Sitron

User's Guide

Installation & Operation

VDX500

Vibration Switch with Local Indication

Contents

VDX500
Vibration Transmitter and Switch w/ local programmable Indicator

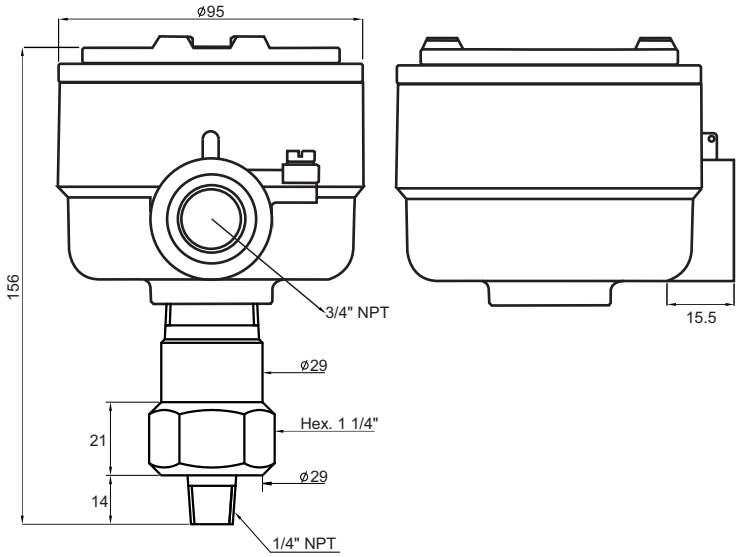
The **VDX500** Vibration Transmitter and Switch is able to monitor the amount of vibration for all types of rotating machinery such fans, pumps, motors and other industrial machines. It measures the vibration to which it is exposed and offers two independent SPDT relay outputs (each with independent time delay and on/off control) when vibration exceeds the preset values so that the equipment it is monitoring can be repaired before extensive damage and more costly repairs are required. This is referred to as Early Fault Detection.

The **VDX500** is well equipped for rotating machine protection applications. It has a bright 3 digit display with unit markings in mm/s, in/s, percentage %, a 4...20mA analog (non isolated) output and 2 independent SPDT relay outputs with LED status indicator per alarm. Set point and Reset point setting for both relay outputs as well as an independent time delay for each switch) is user configurable. Also, the user can configure the unit of measurement shown in the display. Vibration is monitored in r.m.s. (root mean squared), a technique considered best for general machine health.

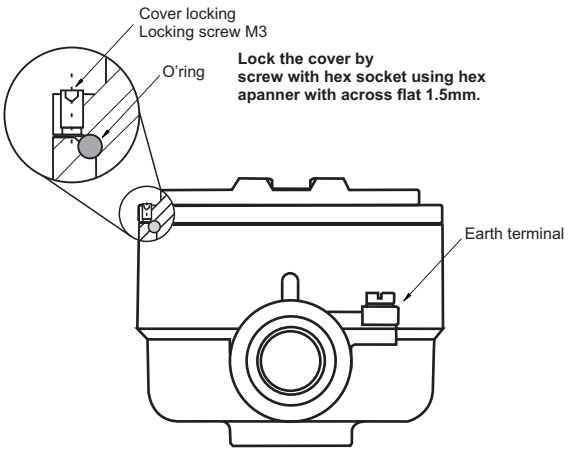
The **VDX500** makes online vibration monitoring cost-effective with its optional analog output retransmission which can be connected to a PLC, DCS or other industrial control equipment.

Features:

- 3 in 1 - Vibration Transmitter - Switch - Display
- Bright 3 digit LED display
- Vibration range available up to 2 in/s RMS
- Vibration Units: mm/s, in/s and % percentage
- 2x SPDT Programmable Relay with independent time delays and 4...20mA (non isolated) analog output
- Easy configuration from front keys
- Set and Reset value switch with both time delay Set


ø95
156
3/4" NPT
15.5
ø29
Hex. 1 1/4"
21
ø29
14
1/4" NPT


Glass window
Sitron
VDX500
Out 2
Out 1
mm/s
in/s
%


Cover locking
Locking screw M3
O'ring
Lock the cover by
screw with hex socket using hex
apanner with across flat 1.5mm.
Earth terminal

VDX500 - OverView

Special Functions

- 3 types of special units for vibration measurement configurable in mm / s (millimeters per second RMS), In / s (RMS per second),% (Percentage for external 4...20mA).

- Individual set-point and reset-point adjustment of the 2 outputs in 0 ~ 100% of the value read in the Display

- Individual Delay setting for each output from 0 to 100 seconds.

