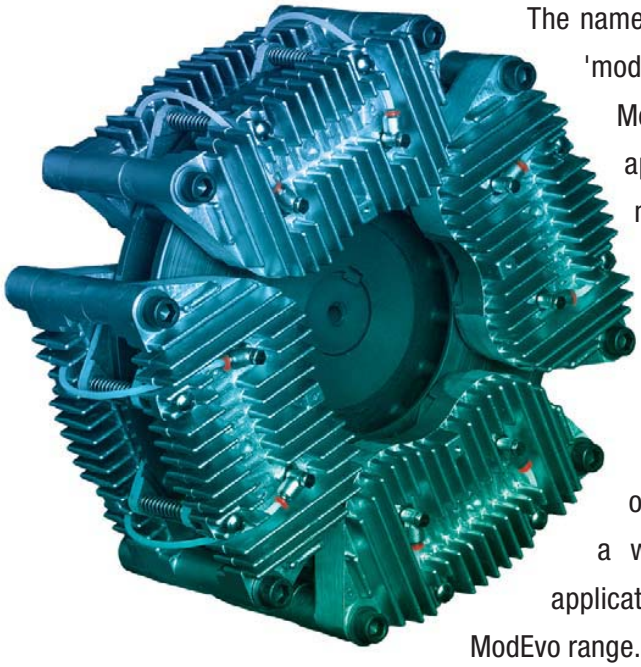
# ModEvo Tension Control Brake

Wichita Clutch

*The Power of Experience*

# “ModEvo” Tension Control Brake

*Versatile, cost-effective performance*

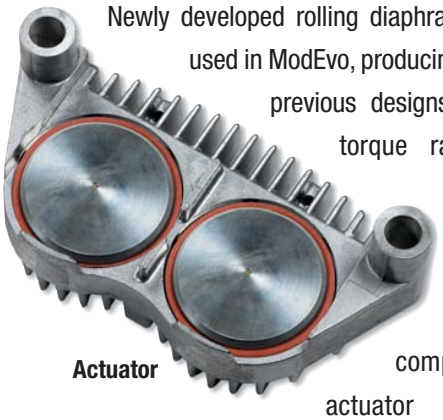


The name for Wichita’s ModEvo tension control brake is derived from 'modular' and 'evolutionary', terms that describe it perfectly. Modular – because braking systems to suit diverse tensioning applications can be assembled from a minimal number of modules common to the entire ModEvo range. Evolutionary – because continuous development of new materials, improved design and manufacturing techniques have enabled Wichita to develop ModEvo to match all customers’ tension needs at affordable cost.

The advantages of the new ModEvo brake lie in the versatility of the modular system, ensuring that the requirements of a wide range of printing and converting unwind tension applications can be met from just a handful of parts common to the ModEvo range. This in turn brings cost benefits, as users can choose just the options they require and add to or upgrade these as their needs change, whilst carrying a minimum of spare parts.

## Actuator options

*More force, no loss of torque precision*



Actuator

Newly developed rolling diaphragm actuators are used in ModEvo, producing more force than previous designs to allow higher torque ratings. However, the sensitivity for which rolling diaphragms are favoured is not compromised. Three actuator options are available, offering clamping forces of 100%, 60% or 25%.

25%

60%

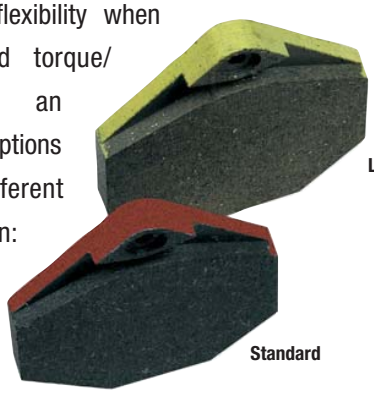
100%

The finned, die-cast aluminium brake module is common to all brake disc diameters. Each module houses two pairs of actuators and allows friction pads to be changed quickly without dismantling the module.

