Operating Instructions Ultrasonic Sieve Controller For

300 & 450 Sieve



Nordson Deutschland GmbH

IMPORTANT WARNING APPLICATION FIELD

This handbook relates only to:

TURBOSONIC Ex

Restrictions of the use in areas potentially explosive for

gases and powders have to be strictly observed:

TURBOSONIC EX:

Generator zone ATEX 21 (on request zone 1)

Transducer: zone ATEX 20 classified:

To be used in ATEX environment, the sieved powders should have the

following features:

- fire point not lower than 135 °C
- Minimum Energy of Primer (MIE) HIGHER than **10 mJ**

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1 GENERAL INFORMATION

1.1 Purpose of handbook

This handbook has been drawn up by VIBROWEST ITALIANA S.r.l., in order to provide those who are allowed to carry out safely any activities of installation, maintenance, use, repair, disassembly and removal of TURBOSONIC accessory with all the required information.

The handbook has to be read complete with the installation, operating and maintenance instructions of machine where TURBOSONIC is installed.

The required information for users is reported inside the "mail-order catalogue" and on company's INTERNET website <u>www.vibrowest.it</u>.

This information written by the Manufacturer is in his own original (Italian) and can be available also in other languages to meet the legislative and/or commercial requirements.

The documentation has to be kept by a reliable person for the intended purpose, in a suitable place, in order to be always available for consultation and in the best state of preservation.

In case of loss or defacement the replaceable documentation should be directly requested to the manufacturer by mentioning the code of this handbook.

This handbook corresponds with the state of the art at the moment when the accessory was brought on the market.

However the manufacturer reserves the right to make any changes, integrations or improvements to the handbook itself, though this publication should not be considered as an inadequate one.

1.2 General warnings about this Instruction Manual

- The instructions contained in the operating manual are addressed to all operators in charge of management and/or maintenance of machine.
- The instruction manual should **not** be considered as a training manual.
- Before using the machine, the designated workers and the operator have to be acquainted with the content of the instruction manual.

- The user has to follow strictly the instructions reported in this handbook and in the handbook that is relevant to the machine on which TURBOSONIC is installed.
- Before setting at work the machine the operator should have learnt its use and know exactly the position and operation of all controls.
- The person in charge of department has to check the implementation of instructions.

1.3 Symbols

To highlight some very significant parts of the text or to show some important specifications, some symbols have been adopted, whose meaning is hereunder described.

Â	DANGER – ATTENTION This signal shows situations of great danger that may seriously risk people's health and safety, if they are disregarded
	CAUTION – WARNING This signal shows that it is required to adopt adequate behaviours, in order to avoid any risk to people's health and safety and not to cause any economic losses
Â	IMPORTANT This signal shows very important technical information to be regarded
Â	The provided prescriptions in correspondence with these symbols, highlighted on a yellow back- ground, relate to dangers due to the potential explosiveness of the sieved powders. It is about prescriptions that meet the requirements of "ATEX" 94/9/CE Directive. The prescriptions themselves, if disregarded, can imply serious risks for people's safety and for the environment.
Æx>	These prescriptions relate to <u>TURBOSONIC Ex21 and TURBOSONIC Ex22 models</u> . THESE PRESCRIPTIONS ARE IN ADDITION TO THOSE SHOWN ON A WHITE BACK- GROUND

1.4 Distinguishing marks of machine

The represented name plate is applied on the Accessory and contains all references and indica-

tions which are essential for operating safety.

TURBOSONIC Ex

VIEROWEST	
Marta B. A.	DNV-MUNO 08 ATEX 4002
	TRASDUTTORE II 1D 2 G Ex d tD IIB T 135°C X
QUADRO CONTOLLO 2D Ex tD ibD 135°C x	I QUADRO DI CONTROLLO II 2GD Ex d to IIB T 135°C X
VIA XXV APRILE, 73 - 20 DESIGNAZIONE DEL	0812 LIMBIATE (MB) ITALY L'APPARECCHIATURA
VIA XXV APRILE, 73 - 20 DESIGNAZIONE DEL TURE MODELLO /TYPE	0812 LIMBIATE (MB) ITALY L'APPARECCHIATURA BOSONIC VOLT 230 EL.IMPUT 0.13A
VIA XXV APRILE, 73 - 20 DESIGNAZIONE DEL TURE MODELLO /TYPE MATRICOLA/SERIAL NR.	MAX POWER 120W
VIA XXV APRILE, 73 - 20 DESIGNAZIONE DEL TURE MODELLO /TYPE MATRICOLA/SERIAL NR. FREQ. 25Khz MAX AMB. 50	0812 LIMBIATE (MB) ITALY L'APPARECCHIATURA BOSONIC VOLT 230 EL.IMPUT 0.13A MAX POWER 120W 0°C PROT. IP67

