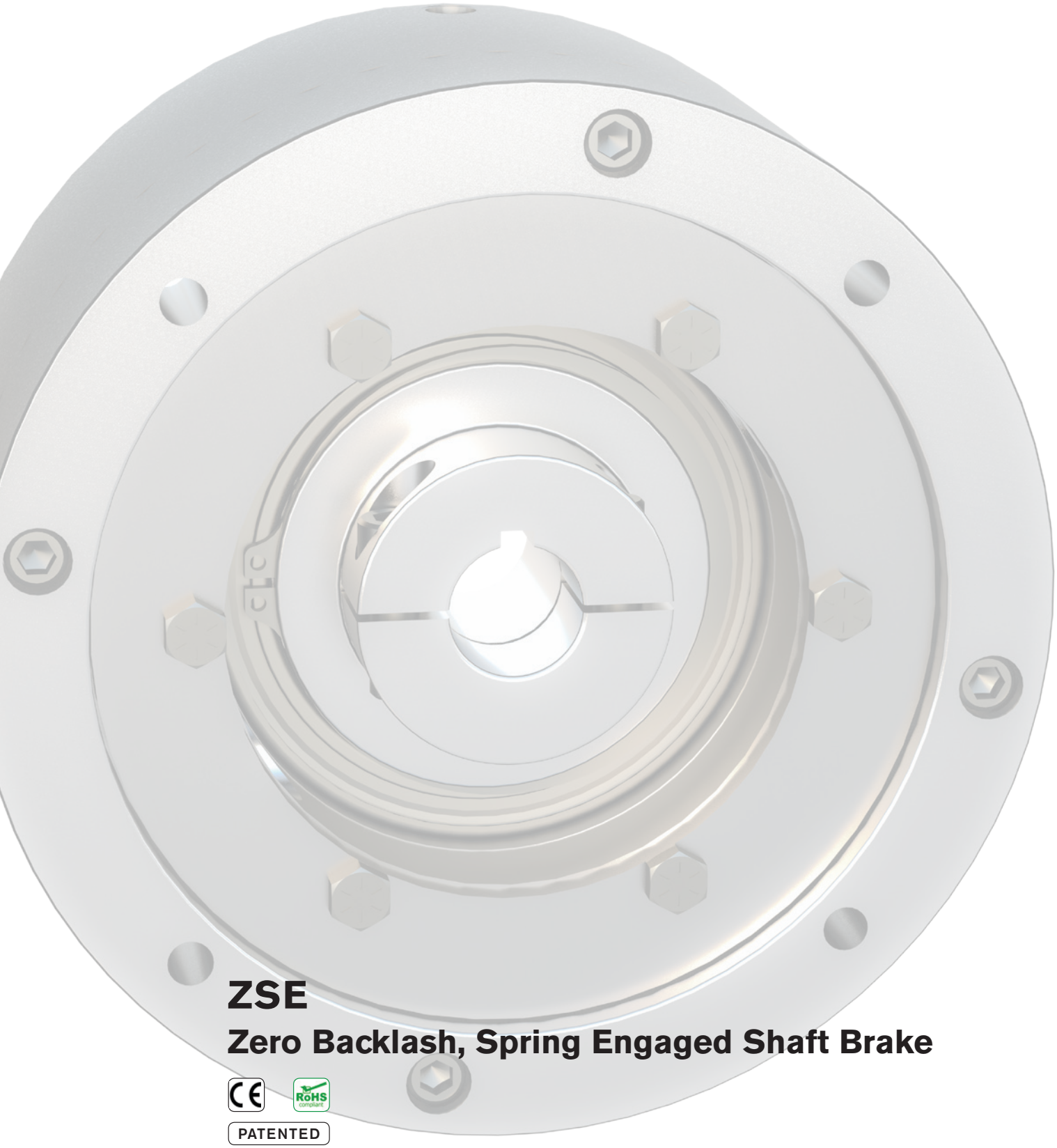
nexen

ROTARY MOTION CONTROL

Application & Selection Guide



ZSE

Zero Backlash, Spring Engaged Shaft Brake

PATENTED

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The Nexen Advantage

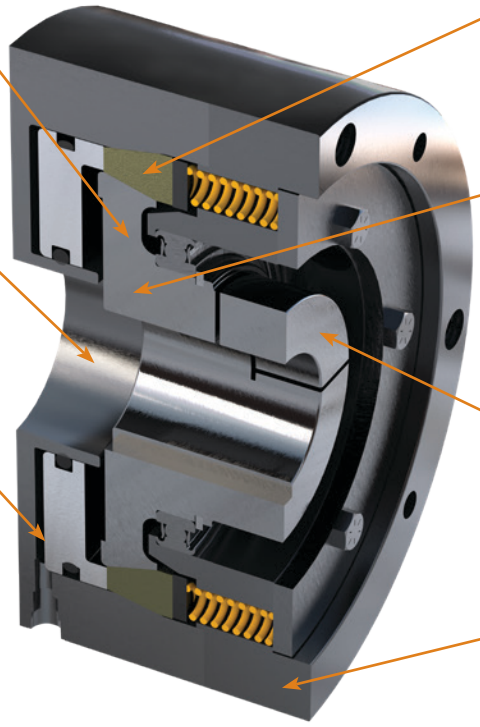
Continually testing and improving products as well as developing new technology, Nexen's contribution to the industry is now illustrated in the ZSE Zero-Backlash Through-Shaft Brake. With countless bore sizes available across the product family Nexen offers an off-the-shelf, zero-backlash braking solution for shaft holding applications. These spring-engaged, air released brakes eliminate the performance problems associated with electrical brakes for consistent, long lasting performance.

LOW INERTIA
One-piece hub/clamping-collar assembly lowers inertia and eliminates spline for zero backlash.

OPEN THROUGH BORE
