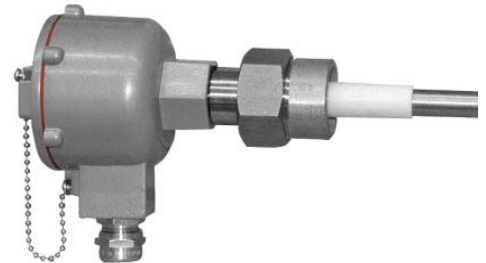


TC50 EMISSION CONTROL PROBE Tribo-Check® 4÷20 mA

www.esaelectronic.it --> MOVIE --> CALIBRATION TRIBO

DOCUMENTATION INDEX

- 1.1 Standard features
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1.1 STANDARD FEATURES

Code	Description
BS40	TC standard probe fastening bush Standard TC probe fixing flange. Muff male thread 1-1/4
AT	Tropicalisation of the Printed Circuit Application of a protective paint on the printed circuit
PC20TC	Brass/nickel cable glands M20 Additional brass/nickel cable glands M20 Hole diameter 20 mm. Cable diameter from 5 to 10 mm. Degree protection: IP68 Temperature: -25°C ÷ +100°C

Date: 27 / 08 / 2019
Ver. 18.9.2
Code: TC50500



GENERIC DOCUMENTATION. THE SPECIFIC DOCUMENTATION IS ATTACHED TO THE SEQUENCER

2.1 GENERAL DESCRIPTION

2.2 PREREQUISITE

The need to signal in advance possible leakages of the dedusting system avoiding high costs of environmental reclamation and of plants stop-overs brought, since a long time, to the use of electronic equipments dedicated to a better environmental safeguard. With the use of these devices it is possible to signal any failure that can produce dangerous emissions in the atmosphere which are symptom of breakdown in the dedusting plant. Especially, it is possible to control any breaks of the filtering surfaces, broken bags or cartridges.

The use of TC probes allows therefore to identify the dust particles which are present in the gases that go through the filter due to any breaks or failures of the bags or cartridges where the quantities of dusts to remark are considerable 100÷400. For a correct functioning of the TC probe, the cartridges or the bags must be mounted in a vertical position.

The TC probe is seldom used for the continuous monitoring of the dustiness degree present in the discharge duct of the gases in the atmosphere.

The above-mentioned use entails a more complicated calibration and a deep knowledge of the device.

2.3 TRIBO-CHECK® TC PROBE OPERATION PRINCIPLE

The probe's operation principle is founded on the TRIBO ELECTRIC 'T-E' effect.

This physical phenomenon is caused by the friction of particles suspended in the air against the surface of a probe which is placed in the measurement area. Particular electronic circuits which are located inside the probe allow to transform the static electricity generated by the T-E phenomenon into the electric signal proportional to the quantity of particles that generated it.

2.4 SENSITIVITY TO THE 'TE' EFFECT

The sensitivity to the TRIBO-ELECTRIC effect of the probe varies according to the type of dusts to be monitored, depending on the flow rate and characteristics of the system. On the basis of acquired experiences, it has been established that this sensitivity, namely the possibility that the probe generates an electric signal consequently to the collision of the particles suspended in the gases to be monitored, starts with minimum dust concentrations from 3÷8 mg/m³ (± 20 %) to 200 mg/m³ (± 20 %) in an acceptable linear way.

The signal generated by the TC probe depends on the type of material analyzed, the speed of the gas in the duct, the probe's length and the density of the particles in the duct.

2.5 OPERATION

The TC probe notes the passage of particles which are present in the gases by turning this physical phenomenon into an electric signal 4÷20 mA proportional to the dustiness degree.

A rotary switch located inside the head of the probe (SW 21) allows to change the amplification of the exit signal in order to permit a correct use of the TC probe in the most part of the dedusting systems.

The output signal (4÷20 mA) can be adjusted to program the activation of any alarms when the dust emissions overtake the values which have been set according to the law restrictions allowed.

3.1 TECHNICAL FEATURES

Supply Voltage	16 ÷ 24 VDC / 100 mA
Output signal	4 ÷ 20 mA Activ. Maximum load 350 Ohm
Terminals	1,5 mm ² 130 V / 13,5 A
GAS temperature	120°C with BS40 (Standard)
GAS temperature	200°C with BS200 (On Request)
GAS temperature	400°C with BS400 (On Request)
GAS temperature	550 °C with BS400H (On Request)
Operating temperature	- 20 °C ÷ + 60 °C
Relative humidity	80%
Dimensions / Protection degree	IP66
Particle Size	>= 0.3 µm
Rod lenght in mm.	500 (Stainless steel AISI136)



Device in class III.

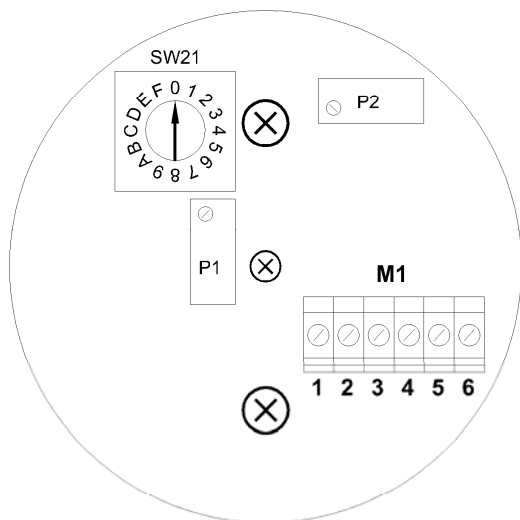


We reserve the right to make any change without notice.

4.1 INSTALLATION RULES AND SECURITY

- 4.2 For connections to PLC or to other devices please use the provided units with galvanically isolated entry.
- 4.3 For the electrical connections use ant flame shielded cable 3 x 0,75 mm²
- 4.4 Remove the TC probe in case of electric weldings on the support structure of it and during the maintenance.
- 4.5 Protect the 'head' of the probe against the direct exposure to sun light.
- 4.6 Every kind of operation on TC probe must be done without dust in the air and with supply voltage Off
- 4.7 A remarkable quantity of rain or water in the sampled gases could distort the reading of the signal.
- 4.8 For supply voltages, cabling and voltages applicable to the relay contacts, follow the current rules
- 4.9 The lack of application of existing rules and standards of installation and safety exonerate the manufacturer of responsibility.
- 4.10 **Insert a fast 200 mA fuse on the supply voltage according to IEC / EN 60127, if not connected to the same equipment manufacturer.**
- 4.11 Not security equipment
- 4.12 Avoid the accumulation of dust on the probe HEAD. Remove it with a damp cloth if necessary.

