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**1559**



**(PLC)**

**(6338)**

:

**2016**



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μ .  
) .  
μ ,  
μ μ  
μ μ

PLC ( μ μ μ  
μ  
PLC  
μ μ  
SCADA (Supervisory Control and Data Acquisition). μ μ  
μ μ  
μ μ



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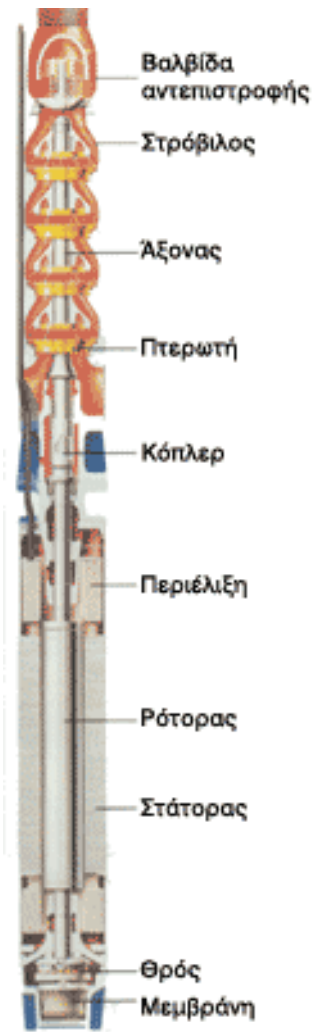


1.1

, μ μ  
μ μ μ, ( μ 1) μ .  
μ . 50 m ( μ )  
μ ( μ 2) μ 8000 μ μ  
μ μ μ μ 2 μ μ μ  
μ μ μ μ μ μ 1 μ μ μ  
μ μ μ μ μ μ μ μ μ  
μ μ μ μ μ μ μ μ  
**HD 384** μ μ μ μ μ  
(SCADA) μ μ μ  
( μ ) μ μ

1.2

I ( ):  
1 μ μ μ μ  
μ μ μ μ μ μ  
μ μ μ μ μ μ  
μ μ μ μ μ μ μ  
μ μ μ μ μ μ μ  
μ μ μ μ μ μ μ μ  
μ μ μ μ μ μ μ μ  
μ μ μ μ μ μ μ μ μ μ  
μ μ μ μ μ μ μ μ μ μ



1 [1]

μ , ( ) :  
 ( 6"(inch), 30 hp). 400V ( ), μ μ 22 kW

\_\_\_\_\_:[3]

μ ( "F", μ 22 kW μ , Franklin Electric, μ  
 μ ( μ 5 x I<sub>N</sub> " ") 380-415V 50Hz 460V 60Hz,  
 μ μ μ .

2 ( ):

– 2, μ , μ μ μ μ  
 μ μ , μ μ μ  
 μ μ , μ μ









5 [11]

:

μ μ **LINER CONTROLS** μ (PLC)  
 μ μ , μ μ

2 μ , (PLC).

« » μ , μ « » μ 2 μ

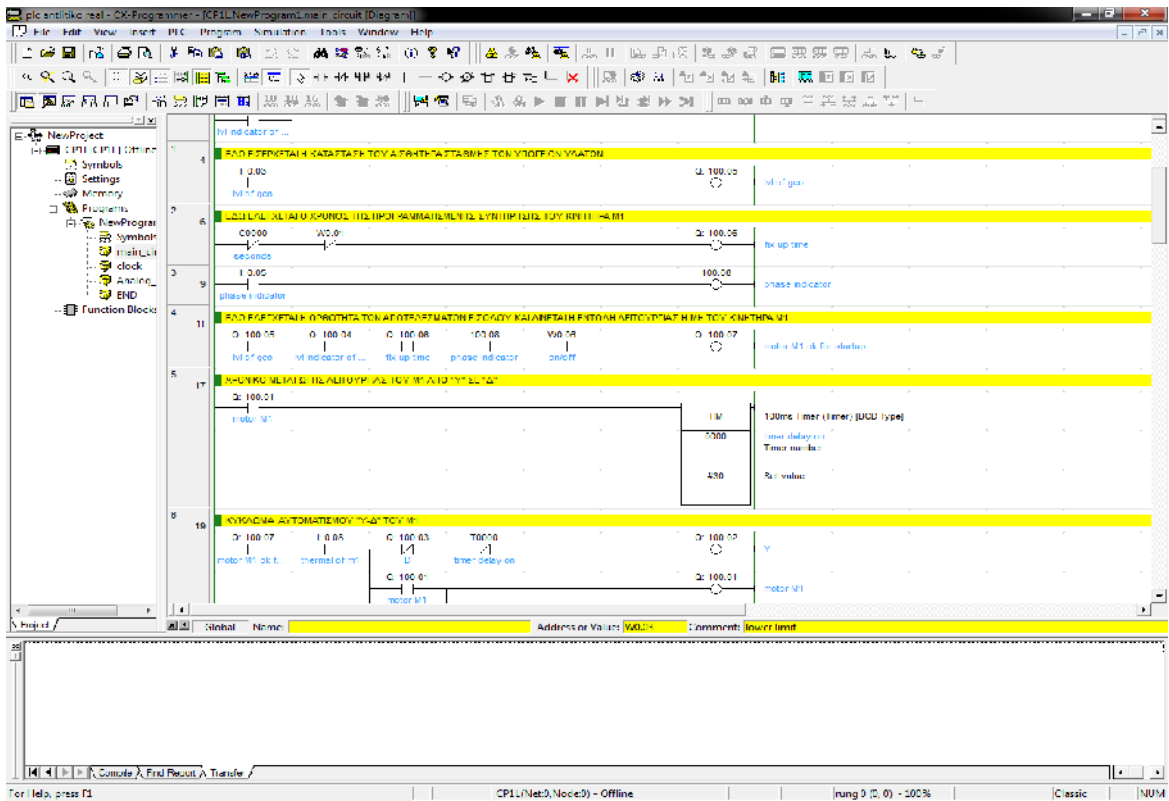


6

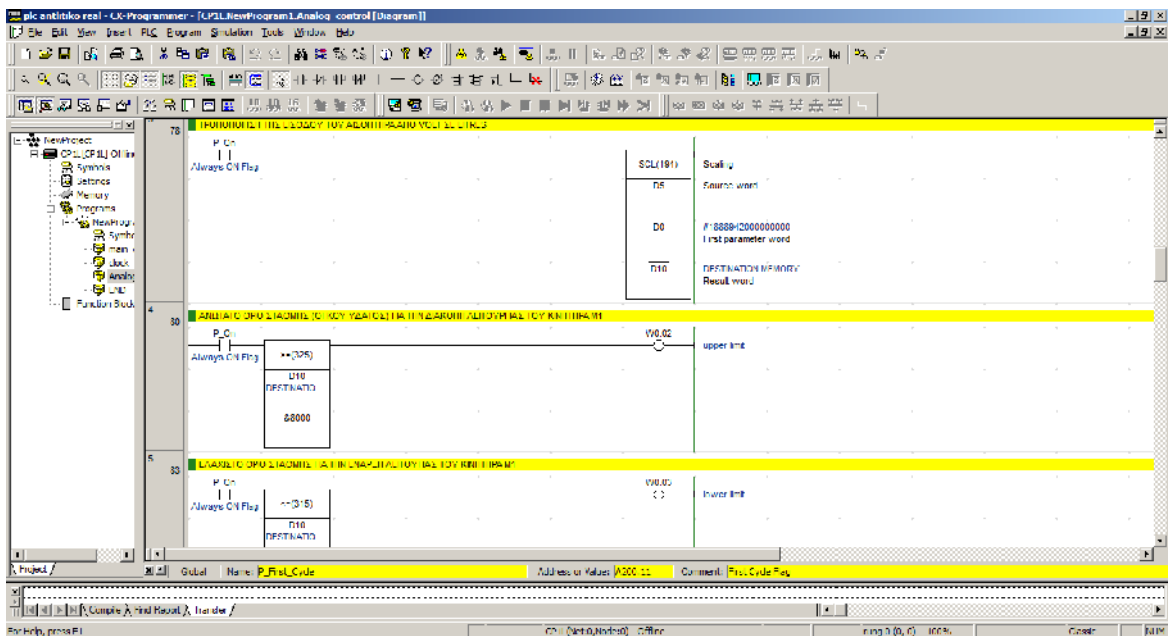








9



10

, μ μ cx-supervisor μ μ μ μ μ .

