

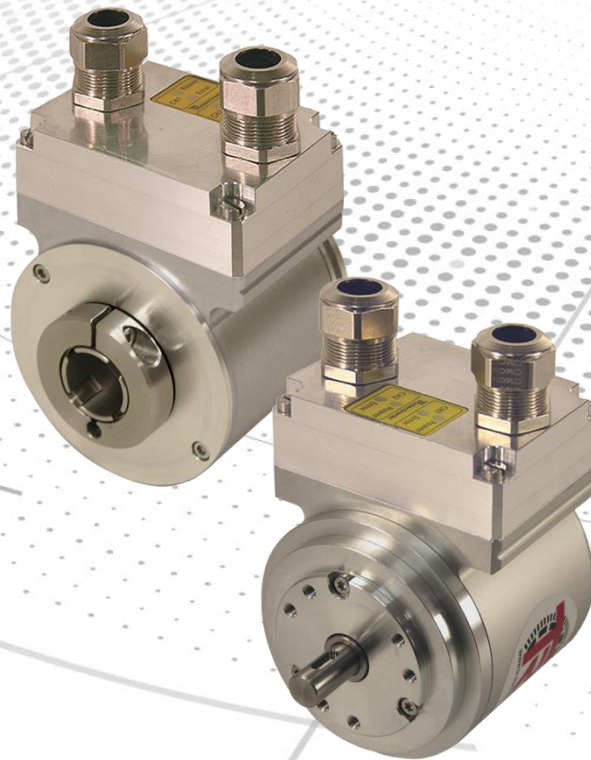
Explosion Protection Enclosure with integrated measuring system

Explosion Protection Enclosure - Types

— ADV75M SSI (Gas, Dust)

— ADH75M SSI (Gas)

ADH75M SSI



ADV75M SSI

CE

 II 3G Ex nAc/ec IIC T4 X

 II 3D Ex tc IIIC T130°C IP64 X

Date of manufacture: DD.MM.YYYY

— Basic safety instructions

— Intended use

— Product description

— General technical data

— Explosion protection characteristics



User Manual

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Text

Cursive or **bold** text represents the title of a document or is used for emphasis.

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" < > " refers to keys on your computer keyboard (e.g. <RETURN>).


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Amendment-index


Amendment	Date	Index
First edition	03/03/2017	00
Declaration of conformity updated	02/21/2018	01
ADH75: Loss of the dust certification, IP64 -> IP54	04/22/2020	02
- New Equipment protection: "increased safety", e - Declaration of conformity updated	08/18/2020	03
Updating the declaration of conformity	03/02/2022	04
Updating the declaration of conformity	09/27/2023	05

1 General


This -User manual contains all relevant explosion-safety information and includes the following topics:

- Basic safety instructions
- Intended use
- Product description
- General technical data
- Explosion protection characteristics

Since the documentation has a modular structure, this -User manual represents a supplement to the other documentation such as for example product data sheets, dimensional drawings and leaflets etc.

The -User manual is included, but can also be ordered separately.


1.1 Scope

This -User manual applies exclusively to the following explosion protection enclosure series:

- Gas  II 3G Ex nAc/ec IIC T4 X, valid for ADV75 / ADH75
- Dust  II 3D Ex tc IIIC T130°C IP64 X, valid for ADV75

The products are labelled with affixed nameplates and are components of a system.

It thus applies together with the following documentation:

- the operator's system-specific operation instructions
- this -User manual
- the pin assignment
- the interface-specific user manual
- the product data sheet

1.2 Relevant directives and standards

The explosion protection enclosure is developed, constructed and finished under compliance with the applicable European- or International standards and directives.

EU-Directive 2014/30/EU	Electromagnetic compatibility
EU-Directive 2014/34/EU	Equipment and protective systems intended for use in potentially explosive atmospheres
EN 61000-6-2	EMC: Interference immunity
EN 61000-6-3	EMC: Interference emission
EN 60079-0	Explosive atmospheres: General requirements
EN IEC 60079-7	Explosive atmospheres: Equipment protection by increased safety "e"
DIN EN 60079-14	Explosive atmospheres: Electrical installations design, selection and erection
EN 60079-15	Explosive atmospheres: Equipment protection by type of protection "n"
EN 60079-31	Explosive atmospheres: Equipment dust ignition protection by enclosure "t"
DIN EN 60529	Degrees of protection provided by enclosures (IP code)

1.3 Used abbreviations / Terms

ADV75M SSI	Explosion protection enclosure with integrated measuring system of the CDV75 series with SSI interface
ADH75M SSI	Explosion protection enclosure with integrated measuring system of the CDH75 series with SSI interface
CDV	Absolute encoder with redundant dual scanning, solid shaft design
CDH	Absolute encoder with redundant dual scanning, hollow shaft design
EU	E uropean U nion
EMC	E lectro m agnetic c ompatib i lity
ESD	E lectro S tatic D ischarge
IEC	I nternational E lectro-technical C ommission
VDE	Association for Electrical, Electronic & Information Technologies

1.4 Product description

The aluminum explosion protection enclosure with built-in systems and integrated evaluation electronics serves the detection of changes in angle for fixed installations. The changes in angle are transmitted to the evaluation electronics via shaft.