5.1 THRESHOLD, LAYOUT, WIRING DIAGRAM



SW21 : Rotative switch to regulate the amplification of the output signal

0 Minimum amplification

F Maximum amplification

M1: External electrical connection

1 + Power supply (16 ÷ 24 VDC / 100 mA)

2 - Power supply / Output signal

3 + Output signal 4 ÷ 20 mA

4-5-6 Not used

**The trimmer P1 and P2
SHOULD NOT BE REGULATED**



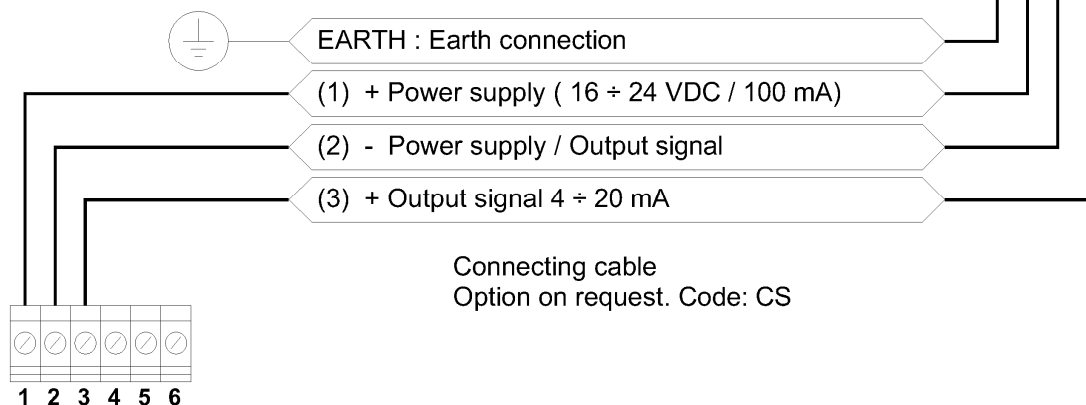
- 1** + Power supply (16 ÷ 24 VDC / 100 mA)
- 2** - Power supply / Output signal
- 3** + Output signal 4 ÷ 20 mA
- 4-5-6** Not used



WARNING:
A wrong connection
may irreparably
damage the probe

Link to all models of the
probe with a predisposition for
tribo probe TC50

20 21 22 23



Connecting cable
Option on request. Code: CS

6.1 POSITIONING AND OPERATING

6.2 POSITIONING AND OPERATING

The installation of the TC probe is done by fixing the BS40 flange to the duct to be monitored.

The BS40 flange, in AISI304 material, should be fixed in a part of the duct where isokinetic conditions happen.

The above condition, as a general rule, is placed at a distance of 6 ± 10 times from the diameter of the duct from the nearer bend from the side of the origin of the gases.

In this area, the components of turbulence in the gases present inside the duct are practically unimportant.

This condition is essential for the correct functioning of the monitoring and the reliability of the registered data.

It is suitable to install the probe with a slight bent downwards (head of the probe slightly upward compared to the end of the metallic pole) so that possible drops of condensation that can appear on the sensitive part of the probe can slip into the duct.

6.3 HOLE FOR CALIBRATION

For the next calibration for the simulation of the TC probe, it is necessary to provide for a hole with its plug in order to allow the introduction of dust. This hole should be positioned in vertical line duct under the TC probe at a certain distance to assure isokinetic conditions in the point of measurement (see next picture A).

6.4 FASTENING

The standard BS40 flange is a muff male thread of $1\frac{1}{4}$ GAS with 35 mm hole.

BS40 is fixed to the duct by means of a welding on the same axis where the 35mm hole has been made. See the picture.

When the fixing operation of the probe is finished, introduce the TC probe.

The probe is fixed by closing the $1\frac{1}{4}$ GAS nut.

In case of high temperatures, consider longer flanges (see the picture)

6.5 DUCT GROUNDING

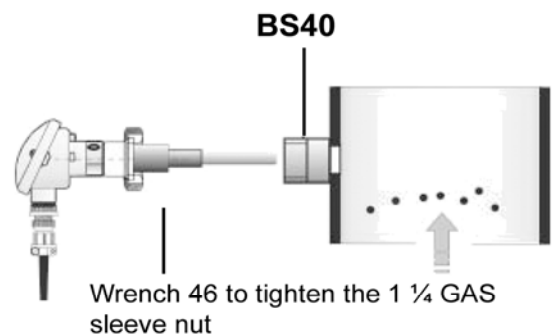
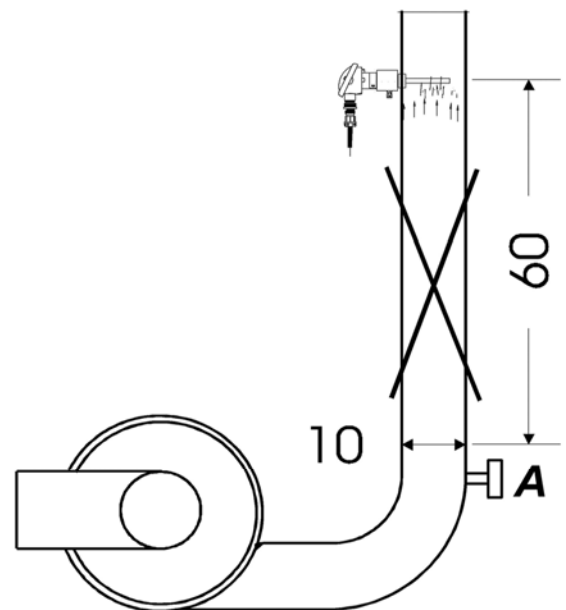
For a correct functioning of the probe it is essential that the sampling duct is connected to the ground.

6.6 MAINTENANCE

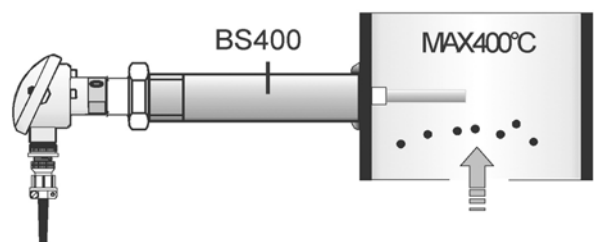
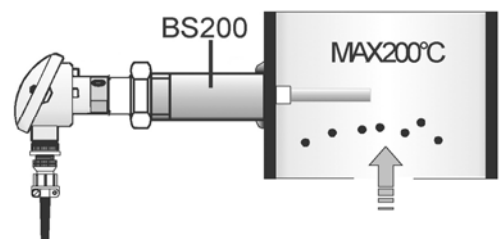
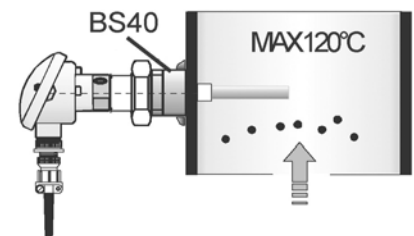
The TC probe does not require a particular maintenance.

Could be necessary polish up with a rag soaked of detergent (alcohol, gasoline etc.) the sensitive part of the probe (inside pole) without particular precautions.

