## Procedura accensione Diffrattometro Rigaku Smartlab Multipurpose

1. Accendere il chiller premendo l'interruttore verde (a). Mentre si accende controllare che il motore si ponga in rotazione (vedi ingrandimento b), in caso contrario spegnere immediatamente per evitare il surriscaldamento che impedirebbe l'accensione per il tempo necessario al raffreddamento dello stesso.

## NOTE:

- Se il motore non parte, spegnere immediatamente e riprovare l'avvio dopo una decina di secondi.
- Il livello dell'acqua deve essere compreso nel range tra le tacche MIN e MAX (c).



2. Accendere lo strumento con la chiave (ruotare da 0 a I)



3. Accendere il PC del HyPix Server, a cui si accede aprendo la carena sotto le porte dello strumento.



- 4. Accendere il PC.
- Attendere il caricamento delle applicazioni ad avvio automatico (1), fare quindi il Restart dell'ICS Server Task Tray(2), al termine dell'operazione, nella finestra Log apparirà la dicitura OnOpened (3).



6. Loggare il desktop parallelo facendo click sull'icona HyPix 3000





7. Controllare che siano letti i valori di temperatura e umidità ed aprire il monitoraggio della temperatura del detector. La temperatura di lavoro del detector è 36±4°C, all'avvio sono richiesti alcuni minuti prima del raggiungimento di tale range; tuttavia è buona norma controllare periodicamente durante la sessione di misura il rispetto di questa condizione.



8. Dopo aver ridotto a icona la schermata del desktop parallelo, avviare il programma SmartLab Studio II. All'apertura la schermata sarà grigia (come da immagine successiva), fino al termine dell'inizializzazione dello strumento.



	Sexantiati Studio ILad4 v4.2	137.0 > slogged in at Administrator from Administrators group	r -
The Date And	Big 205 Big 205 Decar Spect Decar Spect De	We Green "A Carlos Management         Image And	
resolutioner A PRORD II MRSAXS II Stress I	Pouder XID = Data Manager = Logging = User Manager = D6	Manager = Materiah Marager =	
Stuffiers. 7 • *	Fackage Part 7 * *	Display Area	
sckage Activities 🔄 🖷 🤗	5 5 6 6 2		
einend .			
u			
et Activities 🔄 🖷 🔍	Dug activitie Ave	StarburdSundnan	
		Sec.	The defenses
		1 million of the second s	
		Net the Chief Ref	* 10 ml
		Nen Tree Charles Control Contr	* XO off
		Aur Boo C But Key Tunking the DOL NO DO DOL NO DO DOL NO DO DOL NO DO DOL NO DO DOL NO DO DOL NO DO	Ruar * XO off Set 10 mm encem Velocete eff
		Non         State           Remaining tree         O hird # 6 of           International tree         International tree           Data fill of the tree         International tree           Appling condition         Other and provide statistics	* Xio ant See the reservence Velocement off
		Not         Topy           Paraling time         Top of the Gar           District from         Top of the Gar           District from         Top of the Gar           District from         Top of the Gar           Addy countries         "Out of the countries"           District from         Top of an Electronic scattling	X0 of     Set bit moneum     Violanti off
		Note         Citation           Presents to         Set # 50           Presents to         Set # 50           Set # 500         Set # 500           Presents to         Set # 500           Set # 500         Set # 500	Nort Starthi enservice Vitacen off
		Image         Open of the second	kur k XO off ○ Sethis more war ○ Shownh aff
		Image         Control point           Control point         Control point	kod Store Cattineneenee Vetouren att
		Image         Image           Description         Image           Image         Image           Im	Stoph Stoph Stationsmum Mexicon of
And the Chevron Special Address of the Chevron Special Address		Image Network         Observation           Image Network         Image Network	Bar Algel C Belt internet Notes of I

9. Procedere con l'accensione del tubo raggi X dal pannello *Startup* (a), selezionare l'appropriata sequenza di accensione a seconda dell'uso dello strumento, dal tasto *Customize*: sequenza aging corta per uso ravvicinato (b), sequenza lunga dopo periodi di spegnimento lunghi (c).

