Model: 01-2023-009

OPERATING MANUEL

Model : DX-ELS-tx

LEVEL TRANSMITTERS

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.

Modeller :

DX-ELS-tx

CE 2284

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 :

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

Tank level measurement and control,boiler kontrol,store room control..

Advantages:

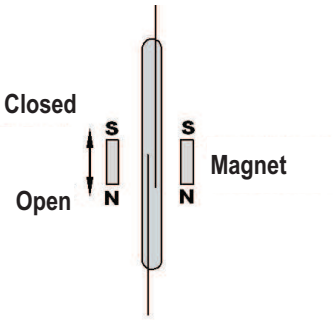
*A variety of materials according to the flow
*Different choices of ignition
*Quick delivery
*Different types of technics

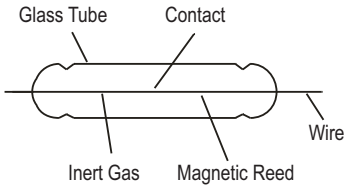
Ambient Conditions: **Relative Humidity:** 0-98 % RH **Ambient temperature:** 60 °C (It is not used under -20 °C)

1.3. Working Principle

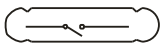
DX-ELS-tx level transmitter are used for tank levels and for controls. In the float when the magnet magnetic area moves according to the liquid in the tube, then the reed swicthes the electrical circuit on or off when it reaches the level of the sensor.Reed swicthes in and out. The changes of the reed sensors with alarm or a level information can be assessable with a relay circuit or a control device.Sensitivity increases according to reed sensor lowering range.The advantages of providing the analog output in the enclosure are preferred by the users.

1.4. Reed Relay and Operation Conditions

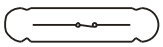




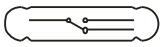
SPST-NO
Single Pole-Single Throw
Normally Open



SPST-NC
Single Pole-Single Throw
Normally Closed

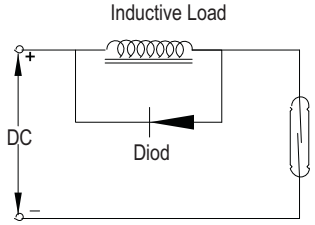


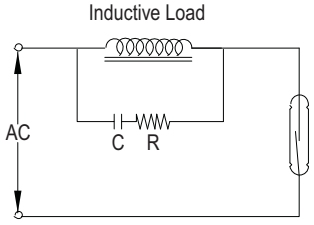
SPDT-NO/NC
Single Pole-Double Throw
Open / Closed Contact

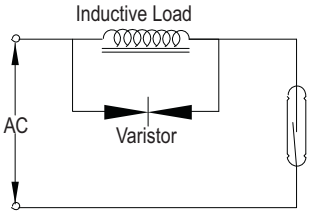


Inductive Load

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.

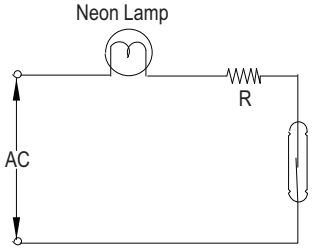


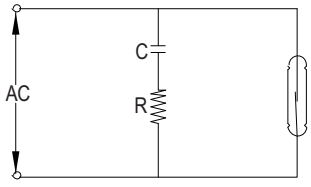




Capacitive Load

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.





1.5. Technical Specifications

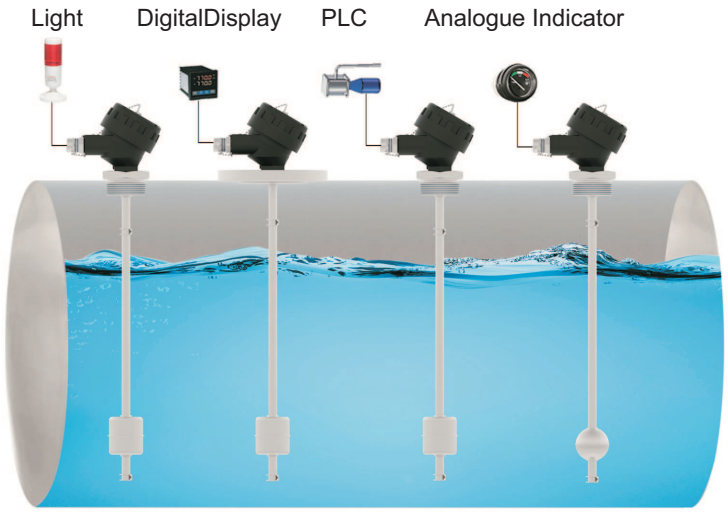
Certification

II 1/2G Ex db ia IIC T6...T2 Ga/Gb For Gas
II 1/2D Ex tb ia IIIC T85°C...T300°C Da/Db For Dust
* Have a look at the temperature class chart.

