

Datasheet for linear direct drive PPU-E55-Z-Achse and servo drive Indradrive Cs  
Type of motor PPU-E55-Z-Achse  
Type of axis PPU-E55-Z-Achse  
Date of creation: 21.06.2018



| Description | Symbol | Unit |  | comment |
|-------------|--------|------|--|---------|
|-------------|--------|------|--|---------|

#### Electrical data

|          |                                   |                             |        |        |  |
|----------|-----------------------------------|-----------------------------|--------|--------|--|
| S-0-0141 | Type of axis                      |                             |        |        |  |
| P-0-4014 | Type of motor                     | Linear synchron motor       |        | 0200h  |  |
| P-0-0512 | Temperature sensor                |                             |        | 3      |  |
|          | PWM frequency                     |                             | kHz    | 4      |  |
| S-0-0111 | Motor idle current (eff.)         | $I_d$                       | A      | 4,7    |  |
|          | Nominal motor force               | $F_{\text{nom}}$            | N      | 525    | with temperature increase of 65 K inside motor   |
|          | Power loss                        | $P_{\text{const}}$          | W      | 177,7  | with temperature increase of 65 K inside motor   |
| S-0-0109 | Motor peak current (eff.)         | $I_{\text{max}}$            | A      | 17     |  |
|          | Motor peak force                  | $F_{\text{max}}$            | N      | 1200   |  |
| S-0-0092 | Bipolar force limit value         |                             | %      | 361,7  |  |
| P-0-0109 | Force peak limit                  |                             | %      | 361,7  |  |
| P-0-0051 | Force constant                    | $k_t$                       | N/A    | 112    |  |
|          | Motor constant                    | $K_m$                       | N/V    | 39,4   |  |
|          | BEMF (velocity 1 m/s)             | $K_e$ (Phase-Phase)         | V/SS   | 210    |  |
|          | Thermal resistance                | $R_{th}$                    | K/W    | 0,37   | temperature increase (65 K) / $P_{\text{const}}$ |
| S-0-0113 | Maximum motor speed               | $v_{\text{max}}$            | mm/min | 240000 |  |
|          | Max. frequency                    | $f_{\text{max}}$            | Hz     | 142,3  |  |
| P-0-0018 | Number of pole pairs per distance | PWT (Npol-Npol)             | mm     | 28,1   |  |
|          | Poles                             |                             |        | 7      |  |
|          | Type of circuit                   |                             |        | Y      |  |
|          | Max. intermediate circuit voltage | $U_{DC}$                    | V      | 900    |  |
|          | Inductance                        | $L_{U-V}, L_{V-W}, L_{W-U}$ | mH     | 48,00  |  |
| P-0-4016 | Motor series inductance           |                             | mH     | 24,00  |  |
| P-0-4017 | Motor shunt inductance            |                             | mH     | 24,00  |  |
| P-0-4048 | Winding resistance by 25 °C       | $R_{U-V}, R_{V-W}, R_{W-U}$ | Ohm    | 4,30   |  |
|          | Winding resistance by 90 °C       | $R_{U-V}, R_{V-W}, R_{W-U}$ | Ohm    | 5,4    |  |
|          | Electrical time constant          |                             | ms     | 11,2   |  |
|          | Type of temperature sensor        |                             |        | KTY    |  |
| S-0-0201 | Motor warning temperature         |                             | °C     | 85     |  |
| S-0-0204 | Motor shutdown temperature        |                             | °C     | 90     |  |
|          | Insulation class                  |                             |        | F      |  |

#### Mechanical Data

|  |                                    |  |      |      |                     |
|--|------------------------------------|--|------|------|---------------------|
|  | Mass primary part without carriage |  | kg   | 0    |                     |
|  | Mass carriage                      |  | kg   | 0    |                     |
|  | Total mass primary part            |  | kg   | 0    |                     |
|  | Total mass rail                    |  | kg/m | 10,4 | without attachments |

