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## Synchronous linear motors of

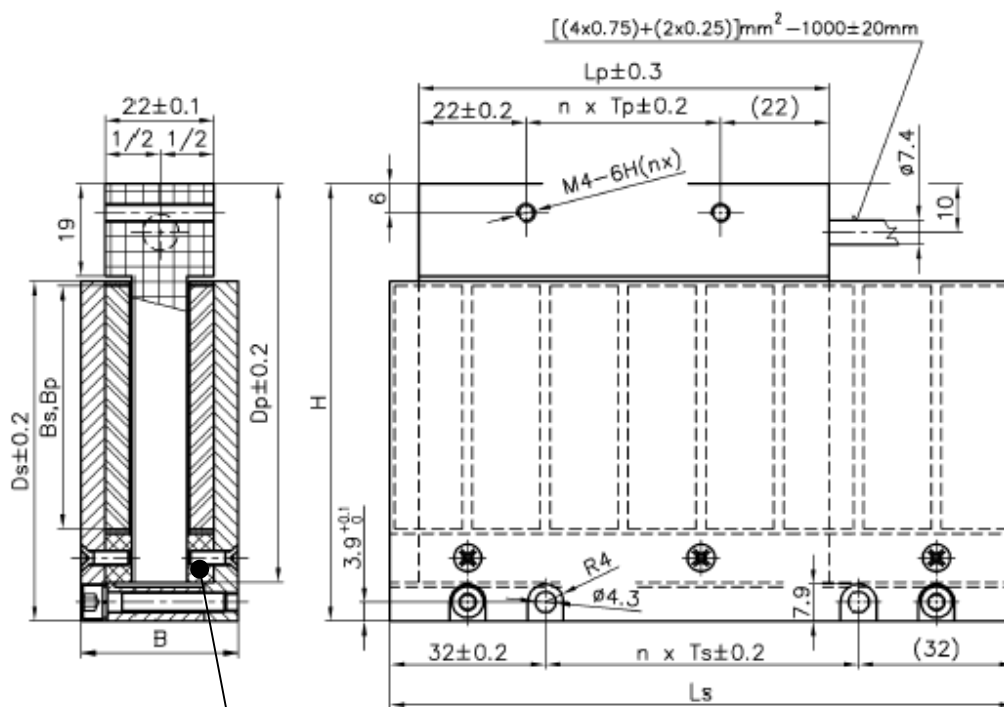
# series LNS

Ironless linear motors for dynamic drives

|                        |                          |
|------------------------|--------------------------|
| Thrust forces          | 80 ÷ 1280 N              |
| Thrust speed           | 0 ÷ 42 m.s <sup>-1</sup> |
| Air cooling            | IC 40                    |
| Temperature class      | F                        |
| Enclosure (electrical) | IP 55                    |

Issue: May 2006<sub>[H1]</sub>.

- ◆ Řada LNS ◆
- ◆ Series LNS ◆
- ◆ Reihe LNS ◆



The linear guiding bars are mounted only in the LNS075P- and LNS100P- type.

