

Anexo 1

Datos de las especificaciones de la placa de los generadores de las 4 unidades de la central Hidroeléctrica URRÁ I.

Tabla 1 Especificaciones del Generador

Característica	Datos
Fabricante	ELECTROSILA
Tipo de Generador	Sincrónico
Tipo del Rotor	Polos Salientes
Potencia Nominal	92,7 MVA
Voltaje Nominal	13,8 kV
Factor de Potencia Nominal	0,9
Velocidad Nominal	120 rpm
Frecuencia Nominal	60 Hz

A continuación se listan los Parámetros de las constantes del generador para cada una de las unidades.

Tabla 2 Parámetros calculados del generador 1

Parámetro	Valor	Unidad
x_d	0,880	pu
x'_d	0,255	pu
x''_d	0,250	pu
x_l	0,11	pu
x_q	0,60	pu
x''_q	0,250	pu
T'_{do}	5,80	s
T''_{do}	0,005	s
T''_{qo}	0,300	s
2H	11	s
D	0,0	s
SG10	0,05187710	-
SG12	0,1467993	-

Tabla 3 Parámetros calculados del Generador 2

Parámetro	Valor	Unidad
x_d	0,87	pu
x'_d	0,255	pu
x''_d	0,245	pu
x_l	0,11	pu
x_q	0,58	pu
x''_q	0,245	pu
T'_{do}	5,80	s
T''_{do}	0,005	s
T''_{qo}	0,280	s
2H	11	s
D	0,0	s
SG10	0,04932702	-
SG12	0,1381169	-

Tabla 2 Parámetros calculados del Generador 3

Parámetro	Valor	Unidad
xd	0,923	pu
x'd	0,255	pu
x" d	0,24	pu
xl	0,12	pu
xq	0,62	pu
x" q	0,24	pu
T'do	5,75	s
T"do	0,005	s
T"qo	0,28	s
2H	11	s
D	0,0	s
SG10	0,04649473	-
SG12	0,1322594	-

Tabla 3 Parámetros calculados del Generador 4

Parámetro	Valor	Unidad
xd	0,888	pu
x'd	0,25	pu
x" d	0,24	pu
xl	0,12	pu
xq	0,52	pu
x" q	0,24	pu
T'do	5,60	s
T"do	0,005	s
T"qo	0,200	s
2H	11	s
D	0,0	s
SG10	0,06714994	-
SG12	0,1851802	-

Convenciones para el sistema por unidad (p.u.)

- Tensión del generador en V_T 1 p.u. = 13,8 kV
- Tensión de control de U_c 1 p.u. = no tiene base, es una Señal de control de la malla.
- Potencia activa P 1 p.u. = 92,7 MVA
- Potencia reactiva Q 1 p.u. = 92,7 MVA
- Corriente del generador I_r 1 p.u. = 3,878 kA
- Señal estabilizador V_{PSS} 1 p.u. = no tiene base, es una Señal en pu mismo

Unidad 1

- Corriente de campo del generador I_f 1 p.u. = 821,67 A
- Tensión de Campo del generador U_f 1 p.u. = 110,09 V

Unidad 2

- Corriente de campo del generador I_F 1 p.u. = 828,87 A
- Tensión de Campo del generador U_F 1 p.u. = 108,39 V

Unidad 3

- Corriente de campo del generador I_F 1 p.u. = 790,33 A
- Tensión de Campo del generador U_F 1 p.u. = 108,85 V

Unidad 4

- Corriente de campo del generador I_F 1 p.u. = 802,0 A
- Tensión de Campo del generador U_F 1 p.u. = 109,61 V

ANEXO 2

DIAGRAMAS DE BLOQUES Y PARÁMETROS

AVR

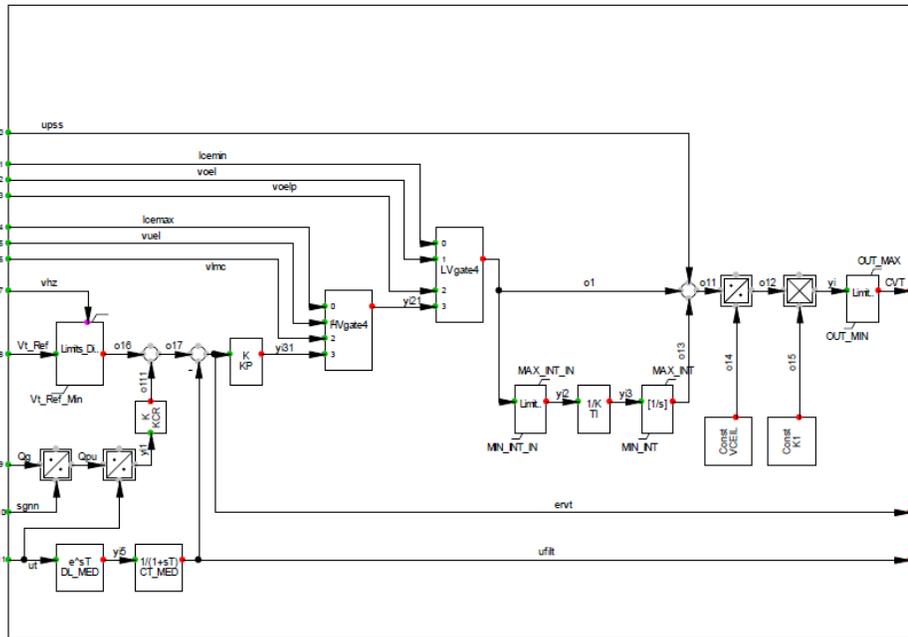
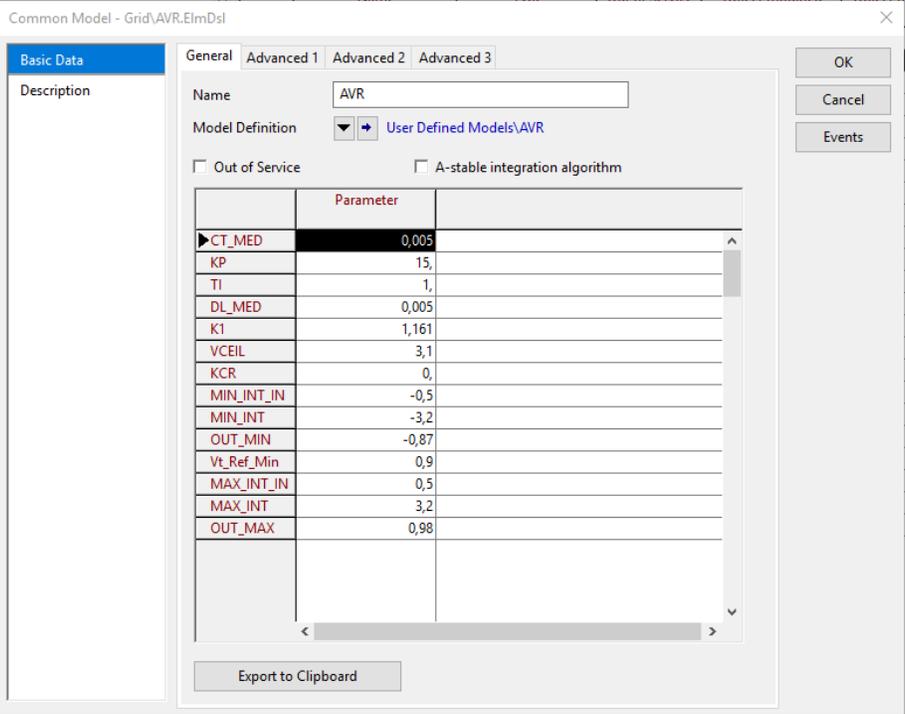


Figura 1. Diagrama de bloques del sistema de excitación

Tabla 4. Parámetros del sistema de excitación en carga Unidad 1

Parameter	
CT_MED	0,01
KP	15,
TI	1,
DL_MED	0,005
VCEIL	3,1
K1	1,1538
KCR	0,
OUT_MIN	-0,87
MIN_INT_IN	-0,5
MIN_INT	-3,2
Vt_Ref_Min	0,9
OUT_MAX	0,98
MAX_INT_IN	0,5
MAX_INT	3,2

Tabla 5. Parámetros del sistema de excitación U2



Common Model - Grid\AVR.ElmDsl

General | Advanced 1 | Advanced 2 | Advanced 3

Name: AVR

Model Definition: User Defined Models\AVR

Out of Service A-stable integration algorithm

Parameter	Value
CT_MED	0,005
KP	15,
TI	1,
DL_MED	0,005
K1	1,161
VCEIL	3,1
KCR	0,
MIN_INT_IN	-0,5
MIN_INT	-3,2
OUT_MIN	-0,87
Vt_Ref_Min	0,9
MAX_INT_IN	0,5
MAX_INT	3,2
OUT_MAX	0,98

Export to Clipboard



Consejo Nacional de Operación

Tabla 6. Parámetros del sistema de excitación U3

Common Model - Grid\AVR.ElmDsl

Basic Data

Description

General Advanced 1 Advanced 2 Advanced 3

Name: AVR

Model Definition: User Defined Models\AVR

Out of Service A-stable integration algorithm

Parameter	
CT_MED	0,005
KP	15,
TI	1,
DL_MED	0,003
VCEIL	3,1
K1	1,161
KCR	0,
OUT_MIN	-0,87
MIN_INT_IN	-0,5
MIN_INT	-3,2
Vt_Ref_Min	0,9
OUT_MAX	0,98
MAX_INT_IN	0,5
MAX_INT	3,2

Export to Clipboard

OK Cancel Events

Tabla 7. Parámetros del Sistema de excitación U4

Common Model - Grid\AVR.ElmDsl

Basic Data

Description

General Advanced 1 Advanced 2 Advanced 3

Name: AVR

Model Definition: User Defined Models\AVR

Out of Service A-stable integration algorithm

Parameter	
CT_MED	0,005
KP	15,
TI	1,
DL_MED	0,005
K1	1,161
VCEIL	3,1
KCR	0,
MIN_INT_IN	-0,5
MIN_INT	-3,2
OUT_MIN	-0,87
Vt_Ref_Min	0,9
MAX_INT_IN	0,5
MAX_INT	3,2
OUT_MAX	0,98

Export to Clipboard

OK Cancel Events

Drive:

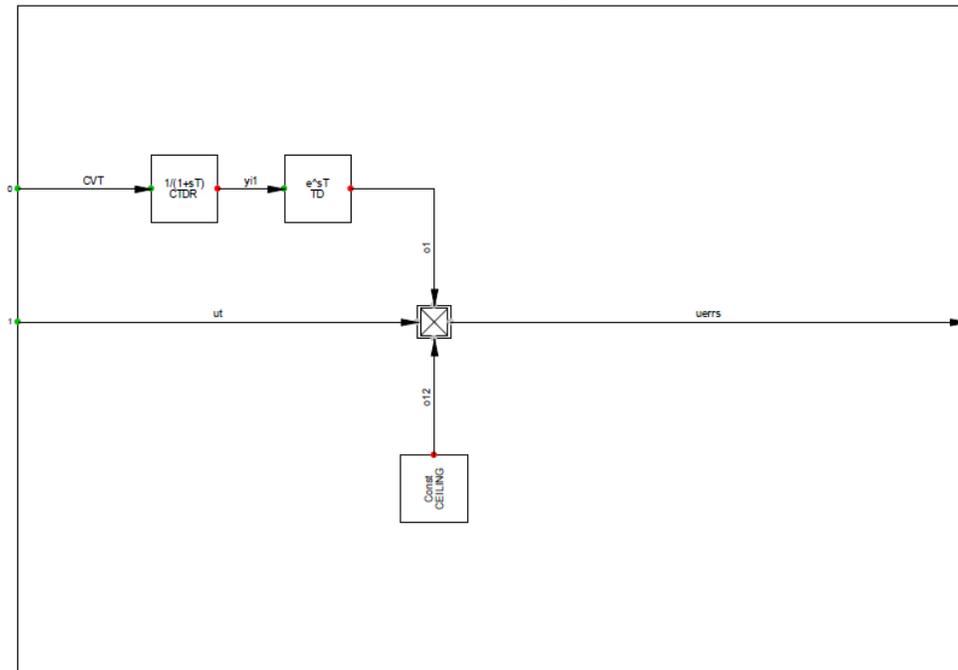


Figura 1. Diagrama de bloques del driver de potencia

Tabla 8. Parámetros del driver de potencia U1

Common Model - Grid\DRIVE.ElmDsl

Name:

Model Definition:

Out of Service A-stable integration algorithm

Parameter	Value
CTDR	0,003
TD	0,005
CEILING	6,89

Export to Clipboard



Consejo Nacional de Operación

Tabla 9. Parámetros del driver de potencia U2

Common Model - Grid\DRIVE.ElmDsl

Name: DRIVE

Model Definition: User Defined Models\DRIVE

Out of Service A-stable integration algorithm

	Parameter	
▶CTDR	0.003	
CEILING	7.02	
TD	0.003	

Export to Clipboard

OK, Cancel, Events, navigation arrows

Tabla 10. Parámetros del driver de potencia U3

Common Model - Grid\DRIVE.ElmDsl

Name: DRIVE

Model Definition: User Defined Models\DRIVE

Out of Service A-stable integration algorithm

	Parameter	
▶CTDR	0,003	
TD	0,003	
CEILING	7,02	

Export to Clipboard

OK, Cancel, Events, Navigation buttons

Tabla 11. Parámetros del driver de potencia U4

Common Model - Grid\DRIVE.ElmDsl

Name: DRIVE

Model Definition: User Defined Models\DRIVE

Out of Service A-stable integration algorithm

	Parameter	
▶CTDR	0,003	
CEILING	7,02	
TD	0,003	

Export to Clipboard

OK, Cancel, Events, Navigation buttons

Limitador LVHZ

LVHz

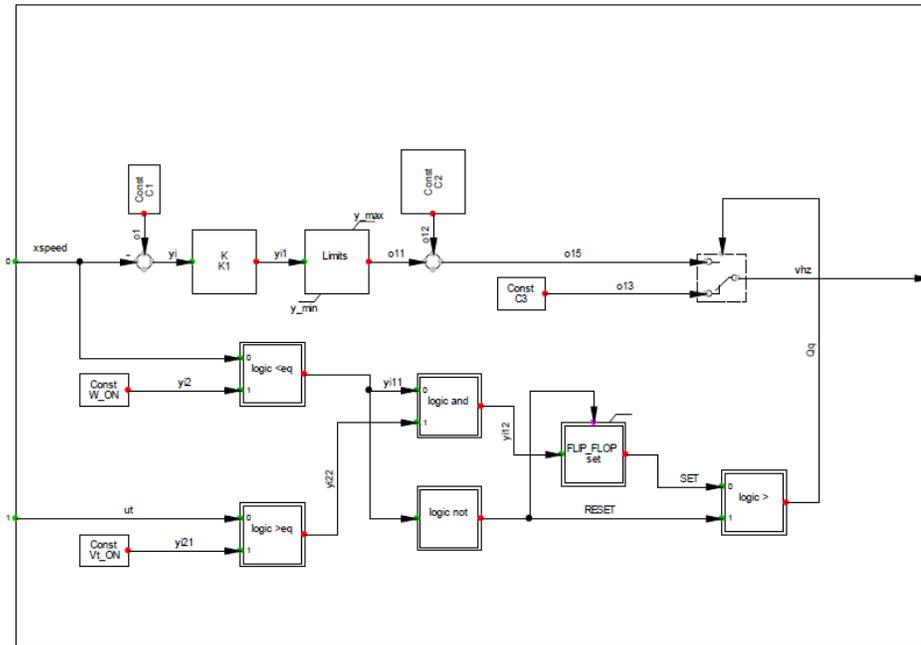


Figura 3. Diagrama de bloques del limitador VHz

Tabla 12. Parámetros del limitador VHz U1

Common Model - Grid\LVHz.ElmDsl

Name: LVHz

Model Definition: User Defined Models\LVHz

Out of Service A-stable integration algorithm

	Parameter	
▶C1	1	
K1	-1	
C2	1,1	
C3	1,1	
W_ON	0,9893	
Vt_ON	1,085	
set	0,5	
y_min	-10	
y_max	0	

Export to Clipboard

Tabla 12. Parámetros del limitador VHz U2

Common Model - Grid\VHZ.ElmDsl

Name: VHZ

Model Definition: User Defined Models\VHZ

Out of Service A-stable integration algorithm

	Parameter	
▶C1	1	
K1	-0,6	
C2	1,1	
C3	1,1	
W_ON	0,9893	
Vt_ON	1,085	
set	0,5	
y_min	-10	
y_max	0	

Export to Clipboard

Tabla 13. Parámetros del Limitador VHz U3

Common Model - Grid\VHZ.ElmDsl

Name: VHZ

Model Definition: User Defined Models\VHZ

Out of Service A-stable integration algorithm

Parameter	
C1	1
K1	-0,65
C2	1,1
C3	1,1
W_ON	0,9893
Vt_ON	1,085
set	0,5
y_min	-10,
y_max	0,

Export to Clipboard

OK, Cancel, Events

Tabla 14. Parámetros del limitador VHz U4

Common Model - Grid\VHZ.ElmDsl

Name: VHZ

Model Definition: User Defined Models\VHZ

Out of Service A-stable integration algorithm

Parameter	
C1	1
K1	-0,85
C2	1,1
C3	1,1
W_ON	0,9893
Vt_ON	1,04
set	0,5
y_min	-10,
y_max	0,

Export to Clipboard

OK, Cancel, Events

Limitador LPQ (LSE)

LPQ

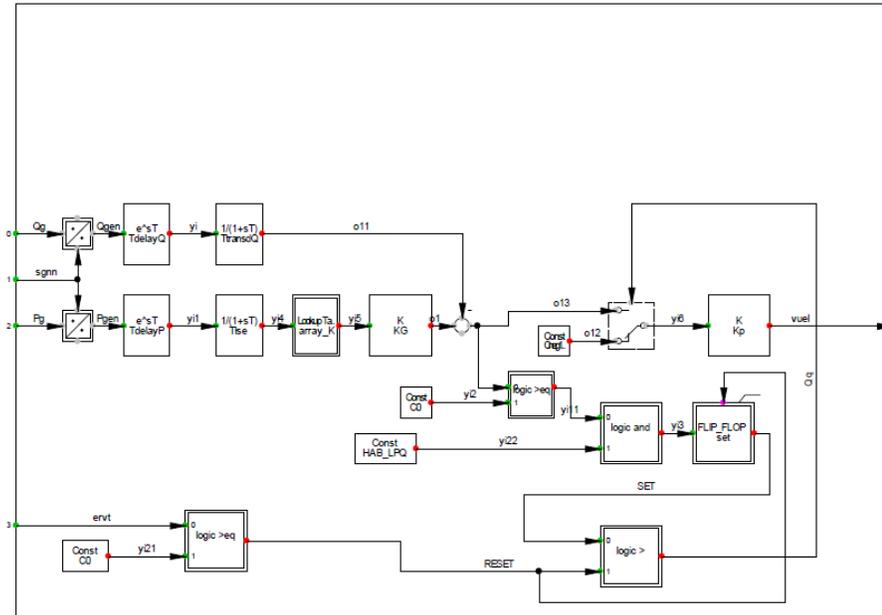


Figura 2. Diagrama de bloques del limitador LPQ

Tabla 15. Parámetros del limitador LPQ U1

Common Model - Grid\LPQ.Elmdsl		Common Model - Grid\LPQ.Elmdsl	
Name	LPQ	Characteristics:	
Model Definition	User Defined Models\LPQ	Size	K _x K _y
Out of Service	<input type="checkbox"/>	1	0,1 -0,6304
A-stable integration algorithm	<input type="checkbox"/>	2	0,297 -0,6304
Parameter		3	0,504 -0,5434
Kp	10	4	0,693 -0,3608
Tlse	0,25	5	0,999 -0,0869
TdelayQ	0,003		
TtransdQ	0,003		
TdelayP	0,003		
HAB_LPQ	1		
CD	0		
set	0,5		
KG	1		
Cneg100	-100		

Tabla 16. Parámetros del limitador LPQ U2

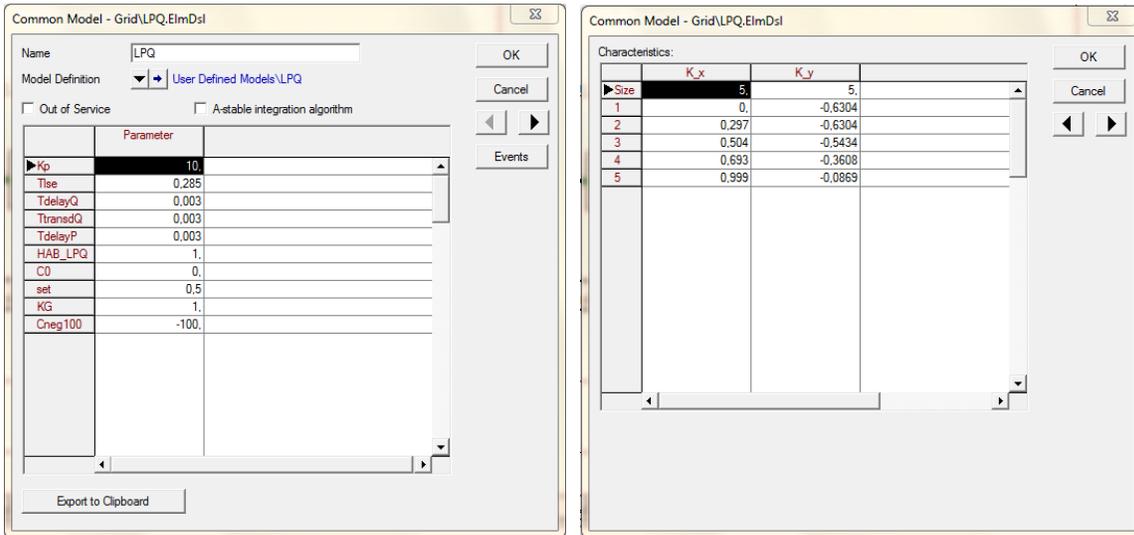


Tabla 17. Parámetros del limitador LPQ U3

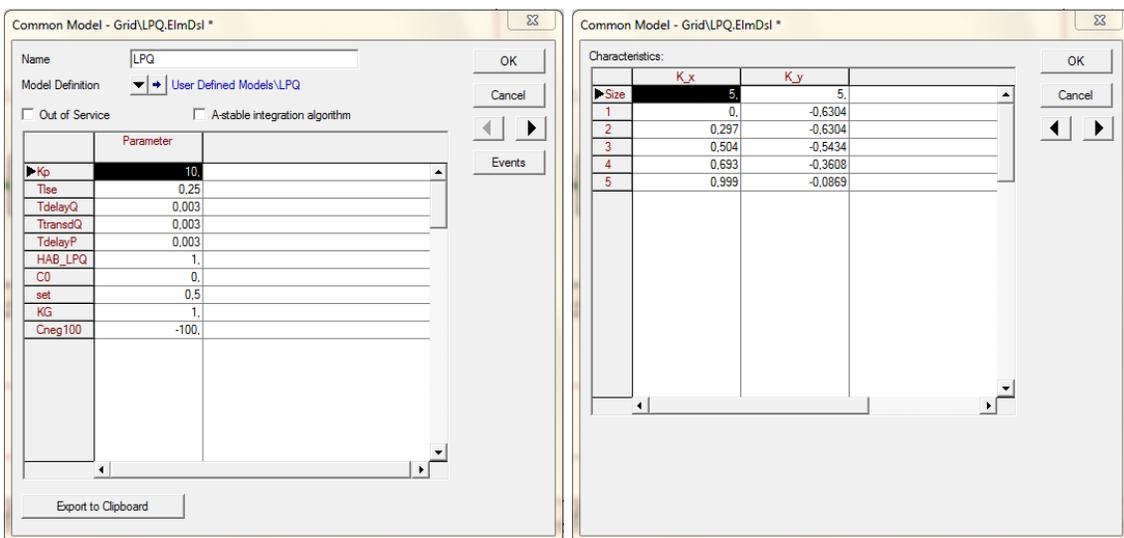
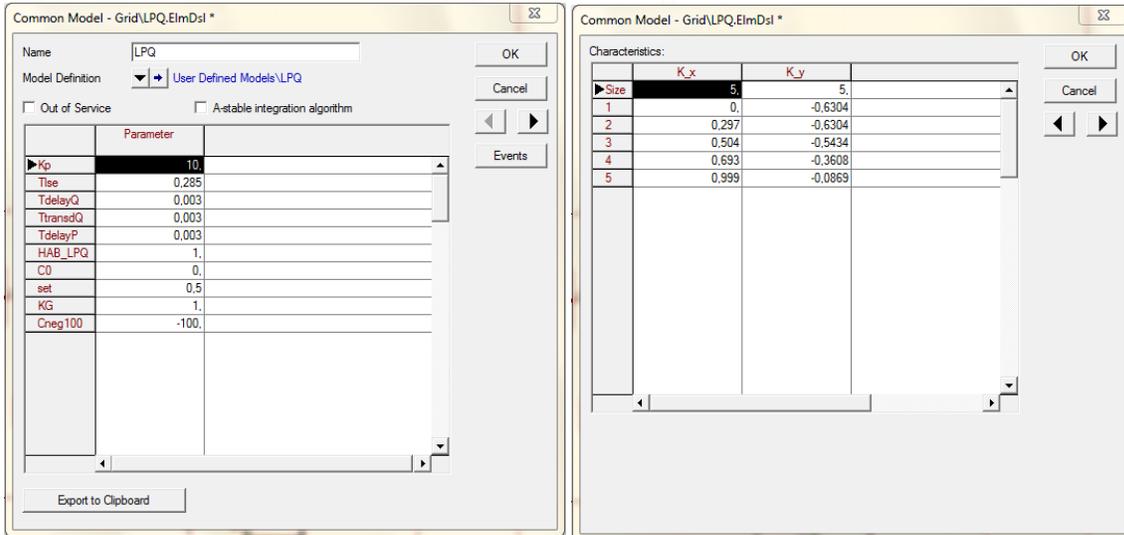


Tabla 18. Parámetros del Limitador LPQ U4



Limitador LCEI (OEL)

