NOTA1: Acest desen nu constituie o obligatie de aplicare de către contractor.
El reprezintă doar un exemplu de circuit de cale utilizat la CFR si nu trebuie aplicat ca atare.

NOTE: It is not compulsory for the contractor to apply this drawing.
It is only an example of track circuit in use at CFR and shall not be applied as such.

D					
C					
B					
A					
Indice Index	Data Date	Modificare Modification/Revision	Proiectant Designer	Aprobat Consultant Approved Consultant	Aprobat CFR Approved CFR

GUVERNUL ROMANIEI
ROMANIAN GOVERNMENT

PROIECT FINANȚAT DE UNIUNEA EUROPEANĂ
EUROPEAN UNION FINANCED PROJECT

CLIENT / CLIENT

C.N.C.F. "C.F.R." - S.A.

ITALFERR
GRUPPO FERROVIE DELLO STATO
Joint Venture Leader

Scott Wilson

OBERMEYER
PLANEN + BERATEN GmbH

TECNIC
Consulting Engineers

CONSULTANT / CONSULTANT

			Data Date	Semnătură Signature
Aprobat Approved	Șef proiect Project manager	R. Lluzo	12.12.2011	
Aprobat Approved	Coordonator Secțiune 1 Section 1 Coordinator	C. Gambell	12.12.2011	
Verificat Checked	Expert Cheie Key Expert	P. Amodio	12.12.2011	

SUBCONTRACTANT / SUBCONTRACTOR

AREX

Aprobat Approved	Responsabil Subcontractant Subcontractor Responsible	A. Stanciu - Dinulescu	12.12.2011	
Întocmit Elaborated	Proiectant Designer	Ing. Jugaru Adriana	12.12.2011	

Reabilitarea liniei de cale ferata Brasov - Simeria, parte componentă a coridorului IV Pan European, pentru circulația trenurilor cu viteza maximă de 160 km/h,
Tronsonul : Brasov - Sighisoara
Rehabilitation of the railway line Brasov - Simeria, component Part of the IV Pan-European Corridor, for the trains circulation with maximum speed of 160 km/h,
Section : Brasov - Sighisoara

Proiect/Project
2004/RO/16/P/PA/00[illegible]

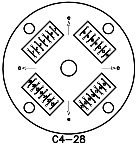
Faza / Phase:
D.E. / D.D.

Denumire desen / Drawing Title :

Statia / Station VANATORI
Fise pichet tip pentru circuite de cale
Model boxes for track circuit equipment

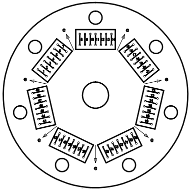
Codificare / Codification System	Scara / Scale Fără / No scale	LOT / LOT	Nr. / No 01 / 01

