

# tekmar® - Application

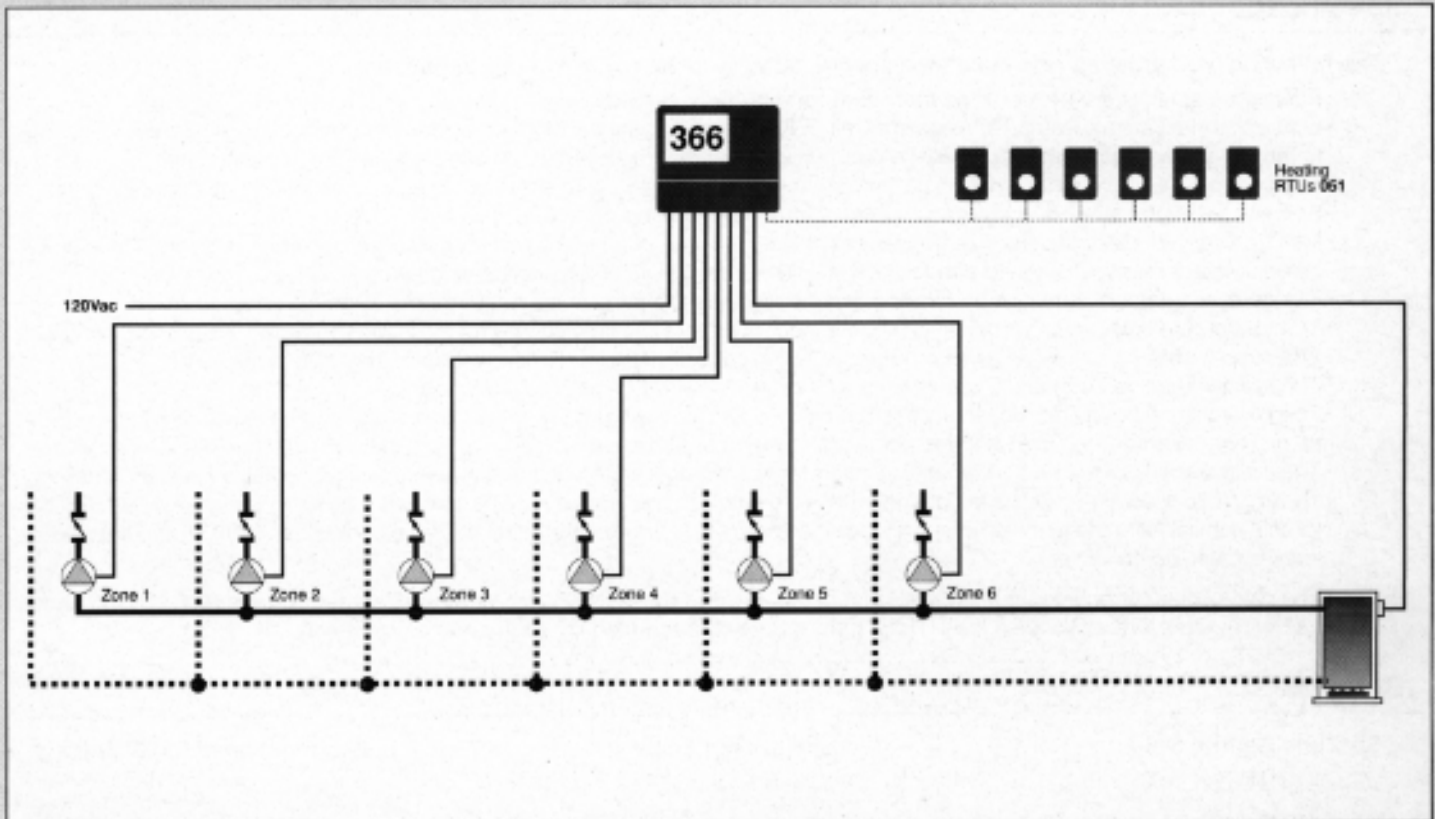
Six Zone Control 366



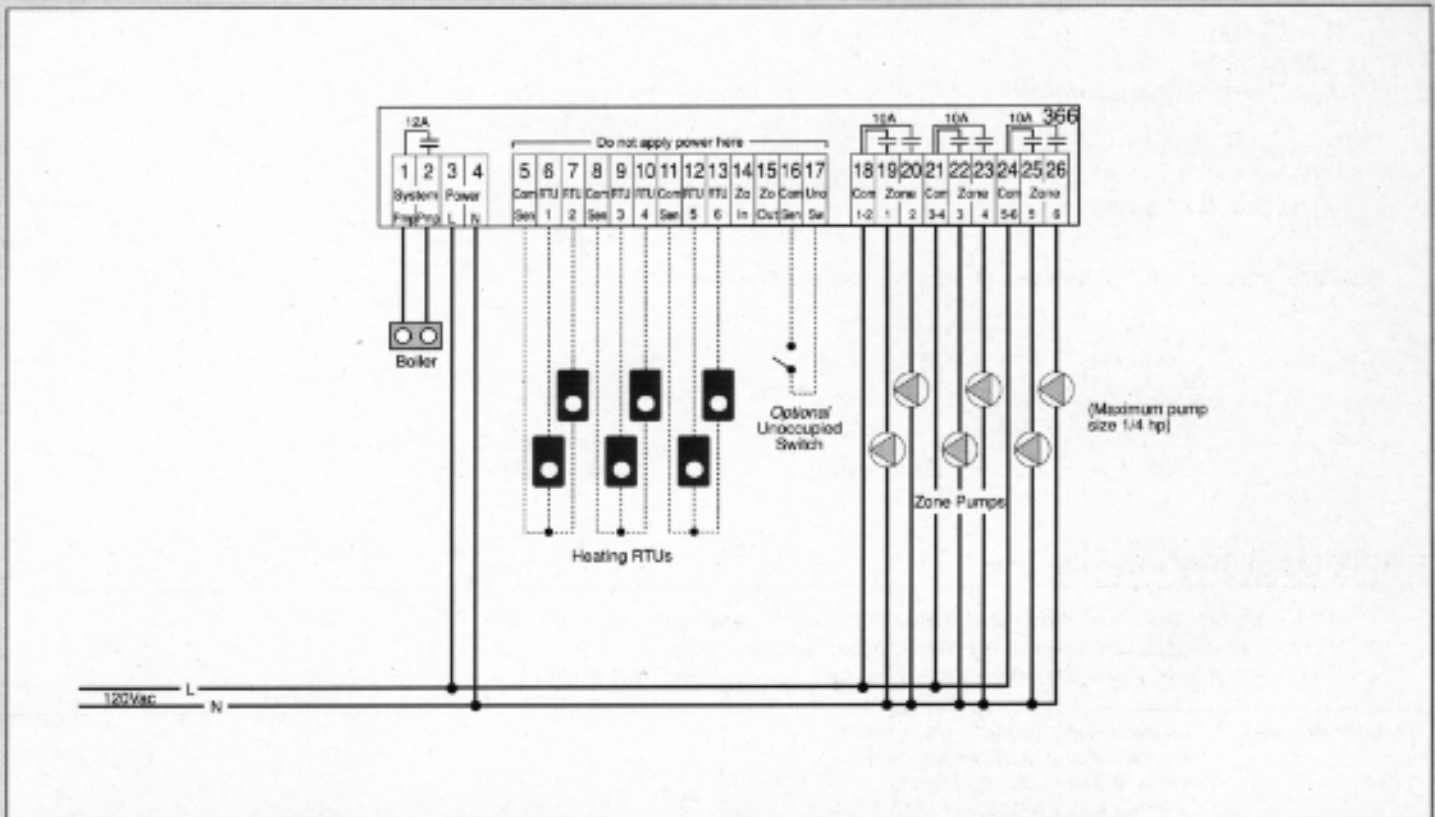
A 366-1

12/93

## Mechanical



## Electrical



**Note:** This is only a concept drawing. Designers must determine whether this system will work in each application and must ensure compliance with code requirements. Necessary auxiliary equipment and safety devices must be added.

## Operation

The tekmar Six Zone Control 366 regulates the heating of each zone based on the reading of the Room Temperature Unit (RTU). Anytime a zone requires heat, the contact for that zone and the boiler contact close. The zone contact causes the zone pump to operate and the boiler contact causes the boiler to operate.

## Specifications

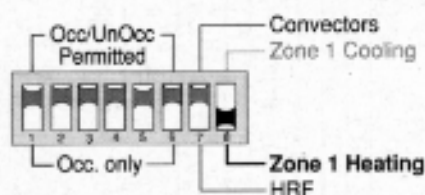
The following are minimum recommended specifications for the control in this application.



