

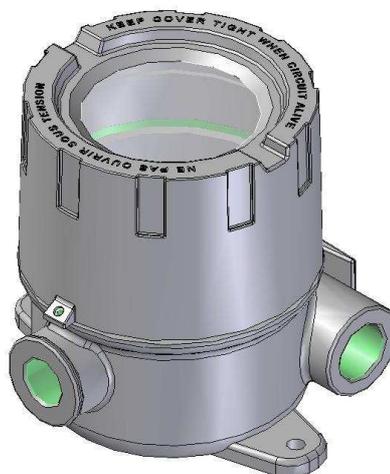


N-L2237

Updated 02.08.2012

# APPLICATION MANUAL

## Flameproof Ex d Universal Instrument Housing Type: **XD-I, XD-Iwin, XD-ILwin, XD-IH, XD-IHwin**



### Contents:

1. Destination.
2. Flameproof joints, process opening, conduit openings.
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## NOTES OF SAFETY

The XD-I... series are designed to accommodate various electronic instruments. If used incorrectly it is possible that application-related dangers may arise. The XD-I... universal instrument housing may be used by qualified and authorized company and people only, under strict observance of these application manual and relevant standards, legal requirements, and, where appropriate the certificate.

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

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## 1. DESTINATION .

Universal instrument housing XD-I... series are designed to accommodate different electronic instruments or devices working in hazardous areas:

- Marking:

94/9/EC	IECEX
 II 2G Ex d IIC Gb  II 2D Ex t IIIC Db	Ex d IIC Gb Ex t 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 <sub>serv</sub>		
	TPE rubber (oil-proof)	VQM rubber (silicone)	FKM rubber
XD-I, XD-IH	-40 ÷ 100 °C	-40 ÷ 100 °C	-20 ÷ +200 °C
XD-Iwin, XD-ILwin, XD-IHwin	-40 ÷ +85 °C	-40 ÷ +85 °C	-20 ÷ +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

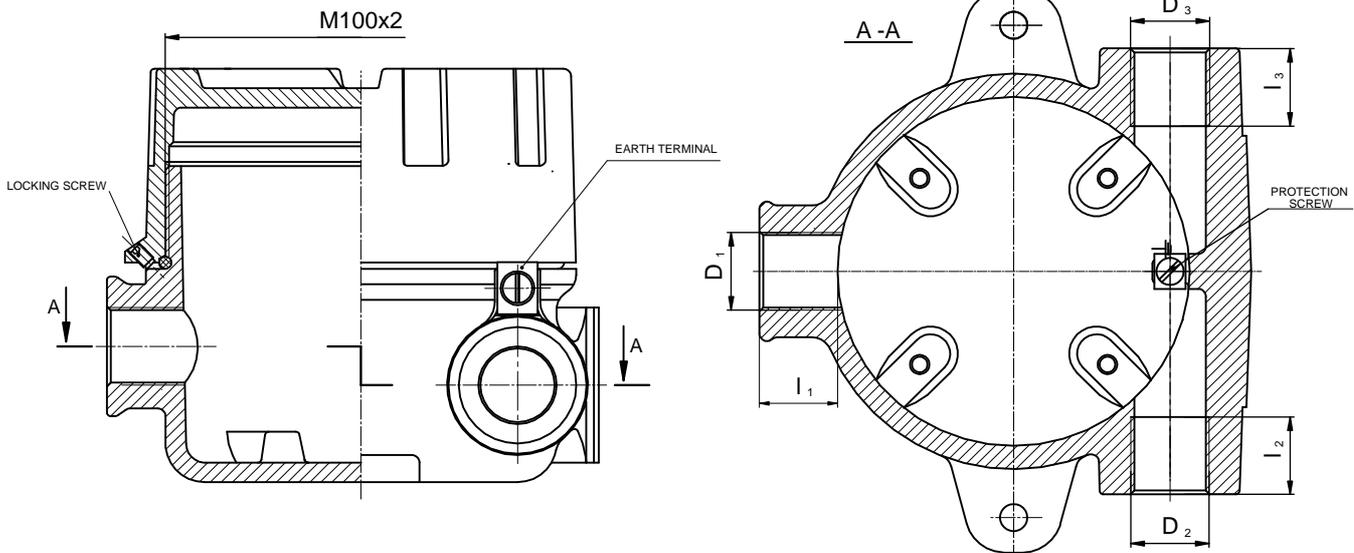
There are four flameproof joints in XD-I, XD-Iwin, XD-ILwin, XD-IH, XD-IHwin housing :