Stop me: Ston g table recommendation g table recommendation g table recommendation tion too stor tion too tion too tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion tion	nended from fr rget able	equency of use	Use Stat	timer ext  ext  ext  ext  ext  ext  ext  ext	09:00 8:51:52 ions		Run XG off Set to r Vacuum	minim n off
me: tion g table recomm replacing the ta- omized aging ta itomize furation: 00:07:2 name: Not used	nended from fr roet able	equency of use	Start a 202 Start a Afte XG set Voltag Curren	ert   End  Adv03/04  Att 2024/03/04 0  r aging conditi  t: Set  ie, kV: 40  nt, mA: 30	v 09:00 8:51:52 ons		XG off     Set to r     Vacuum	minin n off
tion g table recommendation the ta- omized aging ta- itomize	nended from fr rget able	equency of use	202 Start a Afte XG set Voltag Curren	24/03/04 at: 2024/03/04 0 r aging conditi t: Set ge, kV: 40 nt, mA: 30	09:00 8:51:52 0005		O Set to r	minin n off
tion g table recomm replacing the ta- omized aging ta stomize Juration: 00:07:2 name: Not used	nended from fr rget able	equency of use	Start a Afte XG set Voltag Curren	rt: 2024/03/04 0 r aging condit t: Set ge, kV: 40 nt, mA: 30	8:51:52		O Vacuur	n off
tion g table recomm replacing the ta omized aging ta stomize duration: 00:07:2 name: Not used	nended from fr rget able	equency of use	Afte XG set Voltag Currer	r aging conditi t: Set pe, kV: 40 nt, mA: 30	ions		Vacuum	
g table recomm replacing the tai omized aging ta stomize duration: 00:07:2 name: Not used	able	equency of use	XG sel Voltag Currer	t: Set ge, kV: 40 nt, mA: 30	V			
replacing the ta omized aging ta stomize duration: 00:07:2 name: Not used	rget able	equency of use	Voltag	pe, kV: 40 nt, mA: 30				
omized aging ta stomize duration: 00:07:2 name: Not used	able		Currer	re, kv: 40 nt, mA: 30				
omized aging ta stomize duration: 00:07:2 name: Not used	able		Currer	nt, mA: 30				
stomize duration: 00:07:2 name: Not used	23							
Juration: 00:07:2	23							
name: Not used	23							
name: Not used								
	d for 2 days -	1 week	Set pow	er: 1.2 kW (Volt	ent: 30 mA)			
r Startup/S	Shutdown	XG Control	Pro Co	ontrol				
Customiz	Customize - Aging Table ?				ize - Aging Table	g Table ?		
1 week	V N	ew Delete		Not used for mo	re than 3 weeks	× N	lew Del	ete
cus (A-26-Cu)			·	Product ID: Cu Fi	ne focus (A-26-Cu)			
Voltage, kV	Current, mA	Holding time, min		No.	Voltage, kV	Current, mA	Holding tim	ne, min
30	5	5.0	~	1	30	5	5.0	
40	30	2.0	_	2	40	5	5.0	
	Customiz 1 week cus (A-26-Cu) Voltage, kV 30 40	Customize - Aging Table           Iweek         V         N           css (A-26-Cu)         Voltage, kV         Current, mA           30         5         40         30	Customize - Aging Table         2           Customize - Aging Table         2           1 week         V           Nem.         Delete           cos (4-26-Cu)         Votage, KV           Querent mA         Holding time, mini 30           30         5           40         30	Customize - Aging Table         Z         C           Customize - Aging Table         Z         X           1 week         V         Neex.         Delete           cos (A-26-Cu)         Voltage, KV         Current, mA         Holding time, min           30         5         5.0         A0         30         2.0	Customize - Aging Table         2         C           Customize - Aging Table         2         X           I week         V         Neex.         Delete           rook (A/26-G)         No.         No.         No.           30         5         5.0         2         3	Customize - Aging Table         Z         C         Custom           1 week         V         Nem.         Delete         New         New Key Current mA         New Key Curent mA	Customize - Aging Table         Z         C         Customize - Aging Table           1 week         V         Nem.         Delets         New         New	Customize - Aging Table         Z         Customize - Aging Table           1 week         V         Nem.         Delete           1 week         Voltage, kV         Current, mA         Holding time, min           30         5         5.0         1.1.30         5.0.5.0           40         30         2.2         40         5         5.0

