TECHNICAL LITERATURE & INSTALLATION INSTRUCTIONS

MBAS 9700

MICROPROCESSOR - BASED

ALARM ANNUNCIATION SYSTEM WITH SERIAL COMMUNICATION

minilec®

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Index

1.00 SCOPE

The scope of this USER'S MANUAL is limited to the product named MBAS 9700 annunciation system manufactured, marketed and serviced by MINILEC. The scope is further limited to the extent of technical specifications enlisted in this USER'S MANUAL only.

User's should not refer this manual for using any other Annunciator other than MBAS 9700 with unspecified technical specifications and features.

2.00 INTRODUCTION

A Complex manufacturing plant without centralized monitoring and control equipment is unimaginable. Similarly, centralized monitoring and control equipment without an audiovisual fault alarm Annunciator is a rare find.

MINILEC - A well known name in the field of electronic motor protection and microprocessor based annunciation system, offers its unique alarm Annunciator based on the latest single chip micro-controller technology with serial communication facility. Now available in 19" rack type enclosure.

This highly reliable and compact system offers multi point annunciation with operating Sequences as per prevailing standards with special feature of serial communication, Separate site selectable faults (NO / NC) & grouping facility and with optional features, such as multi coloured windows for easy differentiation of trip and non trip or alarm and trip type faults.

This is readily available option for the specific needs of every installation. MINILEC offers Annunciator for all applications.

2.01 STANDARD FEATURES

- Single chip micro-controller logic.
- Ultra bright LED's for window illumination.
- Site selectable NO/NC type fault contacts.
- Site selectable trip /Non trip (Grouping).
- Easy card replacement & hence fault diagnosis.
- Switch Mode Power Supply. (Suitable for Both AC/DC Supply).
- High noise immunity and wide input supply variation.
- Opto - isolated Inputs and Outputs.
- Site Selectable sequences.
- Potential free dry input contacts.
- Two different window sizes.
- Replaceable front Acrylic & legends.
- Computer linking for fault logging with printer facility for report.
- Self-surveillance watch dog LED.
- Relay output for external audible hooter.
- Diagnostics Menu.
- Redundant Power Supply.
- CPU fail & PSU fail indication with relay output contact.
- User Friendly terminal Connectors.

2.02 OPTIONAL FEATURES

- Different colored window acrylics for easy differentiation of critical faults.
- Customized preprogrammed operating sequence.
- Multi channel serial communication (8 Annunciators & single computer).

2.03 CONSTRUCTIONAL DETAILS

MBAS 9700 consist of four basic sections

1. The Power Supply Unit (PSU Module).
2. The Main Control Unit (CPU + IOU Module).
3. The Display Facia Unit (DFU Module).
4. Computer interface.

• THE POWER SUPPLY UNIT (PSU)

The MBAS 9700 is powered by a highly reliable and noise free specially designed Power supply.

(For Fault Points and PSU please refer following table)

Enclosure	Fault Points	PSU 90-270 V AC/DC	20 - 60 VDC
19" RACK	16	PSU1,PSU2 - Inbuilt	PSU1,PSU2 - Inbuilt
	24 - 32	PSU1,PSU2 - Inbuilt	PSU1,PSU2,PSU3 - Inbuilt
	40 - 48	PSU1,PSU2,PSU3 - Inbuilt	PSU1,PSU2,PSU3, PSU4 - Inbuilt
	64	PSU1,PSU2,PSU3 - Inbuilt	PSU1,PSU2,PSU3, PSU4 - Split
	80 - 96	PSU1,PSU2,PSU3,PSU4 - Split	PSU1,PSU2,PSU3,PSU4,PSU5 - Split
	112 - 128	PSU1,PSU2,PSU3,PSU4,PSU5 - Split	PSU1,PSU2,PSU3,PSU4,PSU5,PSU6,PSU7 - Split

PSU converts the available power source into a regulated and filtered DC output, which is fed to the MCU Module & DFUs. The power supply can accept specified AC or DC I/P supply, depending upon the application.

• THE MAIN CONTROL UNIT (MCU)

This section consists of Mother board, CPU module & IOU module for 16 to 128 points. Motherboard carries all signals viz. data bus, control bus & power supply lines.

CPU module is the Main Processing Unit of **MBAS 9700**, which scans and processes the incoming fault signals from the various potential free field contacts through IOU module, and drives the corresponding LED windows and the audible device in order to annunciate the fault through IOU module. Also it transmit information to computer according to the operating sequence. The terminals are provided on front of each block.

The heart of the CPU is the Single Chip Micro-Controller IC that has substituted the conventional individual card system. It operates on regulated supply of +5V DC. It is not only faster in operation but also reliable and more efficient. It consumes low power and ensures a trouble free and maintenance free operation of the Annunciator unit.

The IOU module is the input & output interfacing unit. To each IOU module 16 input contacts (potential free) & 16 window's can be connected. The inputs are Opto isolated. Each IOU module has unique address. Separate DIP switches for NO/NC and grouping selection are provided on each IOU module. The terminals are provided on front of each block.

• THE DISPLAY FACIA UNIT (DFU)

The Facia block is accessible from front (in moulded enclosure) and constitutes of small size ‘S’ window, Big size ‘B’ window. Positive or negative Legend paper / film sandwiched between diffuser plate & front window Acrylic. Window reflector is provided for better illuminations. Green colour Watch Dog LED is provided for the indication of healthiness of the Annunciator system.

The Ultra Bright LED’s ensure a long and absolutely maintenance free window life along with a good visibility as compared to the conventional twin filament lamps. The legend plates are replaceable for individual window.

For 16 to 128 points system the DFUs are given separately.

• COMPUTER INTERFACE

- The MCU unit transmits fault information to computer serially. RS 232C standard is used for serial communication. In computer user-friendly software is written. This software offers on-line Date & Time setting, Legend setting, Display window & also it gives fault report with on demand printing facility. (Further detail information please refer last section of this manual. i.e. section 6.5)

- RS 485 type of interface is given as optional.

2.04 SYSTEM ENCLOSURES

The MBAS 9700 system is configured in standard 19’’ Rack system (for 16 to 128 points in steps of 16)

3.00 ORDERING INFORMATION

1) Model Name
2) Number of points (Big & Small)
3) Sequence
4) colour of windows
5) Legends
6) Serial Communication Port
7) Auxiliary Supply

3.01 SCOPE OF SUPPLY

MINILEC offers to supply its Microcontroller based annunciation system **MBAS 9700** as an isolated system to be installed in control cubicle.

MINILEC'S scope of supply is limited following:

- MBAS 9700 standard Annunciator module
- Built-in power supply block as per purchase specifications.

Window Type	Colour Status	Facia
Small / Big	Colour / Red	2D/4D

Following mandatory accessories are also supplied with **MBAS 9700**

- Noise suppressing NETWORK RRC supplied with the Annunciator to be wired across inductive load of the audible device & across the coil of contactors, which are in vicinity of MBAS 9700.
- 'User's manual' may be supplied with consignment or will be sent to the user / buyer separately.

3.02 OPTIONAL ACCESSORIES

Following optional accessories will be supplied as additional facilities against order only.

- Industrial diaphragm type AC or DC Powered Hooter (Audible Device)
- Electronic (tone controlled) type AC or DC powered hooter (Audible Device)
- External NO type Push Buttons (4 Nos. = 1 Set)
- For 2 to 8 channel serial communications with one computer multi serial card is supplied.
- MCU to DFU cable assembly. (Up to 40 mtr.)
- MCU to COMPUTER cable assembly. (Up to 40 mtr.)

3.03 LIST OF SPARES RECOMMENDED

- Pre programmed microcontroller chip.
- Big / Small window Facia.
- CPU card.
- Software Installation Compact Disk.
- IOU card(s).
- MCU to DFU cable assembly - 3 mtr.
- Power supply card(s).
- MCU to PSU cable assembly - 1mtr.
- LED board (Common for 8 Small / 4Big Windows).
- MCU to COMPUTER cable assembly (all model) - 5 mtr.
- 'S' size window Acrylic.
- 'B' size window Acrylic.
- Extra legend set.

3.04 TECHNICAL SPECIFICATIONS:

1 Supply voltage	20 - 60VDC, 90 – 270VAC/DC.	
2 Supply frequency	50 / 60 Hz. (±3 %) for AC.	
3	**Input**	
3.1	Fault Alarm Inputs.	Actuation Through Fault Contacts.
3.2	Fault contacts.	Potential free (volt free) type.
3.3	Input interrogation voltage.	+12V DC(ISO).
3.4.	Input isolation.	Opto isolating device (2 KV).

3.5	Response Time	40 mS.
3.6	**Site selectable DIP for**	
	Fault type	NO/NC
	Grouping	Trip/Non Trip
	Sequence selection	Manual/Auto/Ringback/Firstup
	Max. No. of points selection	19 " Rack
		16/24/32/40/48/64/80/96/112/128 Points

4	**Output**	
4.1	Output contact for grouping	1 NO + 1NO + 1NO (Optional)
4.2	Output contact for CPU & PSU fail	1 NC
4.3	Contact Rating	5 amp at 240 VAC [Resistive]

5	**Facia**	Ultra Bright White LED (3 mm)		
5.1	Display device	Replaceable Acrylic		
5.2	**No. of windows**			
	In 19" rack	16/24 **Big**/32/40 **Big**/48/64/80/96/112/128		
5.3	**Window dimensions**		**Inner**	**Outer**
		Small windows	31.3 mm x 29.8 mm	32.5 mm x 31.0 mm
		Big windows	65.8 mm x 29.8 mm	67.0 mm x 31.0 mm
5.4	Small window LED	1 LED		
5.5	Big window LED	3 LED		
5.6	Legends	+ ve on paper / (-ve on film)		
	Flash rates			
5. 7	50-60 flashes / Min.	Fast Flashing		
	25-30 flashes / Min.	Slow flashing *(For Ring Back Sequence or other seq. if required)		
5.8	Power Consumption	1.5 W per Window. (Max)		
5.9	Acrylic Colour	Red, Yellow, Amber, Green, Blue, Transparent		

6. Sequence Manual Reset **(S1)**/Auto Reset **(S2)**/ Ring back **(S3)**/Firstup **(S4)**
(Any Other Sequences On Request)

7	**Serial communication**	
7.1	Standard	RS 232C / RS 485
7.2	Baud rate	9600
7.3	Data format	8 Data bits, 1 Start bit, 1 Stop bit
7.4	Communication	Single channel / (2 to 8 channel with additional multi port serial card) Full Duplex system

8 Computer software feature
Please refer PC side Software section 6.5 for detail information.

9 Enclosure

Model	MCU & PSU	DFU
16/24 **Big**/32/40 **Big**/48/ 64/80/96/112/128.	19" rack type	0600 type

