

# DHR Accessories Requirements




## Site Preparation Guide

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# Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements	
Asphalt Submersion Cell 		<p><u>Julabo FP35-HE</u> (PN 500020.901) with TA Instruments firmware. See <a href="#">page 10</a> for circulator requirements.</p> 
Dielectric Accessory 	 	<ul style="list-style-type: none"> <li>• PC with USB port</li> <li>• Customer-supplied <u>Agilent E40980A LCR meter</u></li> </ul> 
Electrically Heated Cylinder (EHC) 		<ul style="list-style-type: none"> <li>• Optional ambient cooling with clean, dry, oil-free compressed air: 206–690 kPa gauge (30–100 psig)</li> <li>• See <a href="#">page 13</a> for gas flow volume</li> </ul>
ETC Viewer 		<ul style="list-style-type: none"> <li>• Clean, dry, oil-free compressed air</li> <li>• 206–690 kPa gauge (30–100 psig)</li> <li>• See <a href="#">page 13</a> for gas flow volume</li> </ul>



Circulator



Power



Cooling



Gas



LN<sub>2</sub>



Fluid



Light



Hardware



Software



Temp



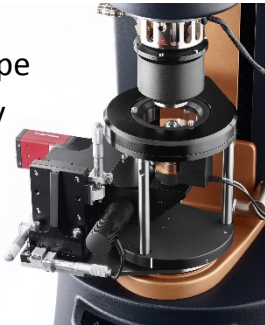








Lab



Customer

# Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements	
Immobilization Cell 		<ul style="list-style-type: none"> <li>Recirculating water bath (supplied)</li> <li>Vacuum pump and pressure gauge with connection for 6mm tubing</li> </ul>
Modular Microscope Accessory (MMA) 		PC with spare network card
Magneto-Rheology Accessory 	 	<ul style="list-style-type: none"> <li>For distilled/deionized water, minimum of 0.5L/min.</li> <li>Fluid circulator required:               <ul style="list-style-type: none"> <li>For <b>open loop</b> temperature control the <b>ThermoCube</b> (PN 403258.901) is recommended. See page 11 for ThermoCube requirements. </li> <li>For <b>closed loop</b> temperature control, the <b>Julabo FP35HE</b> (PN 500020.901) is recommended. See <a href="#">page 10</a> for Julabo requirements. </li> </ul> </li> <li>Always consult circulator manual for correct combination of fluid and temperature range</li> </ul>



Circulator

Power

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LN<sub>2</sub>

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Software

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Lab

Customer

# Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements	
Pressure Cell 		<ul style="list-style-type: none"> <li>Compressed inert gas tank up to 13.8 MPa gauge (2000 psig) with an appropriate regulator</li> <li>High pressure hose and regulator are not supplied with the Pressure Cell option. Regulators and hose are available from: <a href="http://www.buy-compressed-gasregulators.com">http://www.buy-compressed-gasregulators.com</a> or from your local high pressure gas bottle supplier</li> </ul>
Starch Pasting Cell 	 	<ul style="list-style-type: none"> <li>Clean, dry, oil-free compressed air is required to purge cooling water from the cell: 206–690 kPa (30–100 psig)</li> <li>See <a href="#">page 13</a> for gas flow volume</li> <li>Cooling water must be provided. TA Instruments air cooled <u>Heat Exchanger</u> (PN 403209.901) is recommended. Refrigerated circulator is required for cooling below ambient.</li> </ul>
Small Angle Light Scattering (SALS) 		 <ul style="list-style-type: none"> <li>As per Peltier Plate (Refer to the DHR Site Preparation Guide for requirements)</li> <li>Circulation fluid temperature should not be below ambient</li> </ul>



Circulator



Power



Cooling



Gas



LN<sub>2</sub>



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# Air Chiller System (ACS)

Accessory	Smart Swap™ Requirements	
<p>UV Light Guide</p> 	 	<p>Customer-supplied light source must be an <u>EXFO Omnicure Series 2000</u></p> 
<p>UVLED</p> 		<ul style="list-style-type: none"> <li>• As per the Peltier Plate (Refer to the DHR Site Preparation Guide for requirements)</li> <li>• Circulation fluid should not be below ambient</li> <li>• TA Instruments air cooled <u>Heat Exchanger</u> (PN 403209.901) is recommended</li> </ul> 



Circulator



Power



Cooling



Gas



LN<sub>2</sub>



Fluid



Light



Hardware



Software



Temp



Lab



Customer



# Air Chiller System (ACS)



Height: 88.5 cm (35 in)