- Each zone shall be controlled by an individual zone pump to provide heat to the zone when required.
- Each zone shall have a Room Temperature Unit (RTU) 051 to monitor and adjust the room temperature using 2 wires connected to the Six Zone Control 366. (Optional Indoor Sensor 074 may be used for a fixed temperature in each zone)
- The control shall have a built-in 24 hour timer for setback operation and an input for an optional external setback signal.
- Setback for each individual zone must be capable of being turned off.
- The control shall calculate Early Start time requirements when coming into an occupied temperature setting. This ensures setpoint temperature is reached at occupied start time regardless of varying heating leads.
- The on cycling of the zone pumps shall be timed to provide the most even load demand to the boiler.
- The control shall continuously monitor its RTUs or Indoor Sensors and provide an error message upon short circuit or sensor failure.
- The control shall have CSA (Canadian Standards Association) and UL (Underwriters Laboratory) approval.
- The control shall be compatible with standard North American wiring hardware.
- The control shall be microprocessor-based, have one SPST internal relay with 12 amp (resistive) and six SPST internal relays with 10 amp (resistive) isolated contacts for outputs, and have indicator lights for control function and status.
- The control shall have a test button which activates a preprogrammed test sequence to test all control inputs and outputs.
- The installation location must be maintained within the ambient temperature and humidity ranges specified in the D 366 Brochure for this control, with the installer ensuring that the control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise.
- The control components required from tekmar are a Six Zone Control 366 and six Room Temperature Units (RTUs) 051, or six Indoor Sensors 074 optional. (One RTU or Indoor Sensor is required for each zone being used.)

## Settings

Six Zone Control 366	Adjustment Range	Recommended Initial Setting
051 RTU dial	40 to 85°F (5 to 29°C)	
052 RTU dial	74 to 86°F (23 to 30°C)	
074 Indoor Sensor	fixed settings of 70°F (21°C) Heating; 77°F (25°C) Cooling	
Unoccupied	40 to 85°F (5 to 29°C)	
Unoccupied duration	0 to 24 hours	
Occupied/Unoccupied switches	— Each zone can be individually selected to go into setback or not	
Convectors/HRF switch	— To fine tune control operation for different types of heating systems	
Zone 1 heating/cooling switch	— To select zone #1 to operate a cooling system or operate as a heating system	

Six Zone Control 366 DIP switch settings for this application.



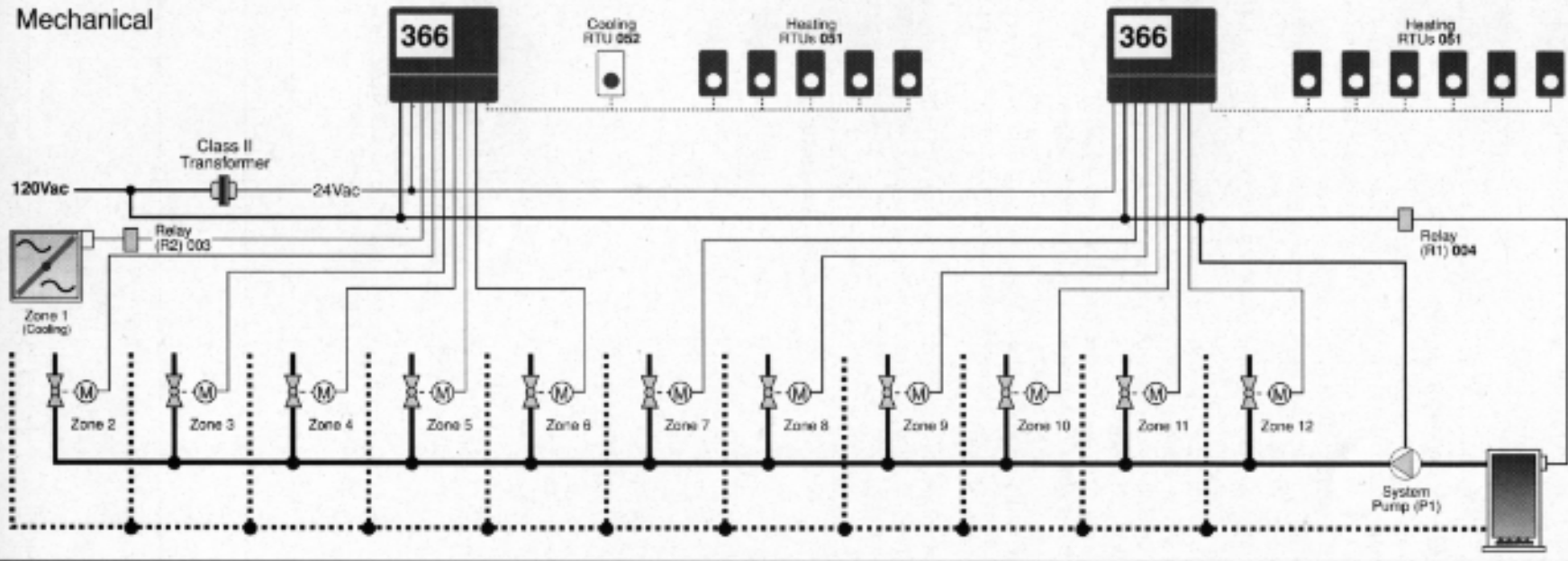
-  = required setting for this application.
-  = optional setting for this application. (see Data Brochure D 366)

## Additional Information

- For control installation and testing instructions see Brochures D 001 and D 366.
- For other control applications see Application Register A 000.
- For control theory and system integration details see Essays E 001 and E 002.

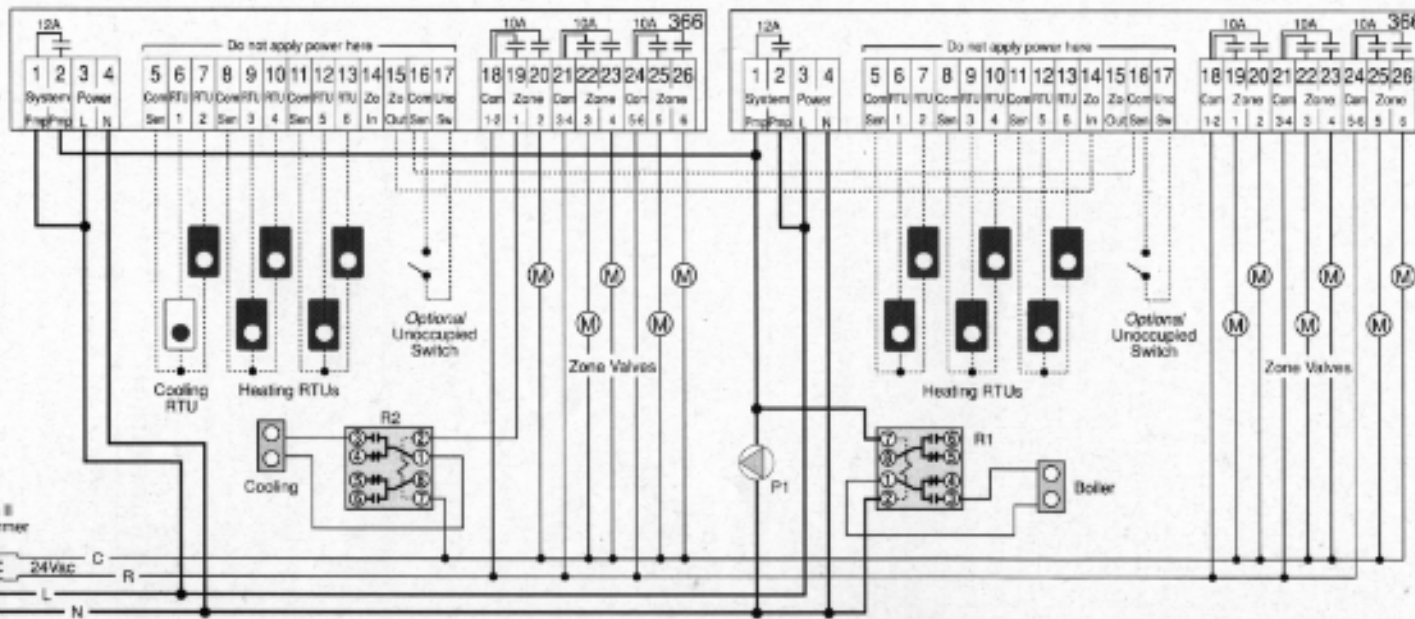
**In North America:** tekmar Control Systems Ltd., Canada  
tekmar Control Systems, Inc., U.S.A.  
Head Office: 4611 - 23rd Street  
Vernon, B.C. Canada V1T 4K7  
Tel. (604) 545-7749 Fax. (604) 545-0650

## Mechanical



## Electrical

R1 = Relay 004  
 R2 = Relay 003  
 P1 = System pump  
 (Max. pump size  
 1/3 hp)



**Note:** This is only a concept drawing. Designers must determine whether this system will work in each application and must ensure compliance with code requirements. Necessary auxiliary equipment and safety devices must be added.

