

Linear Precision Potentiometer



Model 400 Series

Features:

- Linear actuation
- Conductive plastic
- Multiple styles available



Model Styles Available

Model #	Body Style	Termination Style	Weight (grams)
423	Round	Wire Leads	28 + (16 x mechanical travel)
424	Round	Gold Plated Terminals	28 + (16 x mechanical travel)
432	Round with Mounting Flange	Wire Leads	38 + (16 x mechanical travel)
434	Round with Mounting Flange	Gold Plated Terminals	38 + (16 x mechanical travel)
472	Rectangular	Wire Leads	21 + (12 x mechanical travel)
474	Rectangular	Gold Plated Terminals	21 + (12 x mechanical travel)
482	Rectangular with Mounting Flange	Wire Leads	23 + (12 x mechanical travel)
484	Rectangular with Mounting Flange	Gold Plated Terminals	23 + (12 x mechanical travel)

Electrical

Resistance Range	see Table 1
Standard Resistance Tolerance	±10%
Minimum Practical Resistance Tolerance	±5%
Independent Linearity ²	see Table 1
Minimum Practical Independent Linearity	see Table 1
Input Voltage	400 VDC maximum, not to exceed power rating
Power Rating	see Table 1 for Watts at 70°C, derating to 0 at 125°C
Dielectric Strength	1,000 V rms
Insulation Resistance	1,000 Megohms minimum
Output smoothness	0.1% maximum at 10" to 18" per minute
Actual Electrical Travel	see Table 1
Electrical Continuity Travel	within mechanical travel
End Voltage	maximum 0.5% of input voltage
Resolution	essentially infinite
Temperature Coefficient of Resistance ³	-400 ppm/°C typical
Temperature Coefficient of Output Voltage ⁴	±10 ppm/°C typical

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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Mechanical

Total Mechanical Travel	see Table 1
Actuating Force	10 oz. maximum
Shaft Rotation	continuous
Backlash	0.003" maximum
Static Stop Strength	10 lb. minimum

- ¹ Specifications subject to change without notice.
- ² Linearity is measured between 1% and 99% of input voltage.
- ³ Special TCR available to ± 100 ppm/ $^{\circ}$ C.
- ⁴ Measured with 10 VDC CW to CCW and slider at 50% of electrical travel.

Environmental

Operating Temperature Range	-40 $^{\circ}$ C to +125 $^{\circ}$ C dynamic, -55 $^{\circ}$ C to +125 $^{\circ}$ C static
Load Life	10 million shaft actuations at rated power & 70 $^{\circ}$ C, maximum 10% Δ R

