

## Electronic

Rada Solutions for Central Recirculation System Control—Electronic feature a series of eight Electronic Mixing Centers (EMC) designed for use in pumped recirculating hot water systems.

The complete range has been designed to offer an unparalleled level of system temperature control through the use of precision-engineered hydraulics with integrated electronic circuit technology.

## Sizing

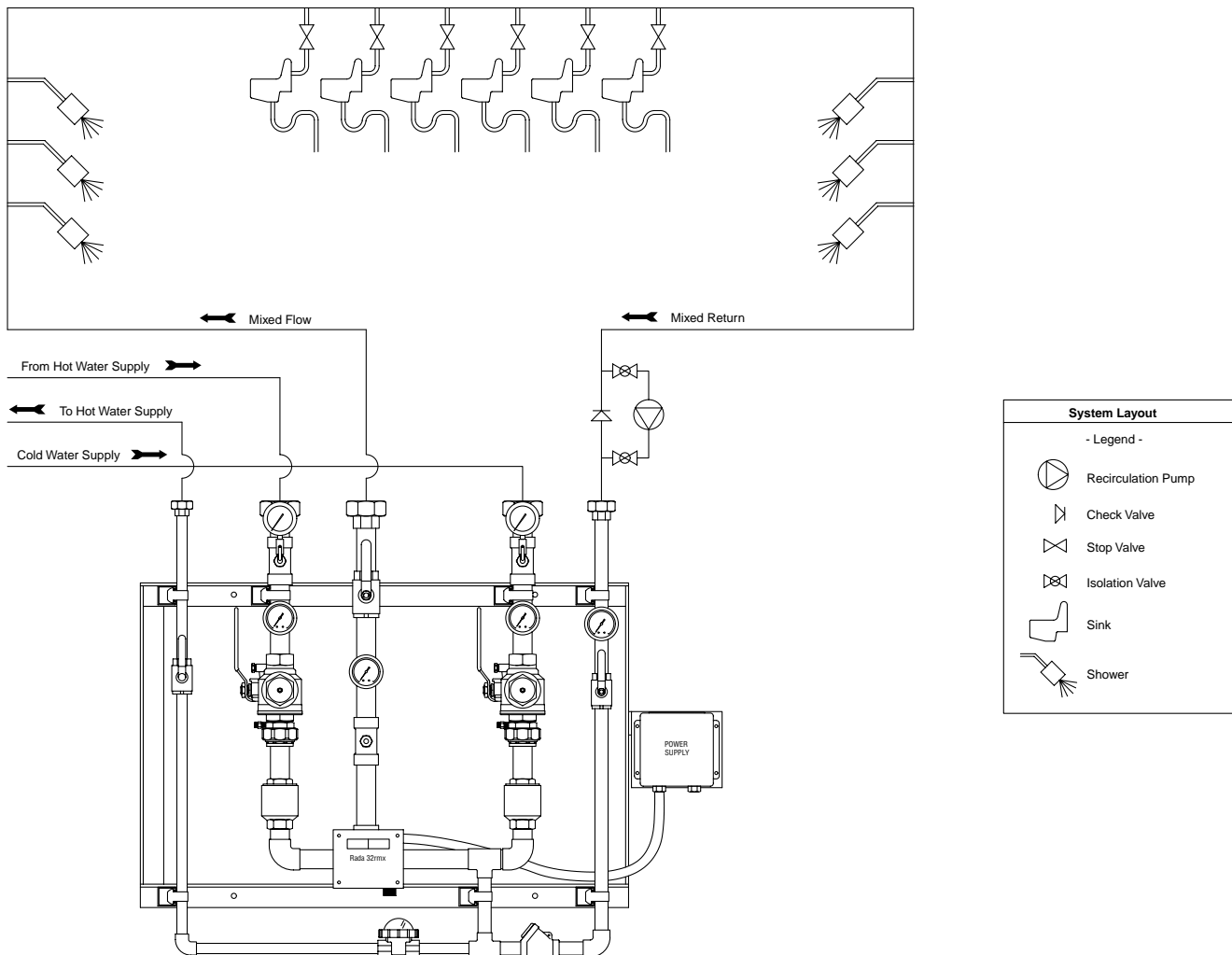
Rada EMC is available in two flow capacities. To select, simply match the required flow rate on the chart below with a pressure drop acceptable to the system design. Armstrong uses the Modified Hunter Curve, where applicable, when determining system flow requirements.

