



Figure similar

SIMATIC S7-300, Analog input SM 331, isolated, 8 AI thermocouples Type B, E, J, K, L, N, R, S, T TXK/TXK (L) according to GOST 16 bit, 50ms, 1x 40-pole

| Supply voltage                                                        |                                                                  |
|-----------------------------------------------------------------------|------------------------------------------------------------------|
| Load voltage L+                                                       |                                                                  |
| • Rated value (DC)                                                    | 24 V                                                             |
| • Reverse polarity protection                                         | Yes                                                              |
| Input current                                                         |                                                                  |
| from load voltage L+ (without load), max.                             | 240 mA                                                           |
| from backplane bus 5 V DC, max.                                       | 100 mA                                                           |
| Power loss                                                            |                                                                  |
| Power loss, typ.                                                      | 3 W                                                              |
| Analog inputs                                                         |                                                                  |
| Number of analog inputs                                               | 8                                                                |
| permissible input voltage for voltage input (destruction limit), max. | 75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20) |
| Constant measurement current for resistance-type transmitter, typ.    | 0.7 mA                                                           |
| Input ranges                                                          |                                                                  |
| • Voltage                                                             | No                                                               |
| • Current                                                             | No                                                               |
| • Thermocouple                                                        | Yes                                                              |
| • Resistance thermometer                                              | No                                                               |
| • Resistance                                                          | No                                                               |
| Input ranges (rated values), voltages                                 |                                                                  |
| • 0 to +10 V                                                          | No                                                               |
| • 1 V to 5 V                                                          | No                                                               |
| • 1 V to 10 V                                                         | No                                                               |
| • -1 V to +1 V                                                        | No                                                               |
| • -10 V to +10 V                                                      | No                                                               |
| • -2.5 V to +2.5 V                                                    | No                                                               |
| • -250 mV to +250 mV                                                  | No                                                               |
| • -5 V to +5 V                                                        | No                                                               |
| • -50 mV to +50 mV                                                    | No                                                               |
| • -500 mV to +500 mV                                                  | No                                                               |
| • -80 mV to +80 mV                                                    | No                                                               |
| Input ranges (rated values), currents                                 |                                                                  |
| • 0 to 20 mA                                                          | No                                                               |
| • -10 mA to +10 mA                                                    | No                                                               |
| • -20 mA to +20 mA                                                    | No                                                               |

