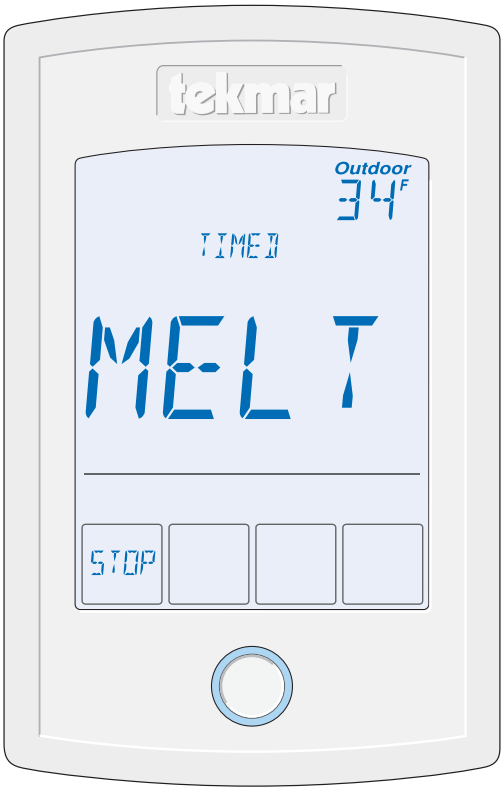
tekmar® Application Brochure

Snow Melting Control 654

Snow Melting

654_A
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Replaces: 06/13

The Snow Melting Control 654 is designed to operate electric or hydronic equipment to melt snow or ice from a driveway, loading dock, sidewalk, patio, helipad or car wash bay. The snow melt surface temperature is controlled using slab outdoor reset to reduce operating energy costs. The 654 provides automatic start and stop when used with the Snow / Ice Sensor 090 or 094. Automatic start with a timed stop is available when used with the Snow Sensor 095. The 654 can operate a dedicated hydronic boiler or a mixing device. Isolation relays are required to operate line voltage pumps. Electric systems require a separate GFCI and electrical relay contactor.



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Description

A Snow Melting Control 654 operates a hydronic snow melting system using a modulating boiler and a system pump. The boiler is piped in primary-secondary to the snow melt system to allow the system pump to operate continuously during melting or idling while allowing the boiler and boiler pump to turn on and off as required. The boiler firing rate is modulated using a 0-10 V (dc) or 4-20 mA signal. The slab is heated to maintain the slab target temperature. When a Snow / Ice Sensor 090 or 094 is installed, the system automatically starts when snow or ice is detected and continues to run until the slab is dry. When a Snow Sensor 095 is installed together with a Slab Sensor 072 or 073, the system automatically starts when snow is detected and runs on a timer before shutting off. All systems can be manually started and shut off using a timer when either a Snow / Ice Sensor 090 or 094 or a Slab Sensor 072 or 073 is installed.

Snow or Ice Detector

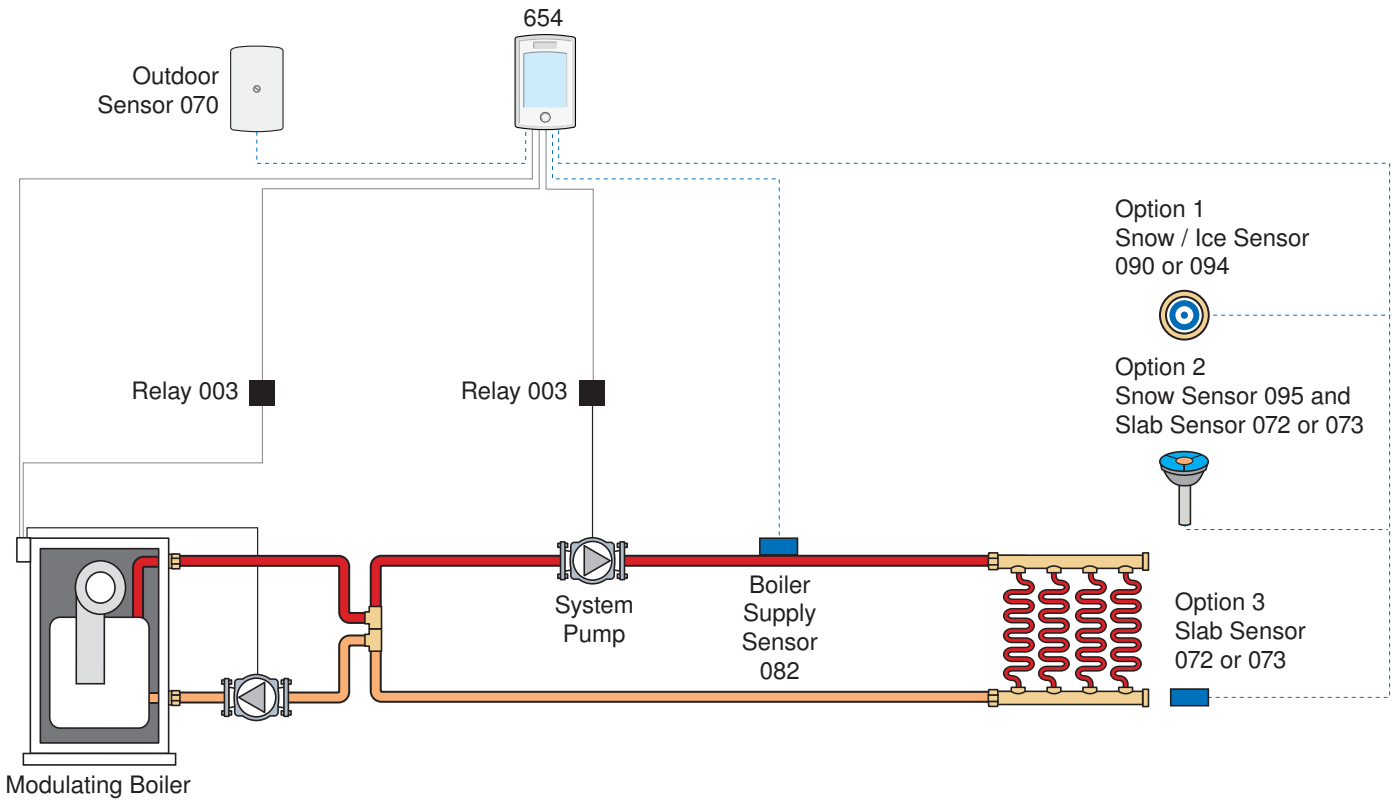
Option	Start and Stop Sequence	Sensors Required (sold separately)
1	Auto start / Auto stop	Snow / Ice Sensor 090 or 094
2	Auto start / Timed stop	Snow Sensor 095 & Slab Sensor 072 or 073
3	Manual start / Timed stop	Slab Sensor 072 or 073