Width: 37 cm (14.5 in) WITHOUT Chiller Panel

Width: 52 cm (20.5 in) WITH Chiller Panel

Depth: 56 cm (22 in)

Weight: 96 kg (211 lbs) WITHOUT Chiller Panel

Weight: 112 kg (247 lbs) WITH Chiller Panel



## ACS-3 MEASUREMENTS

Height: 112 cm (44 in)

Width: 37 cm (14.5 in) WITHOUT Chiller Panel

Width: 52 cm (20.5 in) WITH Chiller Panel

Depth: 56 cm (22 in)

Weight: 121 kg (267 lbs) WITHOUT Chiller Panel

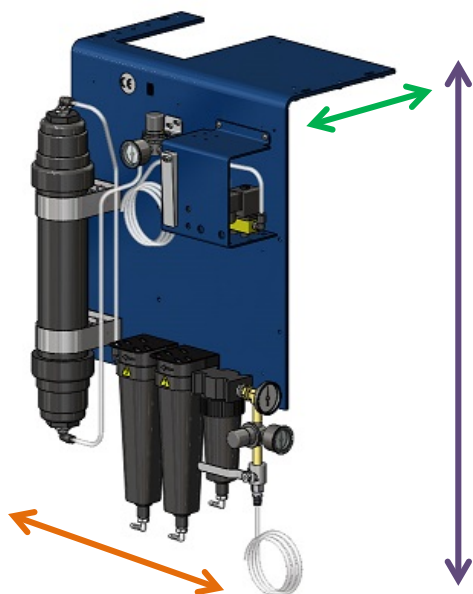
Weight: 137 kg (302 lbs) WITH Chiller Panel



# ETC Chiller Panel



## ETC CHILLER PANEL MEASUREMENTS



Height: 86.4 cm (34 in)

Width: 48.3 cm (19 in)

Depth: 38.1 cm (15 in)

Weight: 15.8 kg (35 lbs)



# ACS/Chiller Panel Utility Requirements



## POWER

- 220–230 VAC
- 50 Hz or 60 Hz (refer to the serial number plate on the rear of the unit)
- Nominal 9.3A (Max 12A)



## GAS

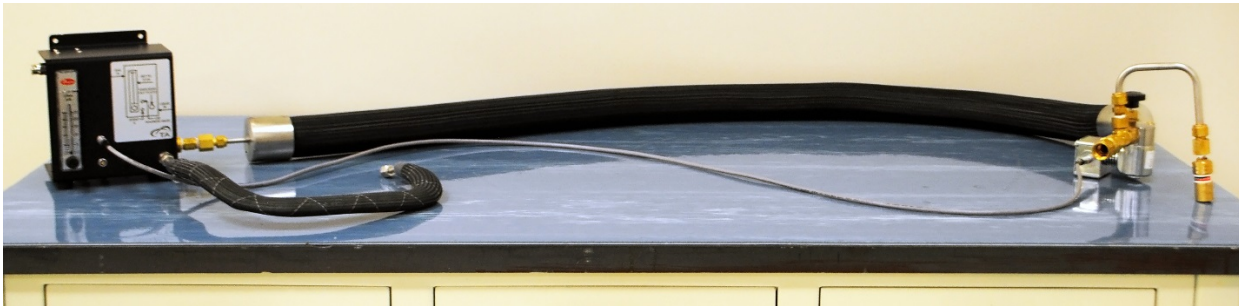
	Cooling Gas: Air or Nitrogen
Gas Pressure	6.2–6.9 bar (90–100 psig)
Flow Rate	See <a href="#">page 13</a> for gas flow volume
Temperature	20–30°C
Dew point	Must not exceed the ambient air temperature by more than 5°C. Dew point is specified at operating temperature.
Laboratory Room Temperature	<ul style="list-style-type: none"><li>• 12°C–21°C = Acceptable</li><li>• 21°C–24°C = Ideal</li><li>• Operating altitude: 2000 m maximum</li><li>• Relative humidity: 5%–80% RH from 15°C–24°C</li></ul>

# ETC Low Temp Cooling Accessory



## GAS

Customer-supplied bulk low pressure liquid nitrogen tank (50–250 liters) with a 23 psig relief valve.



