



Optimum power handling
Low on-state and switching losses
Designed for traction and industrial applications

Phase Control Stud Thyristor Type T171-200-16

| | | | | | | | | | | | | | | | | |
|------------------------------------|---------|-----|-----|-----|-----|-----|-----------|-----|-----|-------------|------|------|------|------|------|------|
| Mean on-state current | | | | | | | I_{TAV} | | | 200 A | | | | | | |
| Repetitive peak off-state voltage* | | | | | | | V_{DRM} | | | 100÷1600 V | | | | | | |
| Repetitive peak reverse voltage* | | | | | | | V_{RRM} | | | | | | | | | |
| Turn-off time | | | | | | | t_q | | | 125 μ s | | | | | | |
| V_{DRM}, V_{RRM}, V | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 |
| Voltage code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| $T_{jv}, ^\circ C$ | -60÷125 | | | | | | | | | | | | | | | |

* **1800 V** – Voltage class on demand

MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | Values | Test conditions | |
|------------------------|--|-------------------|--|--|--|
| ON-STATE | | | | | |
| I_{TAV} | Mean on-state current | A | 200 280 | $T_c = 100\ ^\circ C$; $T_c = 85\ ^\circ C$; 180° half-sine wave; 50 Hz | |
| I_{TRMS} | RMS on-state current | A | 314 | $T_c = 100\ ^\circ C$; 180° half-sine wave; 50 Hz | |
| I_{TSM} | Surge on-state current | kA | 7.5 8.6 | $T_j = T_{jmax}$ $T_j = 25\ ^\circ C$ 180° half-sine wave; 50 Hz ($t_p = 10$ ms); single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50\ \mu s$; $di_G/dt \geq 1$ A/ μs | |
| | | | 8.0 9.2 | $T_j = T_{jmax}$ $T_j = 25\ ^\circ C$ 180° half-sine wave; 60 Hz ($t_p = 8.3$ ms); single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50\ \mu s$; $di_G/dt \geq 1$ A/ μs | |
| I^2t | Safety factor | $A^2s \cdot 10^3$ | 280 365 | $T_j = T_{jmax}$ $T_j = 25\ ^\circ C$ 180° half-sine wave; 50 Hz ($t_p = 10$ ms); single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50\ \mu s$; $di_G/dt \geq 1$ A/ μs | |
| | | | 265 350 | $T_j = T_{jmax}$ $T_j = 25\ ^\circ C$ 180° half-sine wave; 60 Hz ($t_p = 8.3$ ms); single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50\ \mu s$; $di_G/dt \geq 1$ A/ μs | |
| BLOCKING | | | | | |
| V_{DRM}, V_{RRM} | Repetitive peak off-state and Repetitive peak reverse voltages | V | 100÷1600 | $T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; Gate open | |
| V_{DSM}, V_{RSM} | Non-repetitive peak off-state and Non-repetitive peak reverse voltages | V | 110÷1700 | $T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; single pulse; Gate open | |
| V_D, V_R | Direct off-state and Direct reverse voltages | V | $0.75 \cdot V_{DRM}$ $0.75 \cdot V_{RRM}$ | $T_j = T_{jmax}$; Gate open | |

| TRIGGERING | | | | |
|--------------------|---|------------------|---------|---|
| I_{FGM} | Peak forward gate current | A | 6 | $T_j = T_{j\ max}$ |
| V_{RGM} | Peak reverse gate voltage | V | 5 | |
| P_G | Gate power dissipation | W | 3 | $T_j = T_{j\ max}$ for DC gate current |
| SWITCHING | | | | |
| $(di_T/dt)_{crit}$ | Critical rate of rise of on-state current non-repetitive (f=1 Hz) | A/ μ s | 320 | $T_j = T_{j\ max}; V_D = 0.67 \cdot V_{DRM}; I_{TM} = 2 I_{TAV};$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$ |
| THERMAL | | | | |
| T_{stg} | Storage temperature | $^{\circ}C$ | -60÷125 | |
| T_j | Operating junction temperature | $^{\circ}C$ | -60÷125 | |
| MECHANICAL | | | | |
| M | Tightening torque | Nm | 25÷35 | |
| a | Acceleration | m/s ² | 100 | |

CHARACTERISTICS

| Symbols and parameters | | Units | Values | Conditions | |
|------------------------|---|------------|----------------------|---|---|
| ON-STATE | | | | | |
| V_{TM} | Peak on-state voltage, max | V | 1.75 | $T_j = 25\ ^{\circ}C; I_{TM} = 628\ A$ | |
| $V_{T(TO)}$ | On-state threshold voltage, max | V | 1.00 | $T_j = T_{j\ max};$ | |
| r_T | On-state slope resistance, max | m Ω | 1.120 | $0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$ | |
| I_L | Latching current, max | mA | 700 | $T_j = 25\ ^{\circ}C; V_D = 12\ V;$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$ | |
| I_H | Holding current, max | mA | 300 | $T_j = 25\ ^{\circ}C;$ $V_D = 12\ V; \text{Gate open}$ | |
| BLOCKING | | | | | |
| I_{DRM}, I_{RRM} | Repetitive peak off-state and Repetitive peak reverse currents, max | mA | 70 | $T_j = T_{j\ max};$ $V_D = V_{DRM}; V_R = V_{RRM}$ | |
| $(dv_D/dt)_{crit}$ | Critical rate of rise of off-state voltage ¹⁾ , min | V/ μ s | 1000 | $T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM}; \text{Gate open}$ | |
| TRIGGERING | | | | | |
| V_{GT} | Gate trigger direct voltage, max | V | 4.00 2.50 2.00 | $T_j = T_{j\ min}$ $T_j = 25\ ^{\circ}C$ $T_j = T_{j\ max}$ | $V_D = 12\ V; I_D = 3\ A;$ Direct gate current |
| I_{GT} | Gate trigger direct current, max | mA | 400 250 200 | $T_j = T_{j\ min}$ $T_j = 25\ ^{\circ}C$ $T_j = T_{j\ max}$ | |
| V_{GD} | Gate non-trigger direct voltage, min | V | 0.25 | $T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$ | |
| I_{GD} | Gate non-trigger direct current, min | mA | 10.00 | Direct gate current | |
| SWITCHING | | | | | |
| t_{gd} | Delay time | μ s | 2.00 | $T_j = 25\ ^{\circ}C; V_D = 0.4 \cdot V_{DRM}; I_{TM} = I_{TAV};$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$ | |
| t_q | Turn-off time ²⁾ , max | μ s | 125 | $dv_D/dt = 50\ V/\mu s; T_j = T_{j\ max}; I_{TM} = I_{TAV};$ $di_R/dt = -10\ A/\mu s; V_R = 100V;$ $V_D = 0.67 \cdot V_{DRM};$ | |

| THERMAL | | | | |
|-------------------|---|--------------|------------------|----------------|
| R _{thjc} | Thermal resistance, junction to case, max | °C/W | 0.0800 | Direct current |
| MECHANICAL | | | | |
| w | Weight, typ | g | 440 | |
| D _s | Surface creepage distance | mm (inch) | 12.40 (4.882) | |
| D _a | Air strike distance | mm (inch) | 12.40 (4.882) | |

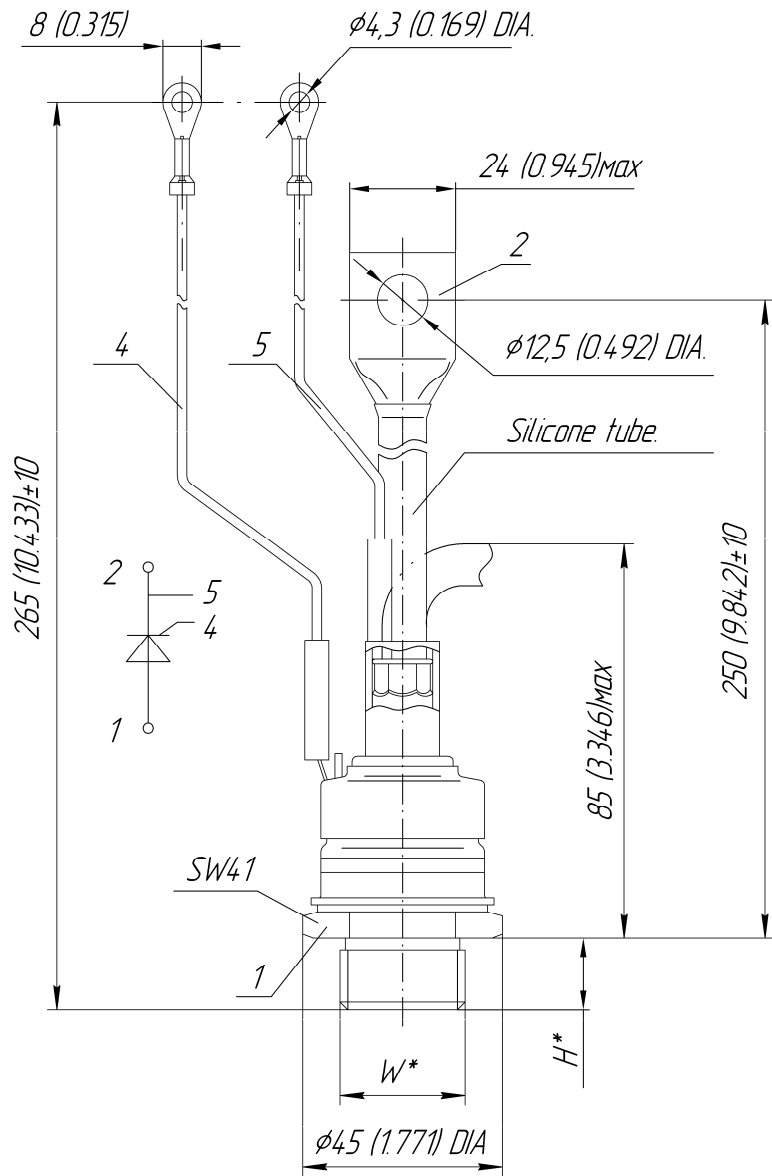
PART NUMBERING GUIDE

| | | | | |
|---|-----|-----|----|---|
| T | 171 | 200 | 16 | N |
| 1 | 2 | 3 | 4 | 5 |

1. Phase Control Thyristor
2. Design version
3. Mean on-state current, A
4. Voltage code
5. Ambient conditions: N – normal; T – tropical

OVERALL DIMENSIONS

Package type: T.SB1



| Type of screw | W | H |
|-----------------------------------|---------|----|
| Metric Screw Type C | M24x1,5 | 18 |
| Metric Screw Type B(upon request) | M20x1,5 | 18 |

| Polarity | Example of code designation | Reference designation | Colors | | |
|---------------|-----------------------------|-----------------------|--------|----------|-------|
| | | | Anode | Cathode | Gate |
| Anode to stud | T171-200-16 | | - | Red tube | White |

All dimensions in millimeters (inches)

The information contained herein is confidential and protected by Copyright. In the interest of product improvement, Proton-Electrotex reserves the right to change data sheet without notice.