10. Selezionare nella tendina Package Activities, l'appropriata sequenza di lavoro: es General BB.

OG Data Browser	SmartLab Studio II x64 v43.	157.0 >>logged in as Administrator from Administrators group	? = 5
Wizard New Open Save Save Runt Row Riow Flow River Row as Flow - Package	B B B B B B B B B B B B B B	<sup>1</sup> / <sub>2</sub> Pro Control <sup>1</sup> /	
XRD Measurement × HRXRD × MRSAXS × Stress ×	Powder XRD × Data Manager × Logging × User Manager × DB M	lanager × Materials Manager ×	
Activities ? # ×	Package Part ? * ×	Display Area	? #
Package Activities 🔊 🗰 🔍			
Greened (BD)     General (BD)     G	General (88) -{c: Optics Alignmerk (Bb) -{c: Optics Alig		
+ <sup>1</sup> 0 Optics Alignment (88) + <sup>1</sup> 0 Optics Alignment (P8)	A General Measurement (BB)	Startun/Shutdown	7 8 X
*10 Optics Alignment (SAXS) *10 Optics Alignment (Micco Area)		Status	Shuttlean
Control Alignment (Source PD)     Control Alignment (Source PD)     Control Alignment (Power PD)     Control Alignment (Power PD)     Control Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control Control     Control     Control Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control     Control		Ran         Step         Use time:           Remaining time         Star @ End           Star @ End         Star @ End           Use sign gate         Star @ End           Use sign gate recommended from frequency of use Star         After regisconditions           Use sign gate recommended from frequency of use Star         Star @ End           Use controls         Other regisconditions           Use controls daying table         Connect: mA           Catomize.         Connect: mA           Catomize.         Connect: mA table size           Catomize.         Set power: 12 LW (foltage: 40 LV / Current: 30 mA)	No. No of Set to minimum Macum off
H/W Status Activities		Data Browser Startup/Shutdown XG Control Pro Control	11 1 02
1D Measurement Ready			
P Type here to search	🖽 🖥 💽 🚅 🚍 🌄 🕫 🛷		へ 行 d× ENG 1049 AM

Procedere con l'allineamento delle ottiche nella geometria di misura scelta. E' possibile leggere le ottiche in uso sullo strumento dalla finestra *Customize Optics/ Set Current Optics*.
 NOTA: per la procedura di allineamento è necessario utilizzare la Center Slit (vedi sotto).

ptical settings Use mirror Use default optics © Customize optics Customize ignment conditions Full Quick (Only receiving optics) rgistration destination ptics attribute: 88 User settings User defined settings V New System settings rgistration date: 2024-02-29 14:49:39 rst alignment Print out results		Optics Alignment (BB)	() ×
Use mirror Use default optics © Customize optics Customize ignment conditions 0 Full © Quick (Only receiving optics) gistration destination ptics attribute: BB User settings User defined settings ♥ New 9 System settings gistration date: 2024-02-29 14.49:39 set alignment IPrint out results	Optical settings		
ignment conditions ) Full Quick (Only receiving optics)  gistration destination ptics attribute: 88 User settings User defined settings V New System settings system settings system settings system settings	Use mirror	tics  Customize optics Customize	1
Pull Quick (Only receiving optics)         gistration destination         ptics attribute:         BB         User settings         User settings         System settings         system settings         system settings         inst alignment         Print out results	lignment conditio	ons	
agistration destination ptics attribute: B8 User settings User defined settings System settings agistration date: 2024-02-29 14:49:39 st alignment Print out results	Full 🔿 Quick (	(Only receiving optics)	
ptics attribute: BB User settings User settings System settings systation date: 2024-02-29 14:49:39 set alignment Print out results	Registration destin	nation	
User settings User defined settings Vor New_ System settings gistration date: 2024-02-29 14:49:39 st alignment Print out results	ptics attribute:	88	
> System settings gistration date: 2024-02-29 14:49:39 st alignment Print out results	User settings	User defined settings	New
gistration date: 2024-02-29 14:49:39 st alignment Print out results	System setting:	5	
st alignment Print out results	Registration date:	2024-02-29 14:49:39	
Print out results	Post alignment		
	Print out result	5	
	P	0	Consel

12. Procedere con l'allineamento del campione, *Sample Alignment*: esempio con vetrino (a) come porta campione ed esempio con piattino per wafer da 4", che richiede l'introduzione del corretto valore di Tickness (campione + portacampione).

