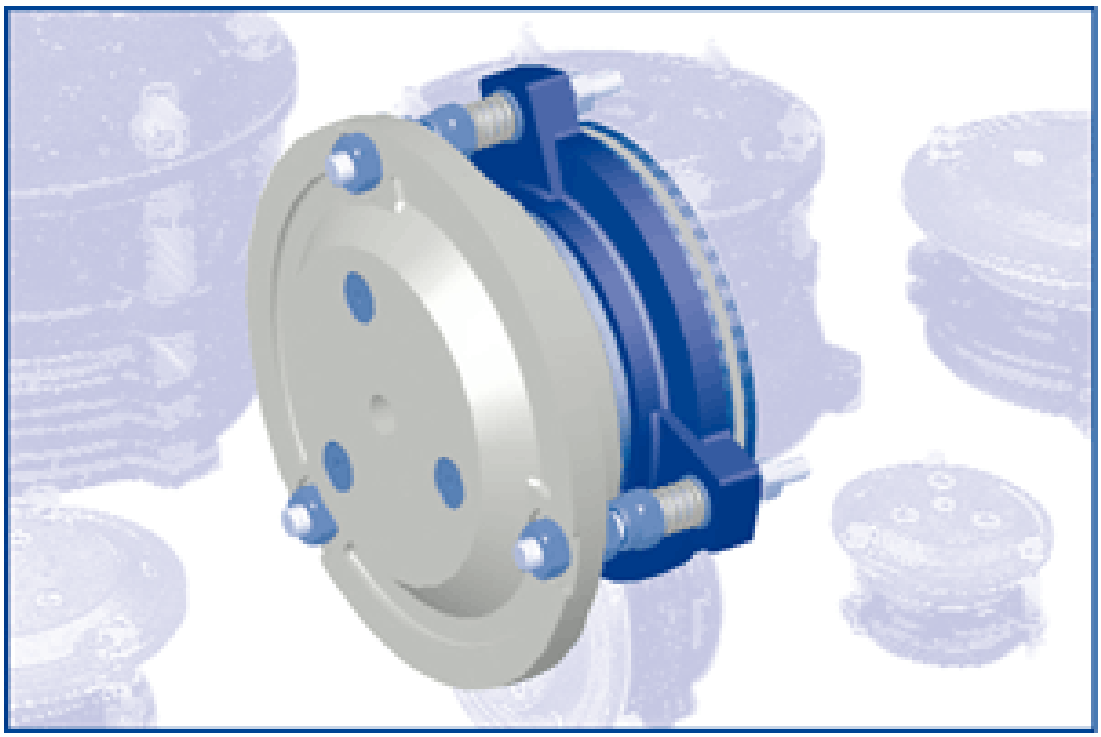
# Characteristics of model “T-Mec” brake

These traditional AC brakes, besides their tested reliability, have the following characteristics:

• Very strong structure;
• Quick operating times. They can be considered negligible.
• Good heat dissipation (see working condition);
• The electromagnet is encased with epoxy resin, unless of other construction criteria, and the mechanical parts are protected by spray painting.