CEL_Pico

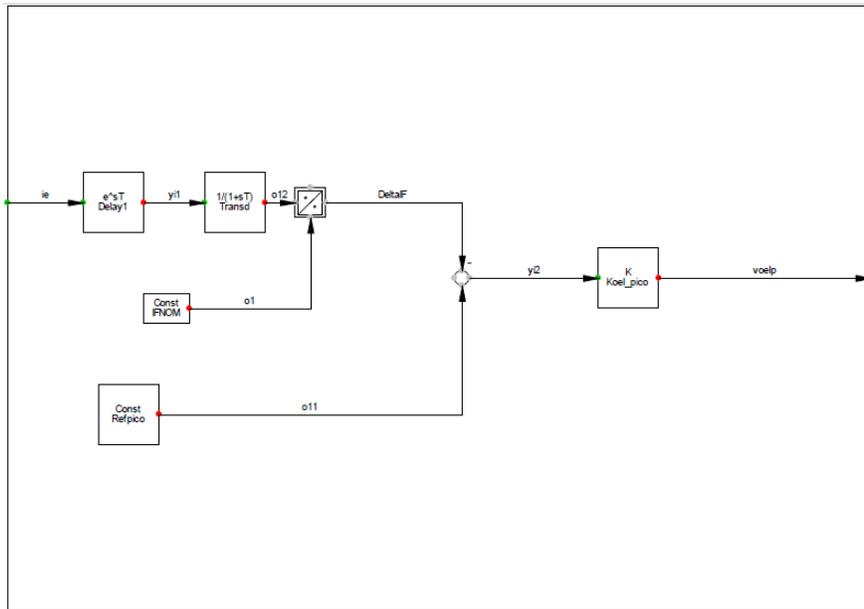


Figura 3. Diagrama de bloques del limitador LCEI

Tabla 19. Parámetros del Limitador LCEI U1

Common Model - Grid\OEL_Pico.ElmDsl		
Name	OEL_Pico	
Model Definition	User Defined Models\OEL_Pico	
<input type="checkbox"/> Out of Service	<input type="checkbox"/> A-stable integration algorithm	
Parameter		
Delay1	0.005	
Transd	0.005	
Refpico	2.	
KoeL_pico	5.	
IFNOM	1.7	
Export to Clipboard		

Tabla 20. Parámetros del Limitador LCEI U2

Common Model - Grid\OELPico.ElmDsl *

Name: OELPico

Model Definition: User Defined Models\OELPico

Out of Service A-stable integration algorithm

Parameter	
Delay1	0,005
Transd	0,005
Refpico	2,
Koel_pico	5,
IFNOM	1,7

Export to Clipboard

Tabla 21. Parámetros del Limitador LCEI U3

Common Model - Grid\OELPico.ElmDsl *

Name: OELPico

Model Definition: User Defined Models\OELPico

Out of Service A-stable integration algorithm

Parameter	
Delay1	0,005
Transd	0,005
Refpico	2,
Koel_pico	5,
IFNOM	1,7

Export to Clipboard

Common Model - Grid\OELPico.ElmDsl

Name: OELPico

Model Definition: User Defined Models\OELPico

Out of Service A-stable integration algorithm

Parameter	Value
Delay1	0.005
Transd	0.005
Refpico	2.
Koel_pico	5.
IFNOM	1.7

Export to Clipboard

Limitador LCER (LCE)

LCE:

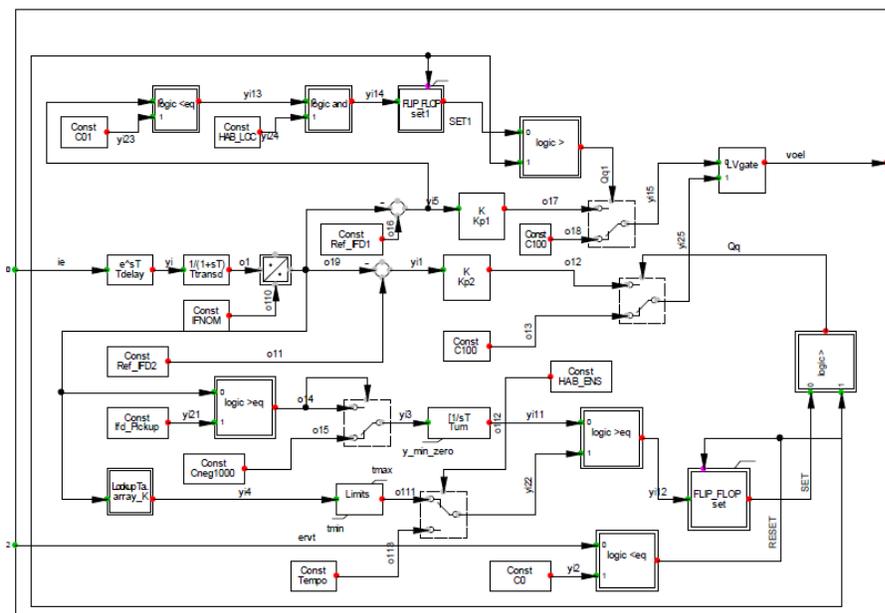
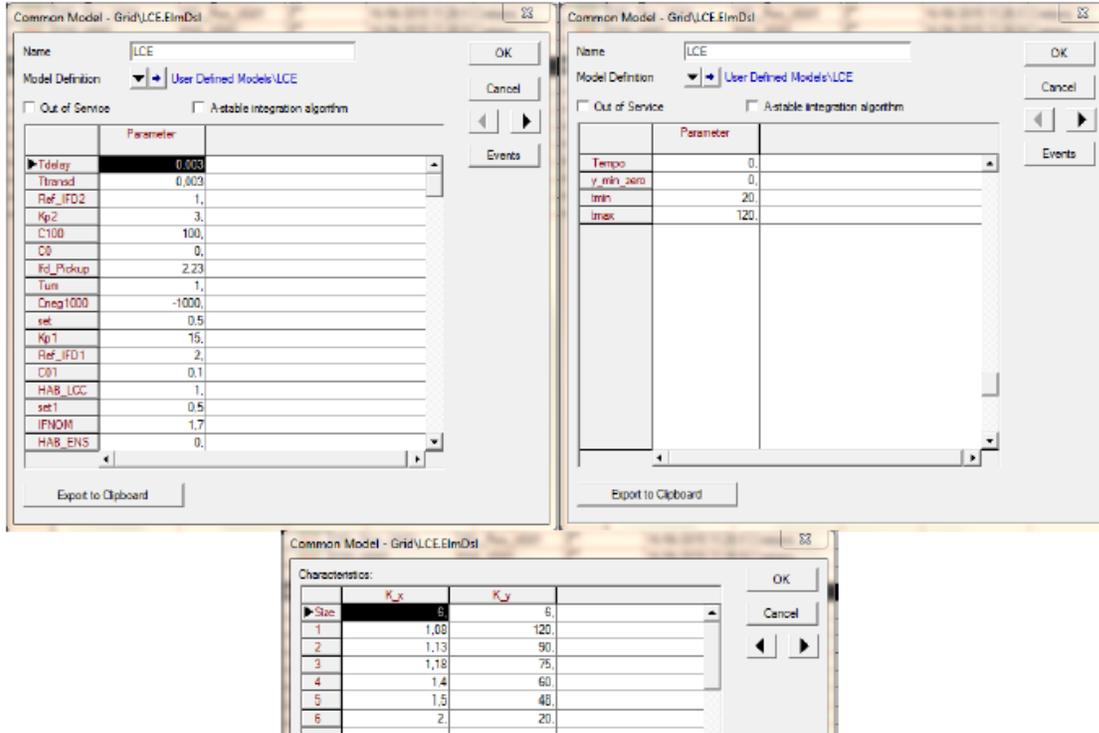


Figura 4. Diagrama de bloques del limitador LCER

Tabla 23. Parámetros del Limitador LCER U1

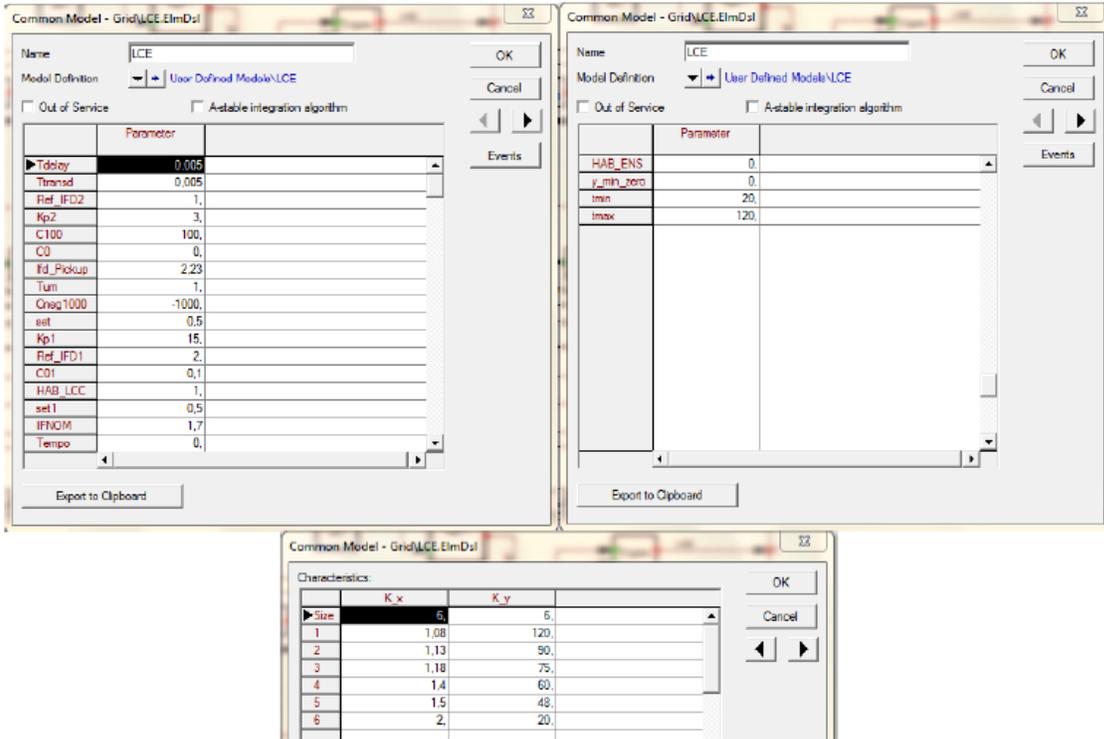


The image displays three screenshots of a software interface for configuring LCE (Line Current Error Reduction) parameters. The top two screenshots show the 'Common Model - Grid\LCE.ElmDef' dialog box with the 'Name' field set to 'LCE' and 'Model Definition' set to 'User Defined Models\LCE'. The left screenshot shows a list of parameters with values, and the right screenshot shows a subset of parameters.

The bottom screenshot shows the 'Characteristics' table for the LCE limiter:

State	K _x	K _y
1	1,00	120
2	1,13	90
3	1,18	75
4	1,4	60
5	1,5	48
6	2	20

Tabla 24. Parámetros del limitador LCER U2

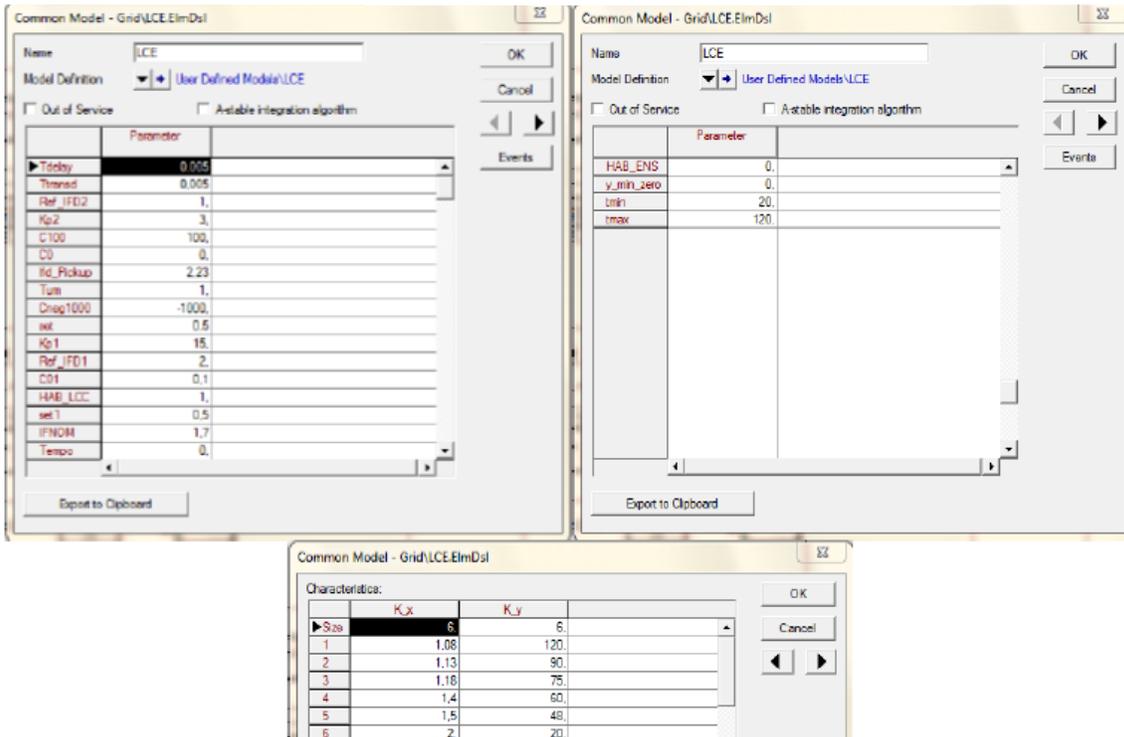


Parameter	Value
Tdelay	0.005
Ttransd	0.005
Ref_IFD2	1
Kp2	3
C100	100
CD	0
Id_Pickup	2.23
Tun	1
Chng1000	-1000
est	0.5
Kp1	15
Ref_IFD1	2
CD1	0.1
HAB_LCC	1
set1	0.5
IFNOM	1.7
Tempo	0

