

COPY

Invitation to Bid No. :

Specification No. : R-506/2546

C Material, equipment, and specifications for CONNECTORS AND ELECTRICAL CONTACT COMPOUND

C1 General material and packing instructions

Additional to the general instructions, the following shall be observed :

1a Scope

These specifications cover mechanical, compression and wedge type connectors to connect conductors, and electrical contact compound.

1b Standard

The connectors shall be manufactured and tested in accordance with the latest IEEE, ANSI, EEI-NEMA, ASTM, VDE Regulations and DIN, or equivalent; unless otherwise specified in these specifications.

The bodies of connectors shall be of aluminium-alloy according to manufacturer's standards, unless otherwise specified in these specifications.

1c Principal requirement

1c.1 General

The connectors shall be suitable for connecting stranded and/or solid conductors according to DIN, TIS, or equivalent; unless otherwise specified in these specifications.

1c.2 Bolted type connector

For the purpose of against self loosening, each bolt shall be furnished with at least of one (1) locknut. The bolts shall be designed for single-wrench installation. Each U-bolt is counted as two (2) bolts. The bolts shall be tightened to torque levels according to these shown in the table below or according to manufacturer's recommendation; the technical details of tightening torque levels shall be submitted on request.

All ferrous materials shall be hot-dip galvanized after manufacturing; except bolts, lockwashers, washers, and nuts up to M6 shall be electro galvanized; according to the relevant standards or having the thickness or zinc coating shown in the table below.

Sizes of Bolts, lockwashers, Washers, and Nuts	Tightening Torque Level of Galvanized Steel Bolts kgf-m	Minimum Thickness of Zinc Coating mm
M 6 (1/4")	-	0.010
M 8 (5/16")	2.0	0.040
M 10 (3/8")	2.7	0.040
M 12 (1/2")	5.5	0.040
M 14 (9/16")	6.5	0.040
M 16 (5/8")	7.5	0.040
M 20 (3/4")	11.0	0.045

1c.3 Compression type connector

Full tension sleeves and partial tension sleeves shall withstand at least 90% and 40%, respectively, of the minimum breaking strength of the conductors for which they are designed. Each sleeve shall be prefilled with electrical contact compound and closed both ends by plastic caps.

Conductor barrel of each terminal lug shall be prefilled with electrical contact compound and closed by a plastic cap.

Tap connectors shall be prefilled with electrical contact compound and packed in suitable packages, one (1) or two (2) pieces per package.

1c.4 Compression deadend assembly set

The aluminium body and aluminium jumper terminal shall accommodate aluminium conductor which is according to TIS; and the conductor barrel shall be prefilled with electrical contact compound and closed by a plastic cap.

1c.5 Wedge type connector

The wedge type connector shall consist of C-shaped member and wedge, and made of aluminium alloys which shall be described.

The wedge type connector shall pass the current cycle tests Class A (500 cycles) in accordance with the latest EEI-TDJ-162/NEMA C3, ANSI C 119.4 or equivalent.

Bidders who have never submitted the test reports of current cycle tests shall submit either prior to receipt of bids or within fifteen (15) days of the bid closing date, for saving bid consideration time, the item without submitting the report shall be rejected.

1c.6 Marking

Each connector shall be marked, on the body, at least as follows :

- (1) Applicable conductor type and size.
- (2) Manufacturer's symbol.
- (3) Marks to press, for compression type only.
- (4) Words "FULL TENSION" and "PARTIAL TENSION", on full tension sleeves and partial tension sleeves, respectively.

Except for compression type tap connectors for main line size less than 10 mm² (not including size 10 mm²), if the applicable conductor type and size can not be marked on the bodies, the marks shall be marked on individual packages.

1c.7 Sample

Free samples shall be supplied on request. The samples will not be returned.

1d Packing

Each item shall be packed separately in suitable packages in sets or pieces of 1, 2, 100, 200, 250, or 300.

Except :

PEA Material No.	Preformed fittings	sets or pieces per package
02300103	Connector, parallel groove	75
02310001	Connector, dead-end type	100

Packages of same item may be packed together in suitable cases.

C2 Material and packing data to be given by bidder

2a For each item offered, the following details shall be submitted with the bid :

Catalogue number.

Specifications of materials used for the component parts (body, bolts, nuts, screws, lockwashers, washers, etc.) .

Surface finishing of the component parts.

Nominal cross-sectional area in mm^2 of conductor for which the connector is designed.

Diameter in mm of conductor for which the connector is designed.

Material of conductors for which the connector can be used (Al, ACSR, Cu, etc.) .

Recommended tightening torques for bolts in kgf-m .

Weight in kg/100 sets or pieces.

2b It shall be advised whether the connectors should be protected by armour tape or preformed line guards, etc.

2c For each item offered, a drawing with dimensions in mm and marking details shall be submitted with the bid. For compression type connector, a drawing with the dimensions including inside and outside diameters and marking details shall be submitted.

2d Number of aluminium-alloy copper-alloy, and/or the chemical compositions of the bodies of connectors.

2e Packing details

Packing method.

Number of sets or pieces in each package (maximum 300 sets or pieces in one package)

Principal dimensions of each package in cm .

Volume of each package in m^3 .

Gross weight of each package in kg .

Net weight of each package in kg .

Number of packages.

If several packages are contained in one big case, further details are required :

Number of packages in each case.

Principal dimensions of each case in cm .

Volume of each case in m^3 .

Gross weight of each case in kg .

Number of cases.

PACKING DETAIL

Specification No.: -

Approved date: 14/08/2558

Rev. No.: -

Form No. -

Page 1 of 3

Addendum

This addendum is made to be a part of specifications it's attached.

