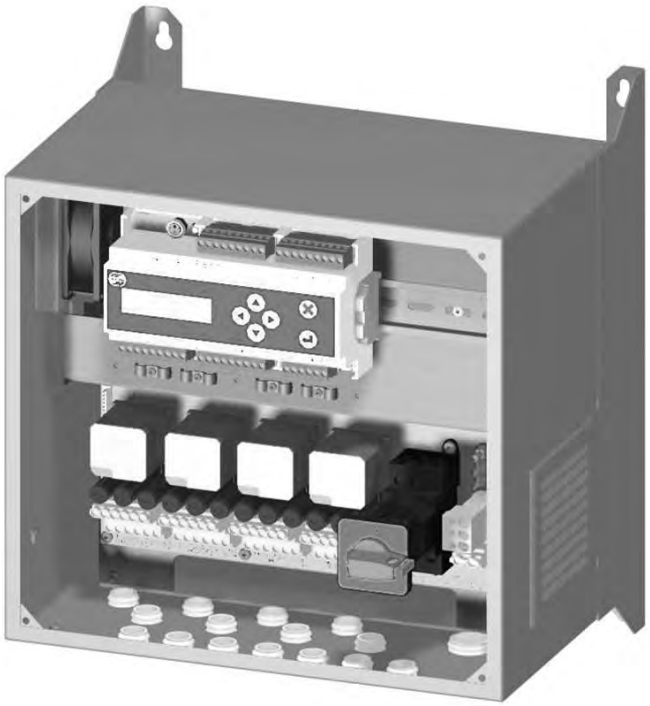
Data sheet GMM phasecut compact 240/4.1



ERP no.: 5205496

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Contents

1 GMM phasecut compact 240/4.1

1.1 Functional description

The GMM phasecut compact is a microprocessor-controlled speed controller in the small switch cabinet designed to regulate the speed of three-phase motors.
The switch cabinet houses the main switch, motor relay and controller.

The **GMM phasecut compact 240/4.1** has four separately fused motor outputs controlled in parallel. The four motor outputs have their own thermocontact monitor and can be switched off individually. The motor load has to be distributed symmetrically to the motor outputs. The maximum nominal load per motor output is 7A.

The power unit is based on the principle of phase cutting. The output voltage can be regulated variably between 0 and 100 percent. No minimum load is required for the GMM phasecut compact owing to the controller implementation.

A GRCP.1 is used as the control unit. The speed of the connected fans is adjusted depending on the control deviation between the actual value and the setpoint. In order to operate the controller it must have a power supply and must be enabled via digital input DI1. If this 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 from the menu or via an external bus module.
The setpoint can be defined via the internal menu, an external analogue value or via 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 sent via a bus system to the power unit (phase-cutting output stage). At the same time this value is also provided as a 0-10V signal.

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

ADVICE

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

The relay outputs are used for control messages. Relay 1 reports priority 1 alarms, relay 2 reports priority 2 alarms, relay 3 reports that the fans are in operation and relay 4 is used to signal a threshold function.

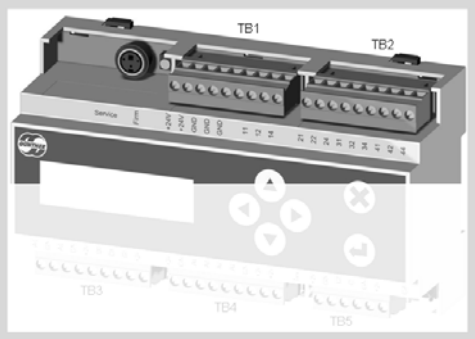
Analogue output AO1 shows the current control value from the controller (0-100%) as a voltage in the range 0-10V. Analogue output AO2 can be used to control an additional subcooler.

1.2 Configuration table

GMM phasecut compact 240/4.1	Phase-cutting compact control unit, max. 24 A nominal motor current, 4 outputs, IP 54, variant 1

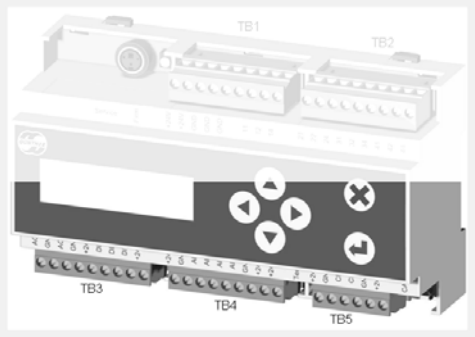
1.3 Connections

GRCP.1 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		Two-way contact for priority 1 alarms
	12		
	14		
TB2	21		Two-way contact for priority 2 alarms
	22		
	24		
	31		Two-way contact for system messages
	32		
	34		

