



N-L2525

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APPLICATION MANUAL

Flameproof Ex d Universal Instrument Housing

Type: **XD-I80, XD-I80win,
XD-I80C, XD-I80Cwin**

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NOTES OF SAFETY

The XD-I80... housings are designed to accomodate various electronic instruments. If used incorectly it is possible that application-related dangers may arise.



The XD-I80... housing may be used by qualified and authorized company and people only, under strict obsevrance of these application manual and relevant standards, legal requirements, and, where appropriate the certificate.

Only the empty XD-I80... instrument housing is certified. When used as part of an end product assembly, subsequent approval of the end use equipment assembly is required.

N-L2525**1. DESTINATION .**

- Universal instrument housing XD-I80, XD-I80win, XD-I80C and XD-I80Cwin are designed to accomodate different electronic instruments or devices working in hazardous areas.
- Rottating machines or other devices which create turbulence shall not be incorporated.
- Oil-filled circuit-breakers and contactors shall not be used.

- Marking:

94/9/EC	IECEX
 II 2G Ex d IIC Gb  II 2D Ex tb IIIC Db	Ex d IIC Gb Ex tb IIIC Db

- Standards : ATEX 94/9/EC
 EN 60079-0, IEC 60079-0
 EN 60079-1, IEC 60079-1
 EN 60079-31, IEC 60079-31

- Ambient temperature:

Housing type	T _{serv}
XD-I80, XD-I80C	-40 to +100 °C
XD-I80win, XD-I80Cwin	-40 to +85 °C

- Possible zone application:

Zone	Protection Code
Zone 0 , Zone 20	Ex d + Ex ia
Zone 1 , Zone 21	Ex d
Zone 2 , Zone 22	Ex d

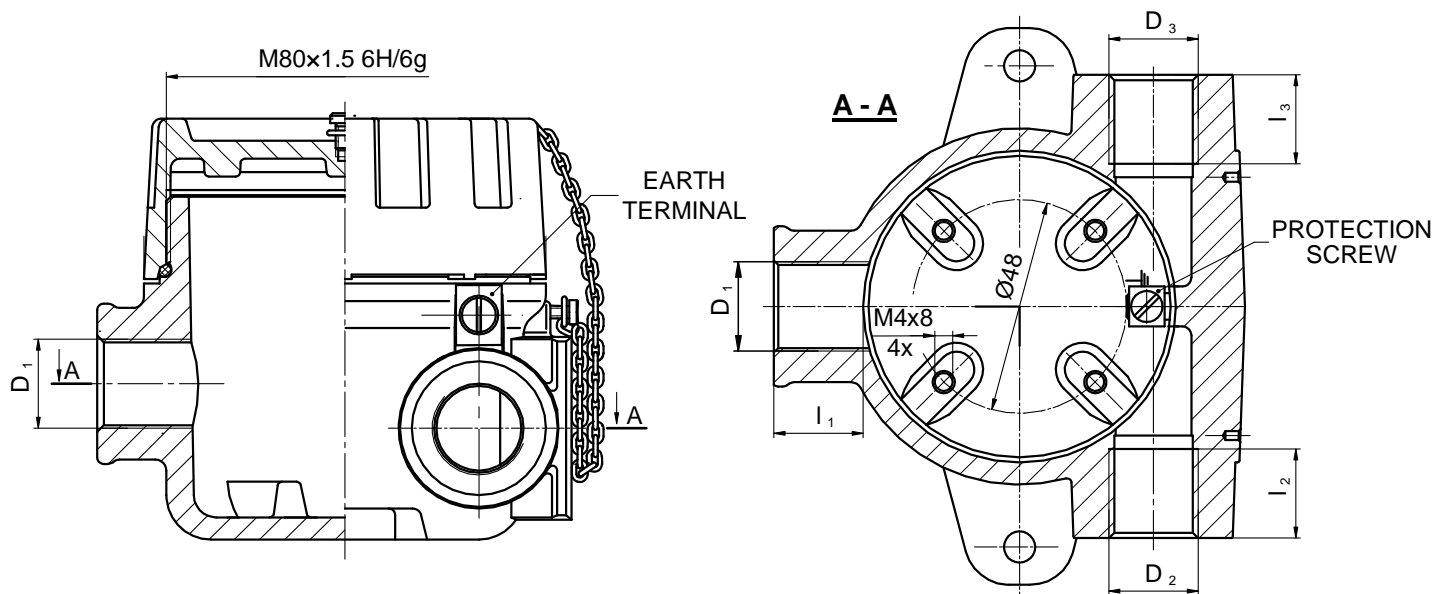
2. FLAMEPROOF JOINTS, PROCESS OPENINGS, CONDUIT OPENINGS

There are four flameproof joints in XD-I80... series housing:

1. on the cover thread M80x1.5
2. on conduit openings D₃, D₂ for cable gland:
 - threaded holes: M20x1,5; M24x1,5; M25x1,5; ½NPTmod; ¾NPT mod;
3. on process opening D₁ for thermowell or sensor:
 - threaded hole: M20x1,5; M24x1,5; M25x1,5; M27x2; ½NPT mod; ¾NPT mod

All four flameproof joints are designed for :

- volume $100 < V \leq 1500 \text{ cm}^3$
- group IIC enclosures

N-L2525**Cylindrical threaded joints: cover thread and D_1 , D_2 , D_3**

Standard EN 60079-1 requirements	Achieved value	
• pitch: ≥ 0.7 mm	cover	1.5 mm
	D_1 , D_2 , D_3 openings	1.5 mm or 2 mm
• threads form and quality of fit: medium or fine tolerance quality according to ISO 965-1 and ISO 965-3	cover	6H / 6g
	D_1 , D_2 , D_3 openings	6H 6g of male thread should be ensured by customer
• threads engaged: ≥ 5	cover	9
	D_1 , D_2 , D_3 openings	should be ensured by customer, possible to reach: 11 or 8
• depth of engagement: ≥ 8 mm	cover	14,5 mm
	D_1 , D_2 , D_3 openings	should be ensured by customer, possible to reach: 17 mm

Taper NPT threaded joints: D_1 , D_2 , D_3

Standard EN 60079-1 requirements	Achieved value
• threads provided on each parts: ≥ 5	7.5 male part should be ensured by customer

Standard Pipeline taper threads which meet above requirements must be modified. The way of modification is described in Annex for OIT-17/03

Each type of parallel threads: M20x1,5; M24x1,5; M25x1,5; M27x2 is adapted to create explosionproof joint. Also taper threads: $\frac{1}{2}$ NPTmod; $\frac{3}{4}$ NPTmod are modified acc. to standard OIT-17/03 and can create flameproof joint with threaded male part with standard cutting tolerance.

Process opening can be used for mounting sensor (e.g. gas sensor) or thermowell. Conduit openings can be used to equip it with various certificated Ex d flameproof cable glands, fill sealing fittings, flexible couplings or thermowells.

Each threaded hole D_1 , D_2 and D_3 can be plugged.

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3. CARRIED OUT TESTS.

a) FOR NON TRANSMISSION OF AN INTERNAL IGNITION

Process holes D ₁	EN 60079-1 p. 15.2.2.1 test
M20x1.5 M24x1.5 M25x1.5 M27x2 ½NPTmod ¾NPTmod	tested - together with plugs
Conduit holes D ₂ , D ₃	EN 60079-1 p. 15.2.2.1 test
M20x1.5 M24x1.5 M25x1.5 ½NPTmod ¾NPTmod	Tested - together with plugs

mod = modified to meet standards: EN 60079-1, IEC 60079-1, FM 3615, CSA C22.2 No. 0.5,

D₁, D₂, D₃ threads and fixed to them threaded male sensor parts, thermowell, cable gland, fill sealing fittings, flexible couplings must create flameproof joint. Apparatus assembler must submit complete device design to notify body for estimating design and eventually for conducting additional tests.

b) OVERPRESSURE TEST

According to clause 15.1.3.1 EN 60079-1 it was carried out tests:

- 4 times reference pressure
- at maximum water pressure 65 bar no routine test is required when reference pressure of final assembly (XD-I80.. with additional volume come from thermowells, conduit, pipe, etc.) is not higher than 16,25 bars.

The content of the housing may be placed in any arrangement provided that an area of at least 40% (group IIC) or 20% (group I) of each cross-sectional area remains free to permit unimpeded gas flow and, therefore, unrestricted development of an explosion. Separate relief areas may be aggregated, provided that each areas has a minimum dimension in any direction of 12,5mm.

