

Smart Thermostat

RDS120



Ultra easy to use cloud connected IAQ controller for managed residential and light commercial applications

- Easy to read, backlit, auto-dimming 3.5" color LCD touch
- All essential user interaction on home screen – no complex operations
- Intuitive remote user control using Apple iOS and Android mobile phone applications
- One-touch green leaf button to maximize energy efficiency
- Industry-unique built-in VOC sensor senses and regulates indoor air quality beyond just CO₂
- Built-in humidity sensor for complete comfort control
- Built-in occupancy sensor and window / door contact enables smart occupancy control
- Full, easy to program user schedule

Thermostat highlights

- Built-in VOC sensor senses wide range of offending organic odors that contribute to stale air and drives ventilation control
- Easy to understand tri-level air quality indication: Good, Okay, Poor
- Humidity control using built-in or remote humidity sensor
- One-touch operation for Away, Fan, and Heating/Cooling mode
- Temperature setpoint limits for use in public spaces
- Screen lock protection against unauthorized access
- Room temperature control using built-in temperature sensor, optional remote sensor or averaged between built-in and remote sensors
- PID algorithm for precise control
- Advanced energy saving control strategy such as free cooling
- Two multifunctional inputs, optional and configurable for:
 - Room temperature
 - Operating mode switch
 - Universal contact
 - Outside air temperature
 - Room humidity
 - Presence detector
 - Condensation monitor
 - Room air quality
- Six relay outputs for:
 - Equipment control (see Application examples [→ 16])
 - One output for humidifier, dehumidifier or air damper
- An additional universal output configurable for humidification, dehumidification or indoor air quality control
- Guided Setup Wizard
- Over the air (OTA) firmware upgradable
- Green leaf button: when the leaf indicator is Green, the unit is operating per program for efficiency. When setting is overridden, the leaf turns Red. Touch the leaf to toggle between scheduled or overridden operation.

Mobile app features

- Supports iOS and Android smartphones
- Each day individually programmable between three mode:
 - "Comfort": comfort settings during occupied periods
 - "Pre-comfort": setting for evening etc. when maximum comfort is not required
 - "Eco": setting for periods during absence to maximize energy savings
- Same operational interface as on thermostat, one-touch "Away", "Fan", and "Heating" / "Cooling" mode settings
- User account management
- Monitor temperature and humidity
- Monitor indoor air quality: "Good", "Okay", "Poor"
- Secure access and data transmission with Siemens Cloud Computing Platform

Application

The RDS120 is designed to control Heat Pump or Conventional HVAC heating and cooling applications. It can control up to three stages of heating and two stages of cooling in

conventional systems and up to two compressors and two stages of auxiliary heat in heat pump systems.

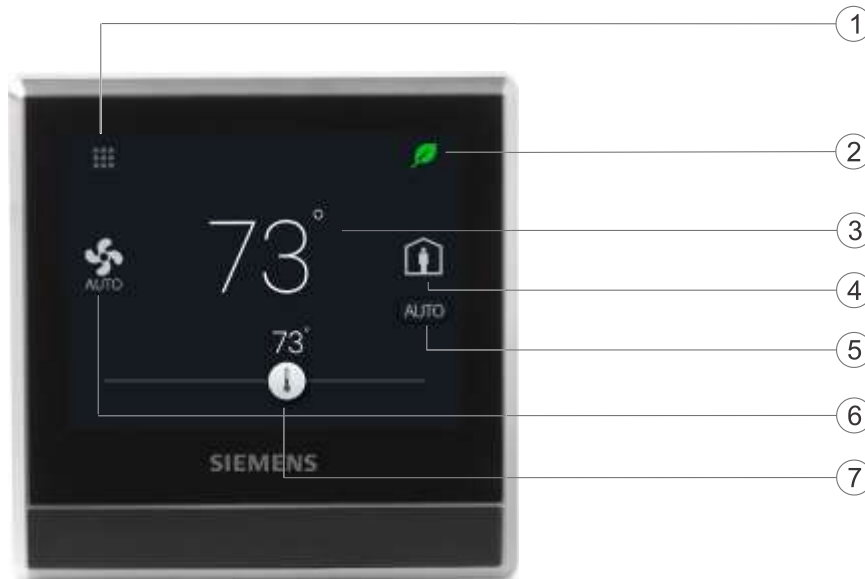
Mechanical design

The room thermostat consists of the following parts:

- Front housing with touch screen and sensors
- Back housing with terminals and relays
- Two different sized metal mounting plates plus a plastic decoration frame

Operation and settings

Normal display



- 1 System setup screens and detailed information display
- 2 Shows if the system is working in an energy-optimized mode. If the leaf is red, some predefined settings have been changed. Tap the red leaf to restore energy-saving mode. The leaf turns green.
- 3 Sensed room temperature
- 4 Tap once to toggle between "Home" and "Away".

