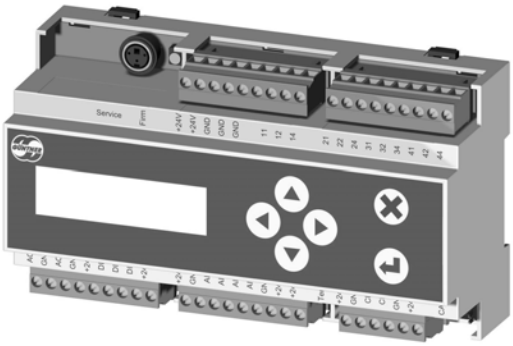
Data sheet GRCS.1
Controller GMM step



ERP no. 5204186

www.guentner.de

Contents

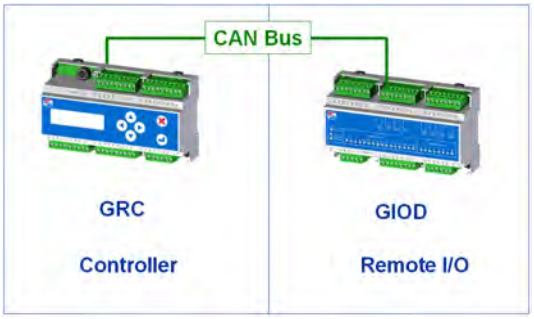
1 GRCS.1

1.1 Functional description

The GRCF.1 is used to control step controllers. As a minimal solution, GRCS.1 can control up to four steps.

Variant GMM step basic

If you need more steps or additional functions you will need to combine the GRCS.1 with a GIOD.1 expansion module, ERP no. 5204183.



Variant GMM step professional

In order to operate the controller it must have a power supply and must be enabled via digital input DI1. If it is not enabled the process will not be regulated.
The unit has an internal PID controller, whose parameters (amplification factor, integral and differential time) can be configured either per menu or via an external bus module.
The setpoint can be given via the internal menu, an external analogue value or via an external bus module.
The current value is determined via a pressure sensor (4-20mA), a temperature sensor (KTY, GTF210) or a 0-10V signal.
The relay outputs controlling the output stages are switched as appropriate for the setpoint and the number of steps. A switch-on threshold can be configured for each step.

The integrated function “Fancycling” makes it possible to balance the running times for the individual fans.

The digital inputs are designed as potential-free contacts that must be connected to +24V. As well as enable (DI1), digital inputs are also used to control external errors (DI2) and the setpoint switchover (DI3).

ADVICE

Please note that connecting the wrong voltage (e.g. 230V) may seriously damage the controller.

The relay outputs are used to control the output stages. Depending on the configuration (the number of steps and your GMM step basic or GMM step professional configuration) a number of special functions may also be available. The function assignment is described in the configuration table.

Analogue output AO1 shows the current control value from the controller (0-100%) as a voltage in the range 0-10V. Analogue output AO2 can be used to control an additional subcooler.

The CAN interface of the GRCS.1 is an internal interface for communicating with other Güntner equipment (e.g. the expansion module GIOD.1). The following communications modules are available for external bus connections: for Modbus (GCMM.1, ERP no. 5204182) or Profibus (GCMP.1, ERP no. 5204543).

1.2 Configuration table

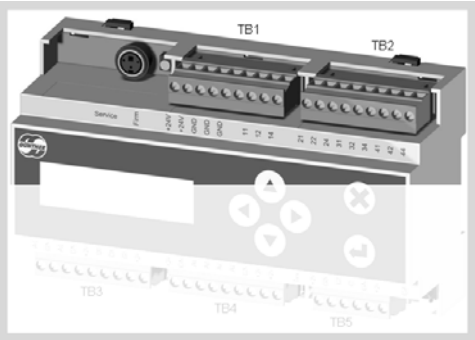
			GMM step basic			GMM step professional
	I/O	**Signal**	**2 steps**	**3 steps**	**4 steps**	**2#9 steps**
GR-CS.1	DI1	24V	Enable			
	DI2	24V	No function / External error / External manual mode			
	DI3	24V	Setpoint switchover or heating/cooling			
	AI1	4..20mA	Pressure / Slave			
	AI2	4..20mA/KTY	Pressure / Temperature / Slave			
	AI3	KTY	Temperature			
	AI4	0..10V	Slave			
	AO1	0..10V	Control value			
	AO2	0..10V	Subcooler			
	DO1	Relay	Fan 1 / Group A	Fan 1 / Group A	Fan 1 / Group A	Alarms priority 1
	DO2	Relay	Fan 2 / Group B	Fan 2 / Group B	Fan 2 / Group B	Alarms priority 2
	DO3	Relay	-	Fan 3 / Group C	Fan 3 / Group C	Thermocontact reset
	DO4	Relay	-	-	Fan 4 / Group D	Threshold value / Fan 9 / Group I
GIOD.1	DO1	Relay	-	-	-	Fan 1 / Group A
	DO2	Relay	-	-	-	Fan 2 / Group B
	DO3	Relay	-	-	-	Fan 3 / Group C
	DO4	Relay	-	-	-	Fan 4 / Group D
	DO5	Relay	-	-	-	Fan 5 / Group E
	DO6	Relay	-	-	-	Fan 6 / Group F
	DO7	Relay	-	-	-	Fan 7 / Group G
	DO8	Relay	-	-	-	Fan 8 / Group H
	DI1	24V	-	-	-	Fan 1 / Group A OK *1)

