

Transmitting  
and generating tubes  
supplement

October 1965

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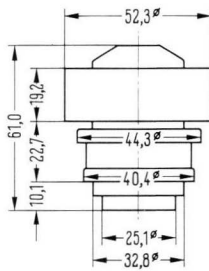
### Transmitting and generating tubes

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# RS 1062 C 7650

The RS 1062 C is a metal-ceramic forced-air-cooled power tetrode with concentric electrode contact surfaces for frequencies up to 1250 Mc. It is particularly suitable for class AB<sub>1</sub> linear amplifiers, class C power amplifiers, and AF power amplifier and modulator.



## General Data

### HEATING

Heater voltage = 6.3 volts  
Heater current = 7.5 amps

indirectly heated Matrix oxide cathode

Grid-screen amplification factor 12	} at DC plate voltage = 2000 volts DC Screen voltage = 400 volts DC plate current = 240 ma
Transconductance 22,000 $\mu$ mhos	

### INTERELECTRODE CAPACITANCES

Grid-Cathode	27.5 $\mu$ F	Grid-Plate max.	0.013 $\mu$ F
Screen-Cathode	max. 0.80 $\mu$ F	Grid-Screen	40 $\mu$ F
Plate-Cathode	max 0.010 $\mu$ F	Screen-Plate	5.4 $\mu$ F

## Maximum Ratings

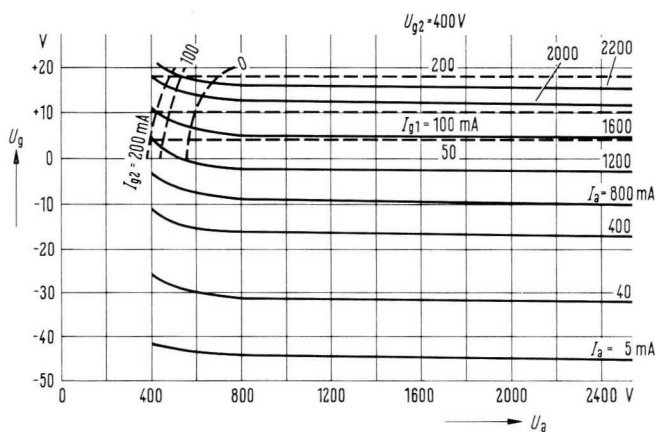
DC Plate Voltage ( $f \leq 1250$ Mc)	=	2500	max.	volts
DC Screen Voltage	=	1200	max.	volts
DC Plate Current	=	500	max.	ma
DC Grid Current	=	100	max.	ma
DC Grid Voltage	=	- 250	max.	volts
Plate Dissipation	=	700	max.	watts
Screen Dissipation	=	25	max.	watts

### Typical Operation

### RF Power Amplifier, Class C, Grounded Grid Operation

Frequency	=	800	470	Mc
Useful Power Output	=	580	730	watts
DC Plate Voltage	=	2500	2500	volts
DC Screen Voltage	=	400	400	volts
DC Grid Voltage	=	-45	-38	volts
DC Plate Current	=	500	500	ma
DC Screen Current	=	7	8	ma
DC Grid Current	=	11	12	ma
Driving Power	=	35	30	watts
Circuit Efficiency	=	75	80	%

### Characteristics

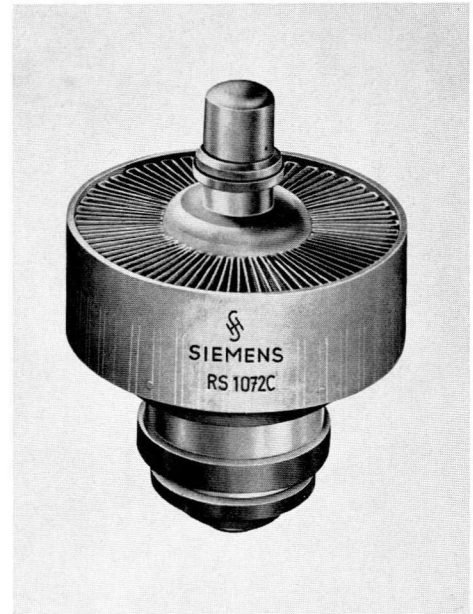
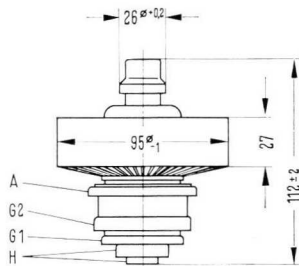


### Cooling

Required air flow on anode at max. plate  
dissipation 0,45 m<sup>3</sup>/min  $\approx$  16 cubic feet per min  
Static Pressure Drop 24,4 mm WS = 1 inch of Water  
Temperature of air at inlet 25 deg C  
Temperature of air at outlet 106 deg C

# RS 1072 C

The RS 1072 C is a metal-ceramic forced-air-cooled power tetrode with concentric electrode contact surfaces for frequencies up to 100 Mc. It is particularly suitable for class AB<sub>1</sub> linear amplifiers.



## General Data

### HEATING

Heater voltage = 3.8 volts ± 5%

Heater current ≈ 23 amps

indirectly heated Matrix oxide cathode

pre-heating time: 180 sec.

pre-heating time at heater voltage = 5 V; 50 sec\*)

Grid-screen amplification factor 11 at DC plate voltage 2000 volts

DC screen voltage = 500 volts

DC plate current = 1 amp

Transconductance

50,000 μmhos

DC plate current = 1 amp

### INTERELECTRODE CAPACITANCES

Grid-cathode 39 μμF Grid-plate 0.18 μμF

Grid-screen 58 μμF Plate-cathode 0.017 μμF

Screen-cathode 1.8 μμF Screen-plate 12 μμF

\*) As soon as the preheating time has elapsed, the heater voltage must immediately be switched back to its nominal value.

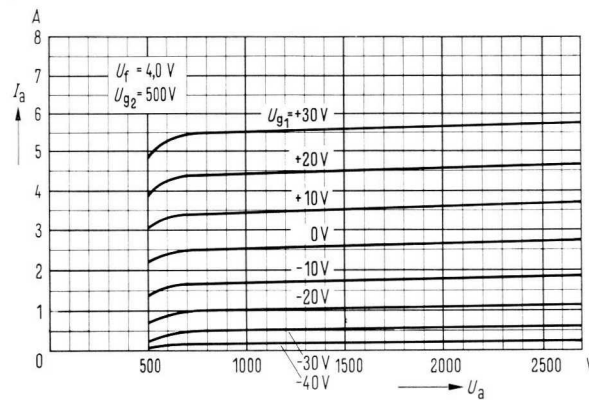
## Maximum Ratings

Frequency	=	100	max.	Mc
DC Plate voltage	=	3500	max.	volts
DC Screen voltage	=	1000	max.	volts
DC Cathode current	=	1.3	max.	amps.
Plate dissipation	=	1600	max.	watts
Grid dissipation	=	2,5	max.	watts
Screen dissipation	=	30	max.	watts

## Typical Operation

Linear RF Power Amplifier SSB, Suppressed Carrier, Class AB			
Modulation		one tone	
Frequency	=	60	Mc
Power Output	=	1100	watts
DC Plate Voltage	=	3000	volts
DC Screen Voltage	=	500	volts
DC Grid Voltage	=	-45	volts
Peak RF Grid Voltage	=	45	volts
Zero-signal DC Plate Current	=	0.3	amp.
DC Plate Current	=	0.7	amp.
Plate Dissipation	=	1000	watts
Grid Dissipation	=	0	watts

## Characteristics

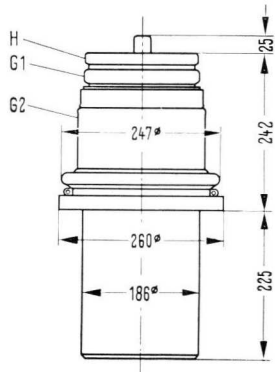


## Cooling

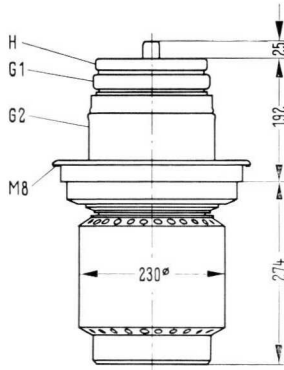
Required air flow on anode at max. plate dissipation  $1.5\text{ m}^3/\text{min} \approx 53$  cubic feet per min  
 Static Pressure Drop  $12.5\text{ mm WS} = 0.49$  inch of Water  
 Temperature of air at inlet  $45\text{ deg C}$   
 Temperature of air at outlet  $105\text{ deg C}$

# RS 2002

The RS 2002 is a coaxially based transmitting tetrode. The grid sections are constructed in metal-ceramic technique. This tube is particularly suited for application in commercial SSB communication transmitters. Maximum plate dissipation is 120 kW or 150 kW respectively, according to the method of cooling.



RS 2002 W  
YL 1090  
Weight approx. 32 kg



RS 2002 V  
YL 1091  
Weight approx. 51 kg



## General Data

### FILAMENT

Filament voltage = 22 volts }  
 Filament current ≈ 350 amps } thoriated tungsten cathode

Emission current 280 A at DC plate voltage = DC screen voltage = DC grid voltage = 700 volts

Grid-screen amplification factor 4 at DC plate voltage 3000 volts  
 DC screen voltage = 800 up to 1200 volts  
 DC plate current = 10 amps

Transconductance 130,000 μmhos at DC plate voltage = 3000 volts, DC screen voltage = 1000 volts  
 DC plate current = 10 amps

### INTERELECTRODE CAPACITANCES

Grid-filament	260 μμF	Grid-plate	8.5 μμF <sup>1)</sup>
Grid-screen	340 μμF	Plate-filament	1.7 μμF <sup>1)</sup>
Screen-filament	33 μμF	Screen-plate	118 μμF

<sup>1)</sup> measured with grounded flat metal shield with 50 cm diameter attached to the screen-grid terminal

## Maximum Ratings

Frequency	≦	30	Mc
DC Plate Voltage	=	15	max. kilovolts
DC Screen Voltage	=	1600	max. volts
DC Grid Voltage	=	-800	max. volts
Peak Cathode Current	=	280	max. amps
Plate Dissipation (RS 2002 W)	=	120	max. kilowatts
Plate Dissipation (RS 2002 V)	=	150	max. kilowatts
Grid Dissipation	=	1200	max. watts
Screen Dissipation	=	2700	max. watts



## Typical Operation

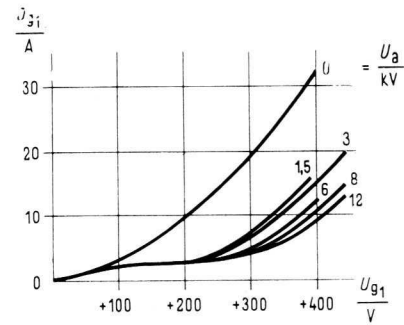
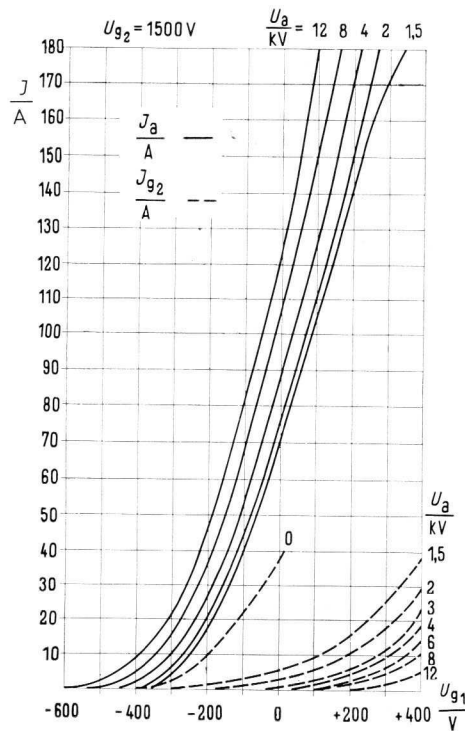
RF Linear Power Amplifier, SSB Modulation, Grid Current = 0

Modulation		without	one tone	two tone	
Power Output	=	0	120	60	kilowatts
DC Plate Voltage	=	9	9	9	kilovolts
DC Screen Voltage	=	1500	1500	1500	volts
DC Grid Voltage	≈	-450	-450	-450	volts
Peak RF Grid Voltage	≈	0	450	450	volts
DC Plate Current	≈	5	21	13.2	amps
DC Screen Current	≈	0	0.8	0.5	amps
Plate Input	≈	45	189	118.5	kilowatts
Plate Dissipation	≈	45	69	58.5	kilowatts
Screen Dissipation	≈	0	1200	750	watts
Efficiency	=	0	63.5	50.5	%

Other kind of operation:

Plate and Screen Modulation, Carrier Power Output = 220 kilowatts  
 at DC Plate Voltage = 11 kilovolts

## Characteristics



## Cooling

RS 2002 W

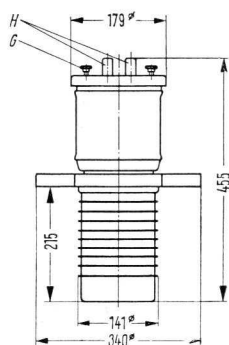
Required water flow on anode for inlet water temperature of 20 deg. C = 68 deg. F at max. plate dissipation . . . . 150 l/min ≈ 40 U. S. gallons per min.

RS 2002 V

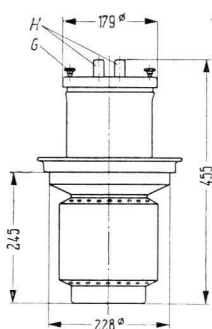
Particulars on request.

# RS 2031

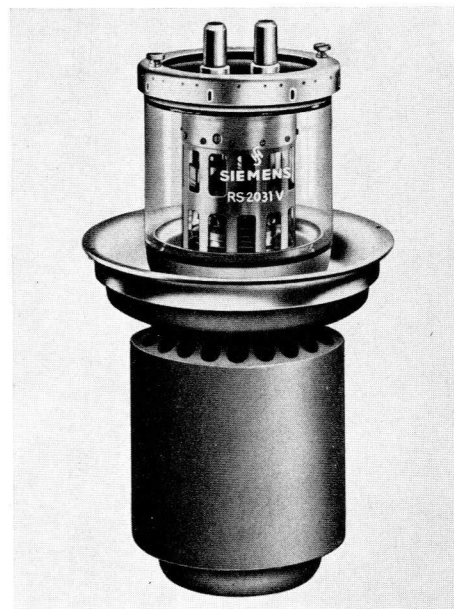
Low-Mu Power Triode intended primarily for use as an audio amplifier or modulator and for application in industrial RF-Generators at frequencies up to 30 Mc.



RS 2031 W  
YD 1090  
Weight approx. 17 kg



RS 2031 V  
YD 1092  
Weight approx. 39 kg



## General Data

### FILAMENT

Filament Voltage = 18 volts }  
 Filament Current approx. = 166 amps } Thoriated tungsten filament

Emission Current = 125 amps at DC Plate Voltage = DC Grid Voltage = 750 volts

Amplification Factor = 13,5 at DC Plate Voltage = 4 to 10 kilovolts,  
 DC Plate Current = 5 amps

Transconductance = 78,000  $\mu$ mhos at DC Plate Voltage = 4 kilovolts,  
 DC Plate Current = 5 amps

### INTERELECTRODE CAPACITANCES

Grid-Filament 160  $\mu$ F  
 Plate-Filament 7,6  $\mu$ F\*)  
 Grid-Plate 76  $\mu$ F

\*) measured with 40 x 40 cm grounded flat metal shield attached to the grid terminal

## Maximum Ratings

Frequency	30 max.	Mc
DC Plate Voltage	12 max.	kilovolts
DC Grid Voltage	-1500 max.	volts
DC Cathode Current	25 max.	amps
Peak Cathode Current	100 max.	amps
Plate Dissipation (RS 2031 W)	60 max.	kilowatts
Plate Dissipation (RS 2031 V)	110 max.	kilowatts
Grid Dissipation	1100 max.	watts

## Typical Operation

### RF-Power Amplifier Class C, Grounded Cathode

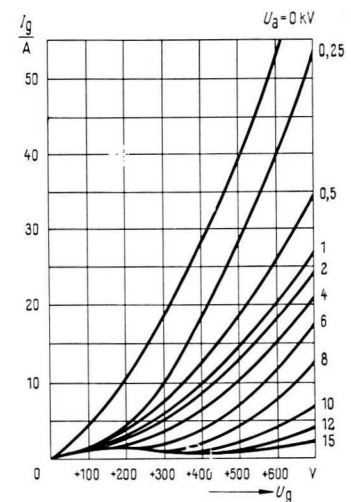
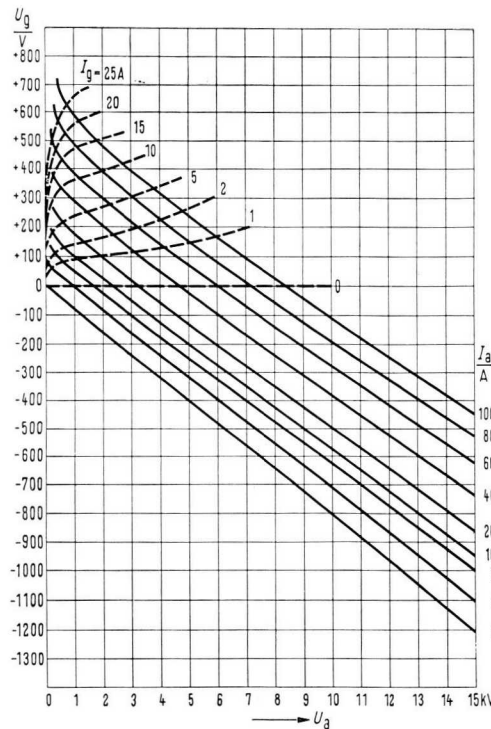
Frequency	30	30	Mc
Power Output	165	110	kilowatts <sup>1)</sup>
DC Plate Voltage	12	10	kilovolts
DC Grid Voltage	-1350	-1200	volts
Peak RF Grid Voltage	1830	1630	volts
DC Plate Current	17	13,8	amps
DC Grid Current	2	1,8	amps
Plate Input	204	138	kilowatts
Driving Power	3,3	2,7	kilowatts <sup>1)</sup>
Plate Dissipation	39	28	kilowatts
Grid Dissipation	600	500	watts
Efficiency	81	80	%
Plate Load Resistance	370	370	$\Omega$

<sup>1)</sup> Circuit losses are not included

Other kind of operation:

AF Power Amplifier and Modulator Power Output = 240 kilowatts  
DC Plate Voltage = 11 kilovolts

## Characteristics



## Cooling

### RS 2031 W

Required water flow on anode for inlet water temperature of 20 deg. C = 68 deg F. at max. plat dissipation... 60 l/min = 16 U. S. gallons.

### RS 2031 V

Particulars on request

## Accessories

Cathode Connectors (2 per tube)

Water Jacket (RS 2031 W)

Jacket for evaporative cooling (RS 2031 V)

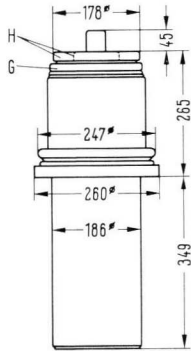
Rö Kat 201

Rö Kü 201

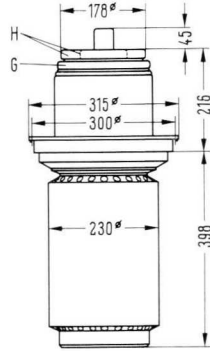
Rö Kü V 201

# RS 2041

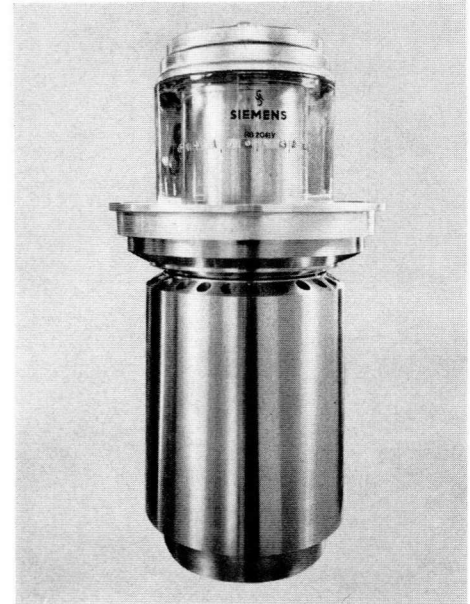
The RS 2041 is a high-power triode designed for use as a power amplifier in shortwave broadcasting transmitting service, or oscillator in industrial RF heating equipment, or grid-pulsed or plate-pulsed oscillator. Compact coaxial construction of all electrodes and terminals, together with metal-and-ceramic grid and filament insulators. The plate dissipation is rated at 170 kilowatts for water cooling and at 220 kilowatts for evaporative cooling.



RS 2041 W  
Weight approx. 40 kg



RS 2051 V  
Weight approx. 65 kg



## General Data

### FILAMENT

Filament Voltage	22 volts	} Thoriated tungsten filament
Filament Current approx.	400 amps	
Emission Current	380 amps	at DC Plate Voltage = DC Grid Voltage = 1000 volts
Amplification Factor	35	at DC Plate Voltage = 4 to 10 kilovolts
		DC Plate Current = 5 amps
Transconductance	180,000	$\mu$ hos at DC Plate Voltage = 4 kilovolts
		DC Plate Current = 10 amps

### INTERELECTRODE CAPACITANCES

Grid-Filament	320	$\mu$ $\mu$ F
Plate-Filament	6	$\mu$ $\mu$ F
Grid-Plate	130	$\mu$ $\mu$ F

## Maximum Ratings

Frequency	=	10	30	max.	Mc
DC Plate Voltage	=	18	12	max.	kilovolts
DC Plate Voltage (Plate Modulation)	=	12.5		max.	kilovolts
DC Grid Voltage	=	-1200	-1200	max.	volts
DC Cathode Current	=	60	60	max.	amps
Peak Cathode Current	=	380	380	max.	amps
Plate Dissipation (RS 2041 W)	=	170	170	max.	kilowatts
Plate Dissipation (RS 2041 V)	=	220	220	max.	kilowatts
Grid Dissipation	=	5.5	4.5	max.	kilowatts

### Typical Operation

Frequency	10	10	Mc
Carrier Power Output	380	280	kilowatts <sup>1)</sup>
DC Plate Voltage	12	11	kilovolts
DC Grid Voltage, fixed	—	—280	volts
Grid Resistor	93	44	ohms
Peak RF Grid Voltage	1200	1160	volts
DC Plate Current	40	32	amps
DC Grid Current	7	8	amps
Plate Input	480	355	kilowatts
Driving Power	8	9	kilowatts <sup>1)</sup>
Plate Dissipation	100	75	kilowatts
Grid Dissipation	3.5	4	kilowatts
Efficiency	79	79	%
Plate Load Resistance	186	185	ohms
Modulation Factor	100	100	%
Modulation Power	240	180	kilowatts
Peak RF Grid Voltage	2000 <sup>3)</sup>	1740 <sup>4)</sup>	volts
DC Grid Current	4.5	12	amps
Driving Power	12	20	kilowatts <sup>1)</sup>
Grid Dissipation, average	22	4.8	kilowatts <sup>2)</sup>

} Maximum values at  
Peak of Modulation

<sup>1)</sup> Circuit losses are not included

<sup>3)</sup> Driver stage 70% modulated

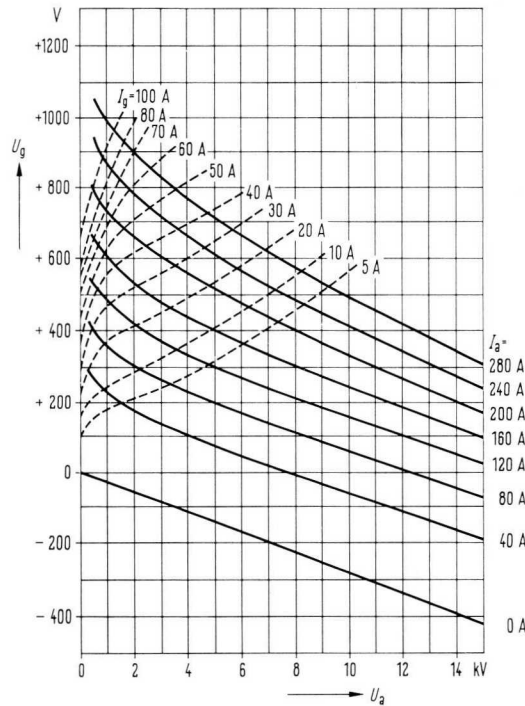
<sup>2)</sup> Average grid dissipation at 100% modulation

<sup>4)</sup> Driver stage 50% modulated

Other kind of operation:

RF Power Amplifier Power Output = 660 kilowatts  
(Class C) at DC Plate Voltage = 18 kilovolts

### Characteristics



### Cooling

#### RS 2041 W

Required water flow on anode for inlet water temperature of 20 deg. C = 68 deg. F.  
at max. plate Dissipation... 140 l per min = 37 U. S. gall. per min.