The meaning of ATEX string relevant to the working in potentially explosive atmosphere is the following:

CONTROL BOX

- II device unit: TURBOSONIC has been designed to work in environments other than mines;
- 2 device class: TURBOSONIC belongs to Class 2, as being intended for working in environments where an explosive atmosphere is always, often or for long periods to be found;
- D the explosive atmosphere is due to the presence of powders (=Dust);
- mD/tD the explosive atmosphere is due to the presence of powders (IP67);
- 135 °C maximum temperature that can be reached by the system
- X for a safe use the generator has to work only together wit the transducer TURBOSONIC

TRANSDUCER

- II group of the unit: TURBOSONIC has been designed to work in environments other than mines
- 1D category of the unit: Category 1 as being intended for working in environments where an explosive atmosphere for dust (powder) is always, often or for long periods to be found ;
- 2G Category 2 as being intended for working in environments where an explosive atmosphere for GAS is always, often or for long periods to be found;
- D the protection against spark ignition of gas is obtained by explosion-proof rooms
- Td the protection against spark ignition of dust is obtained by explosion-proof rooms

- II B Group of gas for the explosion-proof rooms
- 135 °C maximum temperature that can be reached by the system
- IP67 type of IP dust proof of the rooms
- .X For safety, the transducer must be used together with the TURBOSONIC

Powder with MIE <10mj and with a maximum ignition temperature of 135°

	The control box is dust proof. On request, Vibrowest can supply a control box gas-proof. The protection is obtained to the prejudice of the practical use. It has been utilised a strong box where display and easy disassembly of the transducer. In this solution the plate will bei as follows:
^	Modello polveri Modello gas polveri TRASDUTTORE II 1D Ex tD T 135 C X TRASDUTTORE II 1D 2 G Ex d tD IIB T 135 C X
<u>/!</u> {Ex>	QUADRO CONTOLLO 2D Ex tD IbD 135°C x I QUADRO DI CONTROLLO II 2GD Ex d tD IIB T 135°C X VIBROWEST ITALIAN: A S.r.I. VIA XXV APRILE, 73 - 20812 LIMBIATE (MB) ITALY DESIGNAZIONE DELL'APPARECCHIATURA TURBOSONIC MODELLO /TYPE VOLT 230 EL.IMPUT 0.13A
	MATRICOLA/SERIAL NR. MAX POWER 120W
	ANNO DI COSTRUZIONE YEAR OF MANIFACTURING 07/2012
	And the marquage:
	i test made with gas belonging to group IIB;

In case of different plates, please get contact Nordson / Vibrowest Italiana Srl

1.4.1 Legibility of the name plate

All data contained in the name plate has to be always legible and regularly cleaned.

If the name plate has been damaged and/or is no longer legible, also a single one of their reported informative elements, it is recommended to request another one via Nordson / VIBROW-EST ITALIANA S.r.l., by mentioning data contained in this handbook and taking care of its replacement.

1.5 Service request mode

For any request of technical assistance please contact directly Nordson / VIBROWEST, by indicating data reported in the name plate, approximately the hours of use and the type of found defect.

1.6 Manufacturer's liabilities

Nordson / VIBROWEST ITALIANA S.r.I. accepts no responsibilities for:

- use of powders to sieve other than those stated in the order, especially for potentially explosive powders when the accessory TURBOSONIC Ex has NOT been ordered,
- use for applications other than those for which the accessory has been designed,
- use of the Accessory against the national laws on safety and accident prevention,
- wrong installation, non-observance or wrong observance of the instructions provided in this handbook.
- faulty power supply,
- changes or tampering,
- operations performed by untrained or unqualified personnel.
- the safety of the Accessory depends also on the strict observance of prescriptions indicated in the handbook and, in particular, you have to:
- operate always within the limits of use of the Accessory and according to the applications foreseen and specified in the Customer's purchase Order;
- perform always a careful ordinary maintenance;
- destine the trained operators for stages of inspection and maintenance;
- please use only original spare parts

 Do not try using it not complying to the provided indications. The instructions reported in this handbook do not replace, but integrate the obligations of the
current regulations on safety rules.