Ordering

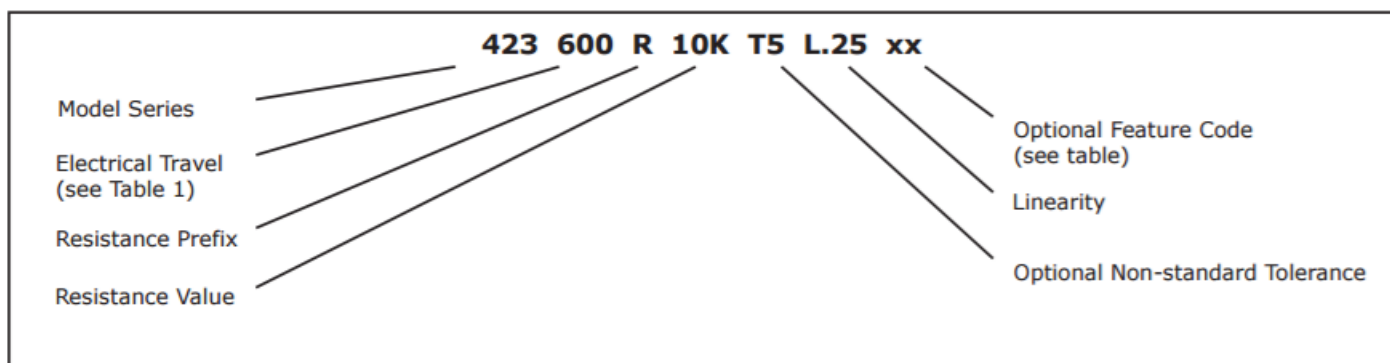


Table 1

Electrical Travel (Inches)	0.5"	1.0"	2.0"	3.0"
Ordering #	050	100	200	300
Standard Resistance Range (Ohms)	1K to 150K	2K to 300K	4K to 600K	8K to 900K
Standard Independent Linearity	$\pm 1.0\%$	$\pm 0.75\%$	$\pm 0.5\%$	$\pm 0.5\%$
Minimum Practical Independent Linearity	0.5%	0.25%	0.25%	0.25%
Power Rating (Watts)	0.5	0.75	1.0	1.5
Mechanical Travel (Inches)	0.6"	1.1"	2.1"	3.1"

Electrical Travel (Inches)	4.0"	5.0"	6.0"
Ordering #	400	500	600
Standard Resistance Range (Ohms)	1.2K to 1Meg	1.5K to 1.3Meg	2K to 1.5Meg
Standard Independent Linearity	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.25\%$
Minimum Practical Independent Linearity	0.25%	0.25%	0.15%
Power Rating (Watts)	2.0	2.5	3.0
Mechanical Travel (Inches)	4.1"	5.1"	6.1"

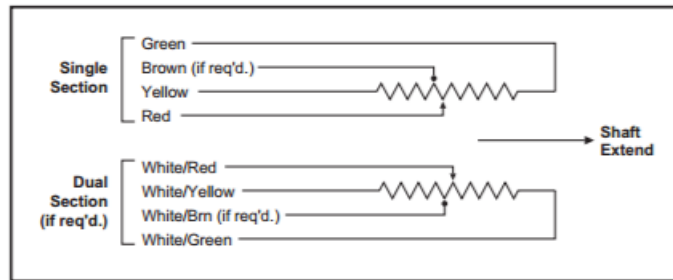
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Feature Codes