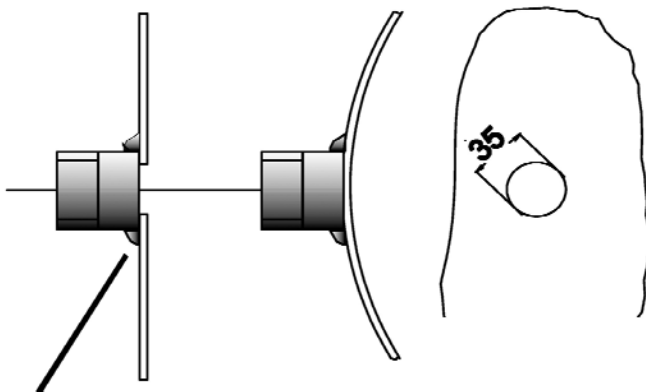
The necessity to clean the probe should be checked after 6 months of operation or more frequently in case of gas with high umidity that could create deposits and consequently provoke alterations to the operation of the probe.



Wrench 46 to tighten the $1\frac{1}{4}$ GAS sleeve nut



BS200 and BS400 available upon request



$1\frac{1}{4}$ GAS male threaded sleeve welded to the duct

7.1 PROBE CALIBRATION

There are three methods for the calibration of the TC probe

1. For COMPARISON with data coming from isokinetic analysis in the gas to be sampled.
2. For SIMULATION with pre-weighed quantities put in the duct if the data from the isokinetic analysis done in apposite laboratories are not available.
3. Calibration to detect only the broken bag or broken cartridge.

7.2 CALIBRATION FOR COMPARISON (SEE PRACTICAL EXAMPLE CALIBRATION FOR COMPARISON 7.7)

In order to proceed with the calibration of the probe, you must know the data concerning the quantity of dust present in the gases in mg/m³.

These data are normally released by special laboratories during the periodical gas analysis. These analysis must be done according to the law restrictions.

7.3 CALIBRATION FOR SIMULATION (SEE PRACTICAL EXAMPLE CALIBRATION FOR SIMULATION 7.8)

The calibration of the probe is recommended after a certain period of operation of the plant. The above mentioned period is necessary to allow the filtering material to reach the typical characteristics of the functioning (filter partially dirty).

7.4 CALIBRATION OF THE 4÷20 mA SIGNAL

The function of the TC probe is to convert the triboelectric 'T-E' physical phenomenon, produced by a certain quantity of dust present in the gases, in an electric signal 'STC' 4÷20 mA.

In order to calibrate the STC signal, it is essential that the sampling duct contains a measurable quantity of dust.

In default of dust, it is impossible to proceed with the calibration.

The STC signal must be calibrated in order to cover the whole range of emissions.

In order to proceed with the calibration, the probe must be connected to an instrument that detects the 4÷20mA output signal.

1. Without dust emissions, the value must be 4mA (value pre-determined by the calibration from the manufacturer's laboratory).
2. With the maximum value of emissions estimated, the signal must be around 14÷18 mA.

In practice, if according to law regulations for certain types of material the maximum level of emissions allowed is equal to 20 mg/m³, the STC signal must be adapted to this value in the presence of maximum emissions.

You can get this calibration by acting on the rotary switch present inside the head of the probe (SW21).

By leaving a margin of 20÷30 % against the maximum value allowed, you can consider that: 0÷20 mg/m³ = 4÷17 mA.

Over 20 mA the STC signal saturates by making insignificant the higher values of dustiness.

This fact does not constitute a problem, since the goal of this application is to control by means of an alarm threshold that the emission limits envisaged by the law are not overtaken.

The STC signal generated is handled by electronic equipments (ESA sequencers, PLC, PC) that convert it into a digital value. The digital value can easily be adapted to the value of the quantity of dust present in the duct.

7.5 SENSITIVITY

The TC probe, by triboelectric effect generates a STC electric signal which is function of 4 parameters:

- 1 Length of the probe
- 2 Speed of the gases in the sampling duct
- 3 Type of material present in the smokes
- 4 Density of dust

The degree of sensitivity of the probe means the possibility to convert the value of the T-E signal (source) in a certain STC 4÷20mA electric signal that can be used by the various equipments connected to it.

The ratio KTC between the two entities is called SENSITIVITY: $STC = KTC \times T-E$.

7.6 SENSITIVITY REGULATION

KTC is a variable coefficient depending by the switch SW21 placed inside of the TC probe (See Pg. 2).

SW21 allows to change the sensibility amplifying or attenuating the response of STC.

Normally SW21 comes set in position 8 to a low level after the laboratory tests.



This product is in compliance with the following directives:

2014/30/UE Directive electromagnetic compatibility and 2014/35/UE low voltage directive as complying to the harmonized rules EN 60730-1:2011. 2011/65/EU ROHS Directive as complying to the harmonized European rule EN 50581:2013-05

Questo prodotto è conforme alle seguenti direttive:

Direttiva 2004/108/EC compatibilità elettromagnetica e direttiva 2014/35/UE bassa Tensione in quanto conforme alle norme Europee armonizzate EN60730-1:2011. Direttiva 2011/65/EU ROHS in quanto conforme alle norme Europee armonizzate EN 50581:2013-05

7.7 PRACTICAL EXAMPLE OF CALIBRATION FOR COMPARISON

It is supposed to know, by means of data coming from previous analysis, that the duct contains around 10 mg/m³ with an output signal of 18 mA.

Suppose that the maximum value allowed by the law is of 20 mg/m³.

In order to obtain the best calibration, you should adapt the two values in the way that about 70% of the STC signal (15÷16 mA) corresponds to the maximum dustiness value allowed (20 mg/m³).

On a scale of 4÷20 mA. The value at 50% is of 12 mA

Having previously noticed an output signal from the probe of 18 mA for 10 mg/m³, it is evident that the amplification is too high.

It is supposed to know, by means of data coming from previous analysis, that the duct contains around 10 mg/m³ with an output signal of 18 mA.

Suppose that the maximum value allowed by the law is of 20 mg/m³.

In order to obtain the best calibration, you should adapt the two values in the way that about 70% of the STC signal (15÷16 mA) corresponds to the maximum dustiness value allowed (20 mg/m³).

On a scale of 4÷20 mA. The value at 50% is of 12 mA

Having previously noticed an output signal from the probe of 18 mA for 10 mg/m³, it is evident that the amplification is too high.

An increase of 30 % of dustiness can be enough to bring the signal to the full range around 20mA by rendering illegible all the emission values above 13 mg/m³.

Therefore, it is necessary to reduce the sensitivity through SW21 placed inside the probe.

If you consider a higher margin of reading of 30% of STC over the maximum limit of emissions allowed (20mA = 20 mg/m³+ 30% = 26 mg/m³), a simple calculation shows that at 10 mg/m³ the signal must be around 10÷11 mA.

Therefore, it is sufficient to regulate the SW21 rotary switch in the way to bring the STC output signal around this range of current and set the activation of the alarm of high emission at about 16 mA.

7.8 PRACTICAL EXAMPLE OF CALIBRATION FOR SIMULATION

If the data obtained by the analysis are not available, by following this most approximate method it is possible to make the same calibrations as previously described. You must simulate an emission of a certain quantity of dust.

This method consists in putting the pre-weighed quantities through the hole mentioned in point 6.3 into the sampling duct in a pre-fixed time and measure the STC signal generated by the TC probe.

