N-L3625
Updated 11.09.2012

APPLICATION MANUAL

Flameproof Ex d
Universal Instrument Housing Type:
XD-SI, XD-SIwin, XD-SILwin,

Contents:
1. Destination.
2. Flameproof joints, process opening, conduit openings.
3. Carried out tests.
4. Temperature classes, ambient temperature, power dissipation.
5. Earth and protection terminals.
6. Cover locking.
7. Protection degree.
8. Way of fixing to the wall.
9. Marking.

NOTES OF SAFETY
The XD-SI, XD-SIwin, XD-SILwin series are designed to accommodate various electronic instruments. If used incorrectly it is possible that application-related dangers may arise.
The XD-SI, XD-SIwin, XD-SILwin 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.

Only the empty XD-SI... 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-SI... series are designed to accommodate different electronic instruments or devices working in hazardous areas:

- Marking:

	ATEX 94/9/EC	*IECEx*
	I M2 Ex d I Mb	Ex d I Mb
	II2G Ex d IIC Gb	Ex d IIC Gb
	II2D Ex tb IIIC Db	Ex tb IIIC Db

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

Service temperature

Housing type	T_{serv} o-ring VQM rubber (silicon)	T_{serv} o-ring FKM rubber
XD-SI	-50 to +150 ℃	-20 to + 200 ℃
XD-Siwin, XD-SILwin	-50 to + 85 ℃	-20 to + 85 ℃

Possible zone application

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

! The enclosure with Ex component certificate shall be applicated only by assumption of filling requests of the standard EN 60079-1:2009 cl.D.3.10 **!**

2. FLAMEPROOF JOINTS, PROCESS OPENING, CONDUIT OPENINGS

There are four flameproof joints in XD-SI housing:

1. on the cover thread M100×2
2. on conduit openings D_3, D_2 for cable gland:
   - threaded holes: M20×1.5; M24×1.5; M25×1.5; ½NPTmod; ¾NPTmod.
3. on process opening D_1 for thermowell or sensor :
   - threaded hole : M20×1.5; M24×1.5; M25×1.5; M27×2; ½NPTmod; ¾NPTmod

All four flameproof joints are designed for :

- volume $100 < V \leq 1500$ cm^3
- group IIC and I enclosures

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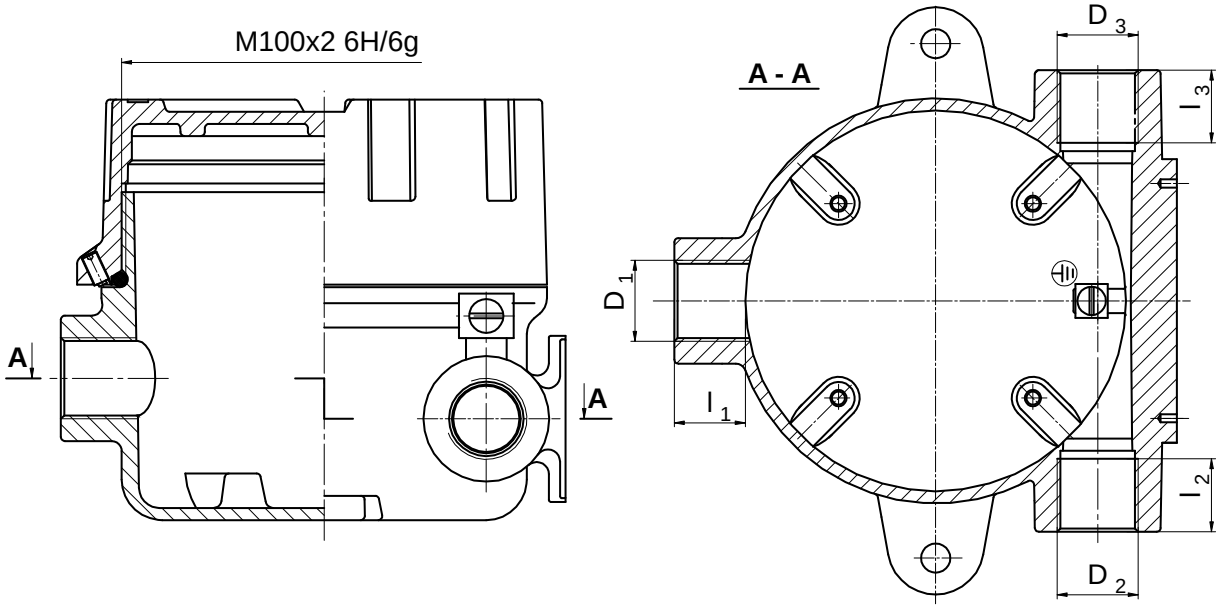