Parameter	Value
HAB_EN	0
y_min_zero	0
tmin	20
tmax	120

Size	K_x	K_y
1	1.08	120
2	1.13	90
3	1.18	75
4	1.4	60
5	1.5	48
6	2	20

Tabla 25. Parámetros del Limitador LCER U3

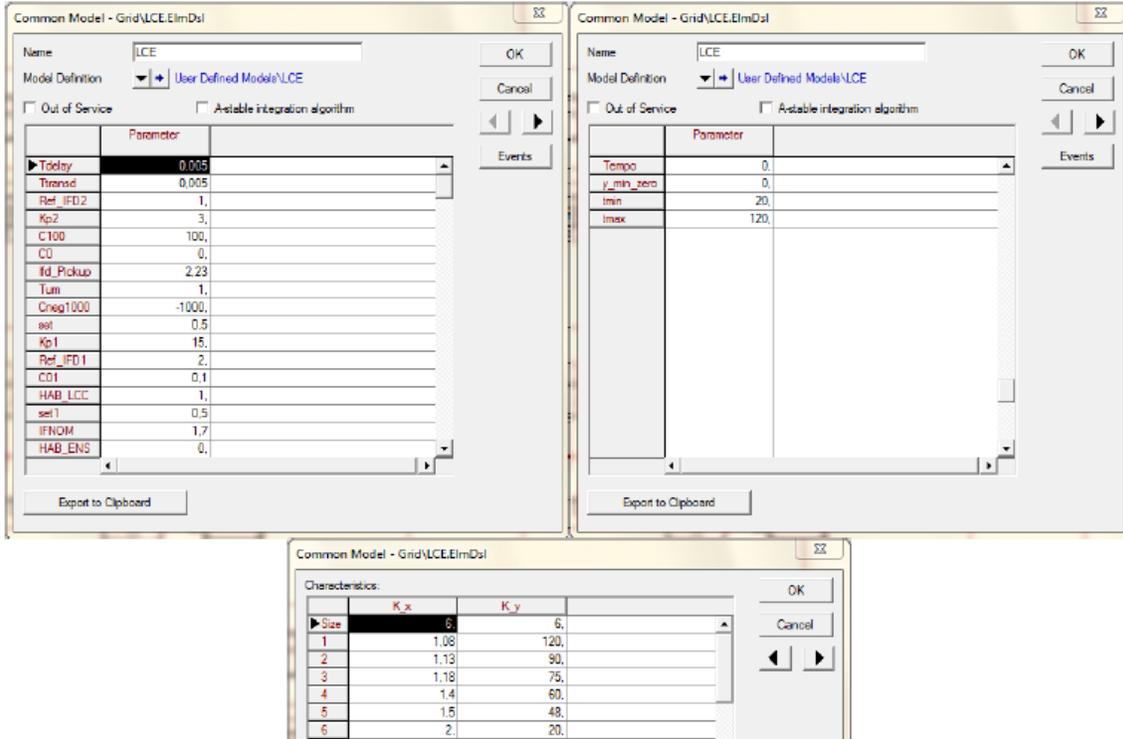


Parameter	Value
Tdelay	0.005
Ttransd	0.005
Ref_IFD2	1
Kp2	3
C100	100
CD	0
Id_Pickup	2.23
Tun	1
Chng1000	-1000
est	0.5
Kp1	15
Ref_IFD1	2
CD1	0.1
HAB_LCC	1
set1	0.5
IFNOM	1.7
Tempo	0

Parameter	Value
HAB_EN	0
y_min_zero	0
tmin	20
tmax	120

Size	K_x	K_y
1	1.08	120
2	1.13	90
3	1.18	75
4	1.4	60
5	1.5	48
6	2	20

Tabla 26. Parámetros del Limitador LCER U4



Parameter	Value
Tdelay	0.005
Transd	0.005
Ref_IFD2	1
Kp2	3
C100	100
CD	0
Id_Pickup	2.23
Tun	1
Cheg1000	-1000
est	0.5
Kp1	15
Ref_IFD1	2
CD1	0.1
HAB_LCC	1
set1	0.5
IFNOM	1.7
HAB_ENS	0

Parameter	Value
Tempo	0
y_min_zero	0
tmin	20
tmax	120

Size	K _x	K _y
1	1.08	120
2	1.13	90
3	1.18	75
4	1.4	60
5	1.5	48
6	2	20

Limitador LCEM

LCEM:

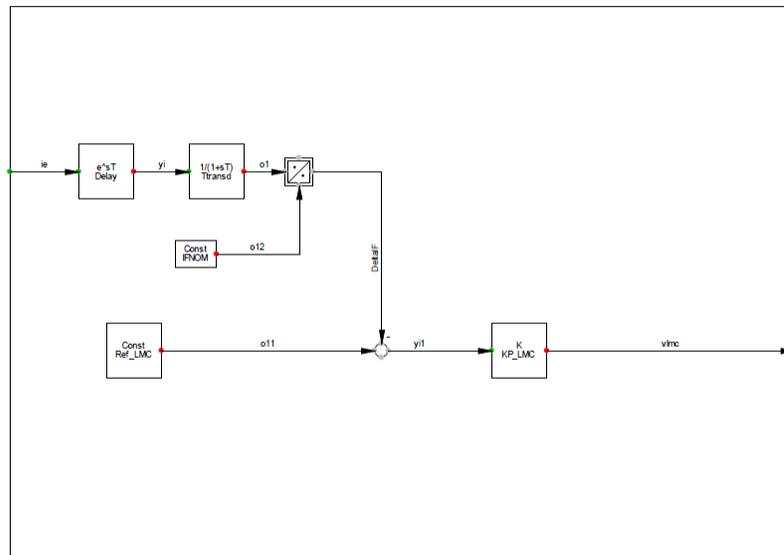


Figura 5. Diagrama de bloques del Limitador LCEM

Tabla 27. Parámetros del limitador LCEM U1

Common Model - Grid\LCEM.ElxDsl

Name: LCEM

Model Definition: User Defined Models\LCEM

Out of Service A-stable integration algorithm

Parameter	Value
Delay	0.005
Ttransd	0.005
KP_LMC	5.
Ref_LMC	0.18
IFNOM	1.7

Buttons: OK, Cancel, Events, Export to Clipboard

Tabla 28. Parámetros del Limitador LCEM U2

Common Model - Grid\LCEM.ElxDsl

Name: LCEM

Model Definition: User Defined Models\LCEM

Out of Service A-stable integration algorithm

Parameter	Value
Delay	0.005
Ttransd	0.005
KP_LMC	5.
Ref_LMC	0.18
IFNOM	1.7

Buttons: OK, Cancel, Events, Export to Clipboard

Tabla 29. Parámetros del Limitador LCEM U3

Common Model - Grid\LCEM.ElmDsl

Name: LCEM

Model Definition: User Defined Models\LCEM

Out of Service A-stable integration algorithm

Parameter	Value
Delay	0,005
Ttransd	0,005
KP_LMC	5,
Ref_LMC	0,18
IFNOM	1,7

Buttons: OK, Cancel, Events, Export to Clipboard

Tabla 30. Parámetros del Limitador LCEM U4

Common Model - Grid\LCEM.ElmDsl

Name: LCEM

Model Definition: User Defined Models\LCEM

Out of Service A-stable integration algorithm

Parameter	Value
Delay	0,005
Ttransd	0,005
KP_LMC	3,
Ref_LMC	0,18
IFNOM	1,7

Buttons: OK, Cancel, Events, Export to Clipboard

Limitador LCTR (LCT)

LCT:

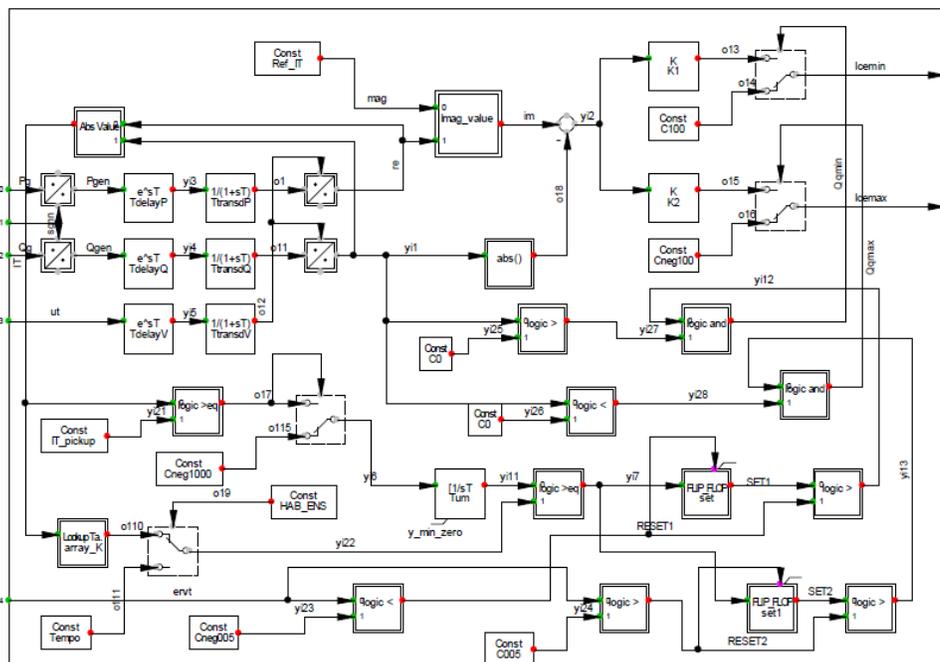


Figura 6 Diagrama de bloques del limitador LCTR

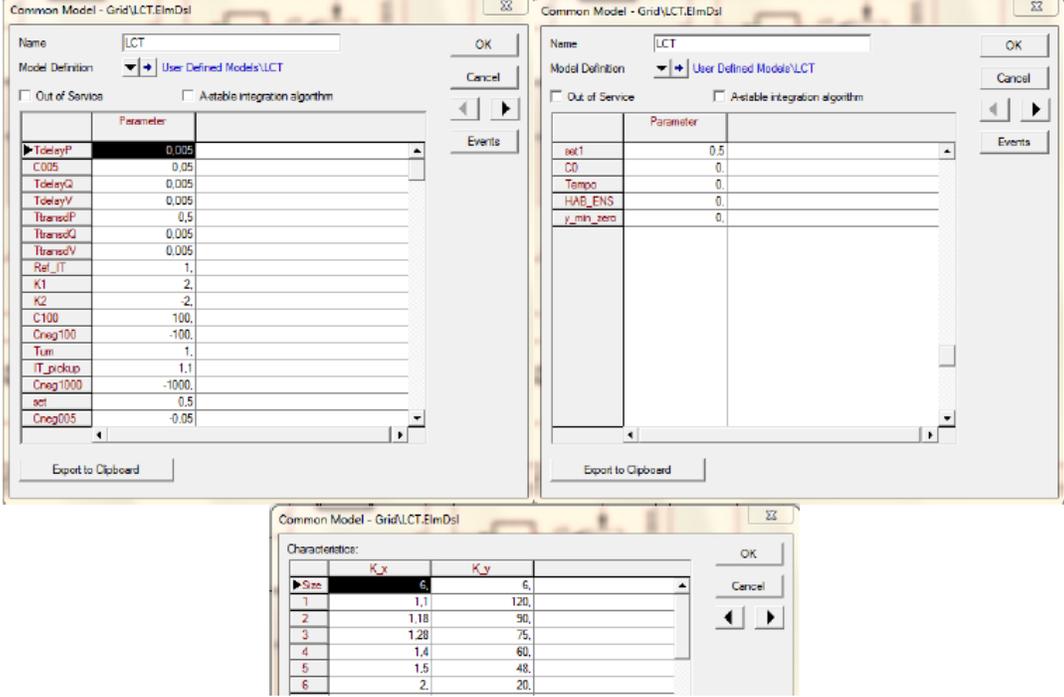
Tabla 31. Parámetros del limitador LCTR U1

Parameter	Value
TdelayP	0.005
C005	0.05
TdelayQ	0.005
TdelayV	0.005
TtransoP	0.5
TtransoQ	0.005
TtransoV	0.005
Ref_IT	1
K1	2
K2	-2
C100	100
Cneg100	-100
Turn	1
IT_pickup	1.1
Cneg1000	-1000
set	0.5
Cneg005	-0.05

Parameter	Value
set1	0.5
CD	0
Tempo	0
HAB_EN5	0
y_min_zero	0

Characteristics	Kx	Ky
Size	6	6
1	1.1	120
2	1.18	90
3	1.28	75
4	1.4	60
5	1.5	48

Tabla 32. Parámetros del Limitador LCTR U2



The image displays three screenshots from a software interface for configuring the LCTR U2 model. Each window has a title bar 'Common Model - Grid\LCTr.ElmsDsl' and a close button.

