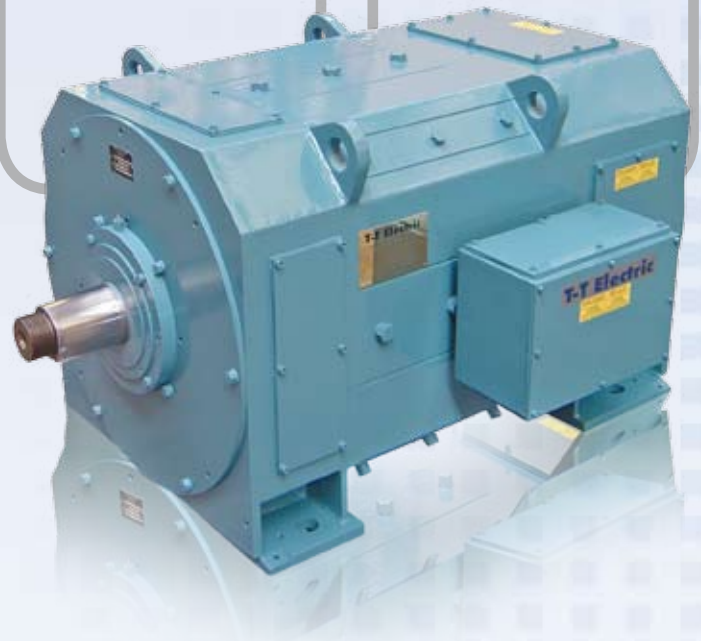


# Mill Duty DC Motors

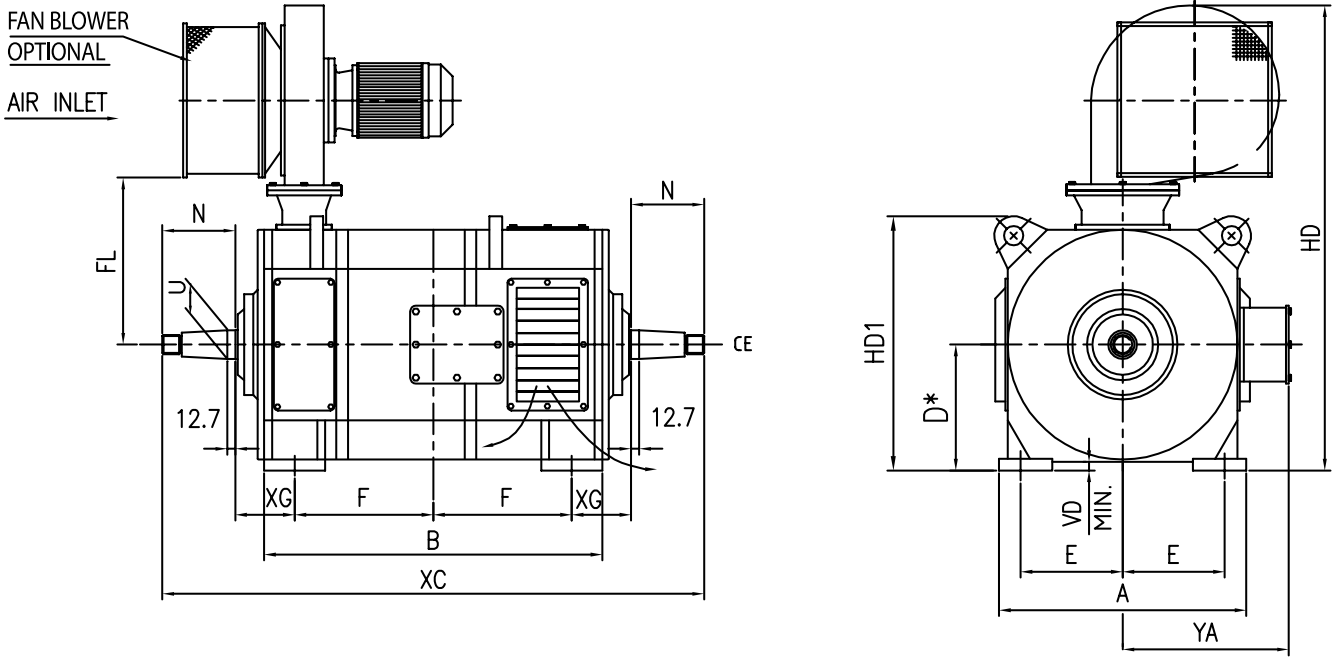
Brochure-2008/04 E

**800 Series**  
7.5-187 kW  
10-250 HP

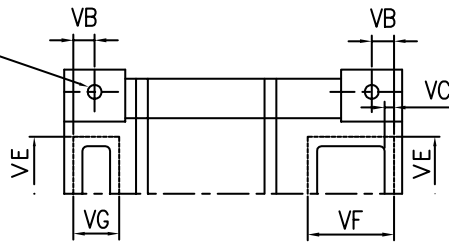