**tekmar® - Application**  
 Six Zone Control 366



**A 366-2**  
 12/93

## Operation

The tekmar Six Zone Control 366 regulates the heating of each zone based on the reading of the Room Temperature Unit (RTU). Anytime a zone requires heat, the contact for that zone and the system pump contact close. The zone contact causes the zone valve to operate. The system pump contact causes the system pump to operate. Either control has the ability to enable the boiler.

On the first Six Zone Control 366, zone one is dedicated to cooling control. Whenever there is no heat demand for one hour on the five other heating zones, cooling may be enabled provided the temperature within the cooling RTU room is above the temperature setpoint.

## Specifications

The following are minimum recommended specifications for the control in this application.

- Each zone shall be controlled by an individual zone valve to provide heat to the zone when required.
- Each zone shall have a Room Temperature Unit (RTU) 051 to monitor and adjust the room temperature using two wires connected to the Six Zone Control 366. (Optional Indoor Sensor 074 may be used for a fixed temperature in each zone)
- Zone one of the first Six Zone Control 366 shall have a Cooling RTU 052 to operate the cooling system.
- Each control shall have a built-in 24 hour timer for setback operation and an input for an optional external setback signal.
- Setback for each individual zone must be capable of being turned off.
- The controls shall calculate Early Start time requirements when coming into an occupied temperature setting. This ensures setpoint temperature is reached at occupied start time regardless of varying heating leads.
- The on cycling of the zone valves shall be timed to provide the most even load demand to the boiler within the control's cycle period.
- The controls shall continuously monitor their RTUs or Indoor Sensors and provide an error message upon short circuit or sensor failure.
- The controls shall have CSA (Canadian Standards Association) and UL (Underwriters Laboratory) approval.
- The controls shall be compatible with standard North American wiring hardware.
- The controls shall be microprocessor-based, have one SPST internal relay with 12 amp (resistive) and six SPST internal relays with 10 amp (resistive) isolated contacts for outputs, and have indicator lights for control function and status.
- The controls shall have a test button which activates a preprogrammed test sequence to test all control inputs and outputs.
- The installation location must be maintained within the ambient temperature and humidity ranges specified in the D 366 Brochure for this control, with the installer ensuring that the control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise.
- The control components required from tekmar are two Six Zone Controls 366, one RTU 052 and eleven RTUs 051, or eleven Indoor Sensors 074 optional, one Relay 003 and one Relay 004. (One RTU or Indoor Sensor is required for each zone being used.)

## Settings

### Six Zone Control 366

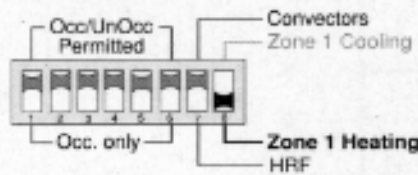
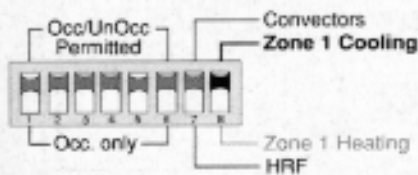
- 051 RTU dial
- 052 RTU dial
- 074 Indoor Sensor
- Unoccupied
- Unoccupied duration
- Occupied/Unoccupied switches
- Convectors/HRF switch
- Zone 1 heating/cooling switch

### Adjustment Range

- 40 to 85°F (5 to 29°C)
- 74 to 86°F (23 to 30°C)
- fixed settings of 70°F (21°C) Heating;
- 77°F (25°C) Cooling
- 40 to 85°F (5 to 29°C)
- 0 to 24 hours
- Each zone can be individually selected to go into setback or not
- To fine tune control operation for different types of heating systems
- To select zone #1 to operate a cooling system or operate as a heating system

### Recommended Initial Setting

### Six Zone Control 366 DIP switch settings for this application.



= required setting for this application.

= optional setting for this application. (see Data Brochure D 366)

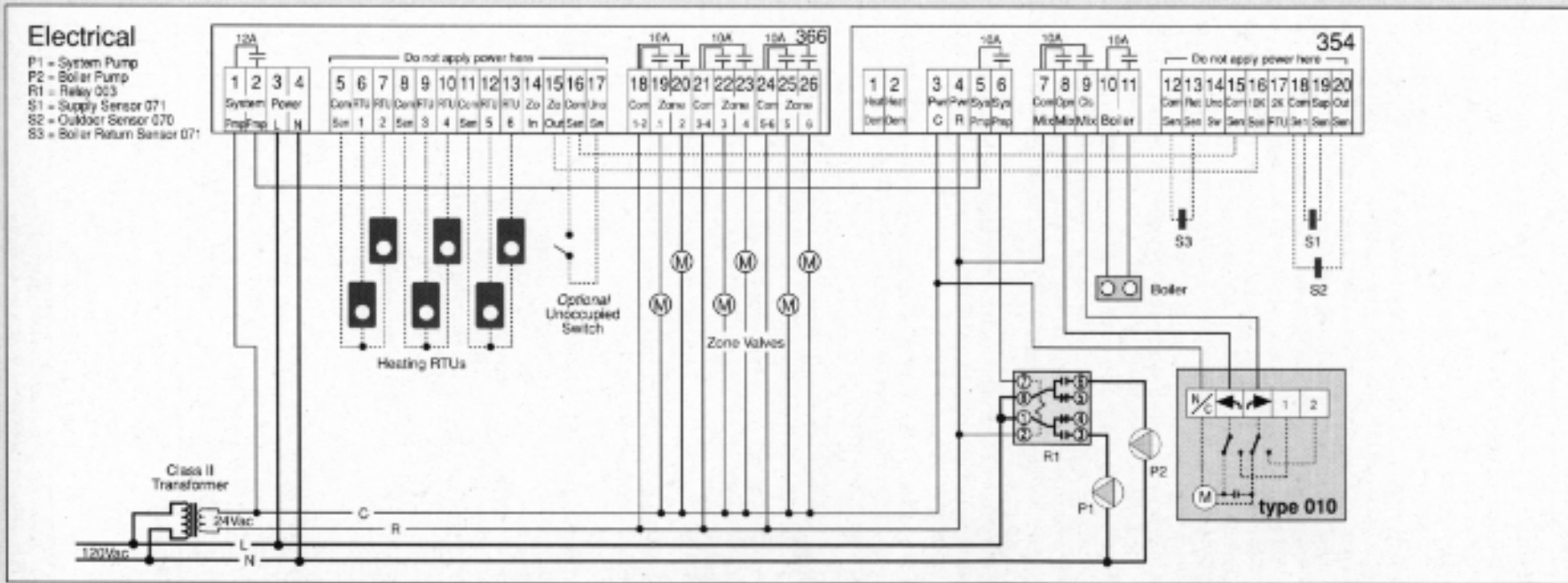
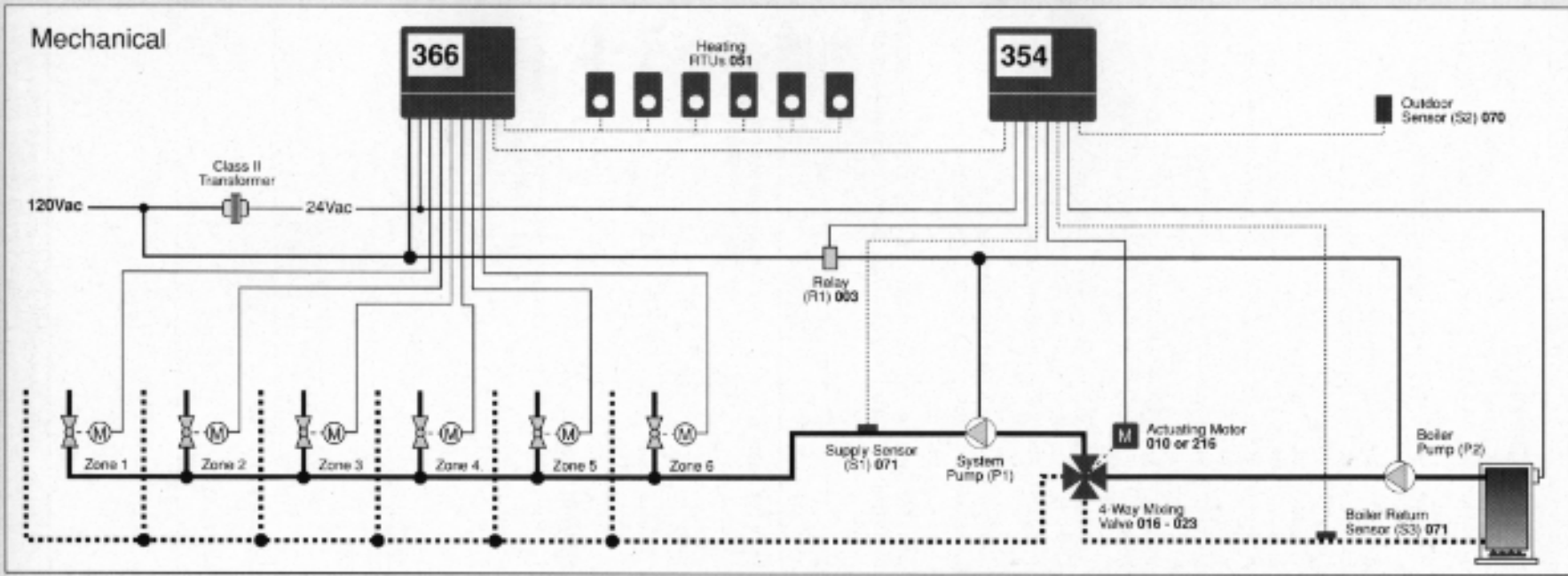
## Additional Information

