



# 东莞市凡睿电子科技有限公司

DONG GUAN FAN RUI TECHNOLOGY&ELECTRONICS CO., LTD.

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## 承认书

### FOR APPROVAL

承认编号

Samples lot No.: Spec.-RV169-20221101

发布日期:

Issue Date: 2022-11-28

版本号:

Version: 0

客户名称(Customer's Name): \_\_\_\_\_

客户摘要(Customer Note): \_\_\_\_\_

#### 客户确认回复/Evaluation Results

| 客户品名     | 客户料号     | 确 认 | 核 准 | 贵公司盖章 |
|----------|----------|-----|-----|-------|
| OK(判定可用) | NG(不可使用) |     |     |       |
|          |          |     |     |       |

如诚蒙贵公司确认合格，敝司将按样品进行生产交货，如规格有变请提前通知！

#### 以下为凡睿资料 FANRUI INFORMATION

机种类别(Product): RK166 旋转式电位器

产品规格(Part No.): RV169NHT01-M9N10-YC20A7.5-B10K280°±10%-L2

物料编码(Materiel No.):

产品图号(Drawing No.): GC-G-RK169-002

摘 要(Note): 碳膜角度 280°, ±10%总阻值误差, 一百万次旋转寿命。

|   |                         |     |
|---|-------------------------|-----|
| 凡睿电子科技有限公司专业生产销售各种编码器，电位器及多路旋转开关，公司从前期的产品开发，模具制做，到后期的零件生产，成品组装及销售为一体的一站式完成。并可根据客户要求设计开发各种编码器，电位器及多路旋转开关。欢迎来电咨询！ | 业务员<br>Sales Department | 曾海发 |
|   | 承 办<br>Prepared By      | 陈 炯 |
|   | 审 核<br>Proofed By       | 吕 单 |
|   | 核 准<br>Checked By       | 刘建国 |

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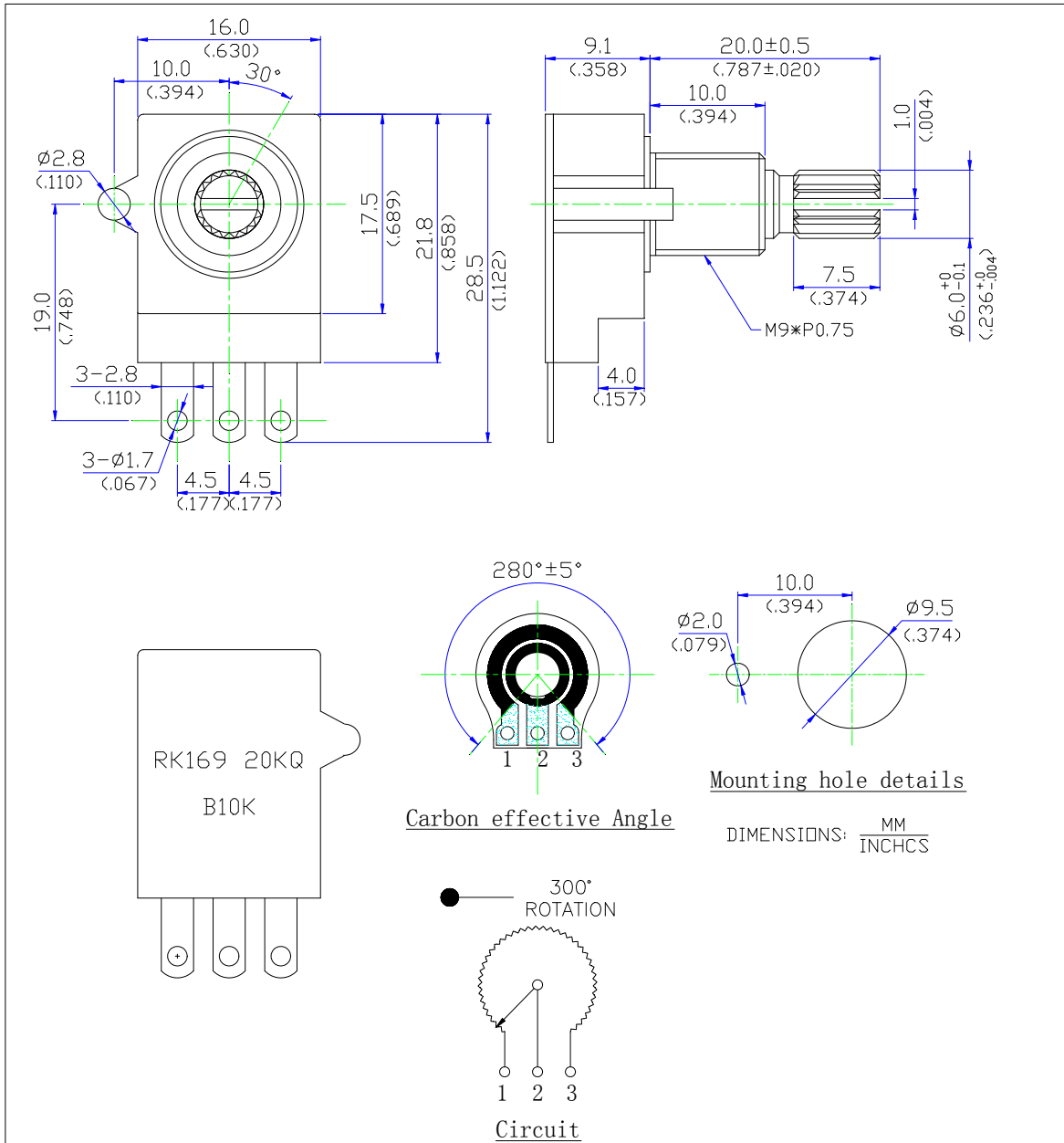


