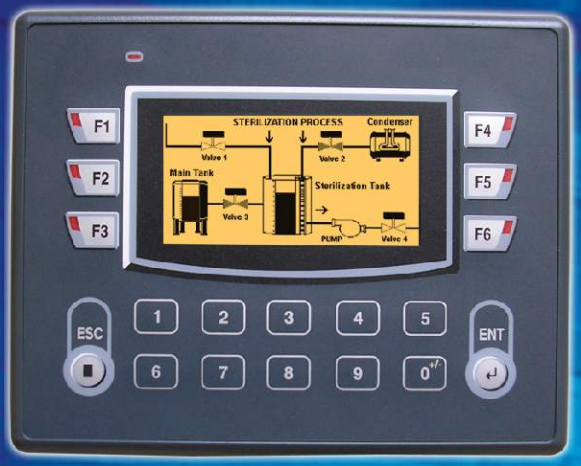
FlexiPanels®

HMI OR HMI + Pluggable I/O

FP4030

Front view
(3.1" Multicolor Backlight LCD)



Back view for HMI

Back view for HMI with expansion
(Up-to 3 expansions)

Back view for HMI with built-in I/O

RENU
ELECTRONICS PVT. LTD.

Salient Features :-

- 128 x 64 (3.1”) Graphical Multicolor Backlight LCD
- Only HMI or HMI with Integrated I/O or Pluggable I/O options available
- Support for Digital I/O (OC / Relays)
- Pluggable Analog I/Os
- Analog Inputs for RTD, mV, mA, Thermocouple, 0 to 5 VDC, 0 to 10 VDC, -10 to +10VDC
  Analog Outputs are 4-20 mA / 0-10 VDC
- Ladder editor with powerful instruction set
- Support for Recipes
- Communication Ports:
  One serial port to connect PLC at RS232 / 422 / 485 levels / Printer / Programming Port
  One USB (Device) port as Programming Port

- User defined Function keys to support various tasks
- Floating point support, Alarms, Bargraph, Built-in RTC
- Multilanguage (Unicode) support with true type Windows® fonts
- IP66 design. CE, UL approved. RoHS compliant
- Common Programming software for the entire FlexiPanels® family.....FREE!!

Operations :-

FlexiPanels® support Operator interface as well as Programmable Logic Controller features. The user can implement logic, specific to application using standard Ladder programming. A PLC logic block can be executed at power up, during every scan, upon receiving an interrupt on specific I/O pins or upon a timer interrupt. The FlexiPanels® operator interface functions revolve around Screens and Tasks that can be assigned to screens and application.

Integrated Digital I/O

FP4030MR-L1208R model can have up-to 12 digital Inputs integrated to the unit. Digital inputs are high impedance 24 VDC. The unit can also have up-to 08 digital outputs. Outputs are 06 relays + 02 transistor outputs (NPN).

Pluggable I/O (Digital)

FlexiPanels® have facility to expand I/O using pluggable I/O modules. The I/O modules can be selected based on the application requirement. User can plug combination of Digital I/O modules. Each high speed I/O module can support 4 nos. of high speed inputs of 25KHz. Quadrature input of up-to 20KHz is also supported. Each high speed I/O Module can support 1 quadrature input of 20KHz or 2 quadrature inputs of 5KHz. Each high speed I/O Module can support up-to 2 PWM outputs of 10KHz. Maximum 3 I/O modules can be connected to FP4030MR-E model.

Analog I/O

FP4030MR-E supports pluggable Analog I/O Modules. FlexiPanels® can have up-to 24 Analog inputs and / or 6 Analog outputs. The Analog inputs are 0-5 VDC, 0-10 VDC,4-20 mA, mV, TC, RTD, - 10 to + 10 VDC and Analog outputs are 4-20mA / 0-10VDC. User can Plug only Analog I/O modules or use them in combination with Digital I/O.

Function Keys

FP4030 has 06 function keys with bulit-in LEDs. These function keys are screen dependent Function Keys. User can assign any application related task / actions to these function keys. The unit also has Numeric Keypad for easy data entry. The function keys are independent of Numeric keypad. User can assign tasks to numeric keys also and use them as function keys, if required.

