



Water Temperature Control - Recirculation Systems

Electronic - The Brain™ The Central Recirculation System

The Brain Electronic Mixing Centers 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.

The Brain Electronic Mixing Centers are supplied as pre-plumbed packages, each of which differs slightly from this schematic.

Adding the Options

The Brain Electronic Mixing Centers offer both the basic mixing center and mixing centers with a series of options and features.

Additionally each Electronic Mixing Center includes a data interface port which can be connected via an optionally supplied Control Module (model number suffix "3"). This Control Module

serves as the gateway onto a third party building automation system (BAS) or PC network.

When engaged with a resident BAS, The Brain offers two way communication capability via a 4-20mA signal.

Remote "Set Point" Adjustment

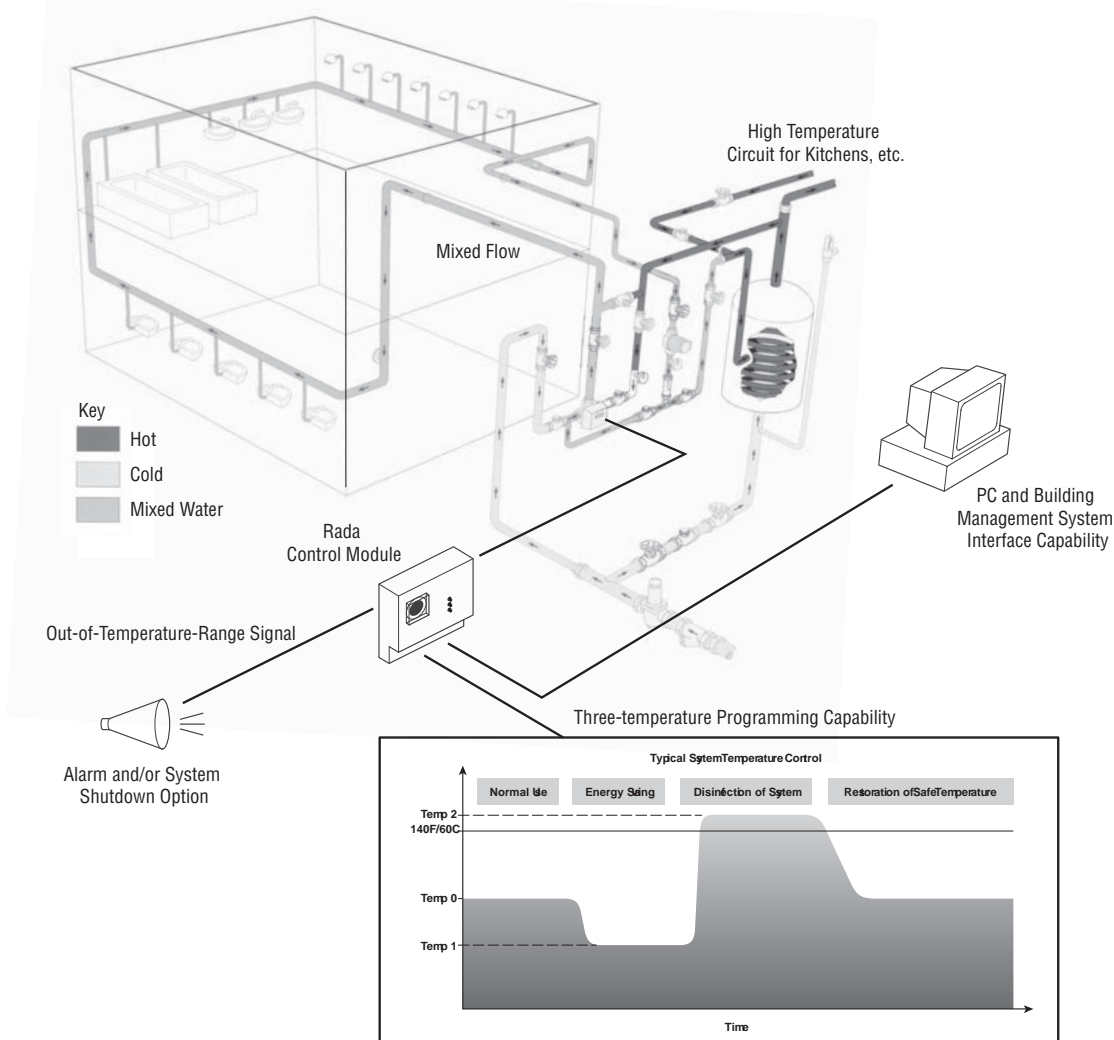
When engaged with a third party BAS, The Brain seeks a supervisory signal and offers a remote set point adjustment capability via the BAS and is "locked out" and can no longer be temperature set point adjustable at the mixing unit.

