level Switch is designed for industrial plants. It should never be used in mines.  
Otherwise, the responsibility of the manufacturer is eliminated.**

DX-ELC level switches are used for checking liquid level of tanks and boilers. As it does not have any movable part, it can be used in the critical ambient and in the liquids with solid particle, low density and high viscosity.

It is an economic and safe solution for air pressure tank applications, water level control of steam boilers and conductive tanks.

#### Advantages :

- \* Economical
- \* Easy to install
- \* No moving parts

Ambient Conditions:                      Relative Humidity: 0-98 %RH                      Ambient temperature: 60C                      (It is not used under -20 C)

### 1.3. Working Principle

When liquid level comes to the level of isolated electrode, current passage starts or stops between electrode and liquid. Strengthened this AC current may be assessed with a relay circuit.

### 1.4. Technical Specifications and Material Knowledge

#### Certification



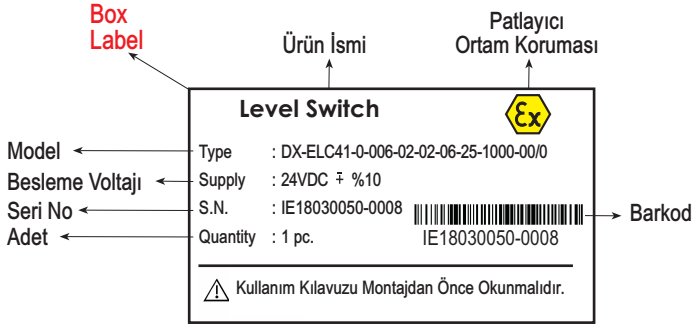
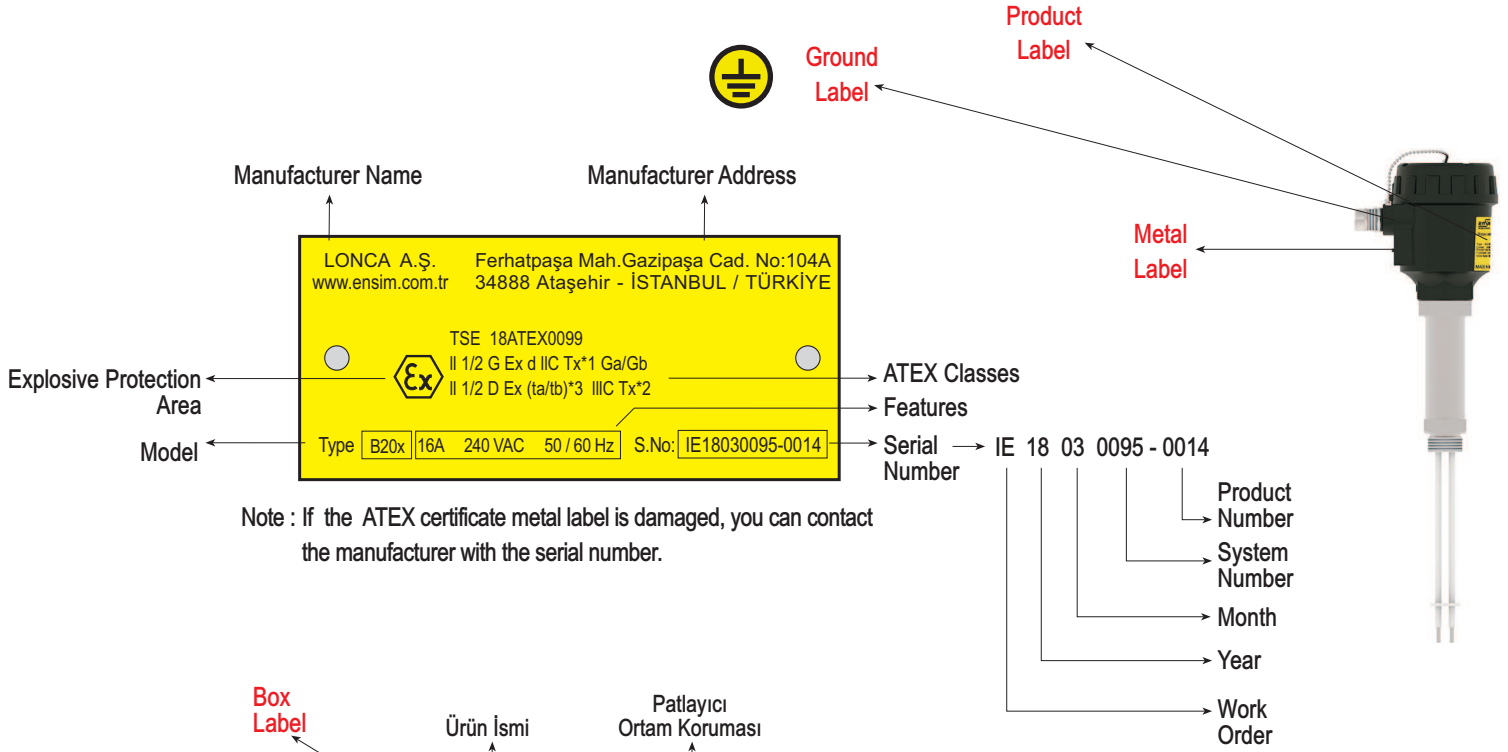
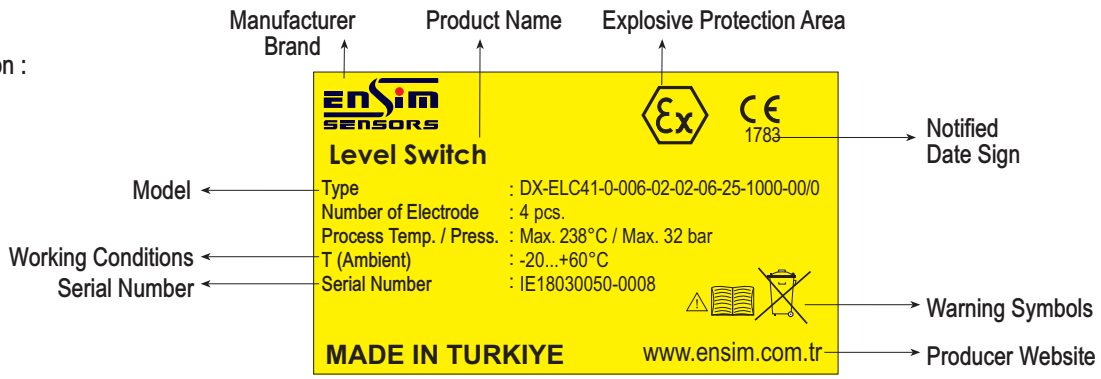
II 1/2 G Ex d IIC Tx\*1 Ga/Gb For Gas  
II 1/2 D Ex (ta/tb)\*3 IIIC Tx\*2 For Dust

