

# DRUM MOTOR

## DM SERIES

### DM 0138



Practice-oriented, scalable and thought out in detail: The new drum motor DM 0138 makes it easy to build a completely individual conveyor system and is dimensioned for the higher requirements of permissible belt tension now demanded from industry and belt manufacturers alike.

With a broader speed spectrum, the DM 0138 covers all possible applications. The clever plug-and-play connection significantly simplifies the installation. Each motor is approved, tested, and modularized so that it can be produced and delivered around the world in the shortest amount of time.

The modular design of the DM 0138 allows a free combination of individual module groups, such as shaft, end housing, shell or steel gear, to perfectly meet the requirements of an application. In addition, various options, such as encoder, brake, backstop, rubber laggings, etc., as well as different accessories are available.

With the platform concept of the DM 0138, it is possible to cover all internal logistics applications in the food processing sector, as well as in industry, distribution and airports.



## Technical data

|                                                                                           | Asynchronous squirrel cage motor                                                                                     | AC synchronous permanent magnet motor             |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>Insulation class of motor windings</b>                                                 | Class F, IEC 34 (VDE 0530)                                                                                           | Class F, IEC 34 (VDE 0530)                        |
| <b>Voltage</b>                                                                            | 230/460 V $\pm 5\%$ (IEC 34/38) Most of the common international voltages and frequencies are available upon request | 230 or 400 V                                      |
| <b>Frequency</b>                                                                          | 60 Hz                                                                                                                | 200 Hz                                            |
| <b>Shaft seal, internal</b>                                                               | NBR                                                                                                                  | NBR                                               |
| <b>Protection rate Motor*</b>                                                             | IP69K                                                                                                                | IP69K                                             |
| <b>Thermal controller</b>                                                                 | Bi-metal switch                                                                                                      | Bi-metal switch                                   |
| <b>Operating mode</b>                                                                     | S1                                                                                                                   | S1                                                |
| <b>Ambient temperature, 3-phase motor</b>                                                 | 36 to 104 °F<br>Low temperature ranges on request                                                                    | 36 to 104 °F<br>Low temperature ranges on request |
| <b>Ambient temperature, 3-phase motor for applications with form-fit belts or no belt</b> | 36 to 77 °F                                                                                                          | 36 to 104 °F                                      |

\* The protection rate of the cable connector may deviate.

## Design variants and accessories

|                    |                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Laggings</b>    | Lagging for friction drive belts<br>Lagging for modular plastic belts<br>Lagging for positive drive solid homogeneous belts |
| <b>Sprockets</b>   | Sprockets                                                                                                                   |
| <b>Options</b>     | Backstop<br>Electromagnetic holding brake and rectifier*<br>Encoder*<br>Balancing<br>Plug connection*                       |
| <b>Oils</b>        | Food-grade oils (EU, FDA, NSF H1)                                                                                           |
| <b>Certificate</b> | cULus safety certificates                                                                                                   |
| <b>Accessories</b> | Idler pulleys; conveyor rollers; mounting brackets; cables; inverters                                                       |

A combination of encoder and safety holding brake is not possible. In addition, the use of a backstop with a synchronous motor is technically not meaningful.

\* Depending on the option, the motor extends by 1.97" – 2.76".

# DRUM MOTOR

## DM SERIES

### DM 0138



#### Material variants

The following components can be selected for the drum motor and the electrical connection. The combination of components depends on the material used.

| Component            | Version                         | Aluminum | Mild steel | Stainless steel | Brass/nickel | Technopolymer |
|----------------------|---------------------------------|----------|------------|-----------------|--------------|---------------|
| Shell                | Crowned                         |          | ●          | ●               |              |               |
|                      | Cylindrical                     |          | ●          | ●               |              |               |
|                      | Cylindrical + key for sprockets |          | ●          | ●               |              |               |
| End housing          | Standard                        | ●        |            | ●               |              |               |
| Shaft                | Standard                        |          |            | ●               |              |               |
|                      | Cross-drilled thread            |          |            | ●               |              |               |
| Gear boxes           | Planetary gear box              |          | ●          |                 |              |               |
| Electrical connector | Straight connector              |          |            | ●               | ●            | ●             |
|                      | Straight hygienic connector     |          |            | ●               |              |               |
|                      | Elbow connector                 |          |            | ●               |              | ●             |
|                      | Terminal box                    | ●        |            | ●               |              | ●             |
|                      | Straight plug connection        |          |            | ●               |              |               |
|                      | 90° plug connection             |          |            | ●               |              |               |
|                      | 90° hygienic connector          |          |            | ●               |              |               |
| Motor winding        | Asynchronous motor              |          |            |                 |              |               |
|                      | Synchronous motor               |          |            |                 |              |               |
| External seal        | PTFE                            |          |            |                 |              |               |