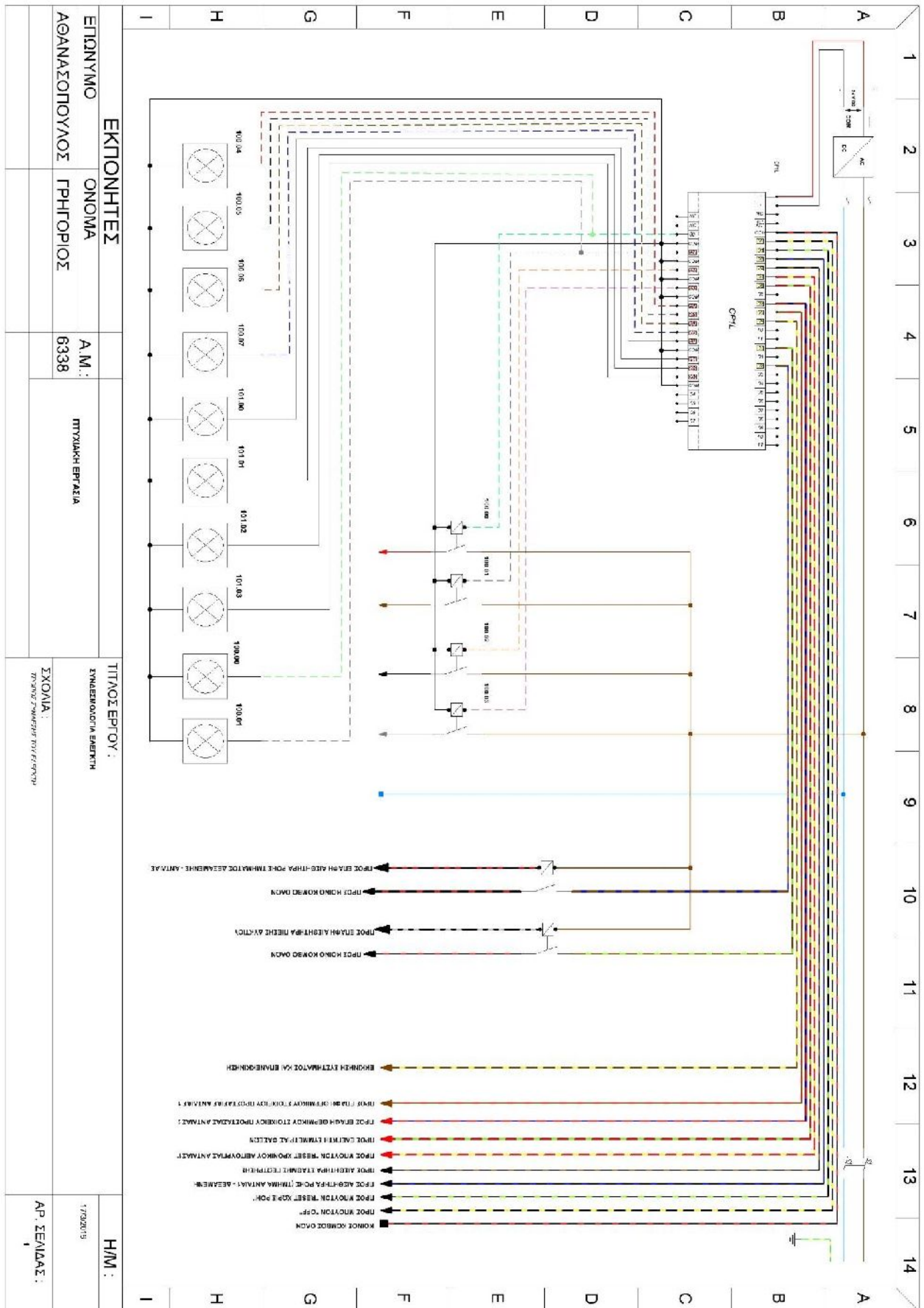


μ , μ μ μ - ( μ , μ ) . μ ,  
 . μ μ μ μ , μ , μ μ μ  
 μ μ μ μ μ , « »  
 μ μ , μ  
 μ , cx-programmer,  
 :  
 1. μ μ μ ( μ  
 μ μ ) .  
 2. μ μ « μ » , μ ,  
 μ :  
 • «0.00»: μ ( μ ) .  
 • «0.01»: ( μ μ ) .  
 • «0.02»: .  
 • «0.03»: μ .  
 • «0.04»: μ μ μ μ  
 1.  
 • «0.05»: μ μ .  
 • «0.07»: μ 2.  
 • «0.08»: μ 1.  
 • «0.09»: μ μ .  
 • «1.00»: - .  
 • «1.02»: 2.  
 :  
 • «100.00»: 2.  
 • «100.01»: 1.  
 • «100.02»: 1 μ  
 .  
 • «100.03»: 1 μ  
 .  
 • «100.04»: μ μ μ μ μ μ .  
 • «100.05»: μ μ .  
 • «100.06»: 1.  
 • «100.07»: μ  
 1.  
 • «101.00»: - 1.  
 • «101.01»: .  
 • «101.02»: μ μ .  
 1 .  
 • «101.03»: 2 .  
**Flags** ( μ - ):  
 • «W0.00»: μ μ 1 -  
 μ .

- «W0.01»:  $\mu \mu$   $\mu \mu$   
1.
- «W0.02»:  $\mu \mu$   $1$   $\mu$   
 $\mu .$
- «W0.03»:  $1$   $\mu$   
 $\mu .$
- «W0.04»:  $1$   
 $\mu - 1 - \mu .$
- «W0.06»:  $\mu .$
- «W0.07»:  $\mu \mu$
- «W0.08»:  $101.01$   
 $\mu 1 - \mu .$

**Destinations:**

- «D00»:  $\mu \mu$  « »  
 $\mu \mu$
  - «D05»:  $\mu \mu$   $\mu \mu$   $\mu$   
 $\mu \mu \mu \mu \mu$
  - «D10»:  $\mu \mu$   $\mu \mu$   $\mu$   $\mu$   $\mu$   $\mu$   
 $\mu \mu \mu \mu$
  - «D13»:  $\mu \mu$  (  $\mu \mu$  )  
 $\mu \mu$   $\mu$  *cx-supervisor*  $1$   $\mu$   $\mu$   
 $\mu$   $\mu$  *Binary BCD.*
  - «D14»:  $\mu \mu$   $\mu \mu$   $\mu \mu$   
 $\mu$  *BCD*  $\mu$   $\mu$
  - «D15»:  $\mu \mu$   $\mu \mu$   
1.
  - «D16»:  $\mu \mu$   $1 \mu$   $\mu$   $\mu$   $\mu$   $\mu$   $\mu$  *BCD*  
*Binary*  $\mu$   $\mu$  *cx-supervisor*
3.  $\mu$  ,  $\mu \mu$  (  $\mu$  )  
 $\mu$  *cx-programmer*  $\mu \mu$   $\mu \mu$
4.  $\mu \mu$   $\mu \mu$   $\mu$   $\mu$   $\mu$   $\mu$   $\mu$   $\mu$   $\mu$   
 $\mu$  ,  $\mu$  ,  $\mu$  ,  $\mu$  ,  $\mu$  .

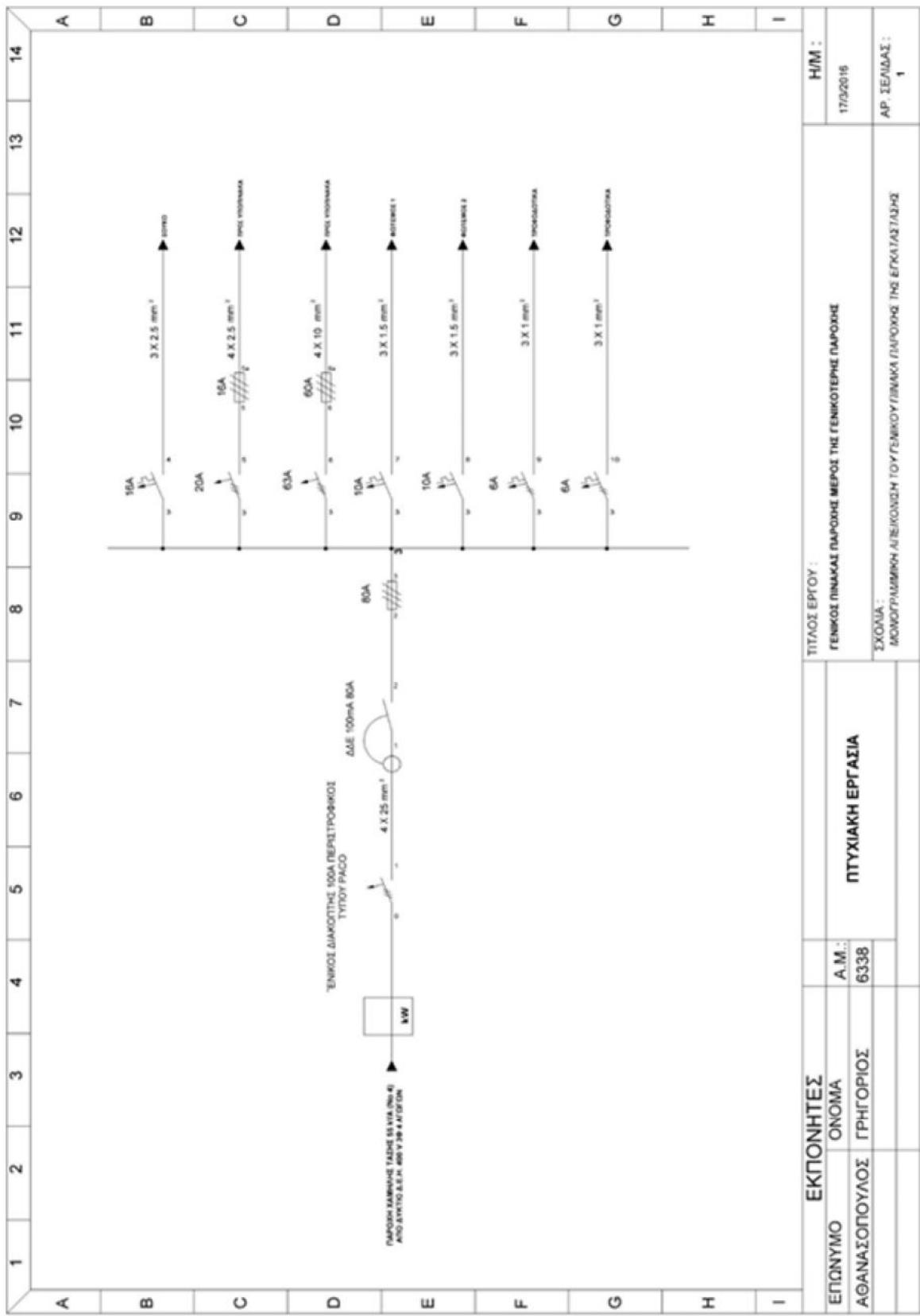


ΕΚΤΟΝΗΤΕΣ		ΤΙΤΛΟΣ ΕΡΓΟΥ :		ΗΜΜ :	
ΕΠΩΝΥΜΟ	ΟΝΟΜΑ	ΕΝΔΕΚΟΜΕΝΗ ΕΡΕΥΝΗ	17/02/019		
ΑΓΑΝΑΣΤΟΠΟΥΛΟΣ	ΓΡΗΓΟΡΙΟΣ	Α.Μ. : 6338	ΣΧΟΛΙΑ :	ΑΡ. ΣΕΛΙΔΑΣ :	
			ΤΙΤΛΟΣ ΕΡΓΟΥ ΤΟΥ ΕΡΓΟΥ	1	
			ΜΥΤΣΑΚΗ ΕΡΓΑΣΙΑ		

