



Updated 23.11.2015

# APPLICATION MANUAL N-L2442

Explosionproof Ex d connection head  
Type: **XD-AD...** , **XD-AH...** , **XD-AB...** **Series**

Explosionproof field transmitter housing  
Type: **XD-ADF...** , **XD-AHF...** , **XD-ABF...** **Series**

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## NOTES OF SAFETY

The **XD-A...** connection head, and field transmitter housing **XD-A...F...** are designed to accommodate various electronic instruments. If used incorrectly it is possible that application-related dangers may arise.

The **XD-A...** connection head and field transmitter 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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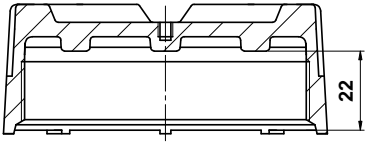
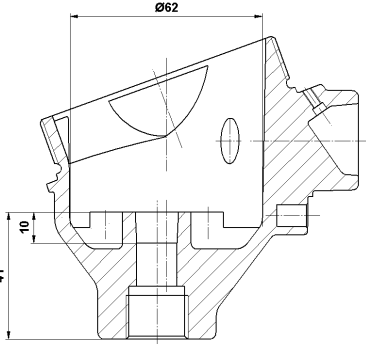
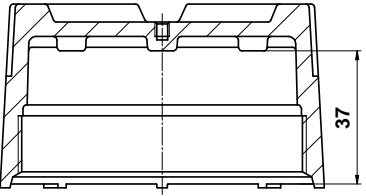
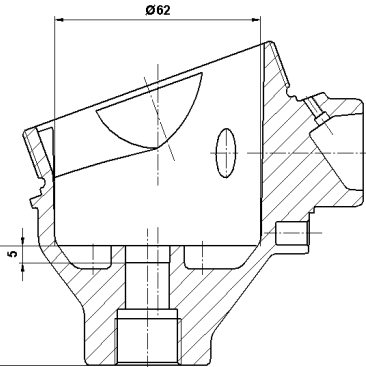
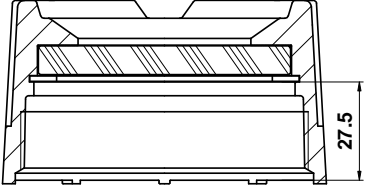
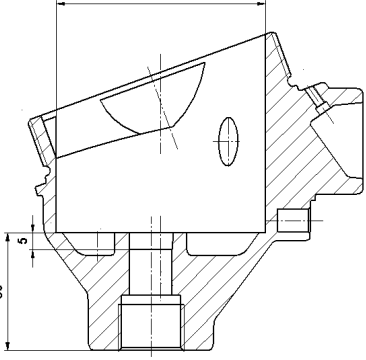
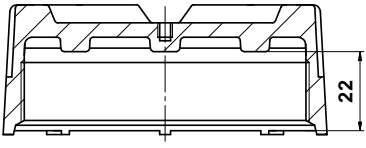
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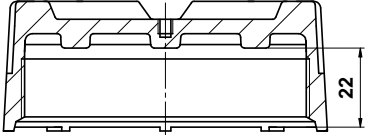
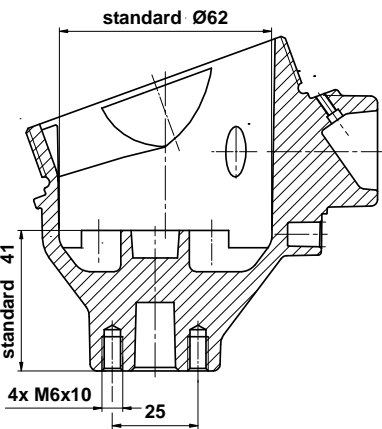
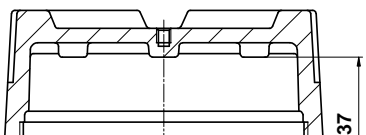
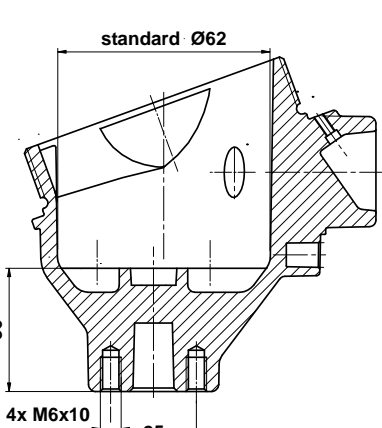
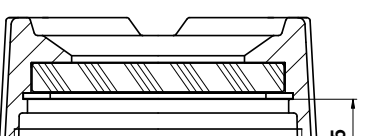
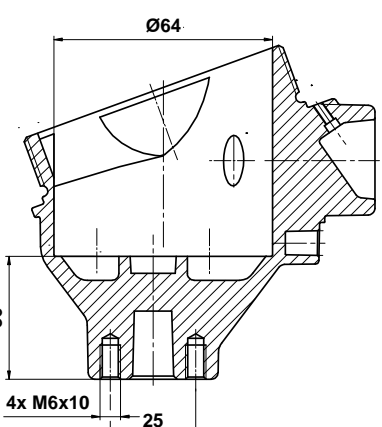
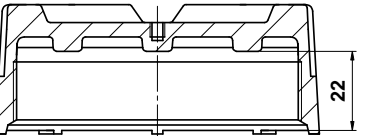
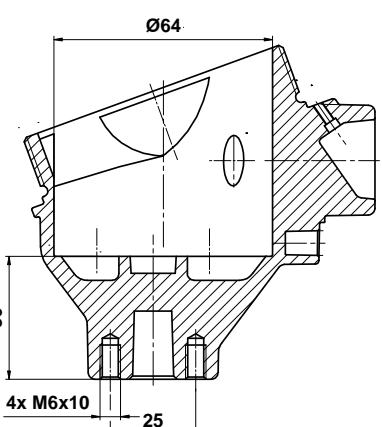
Only the empty XD-A..., XD-ADF... housing is certified. When used as part of an end product assembly, subsequent Approval by FM Approvals or CSA of the end use equipment assembly is required.

