

Current sensors CS300 / CS503
Mounting instructions
Capteurs de courant CS300 / CS503
Instructions de montage

Mounting CS300/CS503

01/02/02

Version 1.0

ABB Entrelec

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SUMMARY

SOMMAIRE

Introduction / Introduction	page 3
➤ Meaning of the “radar” / <i>Explication du “radar”</i>	page 3
A . Configurations / Configurations	page 4
1 – Parallel bar configuration / Configuration barre parallèle	page 4
➤ CS 300 ; 300A ; AC (50 Hz)	page 5
➤ CS 300 ; 450A ; AC (50Hz)	page 6
➤ CS 300 ; 300A ; DC	page 7
➤ CS 300 ; 450A ; DC	page 8
➤ CS 503 ; 500A ; AC (50Hz)	page 9
➤ CS 503 ; 500A ; DC	page 10
2 – Lateral bars configuration / Configuration barres latérales	page 11
➤ CS 300 ; 300A ; AC (50 Hz)	page 12
➤ CS 300 ; 300A ; DC	page 13
➤ CS 503 ; 500A ; AC (50 Hz)	page 14
➤ CS 503 ; 500A ; DC	page 15
3 – External bars configuration / Configuration barres extérieures	page 16
➤ CS 300 ; 300A ; AC (50 Hz)	page 17
➤ CS 503 ; 500A ; AC (50 Hz)	page 18
4 – Configuration round primary bar coupling/ Configuration couplage barre primaire ronde	page 19
➤ CS 300 ; 300A ; AC (50 Hz)	page 20
➤ CS 503 ; 500A ; AC (50 Hz)	page 21
5 – Configuration rectangular primary bar coupling/ Configuration couplage barre primaire rectangulaire	page 22
➤ CS 300 ; 300A ; AC (50 Hz)	page 23
➤ CS 503 ; 500A ; AC (50 Hz)	page 24

Introduction:

This document presents, following five mains configurations, the possible effects on the sensor measuring accuracy due to external magnetic fields.

Meaning of the "RADAR"

Introduction :

Ce document présente suivant 5 configurations les effets possibles des champs magnétiques extérieurs sur la précision des capteurs.

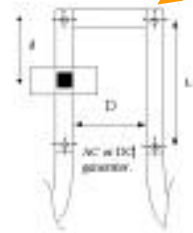
Explication du "RADAR"

General parameters:

$I_{rn} = 450A ; AC (50 Hz)$
 $R_{sd} = 5 \Omega$
 Supply Voltage : $\pm 15 V$

PARAMÈTRES GÉNÉRAUX:

$I_{rn} = 450A ; AC (50 Hz)$
 $R_{sd} = 5 \Omega$
 Alimentation : $\pm 15 V$



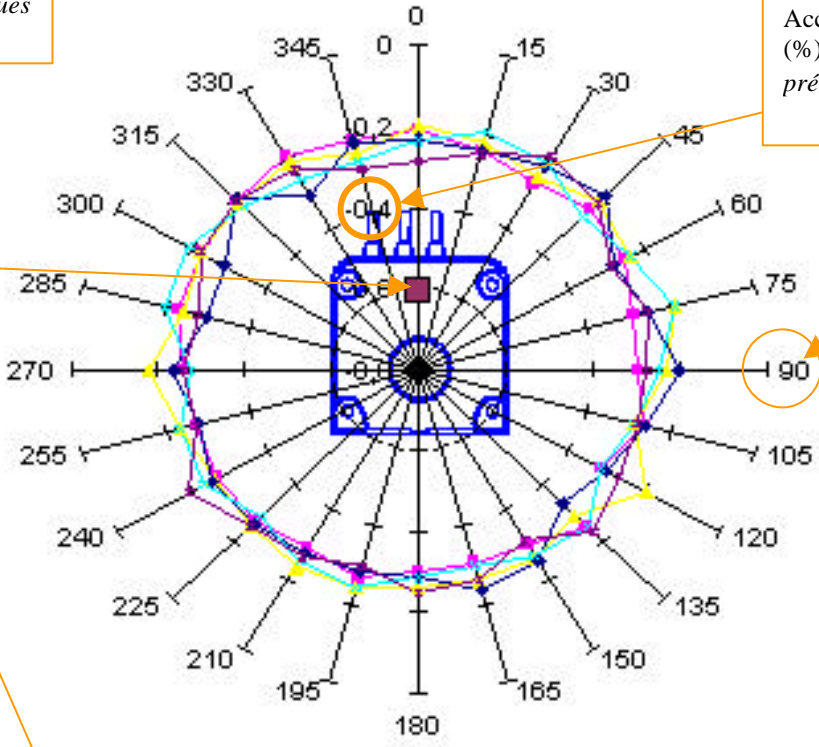
Configuration

Electrical parameters to obtain the radar / paramètres électriques permettant d'obtenir le radar

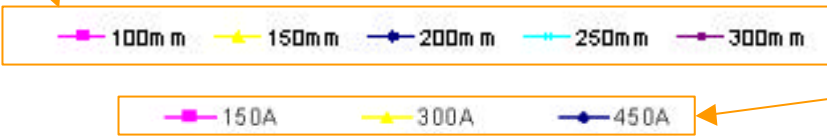
Accuracy value measured (%) / pourcentage de précision mesurée

Hall probe / sonde de Hall

Angle between the sensor (sensor top = 0°) and the external bar / angle entre le capteur (haut du capteur = 0°) et la barre externe



Distance D between the bar inside the sensor and the external bar / distance D entre la barre du capteur et la barre externe



Nominal current for the test / courant nominal du test



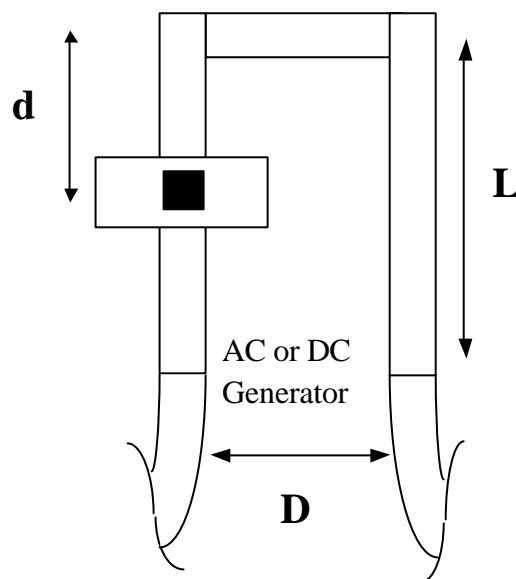
Configurations

Influence of the proximity of a conductor,
on the sensor.

*Influence de la proximité d'un conducteur
sur le capteur.*

1 - Parallel bar configuration

1 - Configuration barre parallèle



Parameters / Paramètres:

Sensor	D	L	d	Round bar
CS300 and CS503	Min=100mm Max=300mm	400mm 400mm	Around 200mm Around 200mm	Diameter=25mm Diameter=25mm

In such a configuration, for each 15° we
measure the accuracy of the sensor. The
result is given in the following pages.

*Dans une telle configuration, tous les 15°
nous mesurons la précision du capteur.
Les résultats sont donnés dans les pages
suivantes.*

CS300: accuracy in parallel bar configuration

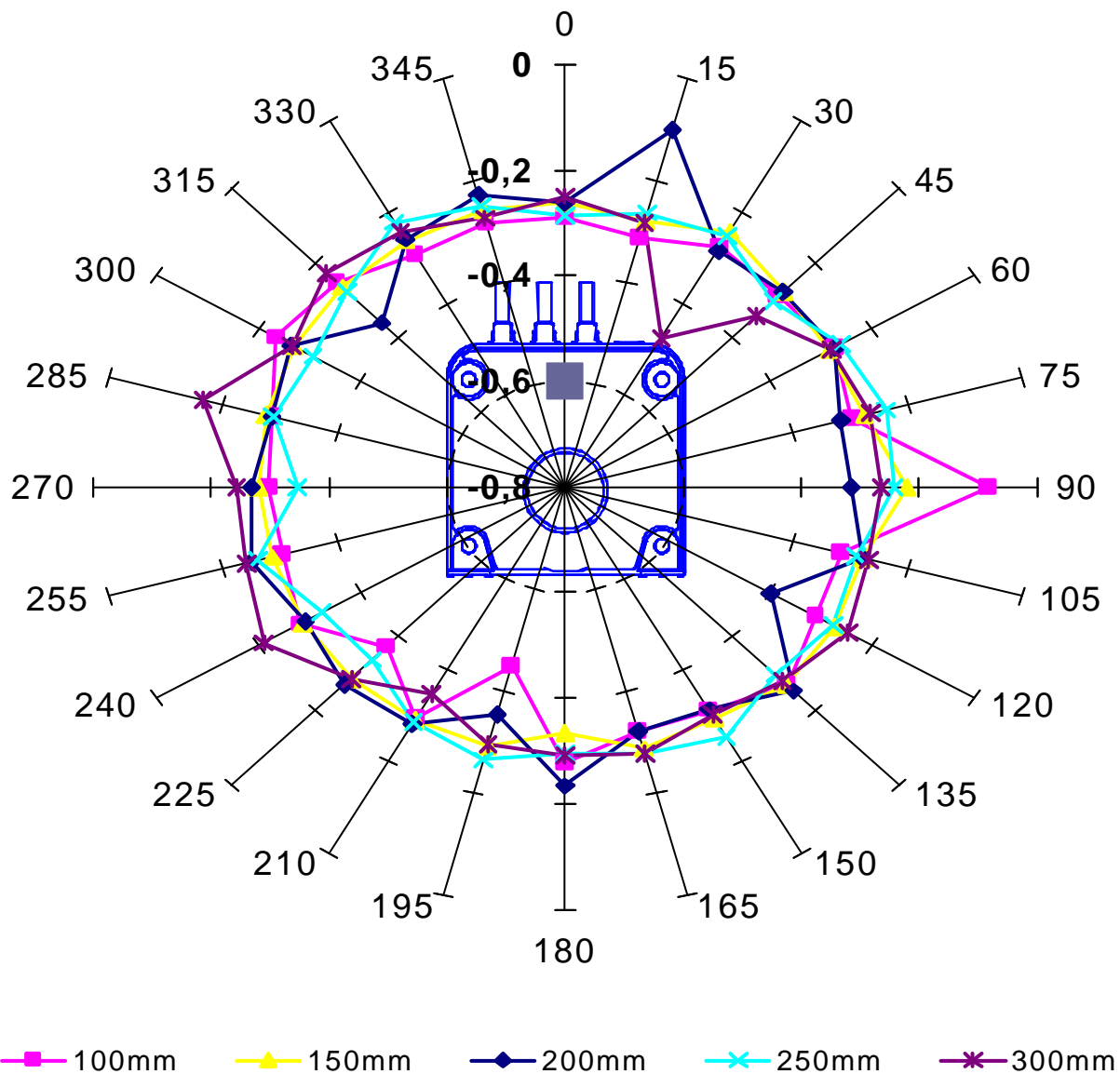
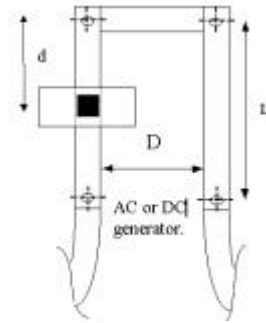
CS300: précision en configuration barre parallèle