Top-Left Window: Shows the 'Parameter' list for the 'LCT' model. The 'Model Definition' is 'User Defined Models\LCT'. The 'Parameter' table is as follows:

Parameter	Value
TdelayP	0.005
C005	0.05
TdelayQ	0.005
TdelayV	0.005
TtransdP	0.5
TtransdQ	0.005
TtransdV	0.005
Ref_IT	1.
K1	2.
K2	-2.
C100	100.
Cneg100	-100.
Tun	1.
IT_pickup	1.1
Cneg1000	-1000.
set	0.5
Cneg005	-0.05

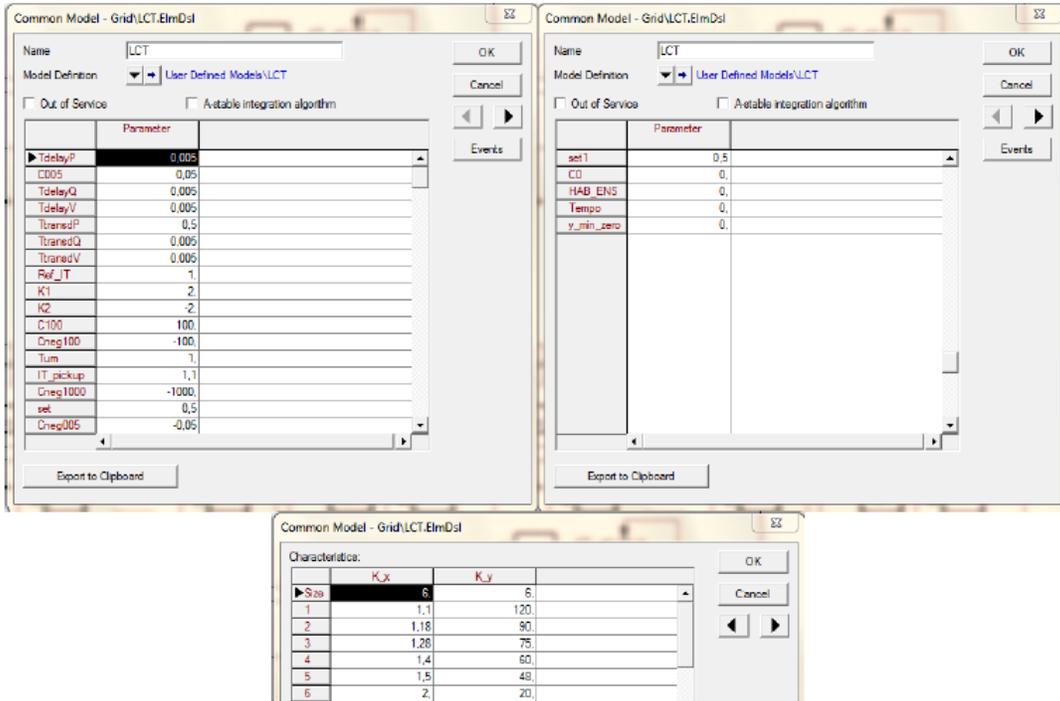
Top-Right Window: Shows the 'Parameter' list for the 'LCT' model. The 'Model Definition' is 'User Defined Models\LCT'. The 'Parameter' table is as follows:

Parameter	Value
set1	0.5
C0	0.
Tempo	0.
HAB_ENS	0.
y_min_zerr	0.

Bottom Window: Shows the 'Characteristics' table for the 'LCT' model. The table is as follows:

Size	K _x	K _y
1	1.1	120.
2	1.18	90.
3	1.28	75.
4	1.4	60.
5	1.5	48.
6	2.	20.

Tabla 33. Parámetros del Limitador LCTR U3



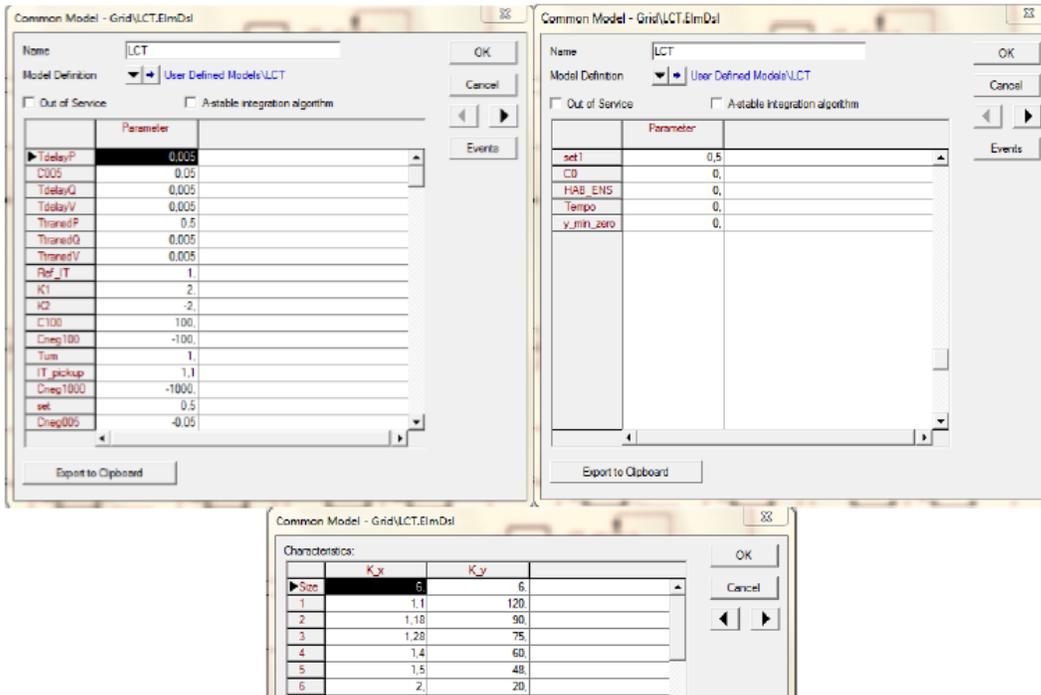
The screenshot displays three windows from the 'Common Model - Grid\LCT.ElmDsl' application:

- Top Left Window:** Shows a list of parameters for the LCT model. The 'set' parameter is highlighted with a value of 0.5.
- Top Right Window:** Shows a list of parameters for the LCT model. The 'set' parameter is highlighted with a value of 0.5.
- Bottom Center Window:** Shows the 'Characteristics' table with columns for Size, K_x, and K_y.

Parameter	Value
TdelayP	0.005
CD05	0.05
TdelayQ	0.005
TdelayV	0.005
TtransdP	0.5
TtransdQ	0.005
TtransdV	0.005
Ref_UT	1
K1	2
K2	-2
C100	100
Cneg100	-100
Tum	1
IT_pickup	1,1
Cneg1000	-1000
set	0.5
Cneg005	-0.05

Size	K _x	K _y
1	1.1	120
2	1.18	90
3	1.28	75
4	1.4	60
5	1.5	48
6	2	20

Tabla 34. Parámetros del Limitador LCTR U4



The screenshot displays three windows from the 'Common Model - Grid\LCT.ElmDsl' application:

- Top Left Window:** Shows a list of parameters for the LCT model. The 'set' parameter is highlighted with a value of 0.5.
- Top Right Window:** Shows a list of parameters for the LCT model. The 'set' parameter is highlighted with a value of 0.5.
- Bottom Center Window:** Shows the 'Characteristics' table with columns for Size, K_x, and K_y.

Parameter	Value
TdelayP	0.005
CD05	0.05
TdelayQ	0.005
TdelayV	0.005
TtransdP	0.5
TtransdQ	0.005
TtransdV	0.005
Ref_UT	1
K1	2
K2	-2
C100	100
Cneg100	-100
Tum	1
IT_pickup	1,1
Cneg1000	-1000
set	0.5
Cneg005	-0.05

Size	K _x	K _y
1	1.1	120
2	1.18	90
3	1.28	75
4	1.4	60
5	1.5	48
6	2	20

Estabilizador de Sistema de Potencia

PSS:

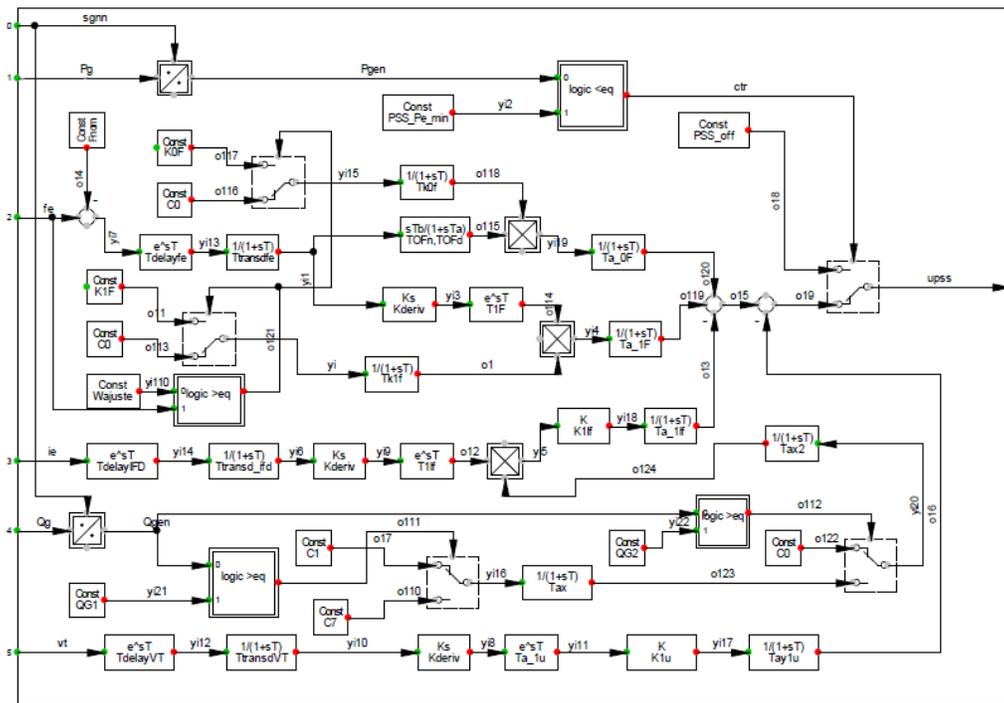


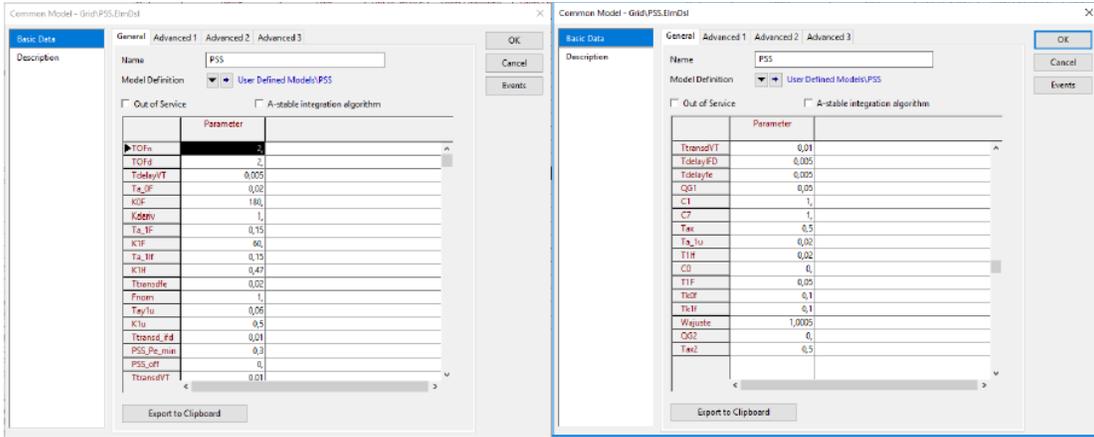
Figura 7. Diagrama de bloques del estabilizador de Sistema de Potencia

Tabla 35. Parámetros del Estabilizador de Sistema de Potencia U1

Parameter	Value
TOFn	2
TOFd	2
TdelayVT	0,002
Ta_OF	0,02
KIP	100
Kderiv	1
Ta_IF	0,15
K1F	60
Ta_1F	0,15
K1F	0,47
TransdVT	0,02
TransdVT	1
TauVu	0,06
K1u	0,5
TransdVd	0,01
TransdVd	0,3
PSS_off	0
TransdVT	0,01

Parameter	Value
TransdVT	0,01
TdelayFD	0,002
Tdelayfe	0,002
QG1	0,01
C1	1
C7	1
Tax	0,5
Ta_1u	0,02
T1F	0,02
C2	0
T1F	0,02
TnDF	0,1
Tx11	0,1
Wajuste	1,0002
QG2	0
Tax2	0,5

