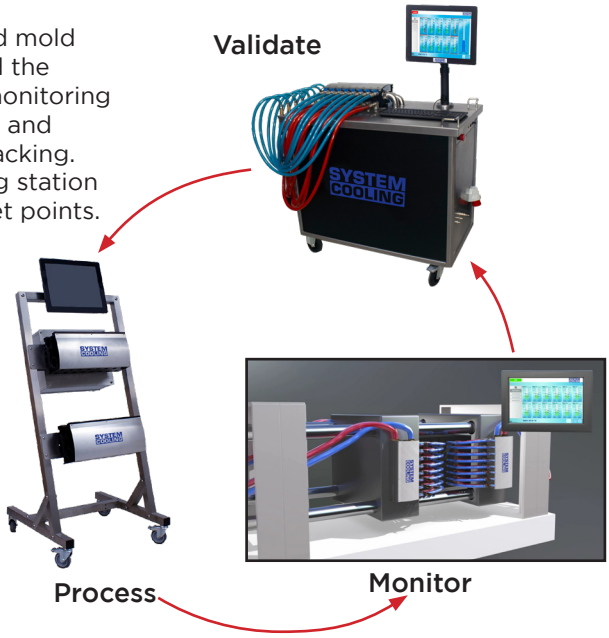
SYSTEM COOLING™
MOLD COOLING MONITORING

System Cooling is a suite of products that allows injection molders and mold makers to collect and view data on the cooling lines within a mold and the cooling parameters during production. Molders utilizing the process monitoring system can view and collect data related to coolant flow, temperature, and pressure with information recorded and time stamped for historical tracking. Mold makers and tool room managers can utilize the Test Rig, a testing station that analyzes the mold for flow capacity, leaks, and optimal process set points.



Benefits:

- Allows for troubleshooting of quality inconsistencies.
- Alarms when process deviations are detected, reducing scrap.
- Reduces setup errors by the detection of flow constraints due to closed valves or dead-headed circuits.
- Identifies flow deviations from long-term corrosion build up, blockages, or equipment faults.
- Identifies temperature deviations and fluctuations from cycle time changes, unauthorized adjustments, or equipment faults.
- Validations certify that molds are production-ready.
- Aids in scheduling maintenance intervals based on past analysis and historical data, while also providing reporting capabilities.

SYSTEM COOLING™
MANIFOLDS

The instrumented manifold takes the place of traditional distribution manifolds on molding machines. Its compact form and stainless steel construction grants versatility in a variety of applications from harsh environments to space-limited configurations and clean rooms. The flow sensors operate on the vortex flow principle without any moving parts. Manifolds can be mounted to the molding machine or a separate cart.

Manifolds monitor:

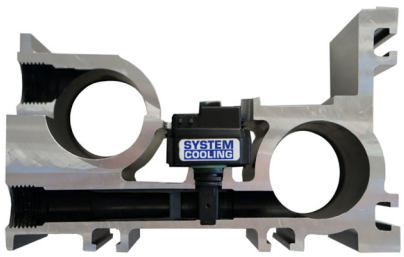
- Supply temperature
- Supply pressure
- Return temperature by zone
- Flow by zone
- Return pressure

Additional features include:

- Main supply and return ports on both top and bottom of manifold provide flexibility.
- No moving parts and large unrestricted flow path.
- Color-coded ball valves and 300 series connectors installed.
- Maximum temperature: 250°F (120°C)

ORDERING INFORMATION

ZONES	FLOW RANGE	CATALOG NUMBER
4	.25-5.25 GPM / 1-20 LPM	SCM-4-1-SS-HT
	.5-10.5 GPM / 2-40 LPM	SCM-4-2-SS-HT
8	.25-5.25 GPM / 1-20 LPM	SCM-8-1-SS-HT
	.5-10.5 GPM / 2-40 LPM	SCM-8-2-SS-HT
12	.25-5.25 GPM / 1-20 LPM	SCM-12-1-SS-HT
	.5-10.5 GPM / 2-40 LPM	SCM-12-2-SS-HT



Flow and temperature are measured in each zone individually.

Monitoring system consists of Manifolds and required electronics.
Please contact SystemMonitoring@procomps.com for system information and quotes.