Open ended design allows a wide range of shaft diameters to pass through the brake.

COOL OPERATION
Pneumatic disengagement adds no heat, providing cool operation and long life.

Standard electric brakes generate heat when disengaged, lowering the efficiency of the unit. The air-release design of the ZSE requires no energy for operation, resulting in higher, more consistent torque capabilities and lower energy costs.



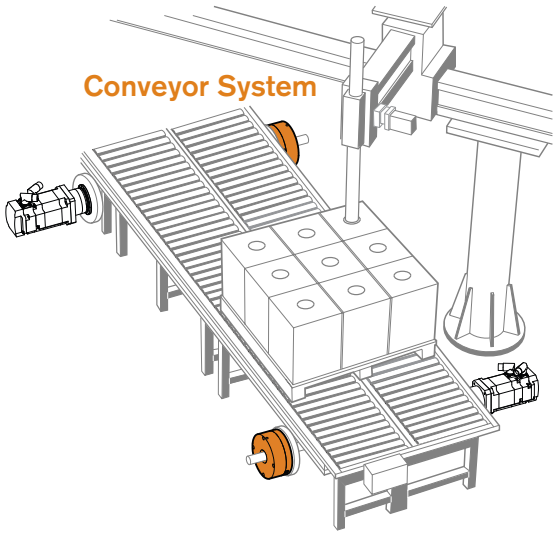
SMOOTH TORQUE TRANSMISSION
Double-taper facing locks down on the housing and hub to create a solid zero-backlash torque transmission interface.

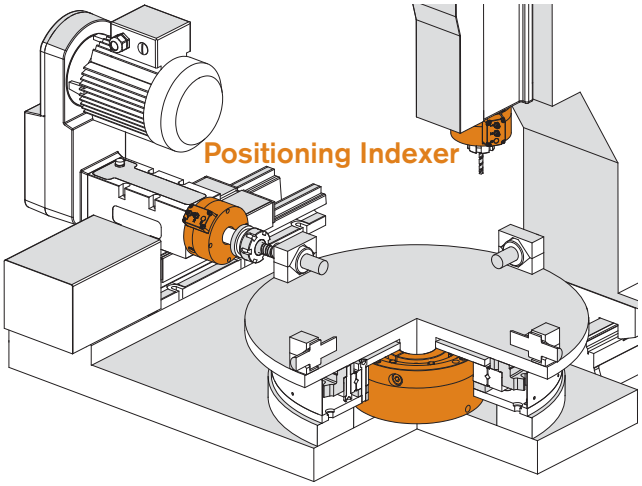
TRUE ZERO BACKLASH HOLDING
Unlike some competitors brakes, which use flexible leaf springs to transmit torque, the ZSE is zero-backlash up to 100% of it's rated holding torque. One piece, solid hub increases torsional rigidity.

