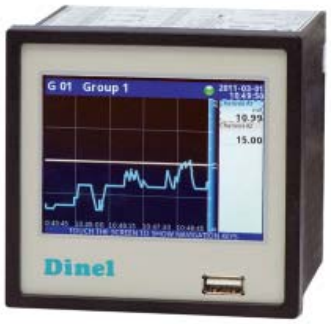
Multifunction graphical unit MGU–800

- **For display, recording and evaluation of process instruments signals (level, temperature, pressure, etc.)**
- **3.5" TFT display, multi-language menu**
- **Variety of possible configurations for current, voltage or binary inputs**
- **Up to 16 independent relay outputs**
- **Measured data recordable into internal memory (1,5 GB)**
- **Extensive ways of data communication**
- **The possibility of evaluating and processing of the measured data on PC**



The **MGU–800** is a sophisticated multichannel unit which allows simultaneous measurement, visualisation and control of numerous channels. This device can operate autonomously or with cooperation with external measurement devices and actuators. MGU–800 is designed as modular device consisting of a base and optional input and output modules.

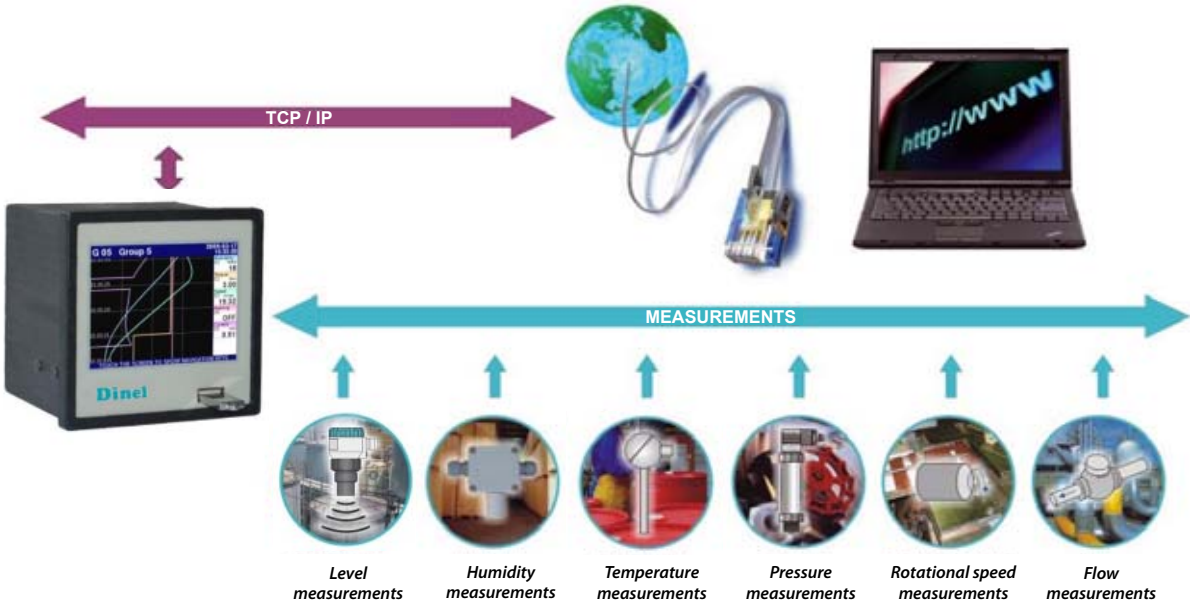
The MGU–800 displays all data and dialogue on a legible, 320x240 pixels, colour TFT screen. Full control of the device is realised using the built-in touch-panel which makes operating easy and intuitive.

All measurement and output modules are optional and can be installed inside the device according to the customer's needs.

Optional modules

- **IUI4** 4 Current inputs, 4 Voltage inputs
- **IUI8** 8 Current inputs, 8 Voltage inputs
- **II16** 16 Current inputs
- **ID8** 8 Optoisolated digital (binary) inputs
- **OI2** 2 Passive current outputs (4 ... 20 mA)
- **OR8** 8 Relay outputs (1 A/250 V)
- **1** Basic communications module (USB, RS485) – In unit price
- **2** Advanced communications module (2x USB, 2x RS485, RS485/232, LAN)