# Series T-MEC

| Tipo Brake Model | | T60 Mec 56 | T70 Mec 63 | T80 Mec 71 | T90 Mec 80 | T100 Mec 90 | T110 Mec100 | T120 Mec112 | T140 | T160 | T180 | T200 | T120D | T140D | T160 | T180D | T200D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coppia frenante Statica * Static Braking Torque | (Nm) | 4 | 9 | 17 | 35 | 48 | 70 | 90 | 130 | 150 | 250 | 250 | 180 | 260 | 300 | 500 | 600 |
| Coppia Frenante Dinamica Dinamic Braking torque | (Nm) | 3,4 | 7,5 | 14 | 30 | 40 | 60 | 75 | 105 | 135 | 220 | 270 | 150 | 210 | 270 | 440 | 540 |
| Velocità massima rotazione motore Max Speed Motor | (rpm) | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 1800 | 1800 | 1800 | 3600 | 3600 | 1800 | 1800 | 1800 |
| Potenza elettrica Input Power | (W) (V.A.) | 35 | 50 | 60 | 140 | 180 | 250 | 400 | 480 | 600 | 740 | 800 | 400 | 480 | 600 | 740 | 800 |
| Momento Inerzia del disco/mozzo Hub/Disc moment of inertia | ($Kg.cm^2$) | 0.45 | 4.2 | 7.8 | 11.1 | 13.2 | 21.9 | 40.8 | 50.1 | 59 | 162 | 162 | 82 | 100 | 118 | 162x2 | 162x2 |
| Valore massimo di rumorosità Max noisiness | (dB-A) | 68 | 68 | 69 | 69 | 70 | 70 | 69 | 70 | 70 | 70 | 70 | 69 | 70 | 70 | 70 | 70 |
| Peso/Weight | ( Kg.) | 1,5 | 2 | 3 | 4,5 | 5 | 6,2 | 9,5 | 16 | 17 | 35 | 40 | 11 | 18,5 | 19,5 | 48,5 | 55 |
| A | | 107 | 130/123 | 144/133 | 164/155 | 176/172 | 187/190 | 227/224 | 240 | 255 | 335 | 335 | 229 | 239 | 255 | 335 | 335 |
| B | | 96 | 115/110 | 125/121 | 145/138 | 160/155 | 170 | 200 | 210 | 225 | 290 | 290 | 200 | 210 | 225 | 290 | 290 |
| C | | 63 | 69 | 79 | 89 | 102 | 114 | 129 | 144 | 144 | 156 | 156 | 129 | 145 | 145 | 155 | 155 |
| D | | 53 | 60 | 60 | 60 | 67 | 80 | 80 | 80 | 88 | 110 | 110 | 80 | 80 | 88 | 110 | 110 |
| E | | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 |
| F | | 52 | 59 | 64 | 74.5 | 74.5 | 75.5 | 85.5 | 92 | 91 | 126 | 126 | 110 | 118 | 118 | 146 | 146 |
| Dimensione max foro +/- 0.01 G* | | 14 | 14 | 14 | 18 | 24 | 24 | 28 | 34 | 44 | 48 | 48 | 28 | 34 | 44 | 48 | 48 |
| N° Denti mozzo K | | 15 | 15 | 15 | 15 | 15/20 | 20 | 20 | 20 | 23 | 28 | 28 | 20 | 20 | 23 | 28 | 28 |
| H | | 88 | 100 | 110 | 124 | 142 | 153 | 182 | 192 | 202 | 248 | 248 | 182 | 192 | 204 | 248 | 248 |
| I | | 61 | 66.5 | 72 | 82.5 | 82.5 | 83.5 | 95.5 | 105.5 | 108.5 | 135 | 135 | 120 | 132 | 132 | 155 | 155 |
| Traferro Air Gap L | | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,25 | 0.25 | 0,25 | 0,35 | 0,35 | 0,25 | 0,25 | 0,25 | 0,35 | 0,35 |
| M | | 12 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 40 | 52 | 80 | 35/40 | 35/40 | 40 | 52 | 52 |
| N | | 3 | 6 | 6 | 5.5 | 5.5 | 7,5 | 7.5 | 9.5 | 28,5 | 31,5 | 59,5 | 1.5/6.5 | 0.5/5.5 | 0.5/5.5 | 17 | 17 |
| O | | 2 | 2 | 2 | 3 | 3 | 4 | 4.5 | 5.5 | 5,5 | 7,5 | 7,5 | 5 | 6 | 6 | 10 | 10 |
| Tiranti filettati P | | M6x69 | M8x77 | M8x90 | M10x98 | M10x101 | M10x106 | M12x120 | M12x130 | M12x130 | 14x175 | 18x205 | 12x135 | 12x145 | 12x145 | M14x195 | M18x220 |
| N° Tiranti / Bolts | | 3 | | | | | | | 6 | | | | 3 | 6 | | | |
| Coppie di Serraggio tiranti | M6 = *5,18 Nm* | M8 = *12,54 Nm* | | M10 = *24,75 Nm* | | M12 = *49,6 Nm* | | M16 = *297,5 Nm* | | M18 = *402,26 Nm* | | | | | | | |

*** The structural load of the hub is connected to the length of the motion drive shaft key. As consequence it is necessary that the length of the key has the same length of the brake hub. Less length can determine breaches of the hub.**

