

electronic product design

Installation Guide
IG-X62U-00
PN 500016
Date: January 31, 2007

Associated documents
Operating Instructions
OI-X62U-00
PN 500015

Installation Guide X62T
IG-X62T-00
PN 500013

- de** Sicherheitshinweise für elektrische Betriebsmittel für explosionsgefährdete Bereiche.
Wenn Sie dieses Handbuch nicht lesen können, können Sie ein in Ihrer Sprache kostenlos bestellen.
- en** Safety instructions for electrical apparatus certified for use in explosion-hazardous areas.
- fr** Conseils de sécurité pour matériels électriques destinés aux zones explosibles.
Si vous ne pouvez pas lire ce manuel, vous pouvez commander un en votre langue gratuitement.
- es** Instrucciones de seguridad de aparatos eléctricos homologados para su utilización en áreas expuestas a riesgos de deflagración.
Si no entiende este manual, puede pedir un ejemplar en su idioma.
- it** Istruzioni di sicurezza per apparecchiature elettriche certificate per l'utilizzo in aree con pericolo di esplosione.
Se il presente manuale non risulta comprensibile potete ordinarne una copia tradotta nella vostra lingua.
- nl** Veiligheidsinstructies voor elektrisch materieel in explosiegevaarlijke omgeving.
- fi** Turvallisuusohjeita sähkölaitteille, jotka on vahvistettu käytettäväksi räjähdysvaarallisilla alueilla.
Jos et ymmärrä tätä käsikirjaa, voit tilata meiltä käännöksen omalla kansallisella kielelläsi.
- sv** Säkerhetsföreskrifter för elektrisk utrustning certifierad för användning i explosionsfarliga områden.
Om du inte förstår denna manual, kan en översatt kopia på ditt eget språk beställas från oss.
- da** Sikkerhedsforskrifter for elektriske apparater certificeret til brug i eksplosionsfarlige områder.
Hvis du ikke forstår denne manual, kan en oversat kopi af den på dit eget sprog bestilles fra os.
- pt** Instruções de segurança para dispositivos eléctricos certificados para utilização em áreas de risco de incêndio.
Se não compreender este manual, pode encomendar-nos directamente uma cópia na sua língua.



es **Declaración de conformidad**
 Por la presente declaración y la inclusión de la marca CE, el fabricante Exalon Delft, Delft, Nederland, garantiza que el producto cumple lo estipulado por la Directiva CEM 89/336/CEE y la Directiva 94/9/CE.
 La prueba de conformidad se presenta según las normas expuestas.


it **Dichiarazione di conformità**
 Con questa dichiarazione e con l'applicazione del marchio CE, il costruttore Exalon Delft, Delft, Nederland, assicura che il prodotto è conforme ai regolamenti della direttiva CEM 89/336/CEE e della direttiva 94/9/CE.
 Prova della conformità è fornita dall'osservanza degli standard elencati.

fi **Varmennustodistus**
 Tällä varmennustodistuksella sekä CE-merkillä, valmistaja Exalon Delft, Delft, Nederland, vakuuttaa, että tuote on direktiivien EMC 89/336/ETY ja 94/9/EU mukainen. Näyttö vastaavuudesta on annettu asiakirjoissa, jotka on listattu varmennustodistukseen.

sv **Försäkran om överensstämmelse**
 Exalon Delft, Delft, Nederland försäkrar med denna försäkran om överensstämmelse och med CE-märkningen att produkten uppfyller bestämmelserna i EMC-direktivet 89/336/EEG och direktiv 94/9/EG. Överensstämmelsen påvisas genom givna standarder.

da **Overensstemmelseserklæring**
 Med denne overensstemmelseserklæring og tilføjelsen af CE-mærket, sikrer producenten Exalon Delft, Delft, Nederland, at produktet er i overensstemmelse med bestemmelserne i det EMC-regulativ 89/336/EEC og Direktiv 94/9/EC. Dokumentation for overensstemmelsen gives i de anførte standarder.

pt **Declaração de Conformidade**
 Com esta Declaração de Conformidade e o anexo do CE-Mark, o fabricante Exalon Delft, Delft, Nederland, garante que o produto obedece aos regulamentos da Directiva EMC 89/336/EEC e Directiva 94/9/EC.
 A prova da conformidade é apresentada segundo os padrões indicadas.



