

T915A-D,F,M,P Proportional Temperature Controllers

Remote bulb temperature controllers for ducts, tanks, boilers, pipes, and other heat exchangers. These controllers are used with modulating motors for proportional control of three-wire, low-voltage valves or damper motors.



- T915M and T915P have spdt switches to control Series 20 motors. T915M controls at high or low end; T915P controls at low end.
- Controllers may be used to regulate temperatures of either air or liquids.
- All models ambient compensated.
- Capillary tubing allows remote bulb mounting up to 20 ft (6.0m) from controller case.
- Temperature setting scale markings in both Fahrenheit and Celsius.
- Steel case with clear plastic cover makes settings readily visible.
- Surface mounting using two screws through back of case.

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Specifications

MODELS (also refer to Table 1):

T915A: One potentiometer for controlling a modulating motor. Nonadjustable throttling range.

T915B: Two potentiometers for controlling two modulating motors in unison or in sequence, factory set for unison control. Nonadjustable throttling range.

T915C: One potentiometer for controlling a modulating motor. Adjustable throttling range.

T915D: Two potentiometers for controlling two modulating motors in unison. Adjustable throttling range.

T915F: Two potentiometers for controlling two modulating motors in sequence. Adjustable deadspot between potentiometers and adjustable throttling range.

T915M and T915P: One potentiometer and Series 20 contacts for controlling one modulating motor and one

Series 20 motor or relay in sequence on a temperature rise. The Series 20 contacts on the T915M operate above the throttling range and the Series 20 contacts on the T915P operate below the throttling range. Both models have nonadjustable throttling ranges and differentials.

BULB HOLDER: Furnished with copper elements.

RANGES: Fahrenheit and Celsius on the same scaleplate.

TEMPERATURE SETTING: Screws on top of controller provide main and differential adjustment.

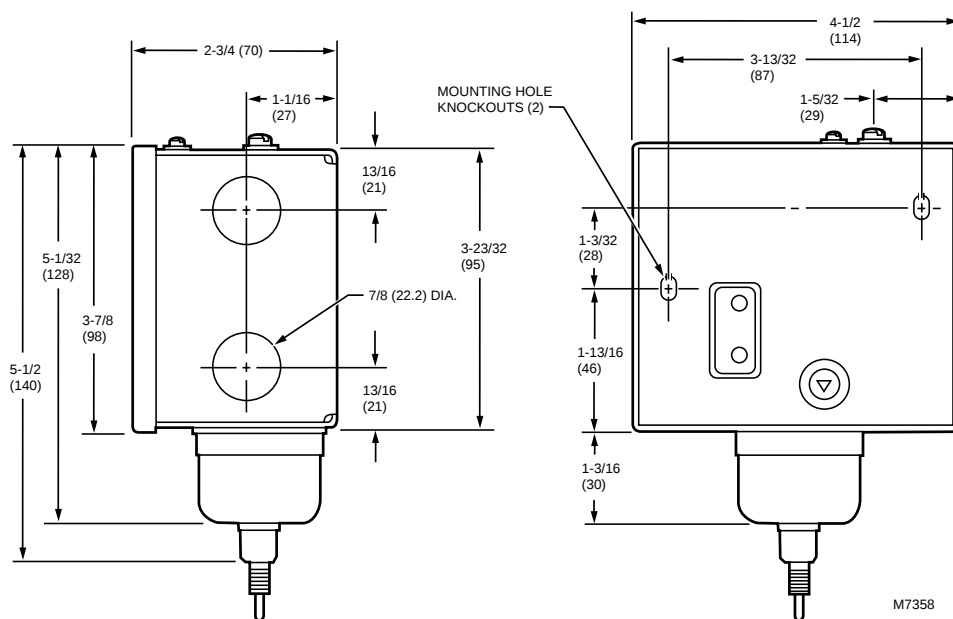
ELECTRICAL RATING: Low voltage ac only.

POTENTIOMETER: Standard 135 ohm. Available with 280 ohm potentiometer in some models; see Table 1.

FINISH: Gray enamel.

DIMENSIONS: See Fig. 1.

Fig. 1—Mounting dimensions in in. (mm).



Ordering Information

When purchasing replacement and modernization products from your TRADELINE[®] wholesaler or distributor, refer to the TRADELINE[®] Catalog or price sheets for complete ordering number, or specify—

1. Order number.
2. Scale range.
3. Bulb size.
4. Capillary length.
5. Accessories, if desired.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Home and Building Control Sales Office (please check the white pages of your phone directory).

