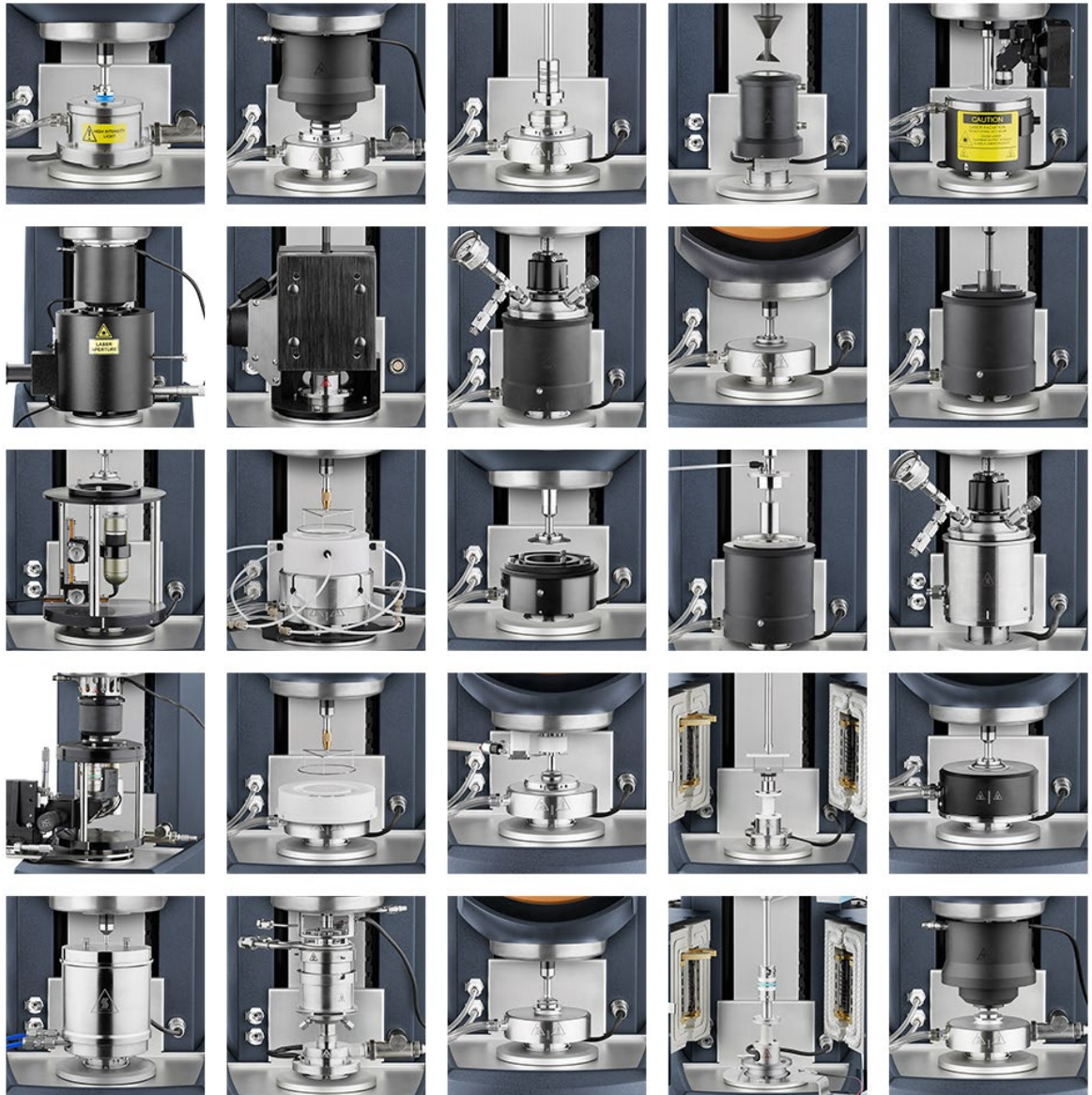


HR/DHR Accessories Requirements



Site Preparation Guide for HR 10/20/30 Series and DHR 1/2/3 Series

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Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp







Lab



Customer

Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements	
Dielectric Accessory	 <ul style="list-style-type: none"> PC with USB port Customer-supplied Keysight E40980A LCR meter 	
Electrically Heated Cylinder (EHC)	 <ul style="list-style-type: none"> Optional ambient cooling with clean, dry, oil-free compressed air: 206–690 kPa gauge (30–100 psig) See page 18 for gas flow volume 	
ETC Viewer	 <ul style="list-style-type: none"> Clean, dry, oil-free compressed air 206–690 kPa gauge (30–100 psig) See page 18 for gas flow volume 	



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

Smart Swap™ Requirements

Accessory

Immobilization
Cell



Modular
Microscope
Accessory
(MMA)



Magneto-
Rheology
Accessory



Smart Swap™ Requirements



- TA Instruments air cooled **Heat Exchanger** (PN 403209.901) or **TCube Edge Model 5A** (PN 404500.901) with Koolance required.
- Vacuum pump and pressure gauge with connection for 6 mm tubing



PC with spare network card



- Fluid circulator required:
 - For **open loop** temperature control the **TCube Edge Model 5A** (PN 404500.901) is recommended. See [page 17](#) for TCube requirements.
 - For **manual** temperature control, the **Julabo DD-600F** (PN 500020.901) is recommended. See [page 14](#) for Julabo requirements.
- Always consult circulator manual for correct combination of fluid and temperature range



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp






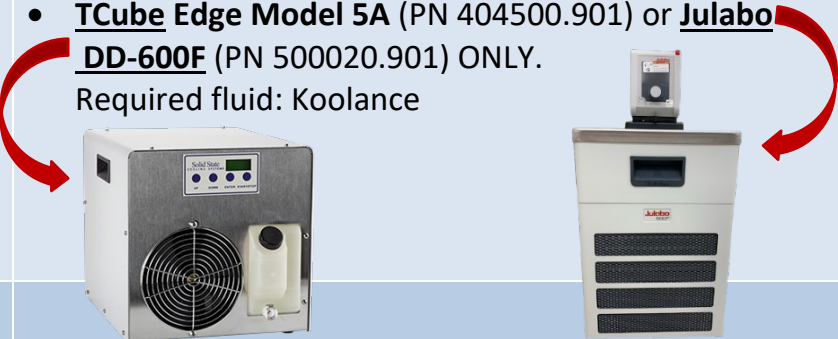





Lab



Customer

Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements	
Pressure Cell 		<ul style="list-style-type: none"> Compressed inert gas tank up to 13.8 MPa gauge (2000 psig) with an appropriate regulator High pressure hose and regulator are not supplied with the Pressure Cell option. Regulators and hose are available from your local high-pressure gas bottle supplier
Starch Pasting Cell 	 	<ul style="list-style-type: none"> Clean, dry, oil-free compressed air is required to purge cooling water from the cell: 206–690 kPa (30–100 psig) See page 18 for gas flow volume TCube Edge Model 5A (PN 404500.901) or Julabo DD-600F (PN 500020.901) ONLY. Required fluid: Koolance 
SALS 		<ul style="list-style-type: none"> TA Instruments air cooled Heat Exchanger (PN 403209.901) with Koolance at 0.5 L/min required. Circulation fluid temperature should not be below ambient 



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp










Lab



Customer

Smart Swap™ Requirements

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



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

Smart Swap™ Temperature Systems

The cooling rate and minimum temperature will depend on the source of cooling.

Accessory	Smart Swap Requirements	
<p>EHP</p> 	 	<ul style="list-style-type: none"> Purge flow of 5 L/min (305 in³/min) inert gas Motor cooling gas flow of 10 L/min for temperatures above 250°C. Air pressure of 50–100 psig. Optional controlled cooling with <u>GCA</u>. Refer to the DHR Accessories Requirement guide for GCA requirements. Crash cooling pressure of 50–100 psig and a flow of ~2.5 scfm (70 L/min) 
<p>ETC</p> 		<p>Purge gas flow rate should be 10 L/min (610 in³/min) at 206–690 kPa (30–100 psig)</p>
<p>Peltier Plates & Peltier CC</p> 	 	<p>Includes Advanced Peltier Plate, High-Temperature Advanced Peltier Plate, Dual Stage Peltier Plate, Upper Peltier Plate, Lower Peltier Plate</p> <ul style="list-style-type: none"> Always consult the Getting Started Guide for correct combination of fluid and temperature range UPP: If desired, for inert samples, use of nitrogen purge gas at 1 L/min is recommended