Exalon Delft
electronic product design

CE Conformiteitsverklaring

EC declaration of conformity
Déclaration CE de conformité
EG-Konformitätserklärung

Exalon Delft, Rotterdamseweg 183C, 2629 HD, Delft
 verklaart als enig verantwoordelijke, dat het product declares in sole responsibility, that the product déclaré sous sa seule responsabilité que le produit erklärt in alleiniger Verantwortung, dass das Produkt

X62U
(Universal Multi-input transmitter with HART capability)

overeenstemt met de voorschriften van de volgende Europese richtlijnen:
 conforms with the following European Directives:
 est conforme aux prescriptions et directives Européennes suivantes:
 mit dem Vorschriften folgender Europäischer Richtlinien übereinstimmt:


EMC Richtlijn 89/336/EG
 ATEX Richtlijn 94/9/EG

Toegepaste geharmoniseerde normen of normatieve documenten:
 Applied harmonised standards or normative documents:
 Normes harmonisées ou documents normatifs appliqués
 Angewandte harmonisierte Normen oder normative Dokumente:

EN60079-0 (2004)	EN61000-6-2 (2001)
EN50020 (2002)	EN61000-3-2 (2000)
EN60079-26 (2004)	EN61000-3-3 (2001)
EN55011 (2002)	

Eerste aanbrenging van de CE markering: 07
 CE-mark first affixed:
 Année de mise en conformité CE:
 Erstmalige Anbringung des CE-Zeichens:

Delft, 31. jan. 2007



Kwaliteitsmanager
Quality assurance manager

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X62U

Safety Instructions
for electrical apparatus
for use in potentially explosive atmospheres

Designation according to Directive 94/9/EC:



- Notified body performing the QA surveillance (when __: internal production control)
- Equipment Group II
- Equipment Category 2(1)
- For explosive mixtures of gases, mists, or vapors in air

Hazardous zones at the mounting points corresponding to the explosion protection category of the devices or sensors:

Zones at the mounting points	Category acc. to Directive 94/9/EC
Installed in Zone 1	2 G
Feeding circuits extending into Zone 0	(1) G

Ex marking:

Ex ia IIB T4

- Electrical apparatus with explosion protection acc. to European standard
- Type of protection
- Apparatus group
- Temperature class

EC-Type Examination Certificate Number: KEMA 06ATEX 0294X

Environmental conditions:

Temperature	-40 °C < Ta < +70 °C
Ingress Protection	IP00 (see Special conditions for safe use)
Pressure	Atmospheric
Humidity	0 – 100%RH

Ex i parameters:

Power supply / Output circuit / HART (CN1)		Sensors / Input circuit (CN3) (circuits combined)	
Ui	30V	Uo	5.9V
Ii	270mA	Io	62mA
Pi	1.2W	Po	92mW
Ci	5nF	Co	900uF
Li	-	Lo	30mA

Power supply / Output circuit are infallibly galvanically isolated from Sensors / Input circuit.

Special conditions for safe use:

Use of Programming Connector CN9 is limited (see Page 7).

The X62U shall be provided with an enclosure suitable for the installation environment with a minimum of IP20 (see Page 5).



General

Document conventions

Warnings, Cautions and Notes are used throughout this installation guide to bring special matters to the immediate attention of the reader.

- A Warning concerns danger to the safety of the technician or user.
- A Caution draws the attention to an action which may damage the equipment.
- A Note points out a statement deserving more emphasis than the general text.

Preface

This installation guide is intended for system integrators involved in the mechanical and electrical installation of the Exalon Delft X62U Interface. The technician must have basic technical skills and knowledge of safety regulations and explosion proof equipment in hazardous areas and must work in accordance with the (local) requirements for electrical equipment in hazardous areas.

Warning

*In hazardous areas it is mandatory to use personal protection and safety gear such as:
hard hat, fire-resistive overall, safety shoes, safety glasses and working gloves.
Avoid possible generation of static electricity.
Use non-sparking tools and explosion-proof testers.
Make sure no dangerous quantities of combustible gas mixtures are present in the working area.
Never start working before the work permit has been signed by all parties.
Pay attention to the kind of product in the tank. If any danger for health, wear a gas mask and take all necessary precautions.*

The X62U is installed in Zone 1 areas and converts temperature and capacitance parameters from sensors provided by third parties which are installed inside Zone 0 areas. Please refer to the sensor manufacturers installation guide for details on installing the sensors.