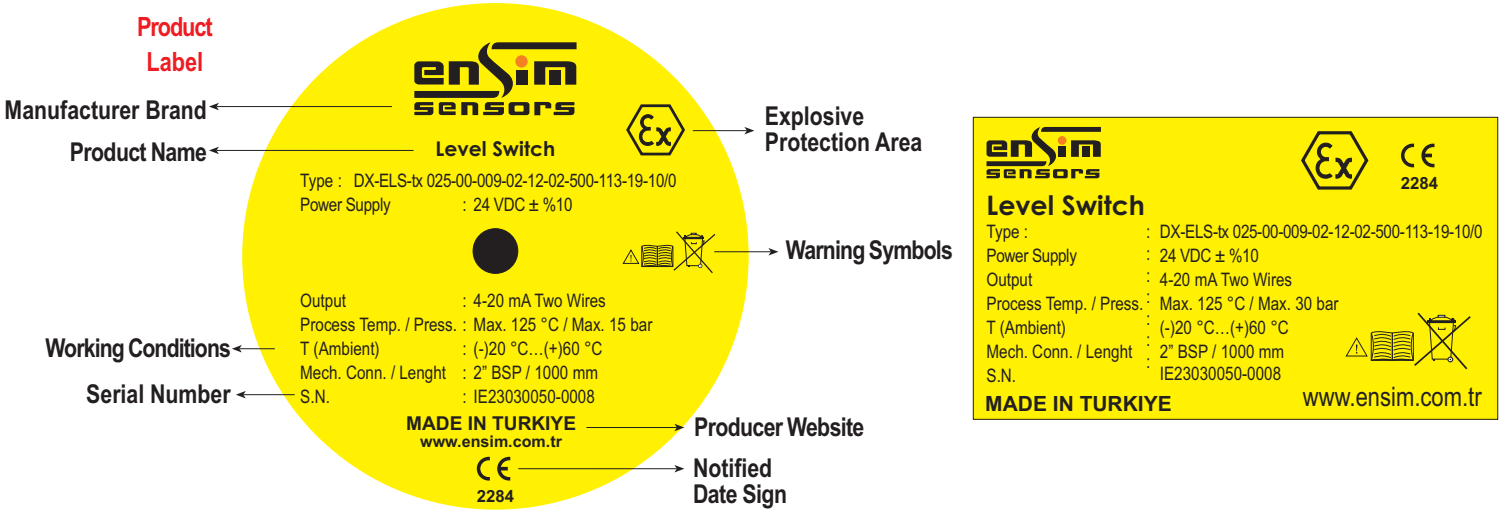
DX-ELS-tx

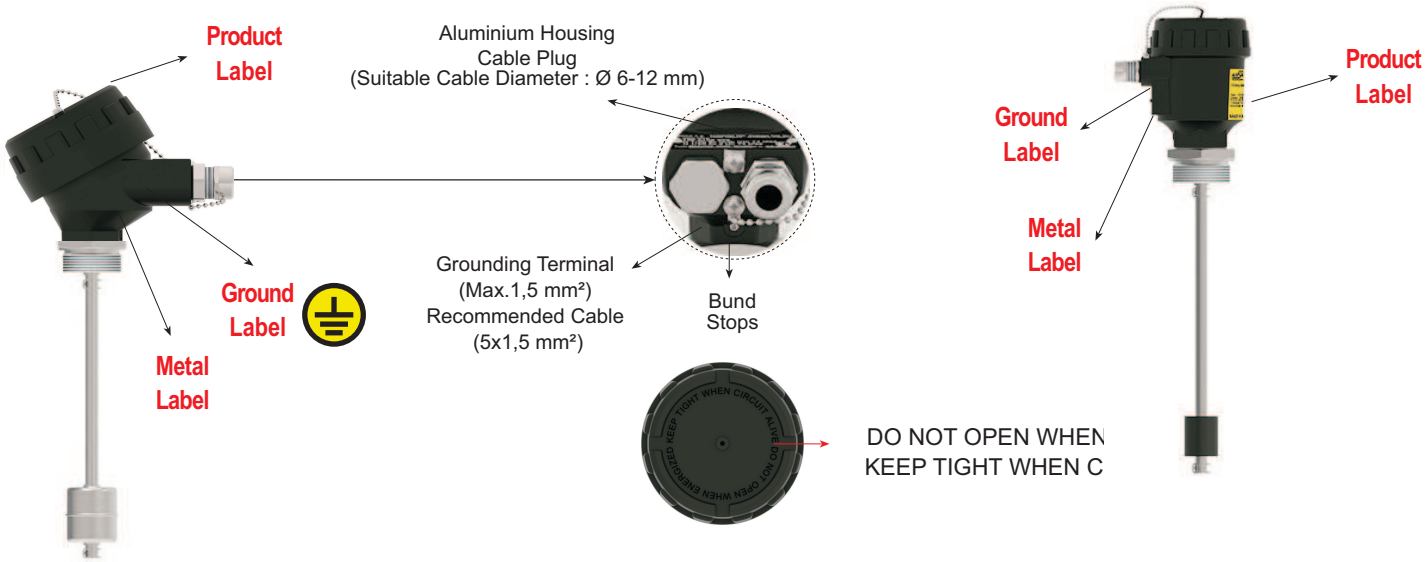
Working Temperature (Tp)	Max. 125 °C
Ambient Humidity	0-98 % Rh (Non-condensing)
Ambient Temperature (Ta)	(-) 20 °C ... (+) 60 °C
Material Connection	304 St.st. (Std.) Opt. 316 St.st. , Aluminum
Housing	Aluminium Injection Molding- AlSi12Fe (Std) Black (RAL 9005)
Float	316 St.st. (Std.) Opt. PU , PP
Pipe	304 St.st. (Std.) Opt. 316 St.St. , Brass
Connection	2" BSP (Std.) Opt.Selectable from Table.
Float Type	S40A (Std.) , Selectable from Table.
Number of Float	1 (Std.) A large number of available.
Stem Length	Max. 2500 mm **(Thread Included)**
Electrical Connection	Terminals
Cable and Plug Entry	M20 x 1,5 (Std)
Output	4-20 mA Std. Two Wire Opt. 4-20mA , 0-20mA , 0-10V Three Wire, Ohm
Fequency of Detection	Std. 15 mm / 10 mm / 5 mm / 1 mm
Supply Voltage	12...32 VDC
Protection Class	IP 66 / 68 (EN60529)
Certifications and Approvals	CE Declaration , EMC , LVD , ATEX

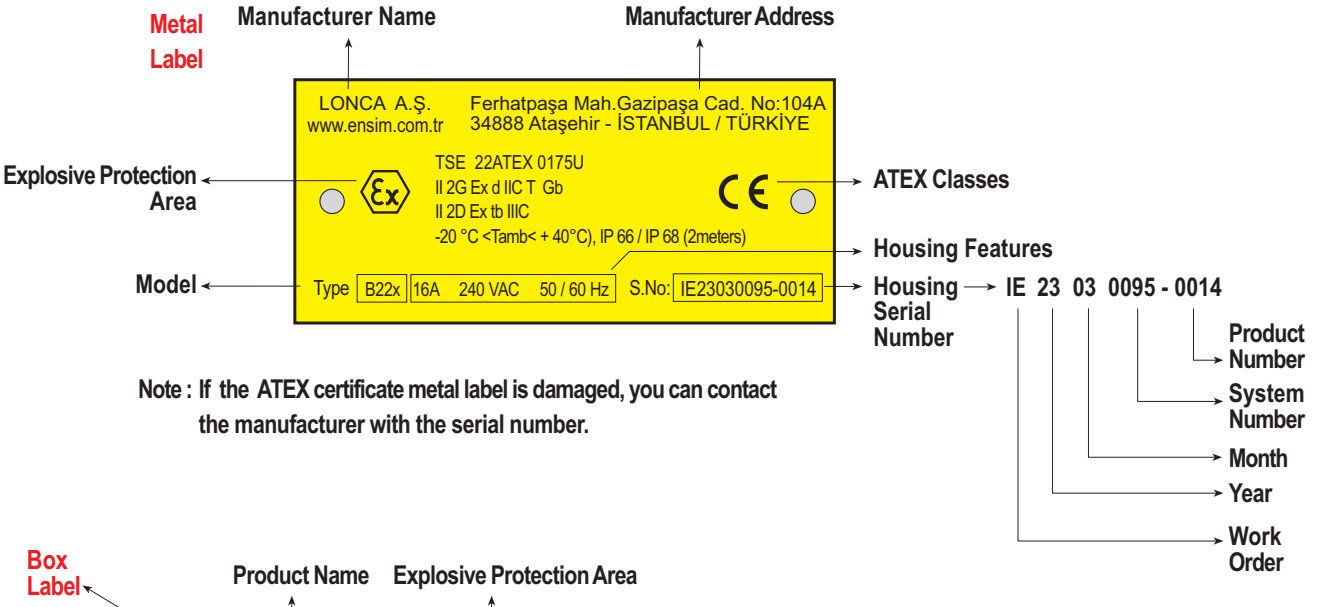
Example of application :



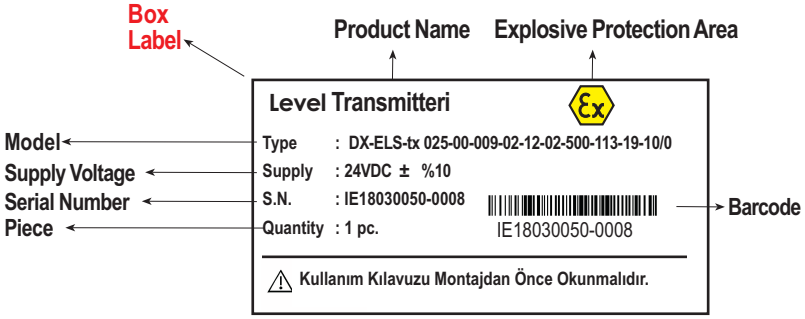
1.6. Label Information :







Note : If the ATEX certificate metal label is damaged, you can contact the manufacturer with the serial number.



1.7. 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:

***Float Level Transmitters**

*This operating manual

Std. Package

1.8. Target Group

This operating manual has been prepared for qualified technical personnel.

1.9. 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 IEC 60079 - 0 : 2018 TS EN 60079 - 1 : 2014 TS EN 60079 - 11 : 2012 TS EN 60079 - 31 : 2014
LVD (2014 / 35 / AB)	:	TS EN 60204 -1 : 2018
EMC (2014 / 108 / AT)	:	TS EN 61326 - 1 : 2021 TS 3033 EN 60529 : 2014

Note : All the features and tests on this decument has manufactured with **DX-ELS-tx** models at LONCA Inc.

1.10. Safety İnstructions (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 enviroment 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.

-İt 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 presure.

-These safety instructions are protected in terms of 1 / 2 D and 1 / 1 G category for **DX-ELS-tx** coded series and is compatible with IEP23ATEX1210X and CE certificate.

-The Label should be used in appropriate environments.