|                                                               |                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • -3.2 mA to +3.2 mA                                          | No                                                                                                                                                                                                                                                                                                                                           |
| • 4 mA to 20 mA                                               | No                                                                                                                                                                                                                                                                                                                                           |
| <b>Input ranges (rated values), thermocouples</b>             |                                                                                                                                                                                                                                                                                                                                              |
| • Type B                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type C                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type E                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type J                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type K                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type L                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type N                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type R                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type S                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type T                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type U                                                      | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Type TXK/TXK(L) to GOST                                     | Yes                                                                                                                                                                                                                                                                                                                                          |
| <b>Input ranges (rated values), resistance thermometer</b>    |                                                                                                                                                                                                                                                                                                                                              |
| • Cu 10                                                       | No                                                                                                                                                                                                                                                                                                                                           |
| • Ni 100                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| • Ni 1000                                                     | No                                                                                                                                                                                                                                                                                                                                           |
| • LG-Ni 1000                                                  | No                                                                                                                                                                                                                                                                                                                                           |
| • Ni 120                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| • Ni 200                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| • Ni 500                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| • Pt 100                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| • Pt 1000                                                     | No                                                                                                                                                                                                                                                                                                                                           |
| • Pt 200                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| • Pt 500                                                      | No                                                                                                                                                                                                                                                                                                                                           |
| <b>Input ranges (rated values), resistors</b>                 |                                                                                                                                                                                                                                                                                                                                              |
| • 0 to 150 ohms                                               | No                                                                                                                                                                                                                                                                                                                                           |
| • 0 to 300 ohms                                               | No                                                                                                                                                                                                                                                                                                                                           |
| • 0 to 600 ohms                                               | No                                                                                                                                                                                                                                                                                                                                           |
| • 0 to 6000 ohms                                              | No                                                                                                                                                                                                                                                                                                                                           |
| <b>Thermocouple (TC)</b>                                      |                                                                                                                                                                                                                                                                                                                                              |
| <b>Temperature compensation</b>                               |                                                                                                                                                                                                                                                                                                                                              |
| — parameterizable                                             | Yes                                                                                                                                                                                                                                                                                                                                          |
| — internal temperature compensation                           | Yes                                                                                                                                                                                                                                                                                                                                          |
| — external temperature compensation with Pt100                | Yes                                                                                                                                                                                                                                                                                                                                          |
| — external temperature compensation with compensations socket | Yes                                                                                                                                                                                                                                                                                                                                          |
| — for definable comparison point temperature                  | Yes                                                                                                                                                                                                                                                                                                                                          |
| <b>Characteristic linearization</b>                           |                                                                                                                                                                                                                                                                                                                                              |
| • parameterizable                                             | Yes                                                                                                                                                                                                                                                                                                                                          |
| — for thermocouples                                           | Type B, E, J, K, L, N, R, S, T, U, C                                                                                                                                                                                                                                                                                                         |
| <b>Cable length</b>                                           |                                                                                                                                                                                                                                                                                                                                              |
| • shielded, max.                                              | 100 m                                                                                                                                                                                                                                                                                                                                        |
| <b>Analog value generation for the inputs</b>                 |                                                                                                                                                                                                                                                                                                                                              |
| <b>Integration and conversion time/resolution per channel</b> |                                                                                                                                                                                                                                                                                                                                              |
| • Resolution with overrange (bit including sign), max.        | 16 bit; Two's complement                                                                                                                                                                                                                                                                                                                     |
| • Integration time, parameterizable                           | Yes                                                                                                                                                                                                                                                                                                                                          |
| • Basic conversion time (ms)                                  | Up to 4 channels: 10 ms per module, 5 channels upwards: 190 ms per module                                                                                                                                                                                                                                                                    |
| <b>Errors/accuracies</b>                                      |                                                                                                                                                                                                                                                                                                                                              |
| <b>Operational error limit in overall temperature range</b>   |                                                                                                                                                                                                                                                                                                                                              |
| • Thermocouple, relative to input range, (+/-)                | Type T: $\pm 0.18\%$ , Type U: $\pm 0.15\%$ , Type E: $\pm 0.12\%$ , Type J: $\pm 0.12\%$ , Type L: $\pm 0.17\%$ , Type K: $\pm 0.15\%$ , Type N: $\pm 0.17\%$ , Type R: $\pm 0.08\%$ , Type S: $\pm 0.10\%$ , Type B: $\pm 0.13\%$ , Type C: $\pm 0.10\%$ , TXK/XK(L): $\pm 1.00\%$ accuracy in the lower range of the characteristic curve |
| <b>Basic error limit (operational limit at 25 °C)</b>         |                                                                                                                                                                                                                                                                                                                                              |
| • Thermocouple, relative to input range, (+/-)                | Type T: $\pm 0.13\%$ , Type U: $\pm 0.08\%$ , Type E: $\pm 0.05\%$ , Type J: $\pm 0.04\%$ ,                                                                                                                                                                                                                                                  |

Type L:  $\pm 0.06\%$ , Type K:  $\pm 0.04\%$ , Type N:  $\pm 0.04\%$ , Type R:  $\pm 0.03\%$ ,  
Type S:  $\pm 0.03\%$ , Type B:  $\pm 0.05\%$ , Type C:  $\pm 0.02\%$ , TXK/XK(L):  $\pm 0.67\%$  accuracy in the lower range of the characteristic curve

#### Interrupts/diagnostics/status information

|                                   |                                       |
|-----------------------------------|---------------------------------------|
| Diagnostics function              | Yes; Parameterizable                  |
| Alarms                            |                                       |
| • Diagnostic alarm                | Yes; Parameterizable per group        |
| • Limit value alarm               | Yes; Parameterizable                  |
| • Hardware interrupt              | Yes; Parameterizable, channels 0 to 7 |
| Diagnoses                         |                                       |
| • Diagnostic information readable | Yes                                   |
| Diagnostics indication LED        |                                       |
| • Group error SF (red)            | Yes                                   |

#### Potential separation

|                                                                |     |
|----------------------------------------------------------------|-----|
| Potential separation analog inputs                             |     |
| • between the channels                                         | Yes |
| • between the channels, in groups of                           | 2   |
| • between the channels and backplane bus                       | Yes |
| • between the channels and the power supply of the electronics | Yes |

#### Isolation

|                       |          |
|-----------------------|----------|
| Isolation tested with | 500 V DC |
|-----------------------|----------|

#### Connection method

|                          |        |
|--------------------------|--------|
| required front connector | 40-pin |
|--------------------------|--------|

#### Dimensions

|        |        |
|--------|--------|
| Width  | 40 mm  |
| Height | 125 mm |
| Depth  | 120 mm |

#### Weights

|                 |       |
|-----------------|-------|
| Weight, approx. | 272 g |
|-----------------|-------|

last modified:

3/2/2021 