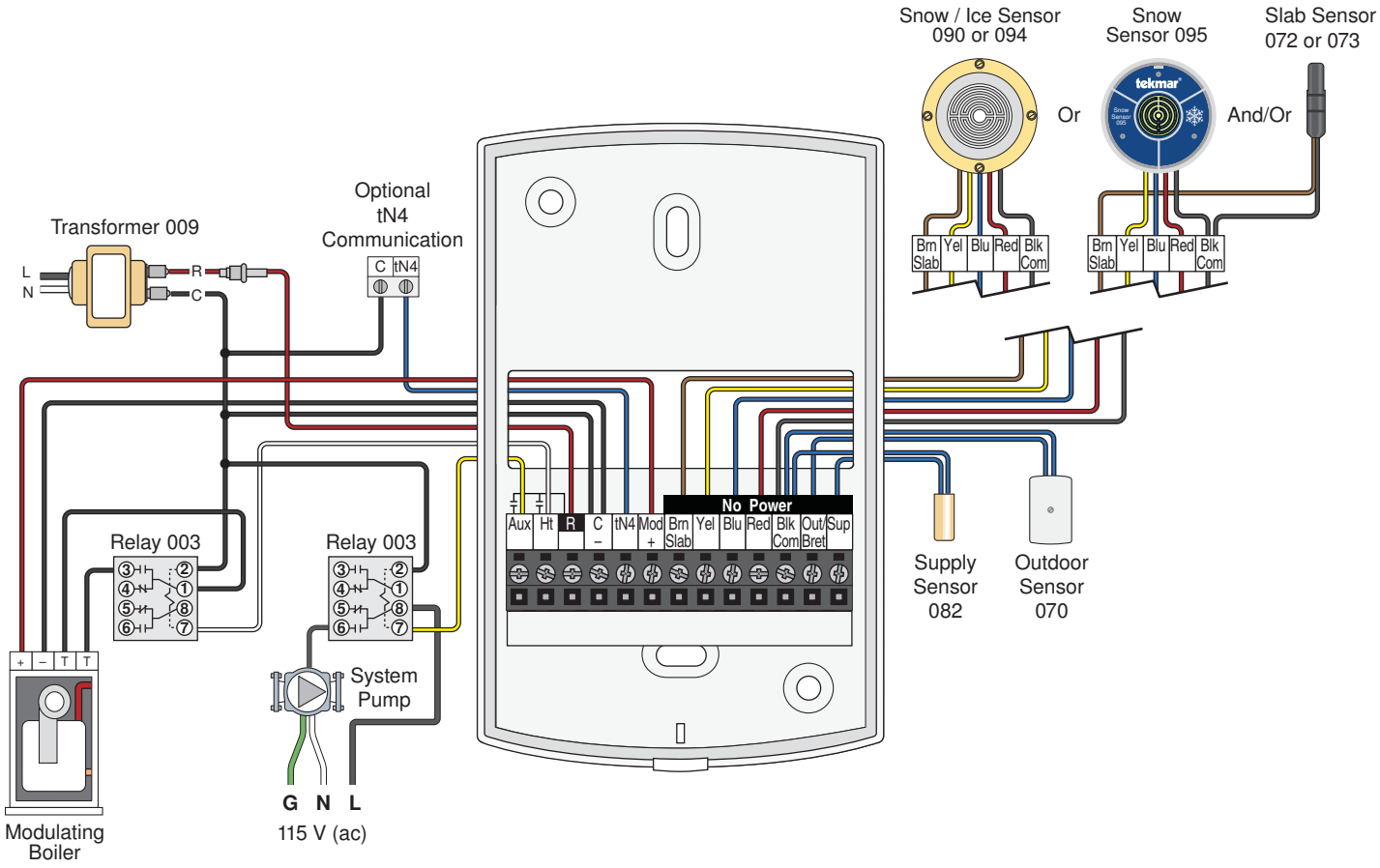
Application Settings

Setting Name	Value
APP MODE	BOIL
BOIL TYPE	MOD (modulating boiler)
AUX RELAY	SYS (system pump)

Recommended Accessories

Qty	Part Name	Part Number
2	Relay	003
1	Transformer	009





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Single Zone with Boiler and Tandem Snow / Ice Sensors — A654-2 Mechanical

Description

A single zone includes two Snow / Ice Sensors 090 or 094 for Tandem Snow / Ice Detection for a wider snow or ice detection area and backup should one of the two sensors fail. When snow or ice is detected the snow melting system is automatically started and stops when the slab is dry. Each sensor requires a Snow Melting Control 654. The master Snow Melting Control 654 operates a hydronic snow melting system using a modulating boiler and a system pump. The boiler is piped in primary-secondary to the snow melt system to allow the system pump to operate continuously during melting or idling while allowing the boiler and boiler pump to turn on and off as required. The boiler firing rate is modulated using a 0-10 V (dc) or 4-20 mA signal. The member Snow Melting Control monitors the Snow / Ice Sensor and relays the sensor information to the master control using tekmarNet® communication.

Snow or Ice Detector

Option	Start and Stop Sequence	Sensors Required (sold separately)
1	Auto start / Auto stop	Snow / Ice Sensor 090 or 094

Recommended Accessories

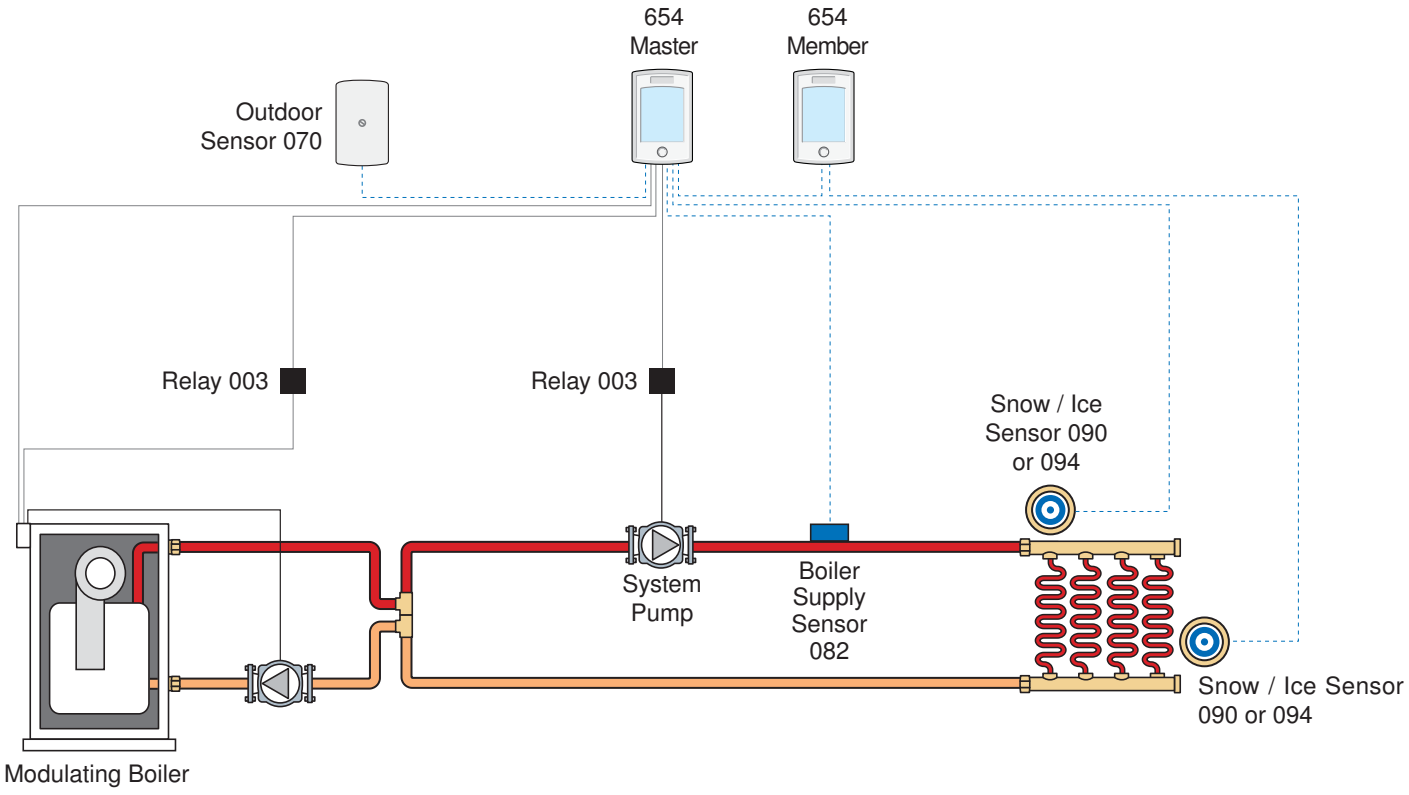
Qty	Part Name	Part Number
2	Relay	003
1	Transformer	009

