

# Product datasheet

Specifications



## Motion control modules, Modicon Premium, 7.2 to 11.5W, 8ms to 10ms, for servomotors, limited and infinite axis

TSXCAY22

⚠ Discontinued

⚠ Discontinued on: 13 April 2022

⚠ To be end-of-service on: 31 December 2026

### Main

|                              |                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Range of product             | Modicon Premium Automation platform                                                                                                                                                                                    |
| Product or component type    | Motion control modules                                                                                                                                                                                                 |
| Product specific application | For servo motors                                                                                                                                                                                                       |
| Servo loop type              | Proportional to overshoot compensation and gain switching 2 ms                                                                                                                                                         |
| Checks                       | Presence of voltage/sensor feedback counter input<br>Consistency of commands<br>Encoder coupling, servo drive present, emergency stop<br>Proper execution of movement<br>Sensor power supply<br>Validity of parameters |

### Complementary

|                                  |                                                                                                                                                                                                                             |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Speed profile path               | Trapezoidal or parabolic                                                                                                                                                                                                    |
| Resolution                       | >= 0.5 position units per point<br><= 1000 position units per point                                                                                                                                                         |
| Length of axis                   | 256...32000000 P                                                                                                                                                                                                            |
| Acquisition speed                | <= 270000 points/mn<br>>= 54000 points/mn                                                                                                                                                                                   |
| Acceleration time                | 8 ms...10 s                                                                                                                                                                                                                 |
| Operating mode                   | FOLLOWER<br>OFF<br>Direct drive mode<br>Manual<br>Automatic                                                                                                                                                                 |
| Type of axis                     | Following axis dynamic ratio<br>Limited axis<br>Infinite axis                                                                                                                                                               |
| Function of module               | Cut on the fly<br>Servo drive offset correction                                                                                                                                                                             |
| I/O modularity                   | 2 axes                                                                                                                                                                                                                      |
| Input compatibility              | Incremental encoder 10...30 V totem pole<br>Incremental encoder 5 V DC RS422<br>With 2-wire/3-wire sensor (24 DC) auxiliary input<br>Absolute encoder parallel output ABE7CPA11<br>Absolute encoder SSI output 12...25 bits |
| Clock frequency                  | 200 kHz SSI absolute encoder                                                                                                                                                                                                |
| Incremental encoder frequency x1 | 500 kHz                                                                                                                                                                                                                     |