2 TECHNICAL INFORMATION

2.1 Description of machine

TURBOSONIC system is used inside the sieving chambers of Nordson / VIBROWEST separators.

The separators perform the operation of sieving of materials with different granulometry by movements of tree-dimensional vibration on sieving nets.

TURBOSONIC system keeps cleaned the sieving nets. This system applies an ultrasound frequency directly on the sifting net. The micro-vibration keeps constantly cleaned the surface of the net, allowing to the sieving movement to sieve perfectly fine powders without any risk of clogging. The system generates continuously the ultrasound frequency, as well as in the form of wave trains, allowing the sieve to optimise the sifting effect formed by the vibration of the separator and the ultrasound vibration of the net.

2.2 Configurations

The TURBOSONIC accessory is produced in three models that differ from each other in the following features:

Model	GENERATOR	TRANSDUCER POSITION	TRANSDUCER HOUSING
TURBOSONIC	4 poles	inside the area of sieving	Aluminium
TURBOSONIC EX	4 poles	inside the machine with explosion risk (transducer ATEX 1 20 area generator zone 121)	Stainless steel AISI 304

These models have different fields of use:

TURBOSONICsieving of powders that do not pose any risk of explosion and use in
Environments without any danger of explosion due to gas powdersTURBOSONIC Exto sieve powders that pose risk of explosion and/or use in areas classified
as 1-21 relevant to the risk of explosion for gases or powders, with internal
or external transducer



Please check that the configuration of TURBOSONIC corresponds with the request upon Order.

If the transducer is in Aluminium and is internal, it is forbidden the use in areas classified as ATEX If the transducer is external, the use is only admissible for area 22..

2.3 Component parts

Components inside the chamber of sieving are, as follows:

- Transducer mounted on the net with resonant bars (except for TURBOSONIC EX22, mounted outside the chamber of sieving)
- Ring for aluminum net support with resonant bars and site for the installation of the transducer

Components outside the chamber of sieving:

- Ultrasound generator with 4 poles (control box)
- A 2 m long HF cable with double armor (on request a 5 and 10 m extension)
- Connectors and so on.

The interface between the chamber of sieving and the outside part is composed of a pass-cable

for HF cable, put on the inspection cap of the sieving chamber.

In Attachment 1 is reported the assembly drawing of the components forming TURBOSONIC system.

2.4 Accessories

Extensions for HF cable of connection to the single armor transducer with the connector:

- length of cable 5 m
- length of cable 10 m.

2.5 Compliance with regulations

Â	TURBOSONIC is designed and produced in compliance with the Essential Safety Requirements (RES) of the Attachment 2 nd of "ATEX" 94/9/CE Directive and complies with the following classification: TURBOSONIC EX
(Ex)	 Device unit: II Class: 2 G D Maximum superficial temperature: class of temperature T4

2.6 Use conditions

Â	Changes of constructive structure, of assembly position, of not original spare parts and whatever type of maintenance, but excluded those hereunder mentioned, are allowed only to prior consultation and authorization by the technical service of VIBROWEST ITALIANA S.r.I. In lack of authorization the warranty lapses
\triangle	Changes of constructive structure, of assembly position, of not original spare parts and what ever type of maintenance, but excluded those hereunder mentioned, are allowed only to prior consultation and written authorization by the technical service of VIBROWEST ITALIANA
×3	S.r.l In lack of authorisation the warranty and the ATEX homologation lapse.

2.6.1 Environmental conditions

- Room temperature: min. 10° C; max. + 40°C;
- Humidity: no particular requirements
- Lighting: no particular requirements



In case of maintenance interventions performed in areas poorly lit please make use of additional lamps by ensuring that the activity occurs in safety conditions according to what provided for in the current provisions of the law.