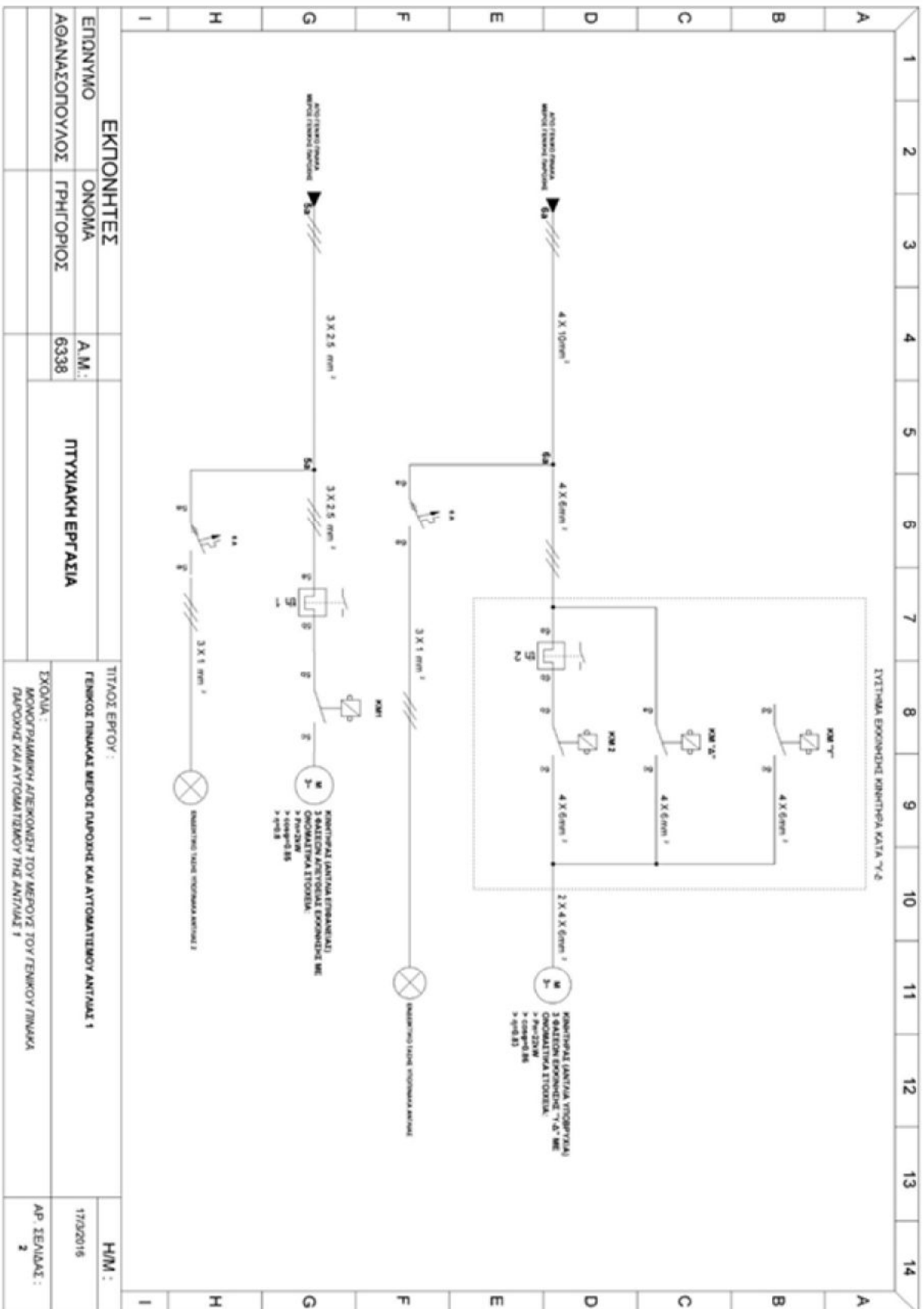
5.  $\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu$ , *cx-supervisor*,  
 $\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu$ .  
 $\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu$ ,  $\mu$ .