**Note (see section Choice of the brake)**

- **The value of the static braking torque may vary of +/-20% from the plate value for brakes that have not been run-in.**
- **For brakes using the friction material anti-sticking, the variation of the torque may be -30/35% of the nominal torque before the running or even less, depending of the mechanical tolerances of the mechanical components and of the braking surfaces. The environmental conditions may affect this value. It always takes control of the torque of the machine before use.**
- **The values shown in the table can be changed by the producer firm without notice.**

# Servicing and repairing

All parts of the brake must be checked frequently. However the friction work depends on a number of factors, mainly on the load inertia, the motor speed, and the operating frequency. The substitution of the disk must be carried out considering the following principles:
- wear of the disk; the friction material must be substituted before, if put under considerable stress due to the high working temperatures.
- the disk must be substituted after a **3mm total (1,5 mm for side)** consumption of friction material. The friction material has an initial thickness of 3 mm for each friction ring. After checking the brake make sure that the air-gap is correctly regulated (see next paragraph "air-gap adjustment").
Brake servicing and repairing must be made when the brake is disconnected and after checking earthing carefully, following the instructions of this catalogue. Good working order of the brake can only be guaranteed if original components are used. For more detailed informations please indicate the specific operating conditions.
**N.B. When the air-gap has achieved a value of 0,7 mm, it's necessary to adjust it to a value indicated in the table. If using the central threaded hole placed on the armature plate to unlock the brake, then the Customer must restore the braking safety.**

# Operating

The brake is designed to assure, by means of the pressure springs and when no voltage is applied, the intrinsic safety same than its label nominal value.
On exciting the electromagnet (1) the armature plate (2) is pulled towards the electromagnet itself,loading the torque springs (5) and enabling the disc (3),which is connected to the motor shaft by means of the hub (4), to turn freely. When the current fails, the torque springs (5) drive the armature plate towards the disc, thus braking the motor shaft. Braking torque adjustment is made by operating the nuts (6).
**For the operation of the brake, the passing holes for the fixing screws to the flange, and the adjuster nuts for the air gap adjustment, they must have a mechanical game around 0,1-0,2mm , in order to grant the correct sliding of the armature plate. Therefore the angular game of the disc refraining to the mechanical tree of the system, can be of some degrees. Such game moreover can come also from the tolerances of connection between the hub and the disc. In case there was the necessity to limit such angular game we ask you to contact our technical Office.**

**Characteristics of the electric coil**

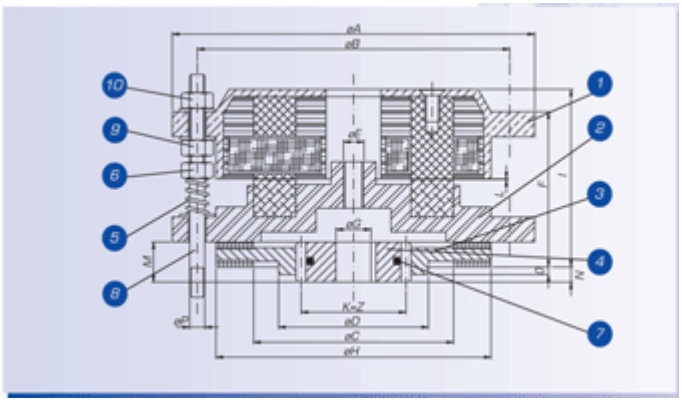
The electric coil allows a variation of +/- 6% of the voltage from its nominal value. The most important characteristics are:

- Protection IP64: total protection against inside dust and water sprinklings. Only in case is protected by epoxy resin.
- Class F insulation: using of materials conform to CLASS F insulation (working temperature 155°C). This value includes also the room temperature.
- S1 duty: Operation at constant load and duration sufficient to reach thermal equilibrium (continuous duty) only with the ventilation of the brake.