10 Dimensions

	90 - 270 V AC/DC		20 - 60 V DC	
Dimensions[mm]	**Overall**	**Mounting**	**Overall**	**Mounting**
MCU / CPU [64-128 POINTS]				
128 PTS	482.60 X 132.50 X 283	465.10 X 57.15	482.60 X 132.50 X 283	465.10 X 57.15
112 PTS	436.88 X 132.50 X 283	419.38 X 57.15	436.88 X 132.50 X 283	419.38 X 57.15
96 PTS	391.16 X 132.50 X 283	373.66 X 57.15	391.16 X 132.50 X 283	373.66 X 57.15
80 PTS	345.44 X 132.50 X 283	327.94 X 57.15	345.44 X 132.50 X 283	327.94 X 57.15
64 PTS	N.A.	N.A.	345.44 X 132.50 X 283	327.94 X 57.15
MCU /CPU + PSU [16 – 64 POINTS]				
64 PTS	452.12 X 132.50 X 283	434.62 X 57.15	N.A.	N.A.
40/48 PTS	406.40 X 132.50 X 283	388.90 X 57.15	457.20 X 132.50 X 283	439.70 X 57.15
32 PTS	309.88 X 132.50 X 283	292.38 X 57.15	360.68 X 132.50 X 283	343.18 X 57.15
24 PTS	309.88 X 132.50 X 283	292.38 X 57.15	360.68 X 132.50 X 283	343.18 X 57.15
16 PTS	264.16 X 132.50 X 283	246.66 X 57.15	264.16 X 132.50 X 283	246.66 X 57.15
PSU [64 - 128 POINTS]				
128 PTS	309.88 X 132.50 X 283	292.38 X 57.15	411.48 X 132.50 X 283	393.98 X 57.15
112 PTS	309.88 X 132.50 X 283	292.38 X 57.15	411.48 X 132.50 X 283	393.98 X 57.15
96 PTS	259.58 X 132.50 X 283	241.58 X 57.15	309.88 X 132.50 X 283	292.38 X 57.15
80 PTS	259.58 X 132.50 X 283	241.58 X 57.15	309.88 X 132.50 X 283	292.38 X 57.15
64 PTS	N.A.	N.A.	259.58 X 132.50 X 283	241.58 X 57.15
DFU module [Applicable for 16 To 128 points]				
	Overall	**Cutout**		
2D type	[144 x 144 x 70] mm	[138 x 138] mm		
4D type	[144 x 288 x 70] mm	[138 x 282] mm		

11	**Mounting**	**19” RACK**
11.1	DFU module	Flush mounting type.
11.2	PSU/ MCU	Wall mounting type.

12	**Cable length**	**19” RACK**
	MCU To PSU module	1 Meter [Max.]
	MCU To DFU module	3 Meter [STD.] 40 meter [Max.]
	MCU To computer	5 Meter [STD.] 40 Meter [Max.]

13	**Environmental Conditions**	**Operational**	**Storage**
13.1	Temp. limits	0^0C to 60^0C	-10^0C to 60^0C
13.2	Humidity	Up to 95% RH	

14 Weight		
Unit	**Enclosure**	**Weight (Kg)**
16 to 128 points	19” rack	08 kg. Max. For 96 Points Big

15 Computer & Peripherals [To be purchased by customer]
Please refer PC side Software section 6.5 for detail information.

16 Power Supply: Redundant

4.00 INSTALLATION INSTRUCTION

4.01 CHECK LIST OF SUPPLY

Check whether following essential items are delivered with your **MBAS 9700** Annunciator packing box.

MBAS 9700 Annunciator module as per order and dispatch documents.

- Mounting clamps for each Facia.(For all models)
- Noise suppressing Network (RRC) & FUSES.
- Compact Disk (CD) containing serial communication windows based software.
- Other optional accessories if ordered (The Hooter, External push Button etc.)
- Window inscription photo legend. (If requested)
- Verify ordered specification like number of windows, number of 'B' & 'S' size window as coded in the model code are incorporated, Supply voltage etc.

4.02 PRE INSTALLATION CHECKS

01. Take your **MBAS 9700** Annunciator module on the Test Bench.

02. List the ordered features like -

- Normal supply voltage.
- Window size combination
- Number of windows
- Number of color windows.
- Operating sequence.
- Compact Disk containing windows based Software
- Serial communication cable.
- Display Facia Cables.
- Multiplexer card (applicable for multi channel)

03. Refer **'INSTALLATION INSTRUCTION'** chapter of the **'USERS MANUAL'** supplied to you.

04. Connect specified normal power supply voltage to your **MBAS 9700** and wait. The 'Self-Surveillance' watch-dog LED will switch 'ON' and start flashing. This indicates your **MBAS 9700** logic circuit is operating perfectly as designed.

05. Below listed test sequence is with presumption of 'MANUAL RESET (S1)**'** operating sequence and NO type fault contacts as inputs.

Connect external 'Push Button' to terminals named 'TEST','MUTE','ACK' & 'RST'

a) Press TEST push button. All windows will flash.
b) Check the output hooter relay's - RLY 1 & RLY 2 will energized and contacts (COM1), (NO1) and (COM2), (NO2) will close.
c) Press MUTE push button. Output hooter relays will de-energized and contacts (COM1), (NO1) and (COM2), (NO2) will open.
d) Press 'ACK' Push button. All windows should stop flashing and glow steady.
e) Press 'RST' Push button to clear all windows.

06. Now use a 'Short link' to actuate individual fault input and operate MUTE, ACCEPT, RESET push button sequentially.

a) If Ringback sequence is used then on fault actuation hooter contact RLY 1 will be energized (COM1 & NO1 will closed) and on fault normalization before or after 'ACK' command the ring back hooter relay RLY 3 (COM3 & NO3 will closed) will energized with slow flashing window.

07. Now connect serial communication cable between Annunciator & serial port of computer. Run the software provided.

08. Check all the individual MBAS 9700 modules as instructed above.

09. Check for configuration of multiple modules of MBAS 9700 as follows
A) Connect hooter contacts (NO1 & COM1) of all MBAS 9700 in parallel for driving one commonaudible hooter for given combination of basic MBAS 9700 modules. Connect the Network RC acrosshooter coil. This network RRC is supplied assuming the supply voltage of annunciator and hooter issame. If hooter is of different supply voltage then do not connect Network RRC, and please ask forNETWORK RRC suitable for hooter coil voltage supply.
B) Similarly connect push button terminals (TEST, MUTE, ACK, RST) of all MBAS 9700 modules in parallel to connect one common set of NO push Buttons.
'ACK' pushbuttoncanbe operateddirectlytoacknowledgethefaultsandtosilence theaudiblealarm.
All above test will ensure that your MBAS 9700 Annunciator are delivered perfectly well as per ordered specification.

NOTE: Connect NETWORK RRC across the contactors coils which are in vicinity of MBAS 9700 module.

4.03 INSTALLATION

Install The **MBAS 9700** Annunciator modules in designated panel cut-out, inserting from front of panel. Before installation, please insure that in the vicinity of **MBAS 9700** there are no equipments / systems generating heat, vibration & radiation.

4.04 MOUNTING

For fixing, use the mounting brackets supplied with the annunciator. Tighten suitably so that it does not move or get lose.
Refer following figures for general arrangement, drilling details & panel cutout details of the respective models from Chapter 6.

16 pts to 128 pts models (19" Rack)	Section 6.1	Fig. 1.1 to Fig. 1.4

4.05 EXTERNALELECTRICAL CABLECONNECTIONDIAGRAM &SYSTEMIDENTIFICATION

Connect various fault contact cables (2.5 sq.mm max) with pin type lugs to the fault input terminals with Respective labels. Please ensure that these are potential free contact and do not carry any voltage from source end. Connect Hooter (s) along with Network RRC.

Referfollowingfiguresforexternalconnectiondiagrams from Chapter 6

16 pts to 128 pts models (19" Rack)	Section 6.1	Fig. 1.6 to 1.8

4.06 WINDOW LEGENDS

For inserting legends or windows inscriptions, please follow the instructions mentioned under fig. 2.6 from Section 6.2 of Chapter 6. The inscription lable is sandwiched between the acrylic plate and diffuser plate.

4.07 TRIP&NON-TRIPGROUPSELECTION

Separate site selectable DIP micro switches are located on the IOU card for 16 to 128 points. Select the grouping of each fault by setting the respective micro switch to ON or OFF position.

4.08 NO/NCCONFIGURATIONSELECTION

Separate site selectable DIP micro switches are located on the IOU card PCB for 16 to 128 points. Select the switch position to ON of OFF for every individual fault signal as required for NC or NO type of Fault contact respectively.

4.09 SEQUENCE SELECTION

DIP micro switch are provided in every system. Please select any one sequence at a time by Changing the switch position. (Refer fig. 2.3 from section 6.2 of chapter 6.)
Refer DIP switch selection chart for respective models for above points 4.07, 4.08 & 4.09

16 pts to 128 ptsmodels	Section 6.1	Fig. 1.5

NOTE: ForchangingDIPswitchpositionopenout IOUcardfrom19"rack.ToopenIOUcard,loosethefront screwoffrontplateofIOUcardanddrawoutthecardwiththehandleprovidedonfrontplate.

4.10 SERIALCOMMUNICATION

Connect **RS-232C** connector between **MBAS 9700** unit and COMPUTER'S (Refer PC side software SELECTION 6.3 for details) serial port.

4.11 POSTINSTALLATIONCHECKS

Before connecting power supply, please check all wiring terminals for correctness. Please ensure power suply is same as that of MBAS 9700.

4.12 TESTING &COMMISSIONING

Connect power supply and test for operation of the **MBAS 9700** as per testing flow chart given in fig. 2.4 from Section 6.2

4.13 PRECAUTIONS

Please ensure that power supply to **MBAS 9700** is stable and free from spikes and surges. Please ensure that fault contact cabling is away from power cabling & does not pick up RF signals. Please ensure that there is no heat and vibration generating source near to the **MBAS 9700** installation**.**

5.00 MAINTENANCE INSTRUCTION

5.01 CHANGINGWINDOWLEGENDS

I**nstructions for removing and fitting of the front Acrylic for changing the Legends of MBAS 9700**
In case of changing the Legends, release top black locking knob of front black window frame by pulling up top black cover with the help of screwdriver. Hold the front black window frame at bottom and pull out gently. Hold the black window frame keeping Acrylic plate side at bottom and window reflector capsule side on the top. Pull up the window reflector capsule. In case of small window facia, pull out window reflector capsule without touching separator between two windows. Keep both the thumbs at center of the diffuser plate from back side and press downward. Then front Acrylic plate also will come out with Legend.

For refitting

1. Insert the window reflector capsule in the respective slot from top and press it.
2. Locate the cutout slot provided on the front side of the front window frame for holding diffuser plate. Insert the diffuser plate in a slot, keeping plain surface on the front and surface provided with cutout edges on the back side.
3. Put the Legend on top plain surface of the diffuser plate.
4. Insert front Acrylic plate keeping textured finished side on the front and plane surface on back side having cutout edges with small additional locking edges on each side of the plate. Match the cutout edges and press it from all sides. The plate gets refitted with locking sound.
5. Always ensure proper insertion and refitting of Acrylic plate.

After fitting of diffuser plate, Legends, Acrylic plate and window reflector capsule, insert the front black window frame in the slot provided in the annunciator front bezel, match the locking knob and push button position at bottom of the front black window frame. Then slightly uphold the top black cover by screwdriver and push the front black window frame inside, so that front black window frame gets locked from top and bottom.
Please refer Fig. No. 2.5 from Section 6.2.

6.00 DRAWING/ILLUSTRATION

All the Drawings / Illustrations / Connection Diagrams are given respective model wise as per below mention sections.