SYSTEM COOLING™ SOFTWARE

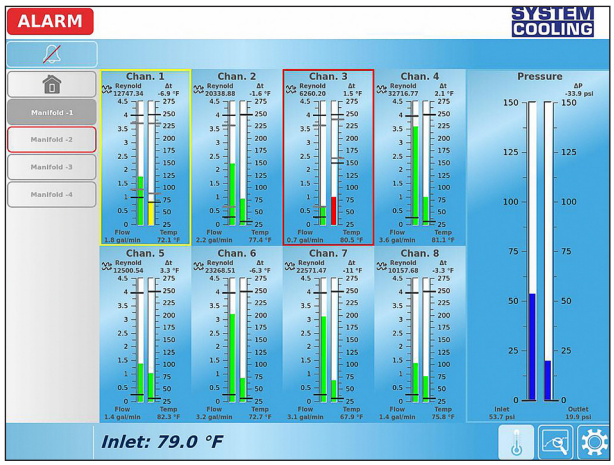
The System Cooling software interface is easy to use with only five screens to navigate. The system provides real-time information, historical data, and profiles (mold ID, circuit names, and data thresholds) for mold management:

A Information Display
- Temperature deltas between supply and return are calculated per zone.
- Reynolds numbers are calculated per zone, and laminar, transitional, or turbulent status is displayed.
- Alarms are activated per monitored parameter based on the profiles of the molds.

B Historical Data
- Graphs present data for the most recent two hours of production.
- Data can be exported via USB or by network connection for viewing in Excel or additional systems.

C System Overview
- The status of the entire system, all zones of all manifolds, can be viewed at a glance.

A



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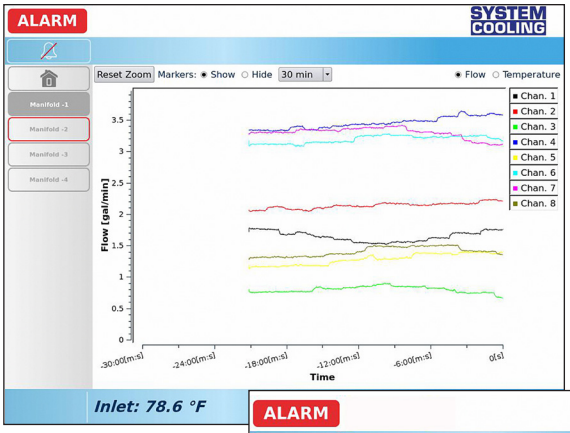

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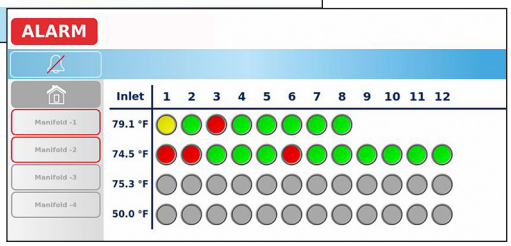


MOUNTING

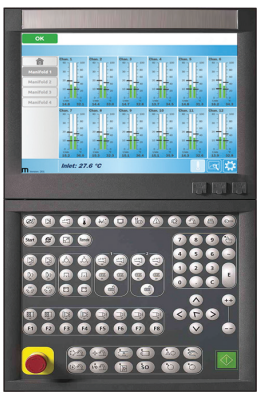
The System Cooling Monitoring System can either be permanently installed on a molding machine or mounted to a mobile cart as shown on the following page.

When mounted to a machine, the System Cooling I/O module, included with every system, can communicate to external devices such as the molding machine, part diverters, stack lights, and data networks.

- Alarm or warning state can switch molding machine to semi-auto or manual mode.
- Part diverters can automatically separate nonconforming parts.
- Illuminate stack lights for visibility to technicians.
- Data markers from the molding machine, typically at the beginning of each cycle, can be accepted and overlaid on the data.
- Machine idle state input signals the system to suppress alarm output during alarm state.

The system is also VNC capable, eliminating the need for a touchscreen controller. The interface can be accessed via VNC from a smartphone, laptop, or the machine controller.

Note: Molding presses must be verified for compatibility.



SYSTEM COOLING™
PORTABLE CART

As an alternative to permanently dedicating System Cooling to a press, the system can be mounted to a mobile cart.

Applications that can benefit from a mobile cart include:

- Troubleshooting
- Process development for new molds.
- Ad-hoc projects and validation efforts.
- On the standard carts, one or two manifolds can be mounted. Custom configurations are also available by contacting Customer Service.