General parameters:

$I_{PN} = 300A$; AC (50 Hz)
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 300A$; AC (50 Hz)
 $R_M = 5 W$
 Alimentation : $\pm 15 V$



CS300: accuracy in parallel bar configuration

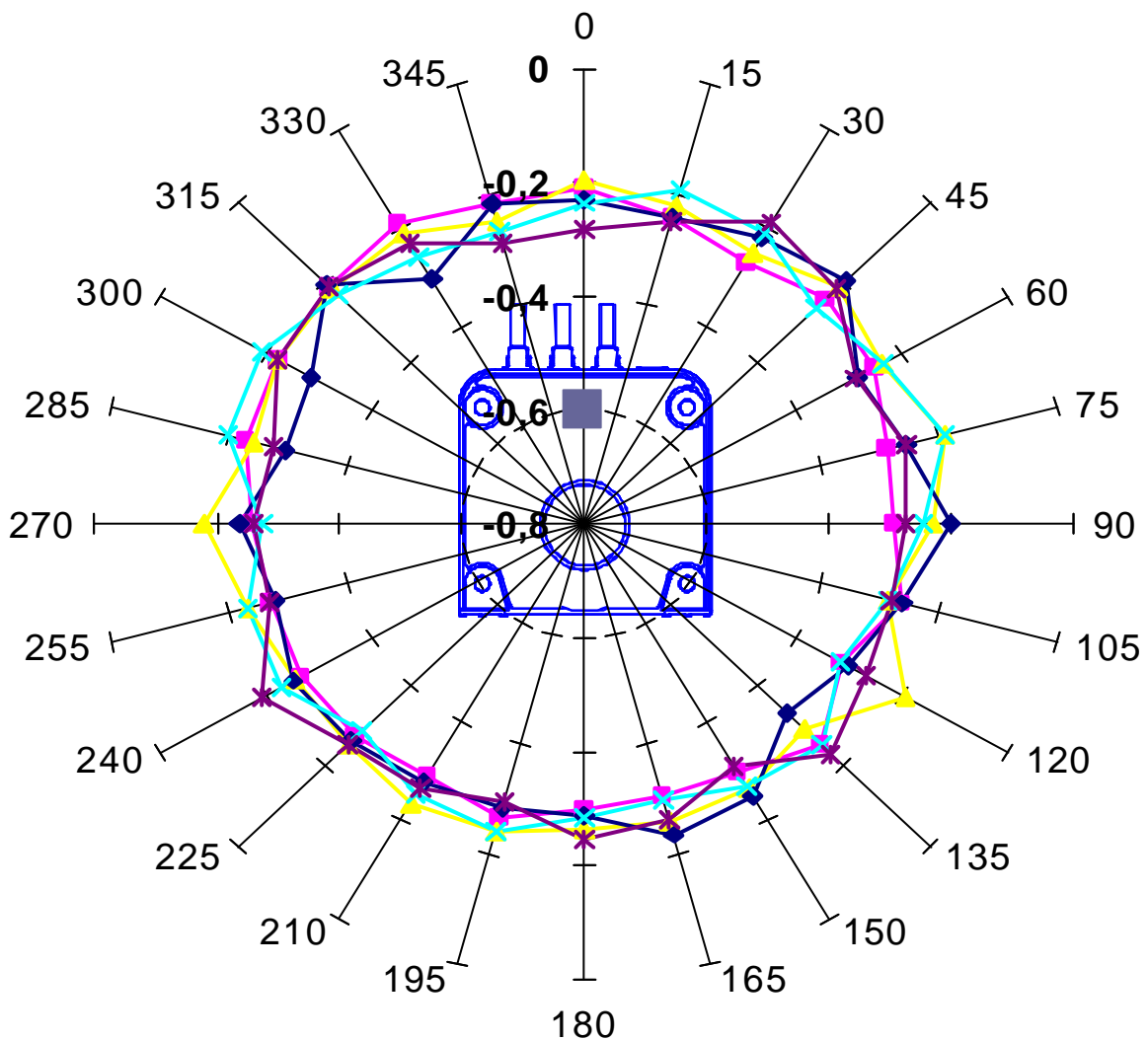
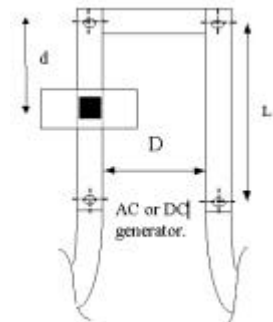
CS300: précision en configuration barre parallèle

General parameters:

$I_{PN} = 450A$; AC (50 Hz)
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 450A$; AC (50 Hz)
 $R_M = 5 W$
 Alimentation : $\pm 15 V$



—■— 100mm —▲— 150mm —◆— 200mm —×— 250mm —*— 300mm

CS300: accuracy in parallel bar configuration

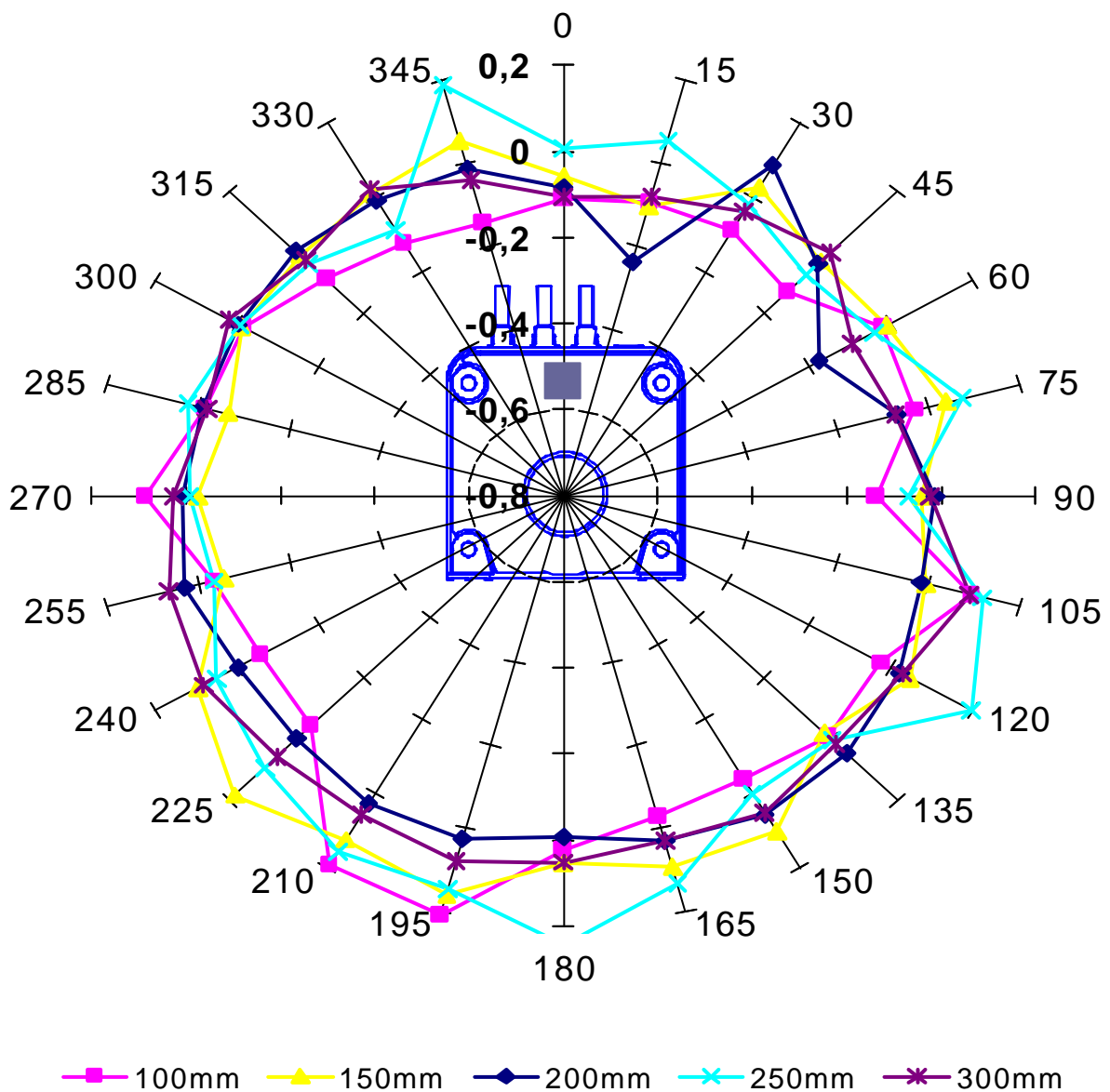
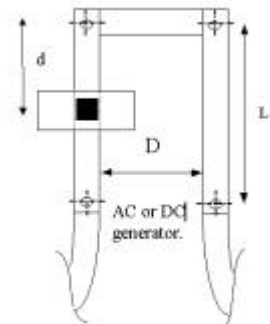
CS300: précision en configuration barre parallèle