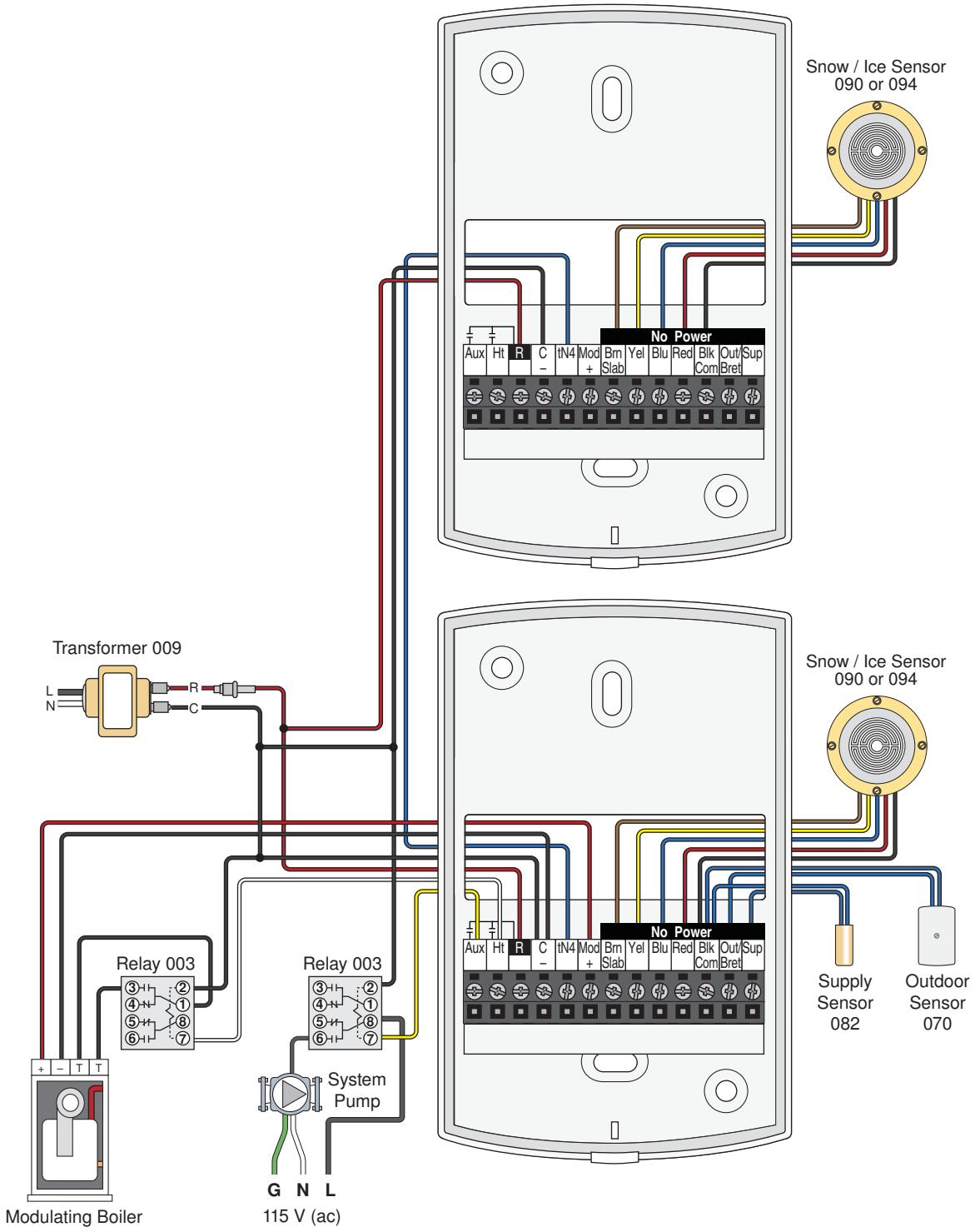
654 Master - Application Settings

Setting Name	Value
APP MODE	BOIL
BOIL TYPE	MOD (modulating boiler)
AUX RELAY	SYS (system pump)

654 Member - Application Settings

Setting Name	Value
APP MODE	090





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Description

A Snow Melting Control 654 operates a modulating steam valve and a system pump. The heat source may be either district steam or a steam boiler. The slab temperature is controlled by adjusting the steam valve position using an analog 0 to 10 V (dc) or 4 to 20 mA signal. The slab is heated to maintain the slab target temperature. When a Snow / Ice Sensor 090 or 094 is installed, the system automatically starts when snow or ice is detected and continues to run until the slab is dry. When a Snow Sensor 095 is installed together with a Slab Sensor 072 or 073, the system automatically starts when snow is detected and runs on a timer before shutting off. All systems can be manually started and shut off using a timer when either a Snow / Ice Sensor 090 or 094 or a Slab Sensor 072 or 073 is installed.

Snow or Ice Detector

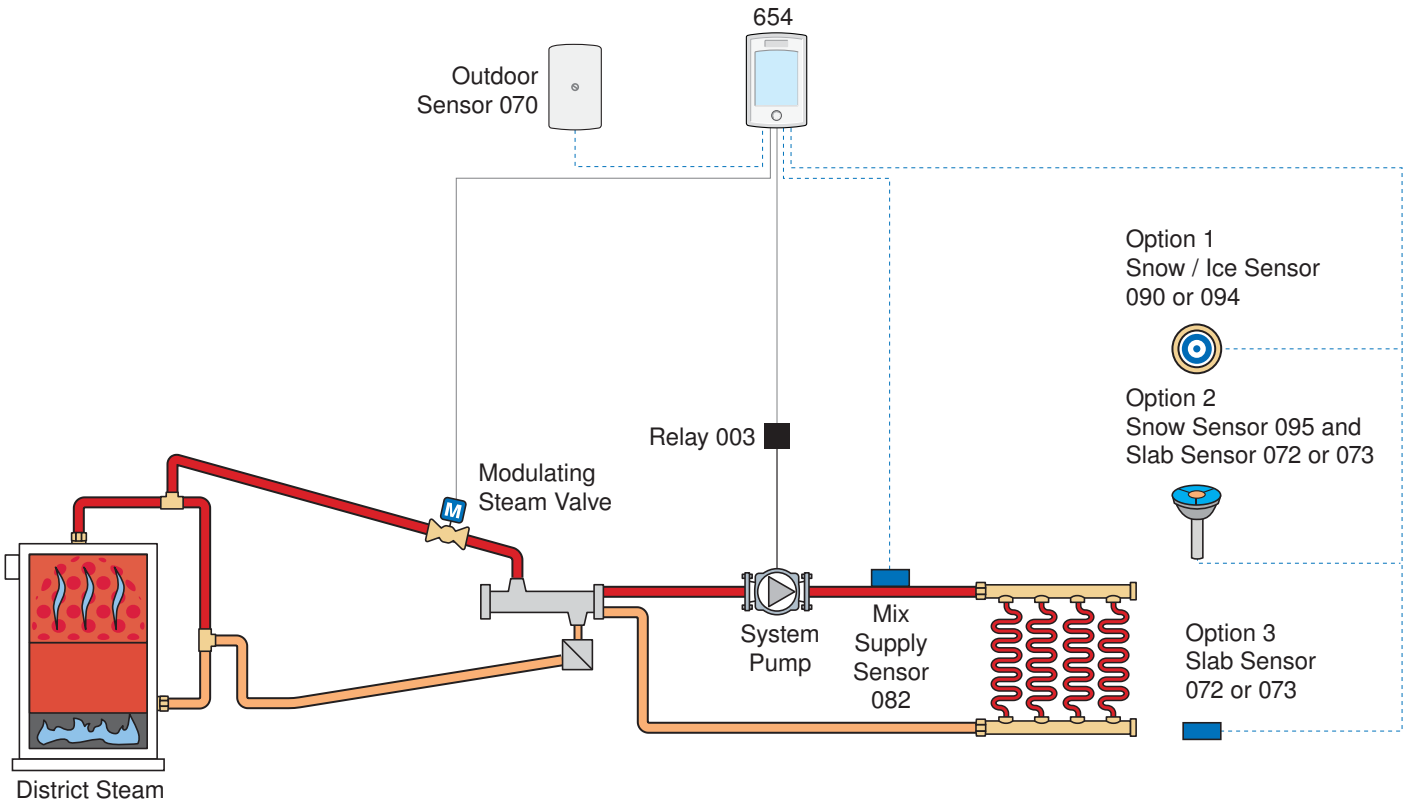
Option	Start and Stop Sequence	Sensors Required (sold separately)
1	Auto start / Auto stop	Snow / Ice Sensor 090 or 094
2	Auto start / Timed stop	Snow Sensor 095 & Slab Sensor 072 or 073
3	Manual start / Timed stop	Slab Sensor 072 or 073