Upper row of connections			
	41 42 44		Two-way contact: GMM phasecut compact: Threshold function GMM phasecut modular: Hardware bypass

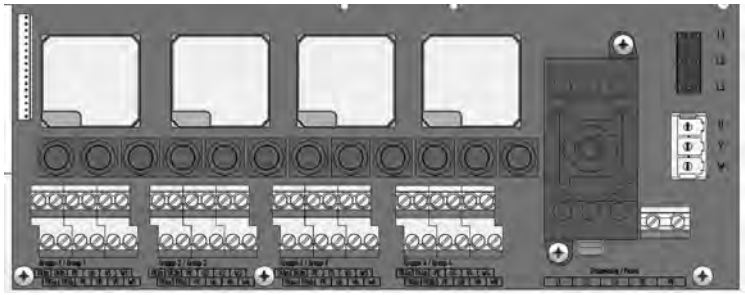


Lower row of connections		
	Name	**Description**
TB3	AO1	Analogue output 1, 0-10V
	GND	Ground
	AO2	Analogue output 2, 0-10V
	GND	Ground
	+24V	Voltage +24V
	DI1	Digital input +24V, Release
	DI2	Digital input +24V / night limiter
	DI3	Digital input +24V, setpoint changeover
	+24V	Voltage +24V
TB4	+24V	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

Connections on power board GMM phasecut compact 240/4.1



Power board - GMM phasecut compact 240/4.1

	Name	Description
Group 1	TK1a	Thermocontact for motor 1, must be bridged to TK1b if unused
	TK1b	Thermocontact for motor 1, must be bridged to TK1a if unused
	PE	Earthing point for motor 1
	U1	Phase U from motor 1
	V1	Phase V from motor 1
	W1	Phase W from motor 1
	TK5a	Thermocontact for motor 5, must be bridged to TK5b if unused
	TK5b	Thermocontact for motor 5, must be bridged to TK5a if unused
	PE	Earthing point for motor 5
	U5	Phase U from motor 5
	V5	Phase V from motor 5
	W5	Phase W from motor 5
Group 2	TK2a	Thermocontact for motor 2, must be bridged to TK2b if unused
	TK2b	Thermocontact for motor 2, must be bridged to TK2a if unused
	PE	Earthing point for motor 2
	U2	Phase U from motor 2
	V2	Phase V from motor 2
	W2	Phase W from motor 2
	TK6a	Thermocontact for motor 6, must be bridged to TK6b if unused
	TK6b	Thermocontact for motor 6, must be bridged to TK6a if unused
	PE	Earthing point for motor 6

	Name	Description
	U6	Phase U from motor 6
	V6	Phase V from motor 6
	W6	Phase W from motor 6
Group 3	TK3a	Thermocontact for motor 3, must be bridged to TK3b if unused
	TK3b	Thermocontact for motor 3, must be bridged to TK3a if unused
	PE	Earthing point for motor 3
	U3	Phase U from motor 3
	V3	Phase V from motor 3
	W3	Phase W from motor 3
	TK7a	Thermocontact for motor 7, must be bridged to TK7b if unused
	TK7b	Thermocontact for motor 7, must be bridged to TK7a if unused
	PE	Earthing point for motor 7
	U7	Phase U from motor 7
	V7	Phase V from motor 7
	W7	Phase W from motor 7
Group 4	TK4a	Thermocontact for motor 4, must be bridged to TK4b if unused
	TK4b	Thermocontact for motor 4, must be bridged to TK4a if unused
	PE	Earthing point for motor 4
	U4	Phase U from motor 4
	V4	Phase V from motor 4
	W4	Phase W from motor 4
	TK8a	Thermocontact for motor 8, must be bridged to TK8b if unused
	TK8b	Thermocontact for motor 8, must be bridged to TK8a if unused
	PE	Earthing point for motor 8
	U8	Phase U from motor 8
	V8	Phase V from motor 8
	W8	Phase W from motor 8
Feed	L1	Phase L1 of feed
	L2	Phase L2 of feed
	L3	Phase L3 of feed
	PE	Earthing point of supply line

	Name	Description
	PE	Earthing point of supply line or auxiliary earthing point
Earthing rods	PE	Earthing rods for earthing on heat exchanger. (see separate drawing below) Connection at the earthing point of the heat exchanger with min. 6 mm2 earthing cable.

