MR. SHUANG LI
ELCO (TIANJIN) ELECTRONICS CO LTD
NO 12, 4TH XEDA BRANCH RD
XIQING ECONOMIC DEVELOPMENT AREA
TIANJIN
300385 CHINA

Date: 2013/04/25
Subscriber: 100235490
PartySite: 1372656
File No: E318824
Project No: 13RS15523
PD No: 13M18012
Type: R
PO Number:

Subject: **Procedure And/Or Report Material**

The following material resulting from the investigation under the above numbers is enclosed.

| Issue Date | Vol | Sec | Pages | Revised Date |
|---|---|---|---|---|
| | 1 | | Revised Authorization Page(s) | 2013/04/25 |

SR9888870 Address change Sub#100237-960

Inspections at your plant will be conducted under the supervision of CHEN BAO SHEN, UL INSPECTION CENTER BEIJING, CHINA NAT'L IMPORT & EXP COM INSP CORP, 5TH FL, CCIC BRANCH OFFICE, CHAOYANG DIST, 6 TIANSHUIYUAN ST, BEIJING, China, 100026., PHONE: 10-5861-9588, FAX: 10-5861-9599, EMAIL: CHENBS@CCICBJ.COM

Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

Please review this material and report any inaccuracies to UL's Customer Service Professionals. Contact information for all of UL's global offices can be found at http://www.ul.com/global/eng/pages/corporate/contactus.

If you'd like to receive updated materials FASTER, UL offers electronic access and/or delivery of this material. For more details, contact UL's Customer Service Professionals as shown above.

This material is provided on behalf of UL LLC(UL) or any authorized licensee of UL.

TPI File

UL INSPECTION CENTER 60

# FOLLOW-UP SERVICE PROCEDURE
(TYPE R)

## POWER CIRCUIT AND MOTOR-MOUNTED APPARATUS
(NMTR)

Manufacturer: SEE ADDENDUM FOR MANUFACTURER LOCATIONS

Applicant: (100235-490)
1372656 (Party Site)
ELCO (TIANJIN) ELECTRONICS CO LTD
NO 12, 4TH XEDA BRANCH RD
XIQING ECONOMIC DEVELOPMENT AREA
300385 TIANJIN, CHINA

Listee/Classified Co.: (100237-960)
1430080 (Party Site)
ELCO INDUSTRY AUTOMATION AG (E321609)
POSTGASSE 8
3052 ZOLLIKOFEN SWITZERLAND

This Follow-Up Service Procedure authorizes the above Manufacturer(s) to use the marking specified by UL LLC, or any authorized licensee of UL LLC, including the UL Contracting Party, only on products when constructed, tested and found to be in compliance with the requirements of this Follow-Up Service Procedure and in accordance with the terms of the applicable service agreement with UL Contracting Party and any applicable Service Terms. The UL Contracting Party for Follow-Up Services is listed on addendum to this Follow-Up Service Procedure ("UL Contracting Party"). UL Contracting Party and UL LLC are referred to jointly herein as "UL."

UL further defines responsibilities, duties and requirements for both Manufacturers and UL representatives in the document titled, "UL Mark Surveillance Requirements" that can be located at the following web-site: http://www.ul.com/fus and in the document titled "UL and Subscriber Responsibilities" that can be located at the following website: http://www.ul.com/responsibilities. Manufacturers without Internet access may obtain the current version of these documents from their local UL customer service representative or UL field representative. For assistance, or to obtain a paper copy of these documents or the applicable Service Terms, please contact UL's Customer Service at http://www.ul.com/global/eng/pages/corporate/contactus, select a location and enter your request, or call the number listed for that location.

The Applicant, the specified Manufacturer(s) and any Listee/Classified Co. in this Follow-Up Service Procedure must agree to receive Follow-Up Services from UL Contracting Party. If your applicable agreement is a Global Services Agreement ("GSA") with an effective date of January 1, 2012 or later and this Follow-Up Service Procedure is issued on or after that effective date, the Applicant, the specified Manufacturer(s) and any Listee/Classified Co. will be bound to a Service Agreement for Follow-Up Services upon the earliest by any Subscriber of use of the prescribed UL Mark, acceptance of the factory inspection, or payment of the Follow-Up Service fees which will incorporate such GSA, this Follow-Up Service Procedure and the Follow-Up Service Terms which can be accessed by clicking here: http://www.ul.com/contracts/Terms-After-12-31-2011. In all other events, Follow-Up Services will be governed by and incorporate the terms of your applicable service agreement and this Follow-Up Service Procedure.

It is the responsibility of the Listee/Classified Co. to make sure that only the products meeting the aforementioned requirements bear the authorized Marks of UL LLC, or any authorized licensee of UL LLC.

This Follow-Up Service Procedure contains information for the use of the above Manufacturer(s) and representatives of UL and is not to be used for any other purpose. It is provided to the Manufacturer with the understanding that it will be returned upon request and is not to be copied in whole or in part.

This Follow-Up Service Procedure, and any subsequent revisions, is the property of UL and is not transferable. This Follow-Up Service Procedure contains confidential information for use only by the above named Manufacturer(s) and representatives of UL and is not to be used for any other purpose. It is provided to the Subscribers with the understanding that it is not to be copied, either wholly or in part unless specifically allowed, and that it will be returned to UL, upon request.

Capitalized terms used but not defined herein have the meanings set forth in the GSA and the applicable Service Terms or any other applicable UL service agreement.

UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages arising out of or in connection with the use or reliance upon this Follow-Up Service Procedure to anyone other than the above Manufacturer(s) as provided in the agreement between UL LLC or an authorized licensee of UL LLC, including UL Contracting Party, and the Manufacturer(s).

UL LLC has signed below solely in its capacity as the accredited entity to indicate that this Follow-Up Service Procedure is in compliance with the accreditation requirements.

William R. Carney
Director
North American Certification Program

LOCATION

1372656 (Party Site)
(100235-490) ELCO (TIANJIN) ELECTRONICS CO LTD
NO 12, 4TH XEDA BRANCH RD
XIQING ECONOMIC DEVELOPMENT AREA
300385 TIANJIN, CHINA

Factory ID:
UL Contracting Party for above site is: UL AG

Listing Mark Data Page (LMDP)

(FILE IMMEDIATELY AFTER AUTHORIZATION PAGE)

LISTING MARK

The Listing Mark consists of four elements placed in close proximity and shall appear on Listed products only. Minimum size is not specified, as long as the Listing Mark is legible. The following is suggested.


XXXX = The control number assigned by UL, 37JV.

The minimum height of the registered trademark symbol ® shall be 3/64 of an inch. When the overall diameter of the UL Mark is less than 3/8 of an inch, the trademark symbol may be omitted if it is not legible to the naked eye.

The product identity is: "INDUSTRIAL CONTROL EQUIPMENT" or "IND.CONT.EQ."

The product identity may be omitted if the Mark is directly and permanently applied to the product by stamping, molding, ink-stamping, silk screening or similar process. The product identity may appear elsewhere on the product if the other three elements are part of the nameplate which includes the rating or the catalog or model designation.