2.6.2 **Noise**

The acoustic radiation pressure during the working tests at the manufacturer is negligible to sonic frequency. Therefore further precautions apart from those necessary to use the separators should not be taken (reported inside the relevant installation, operating and maintenance Instructions).

Vibrations produced by TURBOSONIC are not dangerous for personnel's health. All the external surfaces of control box and of transducer can be touched without any problems.

3 SAFETY INFORMATION

This Accessory has been designed for industrial use. The following information have therefore to be regarded as a supplement to the basic ones required to operate in a potentially dangerous environment as the industrial one.

To make use of TURBOSONIC the same precautions reported in the installation, operating and

maintenance instructions of the Separator on which the accessory is installed should be taken.

	SAFETY SPECIFICATIONS ADOPTED FOR ATEX REQUIREMENTS
•	 Insulation of ultrasound source from the casing of transducer by means of a specific filling resin;
Ĩ	Casing of transducer made of Titanium, as this material is not heated to ultrasound frequencies;
(Ex)	• Use of a PVC-lined cable at high resistance to be employed in environments with abrasive powders;
	Protection against the short circuits at circuit level
	• Any electrostatic charges formed on the sieve or on the transducer are discharged to earth
	through the braiding of the mains cable.

3.1 Fire prevention

Please follow the warnings reported in the installation, operating and maintenance instructions of

the separator on which the accessory is installed.

3.2 Measures to be undertaken in case of malfunctions

If you suspect any malfunction:

- switch off immediately the machine and disconnect it from the electric network;
- before restarting the machine please find out and solve the problem of malfunction.

4 HANDLING AND TRANSPORT

4.1 Package specifications

The standard package, when supplied and if it is not otherwise agreed, is not rain-proofed and is not intended for destinations by seaway, but by land, as well as not for wet environments, but for indoor.

The material can be stored for a undetermined period in indoor environments where the tempera-

ture ranges between -10 °C and + 40 °C with relative humidity not higher than 70%. For environ-

ment conditions other than the present ones it needs to make use of a specific package.

Please dispose the package materials according to the provisions of the law on the subject.

	On receipt of TURBOSONIC please make sure that it corresponds to the specifications of purchase, in particular as far as the areas of use are concerned. If the accessory is installed inside a separator of 72"diameter (for example MREx72. MSCEx72), please check that the transducer is specific for a such diameter (the number 72 has to be printed on the transducer).
<u>^</u> (Ex)	On receipt of TURBOSONIC please make sure that it corresponds to the specifications of purchase, in particular as far as the areas of use are concerned.

4.2 Handling stages

Please handle TURBOSONIC by following the indications supplied by the Manufacturer and reported directly on the package.

4.2.1 **Storage**

If the TURBOSONIC has not been installed within 1 or 2 weeks since its arrival at the Customer, please stick to the following instructions for its temporary storage:

 avoid any environments with too much humidity and exposed to bad weather (please exclude outdoor areas); avoid any direct contact of TURBOSONIC with the ground, by keeping it in its original package; if it has been unpacked, please place TURBOSONIC and especially its net (if it is provided with the supply) on a stable support and make sure that there aren't any risks of sudden movements.

5 INSTALLATION

5.1 Power supply

TURBOSONIC will be able to operate under the best conditions and according to the fixed load, if the voltage and frequency values will have the following maximum ranges:

- a) \pm 5% of nominal voltage with rated frequency.
- b) \pm 3% of rated frequency with nominal voltage.
- c) It is accepted a variation between voltage and frequency (a sum variation between voltage and frequency) not higher than \pm 5%, provided that the variation of frequency does not exceed \pm 3% of rated frequency.

5.2 Installation

5.2.1 Changes made to the Separator

The impact of metallic scraps on the casing of transducer in titanium may generate sparks able to prime an explosion.

To exclude this hazard, it is necessary to prevent that any metallic scraps can enter the sieving chamber. The user can achieve it in different modes, as follows:

- by inserting a coarse grain net in the feeling line (about 1 cm), in order to halt the inlet of dangerous metallic fragments in the sieving chamber;
- by inserting a detector of metallic particles on the top of sieving chamber; linked in such a way to switch off immediately the separator.