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## 1. VARIETY, MARKS AND COVER - BODY FITING OF XD-A... Series.

Type of cover	Type of body	Typed of connetion head
<b>1</b>  no letter mark, standard high, blind	<b>A</b>  AD - standard size	<b>1 + A</b> → XD-AD <b>1 + B</b> → XD-AH <b>1 + C</b> → XD-AB
<b>2</b>  H – higher, blind	<b>B</b>  AH - 5 mm deeper	<b>2 + A</b> → XD-ADH <b>2 + B</b> → XD-AHH <b>2 + C</b> → XD-ABH
<b>3</b>  win – window cover	<b>C</b>  AB - 5 mm deeper 2 mm wide	<b>3 + A</b> → XD-ADwin <b>3 + B</b> → XD-AHwin <b>3 + C</b> → XD-ABwin
<b>4</b>  EH – Endress+Hauser standard		<b>4 + A</b> → XD-ADEH <b>4 + B</b> → XD-AHEH <b>4 + C</b> → XD-ABEH

Type of cover	Type of body	Typed of connetion head
<p><b>1</b></p>  <p>no letter mark, standard high, blind</p>	<p><b>A</b></p>  <p>standard <math>\varnothing 62</math></p> <p>standard 41</p> <p>4x M6x10</p> <p>25</p> <p>ADF - standard size</p>	<p><b>1 + A</b> → XD-ADF</p> <p><b>1 + B</b> → XD-AHF</p> <p><b>1 + C</b> → XD-ABF</p>
<p><b>2</b></p>  <p>H – higher, blind</p>	<p><b>B</b></p>  <p>standard <math>\varnothing 62</math></p> <p>36</p> <p>4x M6x10</p> <p>25</p> <p>AHF - 5 mm deeper</p>	<p><b>2 + A</b> → XD-ADFH</p> <p><b>2 + B</b> → XD-AHFH</p> <p><b>2 + C</b> → XD-ABFH</p>
<p><b>3</b></p>  <p>win – window cover</p>	 <p><math>\varnothing 64</math></p> <p>36</p> <p>4x M6x10</p> <p>25</p> <p>ABF - 5 mm deeper 2 mm wide</p>	<p><b>3 + A</b> → XD-ADFwin</p> <p><b>3 + B</b> → XD-AHFwin</p> <p><b>3 + C</b> → XD-ABFwin</p>
<p><b>4</b></p>  <p>EH – Endress+Hauser standar</p>	<p><b>C</b></p>  <p><math>\varnothing 64</math></p> <p>36</p> <p>4x M6x10</p> <p>25</p> <p>ABF - 5 mm deeper 2 mm wide</p>	<p><b>4 + A</b> → XD-ADFEH</p> <p><b>4 + B</b> → XD-AHFEH</p> <p><b>4 + C</b> → XD-ABFEH</p>

