



**TET ESTEL AS**  
ESTONIA

**June**  
**2013**

**Series**  
**T143-1000**

**Phase Control Press-Pack**  
**Thyristor**  
**Type T143-1000**

Center amplifying gate  
Low on-state and switching losses  
Designed for traction and industrial applications

Maximum mean on-state current	$I_{TAV}$				<b>1000 A</b>			
Maximum repetitive peak off-state and reverse voltage	$U_{DRM}$				<b>200 ÷ 800 V</b>			
Turn-off time	$U_{RRM}$				<b>125; 160; 200; 250 <math>\mu</math>s</b>			
$U_{DRM}, U_{RRM}, V$	200	300	400	500	600	700	800	
Voltage code	2	3	4	5	6	7	8	
$T_{vj}, ^\circ C$	- 60 ÷ 140							

**MAXIMUM ALLOWABLE RATINGS**

Symbols and parameters		Units	T143-1000	Conditions
$I_{TAV}$	Mean on-state current	A	1000 1550	$T_c=94^\circ C$ , $T_c=55^\circ C$ , 180° half-sine wave, 50 Hz
$I_{TRMS}$	RMS on-state current	A	1570	$T_c=94^\circ C$
$I_{TSM}$	Surge on-state current	kA	19 20	$T_{vj}=140^\circ C$ $T_{vj}=25^\circ C$ tp=10 ms $U_R=0$
$I^2t$	Limiting load integral	kA <sup>2</sup> s	1805 2000	$T_{vj}=140^\circ C$ $T_{vj}=25^\circ C$
$U_{DRM}, U_{RRM}$	Repetitive peak off-state and reverse voltage	V	200 ÷ 800	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open
$U_{DSM}, U_{RSM}$	Non-repetitive peak off-state and reverse voltage	V	300 ÷ 900	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave tp=10 ms, Single pulse Gate open
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current : non - repetitive repetitive	A/ $\mu$ s	400 200	$T_{vj}=140^\circ C$ ; $U_D=0,67 U_{DRM}$ , Gate pulse : 10V, 5 $\Omega$ , 1 $\mu$ s rise time, 10 $\mu$ s
$U_{RGM}$	Peak reverse gate voltage	V	5	$T_j \min \leq T_{vj} \leq T_{jM}$
$T_{stg}$	Storage temperature	$^\circ C$	-60 ÷ 80	
$T_{vj}$	Junction temperature	$^\circ C$	-60 ÷ 140	

**CHARACTERISTICS**

$U_{TM}$	Peak on-state voltage	V	1,6	$T_{vj}=25^\circ C, I_{TM}=3,14 I_{TAV}$
$U_{T(To)}$	Threshold voltage	V	0,9	$T_{vj}=140^\circ C$
$R_T$	On-state slope resistance	m $\Omega$	0,24	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
$I_{DRM}$ $I_{RRM}$	Repetitive peak off-state and reverse current	mA	60 60	$T_{vj}=140^\circ C$ , $U_D = U_{DRM}$ $U_R = U_{RRM}$