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

|                                          |                                                                                                                                                                                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Incremental encoder frequency x 4</b> | 1000 kHz in counting<br>250 kHz in input                                                                                                                                                  |
| <b>Power dissipation in W</b>            | 7.2...11.5 W                                                                                                                                                                              |
| <b>Input type</b>                        | Current sink auxiliary input conforming to EN/IEC 1131 Type 2<br>Resistive servo drive control input conforming to EN/IEC 1131 Type 1<br>Resistive counter input                          |
| <b>Input logic</b>                       | Positive                                                                                                                                                                                  |
| <b>Input voltage</b>                     | 24 V 8 mA auxiliary input<br>24 V 8 mA servo drive control input<br>5 V 18 mA counter input                                                                                               |
| <b>Input voltage limits</b>              | <= 5.5 V counter input<br>19...30 V auxiliary input<br>19...30 V servo drive control input                                                                                                |
| <b>Voltage state 1 guaranteed</b>        | >= 11 V for auxiliary input<br>>= 11 V for servo drive control input<br>>= 2.4 V for counter input                                                                                        |
| <b>Current state 1 guaranteed</b>        | >= 3.5 mA (servo drive control input)<br>>= 3.7 mA (counter input)<br>>= 6 mA (auxiliary input)                                                                                           |
| <b>Voltage state 0 guaranteed</b>        | <= 1.2 V for counter input<br><= 5 V for auxiliary input<br><= 5 V for servo drive control input                                                                                          |
| <b>Current state 0 guaranteed</b>        | <= 1 mA (counter input)<br><= 1.5 mA (servo drive control input)<br><= 2 mA (auxiliary input)                                                                                             |
| <b>Input impedance</b>                   | 270 Ohm for counter input<br>3000 Ohm for auxiliary input<br>3000 Ohm for servo drive control input                                                                                       |
| <b>Number of outputs</b>                 | 2 reflex output static conforming to EN/IEC 61131<br>2 analogue output static<br>2 servo drive validation output relay                                                                    |
| <b>Analogue output range</b>             | +/- 10...24 V                                                                                                                                                                             |
| <b>Analogue output resolution</b>        | 13 bits + sign                                                                                                                                                                            |
| <b>LSB value</b>                         | 1.25 mV for analogue output                                                                                                                                                               |
| <b>Output voltage</b>                    | 24 V DC reflex output:<br>24 V DC servo drive validation output:                                                                                                                          |
| <b>Output voltage limits</b>             | Reflex output: 19...30 V<br>Servo drive validation output: 5...30 V                                                                                                                       |
| <b>Nominal output current</b>            | 0.5 A for reflex output                                                                                                                                                                   |
| <b>Maximum output current</b>            | 1.5 mA analogue output<br>200 mA servo drive validation output<br>625 mA reflex output                                                                                                    |
| <b>Minimum load</b>                      | 1 mA 1 V                                                                                                                                                                                  |
| <b>Maximum voltage drop</b>              | <1 V at state on for reflex output                                                                                                                                                        |
| <b>Maximum leakage current</b>           | 0.3 mA for reflex output                                                                                                                                                                  |
| <b>Switching time</b>                    | < 5 ms for servo drive validation<br>< 500 µs for reflex output                                                                                                                           |
| <b>Output compatibility</b>              | Positive logic DC inputs (resistance <= 15 kOhm) for reflex                                                                                                                               |
| <b>Short-circuit protection</b>          | Current limiter reflex output<br>Thermal tripping reflex output                                                                                                                           |
| <b>Output overload protection</b>        | Current limiter reflex output<br>Thermal tripping reflex output                                                                                                                           |
| <b>Output overvoltage protection</b>     | Zener diode between outputs and 24 DC reflex output                                                                                                                                       |
| <b>Reverse polarity protection</b>       | Reflex output: reverse diode on supply                                                                                                                                                    |
| <b>Local signalling</b>                  | 1 LED (green) for module operating (RUN)<br>1 LED (red) for external fault (I/O)<br>1 LED (red) for internal fault, module failure (ERR)<br>2 LEDs (green) for axis diagnostics available |
| <b>Electrical connection</b>             | 1 connector HE-10 with 20 pins for aux inputs, reflex output, for external sensor and preactuator power supply                                                                            |

|                     |                                                                                                                                                                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | 1 connector HE-10 with 20 pins for servo drive ctrl inputs + for ext power supply of servo drive inputs/ outputs<br>1 connector SUB-D 9 for an analogue output (speed reference)<br>2 connectors SUB-D 15 for an incremental or absolute encoder |
| Current consumption | 11...20 mA at 24 V DC on 10/30 V absolute encoder module<br>1100 mA at 5 V DC<br>15 mA at 24 V DC                                                                                                                                                |
| Module format       | Standard                                                                                                                                                                                                                                         |
| Net weight          | 0.48 kg                                                                                                                                                                                                                                          |

## Environment

|                                       |                               |
|---------------------------------------|-------------------------------|
| Protective treatment                  | TC                            |
| Ambient air temperature for operation | 0...60 °C                     |
| Ambient air temperature for storage   | -25...70 °C                   |
| Relative humidity                     | 5...95 % without condensation |
| Operating altitude                    | <= 2000 m                     |

