

## LCR7000 SERIES – CAPILLARY RHEOMETER

**DYNISCO POLYMER TEST** capillary rheometer's have become the instruments of choice because of their ease of use and built-in features. All of our capillary rheometers meet or exceed the specifications of ASTM D3835, DIN ISO 11443, and DIN 53014. They are all microprocessor controlled for automatic operation and can measure the flow of polymers over a wide range of process conditions.

The best way to determine the polymer rheology is to measure the viscosity over a wide range of shear rates. The instrument can operate from low to high shear rates and automatically monitor as many as 45 measurement points with one barrel loading. The thermal stability can be monitored and reported at constant shear rate.

Important process parameters such as temperature and barrel pressure can be optimized since the capillary rheometer simulates what is occurring in the head area of an extruder or the gate area of an injection molding machine. Your regrind (scrap) material can be put to good use since the material blend variations can be researched to find which is best suited to produce a useable end product. In addition, die swell ratio can also be monitored using our laser micrometer system (optional).



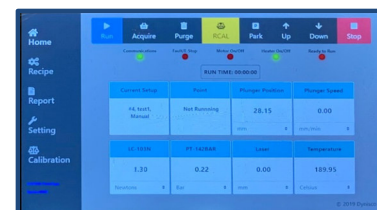
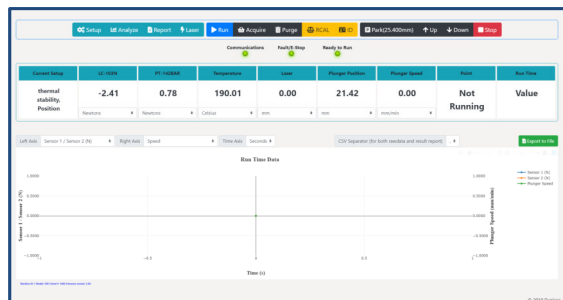
The **Rheosights™** Software (with the purchase of Edge Device – see page 7 for more details) is easy to operate and can store a number of tests on board and will also allow for storage on a network drive. **Rheosights™** is used for data storage as well as printing, plotting, merging, and automatic curve fitting of the generated data. **Rheosights™** also allows for connection to **Dynisco's Cloud Console™** which provides further insights comparing test to test, operator to operator, machine to machine, and plant to plant globally.

**Rheosights™** software allows for Rabinowitsch and Bagley corrections are performed when possible. Other features include deleting points from the graphic screen, viewing the equations used in curve fitting along with the fitted coefficients and their error estimates, graphically interpolating data, annotation of plots, average Bagley corrected data, IMV calculation and apparent MFV (melt flow volume) calculation, setting up of SQC curves, and reporting die swell ratio using the optional laser micrometer system.



**IoT /Industry 4.0  
Enabled**

The 7000 Series capillary rheometer with **Rheosights™** software via Edge Device clearly offers the widest range of testing capabilities for both QC and research/development work. The price to performance ratio of the 7000 Series cannot be matched.



**The LCR 7000 Capillary Rheometer System Includes:**

**1.) LCR 7000 Capillary Rheometer**

Bi-directional PC programming, precision DC servo-drive motor/encoder, 9.5mm bore diameter x 175mm long swing-out barrel, Load cell with 0-15Kn (0-3372lbs) range, temperature range up to 400°C (Std) and 500°C (HT), recessed design orifice holder nuts, digital LED display and touch panel keyboard, multi-zone heater, platinum RTD for barrel temperature, over temperature alarm and cut off, cleaning and operating tools, built-in communication ports.

