

THE BRAIN® MODEL DRV25

DIGITAL RECIRCULATION VALVE

Engineered exclusively for continuously recirculated hot water systems, DRV25 improves system performance and safety by delivering a consistent preset temperature to the points of use.

Innovative digital technology resists “temperature creep” during periods of zero system demand which eliminates the requirement for manual throttling valves, supplementary RTD or a temperature actuated switch to control the pump.

Energy efficient, low temperature loss systems can be implemented by the ability of DRV25 to operate with a system return differential of just 1° F below set point.

User safety and overall system health is maintained by a series of programmable temperature alerts, onboard operational self-diagnostics, and a thermal disinfection option.



The Brain® Model DRV25

DRV25 Performance Chart: Pressure Drop (in PSIG) to Flow Rate (in GPM)

| DRV25 | Pressure Drop (PSIG) | | | | Minimum System Draw-Off | Minimum Flow Rate | C _v |
|-------|----------------------|----|----|----|-------------------------|-------------------|----------------|
| | 5 | 10 | 15 | 20 | | | |
| GPM | 22 | 31 | 39 | 45 | 0 GPM | 2 GPM | 9.8 |

DRV25 Performance Chart: Pressure Drop (in BARG) to Flow Rate (in LPM)

| DRV25 | Pressure Drop (BARG) | | | | Minimum System Draw-Off | Minimum Flow Rate | K _v |
|-------|----------------------|-----|-----|-----|-------------------------|-------------------|----------------|
| | 0.3 | 0.7 | 1.0 | 1.4 | | | |
| LPM | 81 | 118 | 145 | 171 | 0 LPM | 8 LPM | 8.5 |

Designs, materials, weights, and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for the most up-to-date information.



THE BRAIN® MODEL DRV25

TECHNICAL SPECIFICATIONS

| General | | |
|-------------------------------------|--|--|
| Protection | NEMA 3S, IPX4 | |
| Ambient Temperature | Minimum Ambient Temperature: 35°F (2°C) | Maximum Ambient Temperature: 122°F (50°C) |
| Ambient Humidity | 95% Non-Condensing | |
| Installation Environment | Suitable for indoor use only | |
| Materials | Valve: Stainless Steel, Electronics Casing: PC / ABS | |
| Safety | Seven fail-safe cold triggers supported by integral self-diagnostics and a programmable over-temp limit | |
| Connections | | |
| Inlet and Outlet Connections | 1" NPT Female Connections | |
| Pressures | | |
| Inlet Supply Pressures | Maximum Pressure: 200 psi / 1379 kPa = 13.8 bar | Minimum Pressure: 20 psi / 138 kPa = 1.5 bar |
| Supply Pressure Differential | Nominally equal | |
| Temperatures | | |
| Hot Water Supply Temperature | Maximum Inlet Hot Supply Temperature: 185°F (85°C) <i>(131°F (55°C) max. for on/off dead leg group fixture control)</i> | Minimum Inlet Hot Supply Temperature: 2°F (1°C) above DRV set point |
| Cold Water Supply Temperature | Minimum Inlet Cold Supply Temperature: 35.6°F (2°C) | |
| Min. Recirculation Temperature Loss | 1°F (≤ 1°C) | |
| Min. Continuous Recirculation Flow | 2 GPM (8 LPM) | |
| Recirculation Circuit | | |
| Minimum Distance to First Outlet | 25 ft (7.6 m) | |
| Electrical | | |
| Power Supply | 120 - 240V AC - 50/60 Hz | |
| Supply Fuse / Circuit Breaker | Grounding required (Switched Type 3 Amp - no plug; 15 Amp Grounding-type receptacle - plug) | |
| Battery | Qty (4) Duracell High-Power Lithium CR2 (3v) | |
| Configurable Settings | | |
| Set Point Range | 81°F to 158°F (27°C to 70°C) | |
| High Temperature Alert | Minimum of 2°F (1°C) above DRV set point | |
| High Temperature Error | 5°F (2°C) above DRV set point | |
| Thermal Disinfection Temperature | Programmable range of 158°F to 185°F (70°C to 85°C) | |
| Thermal Disinfection Set-Up | Disinfection Duration: ≤ 100 minutes | Disinfection Cool Down Duration: ≤ 30 hours |
| Units of Measure | Degrees Fahrenheit (°F) or Degrees Celsius (°C) | |
| Connectivity | | |
| Bluetooth® | On board with SAGE® mobile application (available in the Apple App Store and Google Play) | |
| BACnet MSTP | On board for connection to building automation system (BAS) operating on BACnet MSTP protocol | |
| Modbus RTU | RS-485 port for connection to building automation systems (BAS) operating on Modbus RTU protocol | |
| SAGE® Module | RS-485 port for connection to SAGE® module with Modbus TCP, BACnet TCP/IP, BACnet MSTP, or LonWorks protoconnector <i>Note: Protoconnectors for other BAS protocols may be available upon request</i> | |
| SAGE® Subscription | Real-time monitoring, recording, and documentation dashboard for Armstrong Hot Water Systems | |
| Standards and Approvals | | |
| ASSE 1017 | Certified & Listed | |
| CSA B125.3-11 | Compliant | |
| UL | Listed | |
| CE | Listed | |