- For control installation and testing instructions see Brochures D 001 and D 366.
- For other control applications see Application Register A 000.
- For control theory and system integration details see Essays E 001 and E 002.

**In North America:** tekmar Control Systems Ltd., Canada  
 tekmar Control Systems, Inc., U.S.A.  
 Head Office: 4611 - 23rd Street  
 Vernon, B.C. Canada V1T 4K7  
 Tel. (604) 545-7749 Fax. (604) 545-0650

# tekmar® - Application

Six Zone Control 366 with Mixing Reset Control 354



**Note:** This is only a concept drawing. Designers must determine whether this system will work in each application and must ensure compliance with code requirements. Necessary auxiliary equipment and safety devices must be added.



A 366-3  
12/93

## Operation

The tekmar Six Zone Control 366 regulates the heating of each zone based on the reading of the Room Temperature Unit (RTU). The Mixing Reset Control 354 regulates the heating system supply water temperature by modulating a 4-way mixing valve based on the outdoor air temperature and information from the Six Zone Control 366.

## Specifications

The following are minimum recommended specifications for the controls in this application.

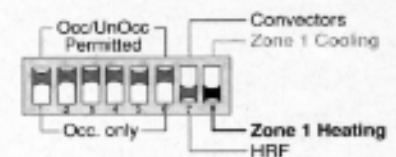
- The heating system shall have a boiler pump (P2) in the boiler loop and a system pump (P1) in the system supply loop.
- The system pump (P1), boiler pump (P2), Actuating Motor and 4-way mixing valve shall be operated a few minutes every 3 days to help prevent seizure during longer idle periods.
- The pumps and the boiler shall be turned off and the 4-way mixing valve driven fully closed whenever the outdoor air temperature is warmer than the control's Warm Weather Shut Down (WWSD) point.
- Each zone shall be controlled by individual zone valves to provide heat to the zone when required.
- Each zone shall have a Room Temperature Unit (RTU) 051 to monitor and adjust the room temperature using 2 wires connected to the Six Zone Control 366. (optional Indoor Sensor 074 may be used for a fixed temperature in each zone)
- The on cycling of the zone valves shall be timed to provide an even load demand on the boiler.
- The zone control shall have a built-in 24 hour timer for setback operation and an input for an optional external setback signal.
- The mixing valve shall be a 4-way cast iron valve and the actuating motor shall have a 90° output shaft rotation in 3 1/2 minutes and be capable of 310 in-lb (35 N-m) of torque.
- The Mixing Reset Control 354 shall have an adjustable Maximum Supply water temperature setting to help protect system components from overheating.
- The controls shall have a test button which activates a preprogrammed test sequence to test all control inputs and outputs.
- The Six Zone Control 366 shall have CSA (Canadian Standards Association) and UL (Underwriters Laboratory) approval.
- The controls shall be compatible with standard North American wiring hardware.
- The controls shall continuously monitor their RTUs and Sensors, and provide an LED error message if one is shorted or disconnected.
- The controls shall be microprocessor-based, with the 366 having one SPST 12 amp (resistive) and six SPST 10 amp (resistive) internal relays, and the 354 having four SPST 10 amp (resistive) internal relays for outputs, and both shall have indicator lights for control function and status.
- The installation location must be maintained within the ambient temperature and humidity ranges specified in the D 354 and D 366 brochures for these controls, with the installer ensuring that the controls and their wiring are isolated and/or shielded from strong sources of electromagnetic noise.
- The control components required from tekmar are one Mixing Reset Control 354, one Universal Sensor 071 (boiler return), one Six Zone Control 366, six Room Temperature Units (RTUs) 051 or six Indoor Sensors 074, one 4-way Mixing Valve 016 to 023, and one Actuating Motor 010 or 216.

## Settings

Six Zone Control 366	Adjustment Range
051 RTU dial	40 to 85°F (5 to 29°C)
052 RTU dial	74 to 86°F (23 to 30°C)
074 Indoor Sensor	fixed settings of 70°F (21°C) Heating; 77°F (25°C) Cooling
Unoccupied	40 to 85°F (5 to 29°C)
Unoccupied duration	0 to 24 hours

### Recommended Initial Settings

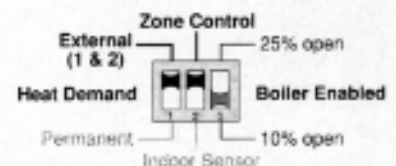
### Six Zone Control 366 DIP switch settings for this application




Mixing Reset Control 354	Adjustment Range
Occupied	35 to 105°F (2 to 41°C)
Unoccupied	35 to 105°F (2 to 41°C)
Heating Curve	0.4 to 3.6
Maximum Supply	100 to 200°F (38 to 93°C)
Minimum Boiler Return	Off, 60 to 150°F (16 to 65°C)
Motor Speed	30 to 250 seconds

### Recommended Initial Settings

### Mixing Reset Control 354 DIP switch settings for this application



 = required setting for this application.  = optional setting for this application.

 = does not matter, switch not used for this application. (see Data Brochure D 366)