-Because the enviroment 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-ELS-tx** models are metal protected.İt 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 presure in the tank hasnt exceed the presure 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.

- Flange surface smoothness must be maintained in flanged connection.

- Flange seating surface should not be scratched, and suitable liquid gasket should be used instead of sealing with gasket in counter flange mounting.

- Flanged connections are welded with the sensor part.

-The sensor is designed to withstand the chemical effects of the materials.Check the suitability of different materials.

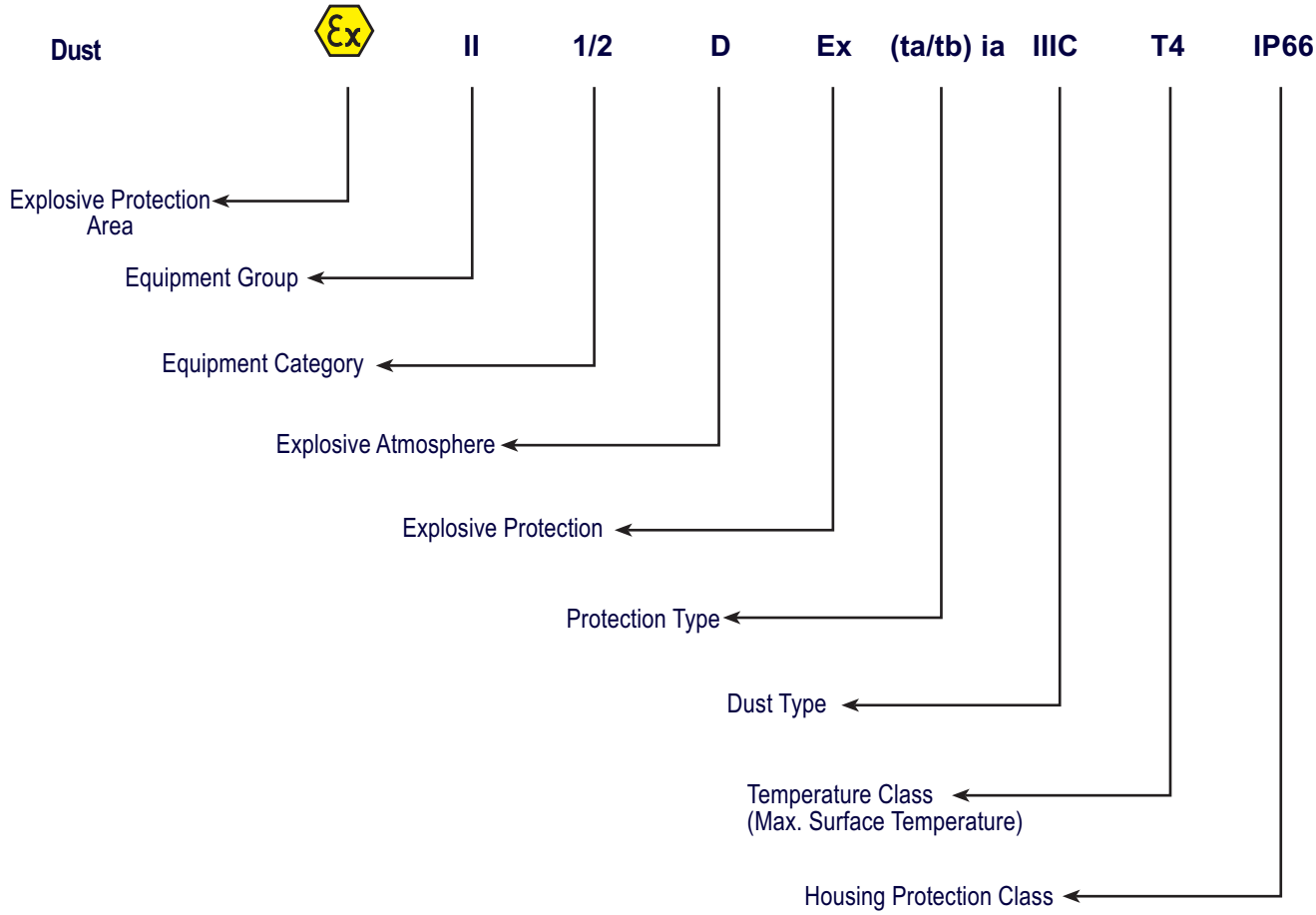
-The Sensors are in suitable storage conditions and protected from dust and damp.

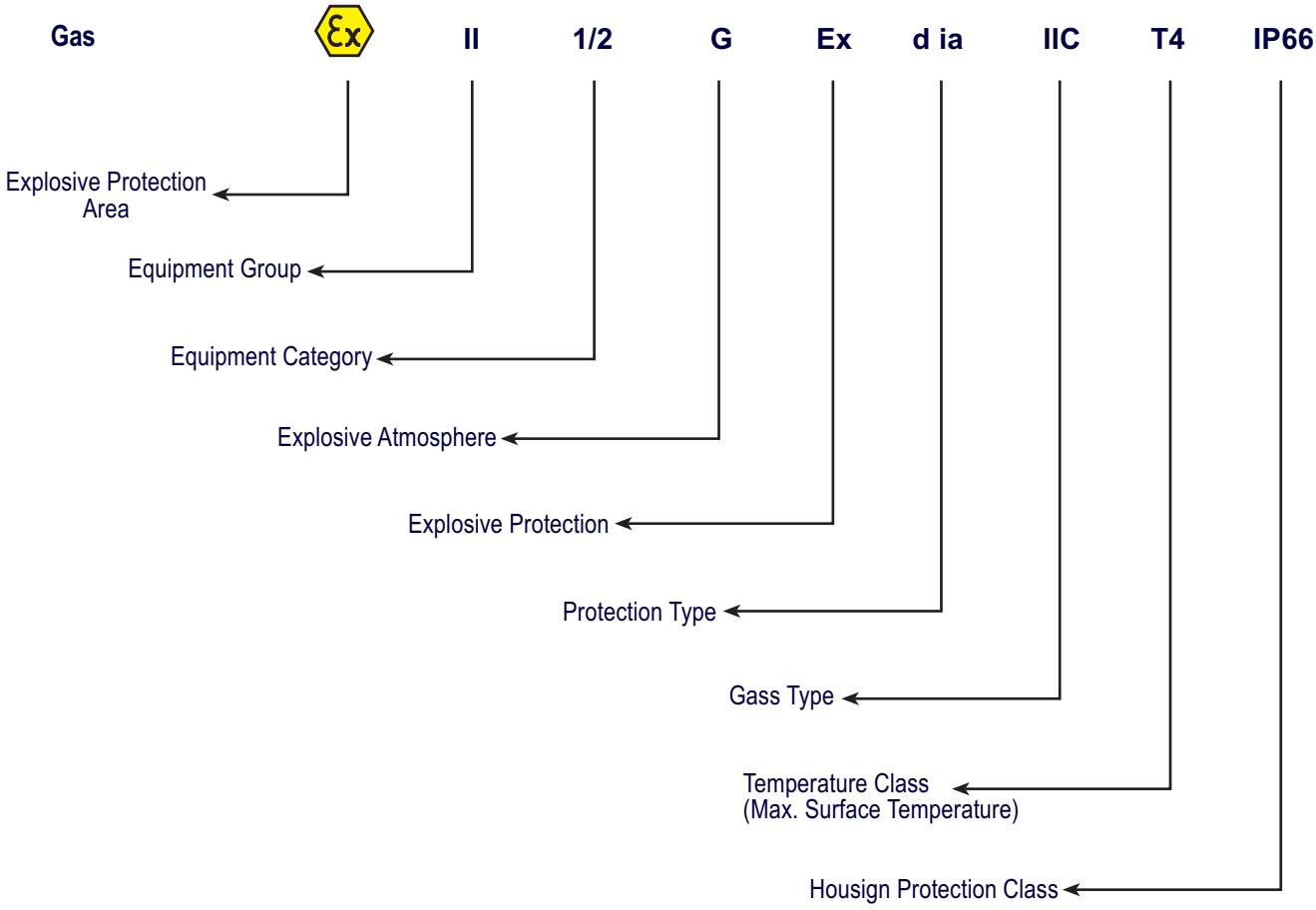
-Device repairs should only be done at the manufacturer Lonca Inc.