1. Replace the packing detail only for the specific items in the specifications by the packing detail specified in

Table A1 below:

Table A1: Packing Detail

Item	Equipment	PEA's material No.	Packing method	Quantity per package/case	Number of packages/cases per pallet
Connectors and cable accessories:					
1	Hot line bail clamp (hot line stirrup clamp), for main aluminium conductor size 25 mm ² to 50 mm ²	1-02-033-0000	Sealed package	40	49
2	Hot line protected thread clamp for main aluminium conductor size 25 mm ² to 50 mm ²	1-02-033-0100	Sealed package	50	100
3	Hot line protected thread clamp for main aluminium conductor size 50 mm ² to 120 mm ²	1-02-033-0101	Sealed package	50	50
4	Compression splicing sleeve, full tension, for aluminium conductor size 50 mm ²	1-02-040-0002	Suitable package	100	100
5	Compression splicing sleeve, full tension, for aluminium conductor size 95 mm ²	1-02-040-0004	Suitable package	50	100
6	Compression splicing sleeve, full tension, for aluminium conductor size 185 mm ²	1-02-040-0007	Suitable package	30	50
7	Compression splicing sleeve, full tension, for aluminium conductor size 400 mm ²	1-02-040-0009	Suitable package	30	50
8	Compression splicing sleeve, partial tension, for aluminium conductor size 50 mm ²	1-02-041-0002	Suitable package	100	100
9	Terminal connector (lug), compression type, for aluminium conductor size 185 mm ²	1-02-041-0106	Suitable package	50	50
10	Pin terminal, for aluminium conductor size 50 mm ²	1-02-042-0400	Suitable package	50	100
Overhead line hardware:					
11	Angle steel crossarm, size 150x100x12 mm, length 4,500 mm	1-00-012-0002	Bundle	10	-
12	Channel steel crossarm, size 100x50x5 mm, length 4,200 mm	1-01-000-0103	Bundle	20	-
13	Channel steel crossarm, size 100x50x5 mm, length 4,500 mm	1-01-000-0104	Bundle	20	-
14	Channel steel crossarm, size 150x75x6 mm, length 2,800 mm	1-01-000-0300	Bundle	20	-
15	Channel steel crossarm, size 150x75x6.5 mm, length 4,000 mm	1-01-000-0301	Bundle	20	-



PROVINCIAL ELECTRICITY AUTHORITY

TECHNICAL SPECIFICATION DIVISION

PACKING DETAIL

Specification No.: -

Approved date: 14/08/2558

Rev. No.: -

Form No. -

Page 2 of 3

Item	Equipment	PEA's material No.	Packing method	Quantity per package/case	Number of packages/cases per pallet
16	Channel steel beam, size 150x75x6.5 mm, length 4,500 mm	1-01-000-0302	Bundle	20	-
17	Channel steel beam, size 150x75x6.5 mm, length 6,000 mm	1-01-000-0303	Bundle	20	-
18	Channel steel beam, size 150x75x6.5 mm, length 2,500 mm	1-01-000-0304	Bundle	20	-
19	Channel steel crossarm, size 150x75x9 mm, length 3,000 mm	1-00-012-0004	Bundle	20	-
20	Angle steel beam, size 65x65x6 mm, length 1,000 mm	1-01-001-0000	Bundle	100	-
21	Bolt, machine, M 16 x 170 mm	1-01-011-0201	Sack	100	56
22	Bolt, machine, M 16 x 300 mm	1-01-011-0204	Sack	80	56
23	Bolt, machine, M 16 x 350 mm	1-01-011-0205	Sack	80	56
24	Bolt, machine, M 16 x 450 mm	1-01-011-0207	Sack	40	56
25	Bolt, machine, M 16 x 500 mm	1-01-011-0208	Sack	40	50
26	Bolt, machine, M 16 x 600 mm	1-01-011-0209	Sack	40	50
27	Bolt, machine, hexagon head, M 16 x 75 mm	1-01-011-0400	Sack	200	56
28	Bolt, machine, hexagon head, M 16 x 550 mm	1-01-011-0401	Sack	40	50
29	Bolt, machine, hexagon head, M 16 x 600 mm	1-01-011-0402	Sack	40	50
30	Bolt, machine, hexagon head, M 16 x 650 mm	1-01-011-0403	Sack	30	50
31	Bolt, double arming, full thread, M 16 x 450 mm	1-01-012-0001	Sack	40	50
32	Bolt, double arming, full thread, M 16 x 500 mm	1-01-012-0002	Sack	40	50
33	Bolt, double arming, full thread, M 16 x 550 mm	1-01-012-0003	Sack	40	50
34	Bolt, double arming, full thread, M 16 x 600 mm	1-01-012-0004	Sack	40	50
35	Bolt, double arming, full thread, M 16 x 650 mm	1-01-012-0005	Sack	30	50
36	Bolt, double arming eye, M 16 x 450 mm	1-01-013-0001	Sack	40	56
37	Bolt, double arming eye, M 16 x 500 mm	1-01-013-0002	Sack	40	50
38	Bolt, double arming eye, M 16 x 650 mm	1-01-013-0005	Sack	30	50
39	Bolt, round eye, M 16 x 200 mm	1-01-014-0001	Sack	80	56
40	Bolt, round eye, M 16 x 250 mm	1-01-014-0002	Sack	80	56
41	Bolt, round eye, M 16 x 300 mm	1-01-014-0003	Sack	50	56
42	Bolt, oval eye, M 16 x 150 mm	1-01-015-0000	Sack	80	56
43	Bolt, oval eye, M 16 x 200 mm	1-01-015-0001	Sack	80	56
Insulators and accessories:					
44	Insulator, pin-post type, TIS 1251, Type 56/57-2	1-03-001-0101	Export package	2	30
45	Clevis-eye	1-03-014-0000	Suitable package	40	56
46	Ball-clevis, ANSI Type K	1-03-014-0001	Suitable package	30	56