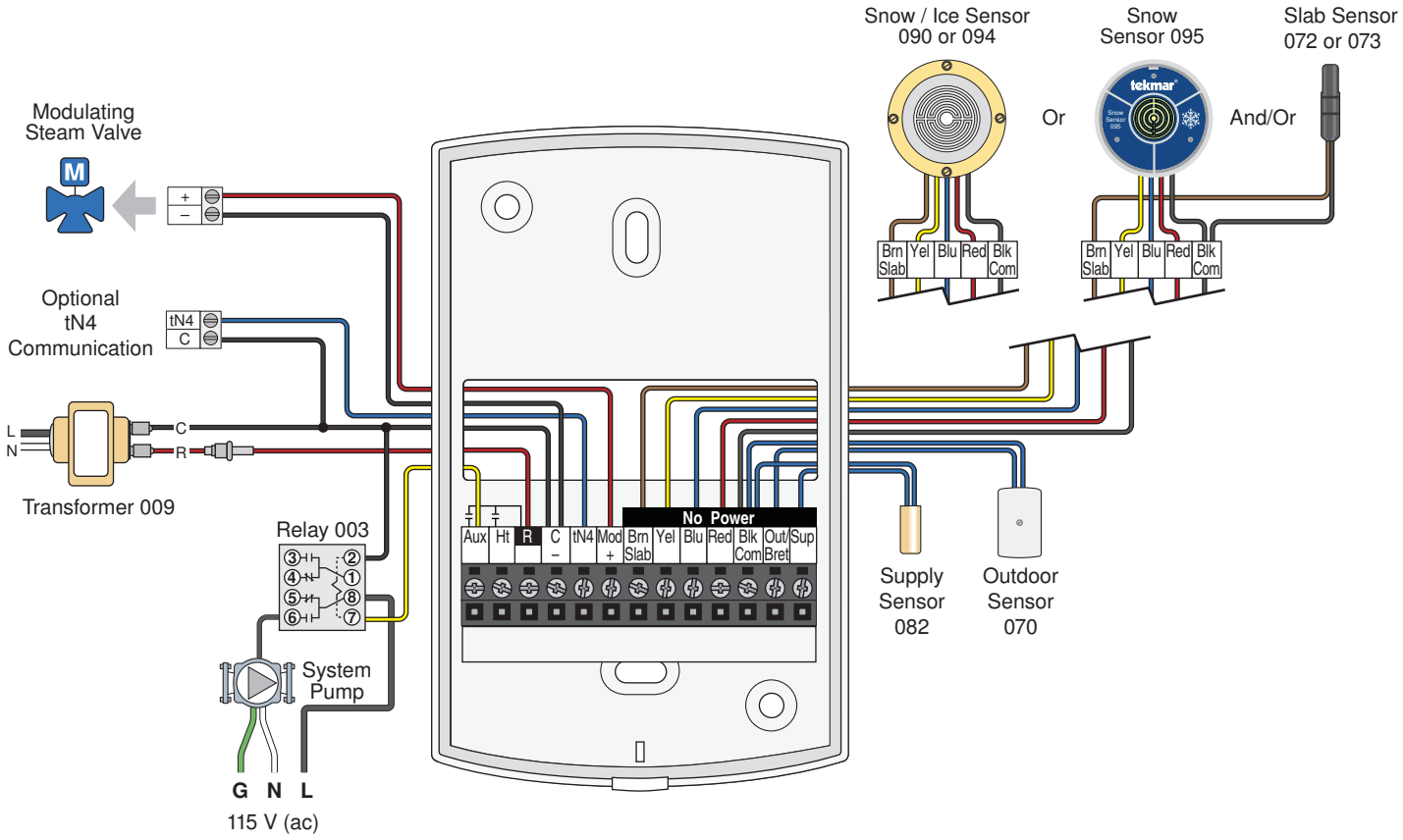
Application Settings

Setting Name	Value
APP MODE	MIX
BOIL TYPE	OFF
AUX RELAY	SYS (system pump)

Recommended Accessories

Qty	Part Name	Part Number
1	Relay	003
1	Transformer	009





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Description

A snow melting system is operated together with a space heating and domestic hot water system. A Snow Melting Control 654 operates the hydronic snow melting system using a mixing injection pump and a system pump. The mixing injection pump is modulated using a 0-10 V (dc) or 4-20 mA signal to maintain the slab at the slab target temperature. The 654 uses tekmarNet® communication to call for heat from the House Control that operates the space heating and domestic hot water system. When a Snow / Ice Sensor 090 or 094 is installed, the system automatically starts when snow or ice is detected and continues to run until the slab is dry. When a Snow Sensor 095 is installed together with a Slab Sensor 072 or 073, the system automatically starts when snow is detected and runs on a timer before shutting off. All systems can be manually started and shut off using a timer when either a Snow / Ice Sensor 090 or 094 or a Slab Sensor 072 or 073 is installed.

Snow or Ice Detector

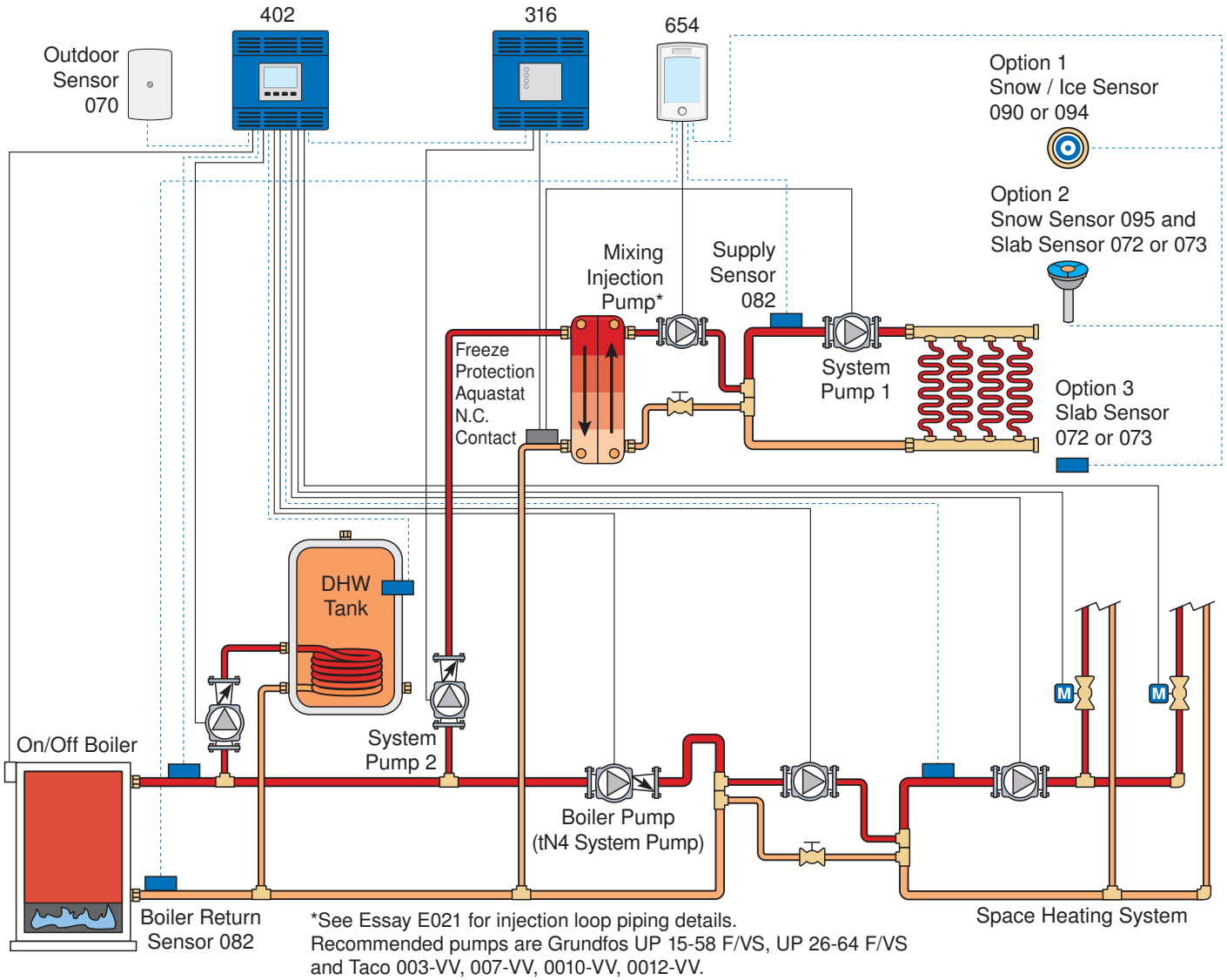
Option	Start and Stop Sequence	Sensors Required (sold separately)
1	Auto start / Auto stop	Snow / Ice Sensor 090 or 094
2	Auto start / Timed stop	Snow Sensor 095 & Slab Sensor 072 or 073
3	Manual start / Timed stop	Slab Sensor 072 or 073