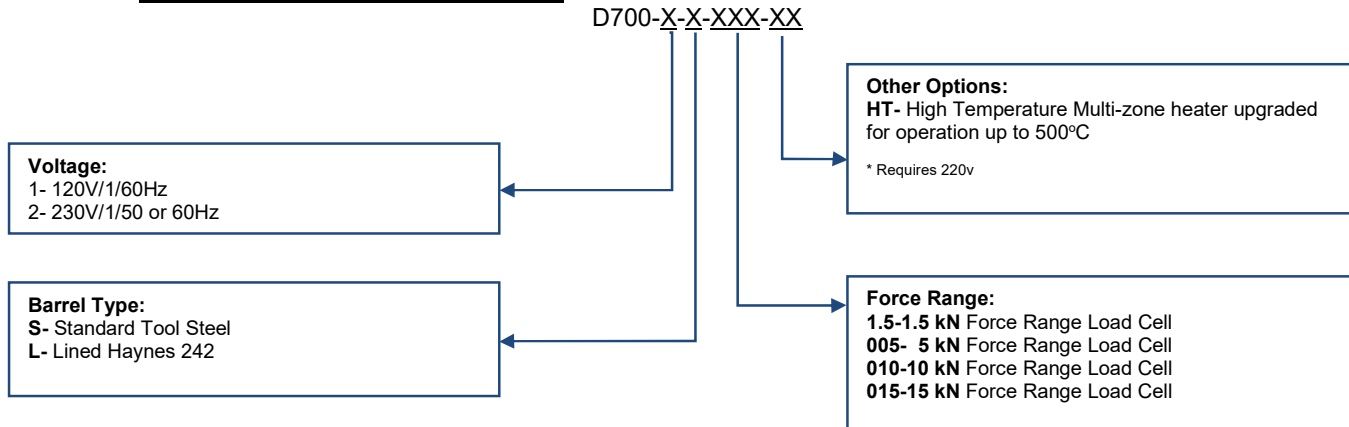
The LCR 7000 Series comes standard with the following features:

- Ram Rate: 0.030 – 600 mm/min
- Force Range Load Cell (See Configurations Below)
- (1 ea.) Tungsten Carbide Orifice, Included at No Charge

*In order to expedite your order please be sure to add the orifice part number on the purchase order.*



**Available LCR 7000 Configurations:**



**2.) GP8000LK Data Processing System:**

- 3GHz / 8GB DDR4 SDRAM
- Monitor: 17" Flat Screen
- Hard Drive: 1TB
- Operating System: Windows 10 Pro 64-bit Edition
- Intel UHD Graphics 630
- Gigabit Ethernet
- **LAB KARS for WINDOWS** – Provides data collection and advanced data analysis. Automatic measurement of up to 45 discreet points per barrel loading, bi-directional rheometer programming, "real time" data storage, plotting, printing, merging and curve fitting capability (power law, polynomial, modified Cross and Carreau with or without temperature dependence). Automatically calculates Rabinowitsch and Bagley corrections. Other calculations include IMV, IV (intrinsic viscosity), and apparent MFV (melt flow volume). Monitors extrudate die swell with optional laser micrometer system (See options list).