1) Earthing rods

Connections properties on power side GMM phasecut compact 240/4.1

Device port	Min	Type	Max	Unit
Recommended mains fuse	*	*	32	A (gL/gG)
Supply line feed phase single-wire			10	mm^2
Supply line feed phase finely stranded with end sleeves			6	mm^2
Supply line feed PE single-wire			6	mm^2
Supply line feed PE finely stranded with end sleeves			4	mm^2
Motor output GroupX single-wire			6	mm^2
Motor output GroupX finely stranded with end sleeves			4	mm^2

* A smaller fuse may be possible if the connected motor load is below the maximum rated current. This must be checked in each case.

1.4 Electrical properties of

Electrical properties of GRCP.1 controller

	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

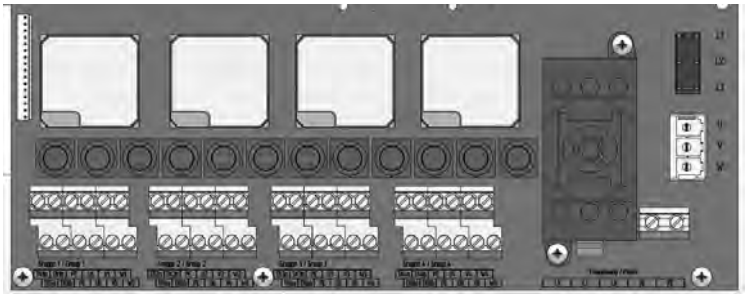
	Min	Type	Max	Unit
Relay outputs				
Voltage DC		24	30	V
Voltage AC			250	V
Current resistive load 24V DC/250V AC			1	A
Current inductive load 24V DC/250V AC			1	A
Switch cycles, mechanical	$1*10^6$			Switching cycles
Switch cycles, electrical	$1*10^5$			Switching cycles
Voltage input				
Dielectric strength	-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				
Voltage range	0		10	V
Load resistance		>=100		kΩ
Resolution			10	bit
Fault			2.5	%[2]
Short protection	Yes			
Potential separation	No			
Temperature input				

	Min	Type	Max	Unit
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

Electrical properties of GMM phasecut compact 240/4.1



	Min	Type	Max	Unit
Voltage supply	380	400	480	V AC
Mains frequency		50/60		Hz
Voltage of motor outputs	0		Mains voltage	V AC
Voltage of motor contact		300		V DC
Rated current (sum total of all connected motor currents)			24[1]	A
Power loss with rated current		130	160	W

Electrical properties of GMM phasecut compact 240/4.1

1) The peak power during an acceleration ramp from 0 to 100% can be 30% above the maximum rated current. The acceleration ramp has to be extended if the values are above this until this factor is fulfilled. The motor load has to be distributed symmetrically to the outputs.

1.5 Fuses

The GMM phasecut compact 240/4.1 has a fuse group in the input and a fuse group for every motor group. The steps involved in replacing the fuses are described in the operating manual. Fuses may only be replaced when the device is disconnected from the mains. The fuses are used for protecting the device. They do not replace the necessary line protection for the supply line.

The following fuse types are used:

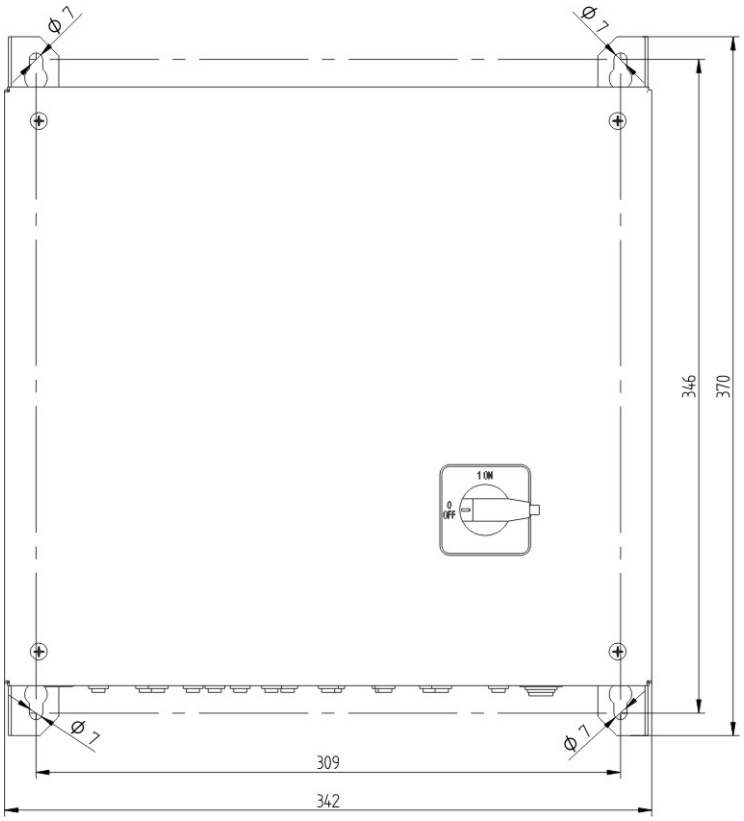
	Type	Güntner Order No.	Reference Manufacturer	Reference Order No.
Supply line	30A, gRL, 10x38mm	5205144	SIBA	6003434.30
Motor outputs	12.5A, FF, 6x32mm	5203132	SIBA	7012540.12.5