## 2. DESTINATION.

Connection head **XD-A...** and field transmitter housing **XD-A...F...** are designed to accommodate terminal blocks, head electronic transmitter and for working in hazardous areas:

CERTIFICATIONS	STANDARDS	HAZARDOUS AREAS
	FM 3600 FM 3615 FM 3810 ANSI/NEMA 250	Class I, Groups A, B, C, D Class II, Groups E, F, G Class III NEMA 4x
	ANSI/ISA - 12.00.01 ANSI/ISA - 12.22.01 ANSI/IEC 60529	Class I, Zone 1, AEx d II C, T6, IP66
	CSA C22.2 No.0.4 CSA C22.2 No.0.5 CSA C22.2 No.25 CSA C22.2 No.30 CSA C22.2 No.94	Class I, Groups A, B, C, D Class II, Groups E, F, G Class III Type 4x
	CSA E60079-0 CSA E60079-1 CSA E60529	Class I, Ex d II C, IP66

Ambient temperature

Connection head type	T <sub>serv</sub>	
	o-ring VQM rubber (silicon)	o-ring FKM rubber
XD-A... Series	-50 to +150 ° C	-20 to +200 ° C
XD-A...win Series	-50 to +85 ° C	-20 to +85 ° C

Possible application

USA and Canada		Europe	
Division	Protection Code	Zone	Protection Code
Division 1 Division 2	Explosionproof	Zone 0 , Zone 20	Ex d + Ex ia
		Zone 1 , Zone 21	Ex d
		Zone 2 , Zone 22	Ex d

## 3. FLAMEPROOF JOINTS.

There are three flameproof joints in XD-AD.. connection head :

- on the cover thread - M80x1,5
- D<sub>2</sub>, D<sub>3</sub> on the conduit openings for cable gland:
  - threaded holes : M20x1.5 , ½NPTmod , ¾NPTmod.
- D<sub>1</sub> on process opening for thermowell :
  - threaded holes : M20x1.5, M24x1.5, M27x2, ½NPTmod, ¾NPTmod.

All three flameproof joints are designed for :

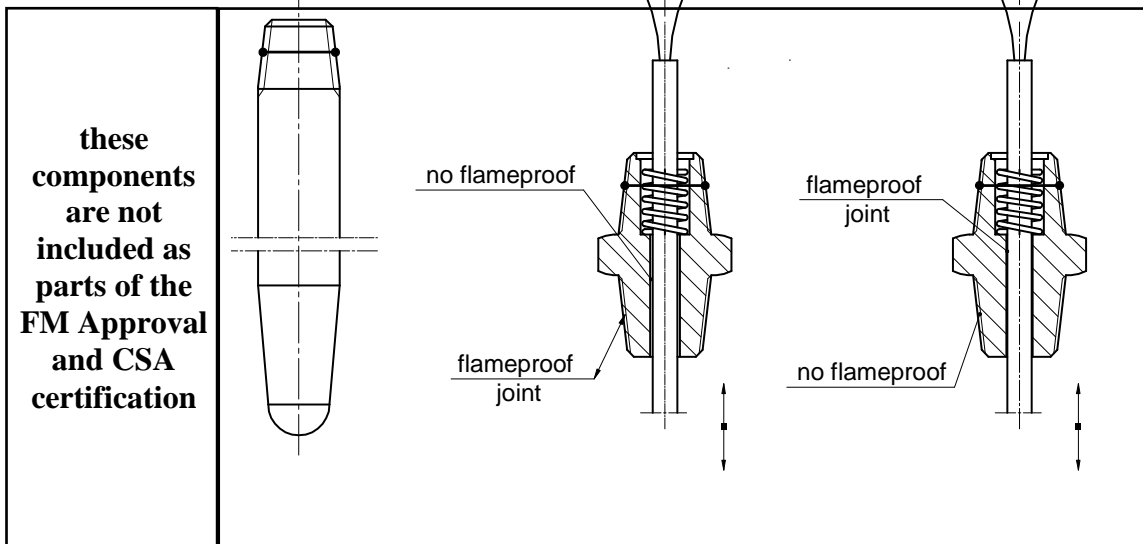
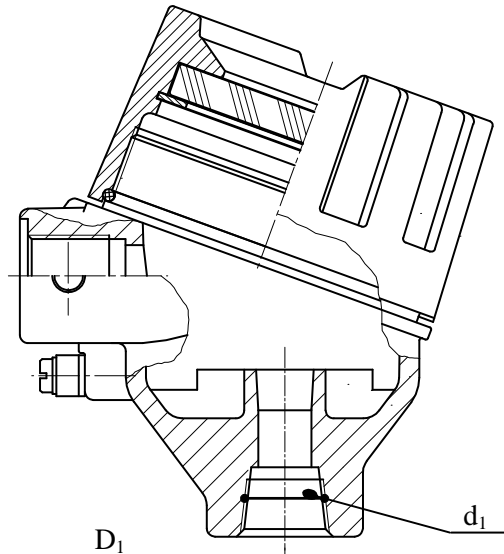
- Volume  $100 < V \leq 500 \text{ cm}^3$
- Gas Group A