-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.

1.11. 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 transmitter** 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 pesure should not be exceeded.

2.2. General Installation Stages

*Remove **Level transmitter** 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

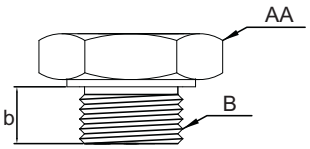
*Please ensure that there is no mechanical stress on the shaft following installation. Such case will cause slipping in thecharacteristic curve.
***Level transmitters** must be placed upright or horizontal.
*Allocate valve certainly in the process connection while instrument is used.
*Allocate blowdown 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 transmitter** 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 :

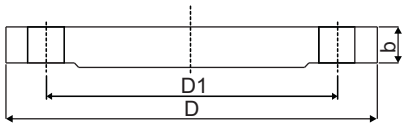
Thread (Connection has been welded with sensor)



(ISO228-1)

Order Code	Dimension B	Hex [mm]	Stem Lenght b [mm]
0003	3/8"BSP	50	20
0004	1/2"BSP	50	14
0005	3/4"BSP	50	14
0006	1"BSP	50	23
0008	1 1/4"BSP	50	23
0009	1 1/2"BSP	60	23
0012	2"BSP	70	23

Flanged (Connection has been welded with sensor)



Order Code (ISO1092-1)

PN 16	D (mm)	D1 (mm)	b (mm)
DN25	165	85	16
DN32	140	100	16
DN50	165	125	18
DN80	200	160	20
DN100	220	180	20

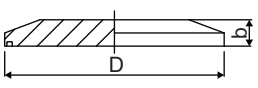
Order Code (ISO1092-1)

PN 40	D (mm)	D1 (mm)	b (mm)
DN25	115	85	18
DN32	140	100	20
DN50	165	125	20
DN80	200	160	20
DN100	235	190	24

Order Code (ANSI B16.5)

150 LBS	D (mm)	D1 (mm)	b (mm)
DN50	152,4	121	19
DN65	177,8	139,7	22,2
DN80	190,5	152,4	23,8
DN100	228,6	157,2	23,8

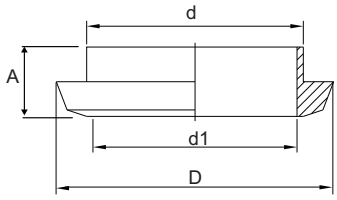
Clamp (Connection has been welded with sensor)



Order Code (ISO2852)

Dimension	Dia. D (mm)	b (mm)
DN32	50,5	15
DN50	64	17
DN65	91	17

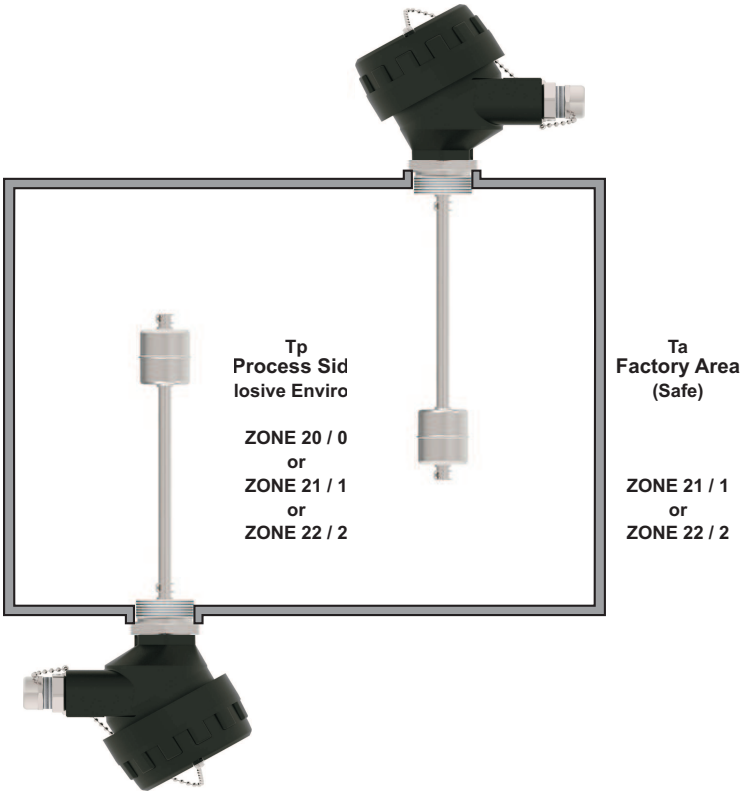
Dairy (Connection has been welded with sensor)

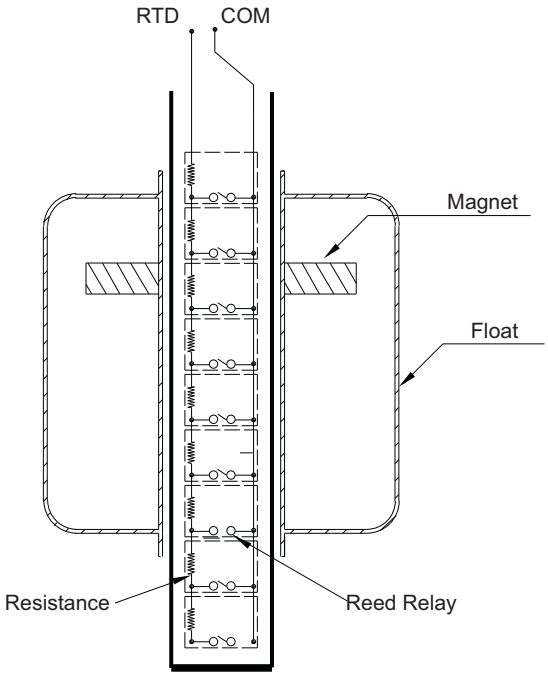


Order Code

Dimension	Dimension	D (mm)	d1 (mm)	A (mm)
DN40	DN40	56	48	13
DN50	DN50	68	61	14
DN100	DN100	121	114	20

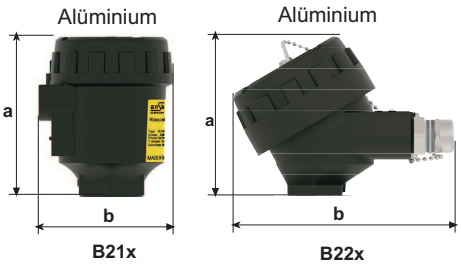
2.6. Example Mounting Types :





Housing :

ORDER CODE	TYPE	MATERIAL	PROTECTION CLASS	TEMPERATURE (°C)	SIZE a x b (mm)
750	B22x	Aluminium	IP 66 /68	(-) 40...(+) 200	117 x 102
704	B21x	Aluminium	IP 66 /68	(-) 40...(+) 200	132 x 104



Cover Seal : NBR Nitrile Rubber 120 °C, Opt. FPM (Viton) 200 °C)

