24.2.2020

Instructions for Safe Use

SLAM

(Certification N:o EESF 20 ATEX 014X and IECEx EESF 20.0003X)

Thank you for choosing SLAM® TrafoEx transformer for your job site. Purpose of this manual is to provide you all the necessary safety and product information to conduct your job conveniently and without any risks for health and safety.



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Contents

Instructions for Safe Use....1
1. Introduction to SLAM® TrafoEx....3
1.1 Technical data....3
1.1.1 2P+E system (PELV))....4
1.1.2 2P system (SELV)....4
1.2 Certification of equipment....5
1.3 Standard unit construction....6
1.4 Quality Guaranteed....7
1.4.1 General....7
1.4.2 Individual testing reports....7
2. Prior to use....8
2.1 Selection of right equipment....8
2.1.1 Intended purpose of equipment....8
2.1.2 Application of use (Zone XX) in accordance with equipment category....9
2.1.3 Gas explosion group (IIA, IIB or IIC) in accordance with Equipment group (IIA, IIB or IIC)....9
2.1.4 Temperature class of the equipment....9
2.1.5 Environmental criteria....10
3. Operating instructions....11
3.1 Personnel....11
3.2 Visual inspection of SLAM® TrafoEx....11
3.3 Special attention on 2-pole use (24 V or 42 V)....11
3.5 Connection to the supply....11
3.5.1 Requirements for supply (electricity)....11
3.5.2 Special conditions....12
4 Inspection & Maintenance....14
4.1 After Use....14
4.2 Maintenance....14
4.3 Testing....14
4.4 Repair report....15
Helpdesk....16

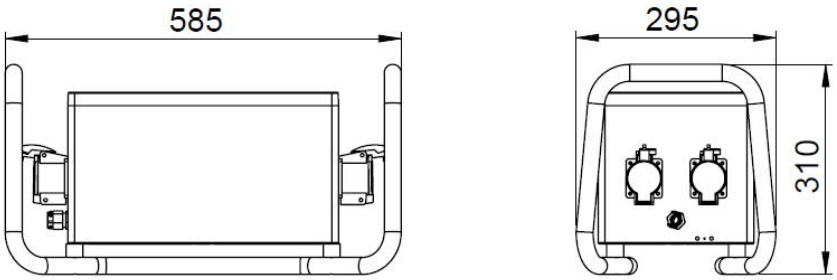
1.Introduction to SLAM® TrafoEx

(Certification N:o EESF 20 ATEX 014X and IECEx EESF 20.0003X)

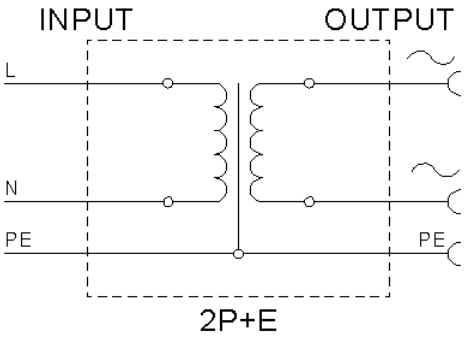
This instruction manual guides you through the process of selecting and adopting SLAM® TrafoEx – transformer for your work site. The manual regards the following SLAM® TrafoEx -types:

1.1 Technical data

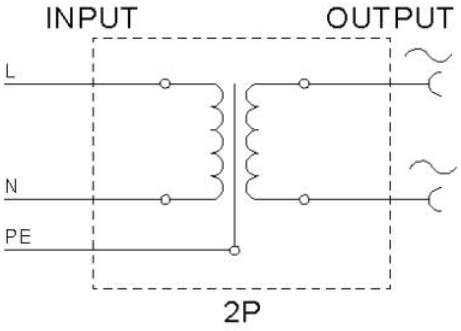
SLAM® TrafoEx 400 (later STREX400) 2P +E version (PELV)
SLAM® TrafoEx 400 (later STREX400) 2P version (SELV)



1.1.1 2P+E system (PELV))



1.1.2 2P system (SELV)



Transformer is equipped with a external bonding point which can be used if preferred. Using the bonding point is not mandatory, since the PE conductor is connected through the supply cable.

