MERLIN NX
MS/TP VAV CONTROLLER

The CLMEVAxxMB24NM MS/TP VAV controller with integrated actuator and air flow sensor are a part of the MERLIN NX family.

The MERLIN NX family of room controllers offers performance-based engineering with ARENA NX (Niagara eXtended) and enables Single-Tool-Engineering throughout the whole Building Management System and allowing cost-effective installation and commissioning, and driving new levels of functionality, and efficiency in today's buildings.

These scalable and freely programmable BACnet MS/TP based unitary controllers utilize smart engineering and commissioning tools. It supports multiple, flexible configurations to address specific applications with the ARENA NX (Niagara) tool, Modbus, and Sylk™ bus sub-bus integration options.

FEATURES AND HIGHLIGHTS

COMMUNICATION

- Supports BACnet MS/TP as the backbone bus for communication.
- Modbus Client for integration purposes.
- Sylk™ bus two-wire polarity-insensitive interface connects to Honeywell Sylk™ wall modules without using I/O points.
- BTL-listed, MSTP VAV: B-AAC profile (BTL certification in process).
- Versions with integrated BLE(Bluetooth).
- Automatic addressing functionality.

ALL-IN-ONE

- Compact design for small enclosures and easy to install on round ducts.
- Color-coded, removable terminal blocks to simplify wiring and replacement.
- Freely programmable in Niagara.
- Real-time clock, a supercapacitor for 24-Hours data retention.
- 24 VAC power supply.
- 20 VDC at 75mA auxiliary

supply for field devices.
- Seven Universal Inputs Outputs usable as analog voltage/current output or as a universal/binary input.
- Five 24 VAC solid state relay outputs with 1.5 A continuous and 3.5 A in-rush for 100 milliseconds per SSR output.
- All UI can be used for pulse input. Maximum frequency 100 Hz, Minimum duty cycle (50 % / 50 %) 5 ms ON / 5 ms OFF.
- Features a non-isolated RS485 interface suitable for Modbus communication.

ACTUATOR

- Integrated 44 in-lbs (5 Nm) actuator with 90 sec runtime at 60 Hz (108 sec at 50 Hz) with position feedback.

PRESSURE SENSOR

- Field replaceable differential pressure sensor (± 500 Pa; accuracy +/- 3% of full range).

MOBILE APPLICATION

Mobile App for VAV Balancing with easy access to the controller via Bluetooth integrated in the controller.

- Support Android and iOS.
- Local language support (English, French, Spanish, German, Italian).
- Wireless signal strength indication.
- Easy pairing without the need to open the ceiling for recalibration.
- Password protection.
- Supports different types of balancing (Min/max, set-point).
- Command individual / group of VAV, e. g. open a group of VAV dampers.
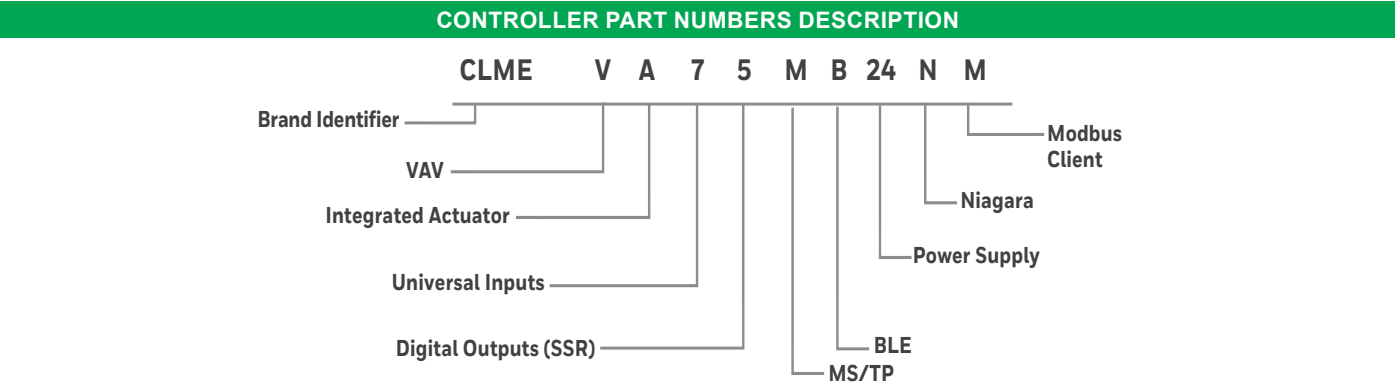- Provides a report on balancing activities.

