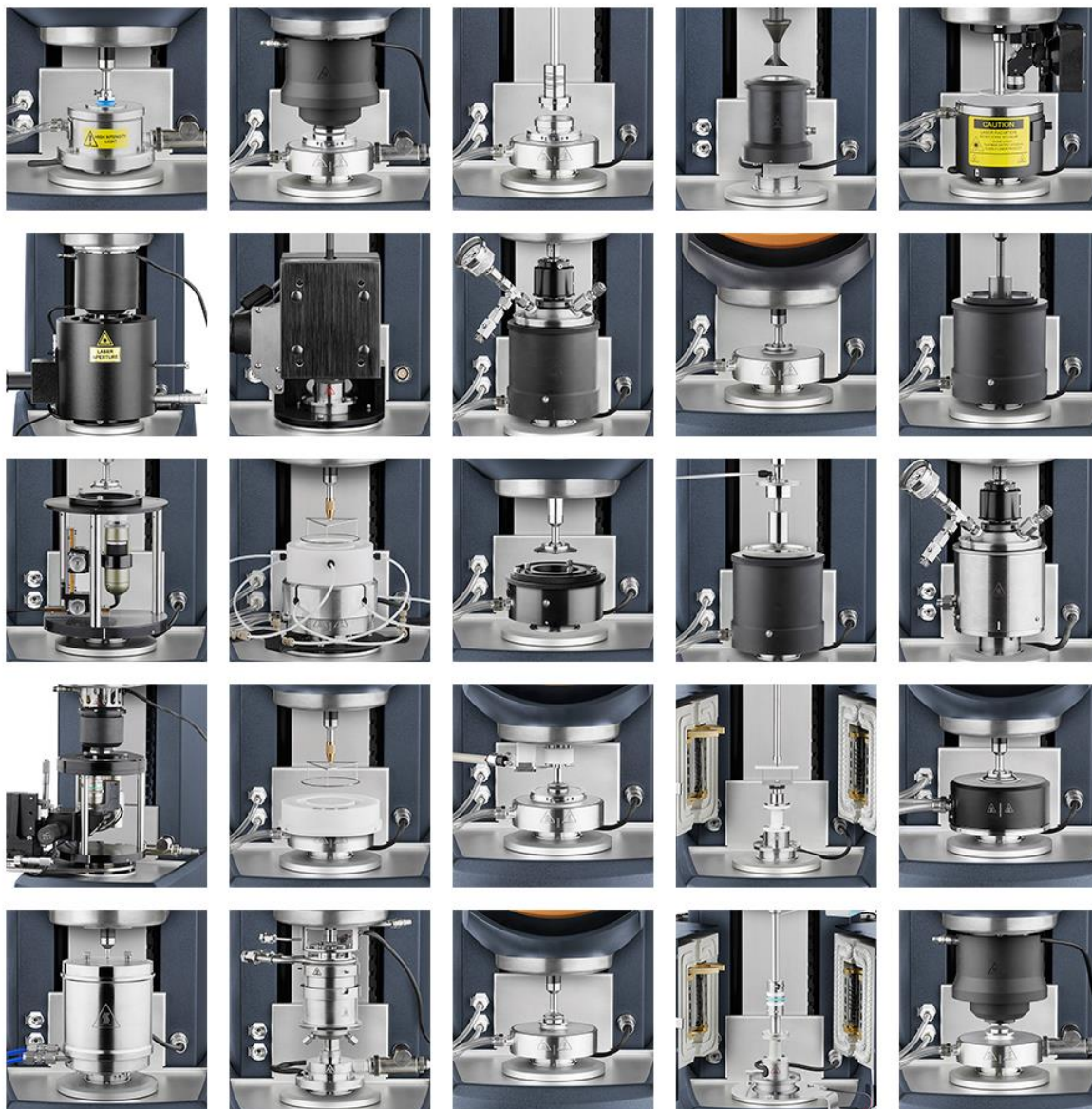


DHR Accessories Requirements



Site Preparation Guide for HR 10/20/30 Series and HR 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	
Asphalt Submersion Cell 		<p>Julabo FP35-HE (PN 500020.901) with TA Instruments firmware. See page 11 for circulator requirements.</p> 
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 15 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 15 for gas flow volume