Application Settings

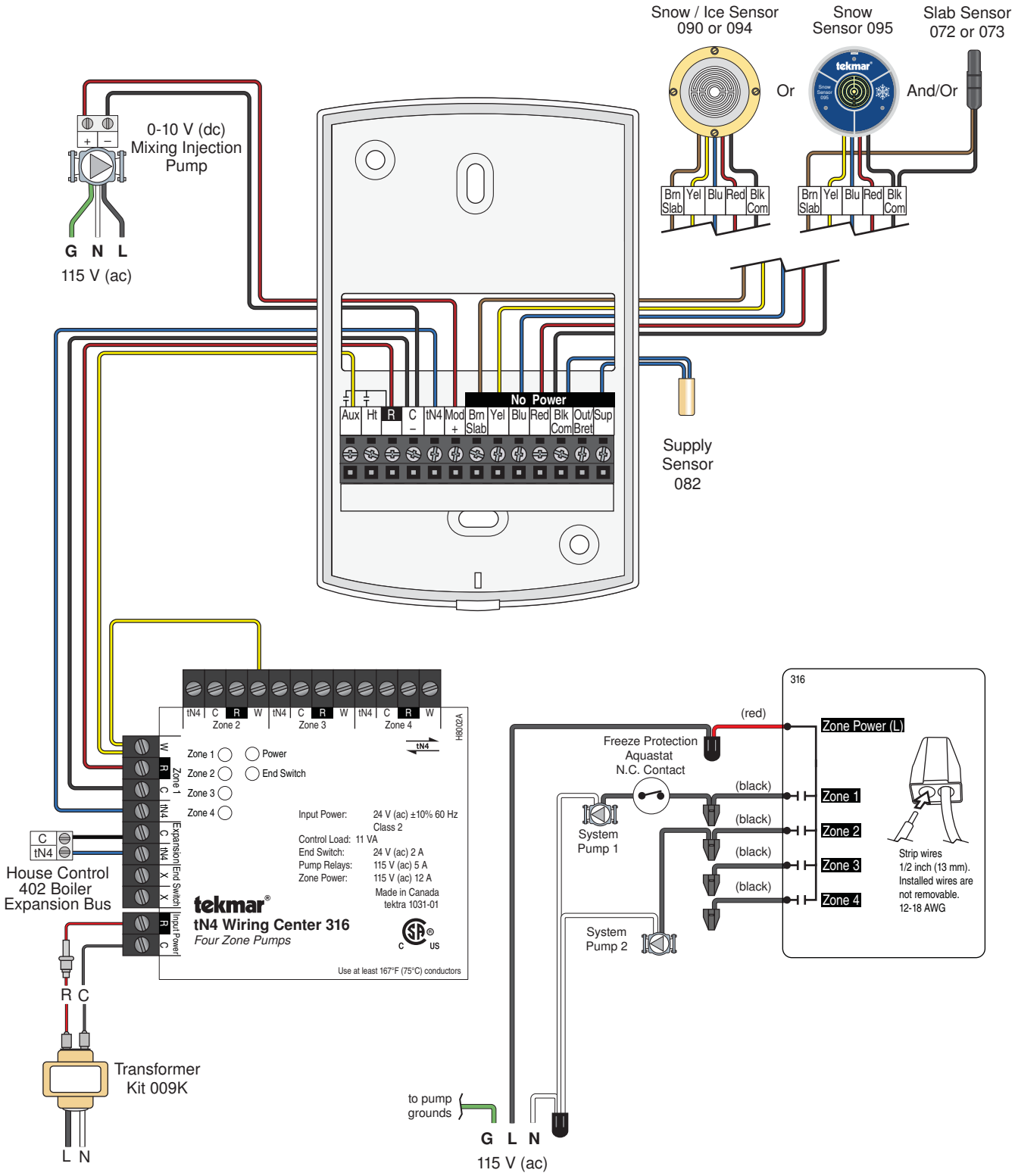
Setting Name	Value
APP MODE	MIX
BOIL TYPE	CTRL (tN4 control)
OUT/BRET SENSOR	BRET
AUX RELAY	SYS (system pump)
tN4 SYS PUMP	OFF

Recommended Accessories

Qty	Part Name	Part Number
1	Wiring Center	316
1	Transformer Kit	009K
1	Universal Sensor	082
1	tN4 System Control	(Choose one) 274, 275, 284, 400, 401, 402, 403, 406, 420, 421, 422, 423



*See Essay E021 for injection loop piping details. Recommended pumps are Grundfos UP 15-58 F/VS, UP 26-64 F/VS and Taco 003-VV, 007-VV, 0010-VV, 0012-VV.



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Multi-Zone with Boiler and Mixing — A654-5 Mechanical

Description

Up to 12 zones of snow melting are heated by a common three-way mixing valve and boiler. Each zone is operated by a Snow Melting Control 654. The mixing valve and boiler are operated by a House Control 402. Snow melt zone priority is available if the boiler is not sized for the combined heating load. Each slab is heated to maintain its slab target temperature. When a Snow / Ice Sensor 090 or 094 is installed, the system automatically starts when snow or ice is detected and continues to run until the slab is dry. When a Snow Sensor 095 is installed together with a Slab Sensor 072 or 073, the system automatically starts when snow is detected and runs on a timer before shutting off. All systems can be manually started and shut off using a timer when either a Snow / Ice Sensor 090 or 094 or a Slab Sensor 072 or 073 is installed.