**The LCR 7001 Capillary Rheometer System Includes:**

**1.) LCR 7001 Capillary Rheometer**

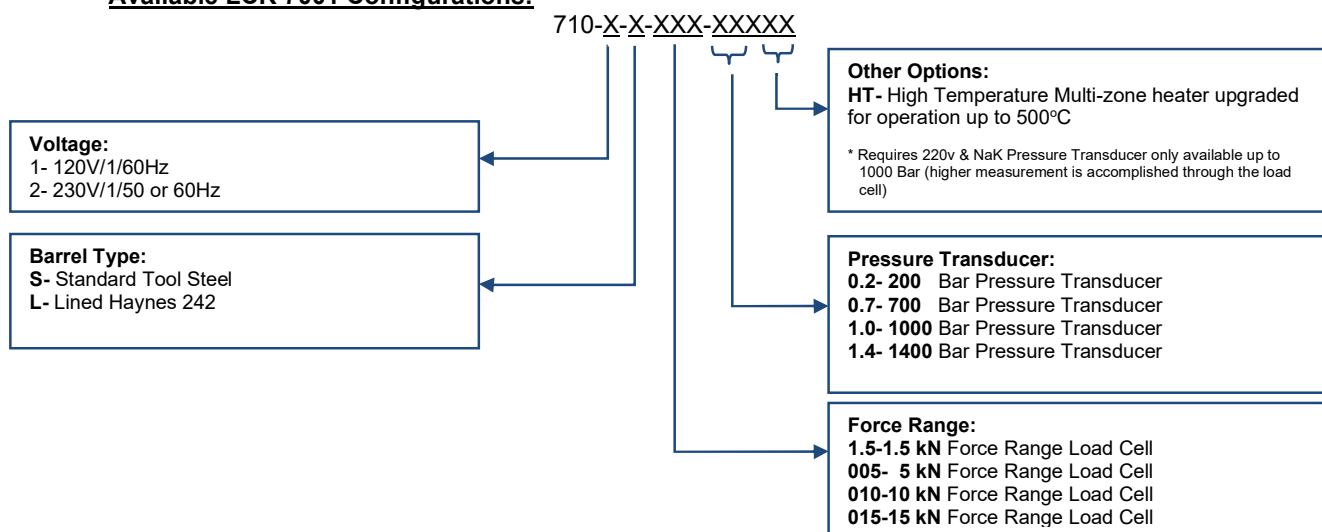
Bi-directional PC programming, precision DC servo-drive motor/encoder, 9.5mm bore diameter x 200mm long swing-out barrel designed to accept melt pressure transducer mounted 0.250" above orifice entrance, a pressure transducer (size specified below) and a load cell (size specified below), temperature range up to 400°C (Std) and 500°C (HT), recessed design orifice holder nuts, digital LED display and touch panel keyboard, multi-zone heater, platinum RTD for barrel temperature, over temperature alarm and cut off, cleaning and operating tools, built-in communication ports.



The LCR 7001 Series comes standard with the following features:

- Ram Rate: 0.030 – 600 mm/min
- Force Range Load Cell (See Configurations Below)
- Pressure Transducer (See Configurations Below)
- (3 ea.) Tungsten Carbide Orifice, Included at No Charge  
*In order to expedite your order please be sure to add the (3) orifice part numbers on the purchase order.*

**Available LCR 7001 Configurations:**



**2.) GP8000LK Data Processing System:**

- 3GHz / 8GB DDR4 SDRAM
- Monitor: 17" Flat Screen
- Hard Drive: 1TB
- Operating System: Windows 10 Pro 64-bit Edition
- Intel UHD Graphics 630
- Gigabit Ethernet
- **LAB KARS for WINDOWS** – Provides data collection and advanced data analysis. Automatic measurement of up to 45 discrete points per barrel loading, bi-directional rheometer programming, "real time" data storage, plotting, printing, merging and curve fitting capability (power law, polynomial, modified Cross and Carreau with or without temperature dependence). Automatically calculates Rabinowitsch and Bagley corrections. Other calculations include IMV, IV (intrinsic viscosity) correlation, and apparent MFV (melt flow volume). Monitors extrudate die swell with **optional** laser micrometer system (See options list).



**The LCR 7002 Capillary Rheometer System Includes:**

**1.) LCR 7002 Capillary Rheometer**

Bi-directional PC programming, precision DC servo-drive motor/encoder, (2) 9.5mm bore diameter x 200mm long swing-out barrels each designed to accept melt pressure transducer mounted 0.250" above orifice entrance, Two pressure transducers (sizes specified below). Temperature range up to 400°C (Std) and 500°C (HT), recessed design orifice holder nuts, digital LED display and touch panel keyboard, multi-zone heater, platinum RTD for barrel temperature, over temperature alarm and cut off, cleaning and operating tools, built-in communication ports.