- 5 Shows if the thermostat works automatically (AUTO) or manually (MANUAL). Please note:
 - If there is Cloud connection and the scheduler has been programmed, the thermostat will follow it. Any temporary change of the temperature setpoint is effective only during the currently scheduled mode.
 - If there is Cloud connection, but the schedule has not been programmed, the thermostat follows the default schedule.
 - If there is no Cloud connection, the thermostat will have no schedule and will be operated manually.
- 6 Tap to select a fan mode (AUTO/ON).
- 7 Tap or slide to change the room temperature setpoint.

Idle display



- 1 Sensed relative humidity
- 2 Shows room air quality:
 - If the icon is green, air quality is Very Good.
 - If the icon is orange, air quality is Average.
 - If the icon is red, air quality is Poor.
- 3 Shows if the system is in an energy-optimized mode. If the leaf is red, some pre-defined settings have been changed. Tap the red leaf to restore to energy-saving mode. The leaf turns green.
- 4 Sensed room temperature

NOTE: Depending on how the thermostat is set up, the displayed options under the idle mode may be different.

Ordering information

Product number	Stock number	Description
RDS120	S55772-T101	Room thermostat

Ordering

- When ordering, indicate product number, stock number and description
- Order valve actuators separately

Contents

Items	Quantity
Thermostat (front and rear modules)	1
Metallic mounting plates (small & big)	2
Plastic frame	1
Set of screws and plastic insert	1
Quick guide	1
Mounting instructions	1
Cabling sticker	1
Activation code sticker	1

Associated equipment

Remote sensors

Type of unit	Product no.	LG-Ni1000 at 32 °F	Pt1000 at 32 °F	NTC 10k at 77°F	DC 0 to 10 V	Datasheet*)
Room temperature sensors						
- Wall-mount	QAA24	x				1721
	QAA2012		x			1745
	QAA2030			x		1745
	QAA2061				x	1749
	QAA2061D ²⁾				x	1749
- Flush-mount ¹⁾	AQR2531ANW	x				1408
	AQR2532NNW				x	1411
- Concealed	QAA64 (vandal-proof)	x				1722
Outdoor temperature sensors						
	QAC22	x				1811
	QAC2012		x			1811
	QAC2030			x		1811
	QAC3161				x	1814

Type of unit	Product no.	LG-Ni1000 at 32 °F	Pt1000 at 32 °F	NTC 10k at 77°F	DC 0 to 10 V	Datasheet*)
Cable temperature sensors						
	QAP21.3	x				1832
	QAP22	x				1831
	QAP21.3/8000	x				1832
	QAP2012.150		x			1831
	QAP1030.200			x		1831
Room humidity sensors						
- Wall-mount	QFA2000				x	1857
- Wall-mount including temperature	QFA2020	x (T)			x (r.h.)	1857
	QFA2060				x (T+r.h.)	1857
	QFA2060D ²⁾				x (T+r.h.)	1857
- Flush-mount ¹⁾ including temperature	AQR2534ANW + AQR2540Nx	x (T)			x (r.h.)	1410
	AQR2535NNW + AQR2540Nx				x (T+r.h.)	1410
Indoor air quality sensors						
- VOC	QPA1000				x	1961
- CO ₂	QPA2000				x	1961
- VOC + CO ₂	QPA2002				x	1961
	QPA2002D ²⁾				x	1961
- CO ₂ including temperature	QPA2060				x	1961
	QPA2060D ²⁾				x	1961
	QPA2080	x	x	x	x (CO ₂)	1961
	QPA2080D ²⁾	x	x	x	x (CO ₂)	1961
- Flush-mount ^{1) 3)}	AQR2546				x	1410
	AQR2548				x	1410

*) The documents can be downloaded from <http://siemens.com/bt/download> by specifying the product number as shown in the above table.

1) Requires mounting plate and/or design frames;

2) With digital display;

3) Model according to front and base module combination.

Accessory

Type of unit		Product no.	Datasheet*
White decoration frame and metallic mounting plate for installation on rectangular conduit box (10 sets)		ARG100.01 S55772-T102	A6V11190640

* The documents can be downloaded from <http://siemens.com/bt/download> by specifying the product number as shown in the above table.