ZERO BACKLASH COUPLING
The easy to install, split-hub shaft collar prevents backlash for smooth stopping and precision holding up to 100% of the max holding torque.

COMPACT HOUSING
The housing is compact in length and diameter, allowing the brake to fit onto short shafts and into small spaces.

Holding and E-Stop
APPLICATIONS





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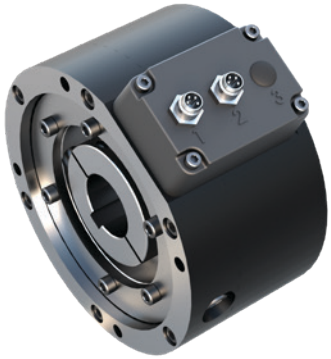
Confidence. Intelligence.

Industry 4.0 Solution

Nexen Smart ZSE Brakes (ZSE-S) are available with Industry 4.0 compatible smart internal sensors. These sensors detect the disengagement status and internal unit temperature to maximize machine efficiency and safety.



Engagement/Disengagement Verification	Internal Temperature of Unit
Having this information available aides with:	*Having this information available aides with:*
• Motor/Drive Programming	• Avoiding Overheat Conditions
• Safe Machine/System Design	• Maximizing Unit Life
• Operational Feedback	• Maximizing Operating RPM

True. Zero. Backlash.

Nexen ZSE brakes are capable of zero-backlash holding up to 100% of rated torque. Some competitors "zero-backlash" brakes use a hub/rotor with a flexible leaf or diaphragm spring to transfer torque. As a result, some competitors brakes only achieve zero-backlash when utilizing as low as 10% of their full rated torque.

100% Rated Torque

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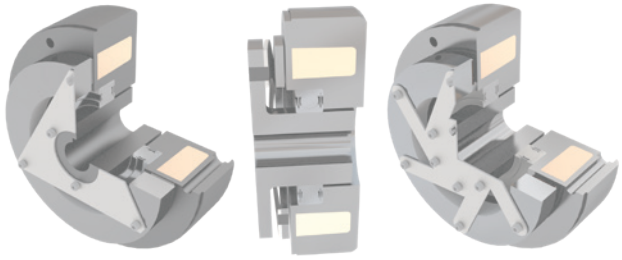
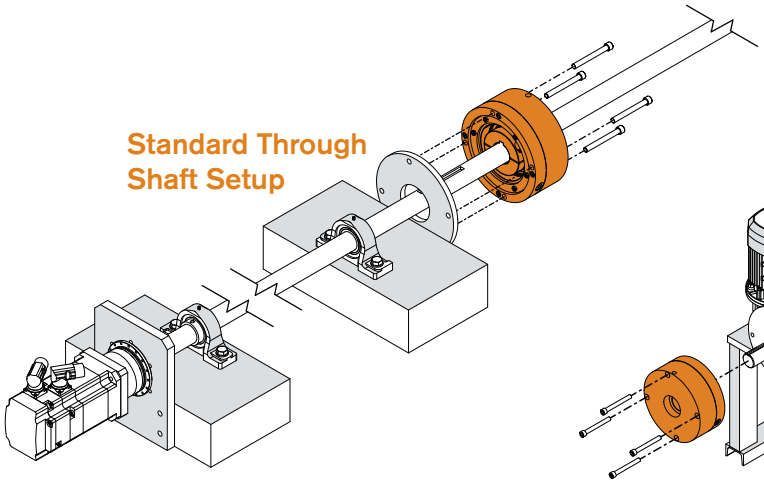
As Low as 10% of Rated Torque