Snow or Ice Detector

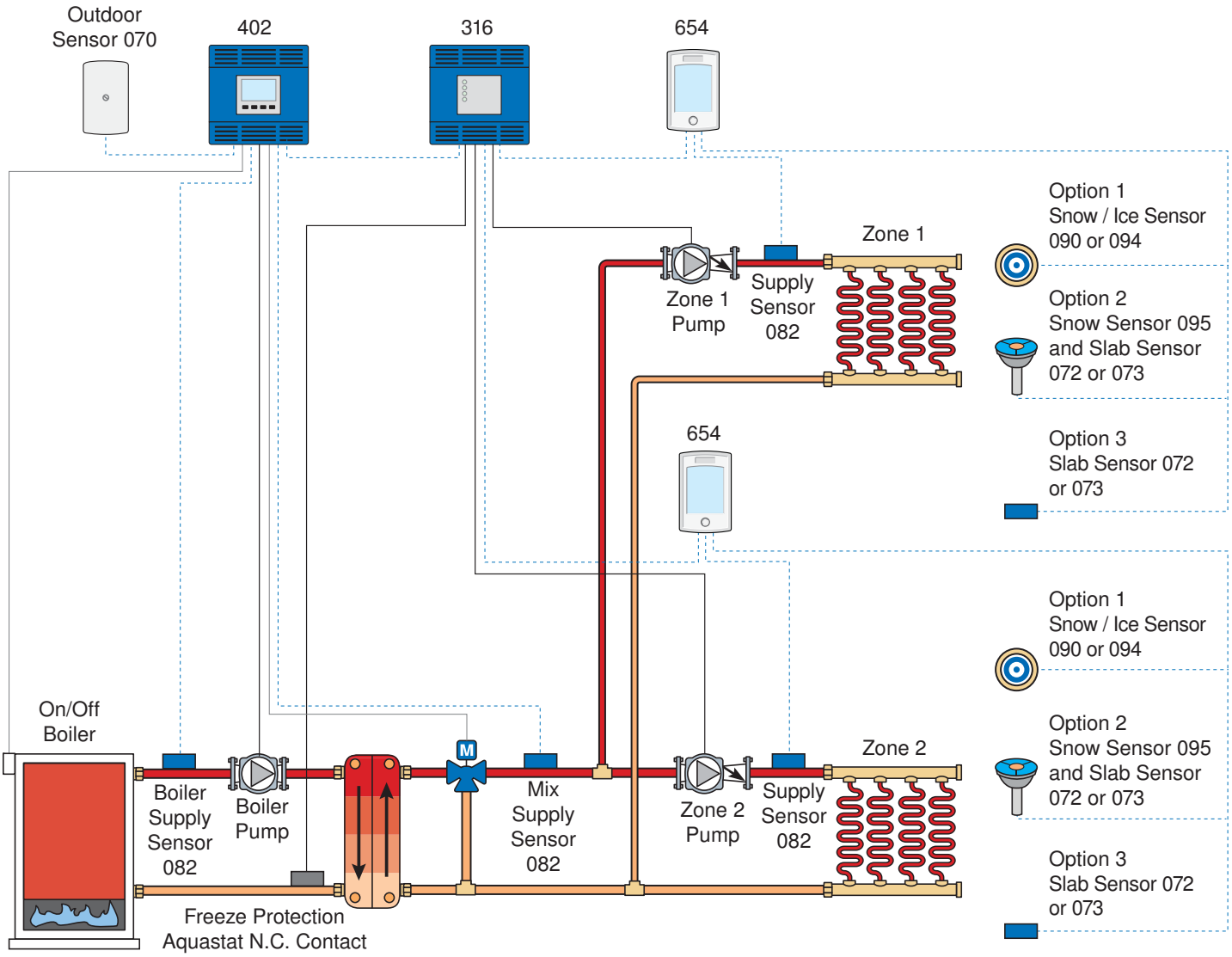
Option	Start and Stop Sequence	Sensors Required (sold separately)
1	Auto start / Auto stop	Snow / Ice Sensor 090 or 094
2	Auto start / Timed stop	Snow Sensor 095 & Slab Sensor 072 or 073
3	Manual start / Timed stop	Slab Sensor 072 or 073

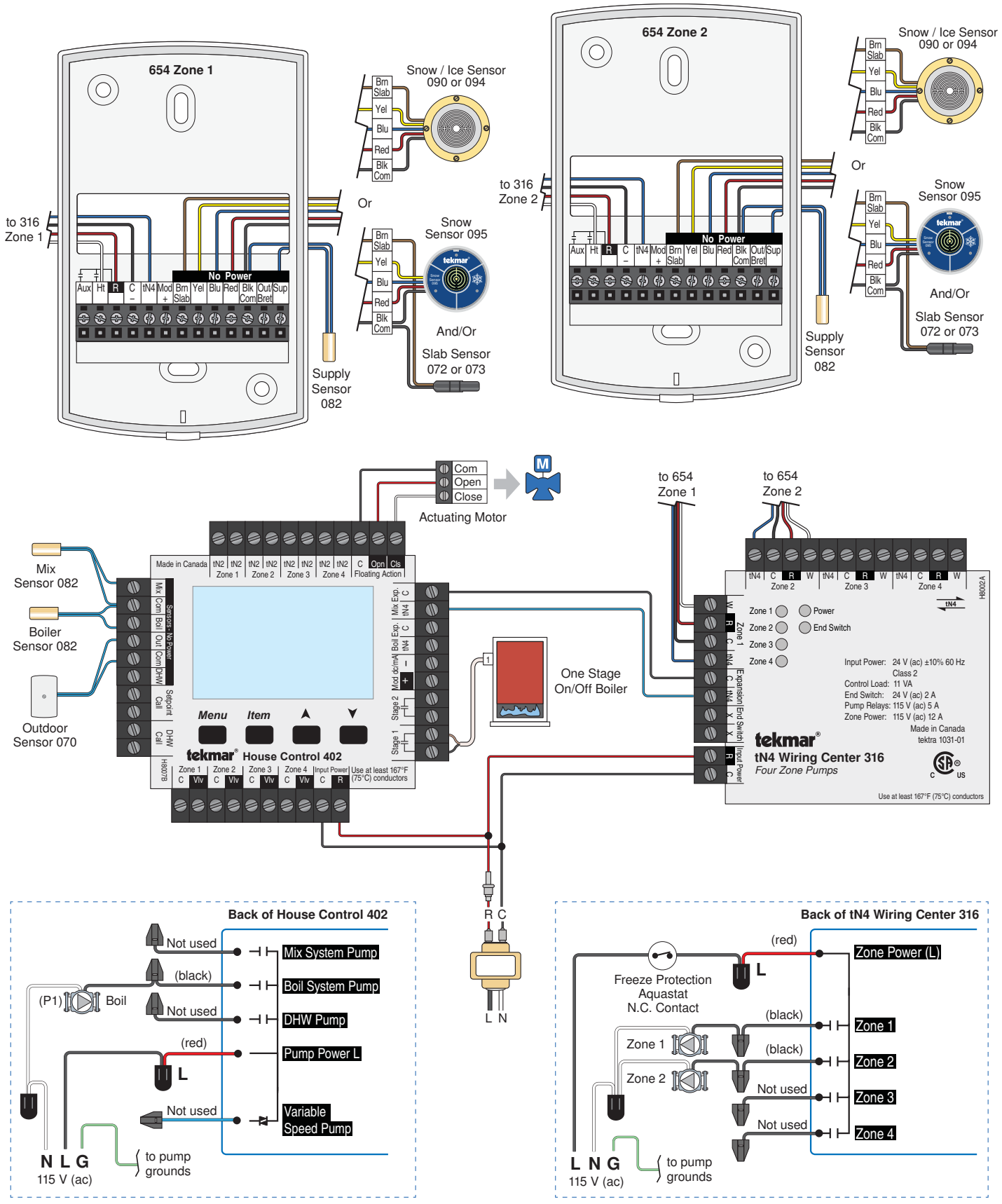
Zone 1 and 2 - Application Settings

Setting Name	Value
APP MODE	PWM
BOIL TYPE	CTRL (tN4 control)
tN4 SYS PUMP	ON

Recommended Accessories

Qty	Part Name	Part Number
1	House Control 402	402
1	Wiring Center	316





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Description

A car wash can have up to 12 bays and aprons each having an ice melting system operated by a Snow Melting Control 654. A boiler or water heater heats a storage tank which is used for hot water to wash vehicles and heat the ice melting system. The control uses a Slab Sensor 072 or 073 to measure the slab temperature and operates the zone to ensure the slab is above freezing. A programmable schedule is used to operate the ice melting system during the car wash business hours and shuts off the system when the car wash is closed.