Warning

Do not use the instrument for anything else than its intended purpose.

Caution

*The X62U Interface has intrinsically safe output/input circuits.
Modifications to the instrument may only be carried out by trained personnel with written authorization from Exalon Delft.
Unauthorized modifications will invalidate the approval certificate and impair safety.*

Legal aspects

The mechanical and electrical installation shall only be carried out by trained personnel with knowledge of the requirements for installation of explosion proof equipment in hazardous areas.

The information in this installation guide is the copyright property of Exalon Delft B.V., Netherlands. Exalon Delft B.V. disclaims any responsibility for personal injury or damage to equipment caused by:

- Deviation from any of the prescribed procedures.
- Execution of activities that are not prescribed.
- Neglect of the general safety precautions for handling tools, use of electricity and microwave radiation.

The contents, descriptions and specifications are subject to change without notice. Exalon Delft B.V. accepts no responsibility for any errors that may appear in this installation guide.

Additional information

Please do not hesitate to contact Exalon Delft or its representative if you require additional information.

Mechanical installation

Note

The X62U is provided without enclosure. This section describes the requirements for system integrators selecting an appropriate enclosure and installing the X62U in the enclosure.

The system integrator must provide an installation guide for the end user describing mechanical installation of the assembly in the field. Refer to the X62T Installation manual IG-X62T-00 for an example of an End User Installation Guide.

Note

The entire installation procedure shall be in accordance with national, local and company regulations.

The electrical installation shall be in accordance with IEC 60079-14 for electrical equipment to be installed in hazardous areas.

Selection of a suitable enclosure

- When the X62U is used in dry, clean and well controlled environments an enclosure with a minimum of IP20 according to EN60529 must be used.
- For outdoor use an enclosure with a minimum of IP44 according to EN60529 must be selected.
- For maximum durability of the product Exalon Delft recommends to use an enclosure with a minimum of IP65.
- Consider the chemical resistance of the enclosure under the envisioned operating condition.
- For conductive enclosures the separation from the circuits to the enclosure walls shall be 3 mm minimum.
- Metal enclosures must contain less than 6% of Mg (magnesium). Verify this with the enclosure manufacturer's documentation.
- Exalon Delft recommends the Roolec AluCase ACF-130 (160x130x70 mm³) enclosure where possible as this allows mounting the X62U without additional mounting brackets.
- For non-conductive enclosures additional measures may be needed to conform with the EMC directive.
- For non-conductive enclosures the surface resistance must comply with EN60079-0 clause 7.1.1 (non-metallic enclosures - applicability), 7.1.2 (specification of materials), 7.3.1 (ESD – applicability), 7.3.2 (avoidance of build-up). Exalon Delft recommends to use a Ex i or Ex e approved non-conductive enclosure, but only when a conductive enclosure can not be used.

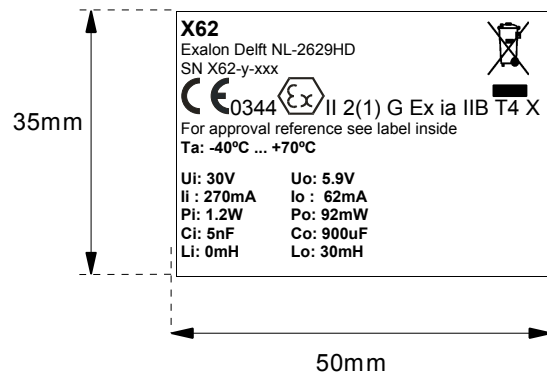
Selection of suitable cable glands

- Select a cable gland that does not decrease the IP rating of the enclosure. Cable glands with rating IP68 are readily available.
- Use metallic cable glands (EMC/IP68) to provide good contact between cable shield and the enclosure. The shield of the cable shall be connected inside the cable gland and connected to ground at both ends of the cable.
- Alternatively verify compliance with the EMC directive and apply appropriate EMC measures where needed.

CE mark/Type Identification Plate

The system integrator can apply an Exalon Delft CE Mark/Type Identification Plate or create his own. The following must be observed:

- The X62U has a CE label attached to terminals CN3. Do not remove this label as it will invalidate the ATEX certification.
- The CE label external to the enclosure is provided as a secondary label for the end-users convenience only. It may not provide misleading information. Exalon Delft recommends to provide at least the information on the example below (replace company name and address with the system integrator's).
- The CE mark should be at least 5 mm high and the Recycle Bin (including the under bar) 8 mm.