Center Tap	CT
Linearity Tape	LT
Two Gangs (dual section)	2G

Circuit Diagram



General Note

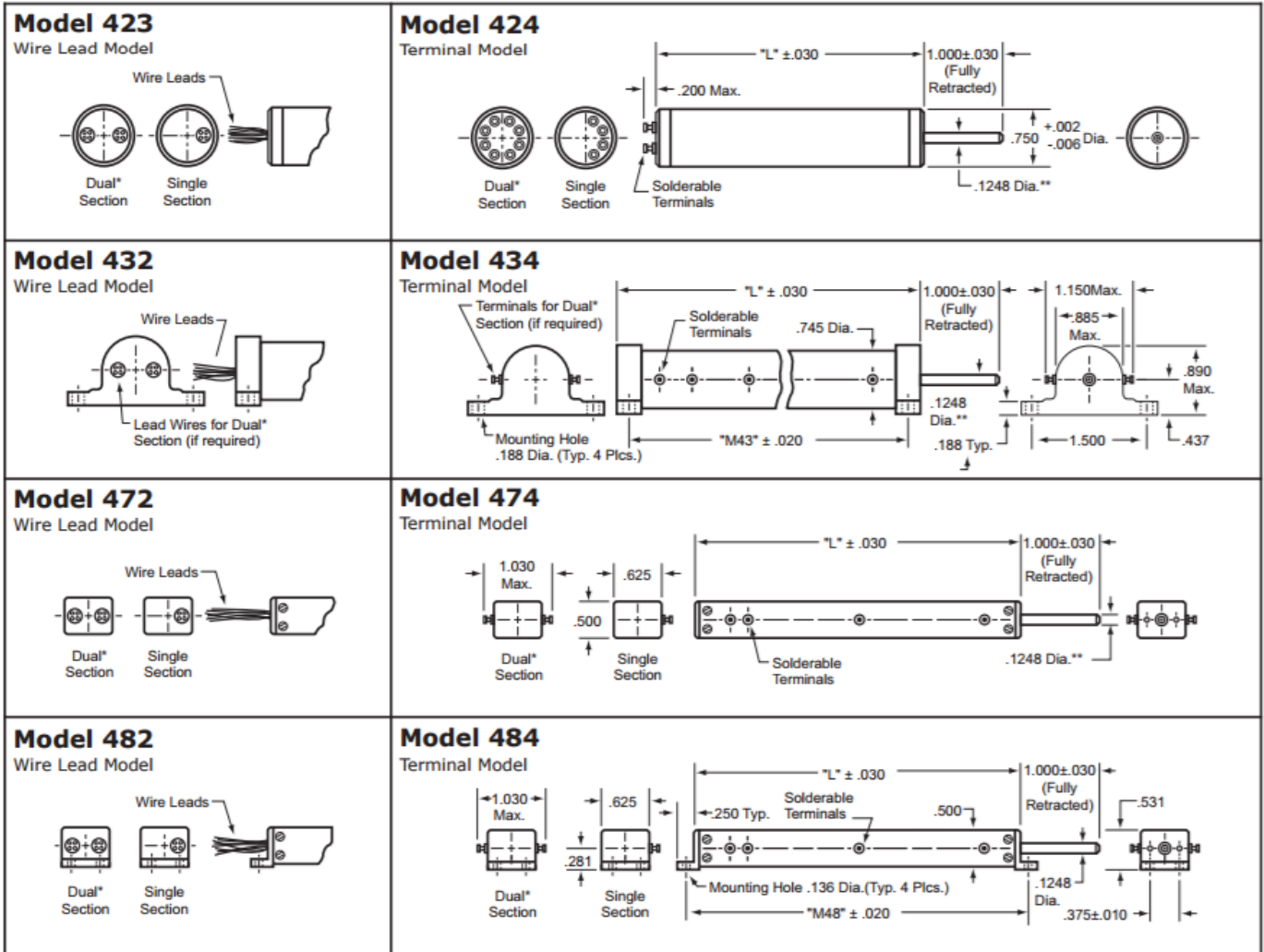
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Outline Drawings



Model Number	Elect. Travel Inch ± 0.015	Mech. Travel Inch ± 0.030	Dim "L" Inch ± 0.030	Dim "M43" Inch ± 0.020	Dim "M48" Inch ± 0.020
4XX-050	0.500	0.560	1.500	1.188	1.750
4XX-100	1.000	1.060	2.000	1.688	2.250
4XX-200	2.000	2.060	3.000	2.688	3.250
4XX-300	3.000	3.060	4.000	3.688	4.250
4XX-400	4.000	4.100	5.000	4.688	5.250
4XX-500	5.000	5.100	6.000	5.688	6.250
4XX-600	6.000	6.100	7.000	6.688	7.250

Notes:

- * Dual sections and Center Tap are available on special order only
- ** Diameter is 0.1248" +0.0000" / -0.0003"

Unspecified tolerances are ±0.005"
 Dimensions for "Wire Lead" models are the same as "Terminal" models except as indicated.
 Housings, brackets, and caps are anodized aluminum.
 Wire leads are #26 wire, 12 inch minimum length, meets MIL-C-16878C.
 Shafts are stainless steel, chamfer is 0.015" x 45°.

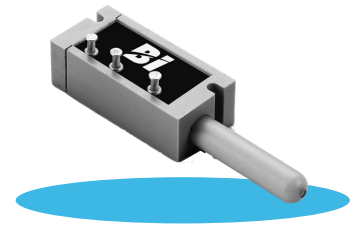
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Model 404 Series

Position Sensor



Features:

- Short travel (0.5 inches), linear motion with spring return
- Accurate position feedback
- Compact design for small spaces
- Conductive plastic technology
- Long life (5 million actuations)

Applications:

- Robotics
- Automotive
- Heavy equipment
- Industrial automation
- Wing flap position
- Pedal position
- Satellite dish
- Electro surgical equipment

Electrical

Resistance range	1K to 150K Ohms
Standard resistance tolerance	±10%
Minimum practical resistance tolerance	±5%
Independent linearity	±1%
Minimum practical independent linearity	±0.5%
Input voltage	400 VDC maximum, not to exceed power rating
Dielectric strength	1,000 V rms
Insulation resistance	1,000 Megohms minimum
Output smoothness	0.1% maximum at 10" to 18" per minute
Actual electrical travel	0.50" ±0.015" (12.7 mm ±0.38 mm)
Electrical continuity travel	Within mechanical travel
End voltage	Maximum 0.5% of input voltage
Resolution	Essentially infinite
Temperature coefficient of resistance	-400 ppm/°C typical
Temperature coefficient of output voltage	±10 ppm/°C typical

Mechanical

Torque mechanical travel	0.56" ±0.015" (14.2 mm ±0.38 mm)
Actuating force	14 oz. maximum, internal spring to return slider to extended position
Backlash	0.003" maximum
Static stop strength	20 lb. minimum
Body style	Rectangular
Termination style	Turret terminations

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Model 404 Series

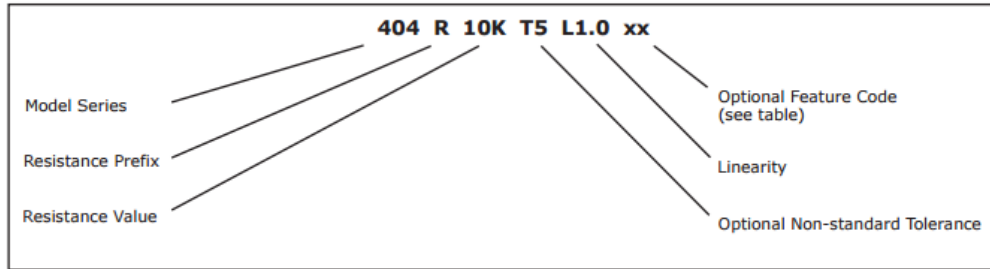
Position Sensor



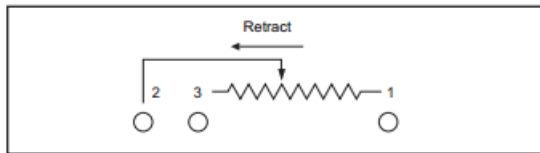
Environmental (MIL-PRF-39023)

Operating temperature range	-40°C to +125°C dynamic, -55°C to +125°C static
Load life	1 million shaft cycles at 0.25 Watts & 70°C, maximum 10% ΔR

Ordering Information



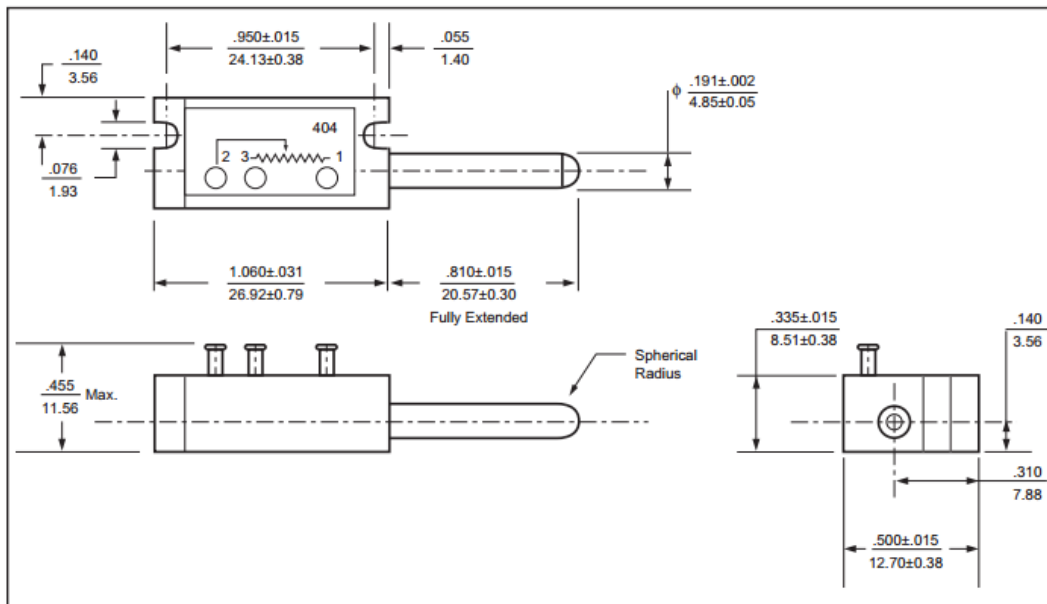
Circuit Diagram



Feature Codes

Linearity Tape	LT
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Outline Drawing