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

Smart Swap™ Temperature Systems

Accessory

Upper Heated Plate
(UHP)



Smart Swap Requirements



Option 1: Standard Cooling Accessory

- TA-supplied Air-Cooled Circulator (PN 403209.901)

- Fluid: Koolance (2 bottles)



Option 2: Low Temperature Cooling Accessory–TCube Edge

- TA-supplied TCube Edge Model 5A (PN 404500.901)

- Fluid: Koolance (supplied with the TCube)



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp







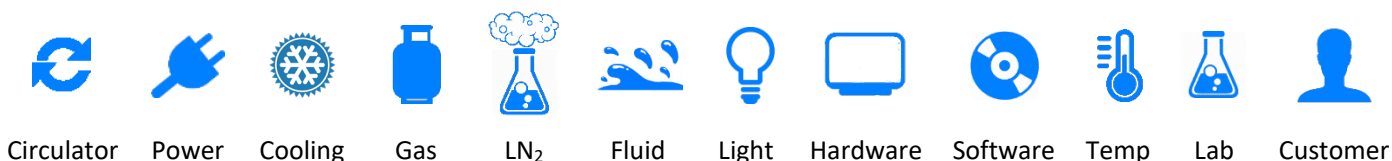
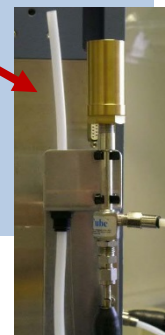
Lab



Customer

Smart Swap™ Temperature Systems

Accessory	Smart Swap Requirements	
UHP, continued	  	<p><u>Option 3: Low Temperature Cooling Accessory–Customer-supplied</u></p> <ul style="list-style-type: none"> Customer-supplied refrigerated and heating circulator and appropriate fluid (ie. silicone fluid)  DO NOT USE WATER AS CIRCULATION FLUID Supply: 5°C below the minimum required temperature at a minimum flow rate through the system of 0.5 L/min (12.2 in³/min) <p><u>Option 4: Low Temperature Cooling Accessory–Vortex</u></p> <ul style="list-style-type: none"> TA-supplied <u>Vortex Cooler</u> (PN 545809.901) Air: Clean, dry, oil-free, compressed air 200L/min at 552–690 kPa gauge (80–100 psig) Dew point: -30°C or better



Air Chiller System (ACS)



ACS-2 MEASUREMENTS



Height: 88.5 cm (35 in)

Width: 37 cm (14.5 in) WITHOUT Chiller Panel

Width: 56 cm (22 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: 56 cm (22 in) WITH Chiller Panel

Depth: 56 cm (22 in)

Weight: 121 kg (267 lbs) WITHOUT Chiller Panel

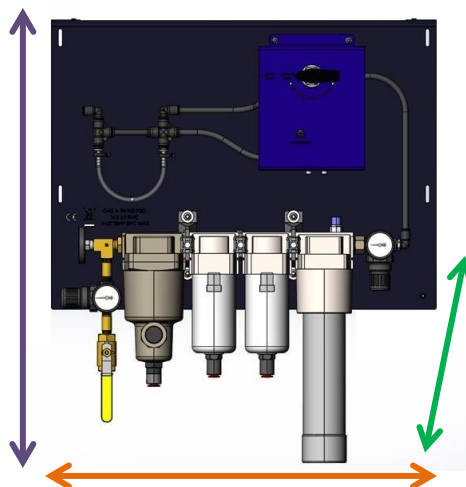
Weight: 128 kg (282 lbs) WITH Chiller Panel



