

ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและรายละเอียดค่าใช้จ่าย
การจัดซื้อจัดจ้างที่มีใช้งานก่อสร้าง

1. ชื่อโครงการ.....จ้างทำชิ้นส่วนต้นแบบ Beam Position Monitor (BPM) จำนวน 1 งาน (รายละเอียดตามเอกสารแนบท้าย)

2. หน่วยงานเจ้าของโครงการ...สังกัดฝ่ายเครื่องเร่งอนุภาค

สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน)

วิธีจัดซื้อจัดจ้าง

☐ วิธีประกาศเชิญชวน ☐ วิธีคัดเลือก ☒ วิธีเฉพาะเจาะจง

3. วงเงินงบประมาณที่ได้รับจัดสรร950,000.00.....บาท (ตามใบขอซื้อ/จ้าง พค 026/2565 ลว. 9 ธ.ค. 2564)

4. วันที่กำหนดราคากลาง (ราคาอ้างอิง) ณ วันที่ 17 ธันวาคม 2564 เป็นเงิน USD 28,400.00

คิดเป็นเงินไทยตามอัตราแลกเปลี่ยน ไทยพาณิชย์ ลว. 17 ธ.ค. 2021 (1 USD =33.45 บาท)

ประมาณ 949,980.00 บาท

5. แหล่งที่มาของราคากลาง (ราคาอ้างอิง)

5.1 ใบเสนอราคา บริษัท KYOCERA Asia Pacific Pte Ltd จำกัด สาธารณรัฐสิงคโปร์

6. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง (ราคาอ้างอิง) ทุกคน

6.1 นายนาวิน จันทรทอง เจ้าหน้าที่ผู้กำหนดราคากลาง

6.2 นายสมศักดิ์ เรืองพูนวิทยา เจ้าหน้าที่ผู้กำหนดราคากลาง




6.3 นางสาวศุภวรรณ ศรีจันทร์ เจ้าหน้าที่ผู้กำหนดราคากลาง

หมายเหตุ :

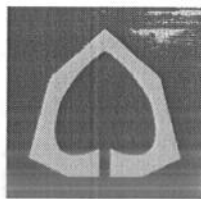
แหล่งที่มาของราคากลาง (ราคาอ้างอิง) พิจารณาตามพระราชบัญญัติการจัดซื้อจัดจ้างและการบริหารพัสดุภาครัฐ พ.ศ. 2560 มาตรา 4 “ราคากลาง” หมายความว่า ราคาเพื่อใช้เป็นฐานสำหรับเปรียบเทียบราคาที่ผู้ยื่นข้อเสนอได้ยื่นเสนอไว้ ซึ่งสามารถจัดซื้อจัดจ้างได้จริง

พิจารณาราคากลาง ตามหลักเกณฑ์ข้อ (4) ราคาที่ได้มาจากการสืบราคาจากท้องตลาด โดยพิจารณาจากใบเสนอราคาตามท้องตลาดซึ่งมีผู้เสนอราคาเพียงรายเดียว

เจ้าหน้าที่ผู้กำหนดราคากลาง (ลงนาม)

1. 
2. 
3. 

ประกาศ ณ วันที่ 30 ธ.ค.2564



ส.ค. 17, 2021 15:14

Unit: Thai Baht

FOREIGN CURRENCIES		BANK SELLS		BANK BUYS			
		D/D & T/T	NOTES	TT	EXPORT SIGHT BILL	T/CHQS. & CHQS.	NOTES
ดอลลาร์สหรัฐ	USD	<u>33.45</u>	33.6	33.15	33.05	32.95	32.9
ดอลลาร์สหรัฐ	USD1	33.45	33.53	33.15	33.05	32.95	32.42
ดอลลาร์สหรัฐ	USD2	33.45	33.51	33.15	33.05	32.95	32.06
ยูโร	EUR	38.07	38.14125	37.33875	37.24875	37.11875	37.05625
ปอนด์สเตอร์ลิง	GBP	44.77	45.0925	43.90875	43.65875	43.50875	43.43375
เยน (ต่อ 100 เยน)	JPY	29.72	29.745	28.94	28.82	28.72	28.68
ดอลลาร์สิงคโปร์	SGD	24.72625	24.8375	24.1025	24.0125	23.9425	23.90125
ดอลลาร์ฮ่องกง	HKD	4.32625	4.3975	4.22	4.19	4.16	4.13125
วอนเกาหลี	KRW	-	0.028	-	-	-	0.023
ฟรังก์สวิสเซอร์แลนด์	CHF	36.57625	36.65125	35.83875	35.73875	35.64875	35.2775
ดอลลาร์ออสเตรเลีย	AUD	24.34125	24.54	23.365	23.265	23.195	23.1775
ริงกิต	MYR	8.0	8.03125	7.78375	7.73375	7.68375	7.2125
แรนด์แอฟริกา	ZAR	-	2.4	-	-	-	-
โครนสวีเดน	SEK	3.715	3.75	3.6475	3.5975	3.5775	3.49875
ดอลลาร์แคนาดา	CAD	26.37875	26.4425	25.73	25.6	25.52	25.17875
โครนเดนมาร์ก	DKK	5.11125	5.15	5.0275	4.9975	4.9725	4.8125
โครนนอร์ว	NOK	3.73625	3.77375	3.65875	3.63875	3.61875	3.47875



KYOCERA Asia Pacific Pte. Ltd.
298 Tiong Bahru Road #13-03/05
Central Plaza Singapore 168730
Tel : +65-6271-0500
Fax : +65-6271-0600
www.kyocera.com.sg
UEN 199804203Z

QUOTATION

To : Synchrotron Light Research Institute Fax :
Attention : Dr. Pornpip Date : 7-Dec-21
From : Jeanette Wong (Mrs)
Cc : Kentaro Nakamura, C. Somphob
Reference : FCB-071221A-0 Page of Pages : 3

Subject : Our quotation no. FCB-071221A-0

Thank you for your enquiry.