## Friction Pad options

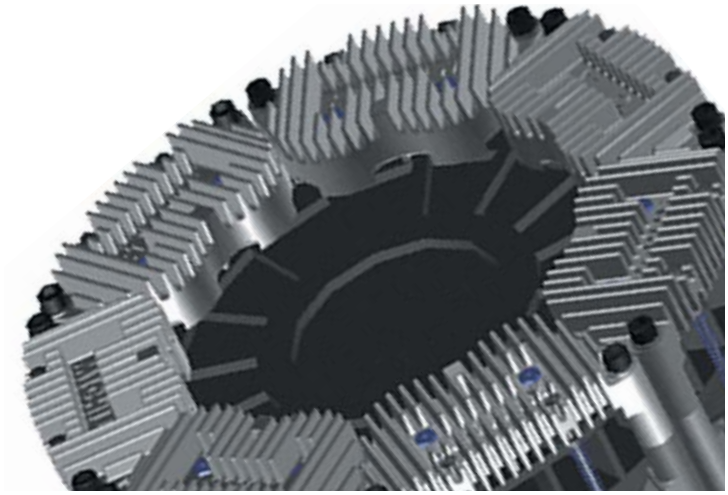
*Match machine requirements exactly*

To provide maximum flexibility when selecting the required torque/tension range for an application, two pad options are available with different coefficients of friction: Low ($\mu$=0.20); colour coded Yellow and Standard ($\mu$=0.35); colour coded Red. Pad types may be mixed within a single brake assembly to provide an exact match to machine requirements.



Low

Standard



# Single actuator ModEvo tension brake

*For lighter tension duties*

The name “ModEvo” comes from Wichita’s ‘modular’ – ‘evolutionary’ design of tension brake. The original ModEvo tension brake was launched in 2000 and has been highly successful in the global tension market.

Wichita is now happy to extend the successful ModEvo range to include the single actuator ModEvo. Designed for lighter tension duties, the single actuator unit is available with all of the same options as the dual acting unit. We believe it offers our customers even greater flexibility in their applications.

With the added benefit of lower cost, we expect this unit to be a great success in the tension market, whilst maintaining the high Wichita quality standards.

# Performance

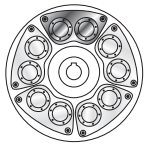
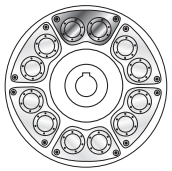
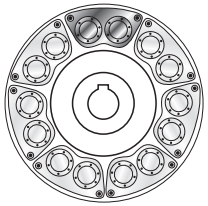
| MODEL | Torque Nm | | | Heat capacity for effective cooling speeds: kW | | | | | | | Max Speed | Inertia (J) kgm² | Weight kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min[1] | Max @ 6 bar | | | | | | | | | | | | |
| ModEvo | 0.2 bar | LC[2] | Std[3] | 50rpm | 100rpm | 200rpm | 300rpm | 400rpm | 500rpm | 600rpm | rpm(5) | rotating parts | total | rotating |
| 250/1 | 5 | 85 | 149 | No Fan | | | | | | | 2750 | 0.060 | 12.0 | 10.0 |
| | | | | 0.5 | 0.6 | 0.8 | 1 | 1.2 | 1.3 | 1.4 | | | | |
| | | | | With Electric cooling fan (150 mm) | | | | | | | | | | |
| | | | | 1.6 | 1.75 | 2.0 | 2.25 | 2.4 | 2.5 | 3.0 | | | | |
| 300/1 | 6 | 108 | 189 | No Fan | | | | | | | 2250 | 0.128 | 16.3 | 14.3 |
| With Electric cooling fan (150 mm) [5] | | | | 0.9 | 1.0 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | | | | |
| | | | | 2.3 | 2.5 | 2.9 | 3.2 | 3.5 | 3.8 | 4.2 | | | | |
| 350/1 | 8 | 130 | 228 | No Fan | | | | | | | 2000 | 0.226 | 23.3 | 21.3 |
| With Electric cooling fan (150 mm) [5] | | | | 1.2 | 1.3 | 1.8 | 2.0 | 2.3 | 2.7 | 3.0 | | | | |
| | | | | 2.6 | 2.8 | 3.1 | 3.5 | 4.0 | 4.5 | 5.0 | | | | |
| 400/1 | 10 | 152 | 267 | No Fan | | | | | | | 1750 | 0.383 | 30.0 | 27.9 |
| With Electric cooling fan (200 mm) [5] | | | | 1.4 | 1.6 | 2.3 | 2.5 | 2.9 | 3.3 | 3.5 | | | | |
| | | | | 4.3 | 4.4 | 4.7 | 5.0 | 5.4 | 5.9 | 6.3 | | | | |
| 450/1 | 11 | 176 | 308 | No Fan | | | | | | | 1500 | 0.587 | 36.6 | 34.6 |
| With Electric cooling fan (250 mm) | | | | 1.5 | 1.8 | 2.6 | 3.0 | 3.3 | 3.9 | 4.2 | | | | |
| | | | | 4.3 | 4.6 | 5.0 | 5.5 | 5.9 | 6.3 | 6.6 | | | | |