1. on the cover thread M100x2
2. on conduit openings D<sub>3</sub>, D<sub>2</sub> for cable gland:
  - threaded holes M20x1.5; M24x1.5; M25x1.5; ½NPTmod; ¾NPTmod.
3. on process opening D<sub>1</sub> for thermowell or sensor:
  - threaded holes: M20x1.5; M24x1.5; M25x1.5; M27x2; ½NPTmod; ¾NPTmod

All four flameproof joints are designed for :

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

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Cylindrical metric threaded joints: cover thread and D <sub>1</sub> , D <sub>2</sub> , D <sub>3</sub>		
Standard EN 60079-1 requirements	Achieved value	
• pitch: ≥ 0.7 mm	cover	2 mm
	D <sub>1</sub> , D <sub>2</sub> , D <sub>3</sub> openings	1.5 mm or 2mm
• threads form and quality of fit: medium or fine tolerance quality according to ISO 965-1 and ISO 965-3	cover	6H / 6g
	D <sub>1</sub> , D <sub>2</sub> , D <sub>3</sub> openings	6H 6g of male part should be ensured by customer
• threads engaged: ≥ 5	cover	10
	D <sub>1</sub> , D <sub>2</sub> , D <sub>3</sub> openings	should be ensured by customer, possible to reach: 13 or 10
• depth of engagement : ≥ 8 mm	cover	18 mm
	D <sub>1</sub> , D <sub>2</sub> , D <sub>3</sub> openings	should be ensured by customer, possible to reach: 20 mm
Taper NPT threaded joints: D <sub>1</sub> , D <sub>2</sub> , D <sub>3</sub>		
Standard EN 60079-1 requirements	Achieved value	
• threads provided on each parts: ≥ 5	7 male part should be ensured by customer	
<b>Standard Pipeline taper threads which meet above requirements must be modified. The way of modification is described in Annex for OIT-17/03</b>		

Each type of parallel threads: M20x1.5; M24x1.5; M25x1.5; M27x2 is adapted to create explosionproof joint. Also taper threads: 1/2NPTmod; 3/4NPTmod 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<sub>1</sub> , D<sub>2</sub> and D<sub>3</sub> can be plugged.

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### 3. CARRIED OUT TESTS

#### a) FOR NON TRANSMISSION OF AN INTERNAL IGNITION

Process holes D <sub>1</sub>	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 <sub>2</sub> , D <sub>3</sub>	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, UNI 6125-74

D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> threads and fixed to them threaded male parts sensor, 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 50 bar no routine test is required when reference pressure of final assembly (XD-I.. with additional volume comes from thermowells, conduit, pipe, etc.) is not higher than 15,5 bars.

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

Maximum power dissipation [W]				
T <sub>amb</sub>	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	$\Delta 0 \leq 40$ K	26 / 20	$\Delta 0 \leq 55$ K	38 / 33
55°C	$\Delta 0 \leq 25$ K	15 / 11	$\Delta 0 \leq 40$ K	26 / 20
70°C	$\Delta 0 \leq 10$ K	5 / 4	$\Delta 0 \leq 25$ K	15 / 11
85°C	N/A	—————	$\Delta 0 \leq 10$ K	5 / 4