PROVINCIAL ELECTRICITY AUTHORITY

TECHNICAL SPECIFICATION DIVISION

PACKING DETAIL

Specification No.: -

Approved date: 14/08/2558

Rev. No.: -

Form No. -

Page 3 of 3

Item	Equipment	PEA's material No.	Packing method	Quantity per package/case	Number of packages/cases per pallet
47	Ball-hook, ANSI Type B	1-03-014-0002	Suitable package	40	56
48	Ball-clevis, ANSI Type B	1-03-014-0005	Suitable package	40	56
Surge arresters:					
49	LV surge arrester, 480 V, 5 kA	1-04-000-0300	Suitable package	100	5
Meters:					
50	Watt-hour meter, 15(45) A, 3-phase 4-wire	1-06-005-0107	Suitable corrugate-paper package	50	-
51	Watt-hour meter, 30(100) A, 3-phase 4-wire	1-06-005-0108	Suitable corrugate-paper package	50	-

2. Sacks used for packing equipment shall have enough durability and shall be made of hemp rope.
3. Bundle packing shall be using galvanized steel wires with diameter not less than 4 mm.
4. Pallets supplied to PEA shall have dimension not more than 1.1 m x 1.1 m (Width x Length) and the total height after containing the packages/cases shall be less than 1.5 m.

การกำหนดระยะเวลาในการส่งรายงานผลการทดสอบเฉพาะแบบ (Type test report)

และระยะเวลาในการจัดส่งตัวอย่างเพื่อประกอบการพิจารณาจัดหา

Specification No.:

-

Approved date: 21/12/2560

Rev. No.: -

Form No.: -

Page 1 of 1

เอกสารเพิ่มเติมแนบท้ายรายละเอียดสเปค

(ADDENDUM)

เอกสารเพิ่มเติม (ADDENDUM) นี้ ให้ถือเป็นส่วนหนึ่งของรายละเอียดสเปคที่เอกสารฯ นี้ได้แนบอยู่ด้วย

1. การกำหนดระยะเวลาในการส่งรายงานผลการทดสอบเฉพาะแบบ (Type test report)

หากรายละเอียดสเปคกำหนดให้ผู้เสนอราคาจะต้องจัดส่งรายงานผลการทดสอบเฉพาะแบบ (Type test report) หรือหนังสือรับรองผลการทดสอบเฉพาะแบบ (Type test certificates) “ให้ผู้เสนอราคาจะต้องจัดส่งรายงานผลการทดสอบเฉพาะแบบ หรือหนังสือรับรองผลการทดสอบเฉพาะแบบมาพร้อมกับการยื่นเอกสารทางเทคนิค” แทนการกำหนดระยะเวลาจัดส่งรายงานฯ ที่ได้ระบุไว้ในรายละเอียดสเปค

ทั้งนี้ ยกเว้นบางพัสดุอุปกรณ์ที่ กฟภ. กำหนดยอมรับให้ทำการทดสอบเฉพาะแบบภายหลังจากที่ทำสัญญากับ กฟภ. แล้ว โดยคู่สัญญาจะต้องจัดส่งรายงานผลการทดสอบฯ ดังกล่าว ก่อนการส่งของนั้น ให้คงรายละเอียดไว้ตามเดิม

2. การกำหนดระยะเวลาในการจัดส่งตัวอย่าง (Sample) เพื่อประกอบการพิจารณาจัดหา

หากรายละเอียดสเปคกำหนดให้ผู้เสนอราคาจะต้องจัดส่งตัวอย่างพัสดุอุปกรณ์ (Sample) เพื่อประกอบการพิจารณาจัดหา “ให้ผู้เสนอราคาจะต้องจัดส่งตัวอย่างพัสดุอุปกรณ์ ภายใน 5 วันทำการ นับถัดจากวันเสนอราคา” แทนการกำหนดระยะเวลาจัดส่งตัวอย่างที่ได้ระบุไว้ในรายละเอียดสเปค



H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 1 of 9

Invitation to Bid No:

C Material, equipment, and specification for H-TYPE COMPRESSION TAP CONNECTORS

CI General material and packing instructions

Additional to the general instructions, the following shall be observed:

1a Scope

These specifications describe requirements for design, manufacture, tests and supply of H-type compression tap connectors used in low-voltage distribution system.

1b Standards

Except otherwise specified elsewhere in the specification, the connectors shall be manufactured and tested in accordance with the following standards

ANSI/NEMA CC1-2009 Electric power connection for substations

ANSI C119.4-2016 Connectors for use between aluminum-to-aluminum and aluminum-to-copper conductors designed for normal operation at or below 93°C and copper-to-copper conductors designed for normal operation at or below 100°C

PEA will also accept connector tested in accordance with the later edition of the above standards.

PEA will also accept the design test report in accordance with the previous edition of the above standards, if there is no significant change in any test items or no additional test item(s) compared with the above standards. On the other hand, if there is significant change in any test items or there are any additional test items, the previous edition design test report with the additional test report(s) of the significant change test item(s) and/or additional test item(s) will be also accepted.