SECTION 6.1
MBAS 9700 16 - 128 POINT insteps of 16

SECTION 6.2
MBAS 9700 COMMON DIAGRAM

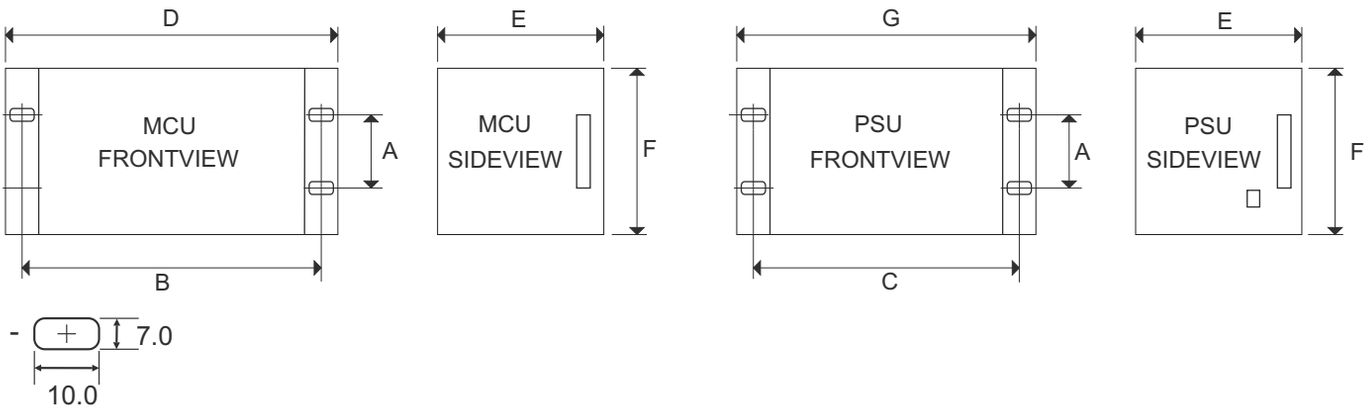
SECTION 6.3
RS232/RS485CONVERSION

SECTION6.4
REPEATRELAYCARD

SECTION6.5
PCSIDEWINDOWBASEDSOFTWAREFORANNUNCIATOR

SECTION6.1

MBAS 9700 16 -- 128 POINT, SPLIT ARCHITECTURE IN 19" RACK ENCLOSURE



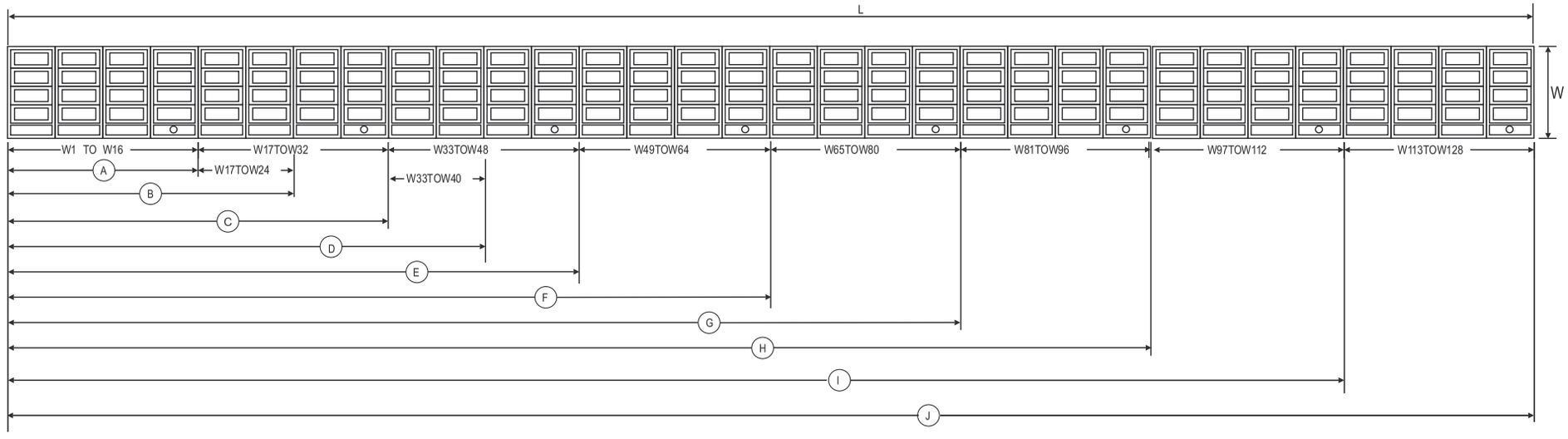
90 - 270 V AC/DC

MODELS	MOUNTINGDIMENSIONALDETAILS			OVERALLDIMENSIONDETAILS			
	A	B	C	D	E	F	G
128POINTS	57.15	465.10	292.38	482.60	283.00	132.50	309.88
112POINTS	57.15	419.38	292.38	436.88	283.00	132.50	309.88
96POINTS	57.15	373.66	241.58	391.16	283.00	132.50	259.58
80POINTS	57.15	327.94	241.58	345.44	283.00	132.50	259.58
64POINTS	57.15	434.62	--------	452.12	283.00	132.50	--------
48POINTS	57.15	388.90	--------	406.40	283.00	132.50	--------
40POINTS	57.15	388.90	--------	406.40	283.00	132.50	--------
32POINTS	57.15	292.38	--------	309.88	283.00	132.50	--------
24POINTS	57.15	292.38	--------	309.88	283.00	132.50	--------
16POINTS	57.15	246.66	--------	264.16	283.00	132.50	--------

20 - 60 V DC

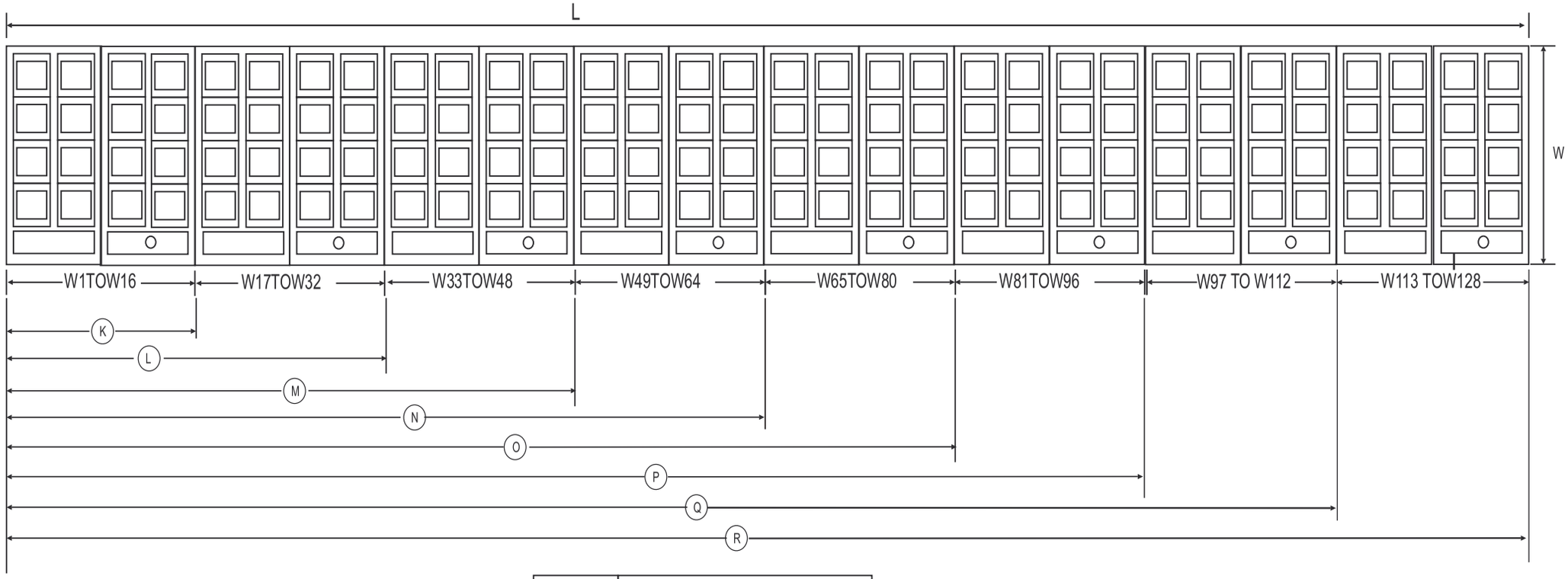
MODELS	MOUNTINGDIMENSIONALDETAILS			OVERALLDIMENSIONDETAILS			
	A	B	C	D	E	F	G
128POINTS	57.15	465.10	393.98	482.60	283.00	132.50	411.48
112POINTS	57.15	419.38	393.98	436.88	283.00	132.50	411.48
96POINTS	57.15	373.66	292.38	391.16	283.00	132.50	309.88
80POINTS	57.15	327.94	292.38	345.44	283.00	132.50	309.88
64POINTS	57.15	327.94	241.58	345.44	283.00	132.50	259.58
48POINTS	57.15	439.70	--------	457.20	283.00	132.50	--------
40POINTS	57.15	439.70	--------	457.20	283.00	132.50	--------
32POINTS	57.15	343.18	--------	360.68	283.00	132.50	--------
24POINTS	57.15	343.18	--------	360.68	283.00	132.50	--------
16 POINTS	57.15	246.66	--------	264.16	283.00	132.50	--------

FIG. 1.1 GENERAL ARRANGEMENT & DIMENSIONAL DETAILS – MCU & PSU



MODELS	UNIT DIMENSIONS		
	W	L	D
(J) 128POINT	144m.m.	2304m.m.	70m.m.
(I) 112POINT	144m.m.	2016m.m.	70m.m.
(H) 96POINT	144m.m.	1728m.m.	70m.m.
(G) 80POINT	144m.m.	1440m.m.	70m.m.
(F) 64POINT	144m.m.	1152m.m.	70m.m.
(E) 48POINT	144m.m.	864m.m.	70m.m.
(D) 40POINT	144m.m.	720m.m.	70m.m.
(C) 32POINT	144m.m.	576m.m.	70m.m.
(B) 24POINT	144m.m.	432m.m.	70m.m.
(A) 16POINT	144m.m.	288m.m.	70m.m.

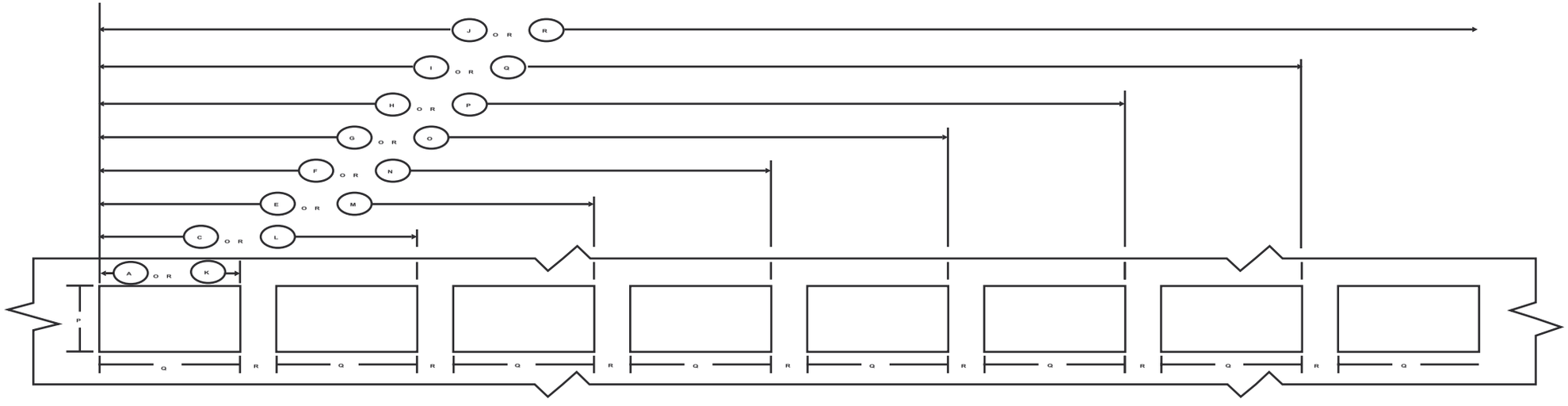
FIG.1.2 GENERAL ARRANGEMENT - DFU (16 - 128 PT. BIG)



MODELS	UNITS DIMENSION		
	W	L	D
(R) 128POINT	144m.m.	1152m.m.	70m.m.
(Q) 112POINT	144m.m.	1008m.m.	70m.m.
(P) 96POINT	144m.m.	864m.m.	70m.m.
(O) 80POINT	144m.m.	720m.m.	70m.m.
(N) 64POINT	144m.m.	576m.m.	70m.m.
(M) 48POINT	144m.m.	432m.m.	70m.m.
(L) 32POINT	144m.m.	288m.m.	70m.m.
(K) 16POINT	144m.m.	144m.m.	70m.m.