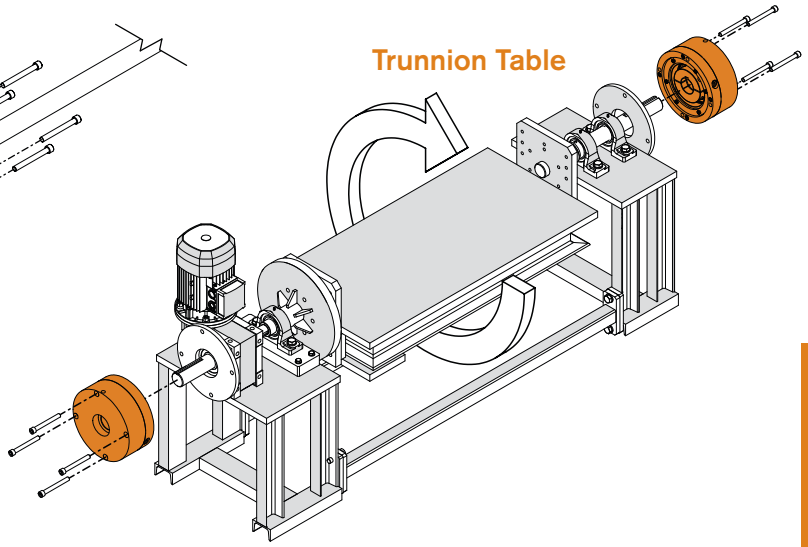
Competitors

Holding and E-Stop APPLICATIONS

Standard Through Shaft Setup



Trunnion Table