4. TEMPERATURE CLASSES, AMBIENT TEMPERATURE, MAX. POWER DISSIPATION

Maximum power dissipation [W]				
T _{amb}	Temp. class T6, or surface temp. 85° C	For all variety of enclosures Position horizontally/vertically	Temp. class T5, or surface temp. 100°C	For all variety of enclosures Position horizontally/vertically
40°C	$\Delta 0 \leq 40 \text{ K}$	22 / 17	$\Delta 0 \leq 55 \text{ K}$	32 / 26
55°C	$\Delta 0 \leq 25 \text{ K}$	13 / 10	$\Delta 0 \leq 40 \text{ K}$	22 / 17
70°C	$\Delta 0 \leq 10 \text{ K}$	4.5 / 3.5	$\Delta 0 \leq 25 \text{ K}$	13 / 10
85°C	N/A	---	$\Delta 0 \leq 10 \text{ K}$	4.5 / 3.5

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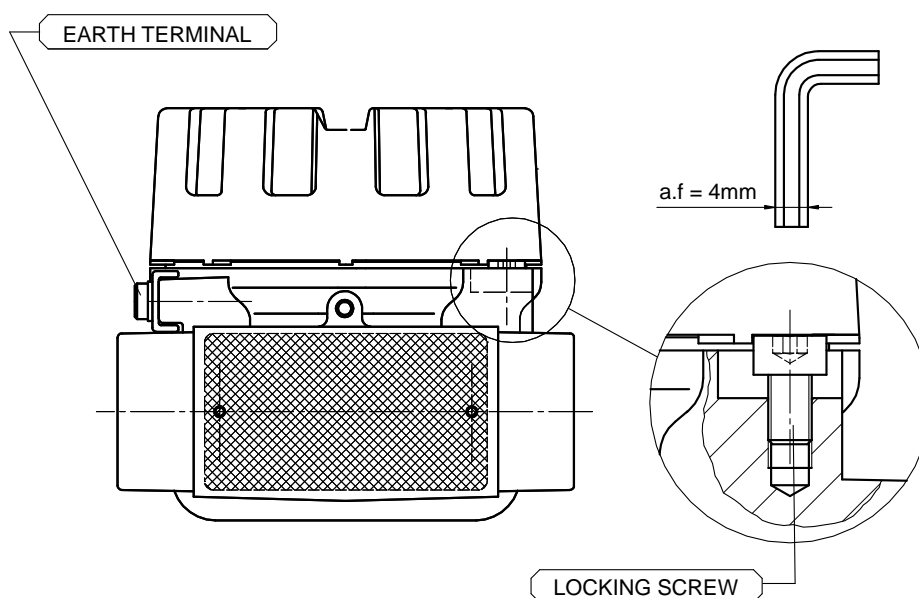
5. EARTH AND PROTECTION TERMINALS

To these terminals can be connected with both solid wire and stranded wire cables as shown in the table below.

Place	Type	Cable cross section [mm ²]	
		Standard wire	Solid wire
Inside	Protection terminal	1.5	2.5
Outside	Earth terminal	4.0	6.0

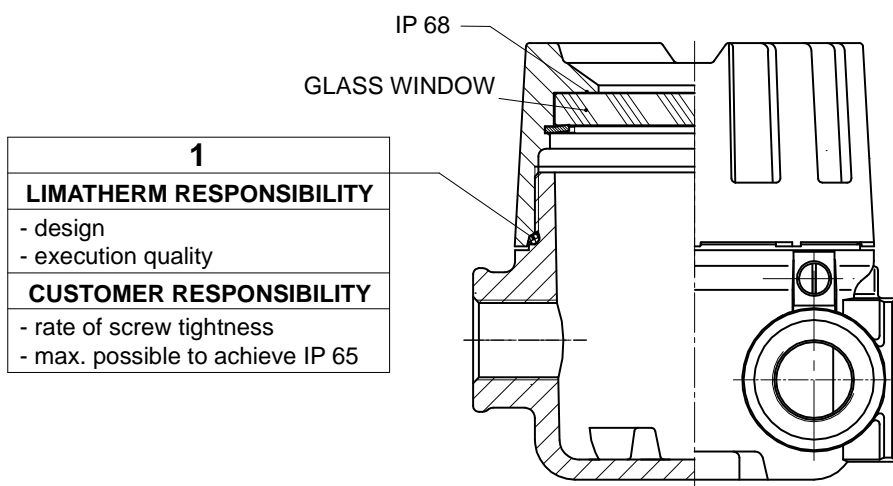
6. COVER LOCKING

Cover is locked by screw with hex socket using hex spanner with across flat 4[mm].

