

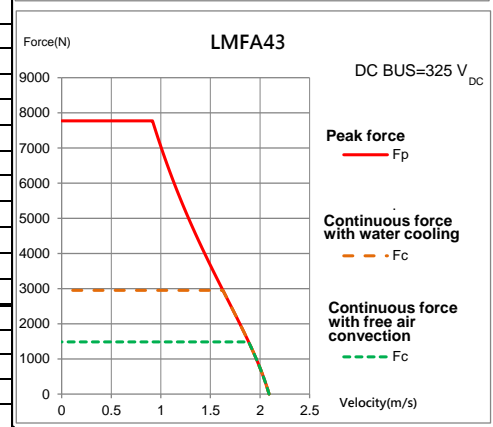
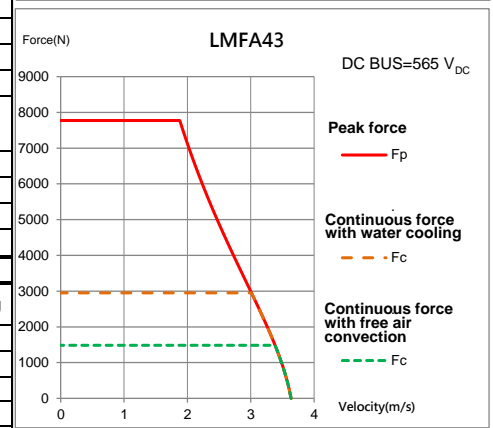
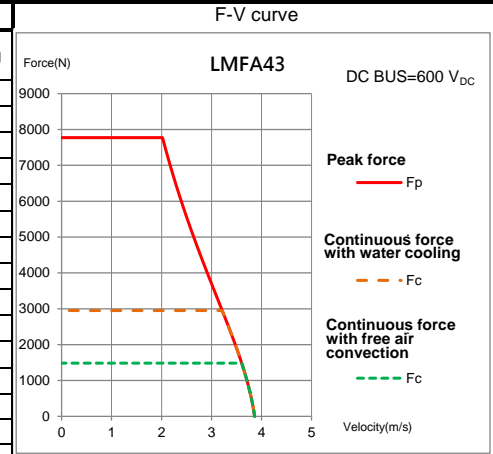
# LMFA43 Linear Motor

| Electrical specifications                    |               |                 |  |               |
|--|---------------|-----------------|--|---------------|
|  | Symbol        | Unit            | Free air convection                        | Water cooling |
| Continuous force                             | $F_c$         | N               | 1484                                       | 2969          |
| Continuous current                           | $I_c$         | $A_{rms}$       | 8.7  | 17.3          |
| Stall force                                  | $F_0$         | N               | -  | 2078          |
| Stall current                                | $I_0$         | $A_{rms}$       | -  | 12.1          |
| Peak force (1s)                              | $F_p$         | N               | -  | 7810          |
| Peak current (1s)                            | $I_p$         | $A_{rms}$       | -  | 53.5          |
| Force constant                               | $K_f$         | $N/A_{rms}$     | -  | 171.4         |
| Attraction force                             | $F_a$         | N               | -  | 15435         |
| Max. winding temperature                     | $T_{max}$     | $^{\circ}C$     | -  | 120           |
| Electrical time constant                     | $K_e$         | ms              | -  | 12            |
| Resistance (line to line · 25 $^{\circ}C$ )  | $R_{25}$      | $\Omega$        | -  | 2             |
| Resistance (line to line · 120 $^{\circ}C$ ) | $R_{120}$     | $\Omega$        | -  | 2.6           |
| Inductance (line to line)                    | $L$           | mH              | -  | 24            |
| Pole pair pitch                              | $2\tau$       | mm              | -  | 46            |
| Back emf constant(line to line)              | $K_v$         | $V_{rms}/(m/s)$ | -  | 98.9          |
| Motor constant (25 $^{\circ}C$ )             | $K_m$         | $N/\sqrt{W}$    | -  | 98.9          |
| Thermal resistance                           | $R_{th}$      | $^{\circ}C/W$   | 0.32                                       | 0.08          |
| Thermal time constant                        | $t_{th}$      | s               | -  | 150           |
| Thermal switch                               |               |                 | 1 x Pt1000 + 1 x (3 PTC SNM 120 In Series) |               |
| Maximum velocity at maximum force            | $V_{MAX,FP}$  | m/s             | -  | 2.61          |
| Maximum electric power input                 | $P_{EL,MAX}$  | W               | -  | 31691         |
| Maximum dissipated heat output               | $Q_{P,H,MAX}$ | W               | -  | 1187          |
| Max. DC bus voltage                          | $V_{DC}$      | V               | -  | 750           |

