



Cyclone High Speed Centering Shaft

User Manual



EN

MI 270013883 1

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About these operating instructions

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Periodically there will be updates to this manual. The latest version is available on our website or by calling the number listed on the back page of this publication.

These instructions are designed to help put the external element winding shafts into service and provide important notes for the proper use of the shaft. These instructions are valid for the following shaft series:

Tidland Cyclone High Speed Centering Shafts

These instructions are important for the machine manufacturer, end user, machine operator and maintenance personnel. Read and understand these instructions before installing and operating the shaft.

The instructions must be read and used by all persons who have the responsibility of installing, operating, and maintaining these shafts.

These instructions must be retained and incorporated in the technical documentation for the machine or partly completed machinery into which the shaft is installed.

The start-up of this winding shaft is forbidden until it is determined that the control, which the operator understands, and the machine into which it has to be assembled, correspond with the regulations of the applicable EC-guidelines.

These are the original instructions, written in English.

Theory of operation

Winding shafts with external expansion elements are air-actuated shafts. The elements expand to grip the roll or core when the shaft is inflated with air.

The core centering elements of the 152.4 mm [6.0 inch] shafts expand just before the gripping elements. The small diameter of the 76.2 mm [3.0 inch] shaft eliminates the need for core centering bars.

Each shaft is designed according to customer requirements.

Safety Information

When using this Tidland product, always follow basic safety precautions to reduce the risk of personal injury. Your company's safety instructions and procedures should always be followed. When using this product with any other equipment or machinery, all safety requirements stipulated by that equipment or machinery manufacturer must be followed. Compliance with local, state, and federal safety requirements is your responsibility. No part of these or the following instructions should be construed as conflicting with or nullifying the instructions from other sources. Be familiar with the hazards and safety requirements in your work environment and always work safely.

- Read and understand all instructions and shaft design application limits before operation.
- The proper and safe operation of the winding shaft assumes that the winding shaft is transported and stored properly, professionally installed, put into its intended use and carefully maintained.
- Attach the Product Safety Data Sheet (PSDS) on or near the machine.
- Follow all warnings and instructions marked on the product and on the PSDS; instruct operating personnel about the PSDS.
- Avoid sudden or shock loads to the shaft during installation.
- Do not wear loose fitting clothes near the machine or winding shaft while in operation.
- Do not inflate or deflate the shaft while it is rotating.
- Do not use fingers or other objects to deflate the shaft; use only the Tidland deflation tool.
- Ensure that all expanding elements are covered by cores during inflation and operation.
- Inspect the shaft for wear and/or other safety and functional deficiencies daily, before each use.

Safety information continued

- Wear safety glasses or proper eye protection when inflating or deflating or otherwise operating the air system. Do not remove or otherwise alter any set screws or fastening devices prior to using this product.
- Do not operate this product if any set screws or fastening devices are missing.
- When performing maintenance or repair procedures, do not pressurize the shaft if any fasteners are loose or missing, or if the journal is loose or missing.
- All replacement parts used and all maintenance and repair procedures performed on this product should be done to Tidland specifications by qualified personnel.

Proper use

The external element shaft is part of a processing machine and exclusively provides gripping of cores or rolls used for winding and unwinding of web materials (paper, cardboard, plastic films, nonwovens, textiles and metal foils).

- With each shaft you will get a Technical Data Sheet (Product Safety Data Sheet/PSDS) which confirms the winding shaft design parameters.
- The installation and use of the winding shaft must be made only in accordance with the technical data specified in the PSDS.
- In particular, these are:
 - The type and design of the bearing arrangement for winding shaft, the bearing center distance, the widths (roll width) with the corresponding maximum roll weights and the number of slits, and the machine speed.

Improper use

- Operation outside the technical specifications
- The use of this shaft in a vertical position is prohibited.
- Any other use than the proper use shall be deemed inappropriate.

Safety warnings



Installation and commissioning

WARNING – Danger of falling down or muscle or skeletal injury during installation

The larger design shafts are heavy. Use appropriate equipment to lift and move shafts. Observe your company safety rules.



Operation

WARNING – Danger of entanglement or pinching during operation

Keep hands and loose clothing away from rotating shaft.



Maintenance and repair

WARNING – Danger of entanglement or pinching

Maintenance and repair tasks on the shaft must be performed only when the machine has been stopped and has been secured from being turned on again.

WARNING – Danger of bodily injury or damage to hearing.
Do not inflate bladders without cores installed.

Decommissioning

The shaft must be disposed of in accordance with all the applicable national, state and local regulations.

