

High Power Thyristor Hockey Puk Version Q/R-PUK Series 4000 PQ/PR

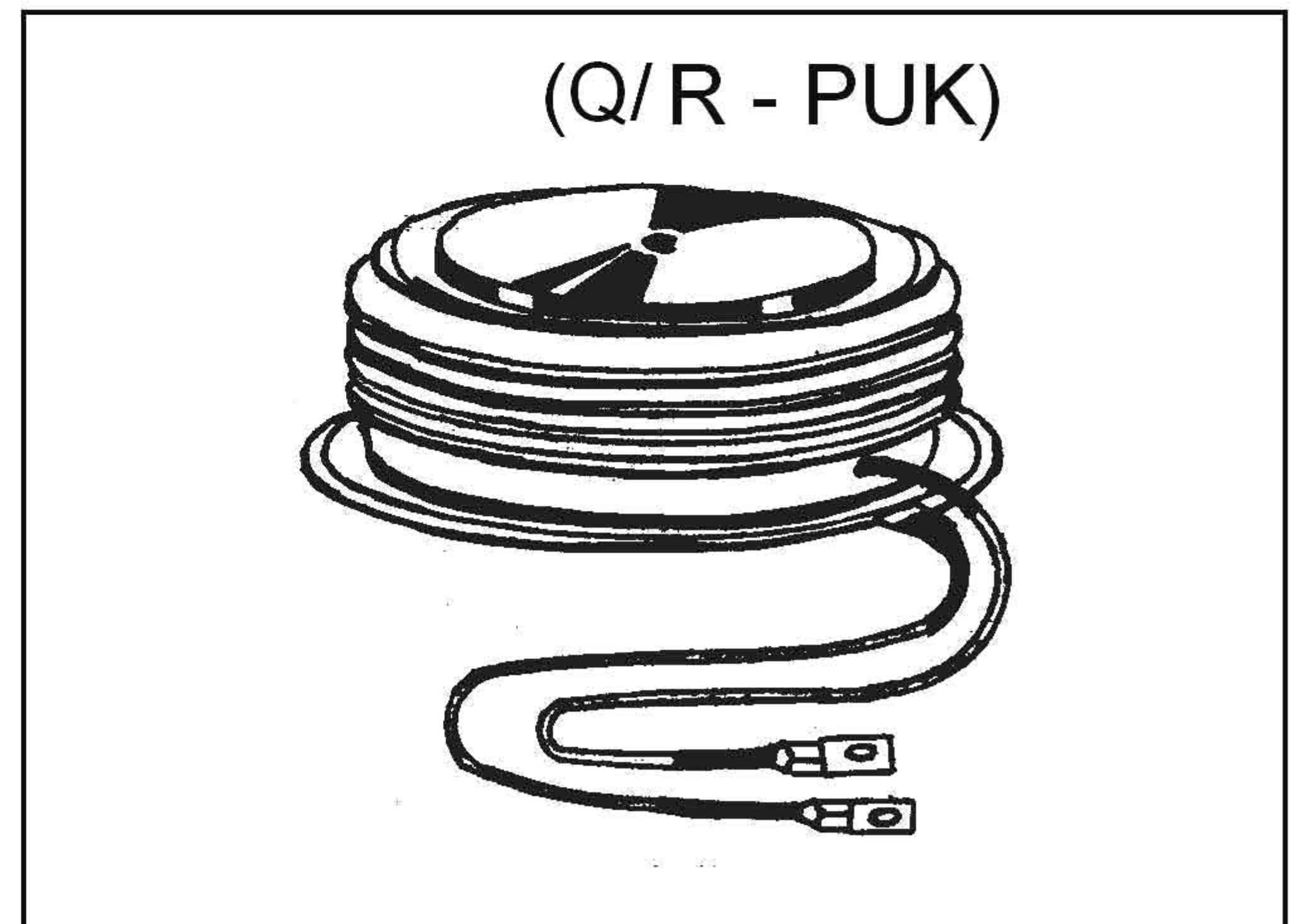
Types : 4000 PQ/PR 60 to 140

FEATURES

- ❖ Center amplifying gate.
- ❖ Metal case with ceramic insulator
- ❖ High profile hockey - puk.

TYPICAL APPLICATIONS

- ❖ DC motor control (e.g. for machine tools).
- ❖ Controlled rectifiers (e.g. for battery charging, Uninterrupted Power Supply).
- ❖ AC controllers (e.g. for temperature control, lights control).