\*Have a look at the temperature class chart.

#### DX-ELC

Working Temp. (Tp)	Max. 238°C
Ambient Humidity	0-98 %Rh (Non-condensing)
Working Press.	Max. 32 bar g
Ambient Temp. (Ta)	(-) 20 ... (+) 60°C
Material	304 St.st. (Std.) Opt. 316 St.st.
Connection	304 St.st. (Std.) Opt. 316 St.st.
Housing	Aluminium Injection - AlSi12Fe (Std) Black (RAL 9005)
Electrod	304 St.st. (Std.) Opt. 316 St.st.
Pipe	304 St.st.
Isolation	PTFE
Connection	2"BSP (Std.) Opt. Selectable from Table.
Number of electrodes	1 ( Std.) Up to 4 selectable.
Stem Length	500mm/1000mm/ 1500mm <b>(Thread Included)</b>
Electrical Connection	Terminals
Cable and Plug Entry	M20x1,5 (Std.)
Protection Class	IP 66 (EN60529)
Certifications and Approvals	CE Declaration , EMC , LVD , ATEX

### 1.5. Label Information :



### 1.6. Package and package contents :

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

- \* Level Switch - Conductivity Type
- \*This operating manual



### 1.7. Target Group

This operating manual has been prepared for qualified technical personnel.

### 1.8. Certifications and Approvals

CE	:	It shows that, product meets required conditions of EU with CE stamp and stipulate that product passed quality assessment stages
ATEX (2014 / 34 / AB)	:	TS EN 60079 - 0 : 2013 TS EN 60079 - 1 : 2014 TS EN 60079 - 31 : 2014
LVD (2014 / 35 / AB)	:	TS EN 61010 - 1 : 2012 TS 3033 EN 60529 : 1997
EMC (2014 / 108 / AT)	:	TS EN 61326 - 1 : 2013

Note : All the features and tests on this document has manufactured with DX-ELC models at LONCA Inc.