Separable Listing Mark (not part of a name plate and in the form of decals, stickers or labels) will always include the four elements.

The manufacturer may reproduce the Mark or obtain it from a UL authorized supplier.

THIS PAGE IS TO BE REVISED BY FUS DEPARTMENT ONLY

INDEX



Note: USL – United States Standard, Listed
CNL – Canadian Standard, Listed

GENERAL

PRODUCT COVERED:

Listed – Power Circuit And Motor-Mounted Apparatus

MULTIPLE MANUFACTURING LOCATION:

If the Applicant manufactures the products in this Follow-Up Services Procedure at more than one location, a distinctive marking (which may be in code) shall be provided to identify the unit as the product of a particular factory.

| Sub. No. | Factory Location | Manufacturer's Identification |
|---|---|---|
| 100235490 | No. 12, 4th Xeda Branch Rd., Xiqing Economic Development Area, Tianjin, CN | None |

CONSTRUCTION DETAILS:

If provided and unless otherwise described in individual Report, the following paragraphs apply to all equipment included in this Procedure:

Marking - Ink-stamped label or die-stamped on metal plate permanently secured to the enclosure designated with Listee's name or file number, model number, rated in volts intended for AC or DC, the number of phases, and, if necessary, the frequency. Device may be marked appropriate for the intended use; in amperes, volt-amperes or watts, horsepower, or any combination thereof.

Abbreviation:

Sec. Gen. – Section General
R/C – Recognized Component
USL – United States Standard, Listed

File E318824
Project 08CA10934

September 08, 2008

REPORT

On

POWER CIRCUIT AND MOTOR-MOUNTED APPARATUS

Applicant: Elco (Tianjin) Electronics Co., Ltd.
Tianjin, China

Listee: Elco Industry Automation Ag.
File No. E321609
Worb, Switzerland

DESCRIPTION

PRODUCT COVERED:

USL – Incremental Encoder, Models EB, EC, EV, and EX, followed by 38, 40, 50, 58, 90, 100, 115, 120, or 150, followed by A, B, C, D, E, G, H, K, M, P, Q, R, W, AR, BR, CR, DR, MR, FH, FK, FP, FQ, FW, RH, RK, RP, or RR, followed by 6, 8, 9, 10, 11, 12, 14, 15, 20, 25, 30, 38, 40, 42, 45, 50, 55, 60, 70, 75, 80, 15K, 15Q, 8R, 9R, 10R, 12R, 14R, or 15R, followed by -C4, -E4, -H4, -H6, -L4, -L5, -L6, -N4, -P4, or -P6, followed by A, I, J, K, P, R, T, Y1, or Y2, followed by A or R, followed by additional suffixes.

USL – Absolute Encoder, Models EAB, EAC, EAM, and PAM, followed by 50, 58, 90, or 115, followed by A, B, C, D, E, F, L, or G, followed by 6, 8, 9, 10, 11, 12, 14, or 15, followed by -B or -G, followed by C5, C6, F6, N5, N6, P5, P6, R5, R6, S5, S6, U5, or U6, followed by N, P, or X, followed by P, PC, T, PD, TA, MC, HA, MA, PE, MD, ME, or X, followed by A or R, followed by additional suffixes.

GENERAL:

These devices are carbon steel or aluminum housed, rotary encoders, with normal or hollow shaft, maximum 30 V dc input. Also a SSI or parallel interface may be applied. The Models EB, EC, EV, EX, EAB, EAC, EAM, and PAM series are constructed in accordance with the Standard for Industrial Control Equipment, UL 508 and intended for use within Limited Voltage Limited Current circuitry.

ELECTRICAL RATINGS:

Maximum 30 V dc, LVLC circuitry

Maximum Ambient Temperature: 85°C

Environmental rating: Type 1

NOMENCLATURE of Incremental Encoder:

| Model | EB | 38 | A | 6 | - | L5 | P | R | - | 1024 | xxxx |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | | V | VI | VII | | VIII | IX |

I. Series
EB – Easydic Incremental
EC – Topydic Incremental
EV – Incremental Heavydic
EX – EX Incremental

II. Dimension
38 – ø38
40 – ø40
50 – ø50
58 – ø58
90 – ø90
100 – ø100
115 – ø115
120 – ø120
150 – ø150

III. Flange Type
A – ø6 mm x 15 mm (EB)
B – ø6 mm x 12.5 mm (EB)
F – double wings spring accessory install blink hollow shaft
FX – embroider machine special design (double wings spring Z=20T) (EB)
P – hollow shaft, with three-claw spring (EB)
M – ø68 square flange, ø50h7, axis length 20 mm (EB)
AR – ø31.75 clamp flange, axis length 20 mm (EB)
BR – synchro flange only ø6 shaft, axis 10 mm (EB)
CR – ø36 clamp flange, axis length 20 mm (EB)
DR – ø63.6 square flange, axis length 20 mm (EB)
MR – ø68 square flange, ø50h7, axis length 25 mm (EB)
P – hollow shaft without accessory
H – hollow shaft with install shelf
Q – short block-pin support ditch
K – long block-pin support ditch
W – double wing spring
FP – hollow shaft without accessory (blink hollow shaft)
FH – hollow shaft with install shelf (blink hollow shaft)
FQ – short block-pin support ditch (blink hollow shaft)
FK - long block-pin support ditch (blink hollow shaft)
FW - double wing spring (blink hollow shaft)
RP - hollow shaft without double wing springs
A – ø20 clamp flange with synchro flange ditch, axis length 15 mm (EC)
B – ø20 clamp flange with synchro flange ditch, axis length 12.5 mm (EC)
C - ø20 clamp flange with synchro flange ditch, axis length 10 mm (EC)
D – ø44 square flange, axis length 15 mm (EC)
E – ø20 clamp flange with synchro flange ditch, gear shaft depth 0.6 mm, shaft length 15 mm (EC)

G – short block-pin support ditch (EC)

NOMENCLATURE of Incremental Encoder: (CONT'D)

R – versatile wring arm (SN5A60)
RP – hollow shaft with spring
RK – block-pin support ditch
RR – versatile wring arm (SN5A60)
RH – hollow shaft with long arm
A – A type standard flange (EV)
A – Round flange (EX)
B – Square flange (EX)

IV. Shaft Diameter
6 – ø6 mm
8 - ø8 mm
9 – ø9.52 mm * 22.2 mm
10 - ø10 mm
11 – ø11 mm
12 – ø12 mm
14 - ø14 mm
15 – ø15 mm
20 – ø20 mm
25 – ø25 mm
30 – ø30 mm
38 – ø38 mm
40 – ø40 mm
42 – ø42 mm
45 – ø45 mm
50 – ø50 mm
55 – ø55 mm
60 – ø60 mm
65 – ø65 mm
70 – ø70 mm
75 – ø75 mm
80 – ø80 mm
15K – ø15 mm with keyway, axis length 30 mm
15Q – ø15 mm with keyway, axis length 25 mm
8R – ø8 mm, with oil-seal
9R – ø9.52 mm, with oil-seal
10R – ø10 mm, with oil-seal
12R – ø12 mm, with oil-seal
14R – ø14 mm, with oil-seal
15R – ø15 mm, with oil-seal

