DHR Accessories Requirements



Site Preparation Guide

Revision E Issued October 2018

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Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements
Asphalt Submersion Cell 	**Julabo FP35-HE** (PN 500020.901) with TA Instruments firmware. See page 11 for circulator requirements. 
Dielectric Accessory 	• PC with USB port • Customer-supplied **Keysight E40980A LCR meter** 
Electrically Heated Cylinder (EHC) 	• 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 	• Clean, dry, oil-free compressed air • 206–690 kPa gauge (30–100 psig) • See page 15 for gas flow volume

Circulator Power Cooling Gas LN_2 Fluid Light Hardware Software Temp Lab Customer

Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements
Immobilization Cell 	• 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 	• Fluid circulator required:
	  • 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

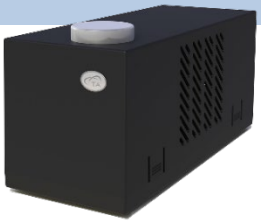
Circulator | Power | Cooling | Gas | LN_2 | Fluid | Light | Hardware | Software | Temp | Lab | Customer

Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements
Pressure Cell 	• 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 	• 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  
Small Angle Light Scattering (SALS) 	• As per Peltier Plate (Refer to the DHR Site Preparation Guide for requirements) • Circulation fluid temperature should not be below ambient

Circulator Power Cooling Gas LN_2 Fluid Light Hardware Software Temp Lab Customer

Smart Swap™ Requirements

Accessory	Smart Swap™ Requirements
UV Light Guide 	• Customer-supplied light source must be an **EXFO Omnicure Series 2000** 
UVLED 	• 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 **Heat Exchanger** (PN 403209.901) is recommended; Koolance required with use of the Heat Exchanger. 

Circulator Power Cooling Gas LN_2 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)

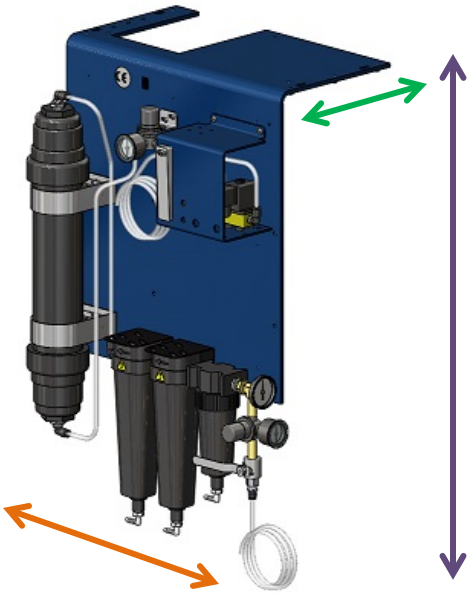
Weight: 121 kg (267 lbs) WITHOUT Chiller Panel

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

- 230–240 VAC
- 50 Hz or 60 Hz (refer to the serial number plate on the rear of the unit)
- Nominal 9.3A (Max 12A)

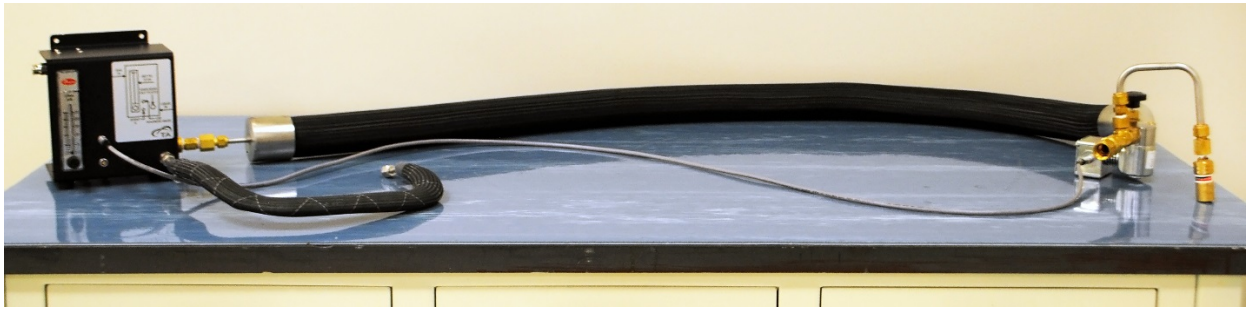


GAS

	Cooling Gas: Air or Nitrogen
Gas Pressure	6.2–6.9 bar (90–100 psig)
Flow Rate	See page 15 for gas flow volume
Temperature	20–30°C
Dew point	-40°C pressure dew point. Note: Dew point is measured at the operating pressure.
Laboratory Room Temperature	• 12°C–21°C = Acceptable 21°C–24°C = Ideal • Operating altitude: 2000 m maximum • Relative humidity: 5%–80% RH from 15°C–24°C

LIQUID NITROGEN

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



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)

POWER

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

FLUID

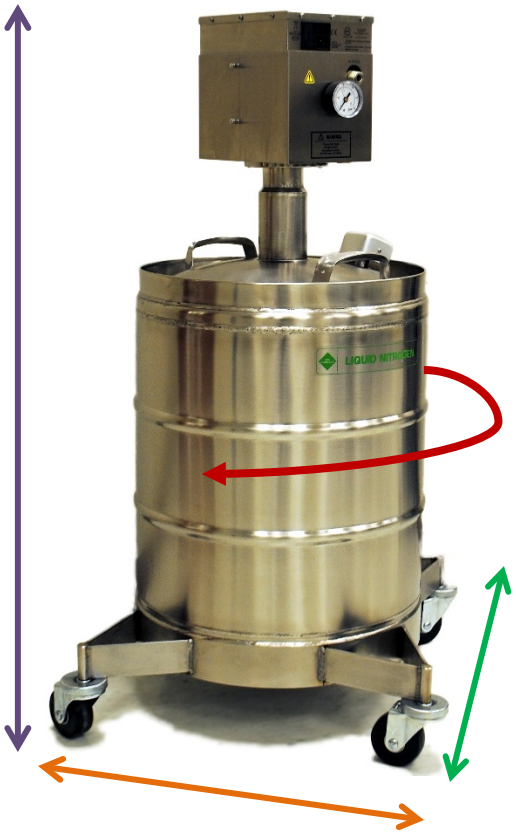
Bath Fluid	Temperature Range	Accessory Used
Distilled or deionized (DI) water	5°C to 80°C	Asphalt Submersion Cell = DI water only
Koolance	-5 to 65°C	Magnet-Rheology Accessory
	----------	Starch Pasting Cell
Julabo H10	80°C to 170°C	

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

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)

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)

POWER

- 90–260 VAC, 45–65 Hz

GAS

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

FLUID

- Distilled water

TCube Edge Model 5A Circulator

Used with Magneto Rheology Accessory

TCUBE MEASUREMENTS



Height: 28 cm (11 in)

Width: 33 cm (13 in)

Depth: 28 cm (11 in)

Weight: 11.3 kg (25 lbs)

POWER

- 100–240 VAC, 50/60 Hz
- 8.5 A at 100 VAC, 3.5 A at 240 VAC
- Digital PID controller for heating and cooling

FLUID

Koolance (supplied with TCube)

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 Accessories

Accessory (check all that apply):	
☐ ACS and ETC Chiller Panel ☐ Asphalt Submersion Cell ☐ Dielectric Accessory ☐ EHC ☐ ETC Viewer ☐ GCA ☐ 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.

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

_____ ___/___/_____

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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