1c Principal requirement

1c.1 Service conditions and installation

The H-type compression tap connector shall be designed and constructed for outdoor installation, and suitable for operation under the following conditions:

Altitude	:	up to 1,000 m above sea level
Ambient air temperature	:	up to 50°C
Average relative humidity in any one year	:	up to 94%
Climatic condition	:	tropical climate





PROVINCIAL ELECTRICITY AUTHORITY
ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 2 of 9

1.c.2 General

The H-type compression tap connectors shall be suitable for connection between LV main aluminium conductor and tap copper conductor which sizes as specified in "C3 Schedule of detailed requirement". The dimensions of the connectors shall be according to Drawing No.SA2-015/25001.

Entire contact surface of the connectors shall be thoroughly filled with oxide inhibiting contact grease, the minimum thickness of the grease shall be 0.5 mm.

Surface of the connectors shall be smooth, consistent, no dirt, no blemishes, no cracks and no rust.

1.c.3 Construction and characteristics

The finished product of the proposed H-type compression tap connector shall be of aluminum grade 1050, 1100 or 1350, which shall be standard grade or designation in accordance with international standards, i.e. SAE, AISI, JIS, ASTM, ANSI, UNS, ISO or BS. It shall be suitable for using with both aluminum to aluminum connection and aluminum to copper connection.

1.c.4 Marking

Each connector shall be marked by mean of engraving, knurling, hot stamping or laser marking on the body at least data listed below, which is clearly visible and durable foil-coated marking, i.e. printing with toner or laser toner with foil-coated, is not accepted.

- (1) Manufacturer's name or Trademark
- (2) Model or catalog/drawing number
- (3) Type and size of conductor to be used with
- (4) Purchase order number

1.c.5 Samples

The bidders shall submit at least one (1) sample for each proposal item within five (5) working days counted from bid closing date for consideration; otherwise, the proposal will be rejected.

PEA's bids committee will initially check the sample by comparing with the color photograph in the proposed type test report and PEA's specification. PEA's bid committee will reject a proposal if there are any parts of sample differing from the color photograph in the type test report and PEA's specification.

PEA reserves the right to test the sample in visual and dimension check and hardness test according to **1e.3 Acceptance tests**, in case of the failing test results, the proposal will be rejected.

The sample will not be returned after consideration, the sample of the successful bidder will be used as a reference sample in acceptance process. The supplied connectors with a different design compared with the reference sample shall be rejected.





PROVINCIAL ELECTRICITY AUTHORITY
ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564	Approved date: 24 DEC 2021	Rev. No.: 2	Form No. -	Page 3 of 9
----------------------------------	-----------------------------------	-------------	------------	-------------

1d Packing

The supplied connectors shall be packed in a seal plastic envelope, by quantity of 1, 5, 10, 20, or appropriate per envelope, for protection the connectors and its compound from dust and moisture.

The envelopes shall be packed in paper box and each paper box shall be marked with purchase order number, contractor's name, manufacturer's name or trademark, model or catalog/drawing number type and size of conductor to be used with, number of connectors in the box and net weight. The box shall be wrapped and sealed with a moisture-proof material.

1e Test and Test report

1e.1 Type tests

The proposed H-type compression tap connector shall be passed all type test items with reference standards and test method as specified in Table 1.

Table 1
Type test items of H-type compression tap connector

No.	Test items	Reference standard/Test method	Description
1	Visual and dimension check	PEA's specification	See (1)
2	Chemical composition test	Optical emission spectrometer	See (2)
3	Temperature rise test	ANSI/NEMA CC1	See (3)
4	Conductor damage test	ANSI C119.4	See (4)
5	Hardness test	Brinell hardness test	See (5)





การไฟฟ้าส่วนภูมิภาค
PROVINCIAL ELECTRICITY AUTHORITY

PROVINCIAL ELECTRICITY AUTHORITY

ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 4 of 9

Before the type tests are proceeded, manufacturer shall submit following detail to PEA for approval:

- Ten (10) samples of H-type compression tap connector (All sample shall be signed by PEA's representative)
- Drawing showing specified dimensions and all information according to Drawing No.SA4-015/25001.
- Standard to be used as a reference of grade or designation of the H-type compression tap connector
- The details of tools and compression dies used for compressing the h-type-compression tap connector shall be submitted as following:
 - The catalogue of tools and compression die which specify the model and the name of manufacturer.
 - The dimensions of compression die are required in case of the manufacturer of h-type-compression tap connector uses his own compression die in the type test processes

One sample of H-type compression tap connector will be kept by PEA (by Electrical Equipment Standard and Quality Control Division) and will be used as a reference sample for bid consideration and acceptance processes.

The other samples will be sent to acknowledged independent testing laboratories/institutes, which have qualification mentioned below, for type tests in accordance with the test items specified in **Table 1**.

(1) Visual and dimension check

Four (4) samples are required for the test. Each sample shall have markings in accordance with clause **1c.4 Marking**, except purchase order number is not required. Dimensions of each sample shall be measured and recorded. The dimensions of all samples shall be according to Drawing No.SA2-015/25001 and according to manufacturer's drawing.

(2) Chemical composition test

One (1) sample is required for the test. The H-type compression tap connector shall be tested by means of optical emission spectrometer for verification grade or designation of aluminium alloy, which shall be aluminium grade or designation specified in accordance with **1.c.3 Construction and characteristics**.

Note: PEA will accept result of the chemical composition test with tolerance of -10% of minimum value of each substance specified in reference standard, except aluminium shall have a minimum value according to the reference standard.





PROVINCIAL ELECTRICITY AUTHORITY

ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: **24 DEC 2021** Rev. No.: 2

Form No. -

Page 5 of 9

(3) Temperature rise test

Four (4) samples are required for the test. The temperature rise test shall be according to ANSI/NEMA CC1. Temperature rise of all connectors shall not exceed the temperature rise of tested conductor.