V. Connector & Power
C4 – NPN collector open, 5-30 V dc power
E4 – Push-pull 7272 HTL (with reverse sign), 5-30 V dc power
H4 - Push-pull HTL (with reverse sign), 5-30 V dc power
H6 - Push-pull HTL (with reverse sign), 10-30 V dc power
L4 – RS422 (with reverse sign), 5-30 V dc
L5 - RS422 (with reverse sign), 5 V dc
L6 - RS422 (with reverse sign), 10-30 V dc
N4 – NPN output, 5 V dc power
P4 - Push-pull HTL (with reverse sign), 5-30 V dc power

P6 - Push-pull HTL (with reverse sign), 10-30 V dc power

NOMENCLATURE of Incremental Encoder: (CONT'D)

VI. Output Line
P – Output cable length 0.5 m (EB)
I - Output cable length 1 m (EB)
A - Output cable length 2 m (EB)
K – D-sub, 15 needles plug without connector
P – Metal fixer output cable length 0.5 m (EC)
R – Rubber fixer output cable length 0.5 m (EC)
P – Output cable length 1.5 m (EV)
T – M23, 12 needles plug without connector
J – J10 type, 10 needles plug without connector
Y1 – Y2M, 10 needles plug without connector
Y2 – CX2419G, 19 needles plug without connector

VII. Output Direction
A – Axis
R – Radial

VIII. Resolution
Pulse/r 1—2500 (EB)
Pulse/r <=2500 (EC)
Pulse/r <=5000 (EV)
Pulse/r 1—10000 (EX)

IX. xxxx – may be additional suffixes

NOMENCLATURE of Absolute Encoder:

| Model | EAM | 50 | B | 8 | - | G | C6 | N | P | R | - | 1024 | xxxx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | | V | VI | VII | VIII | IX | | X | XI |

I. Series
EAB – Easydic Absolute Single
EAC – Topydic Absolute Single
EAM – Standard Absolute Multiple
PAM – Absolute Multiple Profibus -DP

II. Dimension
50 – ø50 (EAB)
58 – ø58 (EAC\EAM\PAM)
90 – ø90 (EAM\PAM)
115 – ø115 flange (EAM\PAM)

III. Flange Type
A – Round flange
B – Synchro flange, axis length 10 mm
C – ø36 clamp flange, axis length 20 mm
D – ø63.5 square flange, ø31.75, axis 20 mm
E – ø63.5 square flange, ø50h7, axis 20 mm
L – Same with type B, axis length 20 mm
G – Blink hollow flange, hexagonal block screw
F – Blink hollow flange, spring

IV. Shaft Diameter
6 – ø6g6 mm
8 - ø8g6 mm
9 – ø9.52g6 mm
10 - ø10g6 mm
11 - ø11g6 mm
12 – ø12H7 mm
14 – ø14H7 mm
15 – ø15H7 mm

V. Output code
B – Binary code
G – Gray code

NOMENCLATURE of Absolute Encoder: (CONT'D)

VI. Connector & Power
N6 – NPN (standard negative logic), 10-30 V dc power
N5 – NPN (standard negative logic), 5 V dc power
C6 - NPN collector open (standard negative logic), 10-30 V dc power
C5 - NPN collector open (standard negative logic), 5 V dc power
R6 – PNP (standard positive logic), 10-30 V dc power
R5 - PNP (standard positive logic), 5 V dc power
U6 - PNP collector open (standard positive logic), 10-30 V dc power
U5 – PNP collector open (standard positive logic), 5 V dc power
P6 - Push-pull (standard positive logic), 10-30 V dc power
P5 - Push-pull (standard positive logic), 5 V dc power
S6 – SSI (synchro serial output), 10-30 V dc power
S5 - SSI (synchro serial output), 5 V dc power
F6 – Bus communication port, 10-30 V dc power

VII. Output Logic
N – Negative logic (paratactic connect)
P – Positive logic (paratactic connect)
X – No use (SSI)

VIII. Output Line
P – Standard output cable length 0.5 m
PC – 12 core cable (SSI), standard output cable length 1.5 m
T - M23, 12 needles connector (SSI)
PD – 18 core cable (paratactic output), standard output cable length 1.5 m
TA – M23, 17 needles connector (paratactic output)
MC – MS type 7 needles connector (SSI)
HA – 12 needles connector (SI)
MA – MS 19 needles connector (paratactic output)
PE – 32 core cable (paratactic output), standard output cable length 1.5 m
MD – SUB-D37 needles connector (paratactic output)
ME – MS 32 needles connector
X – Junction box with 3 PG7 screw connector & integrated T – coupling implement

IX. Output Direction
A – Axis
R – Radial

X. Resolution
Single position
1024 – Max. 1024 (10 bit) – paratactic connect
8192 – Max. 8192 (13 bit) – paratactic connect
4096/8192 – standard 4096/8192 (25 bit)

XI. xxxx – may be additional suffixes

ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVES' USE):

USL – Indicates investigation to United States Standard for Industrial Control Equipment, UL 508, Seventeen Edition.

CONSTRUCTION DETAILS

General - The details of construction are covered in the following photographs and accompanying descriptive pages and illustrations.

Corrosion Protection - All parts of the devices are constructed of corrosion resisting material or are suitably plated or painted as a protection against corrosion.

Tolerances - Unless specified otherwise, the indicated dimensions are nominal.

Spacings - Spacings are not specified since these devices are located in Limited Voltage Limited Current circuitry.

Printed Wiring Boards – R/C (ZPMV2), printed wiring board whose solder time and temperature can be confirmed in the Recognized Component Directory and rated minimum V-2, 105˚C, printed wiring material must be suitable for direct support.

MARKINGS AND INSTRUCTIONS:

Marking - Device is marked with, and marking is permanently secured to the device, designates Listee's name, model number, Type 1 environmental rating, electrical ratings, and wiring terminal marking.

Markings or Information Provided in Manual - The following information shall be provided in the manual.

1. "The device shall be powered by isolating power source and overcurrent protective device rated not more than 3 amperes is required to be installed in the field." or the equivalent;
2. Replacement instruction of overcurrent protection device includes voltage and current rating;
3. Ambient temperature;
4. Installation instruction

MODELS EB, EC, EV, EX, EAB, EAC, EAM, AND PAM –
FIGS. 1-7

General - Figs. 1-7 show the overall view of Models EB38A6-C4AR, EC40B6-C4AR, EB50A8-P4AR, EAC58C10-GC6NPDR, EV100R38-L4PR, EC120R50-H6PR, and EC150P65-H6PR, which represent Models EB, EC, EV, EX, EAB, EAC, EAM, and PAM series.