Cylindrical threaded joints: cover thread and D_1 , D_2 , D_3		
Standard EN 60079-1 requirements	Achieved value	
	Metric	
• pitch: ≥ 0.7 mm	cover	2 mm
	D_1, D_2, D_3 openings	1.5 mm or 2 mm
• threads form and quality of fit: medium or fine tolerance quality according to ISO 965-1 and ISO 965-3	cover	6H / 6g
	D_1, D_2, D_3 openings	6H 6g of male thread should be ensured by customer
• threads engaged: ≥ 5	cover	10
	D_1, D_2, D_3 openings	should be ensured by customer, possible to reach: 13 or 10
• depth of engagement : ≥ 8 mm	cover	18 mm
	D_1, D_2, D_3 openings	should be ensured by customer, possible to reach: 18 mm

Taper NPT threaded joints: D_1 , D_2 , D_3	
Standard EN 60079-1 requirements	Achieved value
• threads provided on each parts: ≥ 5	8 ÷ 9 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: M20×1.5; M24×1.5; M25×1.5; M27×2; is adapted to create explosionproof joint. Also taper threads: ½NPTmod; ¾NPTmod 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.

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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.

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**
M20×1.5 M24×1.5 M25×1.5 M27×2 ½NPTmod ¾NPTmod	tested - together with plugs
Conduit holes D_2, D_3	**EN 60079-1 p. 15.2.2.1 test**
M20×1.5 M24×1.5 M25×1.5 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.

D_1, D_2, D_3 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

It was carried out 4 times reference pressure test, according to clause 15.1.3.1 of EN 60079-1:
- type XD- SI; XD-SIwin – 41 bar;
- type XD-SILwin – 34 bar.

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	Δ 0 ≤ 40 K	20,0 / 15,0	Δ 0 ≤ 55 K	29,0 / 24,0
55°C	Δ 0 ≤ 25 K	11,0 / 8,5	Δ 0 ≤ 40 K	20,0 / 15,0
70°C	Δ 0 ≤ 10 K	3,6 / 3,1	Δ 0 ≤ 25 K	11,0 / 8,5
85°C	N/A		Δ 0 ≤ 10 K	3,6 / 3,1

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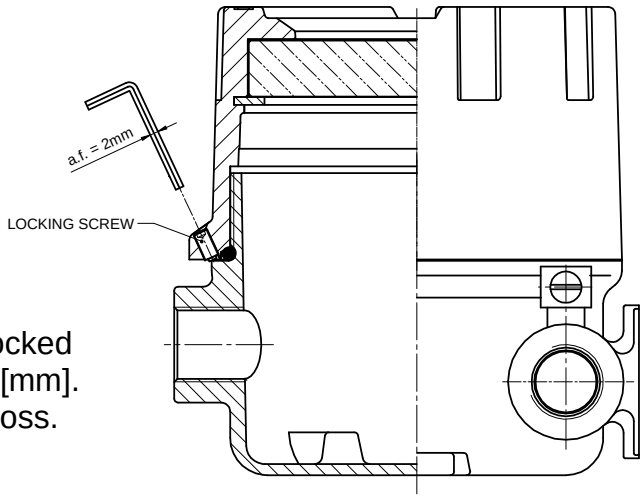
5. EARTH AND PROTECTION TERMINALS

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]	
		Stranded wire	Solid wire
Inside	Protection terminal	1.5	2.5
Outside	Earth terminal	4.0	6.0