General parameters:

$I_{PN} = 300A; DC$
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 300A; DC$
 $R_M = 5 W$
 Alimentation: $\pm 15 V$



CS300: accuracy in parallel bar configuration

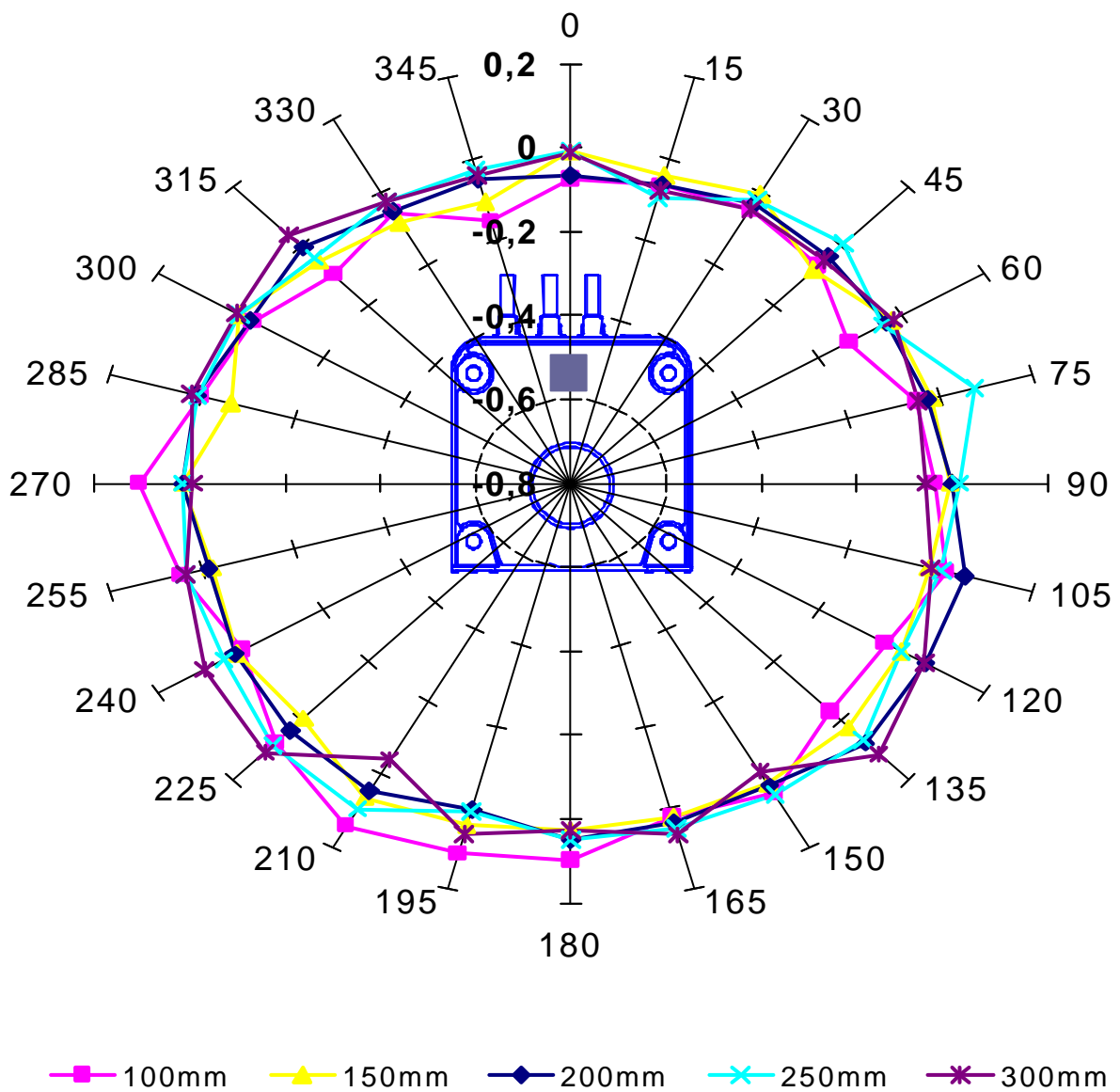
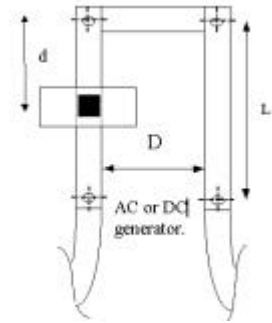
CS300: précision en configuration barre parallèle

General parameters:

$I_{PN} = 450A; DC$
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 450A; DC$
 $R_M = 5 W$
 Alimentation: $\pm 15 V$



CS503: accuracy in parallel bar configuration

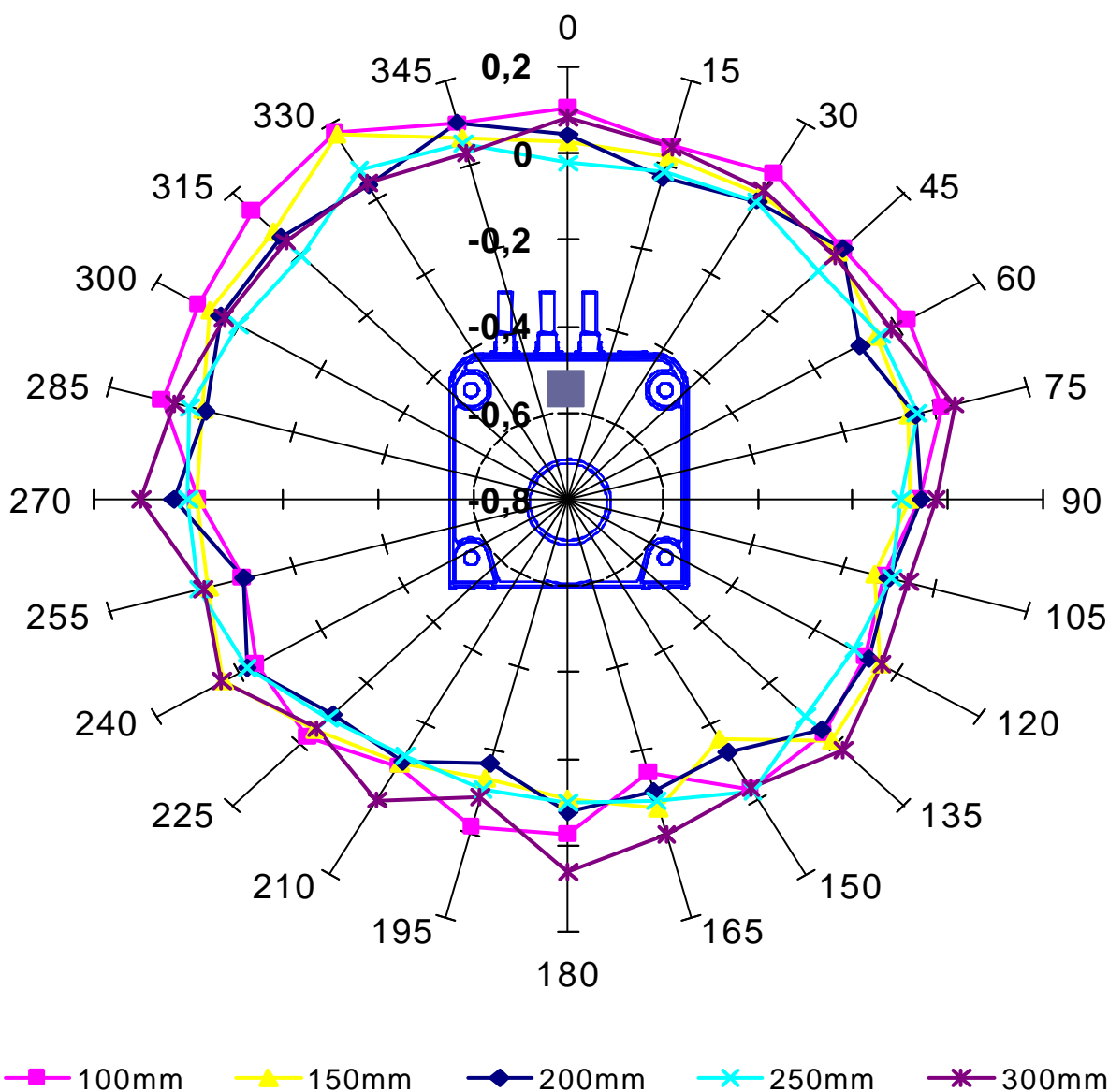
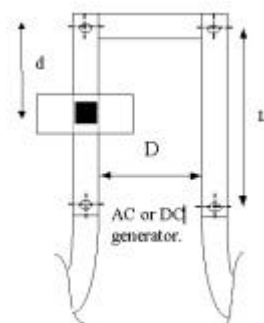
CS503: précision en configuration barre parallèle