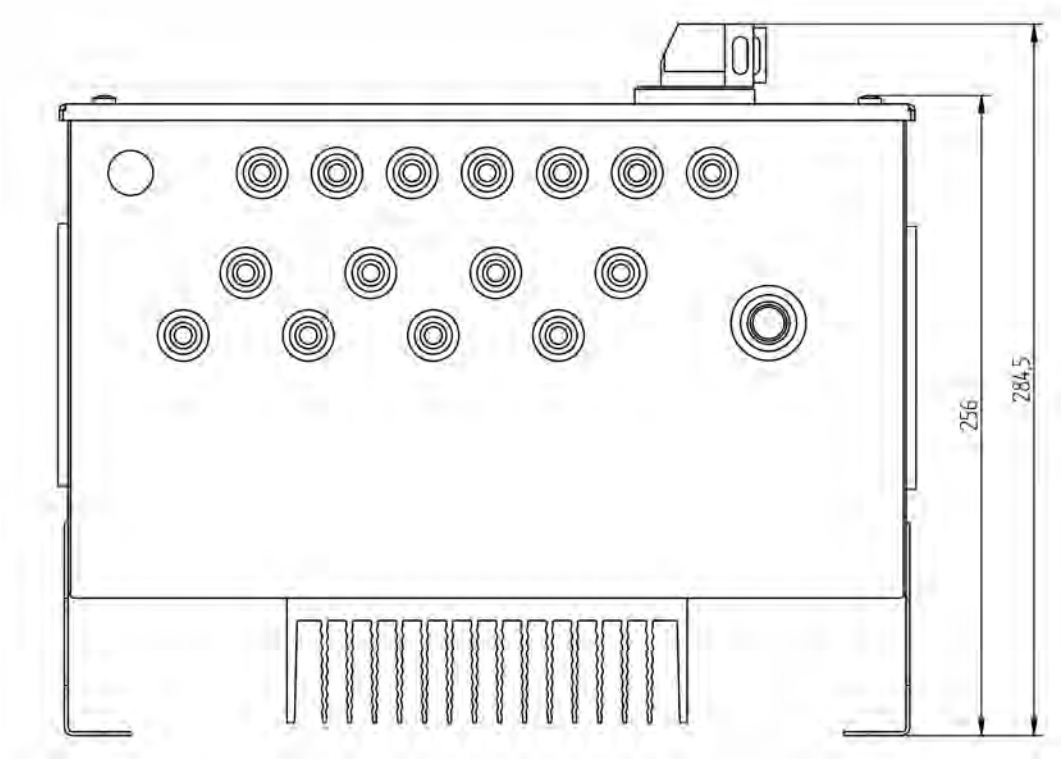
1.6 Installation / Operating conditions

- The small switch cabinet is designed for installation on the heat exchanger.
- All measurement and signal lines must be connected via shielded cables.
- The shielding of measurement, 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.
- Ambient temperature: -20°C .. +40°C
- Storage temperature: -20°C ... +55°C, dry
- Protection rating: IP 54 if the housing is closed, IP 00 if the housing is open.
- The earthing point of the device must be connected to the earthing point of the heat exchanger. The cable must have a minimum cross section of 6 mm2.
- The device must be protected from direct sunlight. A sunshield must be used for mounting on the heat exchanger.

1.7 Dimensions / Weight

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





Dimensions GMM phasecut compact 100/x.1 / 240/4.1

Weight:

GMM phasecut compact 240/4.1 approx. 11 kg