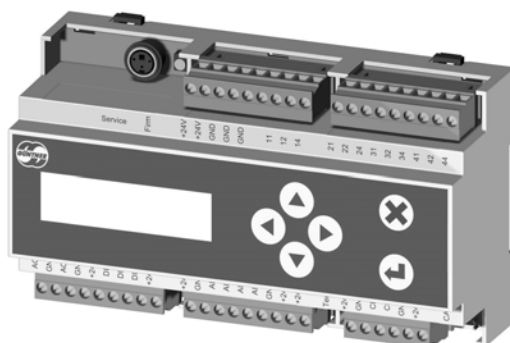


# Datasheet GRCF.1

## Controller GMM sincon®

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BAAN Nr.: 5204184

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# 1 GRCF.1

## 1.1 Functional Description

The GRCF.1 is used for controlling frequency converters. Depending on the control algorithm the output frequency is regulated between 0Hz up to the supply frequency.

It is necessary to enable the controller via DI1 in order for the control algorithm to work. Without a high signal on DI1 the controller will keep the output frequency at 0Hz.

The unit has an internal PID Controller. The parameters (the proportional gain, the integral and differential time) can be configured via the menu or via an external bus module.

The setpoint can be configured via the internal menu, an external analogue value or an external bus module.

The actual value is determined via a pressure sensor (4-20mA), a temperature sensor (KTY, GTF210) or a 0-10V signal. The control value is transferred via a bus system to the load unit (frequency converter). Also the control value is reported back as an analogue signal 0-10V on AO1.

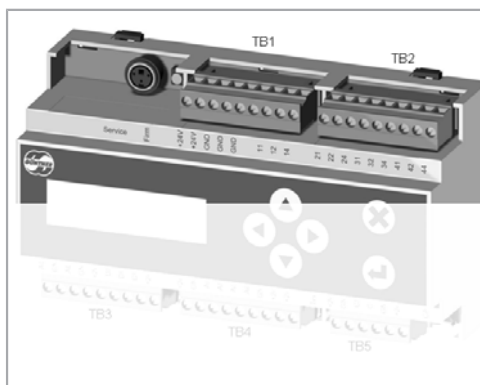
The digital inputs are designed as potential free contacts, which must use a +24V level. Apart from the enabling contact (DI1) there are also the night-setback contact (DI2) and the set-point-switch (DI3).

**Attention:** Please note that a misconfiguration (e.g. with 230V) will permanently damage the controller.

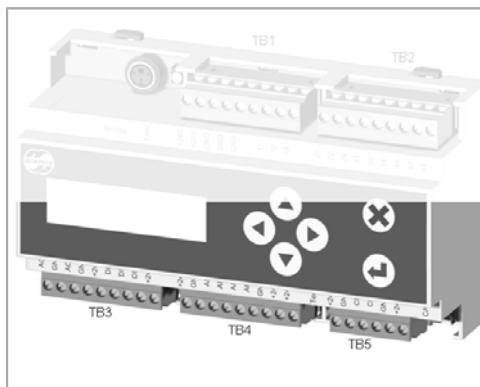
The relay outputs are used as control signals. Relay 1 is used for alarms of priority 1, relay 2 is used for alarms of priority 2, relay 3 signals that the control value is larger than 0% and relay 4 activates the hard-bypass operation.

The analogue output AO1 indicates the control value of 0-100% as a voltage signal of 0-10V. AO2 can be used to control an additional sub-cooler.

## 1.2 Connections



| Upper row |         |                                                                                     |                                      |
|-----------|---------|-------------------------------------------------------------------------------------|--------------------------------------|
|           | Name    | Description                                                                         |                                      |
|           | Service | Service connector for service personnel                                             |                                      |
|           | Firm    | push button for service personnel                                                   |                                      |
| TB1       | +24V    | External Voltage Supply +                                                           |                                      |
|           | +24V    |                                                                                     |                                      |
|           | GND     | External Voltage Supply -                                                           |                                      |
|           | GND     |                                                                                     |                                      |
|           | GND     |                                                                                     |                                      |
|           |         | Unconnected terminal port                                                           |                                      |
|           | 11      |  | SPDT relay for priority 1 alarms     |
|           | 12      |                                                                                     |                                      |
|           | 14      |                                                                                     |                                      |
| TB2       | 21      |  | SPDT relay for priority 2 alarms     |
|           | 22      |                                                                                     |                                      |
|           | 24      |                                                                                     |                                      |
|           | 31      |  | SPDT relay for operating indication  |
|           | 32      |                                                                                     |                                      |
|           | 34      |                                                                                     |                                      |
|           | 41      |  | SPDT relay for hard bypass operation |
|           | 42      |                                                                                     |                                      |
|           | 44      |                                                                                     |                                      |