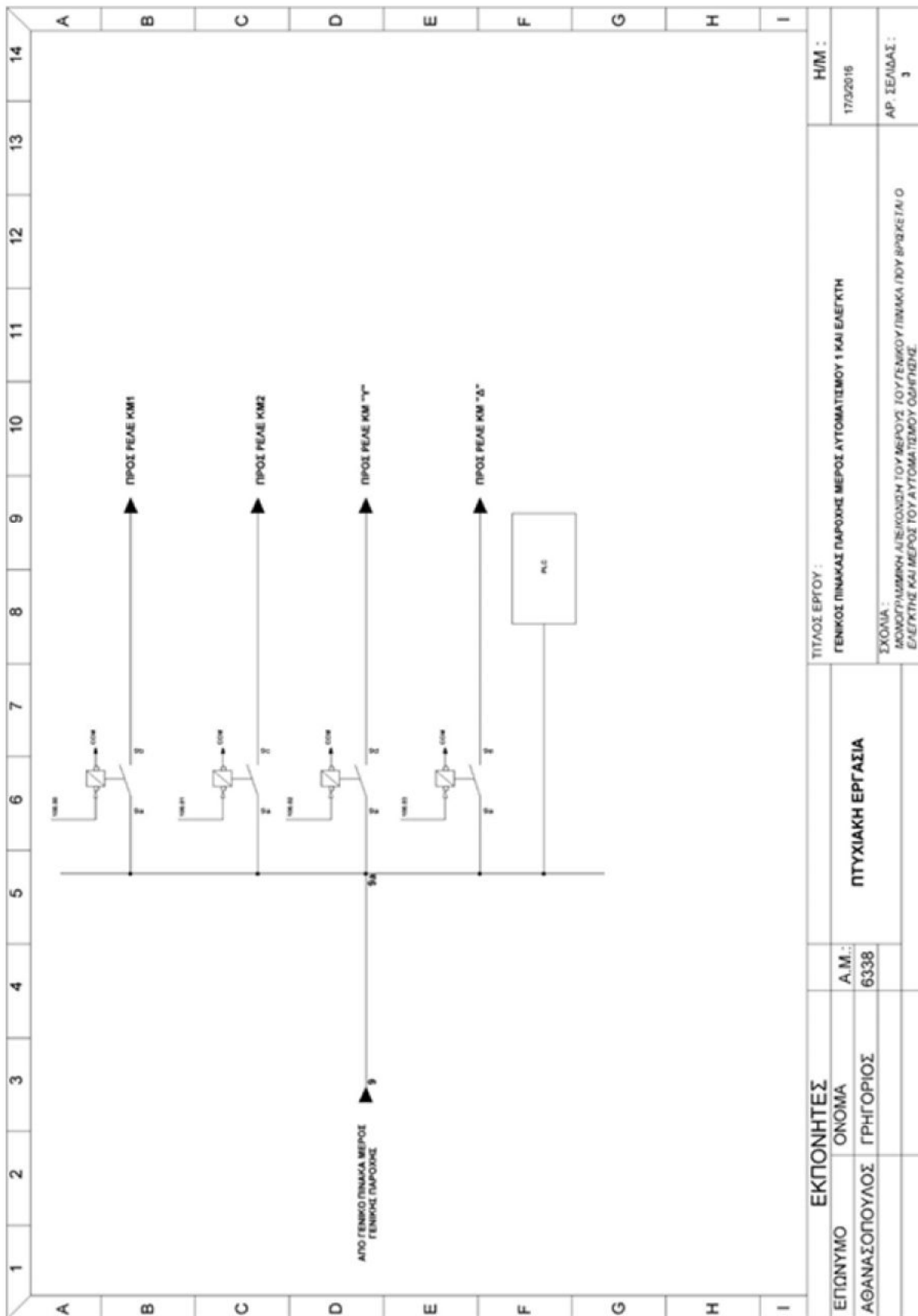




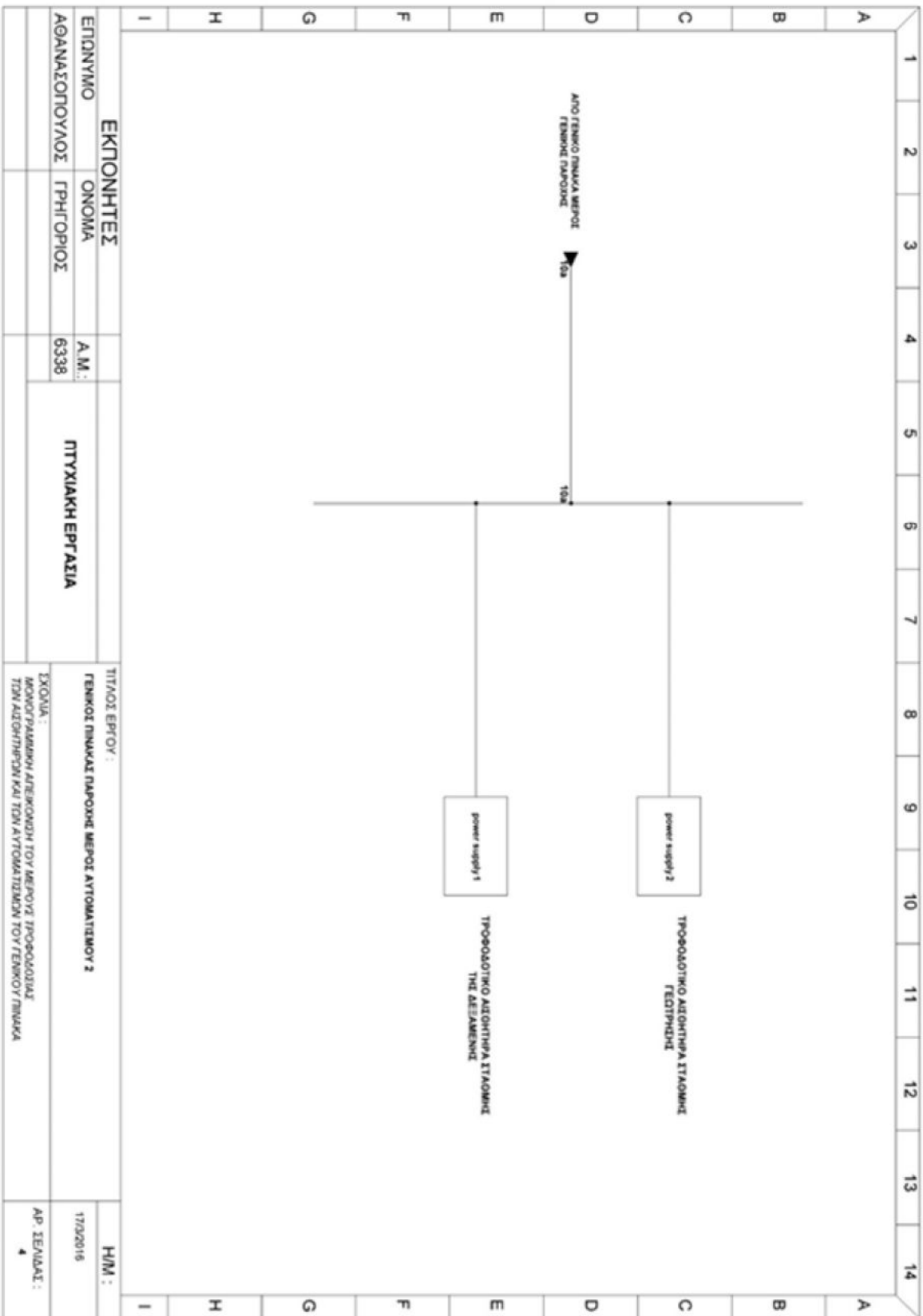
Εικόνα 11



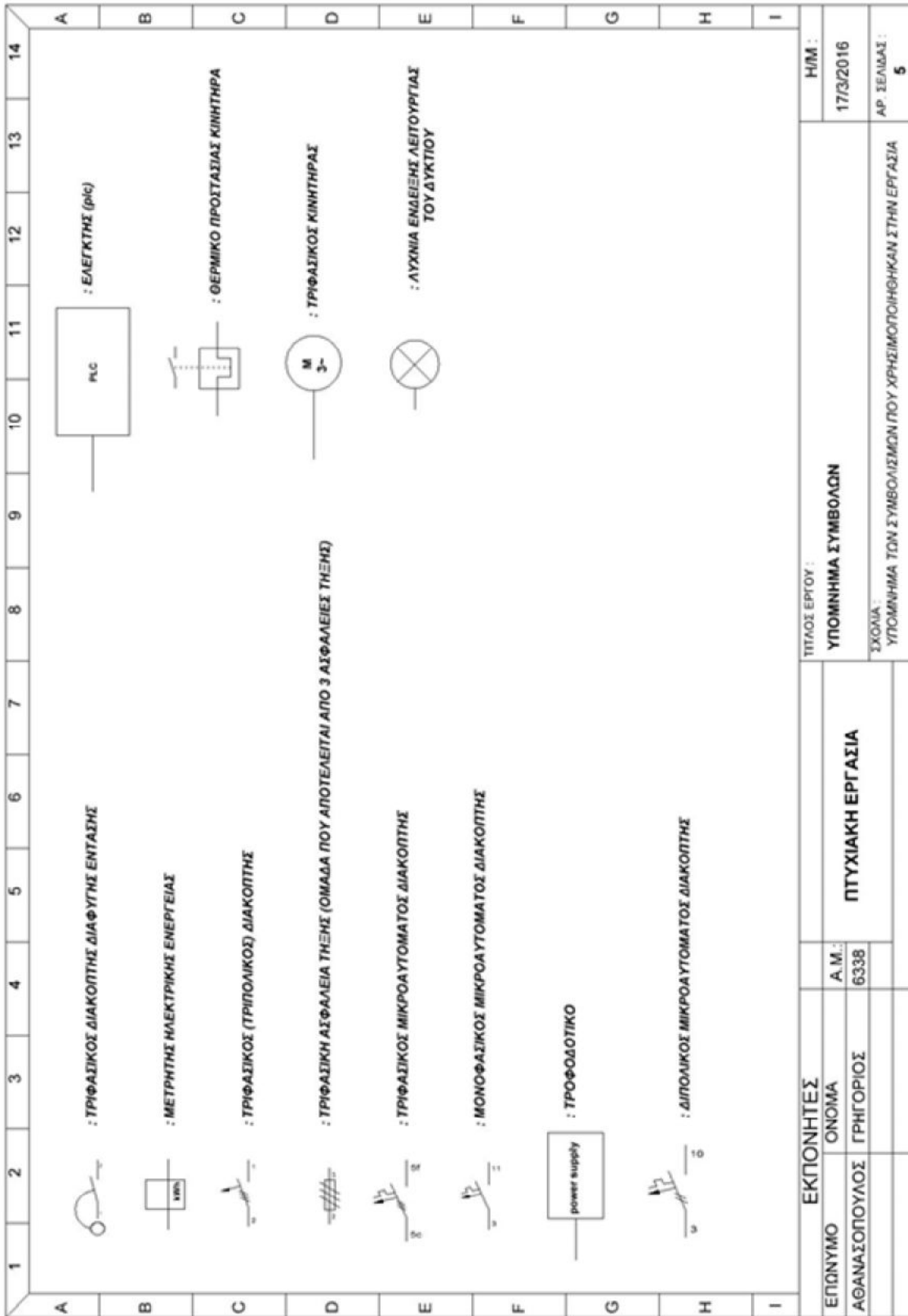
Εικόνα 12



Εικόνα 13



Εικόνα 14



Εικόνα 15

### 3.1.1 1:

- $P_{\mu} = 30 \text{ hp} (= 22 \text{ kW})$
- $U = 400 \text{ V}$
- $\text{PF} = 0.86$
- $\eta = 0.83$  (83%)
- $\mu$  HD384  $25^{\circ}\text{C}$  ( $1.06$ )
- $\mu$  HD384  $25^{\circ}\text{C}$  ( $52-1$ )
- $\mu$  HD384  $1.17$
- $2 \text{ cm}$
- $2 \text{ cm}$

$P_{\mu} = 22000 \text{ Watt}$  ( $\mu$ ),  $P = \frac{22000}{0.83} = 26506 \text{ Watt}$  ( $\mu$ ),  $26.5 \text{ kW}$ .

$$I_1 = \frac{P_{\eta \lambda}}{(\sqrt{3} \times U \times \text{PF})} = \frac{26506}{(\sqrt{3} \times 400 \times 0.86)} = \frac{26506}{595.82} = 44.48 \text{ A} \text{ ( } 44.5 \text{ ), PF}$$