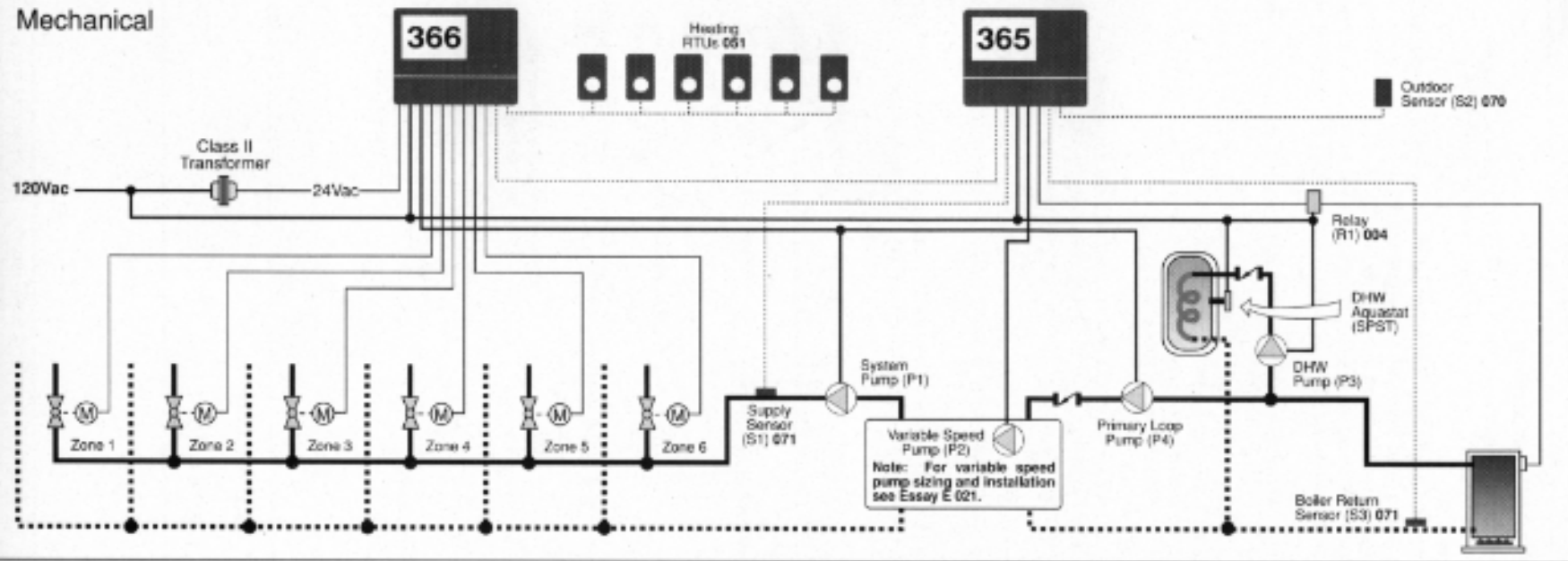
## Additional Information

- For control installation and testing instructions see Brochures D 001, D 354 and D 366.
- For other control applications see Application Register A 000.
- For control theory and system integration details see Essays E 001 and E 002.

<b>In North America:</b>	tekmar Control Systems Ltd., Canada tekmar Control Systems, Inc., U.S.A. Head Office: 4611 - 23rd Street Vernon, B.C. Canada V1T 4K7 Tel. (604) 545-7749 Fax. (604) 545-0650
--------------------------	--

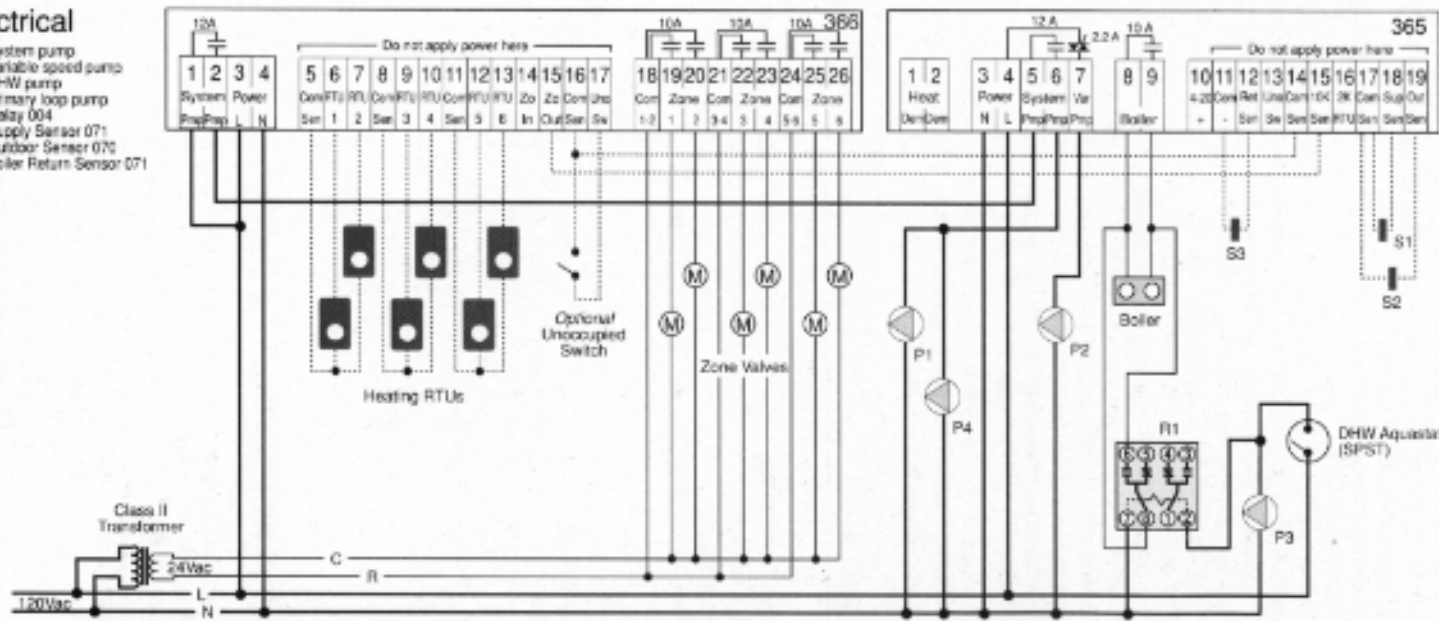


## Mechanical



## Electrical

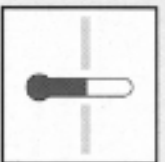
- P1 = System pump
- P2 = Variable speed pump
- P3 = DHW pump
- P4 = Primary loop pump
- R1 = Relay 004
- S1 = Supply Sensor 071
- S2 = Outdoor Sensor 070
- S3 = Boiler Return Sensor 071



**Note:** This is only a concept drawing. Designers must determine whether this system will work in each application and must ensure compliance with code requirements. Necessary auxiliary equipment and safety devices must be added.

# tekmar® - Application

Six Zone Control 366 with Mixing Control 365



A 366-4

12/93

## Operation

The tekmar Six Zone Control 366 regulates the heating of each zone based on the reading of the Room Temperature Unit (RTU). The Mixing Control 365 regulates the amount of hot water injected into the system supply loop through a pump which is driven at varying speeds. Control of the heating system supply water temperature is based on the outdoor air temperature and information from the Six Zone Control 366.

## Specifications

The following are minimum recommended specifications for the control in this application.

- The heating system shall have a primary loop pump (P4) in the boiler loop and a system pump (P1) in the system supply loop.
- The boiler shall be turned off whenever the outdoor air temperature is warmer than the control's Warm Weather Shut Down (WWSD) point.
- On a "call for DHW", the DHW pump (P3) and the boiler shall be turned on.
- Each zone shall have a Room Temperature Unit (RTU) 051 to monitor and adjust the room temperature using 2 wires connected to the Six Zone Control 366. (Optional Indoor Sensor 074 may be used for a fixed temperature in each zone)
- The on cycling of the zone valves shall be timed to provide the most even load demand to the boiler.
- The Six Zone Control shall have a built-in 24 hour timer for setback operation and an input for an optional external setback signal.
- The Mixing Control 365 shall have an adjustable Minimum Boiler Return temperature setting to help prevent cold shock to the boiler and condensation of flue gases.
- The Mixing Control 365 shall have an adjustable Maximum Supply water temperature setting to help protect system components from overheating.
- The Mixing Control 365 shall have a variable speed output capable of driving a maximum 2.2 amp permanent capacitor, impedance protected 120Vac circulator pump, and a 4-20mA output to drive 4-20mA, 1-5 Vdc or 2-10 Vdc devices.
- The controls shall have a Test button which activates a preprogrammed test sequence to test all control inputs and outputs.
- The controls shall have CSA (Canadian Standards Association) and UL (Underwriters Laboratory) approvals.
- The controls shall be compatible with standard North American wiring hardware.
- The controls shall continuously monitor their sensors and provide a LED error message if one is shorted or disconnected.
- The controls shall be microprocessor-based, with the 366 having one SPST internal relay with 12 amp (resistive) and six SPST 10 amp (resistive), and the 365 having one SPST internal relay with 12 amp (resistive) and one SPST with 10 amp (resistive) isolated contacts for outputs and have indicator lights for control functions and status.
- The installation location must be maintained within the ambient temperature and humidity ranges specified in the D 366 and D 365 brochures for these controls, with the installer ensuring that the controls and their wiring are isolated and/or shielded from strong sources of electromagnetic noise.
- The control components required from tekmar are one Mixing Control 365, one Universal Sensor 071, one Six Zone Control 366, one Relay 004 and six Room Temperature Units (RTUs) 051, or six Indoor Sensors 074 optional. (One RTU or Indoor Sensor is required for each zone being used.)