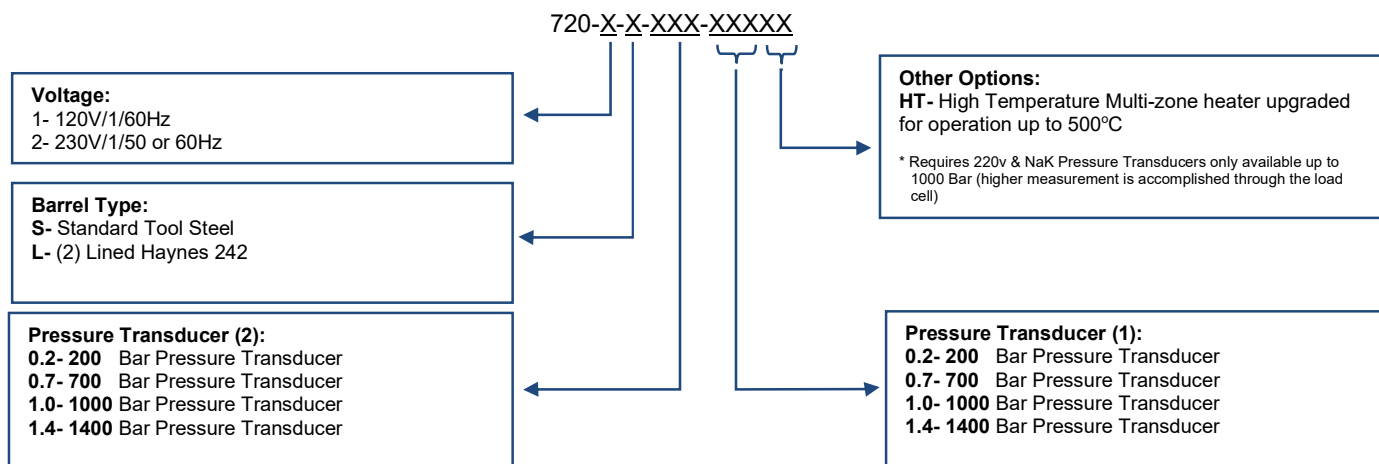


The LCR 7002 Series comes standard with the following features:

- Ram Rate: 0.030 – 600 mm/min
- (2) Pressure Transducer (See Configurations Below)
- (3 ea.) Tungsten Carbide Orifice, Included at No Charge

*In order to expedite your order please be sure to add the (3) orifice part numbers on the purchase order.*

**Available LCR 7002 Configurations:**



**2.) GP800LK Data Processing System:**

- 3.13GHz / 8GB DDR4 SDRAM
- Monitor: 17" Flat Screen
- Hard Drive: 1TB
- Operating System: Windows 10 Pro 64-bit Edition
- Intel UHD Graphics 630
- Gigabit Ethernet
- **LAB KARS for WINDOWS** – Provides data collection and advanced data analysis. Automatic measurement of up to 45 discreet points per barrel loading, bi-directional rheometer programming, "real time" data storage, plotting, printing, merging and curve fitting capability (power law, polynomial, modified Cross and Carreau with or without temperature dependence). Automatically calculates Rabinowitsch and Bagley corrections. Other calculations include IMV, IV (intrinsic viscosity) correlation, and apparent MFV (melt flow volume).