**Assembling**

The assembling and disassembling instructions are shown in the drawing at page 89. Place first the hub (4) on the motor shaft. Then insert the disc (3) on the hub. The o-ring (7), placed in the hub allows the brake to work in vertical position.
Mount then the bolts (8) and insert, for more safety, some glue in the thread ( i.e. LOCTITE). Place the armature plate (2) towards the braking disc. Insert then the torque springs (5) and the self-locking nuts (6) for braking torque adjustment. Insert the air-gap adjusting nut (9). Place then the electromagnet (1) and proceed by mounting the nuts for the electromagnet's locking (10). Please be careful and lock the nuts alternatively. The braking surface must have a roughness 1.6 Ra.
In order to comply with safety legislation the following operations must be carefully carried out:
• Drill the motor cover with an helical drill bit with diameter (M4=3.2), (M5=4,2), (M6=5), (M8=6,75), (M10=8,6), UNI 5699;
• Make sure the drilling is made within tolerance.
• With the correct size thread tap and lubricant, cut the threads.
• Make the drilling for locking equidistant.

1. Elettromagnete • *Electromagnet Elektromagnet*
2. Ancora • *Armature plate • Anker*
3. Disco • *Disc • Scheibe*
4. Mozzo • *Hub • Nabe*
5. Molle di coppia • *Torque springs Bremsfedern*
6. Dado di regolazione coppia • *Torque adjusting nut Einstellmutter für Bremsmoment*
7. O-ring
8. Tiranti • *Bolts • Zugstangen*
9. Dado regolazione traferro *Air-gap adjusting nut Einstellmutter für Luftspalt*
10. Dado bloccaggio magnete *Nut for electromagnet locking Mutter für Fixierung des Magneten*



**Air-gap adjusting**

Make the air-gap adjustment after assembling the brake by operating the nut (9). If the air-gap adjusting is made after a normal brake operation, please allow for a cooling down period.
The correct air-gap value is reported in the chart (tolerance +0.05-0).The maximun value allowed for the air-gap is 0,7 mm.
You can calculate when it's necessary to adjust the air-gap by means of the graph at page "Graphics".

If this value is exceeded the brake performances will change and can prevent brake from braking. Incorrect maintenance of the air-gap adjustment will prevent brake to work properly.

**Warning!**

Proper working of the brake can only be guaranteed if operating at room temperature.

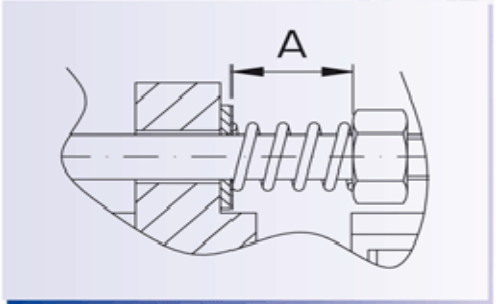
When operating in greasy places or at extreme temperatures, please contact our technical department and specify the operating conditions.
When operating in damp places or extreme temperatures it's necessary to use cover or guards to protect the braking surface, this to avoid the attachment of the friction material to the braking surface when the brake doesn't work for a long time.
Important: loosening the screws for adjusting the brake torque is not generate any braking action on the disc. In the table for adjusting the braking torque is highlighted the minimum value of distance of the screws. The minimum adjustment of the braking torque must always be greater than 30% of the value of the rated torque.

**Braking torque adjusting**

The brake type T-Mec allows to vary the braking torque of work. According to the load, the speed of rotation, and the braking time, the customer can set the braking torque is more suitable to your needs. The table below give the approximate distances (dependent on the mechanical tolerances of the components) in millimeters of nuts [5] from the electromagnet to obtain braking torque (Nm) required.
If your load permits, the registration of the braking torque below the value of 100%, will lead to a reduction of wear of the friction material of the brake. The chart below shows the percentage change in this.
The minimum adjustment of the braking torque must always be greater than 30% of the value of the rated torque. brakes that use the brake friction material anti-sticking see note in the tab "Characteristics".