## Packing Units

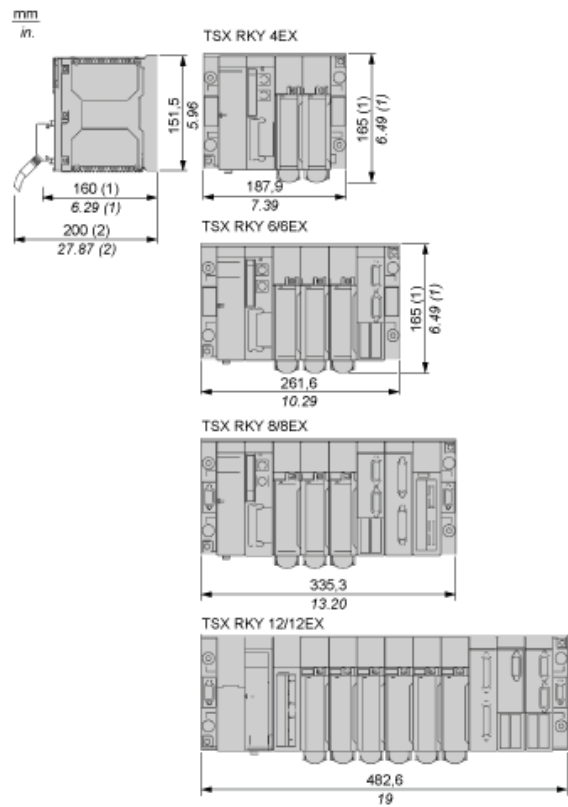
|                              |         |
|------------------------------|---------|
| Unit Type of Package 1       | PCE     |
| Number of Units in Package 1 | 1       |
| Package 1 Height             | 5.5 cm  |
| Package 1 Width              | 18.0 cm |
| Package 1 Length             | 26.0 cm |
| Package 1 Weight             | 636.0 g |

## Contractual warranty

|          |           |
|----------|-----------|
| Warranty | 18 months |
|----------|-----------|

Standard and Extendable Racks for Modules Mounting

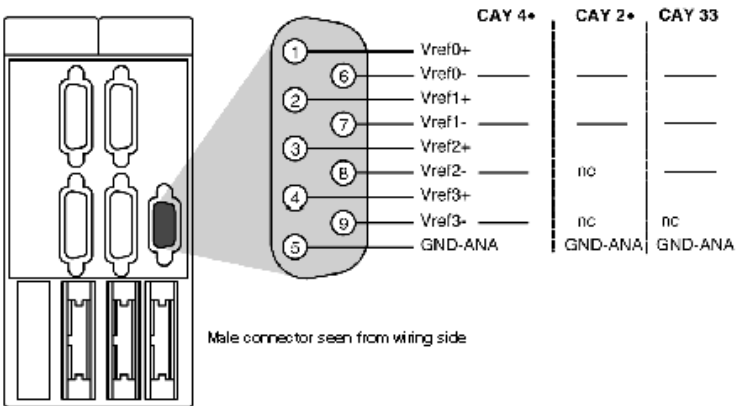
Dimensions of Modules and Racks



- (1) With screw terminal block modules.
- (2) Maximum depth for all types of modules and their associated connectors.