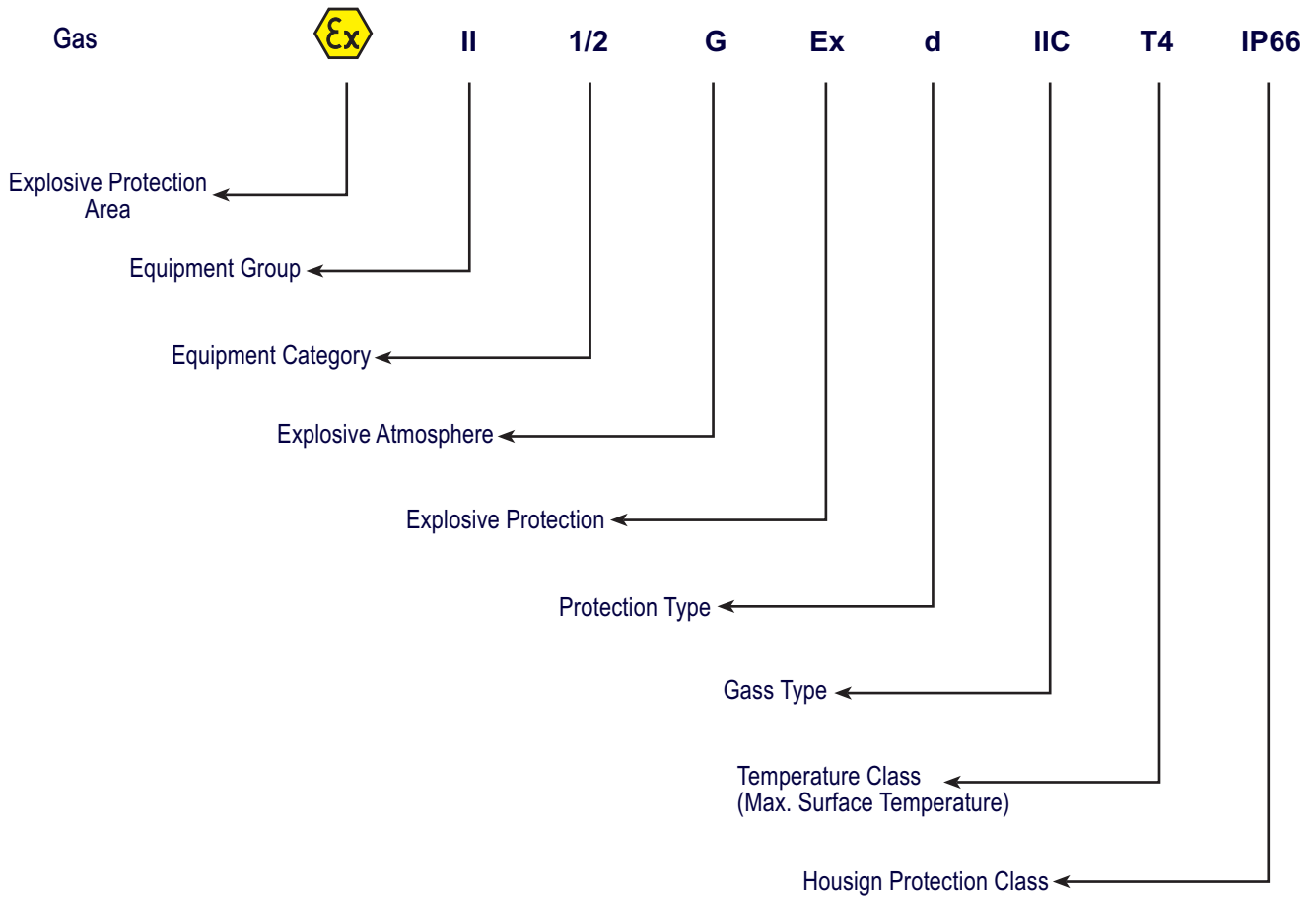
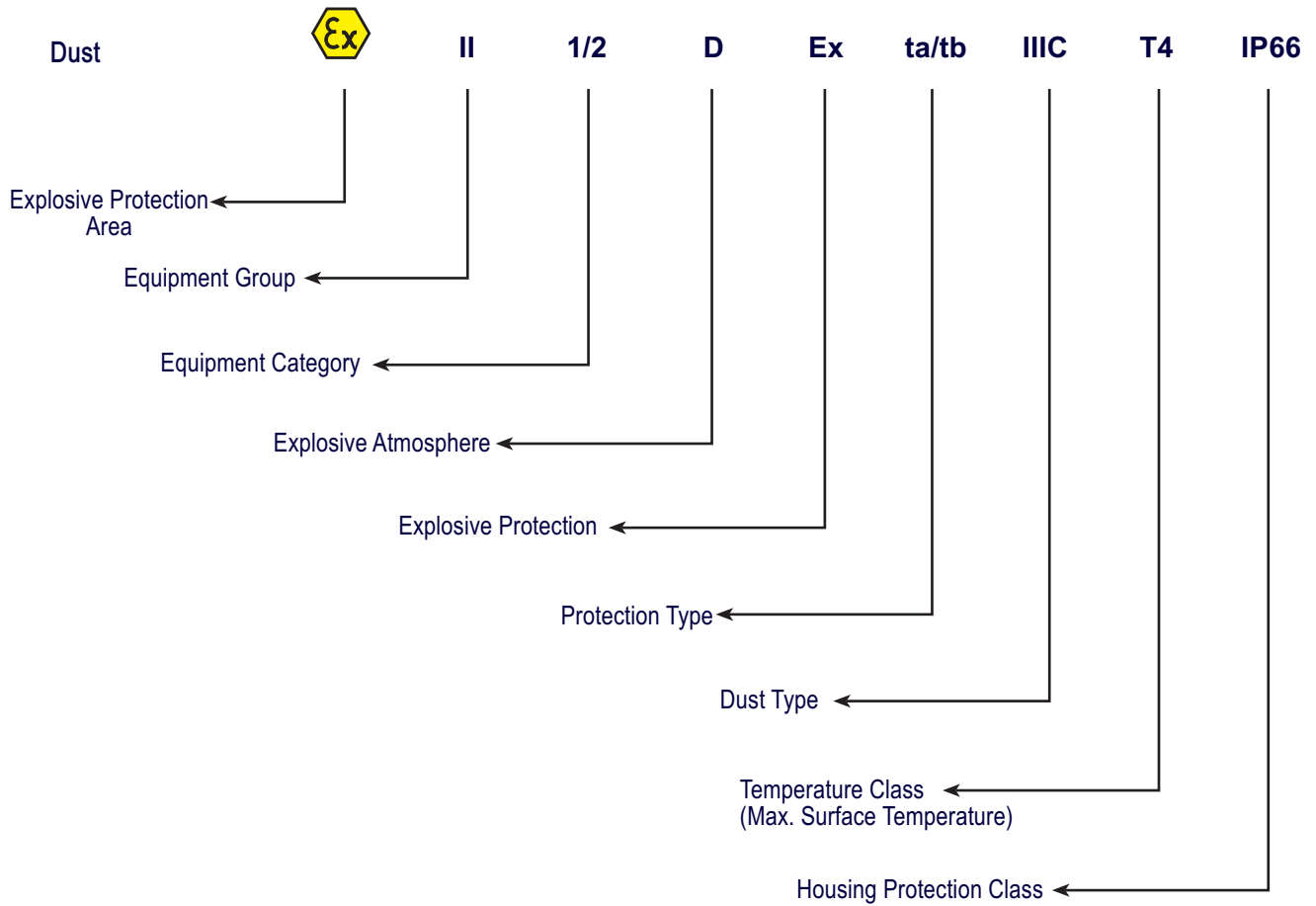
## 1.9. Safety Instructions (ATEX)