General parameters:

$I_{PN} = 500A; AC (50 Hz)$
 $R_M = 5 W$
 Supply Voltage: $\pm 24 V$

Paramètres généraux:

$I_{PN} = 500A; AC (50 Hz)$
 $R_M = 5 W$
 Alimentation: $\pm 24 V$



CS503: accuracy in parallel bar configuration

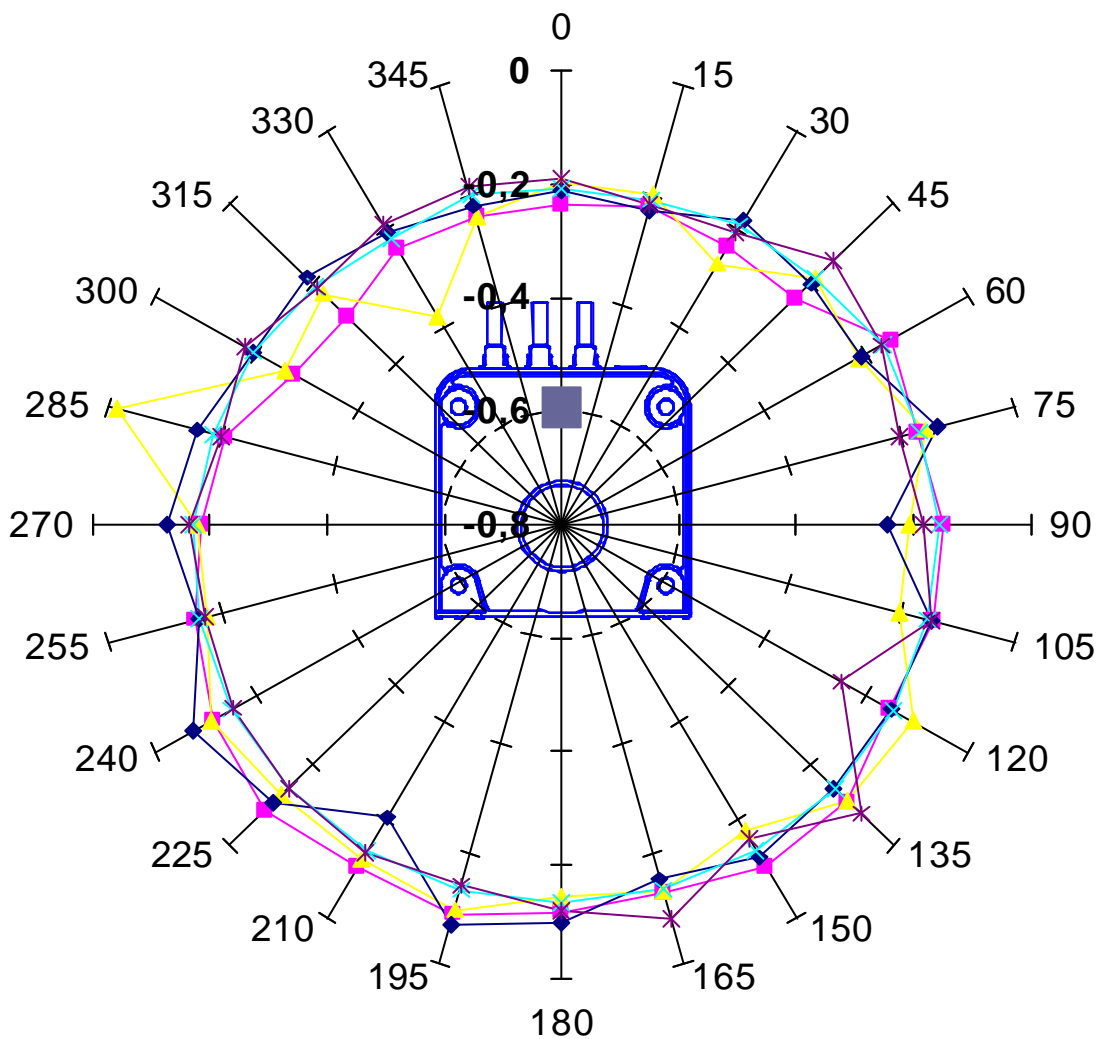
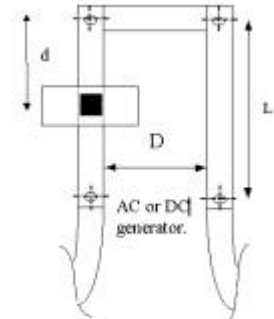
CS503: précision en configuration barre parallèle

General parameters:

$I_{PN} = 500A; DC$
 $R_M = 5 W$
 Supply Voltage: $\pm 24 V$

Paramètres généraux:

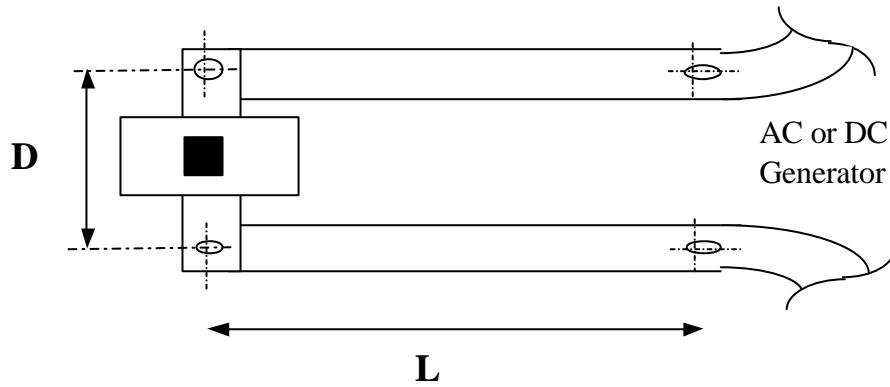
$I_{PN} = 500A; DC$
 $R_M = 5 W$
 Alimentation: $\pm 24 V$



■ 100mm
 ▲ 150mm
 ◆ 200mm
 × 250mm
 ✱ 300mm

2- Lateral bars configuration

2- Configuration barres latérales



Parameters / Paramètres

Sensor	E	L	Round Bar
CS300 and CS503	D1=110mm D2=150mm	400mm 400mm	Diameter=25mm Diameter=25mm

In such a configuration, for each 15° we measure the accuracy of the sensor. The result is given in the following pages.

Dans une telle configuration, tous les 15° nous mesurons la précision du capteur. Les résultats sont donnés dans les pages suivantes.