Product documentation

Topic	Title	Document number
Mounting and installation	Installation guide	A5W90001425
Installation and operation	User guide	A6V10733807
Startup wizard	Quick guide	A5W90001422
CE declaration		A5W90002476
RCM declaration		A5W90002477
Product environmental declaration		A5W90003412

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at: <http://siemens.com/bt/download>.

Notes

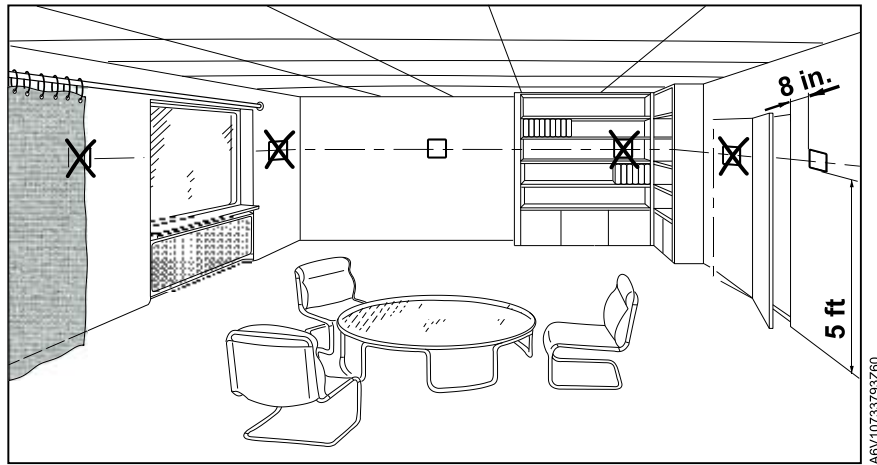
Security

	⚠ CAUTION
	National safety regulations Failure to comply with national safety regulations may result in personal injury and property damage <ul style="list-style-type: none">• Observe national provisions and comply with the appropriate safety regulations.

Engineering

See Product documentation [→ 7] for information on engineering, selection and sizing connecting cables for supply voltage and field devices.

Installation location



- The devices are suitable for wall installation.
- Recommended height: 5 feet above the floor.
- Do not install the devices in recesses, shelves, behind curtains or doors, or above or near heat sources.
- Avoid direct exposure to sun and drafts.
- Seal the conduit or backwall as drafts can affect sensor readings.
- Observe maximum ambient conditions.

Wiring

Use only class 2 rated power source with proper current limiting.

Installation



⚠ WARNING

No user serviceable parts inside.

Risk of fire and injury due to short-circuits

- Use properly sized wires for connections

Commissioning

Refer to the Quick guide and User guide (see Product documentation [→ 7]) to configure your device. Commissioning includes the following:

- Internet connection
- Application setup
- Account registration and device pairing

NOTE: Before configuring your thermostat, make sure you have Internet connection, a valid email address, and a smartphone.

Operation

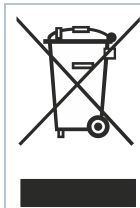
Operating system

OS	OS version	App store
iOS	iOS 10 or above	App store®
Android	Android™ 5.0 or above	Google Play™

Maintenance

The thermostat is designed for maintenance-free operation.

Disposal



The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Regulatory information

Radio equipment directive

The equipment is using harmonized frequency in Europe, and also compliances with the Radio Equipment Directive (2014/53/EU, formerly 1999/5/EC).

ISED regulations

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.



⚠ WARNING

Modification of this device to receive cellular radio telephone service signals is prohibited under FCC rules and federal law.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator & your body.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Technical data

Power supply

Power supply	
Operating voltage	AC 24 V (±20%)
Frequency	48 to 63 Hz
Power consumption	Max. 9 VA
Max. power supply current	4 A current limited

Radio parameter

Radio parameter	
Frequency band	2.4 to 2.4835 GHz
Maximum radio-frequency power	18 dBm
WLAN standard	IEEE 802.11b/g/n (HT20)
WLAN channel	1-11