**Primární díly / Primary parts / Primärteile**

| Typ / Type / Typ | B <sub>p</sub><br>mm | D <sub>p</sub><br>mm | H<br>mm | L<br>mm | L <sub>p</sub><br>mm | n x T <sub>p</sub><br>mm | m <sub>p</sub> *)<br>kg |
|------------------|----------------------|----------------------|---------|---------|----------------------|--------------------------|-------------------------|
| LNS025P-0314     | 25                   | 56                   | 65      | 80      | 84                   | 1 x 40                   | 0,19                    |
| LNS025P-0614     |                      |                      |         | 160     | 164                  | 3 x 40                   | 0,36                    |
| LNS025P-0914     |                      |                      |         | 240     | 244                  | 5 x 40                   | 0,55                    |
| LNS025P-1214     |                      |                      |         | 320     | 324                  | 7 x 40                   | 0,73                    |
| LNS050P-0314     | 50                   | 81                   | 90      | 80      | 84                   | 1 x 40                   | 0,27                    |
| LNS050P-0614     |                      |                      |         | 160     | 164                  | 3 x 40                   | 0,52                    |
| LNS050P-0914     |                      |                      |         | 240     | 244                  | 5 x 40                   | 0,78                    |
| LNS050P-1214     |                      |                      |         | 320     | 324                  | 7 x 40                   | 1,03                    |
| LNS075P-0314     | 75                   | 106                  | 115     | 80      | 84                   | 1 x 40                   | 0,34                    |
| LNS075P-0614     |                      |                      |         | 160     | 164                  | 3 x 40                   | 0,67                    |
| LNS075P-0914     |                      |                      |         | 240     | 244                  | 5 x 40                   | 1,03                    |
| LNS075P-1214     |                      |                      |         | 320     | 324                  | 7 x 40                   | 1,33                    |
| LNS100P-0314     | 100                  | 131                  | 140     | 80      | 84                   | 1 x 40                   | 0,42                    |
| LNS100P-0614     |                      |                      |         | 160     | 164                  | 3 x 40                   | 0,82                    |
| LNS100P-0914     |                      |                      |         | 240     | 244                  | 5 x 40                   | 1,23                    |
| LNS100P-1214     |                      |                      |         | 320     | 324                  | 7 x 40                   | 1,63                    |

\*) – bez kabelu / without cable / ohne Kabel

**Sekundární díly / Secondary parts / Sekundärteile**

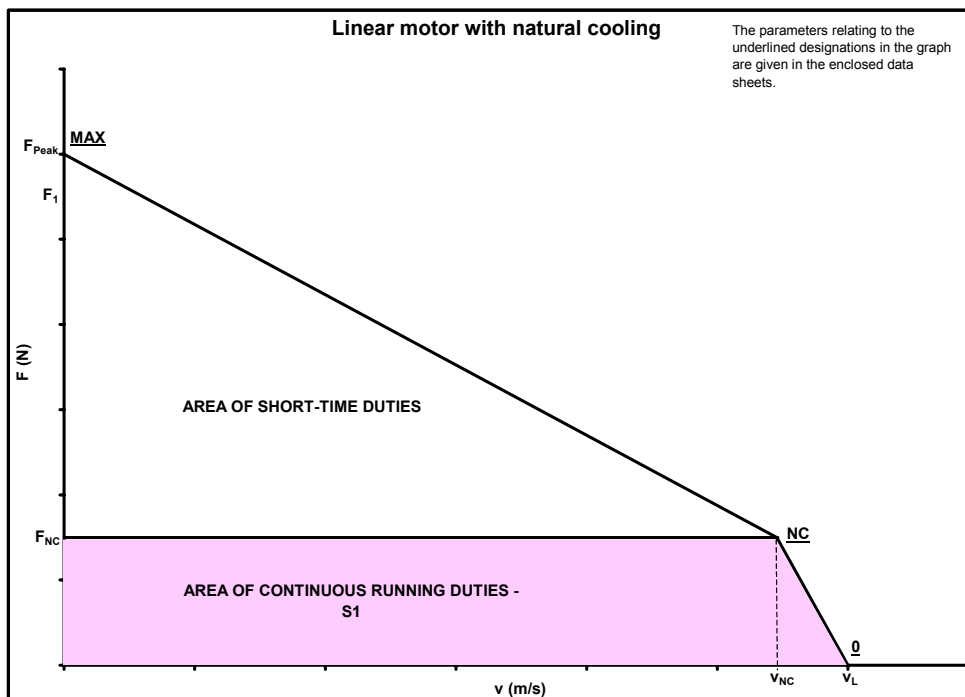
| Typ / Type / Typ | B <sub>s</sub><br>mm | D <sub>s</sub><br>mm | B<br>mm | H<br>mm | L <sub>s</sub><br>mm | n x T <sub>s</sub><br>mm | m <sub>s</sub><br>kg | m <sub>s</sub><br>kgm <sup>-1</sup> |
|------------------|----------------------|----------------------|---------|---------|----------------------|--------------------------|----------------------|-------------------------------------|
| LNS025S-0416     | 25                   | 45                   | 32      | 65      | 64                   | 1 x 32                   | 0,38                 | 6                                   |