Safety instructions should be read and applied to the end.

- The following notes must be taken into attention to protect the operator and the environment from possible hazards.
- The device setup and maintenance of this device must be done by knowledgeable persons who has read the instructions and is familiar with the safety at work.
- It should be checked by the users that the products are fitted suitable to the zone maps.
- Work safety, must be observe by accident prevention regulations and national installation standards.
- The product should be used within the specification presented guideline.
- You can only mount the device when there is no pressure.
- These safety instructions are protected in terms of 1 / 2 D and 1 / 1 G category for DX-ELC coded series and is compatible with TSE 18ATEX0099 and CE certificate.
- The Label should be used in appropriate environments.
- Because the environment is max. 60 C you should choose a suitable cable for use.
- Do not over tighten the cable gland in order not to affect the IP protection class.
- Make sure the cable entry and plug is tightened right.
- Ground connection must be done properly and checked without energizing.
- Before starting use make sure the lid is fully closed and the set screw is tightened.
- DX-ELC models are metal protected. It is Compatible with different supply voltages specified in the catalog.
- The metal enclosure must be in the 2D or 2G zone. **The pipe and float section must be located in the 1D and 1G zone.**
- Max. working temperature, max. Surface temperature can change depending on the model, Please read the document carefully before using.
- During the mounting it should be checked that there is no mechanical stress or deformation in the tank wall. When this happens, the sensor should not be energized without the necessary correction measures.
- Check that the pressure in the tank hasn't exceed the pressure shown in the catalog.
- The mounting sensor must be mount properly in the tank filling system. In case it is not suitable, the sensor must be protected and the in-tank apparatus must be protected.
- The sensor is designed to withstand the chemical effects of the materials. Check the suitability of different materials.
- The Sensors are in suitable storage conditions and protected from dust and damp.
- Device repairs should only be done at the manufacturer Lonca Inc.
- Protect the device from friction and cleaning should be done without water.
- In case of improper circuit conditions, the main energy must be completely disconnected and safety measures should be taken without replacing the temperature circuit breaker with its backup. Changes should be made in a safe area.

1.10. ATEX Marking Sample Description



## 2. Installation :

### 2.1. General Notes :

The device installation is in 2014 / 34 / EU criteria to ensure the safety of atmosphere and people from explosions, must only be done by staff who knows the safeguards.

Do not apply force to the instrument during the installation!

Do not use the **Level switch** with a greater pressure than recommended pressure.

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

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

The Max. working pressure should not be exceeded.

### 2.2. General Installation Stages

\*Remove **Level switch** 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 switch** must be placed upright or horizontal.

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

\*The grounding product must be done properly. (can be done outside or in housing)

### 2.4. Installation For Mechanical Connections

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

\*Ensure that its surface is clean and smooth.

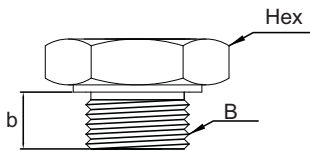
\*Assemble the instrument manually.

\*Connect the contacts as shown in the figure.

(For G1" max. 20 Nm, G 1 1/4" , for G" 1 1/2" max. 30Nm)

### 2.5. Mechanic Connections :

#### Thread

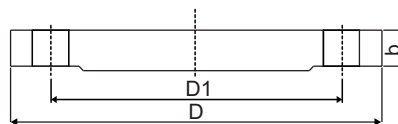


(ISO228-1)

Order Code	Dimension B	Hex [mm]	Thread Length b [mm]
006	1" BSP	41	23
007	1 1/4" BSP	51	23
008	1 1/2" BSP	60	23
009	2" BSP	70	23

#### Flanged

Order Code	(ISO1092-1) PN 16	D (mm)	D1 (mm)	b (mm)
103	DN25	165	85	16
104	DN32	140	100	16
106	DN50	165	125	18
108	DN80	200	160	20
109	DN100	220	180	20