For this calibration it is necessary to know the range of the duct.

The calibration for simulation cannot be done in the absence of dust.

The following example indicates how to proceed:

Range of the duct = 100000 m³/h

Emission that you wish to simulate = 10 mg/m³

Time of insertion of dust in the duct = 60sec.

Quantity of dust to out in 1 minute = $10 \times 100000 \times 60 / 3600 = 16,66$ g.

So, putting in the duct 16,66g in 1 minute, the correspondent emission is 10 mg/m³

Proceed as indicated in point 7.5 CALIBRATION OF THE 4÷20mA SIGNAL

7.9 CALIBRATION OF THE ALARM FOR BROKEN BAG OR BROKEN CARTRIDGE

This type of calibration is relatively simpler than the previous example 7.7 and 7.8 because it consists in checking that the STC signal detects an anomalous passage of dust in the duct..

As the broken bag or the broken cartridge causes emissions of considerable quantities of dust which are visible at the exit of the chimney, the calibration of the probe becomes simpler.

This type of calibration is done by throwing in the duct a handful of dust through the hole (see point 6.3) and checking the increase of the STC signal which is generally considerable.

This peak of the STC signal is used to detect the broken bag by means of the connected equipments or the internal relay in case of TR30R probe.

8.1 WARRANTY

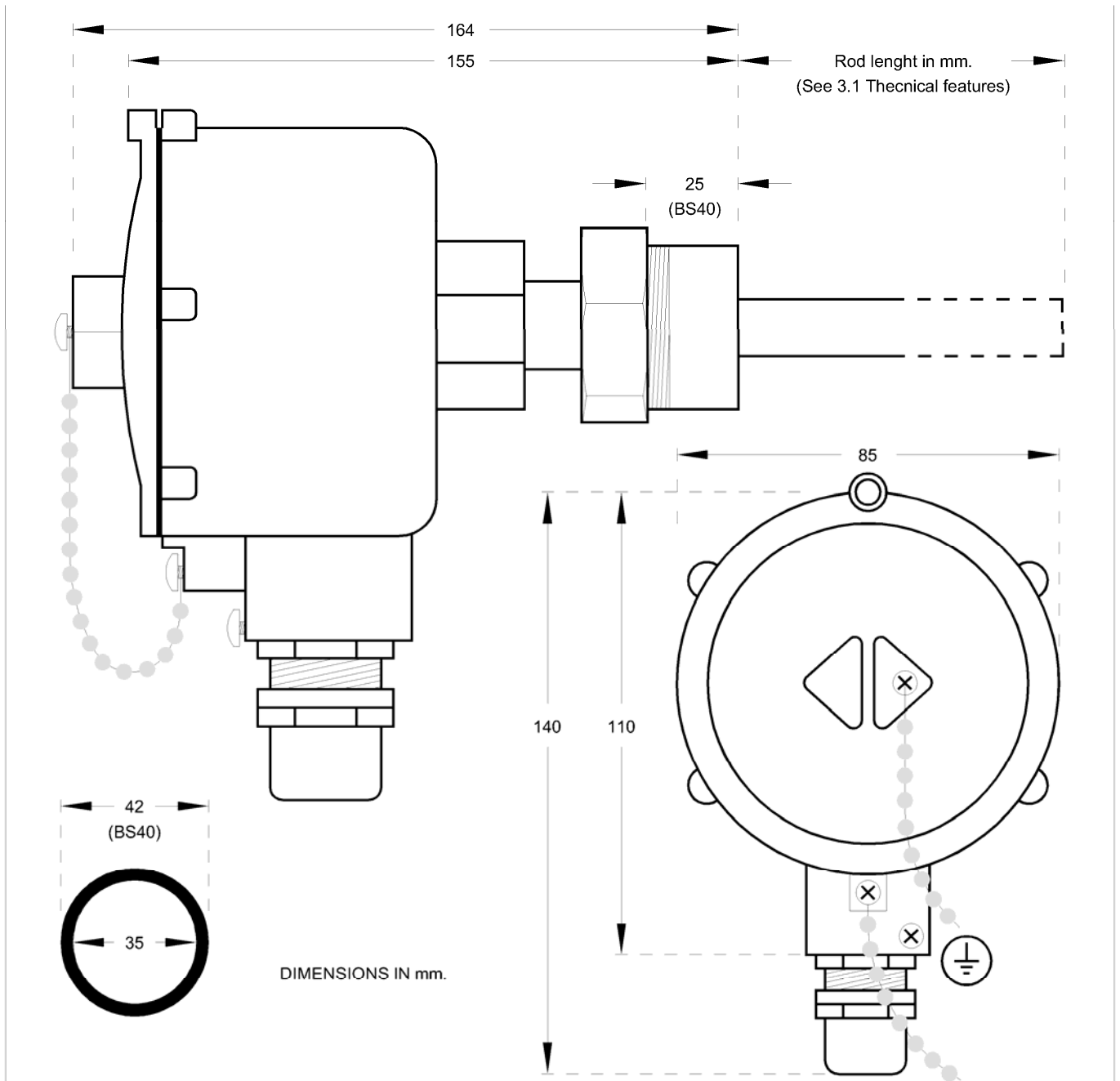
The warranty lasts 4 years. The company will replace any defective electronic component, exclusively at our laboratory, unless otherwise agreed, upon the Company's prior consent.

WARRANTY EXCLUSION

The warranty is not valid in case of:

- 1) Tampering or unauthorized repairs.
- 2) Wrong use of the device, not in compliance with technical data.
- 3) Wrong electrical wiring.
- 4) Inobservance of the installation rules.
- 5) Use of the device, not in compliance with CE rules.
- 6) Atmospheric events (Lightning, electrostatic discharge), Overvoltage.

9.1 ENCLOSURE DIMENSIONS



EU Declaration of Conformity (DoC)

Dichiarazione di conformità UE

Company name / Nome del fabbricante: ECOTECH GTS S.R.L.
Postal address / Indirizzo postale: Via Del Plan Del Sant, 24
Postcode and City / CAP e Città: 38012 Predaia Frazione Mollaro (TN)
Telephone / Telefono: +39 0463 46 10 49
E-Mail address / Indirizzo Posta elettronica: info@ecotechgts.com

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Apparatus model / Apparecchio modello: TC50
Product Type / Tipo di prodotto: Emission control / Controllo emissioni
Serial number / Numero serie:
Object of the declaration / Oggetto della dichiarazione: TC50-500

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation

L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione

Directives 2014/30/UE, 2014/35/UE and 2011/65/UE

Direttiva 2014/30/UE, 2014/35/UE e 2011/65/UE

The following harmonised standards and technical specifications have been applied:

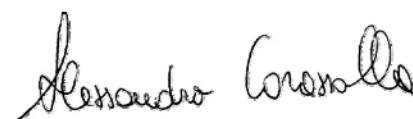
Riferimento alle pertinenti norme armonizzate utilizzate

Title / Titolo	Date of standard / Data di pubblicazione
EN 60730-1	2011
EN 50581	2012