			GMM step basic			GMM step professional
	I/O	Signal	2 steps	3 steps	4 steps	2#9 steps
	DI2	24V	-	-	-	Fan 2 / Group B OK *1)
	DI3	24V	-	-	-	Fan 3 / Group C OK *1)
	DI4	24V	-	-	-	Fan 4 / Group D OK *1)
	DI5	24V	-	-	-	Fan 5 / Group E OK *1)
	DI6	24V	-	-	-	Fan 6 / Group F OK *1)
	DI7	24V	-	-	-	Fan 7 / Group G OK *1)
	DI8	24V	-	-	-	Fan 8 / Group H OK *1)
	DI9	24V	-	-	-	Fan 9 / Group I OK *1)
	DI10	24V	-	-	-	-
	DI11	24V	-	-	-	-
	DI12	24V	-	-	-	-
	DI13	24V	-	-	-	-
	DI14	24V	-	-	-	-
	DI15	24V	-	-	-	-
	DI16	24V	-	-	-	Remote ac-knowledgement

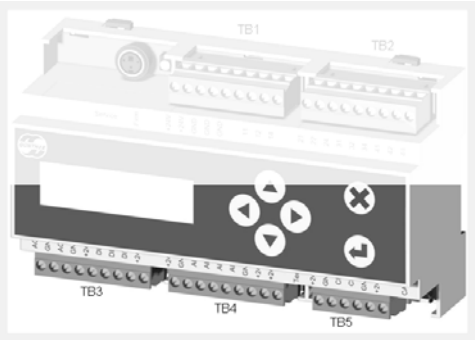
*1) 24V = Fan / group n OK
0 V / open = Fan / group n faulty

The GMM step professional variant requires additional hardware (GIOD.1, ERP no. 5204183).

1.3 Connections



Upper row of connections			
	Name	**Description**	
	Service	Service plug only for use by service personnel	
	Firm	Pushbutton only for use by service personnel	
TB1	+24V	External feed for power supply	
	+24V		
	GND	Contact ground for external power feed	
	GND		
	GND		
		Terminal not connected	
	11		relay DO1
	12		
	14		
TB2	21		relay DO2
	22		
	24		
	31		relay DO3
	32		
	34		
	41		relay DO4
	42		
	44		



Lower row of connections		
	Name	**Description**
TB3	AO1	Analogue output 1, 0-10V
	GND	Ground
	AO2	Analogue output 2, 0-10V
	GND	Ground
	+24V	Voltage +24V
	DI1	Digital input +24V, Release
	DI2	No function / collective fault / external manual operation
	DI3	Digital input +24V, setpoint changeover
	+24V	Voltage +24V
TB4	+24V	Voltage +24V
	GND	Ground
	AI1	Analogue output 4-20mA
	AI2	Analogue input 4-20mA or for temperature sensor GTF must be configured in the soft-ware
	AI3	Analogue input for temperature sensor GTF
	AI4	Analogue input 0-10V
	GND	Ground
	+24V	Voltage +24V
	+24V	
	Term	DIP switch for CAN bus termination (120Ω) / ON = termination activated
TB5	+24V	Voltage +24V
	GND	Ground
	CH	CAN high signal
	CL	CAN low signal

Lower row of connections		
	GND	Ground
	+24V	Voltage +24V
	CAN	CAN bus plug including power supply

*TB: Terminal block

1.4 Electrical properties of

	Min	Type	Max	Unit
Voltage supply	21	24	30	V
Current consumption		80	250[1]	mA
Digital inputs				
High level	15	24	30	V
Low level	-3	0	5	V
Relay outputs				
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
Switch cycles, mechanical	$1*10^6$			Switching cycles
Switch cycles, electrical	$1*10^5$			Switching cycles
Voltage input				
Dielectric strength	-24		30	V
Measuring range	0		12	V
Resolution			10	bit
Fault			1	%[2]
Input resistor:		230		kΩ
Current input				
Dielectric strength	-24		30	V
Measuring range	0		21	mA
Resolution			10	bit
Fault			1	%[2]
Input resistance (without protective circuit)		130		Ω
Voltage output				

	Min	Type	Max	Unit
Voltage range	0		10	V
Load resistance		>=100		kΩ
Resolution			10	bit
Fault			2.5	%[2]
Short protection		Yes		
Potential separation		No		
Temperature input				
Dielectric strength	-24		30	V
Measuring range	-30		100	°C
Resolution			10	bit
Precision			3	%[2]
CAN bus				
Dielectric strength	-24		24	V
Transmission rate		125		kbit/s
Galvanic separation		No		

1. The maximum current consumption includes supplying two attached pressure transponders and one attached temperature sensor.