- Use a label with a suitable adhesive and chemical resistance. Exalon Delft recommends 3M 7872E covered with 3M 7784 laminate.

Electrical installation

Internal wiring

- Make sure the separation between the HART Fieldbus wiring (CN1) and sensor inputs (CN3) is minimally 6 mm. When necessary use a suitable cable binder (not supplied).
- Connect a ground wire between the enclosure cover and the enclosure when possible or use a conductive grease.
- Connect 2x2.5mm² from terminal CN1-2 and CN1-4 to enable the lightning protection (90V gas arrester). Leaving these terminals unconnected will leave the X62U Fieldbus wiring floating with 500V isolation.
- When using capacitive probes in Zone 0 the requirements of EN60079-26 must be fulfilled. In general the non-conductive surface area will be much larger than allowed. Make sure the non-conductive sleeve surrounding the sensor electrode is not thicker than 2 mm for Groups IIA and IIB. By grounding the sensor inputs to the protective earth (P.E.) using CN3-38 these requirements will be fulfilled.
- When no capacitive probes are used grounding to P.E. of the sensor inputs is not required. The (floating) sensors require 500 V isolation to ground in this case.
- To reduce EMC sensitivity Exalon Delft recommends to connect CN3-38 to ground whenever possible.
- Extending wiring into Zone 0 may require lightning protection within 1 m from the entry into Zone 0 (EN60079-25 may apply). Make sure the X62U will be installed within 1 m from the entry and the internal lightning protection is enabled (on the Fieldbus wiring) by connecting CN1-2 and CN1-4 to P.E.
- When this is not possible install external lightning protection on the sensor input wiring near to the entries to Zone 0.

Caution

Safety may depend on proper grounding. Grounding and lightning protection shall be performed according to local regulations.

External Grounding

Proper grounding of the X62U Interface to the equipotential bonding is required. Provide an external ground terminal on the X62U enclosure suitable for accepting 4 mm² ground wiring.

Caution

Check the resistance of the ground connection directly after installation. The measured ground resistance shall be below the maximum prescribed by local grounding requirements.

Warning

When measuring the ground resistance, use a suitable explosion-proof tester.

Field wiring: Supply / transmission

Follow local and company requirements for routing of I.S. wiring.

Power rating of the X62U: 12 - 28 V_{dc} nominal @ 4 mA_{nom}(at the terminals of CN1).

Cable requirements:

- Shielded twisted pair.
- For point-to-point connections refer to Table 1.
- For multi-drop connections apply appropriate HART recommendations or contact Exalon Delft or your local distributor.

Table 1: Cable requirements for a point-to-point connection between a HART master and a X62U

Master Ro < 250 Ω	Cable length	Cable capacitance	Master open circuit voltage (min.)
#24 AWG (Ø 0.51 mm)	<800 m	< 200 pF/m	13 V
#20 AWG (Ø 0.81 mm)	<1000 m	< 200 pF/m	13 V

Caution

Wiring to X62U Interface shall be protected against EMC influences.

Note

Use metallic cable glands (EMC/IP68) to provide good contact between cable shield and X62U enclosure. The shield of the cable shall be connected inside the cable gland and connected to ground at both ends of the cable.

- Open cover of X62U Interface.
- Connect supply/transmission cable to the positive terminal HART_P (CN1-1) and the negative HART-N (CN1-3).

Universal Multi-input transmitter with HART capability**Field wiring: Sensor inputs**

Connect the sensors wiring as indicated in the connection diagrams and CON-200002 in the Appendix.

Note

*There is only an orange wire with those MTT probes which have a thermocouple spot below the Pt100 reference resistor. That orange wire must be connected to terminal CN3-19.
When there is no orange wire from the temperature probe, then connect one of the blue wires to terminal CN3-19.*

- Close cover of X62U enclosure.

Caution

Always connect the probe wires to the grounded input terminals (CN3-1 to 4 & CN-23 to 30) first to prevent damage due to electrostatic discharge.

Programming connector

The programming terminal CN9 of the X62U is not Intrinsically Safe. Programming can only be done using special tools provided by Exalon Delft.

Warning

Do not program the X62U in the Hazardous Area.