# DRUM MOTOR

## DM SERIES

### DM 0138

#### Motor variants

#### Mechanical data for synchronous motors with steel gear

| P <sub>N</sub><br>[W/HP] | n <sub>p</sub> | gs | i  | v<br>[ft/min] | n <sub>A</sub><br>[RPM] | M <sub>A</sub><br>[lbf·ft] | F <sub>N</sub><br>[lbf] | M <sub>MAX</sub> /M <sub>A</sub> | FW <sub>MIN</sub><br>[in] | SL <sub>MIN</sub><br>[in] |
|--------------------------|----------------|----|----|---------------|-------------------------|----------------------------|-------------------------|----------------------------------|---------------------------|---------------------------|
| 1800/2.40                | 8              | 2  | 30 | 142           | 100                     | 114                        | 505                     | 1.35                             | 14.06                     | 13.78                     |
| 1800/2.40                | 8              | 2  | 27 | 157           | 111                     | 103                        | 455                     | 1.55                             | 14.06                     | 13.78                     |
| 1800/2.40                | 8              | 2  | 24 | 177           | 125                     | 91                         | 404                     | 1.65                             | 14.06                     | 13.78                     |
| 1800/2.40                | 8              | 2  | 20 | 213           | 150                     | 76                         | 337                     | 2.3                              | 14.06                     | 13.78                     |
| 1800/2.40                | 8              | 2  | 16 | 266           | 188                     | 61                         | 270                     | 2.8                              | 14.06                     | 13.78                     |
| 1800/2.40                | 8              | 2  | 12 | 356           | 250                     | 46                         | 202                     | 3                                | 14.06                     | 13.78                     |
| 1800/2.40                | 8              | 1  | 9  | 474           | 333                     | 36                         | 160                     | 3                                | 14.06                     | 13.78                     |

|                |                              |                                  |                                                     |
|----------------|------------------------------|----------------------------------|-----------------------------------------------------|
| P <sub>N</sub> | = Rated power                | M <sub>A</sub>                   | = Drum motor rated torque                           |
| n <sub>p</sub> | = Number of poles            | F <sub>N</sub>                   | = Drum motor rated belt pull                        |
| gs             | = Gear stages                | M <sub>MAX</sub> /M <sub>A</sub> | = Ratio of max. acceleration torque to rated torque |
| i              | = Speed ratio                | FW <sub>MIN</sub>                | = Minimum drum width                                |
| v              | = Speed @ 200 Hz             | SL <sub>MIN</sub>                | = Minimum shell length                              |
| n <sub>A</sub> | = Shell rated speed @ 200 Hz |                                  |                                                     |

#### Electrical data for synchronous motors

| P <sub>N</sub><br>[W/HP] | n <sub>p</sub> | U <sub>N</sub><br>[V] | I <sub>N</sub><br>[A] | I <sub>0</sub><br>[A] | I <sub>MAX</sub><br>[A] | f <sub>N</sub><br>[Hz] | η    | n <sub>N</sub><br>[RPM] | J <sub>R</sub><br>[kgcm <sup>2</sup> ] | M <sub>N</sub><br>[Nm] | M <sub>0</sub><br>[Nm] | M <sub>MAX</sub><br>[Nm] | R <sub>M</sub><br>[Ω] | L <sub>SD</sub><br>[mH] | L <sub>SQ</sub><br>[mH] | k <sub>e</sub><br>[V/<br>krpm] | T <sub>e</sub><br>[ms] | k <sub>TN</sub><br>[Nm/<br>A] | U <sub>SH</sub><br>[V] |
|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-------------------------|------------------------|------|-------------------------|----------------------------------------|------------------------|------------------------|--------------------------|-----------------------|-------------------------|-------------------------|--------------------------------|------------------------|-------------------------------|------------------------|
| 1800/2.40                | 8              | 230                   | 5.94                  | 0.4                   | 5.94                    | 200                    | 0.92 | 3000                    | 1.8                                    | 5.73                   | 3.18                   | 17.19                    | 2.17                  | 3.87                    | 5.63                    | 110.2                          | 15.58                  | 0.96                          | 6.45                   |
| 1800/2.40                | 8              | 400                   | 3.43                  | 0.3                   | 3.43                    | 200                    | 0.92 | 3000                    | 1.8                                    | 5.73                   | 3.18                   | 17.19                    | 2.17                  | 11.6                    | 16.9                    | 110.2                          | 15.58                  | 1.67                          | 11.16                  |