2. Home and Building Control Customer Logistics
Honeywell, Inc., 1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386 (612) 951-1000

In Canada—Honeywell Limited/Honeywell Limitée, 740 Ellesmere Road, Scarborough, Ontario M1P2V9. International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

ACCESSORIES:

1. 33312B Knurled Knob for finger adjustment of temperature setpoint.
2. 311266D Bulb Holder for mounting sensing bulb in an air duct (furnished with some models).

3. Immersion well assemblies or pressure fittings—see appropriate Honeywell specification or TRADELINE® Catalog to order. Wells available in copper and stainless steel.

TABLE 1—T915 TEMPERATURE CONTROLLER MODELS.

Model Number	Scale Range		Throttle Range ^a		Maximum Bulb Temp - erature		Capillary (Copper)		Size of Bulb		Type of Fill ^b	Potenti - ometer Resistance (ohms)	Controls
	°F	°C	°F	°C	°F	°C	ft	m	in.	mm			
T915A	15 to 90	-9 to +32	3, fixed ^c	1.7, fixed ^c	200	93	5	1.5	1/2 x 4	13 x 102	LTD	135	1 modulating motor
T915B	15 to 90	-9 to +32	3, fixed ^f	1.7, fixed ^f	130	54	5	1.5	11/16 x 14-1/2	17 x 368	CA	135	2 modulating motors in unison or sequence ^d
T915C	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	200	93	11	3.4	1/2 x 4	13 x 102	LTD	135	1 modulating motor
T915C	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	200	93	20	6.1	1/2 x 4	13 x 102	LTD	135	
T915C	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	130	54	5	1.5	11/16 x 14-1/2	17x 368	CA	135	
T915C	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	130	54	15	4.5	11/16 x 7	17 x 177	CA	135	
T915C	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	130	54	5	1.5	11/16 x 14-1/2	17 x 368	CA	280	
T915C	80 to 210	27 to 99	6 to 32	3.3 to 17.8	230	110	5	1.5	1/2 x 4	13 x 102	HT	135	
T915C	80 to 120	27 to 99	6 to 32	3.3 to 17.8	230	110	20	6.1	1/2 x 4	13 x 102	HT	135	
T915D	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	130	54	5	1.5	11/16 x 14-1/2	17 x 368	CA	135	2 modulating motors in unison
T915D	15 to 90	-9 to +32	7 to 38	3.9 to 21.1	130	54	20	6.1	11/16 x 17-1/2	17 x 445	CA	135	
T915D	105 to 220	40 to 105	9 to 39	5.0 to 21.7	240	116	5	1.5	1/2 x 4	13 x 102	HT	135	
T915F	15 to 90	-9 to +32	8 to 52	4.4 to 28.9	130	54	5	1.5	11/16 x 14-1/2	17 x 368	CA	135	2 modulating motors in sequence
T915F	15 to 90	-9 to +32	8 to 52	4.4 to 28.9	130	54	20	6.1	11/16 x 17-1/2	17 x 445	CA	135	
T915M ^e	15 to 90	-9 to +32	3, fixed ^c	1.7, fixed ^c	130	54	5	1.5	11/16 x 14-1/2	17 x 368	CA	135	1 modulating motor and 1 Series 20 motor or relay
T915M	105 to 220	40 to 105	3, fixed ^c	1.7, fixed ^c	240	116	5	1.5	1/2 x 4	13 x 102	HT	135	
T915P ^f	15 to 90	-9 to +32	3, fixed ^c	1.7, fixed ^c	130	54	5	1.5	11/16 x 14-1/2	17 x 368	CA	135	

^a Throttling range adjustable except where noted.

^b LTD—Limited-fill elements require that controller, including all of capillary (except bulb and adjacent 4 in. [102 mm] of capillary), be in an ambient temperature at least 10°F (5.6°C) above bulb temperature. These controllers become inoperative when temperature of controlled air or liquid is above 120°F (49°C).

HT—High-temperature-fill elements require that controller and all of capillary (except bulb and adjacent 4 in. [102 mm] of capillary) be in an ambient temperature at least 10°F (5.6°C) below bulb temperature.

CA—Cross ambient.

^c Wiper moves toward W on temperature rise.

^d Factory set for unison control.