Zone 1 - Application Settings

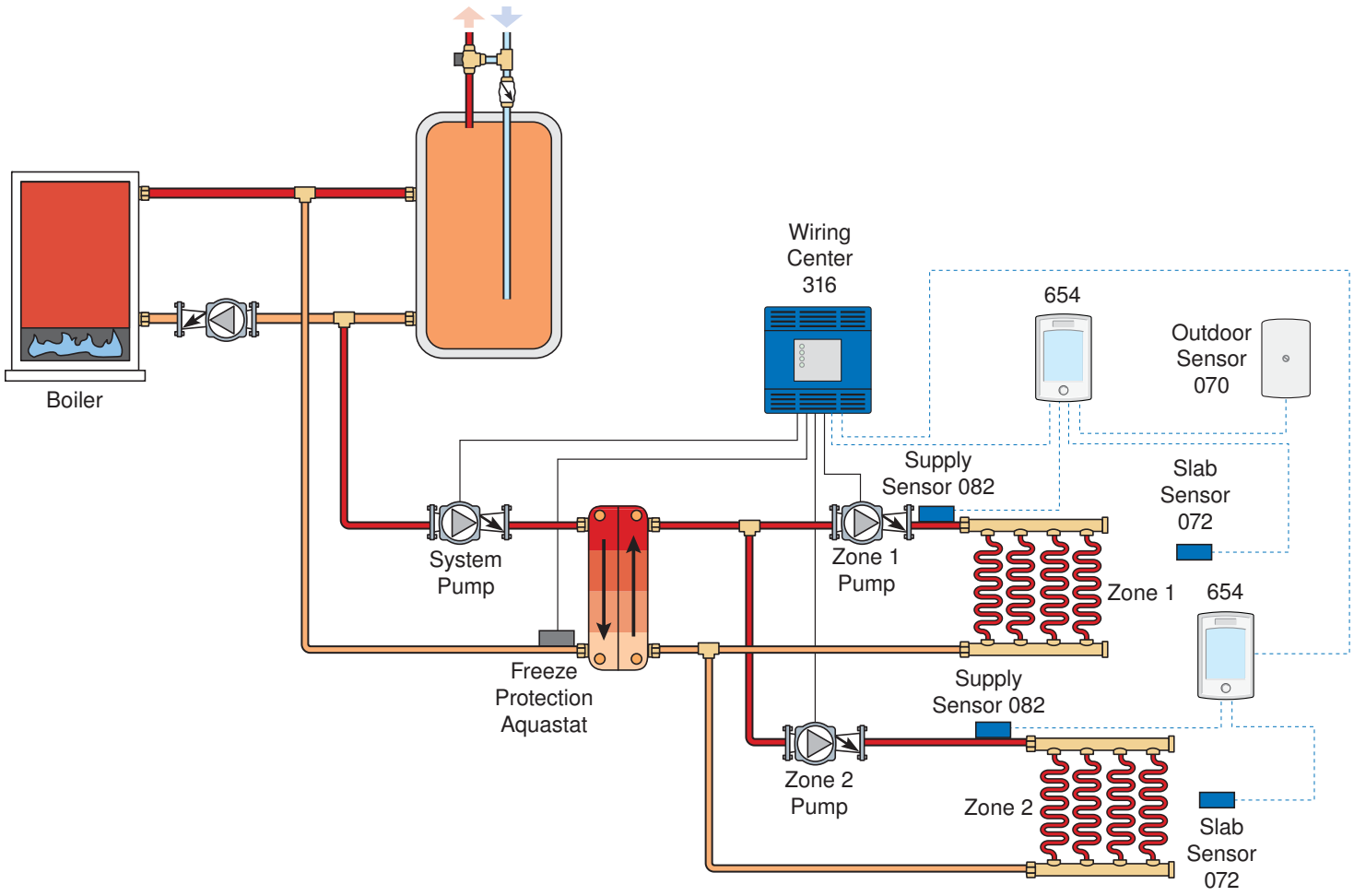
Setting Name	Value
APP MODE	PWM
BOIL TYPE	OFF
AUX RELAY	SYS (system pump)
OUT/BRET	OUT

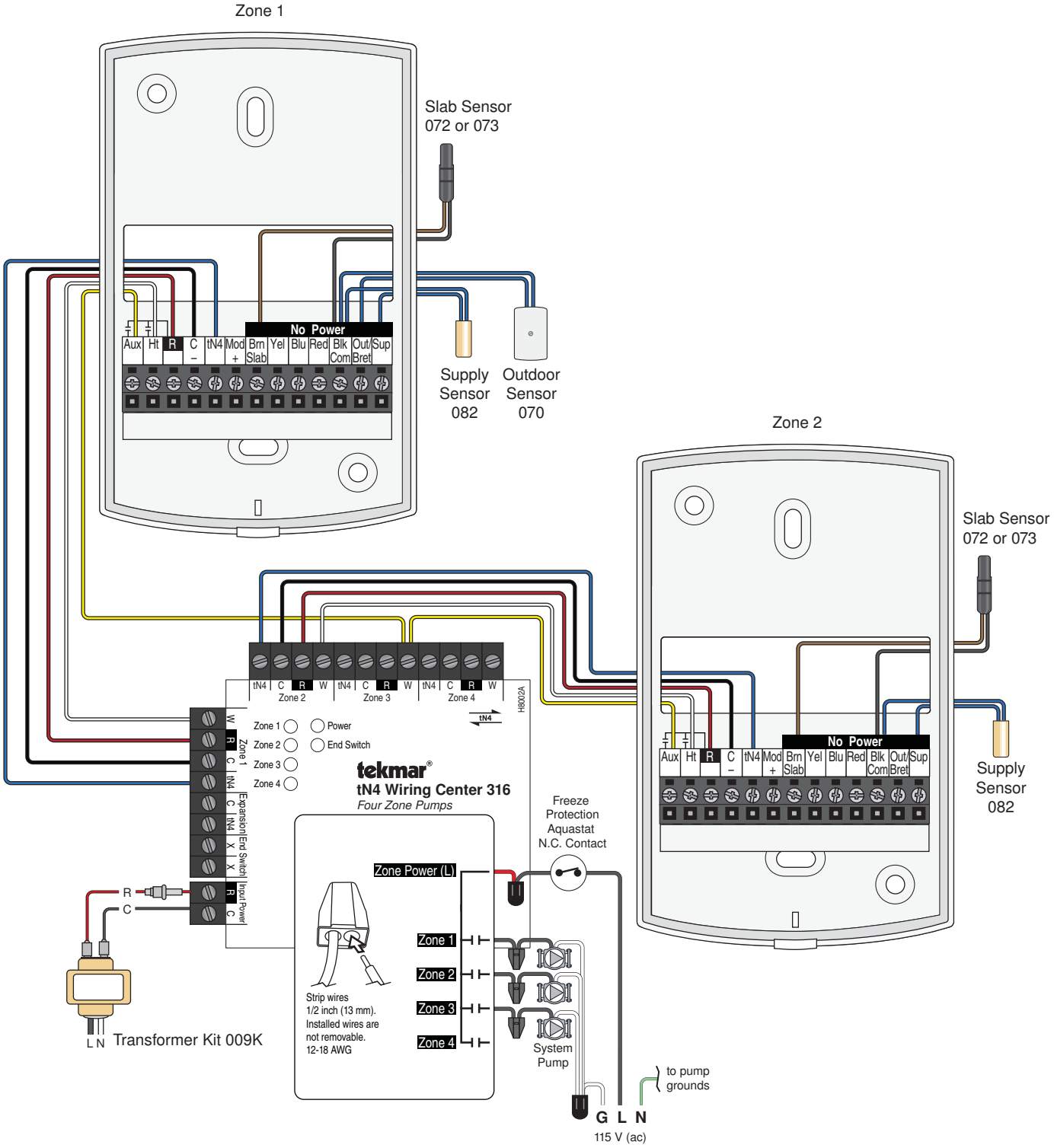
Zone 2 - Application Settings

Setting Name	Value
APP MODE	PWM
BOIL TYPE	OFF
AUX RELAY	SYS (system pump)
OUT/BRET	OFF

Recommended Accessories

Qty	Part Name	Part Number
1	Wiring Center	316





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Description

An electric snow melting system has up to 12 zones. Zone 1 has priority over zones 2 through 12. Each Snow Melting Control 654 is connected to a 230 V (ac) electrical contactor which in turn energizes the electric cables. Whenever the zone 1 electrical contactor is shut off, zone 2 is able to operate. Each slab is heated to maintain its slab target temperature. When a Snow / Ice Sensor 090 or 094 is installed, the system automatically starts when snow or ice is detected and continues to run until the slab is dry. When a Snow Sensor 095 is installed together with a Slab Sensor 072 or 073, the system automatically starts when snow is detected and runs on a timer before shutting off. All systems can be manually started and shut off using a timer when either a Snow / Ice Sensor 090 or 094 or a Slab Sensor 072 or 073 is installed.