Note: For 24 W last 8 Windows will be dummy

FIG.1.3 GENERALARRANGEMENT-DFU(16 - 128PT.SMALL)



	PANEL CUTOUT DETAILS						
	SMALL WINDOW TYPE			BIG WINDOW TYPE			
	P	Q	R	P	Q	R	Q'
JOR R 128 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
IO RQ 112 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
HO R P 96 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
G O R O 80 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
F O R N 64 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
E O R M 48 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
D 40 POINT	———	———	———	138 m.m.	282 m.m.	6 m.m.	144 m.m.
C O R L 32 POINT	138 m.m.	138 m.m.	6 m.m.	138 m.m.	282 m.m.	6 m.m.	———
B 24 POINT	———	———	———	138 m.m.	282 m.m.	6 m.m.	144 m.m.
A O R K 16 POINT	138 m.m.	138 m.m.	———	138 m.m.	282 m.m.	———	———

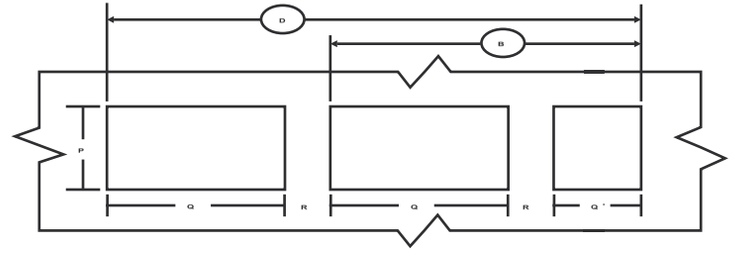
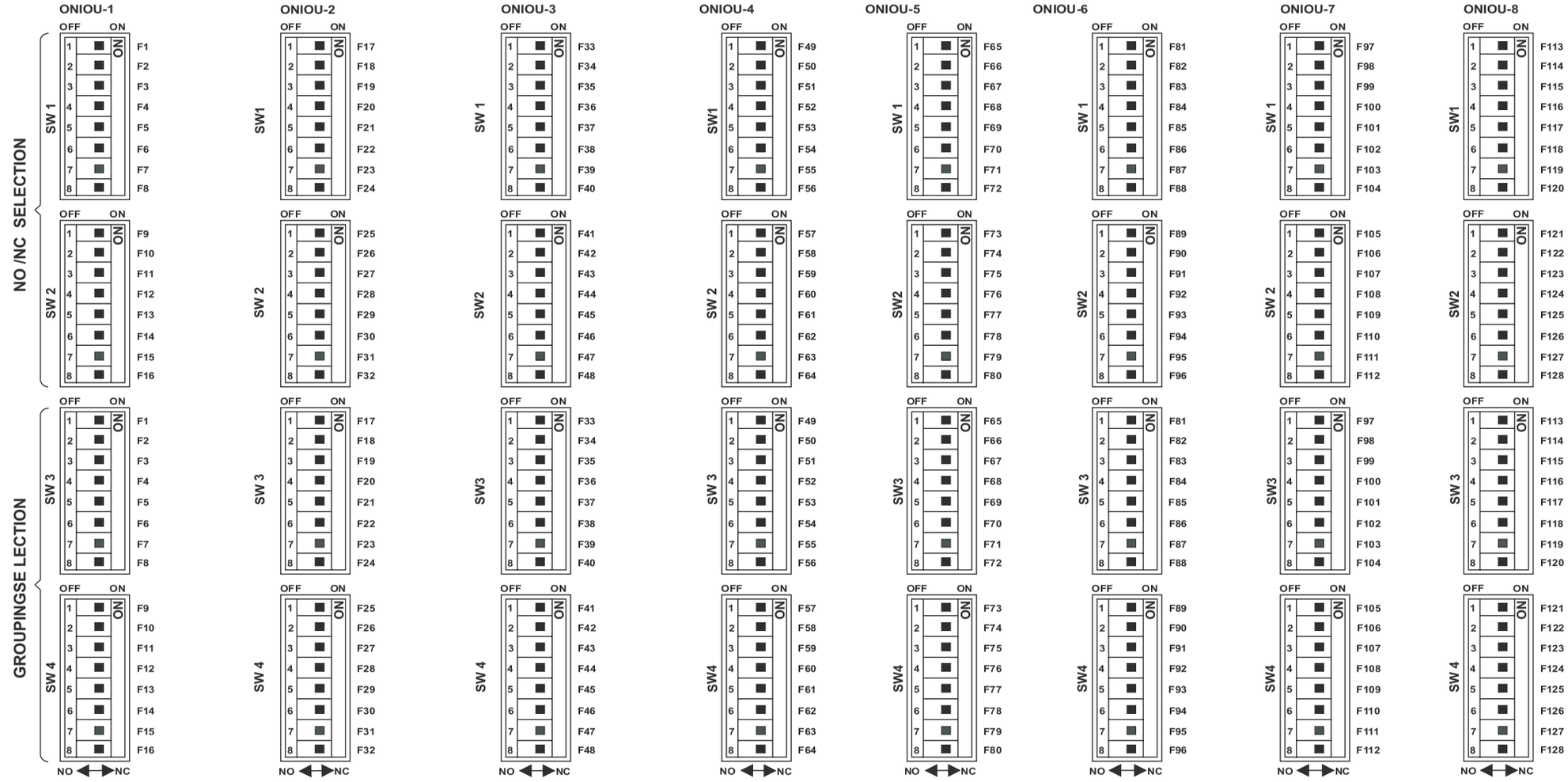


Fig. 1.4 PANEL CUTOUT DETAILS – DFU (16 – 128 PT. BIG & SMALL)



DIPSWITCH	FAULTCONTACT	OUTPUTCONTACT	GROUP
OFF	NO	RELAY–1	1
ON	NC	RELAY–2	2

FIG.1..5 DIP SELECTION CHART

Note: 1) For ID selection please consult minilec.
2) DIP Switch for RS 232 / 485 is available on MCU card

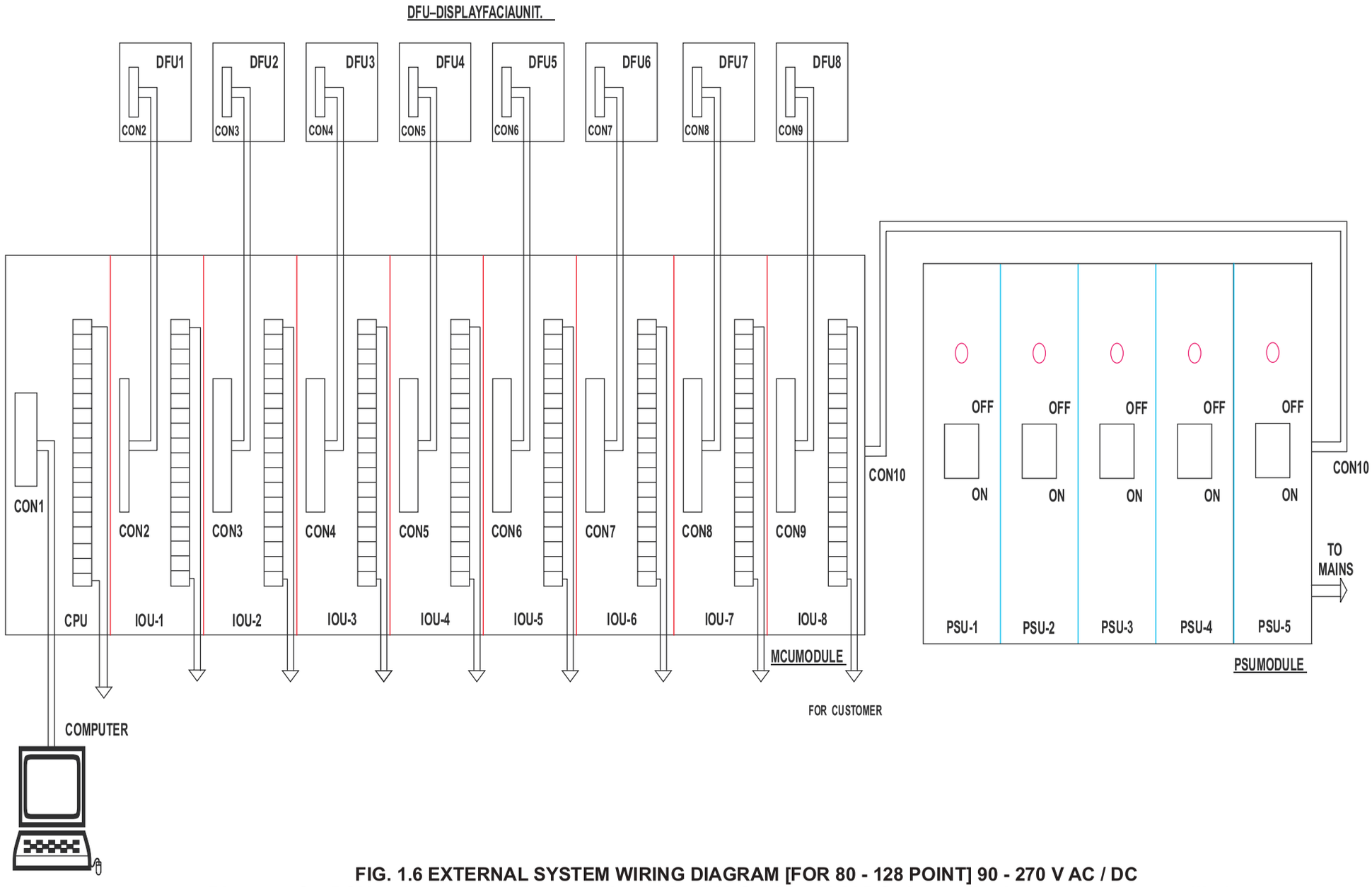
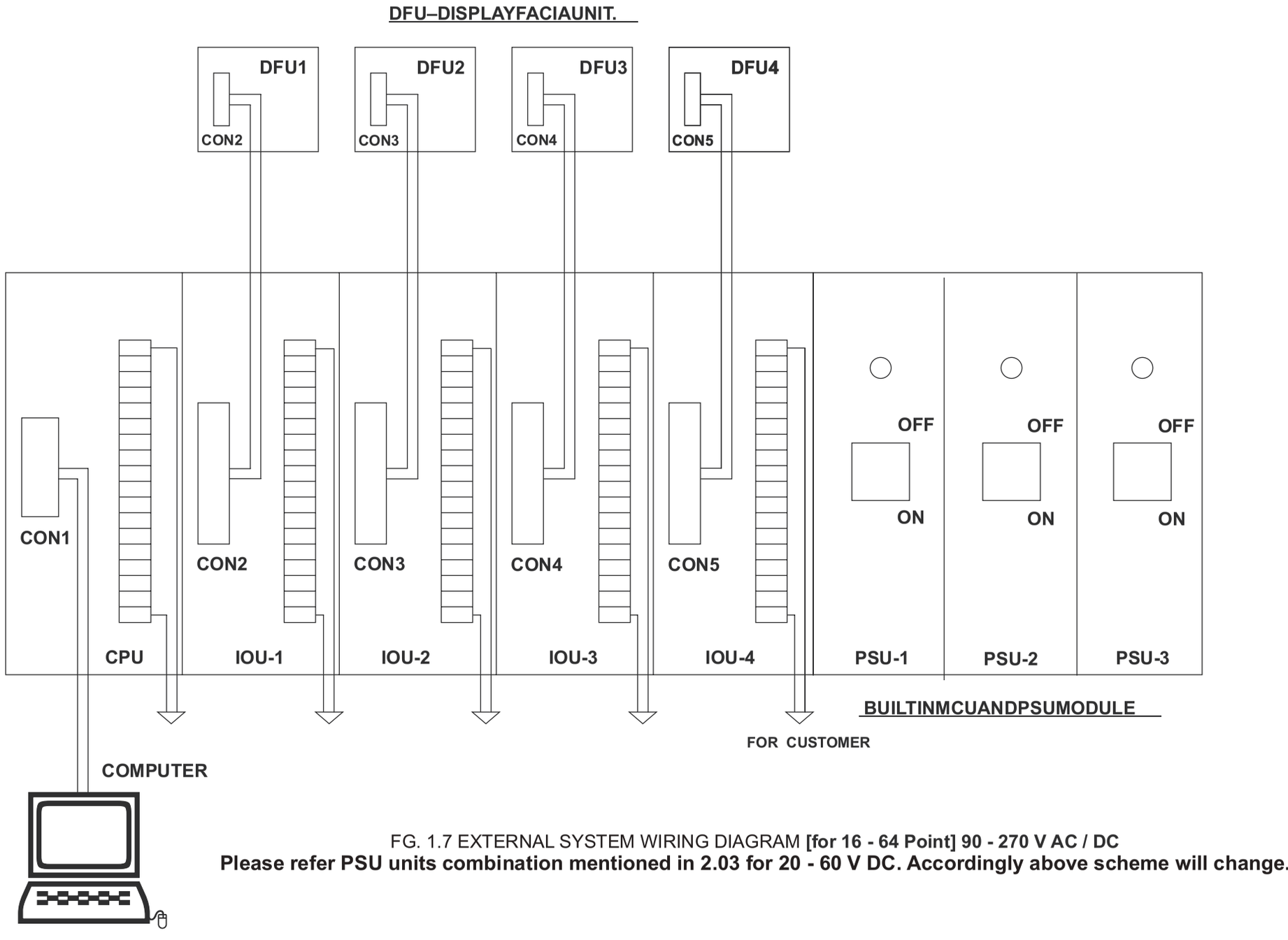