^e Spdt contacts operate approximately 1°F (0.6°C) above the throttling range (0.5°F [0.3°C] differential at midscale).

^f Spdt contacts operate approximately 1°F (0.6°C) below the throttling range (0.5°F [0.3°C] differential at midscale).

Installation

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.



CAUTION

Disconnect the power supply before connecting wiring to prevent electrical shock and equipment damage.

MOUNTING

Locate the bulb where it will sense the average temperature of the controlled air or liquid.

Mount the case and the bulb of these controllers within 2 ft (0.6m) above or below each other. If the case is more than 2 ft (0.6m) above or below the bulb, the calibration can change (Fig. 2). The controller case mounts on a wall or panel using the two screws through the knockouts on the rear of the case. Bulb mounts with a bulb holder, pressure fitting or immersion well assembly.

When running the capillary tubing, avoid kinks by making sure all bends have at least 2 in. (51 mm) radius. Kinking the tubing renders the controllers inoperable. Leave any excess tubing coiled under the controller case.

A bulb holder for mounting the bulb in an air duct is furnished with models having copper elements. If the installation requires a pressure tight fit, use a pressure fitting (Figs. 3 and 4).

If the bulb is located in an agitated liquid, support it firmly or protect it with a separable well (Fig. 5). Refer to the TRADELINE® Catalog for more detailed information on accessories.

Mount low temperature controller where the case and the capillary tubing are always warmer than the bulb; mount high temperature controllers where the case and capillary tubing are colder than the bulb.

When these instructions are followed, ambient temperature will not affect temperature control point.

Fig. 2—Installation of control and sensing element.

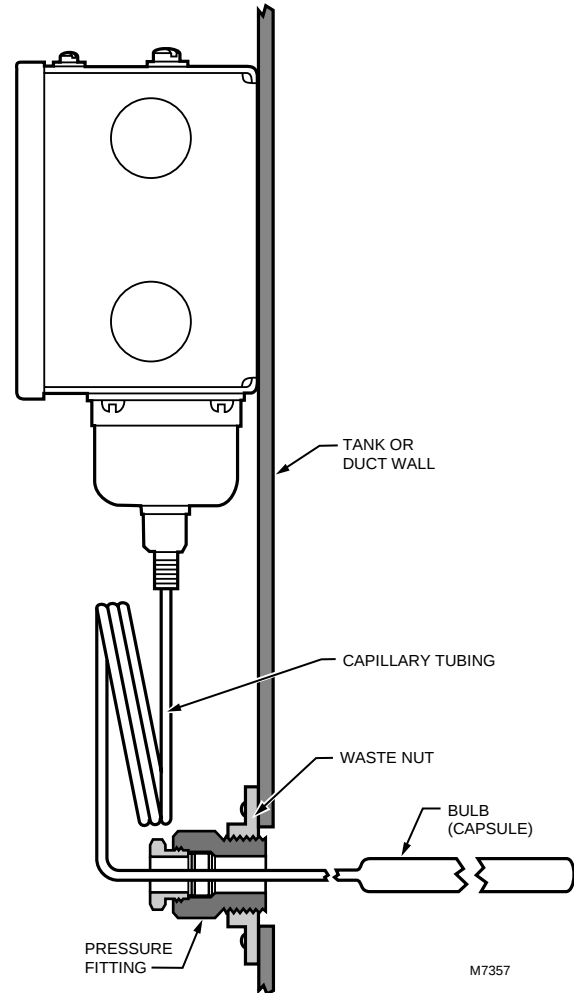


Fig. 3—Assembly of pressure fitting.

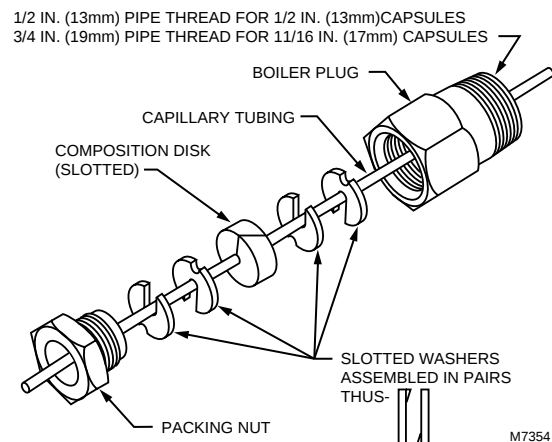


Fig. 4—Use of bulb holder for mounting sensing element in air duct application.
Dimensions in in. (mm).