| Tipo Model | DISTANZA DEL DADO DAL PIANO ANCORA "A" = mm<br>DISTANCE BETWEEN THE ARMATURE PLATE SURFACE AND THE NUT "A" = mm<br>+3 mm | +2 mm | +1 mm | "A" = mm | |
|---|---|---|---|---|---|
| T60 | 2.6 Nm | 3.1 Nm | 3.5 Nm | 4 Nm | A=7 |
| T70 | 3.75 Nm | 5.5 Nm | 7.25 Nm | 9 Nm | A=9,7 |
| T80 | 6.8 Nm | 10.2 Nm | 13.6 Nm | 17 Nm | A=12 |
| T90 | 26.9 Nm | 29.6 Nm | 32.3 Nm | 35 Nm | A=18 |
| T100 | 30 Nm | 36 Nm | 42 Nm | 48 Nm | A=17 |
| T110 | 31.9 Nm | 44.6 Nm | 57.3 Nm | 70 Nm | A=20 |
| T120 | 49.4 Nm | 63.2 Nm | 77.2 Nm | 90 Nm | A=23 |
| T140 | 74.2 Nm | 92.8 Nm | 111.4 Nm | 130 Nm | A=22,5 |
| T160 | 60 Nm | 90 Nm | 120 Nm | 150 Nm | A=23 |
| T180 | 208 Nm | 222 Nm | 236 Nm | 250 Nm | A=26 |
| T200 | 200 Nm | 233 Nm | 266 Nm | 300 Nm | A=31 |
| T120D | 97 Nm | 124 Nm | 152 Nm | 180 Nm | A=23 |
| T140D | 148 Nm | 186 Nm | 123 Nm | 260 Nm | A=22,5 |
| T160D | 120 Nm | 180 Nm | 240 Nm | 300 Nm | A=23 |
| T180D | 416 Nm | 444 Nm | 472 Nm | 500 Nm | A=26 |
| T200D | 400 Nm | 466 Nm | 533 Nm | 600 Nm | A=31 |
| | Valore della coppia frenante (Nm) al variare della distanza<br>Braking Torque Value (Nm.) with different distances | | | Coppia massima<br>Max torque | |

Area critica
*Critical area*



# GRAPHICS

Note: Dissipations show in the graphic are valid only referring RPM indicated in the table.