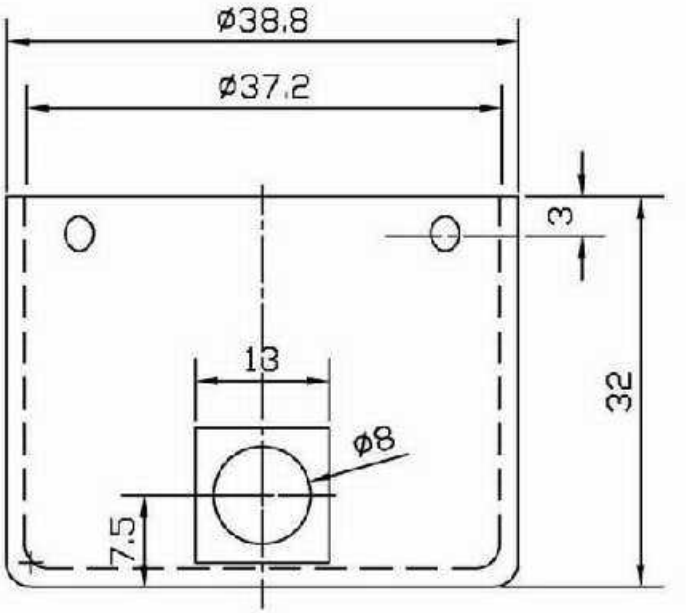
1. Enclosure – Cast metal aluminum or carbon steel, see ILLS. 1-9 for dimension.

2. Cord – Listed (ZJCZ, ZJCZ7), hard-service or junior hard-service flexible cord, min. 18 AWG, 90°C.

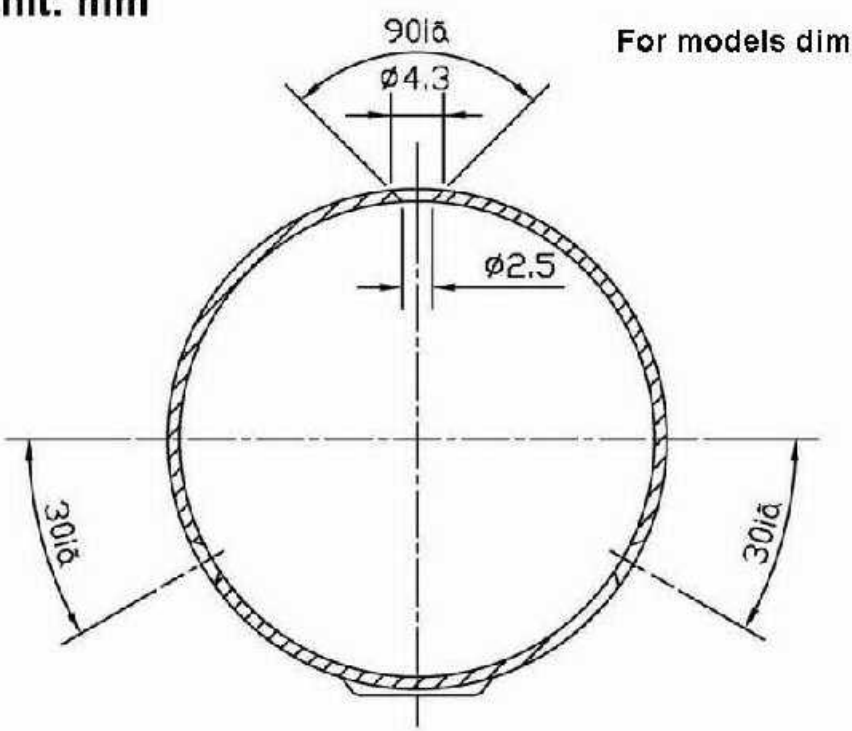
3. Cable Gland – R/C (QCRV2, QCRV8), manufactured by Hummel Metall-Und Kunststofftechnik Gmbh, (E103997), Cat. No. HSK-M sizes Pg7.