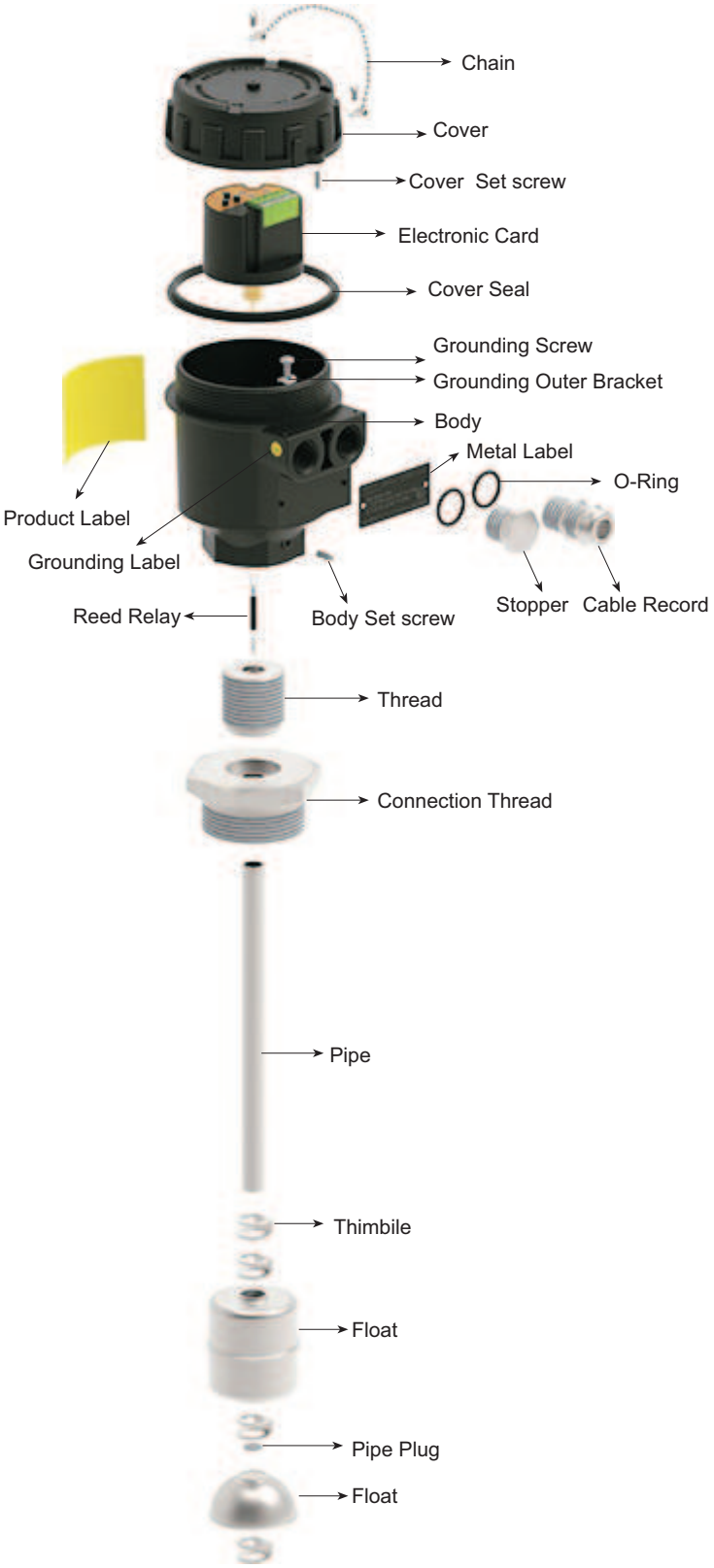
EU-Type Examination Certificate Number : TSE 22ATEX 0175U

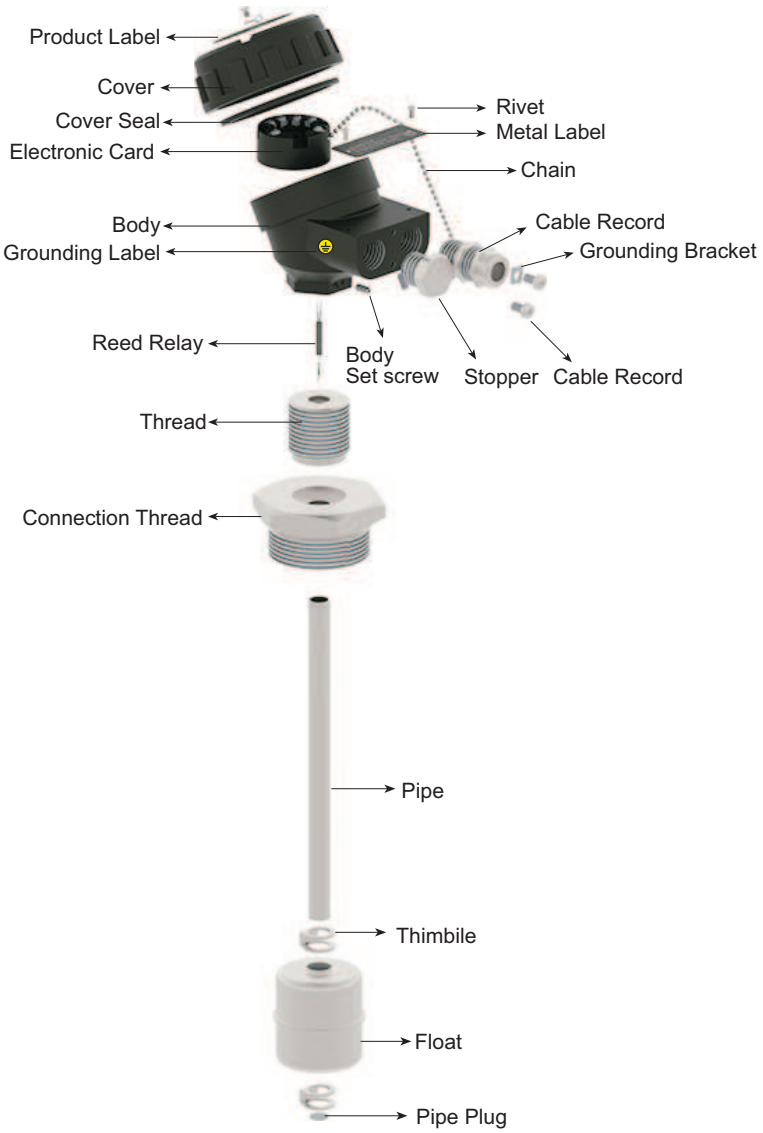
The marking of the equipment : Ex **II 2G Ex d IIC Gb**
II 2D Ex tb IIIC

Protection Case :