|                  |                           |                  |                                           |
|------------------|---------------------------|------------------|-------------------------------------------|
| P <sub>N</sub>   | = Rated power             | M <sub>N</sub>   | = Rated torque of rotor                   |
| n <sub>p</sub>   | = Number of poles         | M <sub>0</sub>   | = Standstill torque                       |
| U <sub>N</sub>   | = Rated voltage           | M <sub>MAX</sub> | = Maximum torque                          |
| I <sub>N</sub>   | = Rated current           | R <sub>M</sub>   | = Phase to phase resistance               |
| I <sub>0</sub>   | = Standstill current      | L <sub>SD</sub>  | = d-axis inductance                       |
| I <sub>MAX</sub> | = Maximum current         | L <sub>SQ</sub>  | = q-axis inductance                       |
| f <sub>N</sub>   | = Rated frequency         | k <sub>e</sub>   | = EMF (mutual induction voltage constant) |
| η                | = Efficiency              | T <sub>e</sub>   | = Electrical time constant                |
| n <sub>N</sub>   | = Rated torque of rotor   | k <sub>TN</sub>  | = Torque constant                         |
| J <sub>R</sub>   | = Rotor moment of inertia | U <sub>SH</sub>  | = Heating voltage                         |

# DRUM MOTOR

## DM SERIES

### DM 0138



#### Mechanical data for synchronous motors with oil-free steel gear

| P <sub>N</sub><br>[W/HP] | n <sub>p</sub> | gs | i  | v<br>[ft/min] | n <sub>A</sub><br>[min <sup>-1</sup> ] | M <sub>A</sub><br>[lbf*ft] | F <sub>N</sub><br>[lbf] | M <sub>MAX</sub> /M <sub>A</sub> | FW <sub>MIN</sub><br>[in] | SL <sub>MIN</sub><br>[in] |
|--------------------------|----------------|----|----|---------------|----------------------------------------|----------------------------|-------------------------|----------------------------------|---------------------------|---------------------------|
| 1000/1.34                | 8              | 2  | 49 | 87            | 61                                     | 104                        | 460                     | 1.60                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 45 | 94            | 67                                     | 95                         | 421                     | 1.80                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 42 | 102           | 71                                     | 89                         | 393                     | 1.90                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 36 | 118           | 83                                     | 76                         | 337                     | 2.20                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 30 | 142           | 100                                    | 63                         | 281                     | 2.70                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 27 | 157           | 111                                    | 57                         | 252                     | 3.00                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 24 | 177           | 125                                    | 51                         | 224                     | 3.00                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 20 | 213           | 150                                    | 42                         | 187                     | 3.00                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 16 | 266           | 188                                    | 34                         | 149                     | 3.00                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 2  | 12 | 356           | 250                                    | 25                         | 112                     | 3.00                             | 14.06                     | 13.78                     |
| 1000/1.34                | 8              | 1  | 9  | 474           | 333                                    | 20                         | 89                      | 3.00                             | 14.06                     | 13.78                     |

|                |                              |                                  |                                                     |
|----------------|------------------------------|----------------------------------|-----------------------------------------------------|
| P <sub>N</sub> | = Rated power                | M <sub>A</sub>                   | = Drum motor rated torque                           |
| n <sub>p</sub> | = Number of poles            | F <sub>N</sub>                   | = Drum motor rated belt pull                        |
| gs             | = Gear stages                | M <sub>MAX</sub> /M <sub>A</sub> | = Ratio of max. acceleration torque to rated torque |
| i              | = Speed ratio                | FW <sub>MIN</sub>                | = Minimum drum width                                |
| v              | = Speed @ 200 Hz             | SL <sub>MIN</sub>                | = Minimum shell length                              |
| n <sub>A</sub> | = Shell rated speed @ 200 Hz |                                  |                                                     |