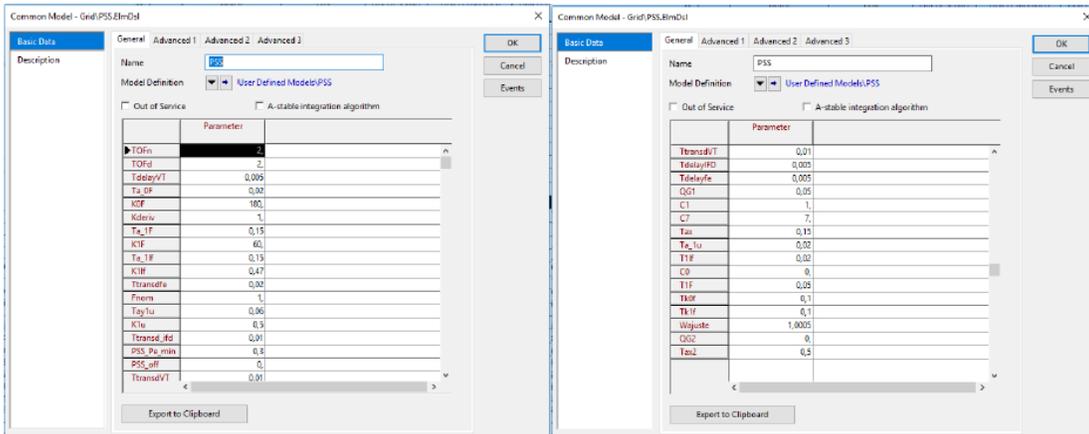
Tabla 36. Parámetros del Estabilizador de Sistema de Potencia U2



Parameter	Value
TOFm	2
TOFd	2
TdelayVT	0.005
Ta_0F	0.02
K0F	180
Kdeliv	1
Ta_1F	0.15
K1F	60
Ta_1IF	0.15
K1IF	0.47
TtransdF	0.02
Fnom	1
Taylu	0.06
Klu	0.5
Ttransd_fd	0.01
PSS_Pa_min	0.3
PSS_off	0
TtransdVT	0.01

Parameter	Value
TtransdVT	0.01
TdelayFD	0.005
Tdelaye	0.005
QG1	0.05
C1	1
C2	1
Tax	0.5
Ta_lu	0.02
T1F	0.02
C0	6
T1F	0.05
Td0F	0.1
Td1F	0.1
Wajuste	1.0005
QG2	0
Tax2	0.5

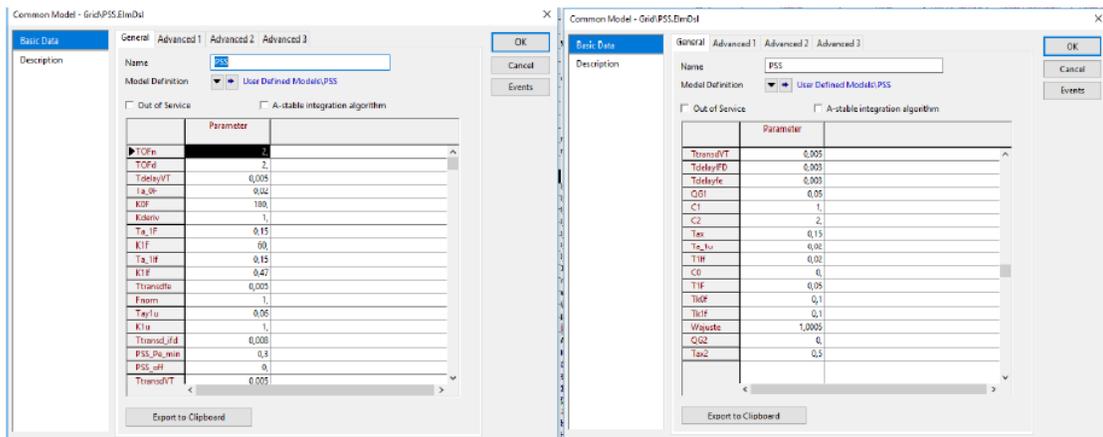
Tabla 37. Parámetros del Estabilizador de Sistema de Potencia U3



Parameter	Value
TOFm	2
TOFd	2
TdelayVT	0.005
Ta_0F	0.02
K0F	180
Kdeliv	1
Ta_1F	0.15
K1F	60
Ta_1IF	0.15
K1IF	0.47
TtransdF	0.02
Fnom	1
Taylu	0.06
Klu	0.5
Ttransd_fd	0.01
PSS_Pa_min	0.3
PSS_off	0
TtransdVT	0.01

Parameter	Value
TtransdVT	0.01
TdelayFD	0.005
Tdelaye	0.005
QG1	0.05
C1	1
C2	1
Tax	0.15
Ta_lu	0.02
T1F	0.02
C0	6
T1F	0.06
Td0F	0.1
Td1F	0.1
Wajuste	1.0005
QG2	0
Tax2	0.5

Tabla 38. Parámetros del Estabilizador de Sistema de Potencia U4



Parameter	Value
TOFm	2
TOFd	2
TdelayVT	0.005
Ta_0F	0.02
K0F	180
Kdeliv	1
Ta_1F	0.15
K1F	60
Ta_1IF	0.15
K1IF	0.47
TtransdF	0.02
Fnom	1
Taylu	0.06
Klu	1
Ttransd_fd	0.008
PSS_Pa_min	0.3
PSS_off	0
TtransdVT	0.005

Parameter	Value
TtransdVT	0.005
TdelayFD	0.005
Tdelaye	0.005
QG1	0.05
C1	1
C2	2
Tax	0.15
Ta_lu	0.02
T1F	0.02
C0	6
T1F	0.05
Td0F	0.1
Td1F	0.1
Wajuste	1.0005
QG2	0
Tax2	0.5

Control de Velocidad y Potencia

Potencia:

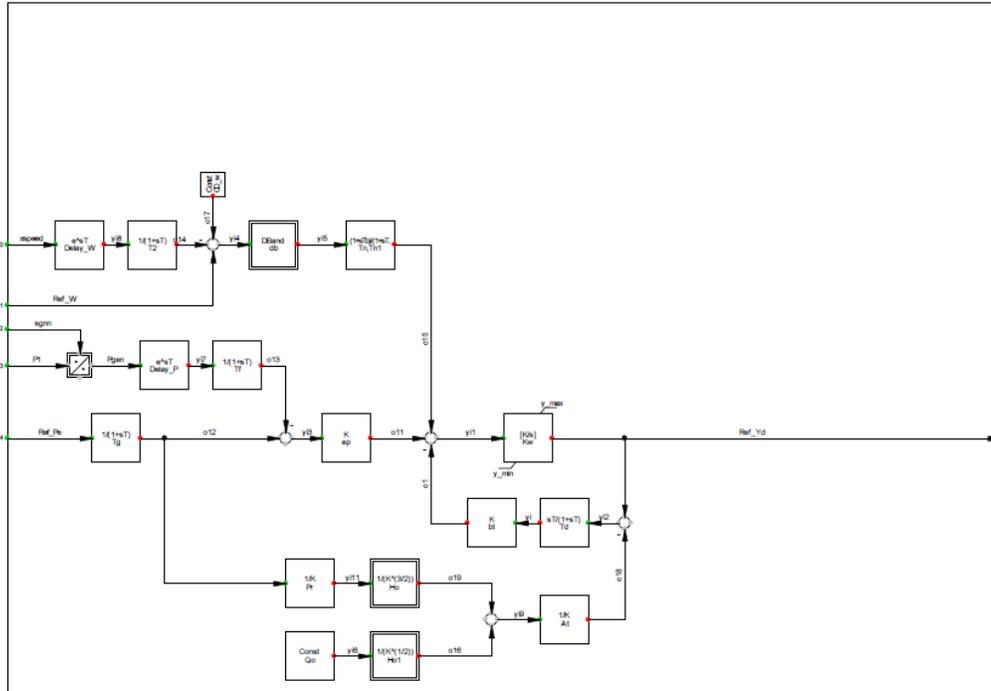


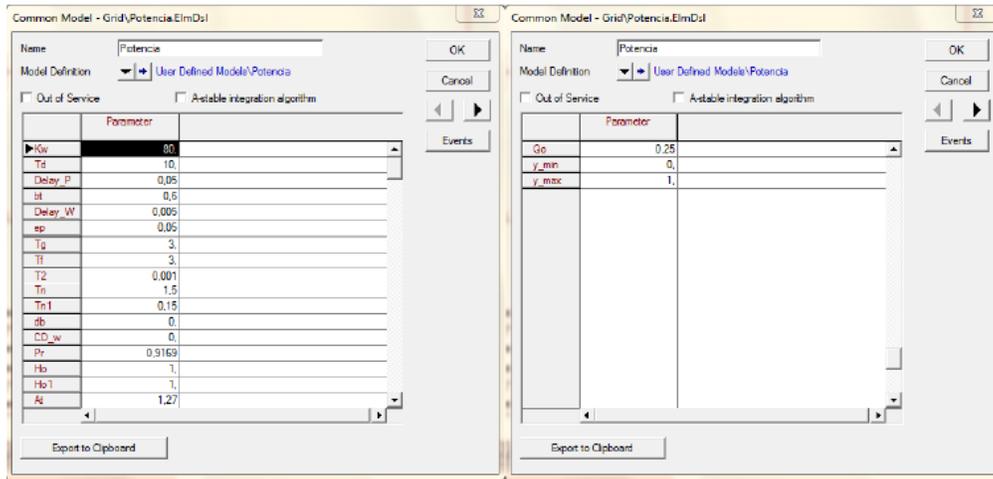
Figura 8. Diagrama de bloques del Control de Velocidad y Potencia

Tabla 39. Datos del control de Velocidad y Potencia U1

Parameter	Value
τ_d	0.0
Delay_P	0.05
τ_i	0.6
Delay_W	0.005
ϵ_p	0.05
T_g	3.
T_i	3.
T_2	0.001
T_n	1.5
T_{n1}	0.15
δ_b	0.
C_D_w	0.
P_r	0.9169
H_0	1.
H_01	1.
A_e	1.27

Parameter	Value
G_0	0.25
y_{min}	0.
y_{max}	1.

Tabla 40. Datos de Control de Velocidad y Potencia U2



Common Model - Grid\Potencia.ElmDsl

Name: Potencia

Model Definition: User Defined Models\Potencia

Out of Service A stable integration algorithm

Parameter	Value
K _{cr}	80
T _d	10
Delay_P	0.05
t _t	0.5
Delay_W	0.005
ε _p	0.05
T _g	3
T _f	3
T ₂	0.001
T _n	1.5
T _{n1}	0.15
δ _b	0
CD_w	0
P _r	0.9169
H ₀	1
H ₀₁	1
A _t	1.27

Export to Clipboard

Common Model - Grid\Potencia.ElmDsl

Name: Potencia

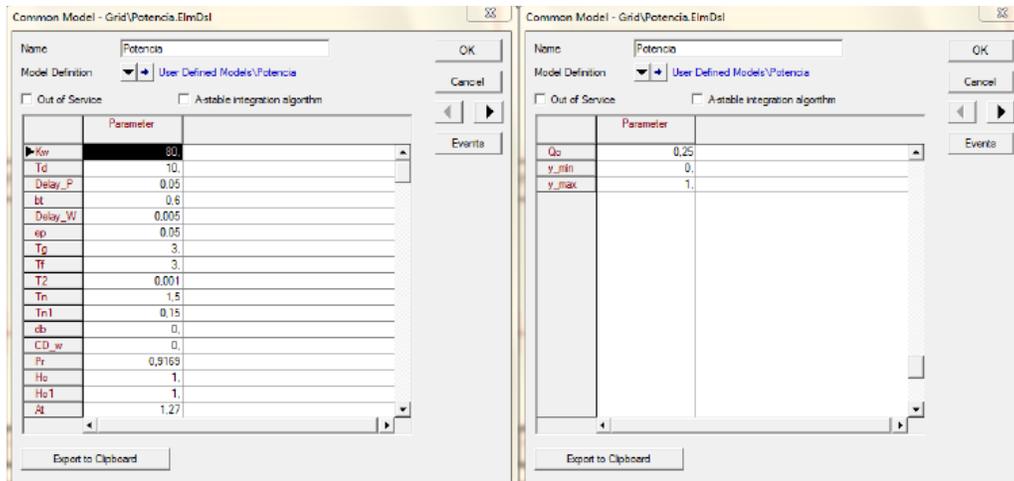
Model Definition: User Defined Models\Potencia

Out of Service A stable integration algorithm

Parameter	Value
G ₀	0.25
y_min	0
y_max	1

Export to Clipboard

Tabla 41. Datos de control de velocidad y potencia U3



Common Model - Grid\Potencia.ElmDsl

Name: Potencia

Model Definition: User Defined Models\Potencia

Out of Service A stable integration algorithm

Parameter	Value
K _{cr}	80
T _d	10
Delay_P	0.05
t _t	0.6
Delay_W	0.005
ε _p	0.05
T _g	3
T _f	3
T ₂	0.001
T _n	1.5
T _{n1}	0.15
δ _b	0
CD_w	0
P _r	0.9169
H ₀	1
H ₀₁	1
A _t	1.27