(4) Conductor damage test

Two (2) samples are required for the test. The conductor damage test shall be according to ANSI C119.4.

(5) Hardness test

Two (2) samples are required for the test.

The type tests of the H-type compression tap connectors shall be conducted or inspected by the acknowledged independent testing laboratories/institutes as follows:

(1) Independent at laboratories/institutes which are members of the Short-circuit Testing Liaison (STL) or independent laboratories/institutes which are accredited according to TIS 17025 or ISO/IEC 17025 with the scope of accreditation covered the relevant test items, standard and equipment. The certification and scope of accreditation of the independent laboratories/institutes shall be submitted with the bid for consideration.

(2) Laboratories, institutes, universities and electric utilities, as follows:

- NSTDA Characterization and testing service center (NCTC)
- Thailand Institute of Scientific and Technological Research (TISTR)
- National Metal and Materials Technology Center (MTEC)
- Electrical and Electronic Products Testing Center (PTEC)
- Thai Industrial Standards Institute (TISI)
- Electrical and Electronics Institute (EEI)
- Department of Science Service (DSS)
- Testing Laboratory, Electrical Engineering Department, Faculty of Engineering, Chulalongkorn University
- Electricity Generating Authority of Thailand (EGAT)
- Metropolitan Electricity Authority (MEA)
- Provincial Electricity Authority (PEA)
- Laboratory of manufacturers approved by PEA

(3) Other laboratories as follow:

- In case the foreign manufacturers have experience of more than twenty (20) years in design, manufactures and sell H-type compression tap connector, PEA will accept type test report(s) conducted by the manufacturer's laboratory or other independent laboratories without





PROVINCIAL ELECTRICITY AUTHORITY

ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 6 of 9

qualification mentioned in (1) or (2). Documents showing the manufacturer's experience such as reference list shall be submitted with the bid for consideration.

- The bidders or manufacturers who prefer to carry out the type tests of H-type compression tap connector with other laboratories without the qualification mentioned above, the detail of laboratory and the test facilities shall be submitted to PEA for approval before proceeding the tests and before the bid closing date. PEA reserves the right to send representatives to inspect or witness the tests.

The type test reports conducted by the laboratories/institutes in Thailand or local manufacturers shall be valid within five (5) years counted from the issued date in the test report to the bid closing date. The type test reports conducted by the laboratories/institutes in other countries shall be valid within ten (10) years counted from the issued date in the test report to the bid closing date.

The cost of all tests and report shall be borne by the Bidders or manufacturers.

The type test reports shall be submitted with the bid.

PEA will also accept other documents instead of the type test reports in the following cases:

- (1) In case the proposed connectors have been sold to PEA at PEA's Procurement Department (from PEA's head office). The bidder can submit the Purchase Order (PO) on the bid closing date, or
- (2) In case the proposed connectors have been registered for PEA Product Acceptance⁽¹⁾, the Bidder can submit the valid registration certificate on the bid closing date, or
- (3) In case the proposed connectors have been registered for Product lists for transmission and substation turnkey project⁽²⁾, the Bidder can submit the valid registration certificate on the bid closing date.

However the document in case (1), (2) and (3) mentioned above shall be proved by the bidding committee that connectors specified in the PO or registration certificate is the same product, type model and all ratings as the proposed connectors for this bid.

Note: ⁽¹⁾ PEA Product Acceptance (PPA) is the process for enhancing quality of electrical apparatus which PEA procure by making quality control system and certification of product's quality by reliable Certification Body (CB). PPA is taken responsibility by Electrical Equipment Standard and Quality Control Division.

⁽²⁾ Product lists for transmission and substation turnkey project is the process of registration of electrical apparatus used in PEA's power system. Product lists is taken responsibility by Substation Project Management Division.

The type test reports shall consist of the necessary as follow; otherwise, it is not accepted by PEA

- (1) The test results of all test items as specified in **Table 1**.
- (2) The details of tools and compression dies used for compressing the H-type compression tap connector in the type test processes shall be declared as following:





PROVINCIAL ELECTRICITY AUTHORITY

ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 7 of 9

- Catalogue of tools and compression die which specify the model and the name of manufacturer, or
 - Dimensions of compression die are required in case of the manufacturer of the connectors uses his own compression die in the type test processes.
- (3) Outline drawing of the H-type compression tap connector, showing dimensions according to Drawing No.SA2-015/25001
- (4) The color photographs of H-type compression tap connector as following:
- Manufacturer's name or Trademark
 - Size of conductor to be used with
 - Model or catalog/drawing number H-type compression tap connector
 - Oxide inhibiting contact grease

1.e.2 Routine tests

Each H-type compression tap connector shall pass visual and dimension check and other tests according to manufacturer's standard.

1.e.3 Acceptance tests

PEA reserves the right to have acceptance tests, conducted by PEA's laboratory or acknowledge independent testing laboratories as mentioned in 1e.1 or by manufacturer's factory qualified by PEA.

The cost of all tests shall be borne by the Contractor.

PEA's acceptance committee will randomly select the samples of connector for each delivery lot with the number as specified in Table 2.

Table 2
Number of samples for acceptance tests

Number of H-type compression tap connector for each delivery lot (sets)	Number of samples (sets)
Up to 100	2
101 – 500	3
501 – 1,000	4
More than 1,000	5

- Note:**
- The samples shall not be returned and shall not be used in the system.
 - After the tests, the additional H-type compression tap connectors, with the equal number of the samples specified in Table 2, shall be supplied by the contractor with free of charge to complete the number of connectors in the purchase contract.