**GRAFICO 1/T** ***GRAPHIC 1/T*** ***GRAPHISCHE DARSTELLUNG 1/T***

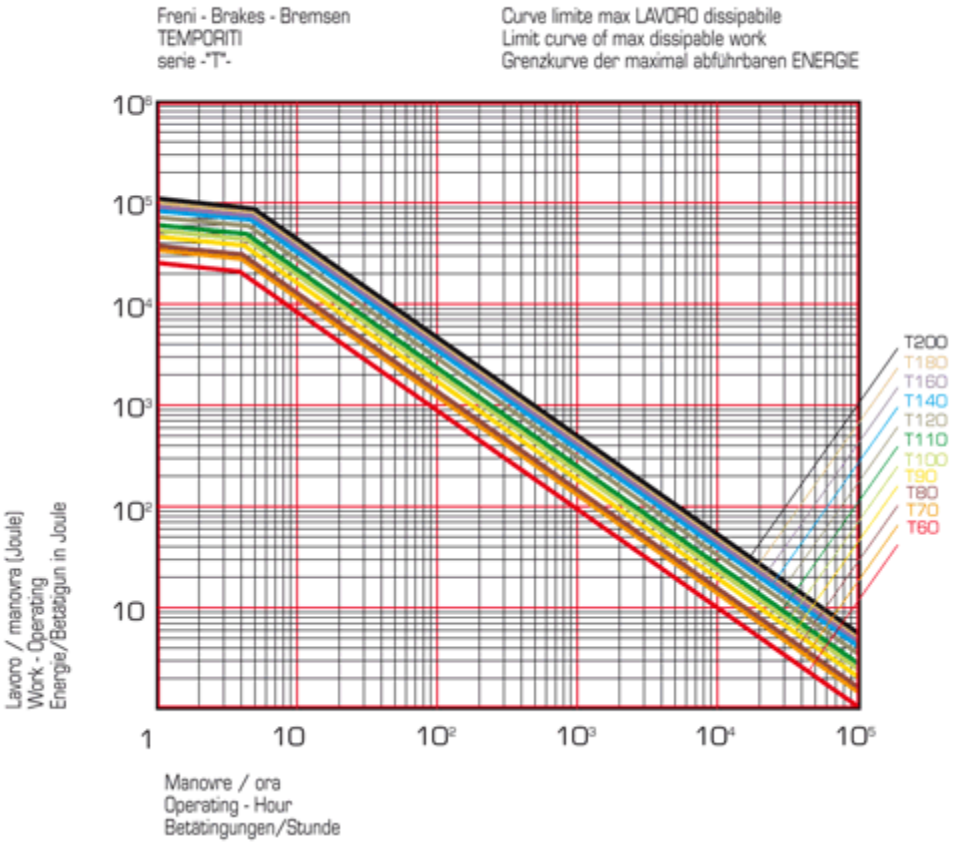
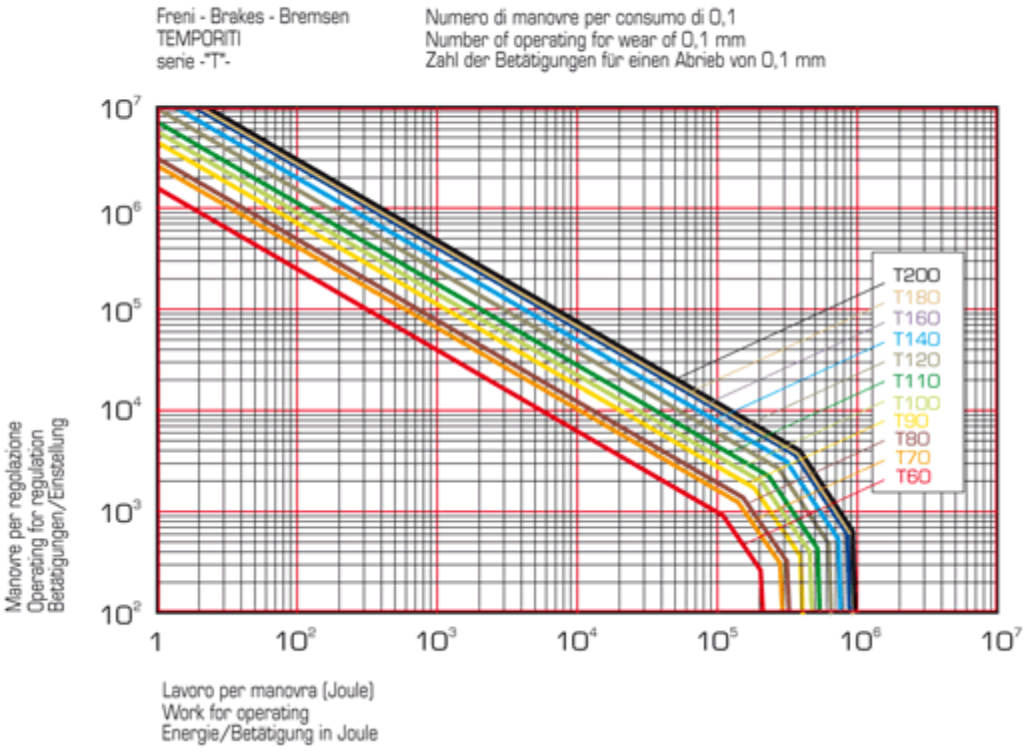