[t-telectric.com](http://t-telectric.com)

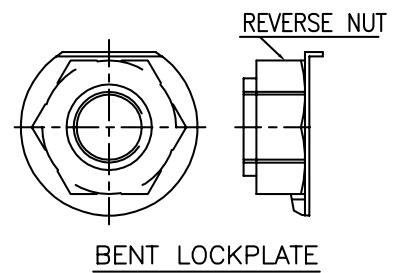
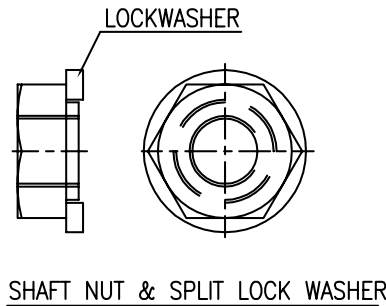
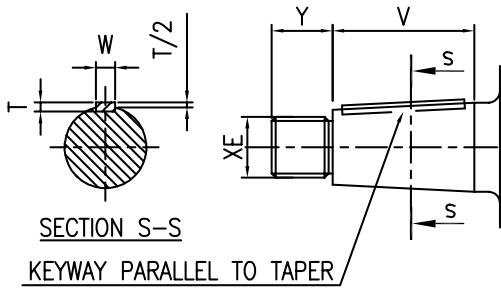
# Dimensions



