

# Temperature and Agitation Control

## using **DASGIP TC4SC4** Modules

### Technology

The DASGIP Temperature and Agitation System TC4SC4 provides individual stirring speeds from 2 to 1600 rpm combined with precise temperature control for four vessels. Low and high speed magnetic stirring plates are supported as well as overhead drives featuring cell culture and microbial applications. Even a combination of overhead and magnetic drives is possible.

Users can freely choose between continuous or interval as well as toggle mode for each stirrer outlet. For temperature control the TC4SC4 supplies four electrical outlets for heating blankets and four outlets to switch cooling valves. The TC4SC4B Module allows a seamless integration with the DASGIP Bioblock\*.

### Application

The TC4SC4 module is best suited for all cultivation processes at benchtop scale demanding precise control of temperature and agitation. Specifically designed module versions with broad control ranges support microbial and cell culture applications.

#### ■ Microbiology

Powerful stirring with maximal 1600 rpm guarantees highest oxygen transfer rates even in viscous media or during high cell density fermentation. Temperatures up to 125°C meet the demands of specific applications e.g. biofuel development. Strong cooling capabilities ensure high efficient temperature control also in high cell density fermentation right up to 4 L working volume.

\* for more information on the DASGIP Bioblock see our detailed product information



#### ■ Animal and Human Cell Culture

Active heating and cooling as well as continuously adjustable agitation speeds starting from 2 rpm support the gentle cultivation of sensitive micro-carrier or suspension cultures and even stem cells.

#### ■ Plant Cell Culture

With high flexibility of agitation and temperature control the TC4SC4 meets the requirements of plant suspension cultures. Combined with the Photo-Bioreactor featuring specific light spectra and user-defined light intensities phototrophic cells can be controlled in an unparalleled manner.

Due to an integrated microprocessor users can operate the TC4SC4 modules as stand-alone devices or as part of the DASGIP Parallel Bioreactor System.

### Benefits

The temperature and agitation control modules TC4SC4 facilitate the parallel but individual control of set points and profiles for temperature and stirrer speed in four culture vessels. Using the Bioblock for instance, temperature, stirrer speed as well as the outlet configuration for overhead or magnetic drives can be easily adjusted directly at the device. All settings are listed in the display.

**Modules TC4SC4**

Quality System certified by DQS ■ DIN EN ISO 9001 ■ Reg.-No. 63431

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Users are provided with an auto restart function, ramps for agitation, adjustable heating and cooling parameters along with overheat protection.

Integrated into a DASGIP Parallel Bioreactor System the TC4SC4 modules support comprehensive data documentation in the central data base. The broad range of control strategies features: freely programmable scripts, trigger automation, user-defined profiles and DO cascades (including stirrers, gas flow and oxygen concentration) with everything individually defined for each reactor.

The DASGIP TC4SC4 module series supplies operators in research and process development with the flexibility of customized and process specific operation modes. Depending on the module type overhead drives as well as magnetic stirring drives can be operated with individual speed.

Various module variations meet the demands of specific applications in microbiology and mammalian cell culture (see table below). Up to 4 modules integrated into one system allow temperature and agitation control for up to 16 vessels.

## Technical Data

Common Features		TC4	SC4/SC8	TC4SC4F Microbiology	TC4SC4C Cell Culture	TC4SC4D Overhead drive	TC4SC4B Bioblock
<b>Control Unit</b>							
Dimensions (WxDxH)	300 x 320 x 190 mm	✓	✓	✓	✓	✓	✓
Temperature Inputs	4	✓	-	✓	✓	✓	DASGIP Bioblock
Heating Outputs	4	✓	-	✓	✓	✓	
Cooling Outputs	4	✓	-	✓	✓	✓	
Permissible Ambient Conditions	5°C – 40°C, max. 80% humidity	✓	✓	✓	✓	✓	✓
Power Supply	110 - 240 V <sub>AC</sub> , 50 / 60 Hz	✓	✓	✓	✓	✓	✓
Weight	[kg]	8,5	8,5	9,0	9,0	9,5	9,0
<b>Temperature Control</b>							
Temperature Range	(+/- 0.1 K)	-10 - 100°C	-	-10 - 100°C	-10 - 100°C	-10 - 100°C	-10 - 125°C
Heating Power per Output	4 x 2,2 A (4 x 500 W at 230 V <sub>AC</sub> , 4 x 250 W at 115 V <sub>AC</sub> )	✓	-	✓	✓	✓	DASGIP Bioblock
Cooling Valve Power	4 x 0,2 A (110-150V <sub>AC</sub> ) (110 - 240 V <sub>AC</sub> , 50 / 60 Hz)	✓	-	✓	✓	✓	DASGIP Bioblock
Alarm Contacts per Output	1x Relay Contact (nc/no)	✓	-	✓	✓	✓	-
Temperature Sensor	Platinum RTD (100 Ohm, Class A)	✓	-	✓	✓	✓	DASGIP Bioblock
<b>Agitation Control</b>							
Low Speed Magnetic Drive	2 - 250 rpm, bioMIXdrive (+/- 0.1 rpm)	-	✓	-	✓	-	-
High Speed Magnetic Drive	60 - 1500 rpm, type M10 (+/- 1 rpm)	-	✓	✓	-	-	✓
Low Speed Overhead Drive	30 - 1250 rpm, RE 30, digitally encoded (+/- 1 rpm)	-	✓	-	-	✓	✓
High Speed Overhead Drive	100 - 1600 rpm, RE 40, digitally encoded (+/- 1 rpm)	-	✓	-	-	✓	✓