Ordering Information

CATALOG NUMBER	TYPE
SCP-CART	Portable Cart for 4/8/12 Zone Manifolds

SYSTEM SPECIFICATIONS

Contact SystemMonitoring@procomps.com for additional specifications or questions.

MANIFOLD SPECIFICATIONS	
Manifold Feed Ports	1” BSPP
Circuit Ports	3/8 (-1) or 1/2 (-2) NPT
Regulation	Color-Coded Ball Valves
Connections	300 Series Quick Connectors
Maximum Pressure	145 PSI
Maximum Temperature	250° F / 120° C
Flow Sensor Type	Vortex
Accuracy-Flow	1.5% fs
Accuracy-Temperature	+/- 1.5% fs
Resolution-Temperature	0.9°F/0.5°C
Response Time	< 1 s
Seals	EPDM

SOFTWARE & ELECTRONICS SPECIFICATIONS	
Display	15.6” Touch Screen
Communication Ports	Ethernet / USB
Communication system	ASCII (USB)/HTML/SSH (optional)/VNC
Supported Protocols	USB Serial / TCP / IP
Machine Controller Integration	VNC
Maximum Supported Manifolds	8 Manifolds / 96 Zones
Display Units	°C, LPM ,Bar / °F, GPM, PSI
Alarm Units	User Defined
Warning Limits	10% of alarm limits (optional)
Alarm & Warning Output	N/C and N/O Dry Contacts
Marker Input	24 VDC Galvanically Isolated
Idle Input	24 VDC Galvanically Isolated
Power Supply	12-24 VDC

SYSTEM COOLING™
TEST RIG

The Test Rig analyzes molds to validate, maintain, and optimize processes. The Rig runs flow capacity and pressure leak tests, and the premium version also determines optimal cooling process parameters. Reports are generated from the results and can be sent, saved, or printed. The Test Rig is a standalone test station equipped with a water reservoir, pump, 8-zone manifold, and unique control system and offered with three different models for customer applications.

New Molds
Mold makers are able to provide new tools to the customer complete with a report of operating parameters, including data relating to the cooling circuits in the mold. Traceable documentation of design validation for flow capacity under simulated production conditions and leak testing is provided by the Test Rig. These benchmarks are vital for any quality assurance process and establish a baseline for future comparisons.

Mold Maintenance
Mold cooling circuits need to be maintained regularly to remove scale and rust to ensure maximum productivity. With the Test Rig, the cooling channels can be analyzed and tested easily. The pressure can be precisely controlled by the variable output pump through the user interface to simulate the production environment. Each report can be compared against the baseline values to determine required maintenance and establish maintenance intervals for future service. The test results certify that a mold has regained flow capacity values and is in ready to run condition before being sent back to production.

Process Optimization
The cooling circuit flow capability at a given supply pressure is determined by the flow capacity test. The additional optimization executed by the extended flow test within the premium version determines the minimum required supply pressure to achieve maximum flow. This aids in defining process parameters to conserve central cooling supply capacity, potentially leading to reduced energy consumption.

Ordering Information

CATALOG NUMBER	FLOW RANGE
SCTR-1-*	8 Zone Test Rig - .25-4 GPM / 1-15 LPM
SCTR-2-*	8 Zone Test Rig - .5-10.5 GPM / 2-40 LPM

Specify the Test Rig catalog number above followed by the model suffix shown at right. Ex: SCTR-2-M will be the Test Rig Premium Model with the higher flow range.

TEST RIG SPECIFICATIONS	
Zones	8
Regulation	Color Coded Ball Valves
Connections	300 Series Quick Connectors
Flow Sensor Type	Vortex
Accuracy - Flow	1.5% fs
Max Total Flow	32 GPM / 120 LPM
Max Pump Pressure	58 PSI
Max Rated Pressure	145 PSI
Seals	EPDM
Display Units	°C, LPM ,Bar / °F, GPM, PSI
Ports	Ethernet and USB
Power Requirements	480v 60Hz 5A

MODEL TYPE	FEATURES
Test Rig Basic (-B)	• Flow capacity and leak tests • Plug and play, ready for testing • Ports for data export or networking
Test Rig Plus (-P)	Includes basic Test Rig features, plus: • Advanced software with extended flow optimization test. • Built-in WiFi router capable of sending reports directly to a printer
Test Rig Premium (-M)	Includes the same features as the Plus model and adds: • Automatic water change system