E A 8 1 | 0 1 | E | 1 7 | B X | S E | 0 1 | 7 | 2 | 0 2 0 | 0



C4−28

DM3,DM2,DR1,DR2,DA1,DA2,DS2,DS4



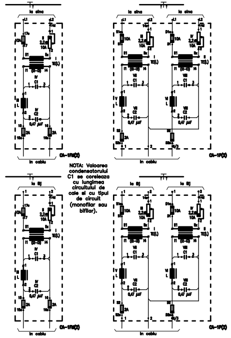
C7−49

DM1,DM4,DR3,DR4,DS1,DS3,DS5,DS7,DS6,DS8

CUTII DE DISTRIBUTIE

Tabel cu valorile condensatoarelor C1, C2 la capetele de emisie

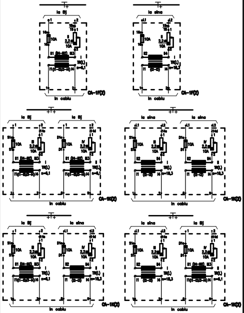
Circuitul de cale	Secventa	Tip Circuit	Lungimea circuitului de cale (m)	Valoarea capacitatii (µF)	
				C1	C2
XO−2AD	1	monofilar	200	1 µF	0,47 µF
XO−1AD(a)	3	monofilar	600	3 µF	0,47 µF
XO−1AD(b)	2	monofilar	600	3 µF	0,47 µF
013 C	3	bifilar	265	1 µF	0,47 µF
XA−1AD	1	bifilar	1260	3 µF	0,47 µF
023 C	2	bifilar	300	1 µF	0,47 µF
XAF−1AD	3	bifilar	1450	3 µF	0,47 µF
033 C	1	bifilar	241	1 µF	0,47 µF
1 Si	1	bifilar	354	1 µF	0,47 µF
3−11 Si	3	bifilar	584	2 µF	0,47 µF
7−9 Si	2	bifilar	398	1 µF	0,47 µF
015 C	2	bifilar	212	0,47 µF	0,47 µF
13 Si	1	bifilar	150	0,47 µF	0,47 µF
15 Si	3	bifilar	115	0,47 µF	0,47 µF
17 Si	2	bifilar	156	0,47 µF	0,47 µF
19 Si	3	bifilar	150	0,47 µF	0,47 µF
1 C	1	bifilar	742	2 µF	0,47 µF
II C	4	bifilar	831	2 µF	0,47 µF
III C	2	bifilar	831	2 µF	0,47 µF
4 C	1	bifilar	798	2 µF	0,47 µF
10 Si	4	bifilar	178	0,47 µF	0,47 µF
12 Si	3	bifilar	124	0,47 µF	0,47 µF
14 Si	4	bifilar	156	0,47 µF	0,47 µF
4−6 Si	2	bifilar	391	1 µF	0,47 µF
2−8 Si	3	bifilar	458	1 µF	0,47 µF
024 C	4	bifilar	290	1 µF	0,47 µF
034 C	2	bifilar	233	0,47 µF	0,47 µF


la sina
la sina
la sina
la Bj
la Bj
la Bj
in cablu
in cablu
in cablu
in cablu
CA−1FM(2)
CA−1F(2)
CA−1FM(2)
CA−1F(2)
TE(L)
10A
2A
2,2Ω
0,47 µF
C1
C2

NOTA: Valoarea condensatorului C1 se coreleaza cu lungimea circuitului de cale si cu tipul de circuit (monofilar sau bifilar).

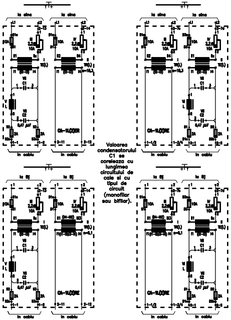
Scheme de conectare a aparatajului in cutii de aparataj pentru circuitul de cale

---


la Bj
la sina
la Bj
la sina
in cablu
CA−1F(2)
CA−1K(2)
TR(L)
n=6,1
n=18,3
10A
2,2Ω

NOTA: La circuitele la care se controleaza ramificatiile, valoarea rezistentei din aparatajul de receptie este de 6 ohmi.

Scheme de conectare a aparatajului in cutii de aparataj pentru circuitul de cale

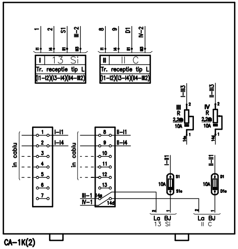

la sina
la BJ
in cablu
CA-1L(2)ER
CA-1L(2)RE
0,47 µF
2A
10A
2,2Ω
TR(L)
n=18,3
n=6,1
(I1-I2)(I3-I4)(II4-III2)
1-1/2
1-3/4
2-11
2-12

Valoarea condensatorului C1 se coreleaza cu lungimea circuitului de cale si cu tipul de circuit (monofilar sau bifilar).

NOTA: La circuitele la care se controleaza ramificatiile, valoarea rezistentei din aparatajul de receptie este de 6 ohmi.

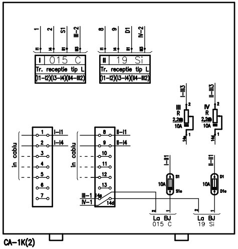
Scheme de conectare a aparatajului in cutii de aparataj pentru circuitul de cale

---


1
2
S1
III-2
8
9
D1
IV-2
I 13 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II II C
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
I-III3
II-III3
III R 2,2Ω 10A
IV R 2,2Ω 10A
in cablu
I-I1
I-I4
II-I1
II-I4
III-1
IV-1
14s
14d
I-II1
II-II1
10A
S1
S1e
D1
D1e
La BJ 13 Si
La BJ II C
CA-1K(2)
BIF