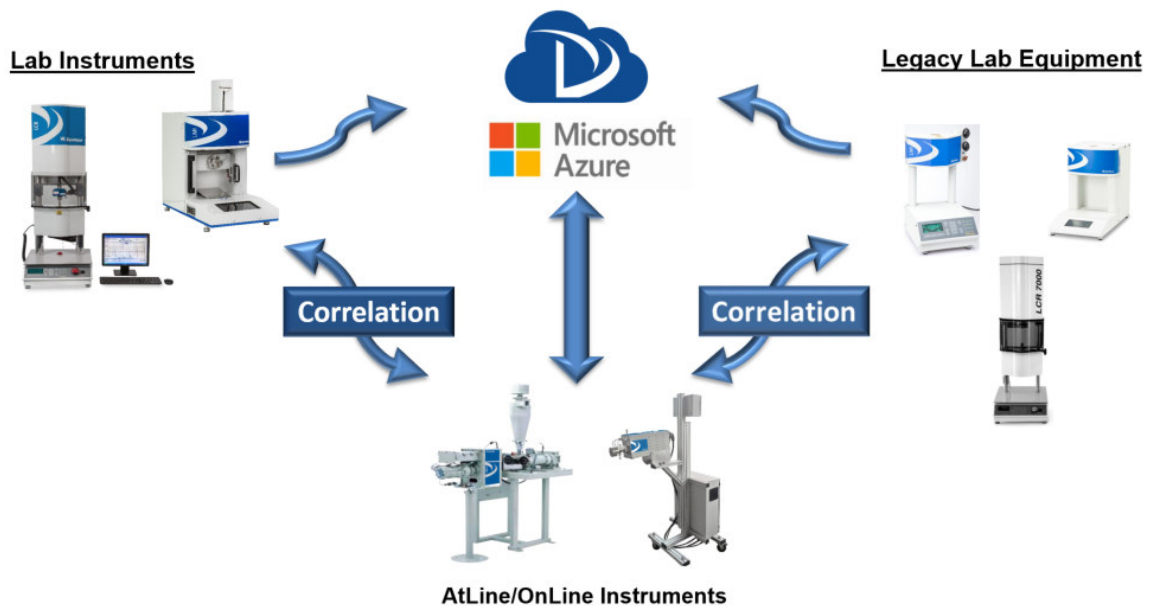
**Dynisco Cloud Connect™ Yearly Subscription Via Edge Device** Dynisco's IoT Managed Service Contract options provide our customers with a comprehensive approach or access of Rheological Data, Correlations, and dashboards. This interface allows for a complete "Window into the Process" providing valuable insight to your polymer process

The LCR7000 allows for connection to the Dynisco IoT Cloud Console for real-time access to your testing information via an Edge Device. This platform also allows you to correlate the lab testing performed on the LCR7000 to online production rheometers that are connected to Dynisco IoT Cloud Console. By comparing this important data, lot to lot traceability for material certifications is handled easily and can be viewed instantaneously globally on your computer, smartphone, or tablet.

The LCR is capable of delivering a wide range of data in digital form. The Dynisco IoT Cloud Console also allows for the archival of sample data and display the information in simple to understand graphs.

Additionally, labs can automatically conduct "Round Robin" tests from various site locations when their LCR7000 units are connected to Dynisco's IoT Cloud Console. This saves time, money, and ensures quality of polymer from all your locations.

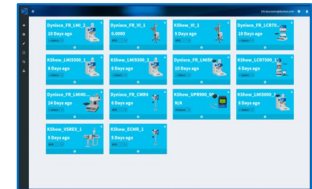
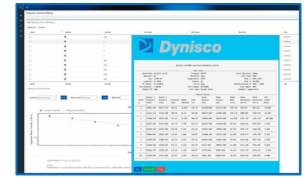
**An Edge\_Serial device must be purchased to obtain IoT Cloud Connect Subscription.**





### Features and Benefits:

- One place to store, manage and correlate all rheological and sensing data
- Enable material verification at each stage of the process using correlations
- Lot to lot material verification
- Show variations in properties of the plastic that affect product quality
- Identify environmental conditions that lead to variations in your process that could product quality
- Provides valuable insights to your process so you can adjust parameters Real time to maintain quality parameters.
- Allow for Instant "Round Robin" Results between equipment lines within Same facility or globally
- Labor/Equipment Utilization Metrics
- Operational Efficiency Metrics
- Full support and access to our team of engineers and polymer scientists



### Dynisco Edge Device Value:

Order Code: Edge\_Serial

**Dynisco Edge Device with RheoSights™:** Includes Dynisco Edge Device and NEW RheoSights Capillary Rheometer Software

Order Code: Edge\_Serial\_R

### Cloud Connect Yearly Subscription Models:

Order Code: IOT365\_LAB\_A\_1\_X (A,B,C,D)

- A. 1-3 Units
- B. 4-6 Units
- C. 7-10 Units
- D. 11+ Units



**Please note that you will need one Edge Device per machine. Additionally, you will not be able to download the RheoSights to be used on another device**