Amministratore delegato

Signed for and on behalf of / Firmato a nome e per conto di

Mesero, 27 / 08 / 2019


Alessandro Corazzolla

3.1 INSTALLATION AND SECURITY RULES (GB). (REFEREMENT LANGUAGE)

- 3.2 Protect the device against the direct exposure to the sun.
- 3.3 Avoid arranging the device in the proximity of or in direct contact with any source of heat and electromagnetic field. Connect the device on supply lines different from those used for motor drives or other devices that may cause some noise on the net.
Not security equipment.
- 3.4 Fix the device on the wall at minimum 60 cm from the floor.
- 3.5 The access to the device to adjust operating parameters have to be done by person with appropriate skills.
- 3.6 Before acting on the device for any operation, check for safe conditions. For electrical operations never forget to disconnect the power supply, wait for 30 seconds for the internal capacitors discharge before opening. At the end of the operations close the device to restore the protection degree before powering again.
- 3.7 In case of faulty that does not depend only the fuse, switch off immediately the supply voltage and contact the supplier.
- 3.8 One time in a month or more frequently if necessary verify if there is dust on the enclosure of the device and remove it if it is present by using wet cloth.
- 3.9 For supply voltages, cabling and voltages applicable to the relay contacts, follow the current rules
- 3.10 For all input control signals to the device (D1a, D5, D6,...) use anti-flame wires with a minimum section of 0.5 mm².
- 3.11 For the electrical connection of the supply voltage and filter cleaning electrovalves use anti-flame wires with a minimum section of 0.75 mm². For output relay contacts use anti-flame wires with a minimum section of 1.5 mm².
- 3.12 For the output signal 4+20 mA use anti-flame shielded wire with minimum section of 0,5 mm². (Option on request. Code: C11a)
- 3.13 Do not connect to earth the common of the electrovalves (see electrical wiring diagram).
- 3.14 The lack of application of existing rules and standards of installation and safety exonerate the manufacturer of responsibility



A wrong supply voltage connection might cause irreparable damages to the device.
The fuse protect only from any short circuit and not necessarily from wrong supply voltage.

3.1 ZASADY BEZPIECZEŃSTWA ORAZ MONTAŻU (PL)

- 3.2 Zabezpieczyć urządzenie przed bezpośrednim oddziaływaniem promieni słonecznych.
- 3.3 Umieścić urządzenie z dala od źródeł ciepła i pól elektromagnetycznych. Należy podłączyć je do linii zasilania różnych od tych, które są używane do uruchamiania silników lub innych urządzeń o dużej mocy, które mogą generować zakłócenia sieci.
Urządzenie nie jest chronione.
- 3.4 Przymocować urządzenie do ściany, na wysokości, co najmniej 60 cm od podłogi.
- 3.5 Dostęp do urządzenia w celu regulacji parametrów pracy powinny mieć osoby z odpowiednimi uprawnieniami.
- 3.6 W celu dokonania jakiegokolwiek czynności na urządzeniu, należy sprawdzić czy są zachowane warunki bezpiecznego użytkowania. Podczas wykonywania prac natury elektrycznej należy przed otwarciem odłączyć napięcie i odczekać 30 sekund na rozładowanie wewnętrznych kondensatorów. Po zakończeniu należy zamknąć urządzenie, aby zachować stopień zabezpieczenia przed ponownym podłączeniem napięcia
- 3.7 W przypadku uszkodzona nie spowodowanego bezpiecznikiem, należy natychmiast wyłączyć zasilanie i skontaktować się z dostawcą urządzenia.
- 3.8 Raz w miesiącu lub w razie potrzeby częściej należy sprawdzić czy kurz nie gromadzi się na obudowie urządzenia. W przypadku jeśli jest on obecny należy usunąć go przy użyciu wilgotnej szmatki.
- 3.9 Dla napięcia zasilania, okablowania i napięć na stykach przekaźników należy przestrzegać aktualnych przepisów.
- 3.10 Dla wszystkich sygnałów kontrolnych na wejściu (D1a, D5, D6,...) stosować kable w powłoce ogniochronnej, o minimalnym przekroju 0.5 mm².
- 3.11 Do podłączania napięcia zasilania oraz zaworów elektromagnetycznych czyszczenia filtra należy wykorzystać kable w powłoce ogniochronnej, o minimalnym przekroju 0,75 mm². Dla styków przekaźnikowych sygnalizacyjnych używać kable w powłoce ogniochronnej o przekroju 1,5 mm².
- 3.12 Dla sygnału 4+20 mA na wyjściu używać kabel ekranowany w powłoce ogniochronnej, o minimalnym przekroju 0,5 mm² (Opcja na życzenie. Kod: C11a)
- 3.13 Nie podłączając do wspólnego uziemienia zaworów elektromagnetycznych (patrz schemat elektryczny).
- 3.14 Brak stosowania istniejących przepisów i norm bezpieczeństwa instalacji zwalnia producenta od odpowiedzialności.



Nieprawidłowe podłączenie napięcia może powodować nieodwracalne uszkodzenie urządzenia.
Bezpiecznik chroni tylko przed ewentualnymi zwarciami i niekoniecznie przed nieprawidłowym napięciem

3.1 BEÉPÍTÉSI ÉS BIZTONSÁGI SZABÁLYOK (H)

- 3.2 A berendezést ne tegye ki közvetlen napsugárzásnak.
- 3.3 A berendezést úgy helyezze el, hogy ne kapjon közvetlen hőszugárzást, ne érintkezzen meleg felületekkel, és ne kerüljön elektromágneses térbe. A berendezés tápellátása ne legyen közös elektromos motor meghajtással, vagy más olyan eszközzel, ami elektromos zavart okozhat.
Ez az eszköz nem biztonsági berendezés.
- 3.4 A berendezést rögzítse függőleges felületre, a talajtól legalább 60 cm távolságra.
- 3.5 A berendezést csak szakképzett személy kezelheti.
- 3.6 A berendezéssel való bármilyen művelet megkezdése előtt ellenőrizze a biztonságos munkavégzés feltételeinek meglétét. Az elektromos részekkel való munkavégzés előtt győződjön meg arról, hogy a berendezés áramtalanítva van. Áramtalanítás után várjon legalább 30 másodpercet a feltöltődött kapacitások kisülésére, mielőtt leveszi a burkolatot. A művelet befejezése után úgy zárja le a burkolatot, hogy a berendezés eredeti védelmi fokozata megmaradjon.
- 3.7 Bármilyen hiba esetén, amit nem a biztosíték kioldváása okoz, azonnal áramtalanítsa a berendezést és lépjen kapcsolatba a berendezés szállítójával.
- 3.8 Havonta legalább egyszer ellenőrizze, hogy nem került-e por a berendezésre, és ha igen, akkor egy nedves törülközővel távolítsa el azt.
- 3.9 A tápfeszültség bekötésénél, a kábelezésnél és a relé kontaktusokra viett feszültségek esetében az érvényes műszaki előírások szerint járjon el.
- 3.10 A berendezésre kerülő valamennyi bemeneti jel esetén (D1a, D5, D6,...) használjon legalább 0.5 mm² keresztmetszetű lángálló vezetékét.
- 3.11 A tápfeszültség és a szűrő-tisztító (lefúvató) mágnesszelepek kábelezésekor használjon legalább 0.75 mm² keresztmetszetű lángálló kábelt. A kimeneti relé kontaktusok részére legalább 1.5 mm² keresztmetszetű lángálló kábelt használjon.
- 3.12 A 4+20 mA kimeneti jelek részére használjon legalább 0,5 mm² keresztmetszetű lángálló, páncélozott kábelt. (Az opció jelet: C11a)
- 3.13 A mágnesszelepek közös vezetékét ne kösse a földeléshez. (Lásd elektromos bekötési rajz).
- 3.14 Az érvényben lévő előírások, szabályok, szabványok és biztonsági előírások figyelmen kívül hagyása kizárja a gyártó bármilyen felelősségét.