Alarms

Real time and historical Alarms can be defined in FlexiPanels®. User-friendly Alarm object can be defined on the display. Alarms can be real time or historical. Keys can be assigned to acknowledge Alarm, view and scroll.

Recipes

Recipes data is stored in the FlexiPanels® memory. With one button stroke, a set of data can be downloaded to the PLC. Once in the local memory, the recipes data can be edited using simple data entry objects.

Bitmaps / Wizards

Different bitmaps can be embedded on the FlexiPanels® screen. Bitmaps can be imported into the application and displayed on the FlexiPanels® screens. In addition, several wizards are supported to create commonly used objects such as Analog meters, Lamps, Buttons and Bar graphs.

Ladder Support

FlexiPanels® support ladder functionality. User can define logic in the unit using FlexiSoft® software. The execution of ladder could be through communication port or through I/O. Only HMI version of FlexiPanels also support ladder functionality. It is used for critical applications where data is processed before sending it to controller. The FlexiLogics® support following different types of instructions :

I/O Instructions -

NO contact	NC contact	Output
Falling Edge	Rising Edge	Inverter
Inverter Coil	Positive Pulse Contact	Negative Pulse Contact
Positive pulse coil	Negative Pulse Coil	

Data Transfer -

MOV word	MOV DWORD	Invert Transfer
Table Initialize	Table Block Transfer	Table Invert Transfer
Data Exchange	Multiplexer	Demultiplexer

Math-

Addition	Subtraction	Multiplication
Division	Addition with Carry	Subtraction with Carry
Increment	Decrement	

Compare -

Greater than	Greater than or equal	Equal
Not Equal	Less Than	Less than or Equal

Logic -

AND	OR	XOR
Shift	Rotate	

Data Conversion -

Hex to Ascii	Ascii to Hex	Absolute Value
7 segment decode	Ascii conversion	Binary Conversion
BCD conversion	2's complement word	2's complement Double word

Timer -

TON	TOFF	TSS

Counter-

Up counter	UP Down Counter

Program Control -

Subroutine CALL	Subroutine RET	For
Next	Master Control Set	Master Control Reset
Jump Control Set	Jump Control Reset	En Intr
Dis Intr	DT	Step sequence Init
Step sequence Input	Step sequence output	

Function -

Moving Average	Digital Filter	PID1,4
Upper limit	Lower limit	Function generator
Average Value	Maximum Value	Minimum Value

Special -

Device Set	Device Reset	Register Set
Register Reset	Set Carry	Reset Carry
Encode Decode	Bit Count	Flip Flop
Direct I/O	Set Calender	Calender Operation

The execution of ladder logic is in microseconds. Ladder monitoring for debugging is also supported in FlexiPanels® configuration software.

Multilanguage / Unicode Support

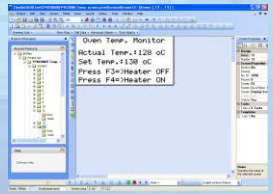
All the languages are supported in the FP4030. The user can now display messages, alarms in any regional language. All Windows® fonts can also be used in an application.

Communication Ports

FP4030 has one serial communication port that supports RS232 / 422 / 485 levels. Serial port can be used for programming of FlexiPanels®, printing screens (only text), connecting to third party serial devices (Barcode readers, Temp scanners, Energy meters etc.) or to connect to a PLC or drive.
FP4030 also has one USB (Device port). The USB port can be used as a programming port or for ladder monitoring.

Configuration Software

FlexiSoft® is a compact, Windows® based software to configure the FlexiPanels® units. User friendly configuration tools and easy approach, helps user create applications quickly and easily.