Data on the EMC series for Rada Solutions for Central Recirculation System Control can be found on pages 24 through 27. Certified drawings, specifications, installation and maintenance guides, and plumbing schematics are available by calling Armstrong at (269) 279-3602.

Rada Electronic Mixing Centers (gpm)							
Model	Pressure Drop (psi)				Min. System Draw-off*	Max. Flow**	C <sub>v</sub>
	5	10	15	20			
EMC 1	36	51	62	72	0	58	16
EMC 2	72	102	124	144	0	100	32

\* EMC 1 requires the circulating pump to operate continuously at a minimum flow rate of 2 gpm. EMC 2 requires the circulating pump to operate continuously at a minimum flow rate of 4 gpm. **There is no minimum system draw-off flow requirement with this equipment.**

\*\* Maximum flow rate determined at 9 ft/sec pipeline velocity.



*All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.*

## Electronic

### The Central Recirculation System

Rada EMCs feature the 32rmx Electronic Mixing Valve. The 32rmx is designed to be the primary controller for a recirculating hot water circuit, as indicated by the schematic drawing below.

This schematic is provided for concept and explanation purposes only. Actual plumbing systems will differ slightly, based upon variables such as the system designer's preferences, the type of water heater selected and the specific site construction feasibility.

Rada EMCs are supplied as pre-plumbed packages, each of which differs slightly from this schematic.

### Adding the Options

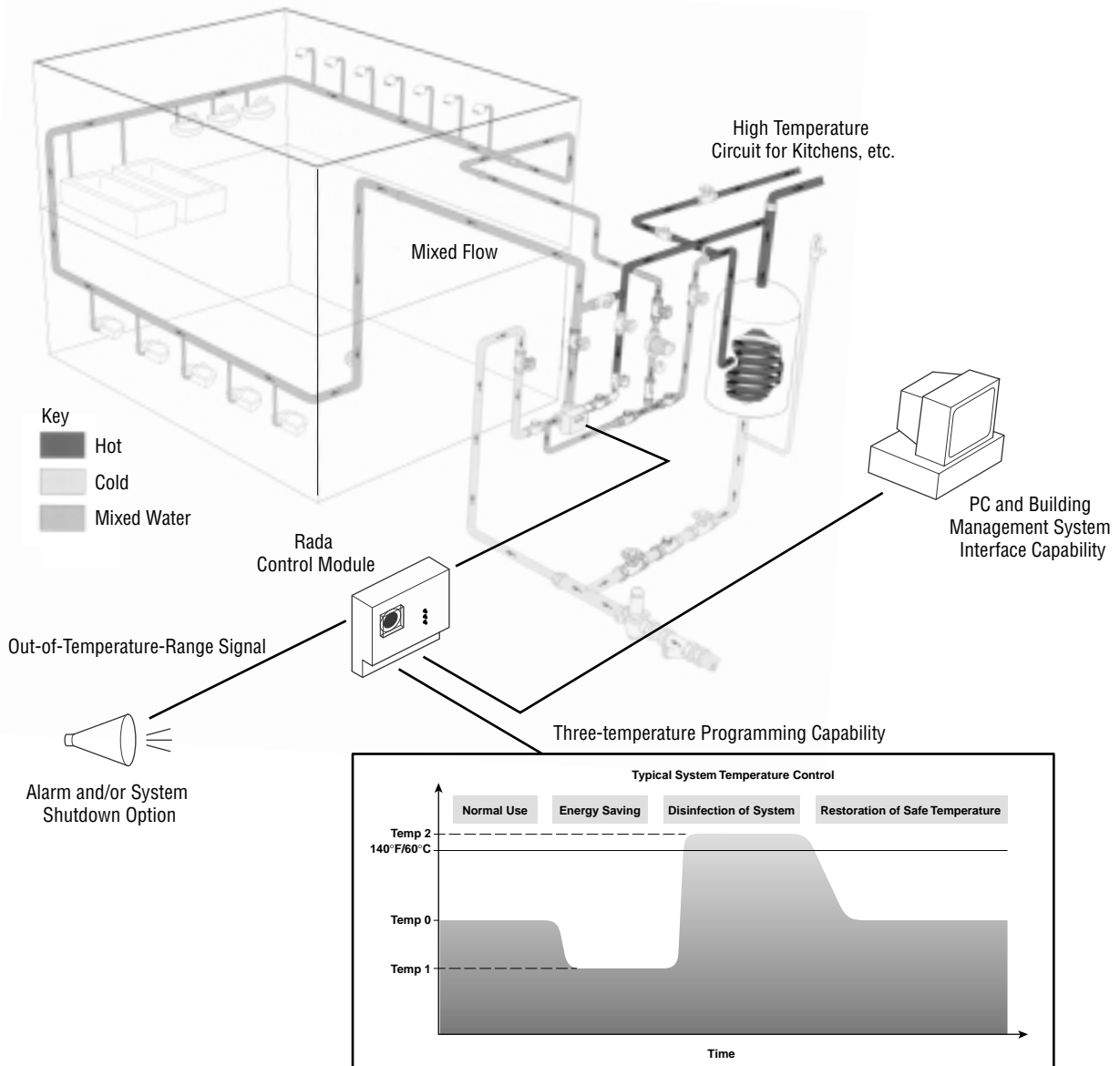
Rada EMCs from Armstrong offer both the basic mixing center and mixing centers with a series of options and features. Additionally, each EMC includes a data interface port that allows the system to be equipped with an alarm. The system can be programmed, monitored and controlled from a remote location and can be