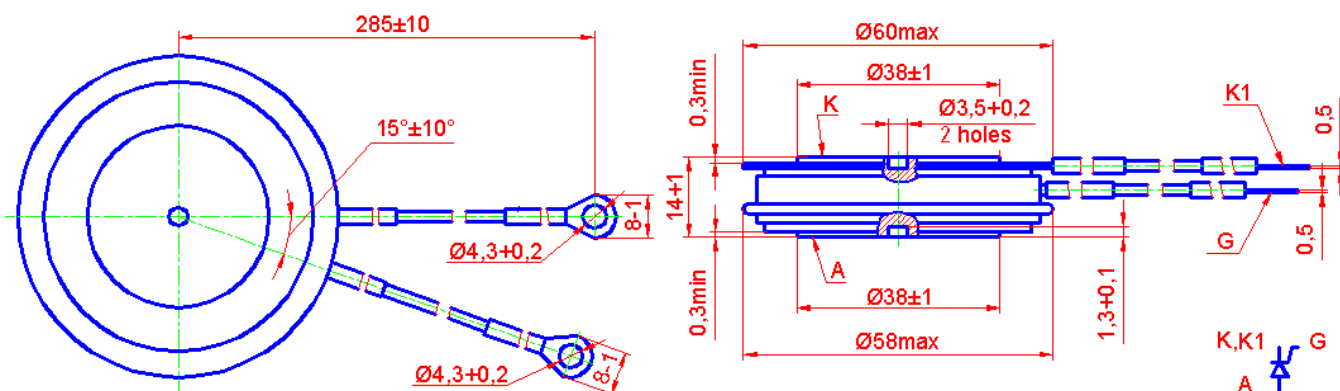
## CHARACTERISTICS

Symbols and parameters		Units	T143-1000	Conditions
$I_L$	Latching current	A	1	$T_{vj}=25^{\circ}C, U_D=12V$ Gate pulse : 10V, 5 $\mu$ s, 1 $\mu$ s rise time, 10 $\mu$ s
$I_H$	Holding current	A	0,5	$T_{vj}=25^{\circ}C, U_D=12V$ , Gate open
$U_{GT}$	Gate trigger direct voltage	V	2,5 5,0	$T_{vj}=25^{\circ}C$ , $T_{vj}=-60^{\circ}C$   $U_D=12V$
$I_{GT}$	Gate trigger direct current	A	0,3 0,85	$T_{vj}=25^{\circ}C$ , $T_{vj}=-60^{\circ}C$
$U_{GD}$	Gate non-trigger direct voltage	V	0,25	$T_{vj}=140^{\circ}C$ , $U_D = 0,67 U_{DRM}$
$I_{GD}$	Gate non-trigger direct current	mA	10	Direct gate current
$t_{gd}$	Delay time	$\mu$ s	3,2	$T_{vj}=25^{\circ}C, U_D=500V$ $I_{TM} = 1000 A$
$t_{gt}$	Turn-on time	$\mu$ s	6,3	Gate pulse : 10V, 5 $\mu$ s, 1 $\mu$ s rise time, 10 $\mu$ s
$t_q$	Turn-off time	$\mu$ s	125÷250	$T_{vj}=140^{\circ}C, I_{TM}=1000 A$ $di_R/dt = 10 A/\mu$ s, $U_R=100V$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 V/\mu$ s
$Q_{rr}$	Recovered charge	$\mu$ C	1700	$T_{vj}=140^{\circ}C, I_{TM}=1000 A$ $di_R/dt = 10 A/\mu$ s, $U_R=100V$
$t_{rr}$	Reverse recovery time	$\mu$ s	25	
$I_{rrm}$	Peak reverse recovery current	A	135	
$(du_D/dt)_{crit}$	Critical rate of rise of off-state voltage	V/ $\mu$ s	500 1000	$T_{vj}=140^{\circ}C, U_D = 0,67 U_{DRM}$ Gate open
$R_{thjc}$	Thermal resistance junction to case	$^{\circ}C/W$	0,030	Direct current, double side cooled

## ORDERING

<b>T</b>	<b>143</b>	<b>1000</b>	<b>6</b>	<b>7</b>	<b>2</b>	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

- Phase control thyristor.
- Design version.
- Mean on-state current, A.
- Voltage code (6=600 V).
- Critical rate of rise of off-state voltage ( $6 \geq 500 V/\mu$ s,  $7 \geq 1000 V/\mu$ s).
- Group of turn-off time ( $du_D/dt=50 V/\mu$ s,  $2 \leq 250 \mu$ s,  $P2 \leq 200 \mu$ s,  $3 \leq 160 \mu$ s,  $X2 \leq 125 \mu$ s).



Mounting force : 13÷19 kN  
Weight : 210 grams