SYSTEM OVERVIEW
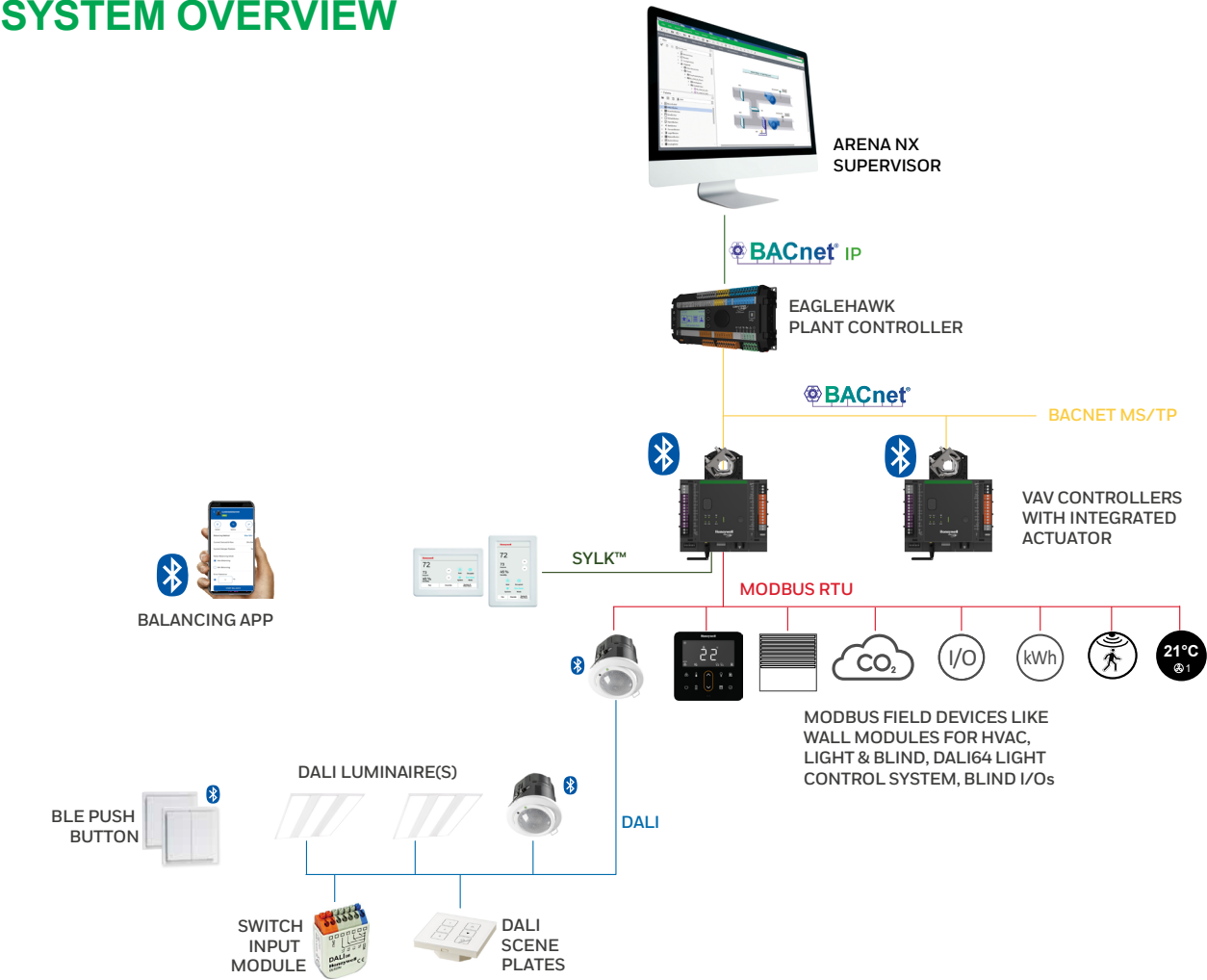
ORDERING PART NUMBER

CONTROLLER MODEL	UIO	SOLID STATE RELAY	SUM IO	BACKBONE COMMUNICATION	DIP SWITCHES	BLE
CLMEVA75M24NM	7	5	12	MS/TP	Yes	No
CLMEVA75MB24NM	7	5	12	MS/TP	Yes	Yes
CLMEVA00MB24NM	0	0	0	MS/TP	Yes	Yes

NOTE: All devices have 24 VAC power supply, Sylk™ wall module bus and Modbus RTU Client.

REPLACEMENT PARTS

PART NUMBER	TYPE	
SDPPF500PA	Air flow sensor	Spare part used in case, original air flow sensor gets damaged.
ANT-REM	Remote antenna	Use the remote antenna if the antenna mounted on the controller does not provide reliable communication due to environmental conditions. The packet contains four antennas.

MOBILE APPLICATION FOR BALANCING

Honeywell Connect Mobile application for the VAV balancing can be downloaded from the Google Play Store / Apple App store.

CONTROLLER PART NUMBERS DESCRIPTION

CLME V A 7 5 M B 24 N M

- Brand Identifier
- VAV
- Integrated Actuator
- Universal Inputs
- Digital Outputs (SSR)
- MS/TP
- BLE
- Power Supply
- Niagara
- Modbus Client

PRODUCT SPECIFICATION

ELECTRICAL

PARAMETER	SPECIFICATION
Voltage Range	20-30 VAC; Class 2 transformer.
Nominal Power Consumption	7.68 VA; Controller and actuator load (nothing connected to IO's and COM).
Full Load Power Consumption	22VA; Maximum load including external loads, Sylk™, communication, BLE, Universal IO output, and 20 VDC output excluding the load on the SSRs.
Frequency Range	50 to 60Hz
Auxiliary Output	20 VDC @ 75 mA

OPERATIONAL ENVOIRNMENT

PARAMETER	SPECIFICATION
Storage	-40 °C to 66 °C (-40 °F to 150 °F)