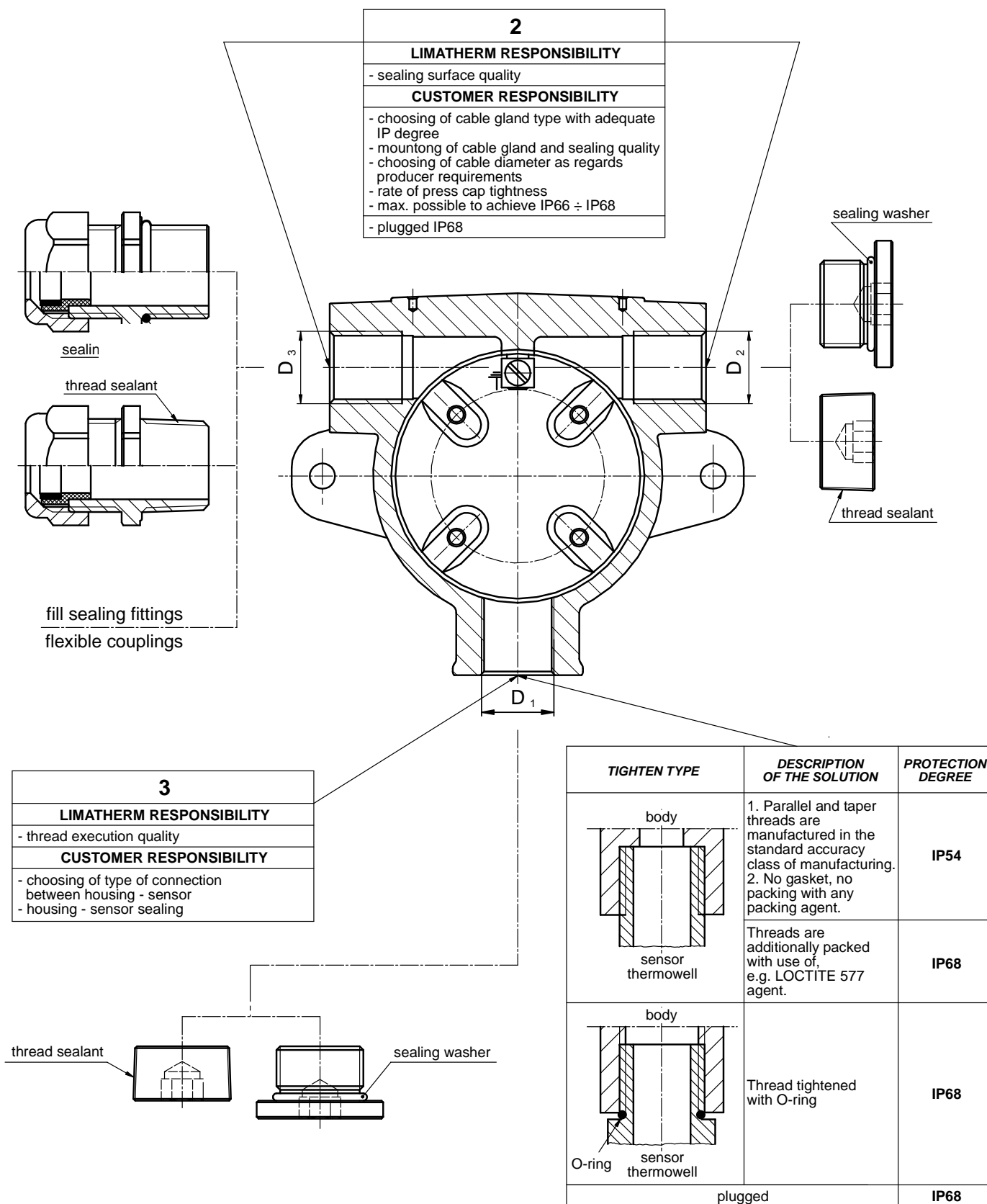


7. PROTECTION DEGREE

There are three places deciding of IP degree.



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Protection degree for elements			Total protection degree Possible to achieving
1	2	3	
	D ₂ , D ₃	D ₁	
IP 65	IP 66	IP 54	IP 54
	IP 67	IP 68	IP 65
	IP 68		
	plugged IP 68		

! ATTENTION !

It is required min IP65 protection for instruments designed for dust zones.