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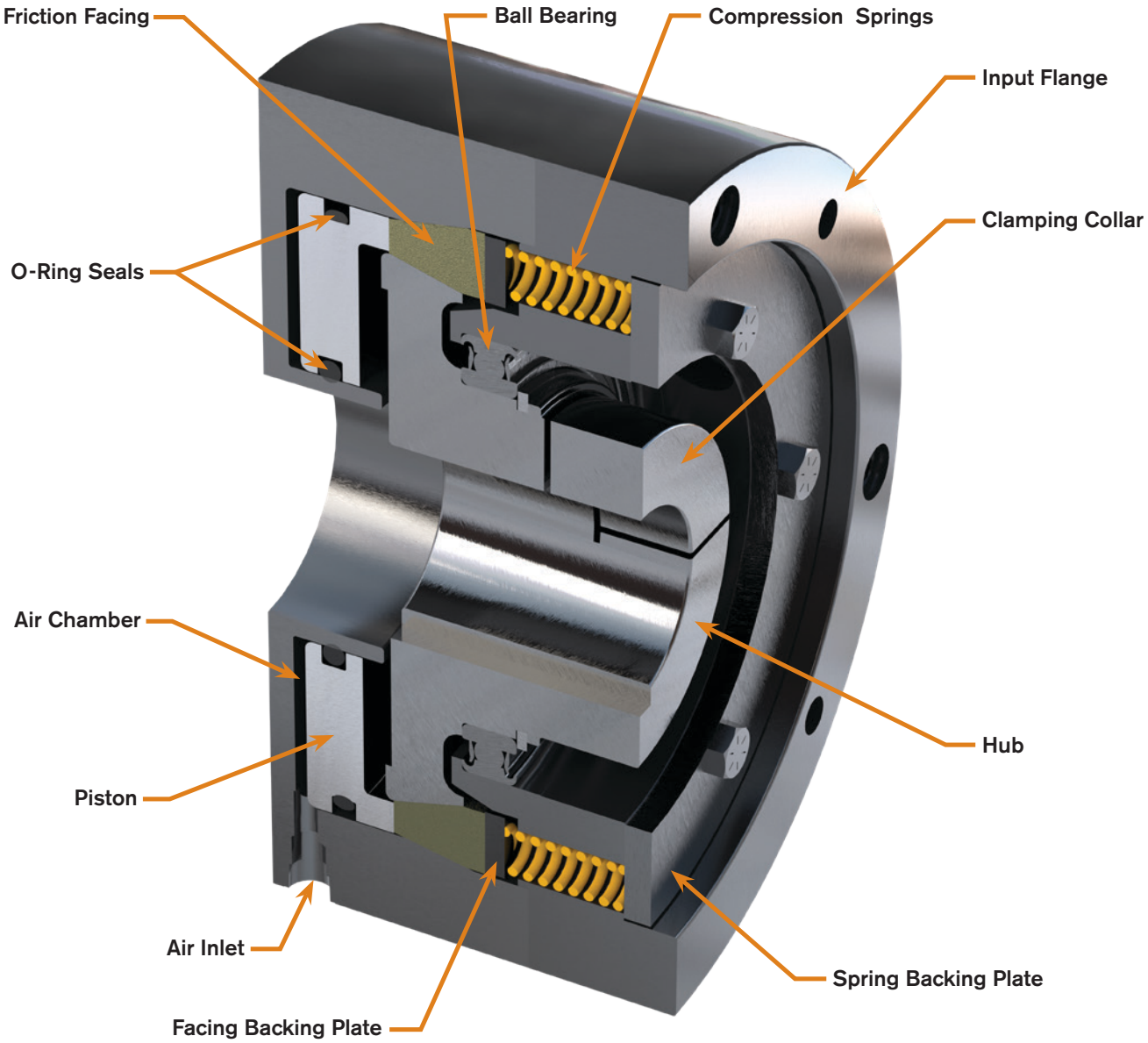
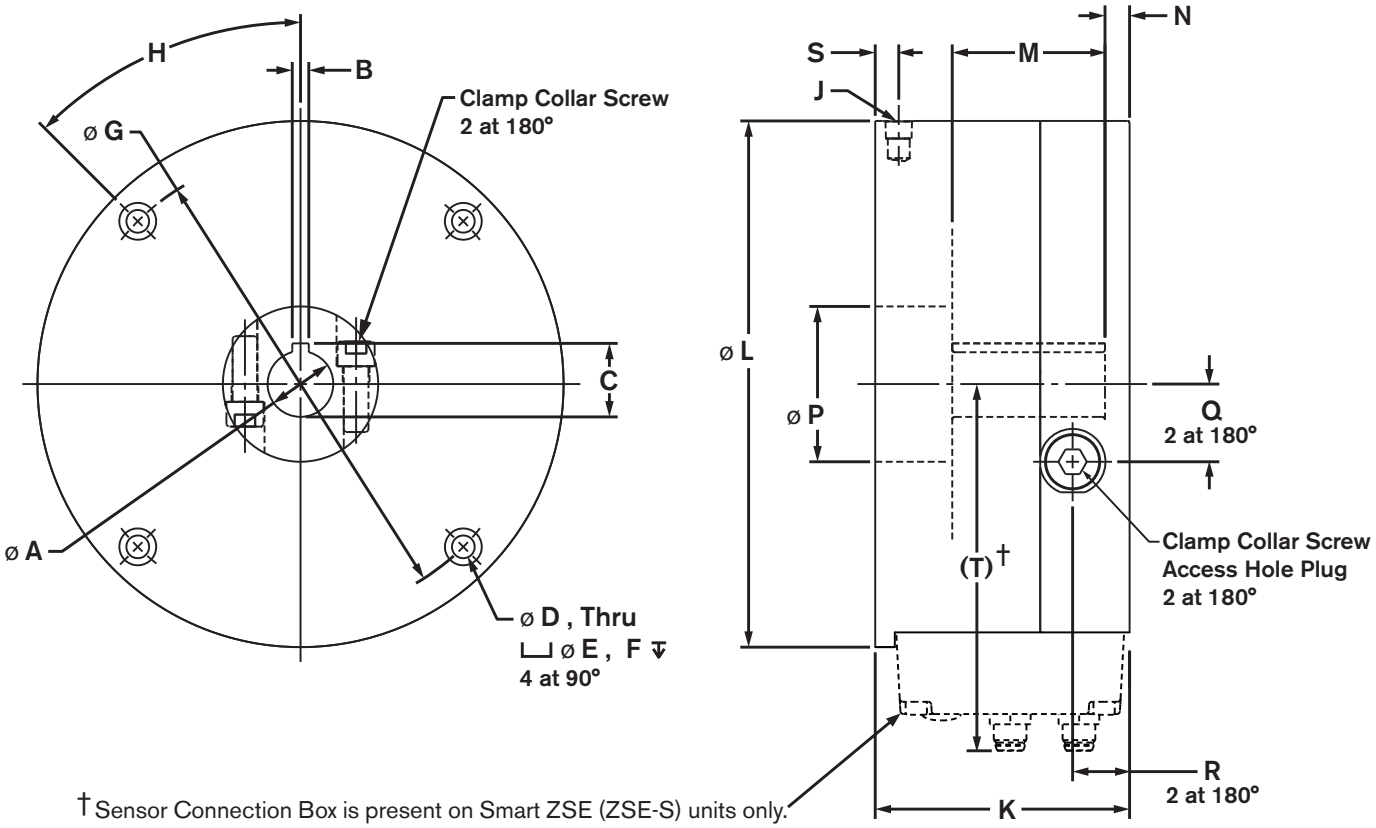
ZSE Brake Cross-Sectional Drawing