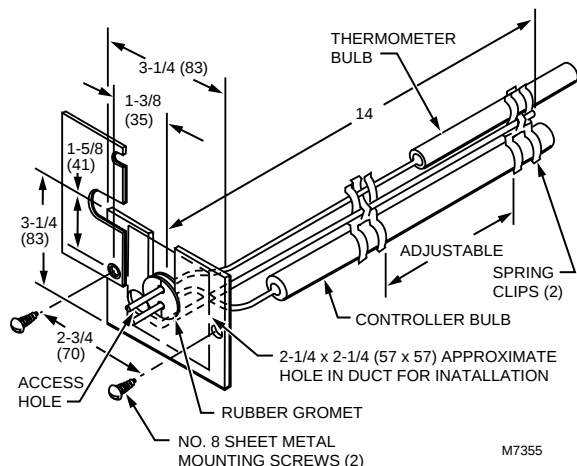
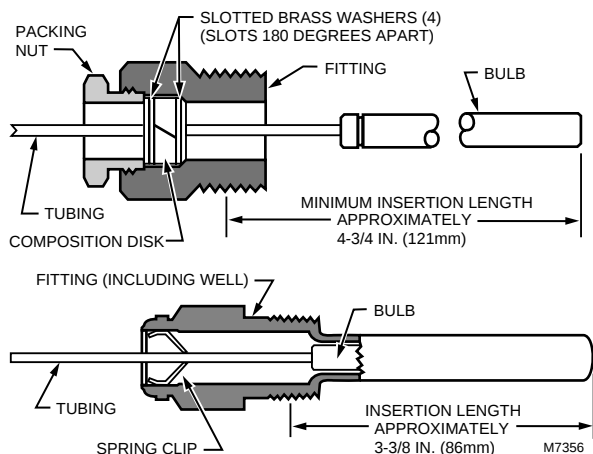


Fig. 5—Use separable well for mounting sensing bulb in an agitated liquid.



WIRING

Disconnect the power supply before connecting wiring to prevent electrical shock and equipment damage. All wiring must agree with local codes, ordinances, and regulations.

There are two 7/8 in. knockouts for 1/2 in. conduit on the right side of the case. When wiring, refer to the instructions packed with the motor or valve and the following typical wiring hookups (Fig. 6 through 8). Refer to Fig. 9 for internal schematics of T915 controllers.

NOTE: Connect B models, which control two motors or valves in sequence on a temperature rise, so that the first motor or valve to operate is connected to the front potentiometer terminals (Fig. 7). Connect F models when used in the above application so that the first operator is connected to the rear potentiometer.

Fig. 6—Typical heating connections for T915A,C.
For cooling, reverse B and W at motor.

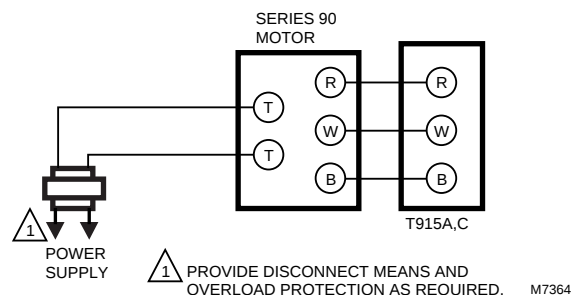


Fig. 7—Typical connections for T915B,D and F.

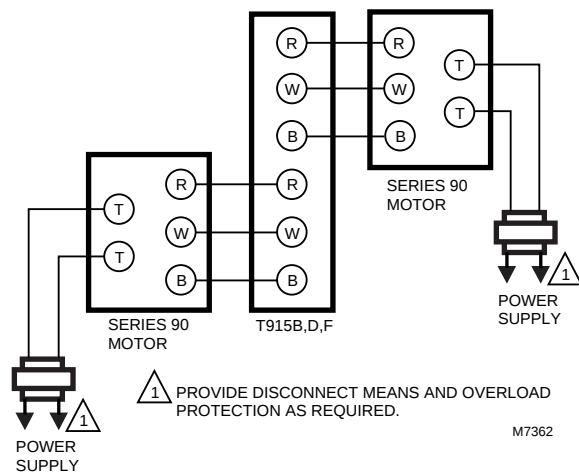


Fig. 8—Typical connections for T915M and P.

