

S7GSM361  
S7GSP361

M.I.S. - PURCHASING AND MATERIAL MANAGEMENT  
INQUIRY OF SPARE PART SUGGESTED TYPE

31-06-92  
12:48:33

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MATERIAL CODE : 404050110089N      ORDER NUMBER :    (OPTIONAL)  
DES MAT: CONTROL MICROPROCESSOR CARD FOR AUTOMATIC INTERVENTION GENER QCM: 6  
CAT.NO / DRW.NO. : 5639109      DOC. TYPE : 5  
CAT.POS./DRW.POS.: A3      DIFFERENCE :  
TYPE : MPA400      CPE  
FLG.      SUGGESTED TYPE      MANUFACTURER      DATE      ORDER      USR

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MPA400		CPE			
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ENTER-PF1→PF2→PF3→PF4→PF5→PF6→PF7→PF8→PF9→PF10→PF11→PF12→  
RET      IGN      BACK      FORW      QUIT M.PREV M.INI

E0018 - TOP OF DATA REACHED

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IRISA      LTG

# **MPA400**

***Control microprocessor card for automatic  
intervention generating set.***

## General

**MPA400** is an electronic card for the automatic/manual management of diesel pump electric board. Based on a microprocessor technology, it makes possible to simplify the diesel pump management and to operate under safety conditions for the system, in conformity to rules of fireman fire-fighting Concordat .

The diesel pump running mode can occur in accordance with two modes:

- Manual mode: the activation/deactivation of the diesel pump shall be executed by the operator, by the use of the push buttons on the control panel.
- Automatic mode: in case of remote request, the diesel pump automatically start. The deactivation of the diesel pump shall be executed by the operator, by the use of the push buttons on the control panel.

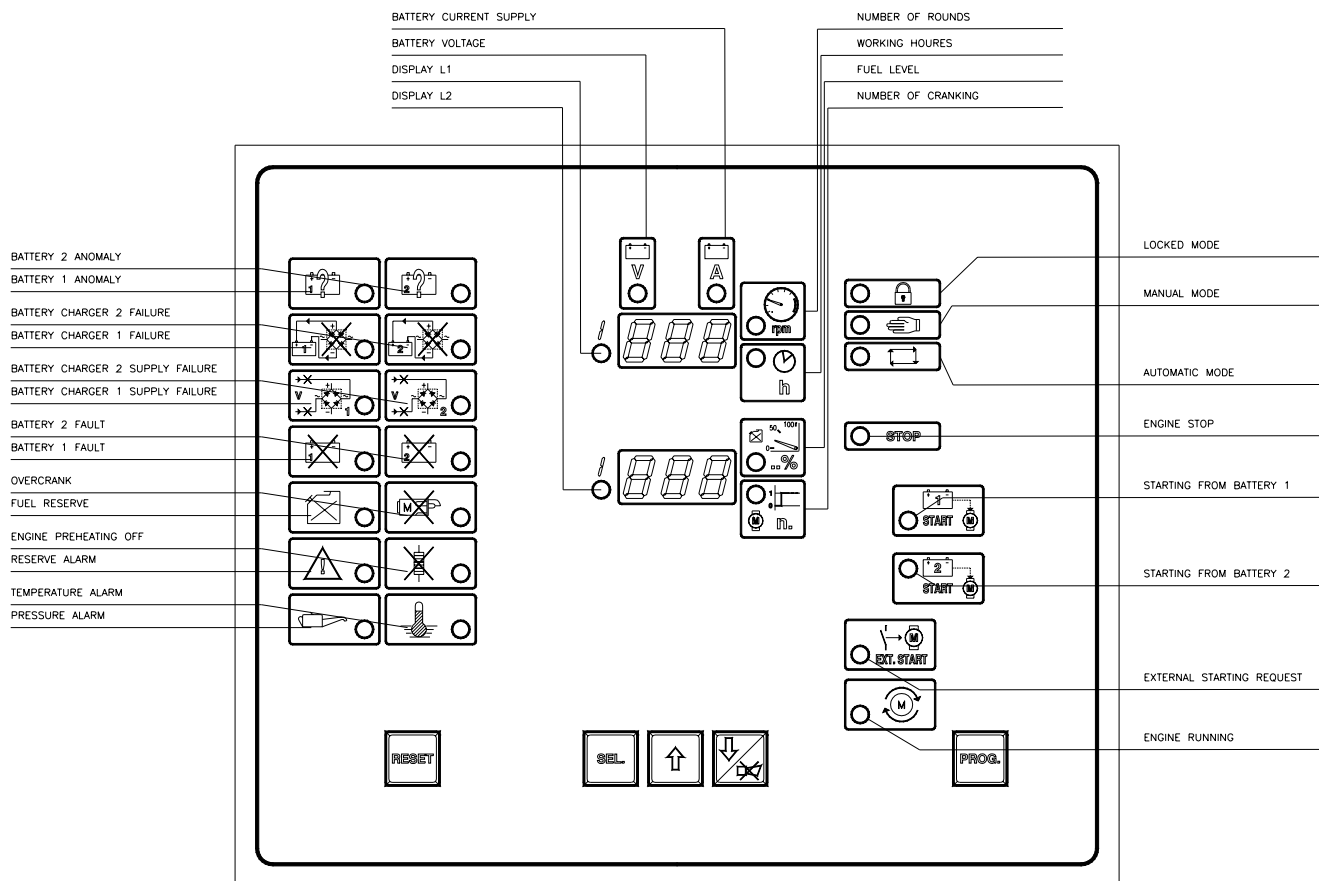
The card makes possible:

- A complete protection of the engine with a wide series of independent optical signals
- A complete control of the diesel pump efficiency, through the several alarms, the state signals and the display of the available analogical measures.
- The configuration of several functional parameters, operating directly on the card push buttons, without the use of any external device.

## Front panel

It is divided into 4 areas:

1. Alarms
2. Electric and functional measures of the diesel pump
3. Card functional state
4. Diesel pump operational condition



## 1. Alarms

Each alarm of the system is equipped with an independent optical signal (led).

The following table shows all alarm causes; the letters Pxx indicate the programming pitch, which establishes the relative alarm behaviour, as the covering time or the threshold on the relative analogical time available, see the programming pitches table below.

N	INPUT	RET	DESCRIPTION	NOTES	TYPE
1	J9 PIN 5		OIL ALARM	NON MEMORIZED (with covering time)	ALARM
2	J9 PIN 4		TEMPERATURE ALARM	NON MEMORIZED	ALARM
3	J9 PIN 3 OR THRESHOLD ON FUEL LEVEL P8		FUEL RESERVE	NON MEMORIZED	ALARM
4	J9 PIN 2		RESERVE ALARM	NON MEMORIZED	ALARM
5	EXCEEDED QUANTITY OF P19 START ATTEMPTS		NO START		ALARM
6	J9 PIN 11		BATTERY 1 ANOMALY	PITCH 20	ALARM
7	J9 PIN 10		BATTERY CHARGER 1 FAILURE	NON MEMORIZED	ALARM
8	J9 PIN 9		BATTERY CHARGER 1 SUPPLY FAULT	NON MEMORIZED	ALARM
9	J9 PIN 8		BATTERY 2 ANOMALY	PITCH 20	ALARM
10	J9 PIN 7		BATTERY CHARGER 2 FAILURE	NON MEMORIZED	ALARM
11	J9 PIN 6		BATTERY CHARGER 2 SUPPLY FAULT	NON MEMORIZED	ALARM
12	J10 PIN 15		PREHEATING OFF	NON MEMORIZED	ALARM
13	P9 or P10 BATTERIES VOLTAGE THRESHOLDS	P11	BATTERY 1 AND 2 FAILURE	MEMORIZED	ALARM

When an alarm occurs, to stop the electro-pump it is necessary to set the manual operation mode by turning the predisposed key selector and pushing the stop pushbutton always provided on the panel board.

If the reported alarm is memorized it will be necessary to cancel it by means of the **Reset** pushbutton. The not memorized alarms are automatically cancelled by repair of the anomaly conditions.

## 2. Electrical and functional measures of the diesel pump

The card is equipped with two high luminescence digital displays, each one with three figures, for values included from 0÷999; each display has a led optical signal on the left, whose value is one thousand

The type of measure, which may be visible on a certain moment on the display, is signalled by a series of optical indicators, located on the high and central part of the panel.

The several type of measures are the following:

- V = batteries direct voltage
- A = batteries direct current

From the top to the bottom, the two displays show the voltages and the currents of battery 1 and 2.

The general precision degree of the measurement instrumentation is equal to 1,5%. The calibration of the measurement instrumentation is carried out in laboratory by a special calibrator.

Any possible adjustment of the above mentioned calibrations, related to the system characteristics (i.e. engine rounds or engine running threshold) shall be executed when the system is set at work, operating on special trimmers inside the control unit.

The other measurement types available are the following:

a) on the upper display:

- RPM (x10) = rounds number of engine
- H = working hours of the diesel pump

b) on the lower display

- Lev = fuel level (only if the tank is equipped with the level measurer)
- N start = number of starts of the setting at work

## 3. Card functional state

The card can work in 3 different modalities, signalled by the relative Led lighting:

Blocked

Manual

Automatic

The change of state occurs according to the modalities below described (use of the auxiliary modality selector on control panel)

## 4. Operational state of the diesel pump

The following operational conditions are displayed by Leds on a synoptic table:

Stop cycle

Start cycle from battery 1

Start cycle from battery 2

External diesel pump starting request presence

Started engine condition

## 5. Operator's and functional keys

Each of the above-described areas is equipped with one or more keys.

### a) Alarms and signals areas

- **Reset** - It makes possible to reset the system alarm condition

### b) Electric and functional measures area of the diesel pump; the functions described are active depending from the unit working selection choice.

#### By working selection in Manual or Automatic

- Sel**                permits to select the type of measure to display on the screen  
 ↓                    permits the siren silencing.

#### By working selection in Blocked mode.

- Sel**                permits to pass to the subsequent programming pitch  
 ↑                    permits a numeric increase in the parameters programming function.  
 ↓                    permits a numeric decrease in the parameters programming function

On panel board there are the following controls.

- Operation selector (with key)** - It allows to select the motor-pump operation mode among the three possibilities: Locked (0) – Manual - Automatic
- Manual stop pushbutton (red)** - It could be used only in Manual operation mode, it allows to stop the motor-pump
- Manual start pushbutton (green)** - It could be used only in Manual operation mode, it allows to start the motor-pump

## Start sequences

- Automatic mode** By intervention request, the motor-pump starts by means of some attempts set in P06 parameter, which take place by turns from the two batteries.
- Manual mode** By keeping pushed the manual start pushbutton on the panel board the motor-pump starts operating. In case of no start, it is necessary to release the pushbutton and try again after a pause. By every press of the pushbutton the start impulses come by turns from the two batteries.

In both the operation modes, in case of battery anomaly alarm, the whole series of start attempts come from the other battery.

## Rear panel

It has a wide terminal board, with interconnection blocks with the outside system and foresees:

TERMINAL BOARD	PIN	DESCRIPTION	NOTES
<b>J2</b>		<b>Input for measure</b>	
	1	W	<i>Input "W" signal from battery charger alternator for rounds counter instrument</i>
	2	<i>Non connected</i>	
<b>J3</b>		<b>Tele-signals outputs</b>	
	1	N.C. mode selector non in automatic position	<i>MAX 10A resistive load</i>
	2	<i>Non connected</i>	
	3	Common mode selector non in automatic position	<i>MAX 10A resistive load</i>
	4	<i>Non connected</i>	
	5	N.O. mode selector non in automatic position	<i>MAX 10A resistive load</i>
<b>J4</b>		<b>Tele-signals outputs</b>	
	1	N.O. starting request	<i>MAX 10A resistive load</i>
	2	<i>Non connected</i>	
	3	N.C. starting request	<i>MAX 10A resistive load</i>
	4	<i>Non connected</i>	
	5	Common starting request	<i>MAX 10A resistive load</i>
<b>J5</b>		<b>Tele-signals outputs</b>	
	1	Battery 1 failure	Negative Out MAX 100mA
	2	Battery 2 failure	Negative Out MAX 100mA
	3	Over-crank	Negative Out MAX 100mA
	4	Reserve	Negative Out MAX 100mA
	5	Pressure alarm	Negative Out MAX 100mA
	6	Temperature alarm	Negative Out MAX 100mA
	7	Fuel reserve	Negative Out MAX 100mA
	8	Acoustic alarm	Negative Out MAX 100mA
	9	Common output	Positive for external relais
<b>J6</b>		<b>Batteries voltage inputs</b>	
	1	<i>Non connected</i>	
	2	Battery 2 positive voltage	
	3	<i>Non connected</i>	
	4	Battery 1 positive voltage	
<b>J7</b>		<b>I/O RS232 serial</b>	
	1	GND	
	2	TX	
	3	<i>Non connected</i>	
	4	RX	
<b>J8</b>		<b>Current inputs for batteries measure</b>	
	1	Battery 1 input	
	2	<i>Non connected</i>	
	3	Battery 1 output	
	4	<i>Non connected</i>	
	5	Battery 2 input	
	6	<i>Non connected</i>	
	7	Battery 2 output	
	8	<i>Non connected</i>	

	9	<i>Non connected</i>	
	10	<i>Non connected</i>	
	11	<i>Non connected</i>	
<b>J9</b>		<b>Feeding and digital 1 inputs</b>	
	1	Selector in manual position	<i>In negative</i>
	2	Reserve alarm	<i>In negative</i>
	3	Fuel reserve	<i>In negative</i>
	4	Temperature alarm	<i>In negative</i>
	5	Pressure alarm	<i>In negative</i>
	6	Battery charger 2 supply fault	<i>In negative</i>
	7	Battery charger 2 failure	<i>In negative</i>
	8	Battery 2 anomaly	<i>In negative</i>
	9	Battery charger 1 supply fault	<i>In negative</i>
	10	Battery charger 1 failure	<i>In negative</i>
	11	Battery 1 anomaly	<i>In negative</i>
	12	MA-	<i>Started engine signal input from "W"</i>
	13	MA+	
	14	+12 Vdc	<i>For 12Vdc feeding</i>
	15	GND	<i>Feeding</i>
	16	+24 Vdc	<i>For 24Vdc feeding</i>
<b>J10</b>		<b>Digital 2 inputs / feeding /common and out relays</b>	
	1	<i>Non connected</i>	
	2	Speed governor feeding (stop dis.VVFF)	Out MAX 10A resistive load
	3	Start from battery 1	Out MAX 10A resistive load
	4	+D +12Vdc (excitation)	Out MAX 3W for +D alternator
	5	+D +24Vdc (excitation)	Out MAX 3W per +D alternator
	6	Diesel pump running	Out MAX 10A resistive load
	7	Common Out relay	
	8	Stop	Out MAX 10A resistive load
	9	Start from battery 2	Out MAX 10A resistive load
	10	Cumulative alarm	Out MAX 10A resistive load
	11	Fuel level analogical input	For DATCON float ref. 100083 Range 0-180 Ohm with earthed neg.; height 150/600mm; 5 holes Ø54mm.
	12	Stop	<i>In negative</i>
	13	Start	<i>In negative</i>
	14	Starting request	<i>In negative</i>
	15	Preheating off	<i>In negative</i>
	16	Selector in automatic position	<i>In negative</i>



## Settable parameters

The programming modality can be reached only under the working selection condition in **BLOCKED** position.

Then the key **Prog.** shall be pressed and kept pressed at the same time for at least 2 seconds.

The indication on the first upper display shows means that the programming phase has been reached, so the Prog. key can be released.

By the key **Sel** it is possible to select the parameter required and/or pass to the next programming pitch.

When the parameters programming phase is ended, press the key **Reset**, which memorizes the parameters and exit from the programming modality.