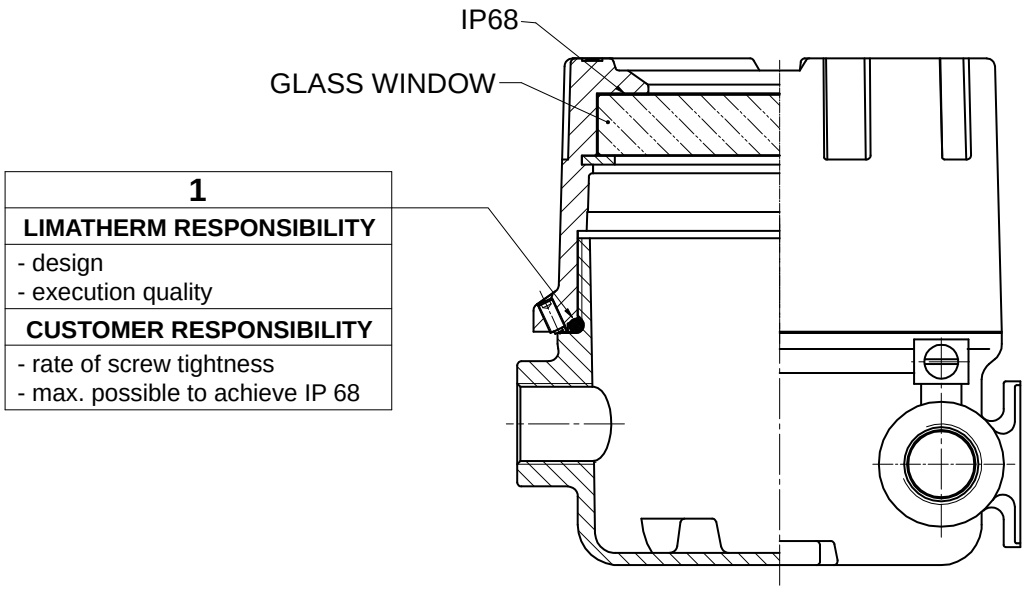
6. COVER LOCKING



Cover is locked by screw with hex socked 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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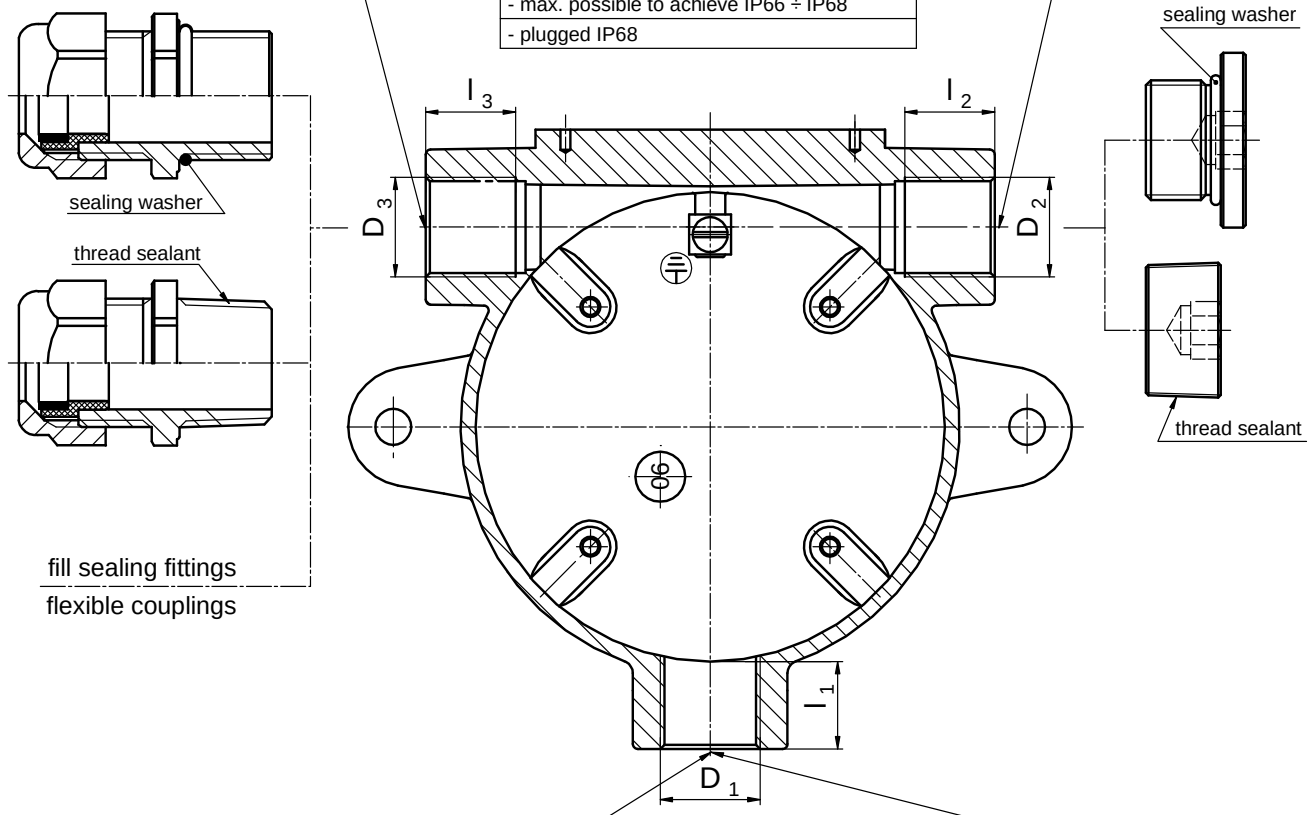
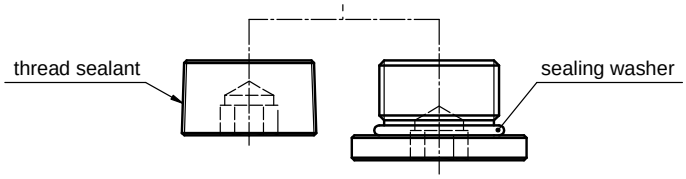
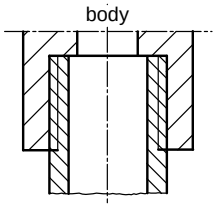
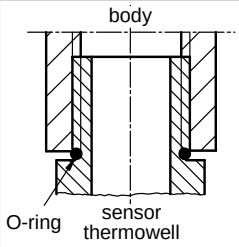
2
LIMATHERM RESPONSIBILITY
- sealing surface quality
CUSTOMER RESPONSIBILITY
- choosing of cable gland type with adequate IP degree - mountong of cable gland and sealing quality - choosing of cable diameter as regards producer requirements - rate of press cap tightness - max. possible to achieve IP66 ÷ IP68
- plugged IP68