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THE BRAIN® MODEL DRV25

WRITTEN SPECIFICATIONS

Category: The Brain®

Type: Digital Recirculation Valve

Model: Model DRV25

Part 1 - GENERAL

1.0 Digital Recirculation Valve

- 1.1 DRV shall have four thermistors integral of the mixing valve body that measure the cold water and recirculation return inlet, hot water inlet, mixed water outlet, and over-temp safety measures.
- 1.2 DRV mixing valve body shall be of 316L stainless steel, mixing valve proportioner of 316L stainless steel, and a NEMA 3S electronics enclosure.
- 1.3 DRV25 shall have 1" inlet and outlet connections that will deliver 31 gpm @ 10 psid.
- 1.4 DRV shall be capable of + / - 2°F control during high, low, or extended periods of zero demand on the system, with a continuous recirculation of >2 gpm. Temperature control shall be achieved without aquastat-like control of the recirculation pump.
- 1.5 DRV setpoint shall be configured by the factory to customer specification. DRV shall be field adjustable.

2.0 DRV25 shall have the following operational specifications:

- 2.1 + / - 2°F (1°C) water temperature control
- 2.2 1° F minimum mixed water outlet to recirculated return inlet differential (system temperature loss)
- 2.3 Minimum continuous recirculation of 2 gpm
- 2.4 Automatic shutoff of hot water upon cold water inlet supply failure
- 2.5 Automatic shutoff of hot water flow in the event of a power failure
- 2.6 Programmable setpoint range of 81°F - 158°F (27°C - 70°C)
- 2.7 Programmable thermal disinfection mode
- 2.8 Programmable 1st level hi/lo temperature alert display
- 2.9 Programmable temperature error level for safety shutdown

3.0 DRV25 shall have the following connectivity specifications:

- 3.1 Bluetooth® on-board with SAGE® mobile application (Apple App Store and Google Play)
- 3.2 BACnet MSTP on-board for connection to building automation system (BAS) operating on BACnet MSTP protocol
- 3.3 Modbus RS-485 port for connection to building automation system (BAS) operating on Modbus RTU protocol
- 3.4 RS-485 port for connection to SAGE® module with Modbus TCP, BACnet TCP/IP, BACnet MSTP, or LonWorks processor

Note: Processors for other BAS protocols available upon request

4.0 DRV shall be certified to ASSE 1017, UL listed, and conform to CSA B125.

5.0 Warranty

- 5.1 DRV shall have a 5-year warranty on all components, with the exception of batteries and O-rings.
- 5.2 Pre-piped DMC components shall have a 2-year warranty from date of installation, but not longer than 27 months from date of shipment.

THE BRAIN® MODEL DRV25

CONNECTIVITY



The Brain® and SAGE®

SAGE® works seamlessly with The Brain® as it analyzes data to track behavior and performance as an integral component of a hot water system operation protocol which complies with a standard of care.

The Brain® and every derivative assembly is supplied with an integral RS-485 serial port. This port provides a direct connection to Building Automation Systems that operate on a **Modbus RTU** or **BACnet MSTP** protocol.

The RS-485 port is also deployed for direct connection to an optionally supplied Building System (BS) Module.

SAGE® Options

SAGE® for Building Automation Systems (BAS) – BS Module available with BAS specific ProtoCessor cards for connection to systems which operate on **Modbus TCP**, **BACnet™ TCP/IP**, **BACnet™ MSTP**, or **LonWorks™** protocols.

SAGE® for Mobile Connectivity - Featuring smart hot water system dashboard monitoring, secure remote programming, multi-location view, temperature and system diagnostic alerts, with unlimited digital documentation and automated report generation.

Mobile connectivity may be enabled by a customer activated no-term subscription.



Optional Building System (BS) Module

Adding a suffix “BS” to The Brain® DRV (example: DRV25BS) will automatically add SAGE®, the supplemental hardware and software required to maximize the connectivity features of Armstrong digital technology.