Major Ratings and Characteristics

Parameter	4000PQ/PR	Units
$I_{T(AV)}$	4000	A
@ T_{hs}	55	°C
$I_{T(RMS)}$	6280	A
@ T_{hs}	55	°C
I_{TSM} @ 50 Hz	60	KA
I^2t @ 50 Hz	18000	KA ² s
V_{DRM}/V_{RRM}	600 to 1400	V
t_q typical	400	μs
T_J	-40 to 125	°C

SILICON CONTROLLED RECTIFIERS

ELECTRICAL SPECIFICATIONS

Types : 4000 PQ/PR

Voltage Ratings

Type number	Voltage Code	V_{DRM}/V_{RRM} , max repetitive peak and off-state voltage V	V_{RSM} , maximum non-repetitive peak voltage V	I_{DRM}/I_{RRM} max. @ $T_J = T_J$ max. mA
4000PQ/PR	60	600/600	700	150
	100	1000/1000	1100	
	120	1200/1200	1300	
	140	1400/1400	1500	

On - state Conduction

Parameter	4000PQ/PR	Units	Conditions		
$I_{T(AV)}$ Max. average on-state current @ Heatsink temperature	4000	A	180° conduction, half sine wave double side cooled		
	55	°C			
$I_{T(RMS)}$ Max RMS on-state current	6280	A	DC @ 55°C heatsink temperature double side cooled		
I_{TSM} Max. peak, one-cycle non-repetitive surge current	60	KA	t = 10 ms		Sinusoidal half wave, Initial $T_J = T_J$ max.
			t = 10 ms		
I^2t Maximum I^2t for fusing	18000	KA ² s	t = 10 ms		
$V_{T(TO)}$ Threshold voltage	0.85	V	$T_J = T_J$ max		
r_t on-state slope resistance	0.06	mΩ	$T_J = T_J$ max.		
V_{TM} Max. on state voltage	1.1	V	$I_{PK} = 3000A, T_J = T_J$ max, $t_p = 10$ ms sine pulse		
I_H Maximum holding current	400	mA	$T_J = 25^\circ C$, anode supply 12 V resistive load		
I_L Maximum latching current	1000	mA	$T_J = 25^\circ C$, anode supply 12 V resistive load		

SILICON CONTROLLED RECTIFIERS

Types : 4000 PQ/PR

Switching

Parameter	4000PQ/PR	Units	Conditions
di/dt Max. non-repetitive rate of rise of turned-on current	100	A/μs	Gate drive 20V, 20Ω , $t_r \leq 1\mu s$ $T_J = T_J \text{ max. anode voltage} \leq 80\% V_{DRM}$
t_q Typical turn-off time	400	μs	$I_{TM} = 1000A$, $T_J = T_J \text{ max.}$ di/dt = 40A/μs , $V_R = 75V$ dv/dt = 50V/μs, 0.5 V_{DRM} Reapplied , $t_p = 500\mu s$

Blocking

Parameter	4000PQ/PR	Units	Conditions
dv/dt Maximum critical rate of rise of off-state voltage	500	V/μs	$T_J = T_J \text{ max. linear to } 80\% \text{ rated } V_{DRM}$
I_{RRM} I_{DRM} Max. peak reverse and off-state leakage current	150	mA	$T_J = T_J \text{ max. rated } V_{DRM} / V_{RRM} \text{ applied}$

*Higher dv/dt is available on request

Triggering

Parameter	4000PQ/PR	Units	Conditions
P_{GM} Maximum peak gate power	30	W	$T_J = T_J \text{ max.}, t_p \leq 5 \text{ ms}$
$P_{G(AV)}$ Maximum average gate power	5		$T_J = T_J \text{ max.}, f = 50\text{Hz}, d\% = 50$
I_{GM} Max. peak positive gate current	3.0	A	$T_J = T_J \text{ max.}, t_p \leq 5 \text{ ms}$
$+V_{GM}$ Maximum peak positive gate voltage	20	V	$T_J = T_J \text{ max.}, t_p \leq 5 \text{ ms}$
$-V_{GM}$ Maximum peak negative gate voltage	5.0		
I_{GT} DC gate current required to trigger	250 MAX.	mA	$T_J = 25^\circ C$ Max.required gate trigger/ current/voltage are the lowest value which will trigger all units 12 V anode-to-cathode applied
V_{GT} DC gate voltage required to trigger	3.0 MAX.	V	$T_J = 25^\circ C$
I_{GD} DC gate current not to trigger	10	mA	$T_J = T_J \text{ max.}$ Max. gate current/voltage not to trigger is the max. value which will not trigger any unit with rated V_{DRM} anode-to-cathode applied
V_{GD} DC gate voltage not to trigger	0.25	V	

PHASE CONTROL THYRISTORS

Types : 4000PQ/PR

Thermal and Mechanical Specifications

Parameter		4000PQ/PR	Units	Conditions
T _J	Max.operating temperature range	-40 to 125	°C	
T _{stg}	Max.storage temperature range	-40 to 150		
R _{thJ-hs}	Max. thermal resistance, junction to heatsink	0.012	K/W	DC operation double side cooled
F	Mounting force, ± 10%	40	KN	
wt	Approximate weight	1050/1500	g	
Case style		Q/R-PUK		See Outline Table

