

Scope :

USER MANUAL
TNCD Ex d Complete Enclosure

BARTEC

Date:
28.02.2020

Ver.:
1

QA Code:
5

Checked by:
E.T.

Approved by:
S.Gr.

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19727

Explosion proof enclosures

TNCD ...



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The TNCD range of Ex d enclosures are rugged and designed for harsh environment like:

- Oil and gas industry
- Chemical industry
- Pharmaceutical
- Industry
- Agribusiness

They are designed for use in potentially explosive atmospheres and certified according to the requirements of the ATEX Directive and IECEx.

Marking

Without Intrinsic safety	With Intrinsic safety
Ex db IIC T6 to T4 Gb	Ex db [ia Ga] [ib Gb] [op is Ga] IIC T6 to T4 Gb
Ex tb IIIC T85°C - T135°C Db	Ex tb [ia Da] [ib Db] [op is Ga] IIIC T85°C – T135°C Db

The enclosures listed in this manual are certified:

II 2 G or II 2 (1) G / II 2 D

The certificate numbers are :

**TÜV 12 ATEX 102320 X
IECEx TUN 12.0018X**

They are made in accordance with the following standards:

Zones due to gases, vapors and fumes

EN 60079-0:2018

IEC 60079-0:2017

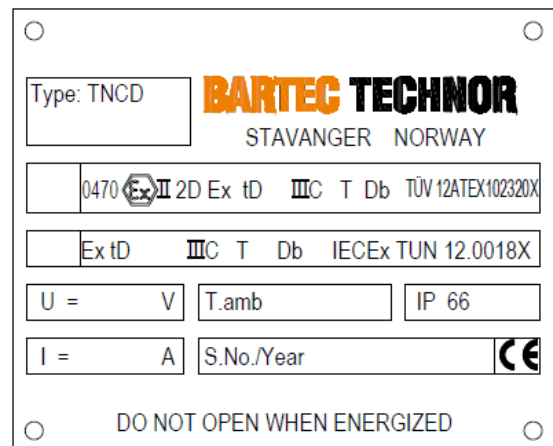
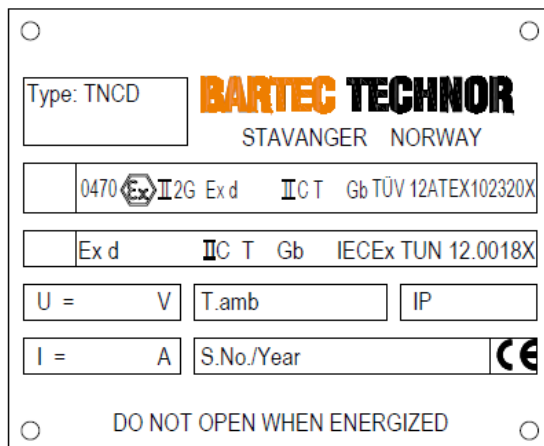
EN 60079-1:2014 / AC:2018-09

IEC 60079-1:2014 / COR1 :2018

Zones for dusts

EN 60079-31:2014

IEC 60079-31:2013



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Description

Our TNCD range of explosion proof enclosures is available in many sizes. They are made of welded or casted and machined acid resistant stainless steel 316L. Each enclosure is expected to receive electrical components inside, making service and maintenance easy. They can also be customized to meet each individual specific need. If necessary, multiple enclosures can be assembled on a frame with or without combined Ex e junction boxes.

The enclosures can be delivered fully equipped according to customer's requirements or empty with component certificate (U-certificate) to be used as basis for further certification of an Equipment or Protective System.