การไฟฟ้านครหลวง
PROVINCIAL ELECTRICITY AUTHORITY

PROVINCIAL ELECTRICITY AUTHORITY

ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 8 of 9

All sample(s) shall pass acceptance test items No. 1 – 5 sequentially, with reference standards and test method as specified in **Table 3**. PEA reserve the right not to continue the tests if the sample is failed the test in any test items.

Table 3

Acceptance test items of H-Type compression tap connectors

No	Test Items	Reference standard /Test method	Acceptance criteria
1	Visual check	PEA's specification	<ul style="list-style-type: none"> - Surface of all samples shall be smooth, consistent, no dirt, no blemishes, no cracks and no rust - All sample shall have markings in accordance with clause 1c.4 Marking - Entire contact surface of all samples shall be thoroughly filled with oxide inhibiting contact grease, the minimum thickness of the grease shall be 0.5 mm
2	Dimension check	PEA's specification	Dimension of all sample shall be according to manufacturer's drawing and shall be according to Drawing No. SA2-015/25001
3	Chemical composition test	Optical emission spectrometer	According to Chemical composition test specified in Table 1 . Note: Testing only one (1) sample per lot
4	Hardness test	Brinell hardness test	The test result shall be within 10% tolerance of the hardness test result in the type test report. Note: Testing only one (1) sample per lot
5	Assembly test	PEA's specification	The samples shall be suitable to assemble with the conductor to be used with.





การไฟฟ้าส่วนภูมิภาค
PROVINCIAL ELECTRICITY AUTHORITY

PROVINCIAL ELECTRICITY AUTHORITY

ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

H - TYPE COMPRESSION TAP CONNECTORS

Specification No.: RCBL-026/2564

Approved date: 24 DEC 2021

Rev. No.: 2

Form No. -

Page 9 of 9

C2 Material and packing data shall be submitted with the bid:

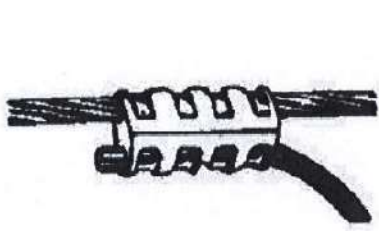
The following critical documents and details shall be submitted with the bid:

Critical documents of the proposed h-type compression tap connector shall be submitted with the bid for each item offered:

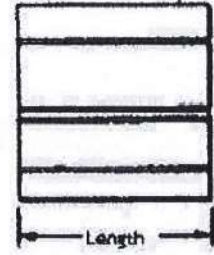
(The bidders shall fill the table below; otherwise, the proposal shall be rejected)

No.	Required technical document	Proposed Technical document	Reference document (Page No.)
1	Type test report (see 1e.1) or	<input type="checkbox"/> YES <input type="checkbox"/> No	
	Purchase Order (PO) from PEA's Procurement Department (from PEA's head office) (see 1e.1) or	<input type="checkbox"/> YES <input type="checkbox"/> No	
	Product acceptance certificate (see 1e.1)	<input type="checkbox"/> YES <input type="checkbox"/> No	
	Product lists certificate (see 1e.1)	<input type="checkbox"/> YES <input type="checkbox"/> No	
2	Drawing(s) of the proposed H-type compression tap connectors, showing dimensions (see 1c.2) (Drawing(s) by using PEA's drawings shall not be accepted)	<input type="checkbox"/> YES <input type="checkbox"/> No	
3	Packing detail (see 1d)	<input type="checkbox"/> YES <input type="checkbox"/> No	





Cross section



Side view

PEA MATERIAL No.	CONDUCTOR RANGE		MINIMUM LENGTH (mm)	SIMILAR TO							
	MAIN SIZES (mm)	TAP SIZES (mm)		BURNDY		KEARNEY		HOMAC		PENN-UNION	
				CATALOGUE NO.	DIE INDEX	CATALOGUE NO.	DIE INDEX	CATALOGUE NO.	DIE INDEX	CATALOGUE NO.	DIE INDEX
1020320009	10-16	4-10	25	YPC2A8U	BG	421-82	5/8"	UB 214	5/8"	-	-
1020320010	25-50	2.5-6	30	-	-	424-82	0	OB 2014	0	KO-R24	0
1020320011	25-50	16-35	40	YHO-150	0	508-82	0	OB 103	0	KO-R06	0
1020320012	50-95	50-95	55	YHD-300	D3	504-82	0	DB 2020	D	KD-R04	D
1020320013	70-95	16-35	40	YHD-200	D3	502-82	0	DB 202	0	KD-R02	D
1020320014	35-50	6-10	30	YPC26R8U	0	428-82	0	-	-	KO-R24	0
1020320015	70-95	6-10	30	YPC26R8U	0	-	-	-	-	-	-

กองวิศวกรรมไฟฟ้าและเครื่องกล ฝ่ายวิศวกรรม การไฟฟ้าส่วนภูมิภาค

มิติเป็น วันที่ 13 ธ.ค. 2564	H-TYPE COMPRESSION TAP CONNECTORS	แบบเลขที่ SA2-015/25001 Issued by SmartSpec Data 30/01/24 แผ่นที่ ... ของจำนวนหน้า ... แผ่น
---	--	---

ประกวดราคาเลขที่ : 67HAH036MM

สเปคเลขที่ : RCBL-506/2546

C3 Schedule of detailed requirement

Item	PEA Material No	Quantity	Description
1	1020300102	41,000	การไฟฟ้าส่วนภูมิภาคจะจัดซื้อพัสดุที่ผลิตภายในประเทศ
2	1020300103	10,900	