We are pleased to quote for the following item as shown below. The validity of this quotation is effective for 30 days (from the date of quotation). We send official quote for record.

When the date of quotation). We send official quote for record.

#	Description	Assembly Jig (USD)	Tooling charge (USD)	Qty (pcs)	Unit Price (USD/Pcs)	Amount (USD) *Exclude Jig and T/C	Lead Time (Days)
1	BPM Flange	1,000 *0	-	2	8,900 *8,200	17,800 16,400	150
	BPM Button			4 6	2,300 *2,000	9,200 12,000	190
				Total Amount		*28,400	

NOTED: *Above unit prices are special price applicable only for 1st Trial order only.

Spec : BPM Flange -> Refer Spec from "KYOCERA PROPOSAL-C1405"
BPM Button -> Refer Spec from "KYOCERA PROPOSAL-C0129"
Incoterm : FCA JPN
Payment Term : Advance payment 100% Along with Purchase order (Before start the production)

Yours sincerely,

Jeanette Wong (Mrs)

Jeanette Wong (Mrs)
Assistant Customer Service Manager
Fine Ceramics Division
KYOCERA Asia Pacific

ได้ตรวจสอบคุณสมบัติแล้ว
ลงชื่อ..... 9111111 e-mail แล้ว.....

28,400 x 33.45 บาท

= 949,950 บาท

Page 1

M. 18/12/64.



KYOCERA Asia Pacific Pte. Ltd.
298 TiongBahru Road #13-03/05
Central Plaza Singapore 168730
Tel : +65-6271-0500
Fax : +65-6271-0600
www.kyocera.com.sg
UEN 199804203Z

**KYOCERA ASIA PACIFIC GROUP COMPANIES
TERMS AND CONDITIONS OF SALES**

I. GOVERNING PROVISIONS

These Terms and Conditions of Sale ("Ts& Cs") govern all quotations and purchase orders accepted by Seller. These Ts& Cs shall prevail over any Ts& Cs on Buyer's purchase order, unless they are accepted in writing by Seller.

II. PRICES

Prices are as set forth on the applicable written quotations. Written quotations are valid for Thirty (30) days. Prices for non-quoted products or contained on expired quotations are subject to Seller's change without notice.

III. PAYMENT

Unless otherwise agreed, payment term shall be just as described in quotation. Seller may, without notice, stop shipment or cancel unfilled purchase orders when, in Seller's opinion, the financial condition of Buyer significantly deteriorates, or when Buyer is delinquent on any payment for invoiced products or services. Without limiting the above provisions, in the event Buyer does not pay all amounts due and owing within allowed payment terms, Seller may withhold further shipments until payment acceptable to Seller is made. Shipment holds shall not constitute Seller's breach and Seller, in its sole discretion, may continue to perform in accordance with Buyer's purchase order.

IV. SHIPMENTS/RISK OF LOSS/DELIVERY

Unless otherwise stated in Seller's quotation, all shipments will be made under the trade term, FCA point of shipment. All risks of loss and damage shall pass to Buyer upon the delivery of the goods to the nominated forwarder. Seller's failure to ship or deliver as scheduled shall not entitle Buyer to cancel a purchase order. Without prejudice to the foregoing, Buyer's acceptance of all or part of a shipment shall constitute Buyer's waiver of all claims for delayed shipment.

In the event that Buyer requests delayed shipment of manufactured products pursuant to a valid, accepted purchase order, Seller shall charge Buyer an inventory holding charge equal to 2% of the value of held inventory per month of delay.

V. CANCELLATION

Buyer shall have no right to cancel a purchase order without first obtaining Seller's prior written consent, which may be given at Seller's sole and absolute discretion. Cancellation charges for special, custom, or standard products or services shall be 100% of all costs incurred to the time of cancellation.

VI. ACCEPTANCE

All shipments falling within the acceptance level set forth by Seller's specifications shall be accepted by Buyer by the lot and, once accepted, any product within the lot shall not be returnable for replacement or credit. Nonconforming products returned to Seller shall be separately packaged, and marked to clearly identify the shipment. Shipping charges shall be paid by Seller as long as the returned product is defective.

VII. WARRANTY

Seller warrants the products to be free from defects in materials and workmanship for a period of six (6) months from the date of shipment. Seller's sole obligation for nonconforming products shall be to repair or replace such products at a location designated by Seller or to credit the purchase price of such products, at Seller's sole option.

VIII. LIMITATION OF LIABILITY

Seller's liability under each contract shall be limited to a sum equal to the contract price. In no event shall seller be liable for any special, indirect, incidental, exemplary, punitive or consequential damages of any kind.

IX. TITLE

Property, rights and title in the products sold hereunder shall pass to Buyer, when the risks are transferred from Seller to Buyer as per the trade term.