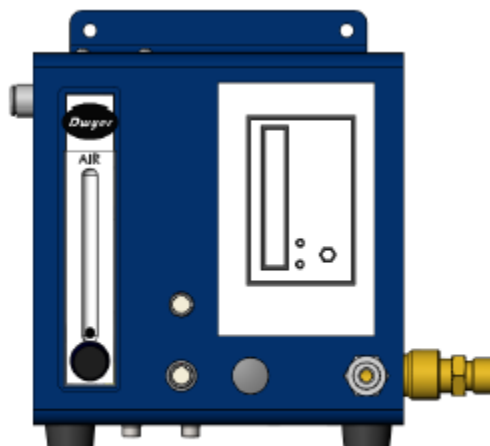
ACS Chiller Panel



CHILLER PANEL



**HR/DHR ETC and DMA 850 Combined
Chiller Panel
P/N 405400.901**



**ETC Lo-Temp Manifold for ACS
P/N 545056.901**

Height: 64 cm (25 in)

Width: 56 cm (22 in)

Depth: 38.1 cm (15 in)

Weight: 7.25 (16 lbs)

ACS/Chiller Panel Utility Requirements



AIR CHILLER SYSTEM REQUIREMENTS

Requirements



- 50 Hz: 207–252 VAC (refer to the serial number plate on the rear of the unit. The ACS is line frequency specific.)
- 60 Hz: 216–252 VAC (refer to the serial number plate on the rear of the unit. The ACS is line frequency specific.)
- 8A, 9A, 9.1A, or 11A (refer to the serial number plate on the rear of the unit)
- US sites require an L6-20 single-phase outlet



NEMA L6-20 plug



- Gas:
 - Air or nitrogen
 - Pressure: 6.9 bar (100 psig)
 - Flow rate: 200 SLPM
 - Temperature: 20–30°C
 - Dew point: -40°C (-40°F) **NOTE:** Dew point is specified at operating pressure. Supplying dryer air at a lower dew point will extend continuous operation.



- Lab Environment (must be below 25°C):
 - 21°C–24°C = Ideal
- Leave 20 cm (8 in) of space in the front and back of the ACS for ventilation



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab

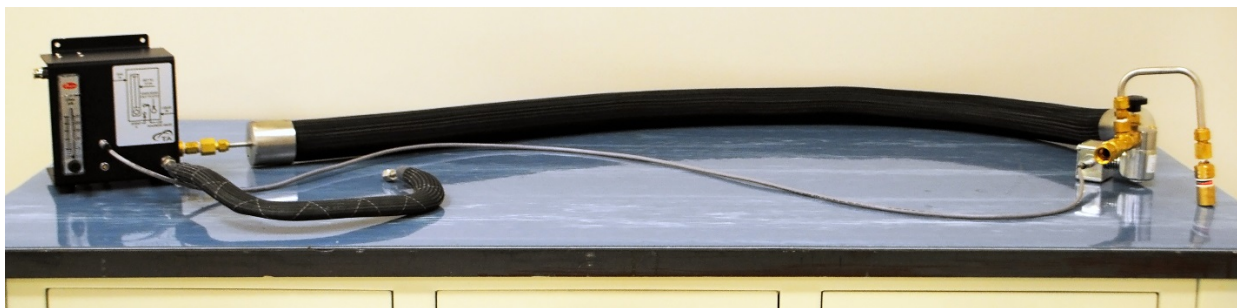


Customer

ETC Low Temp Cooling Accessory



ETC REQUIREMENTS



Requirements



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



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

Julabo Circulator

Used with the Magneto Rheology Accessory



JULABO DD-600F MEASUREMENTS



Height: 64 cm (25 in)

Width: 3.5 cm (12 in)

Depth: 43 cm (17 in)

Weight: 34 kg (74 lbs)

Requirements



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



- See table below

Bath Fluid	Temperature Range	Accessory Used
Koolance	-5 to 65°C	Magneto-Rheology Accessory
	-----	Starch Pasting Cell
Julabo H10	80°C to 170°C	



For the Extended Temperature Module, the temperature range -10°C–170°C must use the Julabo H10 fluid to reach 170°C.