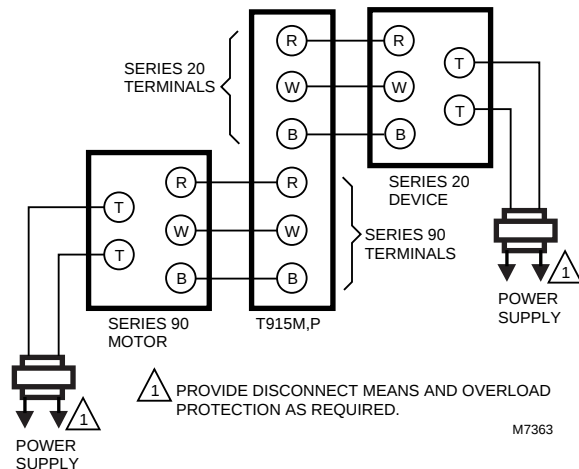
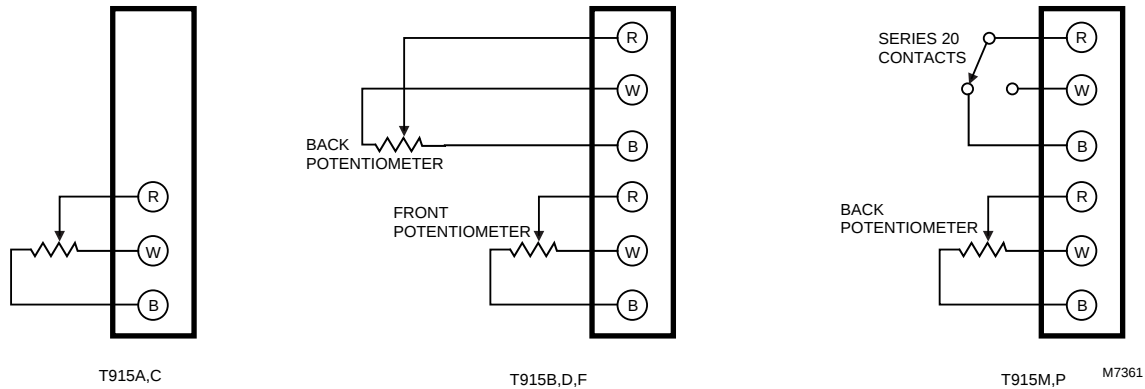


Fig. 9—Internal schematics of T915 temperature controllers.

Operation

Temperature changes at the remote sensing bulb cause a pressure change within the bulb and capillary of the T915 Proportional Temperature Controller. This pressure change is transmitted to the bellows inside the controller case that operate the potentiometer wiper. Proportional control of a valve or damper is obtained.

Operation of T915M and P models is the same except that at the high or low end of the proportioning range (depending on the model), an spdt switch is used to operate a Series 20 system component.

Settings and Adjustments

TEMPERATURE SETTING

Set the main scale setting at the desired temperature on all models except C,D, and F; set those models so the main scale indicator is at the low end of the desired proportioning range.

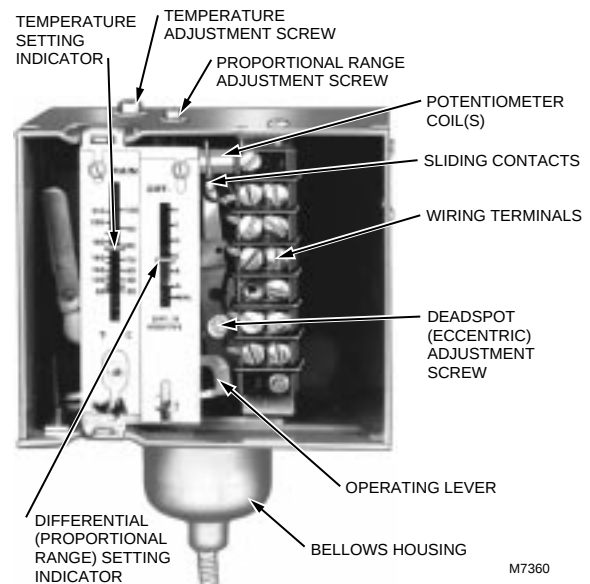
The T915B is factory set for simultaneous operation and is adjustable to full sequence. Depending on the setting, the first operator may complete its full cycle or any portion before the second operator starts.