#### Electrical data for oil-free synchronous motors

| P <sub>N</sub><br>[W/HP] | n <sub>p</sub> | U <sub>N</sub><br>[V] | I <sub>N</sub><br>[A] | I <sub>0</sub><br>[A] | I <sub>MAX</sub><br>[A] | f <sub>N</sub><br>[Hz] | η    | n <sub>N</sub><br>[RPM] | J <sub>R</sub><br>[kgcm <sup>2</sup> ] | M <sub>N</sub><br>[Nm] | M <sub>0</sub><br>[Nm] | M <sub>MAX</sub><br>[Nm] | R <sub>M</sub><br>[Ω] | L <sub>SD</sub><br>[mH] | L <sub>SQ</sub><br>[mH] | k <sub>e</sub><br>[V/<br>krpm] | T <sub>e</sub><br>[ms] | k <sub>TN</sub><br>[Nm/<br>A] | U <sub>SH</sub><br>[V] |
|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-------------------------|------------------------|------|-------------------------|----------------------------------------|------------------------|------------------------|--------------------------|-----------------------|-------------------------|-------------------------|--------------------------------|------------------------|-------------------------------|------------------------|
| 1000/1.34                | 8              | 230                   | 3.36                  | 0.4                   | 10.08                   | 200                    | 0.93 | 3000                    | 1.8                                    | 3.18                   | 3.18                   | 9.54                     | 2.17                  | 3.87                    | 5.63                    | 110.2                          | 15.58                  | 0.95                          | 3.65                   |
| 1000/1.34                | 8              | 400                   | 1.94                  | 0.3                   | 5.82                    | 200                    | 0.93 | 3000                    | 1.8                                    | 3.18                   | 3.18                   | 9.54                     | 2.17                  | 11.6                    | 16.9                    | 110.2                          | 15.58                  | 1.64                          | 6.31                   |

|                  |                           |                  |                                           |
|------------------|---------------------------|------------------|-------------------------------------------|
| P <sub>N</sub>   | = Rated power             | M <sub>N</sub>   | = Rated torque of rotor                   |
| n <sub>p</sub>   | = Number of poles         | M <sub>0</sub>   | = Standstill torque                       |
| U <sub>N</sub>   | = Rated voltage           | M <sub>MAX</sub> | = Maximum torque                          |
| I <sub>N</sub>   | = Rated current           | R <sub>M</sub>   | = Phase to phase resistance               |
| I <sub>0</sub>   | = Standstill current      | L <sub>SD</sub>  | = d-axis inductance                       |
| I <sub>MAX</sub> | = Maximum current         | L <sub>SQ</sub>  | = q-axis inductance                       |
| f <sub>N</sub>   | = Rated frequency         | k <sub>e</sub>   | = EMF (mutual induction voltage constant) |
| η                | = Efficiency              | T <sub>e</sub>   | = Electrical time constant                |
| n <sub>N</sub>   | = Rated torque of rotor   | k <sub>TN</sub>  | = Torque constant                         |
| J <sub>R</sub>   | = Rotor moment of inertia | U <sub>SH</sub>  | = Heating voltage                         |