## Settings

### Six Zone Control 366

051 RTU dial  
Unoccupied  
Unoccupied duration

### Adjustment Range

40 to 85°F (5 to 29°C)  
40 to 85°F (5 to 29°C)  
0 to 24 hours

### Recommended Initial Settings




### Mixing Control 365

Heating Curve  
Max. System Supply/Setpoint  
Minimum Boiler Return  
  
Motor Speed/Pump Response  
Occupied

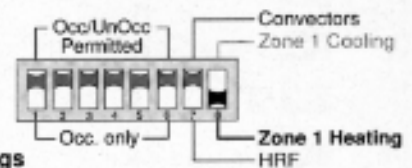
### Adjustment Range

0.4 to 3.6  
100 to 200°F (38 to 93°C)  
Off, 50 to 150°F  
(Off, 16 to 66°C)  
30 to 230 seconds  
35 to 105°F (2 to 41°C)

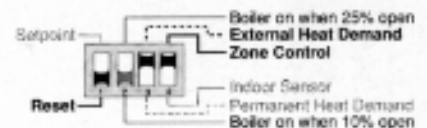
### Recommended Initial Settings

 = required setting for this application.  = optional setting for this application.  
 = does not matter, switch not used for this application.  
(see Data Brochure D 366)

Six Zone Control 366 DIP switch settings for this application



Mixing Control 365 DIP switch settings for this application



## Additional Information

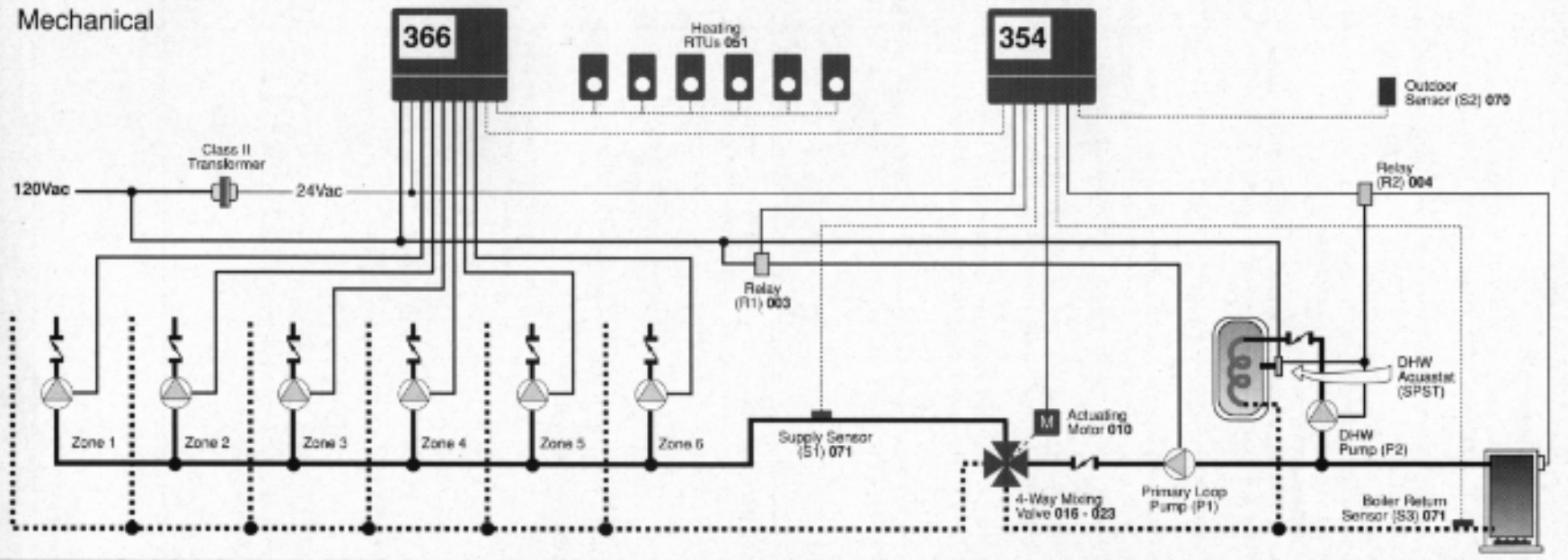
- For control installation and testing instructions see Brochures D 001, D 365 and D 366.
- For other control applications see Application Register A 000.
- For control theory and system integration details see Essays E 001, E 002 and E 021.

**In North America:** tekmar Control Systems Ltd., Canada  
tekmar Control Systems, Inc., U.S.A.  
Head Office: 4611 - 23rd Street  
Vernon, B.C. Canada V1T 4K7  
Tel. (604) 545-7749 Fax. (604) 545-0650



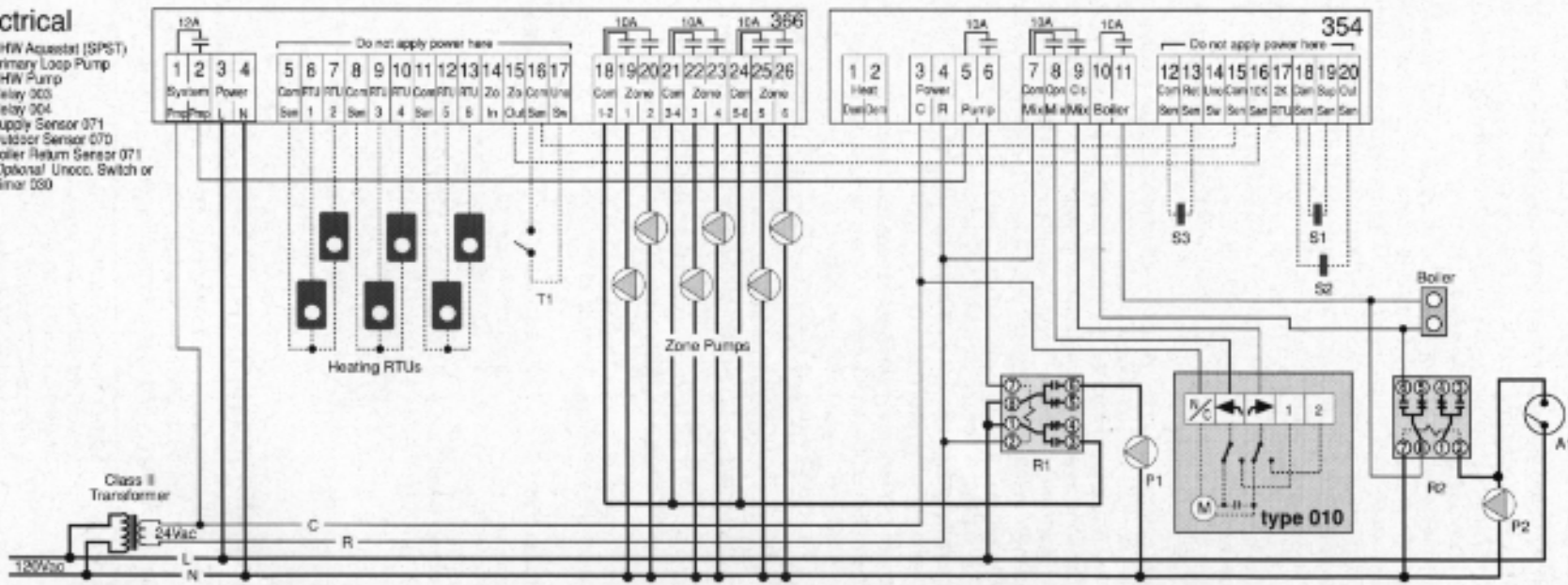


## Mechanical



## Electrical

- A1 = DHW Aquaset (SPST)
- P1 = Primary Loop Pump
- P2 = DHW Pump
- R1 = Relay 003
- R2 = Relay 004
- S1 = Supply Sensor 071
- S2 = Outdoor Sensor 070
- S3 = Boiler Return Sensor 071
- T1 = Optional Unocc. Switch or Timer 030



**Note:** This is only a concept drawing. Designers must determine whether this system will work in each application and must ensure compliance with code requirements. Necessary auxiliary equipment and safety devices must be added.

**tekmar® - Application**  
 Six Zone Control 366 & Mixing Control 354



**A 366-5**  
 03/94

## Operation

The tekmar Six Zone Control 366 regulates the heating of each zone based on the reading of the Room Temperature Unit (RTU). The Mixing Control 354 regulates the heating system supply water temperature by modulating a 4-way mixing valve based on the outdoor air temperature and information from the Six Zone Control 366.

## Specifications

The following are minimum recommended specifications for the controls in this application.