KYOCERA Asia Pacific Pte. Ltd.
298 TiongBahru Road #13-03/05
Central PlazaSingapore 168730
Tel : +65-6271-0500
Fax : +65-6271-0600
www.kyocera.com.sg
UEN 199804203Z

X. TOOLING

Seller, charging in full or part, shall maintain in good condition and for a reasonable period all tooling, molds, fixtures, etc. ("Tooling"). Provided, however, Seller shall have the right to scrap Tooling inactive for more than twelve (12) months with any resulting value belonging to Seller to offset maintenance and storage costs. Seller shall not charge Buyer additional amounts for the use of Tooling in connection with Buyer's subsequent orders for products of the same specification. Seller shall have the right to use Tooling for other customers' orders unless specifically prohibited by a written agreement between Seller and Buyer. Title to Tooling used in manufacturing shall vest in Seller. Due to its proprietary nature, under no circumstances will Seller deliver Tooling to Buyer and Buyer, acknowledging the same, expressly waives any rights to demand delivery of Tooling. Seller shall destroy Tooling at Buyer's request and will allow Buyer to witness such destruction and/or will provide a certification to Buyer of same.

XI. FORCE MAJEURE

Seller shall not be liable for any delay in performance or inability to perform occasioned by any causes beyond its control or beyond the control of its suppliers, manufacturers, processors, or finishers including, but without limiting the generality of the foregoing, fires, strikes, lockouts, labor difficulties, earthquakes, typhoons, embargoes, floods, delays by carriers, orders, rules or regulations of any foreign and/or domestic governmental authorities, trade associations or any other agency having control over export or import, voluntary quotas, restrictions, controls, unavailability or shortage or delay of any transportation. Intervention of any such cause(s) shall give Seller the right, without liability to Buyer of any kind, to terminate this contract with respect to all or any portion of the products or services affected thereby or, upon removal of the cause, to resume deliveries in such proportions as it may determine, until the entire quantity purchased hereunder has been delivered.

XII. ASSIGNMENTS AND SUBCONTRACTING

Seller expressly reserves the right to assign or subcontract all or any portion of a purchase order without Buyer's consent.

XIII. ARBITRATION

Any unresolved dispute arising pursuant to this contract shall be settled by arbitration. The arbitration shall be conducted in Singapore in accordance with the rules of the Singapore International Arbitration Centre. The language of arbitration shall be English. Each party shall pay its own expenses associated with the arbitration, including 50% of the expenses of the neutral arbitrator(s). The decision of the arbitrator(s) shall be binding on the parties and shall be enforceable in any court having jurisdiction thereof. For the avoidance of doubt, non-payment of the price or any sums due to Seller shall not be a dispute and Seller shall be entitled to commence legal proceedings for recovery of the same.

XIV. GENERAL

This contract is the complete and exclusive statement of the agreement between the parties and supersedes all proposals, oral or written, and all other communications between the parties relating to the subject matter of this contract. Any Ts& Cs of any purchase order or other instrument issued by Buyer in connection with this contract which is in addition to, and consistent with or different from the terms and conditions of this contract shall be of no force or effect. Only a written instrument duly executed by authorized representatives of Seller and Buyer may modify this contract. If any legal action, arbitration, or other proceeding is brought to enforce or interpret the terms of this contract, the prevailing party shall be entitled to recover reasonable legal fees and costs. Any waiver by either party of any condition, part, term or provision of this contract shall not be construed as a waiver of any other condition, part, term or provision or a waiver of any future event or circumstance. If any provision of this contract is held invalid or unenforceable, the remainder of the contract shall continue in full force and effect. A person who is not a party to this contract shall not be entitled to the benefit of any of the terms herein or to enforce any of its terms.



Terms of Reference: TOR

Technical Specifications

Fabrication of Beam Position Monitor (BPM) Prototype

1. Introduction

Beam Position Monitor (BPM) system has been designed for Siam Photon Source II (SPS-II) storage ring. The Design, fabrication, and characteristic measurement of prototype BPM are important steps to ensure that the BPM for SPS-II perform as expected, especially for impedance matching, high resolution and accuracy, and long-term stability.

BPM for SPS-II storage ring is a four button pick up electrode which mounted into two BPM blocks as shown in Figure below. Each BPM block compose of a BPM flange, two BPM hosing with SMA connector. The BPM hosing is designed with a diameter of 6 mm, a gap of 0.3 mm and thickness of 4 mm. The BPM hosing and BPM block are made of stainless steel 316L. The BPM button and central connector are made of Molybdenum and form the central pin to reverse polarity female SMA connector. The ceramic insulator is made of Aluminum (Al_2O_3) which will be placed between BPM button and outer conductor for electric insulation and vacuum shielding.

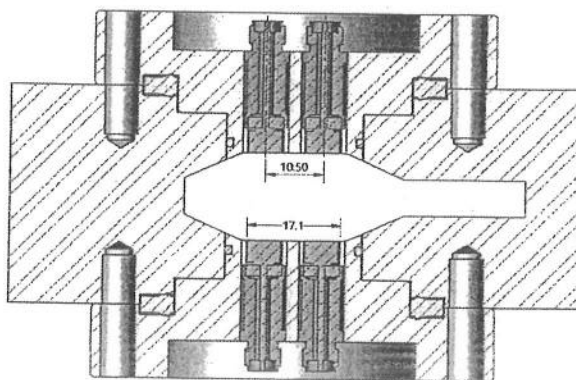


Figure 1: Cross section of the BPM fixed to octagon vacuum vessel

2. Specification

The detail designed of BPM block for SPS-II storage ring is shown in engineering drawing part no. SLRI-SPSII-SR-VAC-BPM-02. It is required the specification as below:

2.1 BPM Material

- Ceramic: AO479 S
- Button and PIN: Molybdenum (Mo)
- BPM Flange: SUS 316 L

2.2 BPM Connector: Reverse polarity/female SMA Connector

2.3 Tolerance:

- Tolerances of the BPM button, and gap between BPM button and BPM flange: $\leq \pm 25 \mu\text{m}$.
- Tolerance of the distance between reference pins (center to center): $\leq \pm 50 \mu\text{m}$.
- Tolerance of diameter the BPM block in the bottom part: $\leq \pm 50 \mu\text{m}$.
- Tolerance of the distance between BPM button (center to center): $\leq \pm 100 \mu\text{m}$.
- Other areas: $\leq \pm 250 \mu\text{m}$.