# DRUM MOTOR

## DM SERIES

### DM 0138

#### Mechanical data for 3-phase asynchronous motor with steel gear

| P <sub>N</sub><br>[W/HP] | n <sub>p</sub> | g <sub>s</sub> | i    | v<br>[ft/s] | n <sub>A</sub><br>[min <sup>-1</sup> ] | M <sub>A</sub><br>[lbf·ft] | F <sub>N</sub><br>[lbf] | FW <sub>MIN</sub><br>[in] | SL <sub>MIN</sub><br>[in] |
|--------------------------|----------------|----------------|------|-------------|----------------------------------------|----------------------------|-------------------------|---------------------------|---------------------------|
| 160/0.21                 | 4              | 3              | 252  | 9           | 7                                      | 143                        | 628                     | 12.09                     | 11.81                     |
| 160/0.21                 | 4              | 3              | 150  | 17          | 11                                     | 85                         | 374                     | 12.09                     | 11.81                     |
| 160/0.21                 | 4              | 3              | 120  | 19          | 14                                     | 68                         | 299                     | 12.09                     | 11.81                     |
| 160/0.21                 | 4              | 3              | 100  | 24          | 17                                     | 57                         | 249                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 73.8 | 33          | 23                                     | 101                        | 446                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 63   | 38          | 27                                     | 86                         | 380                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 49.2 | 47          | 34                                     | 67                         | 297                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 42   | 57          | 40                                     | 58                         | 254                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 36   | 66          | 46                                     | 49                         | 217                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 30   | 78          | 56                                     | 41                         | 181                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 27   | 88          | 62                                     | 37                         | 163                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 24   | 100         | 70                                     | 33                         | 145                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 20   | 119         | 84                                     | 27                         | 121                     | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 16   | 149         | 105                                    | 22                         | 97                      | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 2              | 12   | 199         | 139                                    | 16                         | 72                      | 12.09                     | 11.81                     |
| 370/0.50                 | 4              | 1              | 9    | 263         | 186                                    | 13                         | 57                      | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 73.8 | 66          | 47                                     | 73                         | 323                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 63   | 78          | 55                                     | 63                         | 276                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 49.2 | 100         | 70                                     | 49                         | 215                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 42   | 116         | 82                                     | 42                         | 184                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 36   | 135         | 96                                     | 36                         | 157                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 30   | 164         | 115                                    | 30                         | 131                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 27   | 180         | 127                                    | 27                         | 118                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 24   | 204         | 143                                    | 24                         | 105                     | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 20   | 244         | 172                                    | 20                         | 87                      | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 16   | 306         | 215                                    | 16                         | 70                      | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 2              | 12   | 408         | 287                                    | 12                         | 52                      | 12.09                     | 11.81                     |
| 550/0.74                 | 2              | 1              | 9    | 543         | 382                                    | 9                          | 41                      | 12.09                     | 11.81                     |

DL series

DM series

DP series

Application notes

# DRUM MOTOR

## DM SERIES

### DM 0138



| $P_N$<br>[W/HP] | $n_p$ | gs | i    | v<br>[ft/s] | $n_A$<br>[min <sup>-1</sup> ] | $M_A$<br>[lbf*ft] | $F_N$<br>[lbf] | $FW_{MIN}$<br>[in] | $SL_{MIN}$<br>[in] |
|-----------------|-------|----|------|-------------|-------------------------------|-------------------|----------------|--------------------|--------------------|
| 750/1.00        | 4     | 2  | 42   | 57          | 40                            | 116               | 510            | 14.06              | 13.78              |
| 750/1.00        | 4     | 2  | 36   | 66          | 47                            | 99                | 437            | 14.06              | 13.78              |
| 750/1.00        | 4     | 2  | 30   | 81          | 56                            | 83                | 364            | 14.06              | 13.78              |
| 750/1.00        | 4     | 2  | 27   | 88          | 62                            | 74                | 328            | 14.06              | 13.78              |
| 750/1.00        | 4     | 2  | 20   | 121         | 84                            | 55                | 243            | 14.06              | 13.78              |
| 750/1.00        | 4     | 2  | 16   | 149         | 105                           | 44                | 194            | 14.06              | 13.78              |
| 750/1.00        | 4     | 2  | 12   | 199         | 141                           | 33                | 146            | 14.06              | 13.78              |
| 750/1.00        | 4     | 1  | 9    | 266         | 187                           | 26                | 115            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 49.2 | 100         | 70                            | 89                | 394            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 42   | 116         | 82                            | 76                | 336            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 36   | 135         | 95                            | 65                | 288            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 30   | 164         | 114                           | 55                | 240            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 27   | 180         | 127                           | 49                | 216            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 24   | 204         | 143                           | 44                | 192            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 20   | 244         | 172                           | 36                | 160            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 16   | 306         | 215                           | 29                | 128            | 14.06              | 13.78              |
| 1000/1.34       | 2     | 2  | 12   | 408         | 286                           | 22                | 96             | 14.06              | 13.78              |
| 1000/1.34       | 2     | 1  | 9    | 543         | 382                           | 17                | 76             | 14.06              | 13.78              |