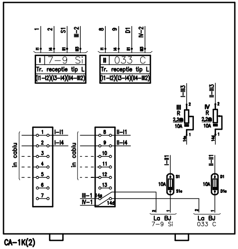
13 Si; II C

CUTIE APARATAJ PENTRU DOUA RECEPTII


1
2
S1
III-2
8
9
D1
IV-2
I 015 C
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II 19 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
I-III3
II-III3
III R 2,2Ω 10A
IV R 2,2Ω 10A
in cablu
I-I1
I-I4
II-I1
II-I4
III-1
IV-1
14s
14d
I-II1
II-II1
10A
S1
S1e
D1
D1e
La BJ 015 C
La BJ 19 Si
CA-1K(2)
BIF

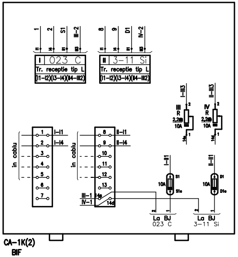
015 C; 19 Si

CUTIE APARATAJ PENTRU DOUA RECEPTII


1
2
S1
III-2
8
9
D1
IV-2
I 7-9 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II 033 C
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
I-III3
II-III3
III R 2,2Ω 10A
IV R 2,2Ω 10A
in cablu
I-I1
I-I4
II-I1
II-I4
III-1
IV-1
14s
14d
I-II1
II-II1
10A
S1
S1e
D1
D1e
La BJ 7-9 Si
La BJ 033 C
CA-1K(2)
BIF

7-9 Si; 033 C

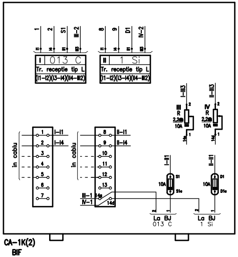
CUTIE APARATAJ PENTRU DOUA RECEPTII


1
2
S1
III−2
8
9
D1
IV−2
I 023 C
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
II 3−11 Si
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
I−III3
II−III3
III R 2,2 10A
IV R 2,2 10A
in cablu
I−I1
I−I4
II−I1
II−I4
III−1
IV−1
14s
14d
I−II1
II−II1
10A
S1
S1e
D1
D1e
La BJ
023 C
La BJ
3−11 Si
CA−1K(2)
BIF

023 C; 3−11 Si

CUTIE APARATAJ PENTRU DOUA RECEPTII

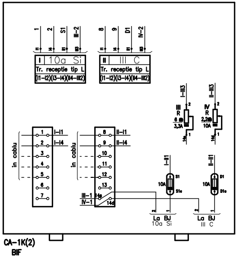
Statia: VANATORI EA51 01 E 17 BK SE 017 2 080 0 10/31


1
2
S1
III−2
8
9
D1
IV−2
I 013 C
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
II 1 Si
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
I−III3
II−III3
III R 2,2 10A
IV R 2,2 10A
in cablu
I−I1
I−I4
II−I1
II−I4
III−1
IV−1
14s
14d
I−II1
II−II1
10A
S1
S1e
D1
D1e
La BJ
013 C
La BJ
1 Si
CA−1K(2)
BIF

013 C; 1 Si

CUTIE APARATAJ PENTRU DOUA RECEPTII

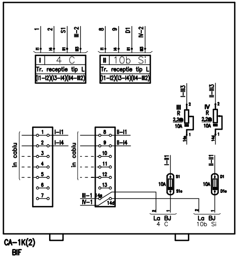
Statia: VANATORI EA51 01 E 17 BK SE 017 2 080 0 11/31


1
2
S1
III−2
8
9
D1
IV−2
I 10a Si
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
II III C
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
I−III3
II−III3
III R 6 3,3A
IV R 2,2 10A
in cablu
I−I1
I−I4
II−I1
II−I4
III−1
IV−1
14s
14d
I−II1
II−II1
10A
S1
S1e
D1
D1e
La BJ
10a Si
La BJ
III C
CA−1K(2)
BIF

10a Si; III C

CUTIE APARATAJ PENTRU DOUA RECEPTII

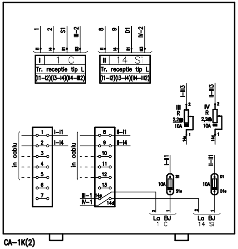
Statia: VANATORI EA51 01 E 17 BK SE 017 2 080 0 12/31