Inputs

Connections to multifunctional inputs X1 - M - X2	
Passive temperature sensors - Cable length max. (copper cable section)	300 ft (90 m) (16 AWG wire), 230 ft (70 m) (18 AWG wire) 200 ft (60 m) (18 AWG wire), 130 ft (40 m) (20 AWG wire)
- NTC type Room temperature range Outdoor temperature range	NTC10K at 77 °F (25 °C) 32 to 122 °F (0...50 °C) -32 to 176 °F (-50...80 °C)
- Ni type Room temperature range Outdoor temperature range	Ni1000 at 32 °F (0 °C) 32 to 122 °F (0...50 °C) -32 to 176 °F (-50...80 °C)
- Pt type Room temperature range Outdoor temperature range	Pt1000_375/Pt1000_385 at 32 °F (0 °C) 32 to 122 °F (0...50 °C) -32 to 176 °F (-50...80 °C)
Active DC 0 V to 10 V sensors - Room temperature range (default) - Outdoor temperature range (default) - Humidity range (default) - CO ₂ range (default) - VOC range (default)	Note: min./max. configurable via parameters 32 to 122 °F (0...50 °C) -32 to 176 °F (-50...80 °C) 0 to 100% 0 to 2000 ppm 0 to 100%
Digital contacts - Operating action - Contact sensing - Parallel connection - Input function	Selectable N.O./N.C. DC 14 to 40 V, 8 mA (typical) Max. 20 thermostats per switch Selectable

Outputs

Relay contact capacity	
Voltage	AC 24 V (±20%)
Current	Min. 0.02 A, Max. 1 A per output

Operational data

Setpoint range
45 to 95 °F (7...35 °C)

Built-in room temperature sensor		
Temperature range	Accuracy at 77 °F (25 °C)	Display resolution
32 to 122 °F	± 1.8 F (1 °C)	1 F (0.5 °C)

Built-in room humidity sensor		
Humidity range	Accuracy at 77 °F (25 °C)	Display resolution
0% to 100%	20% to 80%: ±3% 0% to 20%, 80% to 100%: ±5%	1%

System compatibility

System compatibility	
Conventional	2 stages cooling, 3 stages heating
Heat pump	2 stages cooling and 2 stages heating (+2 stages auxiliary heating)

Connections

Interfaces	
Micro USB	A service port is provided for firmware upgrade and on-site diagnosis

Wiring connections	
Screw terminals	Solid wires or prepared stranded wires: Max. 1 x16 to 20 AWG

Conformity

Ambient conditions and protection classification	
Safety class according to EN60730	Class III
Degree of protection of housing as per EN 60529	IP30
Classification as per EN 60730:	
Function of automatic control devices	Type 1
Degree of contamination	2
Overvoltage category	III
Climatic ambient conditions:	
Storage as per EN 60721-3-1	Class 1K3 Temperature 23 to 113 °F (-5 to 45 °C) Humidity 5 to 95%
Transport (packaged for transport) as per EN 60721-3-2	Class 2K3 Temperature -13 to 158 °F (-25 to 70 °C)

Ambient conditions and protection classification	
	Humidity 5 to 95%
Operation as per EN 60721-3-3	Class 3K5 Temperature 23 to 122 °F (-5 to 50 °C) Humidity 5 to 95%
Mechanical ambient conditions:	
Storage as per EN 60721-3-1	Class 1M2
Transport as per EN 60721-3-2	Class 2M2
Operation as per EN 60721-3-3	Class 3M2

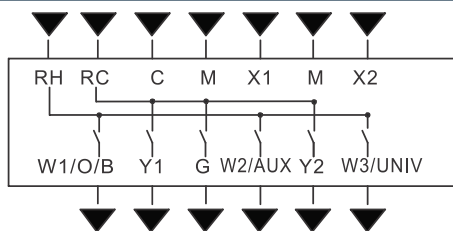
Standards, directives and approvals		
EU conformity (CE)	A5W90002476 ^{*)}	
RCM conformity	A5W90002477 ^{*)}	
FCC standards	FCC CFR 47 Part 15 Class C	
IC standards	RSS-247 issue 1 May 2015, RSS-GEN issue 4 November 2014	
UL	UL916	
The United Arab Emirates	Authorization Number of TRA: ER54733/17	<div style="border: 1px solid black; padding: 10px; text-align: center;"> TRA REGISTERED No: ER54733/17 DEALER No: DA64762/17 </div>
Qatar		
Saudi Arabia		
Environmental compatibility	The product environmental declaration A5W90003412 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