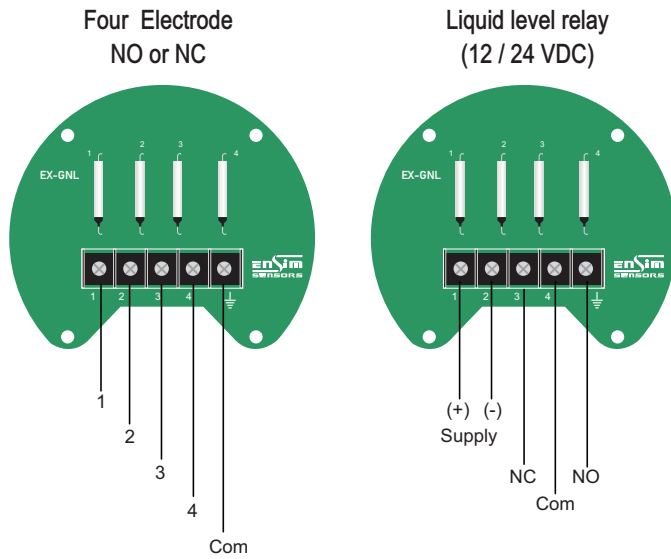


Order Code	(ISO1092-1) PN 40	D (mm)	D1 (mm)	b (mm)
303	DN25	115	85	18
304	DN32	140	100	20
306	DN50	165	125	20
308	DN80	200	160	20
309	DN100	235	190	24

Order Code	(ANSI B16.5) 150 LBS	D (mm)	D1 (mm)	b (mm)
606	DN50	152,4	121	19
607	DN65	177,8	139,7	22,2
608	DN80	190,5	152,4	23,8
609	DN100	228,6	157,2	23,8

## 2.6. Electrical Installation

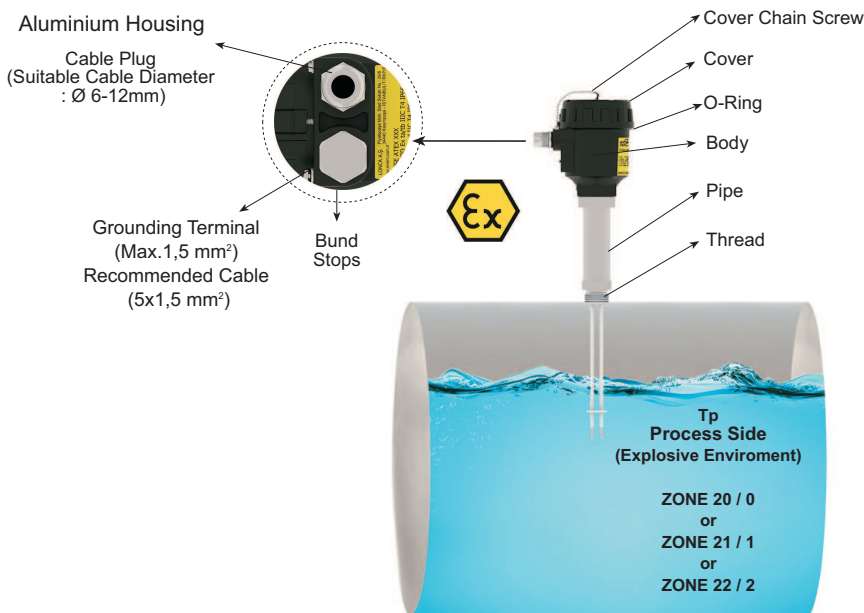
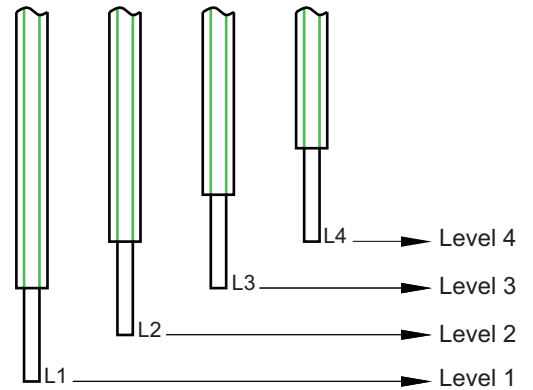
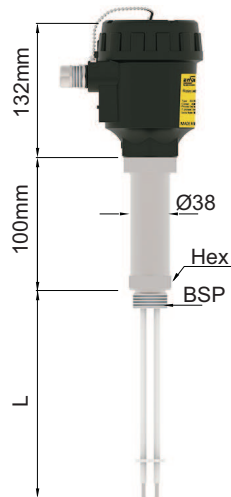
Make the electrical connection of the instrument according to details on its label, table and cable figures in this manual



Note : It has been produced according to IPC A 600 class 2 conditions and tested with 100 % E-test. Moreover, HASL (non-lead) surface test has been applied.

## 2.7. Mechanical Parts and Connection Apparatus:

### DX-ELC 21 , DX-ELC 31 , DX-ELC 41



**DO NOT OPEN WHEN ENERGIZED  
KEEP TIGHT WHEN CIRCUIT ALIVE**



Ta  
Factory Area  
(Safe)

ZONE 21 / 1  
or  
ZONE 22 / 2

2.8. Parts and Accessories :

ORDER CODE	TYPE	MATERIAL	PROTECTION CLASS	TEMPERATURE (°C)	SIZE a x b (mm)
25	B20x	Aluminium	IP 66	-40...+200	132 x 104



Protection Case :



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

2.9. Maximum Surface Temperature

Temperature Class Table

STD. MODEL	DX-ELC
Working temperature	(-)20...(+)238°C
Without opening the cover standby time	20 Min.

