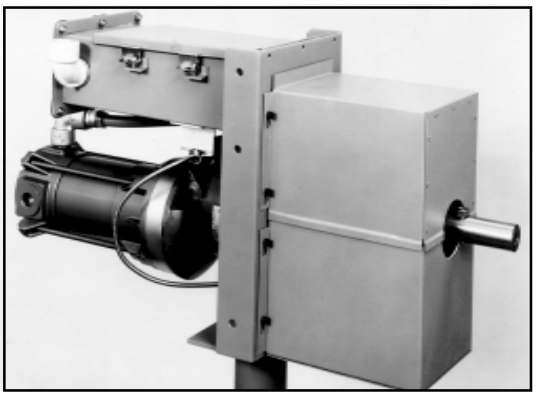
Online Rheometer
CMR Series

Series CMR

Multiple Possibilities

DYNISCO Polymer Test is a world leader in the field of on-line rheological measurements for the plastics industry. Specifically designed for the thermoplastics resin industry, the CMR series (Continuous Melt Rheometer) provides continuous measurements of the melt flow rate or apparent viscosity directly on the manufacturing process. The CMR series system consists of two parts: a rheometer, connected directly to the process, which conditions, and measures the flow characteristics of the resin melt, and an RCU (Rheometer Control Unit) that controls the rheometer test parameters (temperature, pressure, rate), and provides outputs of computed results. It can also provide communications to an external distributed control system. The CMR series can be configured to measure melt flow rate, high/low load MFR, apparent viscosities, or to perform other customer defined tests.



The Rheometer

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 high temperature 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.

Rheometer Control Unit

The Rheometer Control Unit is contained in a NEMA 4 (IP 54) box that may be located in the control room or on the process floor. Programming of the control functions and output displays are achieved via a local digital display with membrane keypad. The RCU can communicate with a DCS through its analog and serial outputs. The RCU operates independently and will continue its control and analysis functions in the event of a DCS failure.

Features of the system

- On-line ASTM D1238 melt flow rate
- 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
- Robust and precise pressure transducer for high accuracy
- A range of metering pump sizes for specific applications
- Simple “in the field“ calibration
- Alarm system for malfunctions
- Rugged industrial design

Series CMR

Option for special requirements

Several options complete the broad application range of the CMR series of Online Rheometers.
Different capillaries allow the user to measure Melt Flow Index or apparent viscosity.

Depending on the installation requirements the **rheometer** as well as the **RCU** is available as **general purpose** version or for **hazardous locations**.
Different gear pumps give the possibility to adjust to the needed polymer flow.

The RCU control cabinet is available as **wall mounted** version or with **free standing console** (option).

Specifications CMR Series and RCU

Performance Specifications:

Melt Flow Index	0.02 – 5000 g/10 min
Viscosity Range	10 – 10^5 Pa s
Shear stress	150 – 1.5 x 10^5 Pa
Shear rate	1 – 7500 s^{-1} (standard die) max. 50 000 s^{-1} (special die)
Capillary dies:	
Viscosity:	Æ 1 – 5 mm, 10:1 to 30:1 L/D
Melt Flow Index:	Æ per melt flow, 3.8182 L/D
Special dies upon request	
Temp.-range	40 – 350 °C
Pressure range	40-5000 psi (3 x 10^5 – 3.5 x 10^7 Pa)
Metering pump	0.16 cm^3/rpm (standard) optional sizes available
Pump speed	3 – 75 rpm
Polymer Flow	1/2 lbs/hr (225 g/hr) avg.

Measurement and Control Functions:

Test Modes
- Shear Stress Mode:
  - Setpoint: Pressure
  - Measurement: Melt Flow Index
- Shear Rate Mode:
  - Set point: Pump speed
  - Measurement: Apparent viscosity

Temp. control 3 Heating zones

Specifications:

Electr. Cabinet	NEMA 4 (IP 54)
CPU 80188	E-PROM Embedded Applications Program
Operator Interface	Nematron LCD display

Analog Outputs: (4-20mA standard)

Standard	Melt Flow Index or apparent viscosity
Optional	Melt temperature Melt pressure Pump speed Temp. pump zone Temp. die zone

Digital Inputs: (NO/NC dry contacts)

RemoteTest ON/OFF (Motor Start / Stop)

Digital Outputs: (NO/NC)

Fault	Shuts down analyzer and requires manual restart
Warning	Information / Deviation Alarms Analyzer continues to operate
Serial Output:	RS 232/485 standard

Electrical Specification:

System voltage	115 or 230 VAC 50/60 HZ
Power consumt.	2000 W (max)

Options

Stand for RCU
Process Isolation valve
Heated transfer section
Hazardous location
Additional I/O
NEMA 4X

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