1
2
S1
III−2
8
9
D1
IV−2
I 4 C
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
II 10b Si
Tr. receptie tip L
(I1−I2)(I3−I4)(II4−III2)
I−III3
II−III3
III R 2,2 10A
IV R 2,2 10A
in cablu
I−I1
I−I4
II−I1
II−I4
III−1
IV−1
14s
14d
I−II1
II−II1
10A
S1
S1e
D1
D1e
La BJ
4 C
La BJ
10b Si
CA−1K(2)
BIF

4 C; 10b Si

CUTIE APARATAJ PENTRU DOUA RECEPTII

Statia: VANATORI EA51 01 E 17 BK SE 017 2 080 0 13/31


1
2
S1
III-2
8
9
D1
IV-2
I | 1 C
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II | 14 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
I-III3
II-III3
III
IV
R
2,2Ω
10A
in cablu
I-I1
I-I4
II-I1
II-I4
III-1
IV-1
14s
14d
I-II1
II-II1
S1
S1e
D1
D1e
La BJ
1 C
La BJ
14 Si

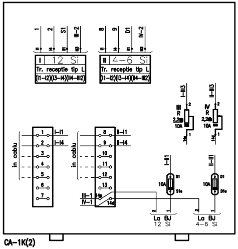
CA-1K(2)
BIF

1 C; 14 Si

CUTIE APARATAJ PENTRU DOUA RECEPTII

Statia: VANATORI

EA51 01 E 17 BK SE 017 2 080 0 14/81


1
2
S1
III-2
8
9
D1
IV-2
I | 12 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II | 4-6 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
I-III3
II-III3
III
IV
R
2,2Ω
10A
in cablu
I-I1
I-I4
II-I1
II-I4
III-1
IV-1
14s
14d
I-II1
II-II1
S1
S1e
D1
D1e
La BJ
12 Si
La BJ
4-6 Si

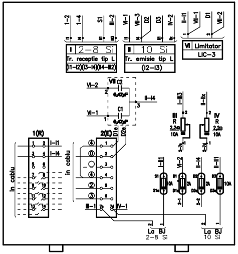
CA-1K(2)
BIF

12 Si; 4-6 Si

CUTIE APARATAJ PENTRU DOUA RECEPTII

Statia: VANATORI

EA51 01 E 17 BK SE 017 2 080 0 15/81


1-2
1-4
S1
III-2
VI-1
VII-3
D2
D3
IV-2
II-I1
VII-1
D1
VII-2
I | 2-8 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II | 10 Si
Tr. emisie tip L
(I2-I3)
VI | Limitator
LIC-3
VII
C2
0,47μF
C1
0,47μF
VI-2
VI-1
II-I4
I-III3
II-IIx
III
IV
R
2,2Ω
10A
1(R)
2(E)
D1e
D2e
in cablu
I-I1
I-I4
III-1
IV-1
7s
7d
I-II1
VI-2
II-I4
II-II1
S1
S1e
D1
D1e
D2
D2e
D3
D3e
10A
2A
2-1
2-2
La BJ
2-8 Si
La BJ
10 Si

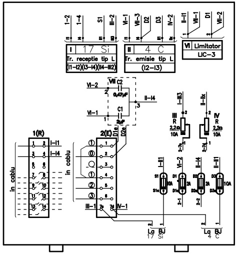
CA-1L(2)RE
BIF

2-8 Si; 10 Si

CUTIE APARATAJ PENTRU RECEPTIE-EMISIE

Statia: VANATORI

EA51 01 E 17 BK SE 017 2 080 0 16/81


1-2
1-4
S1
III-2
VI-1
VII-3
D2
D3
IV-2
II-I1
VII-1
D1
VII-2
I | 17 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
II | 4 C
Tr. emisie tip L
(I2-I3)
VI | Limitator
LIC-3
VII
C2
0,47μF
C1
2μF
VI-2
VI-1
II-I4
I-III3
II-IIx
III
IV
R
2,2Ω
10A
1(R)
2(E)
D1e
D2e
in cablu
I-I1
I-I4
III-1
IV-1
7s
7d
I-II1
VI-2
II-I4
II-II1
S1
S1e
D1
D1e
D2
D2e
D3
D3e
10A
2A
2-1
2-2
La BJ
17 Si
La BJ
4 C

