ENVIRONMENTAL CONDITIONS

Hygienic conditions
For food processing and other applications where hygiene is paramount we recommend the following materials, connectors and accessories:

- Stainless steel Shell,
- Stainless steel Shaft,
- Stainless steel End housing TS8N/10N version
- IP66 Sealing with NBR or FPM with stainless steel labyrinth drum motors
- Hot vulcanized Lagging, FDA approved, white nitrile rubber NBR or in polyurethane PU
- Oil, food-grade, synthetic
- Stainless steel Terminal box
- Straight or elbow connectors in stainless steel
- Diamond patterned lagging is not suitable for food processing as it can be difficult to clean and leave traces of bacteria

Conveyor frame
According to EHEDG design rules, it is highly recommended to incorporate rust-free open conveyor frames to facilitate easy cleaning, wash down and disinfection of the conveyor, drum motor and belt.
The rubber material shall be USDA/FDA and EC1935/2004 compliant.

Wet and wash down applications
Wet and wash-down subject applications require rust-free or stainless steel materials for the drum motor shell and sealing system.
The following materials and accessories are available:

- Stainless steel or mild steel Shell with hot vulcanised lagging
- Stainless steel Shaft,
- End housing for saltwater resistant (80 LS-138LS) powder coating (165LS-320M) or with stainless steel shell (80LS-320M) - TS8N/10N version
- End housings for LP-series, aluminium with stainless steel cover
- IP66 seal, nitrile rubber NBR or FPM, with stainless steel labyrinth
- Lagging, all types possible
- Diamond patterned lagging can be used for non-food wet applications
- Cable connectors, all types possible
- Max. 50 bar at a distance of 0.3 m
- Max. 60°C water temperature for nitrile rubber NBR regreasable sealing
- Max. 80°C water temperature for nitrile rubber NBR or FPM sealing

- Diamond patterned lagging can be used for non-food wet applications
- Lagging, all types possible
- Stainless steel Shell, 80LS-320M - TS8N/10N version
- Stainless steel Shaft, 80LS-320M - TS8N/10N version
- Stainless steel End housing TS8N/10N version
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ENVIRONMENTAL CONDITIONS

Dry and dusty applications
All Rulmeca drum motors regardless of specification or material, are sealed to IP66 protection rating. For applications in hazardous areas requiring intrinsically safe or explosion proof motors, please contact Rulmeca.

High temperature
With Rulmeca drum motors, the cooling is due to the contact of the shell with the conveyor belt. It is essential that every drum motor, has an adequate temperature difference between the internal motor and its ambient operating temperature. All drum motors in the catalogue are designed and tested, without lagging and with a belt for use in a maximum ambient temperature of +40 °C.

- The maximum ambient temperature for standard Rulmeca drum motors is 40° C according to EN 60034
- Every execution is possible, stainless steel versions allow a lower heat dissipation
- Before installing, make sure that the type of oil, declared on the label of the drum motor, ensures a temperature range compatible with the temperature of the applications environment.
- The rubber coating for modular belts can cause overheating of the drum motor, therefore only use recommended specifications
- De-rated motors or standard motors with frequency converters, properly configured for reducing running temperatures (Reduced power and inrush current)
- The rubber lagging to increase the friction with the belts can cause overheating; comply with the limits allowed for the lagging and always connect the motors internal thermal protection.
- For drum motors with motors 6, 8, 12 poles and lagging thicker than 8 mm, use standard motors with frequency converters or de-rated drum motors
- For applications with ambient temperatures above +40 ° C, please contact Rulmeca
ENVIRONMENTAL CONDITIONS

Low temperature
When a drum motor is operated in low temperatures (less than +5 °C), the viscosity of the oil and temperature of the motor when it is not running should be considered. Consider also that condensation inside the drum motor and terminal box may occur with varying wide ranging temperatures.
We recommend the use of the following materials, cables and accessories:

- Mild steel with hot vulcanised lagging or stainless steel Shell
- Stainless steel Shaft,
- End housing in salt water resistant aluminium or solid stainless steel-TS version
- Sealing stainless steel with labyrinth
- Optional special oils for low temperatures
- Use special low temperature seals in temperatures below -25 °C
- System Activation of pre-heating, to prevent condensation
- Lagging, all types possible
- Very low temperatures reduce the effectiveness of the rubber to increase friction
- Cable connections: possible all kinds
- Use of anti rust materials

Anti Condensation heating
In ambient temperatures below +1 °C, consider heating the motor windings to keep the oil viscosity, seals and internal parts at a constant temperature.
If the motor current is switched off for some time and the ambient temperature is very low, then the motor oil becomes viscous. In these situations opt for the use of condensation heating systems, also in order to avoid the formation of ice crystals within the oil seals that would result in a premature damage.
Please refer to Rulmeca.

Altitude higher than 1000 m
The operation of a drum motor at an altitude above 1000 m above sea level may result in a loss of power and overheating due to low atmospheric pressure and the lower density of the air, which cools the motor. The altitude of the final application should be taken into consideration when calculating the required power. For more information please contact Rulmeca.
INDUSTRIAL DRUM MOTOR RANGE

DIFFERENT POWER SUPPLY

Connecting 3-phase motors to a single phase supply

Rulmeca offers a wide range of industrial solutions for different applications and markets.

Collaborations:

- EC
- CE
- FDA
- ISO
- EN
- UL

Certificate:

The chapter will only give an overview of some the most important areas covered.

General logistics

All drum motors in this catalogue are suitable for general logistics applications.

Food application

Rulmeca drum motors are ultra-hygienic and easy to clean. All drum motors for food applications are marked with EC 1935-2004 and FDA.