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



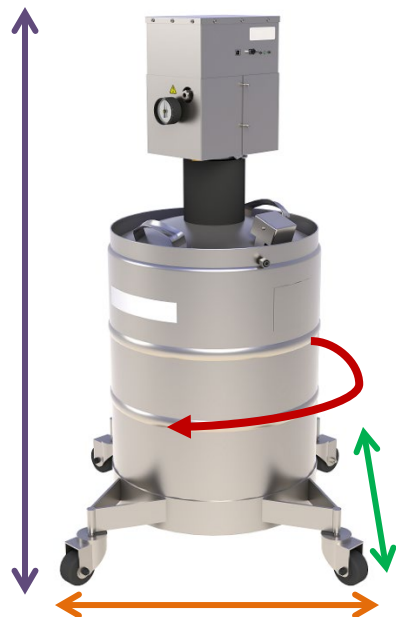
Customer

Gas Cooling Accessory (GCA) V3

Used with Electrically Heated Plates



GCA V3 MEASUREMENTS



Dewar diameter: 46 cm (18 in)

Height: 112 cm (44 in)

Width: 46 cm (18 in)

Depth: 79 cm (31 in)

Weight EMPTY: 47 kg (104 lbs)

Weight FULL: 88 kg (194 lbs)

Transfer line: 1.8 m (6 ft)



GCA V3 REQUIREMENTS

Requirements



- 100–240 VAC at 0.9 kVa, 47–63 Hz
- Approved for operation on a 20 A branch circuit with protective conductor (ground)



- Bulk low-pressure liquid nitrogen tank to refill the 50 L GCA dewar
- Pressure: 90 kPa gauge (13 psig) relief valve on tank
345 kPa gauge (50 psig) on fill line
- Use low pressure supply tank only. Recommended filling pressure is 140 to 170 kPa gauge (20 to 25 psig)



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

Relative Humidity (RH) Accessory



HUMIDITY GENERATOR MEASUREMENTS



Height: 36.8 cm (14.5 in)

Width: 30.5 cm (12 in)

Depth: 50.8 cm (20 in)

Weight EMPTY: 27 kg (60 lbs)

Requirements



- 90–260 VAC, 45–65 Hz



- Dry nitrogen must be available to the dryer supplied with the Relative Humidity option
- Pressure: 207–827 kPa (30–120 psig)



- Distilled water



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

TCube Edge Model 5A Circulator

Used with Magneto Rheology Accessory,



TCUBE EDGE CIRCULATOR MEASUREMENTS



Height: 28 cm (11 in)

Width: 33 cm (13 in)

Depth: 28 cm (11 in)

Weight: 11.3 kg (25 lbs)

Requirements



- 100–240 VAC at 50/60 Hz (3.5 A)
- Neutral to ground < 1 volt
- 8.5 A at 100 VAC, 3.5 A at 240 VAC
- Digital PID controller for heating and cooling



Koolance (supplied with TCube)



Circulator



Power



Cooling



Gas



LN₂



Fluid



Light



Hardware



Software



Temp



Lab



Customer

Gas Flow Requirements



GAS FLOW REQUIREMENTS FOR HR/DHR AND ACCESSORY COMBINED

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

Accessory	Flow Rate
Air Cooling System (ACS)	200 slpm
Dielectric Accessory	2 L/min
Electrically Heated Cylinder (EHC)	52 L/min
Electrically Heated Plate	80 L/min with crash cooling and motor cooling
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
Peltier (all types)	2 L/min
Pressure Cell	2 L/min
Relative Humidity (RH) Accessory	3 L/min nitrogen gas
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 (HR 10/20/30 & DHR 1/2/3) Accessories

Accessory (check all that apply):

- ☐ ACS and ETC Chiller Panel
- ☐ Dielectric Accessory
- ☐ EHC
- ☐ EHP
- ☐ ETC Viewer
- ☐ GCA V3
- ☐ Immobilization Cell
- ☐ Julabo DD-600F Circulator
- ☐ MMA
- ☐ Magneto Rheology Accessory
- ☐ Pressure Cell

- ☐ Peltier Plate
 - ☐ Advanced Peltier Plate
 - ☐ High-Temperature Advanced Peltier Plate
 - ☐ Dual Stage Peltier Plate
 - ☐ Upper Peltier Plate
 - ☐ Lower Peltier Plate
- ☐ RH Accessory
- ☐ Starch Pasting Cell
- ☐ SALS
- ☐ TCube Circulator
- ☐ UV Light Guide
- ☐ 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>.

To find your local TA Instruments office and contact information, visit
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