



From lab to production,
providing a window into the process



Dynisco Continuous Melt Rheometer (CMR)

*MONITORING YOUR CONDITIONS
FOR CONSISTENT RESULTS*



Description

Specifically designed for the thermoplastics resin industry, the Dynisco CMR series can be configured to measure melt flow rate, high/low load melt flow rate, apparent viscosities, or to perform other customer defined tests.

The CMR system consists of two parts: a rheometer head connected directly to the process which samples, conditions, and measures the melt flow of the resin, and an RCU (Rheometer Control Unit) that controls the CMR test parameters (temperature, pressure, rate), and provides outputs of computed results, and communications to an external distributed control system when required.

Features

- On-line melt flow rate correlated to ASTM D1238
- On-line apparent viscosities
- Data exchange by analog and digital input/outputs
- Customer specified solutions
- Systems for hazardous locations
- Compact measuring head for close extruder connection
- Dynisco Vertex® Mercury Free Pressure Transducers for high accuracy
- A range of metering pump sizes for specific applications
- Simple "in the field" calibration
- Alarm system for malfunctions
- Rugged industrial design

CMR IV

The rheometer samples molten polymer from the process through a heated transfer line. A metering pump then drives the polymer melt through a capillary die of accurate diameter and L/D ratio, at a precisely controlled rate. The pressure drop across the die is measured by a Vertex Mercury Free pressure transducer. When the system is run at constant pressure (shear stress) and the flow rate is determined, a continuous measurement of the MFR is obtained. A wide range of accurate inter-changeable capillaries provide the system with high resolution and a broad range of capabilities.



CMR IV RCU: ULTIMATE PERFORMANCE

Our high performance RCU combines the rheological properties of a Laboratory Capillary Rheometer with MFI readings delivered by a Melt Flow Indexer. It has been updated with a Siemens S7-1500 PLC with a Siemens 7" (178mm), Comfort Panel Touch Screen HMI. This combination provides increased processing power and hi-end graphics enabling the RCU to provide +/- .5% Full Scale Accuracy. This allows the RCU to better align measurements with those taken from laboratory instruments. Furthermore, it is certified for hazardous environments as needed. The RCU will allow for up to 7 analog outputs and 8 digital outputs- see more information in specification chart



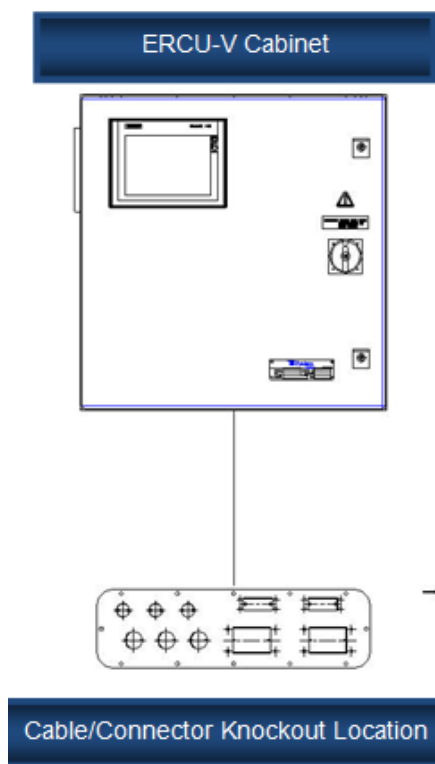
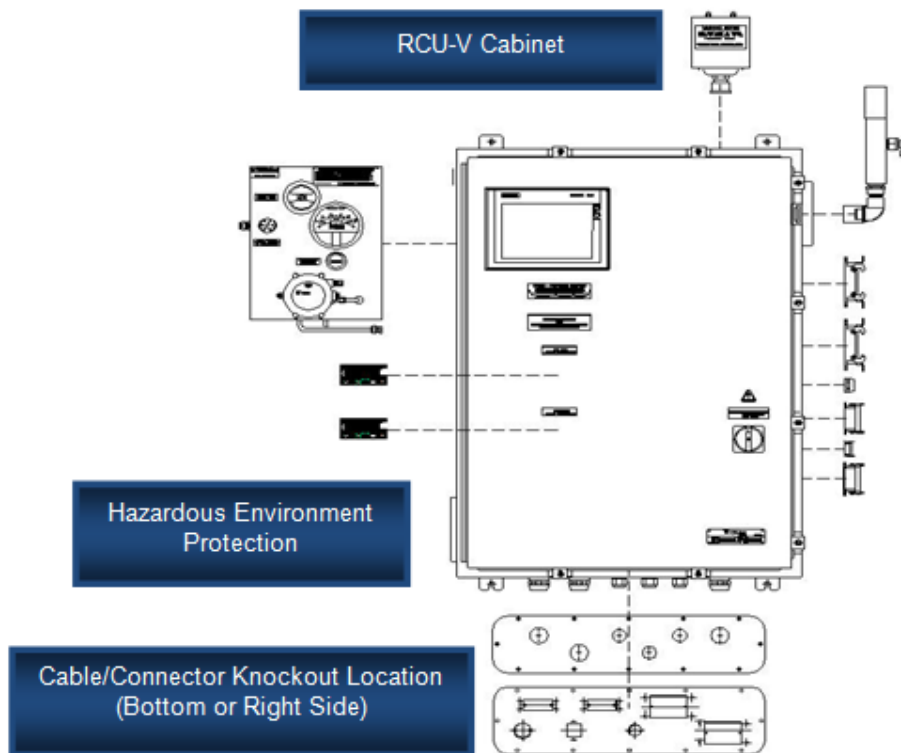
CMR IV e-RCU: PERFORMANCE SIMPLIFIED