[1] Min torque listed is with standard friction coefficient with a single actuator.
For LC Low Coefficient multiply Min torque by 0.6
[2] LC - Low Coefficient based on 0.2 Coefficient of friction
[3] Std - Standard based on 0.35 Coefficient of friction
[5] Max speed is with standard brake disc. A high speed disc capable of 50% higher speed is available (derate heat by 10%)

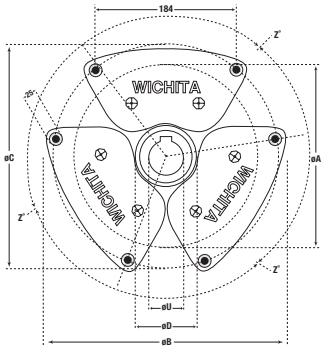
All torque values are obtained based on Wichita's new ModEvo Rolling Diaphragm Actuators
Smaller area (60% and 25%) Rolling Diaphragm actuators are also available for lower torque requirements

Limit to 1.25 kw/ actuator (normal) or 1.5 kw/ actuator (fan cooled)
Limit Lo-Co to 70% of above heat ratings

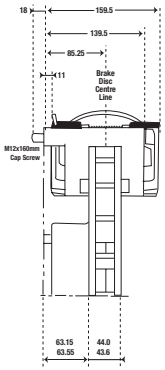
# Performance Charts

| | MODEL | Torque Nm | | | Heat capacity for effective cooling speeds: kW | | | | | | | Max Speed | Inertia (J) kgm² | Weight kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min [1] | Max @ 6 bar | | | | | | | | | | | | |
| | ModEvo | 0.2 bar | LC [2] | Std[3] | 50rpm | 100rpm | 200rpm | 300rpm | 400rpm | 500 rpm | 600 rpm | rpm [4] | rotating parts | total | rotating |
| | 250/1 | 5 | 85 | 149 | No Fan | | | | | | | 2250 | 0.060 | 12.4 | 8.7 |
| | 250/2 | 10 (5) | 170 | 298 | 1.2 | 1.4 | 1.9 | 2.4 | 2.7 | 3.0 | 3.2 | | | 13.2 | |
| | 250/4 | 20 (5) | 340 | 596 | With Electric cooling fan | | | | | | | | | 17.6 | |
| | 250/6 | 30 (5) | 510 | 894 | 3.4 | 3.5 | 3.8 | 4.0 | 4.0 | 4.0 | 4.0 | | | 22.1 | |
| | 300/1 | 6 | 108 | 189 | No Fan | | | | | | | 1900 | 0.125 | 17.3 | 13.6 |
| | 300/2 | 14 (7) | 216 | 378 | | | | | | | | | | 18.1 | |
| | 300/4 | 28 (7) | 432 | 756 | 2.1 | 2.4 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | | | 22.5 | |
| | 300/6 | 42 (7) | 648 | 1134 | With Electric cooling fan | | | | | | | | | 27.0 | |
| | 300/8 | 56 (7) | 864 | 1512 | 5.0 | 5.0 | 5.0 | 5.0 | 5.5 | 6.0 | 6.0 | | | 31.5 | |
|  | 350/2 | 16 (8) | 260 | 456 | No Fan | | | | | | | 1650 | 0.23 | 24.8 | 20.3 |
| | 350/4 | 32 (8) | 520 | 912 | | | | | | | | | | 29.2 | |
| | 350/6 | 48 (8) | 780 | 1368 | 2.8 | 3.1 | 4.2 | 4.8 | 5.5 | 6.6 | 7.2 | | | 33.7 | |
| | 350/8 | 64 (8) | 1040 | 1824 | With Electric cooling fan | | | | | | | | | 38.2 | |
| | 350/10 | 80 (8) | 1300 | 2280 | 5.8 | 6.3 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | | 42.7 | |
|  | 400/2 | 20 (10) | 305 | 534 | No Fan | | | | | | | 1450 | 0.4 | 31.3 | 26.8 |
| | 400/4 | 40 (10) | 610 | 1068 | | | | | | | | | | 35.7 | |
| | 400/6 | 60 (10) | 915 | 1602 | 3.2 | 3.8 | 5.4 | 6.0 | 6.8 | 7.8 | 8.4 | | | 40.2 | |
| | 400/8 | 80 (10) | 1220 | 2136 | With Electric cooling fan | | | | | | | | | 44.7 | |
| | 400/10 | 100 (10) | 1525 | 2670 | 7.5 | 8.3 | 8.7 | 9.3 | 10.0 | 10.0 | 10.0 | | | 49.2 | |
| | 400/12 | 120 (10) | 1830 | 3204 | | | | | | | | | | 53.6 | |
|  | 450/2 | 21 (11) | 352 | 616 | No Fan | | | | | | | 1250 | 0.61 | 37.5 | 33 |
| | 450/4 | 42 (11) | 704 | 1232 | | | | | | | | | | 41.9 | |
| | 450/6 | 63 (11) | 1056 | 1848 | 3.4 | 4.3 | 6.1 | 7.0 | 7.8 | 9.2 | 10.0 | | | 46.4 | |
| | 450/8 | 84 (11) | 1408 | 2464 | With Electric cooling fan | | | | | | | | | 50.9 | |
| | 450/10 | 105 (11) | 1760 | 3080 | | | | | | | | | | 55.4 | |
| | 450/12 | 126 (11) | 2112 | 3696 | 8.5 | 9.5 | 10.0 | 10.8 | 11.6 | 12.5 | 13.3 | | | 59.8 | |
| | 450/14 | 147 (11) | 2464 | 4312 | | | | | | | | | | 64.3 | |