ZSE Brake Approximate Dimensions

The following section contains the approximate dimensions for each size of Nexen's ZSE Brake. Always verify product information with the user manual and detailed product drawings when specifying a new brake into your application. Refer to www.nexengroup.com for user manuals, exact product dimensions and specifications.



† Sensor Connection Box is present on Smart ZSE (ZSE-S) units only.

English ZSE Units

		Product Number	A* Hub Bore ø	B* Hub Keyway Width	C* Hub Keyway Depth	D Mtg. Hole ø	E Mtg. Hole C-Bore	F Mtg. Hole C-Bore Depth	G Mtg. Hole Bolt Circle ø	H Mtg. Hole Locat., Angle	J Air Inlet	K Length	L Outer ø of Housing	M Hub Length	N Hub Locat.	P Thru Hole ø	Q Access Hole Plug Locat.	R Access Hole Plug Locat.	S Air Inlet Locat.	T† Option Sensor Conn. Box
450	ZSE	970501	ø0.625	0.189	0.714	ø0.221	ø0.343	0.22	ø4.100	45°	.125-27 NPT	2.45	ø4.50	1.544	0.24	ø1.38	0.71	0.53	0.28	N/A
		970502	ø0.750	0.189	0.842															
		970505	ø0.938	0.251	1.056															
		970500	ø1.000	0.251	1.119															
	ZSE-S	970580	ø1.000	0.251	1.119															3.29
600	ZSE	970521	ø0.875	0.189	0.969	ø0.281	ø0.406	0.28	ø5.413	45°	.125-27 NPT	2.87	ø5.91	1.814	0.33	ø1.75	0.87	0.67	0.28	N/A
		970522	ø1.000	0.251	1.119															
		970520	ø1.375	0.314	1.523															
	ZSE-S	970600	ø1.375	0.314	1.523															3.99
800	ZSE	970540	ø1.000	0.251	1.119	ø0.346	ø.561	0.35	ø7.000	45°	.125-27 NPT	3.89	ø8.00	2.322	0.37	ø2.36	1.15	0.87	0.36	N/A
		970541	ø1.500	0.376	1.674															
		970542	ø1.938	0.501	2.165															
	ZSE-S	970620	ø1.938	0.501	2.165															5.04
1000	ZSE	970561	ø1.500	0.376	1.674	ø0.531	ø0.781	0.53	ø9.134	10°	.250-18 NPT	4.42	ø10.00	2.953	0.38	ø2.97	1.87	0.93	0.39	N/A
		970562	ø2.000	0.501	2.228															
		970560	ø2.938	0.751	3.274															
	ZSE-S	970640	ø2.938	0.751	3.274															6.10

All Dimensions are in Inches

* Contact Nexen for other Hub Bore Diameters & Keyways. (See specifications table for available range of sizes.)

