Description

WTL Thermostats

The WTL (Wireless Pneumatic Thermostats LoRa) Series Wireless Thermostat is a pneumatic thermostat that retrofits existing pneumatic thermostats to provide Direct Digital Control (DDC) such as single zone control functionality at a fraction of the time and cost, without disturbance to occupants.

The WTL Thermostat controls the following equipment:

• Variable air volume (VAV) cooling only

• VAV with hot water

• Hot water radiator

• Induction unit single coil summer/winter

• Induction unit two coils heating or cooling

• Fan coil

• Constant air volume (CAV) with mixing box

• CAV with hot water reheat

The WTL Thermostat is available in the following direct-acting and reverse-acting models:

• Single setpoint, for cooling only or heating only applications.

• Dual setpoints, for heating and cooling applications.

• Summer/winter, for single setpoint control with summer and winter mode.

Use the WTL Thermostat to remotely monitor the zone temperature and branch pressure, remotely control the temperature setpoints, and program the setback.

You can integrate the WTL Thermostat with an existing building management system (BAS) through BACnet®/IP. As a result, the WTL Thermostat can help save energy through the implementation of energy savings control strategies, improve comfort, and reduce the maintenance cost of the legacy pneumatic HVAC systems.

All WTL Thermostat models feature a white plastic cover with the Johnson Controls® logo.

Figure 1: WTL Thermostat
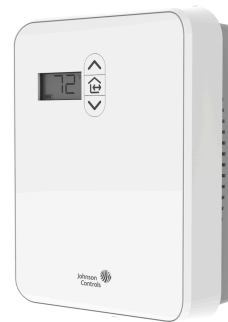
Gateway and Control Server

Use the WTL Gateway to connect WTL Thermostats to a LoRaWAN® wireless network. Each gateway creates its own LoRa wireless network. Connect the gateway to a WTL Control Server for remote control of WTL Thermostats. One control server pairs with one gateway. You can map up to 125 thermostats

to one control server. You must use the gateway and control server to connect to a BAS. If you do not want to connect to a BAS, you can use the control server to set schedules.

The LoRaWAN is a networking protocol designed to wirelessly connect battery operated devices to the Internet. The gateway converts LoRa RF packets into IP packets and IP packets into RF packets. For more information about LoRaWAN, visit https://lora-alliance.org/about-lorawan/

Figure 2: Gateway

Figure 3: Control Server

Survey Kit

The WTL Survey Kit can survey larger, multi-story sites for compatibility with the WTL Thermostat. Use the WTL Survey Kit to perform a range test to determine the strength of the wireless connection between the WTL Thermostat and the WTL Gateways at the location where you plan to install the devices. If the signal strength is not sufficient at the WTL Thermostat installation locations, you may need to adjust the gateway and control server installation location or potentially add additional gateways to ensure sufficient wireless signal coverage.

Features and benefits
Digital zone control

Optimizes energy usage and comfort

Programmable temperature setbacks

Automatic setpoint changes based on time-of-day schedule and night setback to save energy

Diagnostic monitoring

Reduces maintenance and operating cost

Early problem detection

Avoids disruptions to system operation and eliminates customer complaints

Failsafe

Maintains temperature setpoint even if battery is dead

Integrate to a BAS

Provides dual-function operation. WTL Thermostats can operate with wireless infrastructure and connection to a BAS. Integrate with a BAS to log, display, control, and view trend data from the WTL network

Support BACnet Schedule

Supports schedule through the control server if not integrated with BAS, or through the BAS scheduling feature if the WTL system is connected to a BAS

Selection charts
Table 1: WTL Series selection chart

Product code	Description
WTL-PD1-00	Wireless, pneumatic, direct-acting 2-pipe thermostat for terminal unit with one actuator. Single setpoint temperature control for cooling-only or heating-only applications.
WTL-PR1-00	Wireless, pneumatic, reverse-acting 2-pipe thermostat for terminal unit with one actuator. Single setpoint temperature control for cooling-only or heating-only applications.

Johnson Controls

Table 1: WTL Series selection chart

Product code	Description
WTL-PD2-00	Wireless, pneumatic, direct-acting 2-pipe deadband thermostat for terminal unit with two actuators. Provides separate setpoints for cooling and heating with adjustable deadband.
WTL-PR2-00	Wireless, pneumatic, reverse-acting 2-pipe deadband thermostat for terminal unit with two actuators. Provides separate setpoints for cooling and heating with adjustable deadband.
WTL-PD3-00	Wireless, pneumatic, direct-acting summer/winter thermostat for single setpoint control with summer and winter mode.
WTL-PR3-00	Wireless, pneumatic, reverse-acting summer/winter thermostat for single setpoint control with summer and winter mode.
WTL-WRG-00	Wireless LoRa Gateway. Wireless communications hub.
WTL-GBC-00	WTL Control Server. For BACnet/IP interface, web application user interface, history, and trending logs.
WTL-SK-00	WTL Survey Kit. For larger, multi-story buildings to determine wireless signal strength.