- ON / OFF function to enable or disable any output that is not being used.

- 2 individual LEDs for indication of outputs Out 1 and Out 2.

- 20mA offset for fine adjustment of output current. (This current is already factory calibrated with an input impedance of 250 Ohms).

The VDX500 has a 4...20mA input in which the vibration sensor is connected but can easily be adapted to other 4...20mA (2-wire) instruments. Simply disconnect the sensor and insert a new 4...20mA instrument.

Care at this point is needed. Qualified personnel are required to follow all appropriate electrical standards.

When mounting the instrument in a classified area, use only shielded cables and certified cable glands. We recommend the use of shielded 10-way wire cable if all instrument features are used (2 outputs + 4...20mA).
If you want to use the electronics module for an external 4...20mA input, use 12-way wire cable.

1. Make sure that the power is off!

2. Remove the cover from the housing.

3. In the installation of the wiring through the cable entries, certified cable glands must be used according to the type of protection of the equipment. When necessary the use of seal units, these should also be certified according to the type of protection of the equipment. In this case, if necessary the use of adapters these should also be certified.

4. Connect the power wires to the appropriate terminals (+ 24V and -24V) and also the output connections of the relay according to the power requested or identified on the nameplate.

5. Avoid moisture infiltration into the enclosure by installing a certified sealing / drainage unit in the conduit leading to the instrument.

6. After all connections have been made, make a check / review and then insert the cover.

In hazardous areas, do not power the instrument until the conduit is sealed and the housing cover is securely threaded. All cable conduits and conduits must be suitable for rated area and must have protection of at least IP66

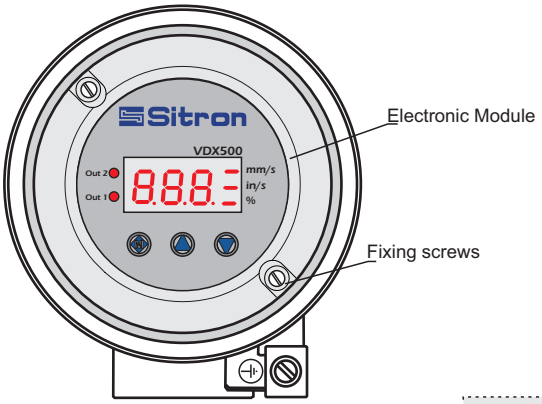
The enclosure must be grounded through the protective ground screw that is at the bottom of the enclosure or internally.

To minimize the risk of electrostatic charging, proper grounding arrangements must be made.

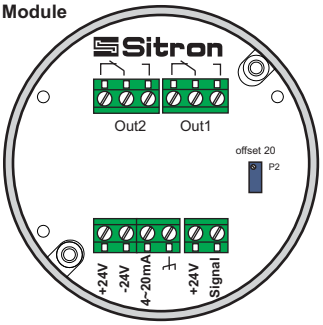
Wiring Diagram

Procedures for electrical connection

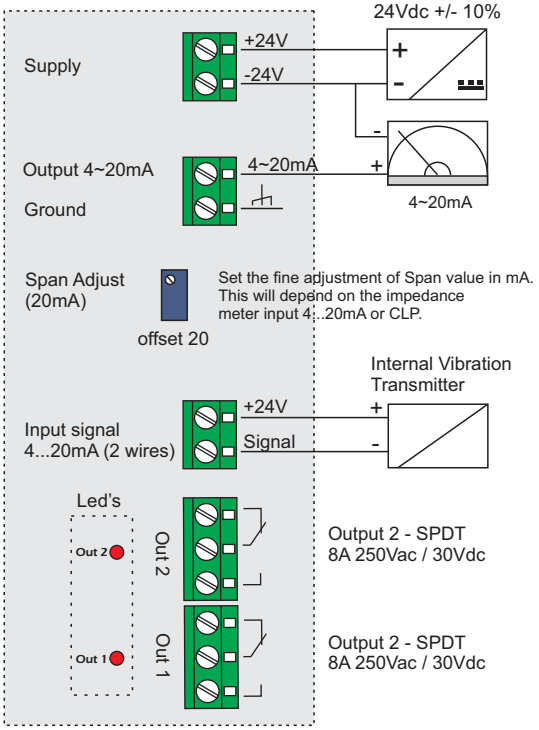
- Remove the cover and loosen the screws of the electronic module
- Remove the electronics module with care.
The connections are on the back of the module