Shaft inspection guidelines

At receipt and before the first use

- Before placing winding shafts into service, check visually for any damage due to shipping or mishandling.
- Track each shaft individually by recording its serial number and when it went into service.

Before each use

- Inspect the shaft daily for wear and/or other safety and functional deficiencies.
- Shaft body: visually check for any damage.
- Journals: visually check for cracks or excessive wear.
- Check for reductions in transitional radii between journal diameter steps. If wear is observed, check for cracks.
- Check the accuracy at those locations where journal, or the body of the winding shaft, rides on bearings.
 - Measure the diameter at those locations.
 - If the diameter is reduced by 0.4 mm or more due to wear, remove shaft from service.

General

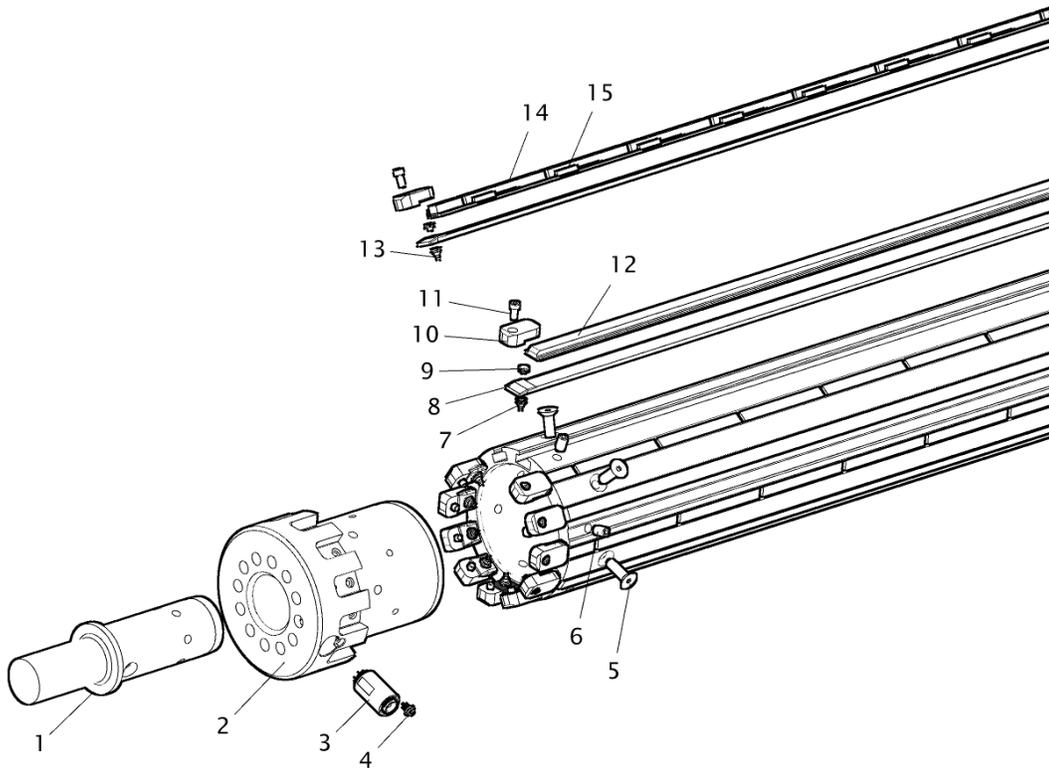
- Check for damaged or missing fasteners.
- Dry polish with an abrasive pad, around the ends of the suspect slots or holes to expose any possible cracks.
 - If any cracks are visible, remove shaft from service.



If any of these problems are found, remove shaft from service!

Shaft life is determined by actual operating conditions; these inspection intervals may be adjusted.

Shaft components



| Item | Description |
|------|--|
| 1 | Journal, valve |
| 2 | Head |
| * 3 | Valve, end or side location |
| 4 | Screw, side valve, M4 button head |
| 5 | Screw, journal, M6 flat head |
| 6 | Set screw, head, M8 cup point (≥6.0" dia. shaft) |
| * 7 | Air fitting barb |
| * 8 | Bladder |
| * 9 | Air fitting, top |
| * 10 | Element end clamp |
| * 11 | Screw, end clamp, M5 soc head |
| * 12 | Expansion element, aluminum |
| * 13 | Air fitting barb (≥6.0" dia. shaft) |
| * 14 | Expansion element, rubber |

* recommended spare parts

Operation

Air pressure



Use only clean, dry, non-lubricated air.

Shaft operation requires 5.5–8.3 bar [80–120 psi].

Connect air hose to the air supply. When inflating shafts not equipped with a rotary union, Tidland recommends the use of a Tidland Air Inflation Tool.