CS300: accuracy in laterals bars configuration

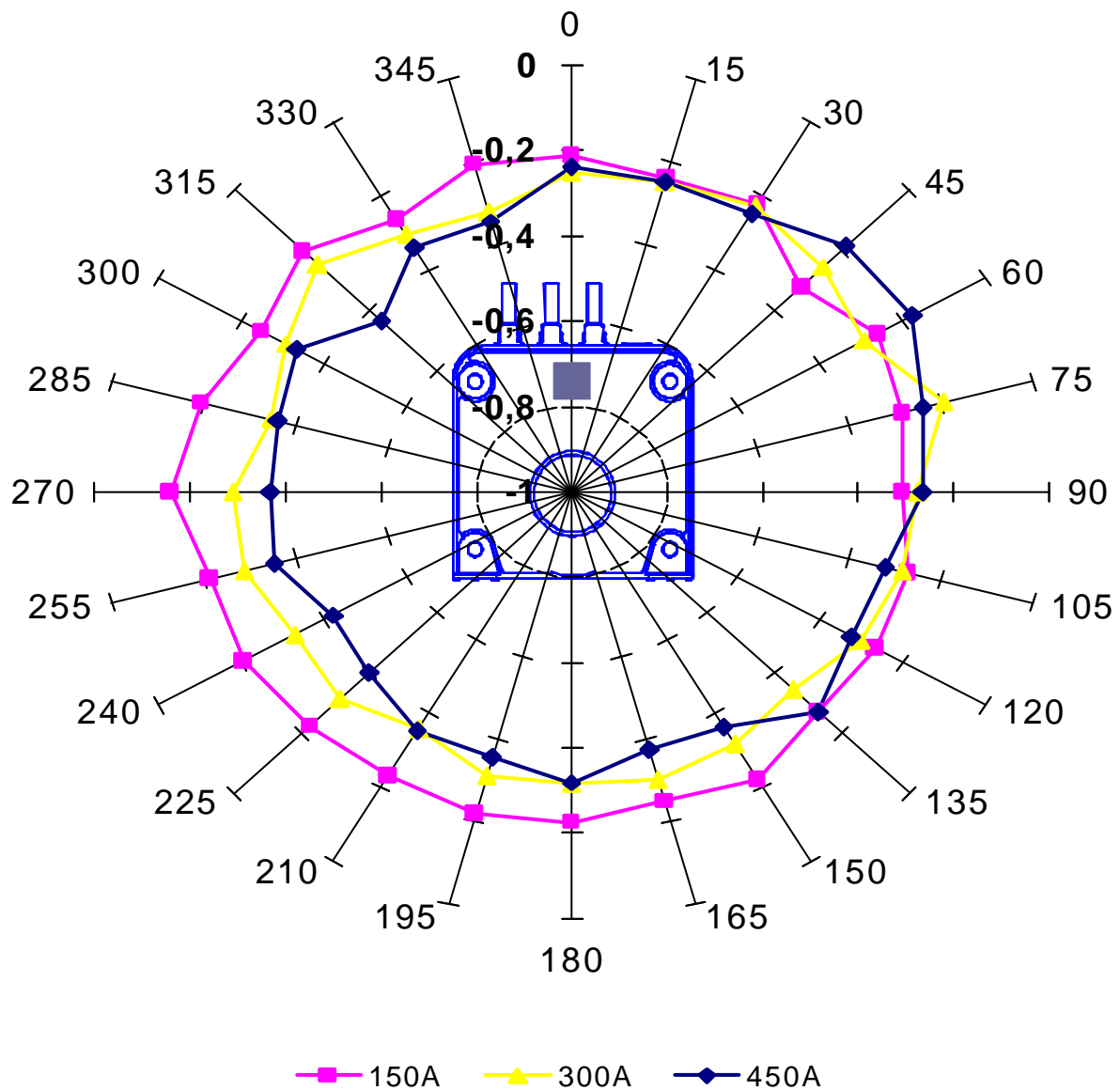
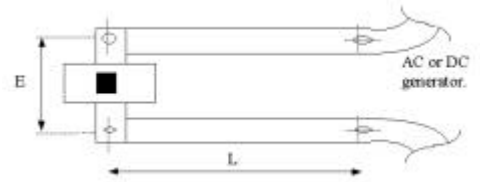
CS300: précision en configuration barres latérales

General parameters:

$I_{PN} = 300A$; AC (50 Hz)
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 300A$; AC (50 Hz)
 $R_M = 5 W$
 Alimentation: $\pm 15 V$



CS300: accuracy in laterals bars configuration

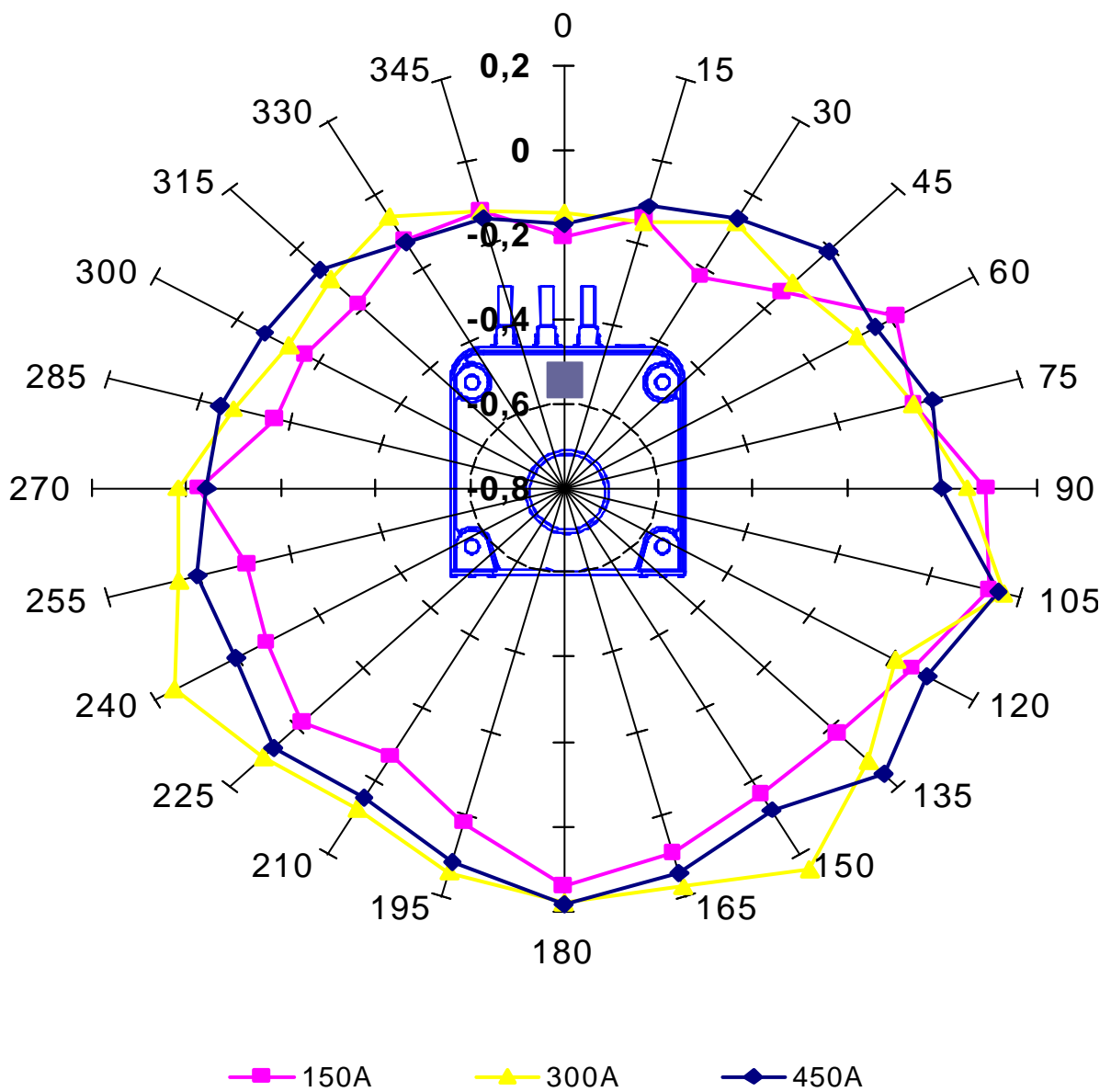
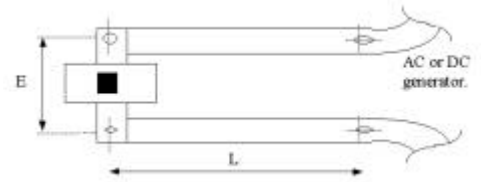
CS300: précision en configuration barres latérales

General parameters:

$I_{PN} = 300A; DC$
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 300A; DC$
 $R_M = 5 W$
 Alimentation: $\pm 15 V$



CS503: accuracy in laterals bars configuration

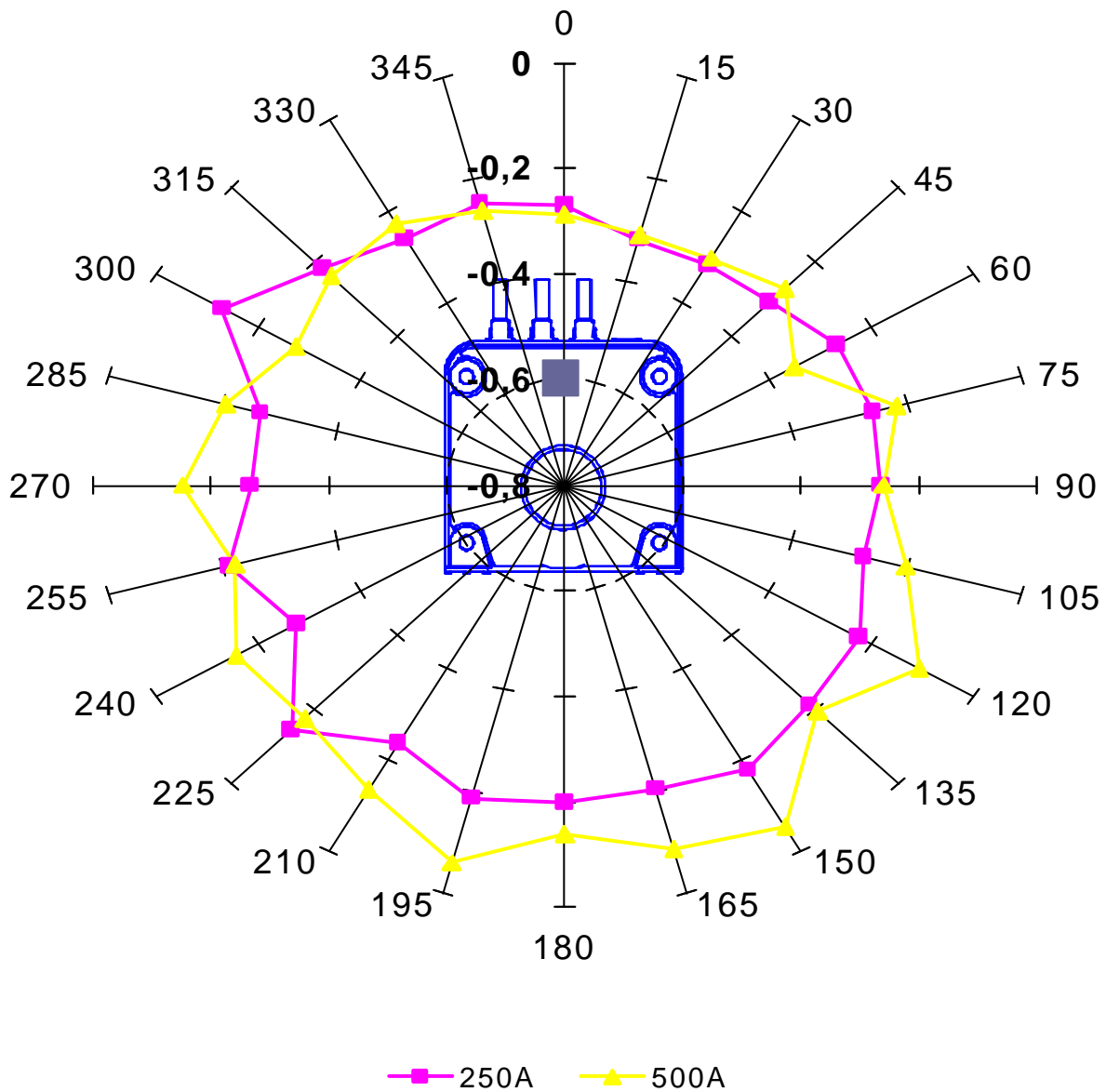
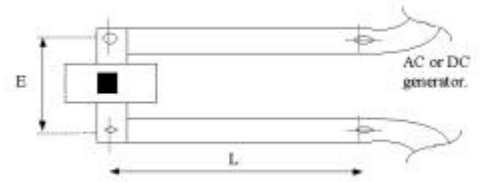
CS503: précision en configuration barres latérales