### **WARNING**

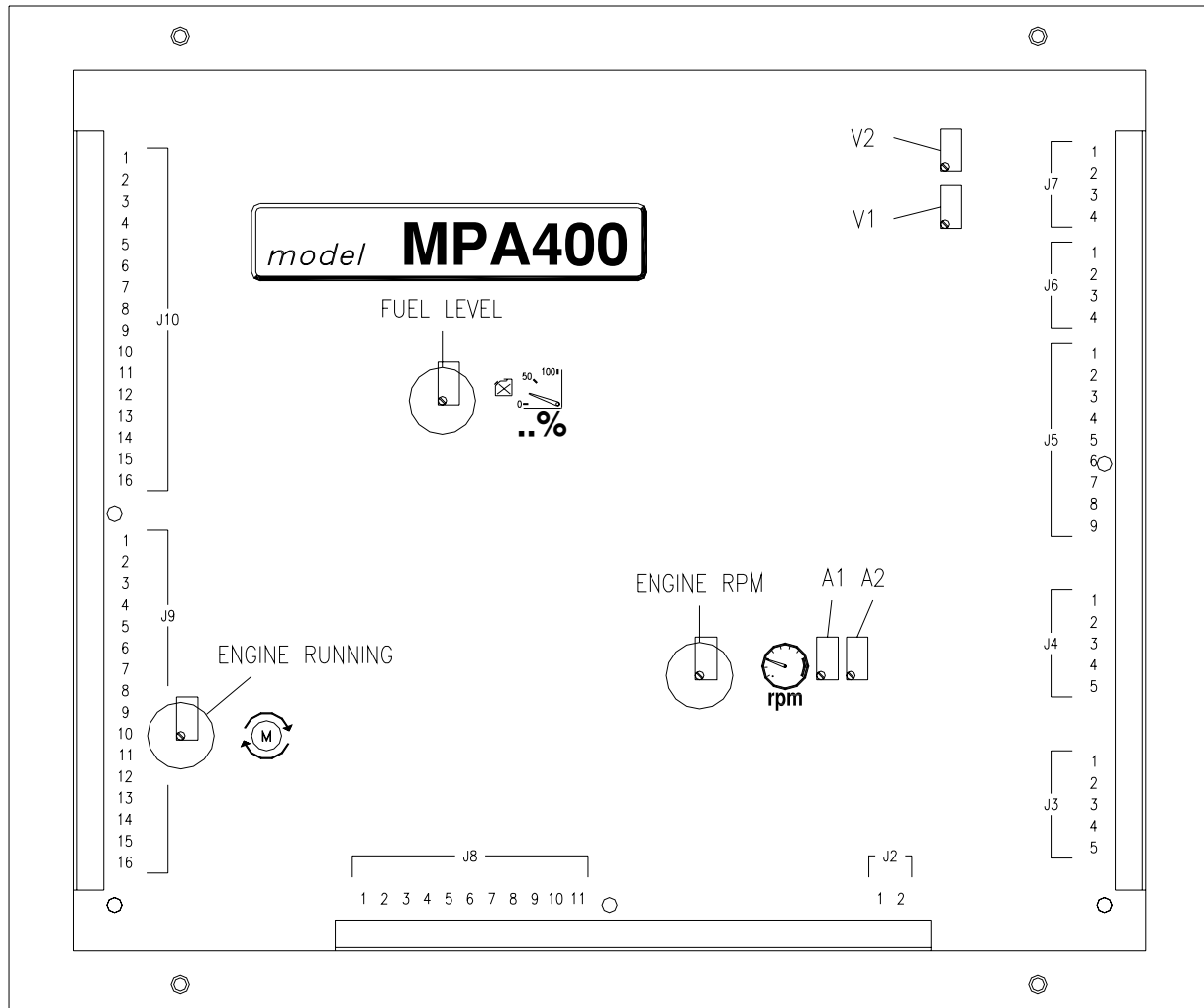
If none of the programming active keys is pressed for 30", this modality exit is forced by an automatic reset of the card (the changed parameters are not memorized).