The CMR IV e-RCU offers a simplified PLC with the digital and analog I/O that most plants would need for a cost effective approach to measuring online rheology. It has a Siemens S7-1200 PLC with a Siemens 7" (178mm) Comfort Panel Touch Screen HMI. This combination provides the system with processing power and hi-end graphics allowing the e-RCU to provide +/- 2% Full Scale Accuracy. The e-RCU provides the processor the ability to measure Melt Flow Ratio, Relative Viscosity, Intrinsic Viscosity, and Melt Viscosity in typical end-user environments. All of which create a cost-effective system that reduces the risk of failure to an acceptable level. If conditions change and the system is needed in a hazardous and/or classified location, compatibility with the standard RCU allows for an easy upgrade. The e-RCU will allow for up to 2 analog outputs and 2 digital outputs- see more information in specification chart



PERFORMANCE CHARACTERISTICS			
Melt Flow Index	0.02 - 5000 g/10 min		
Viscosity Range	10 – 10 ⁵ Pas		
Shear Stress	150 - 1.5 x 10 ⁵ Pa		
Shear Rate	1 to 7500 sec ⁻¹ (standard die) Maximum 50,000 (special die)		
Dies			
Viscosity	1 - 5mm, 10 to 30:1 L/D		
Melt Flow Index	3.8182:1 L/D		
Special Dies	Upon Request		
Pressure Range	3 x 10 ⁵ – 3.5 x 10 ⁷ Pa		
Metering Pump	0.16 cm ³ / RPM (standard) 0.297 cm ³ / RPM (optional) 0.584 cm ³ / RPM (optional)		
Pump Speed	3 – 75 RPM		
Polymer Flow	225 g/hour (average)		
MEASUREMENT AND CONTROL FUNCTIONS			
Shear Stress Mode			
Set point	Pressure		
Measurement	Melt Flow Index		
Shear Rate Mode			
Set point	Pump Speed		
Measurement	Apparent Viscosity		
Temperature Control	3 Heating Zones		
ELECTRICAL SPECIFICATION			
System Voltage	208-240 VAC, 1Ø, 50/60 Hz-standard		
Power	1200 W (max)		
RHEOLOGIC CONTROL UNIT SPECIFICATIONS			
	RCU	E-RCU	
Electrical Cabinet	NEMA 4, 4x, 12 (IP66)	NEMA 4, (IP61)	
CPU	Siemens 1500 Series	Siemens 1200 Series	
Operator Interface	HMI, Siemens Comfort Panel		
Dimensions:	45" H x 30"W x 13"L (1143 mm x 762 mm x 330 mm)	24"H x 24"W x 10"D (609 mm x 609 mm x 254 mm)	
Weight	275 lbs	80 lbs	
ANALOG OUTPUTS: (4 – 20 MA STANDARD)			
	<i>Select any 7 of the following:</i>		<i>Select any 2 of the following:</i>
Options	1. Melt Flow Index ((MFI) in g/10 min 2. Motor Speed (RPM) 3. Capillary Zone Pressure 4. Pump Zone Pressure 5. Melt Temperature 6. Auxillary Temperature Pressure 7. Pressure	8. Shear Rate 9. Shear Stress 10. Melt Viscosity 11. Relative Viscosity 12. Intrinsic Viscosity 13. Configurable by User 14. Configurable by User	1. Melt Flow Ratio 2. Melt Viscosity 3. Relative Viscosity 4. Intrinsic Viscosity
DIGITAL INPUTS			
	24VDC, 9 mA		
DIGITAL OUTPUTS			
	NC dry contacts -- 12 V min, 250 VAC max, 10 mA min, 6 A max, 20 W max		

System Diagrams



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 Refer to www.dynisco.com for access to Operator Manual and other support documentation.
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