General parameters:

$I_{PN} = 500A$; AC (50 Hz)
 $R_M = 5 W$
 Supply Voltage: $\pm 24 V$

Paramètres généraux:

$I_{PN} = 500A$; AC (50 Hz)
 $R_M = 5 W$
 Alimentation: $\pm 24 V$



CS503: accuracy in laterals bars configuration

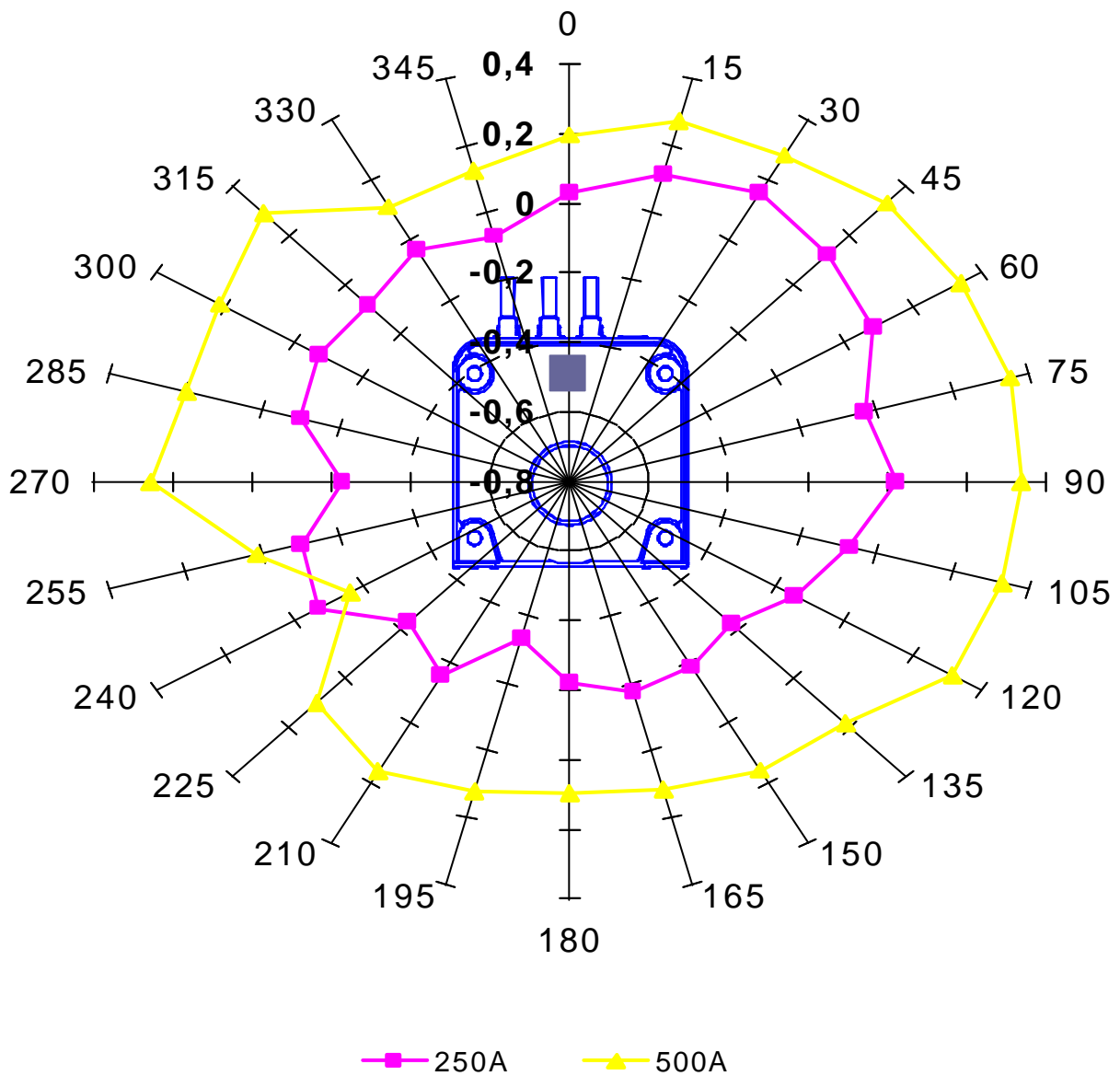
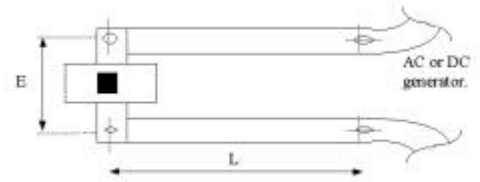
CS503: précision en configuration barres latérales

General parameters:

$I_{PN} = 500A$; DC
 $R_M = 5 W$
 Supply Voltage: $\pm 24 V$

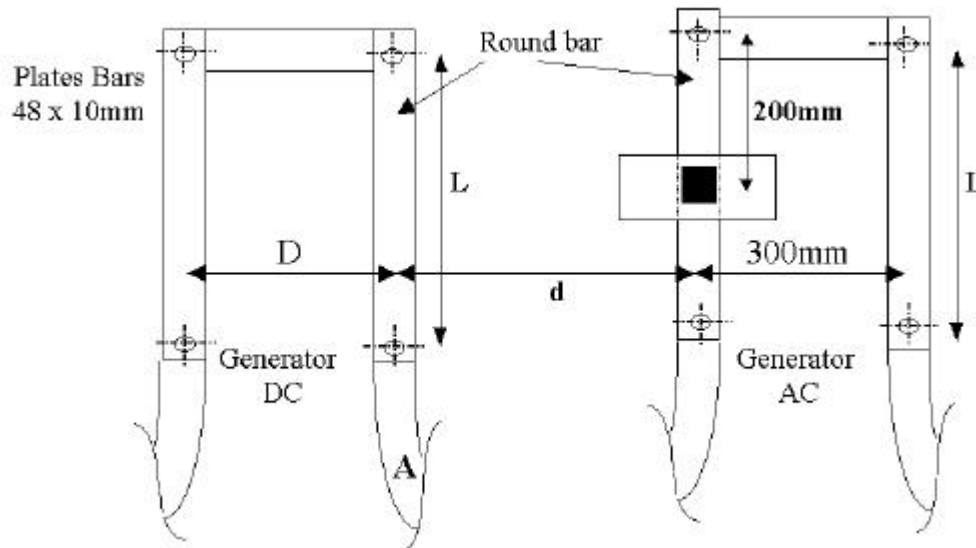
Paramètres généraux:

$I_{PN} = 500A$; DC
 $R_M = 5 W$
 Alimentation: $\pm 24 V$



3 - External bars configuration

3 – Configuration barres externes



Parameters / Paramètres

Sensor	D	d	Rectangular Bar	Round Bar
CS300 and CS503	160mm 160mm	90mm 90mm	L=400mm 48 x 8mm	Diameter=25mm Diameter=25mm

In such a configuration, for each 15° we measure the accuracy of the sensor. The result is given in the following pages.

Dans une telle configuration, tous les 15° nous mesurons la précision du capteur. Les résultats sont donnés dans les pages suivantes.