CYLINDRICAL THREADED JOINTS: COVER THREAD AND $D_1, D_2, D_3$			
STANDARD VALUE		ACHIEVED VALUE	
		Cover	$D_1, D_2, D_3$
<b>FM 3615</b>	<ul style="list-style-type: none"> <li>• pitch <math>\geq 1.27 \text{ mm}</math></li> <li>• depth of engaged -</li> <li>• threads engaged <math>\geq 7 \text{ threads}</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• 15 mm</li> <li>• 9.5 thds</li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• <math>D_1 = 14 \text{ mm}</math> (16mm for M27x2) <math>D_2, D_3 = 20 \text{ mm}</math></li> <li>• <math>D_1 = 9 \text{ th}</math> (8 th for M27x2) <math>D_2, D_3 = 13 \text{ th}</math></li> </ul>
<b>CSA C22.2 No. 30</b>	<ul style="list-style-type: none"> <li>• pitch <math>\geq 1.27 \text{ mm}</math></li> <li>• threads engaged <math>\geq 8 \text{ Class 1 fit}</math></li> <li>• width of engaged <math>\geq 12.5 \text{ mm}</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• 9.5 thds 6H/6g</li> <li>• 15 mm</li> </ul>	-
<b>ANSI/ISA – 12.22.01</b>	<ul style="list-style-type: none"> <li>• pitch <math>\geq 0.7 \text{ mm}</math></li> <li>• depth of engaged <math>\geq 8 \text{ mm}</math></li> <li>• threads engaged <math>\geq 5 \text{ thds}</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• 15 mm</li> <li>• 9.5 thds</li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• <math>D_1 = 14 \text{ mm}</math> (16mm for M27x2) <math>D_2, D_3 = 20 \text{ mm}</math></li> <li>• <math>D_1 = 9 \text{ th}</math> (8 th for M27x2) <math>D_2, D_3 = 13 \text{ th}</math></li> </ul>
<b>CSA E60079-1</b>	<ul style="list-style-type: none"> <li>• pitch <math>\geq 0.7 \text{ mm}</math></li> <li>• depth of engaged <math>\geq 8 \text{ mm}</math></li> <li>• threads engaged <math>\geq 5 \text{ thds}</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• 15 mm</li> <li>• 9.5 thds</li> </ul>	<ul style="list-style-type: none"> <li>• 1.5 mm</li> <li>• <math>D_1 = 14 \text{ mm}</math> (16mm for M27x2) <math>D_2, D_3 = 20 \text{ mm}</math></li> <li>• <math>D_1 = 9 \text{ th}</math> (8 th for M27x2) <math>D_2, D_3 = 13 \text{ th}</math></li> </ul>
TAPER THREADED JOINTS $D_1, D_2, D_3$			
STANDARD VALUE		ACHIEVED VALUE	
		$D_1, D_2, D_3$	
<b>FM 3615</b>	<ul style="list-style-type: none"> <li>• pitch 1.27 mm</li> <li>• threads provide on each parts: 6 threads</li> <li>• threads engaged 5 threads</li> </ul>	<ul style="list-style-type: none"> <li>• 1.814 mm</li> <li>• 6 thds</li> <li>• 5 thds</li> </ul>	
<b>CSA C22.2 No. 30</b>	<ul style="list-style-type: none"> <li>• min. pitch <math>\geq 0.7 \text{ mm}</math></li> <li>• min threads engaged <math>\geq 5</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.814 mm</li> <li>• 5 thds</li> </ul>	
<b>ANSI/ISA – 12.22.01</b>	<ul style="list-style-type: none"> <li>• pitch <math>\geq 0.9 \text{ mm}</math></li> <li>• threads provided on each part: <math>\geq 6 \text{ thds}</math></li> <li>• threads engaged <math>\geq 5 \text{ thds}</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.814 mm</li> <li>• 6 thds</li> <li>• 5 thds</li> </ul>	
<b>CSA E60079-1</b>	<ul style="list-style-type: none"> <li>• pitch <math>\geq 0.9 \text{ mm}</math></li> <li>• threads provided on each part: <math>\geq 6 \text{ thds}</math></li> <li>• threads engaged <math>\geq 5 \text{ thds}</math></li> </ul>	<ul style="list-style-type: none"> <li>• 1.814 mm</li> <li>• 6 thds</li> <li>• 5 thds</li> </ul>	