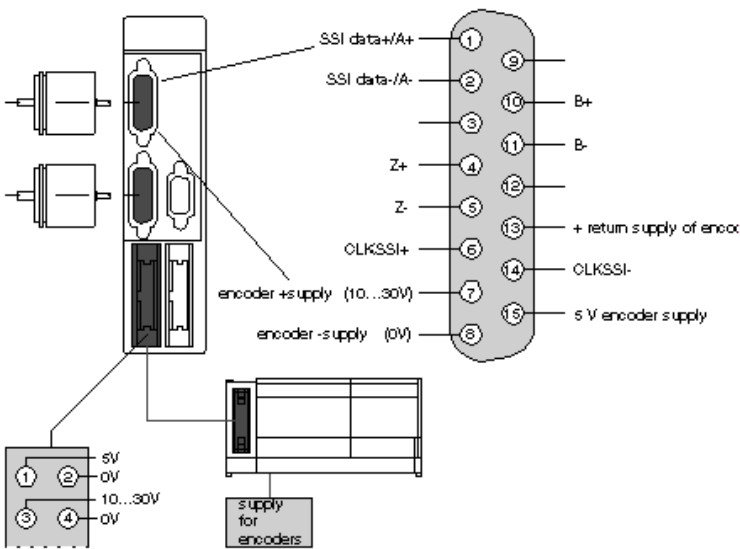
Connection of Speed Reference Signals

Connector Pinout



Connection of Counting Signals

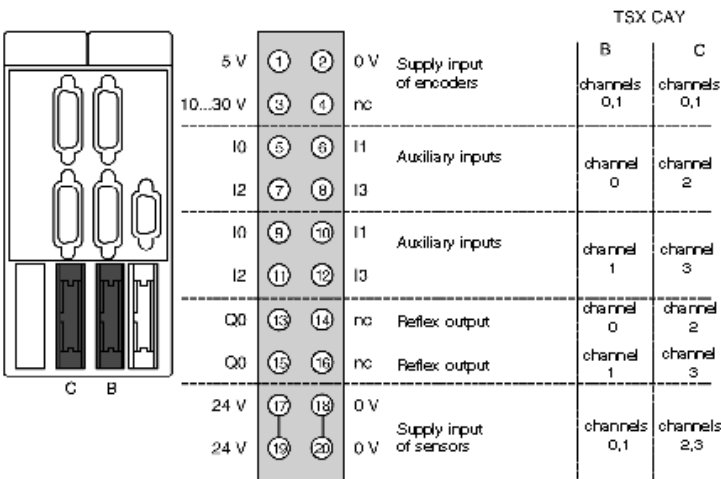
Connectors Pinouts



| Element                        | Designation              | Terminal |
|--------------------------------|--------------------------|----------|
| Incremental encoder            | input A+                 | 1        |
|                                | input A-                 | 2        |
|                                | input Z+                 | 4        |
|                                | input Z-                 | 5        |
|                                | input B+                 | 10       |
|                                | input B-                 | 11       |
|                                | return supply of encoder | 13       |
| Absolute SSI encoder:          | + SSI Data               | 1        |
|                                | - SSI data               | 2        |
|                                | CLKSSI+                  | 6        |
|                                | CLKSSI-                  | 14       |
| 5 V encoder power supply       | +supply (5 V)            | 15       |
|                                | - supply (0 V)           | 8        |
| Encoder power supply (10-30 V) | +supply (10-30 V)        | 7        |
|                                | - supply (0 V)           | 8        |

Connection of Sensors/Pre-actuators and Encoder Power Supply, without Variable Speed Controller

HE10 Connector Pinout



TSX CAY 2+ module: Channels 0 and 1  
TSX CAY 4+ module: Channels 0,1,2 and 3  
TSX CAY 33+ module: Channels 0,1 and 2

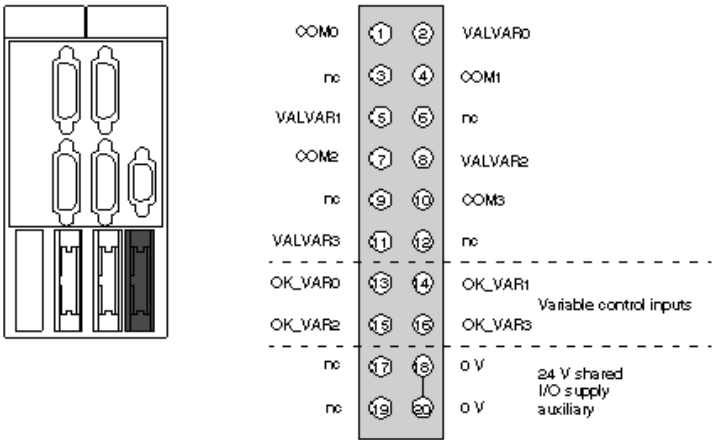
The auxiliary inputs/outputs are allocated the following functions:

- I0 = cam reference point input,
- I1 =emergency stop input (stop if there is no current in the input),
- I2 = adjusting input,
- I3 = adjustment input,
- Q0 = reflex output (static output),
- 0 V = shared auxiliary inputs and reflex outputs.

Connection of the Variable Speed Controller Signals

Connector Pinout

The axis command modules implement basic management of the signals necessary for correct operation of the variable speed controllers. There is only one connector, regardless of the number of axis command module channels.



COMx – VALVARx: potential free contact to validate variable speed controller  
OK\_VARx: variable speed controller input check  
24 V – 0 V sensor power supply  
NOTE: Each channel uses a potential free closing contact.

Recommended replacement(s)