A tápfeszültség hibás bekötése nem javítható kárt okozhat a berendezésben.
A beépített biztosíték csak rövidzár ellen véd, de nem feltétlenül véd a helytelen tápfeszültségtől.

3.1 INŠTALÁCIA A BEZPEČNOSTNÉ PRAVIDLÁ (SK)

- 3.2 Chráňte zariadenie pred priamym slnečným svetlom.
- 3.3 Neinštalujte zariadenie v blízkosti alebo v priamom kontakte so zdrojom tepla a elektromagnetického poľa. Pripojte zariadenie na napájacie vedenie odlišných od tých, ktoré sa používajú pre elektromotory a iné zariadenia, ktoré môžu spôsobovať rušenie siete. Nie je bezpečnostné zariadenie.
- 3.4 Inštalujte zariadenie na stenu, minimálne 60 cm od podlahy.
- 3.5 Nastavenie parametrov zariadenia môže vykonávať iba osoba s potrebnými znalosťami.
- 3.6 Pred nastavením zariadenia, skontrolujte bezpečnostné podmienky. Pre elektrické operácie nikdy nezabudnite na odpojenie elektrického napájania, počkajte 30 sekúnd pre vnútorné vybitie kondenzátorov pred otvorením. Na konci operácie uzatvorte zariadenie pre obnovenie stupňa ochrany pred opätovným zapnutím.
- 3.7 V prípade poruchy, ktorá nezávisí na poistke, vypnite ihneď napájacie napätie a obráťte sa na dodávateľa.
- 3.8 Raz za mesiac alebo častejšie, ak je to potrebné skontrolujte, či je na zariadený prach a v prípade potreby ho odstráňte pomocou vlhkej handričky.
- 3.9 Pre napájacie napätie, kabeľáž a na napätie na kontaktoch relé, je potrebné sa riadiť nasledujúcimi pravidlami.
- 3.10 Pre vstupný riadiaci signál do zariadenia (D1a, D5, D6, ...) použite nehořľavé káble minimálny prierez 0,5 mm².
- 3.11 Pre pripojenie vstupného elektrického napätia a vstupného elektrického napätia na ventily použite nehořľavé káble s minimálnym prierezom 0,75 mm². Pre výstupné relé použite nehořľavé káble s minimálnym prierezom 1,5 mm².
- 3.12 Pre spätný signál 4+20 mA použite nehořľavé káble s minimálnym prierezom 0,5 mm². (Voliteľné na požiadanie kód: C11a)
- 3.13 Neuzemňujte elektroventily (pozri schému elektrického zapojenia)
- 3.14 Nedostatočné dodržiavanie existujúcich pravidiel a noriem pre inštaláciu a bezpečnosť oslobodzuje výrobcu od zodpovednosti



Nesprávne vstupné napätie môže spôsobiť nenapraviteľné škody na zariadení.
Poistka chráni iba pred skratom a nie pred nesprávnym vstupným napätím.

3.1 ΚΑΝΟΝΕΣ ΕΓΚΑΤΑΣΤΑΣΗΣ ΚΑΙ ΑΣΦΑΛΕΙΑΣ (GR)

- 3.2 Προστατεύστε τη συσκευή από την άμεση έκθεση στον ήλιο.
- 3.3 Αποφύγετε να τοποθετήσετε τη συσκευή κοντά ή σε άμεση επαφή με οποιαδήποτε πηγή θερμότητας και του ηλεκτρομαγνητικού πεδίου. Συνδέστε τη συσκευή στις γραμμές προμήθειας διαφορετικές από εκείνες που χρησιμοποιούνται για μονάδες δίσκου με κινητήρα ή άλλες συσκευές που μπορεί να προκαλέσουν κάποιο θόρυβο στο διαδίκτυο.
ΟΧΙ εξοπλισμό ασφαλείας.
- 3.4 Τοποθετήστε τη συσκευή στον τοίχο στο ελάχιστο 60 cm από το δάπεδο.
- 3.5 η πρόσβαση στη συσκευή για να ρυθμίσετε παραμέτρους λειτουργίας πρέπει να γίνει από άτομο με τις κατάλληλες δεξιότητες.
- 3.6 προτού ενεργήσετε στη συσκευή για οποιαδήποτε λειτουργία, ελέγξτε για ασφαλείς συνθήκες. Για ηλεκτρολογικές εργασίες μην ξεχάσετε να απσυνδέσετε το τροφοδοτικό, περιμένετε 30 δευτερόλεπτα για την αποφόρτιση των εσωτερικών πυκνωτών πριν από το άνοιγμα. Στο τέλος των εργασιών, κλείστε τη συσκευή για να επαναφέρετε το βαθμό προστασίας πριν την επανατροφοδότηση.
- 3.7 σε περίπτωση ελαττώματος που δεν εξαρτάται μόνο από το διακόπτη ασφαλείας, σβήστε αμέσως την τάση τροφοδοσίας και επικοινωνήστε με τον προμηθευτή.
- 3.8 μια φορά το μήνα ή συχνότερα, εφόσον είναι απαραίτητα, ελέγξτε αν υπάρχει σκόνη στο περίβλημα της συσκευής και αφαιρέστε την αν υπάρχει χρησιμοποιώντας βρεγμένο πανί.
- 3.9 για τάσεις τροφοδοσίας, καλωδιώσεις και τάσεις που ισχύουν για τις επαφές relé, ακολουθήστε τους ισχύοντες κανόνες
- 3.10 για όλες τις εισόδους σήματος, ελέγχου της συσκευής (D1a, D5, D6, ...) Χρησιμοποιήστε αντι-φλόγας καλώδια με ένα ελάχιστο τμήμα του 0,5 mm².
- 3.11 για την ηλεκτρολογική σύνδεση της παρεχόμενης τάσης και των ηλεκτροβαλβίδων καθαρισμού του φίλτρου χρησιμοποιήστε αντι-φλόγας καλώδια με ένα ελάχιστο τμήμα των 0,75 mm². Για επαφές relé εξόδου χρησιμοποιήστε αντι-φλόγας καλώδια με ένα ελάχιστο τμήμα του 1,5 mm².
- 3.12 για το σήμα εξόδου του 4+20 mA χρήση αντι-φλόγα θωρακισμένο καλώδιο με ελάχιστο τμήμα του 0,5 mm². (Επιλογή καιόπιν αιτήματος. Κωδικός: C11a)
- 3.13 Μην συνδέετε στη γείωση το κοινό των ηλεκτροβαλβίδων (δείτε το διάγραμμα ηλεκτρικής καλωδίωσης).
- 3.14 Η μη εφαρμογή των υφιστάμενων κανόνων και προτύπων εγκατάστασης απαλλάσσει τον κατασκευαστή από την ευθύνη



Μια λανθασμένη σύνδεση τάσης μπορεί να προκαλέσει ανεπανόρθωτες ζημιές στη συσκευή.
Ο διακόπτης ασφαλείας προστατεύει μόνο από τυχόν βραχυκύκλωμα και όχι απαραίτητα από λανθασμένη τάση τροφοδοσίας.

