



Figure similar

SIMATIC S7-300, Analog input SM 331, isolated, 8 AI; +/-5/10V, 1-5 V, +/-20 mA, 0/4 to 20 mA, 16 bit, Single rooting (60 V COM.), 4-channel operation: 10 ms, 8-channel operation: 23-95ms, 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.                             | 200 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; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20) |
| permissible input current for current input (destruction limit), max. | 40 mA                                                               |
| Input ranges                                                          |                                                                     |
| • Voltage                                                             | Yes                                                                 |
| • Current                                                             | Yes                                                                 |
| • Thermocouple                                                        | No                                                                  |
| • Resistance thermometer                                              | No                                                                  |
| • Resistance                                                          | No                                                                  |
| Input ranges (rated values), voltages                                 |                                                                     |
| • 0 to +10 V                                                          | No                                                                  |
| • 1 V to 5 V                                                          | Yes                                                                 |
| — Input resistance (1 V to 5 V)                                       | 10 MΩ                                                               |
| • 1 V to 10 V                                                         | No                                                                  |
| • -1 V to +1 V                                                        | No                                                                  |
| • -10 V to +10 V                                                      | Yes                                                                 |
| — Input resistance (-10 V to +10 V)                                   | 10 MΩ                                                               |
| • -2.5 V to +2.5 V                                                    | No                                                                  |
| • -250 mV to +250 mV                                                  | No                                                                  |
| • -5 V to +5 V                                                        | Yes                                                                 |
| — Input resistance (-5 V to +5 V)                                     | 10 MΩ                                                               |
| • -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                                                          | Yes                                                                 |
| — Input resistance (0 to 20 mA)                                       | 250 Ω                                                               |
| • -10 mA to +10 mA                                                    | No                                                                  |

|                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• -20 mA to +20 mA <ul style="list-style-type: none"> <li>— Input resistance (-20 mA to +20 mA)</li> </ul> </li> <li>• -3.2 mA to +3.2 mA</li> <li>• 4 mA to 20 mA <ul style="list-style-type: none"> <li>— Input resistance (4 mA to 20 mA)</li> </ul> </li> </ul> | Yes<br>250 Ω<br>No<br>Yes<br>250 Ω                                                                                                                                                                                                              |
| Input ranges (rated values), thermocouples                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Type B</li> <li>• Type C</li> <li>• Type E</li> <li>• Type J</li> <li>• Type K</li> <li>• Type L</li> <li>• Type N</li> <li>• Type R</li> <li>• Type S</li> <li>• Type T</li> <li>• Type U</li> <li>• Type TXK/TXK(L) to GOST</li> </ul>                          | No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No                                                                                                                                                                            |
| Input ranges (rated values), resistance thermometer                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Cu 10</li> <li>• Ni 100</li> <li>• Ni 1000</li> <li>• LG-Ni 1000</li> <li>• Ni 120</li> <li>• Ni 200</li> <li>• Ni 500</li> <li>• Pt 100</li> <li>• Pt 1000</li> <li>• Pt 200</li> <li>• Pt 500</li> </ul>                                                        | No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No                                                                                                                                                                                  |
| Input ranges (rated values), resistors                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> <li>• 0 to 300 ohms</li> <li>• 0 to 600 ohms</li> <li>• 0 to 6000 ohms</li> </ul>                                                                                                                                                              | No<br>No<br>No<br>No                                                                                                                                                                                                                            |
| Cable length                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>                                                                                                                                                                                                                                         | 200 m                                                                                                                                                                                                                                           |
| Analog value generation for the inputs                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                 |
| Integration and conversion time/resolution per channel                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> <li>• Basic conversion time (ms)</li> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> </ul>                                | 16 bit; Unipolar: 15/15/15/15 bit; bipolar: 15 bit + sign/15 bit + sign/15 bit + sign/15 bit + sign<br>Yes; 23 / 72 / 83 / 95 ms<br>10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)<br>400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz |
| Encoder                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                 |
| Connection of signal encoders                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• for voltage measurement</li> <li>• for current measurement as 2-wire transducer</li> <li>• for current measurement as 4-wire transducer</li> </ul>                                                                                                                | Yes<br>Yes; with external transmitter, current supply; possible with separate supply for transmitter<br>Yes                                                                                                                                     |
| Errors/accuracies                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Operational error limit in overall temperature range                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> </ul>                                                                                                                                                             | 0.1 %<br>0.1 %                                                                                                                                                                                                                                  |
| Basic error limit (operational limit at 25 °C)                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> </ul>                                                                                                                                                             | 0.05 %<br>0.05 %                                                                                                                                                                                                                                |
| Interrupts/diagnostics/status information                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                 |
| Diagnostics function                                                                                                                                                                                                                                                                                       | Yes; Parameterizable                                                                                                                                                                                                                            |
| Alarms                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                 |

|                                                                |                                                                                              |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| • Diagnostic alarm                                             | Yes; Parameterizable                                                                         |
| • Limit value alarm                                            | Yes; Parameterizable all channels (end of cycle interrupt is also supported across modules)  |
| • Hardware interrupt                                           | Yes; Parameterizable, channels 0 to 7 (on exceeding limit value), at end of cycle            |
| <b>Diagnoses</b>                                               |                                                                                              |
| • Diagnostic information readable                              | Yes                                                                                          |
| <b>Diagnostics indication LED</b>                              |                                                                                              |
| • Group error SF (red)                                         | Yes                                                                                          |
| <b>Potential separation</b>                                    |                                                                                              |
| <b>Potential separation analog inputs</b>                      |                                                                                              |
| • 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                                                                                          |
| <b>Isolation</b>                                               |                                                                                              |
| Isolation tested with                                          | 500 V AC                                                                                     |
| <b>connection method</b>                                       |                                                                                              |
| required front connector                                       | 40-pin                                                                                       |
| <b>Dimensions</b>                                              |                                                                                              |
| Width                                                          | 40 mm                                                                                        |
| Height                                                         | 125 mm                                                                                       |
| Depth                                                          | 117 mm                                                                                       |
| <b>Weights</b>                                                 |                                                                                              |
| Weight, approx.                                                | 272 g                                                                                        |
| <b>last modified:</b>                                          | 3/12/2024  |