1.  $I$ :  $(3 \text{ PVC } 1)$   $\mu$ ,  $\mu$ ,  $4$   $\mu$











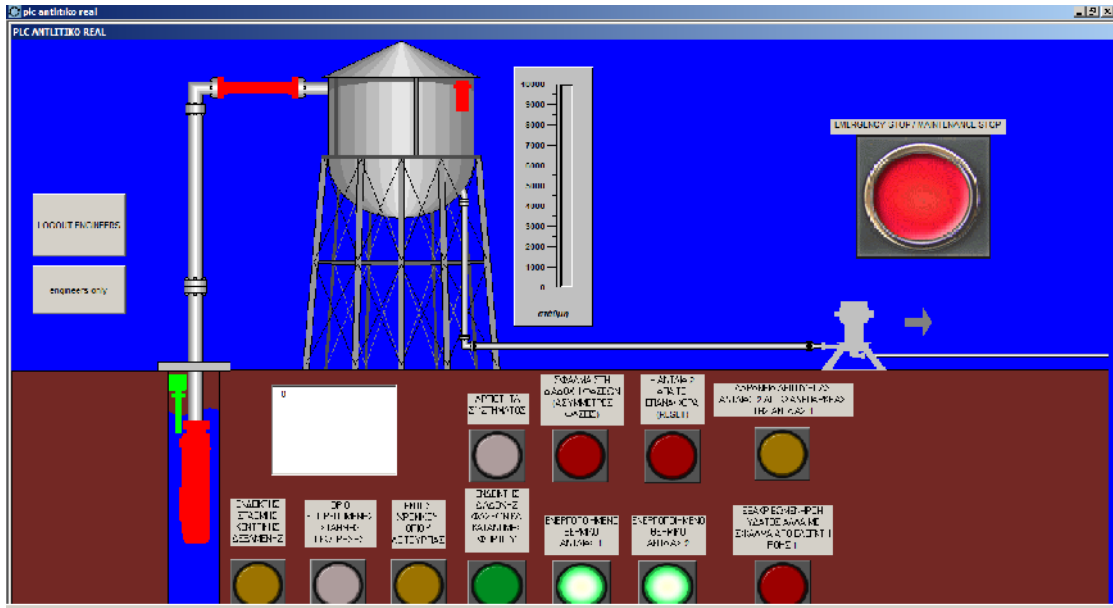




μ μ , μ 2x1mm<sup>2</sup> μ μ 230 V – 2, – μ μ μ (PLC).

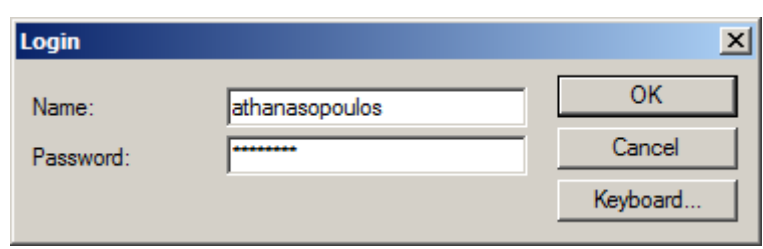






15

(16). SCADA, «Engineers only», «pop-up»  
 (name: *athanasopoulos*, password: *a131313b*)  
 SCADA, «time set»  
 1, «start»  
 «reset»  
 1 (17)  
 2



16











- 
- [1]  
<http://www.papantonatos.gr/modules/products/viewcat.php?cid=2>  
 ( μ μ μ : 18/2/2016)
- [2]  
[http://www.papantonatos.gr/modules/mastop\\_publish/files/files\\_47345ee504ab0.pdf](http://www.papantonatos.gr/modules/mastop_publish/files/files_47345ee504ab0.pdf)  
 ( μ μ μ : 18/2/2016)
- [3] Franklin electric ( 1)  
[http://www.papantonatos.gr/modules/mastop\\_publish/files/files\\_4738377fa54a9.pdf](http://www.papantonatos.gr/modules/mastop_publish/files/files_4738377fa54a9.pdf)  
 ( μ μ μ : 18/2/2016)
- [4] GOULDS 3180 ( 2)  
[https://www.gouldspumps.com/ittgp/medialibrary/goulds/website/Products/3180/Goulds\\_3180\\_Bulletin\\_Web.pdf?ext=.pdf](https://www.gouldspumps.com/ittgp/medialibrary/goulds/website/Products/3180/Goulds_3180_Bulletin_Web.pdf?ext=.pdf)  
 ( μ μ μ : 23/2/2016)
- [5] LEROY SOMER ( 2)  
[http://www.transdrive.co.uk/ac-motors/leroy-somer/LS\\_Catalogue.pdf](http://www.transdrive.co.uk/ac-motors/leroy-somer/LS_Catalogue.pdf)  
 ( μ μ μ : 23/2/2016)
- [6] WELOTEC ( μ μ )  
<http://www.welotec.com/tradepro/shop/artikel/allgemein/OWTG-Datasheet-EN.pdf>  
 ( μ μ μ : 23/2/2016)
- [7]  
<http://industrial.omron.com.br/uploads/arquivos/W516-E1-01+CP1L-EL%28M%29+UsersManual.pdf>  
 ( μ μ μ : 23/2/2016)
- [8]  
[https://www.myomron.com/downloads/1.Manuals/PLCs/CPU/CP1/CP1W-AD\\_DA\\_MAD\\_TS\\_DRT\\_SRT%20Pages%20from%20W471-E1-04.pdf](https://www.myomron.com/downloads/1.Manuals/PLCs/CPU/CP1/CP1W-AD_DA_MAD_TS_DRT_SRT%20Pages%20from%20W471-E1-04.pdf)  
 ( μ μ μ : 23/2/2016)
- [9]  
[http://www.ergo-tel.gr/product\\_info.php?products\\_id=20910](http://www.ergo-tel.gr/product_info.php?products_id=20910)  
 ( μ μ μ : 23/2/2016)
- [10] ( 1  
 μ )  
<http://www.hvac-controls.gr/pdf/945.pdf>  
 ( μ μ : <http://www.hvac-controls.gr/?pid=2&catId=223> )  
**REGIN,** μ  
 μ 6 .  
 ( μ μ μ : 23/2/2016)

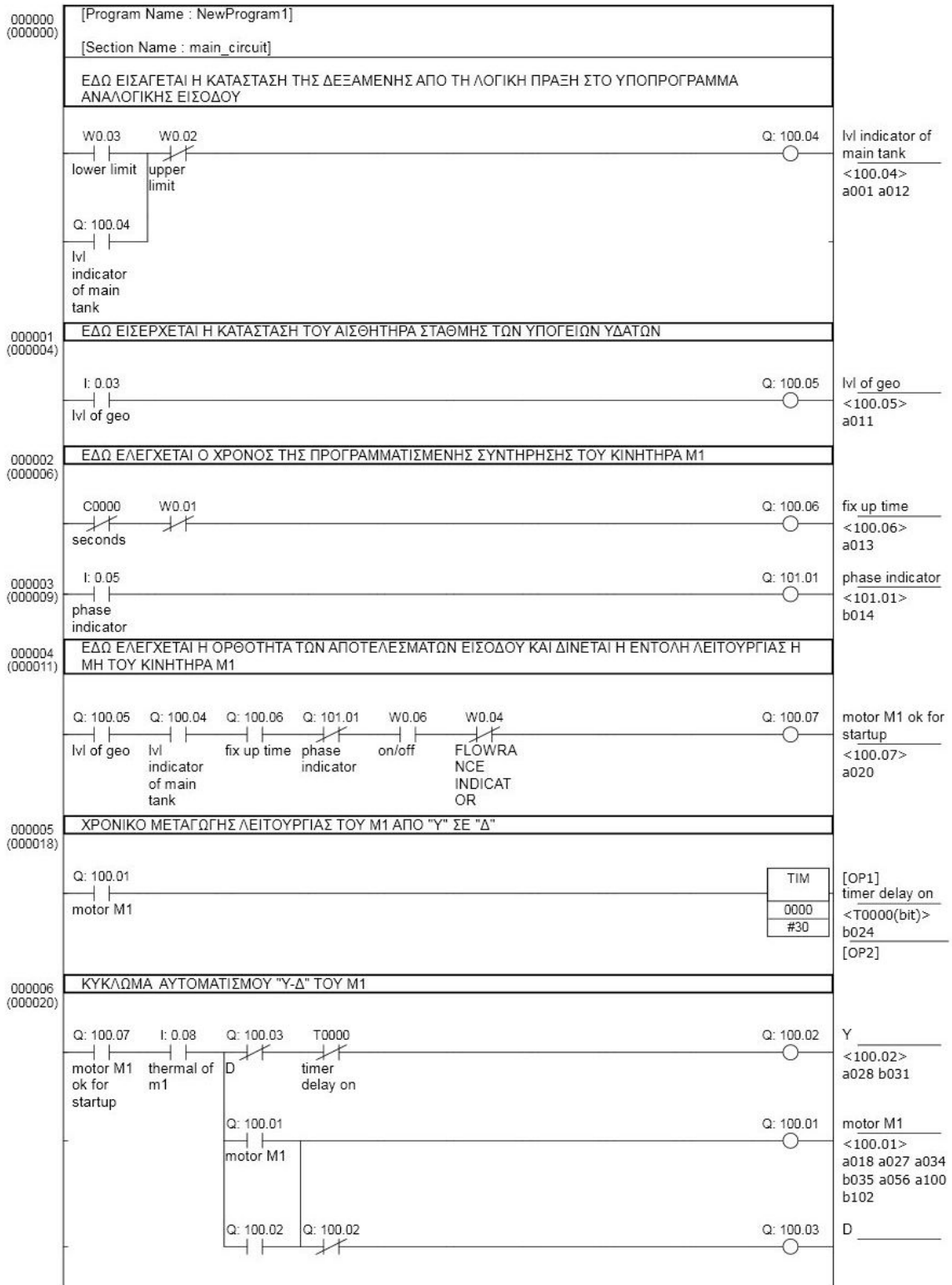
[11] ( μ 2)  
<http://www.hvac-controls.gr/pdf/945.pdf>  
( μ : <http://www.hvac-controls.gr/?pid=2&catId=223> )  
**REGIN,** μ