ZSE Brake Specifications

		ZSE 450	ZSE 600	ZSE 800	ZSE 1000
Minimum Static Torque	Nm	32	75	175	300
Backlash	ArcSec	0			
Max Speed	RPM	5,000			4,000
Brake Engagement Time [3]	msec	77	85	108	162
Torsional Rigidity [1]	Nm/rad	198,104	357,811	709,904	1,343,928
Brake Inertia [1]	kg*mm²	307.5 to 325.4	1,162 to 1,248	4,388 to 4,622	18,799 to 20,177
Minimum Bore Diameter	mm	ø 15.875	ø 19.050	ø 25.400	ø 34.925
	in	ø 0.625	ø 0.750	ø 1.000	ø 1.375
Maximum Bore Diameter	mm	ø 25.400	ø 34.925	ø 49.213	ø 74.613
	in	ø 1.000	ø 1.375	ø 1.938	ø 2.938
Brake Life	Static Cycles	2 million			
B10d	Static Cycles	4 million			
Minimum Disengagement Pressure	bar	5.5			
Maximum Air Pressure	bar	8			
Ambient Temperature	°C	0 to 65.5			
Maximum Unit Temperature [2]	°C	85			
Weight	kg	3.0	5.9	15.6	27.6

[1] Dependent on unit bore size.

[2] As measured with the ZSE-S thermal sensor.

[3] With quick exhaust valve.

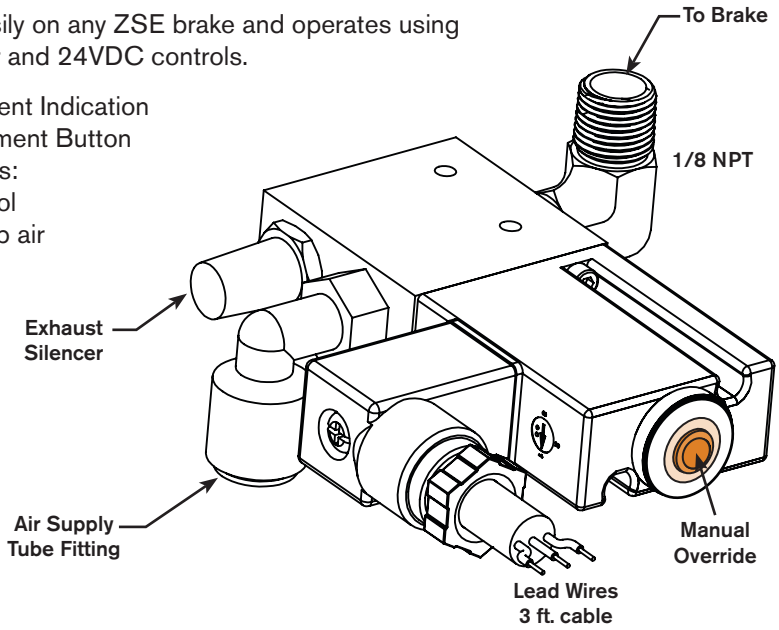
Optional Solenoid Valve

Nexen's optional solenoid valve offers machine operators additional safety and peace of mind by allowing users to see at a glance whether or not the brake is disengaged. The manual override button provides an easy option for manual brake disengagement.

Nexen's solenoid valve mounts easily on any ZSE brake and operates using standard 80 PSIG compressed air and 24VDC controls.

- Visual Disengagement Indication
- Manual Disengagement Button
- Simple Connections:
  - 24VDC control
  - 80 PSIG shop air

Product Number: 964650



Optional Quick Exhaust Valve

Nexen's optional Quick Exhaust Valve offers machine operators additional safety through quicker, more consistent response times when brake engagement is called for.