If seller want to change the tolerance, it must be approved by SLRI before fabrication.

2.4 Joint between BPM flange and BPM Connector: Laser welding

2.5 Hermeticity: $1.0 \times 10^{-10} \text{ Pa.m}^3 / \text{sec}$. ($1.0 \times 10^{-9} \text{ Torr.l/sec}$) He.

2.6 Voltage: DC 1.0 kV maximum

2.7 Bakeout temperature: 300°C maximum

2.8 Before the BPM fabrication, the seller shall provide the engineering design of the BPM block. It is possible to modify the dimension of the BPM block if it needs for BPM fabrication processes. All modification must be approved by SLRI.

3. Quantity

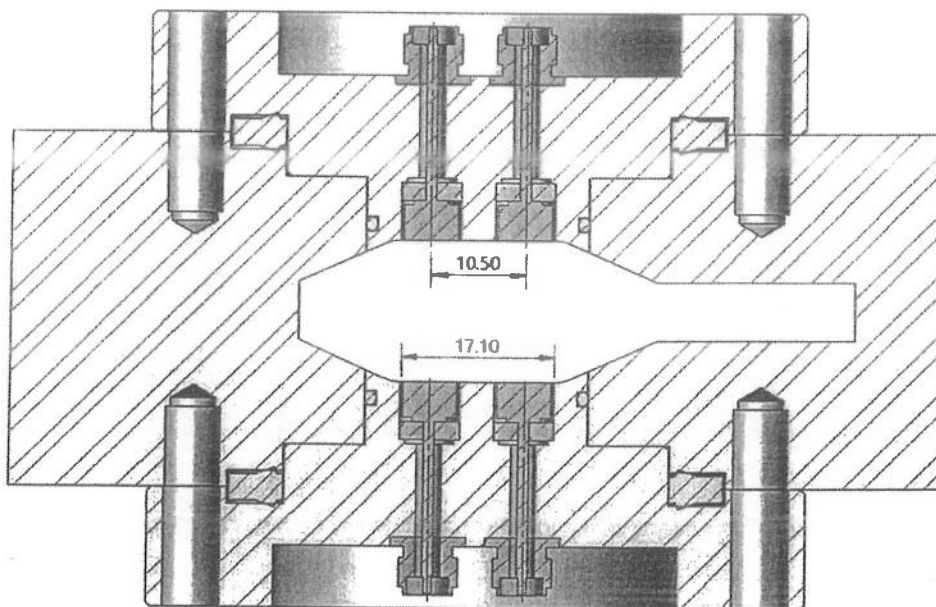
The seller shall provide the 2 BPM blocks and 6 BPM housing. Please note that the RF shielding spring and Al gasket will be response by SLRI.

Signature..... พิกุลพร ลือคำ Purchaser

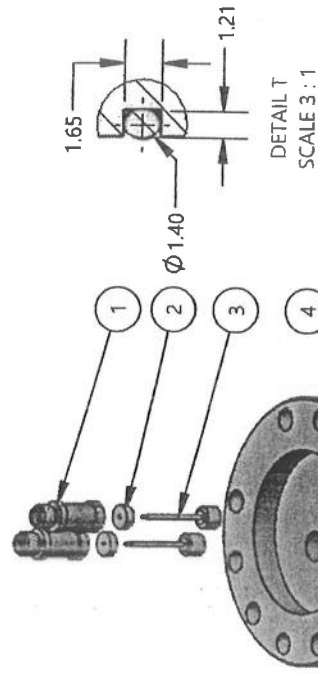
คำแปลรายการจัดซื้อจากต่างประเทศ เพื่อใช้ในการดำเนินการออกของ

รายการ	คำอธิบาย
ชื่อภาษาอังกฤษ :	Fabrication of Beam Position Monitor (BPM) Prototype
ชื่อรายการภาษาไทย :	จัดสร้างชิ้นส่วนต้นแบบอุปกรณ์วัดตำแหน่งลำอิเล็กตรอน
วัสดุที่ทำ/ทำมาจาก :	ตาม Drawing no. SLRI-SPSII-SR-VAC-BPM-02
วิธีการใช้งาน :	สำหรับเป็นต้นแบบอุปกรณ์วัดตำแหน่งอิเล็กตรอน

