THE BRAIN® MODEL DRV40BS

DIGITAL RECIRCULATION VALVE with SAGE®

Engineered exclusively for continuously recirculated hot water systems, DRV40BS 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 DRV40BS 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.

SAGE® (BS) is a performance software that monitors, records, and documents data as a critical component of a Water Safety Management Plan.

SAGE® works seamlessly with several building automation system protocols, or users can purchase a subscription to use SAGE® on a mobile device.

The Brain® Model DRV40BS

DRV40BS Performance Chart: Pressure Drop (in PSIG) to Flow Rate (in GPM)							
DRV40	Pressure Drop (PSIG)				Minimum System Draw-Off	Minimum Flow Rate	C_v
	5	10	15	20			
GPM	48	70	85	98	0 GPM	5 GPM	22

DRV40BS Performance Chart: Pressure Drop (in BARG) to Flow Rate (in LPM)							
DRV40	Pressure Drop (BARG)				Minimum System Draw-Off	Minimum Flow Rate	K_v
	0.3	0.7	1.0	1.4			
LPM	181.7	265	321	371	0 LPM	19 LPM	19

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

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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 Module: PC / ABS	
Safety	Seven fail-safe cold triggers supported by integral self-diagnostics and a programmable over-temp limit	
Connections		
Inlet and Outlet Connections	1-1/2" 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)	Minimum Inlet Hot Supply Temperature: 5°F (2°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	5 GPM (19 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 (2) CR - P2 6V	
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		
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 protocessor *Note: Protocessors for other BAS protocols may be available upon request*	
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 DRV40BS

WRITTEN SPECIFICATIONS

Category: The Brain®

Type: Digital Recirculation Valve

Model: Model DRV40BS

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 DRV40 shall have 1-1/2” inlet and outlet connections that will deliver 70 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 >5 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 DRV40 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 5 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 DRV40 shall have the following connectivity specifications:

3.1 Modbus RS-485 port for connection to building automation system (BAS) operating on Modbus RTU protocol

3.2 RS-485 port for connection to SAGE® module with Modbus TCP, BACnet TCP/IP, BACnet MSTP, or LonWorks protocessor
Note: Protocessors for other BAS protocols available upon request

3.3 SAGE® Building Systems (BS) Module

3.4 SAGE® subscription real-time monitoring, recording, and documentation dashboard for Armstrong hot water systems

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 DRV40BS

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** protocol.

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

SAGE® Options

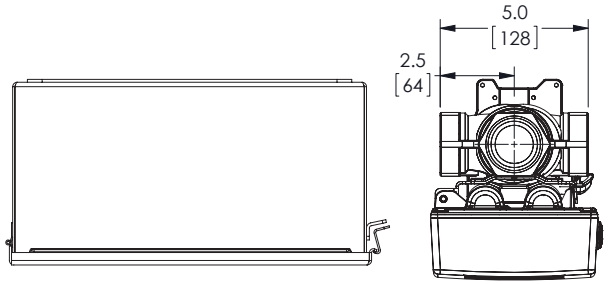
SAGE® for Building Automation Systems (BAS) – BS Module available with BAS specific ProtoCessor cards for connection to systems which operate on **Modbus TCP**, **BACnet™ TCP/IP**, **BACnet™ MSTP**, or **LonWorks™** protocols.

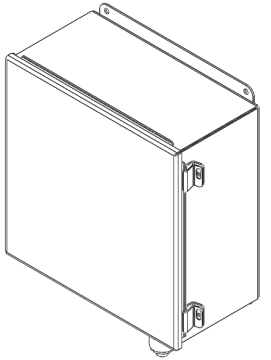
SAGE® for Mobile Connectivity - Featuring smart hot water system dashboard monitoring, secure remote programming, multi-location view, temperature and system diagnostic alerts, with unlimited digital documentation and automated report generation.

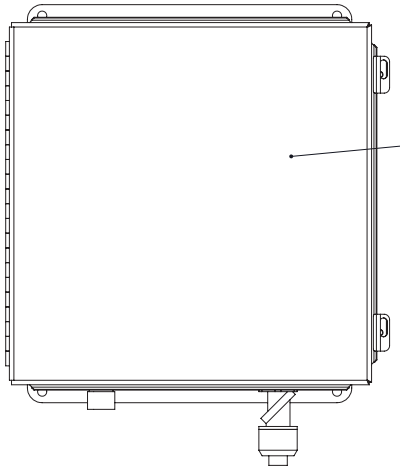
Mobile connectivity may be enabled by a customer activated no-term subscription.

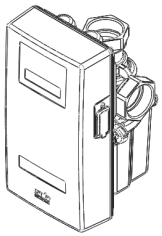
Optional Building System (BS) Module

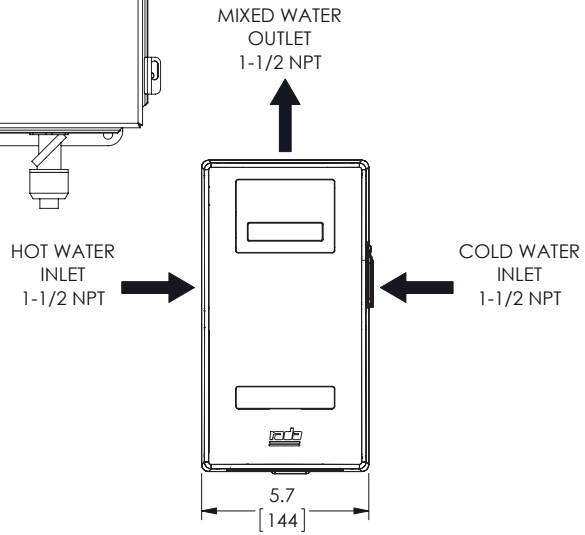
Adding a suffix “BS” to The Brain® DRV (example: DRV25BS) will automatically add SAGE®, the supplemental hardware and software required to maximize the connectivity features of Armstrong digital technology.

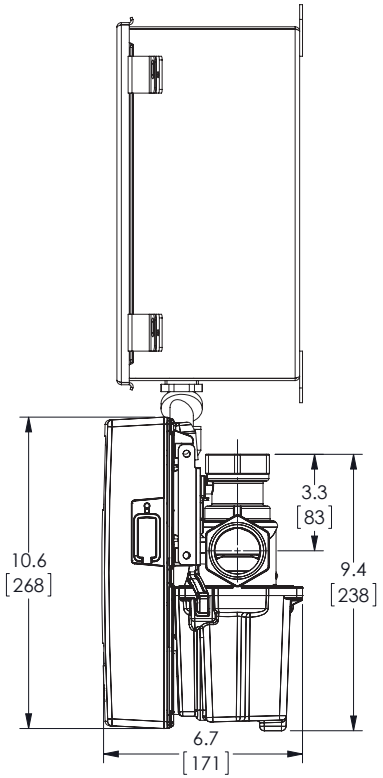












DO NOT SCALE DRAWING
TOLERANCES UNLESS OTHERWISE SPECIFIED
DIMENSIONING ENGLISH [mm]
FRACTIONAL ± 1/64
ANGULAR: ± 2

	IN.	MM
DECIMAL .XXXX ±	.0005	-----
.XXX ±	.005	.010
.XX ±	.015	.10
.X	----------	.3

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	NAME	DATE
DRAWN	Jon Singer	05/29/2012
RELEASED		

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DRV40BS

MATERIAL CN32171 REV. A DWG. D40891