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

2.7. Part Names

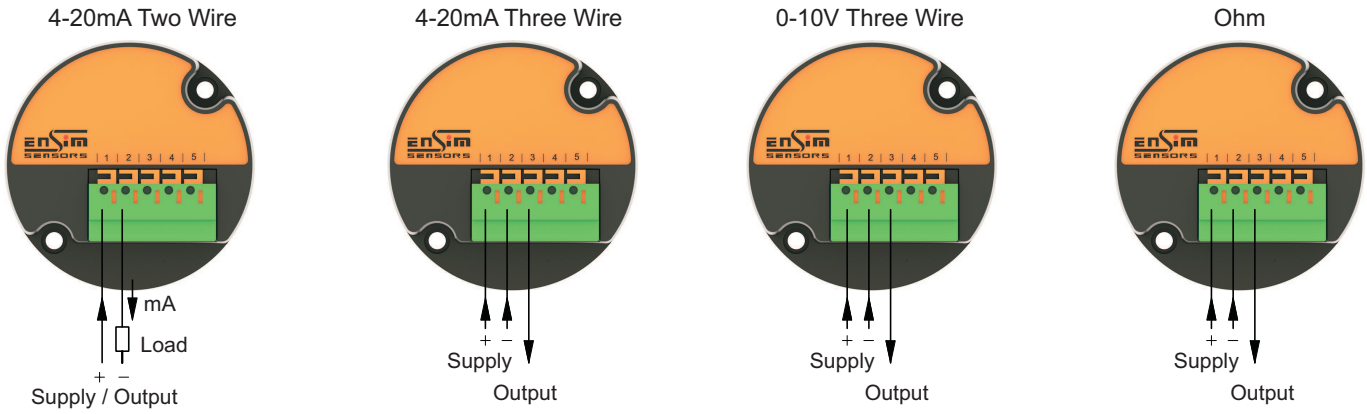




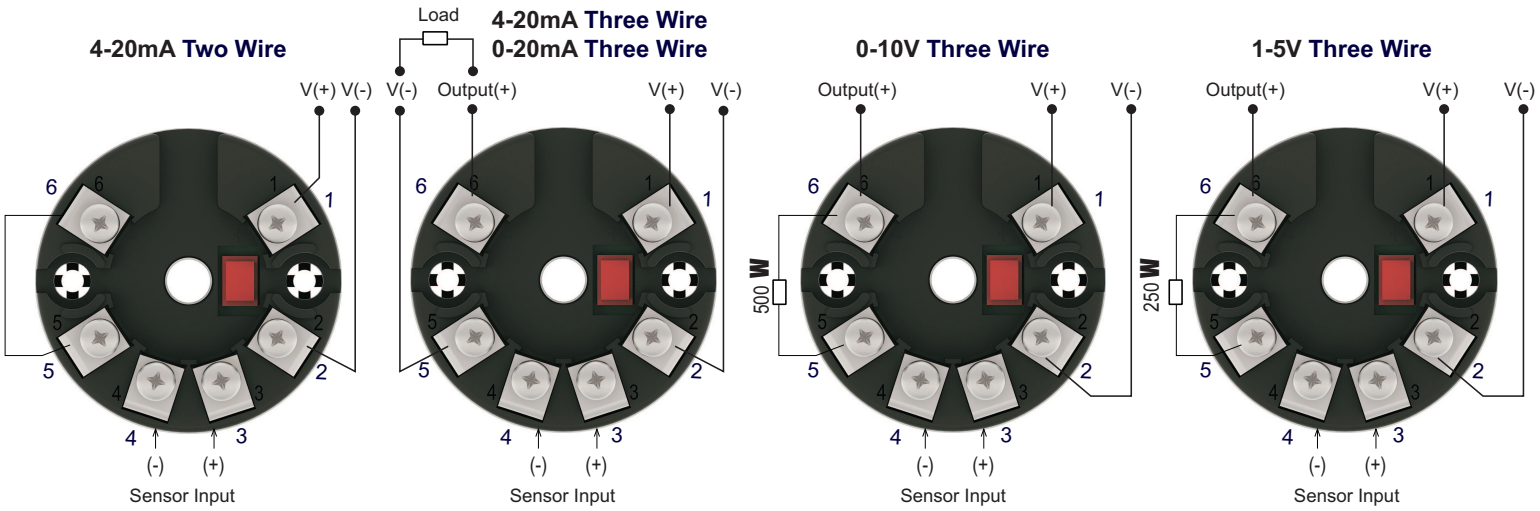
2.8. Electrical Installation

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

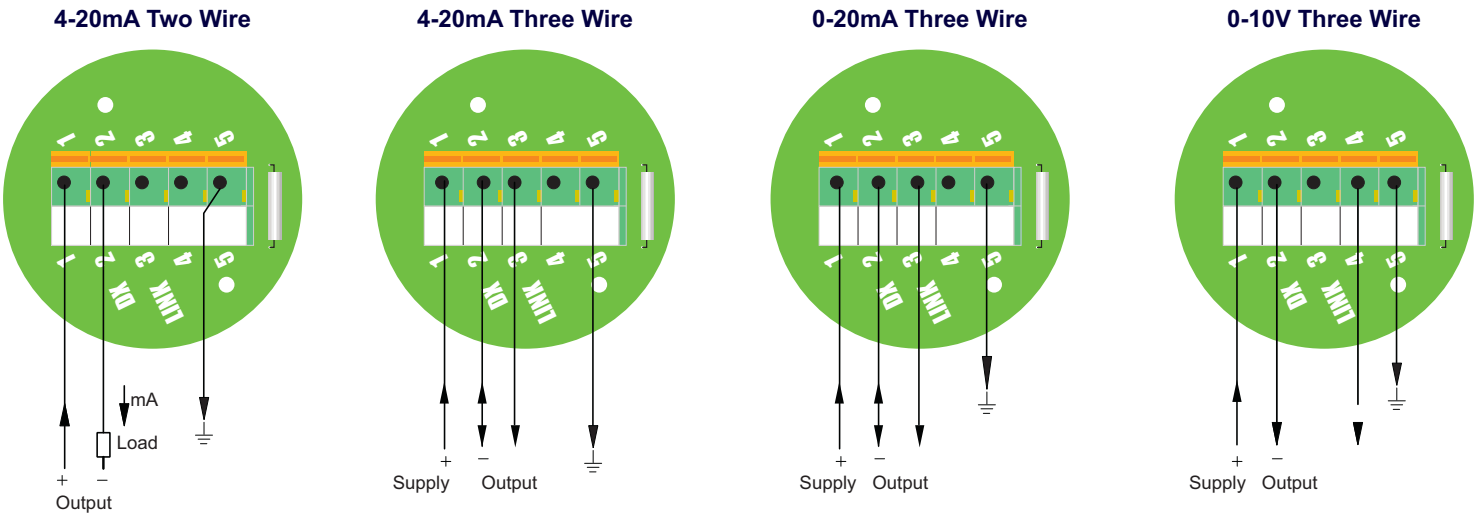
For B21x



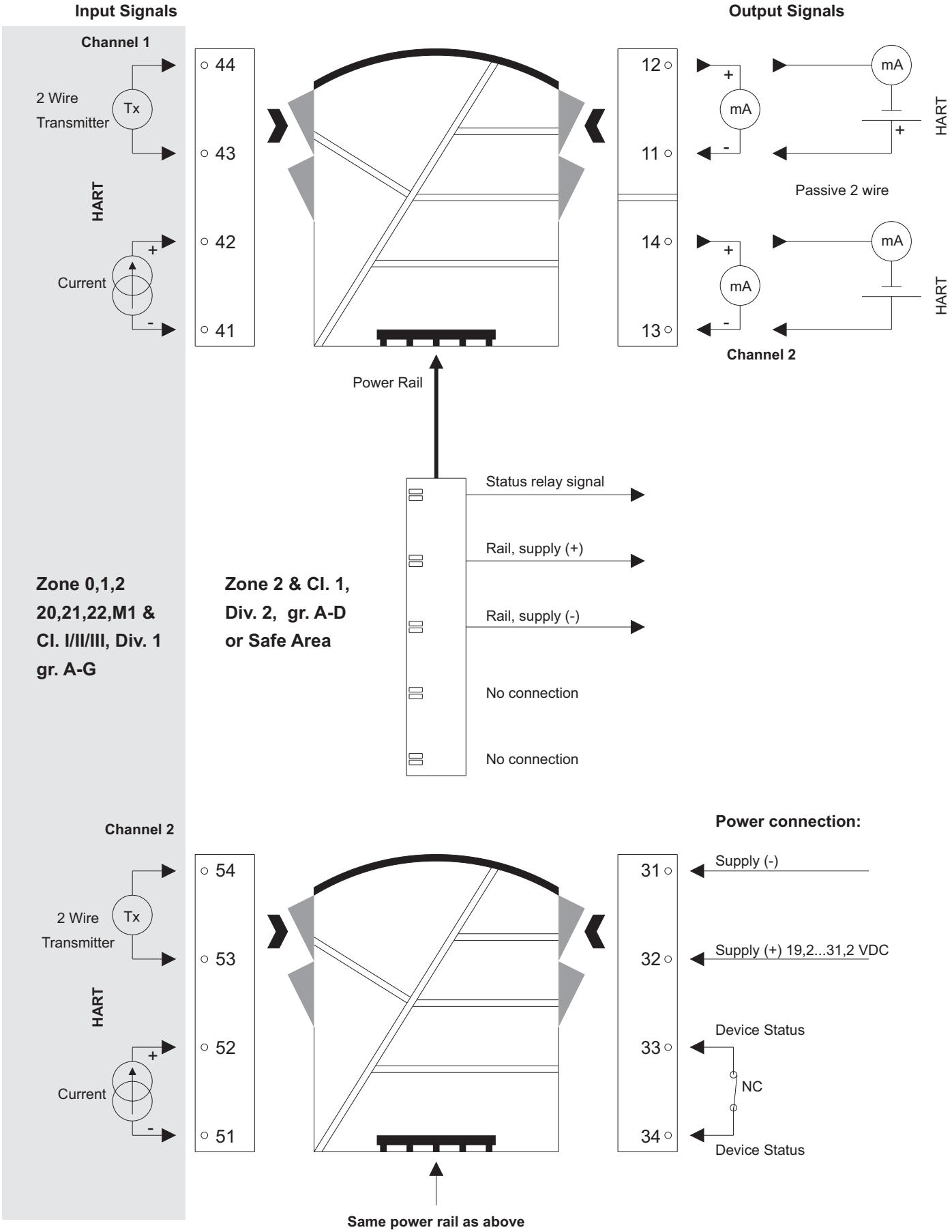
For B22x



For B22x

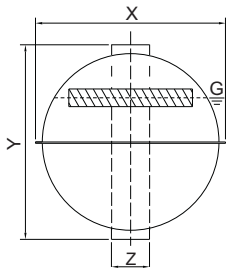


Note: The IPC A 600 is manufactured in accordance with class 2 requirments. HALS (Unleaded) surface treatment applied.