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Linear Precision Potentiometer



Model 405 Series

Features:

- Linear actuation
- Low cost
- Conductive plastic



Model Styles Available

Model #	Shaft	Termination Style	Weight (grams)
405	1/8" plain	Wire Leads	28 + (16 x mechanical travel)

Electrical

Resistance Range	see Table 1
Standard Resistance Tolerance	±20%
Minimum Practical Resistance Tolerance	±10%
Independent Linearity ²	see Table 1
Minimum Practical Independent Linearity	see Table 1
Input Voltage	400 VDC maximum, not to exceed power rating
Power Rating	see Table 1 for Watts at 85°C, derating to 0 at 125°C
Dielectric Withstanding Voltage	1,000 V rms
Insulation Resistance	1,000 Megohms minimum at 500 VDC
Output smoothness	0.1% maximum at 10" to 18" per minute
Actual Electrical Travel	see Table 1
Electrical Continuity Travel	within mechanical travel
End Voltage	maximum 0.5% of input voltage
Resolution	essentially infinite
Temperature Coefficient of Resistance ³	-400 +/-400 ppm/°C typical
Temperature Coefficient of Output Voltage ⁴	±10 ppm/°C typical

Mechanical

Total Mechanical Travel	see Table 1
Actuating Force	10 oz. maximum
Shaft Rotation	continuous
Backlash	0.003" maximum
Static Stop Strength	10 lb. minimum

¹ Specifications subject to change without notice.

² Linearity is measured between 1% and 99% of input voltage.

³ Special hybrid TCR available to ±100 ppm/°C for narrower range of resistance.

⁴ Measured with 10 VDC CW to CCW and slider at 50% of electrical travel.



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Environmental

Operating Temperature Range	-40°C to +125°C dynamic, -55°C to +125°C static
Load Life	5 million shaft actuations at rated power & 70°C, maximum 10% ΔR