engaged with Armstrong's energy optimization system (EOS) or a third-party building management system (BMS).

A primary feature of the EMC models 13, 123, 23 and 223 is the three-temperature programming capability. Using a Rada Control Module, the EMC can be site-programmed to deliver to a normal operating temperature for sanitary use; T1, an energy-saving temperature for periods when the normal operating temperature is not required; and T2, an elevated system disinfection temperature.

### Energy Optimization System (EOS)

To support the Rada EMC in applications where building/system automation is desired but where there is no opportunity to engage with an existing third-party BMS, Armstrong offers EOS. EOS requires a minimal investment in site-based hardware and the purchase of our fee-based access to EOS on a protected Web site. EOS offers user graphics, data output and storage capability, mobile text messaging and site-audible output advisories, and remote system control, along with many other application/site-customized options.



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## Electronic

### Electronic Mixing Centers

The EMCs feature the Rada 32rmx electronic temperature controller.

The EMC 1 will deliver up to 72 gpm (273 lpm) and comprises all required installation components supplied pre-plumbed and pressure-tested, mounted to an enameled steel frame. Installing contractor is required to make up to five standard union connections for hot and cold supply in, blended water to the system, and system and water heater return lines.

The EMC 12 incorporates a circulating pump, while the EMC 13 adds the option of system thermal disinfection and energy efficiency via a Rada Control Module.

The “complete” EMC 123 brings together both of the above options.

The EMC 2 series are as above with two 32rmx temperature controllers installed in parallel for systems where flow rates up to 150 gpm (568 lpm) are required.

The modern integrated circuit technology with precision hydraulics of the 32rmx allows the EMC to deliver blended water economically at a safe, accurate temperature for sanitary use in recirculated hot water systems.