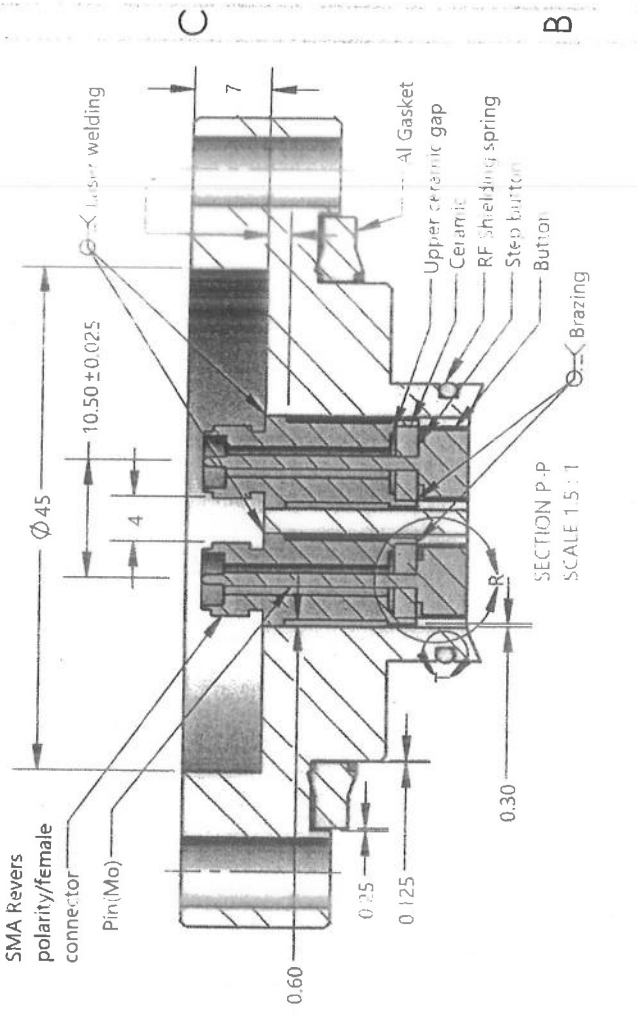
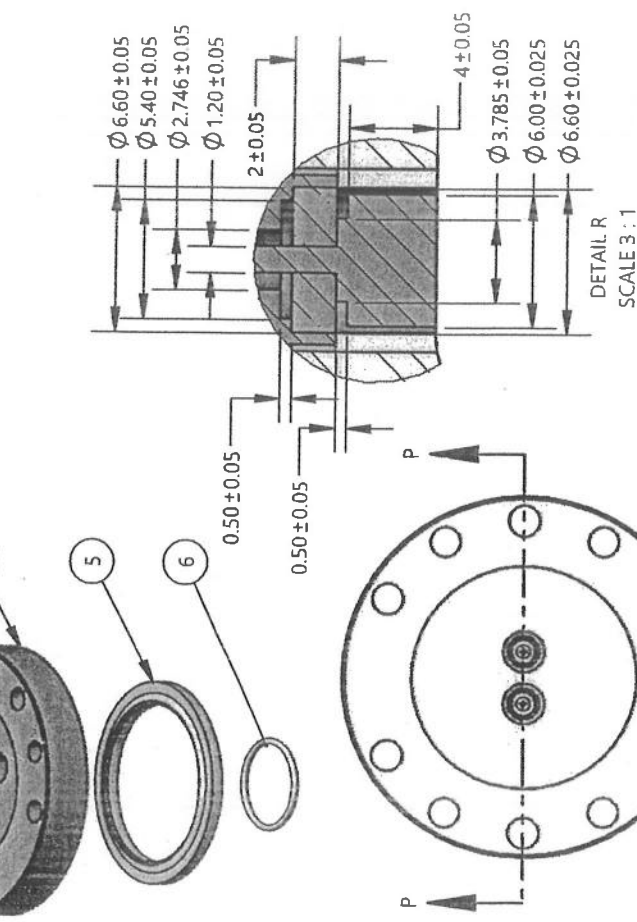
ภาพประกอบ (ถ้ามี)



6 5 4 3 2 1



ITEM NO.	PART NUMBER	PART NAME	DESCRIPTION	MATERIAL	MANUFACTURER	QTY.
1	SLRI-SPSII-SR-VAC-BPM-02:001	SMA connector	See Sheet 2	SUS 316LN	Supplier	2
2	SLRI-SPSII-SR-VAC-BPM-02:002	BPM Button-Ceramic	See Sheet 3	Ceramic	Supplier	2
3	SLRI-SPSII-SR-VAC-BPM-02:003	BPM Button-Pin	See Sheet 4	Molybdenum	Supplier	2
4	SLRI-SPSII-SR-VAC-BPM-02:004	BPM Flange	See Sheet 5	SUS 316LN	Supplier	1
5	SLRI-SPSII-SR-VAC-BPM-02:005	Al Gasket	See Sheet 6	Al 1050	Supplier	1
6	SLRI-SPSII-SR-VAC-BPM-02:006	RF Shielding spring	OD 25.1mm-ID 22.3mm	SUS 316L	Supplier	1



APPROVAL	DATE
DRAWN	Saranyu Chaichuay 22/11/2021
CHECKED	Krirkrit Sittisart
RELEASED	Pornpip Sudmuang
APPROVED	