Operation	0 °C to 50 °C (32 °F to 122 °F)
Humidity	5% to 95% RH., non-condensing
protection	IP20, NEMA -1
Pollution Level	2

WEIGHT AND DIMENSIONS

PARAMETER	SPECIFICATION
Dimension (LXWXH)	175.2 X 154.3 X 90.2 mm (7 X 6 X 3 1/2 inch)
Weight	1.5 kg
Mounting	Fixation with bracket and shaft

DIFFERENTIAL PRESSURE SENSOR

PARAMETER	SPECIFICATION
Range	±2.0 in. H2O (±500 Pa)
Accuracy	±3% of full range

Field Replaceable differential pressure sensor.

INTEGRATED ACTUATOR

PARAMETER	SPECIFICATION
Torque	44 in-lbs (5 Nm)
Run Time	Floating 108 s at 50 Hz; Floating 90 s at 60 Hz
Mounting Shaft	Round 8-16 mm (5/16 – 5/8"); Square 6-13 mm (15/64 – 33/64")
Shaft Length	≥ 1 5/8 in (41 mm)

Position feedback via integrated position potentiometer :
- **No need of synchronization.**
- **Additional diagnostic for example, command to change the actuator position does not provide a corresponding sensor reading - actuator stuck or potentiometer damaged**

HARDWARE

PARAMETER	SPECIFICATION
CPU	Crossover processor NXP I.MRT, Cortex M7
Memory capacity	16MB QSPI Flash, 16MB SDRAM
Real Time Clock	24-Hours backup after power failure. The controller includes a supercapacitor to power the built-in real time clock for 24-Hours. In case of power failure, the super capacitor retains the time set in controller for 24-Hours. After 24-Hours, the time will reset to default factory time until user perform BACnet Time Sync.
Small LEDs	Transmission or Reception of communication Signal (green).
Long LED	Controller status such as normal operation, firmware download, broken sensor, e.g. green, yellow or red.