2. Of the appropriate range

1.5 Installation / Operating conditions

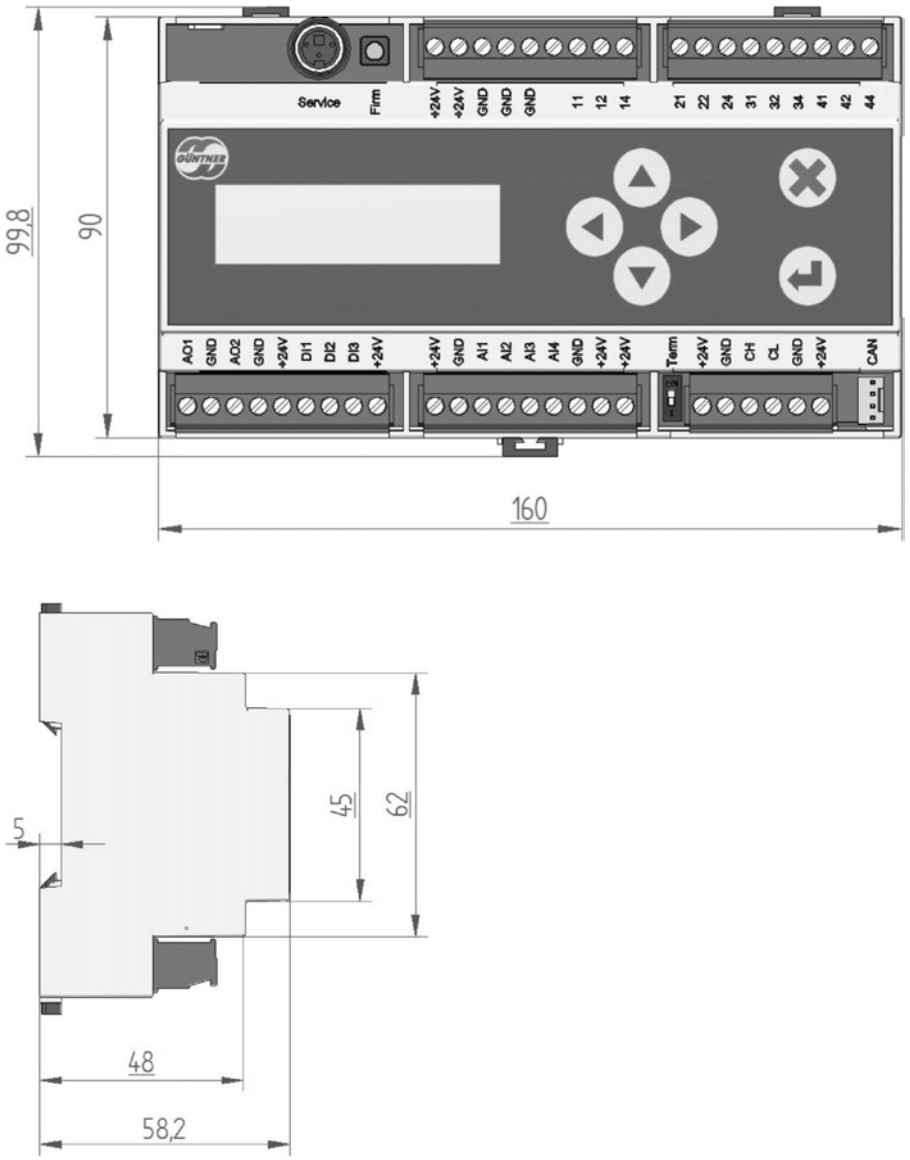
- The module is designed for mounting on a top-hat rail.
- All measurement and signalling lines must be connected via shielded cables.
- The shielding of measuring, signal and bus lines must be earthed at one end only.
- Suitable shielding and routing measures must be taken to ensure that mains cables and motor cables do not give rise to any interference in signal and control lines.
- Temperature:

Storage Transport:	-20°C ... +70°C
Operation:	-20°C ... +65°C

- Protection rating: IP 20
- Recommended cables: Belden 9841, Lapp 2170203, Lapp 2170803, Helukabel 81910

1.6 Dimensions / Weight

You will find the casing dimensions below. All dimensions are given in millimetres.



Casing dimensions of GRCS.1

Weight:
ca. 340g