μ 3 .  
( μ μ : 23/2/2016)

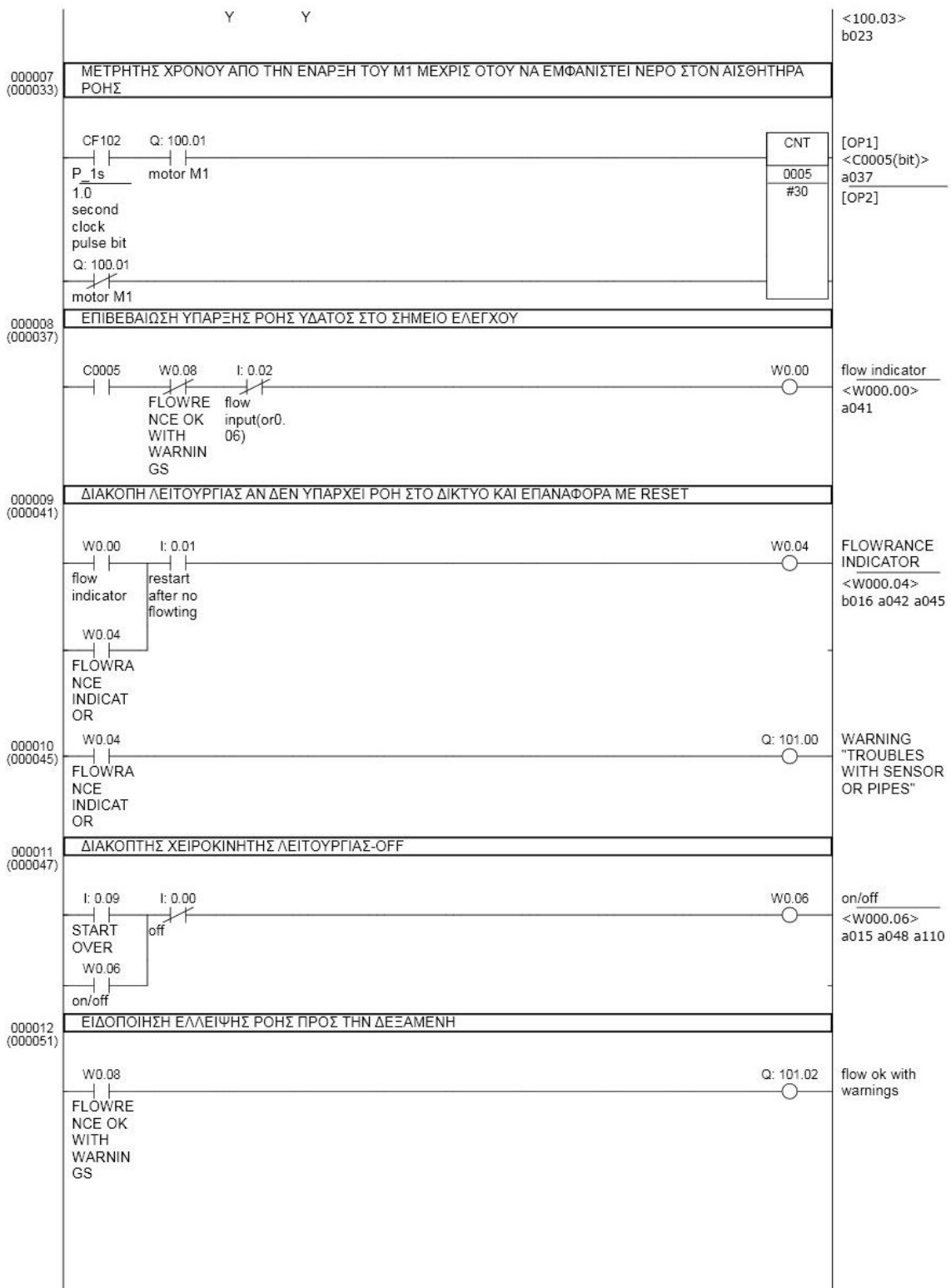
[12] ( )  
<http://www.noratex.gr/pdfgr/TotalCatalogue2010.pdf>  
( μ μ : 23/2/2016)

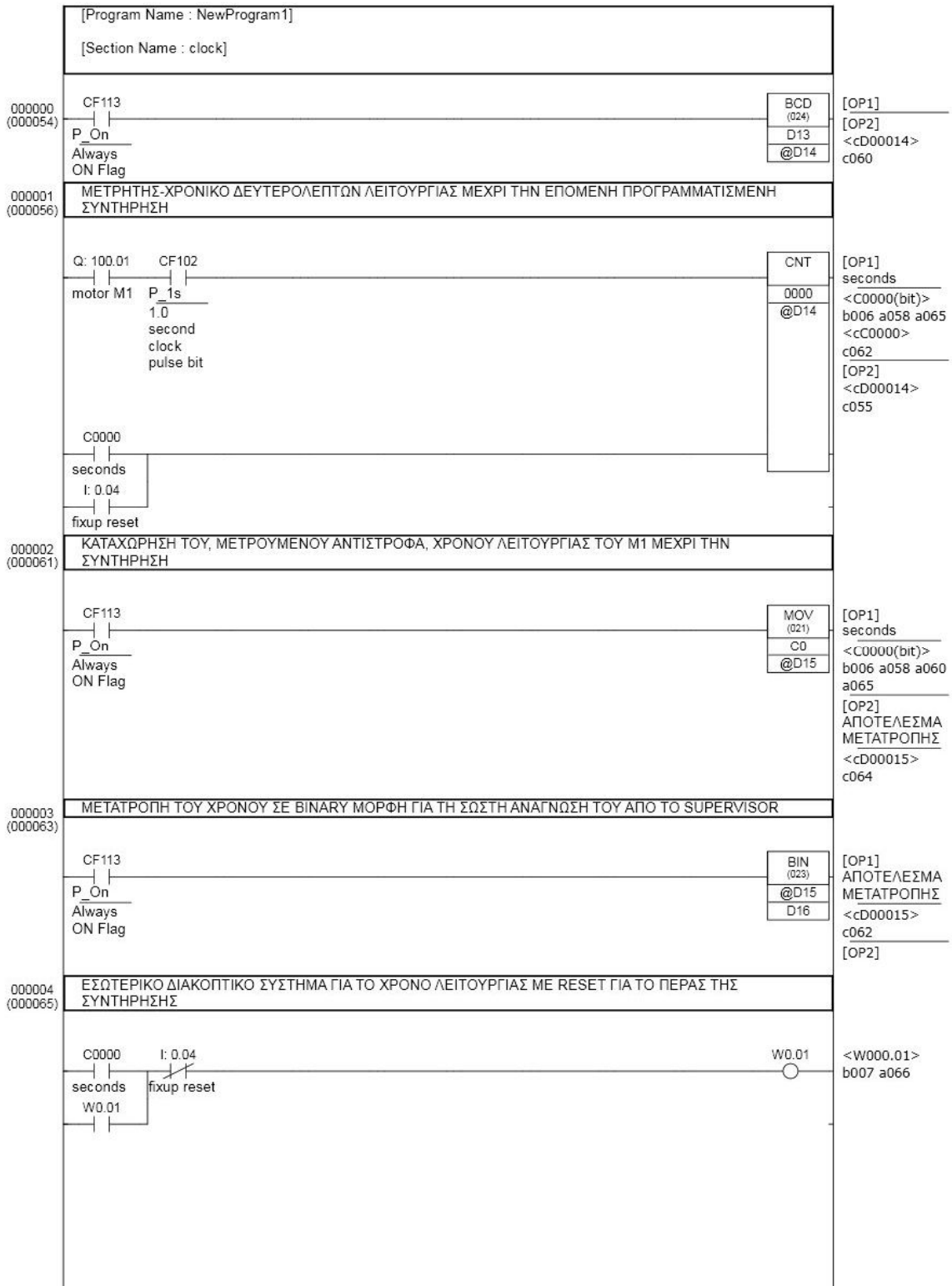
[13]  
[http://www.cronos-electronics.gr/nerou\\_gr.htm](http://www.cronos-electronics.gr/nerou_gr.htm)  
( μ μ : 23/2/2016)