4 HOLES ØH THRO'  
FOR XH BOLT  
(MIN. MOUNTING SURFACE  
ALLROUND BOTH VENTILATION  
OPENINGS)



NOTE:—  
\*TOLERANCE ON D  
802 TO 806: +0.0  
          -0.5  
808 TO 818: +0.0  
          -1.0



SHAFT EXTENSION DETAILS FOR 1 : 9.6 TAPER

All dimensions in mm

| FRAME | General Dimensions |      |      |     |       |       |       |    |     |     | Shaft |     |     |        | Key   |      | Vent Duct Flange Surface |       |       |     |    |    |     |     |     |     |
|-------|--------------------|------|------|-----|-------|-------|-------|----|-----|-----|-------|-----|-----|--------|-------|------|--------------------------|-------|-------|-----|----|----|-----|-----|-----|-----|
|       | A                  | B    | XC   | D   | E     | F     | XG    | H  | XH  | HD1 | HD    | FL  | N   | U      | V     | Y    | XE                       | W     | T     | VB  | VC | VD | VE  | VF  | VG  | YA  |
| 802   | 381                | 521  | 835  | 194 | 159.0 | 209.5 | 95.0  | 24 | M20 | 400 | 750   | 265 | 113 | 44.45  | 70.0  | 30.3 | 25.40                    | 12.70 | 12.70 | 22  | 10 | 10 | 184 | 121 | 56  | 420 |
| 803   | 432                | 597  | 940  | 216 | 178.0 | 228.5 | 114.5 | 28 | M24 | 445 | 780   | 290 | 127 | 50.80  | 82.5  | 31.8 | 31.75                    | 12.70 | 12.70 | 45  | 13 | 10 | 216 | 127 | 83  | 450 |
| 804   | 457                | 648  | 990  | 229 | 191.0 | 241.0 | 127.0 | 28 | M24 | 475 | 910   | 360 | 127 | 50.80  | 82.5  | 31.8 | 31.75                    | 12.70 | 12.70 | 57  | 13 | 10 | 229 | 140 | 70  | 470 |
| 806   | 508                | 699  | 1073 | 254 | 210.0 | 266.5 | 127.0 | 28 | M24 | 510 | 1050  | 372 | 143 | 63.50  | 95.0  | 35.3 | 38.10                    | 12.70 | 12.70 | 54  | 13 | 10 | 260 | 152 | 86  | 515 |
| 808   | 578                | 794  | 1206 | 286 | 238.0 | 314.0 | 130.0 | 35 | M30 | 584 | 1170  | 425 | 159 | 76.20  | 107.9 | 38.4 | 50.80                    | 19.05 | 12.70 | 51  | 13 | 19 | 292 | 165 | 89  | 545 |
| 810   | 622                | 825  | 1276 | 311 | 260.0 | 330.0 | 147.0 | 35 | M30 | 645 | 1230  | 450 | 161 | 82.55  | 107.9 | 40.4 | 57.15                    | 19.05 | 12.70 | 54  | 13 | 19 | 305 | 178 | 92  | 560 |
| 812   | 686                | 914  | 1397 | 340 | 286.0 | 362.0 | 158.5 | 35 | M30 | 675 | 1280  | 475 | 178 | 92.08  | 120.6 | 44.7 | 63.50                    | 19.05 | 12.70 | 64  | 16 | 19 | 345 | 210 | 124 | 620 |
| 814   | 762                | 1054 | 1543 | 375 | 317.5 | 406.5 | 184.0 | 42 | M36 | 770 | 1355  | 515 | 181 | 107.95 | 120.6 | 47.7 | 76.20                    | 25.40 | 19.05 | 86  | 16 | 19 | 387 | 235 | 140 | 660 |
| 816   | 826                | 1188 | 1715 | 406 | 343.0 | 444.5 | 216.0 | 42 | M36 | 835 | 1505  | 525 | 197 | 117.48 | 133.4 | 50.9 | 82.55                    | 31.75 | 19.05 | 114 | 25 | 19 | 406 | 279 | 168 | 750 |
| 818   | 914                | 1218 | 1794 | 451 | 381.0 | 495.0 | 203.0 | 48 | M42 | 930 | 1725  | 635 | 199 | 127.00 | 146.0 | 40.3 | 88.90                    | 31.75 | 25.40 | 98  | 25 | 19 | 457 | 305 | 181 | 810 |

## Mill Duty Motors

T-T Electric proposes a series of Mill Duty DC motors between 7.5 and 187 kW (10 – 250 HP) in A.I.S.E. frame sizes 802 to 818.

TT Electric Mill Duty motors conform to A.I.S.E. No. 1-1991 in regards to output and physical dimensions, and are therefore interchangeable with any other brand of A.I.S.E. standard motors of the same size.

The Mill Duty motors are suitable for operation with the latest generation of thyristor convertors. The fully laminated stator design of the motors permits a very high rate of change of current, meeting the steel mill requirements of high dynamic response and repetitive overload capability. The motors are fully compensated, offering the benefits of enhanced commutation margin in a wide constant power speed range, and good stability independently of motor load. This design, however, does not allow for a split stator frame, as stipulated by the A.I.S.E standard.

The shaft of these motors is easily removed and replaced, and can be offered with taper extensions 1:9.6 or 1:10.