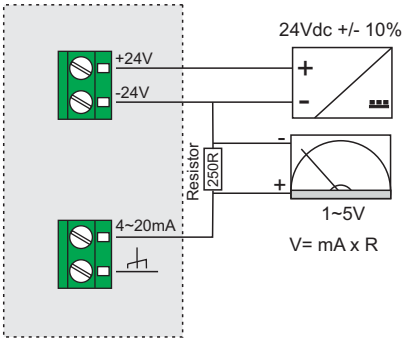
Electrical Connections are located on the back of the Module



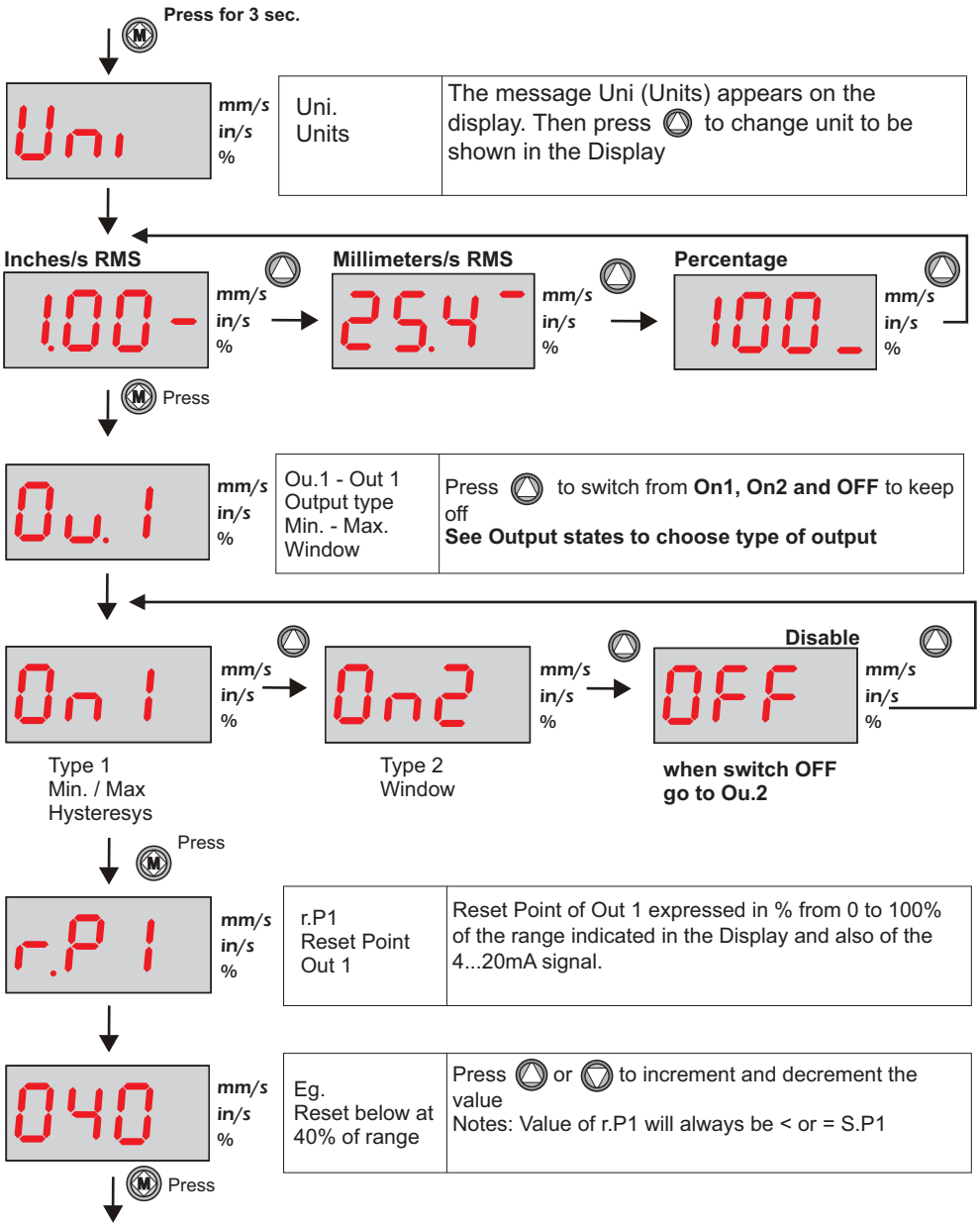
Cable specifications
Cable Type: 9-way + ground
shielded cable