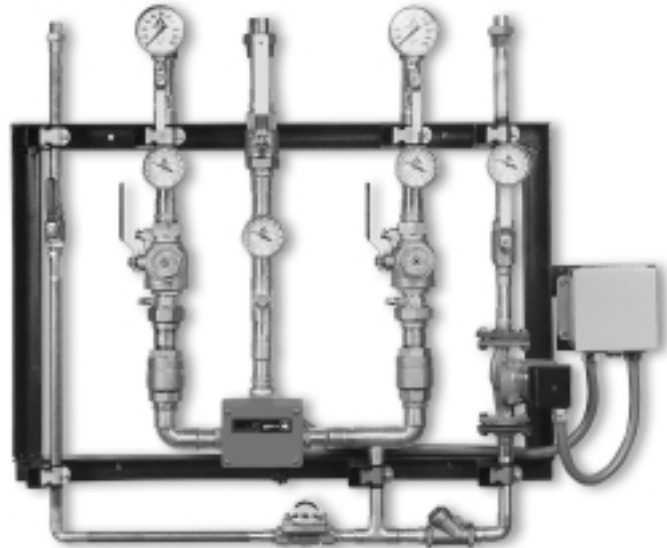
The EMC supplies blended hot and cold water at a safe, predetermined temperature when any fixture in the building is in use.

During periods of no system draw-off, the EMC will maintain the temperature of the continuously flowing, pumped recirculating circuit.

### Performance

The improved accuracy possible with 32rmx control technology, combined with its data input/output communication capability, means:

- Recirculated water control within 2°F (1°C) with minimal recirculation of 2 gpm (7.6 lpm)\*
- Accurate control of blended water drawn from the system at a point of use within 2°F (1°C)\*
- Minimal, 2°F (1°C) recirculation system temperature loss required for effective loop control
- Elimination of dangerous overnight or non-demand-period “temperature creep”
- Dual operation “set” and “actual” temperature display for effective commissioning, adjustment and system monitoring
- Visual signal by display to show “error” mode or “out of range” system failure, coupled with output for audible alarm and/or downstream solenoid valve relay
- Programming via a PC
- System monitoring and control from a remote location
- Engagement with a building management system
- 32rmx valve automatically shuts off the hot water flow upon cold water inlet supply failure
- 32rmx valve automatically shuts off the hot water flow in the event of a power failure



### Application

EMC provides premixed water for multiple showering, hand washing and bathing point-of-use fixtures where hot water is supplied from either a storage-type or instantaneous/semi-instantaneous water heater.

Suitable for installation in hotels, schools, correctional facilities, hospitals, nursing/assisted living homes, dormitories and other multiple-occupant commercial, institutional, and industrial buildings that are required to operate a continuously recirculating pumped hot water system.

### Technical Specifications

#### 32rmx Temperature Controller

- Plated gunmetal body, enameled aluminum housing/cover, stainless steel primary internal components
- Electronics: 12V DC Solid State plug-in micro-electronic circuitry
- Flow rates
  - Maximum: 72 gpm at 20 psi pressure drop (272 lpm at 1.38 bar)
  - Minimum: 32rmx: 2 gpm (7.6 lpm)
  - System: There is no minimum draw-off requirement from the system.
- Operating pressures
  - Maximum: 150 psi (10 bar)
  - Minimum: 10 psi (.7 bar)
- LED digital readout
- “Self-check” integral “out of range” visual/audible alarm
- Approvals/certifications: ASSE 1017, CSA B125

\* Claim does not account for natural system temperature loss at distant points within the system relative to pumped water velocity and ambient temperature.

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## Electronic

### Electronic Mixing Centers up to 72 gpm (273 lpm)

EMC 1 is supplied as a mixing center that includes:

- 32rmx electronic temperature controller
- Inlet/return check valves
- Inlet combination ball valve strainers
- Pressure gauges
- Inlet, system blend and return line thermometers
- Isolation valves
- 110V/12V UL-listed transformer enclosed in a NEMA 4X enclosure
- Low voltage control wiring with protective conduit

**EMC 12** is supplied as EMC 1 with a pre-wired 1/12 HP circulating pump rated at 10 gpm (38 lpm) at 15 ft of head.

**EMC 13** is supplied as EMC 1 with a Rada Control Module for programming energy efficiency and thermal disinfection modes.

**EMC 123** is supplied as EMC 12 with a Rada Control Module for programming energy efficiency and thermal disinfection modes.