ประกวดราคาเลขที่ : 67HAH036MM

สเปคเลขที่ : RCBL-026/2564

C3 Schedule of detailed requirement

Item	PEA Material No	Quantity	Description
3	1020320010	100	การไฟฟ้าส่วนภูมิภาคจะจัดซื้อพัสดุที่ผลิตภายในประเทศ
4	1020320011	208,500	
5	1020320012	60,087	
6	1020320013	1,500	
7	1020320014	450	
8	1020320015	240	

ประกวดราคาเลขที่ 67HAH036MM

สเปคเลขที่ : RCBL-506/2546

C3 Schedule of detailed requirement

Item	PEA Material No	Quantity	Description
1	1020300102	41,000	<p>Connector, parallel groove, 2 -bolt type, length not less than 55 mm, for electrical tap off connection of aluminium, aluminium -alloy, and ACSR conductors to aluminium, aluminium-alloy, and ACSR conductors, with :</p> <p>Main : diameter range of 6.42 mm to 13.60 mm (size 25 mm² to 95 mm²). Tap : diameter range of 6.42 mm to 13.60 mm (size 25 mm² to 95 mm²).</p>
2	1020300103	10,900	<p>Connector, parallel groove, 3 -bolt type, length not less than 90 mm, for electrical tap off connection of aluminium, aluminium -alloy, and ACSR conductors to aluminium, aluminium-alloy, and ACSR conductors, with :</p> <p>Main : diameter range of 10.75 mm to 17.64 mm (size 70 mm² to 185 mm²). Tap : diameter range of 10.75 mm to 17.64 mm (size 70 mm² to 185 mm²).</p> <p>Note :</p> <ol style="list-style-type: none">1. Enclosed Drawing No. SA2-015/40002 and SA2-015/24029.2. The bidder has to supply five(5) samples and approximately 0.5 kg of the COMPOUND, within fifteen (15) days, counted from the Committee's request. The samples will not be returned.



PROVINCIAL ELECTRICITY AUTHORITY
ELECTRICAL AND MECHANICAL ENGINEERING DIVISION

Specification No.: RCBL-026/2564
H - TYPE COMPRESSION TAP CONNECTOR

Page 1 of 2

C3 Schedule of detailed requirement**Invitation to Bid No.: 67HAH036MM**

Item	PEA Material No.	Quantity	Description
3	1020320010	100 pc(s)	Connector, compression tap, H-type, connection of main aluminium conductor to tap copper conductor and main aluminium conductor to tap aluminium conductor, see Drawing No. SA2-015/25001, with : Main : diameter range of 5.90 mm to 9.06 mm (size 25 mm ² to 50 mm ²) Tap : diameter range of 1.78 mm to 2.76 mm (size 2.5 mm ² to 6 mm ²) Minimum Length : 30 mm
4	1020320011	208,500 pc(s)	Connector, compression tap, H-type, connection of main aluminium conductor to tap copper conductor and main aluminium conductor to tap aluminium conductor, see Drawing No. SA2-015/25001, with : Main : diameter range of 5.90 mm to 9.06 mm (size 25 mm ² to 50 mm ²) Tap : diameter range of 4.50 mm to 7.56 mm (size 16 mm ² to 35 mm ²) Minimum Length : 40 mm
5	1020320012	60,087 pc(s)	Connector, compression tap, H-type, connection of main aluminium conductor to tap copper conductor and main aluminium conductor to tap aluminium conductor, see Drawing No. SA2-015/25001, with : Main : diameter range of 8.33 mm to 12.60 mm (size 50 mm ² to 95 mm ²) Tap : diameter range of 8.33 mm to 12.60 mm (size 50 mm ² to 95 mm ²) Minimum Length : 55 mm
6	1020320013	1,500 pc(s)	Connector, compression tap, H-type, connection of main aluminium conductor to tap copper conductor, see Drawing No. SA2-015/25001, with : Main : diameter range of 9.73 mm to 11.45 mm (size 70 mm ² to 95 mm ²) Tap : diameter range of 5.10 mm to 7.56 mm (size 16 mm ² to 35 mm ²) Minimum Length : 40 mm
7	1020320014	450 pc(s)	Connector, compression tap, H-type, connection of main aluminium conductor to tap copper conductor, see Drawing No. SA2-015/25001, with : Main : diameter range of 6.95 mm to 8.33 mm (size 35 mm ² to 50 mm ²) Tap : diameter range of 3.12 mm to 4.05 mm (size 6 mm ² to 10 mm ²) Minimum Length : 30 mm



**PROVINCIAL ELECTRICITY AUTHORITY
ELECTRICAL AND MECHANICAL ENGINEERING DIVISION**

**Specification No.: RCBL-026/2564
H - TYPE COMPRESSION TAP CONNECTOR**

Page 2 of 2

C3 Schedule of detailed requirement

Invitation to Bid No.: 67HAH036MM

Item	PEA Material No.	Quantity	Description
8	1020320015	240 pc(s)	Connector, compression tap, H-type, connection of main aluminium conductor to tap copper conductor, see Drawing No. SA2-015/25001, with : Main : diameter range of 9.73 mm to 11.45 mm (size 70 mm ² to 95 mm ²) Tap : diameter range of 3.12 mm to 4.05 mm (size 6 mm ² to 10 mm ²) Minimum Length : 30 mm)
			<u>Note</u> : Enclosed Drawing No. SA2-015/25001.