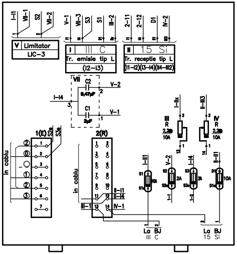
CA-1L(2)RE
BIF

17 Si; 4 C

CUTIE APARATAJ PENTRU RECEPTIE-EMISIE

Statia: VANATORI

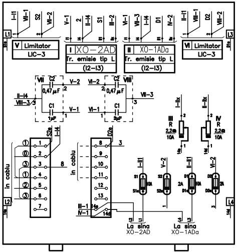
EA51 01 E 17 BK SE 017 2 080 0 17/81


V Limitator
LIC-3
I III C
Tr. emisie tip L
(I2-I3)
II 15 Si
Tr. receptie tip L
(I1-I2)(I3-I4)(II4-III2)
VII
C2
0,47µF
C1
2µF
I-I4
V-2
V-1
III
IV
R
2,2Ω
10A
1(E)
2(R)
in cablu
La BJ
III C
La BJ
15 Si

CA-1L(2)ER
BIF

III C; 15 Si

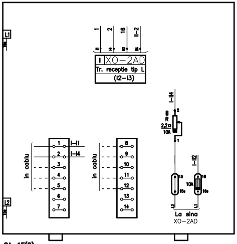
CUTIE APARATAJ PENTRU EMISIE-RECEPTIE


L1
L2
L3
L4
V Limitator
LIC-3
I XO-2AD
Tr. emisie tip L
(I2-I3)
II XO-1ADa
Tr. emisie tip L
(I2-I3)
VI Limitator
LIC-3
VII
VIII
C2
0,47µF
C1
1µF
2µF
II-I4
VIII-3
V-2
V-1
VI-2
VI-1
VII-3
III
IV
R
2,2Ω
10A
in cablu
La sina
XO-2AD
La sina
XO-1ADa

CA-1P(2)
MONO

XO-2AD; XO-1ADa

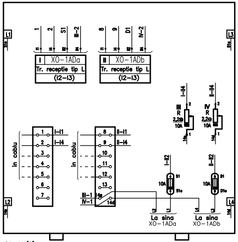
CUTIE APARATAJ PENTRU DOUA EMISII


L1
L2
I XO-2AD
Tr. receptie tip L
(I2-I3)
I-I4
II
R
2,2Ω
10A
I-I1
I-I4
I-II2
in cablu
in cablu
La sina
XO-2AD

CA-1F(2)
MONO

XO-2AD

CUTIE APARATAJ PENTRU O RECEPTIE

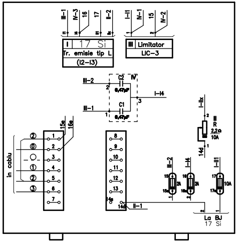

1
2
S1
III–2
8
9
D1
IV–2
L1
L3
S1e
D1e
I XO–1ADa
Tr. receptie tip L
(I2–I3)
II XO–1ADb
Tr. receptie tip L
(I2–I3)
I–II4
II–II4
III R 2,2Ω 10A
IV R 2,2Ω 10A
14e
14d
in cablu
I–I1
I–I4
II–I1
II–I4
I–II2
II–II2
S1 10A S1e
D1 10A D1e
III–1
IV–1
14e
14d
L2
L4
La sina XO–1ADa
La sina XO–1ADb

CA–1K(2)
MONO

XO–1ADa; XO–1ADb

CUTIE APARATAJ PENTRU DOUA RECEPTII

Statia: VANATORI EAS1 01 E 17 BK SE 017 2 080 0 21/31

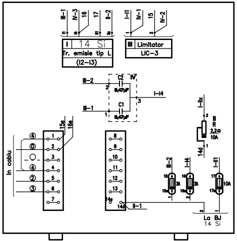

III–1
IV–3
16
17
II–2
I–I1
IV–1
15
IV–2
I 17 Si
Tr. emisie tip L
(I2–I3)
III Limitator
LIC–3
III–2
III–1
C2 0,47μF
C1 0,47μF
IV
I–I4
I–IIx
II R 2,2Ω 10A
14d
15e
16e
in cablu
III–2
I–I4
I–II1
15 2A 15e
16 2A 16e
17 10A 17e
14e
14d
II–1
La BJ 17 Si