| Lower row |      |                                                                          |
|-----------|------|--------------------------------------------------------------------------|
|           | Name | Description                                                              |
| TB3       | AO1  | Analogue output 1, 0-10V                                                 |
|           | GND  | Ground                                                                   |
|           | AO2  | Analogue output 2, 0-10V                                                 |
|           | GND  | Ground                                                                   |
|           | +24V | +24V Supply                                                              |
|           | DI1  | Digital Input +24V, enabling                                             |
|           | DI2  | Digital Input +24V, night setback                                        |
|           | DI3  | Digital Input +24V, setpoint switchover                                  |
|           | +24V | +24V Supply                                                              |
| TB4       | +24V | +24V Supply                                                              |
|           | GND  | Ground                                                                   |
|           | AI1  | Analogue input 4-20mA                                                    |
|           | AI2  | Analogue input 4-20mA or temperature sensor GTF (software configuration) |
|           | AI3  | Analogue input for temperature sensor GTF                                |
|           | AI4  | Analogue input 0-10V                                                     |
|           | GND  | Ground                                                                   |
|           | +24V | +24V Supply                                                              |
|           | +24V |                                                                          |
|           | Term | Dip switch for CAN Bus termination (1200hm) / ON = Terminating switched  |
| TB5       | +24V | +24V Supply                                                              |
|           | GND  | Ground                                                                   |
|           | CH   | CAN High Signal                                                          |
|           | CL   | CAN Low Signal                                                           |

| Lower row |      |                                        |
|-----------|------|----------------------------------------|
|           | GND  | Ground                                 |
|           | +24V | +24V Supply                            |
|           | CAN  | CAN connector including Voltage supply |

\*TB: Terminal Block

## 1.3 Electrical Characteristics

|                                        | Min               | Typ | Max              | Unit           |
|----------------------------------------|-------------------|-----|------------------|----------------|
| Input Voltage DC                       | 21                | 24  | 30               | V              |
| Current consumption                    |                   | 80  | 250 <sup>1</sup> | mA             |
|                                        |                   |     |                  |                |
| <b>Digital Input</b>                   |                   |     |                  |                |
| High Level                             | 15                | 24  | 30               | V              |
| Low Level                              | -3                | 0   | 5                | V              |
|                                        |                   |     |                  |                |
| <b>Relay Outputs</b>                   |                   |     |                  |                |
| Voltage DC                             |                   | 24  | 30               | V              |
| Voltage AC                             |                   |     | 250              | V              |
| Current resistive load 24V DC/250V AC  |                   |     | 1                | A              |
| Current inductive load 24V DC/250V AC  |                   |     | 1                | A              |
| Expected mechanical                    | 1*10 <sup>6</sup> |     |                  | cycle          |
| Expected electrical                    | 1*10 <sup>5</sup> |     |                  | cycle          |
|                                        |                   |     |                  |                |
| <b>Voltage sense Input</b>             |                   |     |                  |                |
| Absolute maximum rating                | -24               |     | 30               | V              |
| Working range                          | 0                 |     | 12               | V              |
| Resolution                             |                   |     | 10               | bit            |
| Error                                  |                   |     | 1                | % <sup>2</sup> |
| Input resistance                       |                   | 230 |                  | kΩ             |
|                                        |                   |     |                  |                |
| <b>Current sense Input</b>             |                   |     |                  |                |
| Absolute maximum rating                | -24               |     | 30               | V              |
| Working range                          | 0                 |     | 12               | V              |
| Resolution                             |                   |     | 10               | bit            |
| Error                                  |                   |     | 1                | % <sup>2</sup> |
| Input resistance (without overcurrent) |                   | 130 |                  | Ω              |
|                                        |                   |     |                  |                |

|                                | Min | Typ        | Max | Unit           |
|--------------------------------|-----|------------|-----|----------------|
| <b>Voltage sense Output</b>    |     |            |     |                |
| Voltage range                  | 0   |            | 10  | V              |
| Load voltage                   |     | $\geq 100$ |     | k $\Omega$     |
| Resolution                     |     |            | 10  | bit            |
| Error                          |     |            | 2,5 | % <sup>2</sup> |
| Short-circuit protection       | Yes |            |     |                |
| Isolation                      | No  |            |     |                |
|                                |     |            |     |                |
| <b>Temperature sense Input</b> |     |            |     |                |
| Absolute maximum rating        | -24 |            | 30  | V              |
| Working range                  | -30 |            | 10  | °C             |
| Resolution                     |     |            | 70  | bit            |
| Error                          |     |            | 3   | % <sup>2</sup> |
|                                |     |            |     |                |
| <b>CAN Bus</b>                 |     |            |     |                |
| Absolute maximum rating        | -24 |            | 24  | V              |
| Data rate                      |     | 125        |     | kbit/s         |
| Galvanic isolation             | No  |            |     |                |

1. The maximum current consumption includes the attachment of 2 pressure sensors and one temperature sensor.
2. Of the working range.

## 1.4 Mounting / Operating conditions

- Temperature:

Storage, transportation, operating: -20 ° C ... +70 ° C

- The module is designed for rail shielded.
- All measuring- and signal leads must be connected via shielded cables.
- The shield of measuring leads, signal leads, and bus leads must be grounded on one side only.
- On appropriate measures of shielding and wiring must ensure that power and motor cables have no interference on the signal and control lines.
- Temperature:  
Storage, transportation: -20°C ... +70°C  
Operating: -20°C ... +65°C
- Degree of protection by enclosure: IP 20
- Recommended cable: Belden 9841, Lapp 2170203, Lapp 2170803, Helukabel 81910

## 1.5 Dimensions / Weight

All values in mm

### Weight:

approx. 340g