Adjustable proportional ranges (differentials) on T915C,D, and F are additive to the main scale setting. The T915D is designed for simultaneous operation and has no sequence adjustment. The T915F is factory set for sequence operation and has a deadspot equal to about one-third of the proportional range. This deadspot cannot be increased, but it can be set to zero or to a partial overlap.

The T915M and P have one potentiometer and a set of Series 20 contacts for controlling one Series 90 operator and a Series 20 motor or relay in sequence.

The T915M contacts operate above the proportioning range about 1°F (0.6°C); the T915P contacts operate below the proportioning range. Both models have non-adjustable proportional ranges (Series 90) and differentials (Series 20).

Turn the adjustment screw (Fig. 10) until the indicator is opposite the desired mark on the scaleplate.

Fig. 10—Internal view of T915F (see Specifications for differences between models).

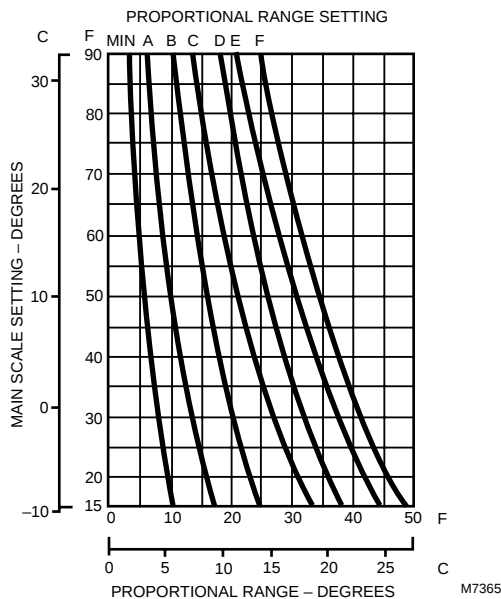
PROPORTIONAL RANGE (Differential) SETTING

Refer to proportional range curve, Fig. 11.

1. If this graph covers the scale and proportional ranges of your controller, refer to the graph and read as follows:
 - a. Locate the horizontal line that represents the desired main scale temperature setting of the controller.
 - b. Locate the vertical line that represents the desired proportional range setting.
 - c. Determine the point at which the lines intersect.
 - d. The relation of this point to the proportional range setting curves, labeled at the top of the graph, determine the proportional range indicator setting. Thus, if the point lies between curve A and curve B, turn the proportional range adjustment screw (Fig. 10) until the proportional range indicator is between A and B on the scaleplate.
2. If the controller model being installed is not covered by this graph, use a trial and error method:
 - a. Refer to the graph in Fig. 11.
 - b. Select a tentative setting by following steps 1.a through 1.d.
 - c. Run a test to determine the direction for further adjustment.

NOTE: Too narrow a proportional range may make the system unstable. Increase the range to stabilize the system, remembering that increasing the proportional range also increases offset (control point rise at very light load and drop at very heavy load).

Fig. 11—Proportional range curve for T915 with 15°F to 90°F (minus 9°C to plus 32°C) scale range.



ADJUSTMENT OF SEQUENCE OPERATION (T915B)

1. For simultaneous operation, no adjustment is required.
2. (On a temperature rise, the front wiper sweeps a portion of the active windings of its potentiometer before the back wiper enters the active windings of its potentiometer.) For operation with partial overlap of wiper travel, turn the eccentric screw to the left an amount proportional to the desired overlap of wiper travel. For example, if on a temperature rise, the back wiper is to enter its active windings after the front wiper has swept one-half of its active windings, turn the eccentric screw to the left one-half as far as it will go.
3. (On a temperature rise, the front wiper leaves the active windings of its potentiometer as the back wiper enters the active windings of its potentiometer.) For sequence operation, turn the eccentric screw to the left as far as it will go.
4. For sequence operation with a deadspot equal to one-third of the overall proportioning range, no adjustment is required.
5. For sequence operation without deadspot or with a deadspot of less than one-third of the overall proportioning, turn the eccentric screw to the left. Turning the eccentric screw three-fourths of its full travel to the left will reduce the deadspot to zero. Turning the eccentric screw less than three-fourths of its full travel will reduce the deadspot proportionally.
6. (Front wiper enters the active windings of its potentiometer before the back wiper leaves the active windings of its potentiometer.) For operation with partial overlap of wiper travel, turn the eccentric screw to the left as far as it will go.

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