Equipment to be installed inside the enclosures in accordance with Technical Note 54-CDX-5 "Specification for the completion of TNCD enclosures":

- Instruments of measure of electrical parameters
- Electronic thermoregulations units
- Radio communication and telephony units, max 3,5 W 80 μ S, 250 μ J
- Laser or optical fibre units in accordance with Technical Note 54-CDX-5, section 6
- PLC and Multiplexer
- Devices for the control and the weight measure: pressure, damp; level; temperature
- Automatic and /or earth leakage circuit breakers
- Switches; on load switches; rotary switches
- Fuses
- Contactors; remote control switches
- Relays
- Electrical and electronic regulation and starting devices
- Time relays
- Photocells
- Capacitors
- Transformers
- Anti-condensate heating
- Various electronic boards

Optional solutions for the enclosures:

- internal hinges
- glass window in lid, walls and / or bottom of enclosure
- threaded holes in lid, walls and / or bottom side of enclosure
- The maximum number of apertures is 72, their maximum size is M42 and their positions are addressed with reference to drawing number CDX-107-4: Entries TNCD575727

Type Code:

TNCD XX YY ZZ

XX: Dimension of box, width in cm, 19 to 57

YY: Dimension of box, height in cm, 19 to 57

ZZ: Dimension of box, depth in cm, max 38

Enclosure type/Maximum window diameter:

- TNCD1919xx 65 mm
- TNCD2828xx 100 mm
- TNCD3838xx 100 mm
- TNCD5757xx 154 mm

Material: CD = Stainless Steel AISI 316L

Meaning of symbols



This symbol means a hazard and precaution to be taken

Safety instructions



The device must be installed, used and maintained in accordance with the following standards:

- IEC/EN 60079-1 (Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d")
- IEC/EN 60079-14 (Explosive atmospheres - Part 14: Electrical installations design, selection and erection)
- IEC/EN 60079-17 (Explosive atmospheres - Part 17: Electrical installations inspection and maintenance)
- IEC/EN 60079-31 (Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t")
- Decrees, orders, laws, directives, circulars, applications, standards, state of art and other documentation relating to its installation site



It is forbidden to change anything (components, installation, wiring ...) without the prior written consent of Bartec Technor.



We cannot accept any responsibility for failure to observe these regulations:

- Make sure of the compatibility between the information on the nameplate, the explosive atmosphere present, the area of use and ambient temperatures on surfaces
- Any damage on the device can cause the explosion-proof protection to become ineffective
- The installation of the enclosure must be done in the state of the art in the technical domains and only by qualified, competent and empowered personnel
- A defective or abnormal use as well as the noncompliance with the instructions of the present document exclude any clause of guarantee and do not engage our responsibility
- The use of the device in case of excessive deposits of dusts superior at 50mm according to EN / IEC 60079-31 is not authorized
- Liability for manufacturer traceability is ensured only at the first known delivery destination (serial number specified on the certification label)
- It is also required to observe the regulations of the country of use
- The lids of the TNCD enclosures are relatively heavy. To avoid sagging of the lids on the TNCD5757xx enclosures, potentially making the door not align with the flange of the enclosure, the lids shall be closed and secured during any moving and shifting of

the enclosures. It is also strongly advisable to close and secure the doors when the daily working shift is over

- Do not open the lid of the enclosure before the enclosure is securely fastened and in an upright position! Check datasheet for weight of lid and act accordingly when handling the lid. Enclosures type TNCD5757xx are delivered with an internally hinged lid
- The flame paths of the lids and of the threads of the enclosures must be well protected whilst work is performed and ongoing inside the enclosures

Transport, storage

- Check if the product has been damaged during transport. If any damage is observed, do the statutory reserves to the carrier
- Do not put damaged products into service

Packaging	Location storage	Duration storage
Open	In a covered location, clean (without contact with external substances) and closed with temperature a constant humidity (-40°C < T < +70°C). Shielded from important temperature variations	2 years and more with regular inspection (cleanliness and mechanical damage)