Remote "Actual" Temperature Access

When engaged with a third party BAS, The Brain seeks a supervisory signal and offers remote temperature access by reporting the "actual" water temperature to the BAS.

Building Automation System Interface Solutions (BASIS)

In installations where additional system data points (inlet HW, CW temps & pressures etc) are desirable, Armstrong offers BASIS. A full description of the BASIS options is provided on Page 47.



Electronic

Electronic Mixing Centers

The Brain Electronic Mixing centers feature the Rada 32rmx electronic temperature controller.

The Brain Model 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 Brain Model EMC 12 incorporates a circulating pump, while the The Brain Model EMC 13 adds the Rada Control Module and the integral capability for BAS interface.

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

The Brain Model 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.

Additionally, The Brain Model EMC 2 series is piped so that it offers a "system redundancy" capability where desirable.

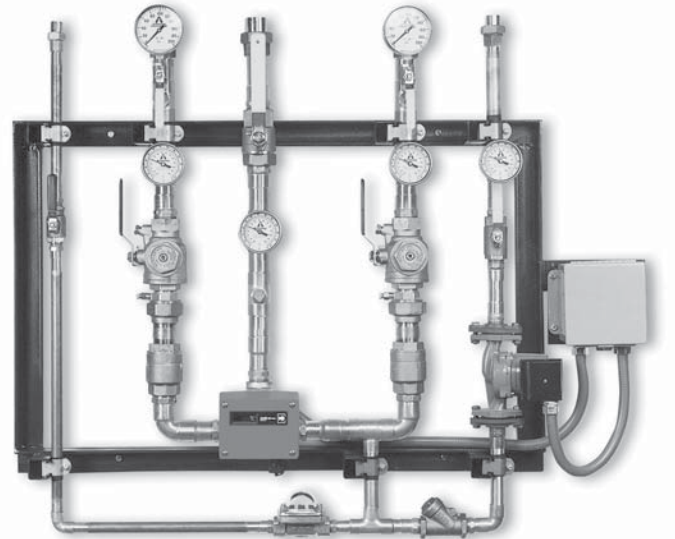
With integrated circuit technology combined with precision hydraulics, the 32rmx allows The Brain to deliver blended water economically at a safe, accurate temperature for sanitary use in recirculated hot water systems.

The Brain 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 Brain will maintain the temperature of the continuously flowing, pumped recirculating circuit.

Operational Specifications

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
- Remote set point adjustment via PC network or BAS.
- System monitoring via PC network or BAS
- 32rmx valve automatically shuts off the hot water flow upon cold water inlet supply failure
- 32rmx valve automatically shuts off the cold water flow upon hot water inlet supply failure 32rmx valve automatically flows cold water only in the event of a power failure



Application

The Brain 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 AC 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



Water Temperature Control - Recirculation Systems

Electronic

Electronic Mixing Centers up to 72 gpm (273 lpm)

- EMC 1 is supplied as a mixing center that includes:
 - 32rmx electronic temperature controller
 - 1-1/2" Inlet/Outlet and 1" recirculation return piping
 - 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 1/25 HP circulating pump rated at 8 gpm (30 lpm) at 8 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
 - 3" Inlet/Outlet and 1" recirculation return piping
 - 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 15 gpm (57 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.