The explosion protection enclosure has the ignition protection type

- "n": non-sparking operating equipm. (potential gas-explosive atmosphere) or
- "e": increased safety (potential gas-explosive atmosphere) and / or
- "t" (ADV75): protection by the enclosure (potential dust-explosive atmosphere)

Through its manner of construction, the types of ignition protection and additional measures, the enclosure is suitable for the incorporation of non-explosion protected installation devices such as the measuring system of the series CDV75 or CDH75 with SSI interface.

The construction, as well as the interaction of the individual components and the housing with regards to their possibilities for use in potentially explosive areas, are tested by the company TR-Electronic GmbH and confirmed by identification with the ATEX nameplate.

2 Basic safety instructions

2.1 Symbol- and note definition



means that death or serious injury can occur if the required precautions are not met.



means that minor injuries can occur if the required precautions are not met.

NOTICE

means that damage to property can occur if the required precautions are not met.




indicates important information or features and application tips for the product used.



signifies that respective ESD-safety measures according to DIN EN 61340-5-1 supplement 1 are to be observed.

2.2 General dangers with the use of this product

The product, hereafter referred to as **equipment** is manufactured using the latest technology and according to recognized safety regulations. **Nevertheless, non-intended use can cause danger to life and limb of the user or third parties or cause damage to the equipment and other property!**

Only use the equipment for its intended use, with safety- and danger awareness and in compliance with the -**user manual** and the **interface specific user manual!**

The operator of an electrical system in a potentially explosive environment should keep the equipment in a proper condition, it should be properly operated and monitored and maintenance- as well as repairs are to be performed. This also includes inspection of the equipment for possible transport damage prior to commissioning.

De-energize the system before carrying out wiring work or opening and closing electrical connections. The equipment may not be used in case of defects, as a basic principle it may not be opened and dust deposits > 5 mm must be removed.



2.3 Intended use

The equipment is a fixed-installation device for use in the Ex-Zone 2 (potentially gas-explosive areas, II 3 G, device protection level Gc) or 22 (areas with combustible dust II 3 D, device protection level Dc).

The assembly is to be made exclusive by the specifications of the interface specific user manual.

The electrical data provided on the nameplates for the device and ATEX, as well as the device category, temperature class etc. for the place of use are to be observed. The operating temperature range of the equipment is -20°C to +60°C.

Intended use also includes:

- observation of all instructions contained in this -User manual and in the interface-specific user manual,
- observation of the nameplates and possible prohibition- or instruction labels,
- observation of the supplementary documentation e.g. the accompanying product sheet, connector assignments etc.,
- observation of the machine- or system manufacturer's operating manual,
- operating of the equipment within the limits indicated in the technical data (-User manual/interface-specific user manual).

2.4 Non-intended use

⚠ WARNING

NOTICE

Risk of death, bodily injury or damage resulting from non-intended use of the equipment!





- The following uses are especially prohibited:
 - in environments with an explosive atmosphere of the Zones ADV75: 0, 1, 20 and 21 / ADH75: 0, 1, 20, 21 and 22
 - for medical aims
 - commissioning of the equipment if the nameplates are no longer readable or are completely missing.
-

2.5 Warranty and liability

The "General terms and conditions" ("Allgemeine Geschäftsbedingungen") of the company TR-Electronic GmbH apply in general. This will be available to the operator with the contract confirmation or –conclusion at the latest. Warranty- or liability claims with regards to personal- and property damage are excluded, if they are the result of one or more of the following causes:

- Non-intended use of the equipment.
- Improper assembly, installation, commissioning, maintenance or dismantling of the equipment.
- Improperly executed work on the equipment by unqualified personnel.
- Operating of the equipment in the presence of technical defects.
- The performance of unauthorized mechanical or electrical modifications of the equipment.
- The performance of unauthorized repairs
- Catastrophic incidents caused by external forces or acts of God.