| LNS025S-0616     |                      |                      |         |         | 96                   | 2 x 32                   | 0,58                 |                                     |
| LNS025S-1016     |                      |                      |         |         | 160                  | 4 x 32                   | 0,96                 |                                     |
| LNS025S-2016     |                      |                      |         |         | 320                  | 9 x 32                   | 1,92                 |                                     |
| LNS025S-3016     |                      |                      |         |         | 480                  | 14 x 32                  | 2,88                 |                                     |
| LNS050S-0416     | 50                   | 70                   | 32      | 90      | 64                   | 1 x 32                   | 0,64                 | 10                                  |
| LNS050S-0616     |                      |                      |         |         | 96                   | 2 x 32                   | 0,96                 |                                     |
| LNS050S-1016     |                      |                      |         |         | 160                  | 4 x 32                   | 1,60                 |                                     |
| LNS050S-2016     |                      |                      |         |         | 320                  | 9 x 32                   | 3,20                 |                                     |
| LNS050S-3016     |                      |                      |         |         | 480                  | 14 x 32                  | 4,80                 |                                     |
| LNS075S-0416     | 75                   | 95                   | 32      | 115     | 64                   | 1 x 32                   | 0,90                 | 14                                  |
| LNS075S-0616     |                      |                      |         |         | 96                   | 2 x 32                   | 1,34                 |                                     |
| LNS075S-1016     |                      |                      |         |         | 160                  | 4 x 32                   | 2,24                 |                                     |
| LNS075S-2016     |                      |                      |         |         | 320                  | 9 x 32                   | 4,48                 |                                     |
| LNS075S-3016     |                      |                      |         |         | 480                  | 14 x 32                  | 6,71                 |                                     |
| LNS100S-0416     | 100                  | 120                  | 36      | 140     | 64                   | 1 x 32                   | 1,15                 | 18                                  |
| LNS100S-0616     |                      |                      |         |         | 96                   | 2 x 32                   | 1,73                 |                                     |
| LNS100S-1016     |                      |                      |         |         | 160                  | 4 x 32                   | 2,88                 |                                     |
| LNS100S-2016     |                      |                      |         |         | 320                  | 9 x 32                   | 5,75                 |                                     |
| LNS100S-3016     |                      |                      |         |         | 480                  | 14 x 32                  | 8,63                 |                                     |