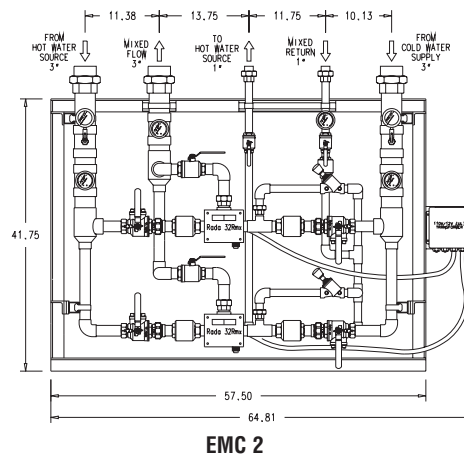
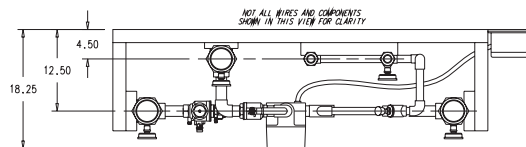
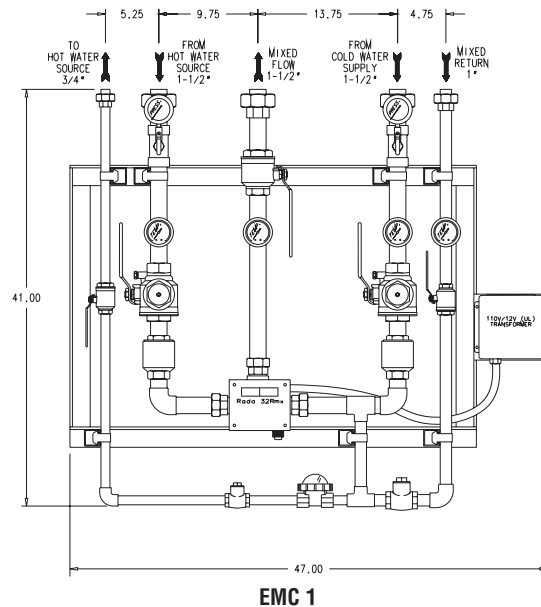
EMC 1	CDLW #1105
EMC 2	CDLW #1109
EMC 12	CDLW #1106
EMC 22	CDLW #1110
EMC 13	CDLW #1107
EMC 23	CDLW #1111
EMC 123	CDLW #1108
EMC 223	CDLW #1112

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 Brain® EMC installation and maintenance guide.



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

Building Automation System Interface Solutions (BASIS)

BASIS 1

Provided as a standard feature of EMC models with suffix "3" where BAS interface option is selected

Includes Model 840 control module with the following:

- Integral 4-20ma output connection for mixing unit temperature transmission to existing BAS.
- Integral 4-20ma input connection for mixing unit remote set point adjustment via existing BAS.
- Model 840 control module to mixing unit interface cable provided.
- Model 840 control module to BAS wiring not included.
- Temperature transmitter* for downstream mixed water temperature transmission to existing BAS.
- Image file containing EMC system graphic template.

*Supplied as hardware only. Temperature transmitter installation and wiring to BAS not included

BASIS 2

Provided as BASIS 1 with the following:

- Three (3) additional temperature transmitters with interface junction panel. Temperature transmitters supplied installed and pre-wired to EMC except for downstream mixed water transmitter.
- Downstream mixed water transmitter supplied as hardware only. Temperature transmitter installation and wiring to BAS not included.
- Interface junction panel wiring to BAS not included.
- Image file containing EMC system graphic template.

BASIS 3

Provided as BASIS 2 with the following:

- Hot supply in, cold supply in and mixed water out pressure transmitters
- Pressure transmitters supplied installed and pre-wired to interface junction panel.
- Interface junction panel wiring to BAS not included.

BASIS 4

Provided as BASIS 3 with the following:

- Mixed water outlet flow meter
- Recirculation return flow meter

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

EMC 13 BASIS 2 CDLW #1156

EMC 13 BASIS 3 CDLW #1157

EMC 23 BASIS 2 CDLW #1160

EMC 23 BASIS 3 CDLW #1161

EMC 123 BASIS 2 CDLW #1158

EMC 123 BASIS 3 CDLW #1159

EMC 223 BASIS 2 CDLW #1162

EMC 223 BASIS 3 CDLW #1163