General characteristics
of electronic thread detectors
XND-A, XND-C, XND-E, XND-F for thread and roving monitoring

General

Application
XND-C: Piezo-electric thread detector for monitoring linear thread movement.
XND-E: Opto-electronic thread detector for monitoring to and fro or ballooning thread or linear movement of rovings.
XND-F: Opto-electronic detector with separate head (cable 30 cm) for monitoring to and fro or ballooning thread or linear movement of rovings.

In the event of breakage or stoppage of the thread, the thread detector provides a signal operating a thread cutters, a relay, etc.

Construction
Fibre glass body housing the electronic circuits.
Mounting on rail or plate; 2 alternative positions at 90°.
Fixing by screws or clips.
Detector head encloses sensitive element; 2 alternative positions.

Device mounting

Vertical

Horizontal

Position of head

Horizontal

On end

Optional
Inhibit function switch, inhibit state pilot light or thread cutter state pilot light.

Operation

Type XND-A
Principal: During the linear passage of the thread in the infra-red beam, the irregularities of the thread are recorded and processed by the electronic circuit.

Maximum thread speed: This depends on the texture of the thread. Example: Synthetic fibre 180 dtex: 2 m/mm
Synthetic fibre 20 dtex: 4 m/mm

Reliability: Automatic compensation for ageing and partial fouling of the optical beam. The complete obscuring of the beam has the same effect as stopping the thread (positive operation, failsafe).

Beam Width: In use without thread guides the thread must stay for the most part in the shaded zone.

Type XND-C
Principal: The sliding of the thread on the guide produces a high frequency vibration of the transducer. This is detected and processed by the electronic circuit.

Minimum speed and pressure of thread. These two values are linked but also depend on a third factor, the type of thread.
For a given thread, the threshold operating curve has the form shown opposite. This type of detection is well suited for high thread speeds where the pressure of the thread can be as low as a few tens of milligrams-pressure.

Type XND-E
Principal: Each passage of the thread through the infra-red beam is recorded and processed by the electronic circuits (to and fro, ballooning).

Minimum thread passage frequency. State when ordering the maximum duration T between two thread passes in the same direction. The delay of thread cutter operation when a breakage occurs will be about 3 x T.

Thread detection range: Φ 60 μ thread can be detected.

Reliability: as for XND-A.

Type XND-F
Identical to XND-E, but with separate head (supplied with 30 cm cable). Head fixed by 2 screws.
### Environment

**Ambient temperature**
For storage: from $-45^\circ$ to $+85^\circ$ C. For operation: from $0^\circ$ to $+50^\circ$ C.

**Ambient lighting**
The devices are immune to the effects of ambient light under normal working conditions.

**Relative humidity**
95%  
95%  
95%  
95%

### Technical characteristics

**Protection against short circuits**
The devices are protected against reverse polarity.

**Nominal supply voltage**
- XND-A: 24 V  
- XND-C: 24 V  
- XND-E: 24 V  
- XND-F: 24 V

**Permissible supply voltage variations**
- XND-A: ± 20%  
- XND-C: ± 20%  
- XND-E: ± 20%  
- XND-F: ± 20%

**Maximum ripple**
- XND-A: Peak-to-peak 4 V  
- XND-C: Peak-to-peak 4 V  
- XND-E: Peak-to-peak 4 V  
- XND-F: Peak-to-peak 4 V

**Typical current consumption**
- XND-A: 18 mA irrespective of voltage  
- XND-C: 20 mA at 24 V  
- XND-E: 18 mA irrespective of voltage  
- XND-F: 18 mA irrespective of voltage

**Maximum current consumption**
- XND-A: 36 mA irrespective of voltage  
- XND-C: 20 mA at 24 V  
- XND-E: 35 mA irrespective of voltage  
- XND-F: 35 mA irrespective of voltage

**Maximum continuous current at terminal – CF**
- XND-A: 400 mA  
- XND-C: 400 mA  
- XND-E: 400 mA  
- XND-F: 400 mA

**Maximum current during 0.1 second at terminal – CF**
- XND-A: 1.5 A  
- XND-C: 1.5 A  
- XND-E: 1.5 A  
- XND-F: 1.5 A

**Typical volts drop between terminals – CF and OV (conducting)**
- XND-A: 1.6 V  
- XND-C: 1.6 V  
- XND-E: 1.6 V  
- XND-F: 1.6 V

**Maximum voltage between terminals – CF and OV (non-conducting)**
- XND-A: 40 V  
- XND-C: 40 V  
- XND-E: 40 V  
- XND-F: 40 V

**Normal time delay before thread-cutter actuation**
- XND-A: 0.5 s  
- XND-C: 0.5 s  
- XND-E: See minimum frequency of thread passage.  
- XND-F: See minimum frequency of thread passage.

**Interchangeable guides**
- XND-A: Yes  
- XND-C: No  
- XND-E: Without guides  
- XND-F: Without guides

**Cabling**
- XND-A: By 6.3 mm Faston tags (1 x 6.3 mm or 2 x 2.8 mm)  
- XND-C: By 6.3 mm Faston tags (1 x 6.3 mm or 2 x 2.8 mm)  
- XND-E: By 6.3 mm Faston tags (1 x 6.3 mm or 2 x 2.8 mm)  
- XND-F: By 6.3 mm Faston tags (1 x 6.3 mm or 2 x 2.8 mm)

### Installation

**Supply precautions**
The ±24 V supply to the thread cutters must be delayed by a minimum of 3 seconds after the supply to the thread detectors. Attention: ±24 V must never be connected to terminal – CF.