The following are the possible programming pitches:

PITCH	DESCRIPTION	RANGE/MEASUREMENT UNIT	DEFAULT	Client's Inserted Value	NOTES
P01	ACOUSTIC ALARM DURATION	0-180s	60		ALARM TIME
P02	STOP CONTROL DURATION	1-180s	30		
P03	DIESEL PUMP ACTIVATION DELAY	1-60s	2		WAITING TIME FROM THE EXTERNAL DIESEL PUMP STARTING REQUEST.
P04	STARTING MOTOR ON DURATIONS	1-30s	10		CONNECTION TIME ON THE STARTING MOTOR
P05	STARTING MOTOR OFF DURATIONS	1-30s	10		PAUSE TIME ON THE STARTING MOTOR
P06	QUANTITY OF START ATTEMPTS	2-20	6		QUANTITY OF START ATTEMPTS BEFORE THE NON-START ALARM IS GENERATED
P07	STARTED ENGINE (FROM REVOL. COUNT.)	20-80RPM(x10)	30		Divide the number of round value by the constant "10". I.E. P07=30 correspond to 300RPM
P08	FUEL RESERVE	0-100%	0		FOR ALARM
P09	BATTERY MINIMUM VOLTAGE	0-999V	100/220		FOR ALARM, VOLT TENTHS VALUE
P10	BATTERY MAXIMUM VOLTAGE	0-999V	170/290		FOR ALARM, VOLT TENTHS VALUE
P11	MINIMUM AND MAXIMUM BATTERY VOLTAGE COVERING TIME	1-240s	60		
P12	BATTERY 1 FAULT ACTIVATION BY EXTERNAL DETECTION	ON/OFF	ON		FOR ALARM
P13	BATTERY 2 FAULT ACTIVATION BY EXTERNAL DETECTION	ON/OFF	ON		FOR ALARM
P14	BATTERY 1 FAULT ACTIVATION BY INTERNAL DETECTION	ON/OFF	OFF		FOR ALARM
P15	BATTERY 2 FAULT ACTIVATION BY INTERNAL DETECTION	ON/OFF	OFF		FOR ALARM
P16	BATTERY CHARGER 1 FAILURE ACTIVATION	ON/OFF	OFF		FOR ALARM
P17	BATTERY CHARGER 2 FAILURE ACTIVATION	ON/OFF	OFF		FOR ALARM
P18	BATTERY CHARGER 1 SUPPLY FAULT ACTIVATION	ON/OFF	OFF		FOR ALARM
P19	BATTERY CHARGER 2 SUPPLY FAULT ACTIVATION	ON/OFF	OFF		FOR ALARM
P20	BATTERY 1 AND 2 FAULT MEMORIZATION	0/1	1		0= NOT MEMORIZED 1= MEMORIZED

## Calibration trimmer

On the panel back side there are some trimmers for the manual calibration of the sizes.



In particular:

**Engine Running**

for the adjustment of the running engine threshold gather

**Fuel level**

for the adjustment of the fuel reserve threshold gather

**Engine RPM**

for the adjustment of the speed measurement

**V1-V2**

for the adjustment of the 1-2 batteries voltage measurement

**A1-A2**

for the adjustment of the 1-2 batteries current measurement

## **Serial interconnection**


A personal computer may be possibly connected on the special connector, in order to carry out a distance control of the system.

By the software supplied to be installed on the personal computer, all state and alarm functional conditions and all settable measures and parameters can be displayed on the video masks.

## **GENERAL TECHNICAL CHARACTERISTICS**

1-	Battery feeding	12Vdc o 24Vdc bi-tension
2-	Working field	6 – 35Vdc
	Extratension protection of Vdc tension	>80 Vdc
3-	Stand-by absorption	160mA
4-	Maximum Absorption	320mA
5-	Alt. Battery charge pick-up current at 12Vdc	200mA
6-	Alt. Battery charge pick-up current at 24dc	200mA
7-	Alt. Battery charge working voltage	0-45Vdc
	Adjustment field	8-32Vdc
8-	Start control contacts capacity at 30Vdc	10A
9-	Stop control contacts capacity at 30Vdc	10A
10-	Front protection degree	IP55
11-	Use temperature	-30 - +85°C
12-	Stocking temperature	-10 - +80°C
13-	General sizes ( LxHxP mm)	280 x 235 x 80
14-	Measures section precision area	1,5%









STOP

START

START

EXT. START

RESET

RESET

SEL

↑

↓