**GRAFICO 2/T** ***GRAPHIC 2/T*** ***GRAPHISCHE DARSTELLUNG 2/T***



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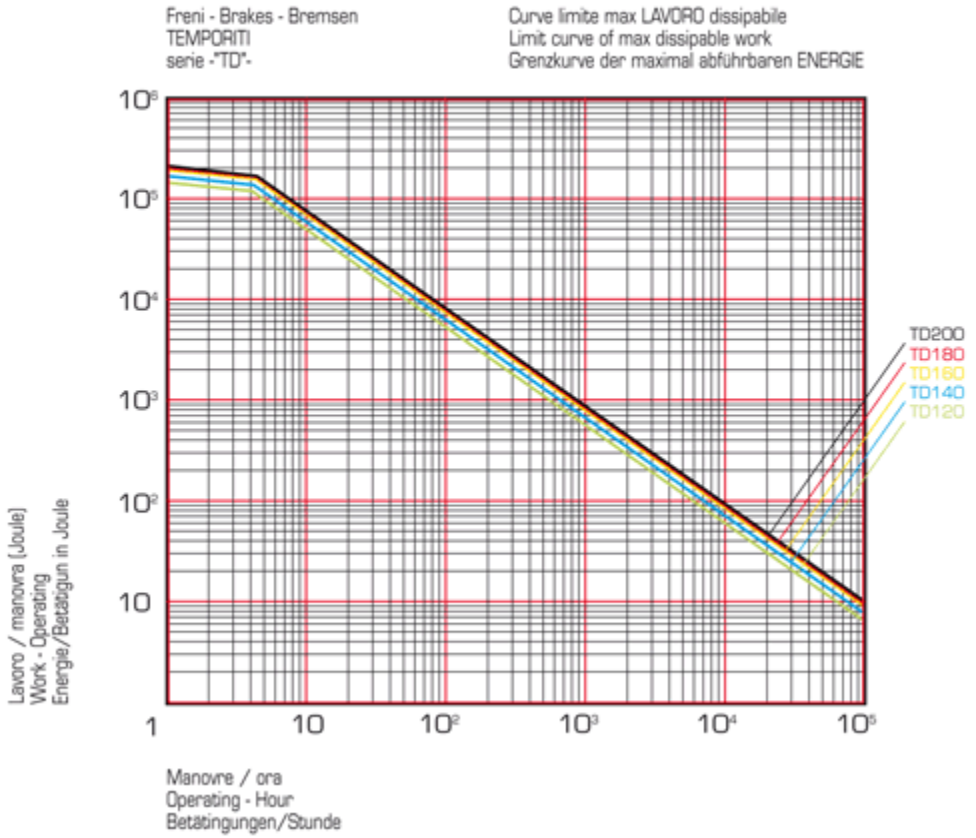
## GRAFICO 1/TD GRAPHIC 1/TD GRAPHISCHE DARSTELLUNG 1/TD

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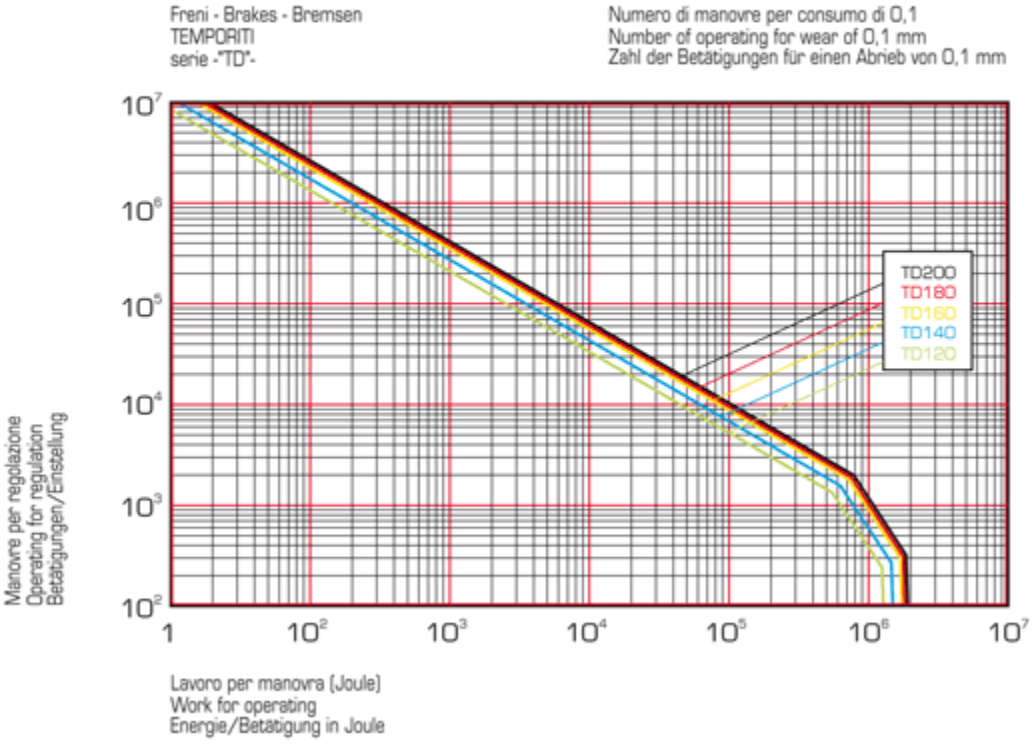


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