Snow or Ice Detector

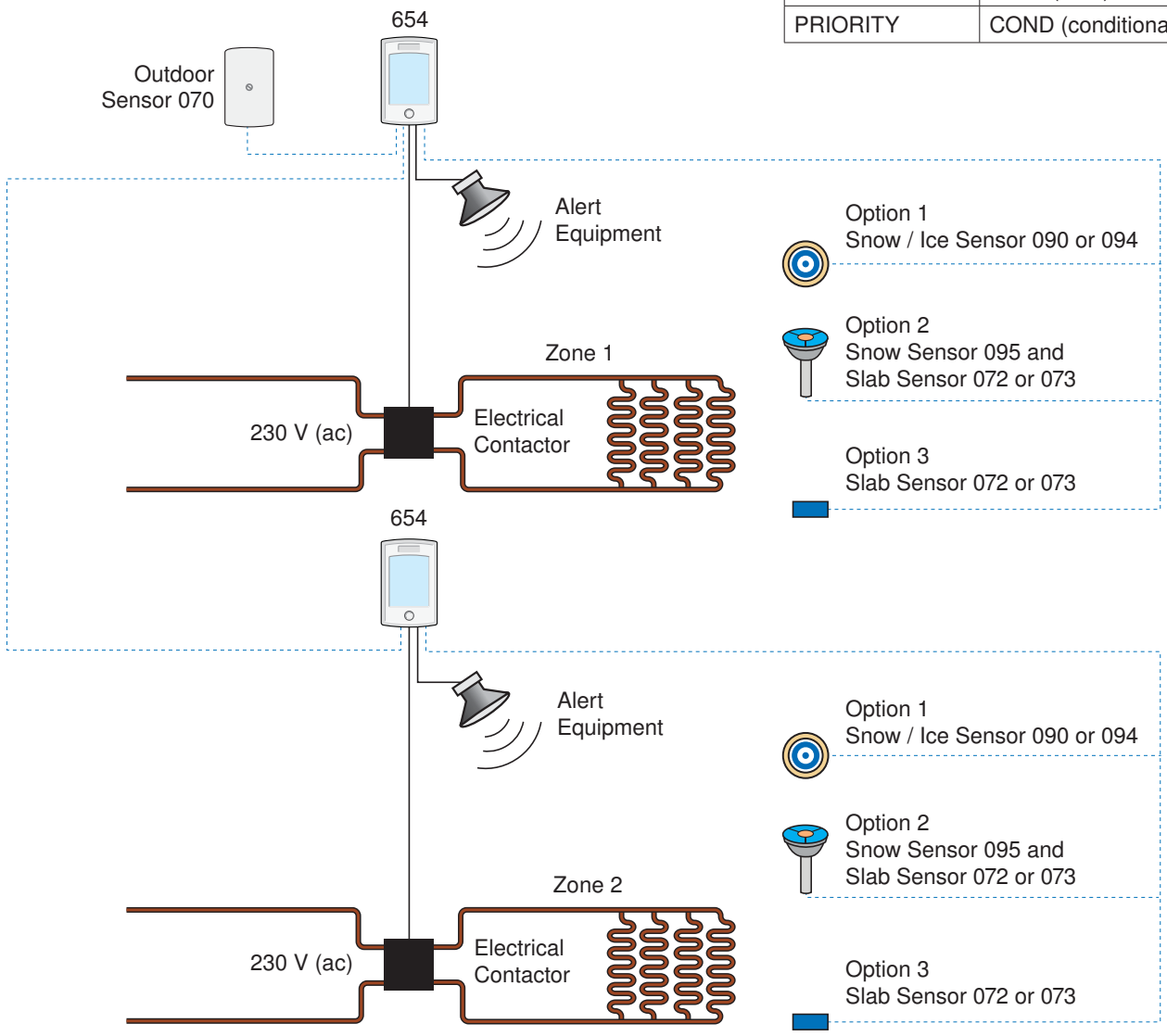
Option	Start and Stop Sequence	Sensors Required (sold separately)
1	Auto start / Auto stop	Snow / Ice Sensor 090 or 094
2	Auto start / Timed stop	Snow Sensor 095 & Slab Sensor 072 or 073
3	Manual start / Timed stop	Slab Sensor 072 or 073

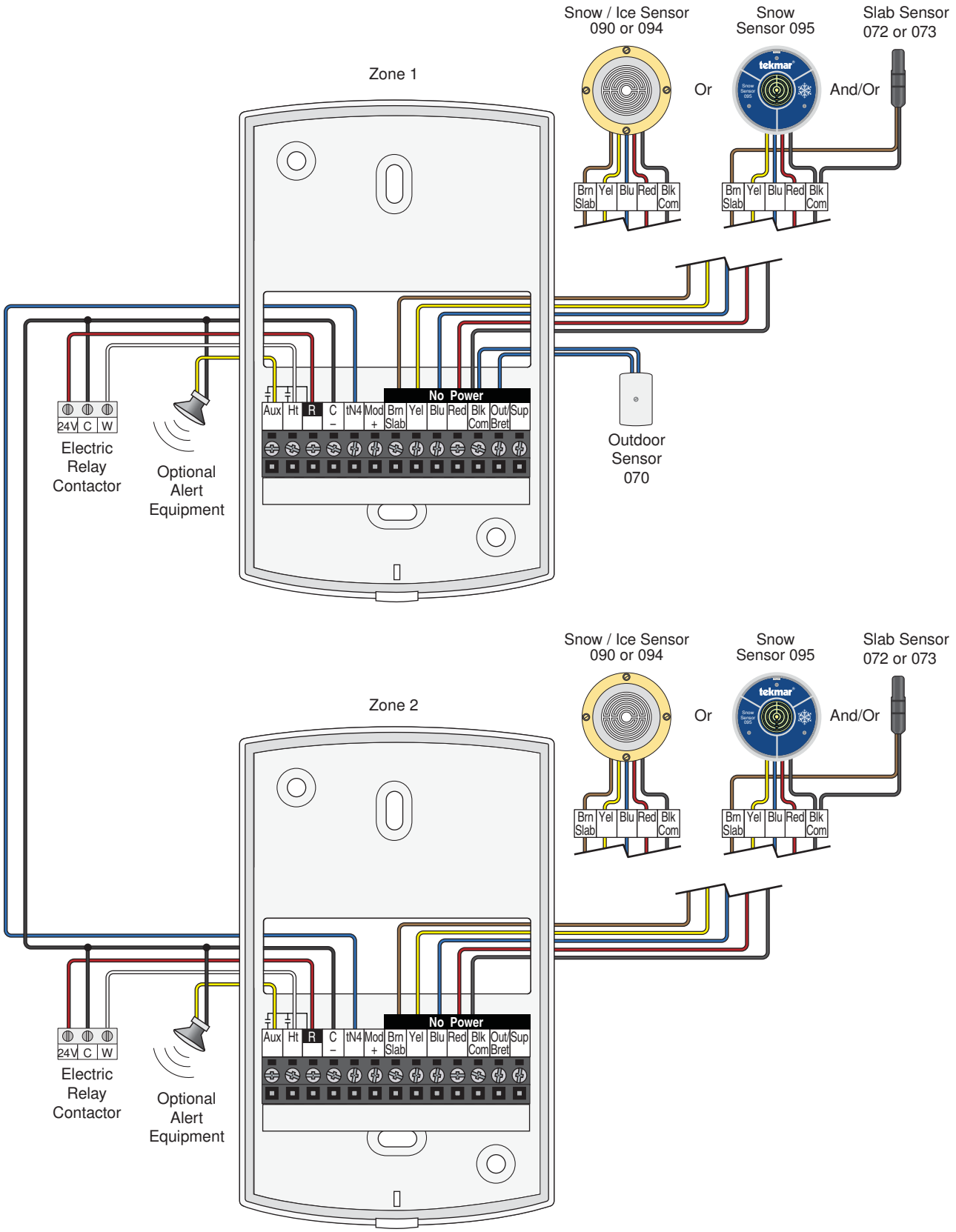
Zone 1 - Application Settings

Setting Name	Value
APP MODE	ELEC
OUT/BRET	OUT
AUX RELAY	ALRT (alert)
PRIORITY	COND (conditional)

Zone 2 - Application Settings

Setting Name	Value
APP MODE	ELEC
OUT/BRET	OFF
AUX RELAY	ALRT (alert)
PRIORITY	COND (conditional)





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tekmar Control Systems

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