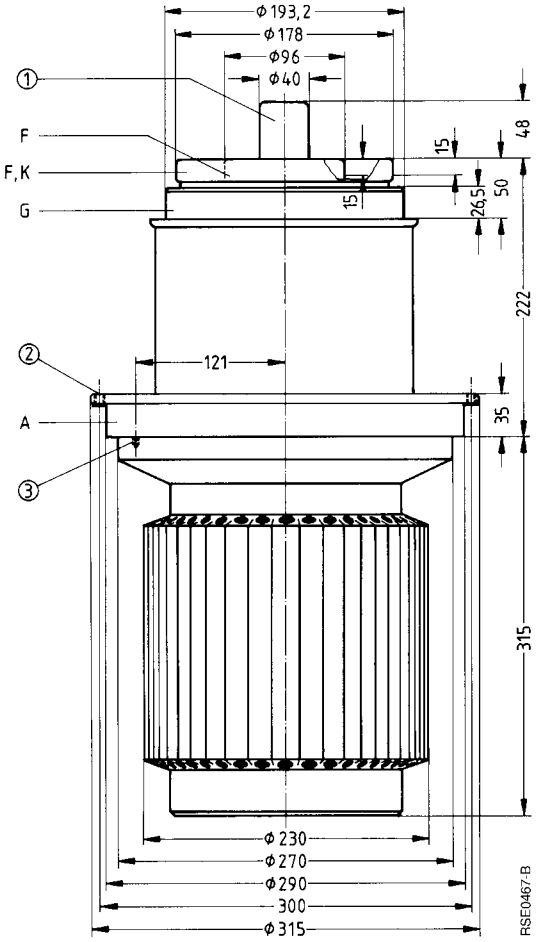
Ordering code Q53-X1043

Coaxial metal-ceramic triode, vapor-cooled, particularly suitable for broadcast transmitters of up to 200 kW medium and short wave.



Dimensions in mm

① Do not use as terminal
② Taphole M8 for screw-in handle RöZub41V
③ Taphole M5 for tube fuse RöSich4

Approx. weight 52 kg

Heating

Heater voltage	U_F	18	V
Heater current	I_F	≈ 260	A
Heating: direct			
Cathode: thoriated tungsten			

Characteristics

Emission current at $U_A = U_G = 750$ V	I_{em}	190	A
Amplification factor at $U_A = 4$ to 10 kV, $I_A = 5$ A	μ	55	
Transconductance at $U_A = 4$ kV, $I_A = 5$ A	s	135	mA/V

Capacitances

Cathode/grid	c_{kg}	≈ 270	pF
Cathode/anode	c_{ka}	≈ 3,8	pF [1])
Grid/anode	c_{ga}	≈ 115	pF

Accessories		**Ordering code**
Mounting instruction	RöMo14	
Mounting instruction	RöMo15	
Cathode terminal	RöKat202	C65055-A805-A61
Cathode connecting strip (4 for each tube)	RöKat221	Q81-X1136
Grid terminal	RöGit202b	Q81-X953
Socket wrench for tube fuse	RöZub10	Q81-X2110
Handle	RöZub41V	Q81-X2141
Tube fuse	RöSich4	Q81-X1404
Pull switch for tube fuse	RöKt11	Q81-X1311
Boiler	RöKüV41	Q81-X1641
Insulating pipe at vapor outlet	RöKüV41Zub3	Q81-X1643
Insulating pipe at water inlet	RöKüV41Zub4	Q81-X1644
Insulator	RöKüV41Zub5K	Q81-X1646
Union at water inlet	RöKüV41Zub7	Q81-X1647
Gasket at vapor outlet	RöKüV41Zub8	Q81-X1648
Water level stabilizer with control electrodes	RöZubV4	Q81-X2105
LL electrolytic target	RöEl23	C65055-A667-A23
Gasket ring for boiler	RöN9374	C65051-A202-C553

1) Measured by means of a 40 cm × 40 cm screening plate in the grid terminal plane.