Caution

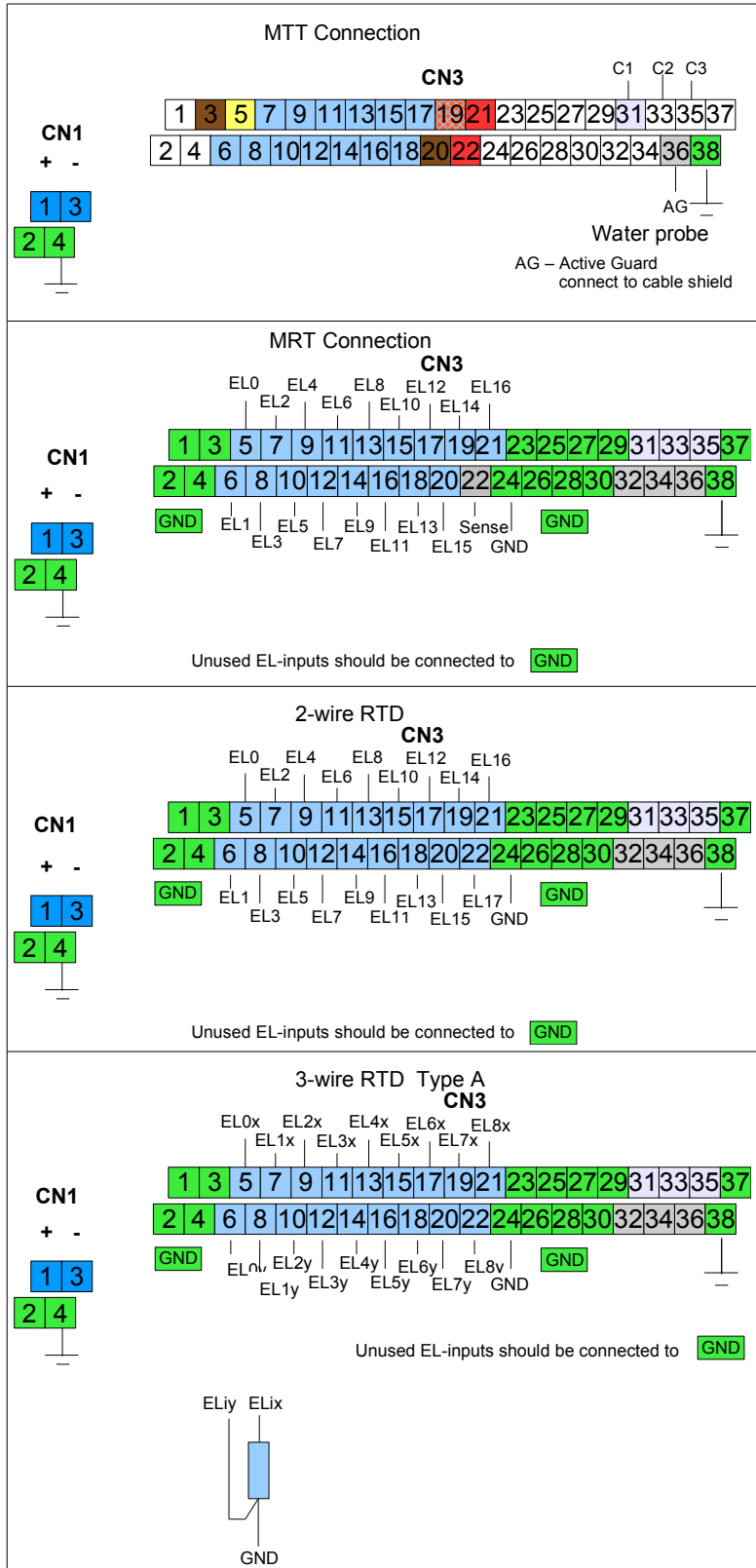
Connecting the X62U directly to a RS232 port may (unnoticeable) damage the Intrinsically Safe circuitry inside the X62U. The X62U shall only be connected to an Exalon Delft supplied RS232/TTL converter.