2.6 Organizational measures

- The -User manual must always be kept within reach in the equipment's operating location.
- In addition to the -User manual, the generally applicable legal regulations and other mandatory directives for work safety, accident prevention and environmental conservation are to be observed and conveyed.
- The applicable national-, site- and system-specific provisions and requirements are to be observed and conveyed.
- The operator has the obligation to point out any special operational features and requirements to the personnel.
- Before starting work, the personnel responsible for work on or with the equipment must have read and understood the -User manual, in particular the chapter on "Basic safety instructions".
- The nameplates and possible affixed prohibition- or instruction labels must be kept in a readable condition.
- Do not perform any mechanical or electrical modifications to the equipment, except those which are specifically described in this -User manual.
- Repairs may only be performed by the manufacturer, or by a person or body who carries the manufacturer's authorization.

2.7 Personnel selection and -qualification; basic obligations

2.7.1 Electrical installations design, device selection and erection

The project development of electrical systems, the selection of the devices and the installation in potentially explosive atmospheres may only be performed by persons whose training includes instruction in various types of ignition and installation techniques, applicable regulations and prescriptions as well as general principles of the Zone-classification. The persons must have the relevant competence for the type of work to be performed.

The personnel must regularly undergo corresponding further training or courses.

For definitions on the knowledge, expertise and competence of the "responsible persons", "manual workers" and "planners", the IEC 60079-14 or DIN EN 60079-14 standards are to be additionally consulted [suppliers e.g. Beuth Verlag GmbH, VDE-Verlag GmbH].

2.7.2 Inspection, maintenance and repair

The inspection, maintenance and repair of electrical systems in potentially explosive environments may only be performed by experienced personnel who have also gained knowledge on the various types of ignition and installation procedures, the requirements of the IEC / DIN EN 60079-17 standard, relevant national provisions and company regulations for the system as well as on the general principles of the Zone-classification during their training.

Personnel are to undergo appropriate further training or instruction regularly. Proof of the relevant experience and completed training must be available.

For definitions on the knowledge, expertise and competence of the "responsible persons", "expert person with leadership functions" and the "performing personnel", the IEC 60079-17 or DIN EN 60079-17 standards are to be additionally consulted [suppliers e.g. Beuth Verlag (publishers) GmbH, VDE-Verlag GmbH].

2.8 First commissioning / Commissioning

Prior to the first commissioning the equipment is to be checked regarding its suitability in the respective zone according to its labeling. The values indicated on the nameplates are not to be exceeded. With use of the equipment in areas which are potentially explosive because of dust, a deposit of dust on the top-side which is more than 5 mm thick is not permissible. Here the installation of an additional covering may be required in circumstances where the deposit of dust cannot be reliably avoided.

The operational safety of the equipment and the correct functional arrangement of the equipment inside the plant must be checked before commissioning. It may only be used in a clean and undamaged condition.

2.9 Assembly, installation and dismantling

With installation and operation of the explosion protective equipment, one should consider protection against hazardous environmental influences which limit the intended use of the equipment. This could be protection against aggressive fluids or weather protection for example. During installation, the IEC 60079-14 and DIN EN 60079-14 as well as other national standards and regulations applicable at the installation site are to be adhered to.

The information on the nameplates must be complied with.

The assembly is to be performed according to the specifications in the interface-specific user manual.

The coupling required for the mechanical connection of the ADV75 model's shaft to the drive must comply with the given specifications according to the interface-specific user manual as well as be approved for use in potentially explosive areas. The requirements for this are defined in the chapter "Technical data", starting on page 15. Here the manufacturer's installation instructions are to be adhered to.

In potentially explosive areas the equipment's connection lines are to be routed in such a way that they are protected from damage and mechanical failure. The individual wires must not be damaged. The maximum connection information on the device nameplate must be complied with.

The instructions for connecting the free connection line ends are to be adhered to, see chapter "Special conditions for safe use, marking "X" " on page 14.

For metal enclosures in potentially explosive areas an equipotential line with at least 4 mm² is required.

Wiring work, opening and closing of electrical connections may only be performed with the power switched off.

Do not perform any welding work once the equipment has already been wired and switched on.



Touching the equipment-connection contacts with bare hands is to be avoided, or the respective ESD-protective measures are to be implemented.

2.10 Inspection, maintenance and repair

The operator of an electrical system in a potentially explosive environment must keep the equipment in an good condition, operate it properly, monitor it and maintenance and repair work must be performed, also see IEC 60079-17 and DIN EN 60079-17 in this respect.