Item 4


LIP
Item 4

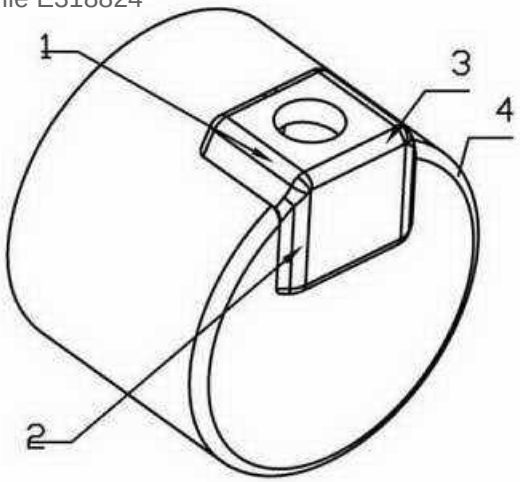



**Unit: mm**

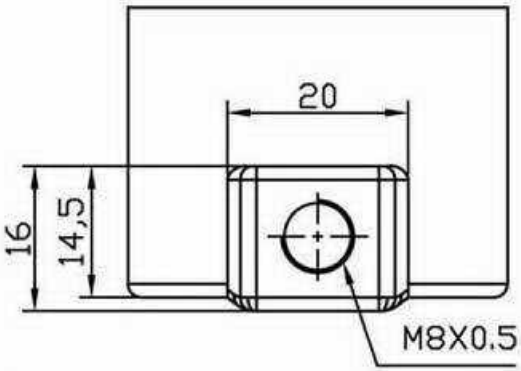


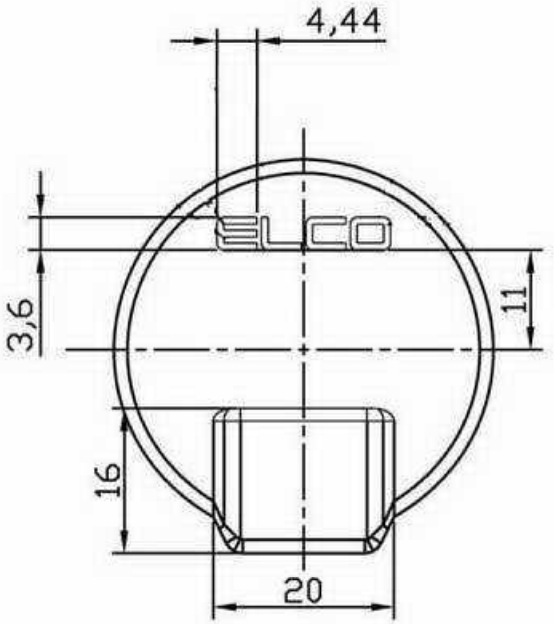

**For models dimensioning ø38**

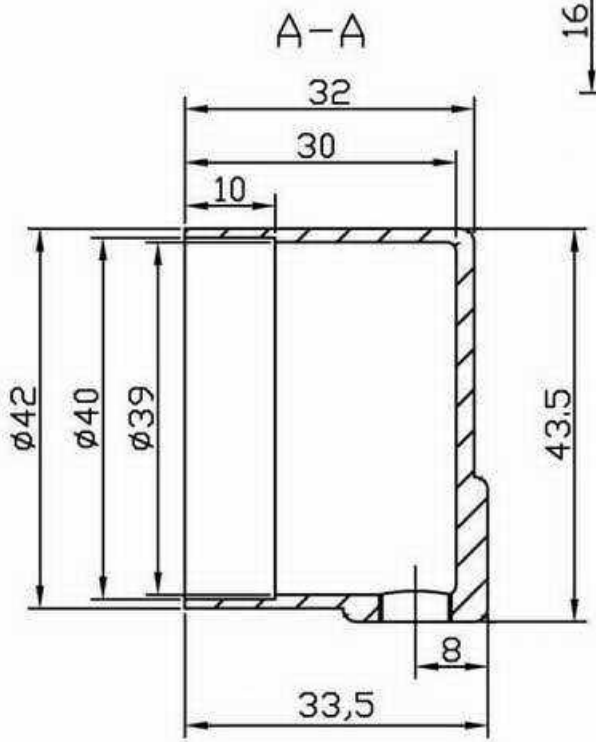
# For models dimensioning ø40

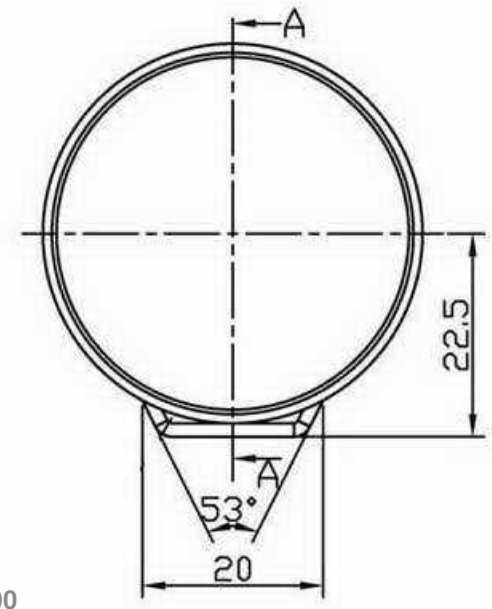


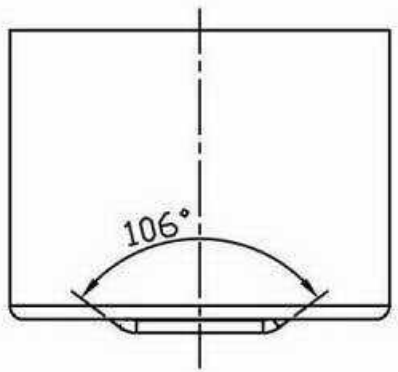