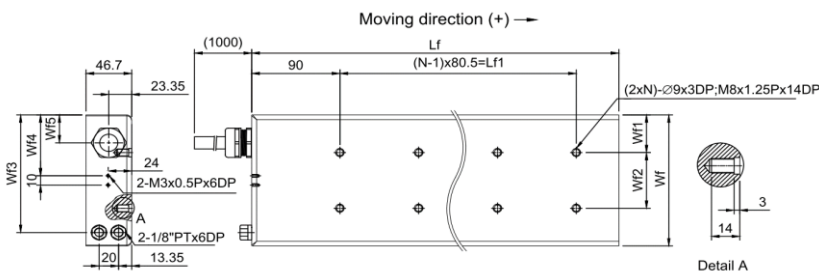
| Mechanical specifications               |                      |             |                     |               |
|---|----------------------|-------------|---------------------|---------------|
|   | Symbol               | Unit        | Free air convection | Water cooling |
| Mass offorcer                           | $M_f$                | kg          | -                   | 23            |
| Unit mass of stator                     | $M_s$                | kg          | -                   | 22.3          |
| Total installation height               | $H$                  | mm          | -                   | 66.1          |
| Minimum flow rate                       |                      | L/min       | -                   | 5.7           |
| Temperature of cooling water            |                      | $^{\circ}C$ | -                   | 20            |
| Pressure drop                           | $\Delta P$           | bar         | -                   | 1.45          |
| Water temperture difference             | $\Delta\theta_{P,H}$ | K           | -                   | 3             |
| <b>Forcer precision cooler</b>          |                      |             |                     |               |
| Maximum dissipated thermal output       | $Q_{FC,Max}$         | W           | -                   | 120           |
| Pressure drop                           | $\Delta P_{FC}$      | bar         | -                   | 1.38          |
| <b>Stator precision cooler</b>          |                      |             |                     |               |
| Maximum dissipated thermal output       | $Q_{SC,Max}$         | W           | -                   | 359           |
| Pressure drop per meter of cooling pipe | $\Delta P_s$         | bar         | -                   | 0.16          |
| Pressure drop per combi distributor     | $\Delta P_{sd}$      | bar         | -                   | 0.85          |
| Pressure drop per coupling point        | $\Delta P_{sp}$      | bar         | -                   | 0.17          |

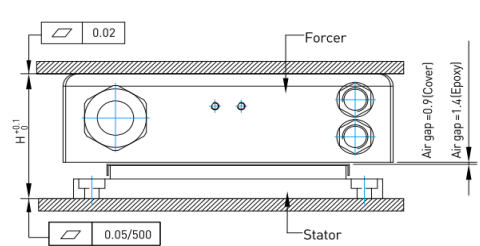
|     |    |       |     |    |       |
|-----|----|-------|-----|----|-------|
| Lf  | mm | 536   | Wf3 | mm | 173.5 |
| Lf1 | mm | 402.5 | Wf4 | mm | 89    |
| Wf  | mm | 188   | Wf5 | mm | 30    |
| Wf1 | mm | 54    | N   | mm | 6     |
| Wf2 | mm | 80    | n   | mm | -     |



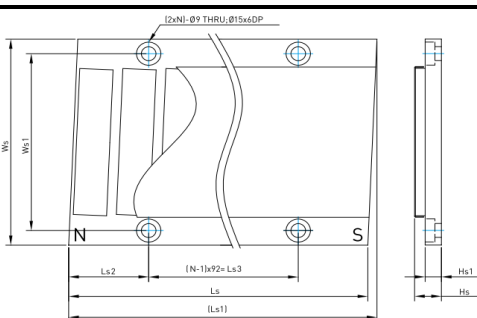
## Forcer dimensions



## Mounting tolerance



## Stator dimensions



| Type    | Ls  | Ls1    | Ls2  | Ls3 | Ls4  | Hs   | Hs1 | Ws  | Ws1 | N |
|---------|-----|--------|------|-----|------|------|-----|-----|-----|---|
| LMF4S1  | 184 | 189.03 | 48.9 | 92  | 18.5 | 12   | 180 | 161 | 2   |   |
| LMF4S1E | 184 | 189.03 | 48.9 | 92  | 18   | 11.8 | 180 | 161 | 2   |   |
| LMF4S2  | 276 | 281.03 | 48.9 | 184 | 18.5 | 12   | 180 | 161 | 3   |   |
| LMF4S2E | 276 | 281.03 | 48.9 | 184 | 18   | 11.8 | 180 | 161 | 3   |   |
| LMF4S3  | 460 | 465.03 | 48.9 | 368 | 18.5 | 12   | 180 | 161 | 5   |   |
| LMF4S3E | 460 | 465.03 | 48.9 | 368 | 18   | 11.8 | 180 | 161 | 5   |   |

Except dimensions, all the specifications in the table are in  $\pm 10\%$  of tolerance

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