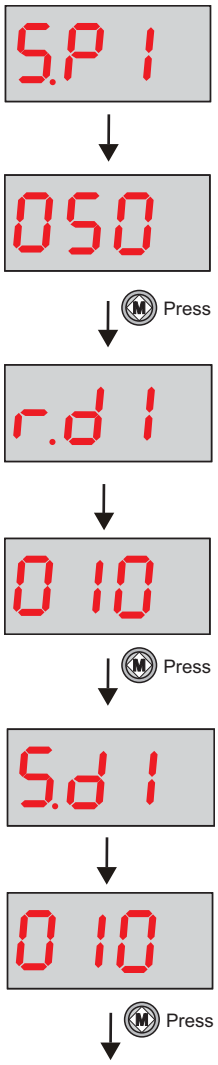
Others Connections
1~5V Output



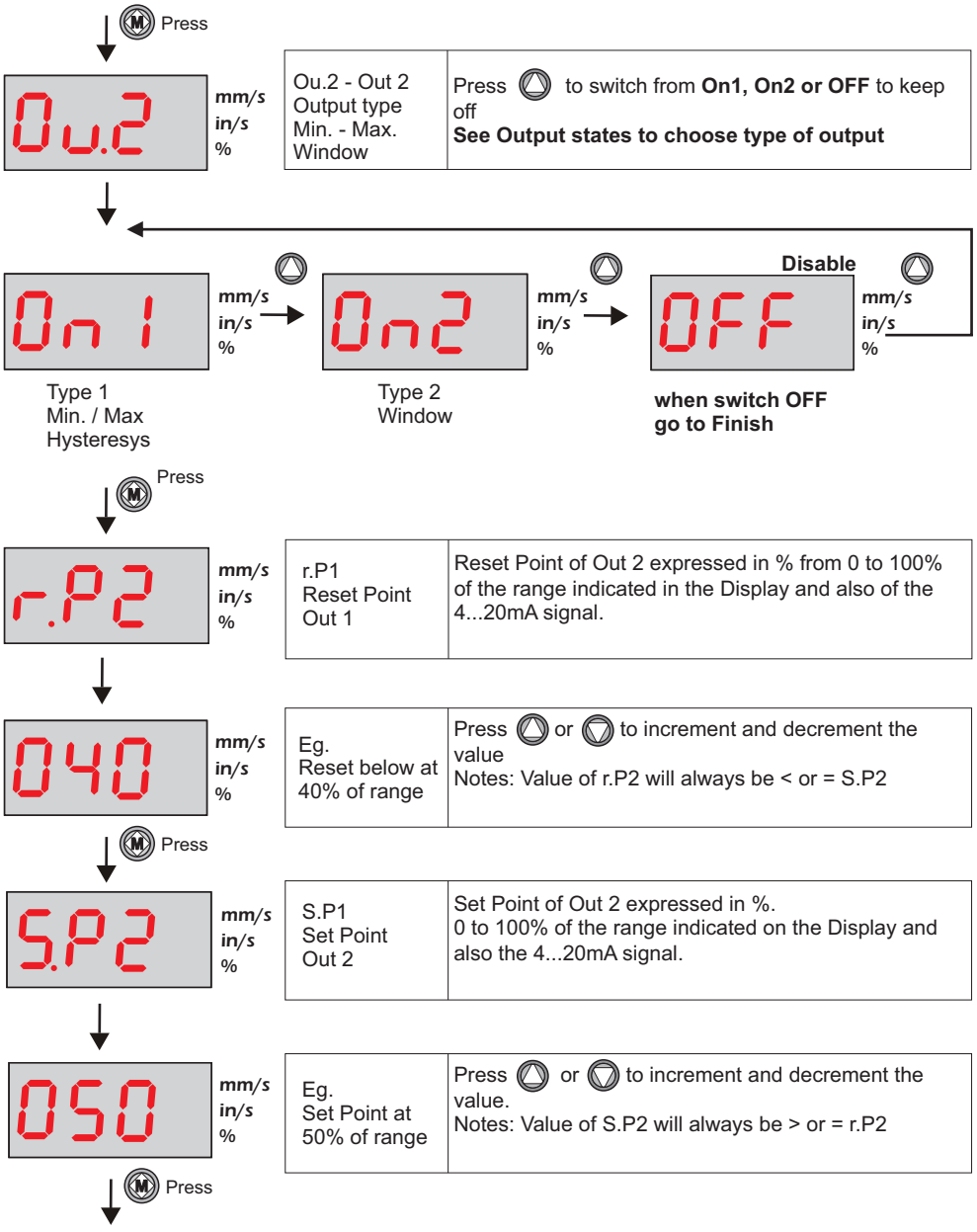
Parameters settings



Settings



S.P1 Set point Out 1	Set Point of Out1 expressed in %. 0 to 100% of the range indicated on the Display and also the 4...20mA signal.
Eg. Set point at 50% of range	Press ▲ or ▼ to increment and decrement the value. Notes: Value of S.P1 will always be > or = r.P1
r.d1 Reset Delay	Reset Point Delay of Out 1 expressed from 0 to 100 seconds
Eg. Delay reset 10 Sec	Press ▲ or ▼ to increase ande decrease delay.
S.d1 Setpoint Delay	Set Point Delay of Out 1 expressed from 0 to 100 seconds. In type 2 output - Delay rappends on down
Eg. Delay 10 Sec.	Press ▲ or ▼ to increase and decrease delay.


Press
Ou.2
mm/s
in/s
%
Ou.2 - Out 2
Output type
Min. - Max.
Window
Press to switch from On1, On2 or OFF to keep off
See Output states to choose type of output
On 1
On2
OFF
Disable
Type 1
Min. / Max
Hysteresys
Type 2
Window
when switch OFF
go to Finish
r.P2
r.P1
Reset Point
Out 1
Reset Point of Out 2 expressed in % from 0 to 100% of the range indicated in the Display and also of the 4...20mA signal.
040
Eg.
Reset below at
40% of range
Press or to increment and decrement the value
Notes: Value of r.P2 will always be < or = S.P2
S.P2
S.P1
Set Point
Out 2
Set Point of Out 2 expressed in %.
0 to 100% of the range indicated on the Display and also the 4...20mA signal.
050
Eg.