General data

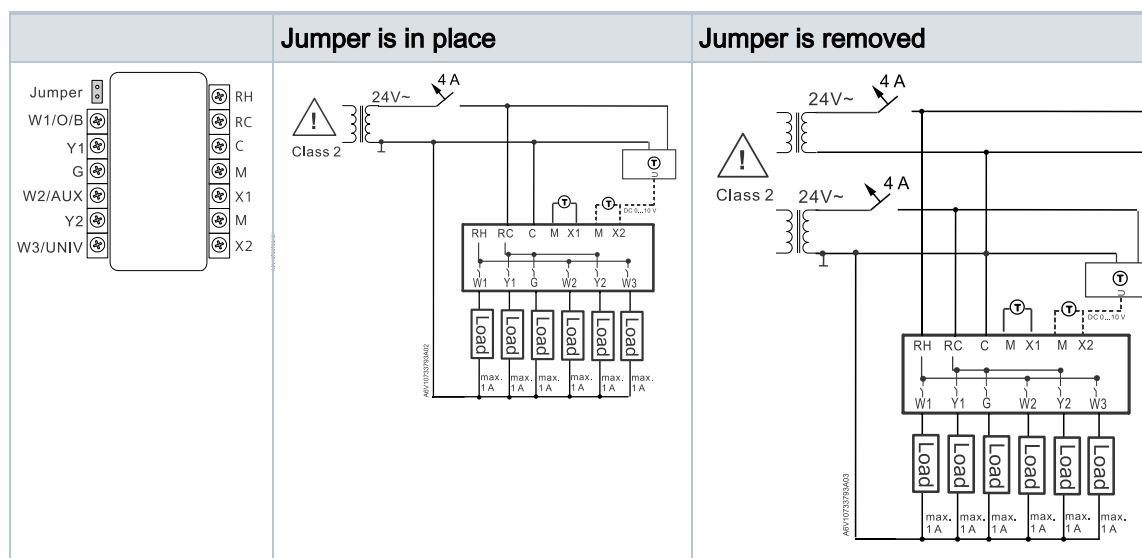
General		
Dimension	Refer to Dimensions	
Weight	Thermostat with package, user document and accessory	15.3 oz (435 g)
	Thermostat	9.5 oz (268 g)
Color	Silver plating Housing: Pantone black	

Connection terminals



Terminal	Use
RH	Heating system transformer, AC 24 V
RC	Cooling system transformer, AC 24 V
C	Common, AC 24 V
W1/O/B	First heating stage in conventional systems or reversing valve in heat pump
W2/AUX	Second heating stage in conventional systems or third heating stage in heat pump systems
W3/UNIV	Third heating stage in conventional systems, fourth heating stage in heat pump systems or auxiliary function
Y1	First cooling stage in conventional systems and first heating stage in heat pump systems
Y2	Second cooling stage in conventional systems and second heating stage in heat pump systems
G	Fan
X1, X2	Remote input (sensor, detector, switch)
M	Measuring neutral for remote input (sensor, detector, switch)

Wiring diagrams



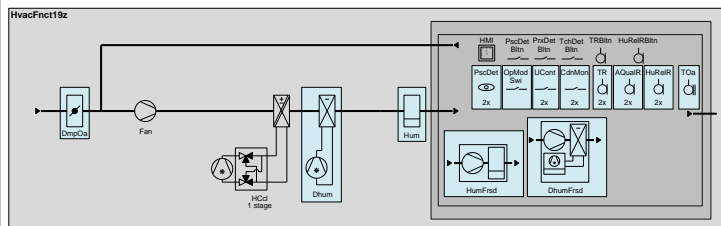
Note:

- For US installations use Class 2 rated power source. For other installations, use current protection with current rated at max. 4 A.
- If a single transformer is used, keep jumper RH-RC in place. Connect AC 24 V to the RC terminal, and neutral to terminal C. If separate transformers are used for heating and cooling systems, remove jumper RH-RC. Connect cooling AC 24 V to terminal RC, neutral to terminal C and heating AC 24 V to terminal RH.