Table 2: WTL Series accessories selection chart

Product code	Description
WTL-CVR-00	White, plastic replacement thermostat cover with LCD screen and buttons

Technical specifications

Table 3: WTL Series Thermostat technical specifications

Specification	Description
Action	Direct acting, reverse acting
Number of pipes	2-pipe

Table 3: WTL Series Thermostat technical specifications

Specification		Description
Setpoint temperature range		55ºF to 85ºF (13°C to 29°C)
Air connections		3/32 in. (2.5 mm) ID tube fittings
Maximum operating pipe pressure		25 psi (170 kPa)
Airflow usage		0.011 scfm (5.2 mL/s)
Sensitivity		Factory adjusted to 2.0 PSI/F – 2.5 PSI/F
Operating frequency band		915 MHz LoRa network band
Transmission ranges[1]	Recommended indoor on one floor	250 ft (76.2 m)
	Recommended indoor over multiple floors	150 ft (45.7 m)
	Line of sight, maximum	400 ft (122 m)
Transmission interval		5 minutes
Antenna gain		1.7 dBi
Output power		18.5 dBm
Battery life		Minimum of 2 years, with four setpoint changes per day
Operating conditions		32ºF to 122ºF (0ºC to 50ºC), 95% RH maximum, noncondensing
Storage conditions		-40ºF to 122ºF (-40ºC to 50ºC) 95% RH maximum, noncondensing
Dimensions H x W x D		5.6 in. (141 mm) x 4.1 in. (104 mm) x 2.1 in. (53 mm)

1   Metal objects or other obstructions can reduce or completely block the wireless signal transmissions.

Table 4: WTL Series Gateway technical specifications

Specification		Description
Power requirements	External power adapter	100 VAC to 240 VAC 50/60Hz
	WTL-WRG-00 input	9 VDC @ 1.7 A from external supply
Communications interface		Ethernet 10 Base-T/100 Base-TX with RJ-45 connector
Operating frequency band		915 MHz

Johnson Controls

Table 4: WTL Series Gateway technical specifications

Specification		Description
Channels	Quantity	8
	Spacing	200 KHz
Transmissions	Power	+27 dBm maximum output before antenna, 30 dBm after antenna
	Rate	5.470 Kbps
	Speed	Ethernet communication through WTL Control Server 10 Mbps, 100 Mbps
Antenna gain		3 dBi
Ambient conditions	Operating	-22°F to 158°F (-30°C to 70°C), 20% RH to 90% RH, noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C), 20% RH to 90% RH, noncondensing
Materials		Anodized blue aluminum
Compliance	United States	FCC Part 15 Class B
		RoHS Compliant (EU Directive)
	Canada	Industry Canada IC: ICES-003 Class B
	UL	UL/cUl 60950-1, UL/cUL 62368-1
Shipping weight		1.00 lb (0.45 kg)
Dimensions H x W x D		6.35 in. (161.29 mm) x 4.17 in. (105.92 mm) x 1.695 in. (43.05 mm)

Table 5: WTL Series Control Server technical specifications

Specification		Description
Power requirements	External power adapter	90 VAC to 264 VAC, 36 W
	WTL-GBC-00 input	12 VDC @ 3 A from external supply
Communications	Interface	Two RJ-45 connectors
	Protocol	BACnet IP
Transmission speeds	Ethernet communication	10 Mbps, 100 Mbps, 1000 Mbps
Operating system		Microsoft®Windows® 10
Ambient conditions	Operating	-4°F to 131°F (-20°C to 55°C), 10% RH to 90% RH, noncondensing
	Storage	-4°F to 131°F (-20°C to 55°C), 5% RH to 95% RH, noncondensing
Materials		Aluminum extrusion with heavy-duty steel, IP40

Table 5: WTL Series Control Server technical specifications

Specification		Description
Compliance	United States	RoHS Compliant (EU Directive)
Shipping weight		3.97 lb (1.8 kg)
Dimensions H x W x D		4.7 in. (120 mm) x 9.33 in. (237 mm) x 2.05 in. (52 mm)

Table 6: WTL Series Survey Kit Gateway and Thermostat units technical specifications

Specification		Description
Operating frequency band		900 MHz LoRaWAN Protocol
Battery	Gateway	Rechargeable battery pack. Nominal capacity 6 Ah, input 12.6 V, 3 A maximum, output 12 V, 3 A maximum
	Thermostat	TL-5920 battery. Nominal capacity 8.5 Ah, rated voltage 3.6 V, maximum continuous current 230 mA
Battery life	Gateway	8 hours
	Thermostat	Minimum 2 years
Operating conditions		32°F to 122°F (0°C to 50°C), 95% RH maximum, noncondensing
Storage conditions		-40°F to 122°F (-40°C to 50°C), 95% RH maximum, noncondensing
Case dimensions H x W x D		14 in. (355.6 mm) x 11 in. (279.4 mm) x 4 in. (101.6 mm)
Weight		8 lbs (3.6 kg)

Repair information

If the WTL thermostat fails to operate within its specifications, replace the unit. For a replacement thermostat, contact the nearest Johnson Controls® representative.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Patents

Patents: https://jcipat.com

Johnson Controls

Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS VOLTAWEG 20 6101 XK ECHT THE NETHERLANDS	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

Contact information

Contact your local branch office:
www.johnsoncontrols.com/locations

Contact Johnson Controls:
www.johnsoncontrols.com/contact-us

Johnson
Controls

Johnson
Controls