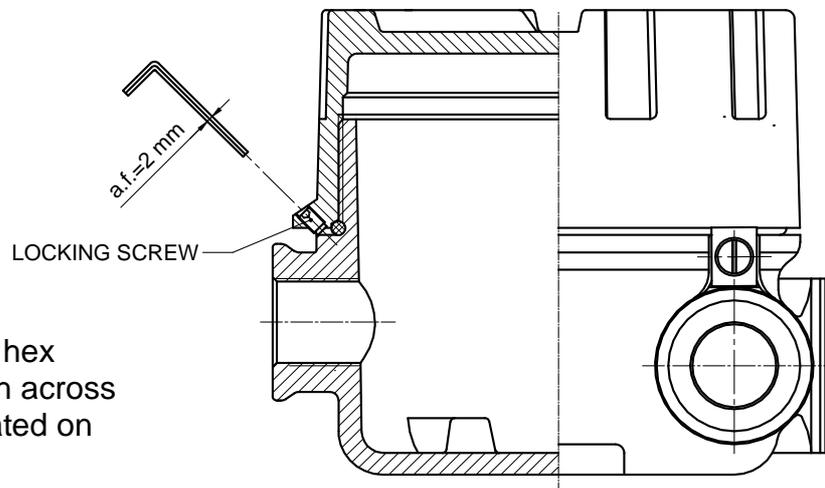
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**5. EARTH AND PROTECTION TERMINALS**