STANDARDS AND COMPLIANCE

CE

UL916, Energy Management Equipment.

FCC Part 15, Class A verified.

EN 55022. Class A

EN 61000-3-2, 61000

BACnet BTL-Listed; MSTP VAV model as BACnet Advanced Application Controller (B-AAC); (BTL certification in process).

COMMUNICATION

PARAMETER	SPECIFICATION
Protocol supported	BACnet MS/TP, Sylk™, Modbus RTU (Modbus Client only), BLE.
Sylk™ Bus	2-wire, polarity-insensitive.
Bluetooth	BLE, optional external antenna.

SOLID STATE RELAY

PARAMETER	SPECIFICATION

SSR switches supply voltage and works with VAC and VDC. VDC switching does not support synchronous motor.

- 1.5A constant; 3.5A inrush for 0.1 sec per SSR output.
- Optional bridge between 24 VAC supply and SSR input shared by all SSRs.

UIO (CONFIGURABLE AS ANALOG OUTPUT OR UNIVERSAL INPUT)

PARAMETER	SPECIFICATION
AO	0(2)…10V direct/reverse with -3mA …+20mA (negative current needed for light dimming) or current output with 0(4)…20mA
UI	- 0(2)…10V direct/reverse or 0(4)…20 mA input - Sensors: NTC10k(Type 2), NTC10K3, 10K3A1, NTC20k, PT100, PT1000, NI1000TK5000, NI1000 Class B DIN43760, PT3000, JOHNSON A99, 100 Ohm to 100k Ohm resistive (custom characteristic). - Hardwired wall modules: set point, fan speed, override - Dry contact binary input with direct/reverse - Counter (S0) with 100Hz (min. pulse width 5 ms; e.g. used to measure fan speed).

Common terminal shared by 2 UIO, protected against 24VAC mis-wiring and short circuit

SYLK™ DEVICES SUPPORTED

Wall Modules Sensors	CLCMTR40, CLCMTR40-H, CLCMTR40-H-CO2, CLCMTR40-CO2, CLCMTR42, CLCMTR42-H, CLCMTR42-H-CO2, CLCMTR42-CO2, CLCMTR71-H, CLCMTR120 (TR75E) and CLCMTR120-H (TR75-HE).