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



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

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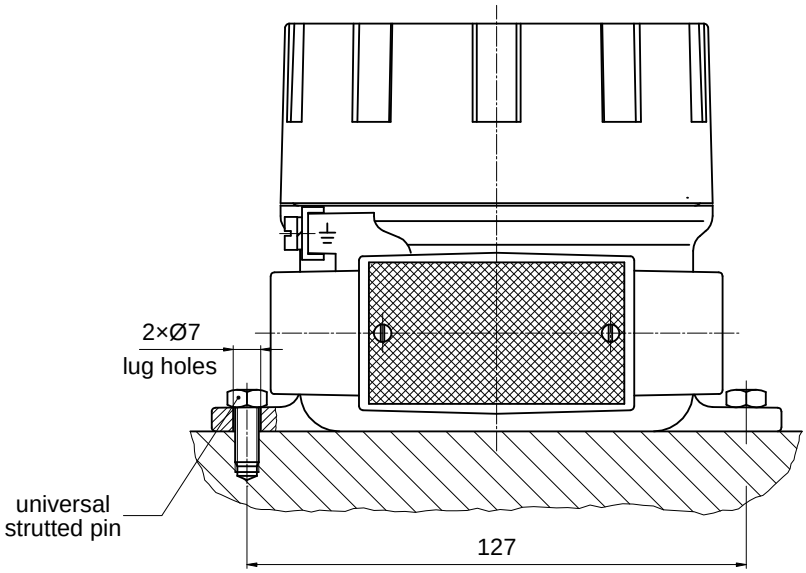
Protection degree for elements				Total protection degree possible to achieving
1	2		3	
	D_2	D_3	D_1	
IP 68	IP 66	plugged (IP 68)	IP 54	IP 54
IP 68	IP 66	plugged (IP 68)	IP 68	IP 66
IP 68	IP 67	plugged (IP 68)	IP 68	IP 67
IP 68	IP 68	plugged (IP 68)	IP 68	IP 68

! 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 FIXING HOUSING TO THE WALL



9. MARKING

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

Limatherm S.A. Poland Type: **XD-SI**
1026 Ex I M2 Ex d I Mb
1026 Ex II 2G Ex d IIC Gb
1026 Ex II 2D Ex tb IIIC Db
FTZU 07 ATEX 0002 U
M2 Ex d I Mb, Ex d IIC Gb, Ex tb IIIC Db
IECEx FTZU 10.0010U

Limatherm S.A. Poland Type: **XD-SIwin**
1026 Ex I M2 Ex d I Mb
1026 Ex II 2G Ex d IIC Gb
1026 Ex II 2D Ex tb IIIC Db
FTZU 07 ATEX 0002 U
M2 Ex d I Mb, Ex d IIC Gb, Ex tb IIIC Db
IECEx FTZU 10.0010U