#### Control parameters without mass moment of inertia

|          |                                     |    |     |      |  |
|----------|-------------------------------------|----|-----|------|--|
| S-0-0106 | Current loop proportional gain      |    | V/A | 27   |  |
| S-0-0107 | Current loop integral action time   |    | ms  | 10   |  |
| S-0-0104 | Position loop KV-Factor             | kv |     | 1    |  |
| P-0-0004 | Velocity loop smoothing time const. |    |     | 900  |  |
| S-0-0100 | Velocity loop proportional gain     | kp |     | 0,02 |  |
| S-0-0101 | Velocity loop integral action time  | TN |     | 5    |  |

#### Parameter of position

|          |                          |  |    |        |  |
|----------|--------------------------|--|----|--------|--|
| S-0-0277 | Position feedback 1 type |  |    | 1001 b |  |
| S-0-0278 | Maximum travel range     |  | mm | 4000   |  |

#### Encoder Feedback

|                            |                       |     |          |                     |            |  |
|----------------------------|-----------------------|-----|----------|---------------------|------------|--|
|                            | Measurement principle |     | magnetic | absolut magnetic    | optical    |  |
|                            | Type of sensor        |     | LE100    | TTK 70              | LIA 22     |  |
|                            |                       |     |          |                     | DOUBLEFLEX |  |
|                            | Tape measure          |     | MB100    | MBA 111             | SINGLEFLEX |  |
|                            | Manufacturer          |     | SIKO     | Sick Stegmann       | NUMERIK    |  |
|                            | Grating period        | μm  | 1000     | 1000                | 20         |  |
|                            | Supply voltage        | V   | 5        | 7-12                | 5          |  |
|                            | Waveform              |     | sin/cos  | sin/cos / Hiperface | sin/cos    |  |
|                            | Reference mark        |     | periodic | --                  | periodic   |  |
|                            | Reference mark pitch  | mm  | 20       | --                  | 50         |  |
|                            | Signal amplitude      | Vss | 1        | 1                   | 1          |  |
| S-0-0116 /<br>S-0-0602.1.3 | Feedback resolution   | mm  | 1,00     | 1,00                | 0,02       |  |

Motor connection

| Connector  | Connector                  | Contact          |
|--|----------------------------|------------------|
| Tyco Electronic                                    | U                          | thick 1          |
| Typ: 923   | V                          | thick 4          |
|  | W                          | thick 3          |
|  | GND                        | thick 2          |
| Series connection of 3* temperature switch and KTY | Switch 105 °C ; KTY 84-130 | thin C<br>thin D |

Thermal motor protection

|                | Sensor1    | Sensor2         |
|----------------|------------|-----------------|
| Type           | NTC        | Switch          |
| Type           | KTY 84-130 | normally closed |
| Characteristic | Datasheet  | 105 °C          |

Motor feedback

| Feedback      | Signal           | LE100      | TTK 70     | LIA 22     |  |
|---------------|------------------|------------|------------|------------|--|
|               |                  | Sub D plug | Sub D plug | Sub D plug |  |
|               | 0V Sense         | 15         |            |            |  |
|               | Ref - / EncData- | 10         | 8          | 4          |  |
|               | Ref + / EncData+ | 9          | 7          | 12         |  |
|               | /B (COS-)        | 6          | 6          | 6          |  |
|               | B(COS+)          | 5          | 5          | 14         |  |
|               | A(SIN+)          | 2          | 2          | 13         |  |
|               | /A(SIN-)         | 3          | 3          | 5          |  |
|               | N.C.             |            |            |            |  |
|               | GND (0V)         | 4          | 4          | 9          |  |
|               | N.C.             |            |            |            |  |
|               | Ucc              | 12         | 11         | 8          |  |
|               | N.C.             |            |            |            |  |
|               | GND (Schirm)     |            |            |            |  |
|               | N.C.             |            |            |            |  |
| Adapter cable | ID               | direct     | direct     | 357798     |  |