CONTROLLER TERMINALS

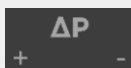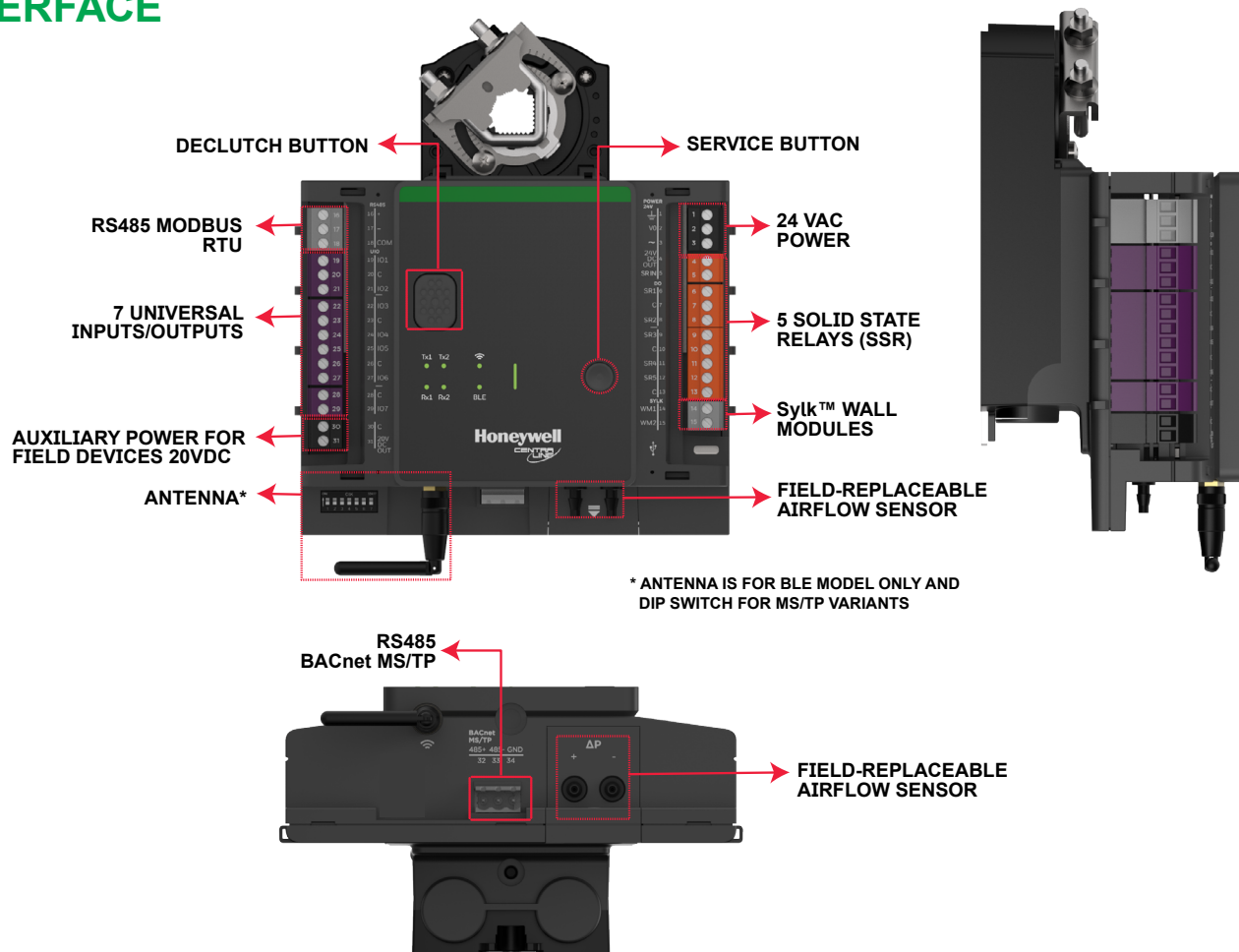| LEGEND	PRINTING	DESCRIPTION
		POWER
1	⏚	Earth Ground (Connected to power earth ground)
2	V0	Ground
3	~	Power supply voltage (Connected to 24VAC~)
4	AC OUT	24VAC~ output
5	SRIN	SSR POWER input (Connected to terminal 4 (AC OUT) by a jumper wire)
		SSR
6	SR1	SSR1 output (if SSR1 is ON, this pin should be connected to 24VAC~)
7	C	Ground
8	SR2	SSR2 output (if SSR2 is ON, this pin should be connected to 24VAC~)
9	SR3	SSR3 output (if SSR3 is ON, this pin should be connected to 24VAC~)
10	C	Ground
11	SR4	SSR4 output (if SSR4 is ON, this pin should be connected to 24VAC~)
12	SR5	SSR5 output (if SSR5 is ON, this pin should be connected to 24VAC~)
13	C	Ground
		SYLK ™
14	WM1	Removable interface for Sylk™ bus
15	WM2	Removable interface for Sylk™ bus
		RS485 MODBUS RTU
16	+	RS 485 Modbus interface
17	-	RS 485 Modbus interface
18	COM	Ground
		UIO
19	IO1	Universal signal input/output 1 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
20	C	Ground
21	IO2	Universal signal input/output 2 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
22	IO3	Universal signal input/output 3 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
23	C	Ground
24	IO4	Universal signal input/output 4 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
25	IO5	Universal signal input/output 5 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
26	C	Ground
27	IO6	Universal signal input/output 6 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
28	C	Ground
29	IO7	Universal signal input/output 7 (Input<"0-20mA" "0-10V" "NTC10K" NTC20K" "RTD" >; Output<"0-10V" "0-20mA">
		20VDC
30	C	Ground
31	20V DC OUT	20VDC power output
		RS 485 BACNET MS/TP
32	+	Signal for 485 bus +
33	-	Signal for 485 bus -
34	COM	Ground
	ΔP + -	Field-replacable airflow sensor