(Besides zone 22, non-conductive dust, where min IP54 protection is required)

8. WAY OF MOUNTING**NOTES**

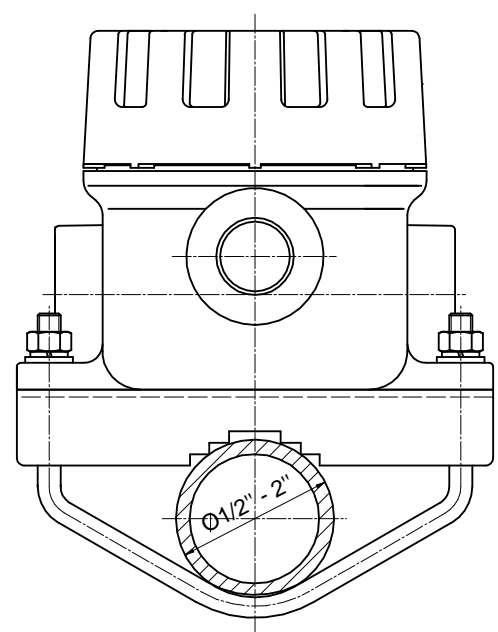
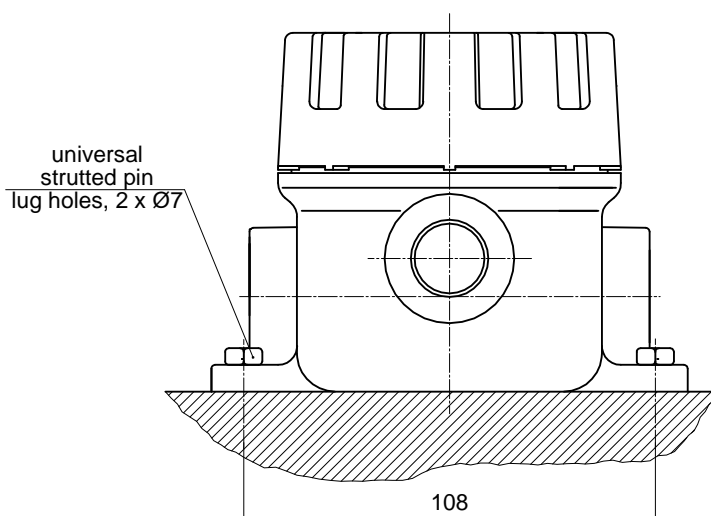
It is important to be careful when screw on or undo a cover. Thread surface should be free of any grains, pellets and other impurity, which cause seizing, and thread could be damaged.

! Never screw on the cover forcefully !

In case of necessities of opening of the connection head's cover after operation in maximum temperature it can be blocked (does not give to open with the hand).