Maintenance work and defect repairs may only be performed by trained professionals. Before the maintenance or repair, the specified safety precautions are to be observed. The warning notes on the equipment and in the ⚠-User manual and the interface-specific user manual are to be adhered to!
The applicable laws and directives are complied with before recommissioning.



- The equipment does not require any maintenance by the operator. Nevertheless, inspections must be performed at regular intervals:
 - Visual inspection
 - of the enclosure for damages
 - of the connection lines for external damages
 - for dust deposits
 - Checking of the cable entries for a tight fit
- In case of damages, the equipment is to be taken out of service immediately and to be repaired by the manufacturer!

2.11 Special conditions for safe use, marking "X"

The "X" symbol in the labeling of the equipment is used to indicate special application conditions:

The equipment's installation location and -manner are generally to be selected in such a way that it is protected from external mechanical influences and in a way that no function limitations can result. In order to guarantee this, in some circumstances additional constructional measures must be realized.

Misappropriations of the equipment as

- support
- tread plank
- stirrup
- ...

are prohibited.

The connection of the free ends of the connection lines must either take place outside of the potentially explosive area or within of an equipment which is permitted for the respective device category.

3 Technical data

3.1 General

Rated Voltage 24 V DC

Power consumption ≤ 4 W

Mechanically permissible speed $\leq 3000 \text{ min}^{-1}$

Ambient temperature range $-20\text{ }^{\circ}\text{C} \dots +60\text{ }^{\circ}\text{C}$

Protection class..... Degrees of protection provided by enclosures
according to DIN EN 60529

ADH75 IP54

ADV75..... IP64


Enclosure- / Flange material Aluminum, EN AW-AlCu6BiPb

Shaft, stainless steel..... WN 1.4305, corrosion resistant

3.2 Explosion protection characteristics

3.2.1 Ex-labeling, gas (ADV75 / ADH75)

 II 3G Ex nAc/ec IIC T4 X

	II	3G	Ex	nAc ec	II	C	T4	X	
									special conditions
									Temperature (IEC/CENELEC)
									Subgroup (IEC/CENELEC)
									Group (IEC/CENELEC)
									Ignition protection type (IEC/CENELEC)
									Labeling (IEC/CENELEC)
									Device category (ATEX)
									Device group (ATEX)
									Ex-labeling (ATEX)

Device group..... **II**: potentially gas-explosive areas

Device category..... **3G**: Zone 2
adequate safety with normal operation

Ignition protection type **nAc**: non-sparking equipment
Ex-Atmosphere cannot be ignited in case of defined malfunction conditions
ec: increased safety
additional measures to prevent ignition of the Ex-Atmosphere

Group..... **II**: potentially gas-explosive areas


Subgroup **C**: typical gas: Hydrogen, acetylene

Temperature..... **T4**: max. enclosure surface-temperature ≤ 135 °C

Special conditions..... **X**: see chapter 2.11 on page 14

3.2.2 Ex-labeling, dust (ADV75)

 II 3D Ex tc IIIC T130°C IP64 X

	II	3D	Ex	tc	III	C	T130°C	IP64	X
									special conditions
								Type of protection	
							Temperature		
						Subgroup (IEC/CENELEC)			
					Group (IEC/CENELEC)				
				Ignition protection type (IEC/CENELEC)					
		Labeling (IEC/CENELEC)							
	Device category (ATEX)								
	Device group (ATEX)								
Ex-labeling (ATEX)									

Device group..... **II**: potentially dust-explosive areas

Device category..... **3D**: Zone 22
adequate safety with normal operation

Ignition protection type **tc**: Protection by enclosure
with adherence to the type of protection and within the
surface temperature limits, Ex-atmosphere cannot be
ignited

Group..... **III**: potentially dust-explosive areas

Subgroup **C**: Type of dust: conductive dust

Temperature..... **T130°C**: max. enclosure surface-temperature ≤ 130 °C

Protection class..... **IP64**: Degrees of protection provided by enclosures
according to DIN EN 60529

Special conditions..... **X**: see chapter 2.11 on page 14

4 Equipotential bonding conductor - Connection

An equipotential is required for systems in potentially explosive areas. This is to be done through one of the four attachment screws of the connection cover and with a minimum wire diameter of 4 mm².