INTERFACE

DECLUTCH BUTTON

SERVICE BUTTON

RS485 MODBUS RTU

7 UNIVERSAL INPUTS/OUTPUTS

AUXILIARY POWER FOR FIELD DEVICES 20VDC

ANTENNA*

24 VAC POWER

5 SOLID STATE RELAYS (SSR)

Sylk™ WALL MODULES

FIELD-REPLACEABLE AIRFLOW SENSOR

* ANTENNA IS FOR BLE MODEL ONLY AND DIP SWITCH FOR MS/TP VARIANTS

RS485 BACnet MS/TP

FIELD-REPLACEABLE AIRFLOW SENSOR

MEASUREMENTS AND DIMENSIONS
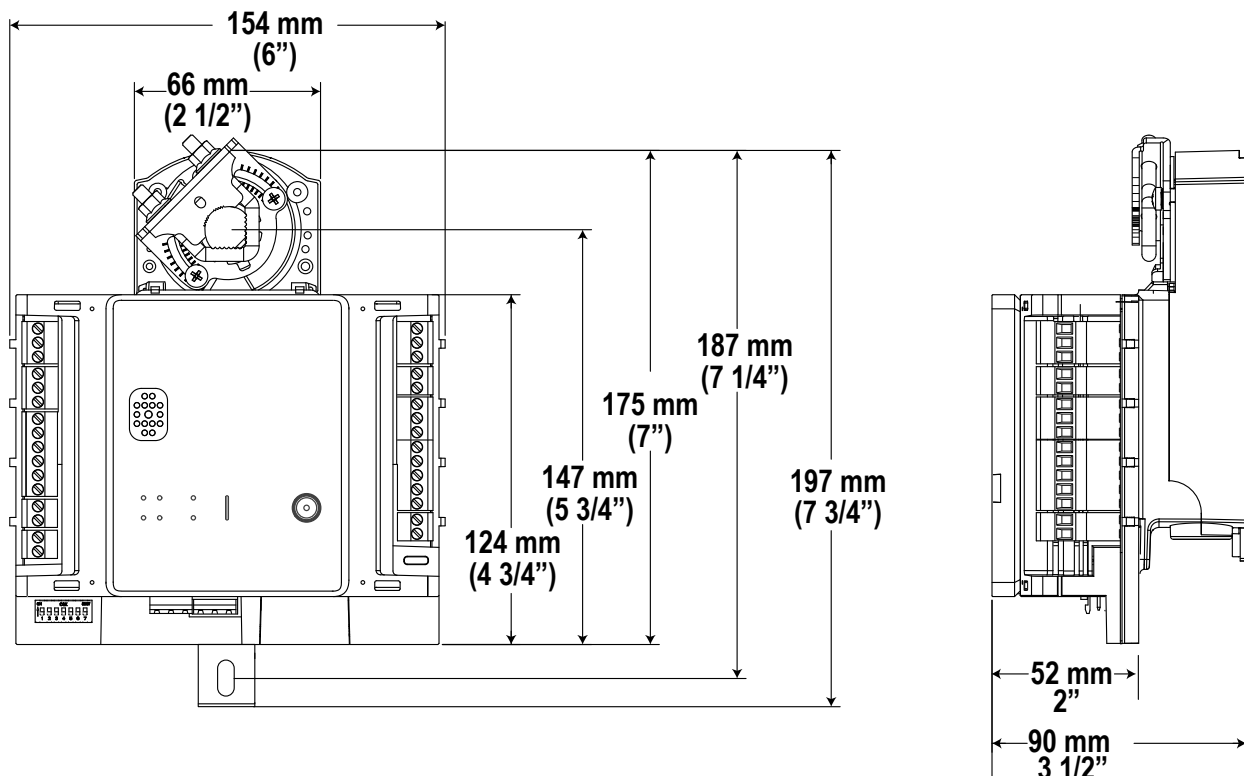
154 mm (6")

66 mm (2 1/2")

187 mm (7 1/4")

175 mm (7")

147 mm (5 3/4")

124 mm (4 3/4")

197 mm (7 3/4")

52 mm 2"

90 mm 3 1/2"

CENTRA LINE
by Honeywell