#### RS 2041 K

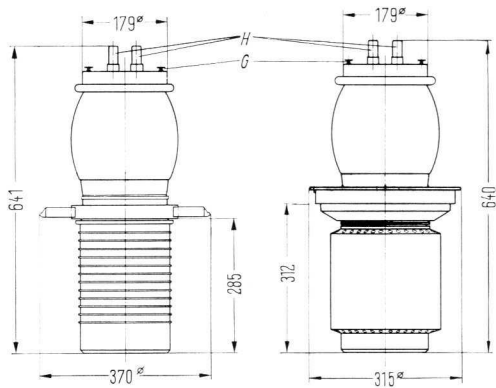
Particulars on request

### Accessories

Cathode Connectors	Rö Kat 202 a
Grid Connector	Rö Git 202 b
Water Jacket (RS 2041 W)	Rö Kü 241
Jacket for Evaporative Cooling (RS 2041 V)	Rö Kü V 241
Supplementary accessories on enquiry	

# RS 2051

The low- $\mu$  disc-seal triode RS 2051 is particularly suited for application in audio amplifiers or modulators. Maximum plate dissipation is 120 kW or 180 kW respectively, according to the method of cooling.



## General Data

### FILAMENT

Filament Voltage	18 volts	} Thoriated tungsten Filament
Filament Current approx.	280 amps	
Emissions Current	160 amps	at DC Plate Voltage = DC Grid Voltage = 650 volts
Amplification Factor	15	at DC Plate Voltage = 4 up to 10 kilovolts
		DC Plate Current = 5 amps
Transconductance	120,000	$\mu$ mhos at DC Plate Voltage = 4 kilovolts
		DC Plate Current = 5 amps

### INTERELECTRODE CAPACITANCES

Grid-Filament	250	$\mu\mu$ F
Plate-Filament	14	$\mu\mu$ F
Grid-Plate	130	$\mu\mu$ F

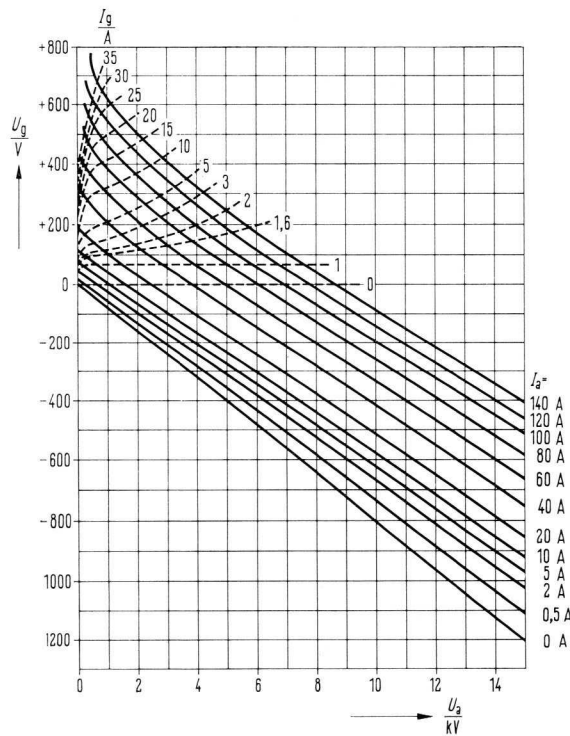
## Maximum Ratings

### AF Power Amplifier and Modulator

DC Plate Voltage	=	15	max.	kilovolts
DC Grid Voltage	=	-1500	max.	volts
DC Cathode Current	=	40	max.	amps
Peak Cathode Current	=	160	max.	amps
Plate Dissipation (RS 2051 W)	=	120	max.	kilowatts
Plate Dissipation (RS 2051 V)	=	180	max.	kilowatts
Grid Dissipation	=	2.5	max.	kilowatts

## Typical Operation

	500 kW carrier output power RS 2051 V		as modulator for 400 kW carrier output power		
Power Output	0	420	0	320	kilowatts
DC Plate Voltage	11		11		kilovolts
DC Grid Voltage	-700		-720		volts
Peak AF Grid to Grid Voltage	0	2100	0	1960	volts
DC Plate Current	2×3	2×31.4	2×2	2×24	amps
DC Grid Current	0	2×1.1	0	2×0.6	amps
Peak Grid Current	0	2×8.0	0	2×5	amps
Plate Input	2×33	2×345	2×22	2×264	kilowatts
Driving Power	0	2×1050	0	2×550	watts
Plate Dissipation	2×33	2×135	2×22	2×104	kilowatts
Grid Dissipation	0	2×280	0	2×120	watts
Efficiency	61		61		%
Effective Load Resistance (Plate to Plate)	350		450		ohms



## Cooling

### RS 2051 W

Required water flow on anode for inlet water temperature of 20 deg. C = 68 deg. F. at max. plate dissipation... 150 l/min  $\approx$  29.6 gallons (US Lip.) per min.