Thermal Protection Insurance is 105 °C

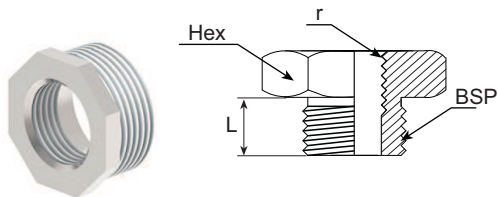
(-) 20° C ≤ T ambient ≤ (+) 30° C...(+) 60° C		Working temperature :(-) 20...(+) 238°C	
DX-ELC Metal			
T Ambient MAX. AMBIENT TEMPERATURE ZONE 21 / 1	T Process MAX. PROCESS TEMPERATURE ZONE 20 / 0	T Surface MAX. SURFACE TEMPERATURE	TEMPERATURE CLASS
30° C	238° C	50°C	T6
40° C	238° C	60°C	T6
50° C	238° C	70°C	T6
60° C	238° C	80°C	T6



2.10. Connection Accessories :

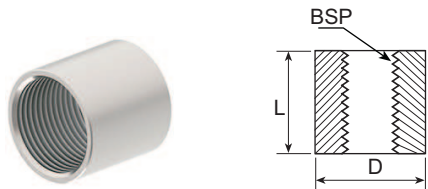
Please consult for Ex-Proof models.

Reduction :



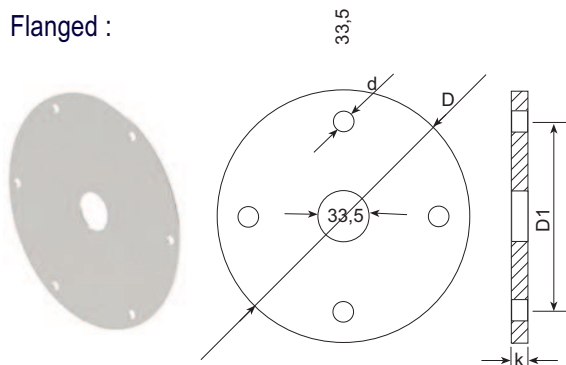
Order Code	BSP	r	L mm	Hex	Material
/ R1	1" BSP	1 1/4" BSP	21	44	304 St.St.
/ R2	1" BSP	1 1/2" BSP	19	50	304 St.St.
/ R7	1" BSP	2" BSP	25	60	304 St.St.
/ R3	1" BSP	1 1/4" BSP	21	44	316 St.St.
/ R4	1" BSP	1 1/2" BSP	19	50	316 St.St.
/ R5	1" BSP	1 1/4" BSP	22	45	ST 37 Steel
/ R6	1" BSP	1 1/2" BSP	22,5	50	ST 37 Steel

Muff :



Order Code	BSP	D mm	L mm	Material
/ M1	1" BSP	Ø 37	41	304 St.St.
/ M2	1 1/4" BSP	Ø 47,5	46,5	304 St.St.
/ M3	1 1/2" BSP	Ø 54,4	48,1	304 St.St.
/ M4	1" BSP	Ø 37	41	316 St.St.
/ M5	1 1/4" BSP	Ø 47,5	46,5	316 St.St.
/ M6	2" BSP	Ø 54,4	48,1	316 St.St.
/ M7	1" BSP	Ø 37,6	40,2	ST 37 Steel
/ M8	1 1/4" BSP	Ø 47,8	47	ST 37 Steel
/ M9	1 1/2" BSP	Ø 52,6	46,5	ST 37 Steel