3.1 PŘEDPISY PRO INSTALACI A BEZPEČNOST (CZ)

- 3.2 Chraňte zařízení před přímým slunečním světlem.
- 3.3 Umístěte zařízení daleko od zdrojů tepla a elektromagnetických polí. Připojte zařízení k napájecímu vedení, které nenapájí pohony motorů či jiná vysoce výkonná zařízení, která mohou způsobit narušení sítě.
Nebezpečné zařízení.
- 3.4 Umístěte zařízení alespoň 60 cm od podlahy.
- 3.5 Přístup k zařízení, za účelem nastavení provozních parametrů, mohou provést pracovníci s odpovídající kvalifikací.
- 3.6 Před zahájením jakékoliv operace na zařízení se ujistěte, že se nachází v bezpečných atmosférických podmínkách. Při provádění elektrických operací vždy odpojte napájení od zařízení, před otevřením počkejte 30 sekund za účelem vypuštění vnitřních kondenzátorů. Po ukončení operace a před zapojením napětí uzavřete zařízení pro obnovení ochranného stupně.
- 3.7 V případě poruchy provozu, které nezávisí výhradně na ochranné pojistce, okamžitě odpojte zařízení od napětí a obraťte se na dodávatele.
- 3.8 Jednou za měsíc, nebo i častěji pokud je to nutné, ověřte přítomnost prachu na obalu a případně jej odstraňte vlhkým hadříkem.
- 3.9 Pro napájecí napětí, kabeľáže a napětí na kontaktech relé, dodržujte platné předpisy.
- 3.10 Pro všechny vstupní kontrolní signály (D1a, D5, D6, ...) použijte nehořľavé kabely s minimálním průřezem 0,5 mm².
- 3.11 Pro připojení napájecího napětí a elektroventilů pro čištění filtru použijte nehořľavé kabely s minimálním průřezem 0,75 mm². Pro kontakty relé k signalizaci použijte nehořľavé kabely s průřezem 1,5 mm².
- 3.12 U výstupního signálu 4 až 20 mA použijte stíněný nehořľavý kabel s minimálním průřezem 0,5 mm² (Volitelné příslušenství. Kód: C11a)
- 3.13 Neuzemňujte společné elektroventily (viz elektrické schéma).
- 3.14 Nedodržení stávajících předpisů a předpisů pro instalaci a bezpečnost zprošřtuje výrobce odpovědnosti.



Nesprávne pripojenie napájecího napětí by mohlo nenávratně poškodit zařízení.
Pojistka chrání pouze proti zkratu a ne před špatným napájecím napětím.

3.1 INSTALLATIONS- OCH SÄKERHETSBESTÄMMELSER (S)

- 3.2 Skydda enheten från direkt exponering av solljus.
- 3.3 Placera enheten långt från värmekällor och elektromagnetiska fält.
Anslut enheten till elledningar som skiljer sig från motordrifter eller andra enheter med hög effekt som kan skapa störningar på nätet.
Ingen säkerhetsutrustning.
- 3.4 Placera enheten minst 60 cm från golvet.
- 3.5 Åtkomst till enheten för att ställa in driftsparametrarna är endast tillåtet för personal med lämplig kompetens.
- 3.6 Innan du ingriper på utrustningen för att genomföra något arbete måste du se till så att du befinner dig i säkra atmosfäriska förhållanden.
För arbeten av elektrisk natur, förutom att du alltid måste koppla bort strömmen, vänta 30 sekunder för att ladda ur de interna kondensatorerna innan du öppnar. Avsluta arbetet, stäng enheten igen för att återställa skyddsgraden innan du matar den.
- 3.7 Vid avvikelser i funktion som inte enbart beror på säkringen, koppla direkt bort spänningen på enheten och kontakta leverantören.
- 3.8 En gång i månaden, eller oftare vid behov, kontrollera om det finns damm i behållaren och ta eventuellt bort det med en fuktig trasa.
- 3.9 Följ gällande bestämmelser för matningsspänning, kablage och spänning som kan appliceras på reläkontakterna.
- 3.10 För alla ingångsstyrtsignaler (D1a, D5, D6, ...) använd flamsäkra kablar med ett avsnitt på minst 0,5 mm².
- 3.11 För att ansluta matningsspänningen och magnetventiler för att rengöra filtret, använd flamsäkra kablar med ett avsnitt på minst 0,75 mm². För reläkontakter till signalering, använd flamsäkra kablar med ett avsnitt på 1,5 mm².
- 3.12 För signalen 4+20 mA i utgången, använd en flamsäker avskärmd kabel med ett avsnitt på minst 0,5 mm² (Alternativ på begäran. Kod: C11a)
- 3.13 Jorda inte vanliga magnetventiler (se kopplingschema).
- 3.14 Nonchalering av gällande bestämmelser eller installations- och säkerhetsbestämmelserna befriar tillverkaren från ansvar.



En felaktig anslutning av matningsspänningen kan ohjälpligt skada enheten.
Säkringen skyddar endast mot eventuella kortslutningar och inte nödvändigtvis mot felaktig matning.