To get started with FlexiPanels®, user needs:
1. FlexiPanels® unit 2. FlexiSoft® Software
3. USB Programming cable (Part no. PC-USBAB-00)

OS requirements for FlexiSoft® are:
Windows Version : Microsoft Windows® 2000 or above

Supported Task in FlexiPanels® are :-

Task \ Type	Power up	Global	Screen			Key/button		
			Before showing	While showing	After hiding	Press	While Pressed	Release
Go to screen	✓	×	✓	×	✓	✓	×	✓
Go to next screen	✓	×	✓	×	✓	✓	×	✓
Go to previous screen	✓	×	✓	×	✓	✓	×	✓
Write value to tag	✓	✓	✓	✓	✓	✓	✓	✓
Add constant to tag	✓	✓	✓	✓	✓	✓	✓	✓
Subtract constant from tag	✓	✓	✓	✓	✓	✓	✓	✓
Add tag B to Tag A	✓	✓	✓	✓	✓	✓	✓	✓
Subtract tag B from Tag A	✓	✓	✓	✓	✓	✓	✓	✓
Turn bit ON	✓	✓	✓	✓	✓	✓	×	✓
Turn bit OFF	✓	✓	✓	✓	✓	✓	×	✓
Toggle bit	✓	✓	✓	✓	✓	✓	×	✓
Copy Tag B to Tag A	✓	✓	✓	✓	✓	✓	×	✓
Swap Tag A and tag B	✓	✓	✓	✓	✓	✓	×	✓
Print Data	×	×	×	×	×	✓	×	✓
Set RTC	×	×	×	×	×	✓	×	✓
Copy tag to STR	✓	✓	✓	×	✓	✓	×	✓
Copy tag To LED	✓	✓	✓	✓	✓	✓	✓	✓
Delay	×	×	×	✓	×	×	×	×
Wait	×	×	×	✓	×	×	×	×
Copy HMI block to HMI/PLC block	✓	✓	✓	✓	✓	✓	✓	✓
Copy HMI/PLC block to HMI block	✓	✓	✓	✓	✓	✓	✓	✓
Copy RTC to PLC block	×	✓	×	×	×	×	×	×
GoTo Popup screen*	×	×	×	×	×	×	×	×
Keys Specific Tasks	×	×	×	×	×	×	×	×
USB Data Log Upload	×	×	×	×	×	×	×	×

* Available for Button

Protocols Supported for :-

Driver	FP4030
ABB	✓
Allen Bradley DF1	✓
Aromat FP Series	✓
Baldor	✓
Danfoss Drive	✓
Delta	✓
Fatek	✓
FlexiLogics***	✓

Driver	FP4030
GE Fanuc	✓
GE SNP-X	✓
Idec	✓
LG Master K series	✓
LG Master-K 300S	✓
Mitsubishi FX	✓
Mitsubishi Q series (Serial)	✓
Modbus master	✓

Driver	FP4030
Modbus slave	✓
Serial Monitor	✓
Toshiba Inverters	✓
Toshiba T1	✓
Toshiba T2 Link port	✓
Twido	✓
Unitelway	✓
Universal Serial (ASCII)	✓

***Supported with native programming environment.

Specifications :-

Power	:	+ 24V DC ±15%, 3 W Max
Bezel	:	IP66 rated Keypad
Operating Temperature	:	0° to 50°C
Storage Temperature	:	-20° to 80°C
Humidity	:	10% to 85% (Non condensing)
Communication Ports	:	One serial port (RS232 / RS422 /RS485 levels supported)
USB Device Port	:	As programming and monitoring port
Type of LCD	:	Graphical Multicolor Backlight LCD
LCD Life	:	50000 hrs at 25°C
Isolation	:	Isolation between communication ports, power and I/O (if applicable) is 500 V DC for 1 Min.
Immunity to ESD	:	as per IEC61000-4-2
Immunity to Fast Transients	:	as per IEC61000-4-4
Immunity to Radiated electromagnetic field	:	as per IEC61000-4-3
Immunity to Conducted disturbances	:	as per IEC61000-4-6
Surge	:	as per IEC61000-4-5
Radiated emission	:	as per EN55011

Digital Inputs

Rated Input Voltage

	For Normal Input	For High Speed
Rated Input Voltage	24 VDC (Max is 28 VDC)	24 VDC (Max is 28 VDC)
Impedance	4.7 k	2.3 k