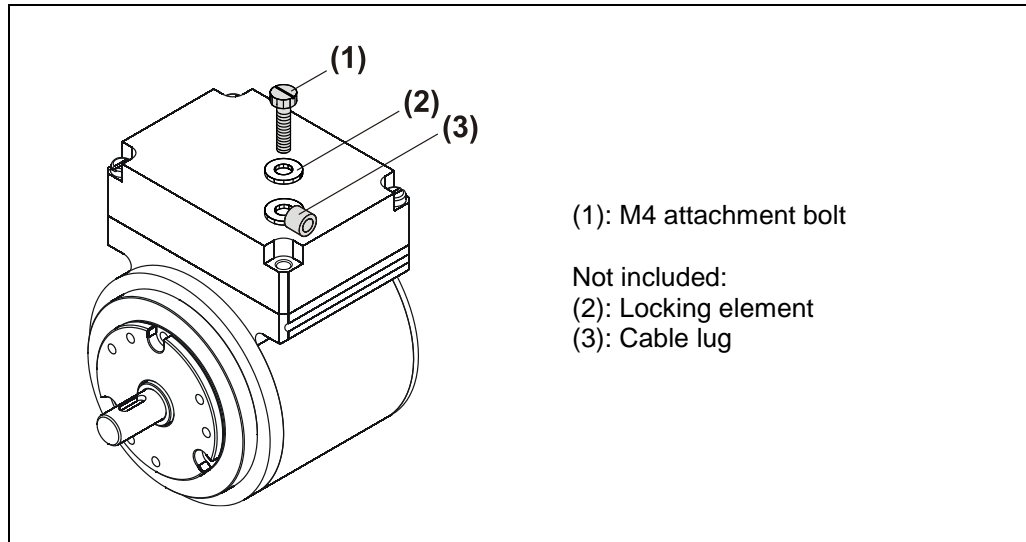


Figure 1: Equipotential bonding conductor - Connection

5 Annex

5.1 EU declaration of conformity



EU Declaration of Conformity

The Rotative Measuring System Series **ADx75M SIL3 with SSI Interface and Explosion Protection Enclosure**

Type: ADV75M SSI, ADH75M SSI
Order-No.: ADV75M-xxxxx, ADH75M-xxxxx

was developed, designed and manufactured to comply with the EU-Directives

Electromagnetic Compatibility (EMC)	2014/30/EU	(L 96/79)
Equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)	2014/34/EU	(L 96/309)
Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)	2011/65/EU	(L 174/88)

under the sole responsibility of

TR Electronic GmbH
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Germany

The following harmonized standards were applied:

EN 61000-6-2:2005/AC:2005 with increased test standards; DIN EN 61326-3-1:2018	Generic standards - Electromagnetic compatibility, Immunity (Industrial environments)
EN 61000-6-3:2007/A1:2011	Generic standards - Electromagnetic compatibility, Emissions (Commercial environments)
EN 61800-5-2: 2007	Adjustable speed electrical power drive systems Safety requirements - Functional
EN ISO 13849-1: 2015	Safety of machinery - Safety-related parts of control systems General principles for design
EN 60204-1:2018 (in extracts)	Safety of machinery - Electrical equipment of machines General requirements
EN IEC 62061:2021	Safety of machinery - Functional safety of safety-related control systems
EN ISO 20607:2019	Safety of machinery - Instruction handbook - General drafting principles
EN IEC 60079-0:2018	Explosive atmospheres Part 0: Equipment - General requirements
EN IEC 60079-7: 2015/A1:2018	Explosive atmospheres Part 7: Equipment protection by increased safety "e"
EN 60079-15: 2010	Explosive atmospheres Part 15: Equipment protection by type of protection "n"
EN 60079-31: 2014	Explosive atmospheres Part 31: Equipment dust ignition protection by enclosure "t"
EN IEC 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

**Other applied standards:**

DIN EN 61508 Part 1-7: 2011	Functional safety of electrical/electronic/programmable electronic safety-related systems
DIN EN IEC 60079-14:2021	Explosive atmospheres Part 14: Electrical installations design, selection and erection
DIN EN 60529: 2014	Degrees of protection provided by enclosures (IP code)

The products are marked additionally with the following characteristics on the ATEX name plate:

 II 3G Ex _ IIC T4 X;  II 3D Ex tc IIIC T130°C IP64 X

The certification to the conformity for an E/E/PE-system was carried out by the notified body:

NB0036, TÜV SÜD Industrie Service GmbH
Location Mannheim, Electrical and Building Services Engineering
Dudenstraße 28
D-68167 Mannheim
Certificate-No.: 1044492

Authorized to compile the technical file:

TR Electronic GmbH, Eglisshalde 6, 78647 Trossingen, Germany

Trossingen, 09/22/2023

Mr. Klaus Tessari, CEO

5.2 Interface-specific user manual

Document-No.:	Description
TR-ECE-BA-DGB-0070	Absolute Encoder Series CD_-75 with SAFETY SSI interface