Each type of parallel threads: M20x1,5; M24x1,5; M27x2; is adopted to create flameproof joint. Also taper threads:  $\frac{1}{2}$ NPTmod;  $\frac{3}{4}$ NPTmod are modified acc. to standard **FM 3615** and **CSA C22.2 No. 0.5** and can create flameproof joint with threaded male part with standard cutting tolerance.

#### 4. PROCESS OPENINGS: $D_1$ , $d_1$ .

Flameproof joint in the process opening:  $D_1$ ,  $d_1$   
 for: XD-A., XD-A.H, XD-A..win, XD-A..EH connection heads.



<b>BODY</b>			
$D_1$ ([mm])	Destination	$d_1$ ([mm])	Destination
M20x1.5 M24x1.5 M27x2 ½NPTmod ¾NPTmod	all these threads are foreseen to create flameproof joint with male threads of thermowells, or male thread of spring loaded adapter (american style)	Ø 13 and other on request	Does not foresee to create flameproof joint – sensor wires opening only.

Process opening can be used for mounting a sensor thermowell.

Conduit openings can be used to equip it with various certificated explosionproof cable glands, fill sealing fittings, flexible couplings.

Threaded hole  $D_3$  can be plugged.

## 5. CARRIED OUT TESTS

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

<b>Process holes <math>D_1</math></b>	<b>FM 3615 p.4.3, ANSI/ISA 12.22.01 p.15.2; CSA C22.2 No.30 p.6.5, CSA E60079-1 p.15.2</b>
M20x1.5 M24x1.5 M27x2 ½NPTmod ¾NPTmod	tested - together with plugs
<b>Conduit holes <math>D_2, D_3</math></b>	<b>FM 3615 p.4.3, ANSI/ISA 12.22.01 p.15.2; CSA C22.2 No.30 p.6.5, CSA E60079-1 p.15.2</b>
M20x1.5 ½NPTmod ¾NPTmod	tested - together with plugs

mod = modified to meet standards: FM 3615, CSA C22.2 No. 0.5, EN 60079-1, IEC 60079-1, UNI 6125-74

$D_1, D_2, D_3$  threads and fixed to them threaded male parts of sensor, thermowell, cable gland, seal fittings, flexible coupling - must create flameproof joint.