Preparing the shaft for operation



Do not rotate shaft without a core installed on expansion elements.

1. Position the shaft in the core.
2. Ensure that all expansion elements are covered by cores or rolls.
3. Use the Tidland Air Inflation Tool to inflate the shaft. Hold the nozzle in place until the line pressure air gauge indicates 5.5–8.3 bar [80–120 psi].

Deflating the shaft



Use an appropriate tool to release air from the shaft. Do not use your finger to deflate the shaft.

The Tidland Air Release Tool is available on request. See page 5-1 for part number.

Recommended tools

Metric hex drive wrench set
 Tidland air inflation tools (contact Maxcess for options)
 Tidland air release tool (Tidland 27L111630)
 Hole punch guide (Tidland Part No. 270013595)
 Hole punch tool (Tidland Part No.27L760668)

Lubricants and thread- lockers

Always use a thread locker on component threads during reassembly.

| Component | Product |
|---|---|
| Element end clamp fasteners Air fitting barbs and valves | Loctite® 222 |
| Journal or end cap fasteners | Loctite® 243 |
| O-rings (on isolation valves) | Dow Corning Molykote® 55 o-ring grease |

Maintenance schedule

Daily

Keep shaft clean and dry.
 Remove dust and debris buildup with compressed air.

Periodically

Inspect journals for wear.
 Check for worn or damaged expansion elements.
 See page 5-1 for complete shaft inspection checklist.

Torque values

When installing fasteners, it is important to use the correct tightening torque. Please use the values in the table below.

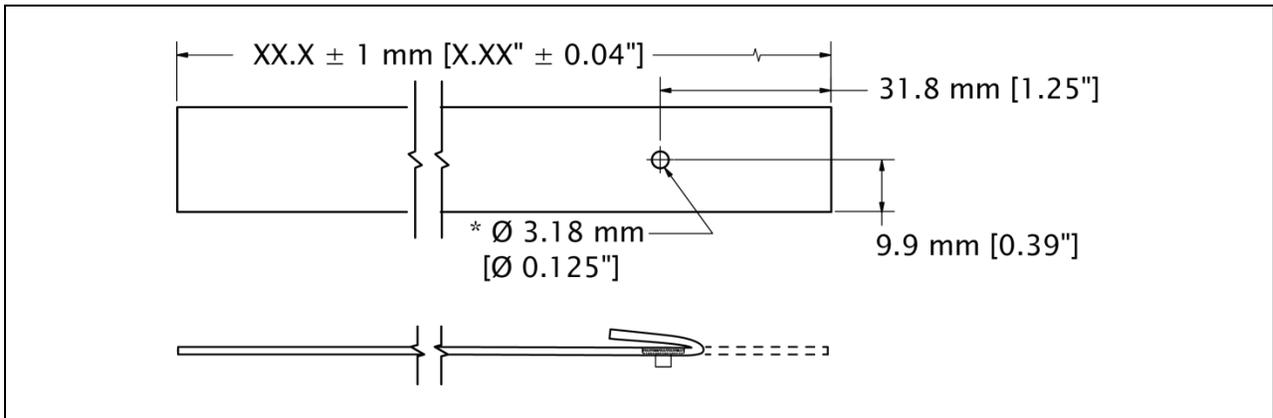
| Bolt type | Grade 10.9 | | | | Grade 12.9 | | | |
|---------------------|------------|---------|---------------|--------|------------|---------|---------------|--------|
| | Steel body | | Aluminum body | | Steel body | | Aluminum body | |
| | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs |
| M4 button head | 1.7-2.3 | 15-20 | 0.6-1.1 | 5-10 | 1.7-2.3 | 15-20 | 0.6-1.1 | 5-10 |
| M5 socket head | 6.2-6.8 | 55-60 | 0.9-1.1 | 8-10 | 8.5-9.0 | 75-80 | 2.5-3.4 | 25-30 |
| M6 flat head | 6.2-6.8 | 55-60 | 0.9-1.1 | 8-10 | 8.5-9.0 | 75-80 | 2.5-3.4 | 25-30 |
| M8 set screw cup pt | 12.4-13.0 | 110-115 | 4.0-4.5 | 35-40 | 15.8-16.4 | 140-145 | 5.1-5.6 | 45-50 |

Repair

The procedure for disassembly and re-assembly is typical for most Tidland winding shafts with external expansion elements. Design variations do occur in custom built equipment.