Airport logistics

Airport applications, such as check-in conveyors, X-Ray machines and scanning machines, require low noise and frequent start / stops. Most applications use friction drive.

Report applications, such as check-in conveyors, X-Ray machines and scanning machines equipped with PU, PVC or nitrile rubber.

Different applications, such as electronics, chemicals, food, automotive and general manufacturing in internal logistics, material handling and storage, require a wide range of industrial solutions.
POWER CALCULATION AND SELECTION OF THE DRUM MOTOR FOR UNIT HANDLING

Calculation of the tangential force

\[ F = \text{Tangential Force [N]}, \quad F = F_0 + F_1 + F_2 + F_3 \]

The tangential forces for drum motors are given in the tables of the range of standard products.

- \( P_n \) = Belt weight per linear metre [kg/m]
- \( P_{pr} \) = Weight of rotating parts of the belt conveyor per metre length (carrying and return section) [kg/m]
- \( P_{m1} \) = Weight in Kg of the conveyed product on the load section, or each metre of length of the belt conveyor [kg/m]
- \( P_{m2} \) = Weight in Kg of the conveyed product on the return section, or each metre of length of the belt conveyor [kg/m]
- \( C_1 \) = Coefficient of friction between product and belt carrying side
- \( C_2 \) = Coefficient of friction between belt carrying side and slider bed
- \( C_3 \) = Coefficient of friction between return belt and product
- \( C_4 \) = Coefficient of friction between return belt side and slider bed
- \( L \) = Length of the conveyor in metres [m]
- \( H \) = Height difference in conveyor [m]
- \( F_0–F_3 \) = Force [N]

\[ F_0 = 0.4 \cdot L \cdot (2P_n + P_{pr}) \]

\[ F_1 = 0.4 \cdot L \cdot P_{m1} \]

\[ F_2 = 10 \cdot H \cdot P_{m1} \]

\[ F_3 = 10 \cdot L \cdot P_{m1} \cdot C_1 \]

\[ F_0 = 11 \cdot L \cdot P_{m1} \cdot C_2 \]

\[ F_1 = 11 \cdot L \cdot P_{m1} \cdot C_2 \]

\[ F_2 = 10 \cdot H \cdot P_{m1} \]

\[ F_3 = 10 \cdot L \cdot P_{m1} \cdot C_1 \]

\[ F_0 = 10 \cdot L \cdot P_{m1} \cdot (C_2 + C_4) \]

\[ F_1 = 10 \cdot L \cdot (P_{m1} \cdot C_2 + P_{m2} \cdot C_4) \]

\[ F_2 = 10 \cdot H \cdot (P_{m1} \cdot P_{m2} - P_{m1}) \]

\[ F_3 = 10 \cdot L \cdot (P_{m1} \cdot C_1 + P_{m2} \cdot C_3) \]
## REQUIRED DATA FOR POWER CALCULATION

### SECTION A - ORDER DETAIL

<table>
<thead>
<tr>
<th>Drum motor (TM)</th>
<th>Q.ty</th>
<th>Ø [mm]</th>
<th>Type</th>
<th>kW</th>
<th>Phase</th>
<th>Voltage [V]</th>
<th>Hz</th>
<th>[m/s]</th>
<th>RL [mm]</th>
<th>EL [mm]</th>
<th>AGL [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idler Pulley (UT)</td>
<td>Q.ty</td>
<td>Ø [mm]</td>
<td>Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RL [mm]</td>
<td>EL [mm]</td>
<td>AGL [mm]</td>
</tr>
</tbody>
</table>

**New EDP code:**

**Additional comments:**

- Terminal box stainless steel: Terminal box aluminium:
- Elbow connector stainless steel: Elbow connector polyamide:
- Straight connector stainless steel: Straight connector brass:
- Cable type (screened/halogen free):
- Insulation class:
- special certification:
- Backstop: Motor turning direction (at connection side):
- Electromagn. brake: AC voltage to rectifier [V]:
- Ø 90 - 220 RL min. + 50 mm
- Fail safe unit: Starts/Stops:
- Special thermal controller: (PTC):
- Encoder option: SKF: RLS: Special:
- VFD operation: delivered with VFD:
- Reversible operation: Starts/Stops per hour:
- Stainless steel option:
- TS7N/TS9N: TS7N/TS9N (with regreasable labyrinths):
- Oil: FDA: Synthetic:
- Special environmental condition - kind of aggressivity:
- Temperature of material to be conveyed if higher than 70°C:
- Ambient temperature if higher than 40°C or lower than - 25°C:
- Special mounting vertical: degrees
- Cylindric shell: Diameter (if special) [mm]:
- Additional motor data plate required:
- Special shell: (customer drawing has to be included):
- Special shaft design: (customer drawing has to be included):
- Special end housings: (customer drawing has to be included):
- Low noise requirements [dBA]:
- Rubber lagging black/white/blue: hot/cold vulcan. Special:
- Thickness of the lagging [mm]:
- Special groove measurements: (customer drawing has to be included):
- Electric motor: Groove dimens. [mm]:
- Top: Bottom: Depth:

### SECTION B - NECESSARY DETAILS FOR POWER CALCULATION

<table>
<thead>
<tr>
<th>Type of conveyor:</th>
<th>Slider bed:</th>
<th>Roller bed:</th>
<th>Special:</th>
<th>Inclining/Declining:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conveyor length [m]:</td>
<td>Load [kg/m]:</td>
<td>Belt width [mm]:</td>
<td>Belt material:</td>
<td></td>
</tr>
<tr>
<td>Belt type:</td>
<td>Belt thickness [mm]:</td>
<td>Belt manufacturer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental conditions:

Accessories: