

# MICROFOCUS X-RAY TUBES

## PRODUCT LINE *TCNF PLUS*



### Product image



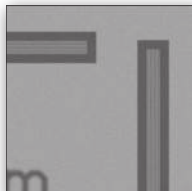
Microfocus X-ray tube XWT-160-TCNF Plus



Target with scale



XWT-190-TCNF Plus with 50 W target power



JIMA resolution 0.5 μm

### Technical data

Data	Product line <i>TCNF Plus</i>			
Max. voltage (kV)	160	190	225	240
Min. voltage (kV)	20	20	20	20
Max. current (mA)	1.0	1.0	1.0	1.0
Min. current (mA)	0.05	0.05	0.05	0.05
Max. power, target (Watt)	50	50	50	50
Tube type	Transmission			
Target type	<i>High Resolution Diamond</i>			
Target material (substrate/active layer)	Diamond / Tungsten			
Min. focus-object-distance (FOD, mm)	0.3	0.3	0.3	0.3
Opening angle (approx. °)	160	160	160	160
Mounting length incl. 90° HV plug (mm)	739	739	831	922
Tube weight (approx. kg)	38	38	59	59
Operation Mode	Target power range (W)	JIMA resolution range (μm)		
Nanofocus	0.1 - 1.5	0.5 – 1.5		
Microfocus	1.0 – 10.0	1.5 – 3.0		
High Power	10.0 – 50.0	3.0 – 35.0		

### Highlights

- ▶ 50 W target power with internal target cooling
- ▶ Ultimate JIMA resolution and magnification for semiconductor, electronics, and composite applications
- ▶ Developed for inline and offline two- and three-dimensional X-ray inspection
- ▶ Internal cooling of tube head to stabilize focal spot position – less than +/- 1 μm focal spot movement\*
- ▶ Liquid cooling of turbo pump to avoid vibrations
- ▶ Automatic venting valve for long life time

\* in laboratory setup

See our new catalogue **Options and Accessories** to find additional auxiliary equipment for your X-RAY WorX tube.

### Scope of delivery

- ▶ Open microfocus X-ray tube with transmission target, turbo vacuum pump, vacuum gauge, and electronic drive unit
- ▶ Cooling element for turbo pump
- ▶ Internal water cooling of tube head
- ▶ High voltage generator and high voltage cable
- ▶ Prevacuum pump with vacuum hose
- ▶ Peltier-type chiller with hoses and cooling agent
- ▶ Tube controller, power supplies, and safety relays on 19" mounting panels
- ▶ Set of cables for electrical connection of X-ray tube and components
- ▶ Spare parts case, documentation, and operating software

## Product Line TCNF Plus

### JIMA resolution

High Resolution Diamond target		Voltage [kV]					
		60	100	150	190	225	240
Nano-focus	0.5	0.8	0.6	0.5	0.5	0.5	0.5
	1.0	1.0	0.6	0.5	0.5	0.5	0.5
	1.5	1.5	0.6	0.5	0.5	0.5	0.5
Microfocus	1.0	1.5	1.5	1.5	1.5	1.5	1.5
	2.0	1.5	1.5	1.5	1.5	1.5	1.5
	3.0	1.5	1.5	1.5	1.5	1.5	1.5
	5.0	2.0	1.5	1.5	1.5	1.5	1.5
	7.0	2.0	1.5	1.5	1.5	1.5	1.5
	10.0	3.0	1.5	1.5	1.5	1.5	1.5
High Power	10.0	7.0	5.0	4.0	3.0	3.0	3.0
	17.5	10.0	7.0	6.0	6.0	6.0	6.0
	25.0	15.0	10.0	7.0	7.0	7.0	7.0
	50.0	35.0	15.0	15.0	15.0	15.0	15.0

JIMA resolution in microns (µm)

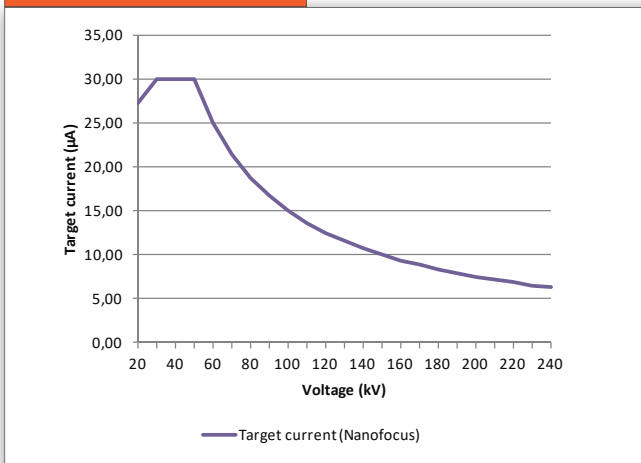
### JIMA resolution

High Energy target*		Voltage [kV]					
		60	100	150	190	225	240
Nano-focus	0.5	0.9	0.9	0.9	0.9	0.9	0.9
	1.0	0.9	0.9	0.9	0.9	0.9	0.9
	1.5	1.5	0.9	0.9	0.9	0.9	0.9
Microfocus	1.0	2.0	2.0	2.0	2.0	2.0	2.0
	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	3.0	2.0	2.0	2.0	2.0	2.0	2.0
	5.0	3.0	2.0	2.0	2.0	2.0	2.0
	7.0	3.0	2.0	2.0	2.0	2.0	2.0
	10.0	4.0	2.0	2.0	2.0	2.0	2.0
High Power	10.0	7.0	5.0	4.0	3.0	3.0	3.0
	17.5	10.0	7.0	6.0	6.0	6.0	6.0
	25.0	15.0	10.0	7.0	7.0	7.0	7.0
	50.0	35.0	15.0	15.0	15.0	15.0	15.0

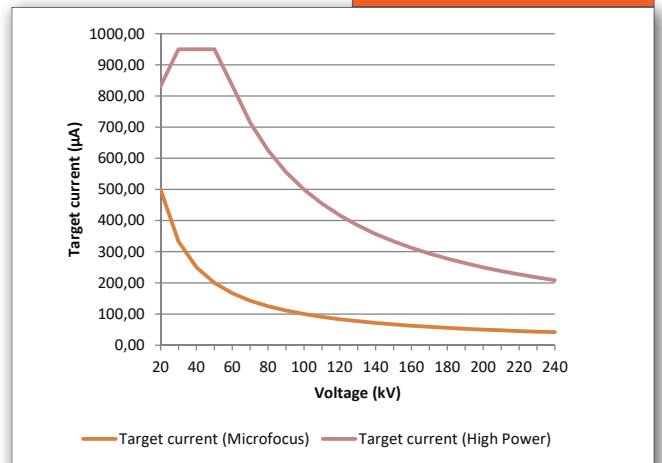
JIMA resolution in microns (µm)

\* Option

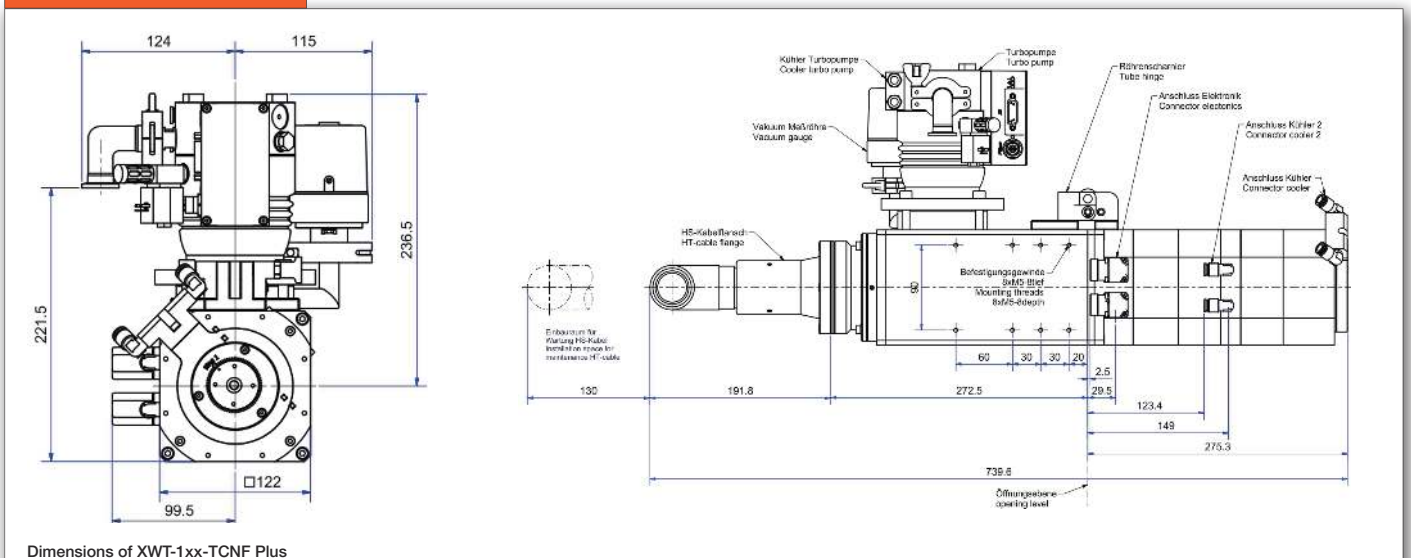
### Power rating chart



### Power rating chart



### Tube dimensions



Dimensions of XWT-1xx-TCNF Plus