Covimag

AX3150CJ

HIGH POWER TRIODE

The AX3150CJ is a high power metal ceramic triode, intended for use in HF industrial generators for frequencies up to 100 MHz and output power up to 240 kW .

Cooling is accomplished by water.

GENERAL DATA

Electrical

Filament : Thoriated tungstenum direct heating			
Voltage (see note 1)	Vf	15	V
Current	If	255	A

Characteristics

Amplification Factor at Va = 14 to 12 kV ; Ia = 8A	μ	22	
Transconductance at Va = 12 kV ; Ia = 6 to 8 A	S	95	mA/V
Direct interelectrode capacitances			
Grid-Anode		66	pF
Grid-Cathode		170	pF
Anode-Cathode		4,5	pF

Mechanical

Overall dimensions		
Length	491	mm
Diameter	220	mm
See mechanical outline drawing		
Approximative weight	20	kg
Mounting position	Vertical, with anode up or down (see cooling characteristics)	
Cooling type	Water	

Accessories

Internal cathode terminal	Ref. 8311 219 25801
External cathode terminal	Ref. 8311 219 26001
Cathode connecting strip (2 per tube)	Ref. 8311 219 25201
Grid terminal for f ≤ 10 MHz	Ref. 8311 219 19401
Grid terminal for f > 10 MHz	Ref. 8311 219 25601
Handle	Ref. 8311 219 26201
Water connector (2 per tube)	Ref. 8311 219 26801

Cooling

To obtain optimum life, the seal/envelope temperature under normal operating conditions should be kept below 220 °C at any point.

Additional cooling by an air flow rate of approximately 3 m3/min, channeled on the tube terminal side is therefore required.

The cooling water diagram applies to water inlet temperature t_1 = 35 °C (100 kPa = 1 atm = 1 bar).

If the tube is mounted in normal position (anode down), water in the anode cooling jacket has to flow in the arrow-marked direction.

If the tube is mounted in reverse position (anode up), input and output water connections should be reversed.

Note 1

The cathodes consist of thoriated tungsten and are directly heated.

No RF voltage is permitted between the two heater terminals of the tube since this would result in an additional heating of the cathode. For this reason, a capacitive bridging of the cathode is generally required. To reduce resonance effects, a low-ohmic resistor should be provided at the heater terminals.

Heater voltage

The heating power is primarily determined by the heater voltage applied to the cathode. The rated heater voltage is the maximum voltage required by a new tube to supply its rated output power.

During operation, the heater voltage value should be kept as precisely as possible ; the utmost average deviation from the rated value may only amount to +1 % or -3%. Temporary deviations between +5 and -10% are permitted. Since higher voltage variations may occur in industrial power systems, stabilization of the heater voltage will usually be necessary.

The heater voltage should be set by means of an rms voltmeter, such as a moving iron meter of 0.5% accuracy, with the measurements being directly carried out at the cathode terminals.

An inaccurately set heater voltage has - due to physical principles - the following effects : on the one hand, the cathode service life is shortened by overheating, while underheating, on the other hand, reduces the emission capability and thereby the possible peak cathode current, thus causing a power decrease.

Heater current

The heater current of a new tube may deviate from the rated value within a set tolerance range. During service life decarburization of the cathode thoriated tungsten filaments causes an increasing heater current which may exceed the initial value by up to 15 %. This has to be considered when dimensioning the heater transformer.

OSCILLATOR FOR INDUSTRIAL APPLICATION

(Anode voltage from three-phase bridge rectifier)

Maximum ratings

Frequency	f	30	MHz
DC anode voltage	Va	15	kV
DC grid voltage	Vg	- 2	kV
DC cathode current	Ik	30	A
Peak cathode current	Ikp	140	A
DC grid current	Ig	4	A
No load DC grid current	Ig_{nl}	5	A
Anode dissipation	Wa	100	kW
Grid dissipation	Wg	2	kW
Grid resistor at blocked tube	Rgc	5	kΩ

OPERATING CHARACTERISTICS

Frequency	f	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	MHz
Output power (see note 2)	Wosc	240	210	190	140	100	kW
DC anode voltage	Va	14	13	12	10	8	kV
DC grid voltage	Vg	- 850	- 800	- 750	- 700	- 630	V
Peak RF grid voltage	Vgp	1310	1250	1200	1130	1050	V
Feedback factor	Vgp/Vap	10.5	10.7	11	12.3	14.2	%
DC anode current	Ia	22.3	20.9	20.3	17.7	15.8	A
DC grid current	Ig	3.1	3.1	3.3	3.4	3.6	A
Grid resistor	Rg	275	260	225	205	175	Ω
Anode input power	Wia	312	272	244	177	126	kW
Drive power	Wdrive	3.8	3.7	3.8	3.7	3.6	kW
Anode dissipation	Wa	68	58	50	33	23	kW
Grid dissipation	Wg	1.2	1.2	1.3	1.3	1.3	kW
Oscillator efficiency	ηosc	77	77	78	79	79	%
Anode load resistor	Ra	325	325	310	300	275	Ω

Note 2 : Not considering circuit losses

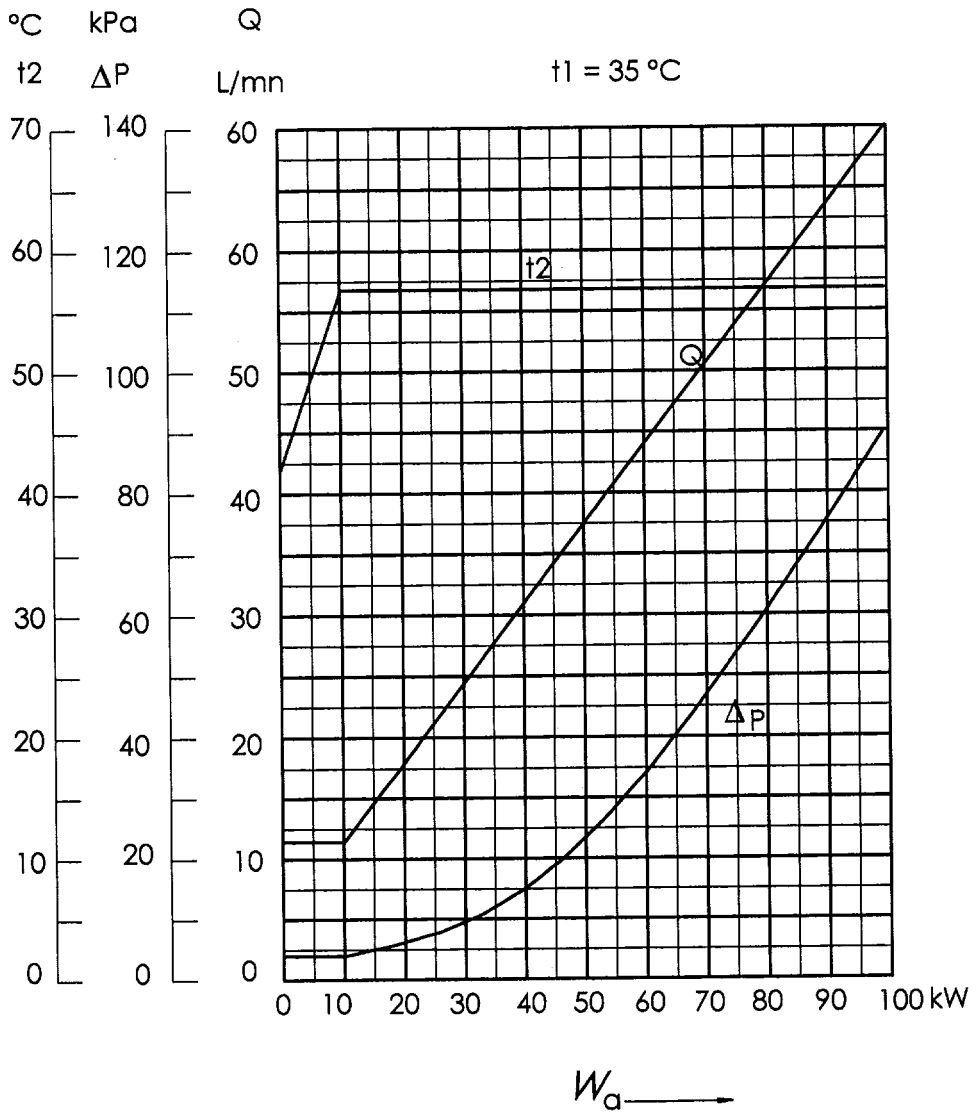


Table 1 - Cooling water diagram

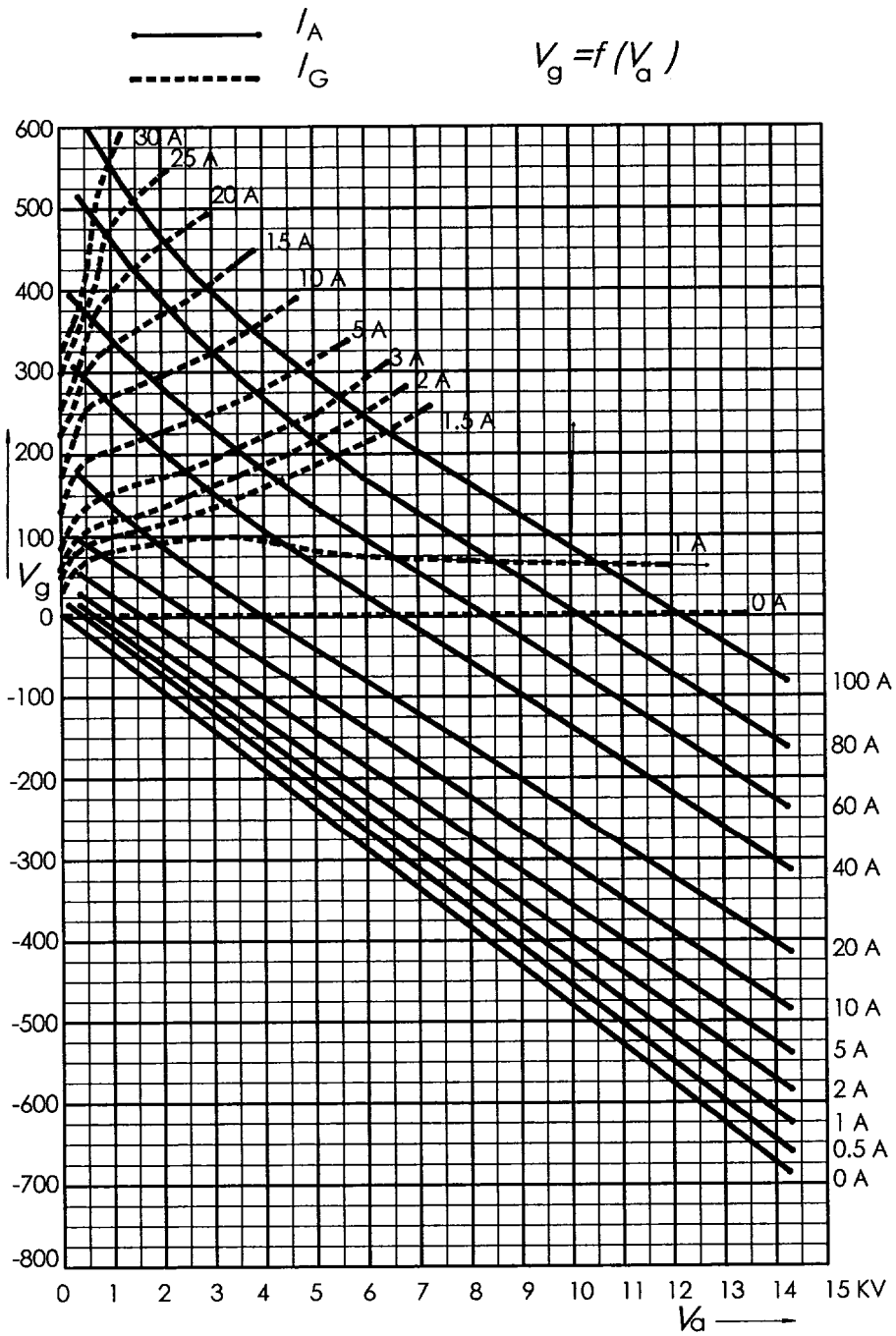
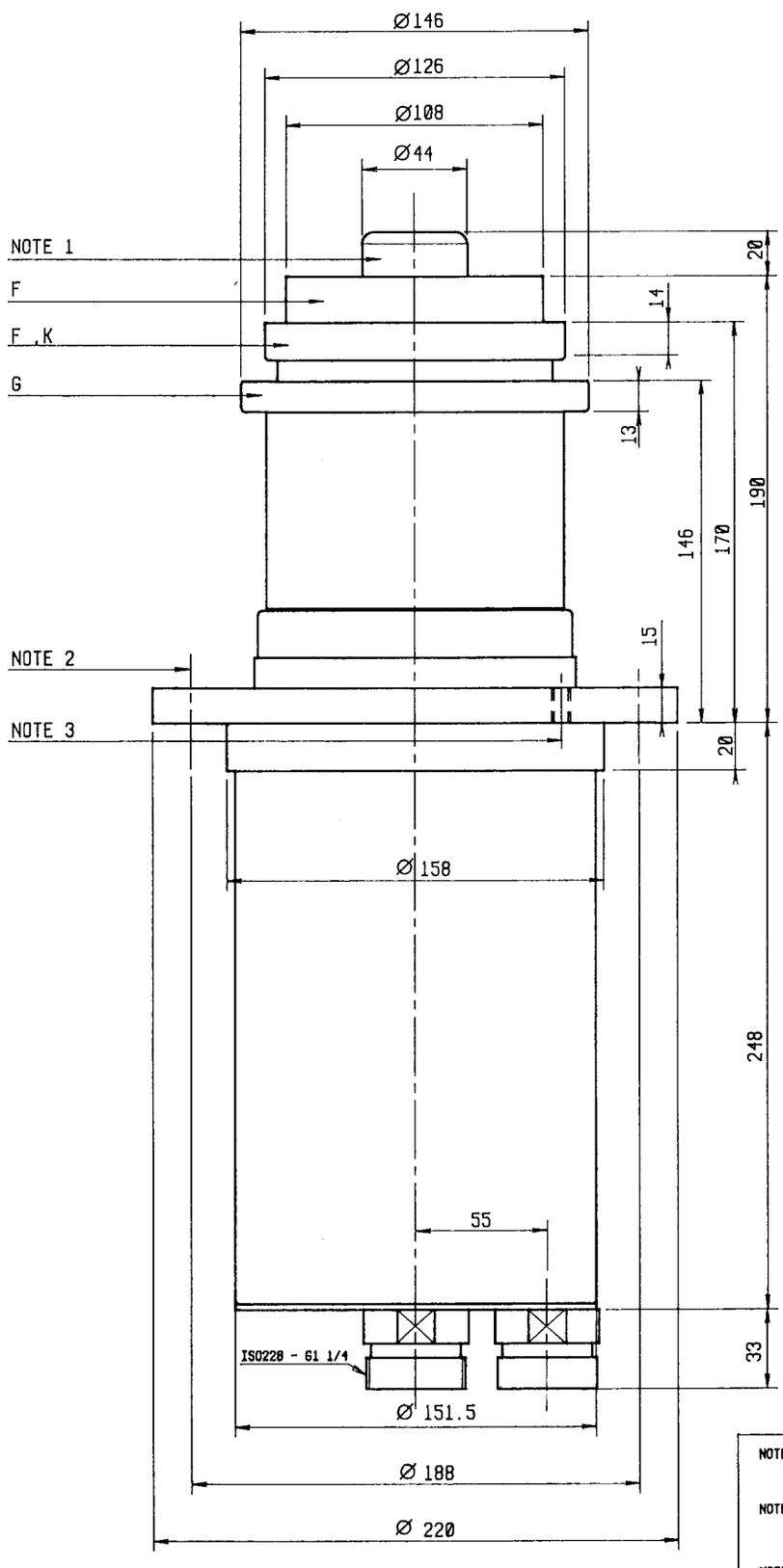


Table 2 - Constant current characteristics



TOLERANCES NON INDIQUEES TOLERANCES UNLESS OTHERWISE STATED	DIMENSION	ANGLE	RUGOSITE ROUGHNESS	UNIT mm	ECHELLE SCALE 1:2	REFERENCE	
MATIERE MATERIAL						REMPLACE SUPERSEDES	ALTERATION
			NOM NAME S.DALLET			CODE	
			DATE 01-03-29				

AX3150CJ

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NOTE 1 : NE PAS UTILISER COMME CONTACT
DO NOT USE AS TERMINAL

NOTE 2 : 6 TROUS DE FIXATION, (x6 D=13 A 60°)
6 FIXING HOLES, (x6 D=13 A 60°)

NOTE 3 : FIXATION POUR FUSIBLE X2 M8
TAPHOLE FOR TUBE FUSE X2 M8

AX3150CJ	Accessories
AX3150C	Internal Cathode Terminal
AX3151C	External Cathode Terminal
AX360G	Grid Terminal for freq. <10 MHz
AX361G	Grid Terminal for freq. >10 MHz
CS363	CATHODE CONNECTING STRIP(2 per tube)
AXEEL2	Antielectrolytic coupling for 1 1/4" hose (2 per tube)
AXEEL6	Antielectrolytic coupling for 1" hose (2 per tube)
AXEEL8	Antielectrolytic coupling for 3/4" hose (2 per tube)