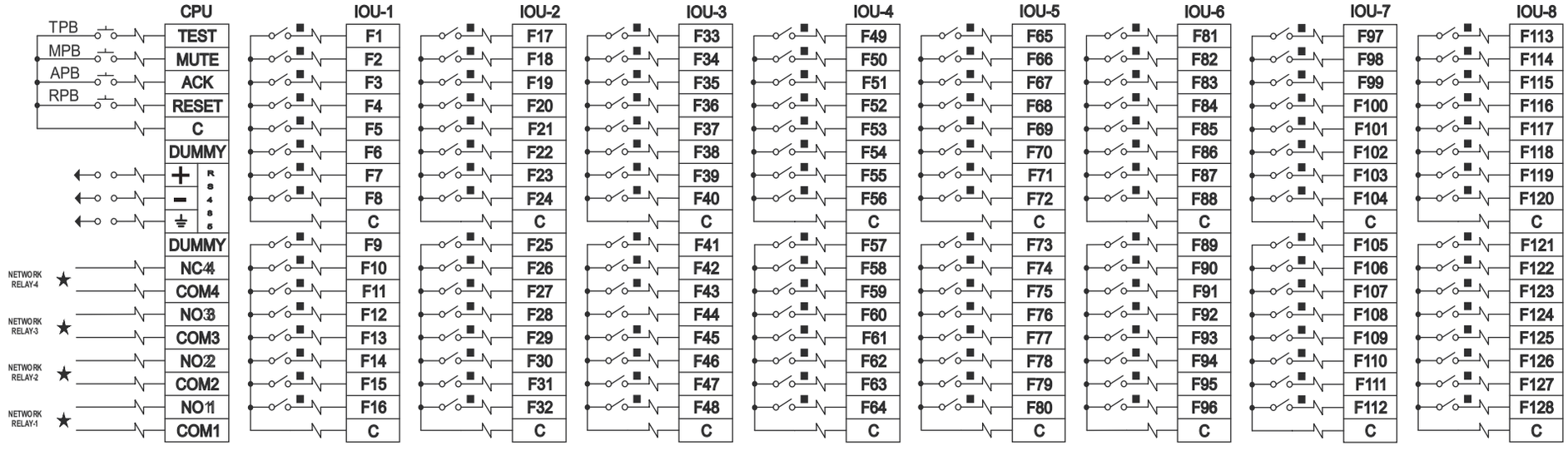
FIG. 1.6 EXTERNAL SYSTEM WIRING DIAGRAM [FOR 80 - 128 POINT] 90 - 270 V AC / DC

Please refer PSU units combination mentioned in 2.03 for 20 - 60 V DC. Accordingly above scheme will change



FG. 1.7 EXTERNAL SYSTEM WIRING DIAGRAM **[for 16 - 64 Point] 90 - 270 V AC / DC**

Please refer PSU units combination mentioned in 2.03 for 20 - 60 V DC. Accordingly above scheme will change.



NOTES:–

1) ■ — EXTERNALPOTENTIALFREECONTACTS.
2) F-----FAULTINPUTCONTACT.
3) C---- COMMONPOINTFAULTINPUTCONTACT.
4)TPB–TESTPUSHBUTTON.
5)MPB–MUTEPUSHBUTTON.
6)APB– ACKNOWLEDGEPUSHBUTTON.
7)RPB–RESETPUSHBUTTON.
8)CONNECTEXTERNALCONNECTIONASPERTERMINALSPROVIDEDONUNIT.
9)DUMMY–NOTERMINALCONNECTIONPROVIDED.
10)CONNECTSUPPLIED RRCNETWORKACROSSHOOTERCOIL.HOOTERSUPPLYISSAMEASAUX.SUPPLYOFANNUNCIATOR.
11) ★ —REFER FIG. NO. 2.7 FOR COMMON HOOTER CONNECTION.
12)RELAY-1 & RELAY-2AREPROVIDED FOR GROUP 1 AND GROUP 2.
13) RELAY 3 IS PROVIDED FOR RING BACK SEQUENCE (OPTIONAL).
14) RELAY4 –ISPROVIDEDFORCPU/PSUFAILINDICATION.
15) +,- ,⏚ TO BE USED WHEN SYSTEM IS WITH BUILT IN RS-485 CARD AS OPTIONAL ELSE CONSIDERED AS DUMMY.

FIG. 1.8 EXTERNAL TERMINAL CONNECTION DIAGRAM

SECTION 6.2

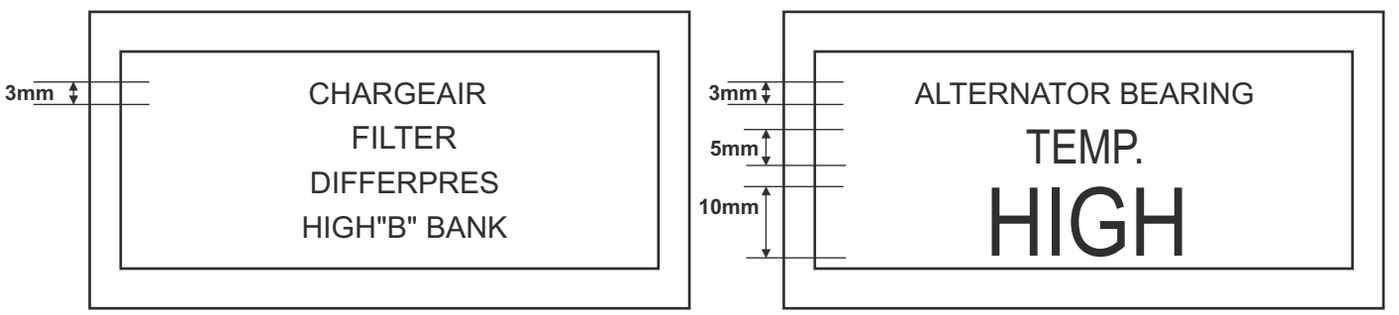
MBAS9700COMMONDIAGRAM

FIG. 2.1 LEGENDSLETTERSIZES

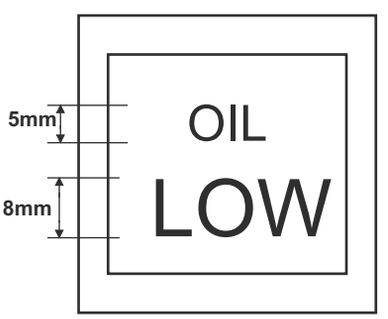
MBAS - 9700 FACIA incorporates a 'Photo Negative' type or 'Positive' type legend plates which are individually accessible from the front of the unit. Guidelines for selection of letter size & number of lines per window are as below.

SMALL &BIG WINDOW

LETTER SIZE IN MM	NO.OF LINE PER WINDOW	NO.OF LETTERS PER LINE	
		Small	Big
3	4	9	19
5	3	5	11
8	2	3	7
10	2	3	5

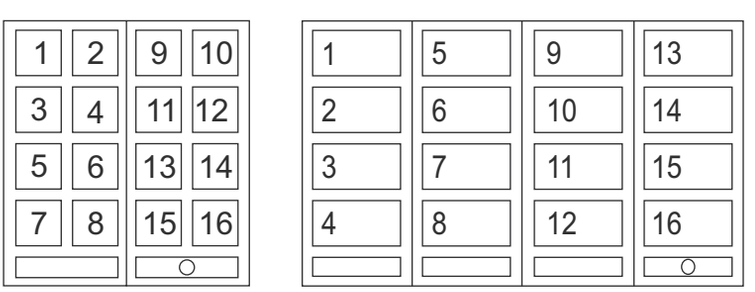


Big size window 65.6mm x 29.6 mm (Internal)



Small size window 29.6 mm x 31.1 mm (Internal)

FIG. 2.2 WINDOW NUMBERING SYSTEM



Ⓐ Small Window configurations

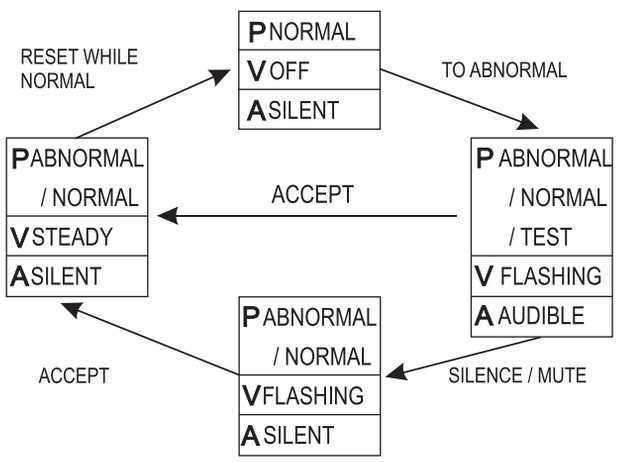
Ⓑ BigWindow configurations

Thenumberingsystemisshownfor16pt.model(Small,Big) for reference.
Allothermodelscanbereferredfromthisfig.

FIG. 2.3 STANDARD OPERATING SEQUENCE CHART

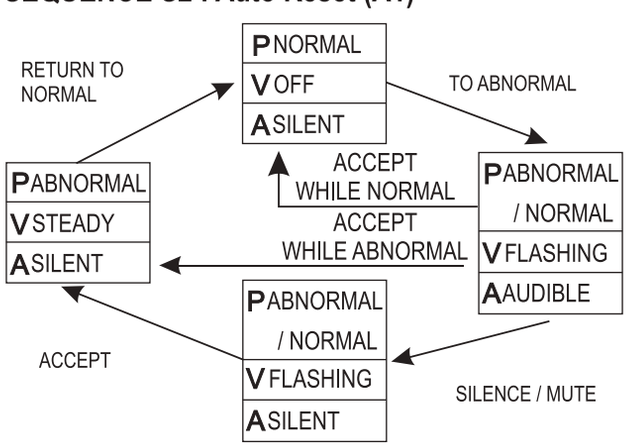
Minilec Sequence Code	Operating Sequence Title	ISA Std. Code
S1	Manual Reset	M1
S2	Auto Reset	A1
S3	Ringback	R1-12
S4	First UP	F2M-1

SEQUENCE S1 : Manual Reset (M1)



1. Test, Silence, Accept, Reset Push Buttons are external.
2. Audible alarm can be silenced by pressing Silence (Mute) Push button.
3. Manual reset of Accepted faults after process conditions return to normal.
4. Operational test provided.

SEQUENCE S2 : Auto Reset (A1)

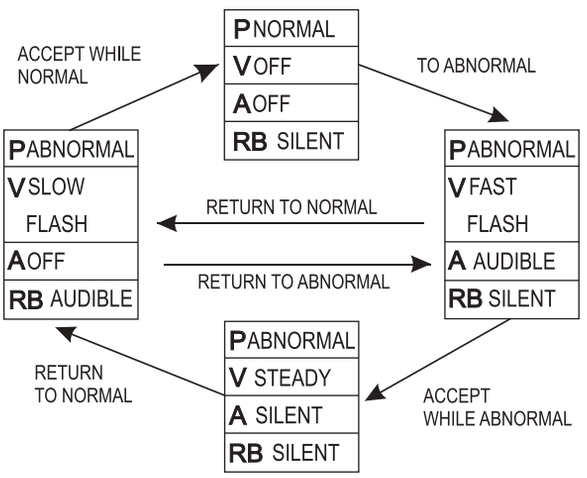


1. Test, Silence, Accept, Reset Push Buttons are external.
2. Audible alarm can be silenced by pressing Silence (Mute) Push button.
3. Automatic reset of Accepted faults after process conditions return to normal.
4. Operational test provided.

Note:
P : Process Status, **V :** Visual Alarm Status, **A :** Audible Alarm Status, **RB :** Ringback audible alarm status.

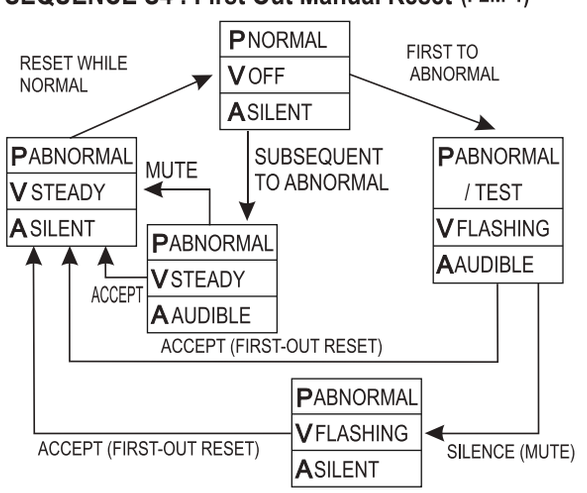
FIG 2.3 STANDARD OPERATING SEQUENCE CHART

SEQUENCE S3 : Ringback (R1-12)



1. Test, Silence, Accept, Reset Push Buttons are external.
2. Alarm & ringback Audible devices.
3. Audible device or ringback alarm can be silenced by pressing Silence (Mute) Push button.
4. Ringback visual & audible alarm when process status returns to normal.
5. Operational test provided.

SEQUENCE S4 : First Out Manual Reset (F2M-1)



1. Test, Silence, Accept, Reset Push Buttons are external.
2. First-out flashing and subsequent steady.
3. Manual reset of Accepted faults when process status return to normal.
4. Operational test provided.

Note:
P : Process Status, **V :** Visual Alarm Status, **A :** Audible Alarm Status, **RB :** Ringback audible alarm status.

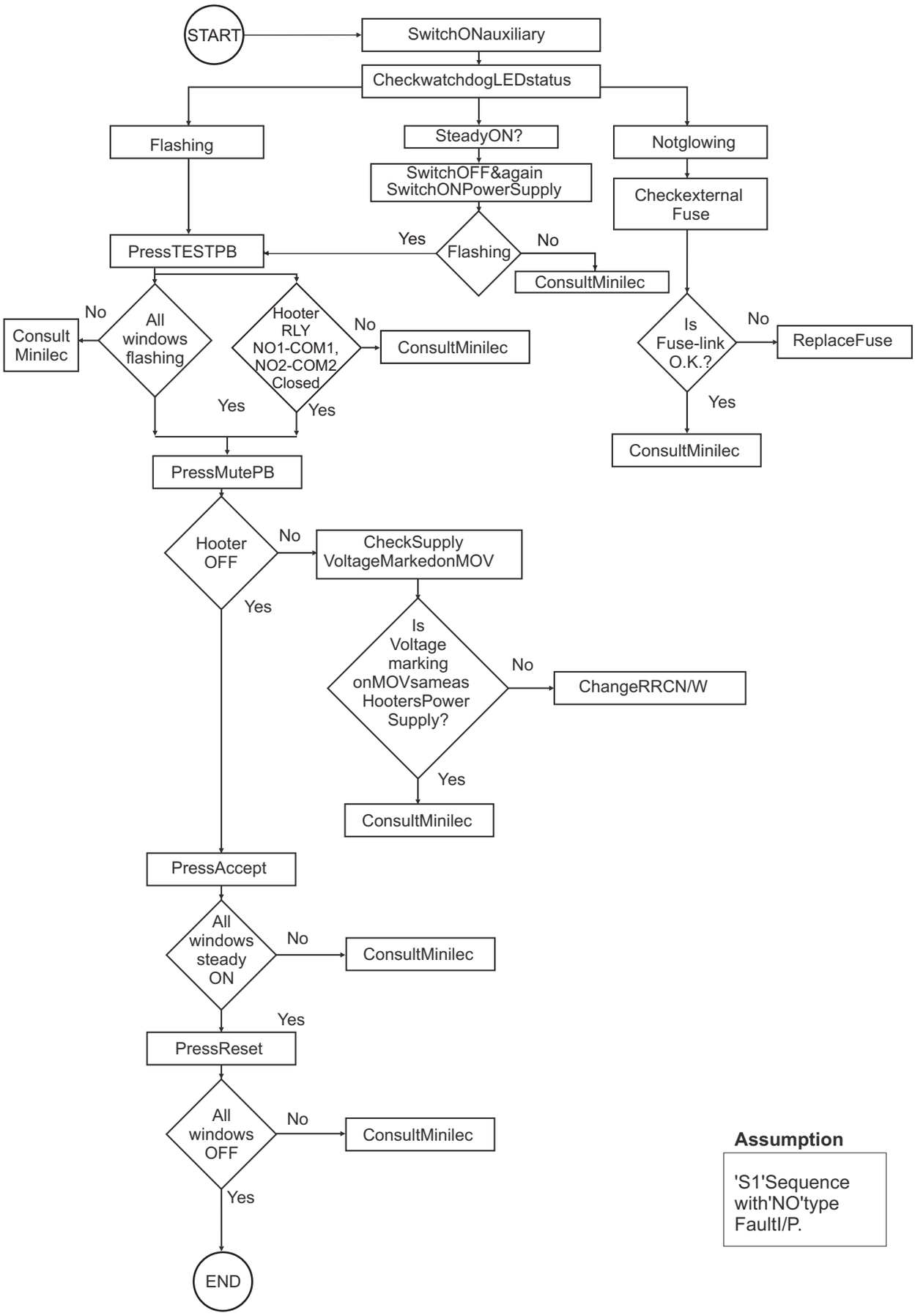


FIG 2.4 TESTING FLOW CHART

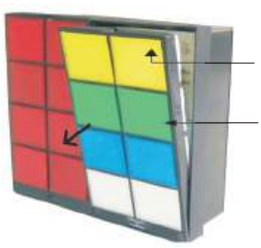
Instructions for removing and fitting of the front Acrylic for changing the Legends of MBAS 9700.

In case of changing the Legends, release top black locking knob of front black window frame by pulling up top black cover with the help of screwdriver. Hold the front black window frame at bottom and pull out gently.

Step 1

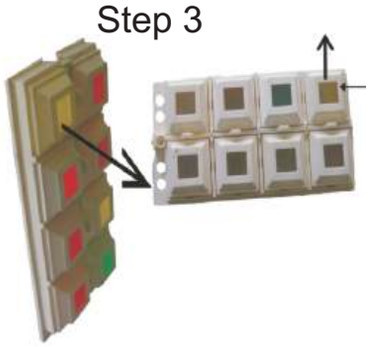
With the help of screwdriver release top black colour locking knob of front window frame by pulling up top black cover.

Step 2

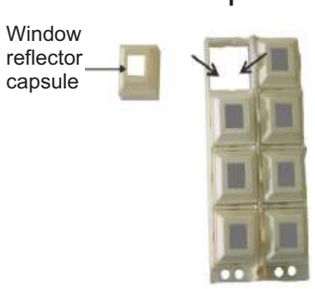


Hold the front black window frame at bottom and pull out gently

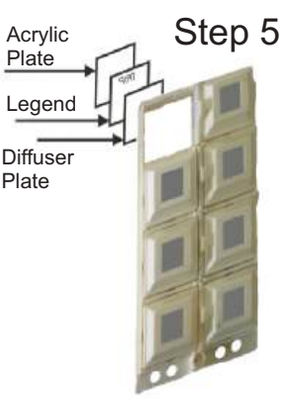
Step 3



Step 4

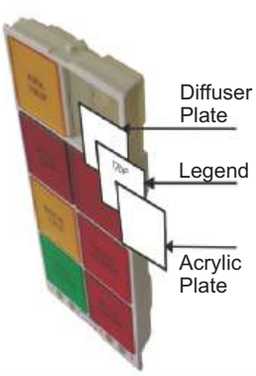


Step 5



Step 6

Step 7



Step 8

Insert Properly front black window frame in the slot provided at the bottom of Bezel.

Step 9

Slightly uphold the top black cover by screwdriver and push the front Black Window frame inside & press to get locked from top and bottom.

Hold the black window frame keeping Acrylic plate side at bottom and window reflector capsule side on the top. Pull up the window reflector capsule. In case of small window facia, pull out window reflector capsule without touching separator between two windows. Keep both the thumbs at center of the diffuser plate from back side and press downward. Then front Acrylic plate will come out with Legend.