$P_N$  = Rated power  
 $n_p$  = Number of poles  
gs = Gear stages  
i = Speed ratio  
v = Speed @ 60 Hz

$n_A$  = Rated speed of shell @ 60 Hz  
 $M_A$  = Drum motor rated torque  
 $F_N$  = Drum motor rated belt pull  
 $FW_{MIN}$  = Minimum drum width  
 $SL_{MIN}$  = Minimum shell length

**Electrical data for 3-phase asynchronous motor**

| $P_N$<br>[W/HP] | $n_p$ | $n_N$<br>[min <sup>-1</sup> ] | $f_N$<br>[Hz] | $U_N$<br>[V] | $I_N$<br>[A] | $I_0$<br>[A] | $\cos\varphi$ | $\eta$<br>[%] | $J_R$<br>[kgcm <sup>2</sup> ] | $I_s/I_N$ | $M_s/M_N$ | $M_B/M_N$ | $M_P/M_N$ | $M_N$<br>[Nm] | $R_M$<br>[Ω] | $U_{SH\Delta}$<br>[V] | $U_{SHY}$<br>[V] |
|-----------------|-------|-------------------------------|---------------|--------------|--------------|--------------|---------------|---------------|-------------------------------|-----------|-----------|-----------|-----------|---------------|--------------|-----------------------|------------------|
| 160/0.21        | 4     | 1661                          | 60            | 230          | 0.72         | 0.45         | 0.8           | 0.67          | 3.98                          | 3.68      | 1.65      | 2.15      | 1.65      | 0.92          | 59.7         | 18.2                  | –                |
| 160/0.21        | 4     | 1704                          | 60            | 460          | 0.4          | 0.31         | 0.7           | 0.72          | 3.98                          | 4.35      | 2.25      | 2.92      | 2.25      | 0.9           | 59.7         | –                     | 30.7             |
| 370/0.50        | 4     | 1679                          | 60            | 230          | 1.5          | 0.90         | 0.82          | 0.76          | 6.48                          | 4.12      | 1.65      | 2.28      | 1.65      | 2.1           | 21.1         | 13.7                  | –                |
| 370/0.50        | 4     | 1713                          | 60            | 460          | 0.86         | 0.65         | 0.71          | 0.71          | 6.48                          | 4.75      | 2.21      | 3.08      | 2.21      | 2.06          | 21.1         | –                     | 23.7             |
| 550/0.74        | 2     | 3408                          | 60            | 230          | 1.9          | 0.90         | 0.88          | 0.83          | 4.21                          | 5.93      | 2.4       | 3.06      | 2.4       | 1.54          | 11.8         | 10.1                  | –                |
| 550/0.74        | 2     | 3461                          | 60            | 460          | 1.06         | 0.73         | 0.78          | 0.83          | 4.21                          | 7.04      | 3.21      | 4.13      | 3.21      | 1.52          | 11.8         | –                     | 17.4             |
| 750/1.00        | 4     | 1675                          | 60            | 230          | 2.84         | 1.51         | 0.82          | 0.81          | 11.45                         | 4.35      | 1.87      | 2.54      | 1.87      | 4.28          | 9.1          | 11.2                  | –                |
| 750/1.00        | 4     | 1712                          | 60            | 460          | 1.57         | 1.08         | 0.74          | 0.81          | 11.45                         | 5.24      | 2.35      | 3.23      | 2.35      | 4.18          | 9.1          | –                     | 19.4             |
| 1000/1.34       | 2     | 3411                          | 60            | 230          | 3.23         | 1.16         | 0.91          | 0.85          | 7.45                          | 6.18      | 2.3       | 3.08      | 2.3       | 2.8           | 5.7          | 8.5                   | –                |
| 1000/1.34       | 2     | 3464                          | 60            | 460          | 1.69         | 0.85         | 0.86          | 0.86          | 7.45                          | 7.82      | 3.08      | 4.14      | 3.08      | 2.76          | 5.7          | –                     | 14.7             |