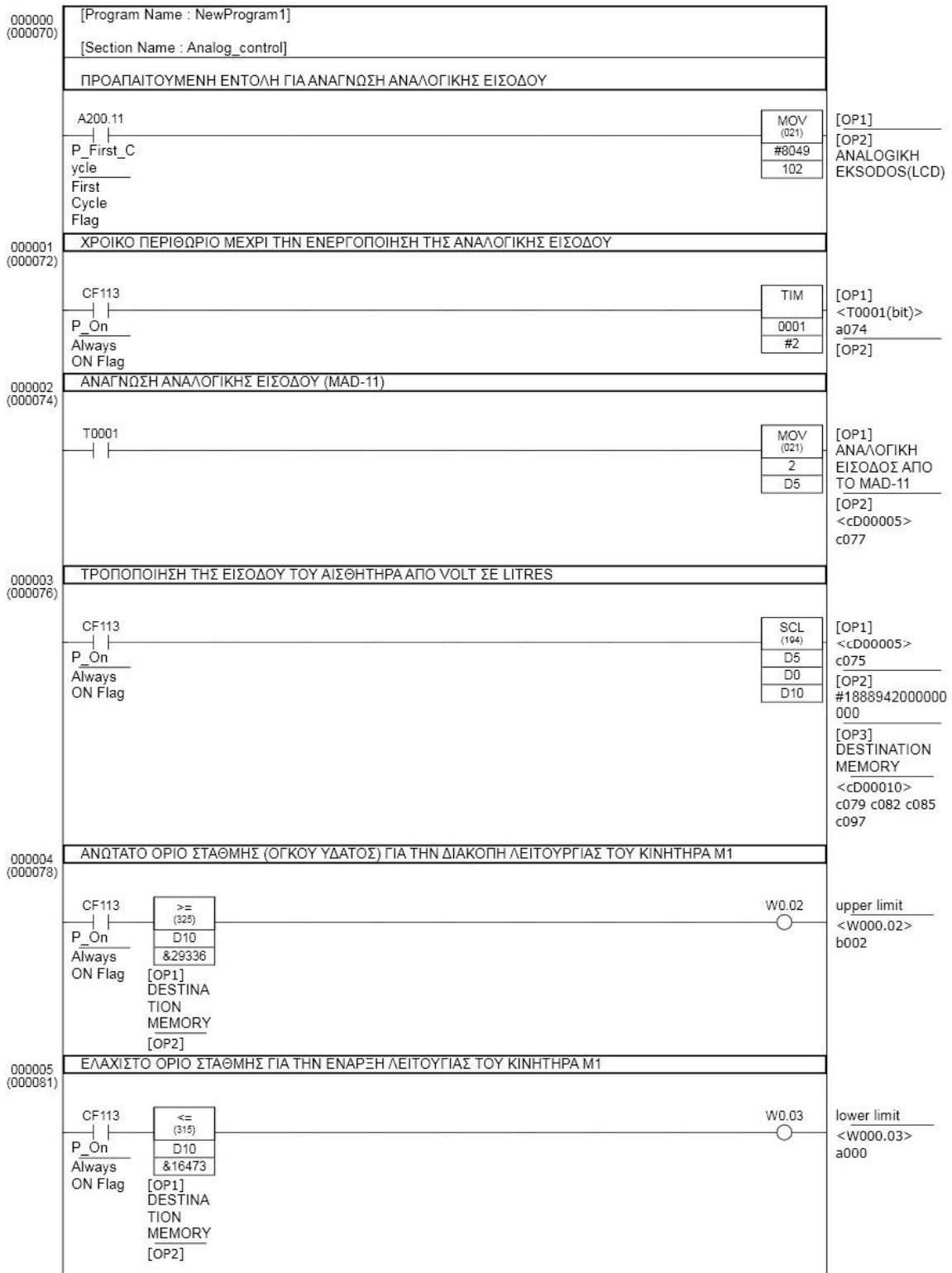
- 
- SCADA: Supervisory Control and Data Acquisition, ( . μ
  - U : μ ( )
  - U : μ ( )
  - P<sub>N</sub>: μ μ μ
  - P : μ μ
  - I<sub>N 1</sub>: μ μ 1
  - I<sub>N 2</sub>: μ μ 2
  - PF: ( Power Factor)
  - : μ μ .
  - P<sub>1</sub> : μ 1
  - P<sub>2</sub> : μ 2
  - Q<sub>1</sub> : μ 1
  - Q<sub>2</sub> : μ 2
  - S<sub>1</sub> : μ μ 1
  - S<sub>2</sub> : μ μ 2