Nordson / VIBROWEST is absolutely not reliable for any problems arisen due to the non-adoption of precautions to avoid any contact of metallic scraps with the casing of transducer.

5.2.2 **Positioning of components in the relevant mode**

Before starting with the operations of installation, please check visually that each component hasn't suffered any damages. Please look if there are also some dents.

After this first operation please perform the following as hereunder mentioned:

- 1. unpack carefully the unit to avoid any damaging;
- 2. keep the packages for possible future uses, otherwise recycle or eliminate the packages in accordance with the local regulations;
- 3. place the control board in the most suitable position and check that it is stable;
- 4. fix the transducer on the mesh (see further);
- 5. insert the cable feeding the transducer in the inspection hole of the cover, using the special chock ATEX approved;
- 6. connect the feeding cable to the current-tap;;

5.2.3 Assembly of transducer on the mesh-ring.

The transducer should be screwed in the middle of the net (TURBOSONIC Ex21) or sideways (TURBOSONIC Ex22).

Please use a dynamometric wrench with a torque wrench setting of 10 Nm.

The net should be put into the sieving chamber in the same way as it has been made with the net without TURBOSONIC transducer.



Check always that the transducer is screwed rightly to the net.

5.2.4 Electrical Connections



Check always that TURBOSONIC is powered by an electric line that complies with ATEX specifications.

The control box should be connected to the electric network with the following features:

- Voltage: 230 V, single-phase
- Earthing
- SAFETY BLOCK SYSTEM

5.2.5 First adjustment

The right regulation of the resonance frequency (adjusted to the sharp light of the net and to the

diameter of the net) is carried out at factory.

The operator can only set the time of the wave train by means of 3 push buttons on the digital display.

For an ideal setting perform the following procedures:

- 1. Based on the regulation made at the factory it needs to check if small quantities of the siftings remain between a wave train and the subsequent one;
- 2. If this is the case (a too short pulse train to sieve the whole material), you should prolong the times in the following way:
 - a. switch the machine off by pressing the STOP push button
 - b. kept pressed the push button C and adjust with the push button + the maximum duration of pulse train;

c. we remind you that the generator box will automatically save the new setting after the release of push buttons;

 in the negative (long times for the complete sieving of the material) the time of the wave train may be reduced in the following way:

- a. switch the machine off by pressing the STOP push button.
- b. kept pressed the push button C and subsequently the push button and restart the machine using the START push button. Repeat the previous operation until the sieving is acceptable.
- c. we remind you that the generator box will automatically save the new setting after the release of push buttons;
- d. by keeping pressed the push button C, after reaching the value " 3 " on the display, the mode will pass from the alternate one to the continuous one. Therefore instead of the time value the reading "CO" will appear on the display by pressing subsequently the green "START" push button.

6 TESTING

TURBOSONIC is beforehand tested at the Manufacturer's factory.

Before starting the machine, please check that:

- the system where it is inserted complies with all current directives, especially those concerning people's safety and health in work places;
- the suitability and proper working of power electrical systems and control systems according to EN 60204-1 standards, as well as the earthing according to EN 50014 standards;
- the correspondence of power supply voltage with the set one.

After having installed the net on the separator, please perform the following as hereunder mentioned:

- 1. please check the switching off by means of an emergency stop
- 2. Testing of continuous mode
 - please bring the duration time on the display to value 3 (press the push button C and adjust with the button -)
 - press the push button C and adjust with the button the reading CO will appear on the display

3. alternate mode

- please bring the duration time on the display to a value between 4 and 30 (press the push button C and adjust with the button o +)
- press the green button when working the value on the display decreases periodically between the set value and 0.

7 USE

	GENERAL RESTRICTIONS ON USE
•	The accessory should NOT be used in the following conditions:
	• products different from those shown in the purchase Order (for which Nordson /
	• VIBROWEST ITALIANA S.r.I. performed an internal evaluation of the compatibility);
	• with powders at an ignition temperature < 140 °C.

- 1. Please switch on by means of the Green START push button
- 2. ACTIVATE THE TIME, as already described under the section "FIRST ADJUSTMENT"
- 3. Please transfer the powder in the separator;

To switch the Separator off, please close first the switch of the Separator and then switch also the

TURBOSONIC off.