Range of applications



Device installation

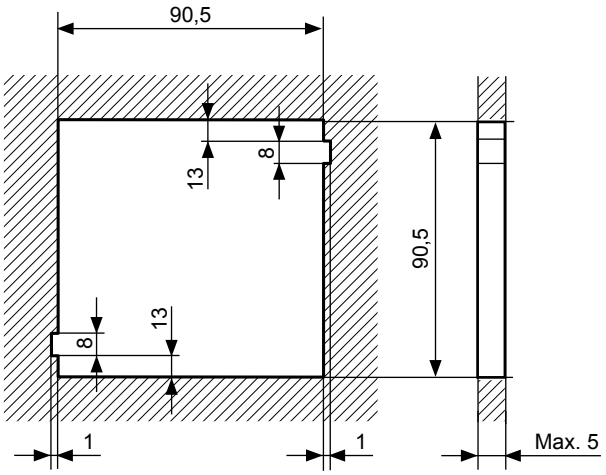


Fig. 1: Mounting hole dimensions

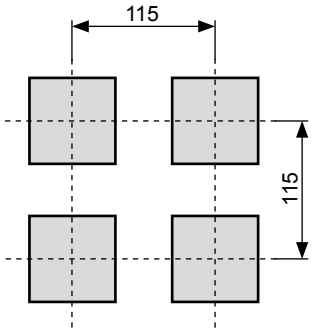


Fig. 2: Minimum distances when assembly of a number of units

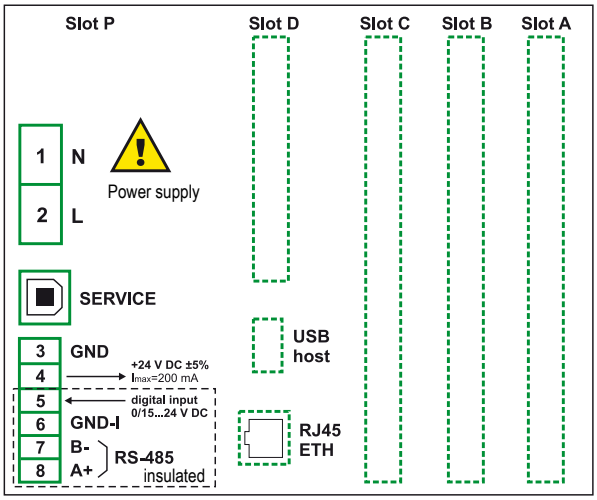


Fig. 3: Terminals description

The basic performance of the units (see Fig. 3) contains only the extreme left terminals:

- Power supply
- USB device port (front panel)
- Sensor supply output 24 V DC I_{max} = 200mA
- Digital input 0V...15...24 V DC
  (low state: 0...5 V, high state: 8...24 V)
- Interface RS–485

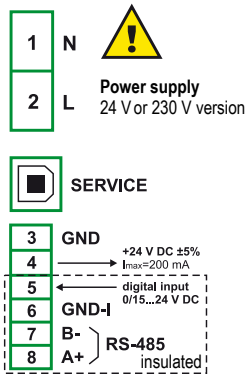
Depending on customer's needs, the basic version of the device can be upgraded with up to:

- Three I / O modules – installed in a place designated as Slot A, B, C.
- Advanced communication module (2x RS–232/485, USB and LAN) – installed in a place designated as Slot D.

Technical specifications of module units

The **power supply module** is a component of MGU–800 which is present in all variants. It includes power supply that supplies the main parts of the MGU–800 and expansion modules. It provides also the basic data communication of the MGU–800 (RS–485 and USB port on front panel).

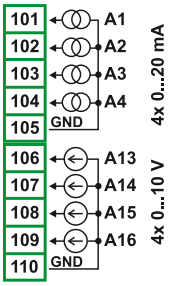
Technical specification – power supply module			
		24 V version	**230 V version**
Power supply voltage		19 ... 50 V DC 16 ... 35 V AC	85 ... 260 V AC/DC 50 ... 60 Hz
USB		Servis port (Type B), Front panel (Type A)	
Sensor power supply output		24 V DC ± 5 % (0.2 A)	
Permissible Long time overload		20 %	
Digital input	Parameters Power consumption Insulation	0 ... 24 V DC, with galvanic insulated 7.5 mA / 24 V 1 Min (500 V DC)	
Input signals voltage levels	Logical low state Logical high state	U_{IN} □ 5 V U_{IN} > 8 V (Max. 24 V)	
Interface		RS–485 (Modbus RTU); 1200 ... 115200 b/s	
Weight		65 g	