Putting into service

- Verify that the information on the label of the product is in accordance with the permissible conditions for the Ex area of the site of use (Group II: Surface Industries - Category 2: high level of protection for ATEX G = for Gas / D = for Dust, IECEx EPL - G = for Gas / D = for Dusts - IPxx: IP rating (waterproofness for solids and liquids))
- Check if there is a specific position of mounting
- Do not open the lid before the enclosure is securely fastened. Also check if the enclosure has been equipped with hinges
- Check the O-ring for damages and grease it with approved grease, we recommend acid-free vaseline
- The wiring of the cable conductors must be made with a particular care
- The conductor insulation must reach the terminal. The conductive soul must not be damaged
- Not to exceed the authorized maximal temperature appropriate cables must be selected and take particular care installing them
- Follow the instructions contained in the specifications
- **Installation of intrinsic safety elements :**
 - The installation of the intrinsic safety circuits (IS) inside the enclosure is subordinated to the respect of the requirements of their documents of certification, their certificates and with that after:
 - IS Circuits are cabled with connection wires of which the thickness of insulator is $\geq 0,5$ mm and the section $\geq 0,5$ mm²
 - The connection wires support a dielectric test of 500 V effective
 - The air gap between the active parts under voltage of the connection elements of the intrinsic safety circuit compared to connection elements of a non intrinsic safety circuit is higher or equal to 50 millimeters
 - The air gap and creepage distances in the air between the active parts under voltage of the intrinsic safety circuit compared to an intrinsic safety circuit close are higher or equal to 6 millimeters

- The air gap and creepage distances in the air between the active parts under voltage of the intrinsic safety circuit compared to the metal parts which can be with the ground are higher or equal to 3 millimeters
- The active parts of the intrinsic safety circuits support a dielectric test of rigidity under an effective alternating voltage of 500 Volts compared to the metal mass
- The active parts of an intrinsic safety circuit support a dielectric test of rigidity under an effective alternating voltage of 500 Volts compared to an intrinsic safety circuit close
- Circuits NIS are cabled with conductive wires whose insulation is such as they can support a dielectric test of $2 U + 1000 V$ effective, U being the sum of the tensions of the IS and NIS circuits, with a minimum of 1500 V

Before starting

- Make sure the unit has been correctly settled and not damaged
- Make sure the wiring and the tightening of the terminal screws have been performed properly (see descriptive tightening torque)
- The device may include any foreign body and no part is damaged
- The cable glands must be tightened (see description of the gland torque)

Maintenance

The maintenance and repairs work on devices must be made only by authorized and trained persons for that purpose.

Before any work the devices must be switched off. In addition:

- Prevent and avoid any formation of layers of dusts: make a periodic cleaning with a wet cloth
- Do not take apart the command and control units (push buttons, pilot light, etc.)

It is advisable that the following checks must be made frequently:

- The external equipment and surfaces must not be damaged
- The cable entries and blanking plugs must be securely fastened
- Check tightness of the connections, rewiring if necessary
- Prior to closing, check the cleanliness of the flame paths (the threads of the lid and the threads of the box). Grease these 2 parts with a grease resistant to oxidation and anti seizing, we recommend GLEITMO 165. Check the O-ring for damages and grease it with approved grease, we recommend acid-free vaseline
- Screw the cover on the box and secure it with the locking screw. Verify that the O-ring is compressed and contact with both flange of the lid and the surface of the enclosure