Export to Clipboard

Common Model - Grid\Potencia.ElmDsl

Name: Potencia

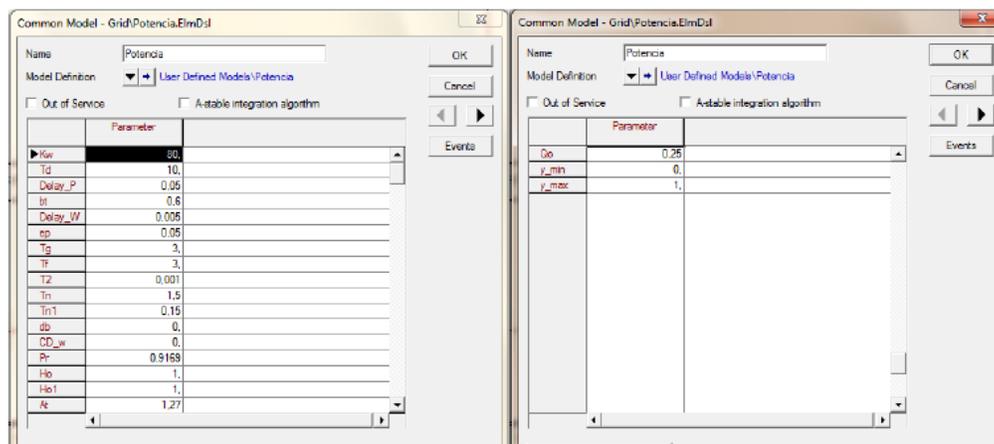
Model Definition: User Defined Models\Potencia

Out of Service A stable integration algorithm

Parameter	Value
G ₀	0.25
y_min	0
y_max	1

Export to Clipboard

Tabla 42. Datos del Control de Velocidad y Potencia U4



Common Model - Grid\Potencia.ElmDsl

Name: Potencia

Model Definition: User Defined Models\Potencia

Out of Service A stable integration algorithm

Parameter	Value
K _{cr}	80
T _d	10
Delay_P	0.05
t _t	0.6
Delay_W	0.005
ε _p	0.05
T _g	3
T _f	3
T ₂	0.001
T _n	1.5
T _{n1}	0.15
δ _b	0
CD_w	0
P _r	0.9169
H ₀	1
H ₀₁	1
A _t	1.27

Export to Clipboard

Common Model - Grid\Potencia.ElmDsl

Name: Potencia

Model Definition: User Defined Models\Potencia

Out of Service A stable integration algorithm

Parameter	Value
G ₀	0.25
y_min	0
y_max	1

Export to Clipboard

Control de los Actuadores

ControlYd:

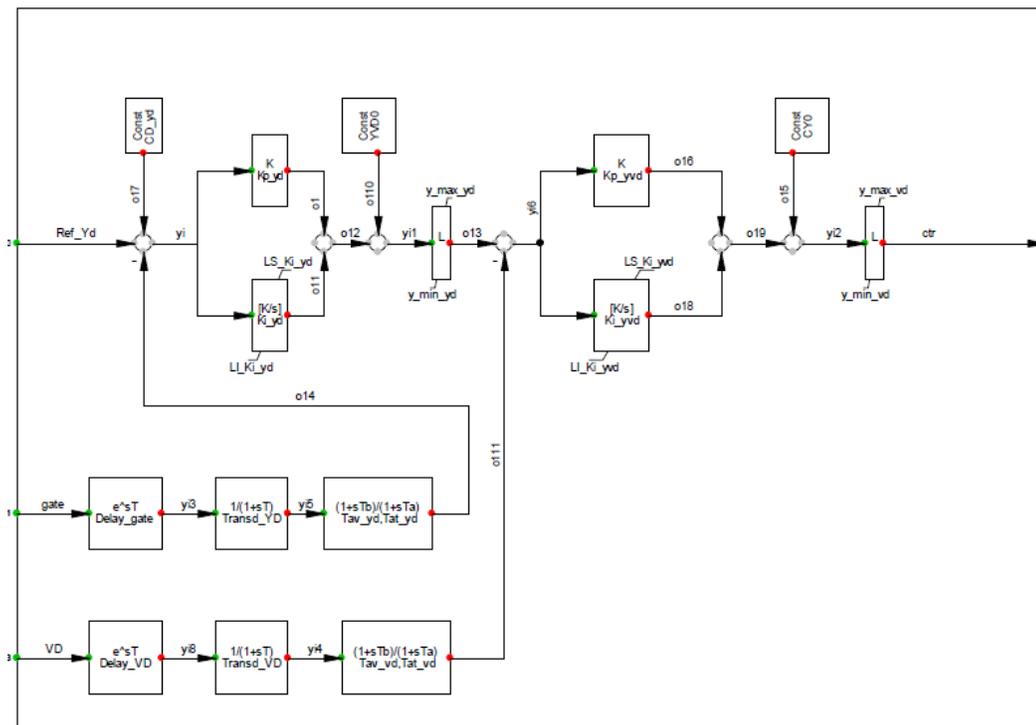
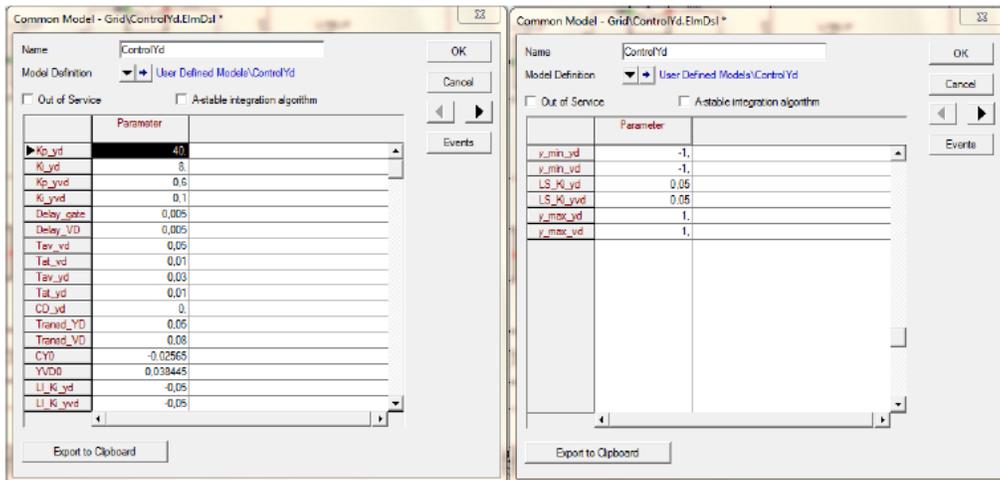


Figura 9. Diagrama de bloques del Control de los Actuadores

Tabla 43. Datos del Control de los Actuadores U1

Parameter	Value
Kp_yd	40
Ki_yd	8
Kp_yvd	0.6
Ki_yvd	0.1
Delay_gate	0.005
Delay_VD	0.005
Tav_vd	0.05
Tat_vd	0.01
Tav_yd	0.03
Tat_yd	0.01
CD_yd	0
Transd_YD	0.05
Transd_VD	0.08
CYO	-0.02560
YD0	0.038445
LI_Ki_yd	-0.05
LI_Ki_yvd	-0.05
y_min_yd	-1
y_min_vd	-1
LS_Ki_yd	0.05
LS_Ki_yvd	0.05
y_max_yd	1
y_max_vd	1

Tabla 44. Datos del control de los Actuadores U2

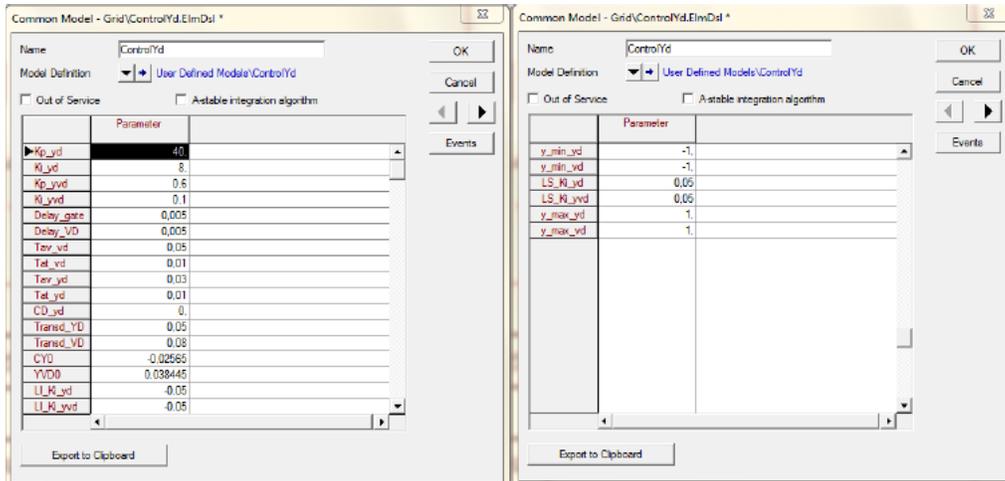


The image shows two side-by-side screenshots of a software window titled 'Common Model - Grid/ControlYd.ElmDsl'. Both windows show the 'ControlYd' model definition. The left window displays a full list of parameters, while the right window shows a subset of parameters.

Parameter	Value
Kp_yd	40
Ki_yd	8
Kp_yvd	0.6
Ki_yvd	0.1
Delay_gate	0.005
Delay_VD	0.005
Tav_vd	0.05
Tat_vd	0.01
Tav_yd	0.03
Tat_yd	0.01
CD_yd	0
Transd_YD	0.05
Transd_VD	0.08
CYD	-0.02565
YVD0	0.038445
LL_K_yd	-0.05
LL_K_yvd	-0.05

Parameter	Value
y_min_yd	-1
y_min_vd	-1
LS_K_yd	0.05
LS_K_yvd	0.05
y_max_yd	1
y_max_vd	1

Tabla 45. Datos del Control de los actuadores U3

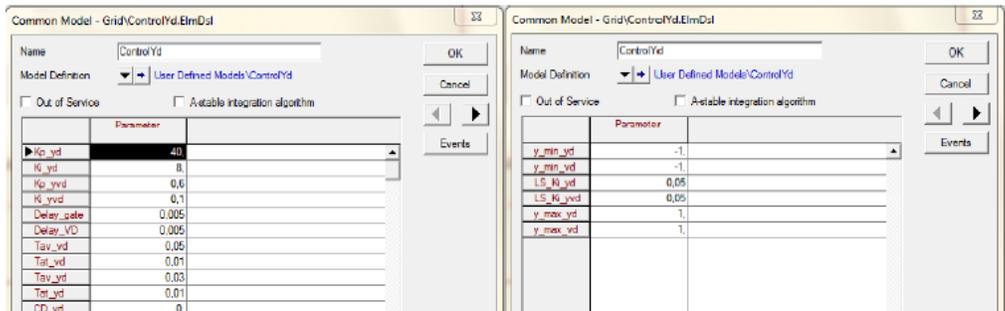


The image shows two side-by-side screenshots of a software window titled 'Common Model - Grid/ControlYd.ElmDsl'. Both windows show the 'ControlYd' model definition. The left window displays a full list of parameters, while the right window shows a subset of parameters.

Parameter	Value
Kp_yd	40
Ki_yd	8
Kp_yvd	0.6
Ki_yvd	0.1
Delay_gate	0.005
Delay_VD	0.005
Tav_vd	0.05
Tat_vd	0.01
Tav_yd	0.03
Tat_yd	0.01
CD_yd	0
Transd_YD	0.05
Transd_VD	0.08
CYD	-0.02565
YVD0	0.038445
LL_K_yd	-0.05
LL_K_yvd	-0.05

Parameter	Value
y_min_yd	-1
y_min_vd	-1
LS_K_yd	0.05
LS_K_yvd	0.05
y_max_yd	1
y_max_vd	1

Tabla 46 Datos del Control de Actuadores U4



The image shows two side-by-side screenshots of a software window titled 'Common Model - Grid/ControlYd.ElmDsl'. Both windows show the 'ControlYd' model definition. The left window displays a full list of parameters, while the right window shows a subset of parameters.