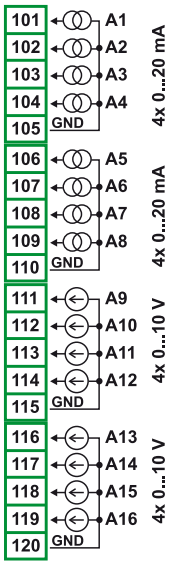
Technical specification – voltage and current input modules				
		IUI4	**IUI8**	**II16**
Number of inputs		4x U + 4x I	8x U + 8x I	16x I
Hardware measurement ranges	Voltage input Current input	-2 V ... 13 V -2 mA ... 30 mA	-2 V ... 13 V -2 mA... 30 mA	– -2 mA... 30 mA
Hardware resolution	Voltage input Current input	1 mV 1 □A	1 mV 1 □A	– 1 □A
Precision		0.25 %	0.25 %	0.25 %
Permissible Long time overload		20 %	20 %	20 %
Software measurement ranges		0 ... 5 V 1 ... 5 V 0 ... 10 V 2 ... 10 V 0 ... 20 mA 4 ... 20 mA	0 ... 5 V 1 ... 5 V 0 ... 10 V 2 ... 10 V 0 ... 20 mA 4 ... 20 mA	0 ... 20 mA 4 ... 20 mA
Internal impedance	Voltage input Current input	100 k□ Typ. 100 k□	100 k□ Typ. 100 k□	– Typ. 100 k□
Protection	Voltage input Current input	No 50 mA [1]	No 50 mA [1]	– 50 mA [1]
Weight		32 g	32 g	42 g

[1] Auto-reset fuse

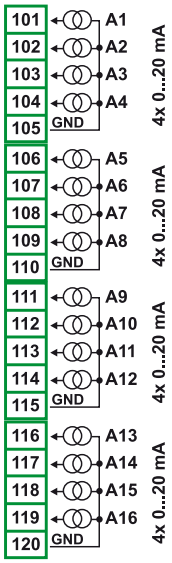
IUI4



IUI8



II16



IUI4 – 4 Current inputs, 4 Voltage inputs

IUI8 – 8 Current inputs, 8 Voltage inputs

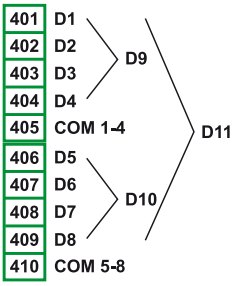
II16 – 16 Current inputs

All ground terminals (GND) of a particular module are common, but separated from power supply and other modules.

ID8 is module with 8 digital inputs respectively. Inputs are divided into groups of four input every. Every group has own common terminal, and is optically isolated from others groups and MGU–800 GND signal as well.

Technical specification – optoisolated digital input module		
		ID8
Number of inputs		8 (2 groups 4 inputs every, optoisolated from others signals)
Input signals voltage levels	Logical low state Logical high state	U_{IN} □ 1 V U_{IN} > 4 V
Maximum input voltage		30 V
		20 %
Input current consumption		approx. 15 mA (24 V) approx. 5 mA (10 V) approx. 2 mA (5 V)
Insulation strength		500 V
Input signals representation		8 single bits **D1 – D8** 2 nibbles **D9 – D10** 1 byte **D11**
Weight		40 g

ID8

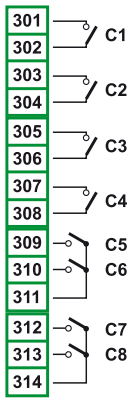


OR8 is the output module with 8-relay switching contacts. The outputs are divided into two groups of 4, the first group has individual contacts electrically isolated, the second group is divided into pairs and each pair has a common contact (see block diagram).

TECHNICAL SPECIFICATIONS – RELAY MODULES	
	OR8
Number of relays	8x SPST NO
Maximum load per relay	1 A, cos φ = 1 (resistive load)
Voltage switched by relay	Max. 250 V AC
Insulation strength [1)]	≥ 1000 V AC (60 s)
Weight	74 g

[1)] Relay to relay, relay to MGU–800 supply

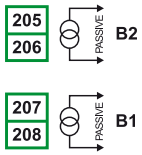
OR8



OI2 is a module with two passive current outputs (4 ... 20 mA). These outputs require an external power supply through the loop. For its supplying can be used internal power source. The polarity of power can be arbitrary