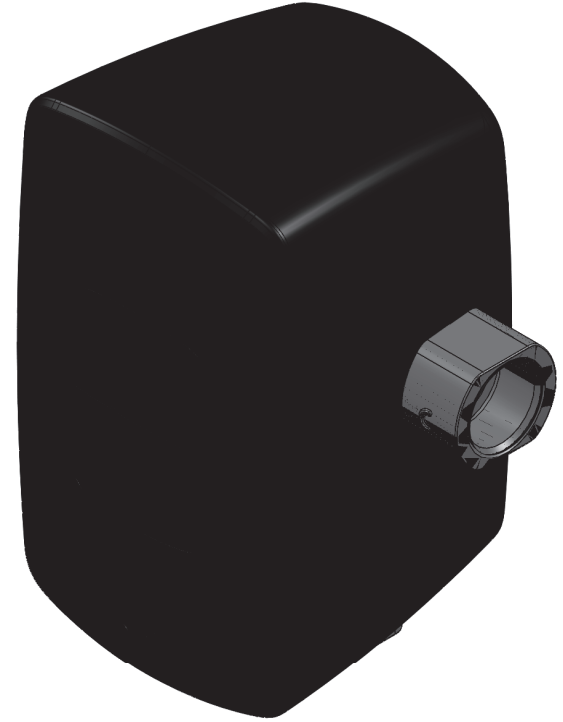
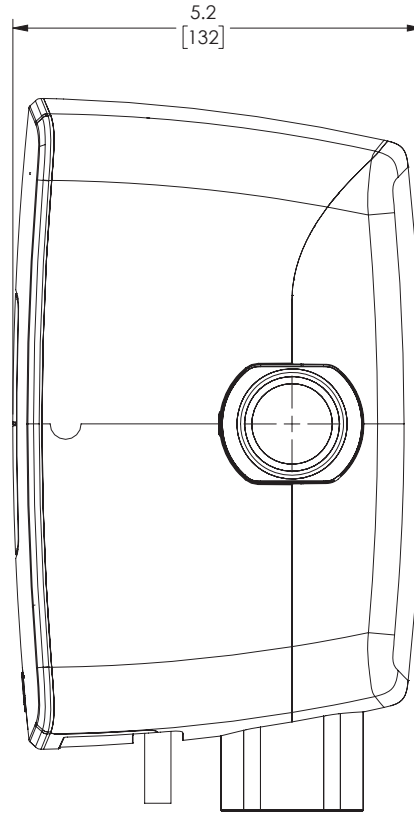
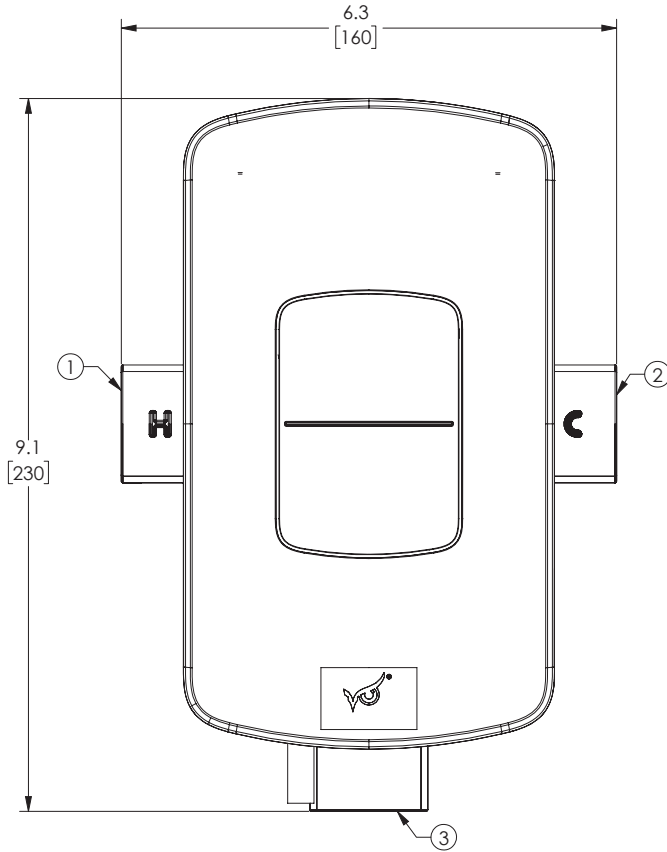
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APPROVAL


BY: _____ DATE: _____

- APPROVED, PROCEED WITH FABRICATION
- APPROVED AS NOTED, PROCEED WITH FABRICATION IN ACCORDANCE WITH COMMENTS
- DISAPPROVED, DO NOT FABRICATE



| PROJECT DESCRIPTION: | | |
|----------------------|--------------------|------------|
| TAG: | | |
| ITEM | DESCRIPTION | CONNECTION |
| 1 | HOT WATER INLET | 1" NPT |
| 2 | COLD WATER INLET | 1" NPT |
| 3 | MIXED WATER OUTLET | 1" NPT |

| | |
|--|--------|
| DO NOT SCALE DRAWING TOLERANCES UNLESS OTHERWISE SPECIFIED | |
| DIMENSIONING ENGLISH [mm] | |
| FRACTIONAL ± 1/64 | |
| ANGULAR: ± 2 | |
| DECIMAL | IN. MM |
| .XXXX ± .0005 | ---- |
| .XXX ± .005 | .010 |
| .XX ± .015 | .10 |
| .X | .3 |

| | | | |
|---|---------------|------------|------|
|  | | | |
| | | NAME | DATE |
| DRAWN | Kyle Bradford | 11/12/2018 | |
| RELEASED | | 11/21/2018 | |

| | |
|---|---------|
| ARMSTRONG INTERNATIONAL Copyright © 2010 ARMSTRONG INTERNATIONAL, INC. | |
| DRV25 | |
| MATERIAL | CN65424 |
| REVA | DWG. |
| SHEET 1 OF 1 | SALES |

NOTE(S):

1. REFERENCE ARMSTRONG DRAWING D112404.