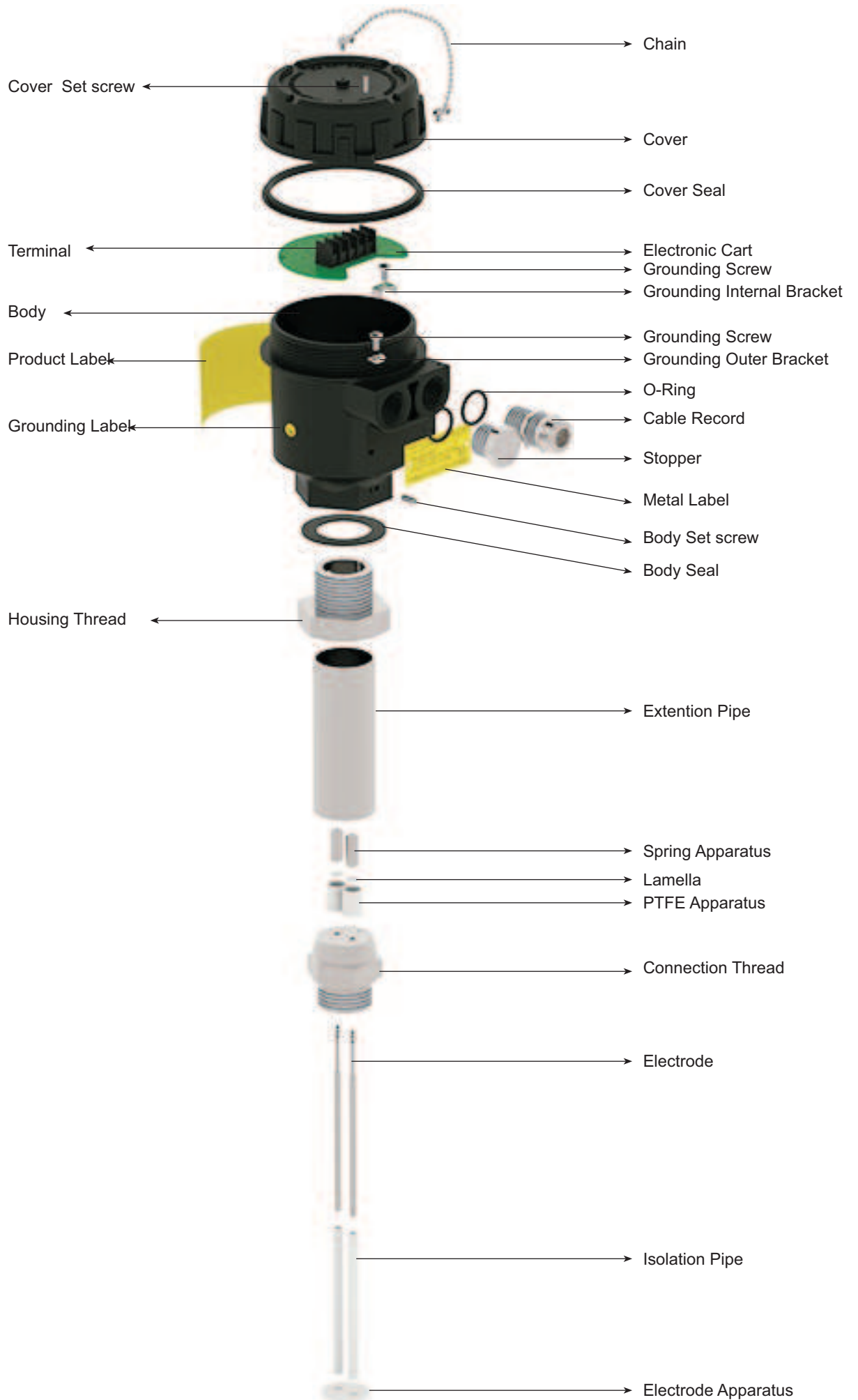
Flanged :



Order Code	D	D1	d	k	Number of holes	Material
/ F1	110	90	8	2	4	304 St.St.
/ F2	110	90	8	2	4	316 St.St.
/ F3	200	180	8	2	6	304 St.St.
/ F4	200	180	8	2	6	316 St.St.

Note: 1" BSP with aluminum nut

2.11. Part Names



2.12. Sipariş Şekli: **Kodlamada örnek modelleri dikkate alabilirsiniz!**

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

## 1 MODEL DX-ELC

2 Electrode.....	21	3 Electrode.....	31
		4 Electrode.....	41

## 2 CERTIFICATE

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

## 3 CONNECTION (BSP)

1" BSP (Std.).....	006	Special.....	x
2"BSP.....	009		

## 4 CONNECTION MATERIAL

304 St. St. ....	01	Special.....	x
316 St. St. ....	02		

## 5 ELECTROD MATERIAL

304 St. St. ....	01	Titanium.....	09
316 St. St. ....	02	Special.....	x

## 6 INSULATION MATERIAL

PTFE (Std.).....	66	PFA.....	67
		Special.....	x

## 7 HOUSING

Alüminyum B20x.....	25	Special.....	x
---------------------	----	--------------	---

## 8 STEM LENGTH (LL)

500mm.....	500	1500mm.....	1500
1000mm.....	1000	Special.....	x

## 9 ELECTRICAL CONNECTION

With Terminals.....	00	Special.....	x
---------------------	----	--------------	---

## 10 OPTIONAL

Yok.....	/ 0	Special.....	x
Liquid Level Relay.....	/ SSR		

## SAMPLE

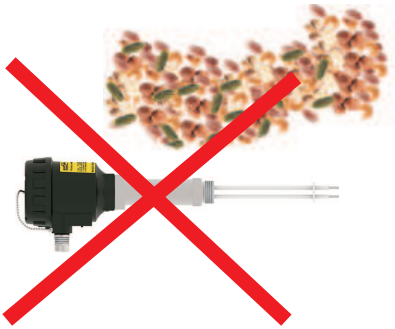
DX-ELC 41-0-006-02-02-06-25-1000-00/0

DX-ELC 41 , 4 Electrode - 1" 316 St. St. Connection - Electrode 316 St.St. - With Terminals

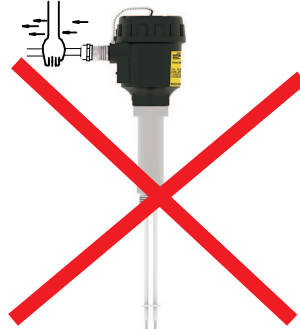
**WARNING !!!**



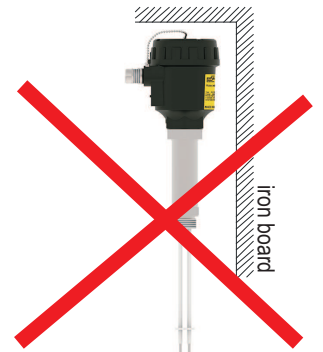
Please pay attention to following matters in order to operate your flow switch properly.