For refitting

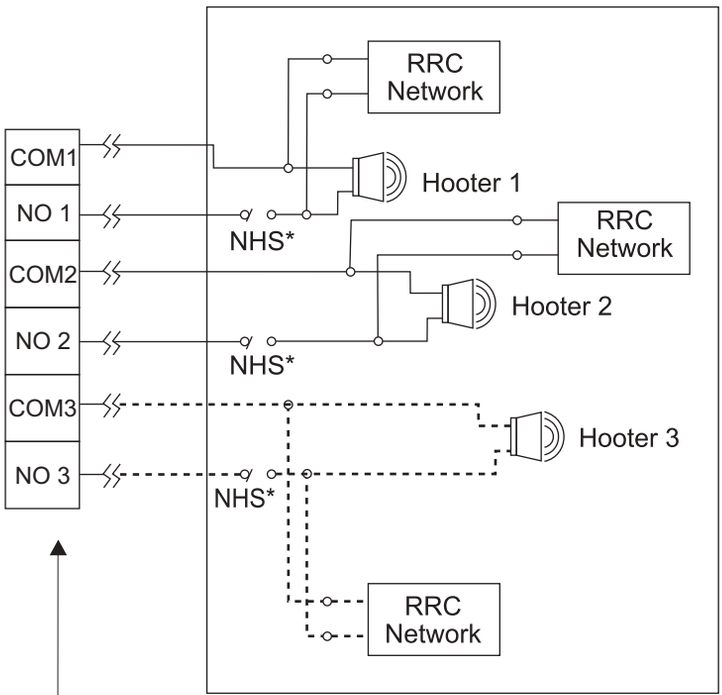
1. Insert the window reflector capsule in the respective slot from top and press it.
2. Locate the cutout slot provided on the front side of the front window frame for holding diffuser plate. Insert the diffuser plate in a slot, keeping plain surface on the front and surface provided with cutout edges on the back side.
3. Put the Legend on top plain surface of the back side.
4. Insert front Acrylic plate keeping textured finished side on the front and plain surface on back side having cutout edges with small additional locking edges on each side of the plate. Match the cutout edges and press it from all side. The plate gets refitted with locking sound.
5. Always ensure proper insertion and refitting of plate.

After fitting of diffuser plate, Legends, Acrylic plate & window reflector capsule, insert the front black window frame in the slot provided in he annunciator front bezel, match the locking knob and push button position at bottom of the front black window frame. Then slightly uphold the top black cover by screwdriver and push the front black window frame inside, so that front black window frame gets locked from top and bottom.

FIG 2.5Instructions for removing and refitting of the front Acrylic & Legends.

CommonHooterRelayContactConnections, with RCC Network.

Fig : 2.6 Common Hooter Relay connection diagram



- Hooter 1 & Hooter 3 shown inside the box are external to the annunciator module.
- RLY1 & RLY2 are universally provided with every **MBAS 9700** annunciator module.
- RRC Network assembly is supplied with every annunciator module. It is designed for normal power supply voltage of Hooter coil (load).
- Connect this network (RRC) across the audible Hooter coil (load).
- Presumption
  Normal supply voltage of **MBAS 9700** and Hooter coil supply voltage are same.
- When more annunciator modules are used together, for multiple window configuration, consult Minilec while ordering or before delivery to enable correct supply of the network RRC or one common audible device (Hooter).

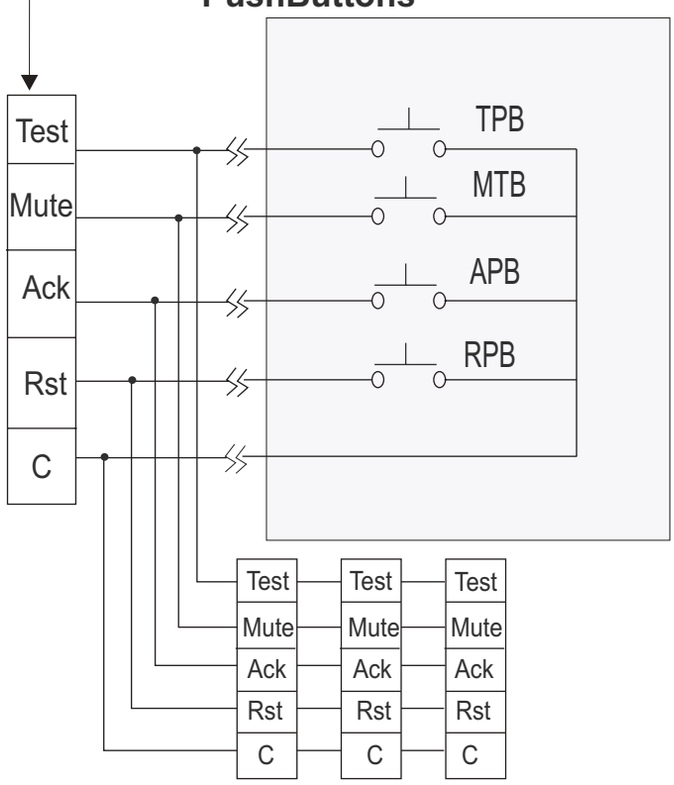
Dotted line to be considered for 3rd relay.

* NHS = Normal Hooter Supply

Lookfortheseterminallablesatthe front ofMBAS9700Annunciatormodule.

PushButtons

Fig :2.7



NOTE: External Potential NO type Push Buttons. Wherever multiple units (modules) are used together for multipoint windows, the same set of push button should be connected in parallel as shown.

Press the keys till, all the Annunciator accept those keys.

SECTION6.3

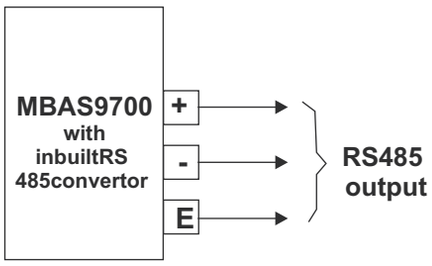
RS232/RS485CONVERSION

FIG.6.3-1INBUILTRS485CONVERTORCARD

FIG.6.3-2USINGRS232TORS485CONVERTOR

6.3-1 INBUILT RS 485 CONVERTOR CARD

RS485OUTPUTREQUIREMENT/FORLONGDISTANCECOMMUNICATION(UPTO1KM)



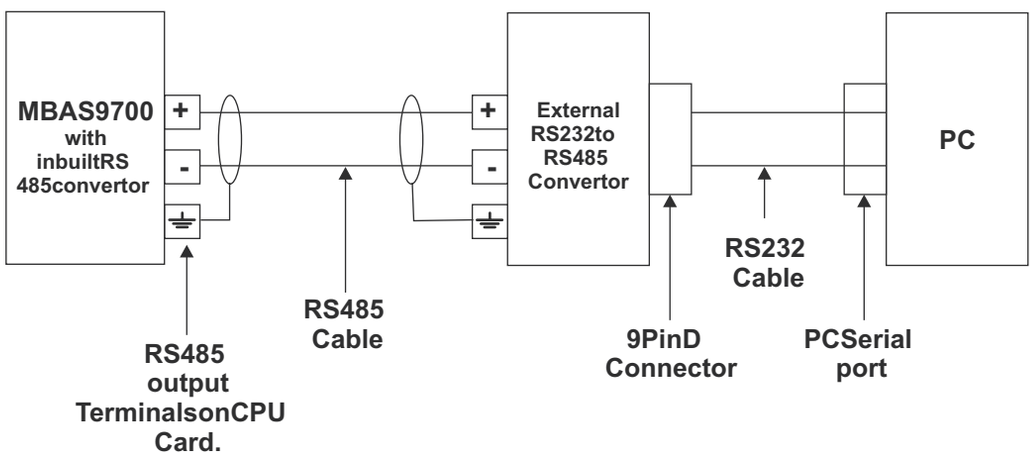


FIG 3.1

Notes

1)RS485cardisprovidedasadd-oncardonCPUcard.

2)Terminalsof-,+, areprovidedonCPUcardwhenAnnunciatorissuppliedwithbuiltinRS485facility.

3)WhileusingRS485outputoftheAnnunciatorsystemensurethatalltheDIPswitchesofSW1 WhichareprovidedonRS485cardshouldbeturnedONposition.

4)IncaseUserwanttouseRS232outputfacilitytheDIPswitchesofSW1WhichareprovidedonRS485 CardshouldbeturnedOFFposition.

5)Shieldedtwistedpaircablewithcharacteristicimpedanceof120 Ω isrecommendedforRS485 Cable.

6.3-2 USING RS 232 to RS 485 CONVERTOR

FORLONGDISTANCECOMMUNICATION(UPTO1KM).

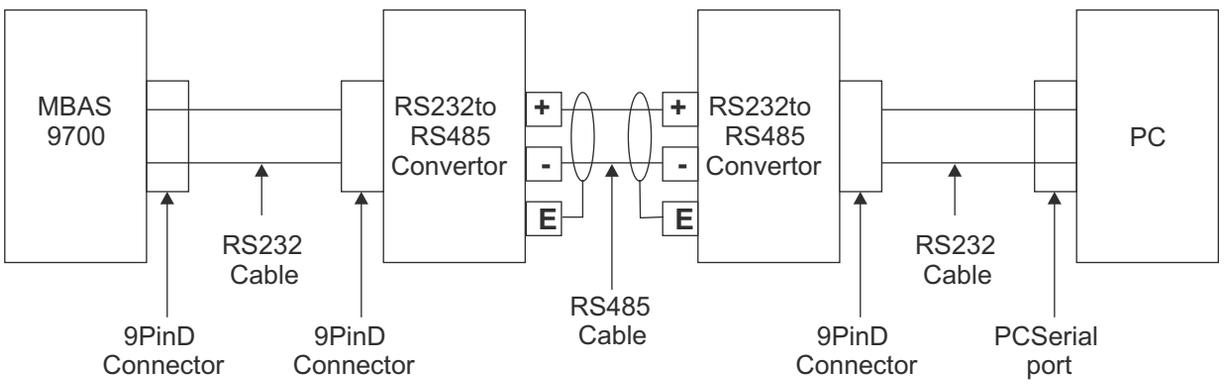


FIG 3.2

Notes

1)UseRS232cablesassuppliedwithannunciatorandRS232toRS485convertors.

2)RS232cableistobeconnectedwithproperendasmentionedoncableconnectors.

3)RS485cable(whichistobepurchasedbyuser)istobeconnectedwithproperpolarities.

4)Shieldedtwistedpaircablewithcharacteristicimpedanceof120 Ω isrecommendedforRS485 Cable.

5)ConnectAux.SupplytoRS232toRS485convertorasmentionedonit.