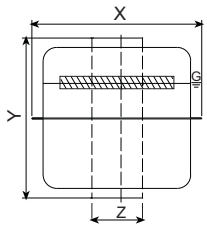

Input Signals
Output Signals
Channel 1
2 Wire
Transmitter
Tx
HART
Current
+
-
44
43
42
41
12
11
14
13
mA
HART
Passive 2 wire
Channel 2
Power Rail
Status relay signal
Rail, supply (+)
Rail, supply (-)
No connection
No connection
Zone 0,1,2
20,21,22,M1 &
Cl. I/II/III, Div. 1
gr. A-G
Zone 2 & Cl. 1,
Div. 2, gr. A-D
or Safe Area
Channel 2
Power connection:
54
53
52
51
31
32
33
34
Supply (-)
Supply (+) 19,2...31,2 VDC
Device Status
NC
Device Status
Same power rail as above

2.9. Float Types

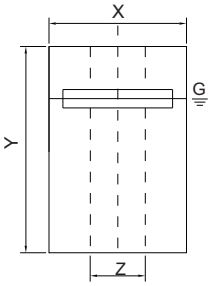
Float :



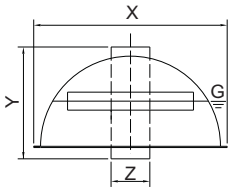
S2A / S5A / S6A
S40A / S41A / S53A



S1Y / S1A / S7A / S17A
S10Y / S11A / S54A

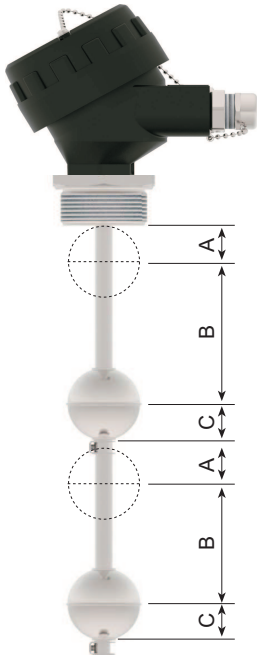


P3 / P6 / P7 P9



S42A / S52A

Minimum Distances



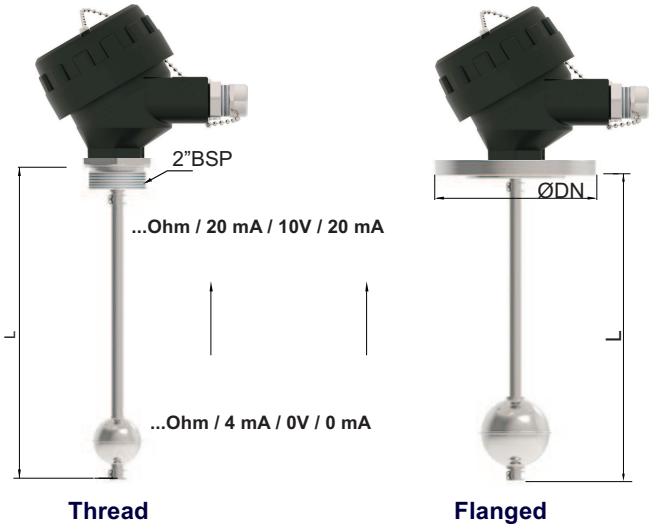
Technical Specifications :

Order Code	Type	Material	X	Y	Z	Dia. of Pipe	Max. Press.	Max. Temp.	Density	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

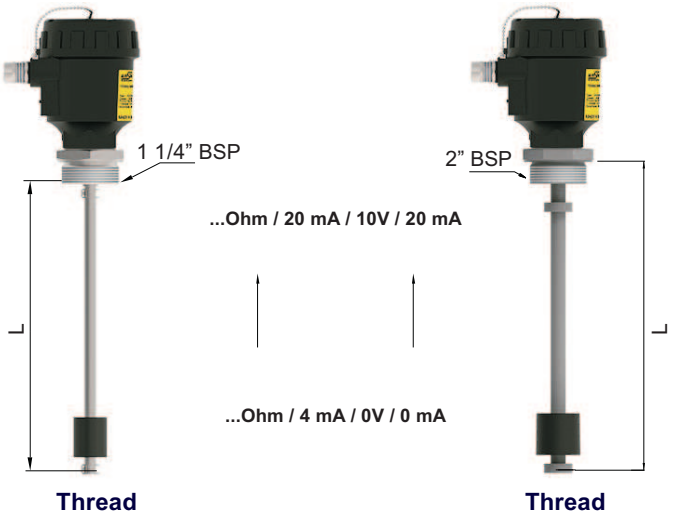
Technical Specifications :

Order Code	Type	Material	X	Y	Z	Dia. of Pipe	Max. Press.	Max. Temp.	Density	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