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

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

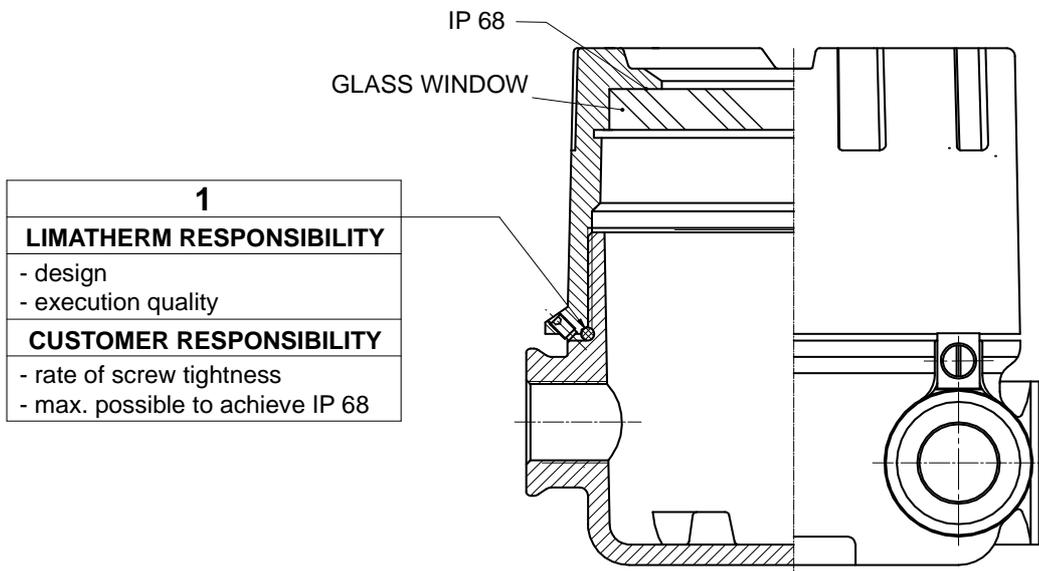
**6. COVER LOCKING**



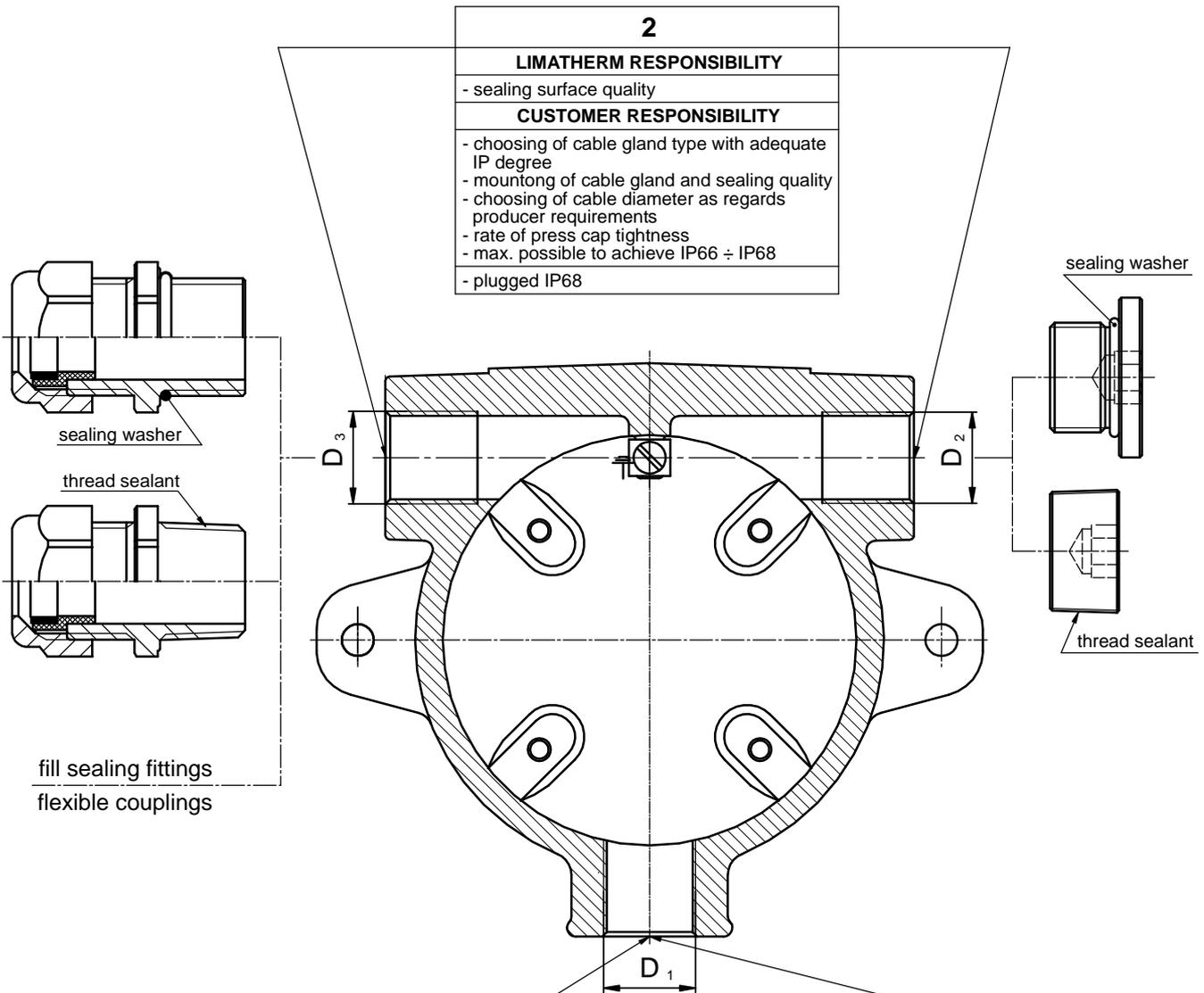
Cover is locked by screw with hex socketed using hex spanner with across flat 2 [mm]. This screw is situated on the cover boss.

**7. PROTECTION DEGREE**

There are three places deciding of IP degree.

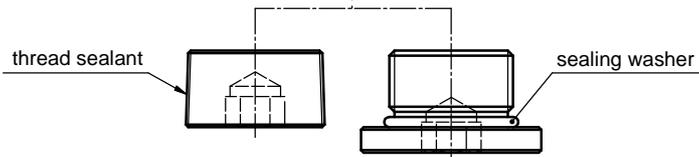


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<b>2</b>
<b>LIMATHERM RESPONSIBILITY</b>
- sealing surface quality
<b>CUSTOMER RESPONSIBILITY</b>
- choosing of cable gland type with adequate IP degree
- mounting of cable gland and sealing quality
- choosing of cable diameter as regards producer requirements
- rate of press cap tightness
- max. possible to achieve IP66 ÷ IP68
- plugged IP68

<b>3</b>
<b>LIMATHERM RESPONSIBILITY</b>
- thread execution quality
<b>CUSTOMER RESPONSIBILITY</b>
- choosing of type of connection between housing - sensor
- housing - sensor sealing