If the adjustment is not ideal (too short or too long cycles), please follow what already described under the section "First adjustment" – attention perform the adjustment, when the separator has been switched off.

7.1 Availability of recommended spare parts

To avoid any interruption owing to sudden breakdowns, it is recommended to keep the following spare parts:

- a 250 V 2 A fuse
- a 250 V 1 A. fuse

8 MAINTENANCE

8.1 Planned maintenance

TURBOSONIC is a machine which needs a little maintenance.

FREQUENCY	MAINTENANCE / CHECK
Weekly	Please check the intactness of the transducer cable
	Check of the electrical connections
Monthly	Check of the cable inside the sieving chamber
	Dusting of the control box



8.1.1 *Recording of maintenances*

To record the performed maintenances it is possible to use the same form used for the Separator.

8.2 General maintenance

8.2.1 **Disassembly of the transducer**

The transducer is removed from the net by using a 22 fixed wrench.

To separate the transducer from the control box, disconnect the wire from the supply box.

8.2.2 Replacement of fuses

In case of an alarm (red light of the panel face) turn off the voltage from the panel. Please check the connections between the transducer and the control box. Then check if the fuses are still intact. Start to check the fuse in position 1 (the fuse outside the card) (see the drawing).

Subsequently check the fuse of position 2.

Please replace fuses possibly burnt with the follow-

ing ones: 250V 2 A position 1

250 V 1 A position 2 (on the card)



If the problem persists, please contact VIBROWEST ITALIANA s.r.l.

8.3 Dismantling

At the end of the product life cycle TURBOSONIC has to be dismantled in accordance with the

current regulations on the subject of work safety and environmental protection.



Please do not try using again any parts or components that can apparently seem to be still Intact, once they have been considered as no longer suitable following to checks and inspections and/or replacements made by skilled personnel.

9 FAILURES AND SOLUTIONS

The hereunder reported information is intended to be of help to find and adjust any defects and troubles. In some cases these malfunctions could also depend on other machines in the system where the Separator is installed. Therefore the cause and a possible solution should be found in the technical documentation provided by the Manufacturer of machinery.

This table has been worked out based on the experience made at our house and at our customers.

MALFUNCTIONS	CAUSE	SOLUTION
TURBOSONIC doesn't start.	No voltage reaches the machine.	Please check that the control board is connected to the network and that the latter is powered. Check that the mains cable of the transducer are intact
	The safety cut-out / automatic circuit	Set the safety cut-out / automatic circuit
	breaker could not be armoured.	breaker in the mode.
	Fuses could be burned.	Please replace fuses.
The transducer doesn't remain stable in its position.	Wrong installation of the net.	Please check that the transducer has been secured with the right fastening couple.
	Wrong adjustment of the wave train duration.	Please repeat the operations of the set- ting up process.
Low efficient separation.	Wrong clamping of the transducer on the ring.	Please clamp the transducer as mentioned under point 5.2.3.
	Clogged nets.	Please clean the nets more frequently. Please use nets with larger meshes. Please reduce the product capacity to be sieved.
The material has not	Net breakage.	Please replace the net as described in the opportune section.
opportunely sieved.	Wrong reassembly of nets.	After having cleaned the nets, please check if they have been mounted with the face from the same side.

10 ATTACHMENTS



10.2Technical Specifications

10.2.1 *Control box*

Protection class:	IP 67
Place of installation:	ATEX area 21 (on request zone 1)
Frequency:	25 ÷ 40 kHz
Frequency control:	Automatic
Adjustment of wave amplitude:	30 - 100 % continuously
Power supply:	230 V – 50/60 Hz (on request 110 V – 50/60 Hz)
Maximum voltage output:	800 V
Maximum current output:	0.13 A
Absorbed power:	max 120 W
Operating modes:	continuous – pulsed (20 up 2 pulses / min)
Display:	Power – alarm – frequency
Alarm:	Breakage or disjunction of the mains cable of the ultra-
	sonic transducer

10.2.2 Transducer

Maximum increase in temperature again	st the room temperature $< 5 \degree C$
Mains cable HF:	standard 2 m, on request 5 m and 10 m
Weight:	400 g.
Protection class:	IP 67
TURBOSONIC EX	
Housing:	AISI 304
Internal place of installation:	ATEX area 20