Logic '0' Voltage : 0 to 5 V Logic '1' Voltage : 14 to 28 V

Rated Input Current at (24 VDC)

	For Normal Input	For High Speed
Rated Input Current	4.89 mA	10 mA

Digital Outputs (Open Collector)

Maximum Load current :	500 mA NPN or PNP. Short circuit protected
Voltage drop at ON :	0.4 V or less

Digital Outputs (Relay)

Relay Rating :	230 V AC, 2 Amp. (Max) 5 Amp per common

Analog Inputs

Resolution	12-bit
Voltage Mode	Y
Input Range	-10V to +10V
Value of LSB	For 0-10V : 2.44mV
	For +/- 10V : 4.88mV
Input Impedance	200KΩ
Accuracy at 25°C	0.1% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	0.3% of full scale
Frequency Limit (-3db)	3.5KHz
Behavior upon sensor failure	Input goes to 0, as if no input is connected
Current Mode	Y
Input Range	4mA – 20mA, 0mA - 20mA
Value of LSB	3.906uA
Input Impedance	120Ω
Accuracy at 25°C	0.2% of full scale
Overall accuracy (–25°C to 55°C) Full scale	0.8% of full scale
Frequency Limit (-3db)	15KHz
Behavior upon sensor failure	Input goes to 0, as if no input is connected
Maximum permissible voltage (surge voltage)	
between analog inputs	500V
between analog inputs and reference	1000V
Reverse Connection Protection	No

Analog Outputs

Resolution	12bit
Voltage Mode	Y
Output Range	0 to +10V
Value of LSB	2.44mV/step
Output Load minimum	1000Ω
Accuracy at 25°C	0.05% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	±10ppm/°C
Current Mode	
Output Range	4mA to 20mA
Value of LSB	3.9umA
Output Load maximum	500Ω
Accuracy at 25°C	0.13% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	±10ppm/°C
Current Mode	
Output Range	0mA to 20mA
Value of LSB	4.8umA
Output Load	500Ω
Accuracy at 25°C	0.13% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	±10ppm/°C

Specifications :-

High Speed Digital inputs and PWM output -
FPED-HS-0808N (NPN Type transistor output)
FPED-HS-0808P (PNP Type transistor output)

24V DC Digital Inputs	
Number of Inputs	8 Inputs Bi-directional Type (Within which 4 are high speed)
Isolation	Optically isolated from internal circuit. High isolation voltage(BV=3750Vr.m.s.)
Input Impedance	4.9KΩ
Turn OFF time	10msec
Turn ON time	10msec
High Speed Inputs	
Number of HS Inputs	4
High Speed Channels	X0, X5, X2, X7
Max. input frequency	25KHz
Max. input count	4294967295
24V DC Digital Outputs PNP / NPN Transistor type	
Number of Outputs	8 PNP / NPN type (Within which 2 are high speed outputs)
Nominal Output current per channel	500mA Typical [For HS: FPED-HS-0808N: 300mA and FPED-HS-0808P: 250mA]
Isolation	Optically isolated from internal circuit. High isolation voltage(BV=3750Vr.m.s.)
Short Circuit protection	Auto Protection for 6 normal digital output PNP / NPN type channels.
Nominal load	
- Ohmic	48 Ω / 12 W
- Lamp	12 W
- Inductive	12 VA (1.2 H, 50 W)
Switching frequency with	
- Inductive nominal load	0.5 Hz (1.2 H, 50 W), maximum
24V DC Auxiliary Power Supply	
Nominal value	24 V DC
Tolerance	-15% / +20% according to EN 61131-2
Safety equipment	Surge voltage, protection against Reversal polarity