### RS 2051 V

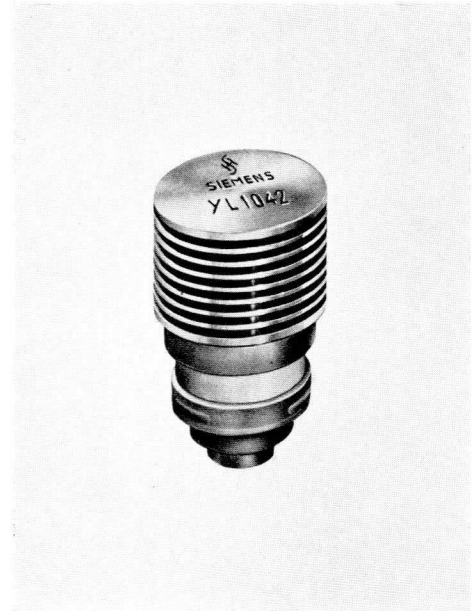
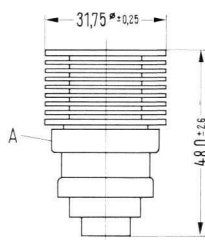
Particulars on request

## Accessories

Cathode Connectors (2 per tube)	Rö Kat 41
Water Jacket (RS 1041 W)	Rö Kü 41
Jacket for Evaporative Cooling (RS 1041 V)	Rö Kü V 41
Supplementary accessories on enquiry	

# YL 1042

The YL 1042 is a very small forced-air-cooled metal-ceramic planax tetrode for frequencies up to 2 kMc, particularly suited for application in commercial radio communications SSB transmitters and TV-Transposers. Due to its stability under severe shock and vibration the tube is ideal for use in mobile equipment.



Weight approx. 60 g

## General Data

### HEATING

Heater Voltage 6.3 volts }  
 Heater Current 1.1 amps } Matrix-Oxide-Cathode

Grid-Screen Amplification Factor 20 at DC Plate Voltage = 1000 volts  
 DC Screen Voltage = 200 volts  
 DC Plate Current = 100 ma

Transconductance 20,000  $\mu$ mhos at DC Plate current = 100 ma

### INTERELECTRODE CAPACITANCES

measured with special socket

Grid-Cathode	9 $\mu$ F	Grid-Plate	0.03 $\mu$ F
Grid-Screen	15 $\mu$ F	Screen-Cathode	0.2 $\mu$ F
Screen-Plate	3.5 $\mu$ F	Plate-Cathode	0.01 $\mu$ F

## Maximum Ratings

DC Plate Voltage ( $f \leq 1250$ Mc)	max.	1000 volts
DC Screen Voltage	max.	300 volts
DC Grid Voltage	max.	-75 volts
DC Cathode Current	max.	180 ma
Plate Dissipation	max.	130 watts
Screen Dissipation	max.	2 watts
Grid Current	max.	16 ma
Grid Resistor	max.	30 kohms



## Typical Operation

### Linear RF Power Amplifier, SSB

	one tone	two tone	
Class	AB <sup>1)</sup>	AB <sup>2)</sup>	
Frequency	60	900	Mc
Power Output	55	30 <sup>3)</sup>	watts
DC Plate Voltage	1000	1000	volts
DC Screen Voltage	300	300	volts
DC Grid Voltage	-14	-8.5	volts
Peak RF Grid Voltage	14	7	volts
Zero Signal DC Plate Current	40	140	ma
DC Plate Current	120	150	ma
Plate Input	120	150	watts
Plate Dissipation	65	117	watts
3rd order Intermodulation Products		35 <sup>4)</sup>	db
Gain		15	db

<sup>1)</sup> Grounded cathode

<sup>2)</sup> Grounded grid

<sup>3)</sup> Peak envelope power at 90 % circuit-efficiency

<sup>4)</sup> at plate Load resistance of 3000 ohms

Other kind of operation :