Limatherm S.A. Poland Type: **XD-SILwin**
1026 Ex I M2 Ex d I Mb
1026 Ex II 2G Ex d IIC Gb
1026 Ex II 2D Ex tb IIIC Db
FTZU 07 ATEX 0002 U
M2 Ex d I Mb, Ex d IIC Gb, Ex tb IIIC Db
IECEx FTZU 10.0010U

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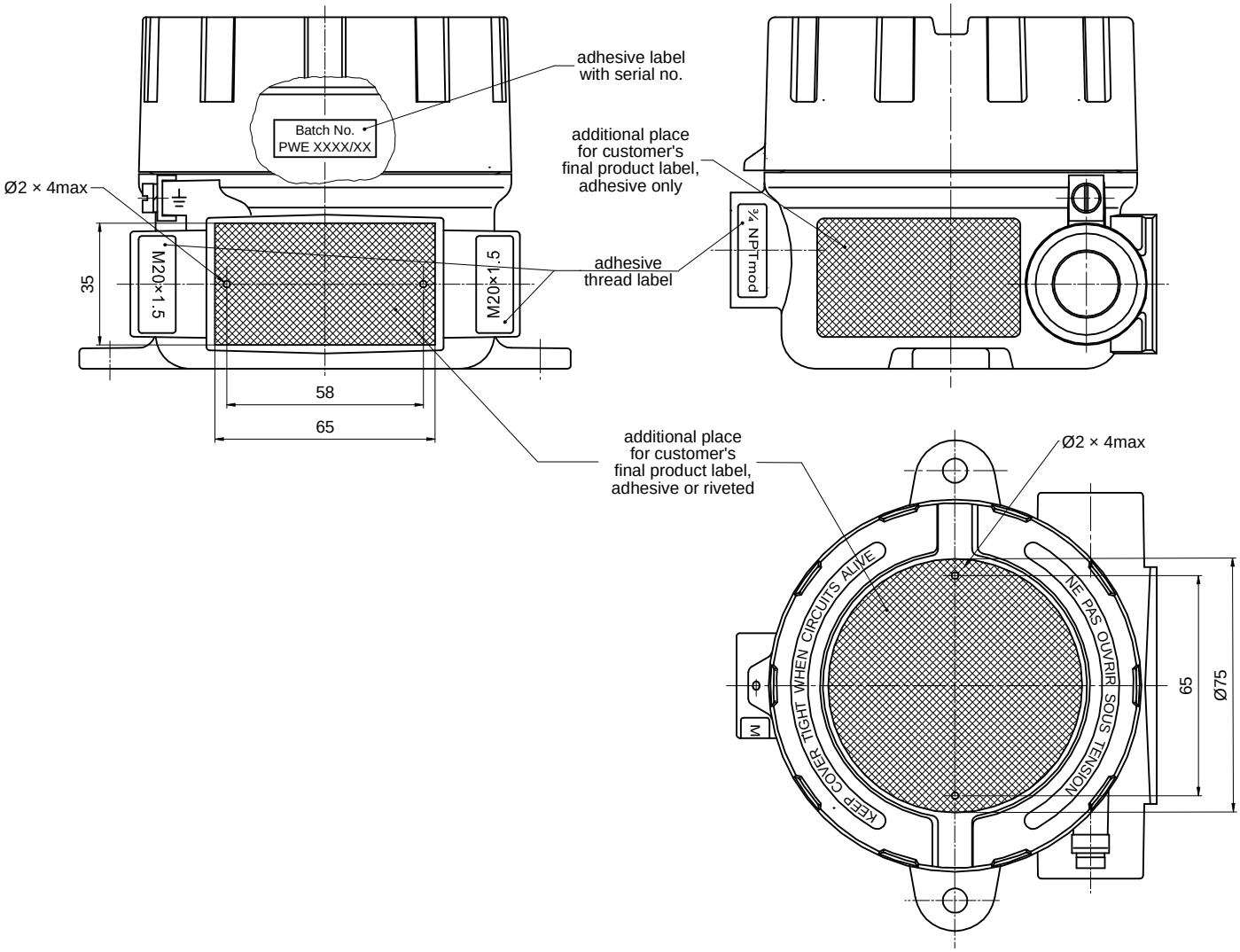
Each housing can be equipped with this label. The label can be glued on the outside surface or put inside. It's up to customer. Instruments producer should apply additional own label with the rest marking of complete sensor or transfer valuable information from Limatherm's label to instrument label.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



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