Technická data / Technical data / Technische Daten

U<sub>DC</sub> = 330 V

| Typ / Type / Typ | F <sub>peak</sub><br>[N] | I <sub>peak</sub><br>[A] | F <sub>1</sub><br>[N] | I <sub>1</sub><br>[A] | v <sub>1</sub><br>[ms <sup>-1</sup> ] | f <sub>1</sub><br>[Hz] | ΔP <sub>1</sub><br>[W] | F <sub>nc</sub><br>[N] | I <sub>nc</sub><br>[A] | v <sub>nc</sub><br>[ms <sup>-1</sup> ] | ΔP <sub>nc</sub><br>[W] | F <sub>A</sub><br>[N]                                       | I <sub>ULT</sub><br>[A] | k <sub>F</sub><br>[NA <sup>-1</sup> ] | k <sub>E</sub><br>[Vsm <sup>-1</sup> ] | R <sub>U-V</sub><br>[W] | L <sub>U-V</sub><br>[mH] | t <sub>el</sub><br>[ms] | k <sub>M</sub><br>[NW <sup>-0,5</sup> ] | R <sub>th</sub><br>[KW <sup>-1</sup> ] | B x H<br>[mm] |
|------------------|--------------------------|--------------------------|-----------------------|-----------------------|---------------------------------------|------------------------|------------------------|------------------------|------------------------|--|-------------------------|---|-------------------------|---------------------------------------|--|-------------------------|--------------------------|-------------------------|---|--|---------------|
| LNS025P-0314-BL  | 80                       | 6,8                      | 20                    | 1,7                   | 25                                    | 780                    | 38                     | 16                     | 1,4                    | 25                                     | 26                      | Attraction force between primary and secondary part is zero | 12                      | 11,7                                  | 6,8                                    | 6,623                   | 3,5                      | 1                       | 3                                       | 4,04                                   | 32x65         |
| LNS025P-0614-BL  | 160                      | 13,7                     | 40                    | 3,4                   | 25                                    | 780                    | 77                     | 31                     | 2,6                    | 25                                     | 46                      |   | 24                      | 11,7                                  | 6,8                                    | 3,312                   | 1,8                      | 1                       | 5                                       | 2,28                                   |               |
| LNS025P-0914-BL  | 240                      | 20,5                     | 60                    | 5,1                   | 25                                    | 780                    | 115                    | 45                     | 3,9                    | 25                                     | 65                      |   | 35                      | 11,7                                  | 6,8                                    | 2,208                   | 1,2                      | 1                       | 6                                       | 1,62                                   |               |
| LNS025P-1214-BL  | 320                      | 27,4                     | 80                    | 6,8                   | 25                                    | 780                    | 153                    | 57                     | 4,8                    | 25                                     | 77                      |   | 47                      | 11,7                                  | 6,8                                    | 1,656                   | 1,0                      | 1                       | 6                                       | 1,36                                   |               |
| LNS050P-0314-CL  | 160                      | 6,8                      | 40                    | 1,7                   | 13                                    | 406                    | 59                     | 33                     | 1,4                    | 13                                     | 39                      | 12  | 23,4                    | 13,5                                  | 10,15                                  | 5,9                     | 1,1                      | 5                       | 2,69                                    | 32x90                                  |               |
| LNS050P-0614-CL  | 320                      | 13,7                     | 80                    | 3,4                   | 13                                    | 406                    | 117                    | 62                     | 2,6                    | 13                                     | 70                      | 24  | 23,4                    | 13,5                                  | 5,073                                  | 3,0                     | 1,1                      | 7                       | 1,50                                    |  |               |
| LNS050P-0914-CL  | 480                      | 20,5                     | 120                   | 5,1                   | 13                                    | 406                    | 176                    | 90                     | 3,9                    | 13                                     | 100                     | 35  | 23,4                    | 13,5                                  | 3,382                                  | 2,0                     | 1,1                      | 9                       | 1,05                                    |  |               |
| LNS050P-1214-CL  | 640                      | 27,4                     | 160                   | 6,8                   | 13                                    | 406                    | 235                    | 113                    | 4,8                    | 13                                     | 117                     | 47  | 23,4                    | 13,5                                  | 2,537                                  | 1,5                     | 1,1                      | 10                      | 0,90                                    |  |               |
| LNS075P-0314-EL  | 240                      | 6,8                      | 60                    | 1,7                   | 8,5                                   | 266                    | 79                     | 49                     | 1,4                    | 8,5                                    | 53                      | 12  | 35,1                    | 20,3                                  | 13,67                                  | 8,3                     | 1,2                      | 7                       | 1,98                                    | 32x115                                 |               |
| LNS075P-0614-EL  | 480                      | 13,7                     | 120                   | 3,4                   | 8,5                                   | 266                    | 158                    | 93                     | 2,6                    | 8,5                                    | 95                      | 24  | 35,1                    | 20,3                                  | 6,835                                  | 4,2                     | 1,2                      | 10                      | 1,11                                    |  |               |
| LNS075P-0914-EL  | 720                      | 20,5                     | 180                   | 5,1                   | 8,5                                   | 266                    | 237                    | 135                    | 3,9                    | 8,5                                    | 134                     | 35  | 35,1                    | 20,3                                  | 4,557                                  | 2,8                     | 1,2                      | 12                      | 0,78                                    |  |               |
| LNS075P-1214-EL  | 960                      | 27,4                     | 240                   | 6,8                   | 8,5                                   | 266                    | 316                    | 170                    | 4,8                    | 8,5                                    | 158                     | 47  | 35,1                    | 20,3                                  | 3,418                                  | 2,1                     | 1,2                      | 13                      | 0,66                                    |  |               |
| LNS100P-0314-FL  | 320                      | 6,8                      | 80                    | 1,7                   | 6,5                                   | 203                    | 99                     | 65                     | 1,4                    | 6,5                                    | 66                      | 12  | 46,8                    | 27,0                                  | 17,19                                  | 10,8                    | 1,3                      | 8                       | 1,59                                    | 36x140                                 |               |
| LNS100P-0614-FL  | 640                      | 13,7                     | 160                   | 3,4                   | 6,5                                   | 203                    | 199                    | 124                    | 2,7                    | 6,5                                    | 120                     | 24  | 46,8                    | 27,0                                  | 8,596                                  | 5,4                     | 1,3                      | 11                      | 0,88                                    |  |               |
| LNS100P-0914-FL  | 960                      | 20,5                     | 240                   | 5,1                   | 6,5                                   | 203                    | 298                    | 181                    | 3,9                    | 6,5                                    | 169                     | 35  | 46,8                    | 27,0                                  | 5,731                                  | 3,6                     | 1,3                      | 14                      | 0,62                                    |  |               |
| LNS100P-1214-FL  | 1280                     | 27,4                     | 320                   | 6,8                   | 6,5                                   | 203                    | 398                    | 225                    | 4,8                    | 6,5                                    | 196                     | 47  | 46,8                    | 27,0                                  | 4,298                                  | 2,7                     | 1,3                      | 16                      | 0,54                                    |  |               |