# Julabo FP35-HE Circulator

Used with Asphalt Submersion Cell and/or  
Magneto Rheology Accessory



## JULABO MEASUREMENTS



Height: 64 cm (25 in)

Width: 35 cm (12 in)

Depth: 43 cm (17 in)

Weight: 34 kg (74 lbs)



## POWER

- 115 VAC at 60 Hz (14 A)
- 230 VAC at 50 Hz (12 A)
- 15 A with receptacle and plug



## WATER

Distilled or deionized water

# Gas Cooling Accessory (GCA)

Used with Electrically Heated Plates



## GCA MEASUREMENTS



Standard diameter: 51 cm (20 in)

Height: 107 cm (42 in)

Width: 46 cm (18 in)

Depth: 79 cm (31 in)

Weight EMPTY: 40 kg (101 lbs)

Weight FULL: 87 kg (191 lbs)



## POWER

- 120 VAC at 0.9 KW, 47–63 Hz  
OR
- TA Instruments transformer (PN 546153.901) for 220 VAC environments



## LIQUID NITROGEN

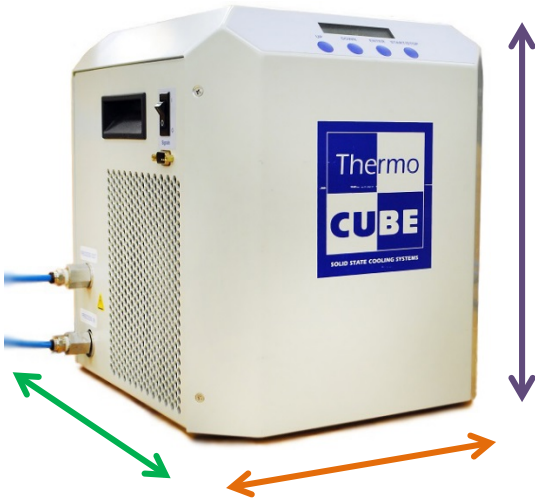
- Bulk low pressure liquid nitrogen tank to refill the 50 L GCA dewar
- Pressure: 150–170 kPa gauge (22–25 psig)

# ThermoCube Circulator

Used with Magneto Rheology Accessory



## THERMOCUBE MEASUREMENTS



Height: 32 cm (12.75 in)

Width: 28 cm (11 in)

Depth: 32 cm (12.75 in)

Weight: 14 kg (28 lbs)



## POWER

- 115–230 VAC at 50/60 Hz (3.5 A)
- 15 A with receptacle and plug



## WATER

80/20 water/alcohol mixture recommended

# Gas Flow Requirements



## GAS FLOW REQUIREMENTS FOR DHR AND ACCESSORY COMBINED

DHR accessory combined (instrument and accessory) compressed air flow rates:

Accessory	Flow Rate
Air Cooling System (ACS)	200 L/min
Dielectric Accessory	2 L/min
Electrically Heated Cylinder (EHC)	52 L/min
Environmental Test Chamber (ETC) Viewer	17 L/min
Gas Cooling Accessory (GCA)	2 L/min
Immobilization Cell	2 L/min
Magneto Rheology	2 L/min
Modular Microscope Accessory (MMA)	2 L/min
Pressure Cell	2 L/min
Single Angle Light Scattering (SALS)	2 L/min
Starch Pasting Cell	3 L/min
Submersion Cell	2 L/min
UV LED	2 L/min
UV Light Guide	2 L/min



# Site Preparation Checklist



## Discovery Hybrid Rheometer Accessories

Accessory (check all that apply):

- |  |   |
|--|---|
| <input type="checkbox"/> ACS and ETC Chiller Panel | <input type="checkbox"/> MMA                        |
| <input type="checkbox"/> Asphalt Submersion Cell   | <input type="checkbox"/> Magneto Rheology Accessory |
| <input type="checkbox"/> Dielectric Accessory      | <input type="checkbox"/> Pressure Cell              |
| <input type="checkbox"/> EHC                       | <input type="checkbox"/> Starch Pasting Cell        |
| <input type="checkbox"/> ETC Viewer                | <input type="checkbox"/> SALS                       |
| <input type="checkbox"/> GCA                       | <input type="checkbox"/> ThermoCube Circulator      |
| <input type="checkbox"/> Immobilization Cell       | <input type="checkbox"/> UV Light Guide             |
| <input type="checkbox"/> Julabo FP35-HE Circulator | <input type="checkbox"/> UVLED                      |

I hereby acknowledge that all utility requirements for the accessories checked above have been met per this document and that they will be ready at the agreed time of installation.

**If all utility requirements are not met at the agreed time of installation, additional charges may be incurred for a return Service trip.**

\_\_\_\_\_  
Customer DD / MM / YYYY

\_\_\_\_\_  
Company City State Country

Please send a signed copy of the completed checklist to your local Service representative.

# TA Instruments Offices

For information on our latest products, contact information, and more, see our website at:  
<http://www.tainstruments.com>.

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