GENERAL TOLERANCES	PROJECTION
ISO 2768-mk	
STANDARD DRAWING	ISO 5457

SIZE	3D CAD No.
A4	

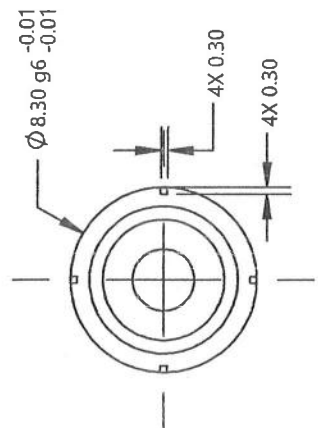
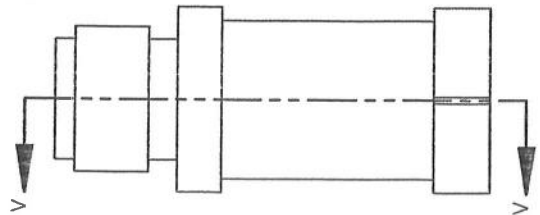
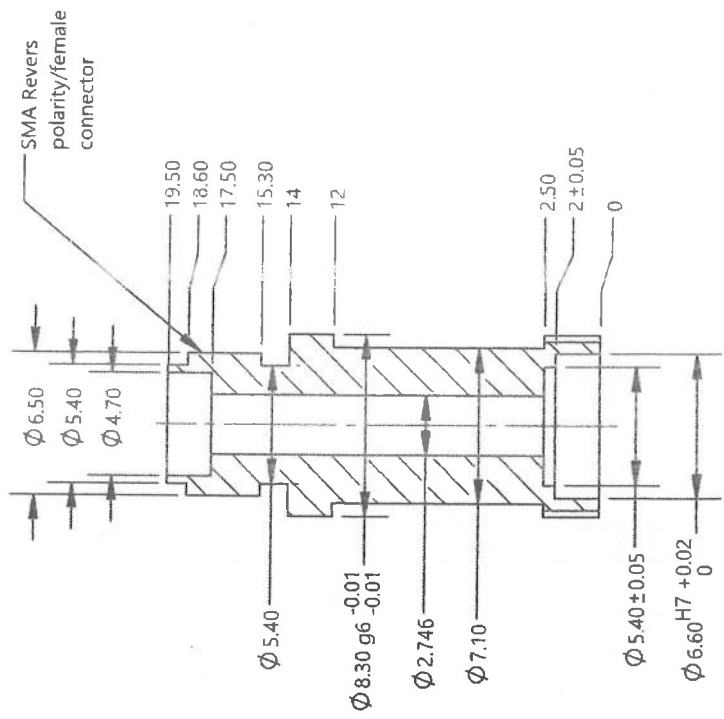
LIFE CYCLE	For information
MATERIAL	SPS-II BPM
DRAWING NO.	SLRI-SPSII-SR-VAC-BPM-02
SHEET	1 of 6

สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน)
Synchrotron Light Research Institute (Public Organization)

TITLE: SPS-II BPM

SCALE: SHEET 1 of 6

ITEM NO.	PART NUMBER	PART NAME	DESCRIPTION	MATERIAL	MANUFACTURER	QUANTITY
1	SLRI-SPSII-SR-VAC-BPM-02-001	SMA connector	See Sheet 2	SUS316LN	Supplier	2



SECTION V-V
SCALE 3 : 1

APPROVAL	DATE
DRAWN Sarunyu Chaichuay	22/11/2021
CHECKED Kerkrit Sittisart	
RELEASED Pointip Sudmuang	
APPROVED	
GENERAL TOLERANCES ISO 2768-mk	PROJECTION
STANDARD DRAWING ISO 5457	UNIT : mm



สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน)
Synchrotron Light Research Institute (Public Organization)

TITLE:

SMA connector

LIFE CYCLE

For information

MATERIAL

SUS316LN

SCALE

3:1

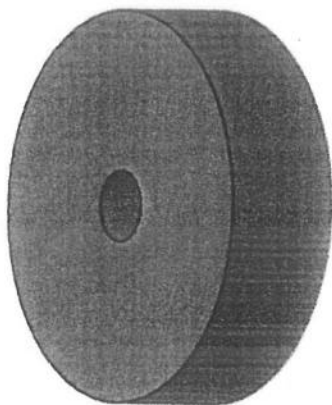
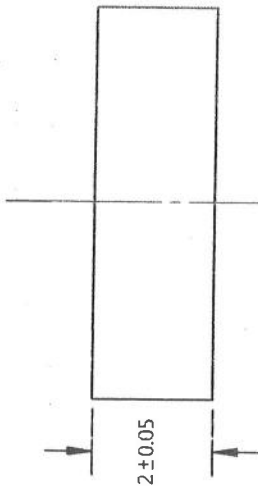
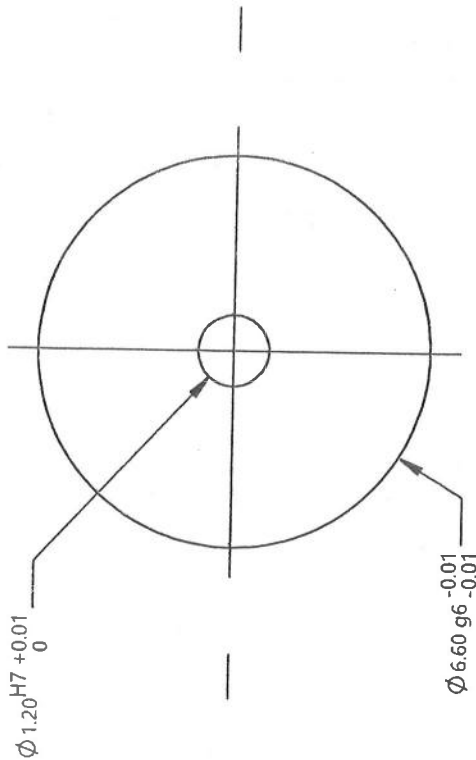
DRAWING NO.