Parameter	Value
Kp_yd	40
Ki_yd	8
Kp_yvd	0.6
Ki_yvd	0.1
Delay_gate	0.005
Delay_VD	0.005
Tav_vd	0.05
Tat_vd	0.01
Tav_yd	0.03
Tat_yd	0.01
CD_yd	0
Transd_YD	0.05
Transd_VD	0.08
CYD	-0.02565
YVD0	0.038445
LL_K_yd	-0.05
LL_K_yvd	-0.05

Parameter	Value
y_min_yd	-1
y_min_vd	-1
LS_K_yd	0.05
LS_K_yvd	0.05
y_max_yd	1
y_max_vd	1

Lazo de los actuadores

Actuador:

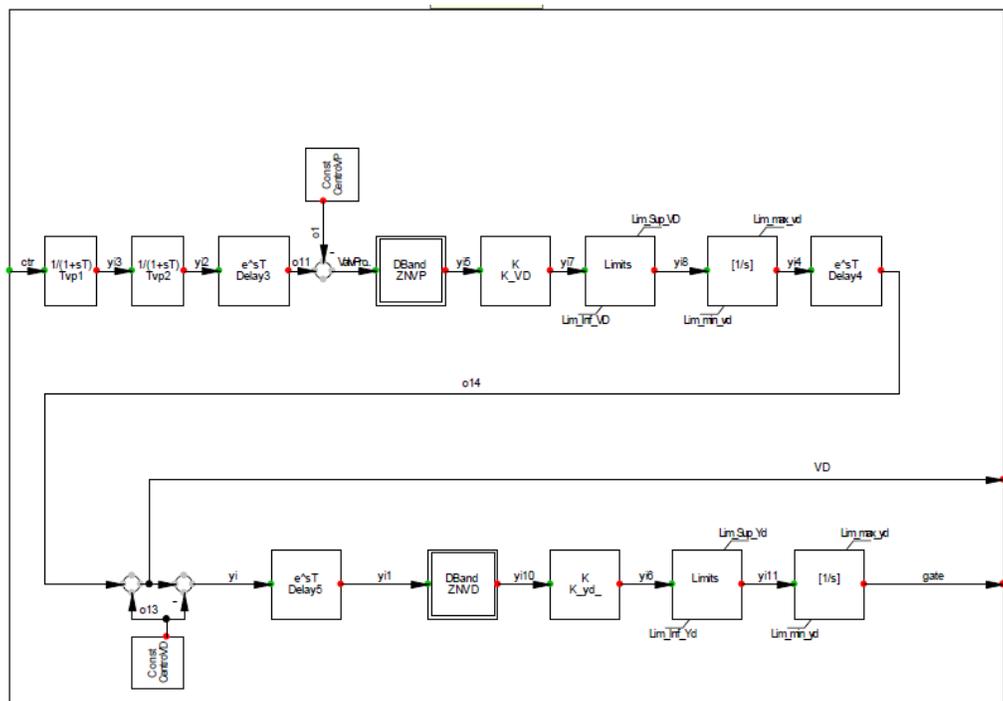
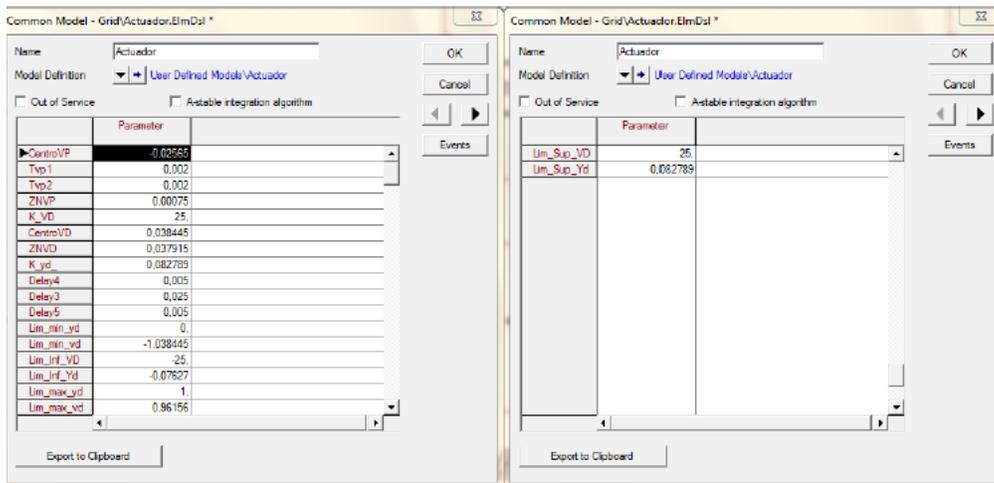


Figura 10. Diagrama de bloques de los actuadores

Tabla 47. Datos de los Actuadores U1

Parameter	Value
CentroVP	-0.02565
Typ1	0.002
Typ2	0.002
ZNVP	0.00075
K_VD	25
CentroVD	0.038445
ZNVD	0.037815
K_Vd	0.082789
Delay4	0.005
Delay3	0.025
Delay5	0.005
Lim_min_yd	0
Lim_min_vd	-1.038445
Lim_inf_VD	-25
Lim_inf_Vd	-0.07627
Lim_Sup_VD	25
Lim_Sup_Vd	0.082789

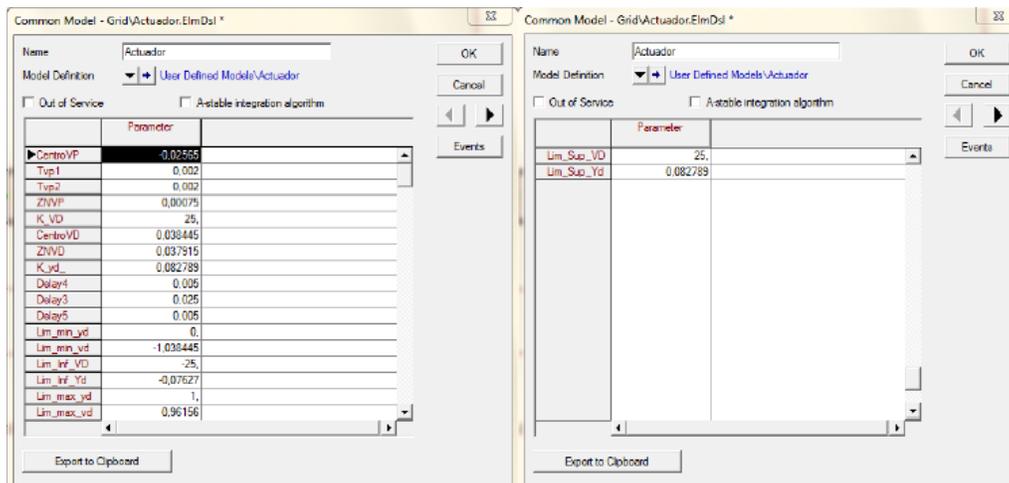
Tabla 48. Datos de los Actuadores U2



Parameter	Value
ControlVP	0.02565
Tvp1	0.002
Tvp2	0.002
ZNVp	0.00075
K_VD	25
CentroVD	0.038445
ZNV0	0.037915
K_yd	0.082789
Delay4	0.005
Delay3	0.025
Delay5	0.005
Lim_min_yd	0
Lim_min_vd	-1.038445
Lim_inf_VD	-25
Lim_inf_Yd	-0.07627
Lim_max_yd	1
Lim_max_vd	0.96156

Parameter	Value
Lim_Sup_VD	25
Lim_Sup_Yd	0.082789

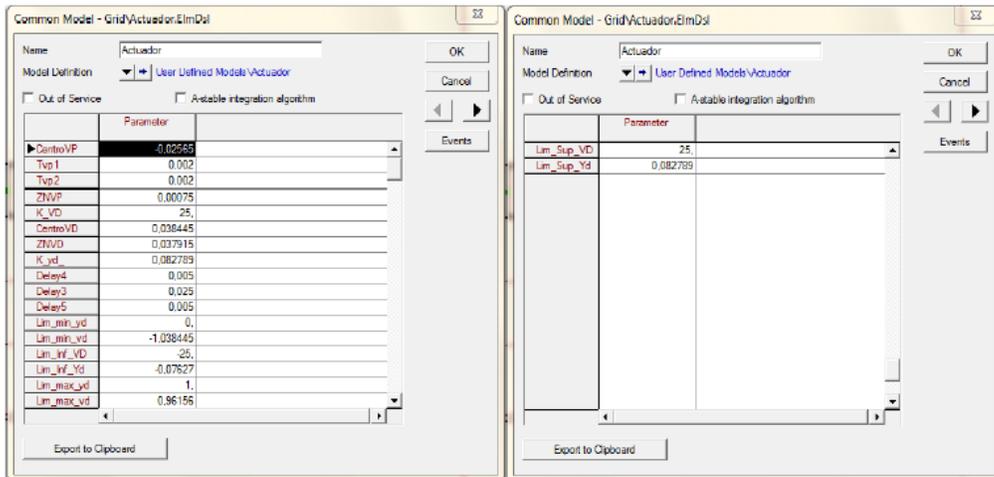
Tabla 49. Datos de los Actuadores U3



Parameter	Value
ControlVP	0.02565
Tvp1	0.002
Tvp2	0.002
ZNVp	0.00075
K_VD	25
CentroVD	0.038445
ZNV0	0.037915
K_yd	0.082789
Delay4	0.005
Delay3	0.025
Delay5	0.005
Lim_min_yd	0
Lim_min_vd	-1.038445
Lim_inf_VD	-25
Lim_inf_Yd	-0.07627
Lim_max_yd	1
Lim_max_vd	0.96156

Parameter	Value
Lim_Sup_VD	25
Lim_Sup_Yd	0.082789

Tabla 50. Datos de los Actuadores U4



Lazo de la conducción y tubería

Conducto_Turbina:

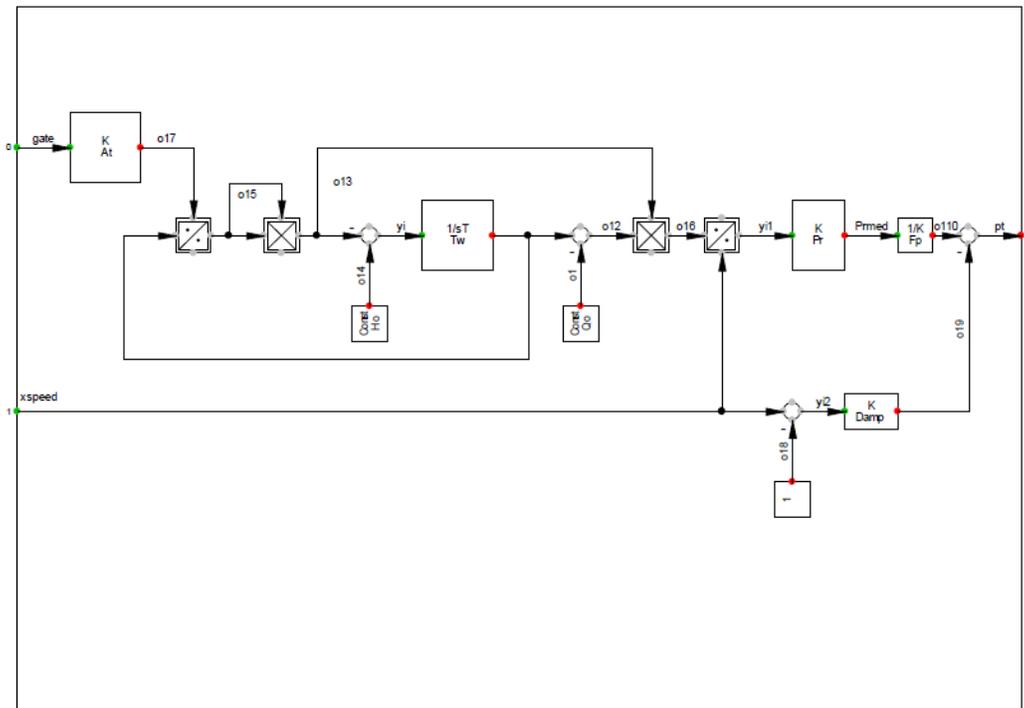


Figura 11. Diagrama de bloques de la conducción y Tubería

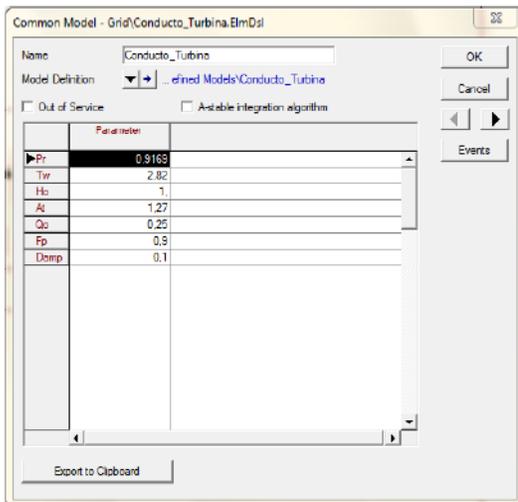
Tabla 51. Datos de la Conducción y Tubería U1

Parameter	Value
Pr	0.9169
Tw	2.82
Ho	1.
At	1.27
Qo	0.25
Fp	0.9
Damp	0.1

Tabla 52. Datos de la Conducción y Tubería U2

Parameter	Value
Pr	0.9163
Tw	2.82
Ho	1.
At	1.27
Qo	0.25
Fp	0.9
Damp	0.1

Tabla 54. Datos de la Conducción y Tubería U3



Common Model - Grid\Conduccion_Turbina.ElmDsl

Name: Conduccion_Turbina

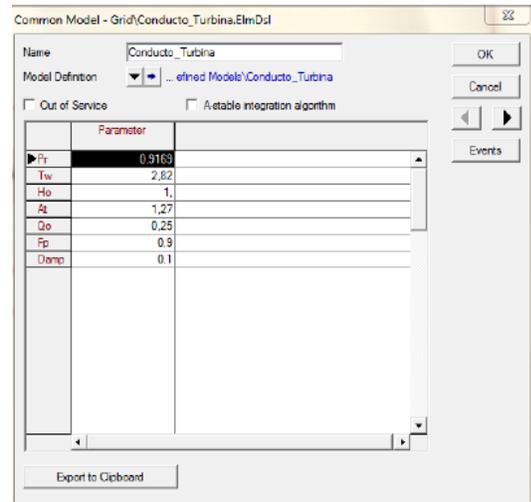
Model Definition: ...elmed Models\Conduccion_Turbina

Out of Service A stable integration algorithm

Parameter	Value
Pr	0.9163
Tw	2.82
Ho	1.
At	1.27
Qc	0.25
Fp	0.9
Damp	0.1

Export to Clipboard

Tabla 53. Datos de la Conducción y Tubería U4



Common Model - Grid\Conduccion_Turbina.ElmDsl

Name: Conduccion_Turbina

Model Definition: ...elmed Models\Conduccion_Turbina

Out of Service A stable integration algorithm

Parameter	Value
Pr	0.9163
Tw	2.82
Ho	1.
At	1.27
Qc	0.25
Fp	0.9
Damp	0.1

Export to Clipboard