TIGHTEN TYPE	DESCRIPTION OF THE SOLUTION	PROTECTION DEGREE
 body sensor thermowell	1. Parallel and taper threads are manufactured in the standard accuracy class of manufacturing. 2. No gasket, no packing with any packing agent.	<b>IP54</b>
 body sensor thermowell	Threads are additionally packed with use of, e.g. LOCTITE 577 agent.	<b>IP68</b>
 body O-ring sensor thermowell	Thread tightened with O-ring	<b>IP68</b>
plugged		<b>IP68</b>

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Protection degree for elements				Total protection degree possible to achieving
1	2		3	
	D <sub>2</sub>	D <sub>3</sub>	D <sub>1</sub>	
IP 68	IP 66	plugged (IP 68)	IP 54	IP 54
IP 68	IP 66	plugged (IP 68)	IP 68	IP 66
IP 68	IP 67	plugged (IP 68)	IP 68	IP 67
IP 68	IP 68	plugged (IP 68)	IP 68	IP 68

**! ATTENTION !**

**Protection IP68 refers to depth 1,0m of submersion under water.**

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

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

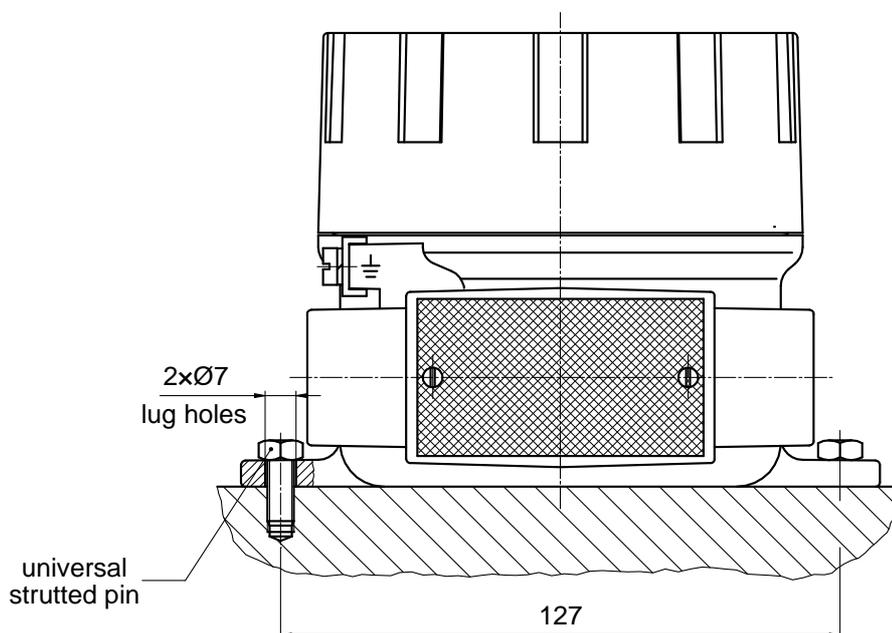
**8. WAY OF MOUNTING**

**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.



### 9. MARKING

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According to standards:  
ATEX 94/9/EC

- EN 60079-0, IEC 60079-0
- EN 60079-1, IEC 60079-1
- EN 60079-31, IEC 60079-31

marking of the XD-I... series is as follow:

LIMATHERM 34-600 Limanowa  
Type: **XD-I** POLAND  
1026  II2G Ex d IIC Gb  
 II2D Ex tb IIIC Db  
FTZU 03 ATEX 0207U  
Ex d IIC Gb, Ex tb IIIC Db, IP68  
IECEX FTZU 12.0017U

LIMATHERM 34-600 Limanowa  
Type: **XD-Iwin** POLAND  
1026  II2G Ex d IIC Gb  
 II2D Ex tb IIIC Db  
FTZU 03 ATEX 0207U  
Ex d IIC Gb, Ex tb IIIC Db, IP68  
IECEX FTZU 12.0017U

Each housing is equipped with the 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. To each batch of housing will be attached also this Application Manual with drawing of the marking label.