**CAPILLARY DIE STANDARD SELECTION CRITERIA**

Special capillary dies available upon request consult factory for specific needs based on your application

**LCR STANDARD DIES: (Able to produce the most popular shear rates)**

ITEM NO.	ITEM DESCRIPTION	Possible Shear Rates
Y295-05	.75mm x 3.75mm (5:1) 90 deg	Over 18,000 sec <sup>-1</sup>
Y295-16	.75mm x 12.00mm (16:1) 90 deg	Over 18,000 sec <sup>-1</sup>
Y295-30	.75mm x 22.50mm (30:1) 90 deg	Over 18,000 sec <sup>-1</sup>
Z394-01	1mm x 1mm (1:1) 180 degree	Up to 7,900 sec <sup>-1</sup>
Z394-05	1mm x 5mm (5:1) 180 degree	Up to 7,900 sec <sup>-1</sup>
Z394-10	1mm x 10mm (10:1) 180 degree/flat	Up to 7,900 sec <sup>-1</sup>
Z394-20	1mm x 20mm (20:1) 180 degree/flat	Up to 7,900 sec <sup>-1</sup>
Z394-40	1mm x 40mm (40:1) 180 degree/flat	Up to 7,900 sec <sup>-1</sup>
Y394-20	1mm x 20mm (20:1) 90 degree	Up to 7,900 sec <sup>-1</sup>

ITEM NO.	Bagley Correction R&D	Bagley Correction QC		Dies for QC of High Viscosity Mat'l (HDPE, PVC)	Dies for QC Low Viscosity Mat'l (PET, Nylon)	Dies to Determine Polymer Melt Slippage (Macosko Method)	Study Entrance Angle Vs. Flat Die (Elastic or Memory effects)
	Shear Rates Up to 7900 sec <sup>-1</sup>	Shear Rates Up to 7900 sec <sup>-1</sup>	Shear Rates Over 18,000 sec <sup>-1</sup>				
Y295-05			✓ Required				
Y295-16			✓ Required			✓ Small Diameter	
Y295-30			✓ Add as 3 <sup>rd</sup> Die for Improved Accuracy		✓ PET		
Z394-01	✓ Fragile/Wear Quickly						
Z394-05		✓ Required Short Die		✓			
Z394-10		✓ Add as 4th Die for Improved Accuracy		✓			
Z394-20	✓	✓ Required Long Die		✓	✓		✓ Flat Die
Z394-40		✓ Add as 3 <sup>rd</sup> Die for Improved Accuracy			✓		
Y394-20						✓ Large Diameter	✓ 90 Deg Entrance Angle

For additional information about the above table ask your sales manager for assistance



### LCR7000 - CLEANING ACCESSORIES:

- 8052-155 Pressure Transducer Port Cleaning Kit**  
Includes solid plug, 1/2" –20 tap with handle, seat prep tool with handle, Dykem steel blue layout fluid and carrying case
- 8052-97KE Barrel Bore Power Cleaning Kit, 230V**  
Includes rechargeable power drill, battery charger, and (1) special cleaning tool
- 8052-98S Bore Cleaning Kit**  
Set of 3, used with 8052-97K
- 8052-99S Bore Cleaning Rod**  
Set of 3, used with 8052-97K
- GP0103D Cleaning Patches**  
Package of 1000 pieces, 2 1/4" diameter cotton

### LCR7000 - CALIBRATION TOOLS:

- 8052-65BG Barrel Bore Gauge**  
Used to confirm barrel bore
- Spare Orifice Specify bore diameter, L/D ratio and entrance angle**

### LCR7000 – OPTIONS

- D7052DS3 Laser Micrometer Diameter Measuring System**  
For determining die swell, includes single axis laser micrometer, data collection board and special "swing out" mounting bracket  
Note:  
The Laser Micrometer Diameter Measuring System is designed to be fitted on all LCR7000 & 7001 series Capillary Rheometers.