- The heating system shall have a Primary Loop pump (P1) in the boiler loop and a Zone pump for each heating zone.
- The Primary Loop pump (P1), Actuating Motor and 4-way mixing valve shall be operated a few minutes every 3 days to help prevent seizure during longer idle periods.
- The pumps and the boiler shall be turned off and the 4-way mixing valve driven fully closed whenever the outdoor air temperature is warmer than the control's calculated Warm Weather Shut Down (WWSO) point.
- Each zone shall be controlled by an individual zone pump to provide heat to the zone when required.
- Each zone shall have a Room Temperature Unit (RTU) 051 to monitor and adjust the room temperature using 2 wires connected to the Six Zone Control 366. (Optional Indoor Sensor 074 may be used for a fixed temperature in each zone.)
- The on cycling of the zone valves shall be timed to provide an even load demand on the boiler.
- The zone control shall have a built-in 24 hour timer for setback operation and an input for an optional external setback signal.
- The mixing valve shall be a 4-way cast iron valve and the actuating motor shall have a 90° output shaft rotation in 3 1/2 minutes and be capable of 310 in-lb (35 N-m) of torque.
- The Mixing Control 354 shall have an adjustable Maximum Supply water temperature setting to help protect system components from overheating.
- The controls shall have a test button which activates a preprogrammed test sequence to test all control inputs and outputs.
- The controls shall continuously monitor their RTUs and Sensors, and provide an LED error message if one is shorted or disconnected.
- The Six Zone Control 366 shall have CSA (Canadian Standards Association) and UL (Underwriters Laboratory) approval.
- The controls shall be compatible with standard North American wiring hardware.
- The controls shall be microprocessor-based, with the 366 having one SPST 12 amp (resistive) and six SPST 10 amp (resistive) internal relays, and the 354 having four SPST 10 amp (resistive) internal relays for outputs, and both shall have indicator lights for control function and status.
- The installation location must be maintained within the ambient temperature and humidity ranges specified in the D 354 and D 366 brochures for these controls, with the installer ensuring that the controls and their wiring are isolated and/or shielded from strong sources of electromagnetic noise.
- **Order the following components for this application:** one Mixing Control 354, one Universal Sensor 071 (boiler return), one Six Zone Control 366, an RTU 051 or Indoor Sensor 074 for each active zone, one 4-way Mixing Valve 016 to 023, one Actuating Motor 010, one Relay 003, and one Relay 004.

## Settings


Six Zone Control 366	Adjustment Range
051 RTU dial	40 to 85°F (5 to 29°C)
052 RTU dial	74 to 86°F (23 to 30°C)
074 Indoor Sensor	fixed settings of 70°F (21°C) Heating; 77°F (25°C) Cooling
Unoccupied	40 to 85°F (5 to 29°C)
Unoccupied duration	0 to 24 hours

### Recommended Initial Settings

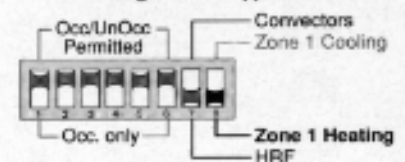
Mixing Control 354	Adjustment Range
Occupied	35 to 105°F (2 to 41°C)
Unoccupied	35 to 105°F (2 to 41°C)
Heating Curve	0.4 to 3.6
Maximum Supply	100 to 200°F (38 to 93°C), Off
Minimum Boiler Return	Off, 60 to 150°F (16 to 65°C)
Motor Speed	30 to 250 seconds

### Recommended Initial Settings

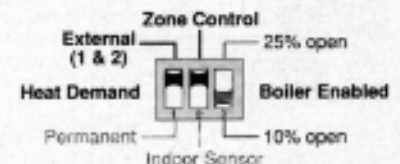
 = required setting for this application.  = optional setting for this application.

 = does not matter, switch not used for this application. (see Data Brochure D 366)

### Six Zone Control 366 DIP switch settings for this application



### Mixing Control 354 DIP switch settings for this application

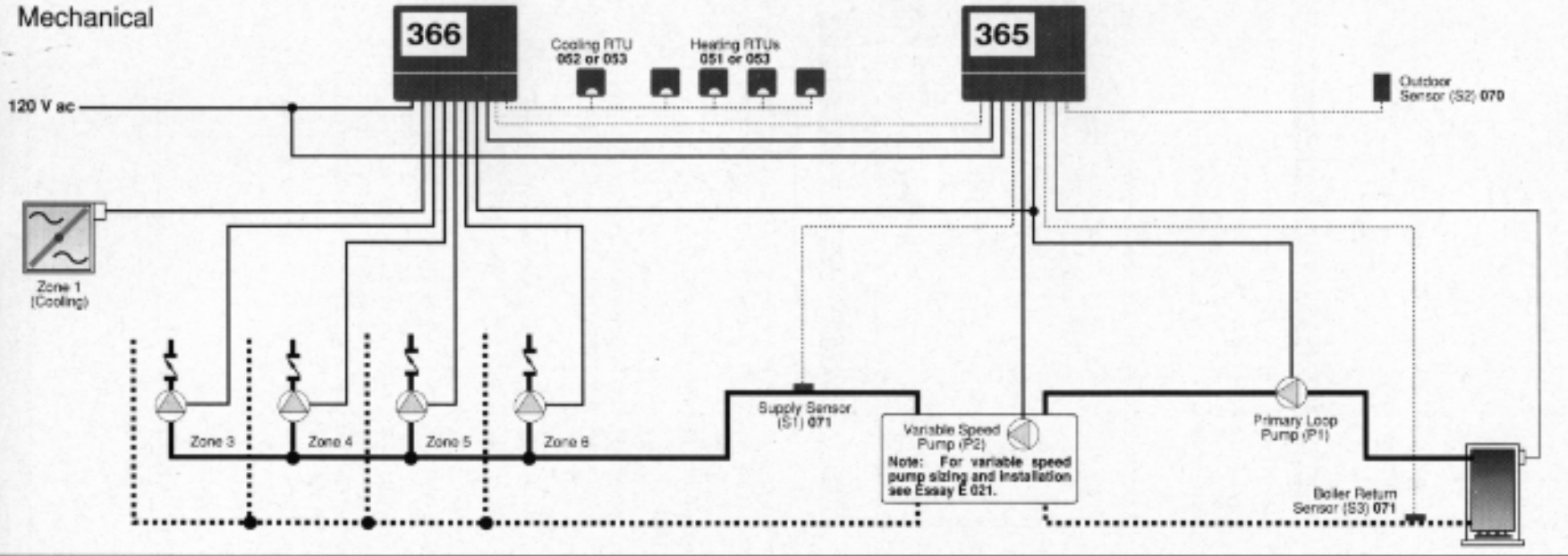


## Additional Information

- For control installation and testing instructions see Brochures D 001, D 354 and D 366.
- For other control applications see Application Register A 000.
- For control theory and system integration details see Essays E 001 and E 002.

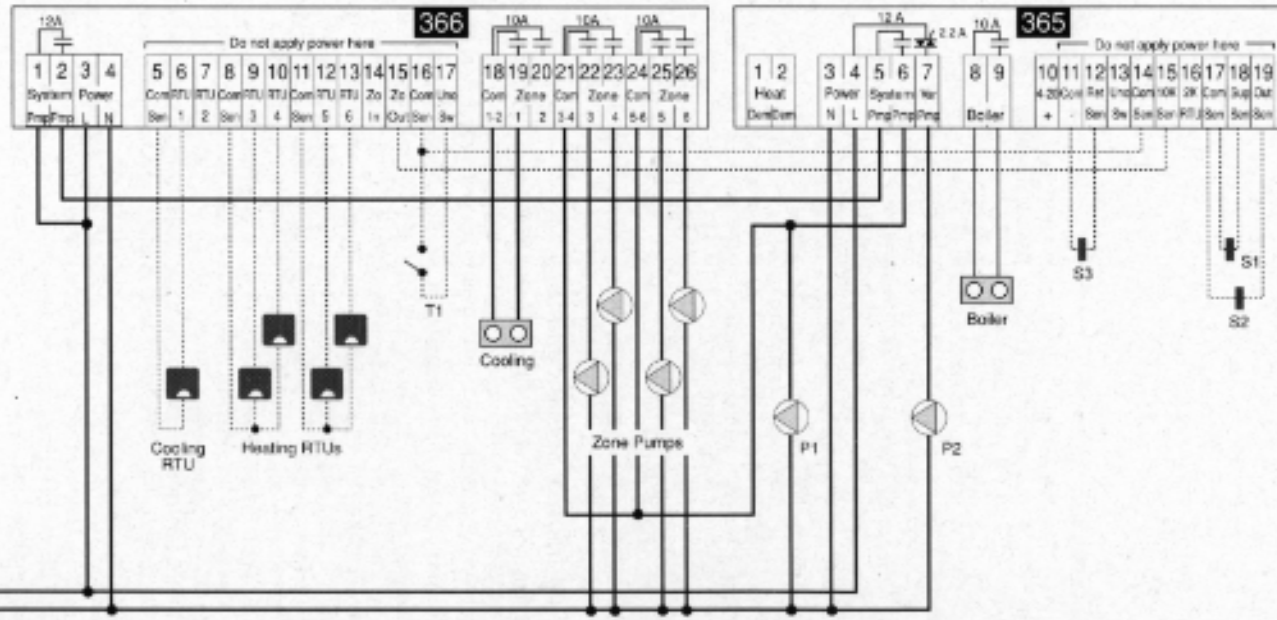
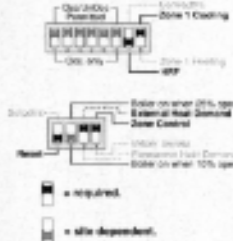
**In North America:** tekmar Control Systems Ltd., Canada  
 tekmar Control Systems, Inc., U.S.A.  
 Head Office: 4611 - 23rd Street  
 Vernon, B.C. Canada V1T 4K7  
 Tel. (604) 545-7749 Fax. (604) 545-0650