TV-Transposer

Power Output (sync. Level) = 12 watts

at DC Plate Voltage = 900 volts

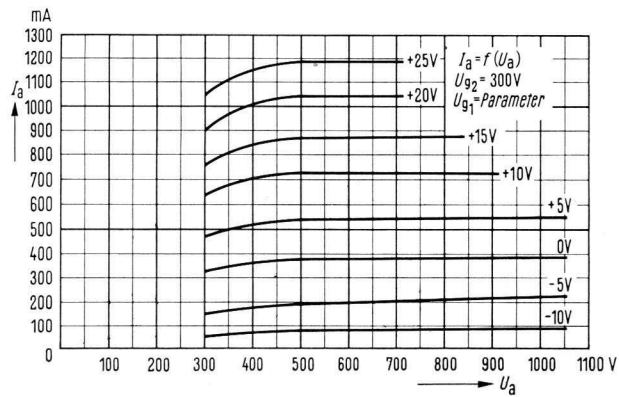
DC Screen Voltage = 300 volts

Zero-Signal

DC Plate Current = 100 ma

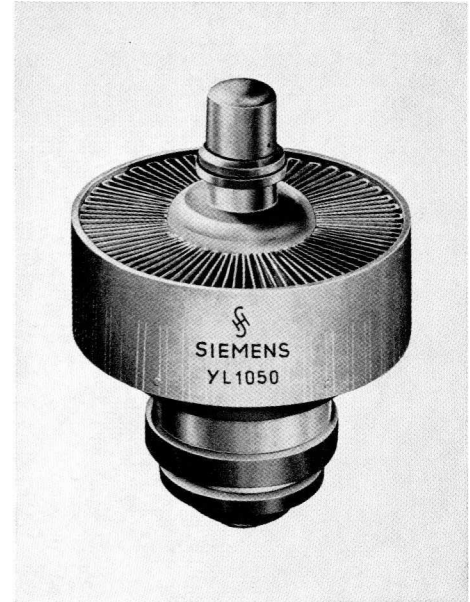
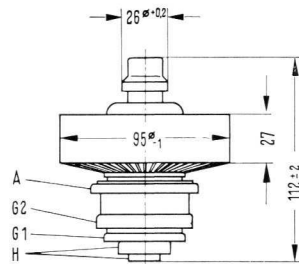
DC Plate Current = 120 ma

## Characteristics



# YL 1050

The YL 1050 is a metal-ceramic forced-air-cooled power tetrode with concentric electrode contact surfaces for frequencies up to 1250 Mc. It is particularly suitable for class AB<sub>1</sub> linear amplifiers, class C power amplifiers and the power stages of TV transmitters.



## General Data

### HEATING

Heater voltage = 3.8 volts ± 5%

Heater current ≈ 23 amps

indirectly heated Matrix oxide cathode

pre-heating time: 180 sec.

pre-heating time at heater voltage = 5 V; 50 sec \*\*)

Grid-screen amplification factor 12 at DC plate voltage = 2000 volts

DC screen voltage = 500 volts

DC plate current = 1 amp

Transconductance

55,000 μmhos

DC plate current = 1 amp

### INTERELECTRODE CAPACITANCES

Grid-filament 39 μμF      Grid-plate 0.18 μμF\*)

Grid-screen 58 μμF      Plate-filament 0.017 μμF\*)

Screen-filament 1.8 μμF      Screen-plate 12 μμF

\*) measured with 40 × 40 mm grounded flat metal shield attached to the screen-grid terminal.

\*\*\*) As soon as the preheating time has elapsed, the heater voltage must immediately be switched back to its nominal value.

## Maximum Ratings

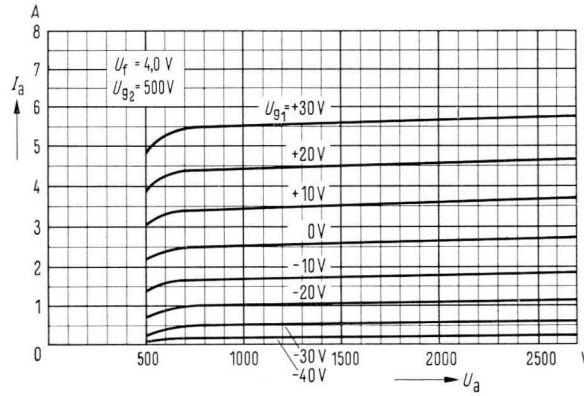
DC Plate Voltage (f ≤ 500 Mc)	=	2750	max.	volts
DC Plate Voltage (f ≤ 1250 Mc)	=	2500	max.	volts
DC Screen Voltage	=	1000	max.	volts
DC Cathode Current	=	1.3	max.	amps.
Plate Dissipation	=	1600	max.	watts
Grid Dissipation	=	10	max.	watts
Screen Dissipation	=	30	max.	watts

### Typical Operation

#### RF Power Amplifier, Class B

Frequency	=	600	Mc
Power Output	=	1000	watts
DC Plate Voltage	=	2500	volts
DC Screen Voltage	=	500	volts
DC Grid Voltage	=	- 50	volts
Peak RF Grid Voltage	=	60	volts
DC Plate Current	=	1.2	amp.
Driving Power	=	80	watts
Plate Dissipation	=	1600	watts

### Characteristics



### Cooling

Required air flow on anode at max. plate dissipation  $1.5 \text{ m}^3/\text{min}$   
 $\approx 53$  cubic feet per min  
 Static Pressure Drop  $12.5 \text{ mm WS} = 0.49$  inch of Water  
 Temperature of air at inlet  $45 \text{ deg C}$   
 Temperature of air at outlet  $105 \text{ deg C}$