TECHNICAL SPECIFICATIONS – PASSIVE CURRENT OUTPUT	
	OI2
Number of inputs	2
Output type	Passive current output 4 ... 20 mA
Hardware output limitation	3 ... 22 mA
Output voltage dropout	Max. 9 V
Overload protection	Internal resettable fuse 50 mA
Loop supply range	9 ... 30 V
Output current precision	0.1 % (25°C), 50 ppm/°C
Resolution	12 bit
Weight	23 g

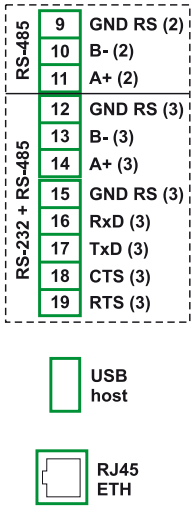
OI2



MGU–800 unit is equipped with basic communication module, which is located together with the power module. It includes RS–485 ports, USB port (front panel) and USB service port (on the rear panel). Additionally, the unit can be equipped with communication expansion module with 2 ports RS–485, 1x RS–232, USB (back panel) and Ethernet. A variant with the basic module only is marked with number **1**; with the basic and extension module is marked by **2**.

TECHNICAL SPECIFICATION – COMMUNICATIONS MODULE			
		Version 1	**Version 2**
Input / output type		1x RS–485 1x USB (front)	3x RS–485 1x RS–232 1x USB (front) 1x USB (back) 1x Ethernet (RJ45)
Hardware output limitation		Max. 100 mA (USB)	Max. 100 mA (USB)
Baudrate	USB host	12 Mb/s	12 Mb/s
	RS–485 (RS–232)	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 b/s	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 b/s
	Ethernet	–	10 Mb/s
Data format RS–232/485		8N1, 8N2, 8E1, 8E2, 8O1, 8O2	8N1, 8N2, 8E1, 8E2, 8O1, 8O2
Weight		–	48 g

Advanced communications module



Technical specifications – units		
Power supply voltage (depending on version) [1]		230 V AC or 24 V AC/DC
Power consumption		Typically 15 VA
External Fuse (required)		T – type, Max. 2 A
Display		3.5" TFT colour graphic display with LED backlight
Display resolution		320 x 240 pixels
Sensor power supply output [1]		24 V DC (Max. 0.2 A)
Data storage [2]		1.5 GB, up to 250M samples, min interval 0.1 seconds
Basic communication interfaces [1]		RS–485 (Modbus RTU), USB
Digital input [1]		0 ... 24 V DC, Galvanic insulation
Optional advanced communication module [1]		USB, RS–485, RS–485/232, Ethernet
Optional input modules [1]	IUI4 IUI8 II16 ID8	4 Current + 4 Voltage 8 Current + 8 Voltage 16 Current 8 Digital input
Optional output modules [1]	OR8 OI2	8 Relay outputs (1 A / 250 V) 2 Passive current outputs (4 ... 20 mA)
Protection class		IP 40 (from front, standard)) IP 20 (housing and connection clips)
Housing material		NORYL – GFN2S E1
Dimensions		96 x 96 x 100 mm
Mounting hole		90.5 x 90.5 mm
Panel thickness		Max. 5 mm
Ambient temperature range		0 ... +50 °C
Storage temperature		-10 ... +70 °C
Humidity		5 ... 90% No condensation
Altitude		Up to 2000 meters above sea level
Max. conductor size		2.5 mm^2
Weight		340 g (only base Fig. 3)

[1] see the full specification in the appendix
[2] data from internal memory can be download to PC by USB flash disk or LAN

Electrical connection

Connections of power supply voltage and measurement signals are executed using the screw connections on the back of the unit's housing.

Avoid running signal cables and transmission cables together with power supply cables and cables controlling inductive loads (e.g. contactors). Such cables should cross at a right angle. Contactor coils and inductive loads should be equipped with interference protection systems, e.g. RC–type.

The unit is not equipped with an internal fuse or power supply circuit breaker. Because of this an external time-delay cut-out fuse with a small nominal current value must be used (recommended bipolar, Max. 2 A) and a power supply circuit breaker located near the unit. In the case of using a monopolar fuse it must be mounted on the active wire (L).