2.10. Sample Models

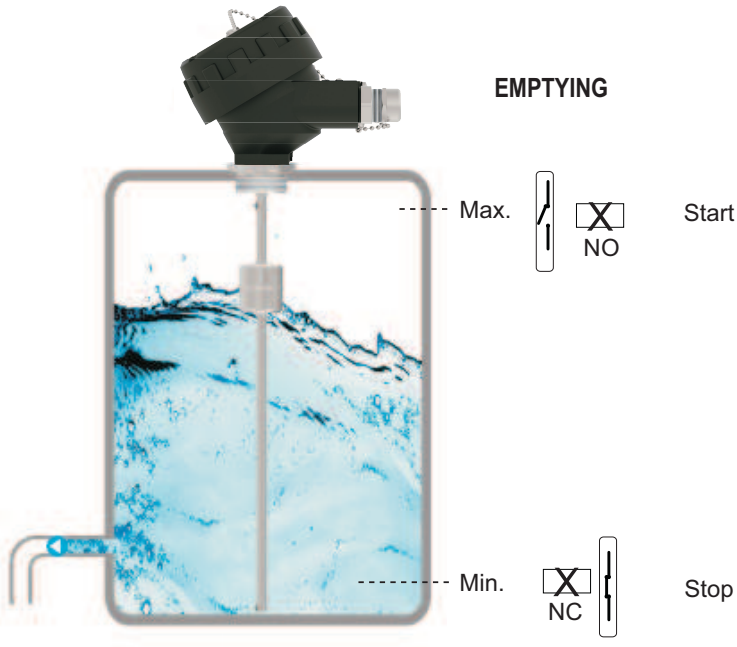


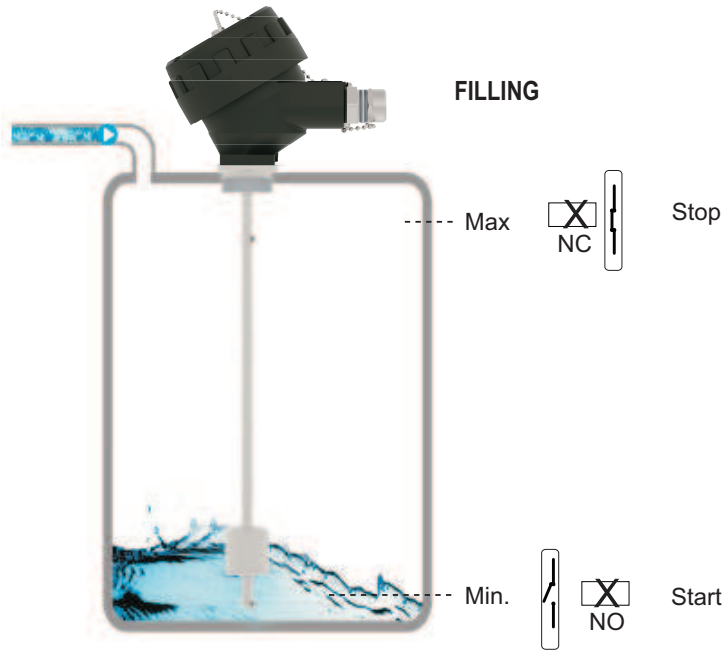
Thread Flanged



Thread Thread

Sample Application :





** Length -/+ 5 mm tolerance is available.

2.11. Maximum Surface Temperature

Temperature Class Table

(-) 20° C ≤ Ta Ambient ≤ (+) 30° C...(+) 60°C	Working Temperature: (-) 20°C … (+) 125°C	Group II
MODEL	DX-ELS-tx	
Without opening the cover standby time	30 min. (-)40…(+)150°C	40 min. (-)40…(+)200°C
Ta AMBIENT TEMPERATURE	Tp PROCESS TEMPERATURE	TEMPERATURE CLASS
60°C	< 80°C	T6
60°C	< 90°C	T5
60°C	< 125°C	T4

(-) 20° C ≤ Ta Ambient ≤ (+) 30° C...(+) 60°C	Working Temperature: (-) 20°C … (+) 60°C	Group III
MODEL	DX-ELS-tx	
Without opening the cover standby time	10 min. (-)40…(+)60°C	
Ta AMBIENT TEMPERATURE	Tp PROCESS TEMPERATURE	TEMPERATURE CLASS
60°C	< 60°C	T6

2.12. Order Form : Please consider sample models when coding

1 MODEL

Standard Version .....DX-ELS-tx

2 HOUSING

Aluminium Housing , B22x IP66 / 68.....750
Aluminium Housing , B21x IP66 / 68.....704
Special.....x

3 CERTIFICATE

No.....0
(EN10204-3-1) Material Certification.....1

4 ELECTRICAL CONNECTION

With Terminals (For Housing Models).....00
Special.....x

5 CONNECTION (Connection has been welded with sensor)

Thread 3/8" BSP.....0003
Thread 1/2" BSP.....0004
Thread 3/4" BSP.....0005
Thread 1" BSP.....0006
Thread 1 1/4" BSP.....0008
Thread 1 1/2" BSP.....0009
Thread 2" BSP.....0012
Thread 1/2" BSP (Moving Type).....0112

Thread 3/8" BSP Elbow Type.....0109
Thread 1/2" BSP Elbow Type 0110

1/8" NPT.....0200
1/4" NPT.....0201
3/8" NPT.....0202
1/2" NPT.....0203
3/4" NPT.....0204
1" NPT.....0205
1 1/4" NPT.....0206
1 1/2" NPT.....0207
2" NPT.....0208

Special.....x
Note: Refer to the table for others.

6 CONNECTION MATERIAL

304 Stainless Steel.....001
316 Stainless Steel.....002
Brass.....003
Aluminium.....005
Special.....x

7 PIPE SIZE

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

8 PIPE MATERIAL

304 Stainless Steel.....001
316 Stainless Steel.....002
Brass.....008
Special.....x

9 STEM LENGHT

.... mm

Note: From connection thread included

10 FLOAT MODEL

Select from Table

Note: Should be selected according to the connection and radius.

11 OUTPUT

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

12 SENSITIVITY RANGE

15 mm.....15
10 mm.....10
5 mm.....05
11mm.....01
Special.....x

13 OPTIONAL

No...../ 0
External Tank (Measurement must be specified) ... / H
Test Rod ..... / T
Shetter (For the outside of the tank) 304 St. St...../ K2
Float Housing..... / M
Zener Baryer 9106B-BIB Single Channel...../B1B
Zener Barier 9106B-B2B Double Channel...../B2B
Special..... / x

EXAMPLE

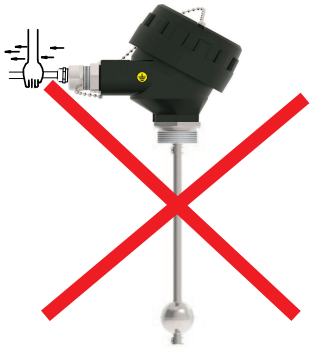
DX-ELS-tx 750 - 00 - 0012 - 002 - 13 - 001 - 1200 - S40A - 20 - 10 / 0

DX-ELS-tx Level Transmitter, Aluminium Housing B22x, 2” BSP Male Thread, Connection and Pipe Material 316 St.St.
L = 1200mm, S40A Float, 4-20mA Three Wire Output, 10mm sensivitiy

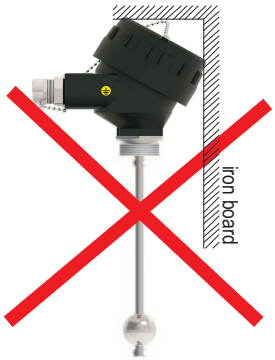
WARNING !!!

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

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



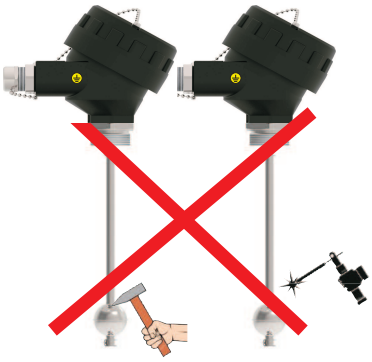
Do not pull the cable strongly, otherwise the characteristics might be changed.



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.

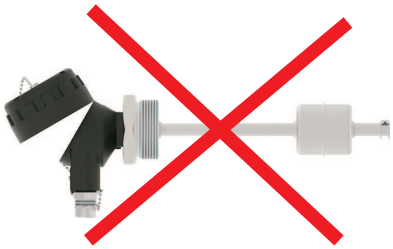


Please do not drop , otherwise the characteristics might be changed.

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 connect the switch in reverse. Their characteristics may vary.

3. Failure Delection

Breakdown	Probable cause	Failure detection\correction
Fluid is leaking	-Hole in the body metarial.	-Check if their working under favorable conditions , contact the manufacturer.
The analog isn't giving signal or it's giving the incorrect value.	-The socket may not contact -The product has been exposed in a mangetic ambient. -Angle of connection is not right. -Applied voltage above the value.	-Check the socket connections. -The magnetic field element must be removed or isolated. -Fix the angle of the montage. -Report to authorized service.
Housing or body broken	-Over tightening the screws during installation -Product falling or impact from outside.	-Report to authorized service.
There is an Unstable work in the signal.	-The product has been left in a magnetic ambient. -The product has been exposed in a vibration. -Product exposure in high temperature.	-The magnetic field element must be removed or isolated. -Vibrations must be blocked from that will effect the product or must connect where there is no vibration.
The thread is stripped.	-Been tightend with torks more than specified during installation.	-Use in suitable temperature. -Report to authorized service.

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 recomended. 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.Respobsibility 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 MAK. SAN. TİC. A.Ş.Ferhatpaşa Mah. Gazipaşa Cad. No:104A - P.K. 34888 Ataşehir - İSTANBUL - TÜRKİYE
Phone:+90 216 50 50 555 Pbx - Fax:+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.