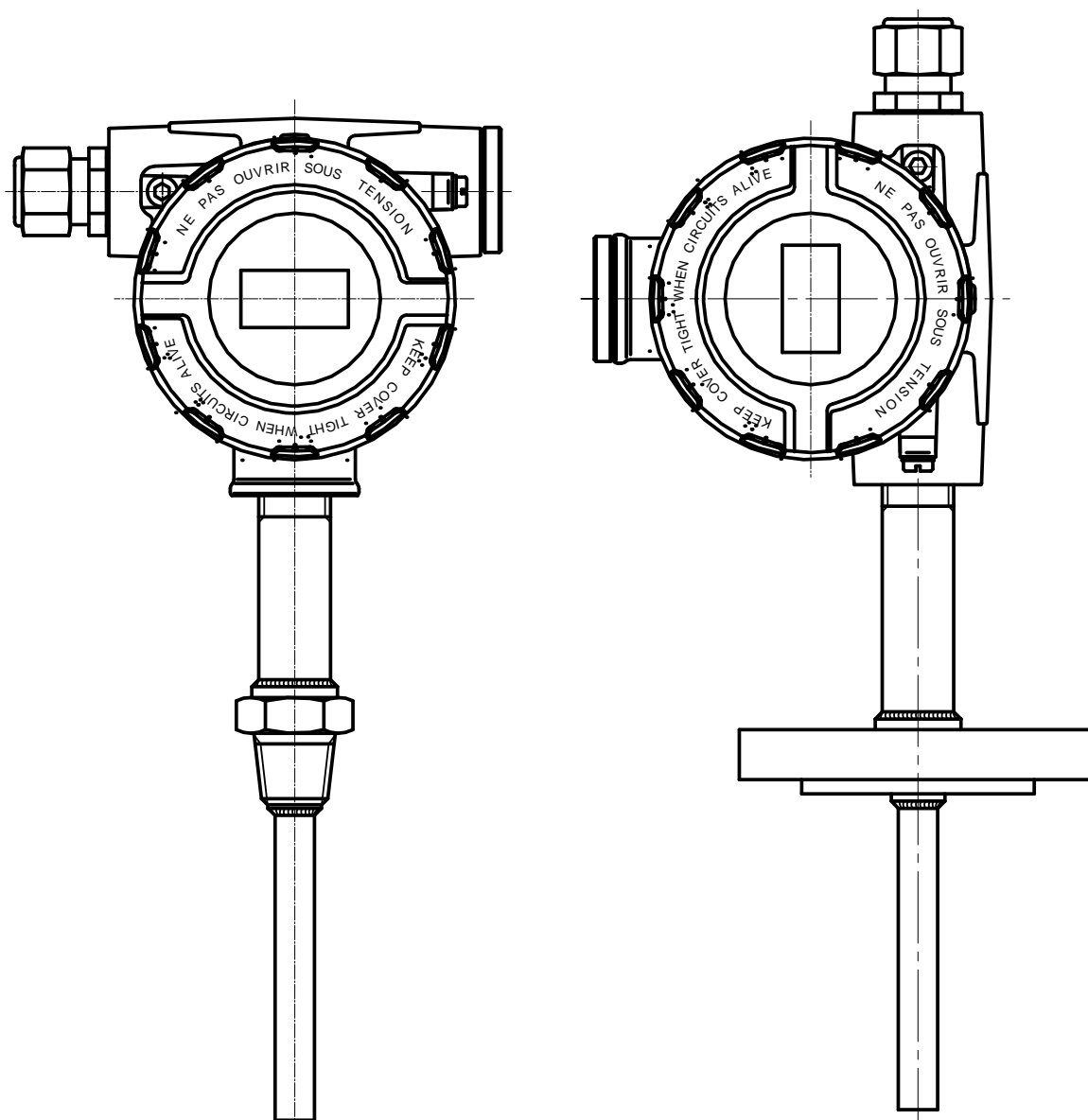
In such case keep cover tensioned with the hand to opening and hit delicate with rubber hammer into cover.

a) WAY OF FIXING to the WALL and to the PIPE – types XD-I80, XD-80win (with lugs)



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b) WAY OF MOUNTING with the SENSOR – types XD-I80C, XD-I80Cwin (without lugs)



9. MARKING

According to standards: ATEX 94/9/EC, EN 60079-0, EN 60079-1, EN 60079-31 marking of the XD-I80... series is as follow:

LIMATHERM 34-600 Limanowa
Type: **XD-I80** POLAND
1026 Ex II2G Ex d IIC Gb
Ex II2D Ex tb IIIC Db
FTZU 04 ATEX 0265U
Ex d IIC Gb, Ex tb IIIC Db, IP65
IECEx FTZU 13.xxxxU

LIMATHERM 34-600 Limanowa
Type: **XD-I80win** POLAND
1026 Ex II2G Ex d IIC Gb
Ex II2D Ex tb IIIC Db
FTZU 04 ATEX 0265U
Ex d IIC Gb, Ex tb IIIC Db, IP65
IECEx FTZU 13.xxxxU

LIMATHERM 34-600 Limanowa
Type: **XD-I80C** POLAND
1026 Ex II2G Ex d IIC Gb
Ex II2D Ex tb IIIC Db
FTZU 04 ATEX 0265U
Ex d IIC Gb, Ex tb IIIC Db, IP65
IECEx FTZU 13.xxxxU

LIMATHERM 34-600 Limanowa
Type: **XD-I80Cwin** POLAND
1026 Ex II2G Ex d IIC Gb
Ex II2D Ex tb IIIC Db
FTZU 04 ATEX 0265U
Ex d IIC Gb, Ex tb IIIC Db, IP65
IECEx FTZU 13.xxxxU

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Each housing is equipped with this label. The label can be glued on the outside surface or put inside. It's up to customer. Instruments producer should apply additional own label with the rest marking of complete sensor or transfer valuable information from Limatherm's label to instrument label. This Application Manual with drawing of the marking label will be attached to each batch of housing.