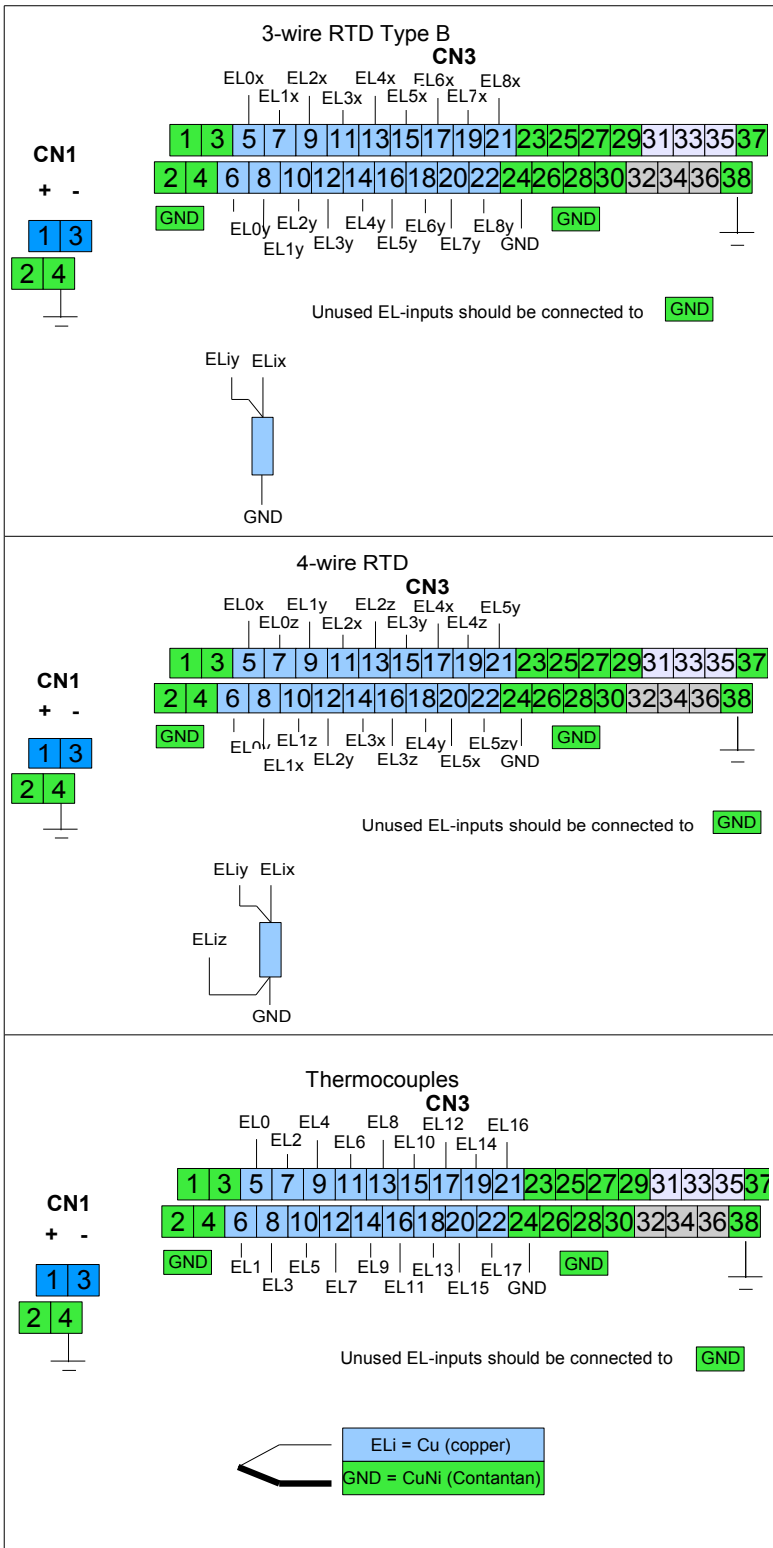
Note

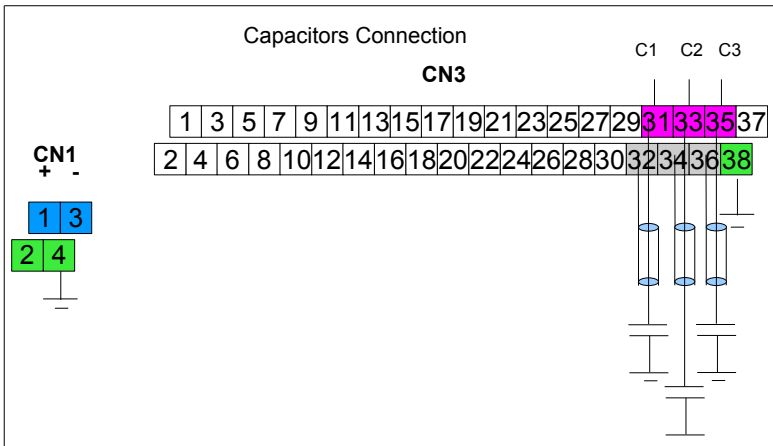
Attempting to read or write the internal memory with unapproved tools or by following the incorrect procedure may inadvertently erase the software and/or the configuration settings. Refer to your local distributor when a software upgrade is necessary.