Universal Analog Inputs -
FPEA-0402U-16

Analog Inputs	
Number of inputs	4
Resolution	16 Bit
Input range:	
Voltage	0 to 10VDC and 0 to 5VDC
Current	0 to 20mA and 4 to 20mA
Thermocouple	J type -210 to 1200°C K type -200 to 1373°C
mV	0 to 50mV and 0 to 100mV
RTD	α (PT100): -200 to 850°C α (PT100): -100 to 457°C and PT1000: -200 to 850°C
Overall accuracy	1 % of full scale (Max)
Input Impedance	1MΩ for voltage, thermocouple, mV and RTD input 100Ω for current input (with fuse)
Absolute maximum input	±30VDC, 30mA
Output Type	**Analog (voltage and current), non-isolated**
Number	2
Resolution	16 bit
Output range:	
Voltage	0 to 10VDC and 0 to 5VDC
Current	0 to 20mA and 4 to 20mA
Overall accuracy	1% of full scale (Max)
Load	1KΩ (Min) for Voltage and 500Ω (Max) for current
24V DC Auxiliary Power Supply	
Nominal value	24 V DC
Tolerance	-15% / +20% according to EN 61131-2
Safety equipment	Surge voltage, protection against Reversal polarity

FPEA0800LV

Analog Inputs	
Number of inputs	8
Resolution	12 Bit
Voltage Mode:	
Input Range	-10V to +10V, 0V to 10V
Value of LSB	For 0-10V : 2.44mV
	For +/- 10V : 4.88mV
Input Impedance	200 KΩ
Accuracy	At 25°C: 0.1% of full scale.
	Overall accuracy (–25°C to 55°C) : 1% of full scale Max.
Behavior upon sensor failure	Input goes to 0, as if no input is connected

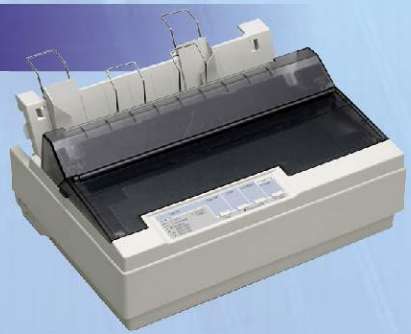
FPEA0800LC

Analog Inputs	
Number of inputs	8
Resolution	12 Bit
Current Mode:	
Input Range:	4 - 20mA and 0 - 20mA
Value of LSB:	3.906uA
Input Impedance	120 Ω
Accuracy	At 25°C: 0.1% of full scale.
	Overall accuracy (–25°C to 55°C) : 1% of full scale Max.
Behavior upon sensor failure	Input goes to 0, as if no input is connected

Supported Printers :-

FlexiPanels® support following Dot matrix serial printers:

- EPSON
- SAMSUNG
- TVS



Model Comparison :-

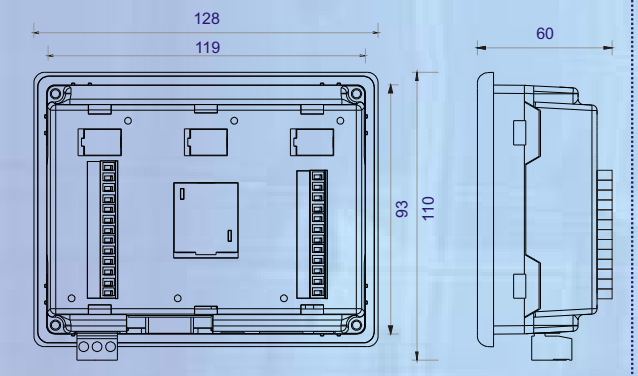
Product	Model	Display	LCD Life at 25°C	Keys	Memory	PLC Steps	Screen Memory	Local I/O	Expansion	Serial Ports **	USB	RTC	Power Consumption	Weight	Bezel Dimensions (mm)	Panel Cutout (mm)
FP4030	FP4030MR	128x64 Graphical Multicolor backlight	30000 hrs	18	Up-to 1.5 MB	10 k	Up-to 1 MB	NA	NA	1	Device	Yes	3W	255 gms.	128 W x 110 H x 45 D (Drawing D)	119 W x 93 H
	FP4030MR-L1208R	128x64 Graphical Multicolor backlight	30000 hrs	18	Up-to 1.5 MB	10 k	Up-to 1 MB	12 DC in 6 Relays 2A 2 NPN 0.5A	NA	1	Device	Yes	3W	320 gms.	128 W x 110 H x 60 D (Drawing C)	119 W x 93 H
	FP4030MR-E	128x64 Graphical Multicolor backlight	30000 hrs	18	Up-to 1.5 MB	10 k	Up-to 1 MB	NA	3	1	Device	Yes	3W	265 gms.	128 W x 110 H x 45 D (Drawing D)	119 W x 93 H