Technical features

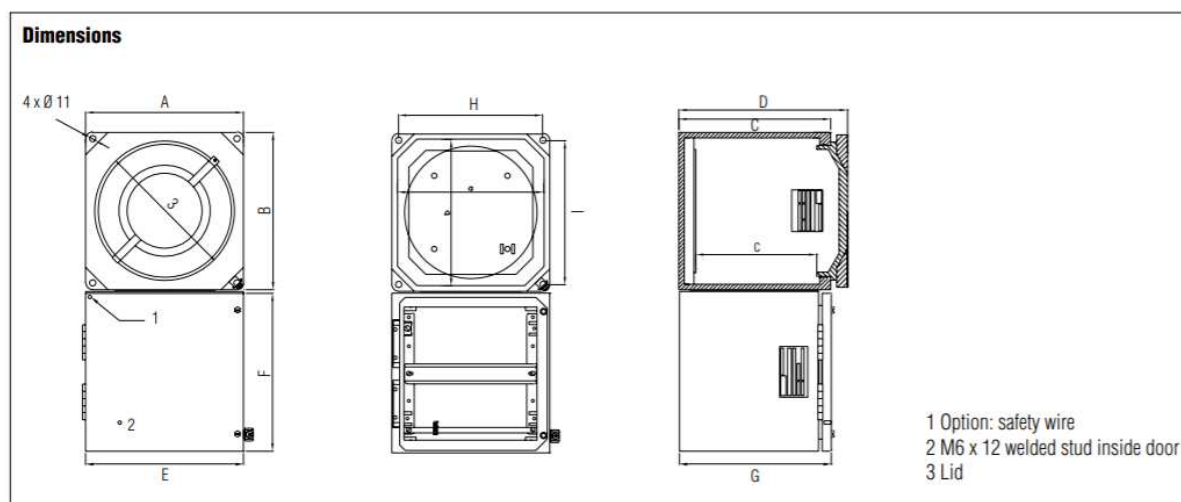
Measurement table for **Ex d IIC Explosion proof enclosures** (mm)

External dimensions						Internal dimensions			Weight (kg)	Fixing dimensions	
TNCD	Width A	Height B	Depth C	Total depth D	Lid aperature	Width a (mm)	Height b (mm)	Depth c (mm)		H	I
191918	190	190	180	205	M 152	167	167	134	16	166	166
282827	280	280	270	295	M 237	257	257	225	37	256	256
383827	380	380	270	295	M 337	357	357	225	60	356	356
575727	570	570	270	300	M 500	550	550	213	125	546	546

Other sizes upon request.

Measurement table for **Ex e connection boxes**

External dimensions				Weight (kg)
TNCD	Width E (mm)	Height F (mm)	Depth G (mm)	
191918	190	190	180	3.0
281927	280	190	270	4.4
282827	280	280	270	6.6
381927	380	190	270	4.6
383827	380	380	270	10.5
571927	570	190	270	9.6
573827	570	380	270	13.4
575727	570	570	270	19.7



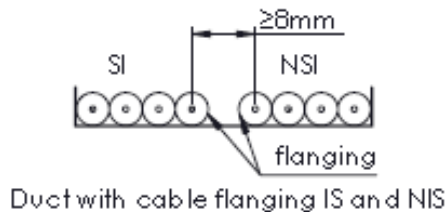
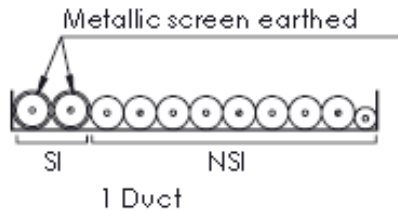
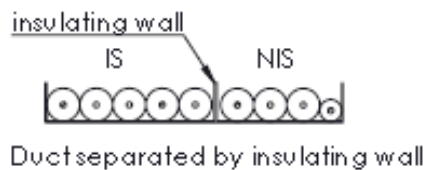
Number of cable entries:

- Any type of cable or conduit entry certified Ex d can be used and installed according to EN / IEC 60079-14
- Different types of threads can be used but minimum five threads by bolt must always been engaged