### Electronic Mixing Centers up to 144 gpm (545 lpm)

EMC 2 is supplied as mixing center that includes:

- Two 32rmx electronic temperature controllers
- Inlet/return check valves
- Inlet combination ball valve strainers
- Pressure gauges
- Inlet, system blend and return line thermometers
- Isolation valve
- System balancing valves
- 110V/12V UL-listed transformer enclosed in a NEMA 4X enclosure
- Low voltage control wiring with protective conduit

**EMC 22** is supplied as EMC 2 with a pre-wired 1/6 HP circulating pump rated at 10 gpm (38 lpm) at 30 ft of head.

**EMC 23** is supplied as EMC 2 with a Rada Control Module for programming energy efficiency and thermal disinfection modes.

**EMC 223** is supplied as EMC 22 with a Rada Control Module for programming energy efficiency and thermal disinfection modes.

**For fully detailed certified drawings, please refer to the list below and consult your local representative, Armstrong directly or our Web site.**

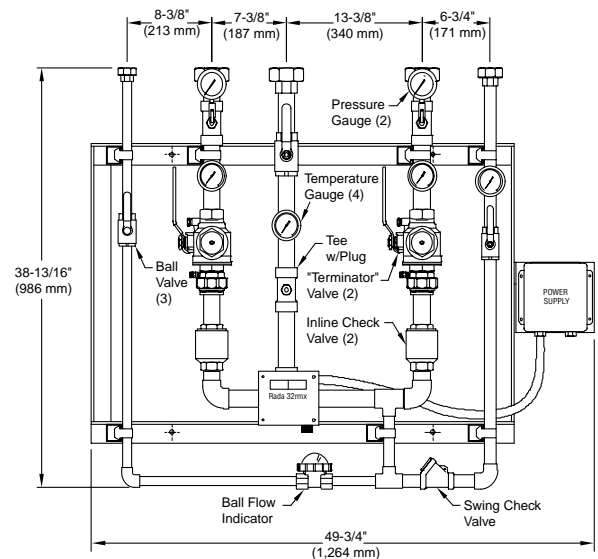
EMC 1	CDLW #1105
EMC 2	CDLW #1109
EMC 12	CDLW #1106
EMC 22	CDLW #1110
EMC 13	CDLW #1107
EMC 23	CDLW #1111
EMC 123	CDLW #1108
EMC 223	CDLW #1112

**TECHNICAL NOTES:** A fully licensed electrician will be required to connect a GFI-protected 110V power supply to the power supply enclosure provided on the EMC. All subsequent low voltage control wiring is supplied factory completed and tested, housed in a protective conduit.

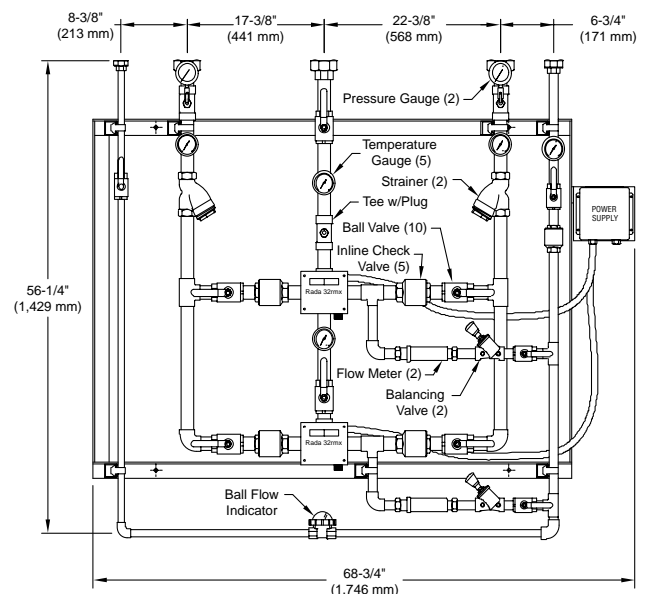
EMC models that include a circulating pump will require a fully licensed electrician to connect a GFI-protected 110V power supply directly to the pump connection point provided.

The 110V power supply for the power supply enclosure and the pump must be on the same circuit, protected by the same circuit breaker.

Further wiring detail is provided in the Rada EMC installation and maintenance guide.



**EMC 1**



**EMC 2**

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