

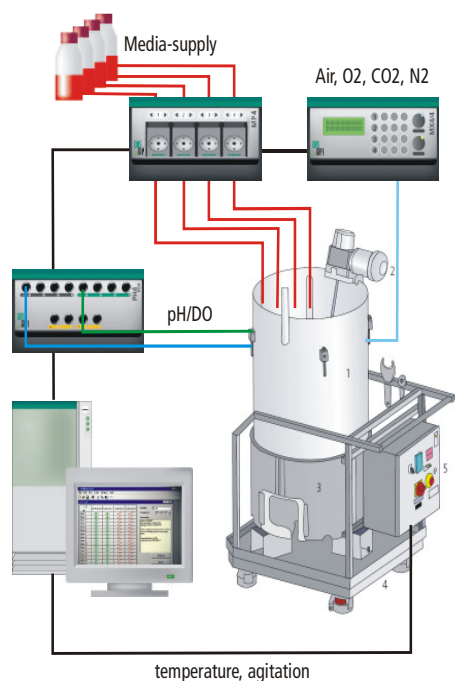
# DASGIP Control System for Thermo Scientific HyClone S.U.B.

## Technology

The Thermo Scientific HyClone product line combines the advantages of single-use bioreactor technologies such as ease-of-use, elimination of cleaning procedures or minimization of the cross contamination risk, with traditional and proven stirred tank technologies. The DASGIP Control system can perfectly support the Thermo Scientific HyClone Single-Use Bioreactor (S.U.B) ([www.thermo.com/hyclone](http://www.thermo.com/hyclone)).

## Integration

With its modular design the DASGIP Control System adds mass flow controlled gas mixing (MX4/1), variable speed peristaltic drive pumps (MP4) and a monitoring module for pH and dissolved oxygen control to the S.U.B. The DASGIP Control System seamlessly integrates the complete family of Thermo Scientific HyClone bioreactors. All set-point and process values, including speed and temperature, can be accessed through the DASGIP Control user interface.



**HyClone S.U.B.**

### ■ Measurement and Control

The DASGIP monitoring module PHPO allows the read-out of pH and DO process values of up to eight HyClone S.U.B. at the same time. Single side or two sided pH control as well as cascaded DO control loops are supported. Optionally additional process signals like optical density for cell growth monitoring are available.

### ■ Gassing

The DASGIP gas mixing module MX4/1 is designed for the support of one HyClone S.U.B. and supplies an independently blended gas mixture of up to four input gasses. Air, oxygen, carbon dioxide and nitrogen can be individually mixed to provide optimal gas supply with flow rates up to 30 sL/min. Mass flow controllers with individual set-points for each gas guarantee an accurate mix of gases and support headspace, overlay and/or submerge gassing. An optional external pressure sensor can be used to limit maximal operating pressure.

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

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## ■ Media addition or removal

The multi pump module MP4 provides four variable speed controlled peristaltic pumps for multiple fluid transfers in or out of the HyClone S.U.B.. Each pump can be operated independently. In combination with different sized pump head tubing continuous flow rates between 0.01 and 5 L/h are possible.

## ■ DASGIP Control

The integrated process control software DASGIP Control, allows easy operation of one up to eight HyClone S.U.B. units. Critical parameters are monitored and controlled by preset values, profiles or by triggered automation. A comprehensive automatic documentation and export to Microsoft Excel® contains all data for further investigations. Optionally a 21CFR Part 11 package is available.

## Technical Specifications

### pH & pO2 Measurement & Control

pH Inputs	2, 4 or 8, pH0 .. pH14 (+/- 0.01 pH), -472 .. +472mV
pO2 Inputs	2, 4 or 8, 0 ..250%DO (+/- 1% DO), 0 .. 400nA
Temp. compensation	RTD integrated
Calibration	One or two point calibration
pH Control	CO <sub>2</sub> and base
pO2 Control	Cascade of O <sub>2</sub> and gas flow rate
Optional	Optical Sensors

### Gassing

Type	4 mass flow controller
Inputs	4 (Air, Oxygen, Carbon Dioxide and Nitrogen)
Outputs	2 (headspace and submerge)
Flow Rates	0; 0.5 .. 30 sL/min (30 .. 1800 sL/h), accuracy approx. 1.5%FS
Features	Over pressure detection and gas flow cut-off

### Feeding

Type	4 pumps with 2 rollers, spring loaded tube bed
Drive	Speed controlled with planetary gear
Operating Modes	Continuous / Dispense
Features	Autom. switch to dispense mode when speed is lower than min. continuous flow rate
Tube Material	Bioprene®, Pharmed®, Marprene®, Silicone
Wall Thickness	1.6 mm
Inner Diameter	min. 0.5 mm (0.01 to 0.07 L/h) max. 4.8 mm (0.43 to 5.04 L/h)

### Temperature Control & Agitation

Temperature	HyClone temperature controller fully integrated (set point and process value)
Agitation	HyClone agitation speed controller fully integrated (set point and process value)
Optional	Support of water jacket version of HyClone S.U.B.

### Control System

Features	Triggering automation package, User defined scripting; 21 CFR Part 11 package, Offline values, Integrated logging, Data export and documentation within MS-Excel®
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### Balance

Optional	Mettler Toledo product line integrated via RS 232
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