**Unit: mm**

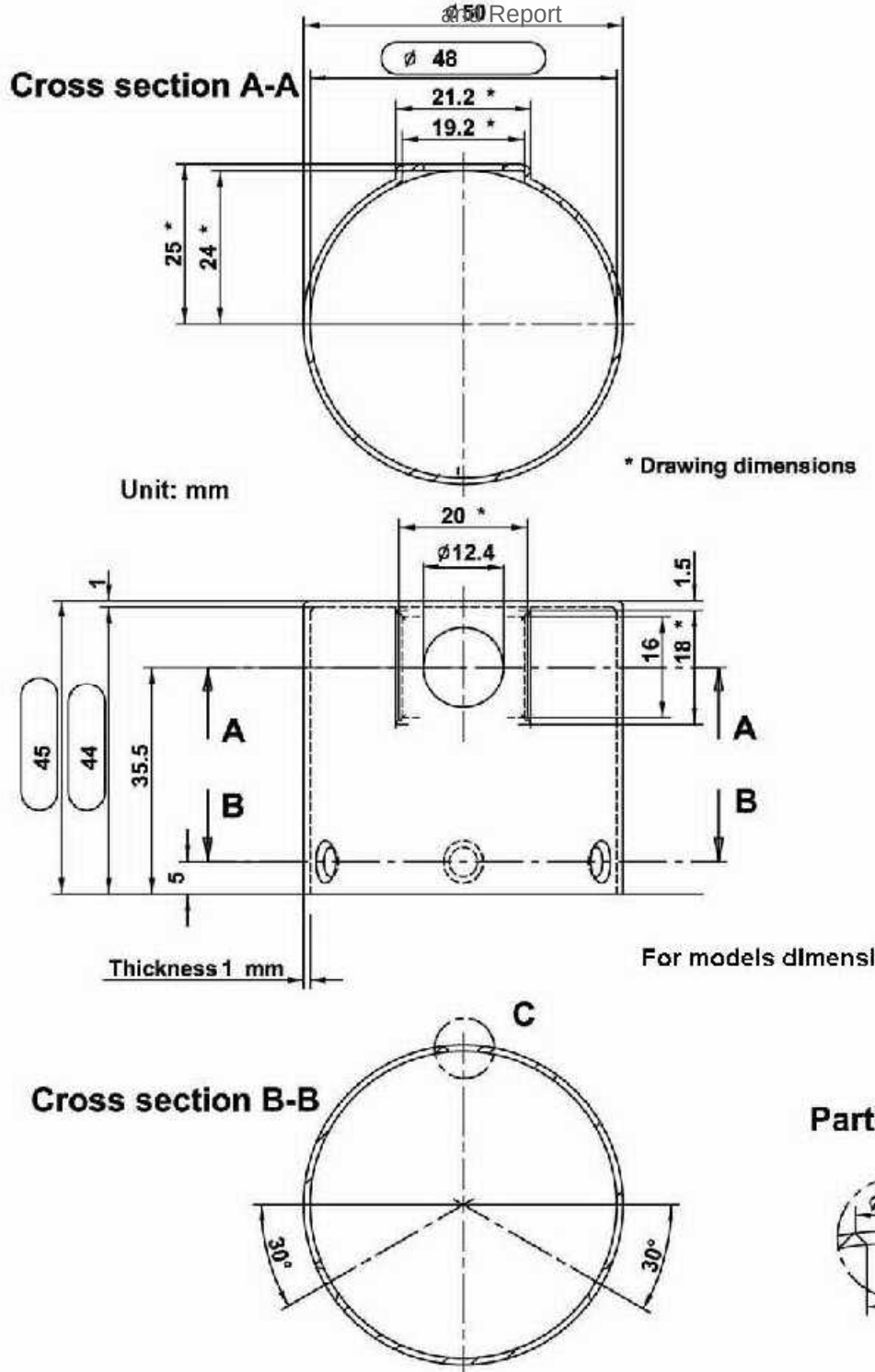


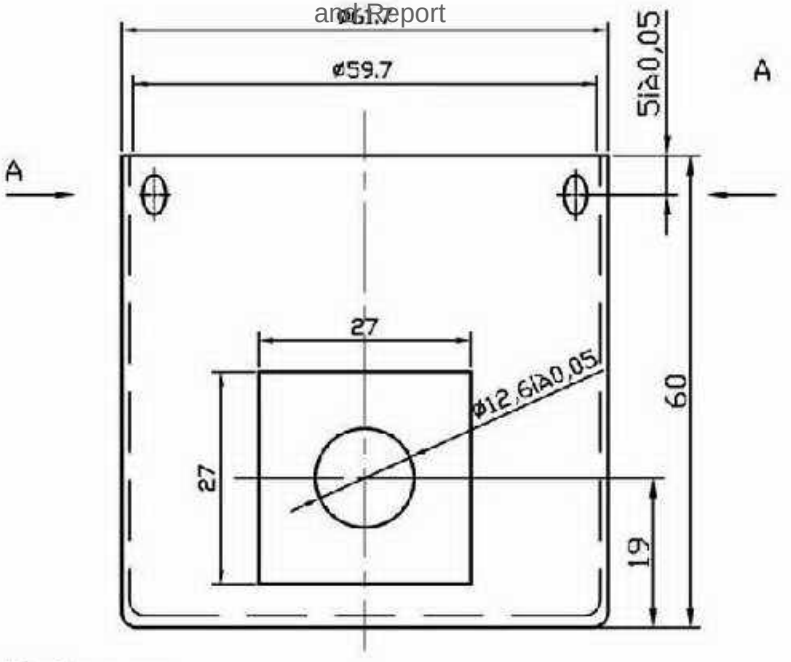



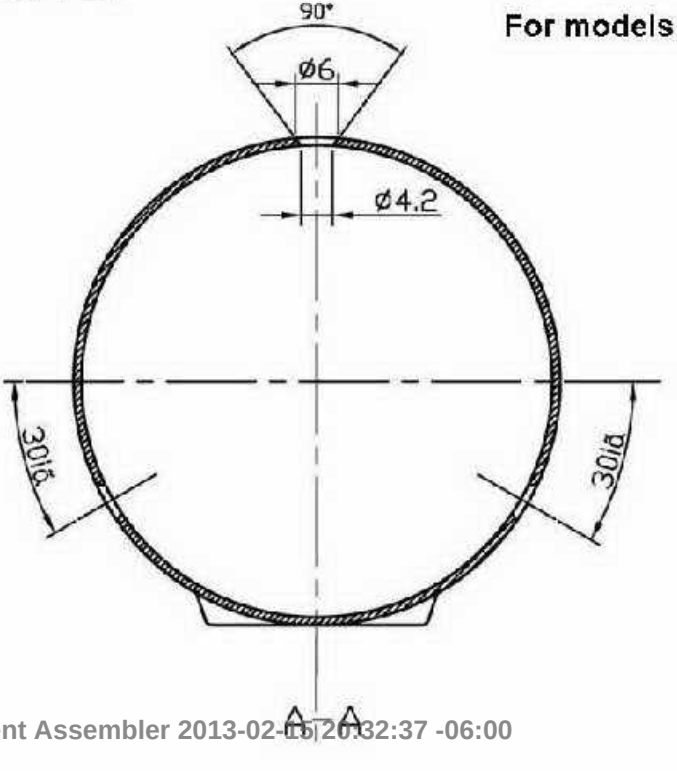



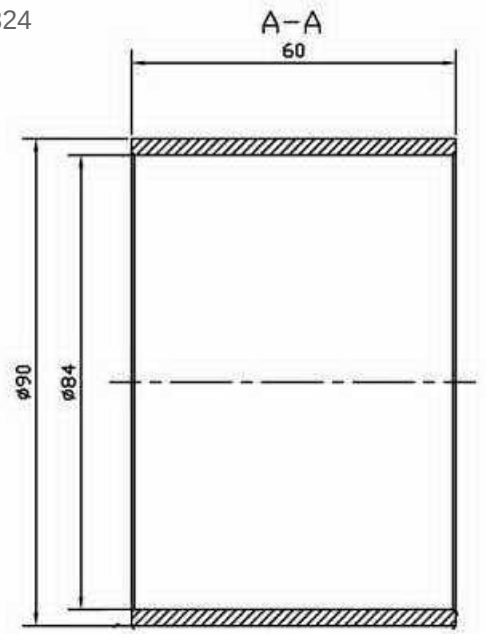

Cross section A-A
ø 50
ø 48
21.2 *
19.2 *
25 *
24 *
* Drawing dimensions
Unit: mm
20 *
ø12.4
1
1.5
16
18 *
A
B
45
44
35.5
5
Thickness 1 mm
For models dimensioning ø50
C
Cross section B-B
30°
30°
Particular C
ø 6
ø 4.2