Sample Alignment (Powder, Bulk)	Sample Alignment (Powder, Bulk)
Sample alignment conditions	Sample alignment conditions
Attachment and sample plate: Standard attachment head + Height reference sample plate	Attachment and sample plate: Standard attachment head + 4-inch wafer sample plate
🔿 No height alignment	O No height alignment
Set registered position without alignment	<ul> <li>Set registered position without alignment</li> </ul>
Curved sample (Z scan only)	Curved sample (Z scan only)
🔾 Flat sample	○ Flat sample
Sample height, mm: 20.0	Sample height, mm: 20.0
Sample thickness, mm: 3.0	Sample thickness, mm: 9.0
Run recommended sequence      Customize conditions     Customize_	Run recommended sequence      Customize conditions     Customize
☑ Put a sample every time	☑ Put a sample every time
Run OK Cancel	Run OK Can

- 13. Dalla finestra General Measurement (BB) settare i parametri della misura:
  - a. Range angolare di misura: *Start*° e *Stop*°
  - b. Aumentare o diminuire la velocità di scansione: Speed °/min
  - c. Detector in modalità standard o rimozione fluorescenza (XRF)

Altre opzioni utili:

- Spuntare *Move to Home position* per riportare i bracci nella posizione iniziale al termine della misura.
- Salvataggio della misura.

							G	General Measure	ment (BB)						?	×
🗸 Ma	nual exc	hange slit c	ondit	ions		*	🗸 к	β filter condition		*	☑ Detector	cond	itions			į.
Incider	nt Soller	slit: Soller	r slit S	5.0°		~	Kβ fi	lter: Kβ filter for Cu	1	~	Detector:	1	HyPix-3000		~	
Length	-limitin	g slit: 15 m	m			~					Monochrom	ator:	None			~
Receivi	ing Solle	er slit: Soller	r slit S	5.0°		~					Scan mode:		1D(scan)			~
					Read Current O	otics					Energy mod	e:	Standard			~
Measu	rement	conditions														-
	Exec.	Range	=	Start, *	Stop, *	Step,	• =	Speed, */min	Incident Slit, ° =	Rec	ceiving : #1, mm 😑	Recei Slit #	iving 2, mm 😑	Comment =	Options =	
1	$\checkmark$	Absolute	~	5.0000	80.0000	0.0100		50.0	1/2	20.0	000	Open	~		Set	^
2								50.0		20.0	000	Open				
3								50.0		20.0	000	Open				
4								50.0		20.0	000	Open				
5								50.0		20.0	000	Open				
6								50.0		20.0	000	Open				
7		Absolute						50.0		20.0	000	Open				
8		Absolute						50.0		20.0	000	Open				
9		Absolute	1					50.0		20.0	000	Open				
10		Absolute	1	5.0000	80.0000	0.0100		50.0	1/2	20.0	000	Open	1		Set	
🖊 Sav	e measi	ured data														
Sep	oarate m	easured file														
ile na	me:	8														
ample	e name:															
/lemo																
Move	to hom	e position a	fter t	he measurem	ent completed.											_
	eal-time	search mat	ch													
culate	d scan	duration: 2m	nin 8s													
Rur	n													OK	Cano	cel

14. Nel caso di più campioni, ripetere i punti 12, *Sample Alignment* e 13, *General Measurement*.

## Procedura Spegnimento Diffrattometro Rigaku Smartlab Multipurpose

15. Dal programma Smartlab Studio spegnere la sorgente: sezione *Shutdown*, selezionare *XG off*, quindi cliccare *Run*.

Startup			Shutdown	
Run   Stop     Remaining time:		Use timer Start  End 2023/12/05 O9:00 E Start at: 2023/12/05 09:00:00	Run XG off Set to minimum Vacuum off	
Aging condition  Use aging table recommended from fre After replacing the target Use customized aging table  Customized.	quency of use	After aging conditions       XG set:     Set       Voltage, kV:     40       Current, mA:     30		
Calculated duration: 00:00:00 Aging table name: Not used for more than	n 3 weeks	Set power: 1.5 kW (Voltage: 50 kV / Current: 30 mA)		
Data Browser Startup/Shutdown	XG Control	Pro Control		

16. Andare sul desktop remoto e spegnere l'interfaccia cliccando su Shutdown



- 17. Spegnere lo strumento con la chiave.
- 18. Dopo circa una decina di minuti (per far raffreddare il tubo raggi X), spegnere il chiller.