3.1 INSTALLATIE- EN BEVEILIGINGSNORMEN (NL)

- 3.2 Bescherm de apparatuur tegen directe blootstelling aan zonlicht.
- 3.3 Plaats de apparatuur uit de buurt van warmtebronnen en elektromagnetische velden.
Sluit de apparatuur aan op andere stroomaansluitpunten dan die gebruikt worden voor het aandrijven van motoren of apparatuur die veel vermogen vragen die voor storingen in de stroomtoevoer kunnen zorgen.
- 3.4 Plaats de apparatuur op minstens 60 cm van de vloer.
- 3.5 De toegang tot de apparatuur voor het instellen van de parameters dient uitgevoerd te worden door bevoegd personeel.
- 3.6 Controleer alvorens enige werkzaamheid te voeren aan de apparatuur of de atmosferische omstandigheden veilig zijn. Wacht bij werkzaamheden van elektrische aard buiten het verwijderen van de spanning nog eens 30 seconden zodat de interne condensatoren zich kunnen ontladen alvorens de apparatuur te openen. Sluit na he uitvoeren van de werkzaamheden de apparatuur weer voor volledige bescherming voordat de spanning er weer op wordt gezet.
- 3.7 Vertrouw bij storingen niet alleen op de beveiliging en haal direct de spanning van de apparatuur af en neem contact op met de leverancier.
- 3.8 Controleer een keer per maand of vaker als dat nodig is of er stof op het reservoir zit en verwijder dit eventueel met een vochtige doek.
- 3.9 Zorg dat voor de stroomtoevoer de snoeren en de geldende spanningen die van toepassing zijn op de relaiscontacten voldoen aan de geldende normen.
- 3.10 Gebruik voor alle controlesignalen bij de toevoer (D1a, D5, D6, ...) anti-ontbrandingskabels met een minimaal oppervlak van 0,5 mm².
- 3.11 Gebruik voor het aansluiten op de stroomtoevoer en de elektromagnetische kleppen voor het reinigen van het filter anti-ontbrandingskabels met een minimaal oppervlak van 0,75 mm². Gebruik voor relaiscontacten voor de signalering anti-ontbrandingskabels met een minimaal oppervlak van 1,5 mm².
- 3.12 Gebruik voor de signalering 4+20 mA bij uitvoer een afgeschermde anti-ontbrandingskabel met een minimaal oppervlak van 0,5 mm² (Optie op verzoek. Code: C11a)
- 3.13 De algemene elektromagnetische klep niet aarden (zie elektriciteitsoverzicht).
- 3.14 Het niet toepassen van de geldende normen en de installatie- en veiligheidsnormen ontslaat de fabrikant van elke verantwoordelijkheid.



Een verkeerde stroomaansluiting kan de apparatuur zodanig beschadigen dat deze niet meer gerepareerd kan worden.
De zekering beschermt alleen tegen eventuele kortsluiting en niet tegen verkeerde stroomspanning.

3.1 ПРАВИЛА ЗА БЕЗОПАСНОСТ ПРИ МОНТАЖА (BG)

- 3.2 Изберете мястото на монтаж на уреда, така че да е защитен от директна слънчева светлина.
- 3.3 Не монтирайте устройството в близост или върху източник на топлина и/или електромагнитно излъчване. Свържете уреда към токов кръг, отделен от други машини или уреди, които биха могли да причинят смущения в мрежата.
- 3.4 Монтирайте уреда на стена и на разстояние от пода, не по-малко от 60 см.
- 3.5 Достъпът и настройването на работните параметри на уреда, трябва да се извършва единствено и само от персонал с необходимите знания и умения.
- 3.6 Преди извършване на каквато и да била дейност по поддръжка на уреда, уверете се, че са спазени условията за безопасност. За работа по ел. вериги на уреда, изключете захранващото напрежение и изчакайте 30 секунди (за разреждане на кондензаторите) преди да отворите капака на уреда. При приключване на работите, затворете плътно капака на уреда (за да възстановите степента му на защита) и едва тогава, възстановете ел. захранването му.
- 3.7 В случай на дефект, при който смяната на ел. предпазител с нов не решава проблема, веднага изключете захранващото напрежение и се свържете с доставчика или оторизирания сервиз.
- 3.8 Най-малко един път в месеца или по-често, ако е необходимо, проверявайте дали има прах върху корпуса на устройството. В случай, че такъв е наличен, премахнете го като използвате влажна кърпа.
- 3.9 За захранващи напрежения и окабеляване, приложими към релейните контакти, следвайте следните правила:
- 3.10 За всички входни управляващи сигнали на устройството (D1a, D5, D6, ...), използвайте негорими ел. проводници със сечение не по-малко от 0,5 mm².
- 3.11 За свързване на захранващото напрежение и ел. магнитните вентили, използвайте негорими ел. проводници със сечение не по-малко от 0,75 mm². За изходящите релейни контакти, използвайте негорими ел. проводници със сечение не по-малко от 1,5 mm².
- 3.12 За изходящия сигнал 4 + 20 mA, използвайте негорим екраниран ел. проводник със сечение не по-малко от 0,5 mm². (опция - код за поръчка: C11a).
- 3.13 Не свързвайте общия проводник на ел. магнитните вентили към заземителна клема (виж електрическата схема на свързване).
- 3.14 Неспазването на настоящите правила и/или действащите местни норми и мерки за безопасност при инсталиране, освобождава производителя и неговия дистрибутор от отговорност.



Прилагането на погрешно захранващо напрежение, може да причини непоправими щети на устройството. Вграденият електрически предпазител, защитава уреда само от късо съединение, а не непременно от грешно захранващо напрежение.

3.1 REGRAS DE INSTALAÇÃO E SEGURANÇA (P)

- 3.2 Proteger o dispositivo da exposição direta ao sol.
- 3.3 Evitar arranjar o dispositivo na proximidade de ou em contacto direto com qualquer fonte de calor e campo magnético. Conectar o dispositivo a linhas de alimentação diferentes das utilizadas para acionamentos de motor ou outros dispositivos que possam causar ruído na rede.
Não é equipamento de segurança.
- 3.4 Reparar o dispositivo na parede no mínimo a 60 cm do chão.
- 3.5 O acesso ao dispositivo para ajustar os parâmetros de funcionamento tem de ser executado por um profissional competente.
- 3.6 Antes de proceder a qualquer tipo de operação no dispositivo, verifique se há condições de segurança. Para operações elétricas nunca esquecer de desconectar a alimentação, esperar 30 segundos para descarga dos condensadores internos antes da abertura. No final das operações fechar o dispositivo para restaurar o grau de proteção antes de o ligar novamente.
- 3.7 Em caso de defeito que não dependa apenas dos fusíveis, desligar imediatamente a alimentação e contactar o fornecedor.
- 3.8 Uma vez por mês, ou mais frequentemente se necessário, verificar se há poeira no revestimento do dispositivo e caso haja limpar com um pano húmido.
- 3.9 Para tensões de alimentação, cableamento e tensões aplicáveis aos contactos de relé, seguir as regras atuais.
- 3.10 Para todos os sinais de controlo de entrada para o dispositivo (D1a, D5, D6,...) utilizar cabos antideflagrantes com uma secção mínima de 0,5 mm².
- 3.11 Para a conexão elétrica da tensão de alimentação e eletroválvulas de despoeiramento utilizar cabos antideflagrantes com uma secção mínima de 0,75 mm². Para contactos de relé de saída utilizar cabos antideflagrantes com uma secção mínima de 1,5 mm².
- 3.12 Para o sinal de saída 4+20 mA utilizar cabo blindado antideflagrante com uma secção mínima de 0,5 mm². (Opção sob encomenda. Código: C11a)
- 3.13 Não conectar o comum das eletroválvulas à terra (ver diagrama da cablagem elétrica).
- 3.14 O incumprimento das regras existentes e normas de instalação e segurança exoneram a responsabilidade do fabricante



Uma conexão de tensão de alimentação errada pode causar danos irreparáveis no dispositivo.
O fusível protege apenas dos curto-circuitos e não necessariamente de tensão de alimentação errada.