|               |                        |                |                                            |
|---------------|------------------------|----------------|--------------------------------------------|
| $P_N$         | = Rated power          | $J_R$          | = Rotor moment of inertia                  |
| $n_p$         | = Number of poles      | $I_s/I_N$      | = Ratio of startup current – rated current |
| $n_N$         | = Rated speed of rotor | $M_s/M_N$      | = Ratio of startup torque – rated torque   |
| $f_N$         | = Rated frequency      | $M_B/M_N$      | = Ratio of pull-out torque – rated torque  |
| $U_N$         | = Rated voltage        | $M_P/M_N$      | = Ratio of pull-up torque – rated torque   |
| $I_N$         | = Rated current        | $M_N$          | = Rated torque of rotor                    |
| $I_0$         | = Standstill current   | $R_M$          | = Branch resistance                        |
| $\cos\varphi$ | = Power factor         | $U_{SH\Delta}$ | = Heater voltage in delta connection       |
| $\eta$        | = Efficiency           | $U_{SHY}$      | = Heater voltage in star connection        |

# DRUM MOTOR

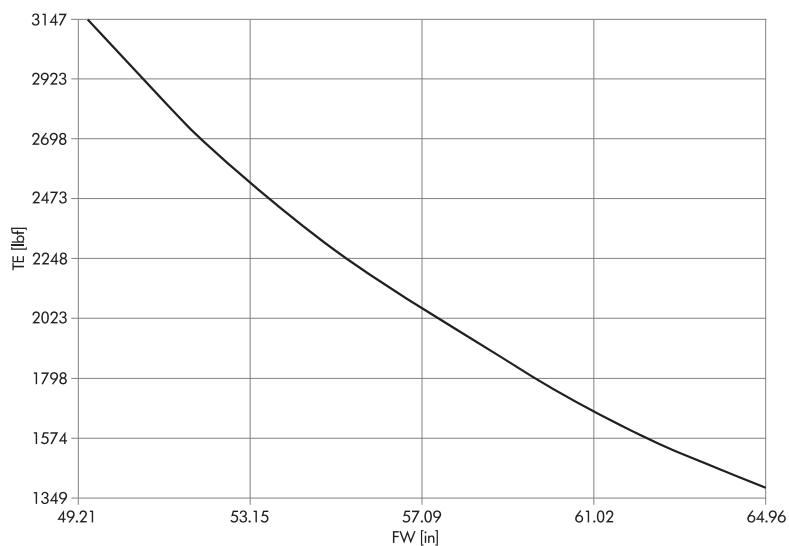
## DM SERIES

### DM 0138

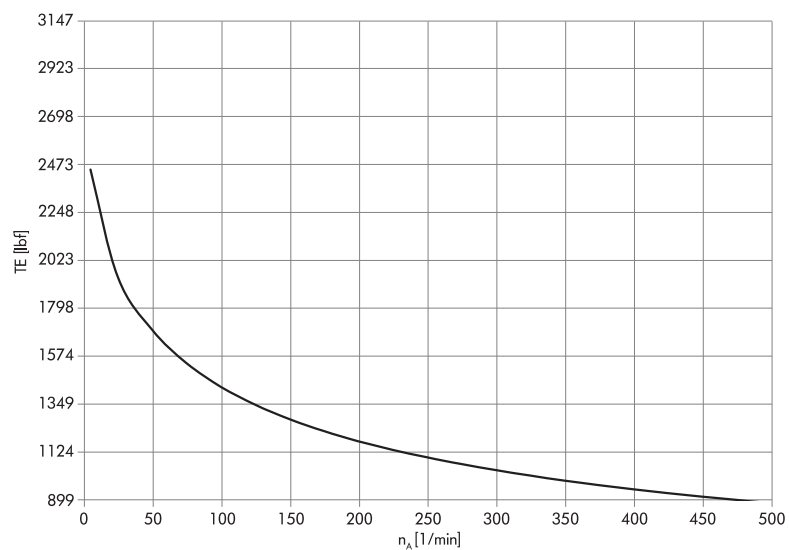


## Belt tension diagrams

### Belt tension depending on drum width



### Belt tension depending on rated speed of shell



**Note:** The correct value for the maximum permissible belt tension is determined from the speed of the drum motor. When selecting the motor, also check whether the maximum permissible TE value fits the desired drum width (FW). The belt tension diagrams apply only to standard shafts.

TE = Belt tension  
 $n_A$  = Shell rated speed  
 FW = Drum width

## DL series

## DM series

## DP series