1.2 Certification of equipment

The SLAM® TrafoEx–series has been designed, tested and certified (according to ATEX and IECEx) for portable or transportable use. There is “X” –mark in the certificate for special conditions of safe use of the equipment. Please refer to the certificate of the equipment or section 3.5.2 for more information. The equipment is to used properly and according to its ratings, documentation and local applicable laws. Local, national certificates of these units may exist outside the region of EU. Possible variations is marked on the typelabel of the product (e.g IP XX)

The aforementioned SLAM® TrafoEx–types are certified e.g as follows. You may find brief explanation of certificate beneath:

Transformers with ATEX certification

CE_{0537} Ⓔx II 2 GD **Ex eb IIC T4/T3 Gb**
Ex tb IIIC T70°C Db

Transformers with IECEx certification

Ex eb IIC T4/T3 Gb

CE_{0537} = Valid production quality system approved and notified by EESF (Finnish Notified Body, listed by EC)

Ⓔx = Certified for explosion-hazardous areas
II = Certified for use in areas excluding mines
2 = Equipment category (suitable for Zone 1&21 and Zone 2&22)
G = Certification taking account explosion hazardous GASES
D = Certification taking account explosion hazardous DUSTS

Explanation of marking for explosion hazardous area due to Gases (Ex eb IIC T4/T3 Gb)

Ex = Certified for use in explosion hazardous areas
eb = Explosion protection method increased safety (of certain components)
IIC = Equipment group (for all IIA, IIB and IIC gases)
T4 = Maximum inside temperature of the unit is 135 °C (within the ambient temperature range of -20°C … +45°C)
T3 = Maximum inside temperature of the unit is 200 °C (within the ambient temperature range of +45°C … +55°C)
Gb = Explosion Protection Level (EPL) marking for “HIGH” level of protection. Equipment for explosive **GAS** atmospheres, which is not a source of ignition in normal operation or during expected malfunctions

Explanation of marking for explosion hazardous area due to Dusts (Ex tb IIIC T70°C Db):

Ex = Certified for use in explosion hazardous areas
tb = Explosion protection method “protection by enclosure”
IIIC = Equipment group for conductive dusts (including IIIA, IIIB and IIIC dusts)
T70°C = Maximum OUTSIDE surface temperature of the unit is 70 °C (within the ambient temperature range of -20°C - +55°C)
Db = Explosion Protection Level (EPL) marking for “HIGH” level of protection. Equipment for explosive **DUST** atmospheres, which is not a source of ignition in normal operation or during expected malfunctions

1.3 Standard unit construction

The following list familiarizes you with some common unit features important to recognize:

2P+E: Electrical system having Phase (P), Neutral (N) and Protective Earth (PE). With Extra-Low-Voltage system is recognized as PELV (Protective Extra Low Voltage)

2P : Electrical system having Phase (P), Neutral (N). With Extra-Low-Voltage this system is recognized as SELV (Safety Extra Low Voltage). No means for bonding available.

Cable: Standard cable of the SLAM® TrafoEx–series is H-FLEX C-PUR. This cable has polyurethane (PUR) outer sleeve and copper sheathing. PUR withstands well chemicals as well mechanical wearing.

Fuse: SLAM® TrafoEx has two fuses for protecting against dangers of electrical e.g shortcircuits of relating equipment/systems.One of the fuses is in the primary side (L conductor of supply) protecting against supply failures. One of the fuses is in the secondary side (L conductor) protecting against failures of relating equipment connected to the sockets of the TrafoEx transformer.

In case of activated fuse protection: Stop the work in hazardous area immediately until the likely shortcircuit of relating equipment/system has been identified and corrected.

Shortcircuit is definitely a source of ignition which may cause an explosion !

Other common accessories (optional):
To view options on accessories, please visit http://www.atexor.com for further study or call +358 20 734 3250

1.4 Quality Guaranteed

1.4.1 General

The SLAM® TrafoEx–series is designed, certified, manufactured and tested under ISO 9001 quality system as well as additional requirements of the Directive 2014/34/EU (ATEX). The SLAM® TrafoEx–series is designed and tested according to the latest directives and standards. The referred directives and standards of the production date in case are stated on the Declaration of Conformity which is included in the delivery.

1.4.2 Individual testing reports

Each SLAM®–unit has its own individual serial number and is provided with an original, individual testing report when leaving the factory. The year of manufacture is specified on the type label of the equipment. Following tests have been done for SLAM® TrafoEx–units according to standards relating to portable TrafoEx transformer for explosion hazardous area. The Declaration of Conformity is specifying the relevant standards. The testing report included in the delivery specifies the results of the factory tests for that particular unit. The testing report typically specifies the following tests:

PE –resistance test
The purpose of this test is to measure persistence of earth conductor.
Vital test for electrical safety as well as explosion safety because of e.g static electricity control.

The test current is 10A (current) and the overall resistance should not exceed 0,5 ohm.

Operation under load
Each of the sockets is tested with either 8A or 16A load. The output voltage has to be as specified for the particular type of TrafoEx transformer

High voltage test (electrical strength)
The purpose of this test is to measure leakage current trough insulation. Vital test for revealing broken components or similar failures which can not be identified visually. For TrafoEx transformer there are three tests runned: Primary, Secondary and Primary agaist Secondary. Testing voltage applied is 2550VDC or 1500VAC. Maximum leakage current is 5mA.