## Mechanical



## Electrical

- P1 = Primary Loop pump
- P2 = Variable Speed pump
- S1 = Supply Sensor 071
- S2 = Outdoor Sensor 070
- S3 = Boiler Return Sensor 071
- T1 = Optional Unacc. Switch or Timer 030



**Note:** This is only a concept drawing. The designer must determine whether this application will work in his system and must ensure compliance with code requirements. Necessary auxiliary equipment, isolation relays (for loads greater than the specified tekmar internal relay ratings), and other safety and limit devices must be added.

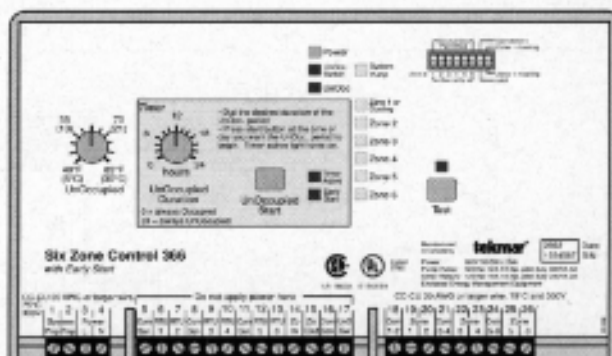
**tekmar® - Application**  
 Six Zone Control 366 & Mixing Control 365



**A 366-6**  
 06/94

### Six Zone Control 366

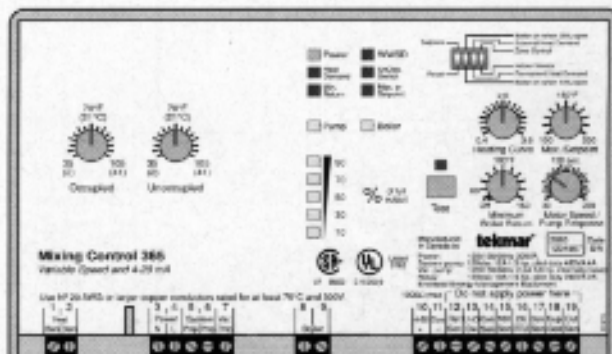
Literature	— D 366, A 366, D 001, E 000, E 300
Control	— Microprocessor PI control. This is <b>not a safety (limit) control</b> .
Packaged weight	— 2.9 lb. (1300 g), Enclosure A, PVC plastic
Dimensions	— 6-5/8" H x 7-9/16" W x 2-13/16" D (170 x 193 x 72 mm)
Approvals	— CSA, UL listed, meets DOC regulations for EMI/RFI.
Ambient conditions	— Indoor use only, 30 to 120°F (0 to 50°C), < 90% RH non-condensing.
Power supply	— 120 V ac ±10% 50/60 Hz 3 VA
Pump Relay	— 120 V ac 12 A 1/3 hp, pilot duty 480 VA 4 A
Other Relays	— 120 V ac 6 A 1/4 hp, pilot duty 240 VA 2 A
Sensors	— NTC thermistor, 10 kΩ @ 25°C ±0.2°C B=3892
included:	None.
required:	RTU 051 or 053, Indoor Sensor 074 or 076, RTU 052 or 053 for zone 1 cooling. (Order separately)
Control accuracy	— ±0.8°F (±0.4°C) with up to 500 feet (150m) of 18 AWG wire to RTUs.
Unoccupied	— 40 to 85°F (4 to 29°C)
Unoccupied Duration	— 0 to 24 hours



### Mixing Control 365

Literature	— D 365, A 365, D 001, E 000, E 021, E 300
Control	— Microprocessor PID control. This is <b>not a safety (limit) control</b> .
Packaged weight	— 3.1 lb. (1400 g), Enclosure A, PVC plastic
Dimensions	— 6-5/8" H x 7-9/16" W x 2-13/16" D (170 x 193 x 72 mm)
Approvals	— CSA, UL listed, meets DOC regulations for EMI/RFI.
Ambient conditions	— Indoor use only, 30 to 105°F (0 to 40°C), < 90% RH non-condensing.
Power supply	— 120 V ac ±10% 50/60 Hz 300 VA
System Pump	— 120 V ac 12 A 1/3 hp, pilot duty 480 VA 4 A
Variable Speed Pump	— 120 V ac 50/60 Hz 2.2 A 1/6 hp, internally fused
Other Relay	— 120 V ac 10 A 1/3 hp, pilot duty 240 VA 2 A
Sensors	— NTC thermistor, 10 kΩ @ 25°C ±0.2°C B=3892
included:	Outdoor Sensor 070 and Universal Sensor 071.
optional:	Universal Sensor 071 and Indoor Sensor 074 or 076.
Control accuracy	— ±1°F (±0.5°C) with up to 1000 feet (300m) of 18 AWG wire to sensors.
Occupied	— 35 to 105°F (2 to 41°C)
Unoccupied	— 35 to 105°F (2 to 41°C)
Heating Curve	— 0.4 to 3.6
Maximum Supply	— 100 to 190°F, Off (38 to 88°C)

Min. Boiler Return	— Off, 60 to 150°F (16 to 66°C)
Motor Speed	— 30 to 230 seconds
Setpoint & UnOcc	— 35 to 200°F (2 to 93°C)



### System Operation & Specifications

The tekmar Six Zone Control 366 regulates the heating of each zone based on the reading of the Room Temperature Unit (RTU). Zone one on the 366 is the dedicated cooling. The Mixing Control 365 regulates the heating system supply water temperature by controlling the rotational speed of a pump based on the outdoor air temperature and information from the Six Zone Control 366.

**The controls shall meet the technical specifications listed above and shall provide the following functions.**

- The heating system shall have a pump (P1) in the boiler loop and individual zone pumps.
- The Six Zone Control 366 shall have a dedicated zone for cooling with interlock to heat demand.
- The boiler shall be turned off whenever the outdoor air temperature is warmer than the control's Warm Weather Shut Down (WWSD) point.
- Each zone shall have a Room Temperature Unit (RTU) to monitor and adjust the room temperature using 2 wires connected to the Six Zone Control 366. (Optional Indoor Sensor 074 or 076 may be used for a fixed temperature in each zone)
- The on cycling of the zone valves shall be timed to provide an even load demand to the boiler.
- The Six Zone Control shall have a built-in 24 hour timer for setback operation and an input for an optional external setback signal.
- The Mixing Control 365 shall have an adjustable Minimum Boiler Return temperature setting to help prevent cold shock to the boiler and condensation of flue gases.
- The Mixing Control 365 shall have an adjustable Maximum Supply water temperature setting to help protect system components from overheating.
- The Six Zone Control 366 shall be able to shift the heating curve of the Mixing Control 365 to meet the requirements of whichever zone has the greatest heat loss.
- The controls shall have a test button which activates a preprogrammed test sequence to test all control inputs and outputs.
- The controls shall continuously monitor their sensors and provide a LED error message if one is shorted or disconnected.
- The installation location must be maintained within the ambient temperature and humidity ranges as specified, with the installer ensuring that the control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise.
- **Order the following tekmar products for this application:** one Mixing Control 365, one Universal Sensor 071, one Six Zone Control 366, four of Room Temperature Unit (RTU) 051 or 053 and one Room Temperature Unit 052 or 053 Cooling. (One RTU is required for each zone being used.)

**In North America:** tekmar Control Systems Ltd., Canada  
 tekmar Control Systems, Inc., U.S.A.  
 Head Office: 4611 - 23rd Street  
 Vernon, B.C. Canada V1T 4K7  
 Tel. (804) 545-7749 Fax. (604) 545-0650