### b). OVERPRESSURE TEST

According to **FM 3615 p.4.5.1, ANSI/ISA 12.22.01 p.15.1.3.1;**  
**CSA C22.2 No.30 p.6.6.1, CSA E60079-1 p.15.1.3.1**

It was carried out tests

(maximum water overpressure for maximum permissible strength without visible permanent deformation in the enclosure)

Type of connection head	Maximum water overpressure [bar]	Maximum reference pressure [bar]
XD-A...	80	20
XD-A...H, XD-A... win	90	22,5

No routine test is required when maximum reference pressure of final assembly (XD-A... with additional volume come from thermowells, conduit, pipe, etc.) is not higher than respectively 20 or 22,5 bars according to column in the above table.

## 6. EARTH AND PROTECTION TERMINALS

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

Place	Type	AWG
Inside	Protection terminal	14
Outside	Earth terminal	10

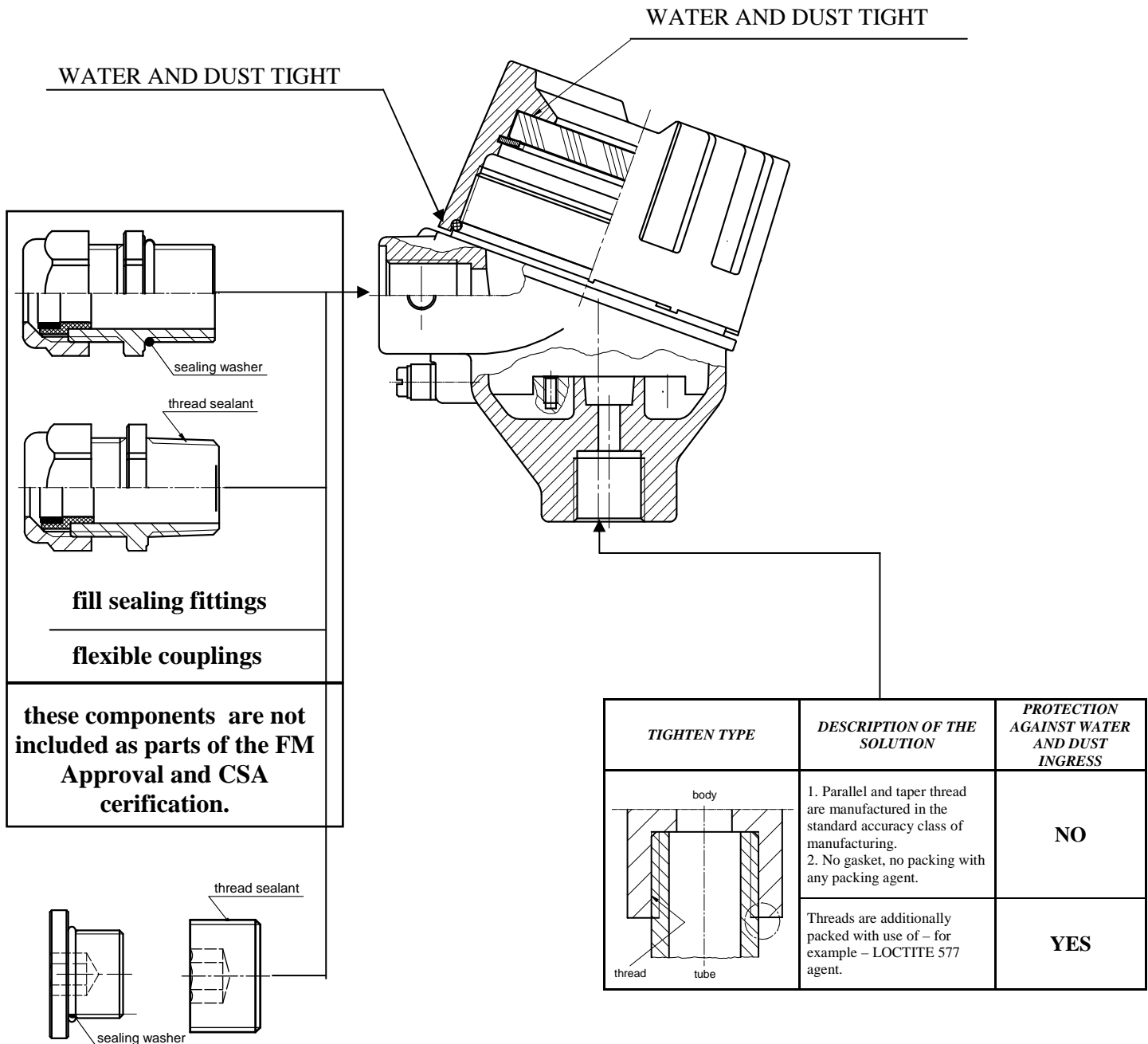


### 7. MAXIMUM SPACE FOR TRANSMITTER AND DISPLAY MODULE.

Connection head type	Temperature transmitter	Loop powered display module
XD-AD	∅ 55 x 50	no
XD-AD win	∅ 55 x 50	yes connections : M2,5 / 68