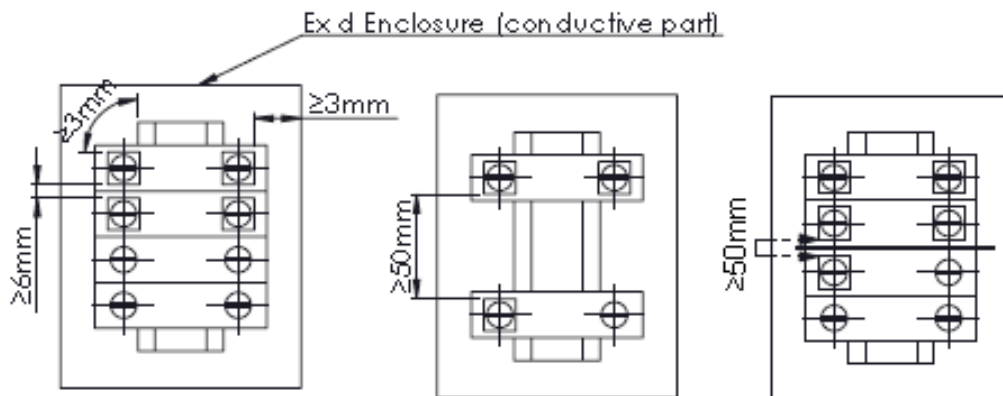
⚠ Special Conditions for safe use (X):

- When the enclosure is equipped with intrinsic safety elements, a temperature probe must be fitted inside and be connected to a system that can switch off the supply when the inner temperature raises above the maximum ambient temperature indicated in the certificates of the IS equipment.
- The products that can be connected to the IS equipment installed inside the enclosure must be of a certified type and association must be compatible in regards of intrinsic safety.

1- Isolating IS and NIS



2- Clearances and creepage distances between IS and NIS materials



1. It's only allowed for the manufacturer to make the finished mounting of the enclosures in accordance with Technical Note 54-CDX-5 "Specification for the completion of TNCD enclosures"
2. Spacing between internal mounted components must be in accordance with Installation drawing CDX-139-5
3. The requirements in clause D.4 of EN 60079-1 shall be observed
4. Ultrasonic sources may not be mounted into the enclosure
5. Primary or secondary batteries may not be installed
6. [Ex i] certified components can only be installed if two thermostats are mounted in series for disconnecting the [Ex i] component if the temperature inside the flameproof enclosure

- exceeds the highest Tamb for the [Ex i] component. Alternatively a full-scale test for determination of the surface temperature must be performed
7. When viewing windows are mounted the temperature of the cementing resp. window shall not exceed 90°C
 8. The maximum number of apertures is 72, their maximum size are M42 and their positions are addressed with reference to drawing number CDX-107-4: Entries TNCD575727
 9. IECEx Certified and tested components that are built into the enclosure's walls need to fulfil the requirements of types of explosion protection used as well as the IP level shown on the type label
 10. Bartec Technor's Type TNCN/TNCC Ex e junction box may be used for indirect cable entry
 11. Rotating machines, or other devices which create turbulence, shall not be incorporated
 12. Oil-filled circuit-breakers and contactors shall not be used
 13. The Maximum dissipated power in the TNCD enclosures have to follow values in the manufacturer's power dissipation tables
 14. Calculations of inner and surface temperatures must be performed by program: TempCalc-sm Rev. 1
 15. The Manufacturer has to ensure all maximum temperatures of equipment used inside or in the enclosure walls are lower than its maximal Tamb
 16. Repairs on flame-proof joints can only be done by Bartec Technor
 17. No high-pressure water to be applied in the connection between lid and enclosure



The content of the TNCD enclosures may be placed in any arrangement provided that an area of at least:

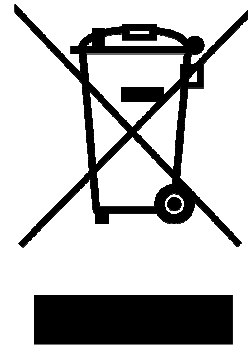
- - 40 % of each cross-sectional area remains free for gas group IIC



Dismantling, taking out of service :

When removing the enclosure and taking it out of service, the same precautions apply as those observed when mounting the enclosure.

The enclosure with its content must be handled according to the WEEE (Waste Electrical and Electronic Equipment) Directive, 2012/19/EU.



SS316L