CA–1FM(2)
BIF

17 Si

CUTIE APARATAJ PENTRU O EMISIE

Statia: VANATORI EAS1 01 E 17 BK SE 017 2 080 0 22/31

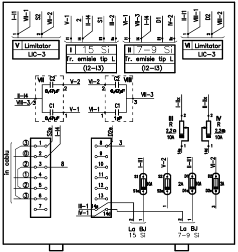

III–1
IV–3
16
17
II–2
I–I1
IV–1
15
IV–2
I 14 Si
Tr. emisie tip L
(I2–I3)
III Limitator
LIC–3
III–2
III–1
C2 0,47μF
C1 0,47μF
IV
I–I4
I–IIx
II R 2,2Ω 10A
14d
15e
16e
in cablu
III–2
I–I4
I–II1
2A
2A
10A
14e
14d
II–1
La BJ 14 Si

CA–1FM(2)
BIF

14 Si

CUTIE APARATAJ PENTRU O EMISIE

Statia: VANATORI EAS1 01 E 17 BK SE 017 2 080 0 23/31

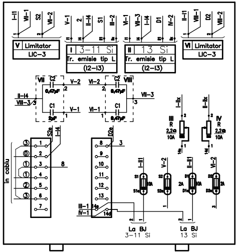

I–I1
VII–1
S2
VII–2
V–1
2
II–I4
S1
III–2
VI–1
VII–3
I–I4
D1
IV–2
II–I1
VIII–1
D2
VIII–2
V Limitator
LIC–3
I 15 Si
Tr. emisie tip L
(I2–I3)
II 7–9 Si
Tr. emisie tip L
(I2–I3)
VI Limitator
LIC–3
VII
C2 0,47μF
C1 0,47μF
II–I4
VIII–3
V–2
V–1
VI–2
VI–1
VIII
C2 0,47μF
C1 1μF
VII–3
I–IIx
II–IIx
III R 2,2Ω 10A
IV R 2,2Ω 10A
S2e
I–I4
D2e
3
8
in cablu
I–II1
V–2
II–II1
VI–2
S1 10A S1e
S2 2A S2e
D1 10A D1e
D2 2A D2e
III–1
IV–1
14e
14d
La BJ 15 Si
La BJ 7–9 Si

CA–1P(2)
BIF

15 Si; 7–9 Si

CUTIE APARATAJ PENTRU DOUA EMISII

Statia: VANATORI EAS1 01 E 17 BK SE 017 2 080 0 24/31

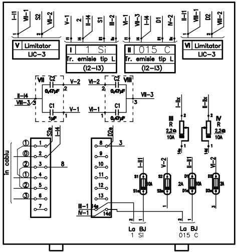

V Limitator
LIC-3
I 3-11 Si
Tr. emisie tip L
(I2-I3)
II 13 Si
Tr. emisie tip L
(I2-I3)
VI Limitator
LIC-3
VII
VIII
C1
C2
0,47µF
III
IV
R
2,2Ω
10A
in cablu
La BJ
3-11 Si
La BJ
13 Si

CA-1P(2)
BIF

3-11 Si; 13 Si

CUTIE APARATAJ PENTRU DOUA EMISII

Statia: VANATORI EAS1 01 E 17 BX SE 017 2 080 0 25/31

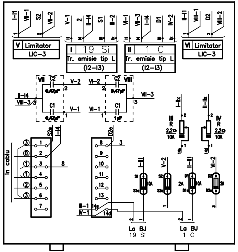

V Limitator
LIC-3
I 1 Si
Tr. emisie tip L
(I2-I3)
II 015 C
Tr. emisie tip L
(I2-I3)
VI Limitator
LIC-3
in cablu
La BJ
1 Si
La BJ
015 C