Anode voltage modulation, grounded cathode circuit

Maximum ratings

Frequency	f	30	MHz
Anode voltage (dc)	U_A	13	kV
Grid voltage (dc)	U_G	– 1200	V
Cathode current (dc)	I_K	30	A
Peak cathode current	$I_{K\,M}$	190	A
Anode dissipation	P_A	180	kW
Grid dissipation	P_G	4,0	kW

Operating characteristics

Frequency	f	≤ 30	≤ 30	≤ 30	MHz
Carrier power	P_{trg}	212	165	110	kW [1]
Anode voltage (dc)	U_A	12,5	11	8,0	kV
Grid bias (dc), fixed	$U_{G\,fix}$	– 250	– 170	– 100	V
Grid resistance	R_G	40	40	33	Ω
Peak grid voltage (ac)	$U_{g\,m}$	870	1000	855	V
Anode current (dc)	I_A	21	19	18	A
Grid current (dc)	I_G	5,5	7,4	7,6	A
Anode input power	$P_{B\,A}$	262	209	144	kW
Drive power	P_1	4,4	7,1	6,0	kW [1]
Anode dissipation	P_A	50	44	34	kW [2]
Grid dissipation	P_G	1,8	3,6	3,4	kW
Efficiency	η	81	79	76,5	%
Anode load resistance	R_A	300	365	290	Ω
Modulation factor	m	100	100	100	%
Modulation power	P_{mod}	131	105	72	kW
Grid current (dc)	I_G	7,0	9,5	9,6	A [3]
Drive power	P_1	5,4	8,8	7,3	kW [1] [3]
Grid current (dc)	I_G	4,3	5,8	5,9	A [4]
Drive power	P_1	3,3	5,3	4,6	kW [1] [4]
Anode dissipation during modulation	$P_{A\,mod}$	75	66	51	kW

1) Circuit losses are not included.
2) Even during modulation the indicated maximum ratings must not be exceeded. It has to be observed that during 100 % modulation the plate dissipation increases to about 1,5 times the power dissipation stated for the carrier value.
3) Maximum values at U_A = 0 V.
4) Maximum values at peak modulation.

AF amplifier and modulator,
class B operation, 2 tubes in push-pull circuit

Maximum ratings

Anode voltage (dc)	U_A	13	kV
Grid voltage (dc)	U_G	– 1200	V
Cathode current (dc)	I_K	35	A
Peak cathode current	$I_{K\,M}$	190	A
Anode dissipation	P_A	180	kW
Grid dissipation	P_G	4,0	kW

Operating characteristics

Output power	P_2	0	450	0	400	kW
Anode voltage (dc)	U_A	12	12	10	10	kV
Grid voltage (dc)	U_G	– 180	– 180	– 150	– 150	V
Peak control grid voltage (ac) between the 2 tubes	$U_{gg\,m}$	0	1210	0	1205	V
Anode current (dc)	I_A	2×2	2×26	$2 \times 1{,}8$	2×28	A
Grid current (dc)	I_G	0	$2 \times 4{,}4$	0	$2 \times 4{,}8$	A
Peak grid current	$I_{G\,M}$	0	2×23	0	2×24	A
Anode input power	$P_{B\,A}$	2×24	2×312	2×18	2×280	kW
Drive power	P_1	0	$2 \times 2{,}4$	0	$2 \times 2{,}6$	kW
Anode dissipation	P_A	2×24	2×87	2×18	2×80	kW
Grid dissipation	P_G	0	$2 \times 1{,}6$	0	$2 \times 1{,}9$	kW
Efficiency	η	–	72	–	71,4	%
Effective load resistance (anode to anode)	R_{AA}	–	552	–	410	Ω

Tube mounting

Axis vertical, anode down.

For connection of the tube use the terminals listed under “Accessories”.

Maximum tube surface temperature

The temperature of the tube’s ceramic and metal parts must not exceed 220 °C at any point. Therefore, a sufficient air flow has to be provided to cool the terminal side.

Vapor cooling

Cooling data for maximum anode dissipation	$P_{A\,max}$ = 180 kW
Total power to be dissipated by the cooling system ($P_A + P_G + 0{,}8\ P_F$)	188 kW
Equivalent thermal output	11300 kJ/min (2700 kcal/min)
Flow rate of returning water	
at returning water temperature of 20 °C	approx. 4,4 l/min
at returning water temperature of 90 °C	approx. 5,1 l/min
Volume of generated vapor	
at returning water temperature of 20 °C	approx. 7,3 m^3/min
at returning water temperature of 90 °C	approx. 8,3 m^3/min

Detailed information on vapor cooling upon request. Please observe instructions on vapor cooling given under “Explanations on Technical Data”.

Safety precautions

The section “Safety precautions” under “Explanations on Technical Data” describes how the tube is to be protected against damage due to electric overload or insufficient cooling. A copper wire with 0,26 mm diameter should be used to test the anode overcurrent trip circuit.

For protection against thermal anode overload the tube fuse RöSich4 is recommended. In conjunction with pull switch RöKt11 it disconnects the voltages at the tube in case of overload (see accessories).

$U_G = f(U_A)$ Parameter = I_A ——————————
Parameter = I_G — — — — — — — —