SECTION6.4

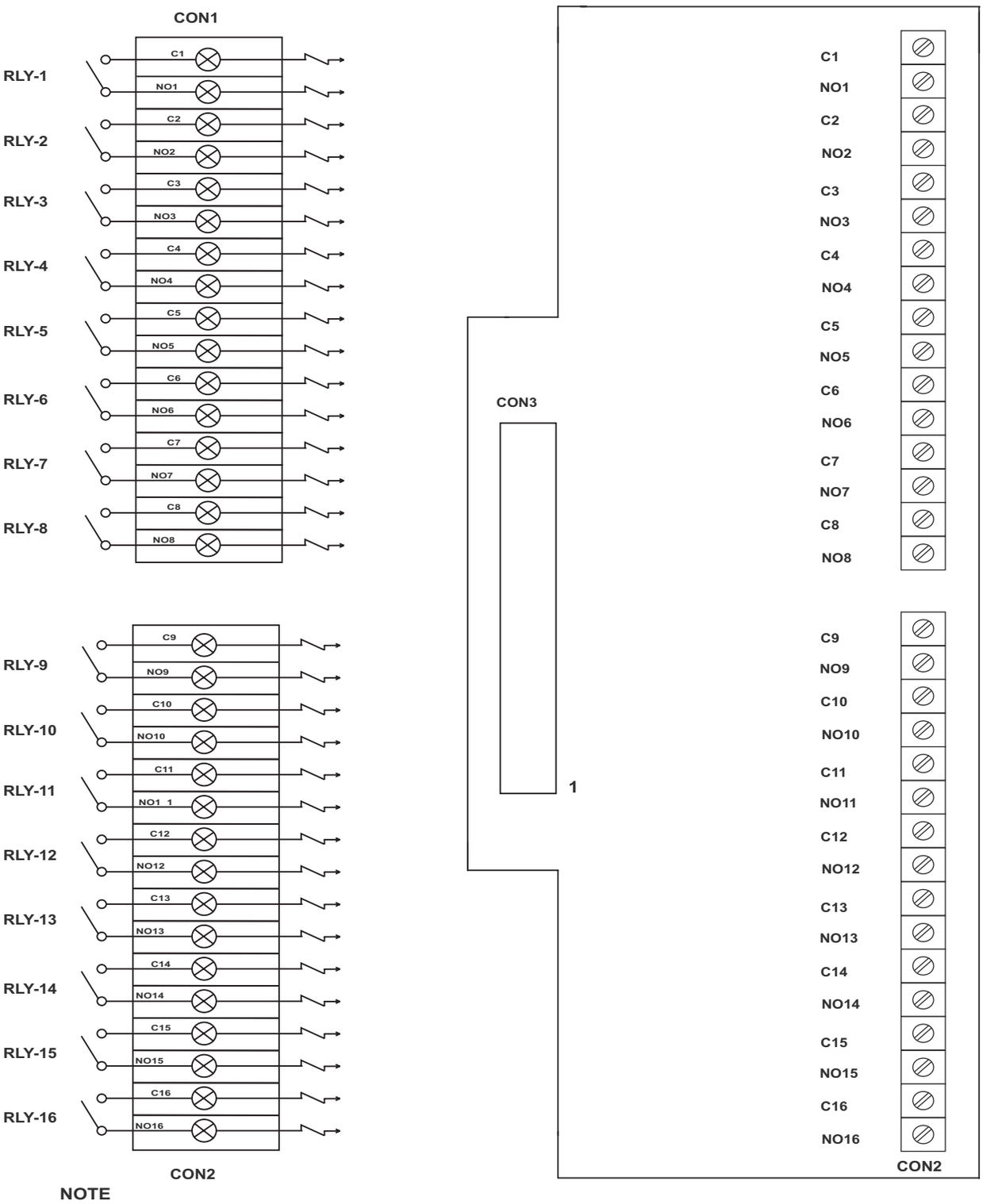
REPEATRELAY

FIG.6.4-1 REPEATRELAYOUTPUTCONTACTCONNECTION

FIG.6.4 - 2 EXTERNALSYSTEMWIRINGDIAGRAMWITHREPEATRELAY[FOR80-128POINT]

FIG. 6.4- 3 EXTERNALSYSTEMWIRINGDIAGRAMWITHREPEATRELAY[FOR 16 - 64 POINT]

6.4 - 1 Repeat Relay Output contact connections



NOTE

- C-RepeatFaultcontact.
- NO-CommonpointofrespectivefaultcontactUseinterfacingcableforconnectionofrepeatRelaycardCON3tomainannunciatorunitR/Rconnector

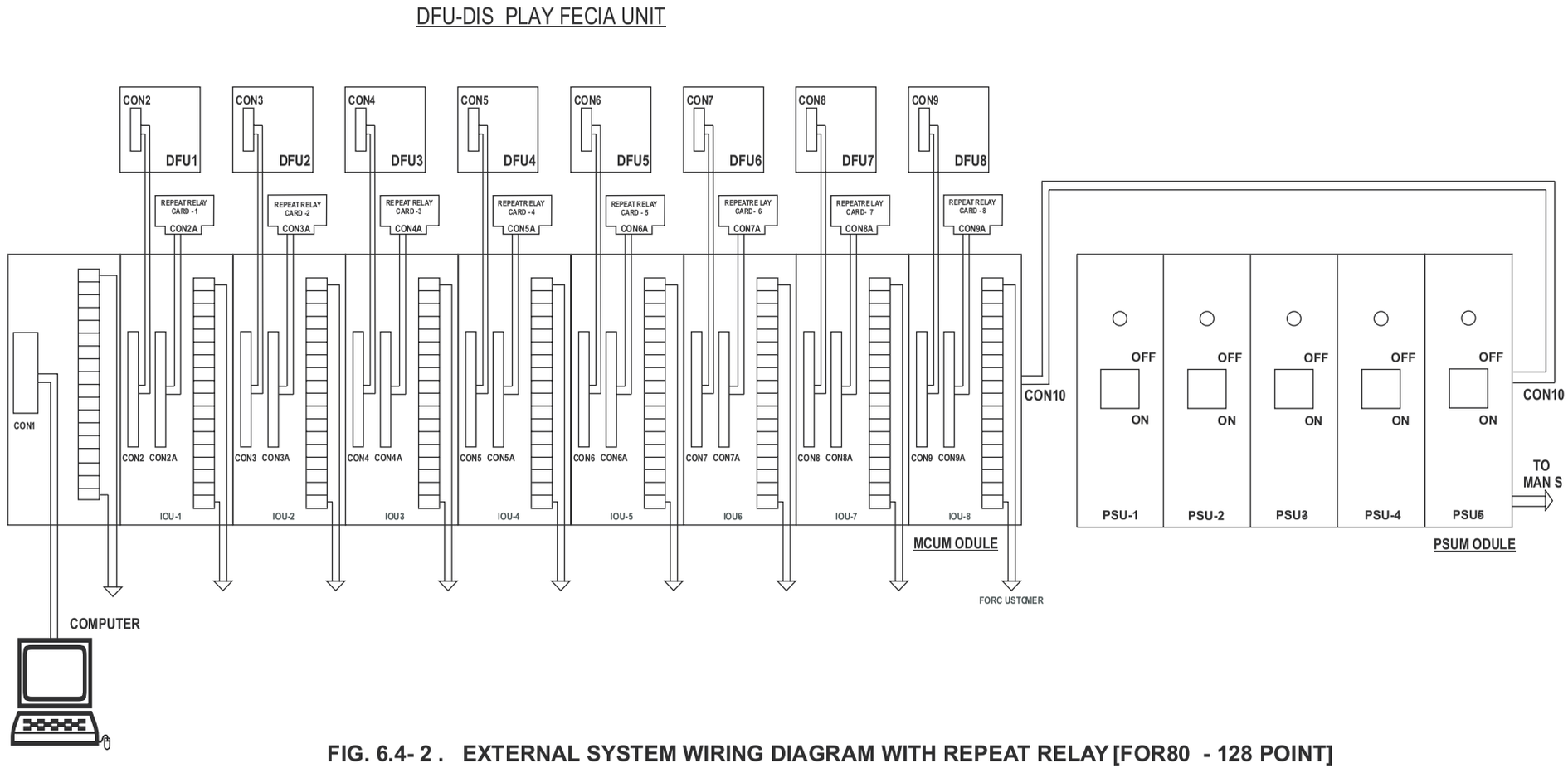


FIG. 6.4- 2 . EXTERNAL SYSTEM WIRING DIAGRAM WITH REPEAT RELAY [FOR80 - 128 POINT]

DFU-DIS PLAYFE CIA UNIT

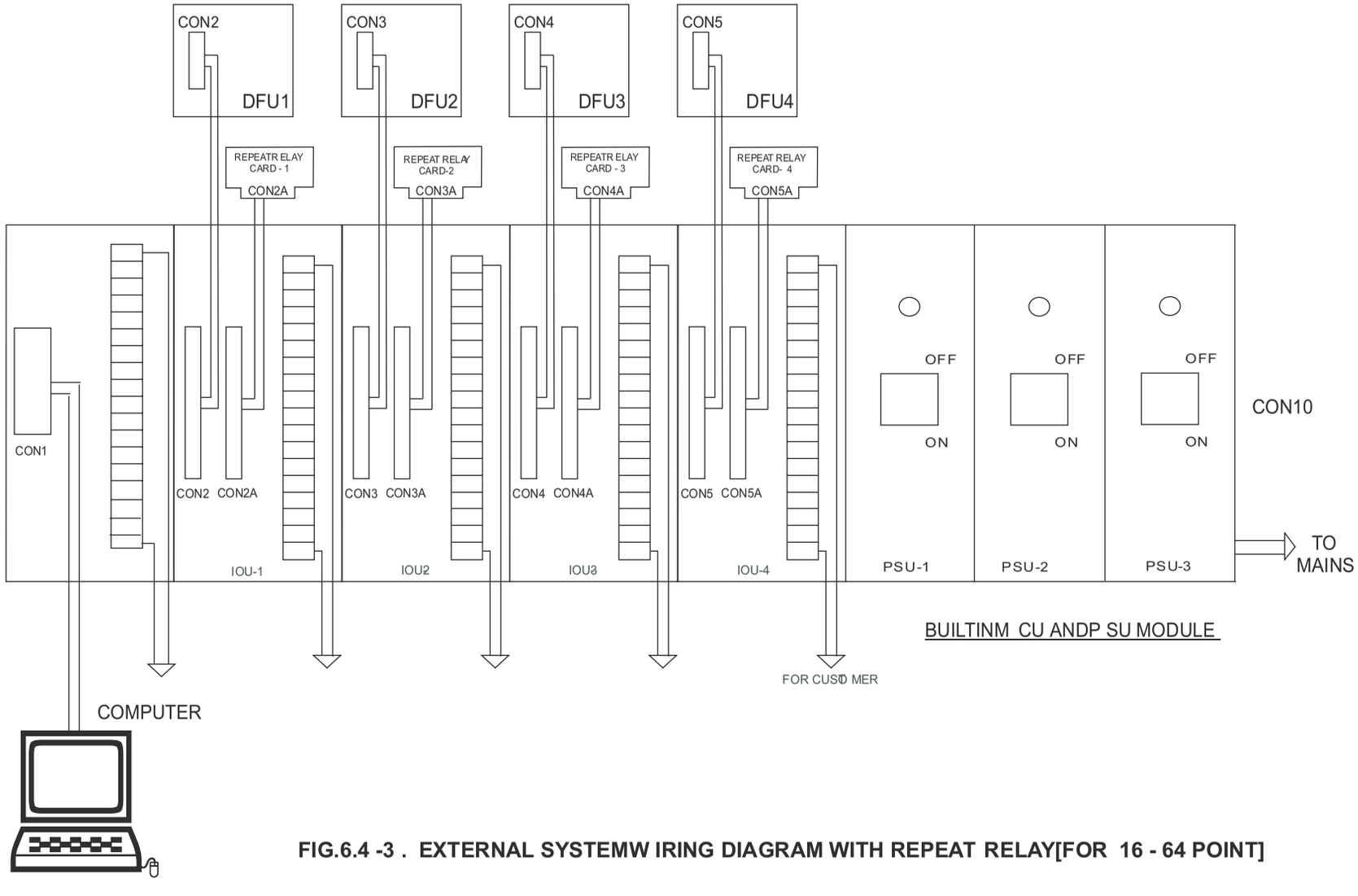


FIG.6.4 -3 . EXTERNAL SYSTEMW IRING DIAGRAM WITH REPEAT RELAY[FOR 16 - 64 POINT]