**Wiring diagram**

- ± 24 V (thread cutter)

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- ± 24 V (thread detector)

- 0 V (zero volt)
XND-G
General characteristics
of electronic thread detectors
XND-G for rovings

General

Function
Detects the to and fro thread movement linked to the speed of the machine; (absence of roving is detected within a maximum of one complete movement).

- A fault is signalled if:
  - The roving is absent when the synchronisation signal is transmitted.
  - The synchronisation signal is absent when the roving passes in the fork of the detector in this case the internal relay of the detector is no longer supplied and the contact (terminal T1 and T2) open.

Reliability: Automatic compensation for ageing and partial fouling of the optical coupling.
The following give fault signal (Same result as absence of thread)
- accidental obscuring of beam
- accidental absence of synchronisation signal
- accidental absence of supply voltage to device

Environment

Ambient temperature
For storage: from −45° to + 85 °C. For operation: from 0° to +50 °C.

Relative humidity
95%

Technical characteristics

Nominal supply voltage
24 V

Permissible supply voltage variation
± 20%

Maximum ripple voltage
Full wave rectification, without smoothing.

Typical consumption at 24 V
When roving is intact 36 mA
When roving is broken 48 mA

Maximum consumption
60 mA

Breaking capacity of relay contact (resistive load)
2 A at 24 V

Maximum switching voltage
250 V

Synchronization and reset resistance
22 kΩ at terminals

Synchronization and reset signal
24 V applied to terminals

Sensitivity
Roving Ø 2 mm minimum

Cabling
6 core cable
Length 1.20 m

- Black: Reset
- Green: OV
- Red: + 24 V
- Blue: synchronisation
- White: T1
- Yellow: T2

Installation

Safety in use
The device is unaffected by ambient lighting in normal working conditions (incandescent lighting at more than 1 metre vertically from thread detector).
The terminals of the indicator button are protected against fleeting short circuits (3 seconds).
The detector is protected against reverse polarity.
### Electronic thread detectors

**For thread and roving detection**

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<th>Function</th>
<th>Basic reference to be completed</th>
<th>Signalling</th>
<th>Guide</th>
<th>Fixing</th>
<th>Response time</th>
<th>Weight kg</th>
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<tr>
<td>Thread with linear movement</td>
<td>Optical detection</td>
<td>XND-A</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>0.055</td>
</tr>
<tr>
<td></td>
<td>Piezo-electric detection</td>
<td>XND-C</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>0.070</td>
</tr>
<tr>
<td>Thread with to and fro or ballooning movement</td>
<td>Optical detection</td>
<td>XND-E</td>
<td>•</td>
<td>0</td>
<td>•</td>
<td>0.055</td>
</tr>
<tr>
<td>movement or linear travel rovings</td>
<td>Optical detection separate head</td>
<td>XND-F</td>
<td>•</td>
<td>0</td>
<td>•</td>
<td>0.060</td>
</tr>
</tbody>
</table>

*• Cable length 30 cm. For other lengths please consult us.*

#### Signalling

- Without inhibitor switch or indicator light:
  - Without thread cutter pilot light: 1
  - With thread cutter pilot light: 3

- With inhibitor switch and indicator light:
  - Without thread cutter pilot light: 2

#### Guide

- Without thread guide: 0
- With thread guide: 1

#### Mounting (see page 4)

- **Horizontal**
  - With screws: Head horizontal: 1, Head on end: 5
  - Clip-on: Head horizontal: 2, Head on end: 6

- **Vertical**
  - With screws: Head horizontal: 3, Head on end: 7
  - Clip-on: Head horizontal: 4, Head on end: 8

#### Response time

<table>
<thead>
<tr>
<th>In milliseconds</th>
<th>Available for units</th>
<th>XND-A and XND-C only</th>
<th>Available for all types</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>35</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>35</td>
<td>50</td>
<td>200</td>
<td>500</td>
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<td>50</td>
<td>200</td>
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<td>200</td>
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<tr>
<td>200</td>
<td>500</td>
<td>200</td>
<td>500</td>
</tr>
</tbody>
</table>

#### For roving detection

<table>
<thead>
<tr>
<th>Description</th>
<th>Reference</th>
<th>Weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic thread detector with pilot light indicating absence of roving</td>
<td>XND-G01</td>
<td>0.440</td>
</tr>
</tbody>
</table>

#### When ordering

A thread detector for thread or rovings.
Complete the basic reference by 4 numbers indicating in order the combination of features required (signalling, guide, mounting, response time).
Example XND-A 3075.

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Dimensions of electro-mechanical and electronic thread detectors

Electro-mechanical thread detectors without base
XC2-FA11
XC2-FA16
XC2-FA010
XC2-FA021
XC2-FA021

With screw fixing base
XC2-FA11•
XC2-FA16•
XC2-FA021
XC2-FA021

With clip-on base
XC2-FA12•
XC2-FA17•

Electronic thread detectors
XND-A, C, E

Vertical fixing with screws
clip-on

Horizontal fixing with screws
clip-on

XND-G01

A = 18 (chromed lever)
A = 19 (ceramic lever)
(1) Parking button
(2) Red lines indicate “parked”
(out of service)

In service
Out of service

* 2 holes Ø 3.2 mm for mounting on left or right side of XC2-FA021 plate
P = pre-set torque

Length of interconnecting cable: 300 mm

XND-A
11 11.5 16 12 86 86 80 80 33.5 33.5 41 37
XND-C
10 11 15.5 11 81.5 86.5 75.5 80.5 29 34 40 36
XND-E
20 7.5 28 21 97.5 94.5 91.5 88.5 45 42 52 44