Set Point at
50% of range
Press or to increment and decrement the value.
Notes: Value of S.P2 will always be > or = r.P2

Settings

r.d2 Reset Delay	Reset Delay of Out 2 expressed from 0 to 100 seconds
Eg. Reset Delay 10 Sec.	Press or to increase ande decrease delay.
S.d2 Setpoint Delay	Set Point Delay of Out 2 expressed from 0 to 100 seconds.
Eg. Delay 10 Sec.	Press or to increase and decrease delay.

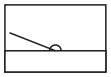
→ finish Parametrization. Data has been saved in memory

Notes: Sleep period in the 10 second menus causes the parameterized data to be recorded and the display returns to monitor the measurement.

Description of error messages

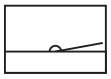
Alert Message

mm/s
in/s
%



Alert message indicates current is low <3.90mA.

mm/s
in/s
%



Alert message indicates current is High > 20.80mA.

mm/s
in/s
%

Error	Signal input 4...20mA disconnected.

Output Switch ON

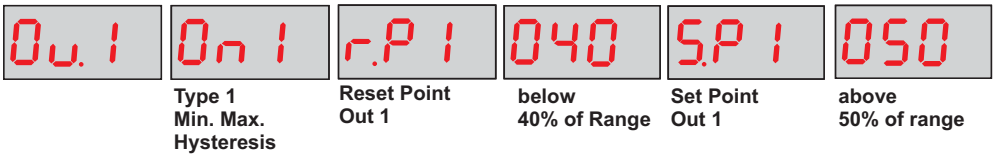
mm/s
in/s
%

3° decimal point	In addition to the 2 output indication LEDs, the 3rd decimal point starts to flash when either of the 2 outputs is triggered

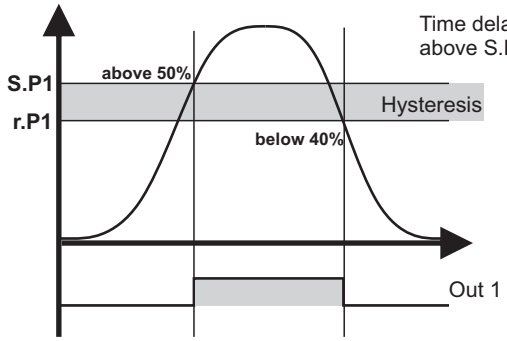
Output State

Output Relay status example settings below:

Output Out 1 with Hysteresis

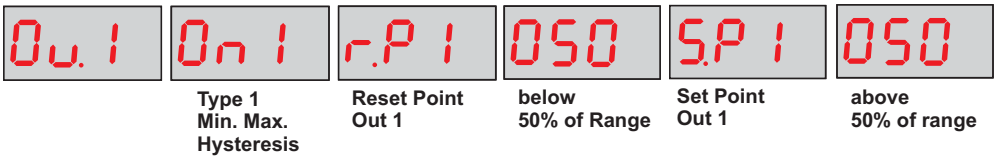


Type 1 Min. Max. Hysteresis | **Reset Point Out 1** | **below 40% of Range** | **Set Point Out 1** | **above 50% of range**