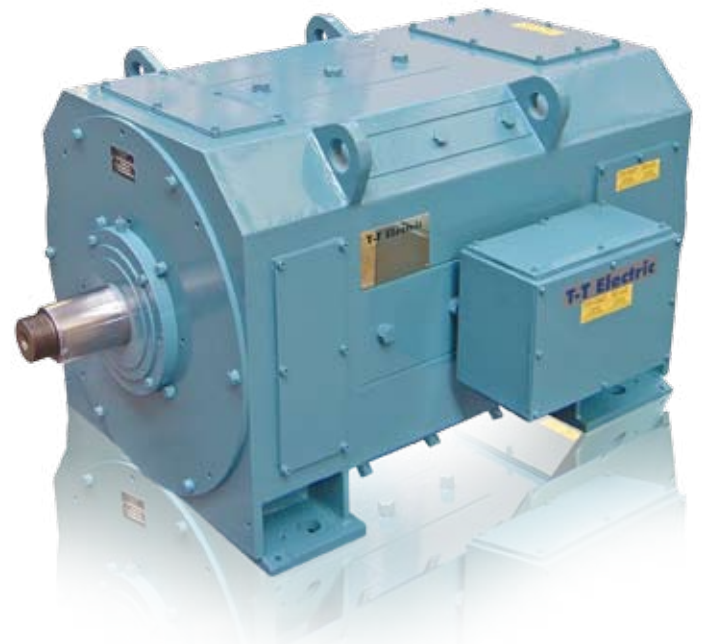
The 800 series is available in FULL SPEED, HALF SPEED and QUARTER SPEED options, in order to meet the specific requirements of steel industry.

As standard, the Mill Duty motors are mutually convertible from enclosure type Totally Enclosed Non-Ventilated (TENV) to Totally Enclosed Force Ventilated (TEFV). Other enclosure types, e.g Drip Proof Blower Ventilated or Drip Proof Pipe Ventilated, are available on request.

The ruggedness and reliability of the motors ensure safe operation with long life expectancy. The LAKC Mill Duty motors can also be used in other heavy duty applications.

### BASIC Design Characteristics

- Suitable for operation with adjustable DC voltages from thyristor convertors (230 V - 460 V - 500 V)
- Fully laminated stator, main poles and interpoles
- Fully compensated machines ensuring good commutation also in the field weakening range
- Convertible motors from TEFV (Totally Enclosed Force Ventilated) to TENV (Totally Enclosed Non Ventilated)
- Removable and replaceable shaft with two tapered extensions
- D-end and N-end heavy duty roller bearings
- Easily removable bearing housings
- Insulation class H with temperature rise limited to 110 °C for longer life expectancy
- High dynamic response, with a current change rate of 250 times the nominal current per second
- A large number of options and accessories ensuring high flexibility
- Max armature voltage 500 V



## Technical Data

### Motor Data at U<sub>a</sub> = 230 V

| Frame | TENV S2-60' or TEFV S1 (continuous) |     |                           |              |       |                      | TENV S2-30' |      |                   | TENV S3-30% (3) |     |                   |          |      |                   |       |     |                   |
|-------|-------------------------------------|-----|---------------------------|--------------|-------|----------------------|-------------|------|-------------------|-----------------|-----|-------------------|----------|------|-------------------|-------|-----|-------------------|
|       | Power                               |     | Speed - min <sup>-1</sup> |              |       |                      | Series      |      |                   | Series          |     |                   | Compound |      |                   | Shunt |     |                   |
|       | kW                                  | HP  | Series                    | Compound (1) | Shunt | Adjustable Speed (2) | kW          | HP   | min <sup>-1</sup> | kW              | HP  | min <sup>-1</sup> | kW       | HP   | min <sup>-1</sup> | kW    | HP  | min <sup>-1</sup> |
| 802   | 7.5                                 | 10  | 800                       | 900          | 900   | 900/1800             | 10          | 13.5 | 675               | 7.5             | 10  | 800               | 7        | 9.5  | 940               | 7     | 9   | 1000              |
| 803   | 11                                  | 15  | 725                       | 800          | 800   | 800/2000             | 14          | 19   | 620               | 11              | 15  | 725               | 11       | 14.5 | 840               | 10    | 14  | 880               |
| 804   | 15                                  | 20  | 650                       | 725          | 725   | 725/1800             | 19          | 26   | 580               | 15              | 20  | 650               | 14       | 18.5 | 775               | 13    | 17  | 800               |
| 806   | 22                                  | 30  | 575                       | 650          | 650   | 650/1950             | 29          | 39   | 500               | 22              | 30  | 575               | 21       | 28.5 | 690               | 18    | 25  | 715               |
| 808   | 37                                  | 50  | 525                       | 575          | 575   | 575/1725             | 49          | 65   | 450               | 30              | 40  | 570               | 28       | 37.5 | 625               | 26    | 35  | 630               |
| 810   | 52                                  | 70  | 500                       | 550          | 550   | 550/1650             | 68          | 90   | 440               | 45              | 60  | 550               | 39       | 52.5 | 615               | 34    | 45  | 600               |
| 812   | 75                                  | 100 | 475                       | 515          | 515   | 515/1300             | 101         | 135  | 420               | 64              | 85  | 525               | 56       | 75   | 580               | 45    | 60  | 565               |
| 814   | 110                                 | 150 | 460                       | 500          | 500   | 500/1250             | 150         | 200  | 400               | 86              | 115 | 515               | 82       | 110  | 565               | 64    | 85  | 560               |
| 816   | 150                                 | 200 | 450                       | 480          | 480   | 480/1200             | 199         | 265  | 400               | 110             | 150 | 500               | 105      | 140  | 540               | 82    | 110 | 535               |
| 818   | 187                                 | 250 | 410                       | 435          | 435   | 435/1100             | 244         | 325  | 360               | 139             | 185 | 485               | 124      | 165  | 490               | 98    | 130 | 470               |