CS300: accuracy in external bars configuration

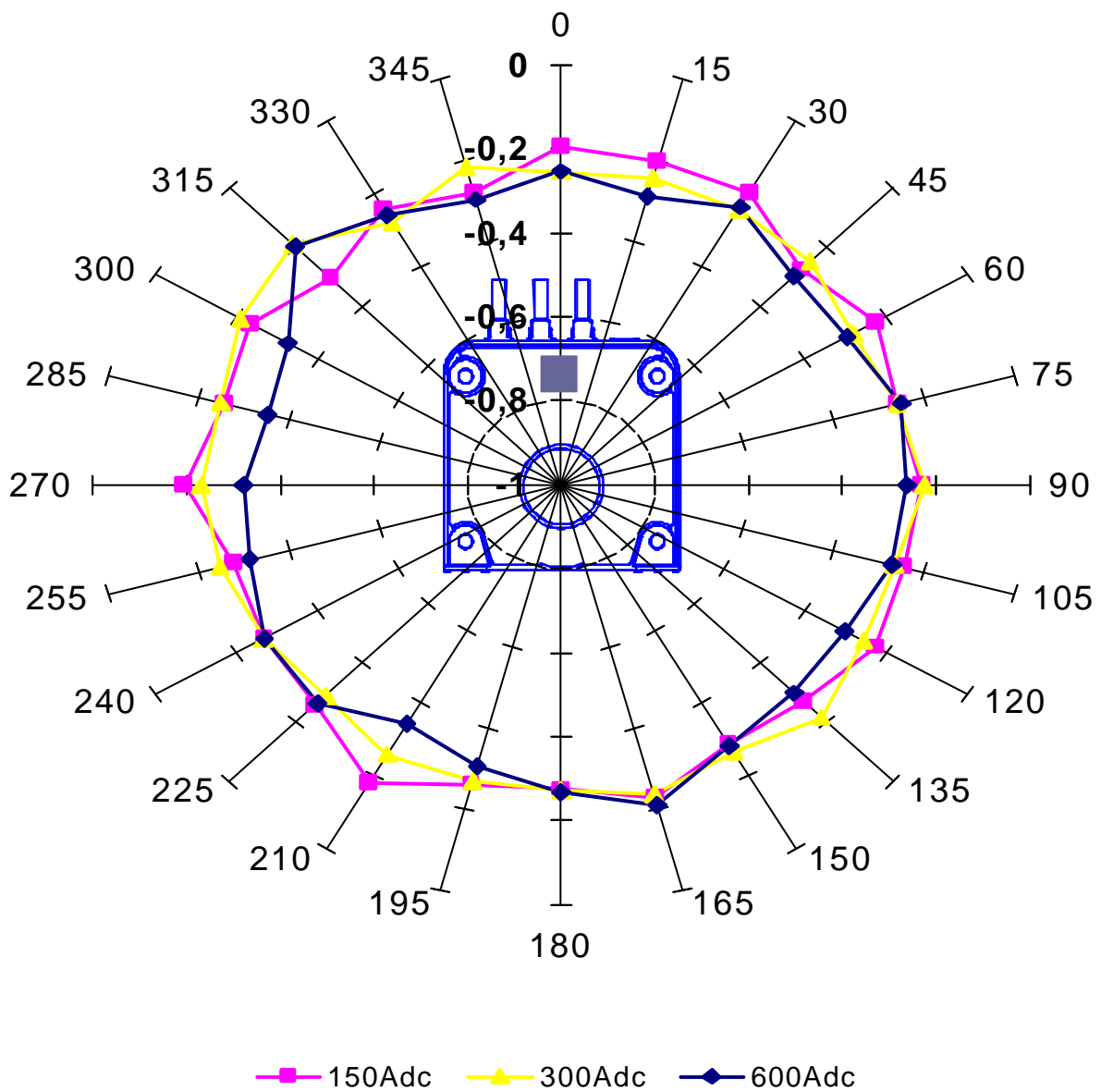
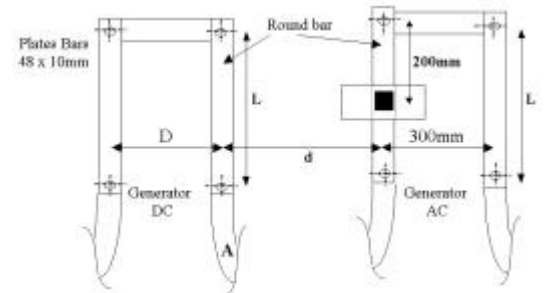
CS300: précision en configuration barres extérieures

General parameters:

$I_{PN} = 300A$; AC (50 Hz)
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 300A$; AC (50 Hz)
 $R_M = 5 W$
 Alimentation: $\pm 15 V$



CS503: accuracy in external bars configuration

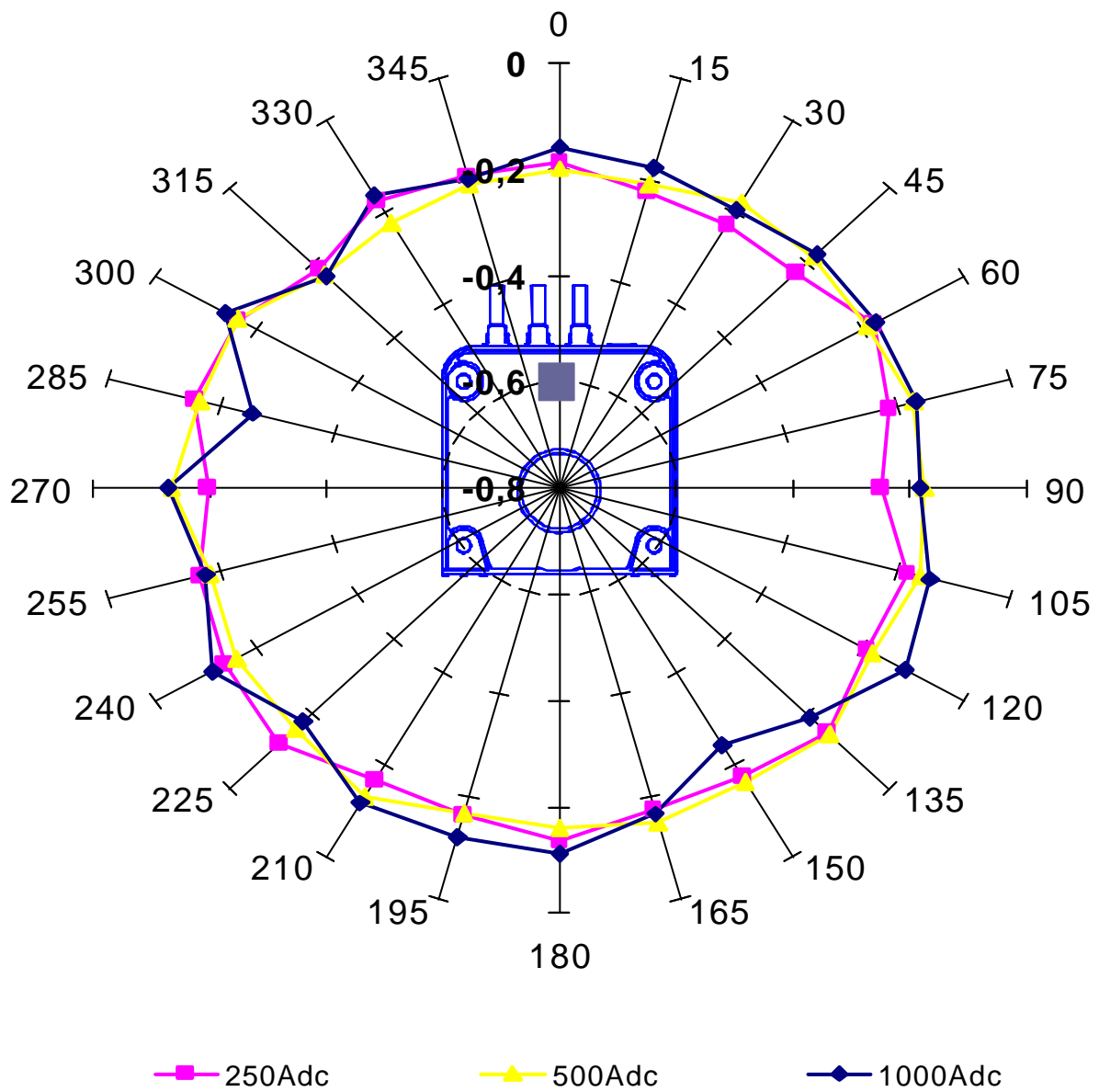
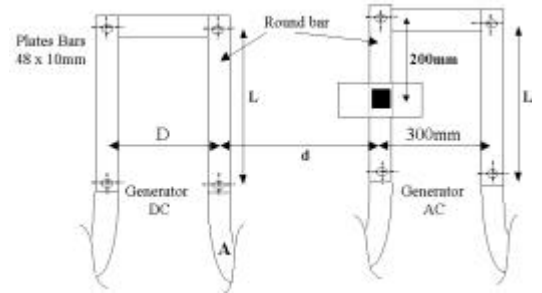
CS503: précision en configuration barres extérieures

General parameters:

$I_{PN} = 500A$; AC (50 Hz)
 $R_M = 5 W$
 Supply Voltage: $\pm 15 V$

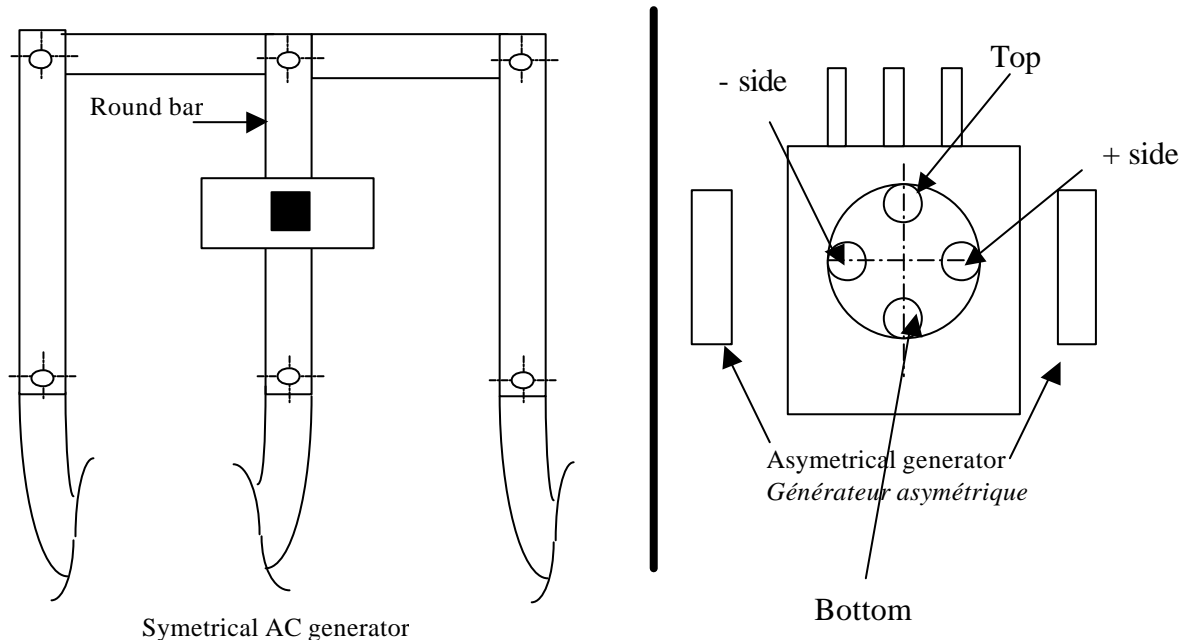
Paramètres généraux:

$I_{PN} = 500A$; AC (50 Hz)
 $R_M = 5 W$
 Alimentation: $\pm 15 V$



4 – Configuration round primary bar coupling:

4 – Configuration couplage barre primaire ronde :

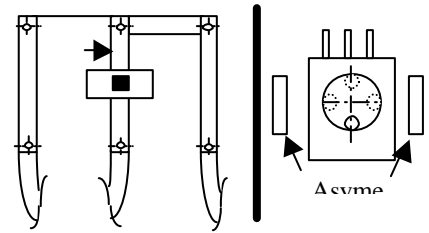


Parameters / Paramètres

Sensor	Round bar
CS300 and CS503	Diameter = 10mm
CS500 and CS1000	Diameter = 25mm

In such a configuration, we determinate the influence of the position of the round bar inside the primary hole on the sensor accuracy.

Dans cette configuration, on détermine l'influence de la position de la barre ronde dans le trou primaire sur la précision du capteur.

CS300: accuracy in round primary bar coupling configuration*CS300: précision en configuration couplage barre primaire ronde***General parameters:** **$I_{PN} = 300A$; AC (50 Hz)** **$R_M = 5 W$** **Supply Voltage: $\pm 15 V$** **Paramètres généraux:** **$I_{PN} = 300A$; AC (50 Hz)** **$R_M = 5 W$** **Alimentation: $\pm 15 V$** 

Position of the round bar inside the sensor hole	I_p moy A	I_s moy A	Accuracy moy %
Top	315	0,16	-0,23
Bottom	305	0,15	-0,29
- Side	297	0,15	-0,23
+ Side	304	0,15	-0,26

CS503: accuracy in round primary bar coupling configuration

CS503: précision en configuration couplage barre primaire ronde

General parameters:

$I_{PN} = 500A$; AC (50 Hz)

$R_M = 5 W$

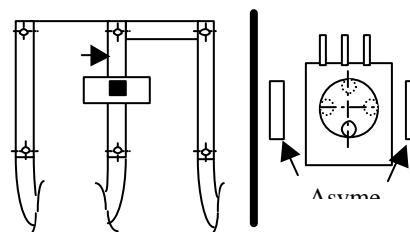
Supply Voltage: $\pm 24 V$

Paramètres généraux:

$I_{PN} = 500A$; AC (50 Hz)

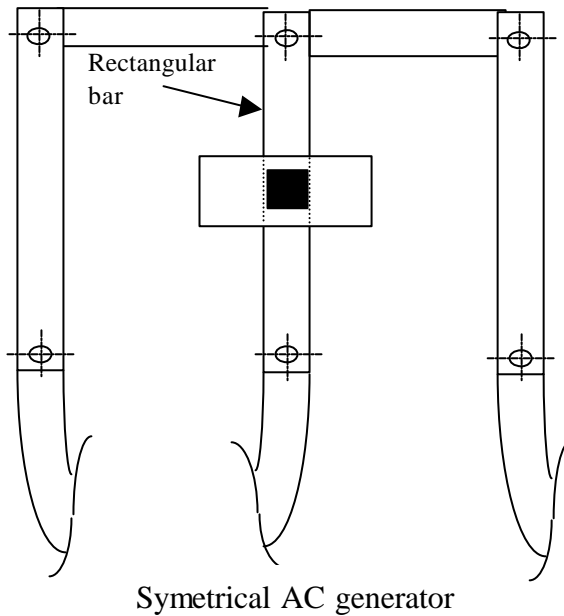
$R_M = 5 W$

Alimentation: $\pm 24 V$

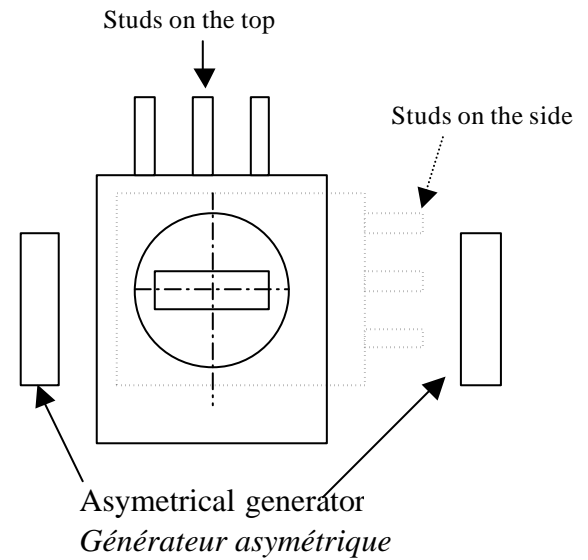


Position of the round bar inside the sensor hole	I_p moy A	I_s moy A	Accuracy moy %
Top	499	0,142	-0,12
Bottom	491	0,141	-0,17
- Side	519	0,148	-0,24
+ Side	507	0,145	-0,11

5 – Configuration rectangular primary bar coupling



5 – Configuration couplage barre primaire rectangulaire



Parameters / Paramètres

Sensor	Rectangular bar
CS300 and CS503	25 x 10mm

In such a configuration, we determine the influence of the position of the round bar inside the primary hole on the sensor accuracy.

Dans cette configuration, on détermine l'influence de la position de la barre rectangulaire dans le trou primaire sur la précision du capteur.

CS300: accuracy in rectangular primary bar coupling configuration

CS300: précision en configuration couplage barre primaire rectangulaire

General parameters:

$I_{PN} = 300A$; AC (50 Hz)

$R_M = 5 W$

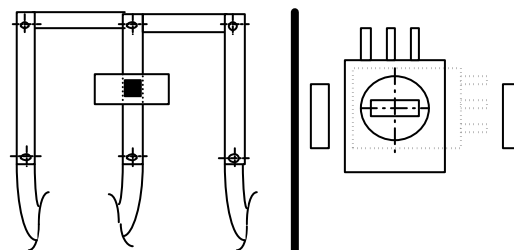
Supply Voltage: $\pm 15 V$

Paramètres généraux:

$I_{PN} = 300A$; AC (50 Hz)

$R_M = 5 W$

Alimentation: $\pm 15 V$



Position of the sensor	I_p moy A	I_s moy mA	Accuracy moy %
studs on the top	305	152,1	-0,21
studs on the side	298	148,6	-0,24

CS503: accuracy in rectangular primary bar coupling configuration

CS503: précision en configuration couplage barre primaire rectangulaire

General parameters:

$I_{PN} = 500A$; AC (50 Hz)

$R_M = 5 W$

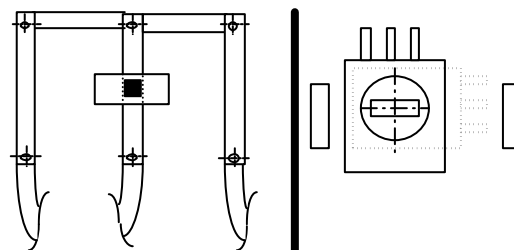
Supply Voltage: $\pm 24 V$

Paramètres généraux:

$I_{PN} = 500A$; AC (50 Hz)

$R_M = 5 W$

Alimentation: $\pm 24 V$



Position of the sensor	I_s moy mA	I_p moy A	Accuracy moy %
studs on the top	142	497	-0,17
studs on the side	144	505	-0,14