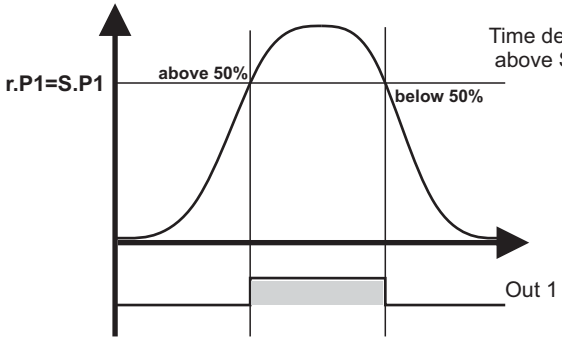


Time delay, when adjusted, will actuate above S.P1 and Down r.P1

Output Out 1 None Hysteresis



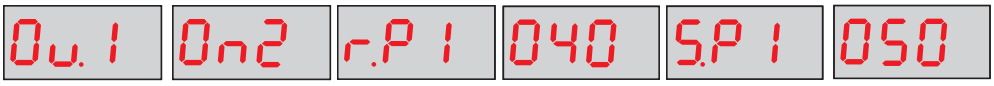
Type 1 Min. Max. Hysteresis | **Reset Point Out 1** | **below 50% of Range** | **Set Point Out 1** | **above 50% of range**



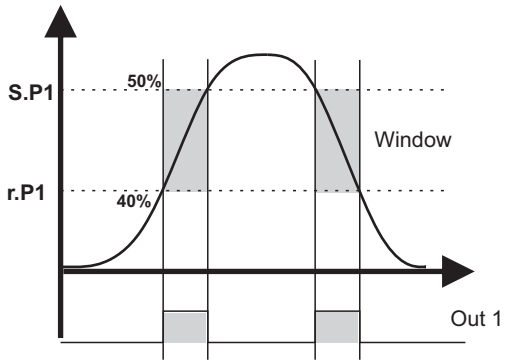
Time delay, when adjusted, will actuate above S.P1 and Down r.P1

Output Relay status Min. & Max with Window

Output Out 1 Min. & Max with Window



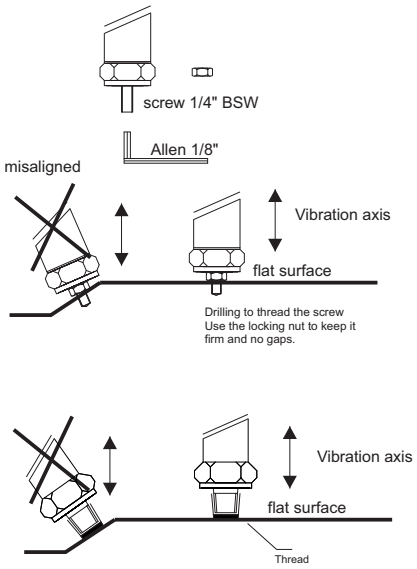
Output Out 1	Type 2 Min. Max. Window	Reset Point Out 1	Reset Point 40%	Set Point Out 1	Set Point 50%

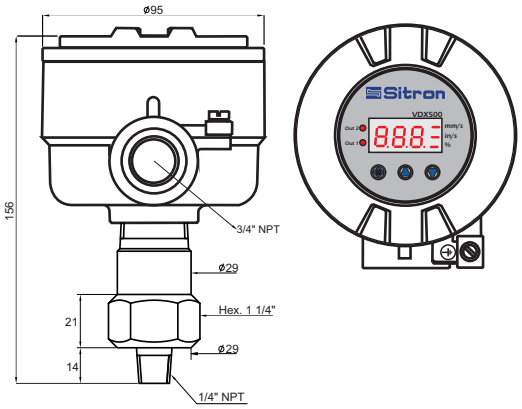


Time delay, when adjusted, will actuate above S.P1 and above r.P1

Installation

Stud bolt for permanent and safe installation. Do not attempt to mount on curved, rough or uneven surfaces as the misalignment potential and the limited contact surface can significantly reduce the operating frequency range of the sensor. Attach the screw to the base of the transmitter with a 1/8 "allen wrench. Prepare the surface and leave the surface smooth and then drill with 1/4" BSW male drill bit to use the nut for tightening and fastening without gap. For threaded connections keep the same procedures.