Appendix

Diagrams for connecting various type of probes

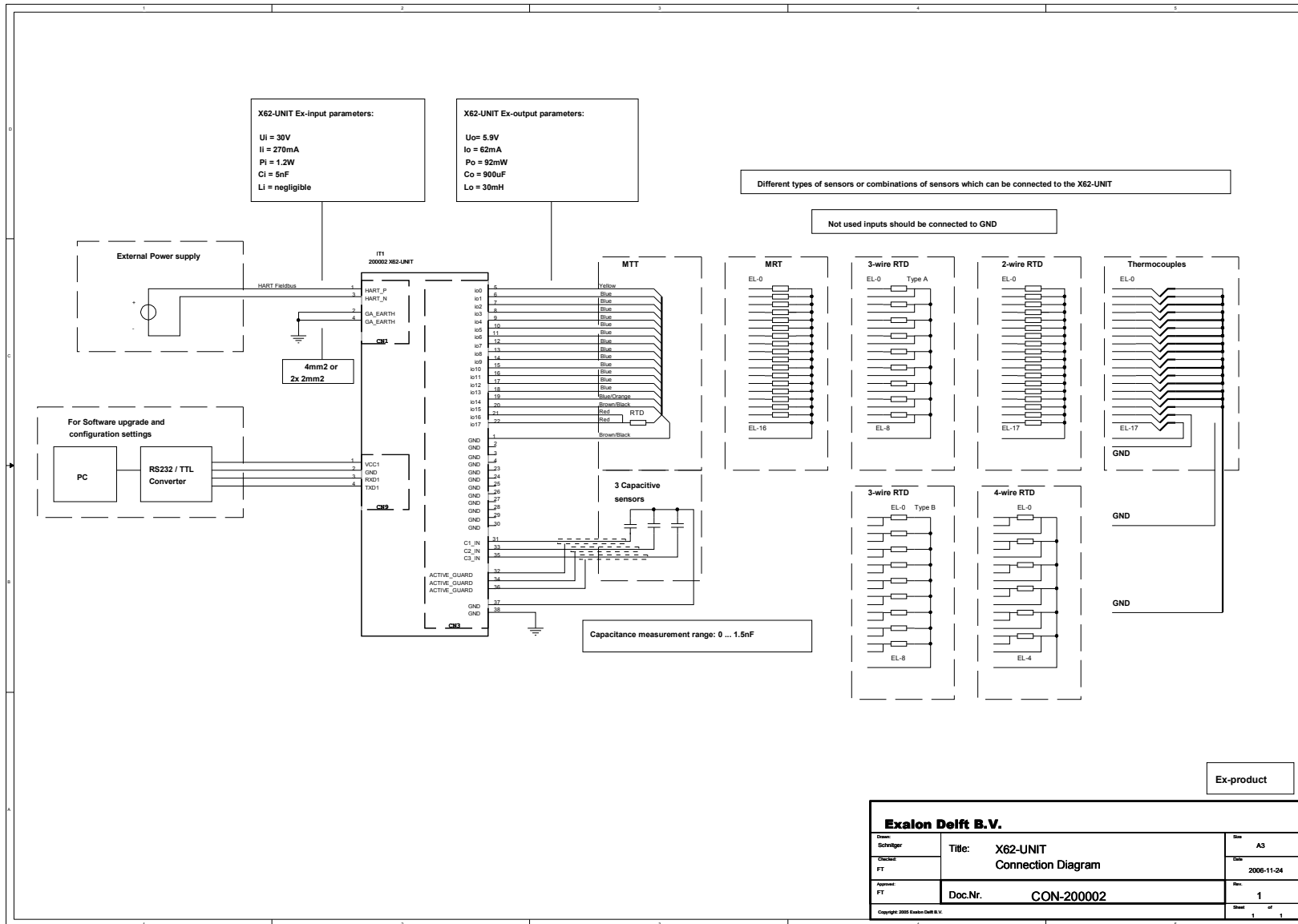






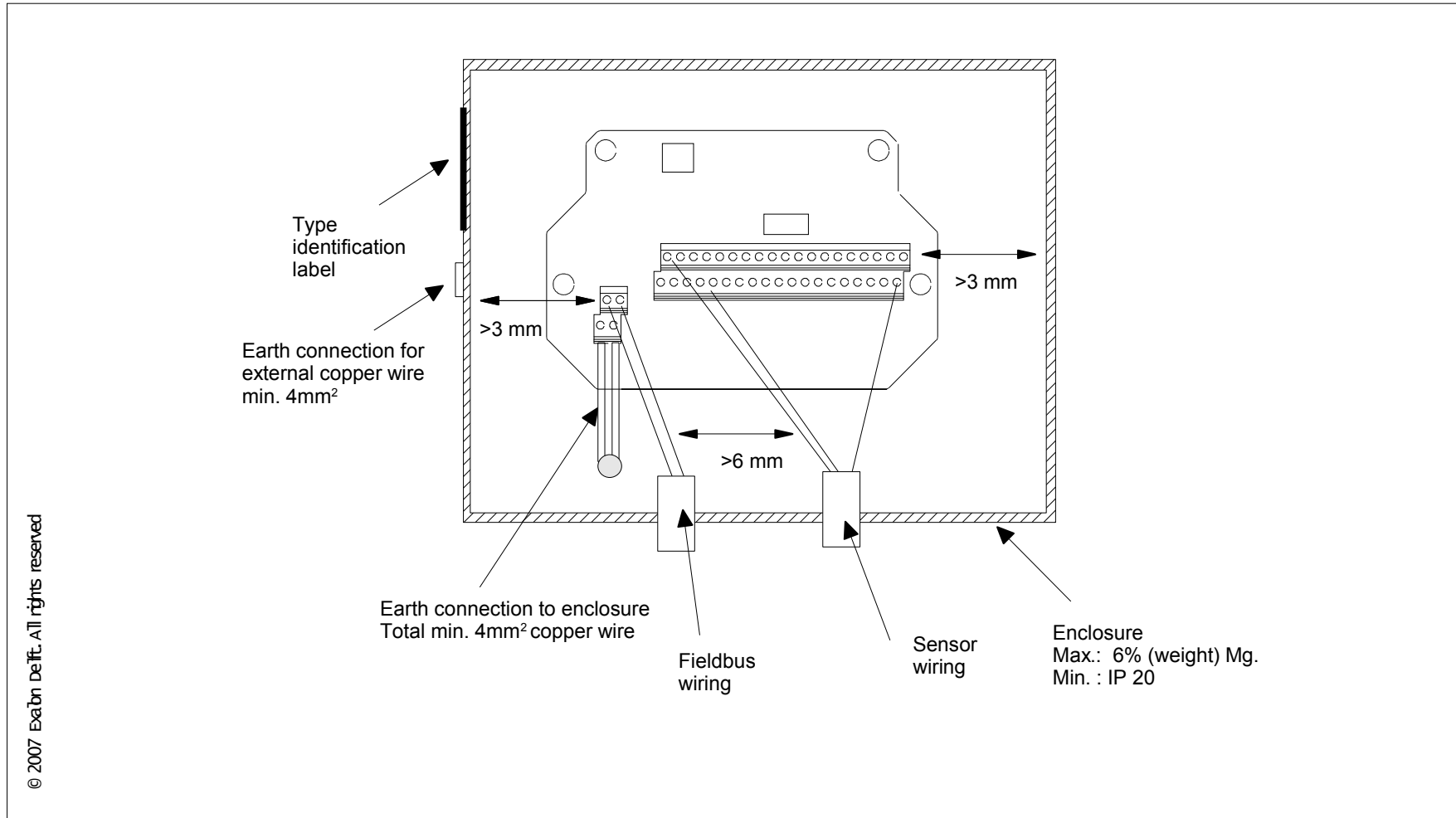
X62U

Universal Multi-input transmitter with HART capability



X62U

Universal Multi-input transmitter with HART capability



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