Circulator



Power



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Temp












Lab



Customer

Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements	
Immobilization Cell 		<ul style="list-style-type: none"> 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 
Modular Microscope Accessory (MMA) 		PC with spare network card
Magneto-Rheology Accessory 	 	<ul style="list-style-type: none"> Fluid circulator required: <ul style="list-style-type: none"> For open loop temperature control the TCube Edge Model 5A (PN 404500.901) is recommended. See page 14 for TCube requirements. For closed loop temperature control, the Julabo FP35HE (PN 500020.901) is recommended. See page 11 for Julabo requirements. Always consult circulator manual for correct combination of fluid and temperature range 



Circulator



Power



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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 15 for gas flow volume TCube Edge Model 5A (PN 404500.901) or Julabo FP35HE (PN 500020.901) ONLY. Required fluid: Koolance
SALS 		  <ul style="list-style-type: none"> As per Peltier Plate (Refer to the DHR Site Preparation Guide for requirements) Circulation fluid temperature should not be below ambient



Circulator



Power



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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 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



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Light



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Lab



Customer

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

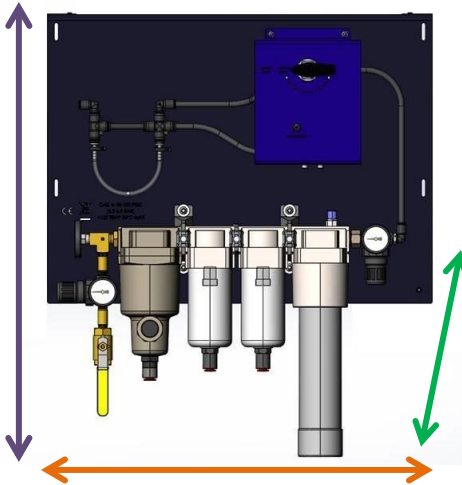
Weight: 128 kg (282 lbs) WITH Chiller Panel



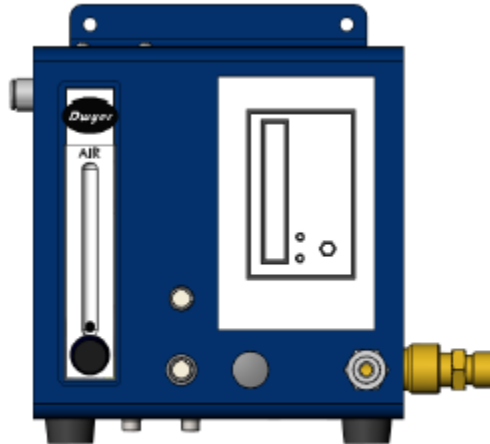
ACS Chiller Panel



CHILLER PANEL



**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



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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

Julabo FP-35 is used with the Asphalt Submersion Cell and
the Julabo FP-32 is used with the Magneto Rheology Accessory



JULABO 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
Distilled or deionized (DI) water	5°C to 80°C	Asphalt Submersion Cell = DI water only
Koolance	-5 to 65°C	Magnet-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



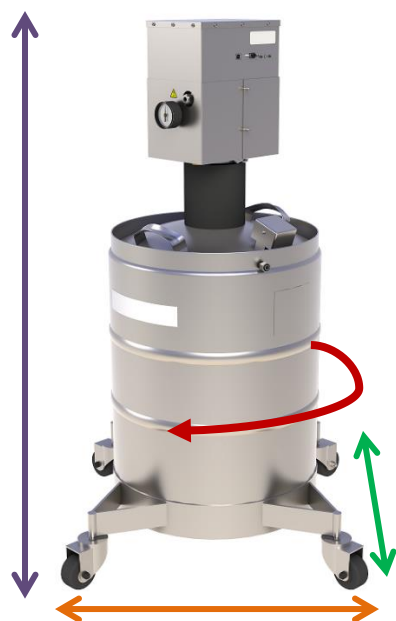
Customer

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 DHR AND ACCESSORY COMBINED

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
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
Relative Humidity (RH) Accessory	3 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 (HR 10/20/30 & HR 1/2/3) Accessories

Accessory (check all that apply):

- ☐ ACS and ETC Chiller Panel
- ☐ Asphalt Submersion Cell
- ☐ Dielectric Accessory
- ☐ EHC
- ☐ ETC Viewer
- ☐ GCA V3
- ☐ Immobilization Cell
- ☐ Julabo FP35-HE Circulator
- ☐ MMA

- ☐ Magneto Rheology Accessory
- ☐ Pressure Cell
- ☐ 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

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