### 8. PROTECTION AGAINST WATER AND DUST INGRESS. (Enclosure type 4x)

There are three places deciding of water and dust tightness.



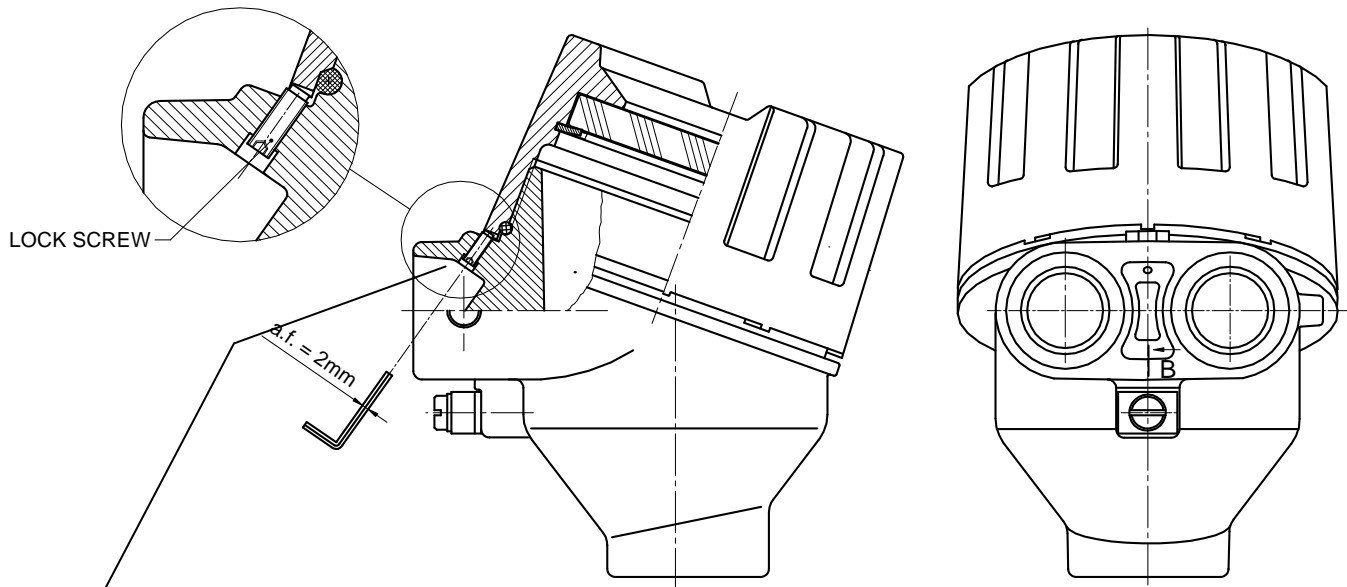


## 9. COVER LOCKING.

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 !**

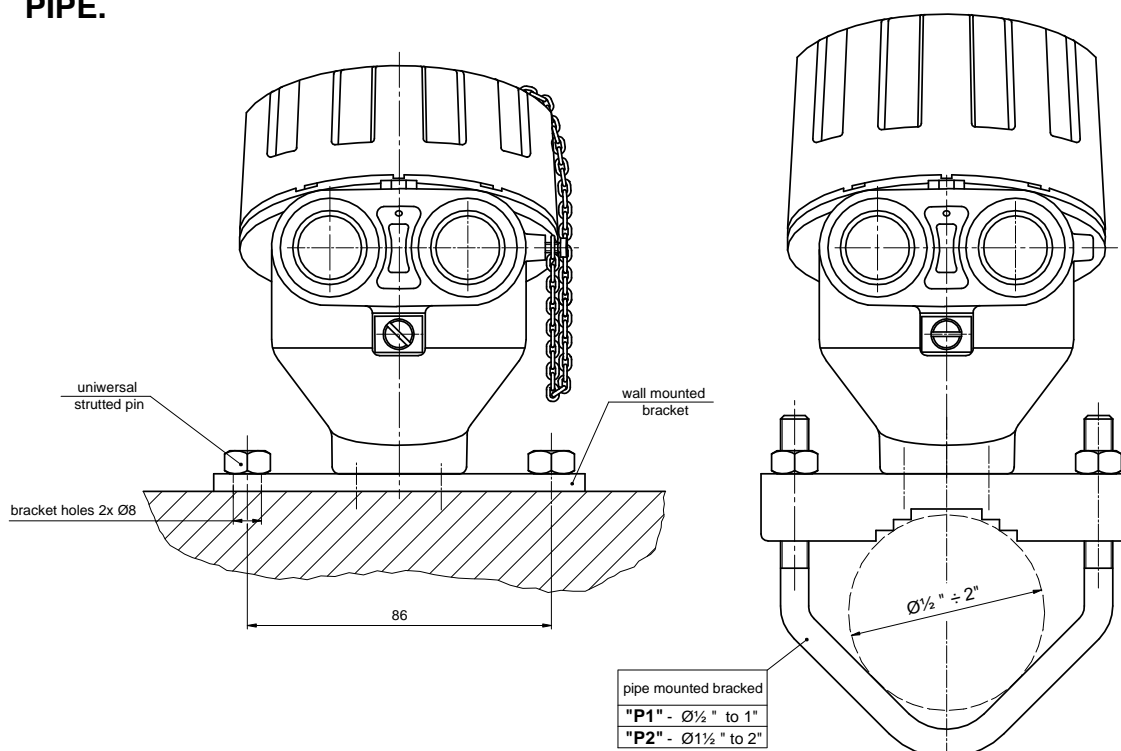
Cover is locked by screw with hex socket using hex spanner with across flat 2mm. This screw is situated in cavity between two conduit openings' bosses.



**Note:**

If the connection head worked in the temperature 200°C and happens necessity of its opening, the cover can be blocked (impossible is its opening a hand or with the tool). In such case stretch the cover with the hand to opening and strike lightly the cover with the rubber hammer.