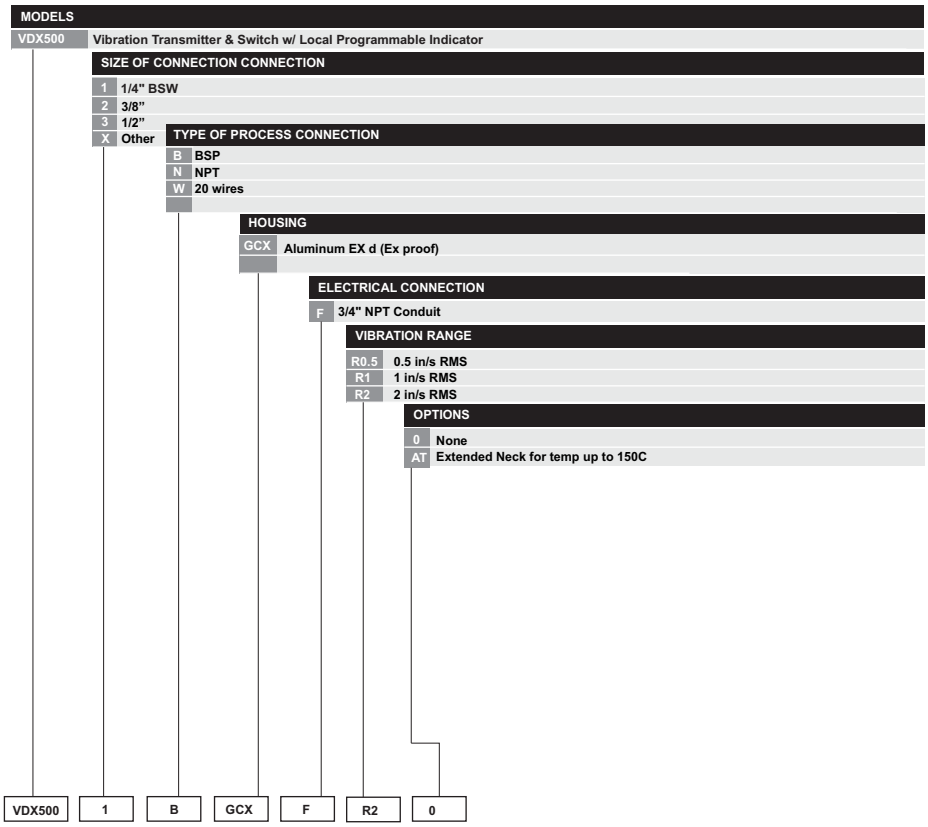




VDX500

Applications:	Monitor misalignment and unbalance on rotating machines
Power Supply:	24Vdc +/- 10%
Output:	2 x SPDT (5A / 250Vac) + 4...20mA (3 wires)
Consumption:	<100mA
Accuracy:	Output 4...20mA (error +/- 0.5% F.S)
Settings:	Time Delay / Alarm Setpoint
Indication:	Display 7 seg + Led's
Accuracy Display:	+/- 1% (0.16mA)
Vibration Ranges:	0.5 / 1 / 2 in/s RMS
Frequency range:	40Hz to 1000Hz
Type of sensor:	1 Axis Accelerometer
Housing Material:	Aluminum with Blue Polyester Paint / Glass window
Temperature range:	-10...70°C
Process connection:	Thread or Fixing Nut
Electrical connection:	3/4" NPT Cable Gland
Class Protection:	IP66
Body Material:	316 stainless steel
Protections:	Polarity Inversion and Voltage Surges
Enclosure Rating:	EN 60079-0 / EN 60079-1 / EN 60079-31 / IEC 60079-0 / IEC 60079-0 / IEC 60079-31 IECx: Ex db IIC Gb (Zone 1 and Zone 2) / Ex tb IIIC Db (Zone 21 and Zone 22)

Order Code


MODELS
VDX500
Vibration Transmitter & Switch w/ Local Programmable Indicator
SIZE OF CONNECTION CONNECTION
1 1/4" BSW
2 3/8"
3 1/2"
X Other
TYPE OF PROCESS CONNECTION
B BSP
N NPT
W 20 wires
HOUSING
GCX Aluminum EX d (Ex proof)
ELECTRICAL CONNECTION
F 3/4" NPT Conduit
VIBRATION RANGE
R0.5 0.5 in/s RMS
R1 1 in/s RMS
R2 2 in/s RMS
OPTIONS
0 None
AT Extended Neck for temp up to 150C
VDX500
1
B
GCX
F
R2
0

Sitron's TERMS & CONDITIONS

Design: Sitron reserves the right to make any alterations or changes necessary to improve the Products, correct defects or to make the Products safer, without prior notice or consent by Buyer.