- (1) 50% series - 50% shunt or straight shunt
  - (2) A light stabilizing series field may be used as required to obtain these speed ranges.  
Speed variation by field weakening at constant power.
  - (3) Continuously repeated duty cycle of 5 min duration, with 90 sec load.  
Power off for 210 sec with shunt field continuously excited.
- Max. armature voltage 500 V.
  - All motors are laminated yoke, non-split, compensated.

### Motor Characteristics

| Frame | Maximum Mechanical Speed | Rotor GD2         |      | Max Field Power | Motor Weight |      | Air Requirement for TEFV |      |                          |       |                   |       |
|-------|--------------------------|-------------------|------|-----------------|--------------|------|--------------------------|------|--------------------------|-------|-------------------|-------|
|       |                          |                   |      |                 |              |      | Air Flow                 |      | Static Pressure at Inlet |       |                   |       |
|       |                          |                   |      |                 |              |      |                          |      | Drive End                |       | Non-Drive End     |       |
| min-1 | kgm <sup>2</sup>         | lbft <sup>2</sup> | W    | kg              | lb           | m3/h | CFM                      | Pa   | "H <sub>2</sub> O        | Pa    | "H <sub>2</sub> O |       |
| 802   | 3600                     | 1.4               | 8.3  | 450             | 275          | 605  | 270                      | 160  | 250                      | 1     | 130               | 1/2   |
| 803   | 3300                     | 3                 | 18   | 525             | 370          | 810  | 340                      | 200  | 320                      | 1 1/4 | 130               | 1/2   |
| 804   | 3000                     | 6.2               | 36.5 | 900             | 460          | 1010 | 425                      | 250  | 320                      | 1 1/4 | 130               | 1/2   |
| 806   | 2600                     | 10                | 59   | 1100            | 625          | 1375 | 570                      | 340  | 380                      | 1 1/2 | 190               | 3/4   |
| 808   | 2300                     | 20                | 118  | 1400            | 860          | 1890 | 720                      | 430  | 380                      | 1 1/2 | 190               | 3/4   |
| 810   | 2200                     | 29                | 171  | 1500            | 1175         | 2585 | 890                      | 530  | 450                      | 2     | 260               | 1 1/4 |
| 812   | 1900                     | 36                | 212  | 1950            | 1575         | 3465 | 1275                     | 755  | 510                      | 2 1/4 | 380               | 1 3/4 |
| 814   | 1700                     | 70                | 413  | 2250            | 2150         | 4730 | 1530                     | 905  | 570                      | 2 1/4 | 260               | 1 1/4 |
| 816   | 1600                     | 180               | 1060 | 2250            | 2910         | 6400 | 2040                     | 1210 | 640                      | 2 1/2 | 320               | 1 1/2 |
| 818   | 1500                     | 212               | 1250 | 2400            | 3550         | 7810 | 2720                     | 1610 | 760                      | 3     | 380               | 1 3/4 |