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|  |  |          |   |   |   |              |          |      |          |      |          |      |                   |     |
|--|--|----------|---|---|---|--------------|----------|------|----------|------|----------|------|-------------------|-----|
| 东莞市凡睿电子科技有限公司<br>DONG GUAN FAN RUI ELECTRONICS&TECHNOLOGY CO.,LTD. |  |          |   | $\triangle 3$<br>$\triangle 2$<br>$\triangle 1$ |   |              |          |      |          |      |          |      |                   |     |
| Title  | RK166 Series                           |          |   | Devision  | Date  | Design       |          |      |          |      |          |      |                   |     |
| Dwg Name   | RV169NHT01-M9N10<br>-YC20A7.5-B10K±10% |          |   |   | Unit<br>MM  | Scale<br>2:1 |          |      |          |      |          |      |                   |     |
| Dwg No   | GC-G-RK169-002                         | Version  | 0 | MTL   | <table border="1"> <tr> <td>UNDER 10</td> <td>±0.3</td> </tr> <tr> <td>10 ~ 100</td> <td>±0.5</td> </tr> <tr> <td>OVER 100</td> <td>±0.8</td> </tr> <tr> <td>ANGULAR DIMENSION</td> <td>±5°</td> </tr> </table> |              | UNDER 10 | ±0.3 | 10 ~ 100 | ±0.5 | OVER 100 | ±0.8 | ANGULAR DIMENSION | ±5° |
| UNDER 10   | ±0.3                                   |          |   |   |   |              |          |      |          |      |          |      |                   |     |
| 10 ~ 100   | ±0.5                                   |          |   |   |   |              |          |      |          |      |          |      |                   |     |
| OVER 100   | ±0.8                                   |          |   |   |   |              |          |      |          |      |          |      |                   |     |
| ANGULAR DIMENSION  | ±5°                                    |          |   |   |   |              |          |      |          |      |          |      |                   |     |
| DESIGN   | CHECK                                  | APPROVAL |   | SPEC  |   |              |          |      |          |      |          |      |                   |     |
|  |  |          |   | DISPOSAL  |   |              |          |      |          |      |          |      |                   |     |

# RK166 SERIES GENERAL SPECIFICATION

## RK169 系列规格书

|  |   |
|--|---|
| <b>1、GENERAL 一般事项</b>  |   |
| 1.1、Scope<br>The specification applies to model RK166 type mainly used for consumer products<br>1.2、Operating temperature range<br>1.3、Storage temperature range<br>1.4、Test conditions:<br>Standard atmospheric conditions:<br>Unless otherwise specified,the standard range of atmospheric conditions for making measurements and test is as follows:<br>Ambient temperature:5~35℃ Relative humidity:45~85%<br>Air pressure:86kpa to 106kpa<br>If there is any doubt about the results,measurements shall be Made within the following limit:<br>Ambient temperature:20±2℃ Relative humidity:60~70%<br>定。 Air pressure:86kpa to 106kpa | 适用范围<br>此规格书适用于 RK166 机型<br>使用温度范围 -30℃~70℃<br>保存温度范围 -50℃~100℃<br>试验状态<br>标准状态<br>无特别规定之实验及测定以温度 5~35℃，相对湿度 45~85%，气压 86~106kpa 之标准状态测定。<br>发生判定疑问或另有特别要求则以基准状态（温度 20±2℃，相对湿度 60~70%，气压 86~106kpa）为标准测 |

### 1 ELECTRICAL CHARACTERISTICS 电气特性

| Item<br>项目   | Conditions<br>条件  | Specifications<br>规格  |
|--|---|---|
| 1、Nominal total resistance and tolerance<br>公称全阻抗值 | The resistance between terminals 1 and 3 shall be measured<br>端子 1-3 间阻值测定。   | <u>10 KΩ ± 10 %</u>   |
| 2、Resistance law<br>阻抗变化特性                         | Measurement shall be made by the resistance law method.<br>For other procedures(refer JISC5261 standard)<br>用电压法测试，参照 JISC5261 标准   | <u>B Taper 线性</u><br>See the potentiometer curve on the last page<br>参见最后一页电位器曲线图   |
| 3、Power rating<br>额定功率                             | Power rating is based on continuum full load operation at the maximum voltage between terminals 1 and 3 . Power rating vs.ambient temperature shall be denoted on the following graph.<br>端子 1-3 间连续负载后的最大功率。<br>环境温度对功率影响的曲线如下图所示：<br><div style="text-align: center;"> <p style="font-size: small;">Rated power ratio<br/>额定功率比(%)</p> <p style="font-size: small;">Ambient temperature 周围温度(°C)</p> </div> | <input checked="" type="checkbox"/> B taper: 0.25W<br>B 曲线:0.25W<br><input type="checkbox"/> Other taper: 0.1W<br>其它曲线:0.1W |
| 4、Rated voltage<br>额定电压                            | $E = \sqrt{PR}$<br>E: 额定电压 Rated voltage (V)<br>P: 额定功率 Power rating (W)<br>R: 公称阻抗值 Nominal total resistance (Ω)<br>The rated voltage is calculated by above formula.<br>When the rated voltage exceeds the maximum operating voltage, the maximum operating voltage shall be the rated voltage .<br>额定电压按以上公式计算。<br>额定电压大于最高使用电压时,最高使用电压作为额定电压.   | Maximum operating voltage<br>最高使用电压   |
|  |   | 150V AC   |
| 5、Residual resistance<br>残留电阻                      | Contact brush stop at the end of the (A). Resistance between terminals 1 and 2, terminals 2 and 3 shall be measured. A: Angle of effective rotation<br>接触刷停留在(A)终端位置,在端子 1-2 间,端子 2-3 间测定之电阻值。<br>A:有效回转角度  | R1,2: $\leq 20 \Omega$ less<br>R2,3: $\leq 20 \Omega$ less<br>以下  |
| 6、Rotational noise<br>转动噪音                         | Apply DC 20V between terminals 1-3 to measure the noise voltage ( rated voltage $\leq 20V$ apply by rated voltage ).<br>在端子 1-3 间加直流电压 20V(额定电压 $\leq 20V$ ,则以额定电压值测试)后,测定的杂音电压.<br>Shaft rotation : 1 rotation / 3S                      轴转速:1 回转/3 秒  | 100mVp-p or less<br>$\leq 100mVp-p$ 以下  |


# RK166 SERIES GENERAL SPECIFICATION

## RK166 系列规格书

| 1 ELECTRICAL CHARACTERISTICS 电气特性          |  |   |   |
|--|--|---|---|
| Item<br>项 目                                | Conditions<br>条 件  |   | Specifications<br>规 格   |
| 7、Insulation resistance<br>绝缘阻抗            | Apply voltage of 100V DC<br>and measure for 1 minute   | Between individual terminals<br>and frame 端子-固定板    | 1 GΩ or more<br>1GΩ 以上  |
| 8、Dielectric strength<br>耐电压               | Measuring frequency : 50~60Hz;<br>1000V AC for 1 minute.   | Between individual terminals<br>and frame<br>端子-固定板 | Electrical characteristics shall be satisfied with<br>specification.<br>电气性能符合规定要求  |
| 2 MECHANICAL CHARACTERISTICS 机械特性          |  |   |   |
| 1、 Total mechanical<br>rotation 全回转角度      | Angle of effective rotation<br>有效旋转角度  |   | 300°±10°  |
| 2、 Rotational torque<br>旋转力矩               | Rotational speed<br>旋转速度 S 旋<br>转速度 60°/S  | Standard atmospheric conditions<br>常温 5°C 至 35°C    | 20~200 gf.cm  |
| 5、 Terminal strength<br>端子强度               | A static load of 1.2kgf shall be applied to the terminals for 10 Seconds<br>in any direction(After fixation )<br>固定后与端子加 1.2kgf 的力矩并保持 10 秒  |   | Electrical characteristics<br>shall be satisfied with specification<br>电气性能符合规定要求   |
| 6、 Shaft stop strength<br>止档强度             | The following torsion moment load of (metal)6kg (plastic)3kg shall be<br>applied to the shaft for 5sec at both ends (After fixation).<br>固定后与轴转至末端加 (金属) 6Kg(塑胶) 3Kg 力矩并持续 5 秒。            |   | Electrical characteristics shall be<br>satisfied with specification.<br>电气性能符合规定要求  |
| 7、 Shaft push & pull<br>strength<br>轴向推拉强度 | Push & pull static load of 5kgf.cm shall be applied to the shaft in<br>vertical with axial directions for 10 seconds.(After fixation).<br>固定后与轴垂直的端面方向加 5Kg 并保持 10 秒。                      |   | Shaft without damage, rotational torque. without<br>abnormality . Electrical characteristics shall be<br>satisfied with<br>specification 轴无破损, 旋转无异常。<br>电气性能符合规定要求 |
| 8、 Nut tightening<br>strength<br>螺母紧固强度    |  |   | Metal ≥8kgf.cm<br>plastic ≥4kgf.cm  |
| 9、 Shaft wobble<br>轴摆动                     | A momentary load of 500gf.cm shall be applied at the point 5 mm from<br>the tip of the shaft in a direction perpendicular to the axis (after fixation)<br>固定后在与轴垂直的端面 5mm 处施加 500gf.cm 静载荷 |   | 0.7 x L / 30 mm p-p<br>L: 固定面到测试点的距离<br>L is the length between mounting surface and<br>measuring point .   |

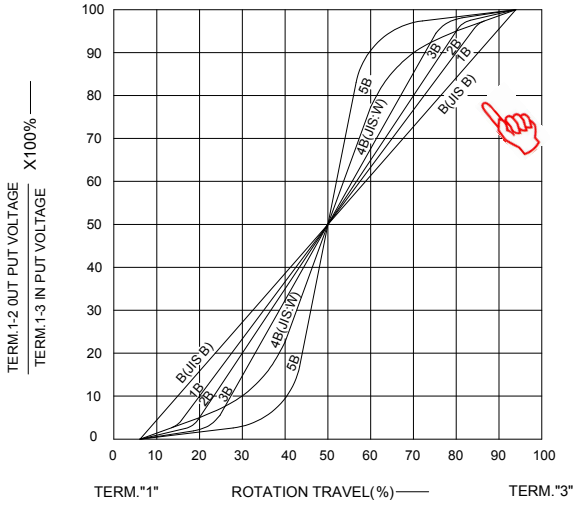
# RK166 SERIES GENERAL SPECIFICATION

## RK166 系列规格书

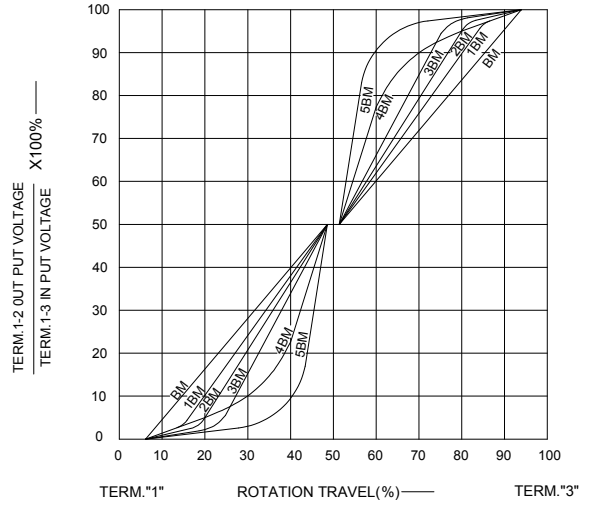
| <b>3 ENDURANCE CHARACTERISTICS 耐久性能</b> |   |   |          |          |
|---|---|---|----------|----------|
| Item<br>项 目                             | Conditions<br>条 件   | Specifications<br>规 格   |          |          |
| 1、Solderability<br>焊锡性                  | The terminals shall be stored at a temperature of 40°C with relative humidity of 90~95% and measured in 168 hours.<br>温度 40°C, 湿度 90~95%RH, 168 小时测定。<br>The terminals shall be immersed into solder bath at 260°C±5°C for 3±0.5S<br>端子在 260°C±5°C 温度的焊锡槽内浸锡 3±0.5 秒  | A new uniform coating of solder shall cover 75% minimum of the surface being immersed.<br>浸渍面须有 75% 以上焊锡附着  |          |          |
| 2、Resistance to soldering heat<br>焊锡耐热性 | Soldering method 手焊条件:<br>Soldering temperature 手焊温度: 300°C±10°C<br>Application time of soldering 时间: 3±1 秒<br><br>Substrate to be soldered: Copper clad laminated phenol in one surface of 1.6mm thickness, Do not use double sided through PCB.<br>Preheating: Surface temperature of substrate shall be settled within 100°C in one minutes.<br>使用基板: T=1.6mm 厚单面铜箔积层板面。<br>预热: 基板表面温度 100°C 以下, 1 分钟以内。<br>Wave soldering: 波峰焊条件:<br>Bit temperature 温度: 260°C±5°C<br>Application time of soldering 时间: 3±1 sec | Change in total resistance is relative to the value before test: ±5% Without visual deformation or terminals loosening, Electrical characteristics shall be satisfied with specification<br>总阻变化值: ±5% 外观无变形, 端子无松动, 电气性能符合规定要求 |          |          |
| 3、Resistance to heat<br>耐热性             | The potentiometer shall be stored at a temperature of 70°C±2°C for 120±8H in a thermostatic chamber. Then the potentiometer shall be measured after maintaining at standard atmospheric conditions for 1.5H, in order to remove surface moisture.<br>温度 70°C±2°C 恒温槽中 120±8 小时放置后, 置于常温常湿 1.5 小时除去水滴后测定。  | Change in total resistance is relative to the value before test: ±20%<br>总阻变化值: 初期值的±20%  |          |          |
| 4、Resistance to cold<br>耐寒性             | The potentiometer shall be stored at a temperature of -25±3°C for 96±4H in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed.<br>And measure the potentiometer which shall be subjected to standard atmospheric conditions for 1.5H.<br>温度 -25±3°C 恒温槽中 96±4 小时放置后, 置于常温常湿 1.5 小时除去水滴后, 1.5 小时内测定。   | Change in total resistance is relative to the value before test: ±20%<br>总阻变化值: 初期值的±20%  |          |          |
| 5、Damp heat<br>耐湿性                      | The potentiometer shall be stored at a temperature of 40±2°C, with relative humidity of 90% to 95% for 96±4H in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed, and measure the potentiometer which shall be subjected to standard atmospheric conditions for 1.5H.<br>温度 40±2°C, 湿度 90-95%, 恒温恒湿槽中放置 96±4 小时后, 置于常温常湿 1.5 小时除去水滴后, 1.5 小时内测定。  | Change in total resistance is relative to the value before test: +35%, -5%<br>总阻变化值: 初期值的+35%, -5%<br>Insulation resistance: 10M Ω or more<br>绝缘阻抗: 10M Ω 以上<br>Rotational Noise: 150mV p-p less than<br>转动噪音: 150mV p-p 以下     |          |          |
| 6、Endurance<br>耐久性                      | The moving contact without electrical load shall be rotated from one end stop to the other and returned to its original position exceeds 90% of effective angle. This procedure constitutes 1 cycle.<br>And the moving contact shall be subjected to 600 cycles per hour, total 1,000,000±200 cycles. (5000 to 8000 continuous cycles for 24H).<br>轴以 600 周/小时(来回算 1 周)的速度旋转, 24 小时旋转 5000~8000 周, 有效旋转角度超过 90%, 共 1,000,000±200 周。   | Variable Value of Total Resistance: specified value±15%<br>总阻变化值: 规格值范围的±15%<br>Noise 300mV p-p less than<br>转动噪音: 300mV p-p 以下<br>Rotational torque shall not deviate from the previously specified value.<br>回转矩满足规格值         |          |          |
| REVISION 变更记事                           | 变更时间  |  <b>东莞市凡睿电子科技有限公司</b>  |          |          |
|   |   | DSGD. 主办  | CHKD. 审查 | APPD. 核准 |
|   |   | TITLE 标题:   |          |          |
|   |   | POTENTIOMETER 电位器规格书  |          |          |
|   |   | Model. 机种:  |          |          |
|   |   | RK169 系列  |          |          |

# 电位器曲线图

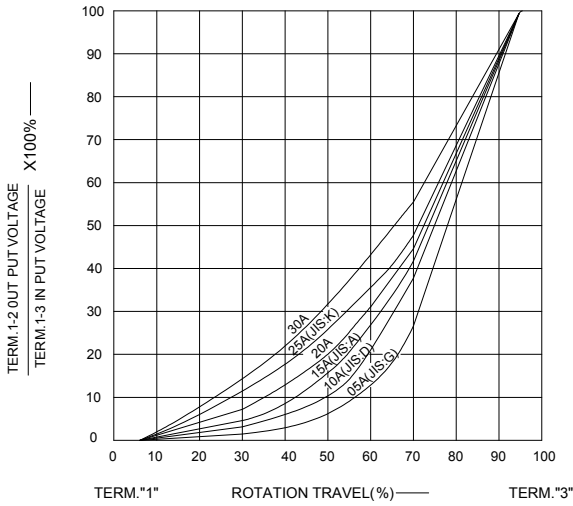
TAPERS B SERIES



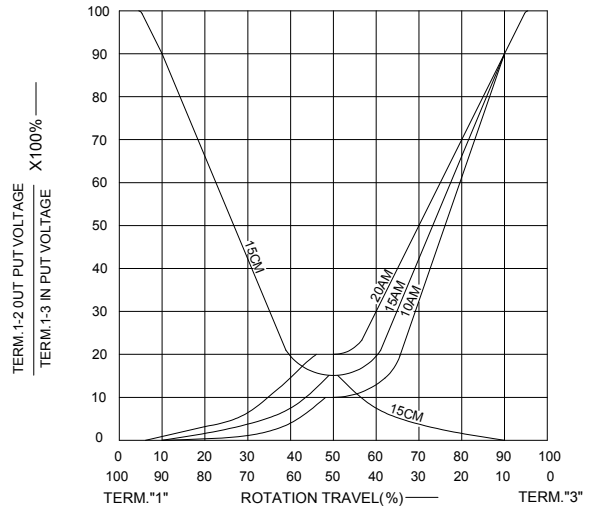
TAPERS B WITH 50% TAP



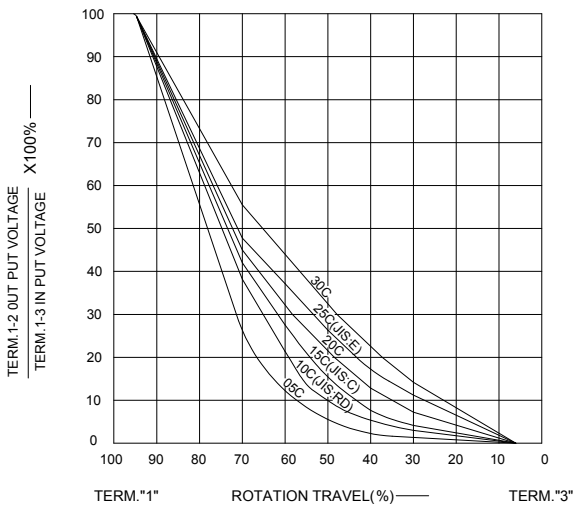
TAPERS A SERIES



TAPERS A & C WITH 50% TAP



TAPERS C SERIES



TAPERS M & N