Ordering

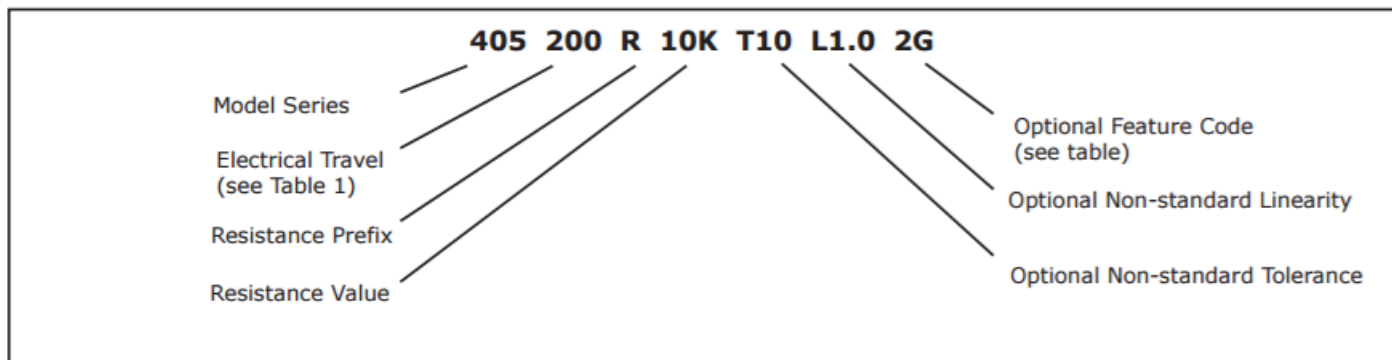


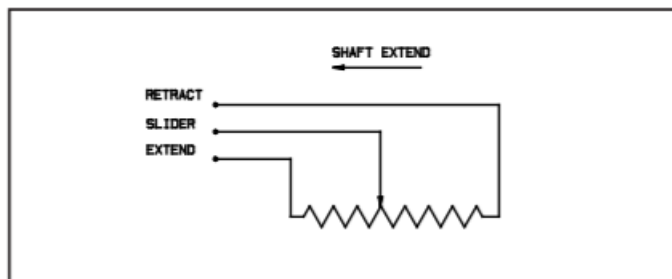
Table 1

Electrical Travel (Inches)	1"	2"	3"
Ordering #	100	200	300
Standard Resistance Range (Ohms)	1K to 300K	2K to 600K	3K to 900K
Hybrid (low TCR) resistance range (Ohms)	400 to 30K	700 to 60K	1K to 90K
Standard Independent Linearity	±1.5%	±1.5%	±1.0
Minimum Practical Independent Linearity	1.0	1.0	0.75
Power Rating (Watts)	0.75	1.0	1.5
Mechanical Travel (Inches)	1.060"	2.060"	3.060"

Feature Codes

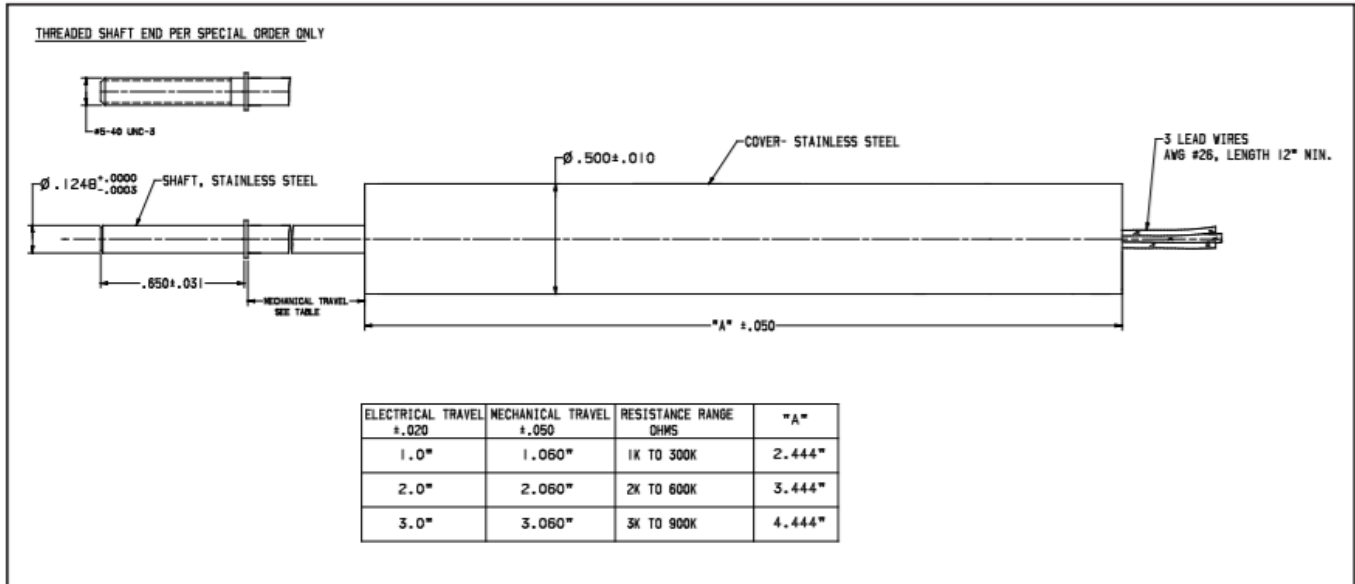
Linearity Tape	LT
Two Gangs (dual section)	2G
Threaded shaft (5-40 UNC-3A)	TS

Circuit Diagram



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