Test of expected use of equipment
The TrafoEx transformer is subjected to shaking and vibration – to see that all the internal wires are properly attached and components are not loose.

Operational test of TrafoEx transformer and accessories
The unit is plugged-in and checked that it is working properly after all accomplished tests above.

Visual inspection
A final check to see everything is fine (screws attached properly, wires connected and required markings attached).

2.Prior to use

2.1 Selection of right equipment

You need to be sure that the equipment you intend to take into explosion hazardous area matches up with the zone classification and other safety requirements related. At least the following points should be notified prior to use:

2.1.1 Intended purpose of equipment

Please keep in mind what the actual application of equipment is. For example in case the equipment is to be moved when connected to the supply it needs to be designed for that purpose. If the certification is mentioning “portable” it means that the equipment is suitable and tested for portable use. If the certification does not mention portable it means that the equipment shall not be moved when it is in operation.

SLAM® -units are designed and tested for portable or transportable use.

2.1.2 Application of use (Zone XX) in accordance with equipment category

Operator has the best knowledge of area classification at his site. To help the operators' selection of equipment the certification is describing the equipment category. For explosion hazardous areas there are three equipment categories. SLAM® -units mentioned in this instruction fall into Category 2 equipment.

Category 1 product is suitable for use in Zones 0, 1 and 2 / (20, 21 and 22)

Category 2 product is suitable for use in Zones 1 and 2 / (21 and 22)

Category 3 product is suitable for use in Zones 2 / (22)

2.1.3 Gas explosion group IIA, IIB or IIC and dust explosion group IIIA, IIIB or IIIC in accordance with Equipment group IIA, IIB or IIC for gases and equipment group IIIA, IIIB or IIIC for dusts

This information is vital because the substances require different amount of energy to be ignited. Safety requirements for equipment are not the same for different substances (e.g. static electricity requirements).Therefore making the selection easier the gases are divided to three different groups (IIA, IIB and IIC). Further information about the substances can be found from EN 60079-20 (Data for flammable gases and vapours, relating to the use of electrical apparatus).

SLAM® -units mentioned in this instruction are Equipment **group IIC for gases, group IIIC for dusts**

2.1.4 Temperature class of the equipment

Please observe the Ignition Temperature (IT) of the substance creating the explosion hazard at your site. Select the equipment based on IT of the substance. The temperature of the equipment must be lower than IT. The highest temperature of the equipment is specified by using Temperature Classes T1 to T6.

Example:

Petroleum IT is approximately 250 Celsius → Maximum allowed temperature class of the equipment is T3 (< 200° C)

SLAM® -units mentioned in this instruction are Temperature Class T3/T4 (GASES)
SLAM® -units mentioned in this instruction maximum surface temperature of 70ºC (DUSTS)

2.1.5 Environmental criteria

Please observe the ambient temperature of the application in use because certification is valid for temperatures between – 20°C --- + 55°C. Please see type label of the product for further data. If the equipment is used in other temperatures than mentioned the safety can not be guaranteed.

Selection and use of equipment is always under the responsibility of the operator. Please note that all of the aforementioned criteria are to be passed when selecting the equipment.

Please do not take any unnecessary risks.



3. Operating instructions

3.1 Personnel

The use of the equipment is to be controlled and accepted by the operator. The personnel using the unit have to be authorized by the operator or his representative. In case of further training of using the equipment please contact the local supplier of this equipment.

3.2 Visual inspection of SLAM® TrafoEx

As for all equipment to be used inside explosion hazardous area it is recommended that before taking the unit into Ex –area, a visual re-inspection on the unit was taken and an analysis made the unit to be un-damaged and fully operational.

In case faults or defects on the unit are noticed, it is prohibited to take such a unit into Ex –area until corrective actions have been made.

3.3 Special attention on 2-pole use (24 V or 48 V)

Using SLAM® TrafoEx -unit with 2-pole socket outlets (without earthing / bonding) imposes certain extra requirements for the relating equipment. Please note that the relating equipment should not have any external metal parts which may be a source of ignition because of static electricity (ref. EN 60079-14). Extra bonding may be required for ensuring correct bonding.

SLAM® range of products does include luminaries suitable for 2-pole use. Please ask us or your supplier for further details.

3.5 Connection to the supply

It is recommended that the unit is first connected to the mains before entering the explosion-hazardous area.

3.5.1 Requirements for supply (electricity)

The following main requirements should be taken into account:

Supply voltage: Variation may be maximum +/- 6% from the value stated in the unit type label.
Type of Supply: Class 1 (incorporating protective earth conductor)
Current: Maximum current of the system is 16 A
Frequency: Standard 50 Hz if not otherwise stated in the type label.
Fuse protection: The supply has a fuse with a breaking capacity of at least 1500 A

Please observe the type label for further data.

3.5.2 Special conditions

Ambient temperature vs. max. output current

SLAM® TrafoEx -units are equipped with Ex –certified sockets in the factory. The type and number of the sockets are considered as an option so they are added to the unit upon customer's special request.

Please note the following operational characteristics:

- In case the ambient temperature is between -20°C -- +39°C and the nominal output voltage is 12 VAC or 24 VAC the maximum output current is 16 A.
- In case the ambient temperature is between -20°C -- +39°C and the nominal output voltage is 48 VAC the maximum output current is 8 A.

Output voltage (VAC)	Max. Output current (A)	Max Power (VA)
48	8	384
24	16	384
12	16	192

Certain socket options have restrictions on max. output current relating to the maximum ambient temperature. Please observe the table below. Applicable table for your unit can be determined from the type label.

Transformers with ATEX certification

Ambient temp.	Max. Output current with ATX sockets		Max. Output current with CEAG sockets	
	Output 24V**	Output 48V	Output 24V	Output 48V
+55°C	8A	8A	6A	6A
+50°C	12A	8A	10A	8A
+45°C	14A	8A	13A	8A
+40°C	16A	8A	15A	8A
+39°C	16A	8A	16A	8A

**** Also applicable for 110V or 230V throughwired output socket**

Transformers with IECEx certification

Ambient temp.	Max. Output current with CEAG sockets	
	Output 12V or 24V	Output 48V
+55°C	6A	6A
+50°C	10A	8A
+45°C	13A	8A
+40°C	15A	8A
+39°C	16A	8A

Please note the Max. output current is total current for the whole system, not just for single individual socket. For example, if max. output current is 16A and the TrafoEx transformer is equipped with 2x sockets, total current of the 2x sockets can't exceed 16A. If one socket is used with 10A load, the other available socket can be used with no more than 6A load.

When connecting relating equipment to the SLAM® TrafoEx please observe the operational characteristics of the equipment in case and ensure that above mentioned special conditions are taken account.

Portable and transportable

The SLAM® TrafoEx is certified for portable or transportable use. Please see below for conditions defining the portable and transportable conditions.

- Portable

The unit is connected to mains power source, but none of the relating equipment has not been connected to the output sockets of the transformer. Unit may be moved around when energized.

- Transportable

The unit is connected to mains power source and relating equipment has been connected to the output sockets with compatible plug. Unit may not be moved when energized. To move the equipment, disconnect the mains power source or related equipment from the output sockets.

Enclosure

The empty enclosure with a coating must not be used in areas affected by charge-producing processes, mechanical friction and separation processes, electron emission (e.g. in the vicinity of electrostatic coating equipment), and pneumatically conveyed dust.

4 Inspection & Maintenance

4.1 After Use

Take the following steps after the SLAM® TrafoEx –unit has been taken out from Ex –area:

1. Clean the unit with a damp cloth (do not use detergents or solvents)
2. Have a visual check on the unit (condition of cable, enclosure, tightness of parts)
3. Let the unit dry in open air

4.2 Maintenance

The following procedure should be taken in case the SLAM® TrafoEx -unit needs to be repaired:

1. Maintenance may be carried out only outside Ex –area.

2. Person responsible for maintenance should have been trained the basics of explosion-protection as well electricity.

3. Only original spare parts from the manufacturer should be used. Please note that there are no components in this unit which can be repaired by using glue, silicone or any other similar method.

4. Maintenance instructions with exploded-view diagram and spare parts list are available at your local distributor and the manufacturer. Please, when requesting maintenance instructions with exploded-view diagrams, include the model and serial number of the product.

4.3 Testing

Tests are to be done according to EN 60079-19 until returning the repaired unit back to operation. Below mentioned tests shall be done in addition to the tests specified in EN 60079-19:

- PE –resistance test
- High-voltage test (500 VDC between Phase& Neutral against P/E conductor)
- Operational test (e.g. wiring of sockets)
- Test of expected use (vibrations, shaking)

Proper testing ensures safe operation of repaired equipment.

4.4 Repair report

The operator is responsible for keeping up to date record of the condition of his equipment (EN 60079-14). Ensuring the availability of this important information each repair procedure should be written down in repair report according to EN 60079-19.

This report should reveal at least:

- Person who conducted the maintenance
- Date of maintenance
- Procedure of maintenance
- Signature of person responsible accepting the maintenance

More information about the use of Electrical Apparatus for Explosive Gas Atmospheres is available at:

EN 60079-14 (Electrical installations in hazardous areas)
EN 60079-10 (Classification of hazardous areas)
EN 60079-17 (Inspection and maintenance of electrical installations in hazardous areas)
IEC 60079-19 (Repair and overhaul for apparatus used in potentially explosive atmospheres)

Helpdesk

Under any doubt or question, please contact your local distributor or the manufacturer.

Contact details:

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