## 10. WAY OF FIXING FIELD TRANSMITTER HOUSING TO THE WALL AND THE PIPE.

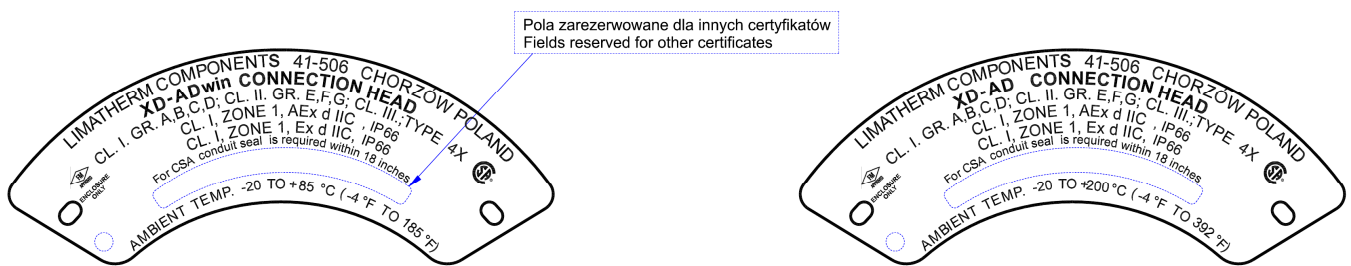


## 11. MARKING

According to standards requirements Limatherm is gluing product data label on the outside surface of the body. Serial number label is glued on the inner surface of the body.

Example of marking of the XD-A...is as follow:

### Metal Labels



The Limatherm's metal label can be screw on the outside surface or plastic label put inside. It's up to customer. Sensor producer should apply additional own label with the rest marking of complete sensor or transfer valuable information from Limatherm's label to sensor label. To each batch of connection heads will be attached also this Application Manual with drawing of the marking label.

### Places for product labels