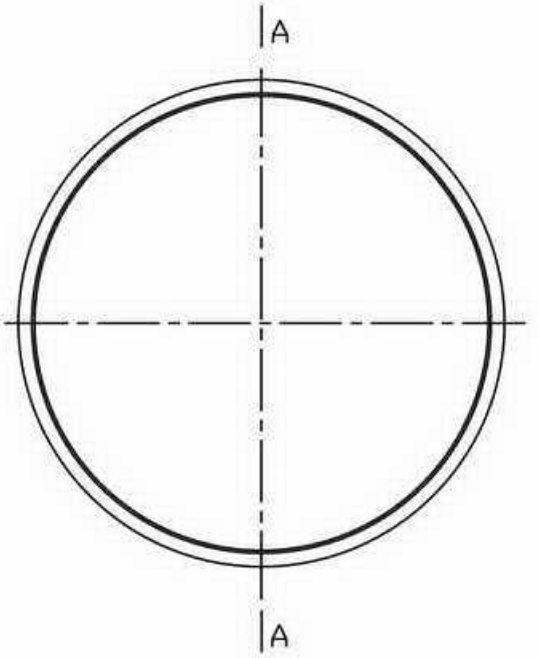


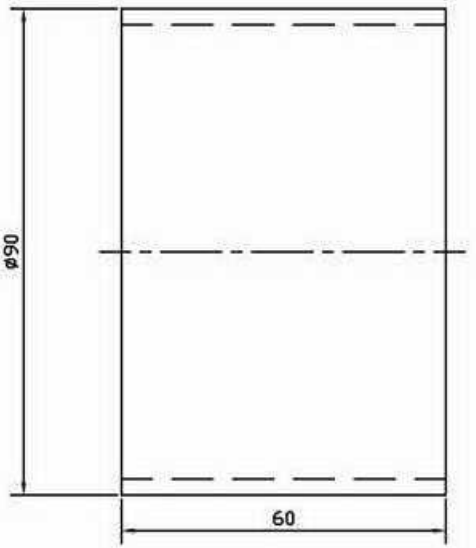

**Unit: mm**

**For models dimensioning ø58**



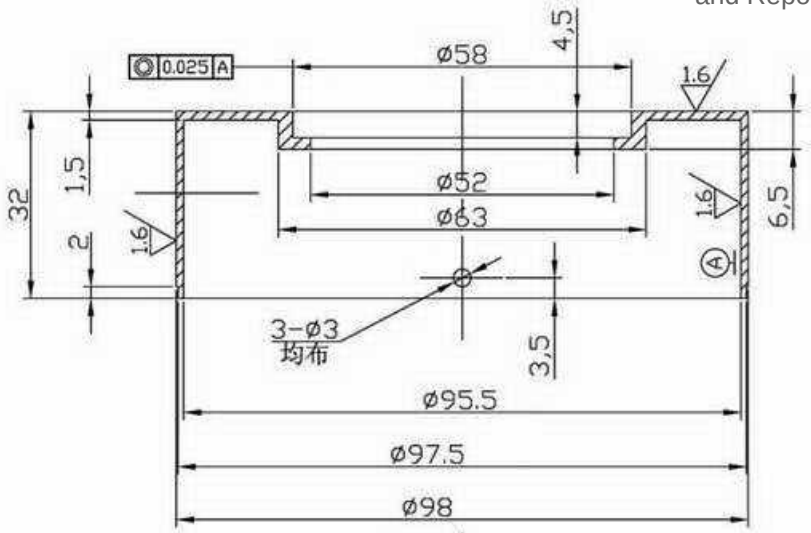


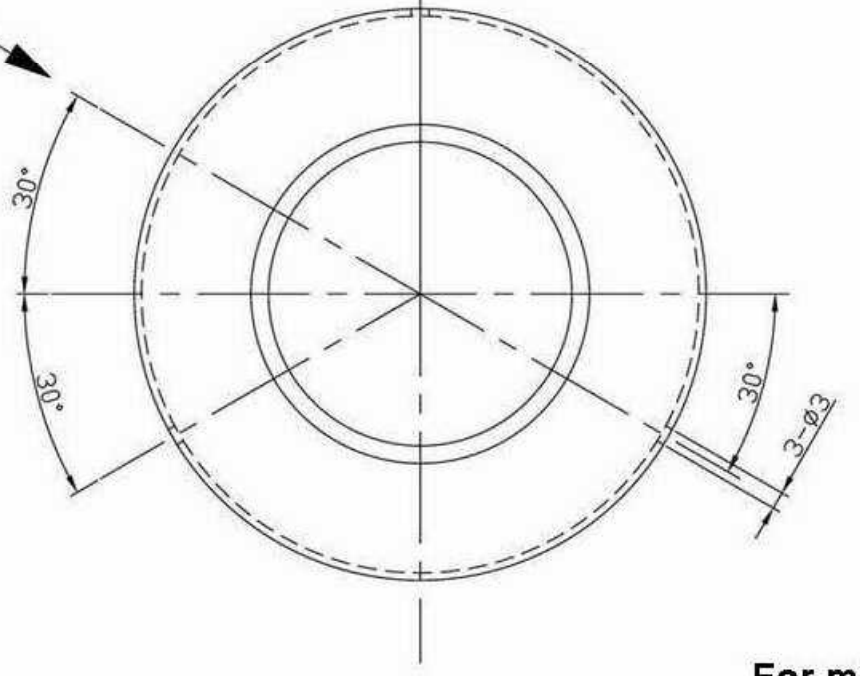

**For models dimensioning ø90**

**Unit: mm**

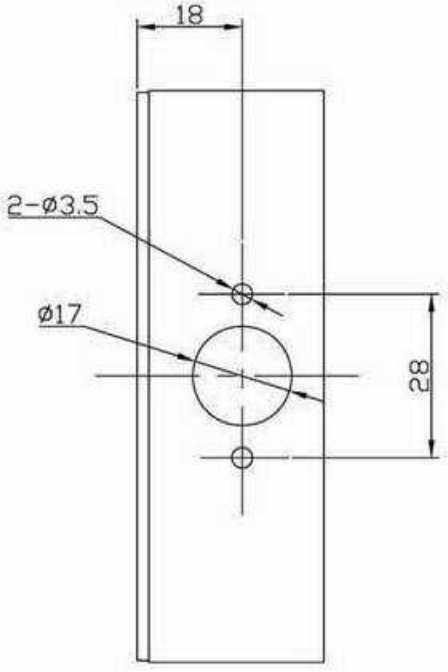



**Unit: mm**

K向

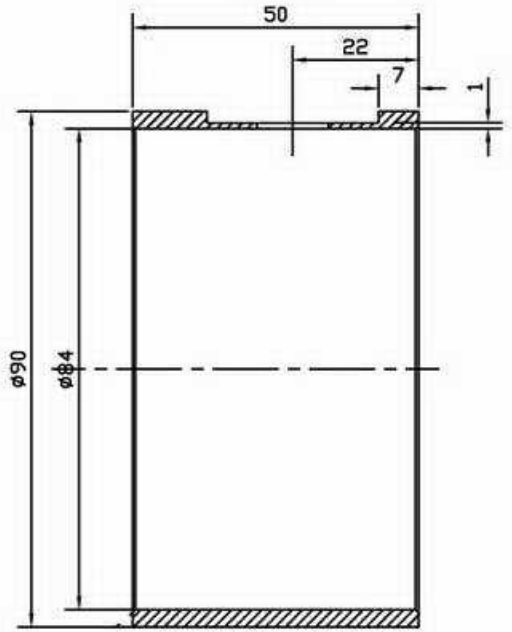


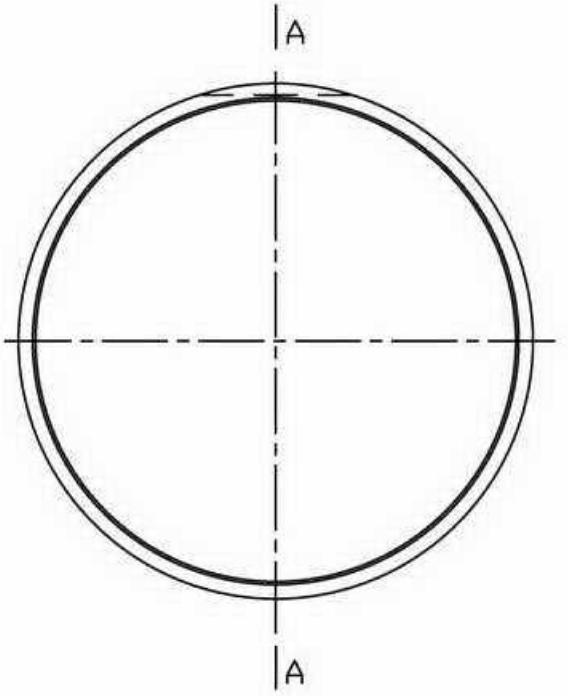

K向