SLRI-SPSII-SR-VAC-BPM-02-001

SHEET

2 of 6


6	5	4	3	2	1
ITEM NO.		PART NUMBER	PART NAME	DESCRIPTION	MATERIAL
2		SLRI-SPSII-SR-VAC-BPM-02.002	BPM Button-Ceramic	See Sheet 3	Ceramic
				Manufacturer	2



APPROVAL		DATE
DRAWN	Sarunyu Chaichuay	22/11/2021
CHECKED	Krerkrit Sittisart	
RELEASED	Pontip Sudmuang	
APPROVED		
GENERAL TOLERANCES ISO 2768-mk		PROJECTION
STANDARD DRAWING ISO 5457		



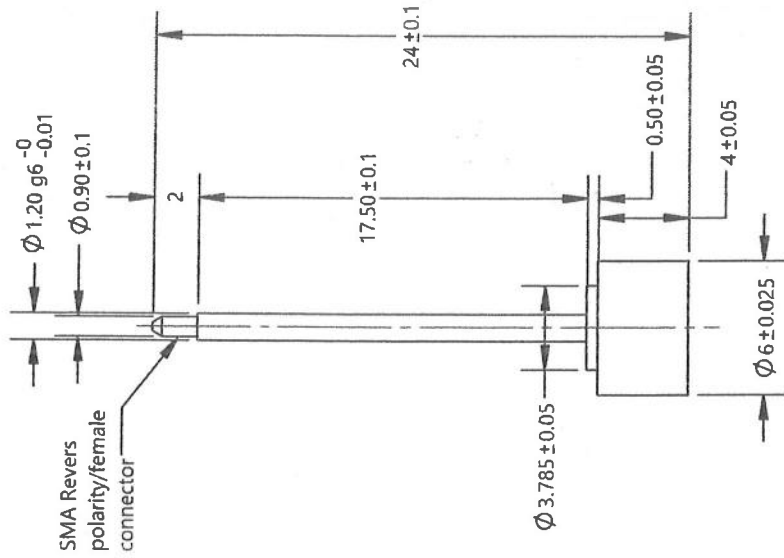
UNIT: mm

		สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน) Synchrotron Light Research Institute (Public Organization)
TITLE:		BPM Button-Ceramic
LIFE CYCLE	For information	MATERIAL Ceramic
SIZE A4	3D CAD No.	DRAWING NO. SLRI-SPSII-SR-VAC-BPM-02.002

SCALE
8:1

SHEET
3 of 6

ITEM NO.	PART NUMBER	PART NAME	DESCRIPTION	MATERIAL	REVISION	QUANTITY
3	SLRI-SPSII-SR-VAC-BPM-02:003	BPM Button-Pin	See Sheet 4	Molybdenum	0	2



APPROVAL	DATE
DRAWN	Saranyu Chaichuay 22/11/2021
CHECKED	Krekrit Sittisart
RELEASED	Pornpip Sudmuang
APPROVED	
GENERAL TOLERANCES	PROJECTION
ISO 2768-mk	ISO 5457
STANDARD DRAWING	ISO 5457


 สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน)
 Synchrotron Light Research Institute (Public Organization)

TITLE:

BPM Button-Pin

LIFE CYCLE

For information

MATERIAL

Molybdenum

3D CAD No.

DRAWING NO.