Pluggable Expansion Modules (Digital I/O)		Power Consumption	Weight (Approx.)	Dimensions (mm)
FPED0808P	8 Digital inputs (PNP or NPN) and 8 outputs (0.5A PNP transistor)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808P#	8 Digital inputs and 8 Digital Outputs (PNP Type)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0808N	8 Digital inputs (PNP or NPN) and 8 outputs (0.5A NPN transistor)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808N#	8 Digital inputs and 8 Digital Outputs (NPN Type)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0012R	12 Digital outputs (Relay)	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)
FPED1600	16 Digital inputs	0.3 W	65 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0016N	16 Digital outputs (0.5A NPN transistor)	0.3 W	65 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0016P	16 Digital outputs (0.5A PNP transistor)	0.3 W	75 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808RP	8 Digital inputs (PNP or NPN) and 8 outputs (6 Relay, 2 PNP)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808RN	8 Digital inputs (PNP or NPN) and 8 outputs (6 Relay, 2 NPN)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)

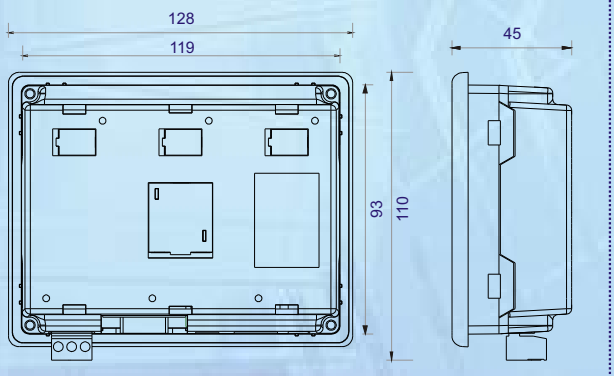
Pluggable Expansion Modules (Analog I/O)		Power Consumption	Weight (Approx.)	Dimensions (mm)
FPEA0202L	2 Analog inputs (4-20mA, 0 – 20mA, 0 – 10 V, -10 to + 10V ranges) 2 Analog Outputs (4-20mA, 0 – 20mA, 0 – 10 V)	0.3 W	85 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA0400L	4 Analog inputs (4-20mA, 0 – 20mA, 0 – 10 V, -10 to + 10V ranges)	0.3 W	80 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA-0402U-16	4 Universal Analog Inputs (4-20mA, 0 – 20mA, TC , RTD, 0-5V, 0 – 10 V, 0-50mV, 0 - 100mv ranges) 2 Analog Outputs (4-20mA, 0 – 20mA, 0 – 10 V). All AI/O 16 bit resolution	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA0800LC	8 Analog inputs (4-20mA)	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA0800LV	8 Analog inputs (0-10VDC)	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)

4 inputs can be configured as high speed inputs (25KHz) and 2 outputs can be configured for PWM (10 KHz) or 1 quadrature input of 20KHz or 2 quadrature inputs of 5 KHz.
** One "D" type port that supports RS232 and RS485 levels on different pins. "Y" type cable can be used for separate RS232 and RS485 levels simultaneously.

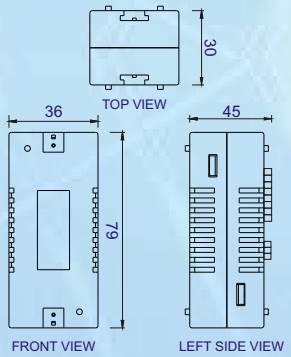
Dimensions :-



Drawing C
Height including power connector and Depth including I/O



Drawing D
Depth 90mm with pluggable module. Height including power connector.



Drawing G
Expansion Module

Please contact factory for more information. We welcome an opportunity to develop new, custom drivers and customized units.

RENU
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