Nexen's Quick Exhaust Valve mounts easily on any Nexen ZSE brake and operates using standard 80 PSIG compressed air.

ZSE Unit Size	Quick Exhaust Valve Part Number
450, 600, 800	945100 (.125-27 NPT)
1000	945125 (.250-18 NPT)

Part# 945100

Part# 945125

Smart ZSE (ZSE-S) Sensor Connections

Industry 4.0 Solution

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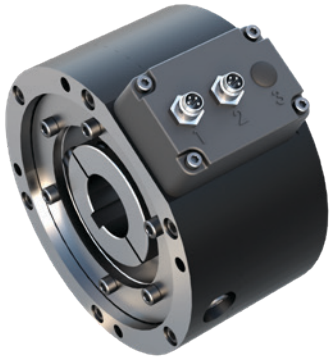

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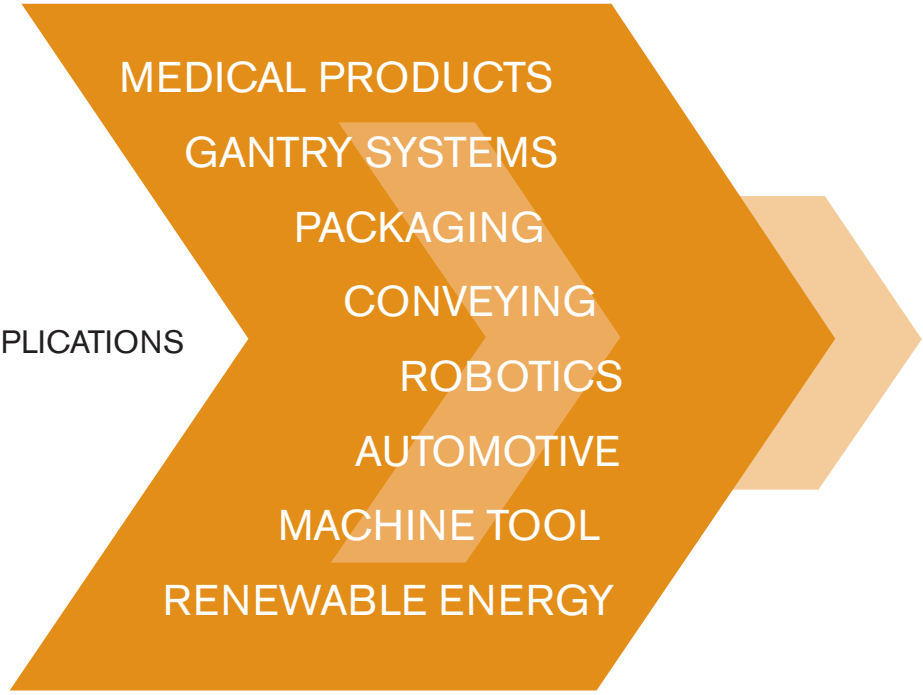
Internal Temperature Sensor	
Sensor Type	Platinum RTD (Resistive Thermal Device)
Sensor Measurement	PT100 (DIN Standard)
Sensing Configuration	2, 3, 4 Wire Configurable
Connector	4 Pin M8 DIN

Disengagement Sensor	
Operating Principal	Inductive Proximity Sensor
Sensor Output	PNP Normally Open
Supply Voltage	10 to 30 VDC
Output Current	100 mA
Protection	Short-Circuit & Voltage Reversal Protection
Fieldbus Connectivity *	IO-Link v1.0
Connector	3 Pin M8 DIN

* If connected to an IO-Link sensor hub, IO-Link functionality is automatically enabled. If not using IO-Link, sensor defaults to standard PNP N.O. operation.

INDUSTRIES & APPLICATIONS



www.nexengroup.com

In accordance with Nexen's established policy of constant product improvement, the specifications contained in this document are subject to change without notice. Technical data listed in this document are based on the latest information available at the time of printing and are also subject to change without notice. For current information, please consult www.nexengroup.com or contact Nexen's Technical Support Group at the location to the right.

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FORM NO. L-21289-C-1118