Material should not touch on the pedal. You should protection plate on the top.



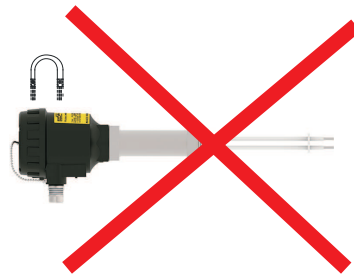
Do not pull the cable strongly, otherwise the characteristics might be changed.



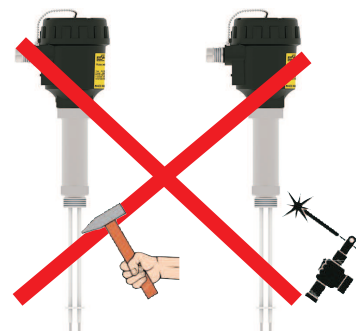
Please keep away from magnetic materials like iron board ; otherwise the characteristics might be affected



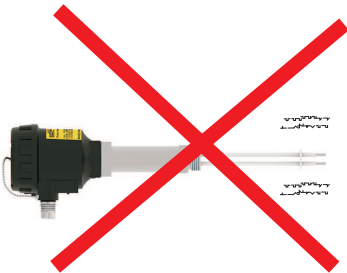
Please do not dip cables potting into liquids, otherwise insulation problem may cause.



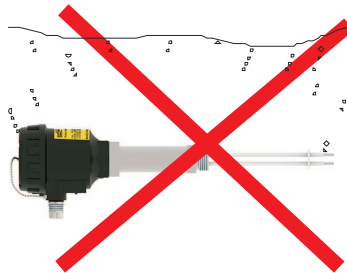
Do not fasten switch reversely , otherwise its characteristics might be changed.



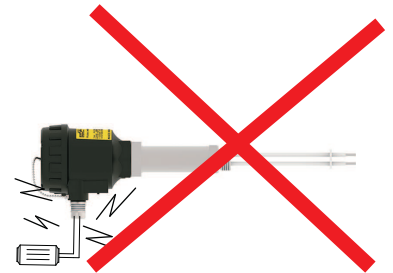
Please do not drop , otherwise the characteristics might be changed.



Vibration might be caused instability.



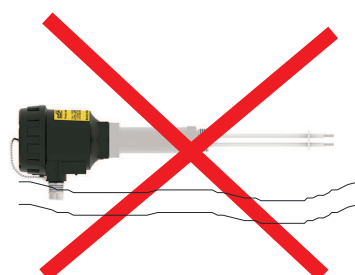
In case vapour splash cable potting points, insulation problem may cause.



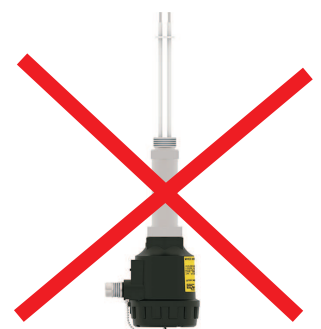
Excess current , to be drawn as a result of direct connection to motor, may burn relay of switch



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 connect the switch in reverse. Their characteristics may vary.

### 3. Failure Delection

Breakdown	Probable cause	Failure detection\correction
Body was broken	-Tightening the screws more than adequate during the assembly. -Product falling or taking a blow from outside.	-Inform authorized service.
Fluid is leaking	-There is a hole on the body.	-Check that is worked under appropriate condition and then contact with producer company.
High Resistance Output	-Probes have short-circuited - The wires used in process is not suitable - Dirt has stacked on probes due to maintenance neglect	- The nut on probe thread have overly screwed inside of housing - Proper connection cable should be used. - According to liquid, periodic maintenance should be sustained.
Probe Does Not Produce Resistance Output	- Liquid might not be contacted. - Plugs of the probe might be too relaxed. - There might be a break in process wire. - Probe might be dissolved due to chemical substance.	- Liquid contact should be checked. - Plugs should be checked. - Process wire should be checked. - Contact with the manufacturer.

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! Serial number shall be indicated to the authorized service center.

### 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. Re-Calibration

During long period usage of level switch, there might be deviations on measurements. In those cases, recalibration is recommended. Re-calibration could be made by your technical staff or you could send to manufacturer company. According to IEC 60017, ex proof devices must be go through detailed inspection every 3 year from purchase date. Responsibility of inspections are belong to the user (IEC: International Electrotechnical Commission)

### 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 PAZ. MAK. SAN. TİC. A.Ş. Ferhatpaşa Mah. Gazipaşa Cad. No: 104A Ataşehir - İSTANBUL - TÜRKİYE  
Tel:+90 216 50 50 555 Faks:+90 216 515 45 84 E-Mail: lonca@ensim.com.tr Web: 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.