### Overloads

### Permissible Stall Current For TENV Motors

| % Load | % Rated Speed |          | % Load | Time    |
|--------|---------------|----------|--------|---------|
|        | at 230 V      | at 460 V |        |         |
| 300    | 200           | 100      | 300    | 15 sec. |
| 250    | 250           | 140      | 200    | 30 sec. |
| 200    | 300           | 200      | 100    | 2 Min.  |
|        |               |          | 50     | 5 Min.  |
|        |               |          | 40     | 1 Hr.   |

## Motor Data for Full, Half and Quarter Speed Motors

| Frame |   | Ua = 230 V |       |      | Ua = 460 V |       |      |
|-------|---|------------|-------|------|------------|-------|------|
|       |   | Speed      | Power |      | Speed      | Power |      |
|       |   | min-1      | kW    | HP   | min-1      | kW    | HP   |
| 802   | F | 900        | 7.5   | 10   | 1885       | 15.5  | 20   |
|       | H | 405        | 3.4   | 4.5  | 900        | 7.6   | 10   |
|       | Q | 160        | 1.3   | 1.7  | 404        | 3.3   | 4.4  |
| 803   | F | 800        | 11    | 15   | 1670       | 23    | 30   |
|       | H | 365        | 5     | 6.6  | 800        | 11    | 15   |
|       | Q | 145        | 2     | 2.6  | 360        | 5     | 6.6  |
| 804   | F | 725        | 15    | 20   | 1510       | 30    | 40   |
|       | H | 330        | 7     | 9.3  | 725        | 15    | 20   |
|       | Q | 125        | 3     | 4    | 330        | 7.5   | 10   |
| 806   | F | 650        | 22    | 30   | 1355       | 46    | 60   |
|       | H | 300        | 10    | 13.3 | 650        | 22    | 30   |
|       | Q | 125        | 4     | 5.3  | 305        | 10.3  | 13.5 |
| 808   | F | 575        | 37    | 50   | 1195       | 76.5  | 100  |
|       | H | 265        | 17    | 22.5 | 575        | 37    | 50   |
|       | Q | 115        | 7.5   | 10   | 275        | 18    | 24   |
| 810   | F | 550        | 52    | 70   | 1140       | 108   | 140  |
|       | H | 255        | 24    | 32   | 550        | 52    | 70   |
|       | Q | 110        | 10.5  | 14   | 260        | 25    | 33   |
| 812   | F | 515        | 75    | 100  | 1070       | 156   | 200  |
|       | H | 240        | 35    | 46.5 | 515        | 75    | 100  |
|       | Q | 110        | 16    | 21   | 260        | 38    | 50   |
| 814   | F | 500        | 110   | 150  | 1045       | 234   | 300  |
|       | H | 230        | 52    | 69   | 500        | 112   | 150  |
|       | Q | 105        | 24    | 32   | 251        | 57    | 75   |
| 816   | F | 480        | 150   | 200  | 1000       | 311   | 400  |
|       | H | 222        | 69    | 92   | 480        | 150   | 200  |
|       | Q | 97         | 30    | 40   | 228        | 71    | 94   |
| 818   | F | 435        | 187   | 250  | 905        | 389   | 500  |
|       | H | 201        | 87    | 116  | 435        | 187   | 250  |
|       | Q | 90         | 39    | 52   | 212        | 92    | 122  |

\* Motor data for TEFV motors only.

Founded over 100 years ago, T-T Electric is a world-class supplier of top-quality industrial electric motors and drives. Pioneers in the industry, we are an experienced and established manufacturer of a comprehensive and cost-effective range of highly reliable drive products. They are used around the world in the toughest of application environments and in all industrial segments.

Driven by customer demand, T-T Electric is continually researching product excellence and manufacturing

process perfection. The flexible product design ensures easy adaptations to customer requirements. This, combined with unequalled short delivery times, make T-T Electric a reference within industry. Our extensive support services include diagnostics and maintenance on site as well as full overhaul in our own repair facilities.

T-T Electric is committed to a working partnership with our customers. For mutual benefit, we focus on complete and innovative solutions together.

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