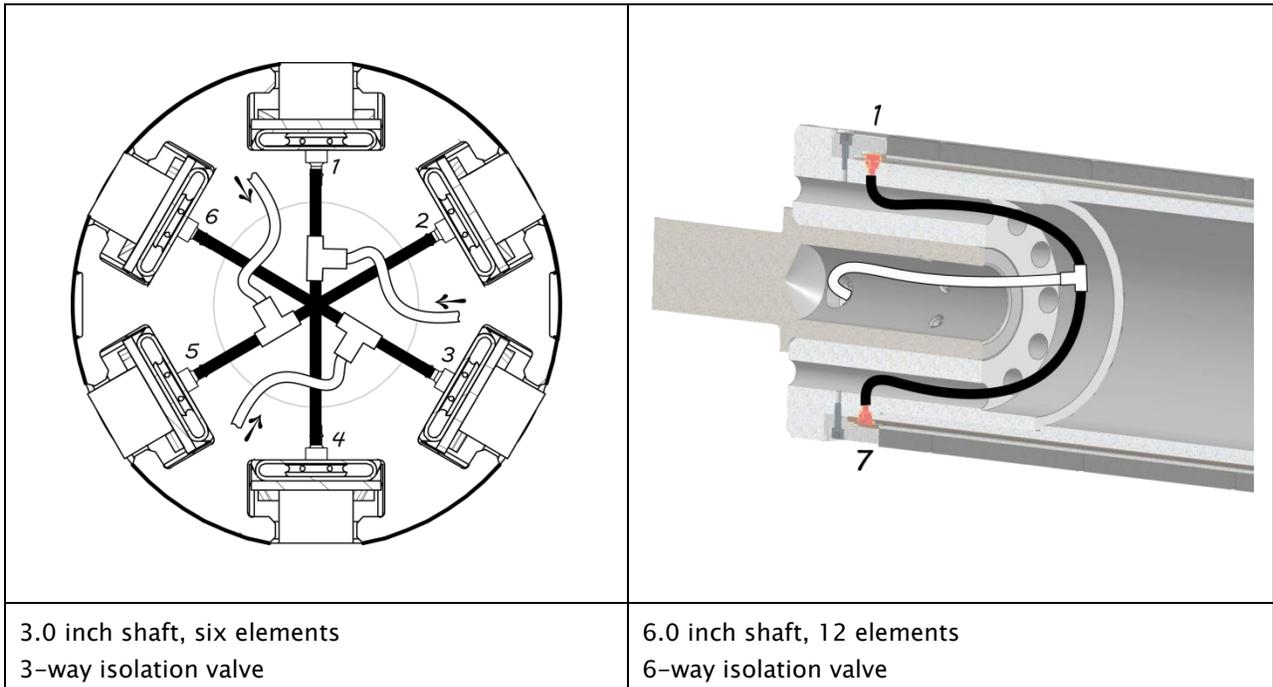
All maintenance and repair procedures performed on this product should be done by qualified personnel.

Preparing replacement bladder



* Punch through one wall only

Air circuits (typical)



| Problem | Possible Cause | Recommended Solution |
|------------------------------------|--|--|
| Cores slipping | Low air pressure | Operate shaft at 5.5 bar [80 psi] minimum for optimal performance. Check for leaks. |
| | Wrong core diameter | Shaft is designed to support core diameter of 76.2–76.7 mm [3.000–3.098"] |
| | Web tension out of spec | Check your winding process. |
| Shaft will not inflate or hold air | Bladder leak | Listen for leaks to determine which element is leaking; replace the bladder. |
| | Valve is leaking | Use soapy water to test the valve for leaks. Replace valve if necessary. |
| | Internal air hose is leaking or kinked | Disassemble shaft and check the air hose. Replace if necessary. |
| Journals wear prematurely | High loads or speeds | Check PSDS specifications for your shaft application. |
| | Incorrect shaft mounting | Check shaft at installation mounting points. |
| Excessive shaft vibration | Shaft imbalance | Contact Maxcess. |

Specifications



WARNING – Do not use the devices outside of their rated specifications.

Refer to your Product Safety Data Sheet (PSDS) for your custom shaft specifications.

| | |
|-------------------------------|------------------------------|
| Operating air pressure | 5.5–8.3 bar [80–120 psi] |
| Ambient operating temperature | 38° C [100° F] |
| Core diameter | 76.2–76.7 mm [3.000 –3.098"] |

Service requests and replacement parts

To request service or to get replacement parts, contact Maxcess or one of the locations listed on the back page of this publication.

Maxcess

2305 SE 8th Avenue

Camas WA 98607

1.360.834.2345

1.800.426.1000

Please have your shaft serial number available when you call.



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