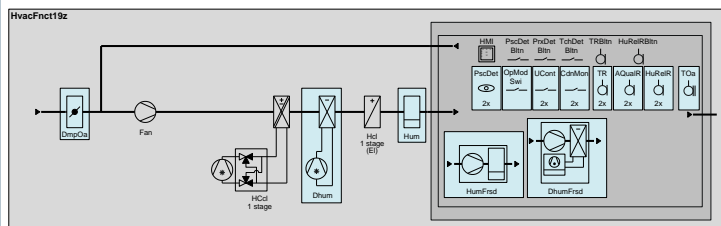
Application examples

Applications

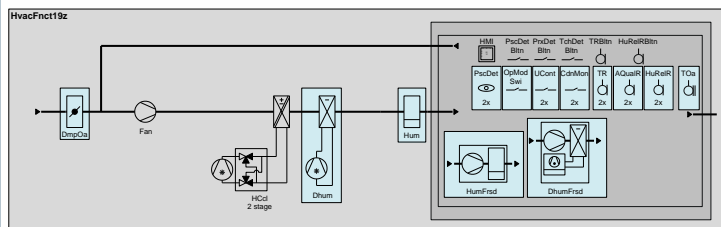
- 1 1-stage heat pump and
outside air damper (*optional*)
control



- 2 1-stage heat pump, 1-stage electric heating and outside air damper *(optional)* control

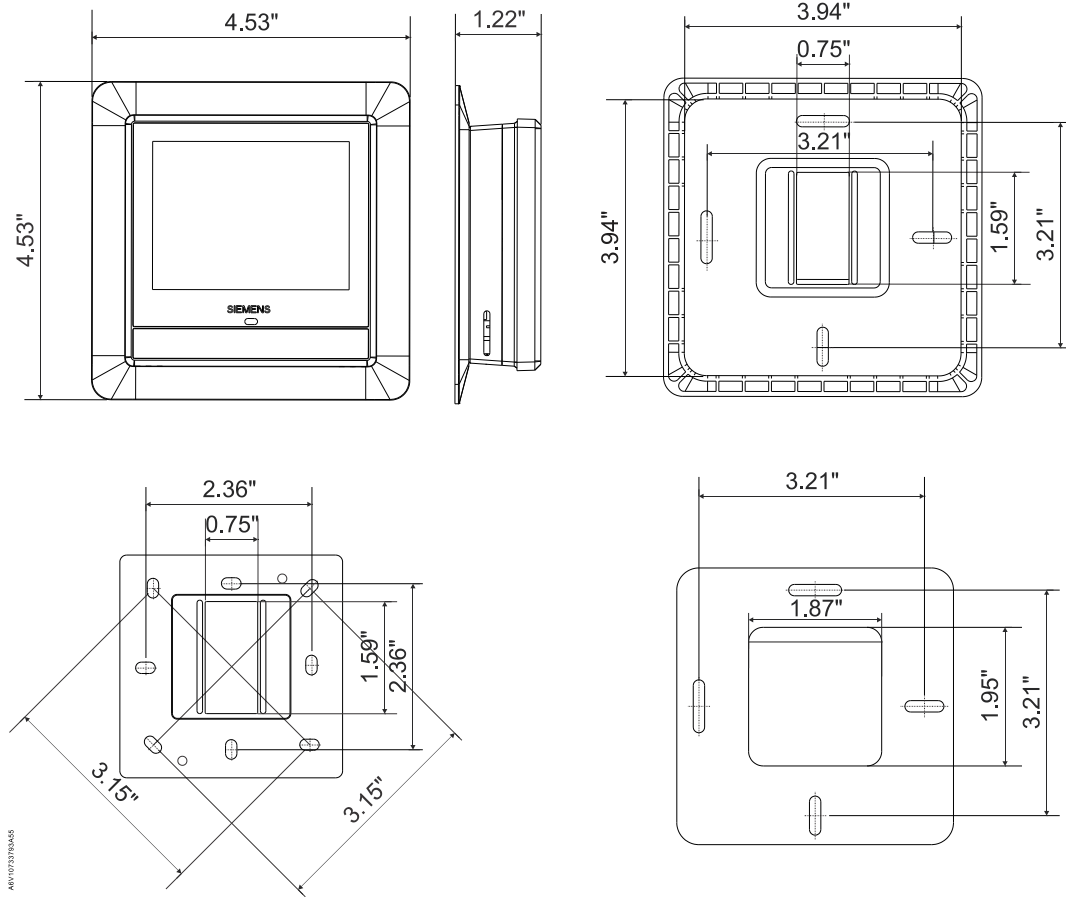


- 3 2-stage heat pump and
outside air damper (*optional*)
control



Applications	
4	2-stage heat pump, 1-stage electric heating and outside air damper (optional) control
5	2-stage heat pump, 1-stage gas heating (dual fuel)
6	2-stage heat pump, 2-stage electric heating and outside air damper (optional) control
7	Conventional heating application with 1-stage gas heating
8	Conventional cooling with 1-stage DX cooling and outside air damper (optional) control application

Dimensions



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