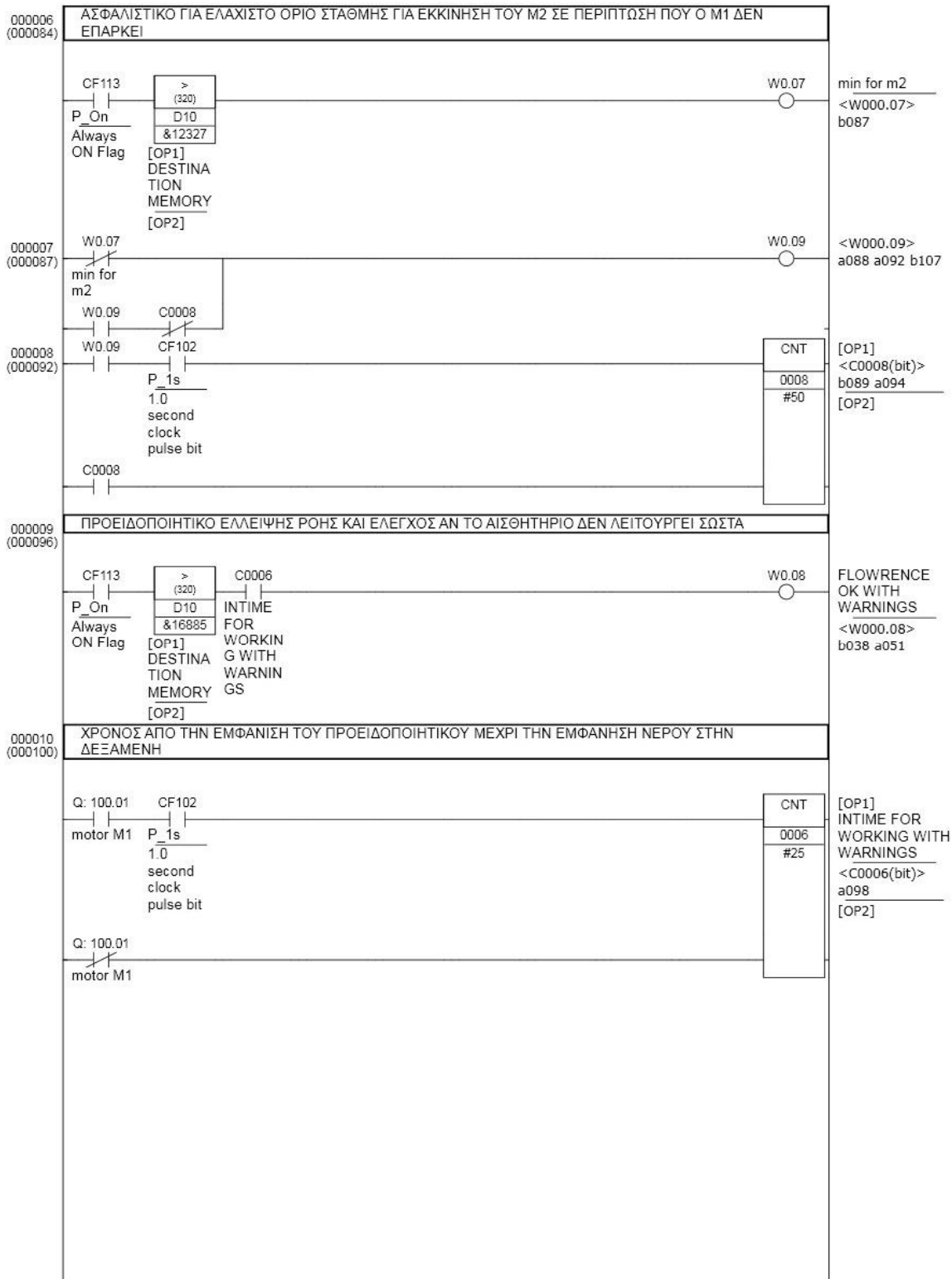


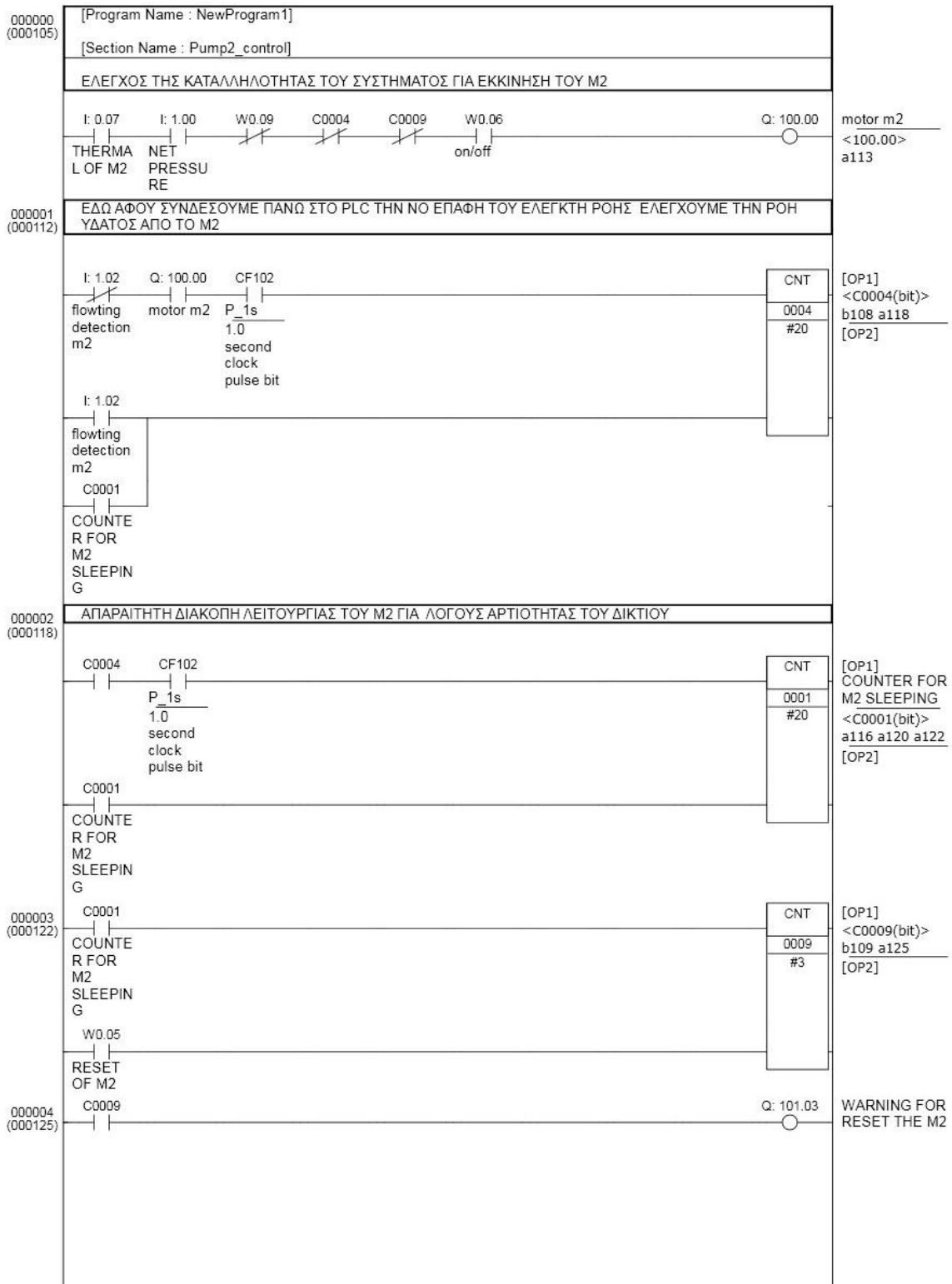


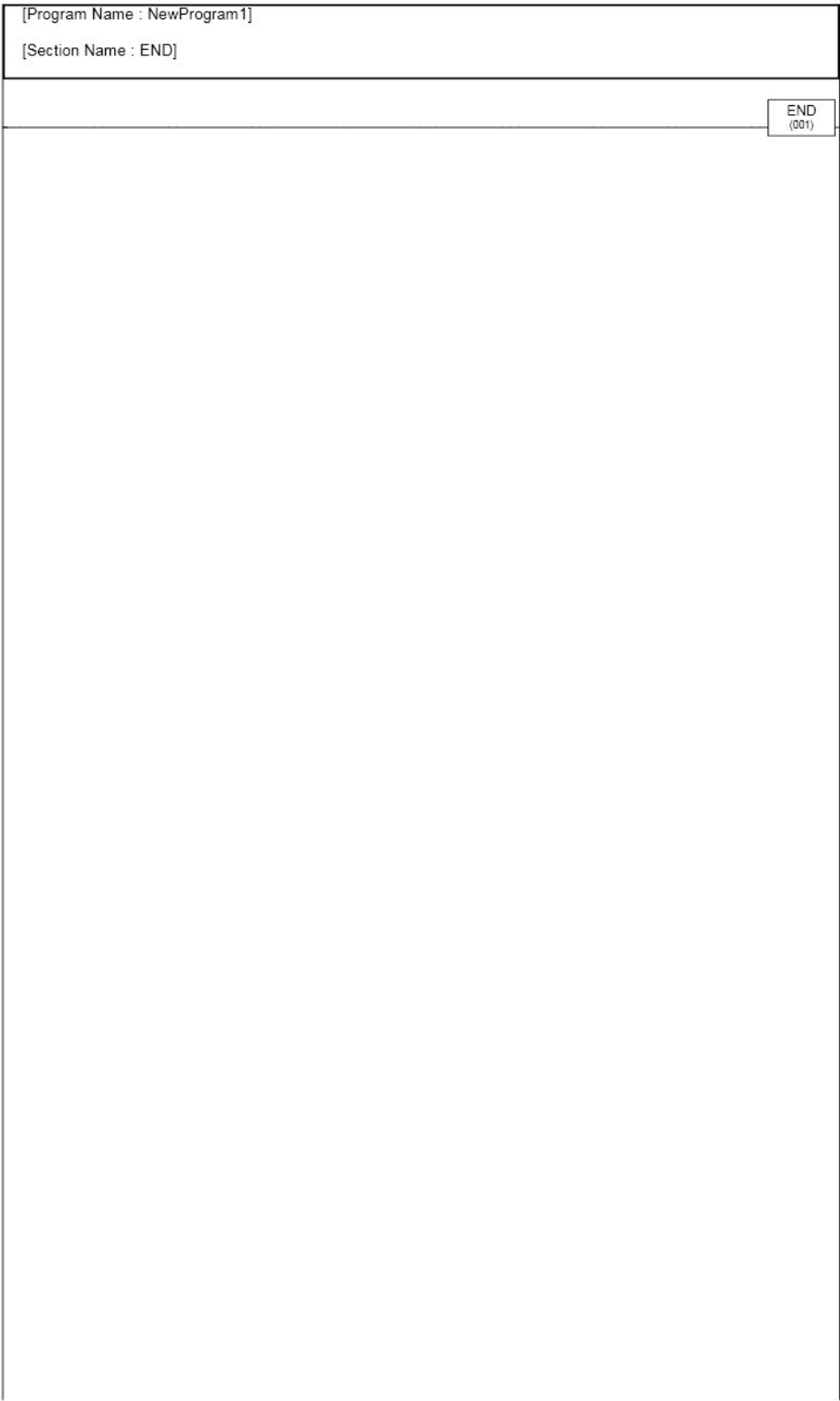












0.00	off main_circuit IN: b049	100.05	lvl of geo main_circuit OUT: a005 IN: a011
0.01	restart after no flowing main_circuit IN: a043	100.06	fix up time main_circuit OUT: a008 IN: a013
0.02	flow input(or0.06) main_circuit IN: b039	100.07	motor M1 ok for startup main_circuit OUT: a017 IN: a020
0.03	lvl of geo main_circuit IN: a004	101.00	WARNING "TROUBLES WITH SENSOR OR PIPES" main_circuit OUT: a046
0.04	fixup reset clock IN: a059 b067	101.01	phase indicator main_circuit OUT: a010 IN: b014
0.05	phase indicator main_circuit IN: a009	101.02	flow ok with warnings main_circuit OUT: a052
0.07	THERMAL OF M2 Pump2_control IN: a105	101.03	WARNING FOR RESET THE M2 Pump2_control OUT: a126
0.08	thermal of m1 main_circuit IN: a021	102	ANALOGIKH EKSODOS(LCD) Analog_control 071
0.09	START OVER main_circuit IN: a047	W000.00	flow indicator main_circuit OUT: a040 IN: a041
1.00	NET PRESSURE Pump2_control IN: a106	W000.01	main_circuit IN: b007 clock OUT: a068 IN: a066
1.02	flowing detection m2 Pump2_control IN: b112 a115	W000.02	upper limit main_circuit IN: b002 Analog_control OUT: a080
2	ΑΝΑΛΟΓΙΚΗ ΕΙΣΟΔΟΣ ΑΠΟ ΤΟ MAD-11 Analog_control 075	W000.03	lower limit main_circuit IN: a000 Analog_control OUT: a083
100.00	motor m2 Pump2_control OUT: a111 IN: a113	W000.04	FLOWRANCE INDICATOR main_circuit OUT: a044 IN: b016 a042 a045
100.01	motor M1 main_circuit OUT: a030 IN: a018 a027 a034 b035 clock IN: a056 Analog_control IN: a100 b102	W000.05	RESET OF M2 Pump2_control IN: a123
100.02	Y main_circuit OUT: a025 IN: a028 b031	W000.06	on/off main_circuit OUT: a050 IN: a015 a048 Pump2_control IN: a110
100.03	D main_circuit OUT: a032 IN: b023		
100.04	lvl indicator of main tank main_circuit OUT: a003 IN: a001 a012		

W000.07	min for m2 Analog_control OUT: a086 IN: b087
W000.08	FLOWRENCE OK WITH WARNINGS main_circuit IN: b038 a051 Analog_control OUT: a099
W000.09	Analog_control OUT: a091 IN: a088 a092 Pump2_control IN: b107
A0200.11	First Cycle Flag Analog_control IN: a070
T0000(bit)	timer delay on main_circuit OUT: a019 IN: b024
T0001(bit)	Analog_control OUT: a073 IN: a074
C0000	seconds clock 062
C0000(bit)	seconds main_circuit IN: b006 clock OUT: a060 IN: a058 a065
C0001(bit)	COUNTER FOR M2 SLEEPING Pump2_control OUT: a121 IN: a116 a120 a122
C0004(bit)	Pump2_control OUT: a117 IN: b108 a118
C0005(bit)	main_circuit OUT: a036 IN: a037
C0006(bit)	INTIME FOR WORKING WITH WARNINGS Analog_control OUT: a103 IN: a098
C0008(bit)	Analog_control OUT: a095 IN: b089 a094
C0009(bit)	Pump2_control OUT: a124 IN: b109 a125
D00000	#1888942000000000 Analog_control 077

D00005	Analog_control 075 077
D00010	DESTINATION MEMORY Analog_control 077 079 082 085 097
D00013	clock 055
D00014	clock 055 060
D00015	ΑΠΟΤΕΛΕΣΜΑ ΜΕΤΑΤΡΟΠΗΣ clock 062 064
D00016	clock 064



PLC Name	Program Name	Section Name	Start Step Num.	End Step Num.	Pages
CP1L					7
	NewProgram1				7
		main_circuit	0	52	2
		clock	54	68	1
		Analog_control	70	103	2
		Pump2_control	105	126	1
		END	128	128	1