Pricing: All stipulated amounts shall be in US dollars and all prices quoted are valid for thirty (30) days from date of offer, unless otherwise stated.

Safety and Instructions: The Buyer ensures that it and all its representatives and agents will observe all safety and technical instructions in Sitron's operating manuals, catalogs or other directions or instructions (either written or verbal).

Delivery and Freight: All goods are sold FOB point of shipment, Brasil. Transportation to the destination is the Buyer's responsibility and Buyer alone shall bear the cost of freight, optional or other shipping requirements, and or insurance. Sitron shall not be liable for loss or damage to the Products after said Products are delivered to or received by the shipper/carrier, and all risk of damage or loss shall immediately pass to Buyer.
Receiving, unloading and storing of Products will be the responsibility of the Buyer.
Buyer also accepts that courier may choose to return Products to Sitron if any local taxes or duties are not paid by Buyer at point of delivery. Buyer must make any and all claims for corrections or deductions within ten days of the delivery of the Products.

Shipment Delays: Sitron has no control over the length of time shipments may be held at customs, etc. For this reason, Sitron commits only to a "shipment date", not a "delivery date". Buyer shall not hold Sitron liable for claims resulting from delay in shipment except in cases where these terms are accepted in writing by Sitron. Acceptance of delivery of Products by Buyer shall constitute a waiver of all claims for delay.

Partial Deliveries: While Sitron strives to deliver all orders on time and complete, Sitron reserves the right to make partial deliveries when necessary.
Changes: Any changes initiated by the Buyer which affects the products specifications; quantities ordered; delivery schedule; method of shipment or packing; or delivery location, must be made in writing and signed by both parties.
In this case, Sitron reserves the right to adjust the pricing and or delivery of the order, which will be agreed to by both parties before further work is performed on the order. Any such requests will be priced according to the scope of changes and the status of the current order.
Customer must sign and return or acknowledge approval of drawings along with any Purchase Order. If approval drawings are not returned with order, the delivery date may be held or pushed back until Customer has acknowledged approval.

Cancellation: Any cancellation of the Contract by the Buyer shall be effective only if made in writing and accepted, in writing by the Sitron. In such a case, Sitron is entitled to reasonable cancellation charges including but not limited to labor, material and other related expenses.
Termination Fee Schedule:

Order entered but not released for manufacturing	**10%**
Order in any stage of production	**75%**
Order complete and ready for shipment	**100%**

Warranty: Sitron warrants its product against manufacturing defects in material and workmanship, when installed in applications approved by Sitron, for a period of one year from the date of original shipment, unless otherwise stated in writing by Sitron.
Sitron is not responsible for damage to Sitron's Products or other equipment or products because of improper installation or misapplication of the Products by Buyer. Installation or startup of Sitron's equipment must be performed under the guidelines set forth in Sitron's instruction manuals, wiring diagrams, etc., or performed under the direct supervision of Sitron's field technicians or Sitron's authorized Sales Representatives, in order to be covered by Sitron's warranty.
Sitron shall be under no liability in respect to any defect from fair wear and tear, willful damage, negligence, abnormal working conditions, failure to follow Sitron's instructions (whether written or verbal), misuse, modification or alteration or attempted repair of the Goods without Sitron's approval.
Sitron shall not be liable under the above warranty (or any other warranty, condition or guarantee) if the total price for the Products or the payment of Services rendered has not been paid by the due date for payment.
The Buyer must make all tools, resources or personnel available to help Sitron to diagnose the defect without any back charge. In absence of Buyer's cooperation in this regard, there shall be no liability under the above Warranty.
Sitron's liability under this warranty shall be limited to repair or replacement at Sitron's option of such defective Products, FOB factory, upon proof of defect satisfactory to Sitron. Warranty does not include transport.

Return Goods: No goods may be returned without Sitron's permission and an RMA number. Sitron assumes no responsibility for return shipments made without permission. In issuing credit for such shipments, Sitron reserves the right to charge a restocking fee dependent on Sitron's ability to recondition and resell the returned equipment.
Insurance: The responsibility for insuring the Goods after the risk in them has passed to the Buyer shall be that of the Buyer.

Confidential Information: All drawings, specifications, and technical information provided by either Buyer or Sitron shall be treated as confidential and shall not be disclosed to anyone other than those who require it as part of the fulfillment of the order. Buyer agrees that the designs and/or any other related material provided are and remain Sitron's exclusive property and that the Buyer acquires no right, title or interest to this intellectual property, whether in whole or in part.

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