Invitation to Bid No. 67HAH036MM
Specification No : RCBL-506/2546

Manufacturer :
Trade-Mark :
Country of Origin :
Bidder :
Bid No. :
Date :

C4 Price Schedule

Item	PEA Material No	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Unit Cost (See details & conditions attached)
			<p>1.ผลิตภัณฑ์ที่จัดส่งต้องระบุชื่อบริษัท/ห้างฯ/ร้าน ตรงกับผลิตภัณฑ์ที่เสนอราคาครั้งนี้ และจำเป็นต้องกรอกข้อความให้ถูกต้องครบถ้วน</p> <p>2.การจัดส่งให้บรรจุในบรรจุภัณฑ์ตามที่ กฟผ. กำหนด และให้แสดงรูปแบบรายละเอียดของบรรจุภัณฑ์ในการเสนอราคาด้วย</p> <p>3.กำหนดส่งพัสดุ เป็นงวด และภายในงวดสามารถทยอยส่งได้ โดยจัดส่งภายในกำหนดเวลาตามสัญญา นับถัดจากวันลงนามในสัญญา กฟผ. จะเบิกจ่ายเงินเมื่อผู้ขายส่งมอบพัสดุและผ่านการตรวจรับครบถ้วน ตามงวดที่กำหนด แต่ละรายการ ดังนี้</p> <p><u>หมายเหตุ</u> กฟผ. สงวนสิทธิ์ ในการเปลี่ยนจำนวนแต่ละจุดจัดส่ง ตามที่ระบุในใบสั่งซื้อ และสัญญาซื้อขาย ทั้งนี้ ไม่เพิ่มจากสถานที่กำหนดในเงื่อนไขประกวดราคานี้</p>			
1	1020300102		กำหนดการจัดส่งเป็น 1 งวด ภายใน 45 วัน โดยจัดส่งที่ คลังพัสดุชลบุรี จำนวน 21,000 อัน คลังพัสดุจันทบุรี จำนวน 20,000 อัน	41,000		
2	1020300103		กำหนดการจัดส่งเป็น 1 งวด ภายใน 30 วัน โดยจัดส่งที่ คลังพัสดุชลบุรี จำนวน 7,000 อัน คลังพัสดุจันทบุรี จำนวน 3,900 อัน	10,900		

Invitation to Bid No. 67HAH036MM
 Specification No : RCBL-026/2564

Manufacturer :
 Trade-Mark :
 Country of Origin :
 Bidder :
 Bid No. :
 Date :

C4 Price Schedule

Item	PEA Material No	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Unit Cost (See details & conditions attached)
			<p>1.ผลิตภัณฑ์ที่จัดส่งต้องระบุชื่อบริษัท/ห้างฯ/ร้าน ตรงกับผลิตภัณฑ์ที่เสนอราคาครั้งนี้ และจำเป็นต้องกรอกข้อความให้ถูกต้องครบถ้วน</p> <p>2.การจัดส่งให้บรรจุในบรรจุภัณฑ์ตามที่ กฟภ. กำหนด และให้แสดงรูปแบบรายละเอียดของบรรจุภัณฑ์ในการเสนอราคาด้วย</p> <p>3.กำหนดส่งพัสดุ เป็นงวด และภายในงวดสามารถทยอยส่งได้ โดยจัดส่งภายในกำหนดเวลาตามสัญญา นับถัดจากวันลงนามในสัญญา กฟภ. จะเบิกจ่ายเงินเมื่อผู้ขายส่งมอบพัสดุและผ่านการตรวจรับครบถ้วน ตามงวดที่กำหนด แต่ละรายการ ดังนี้</p> <p><u>หมายเหตุ</u> กฟภ. สงวนสิทธิ์ ในการเปลี่ยนจำนวนแต่ละจุดจัดส่ง ตามที่ระบุในใบสั่งซื้อ และสัญญาซื้อขาย ทั้งนี้ ไม่เพิ่มจากสถานที่กำหนดในเงื่อนไขประกวดราคานี้</p>			
3	1020320010		กำหนดการจัดส่งเป็น 1 งวด ภายใน 30 วัน โดยจัดส่งที่คลังพัสดุจันทบุรี	100		
4	1020320011		<p>กำหนดการจัดส่งเป็น 2 งวด รายละเอียดดังนี้</p> <p>งวดที่1 ภายใน 30 วัน โดยจัดส่งที่คลังพัสดุจันทบุรี จำนวน 100,000 อัน</p> <p>งวดที่2 ภายใน 60 วัน โดยจัดส่งที่คลังพัสดุระยอง จำนวน 58,500 อัน</p> <p>คลังพัสดุฉะเชิงเทรา จำนวน 50,000 อัน</p>	208,500		

Invitation to Bid No. 67HAH036MM
Specification No : RCBL-026/2564

Manufacturer :
Trade-Mark :
Country of Origin :
Bidder :
Bid No. :
Date :

C4 Price Schedule

Item	PEA Material No	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Unit Cost (See details & conditions attached)
5	1020320012		กำหนดการจัดส่งเป็น 1 งวด ภายใน 45 วัน โดยจัดส่งที่ คลังพัสดุชลบุรี จำนวน 40,000 อัน คลังพัสดุจันทบุรี จำนวน 20,087 อัน	60,087		
6	1020320013		กำหนดการจัดส่งเป็น 1 งวด ภายใน 30 วัน โดยจัดส่งที่ คลังพัสดุจันทบุรี	1,500		
7	1020320014		กำหนดการจัดส่งเป็น 1 งวด ภายใน 30 วัน โดยจัดส่งที่ คลังพัสดุจันทบุรี	450		
8	1020320015		กำหนดการจัดส่งเป็น 1 งวด ภายใน 30 วัน โดยจัดส่งที่ คลังพัสดุจันทบุรี	240		