## Power characteristic for the type LNS



### Used symbols

|   |  |                         |   |
|---|--|-------------------------|---|
| $F_{peak}$ [ N ]  | - highest force developed by the motor (it is used as starting force)  | $L_{U-V}$ [ mH ]        | - inductance of the winding   |
| $F_1$ [ N ]   | - max. force by current $I_1$ and speed $v_1$  | $\tau_{el}$ [ ms ]      | - electromagnetic time constant of the motor  |
| $v_1$ [ m/s ]   | - speed of the motor by current $I_1$ and force $F_1$  | $U_{BUS}$ [ V ]         | - DC voltage of intermediate circuit of the frequency converter for which the motor is produced |
| $F_1$ , $I_1$ and $v_1$ values determine the transition point of the motor. |  | $k_F$ [ N/A ]           | - force constant of the motor   |
| $F_{NC}$ [ N ]  | - force being developed by the motor continuously at the air cooling by the motor surface  | $k_E$ [ Vs/m ]          | - voltage constant of the motor   |
| $F_A$ [ N ]   | - attractive force between the primary and secondary parts of the motor  | $k_M$ [ N/ $\sqrt{W}$ ] | - constant of the motor   |
| $I_{peak}$ [ A ]  | - current corresponding to the force $F_{peak}$  | $v_L$ [ m/s ]           | - theoretic no-load velocity  |
| $I_1$ [ A ]   | - maximum short-time permissible current (r.m.s. value) which is given by the intersection of current limitation of the servomotor and of limitation by the rated voltage of the converter | $\Delta P_1$ [ W ]      | - motor losses corresponding to the force $F_1$ at the winding temperature of 130°C             |
| $I_{NC}$ [ A ]  | - current corresponding to the force $F_{NC}$  | $\Delta P_{NC}$ [ W ]   | - motor losses corresponding to the force $F_{NC}$ at the winding temperature of 130°C          |
| $R_{U-V}$ [ $\Omega$ ]  | - resistance of the motor winding at 20°C  | $m_p$ [ kg ]            | - mass of the primary part of the motor   |
|   |  | $m_s$ [ kg ]            | - mass of the secondary part of the motor   |
|   |  | $f_1$ [ Hz ]            | - supply current frequency corresponding to the velocity $v_1$                                  |
|   |  | $I_{lit}$ [ A ]         | - supply current the exceeding of which brings about demagnetization of magnets                 |