CA-1P(2)
BIF

1 Si; 015 C

CUTIE APARATAJ PENTRU DOUA EMISII

Statia: VANATORI EAS1 01 E 17 BX SE 017 2 080 0 26/31

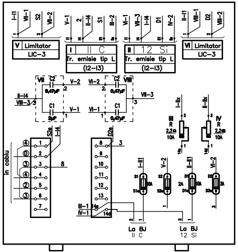

V Limitator
LIC-3
I 19 Si
Tr. emisie tip L
(I2-I3)
II 1 C
Tr. emisie tip L
(I2-I3)
VI Limitator
LIC-3
in cablu
La BJ
19 Si
La BJ
1 C

CA-1P(2)
BIF

19 Si; 1 C

CUTIE APARATAJ PENTRU DOUA EMISII

Statia: VANATORI EAS1 01 E 17 BX SE 017 2 080 0 27/31

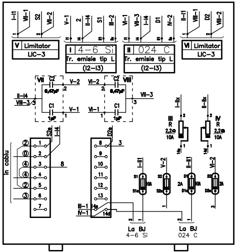

V Limitator
LIC-3
I II C
Tr. emisie tip L
(I2-I3)
II 12 Si
Tr. emisie tip L
(I2-I3)
VI Limitator
LIC-3
in cablu
La BJ
II C
La BJ
12 Si

CA-1P(2)
BIF

II C; 12 Si

CUTIE APARATAJ PENTRU DOUA EMISII

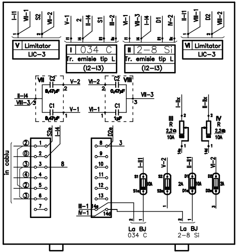
Statia: VANATORI EAS1 01 E 17 BX SE 017 2 080 0 28/31


I–I1
VII–1
S2
VII–2
V–1
2
II–I4
S1
III–2
VI–1
VII–3
I–I4
D1
IV–2
II–I1
VIII–1
D2
VIII–2
V Limitator
LIC–3
I 4–6 Si
Tr. emisie tip L
(I2–I3)
II 024 C
Tr. emisie tip L
(I2–I3)
VI Limitator
LIC–3
VII
C2
0,47µF
V–2
VI–2
VIII
II–I4
VIII–3
C1
1µF
V–1
VI–1
VII–3
I–IIx
II–IIx
III
R
2,2Ω
10A
IV
R
2,2Ω
10A
S2e
I–I4
D2e
in cablu
8
3
I–III
V–2
II–III
VI–2
S1
S1e
S2
S2e
D1
D1e
D2
D2e
10A
2A
III–1
IV–1
14e
14d
La BJ
4–6 Si
La BJ
024 C

CA–1P(2)
BIF

4–6 Si; 024 C

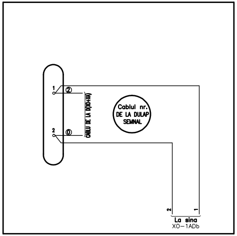
CUTIE APARATAJ PENTRU DOUA EMISII


I–I1
VII–1
S2
VII–2
V–1
2
II–I4
S1
III–2
VI–1
VII–3
I–I4
D1
IV–2
II–I1
VIII–1
D2
VIII–2
V Limitator
LIC–3
I 034 C
Tr. emisie tip L
(I2–I3)
II 2–8 Si
Tr. emisie tip L
(I2–I3)
VI Limitator
LIC–3
VII
C2
0,47µF
V–2
VI–2
VIII
II–I4
VIII–3
C1
0,47µF
1µF
V–1
VI–1
VII–3
I–IIx
II–IIx
III
R
2,2Ω
10A
IV
R
2,2Ω
10A
S2e
I–I4
D2e
in cablu
8
3
I–III
V–2
II–III
VI–2
S1
S1e
S2
S2e
D1
D1e
D2
D2e
10A
2A
III–1
IV–1
14e
14d
La BJ
034 C
La BJ
2–8 Si

CA–1P(2)
BIF

034 C; 2–8 Si

CUTIE APARATAJ PENTRU DOUA EMISII


1
2
②
⓪
CABLU DE LA D(XO+XA)
Cablul nr.
DE LA DULAP
SEMNAL
La sina
XO–1ADb

PC–1

MONO

XO–1ADb

CUTIE APARATAJ PENTRU O EMISIE DIN DULAP SEMNAL
CUTIE APARATAJ PENTRU O RECEPTIE DIN DULAP SEMNAL