SLRI-SPSII-SR-VAC-BPM-02:003

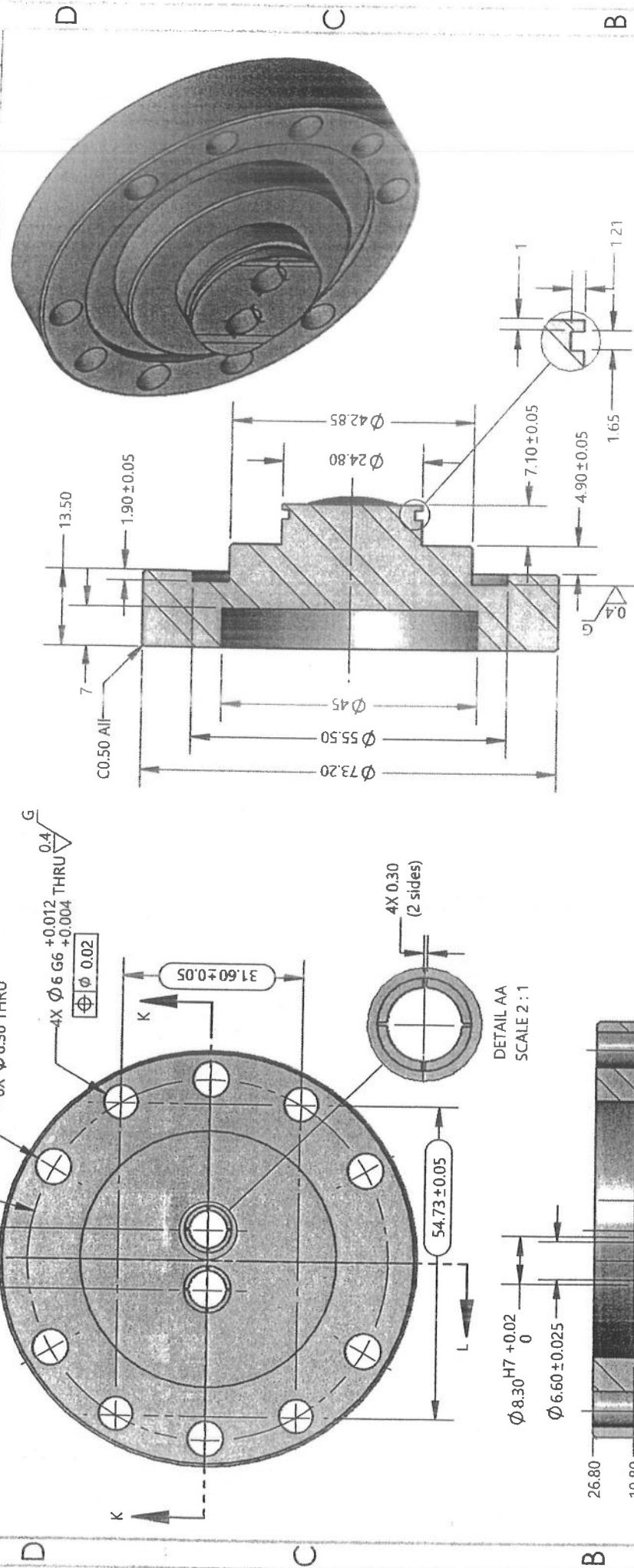
SCALE

3:1

SHEET

4 of 6

6	5	4	3	2	1			
		ITEM NO.	PART NUMBER	PART NAME	DESCRIPTION	MATERIAL	MANUFACTURER	QTY
		4	SLRI-SPSII-SR-VAC-BPM-112-004	BPM Flange	See Sheet 5	SUS316LN	Supplier	1



SECTION L-L		DETAIL M		SCALE 2 : 1	
APPROVAL		DATE		TITLE:	
DRAWN	Sarunyu Chaichuay	22/11/2021		BPM Flange	
CHECKED	Krerkrit Sittisart			MATERIAL	
RELEASED	Pornitip Sudmuang			SUS 316L/4	
APPROVED				DRAWING NO.	
GENERAL TOLERANCES		ISO 2768-mk		SLRI-SPSII-SR VAC-BPM-112-004	
STANDARD DRAWING		ISO 5457		SHEET	
PROJECTION		UNIT : mm		5 of 6	
SCALE		1:1			

สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน)
Synchrotron Light Research Institute (Public Organization)



SECTION K-K

For information

3D CAD No.

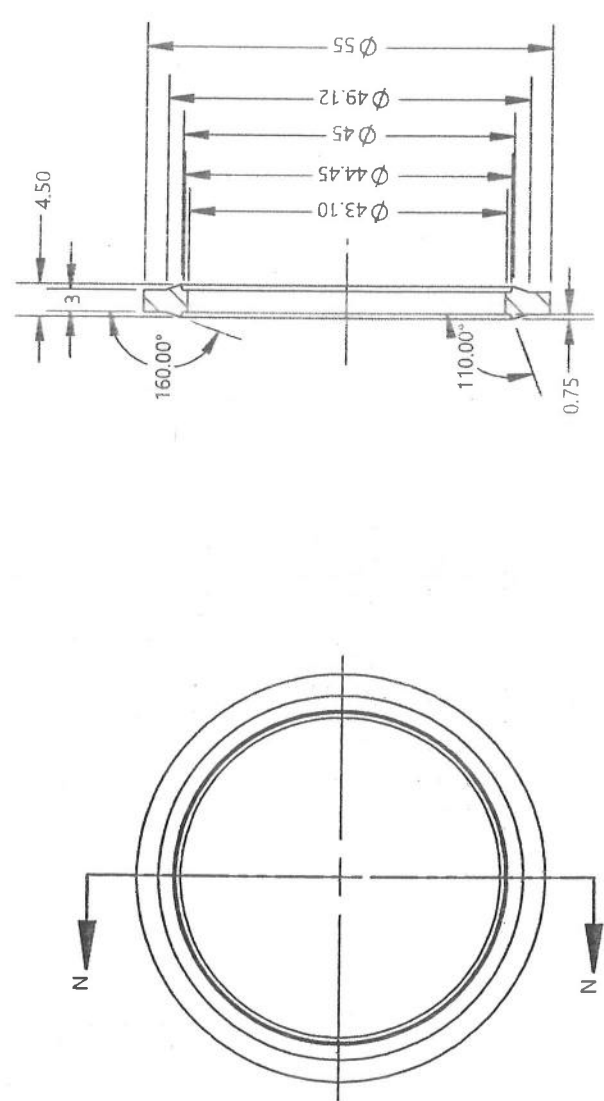
SIZE



A4

3

2

6	5	4	3	2	1
ITEM NO.		PART NUMBER	PART NAME	DESCRIPTION	MATERIAL
5		SLRI-SPSII-SR-VAC-BPM-02-005	Al Gasket	See Sheet 6	Al 1050
					TURER QTY
					1



APPROVAL		DATE	 สถาบันวิจัยแสงซินโครตรอน (องค์การมหาชน) Synchrotron Light Research Institute (Republuc Organization)	
DRAWN	Saranyu Chaichuay	22/11/2021	TITLE:	
CHECKED	Krekit Sittisart		MATERIAL	
RELEASED	Pornip Sudmuang		Al 1050	
APPROVED			DRAWING NO.	
GENERAL TOLERANCES ISO 2768-mk		LIFE CYCLE For information		SLRI-SPSII-SR-VAC-BPM-02-005
STANDARD DRAWING ISO 5457		SIZE A4	3D CAD No.	
 PROJECTION UNIT: mm		SCALE 1:1 SHEET 6 of 6		