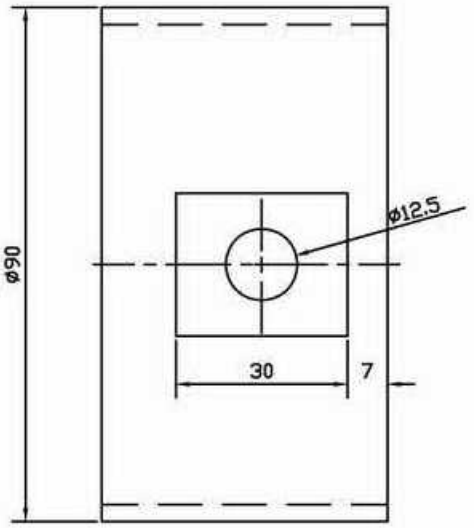



**For models dimensioning ø100**

A–A

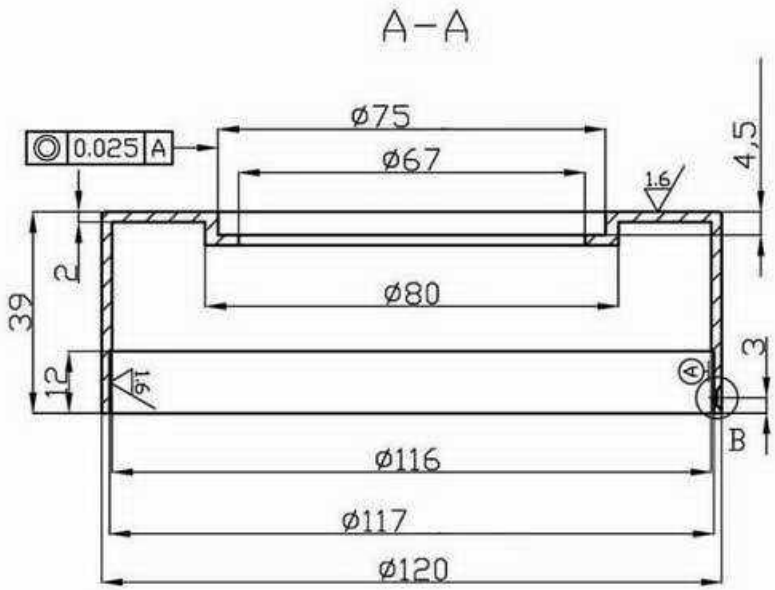


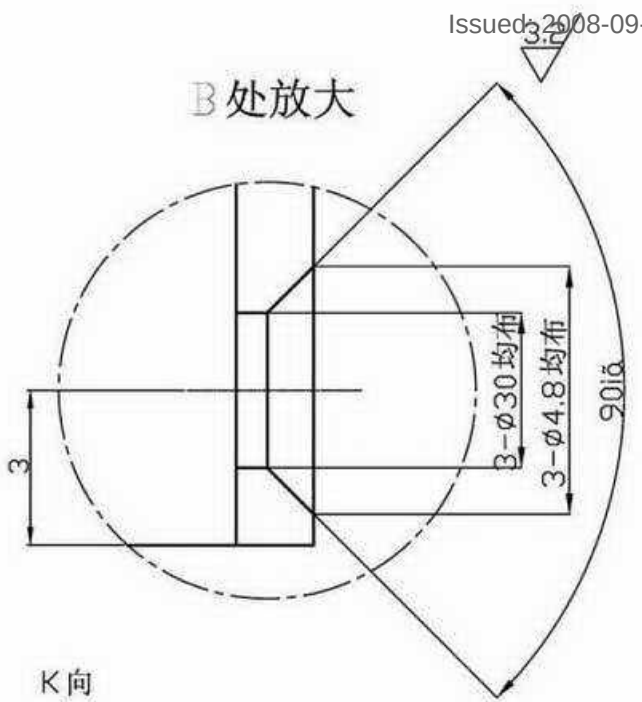



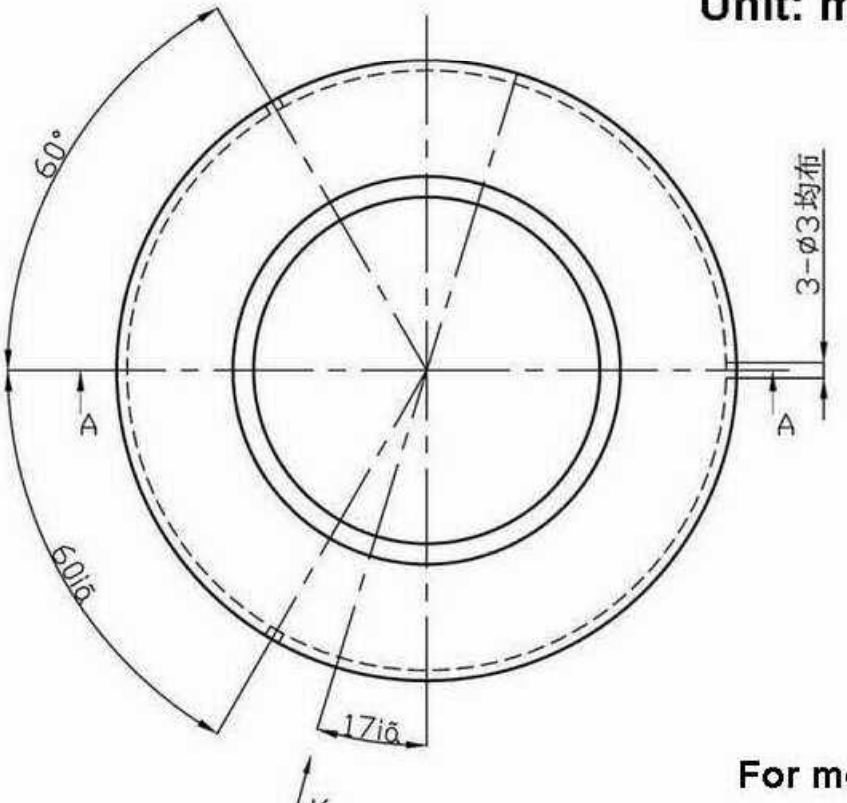

**Unit: mm**

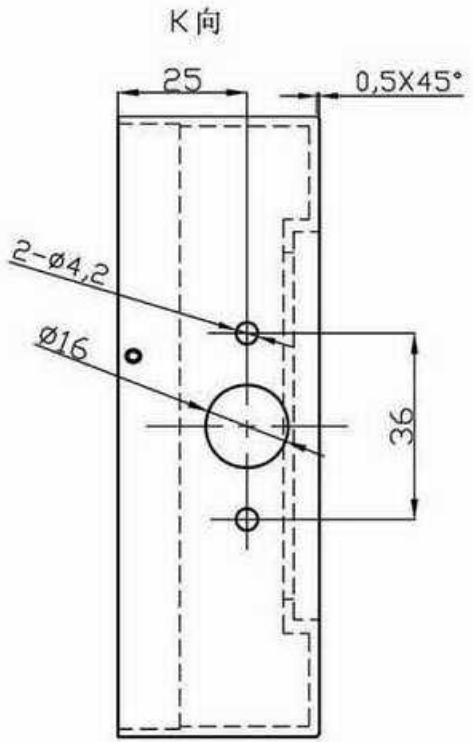
**For models dimensioning ø115**



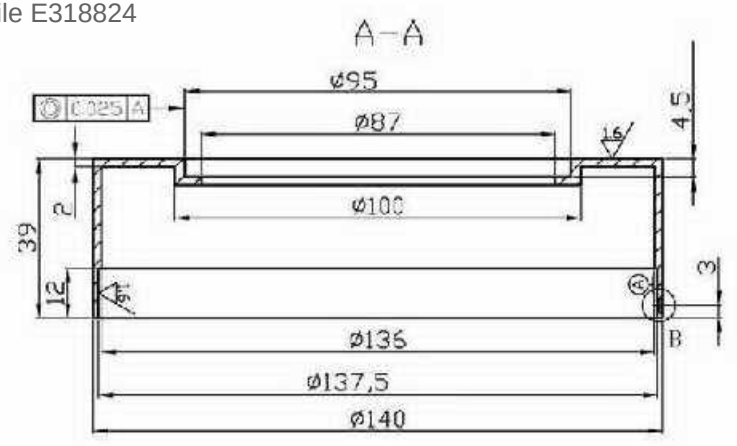




**Unit: mm**




**For models dimensioning ø120**





**Unit: mm**

**For models dimensioning ø150**