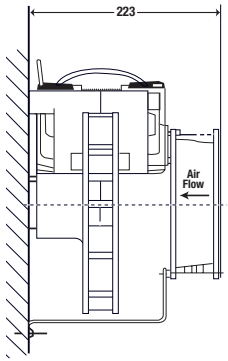
# Dimensions




ModEvo Front View




ModEvo Side View




ModEvo Side View With Fan

| ModEvo Dimensions Table | | | | | |
|---|---|---|---|---|---|
| øA - Disc Size | 250 | 300 | 350 | 400 | 450 |
| øB - Overall | 324 | 369 | 415 | 461 | 508 |
| øC - Bolt P.C.D | 298.5 | 343.5 | 389 | 435.5 | 482.5 |
| øD - Clearance Dia. | 90 | 140 | 190 | 240 | 290 |
| U - As cast bore<br>Max. Bore | SOLID<br>55 | SOLID<br>79 | 25<br>117 | 25<br>136 | 25<br>154 |
| Z" - Angular Position | 120° | 90° | 72° | 60° | 51.4° |
| Maximum No. of Brake Modules | 3 | 4 | 5 | 6 | 7 |
| Wichita. Generic Drawing No. | 73125-000 | 73130-000 | 73135-000 | 73141-000 | 73145-000 |

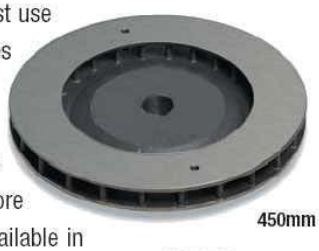
[1] Min torque listed is with standard friction coefficient. Values in (brackets) are with a single actuator.
For LC Low Coefficient multiply Min torque by 0.6.
[2] LC - Low Coefficient based on 0.2 Coefficient of friction
[3] Std - Standard based on 0.35 Coefficient of friction
[4] Max speed is with standard brake disc. A high speed brake disc capable of 50% higher speed is also available.
All torque values are obtained based on Wichita's new ModEvo Rolling Diaphragm Actuators. Smaller area (60% and 25%) Rolling Diaphragm actuators are also available for lower torque requirements.

# Brake Discs and Cooling

*Strong, light and efficient*

ModEvo with fan installed

The ModEvo brake disc was developed at the Bedford, UK factory using Finite Element Analysis techniques to ensure maximum strength with minimum weight. The design is optimised to make best use of the cooling air available at slow speeds and being bidirectional, it achieves high heat dissipation capacity in either rotational direction, unlike some other brakes. An optional electric cooling fan is available where space is limited or more extreme heat handling is required. Available in five sizes: 250mm, 300mm, 350mm, 400mm and 450mm diameters, all discs are the same thickness and use the same brake modules and actuators. Each disc can be specified with a minimum of a single module, up to the maximum number of modules that can be fitted around the disc – seven in the case of the 450mm disc. This allows torque handling capabilities ranging from a maximum of 1026 Nm (9080 lbf.in) for the 250mm disc, up to 4935 Nm (43650 lbf.in) for the 450mm disc.

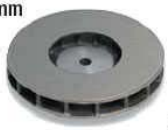


450mm

400mm

350mm

300mm



250mm

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