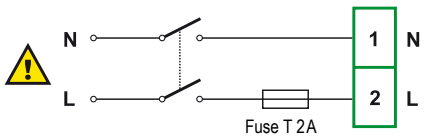


Fig. 4: Connection of power supply

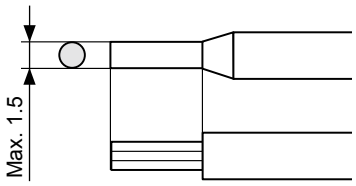


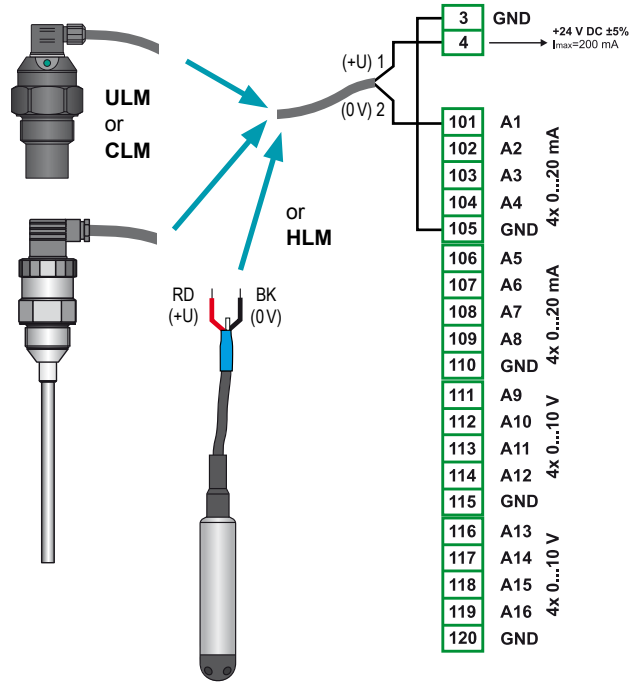
Fig. 5: Method of cable insulation replacing and cable terminals dimensions

Range of supply voltage:

Version **230 V**: 85 ... 260 V AC/DC
Version **24 V**: 19 ... 50 V DC (16 ... 35 V AC)

Examples of electrical connections

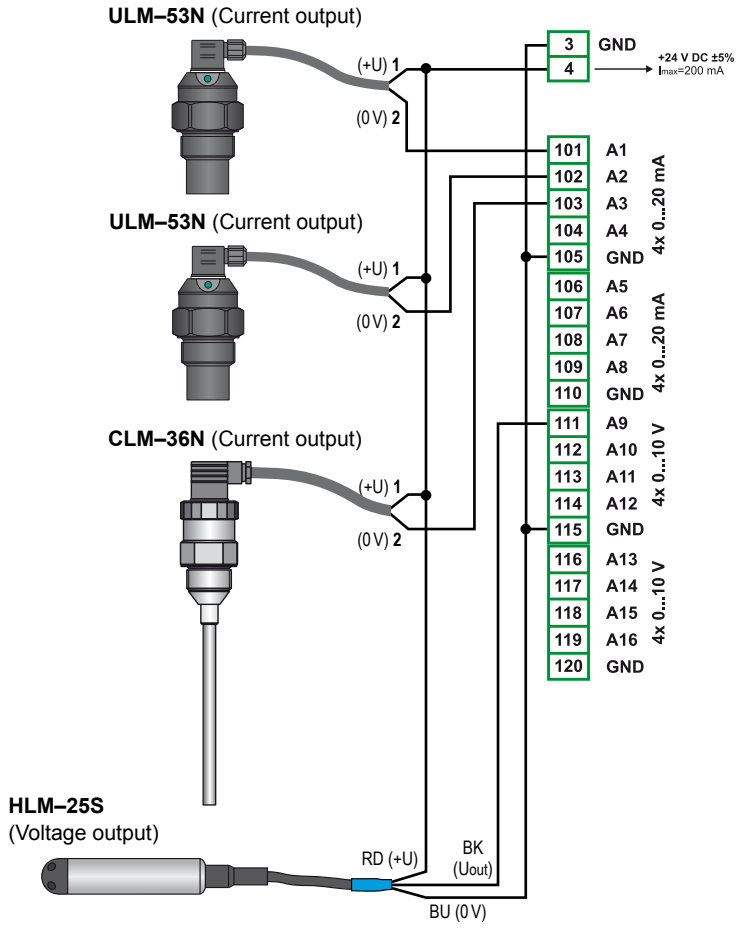
Here are some examples of the connection unit MGU–800 with Dinel level sensors (CLM, ULM, HLM). The examples are with the **IUI8** module. Similar connection is applied to modules **IU4** and **II16**.



Legend:
RD – Red
BK – Black

Fig. 6: Examples of the connection Dinel level meters (output 4 ... 20 mA)

The individual connector pins (of dismountable connector) which is a standard accessory to level sensors ULM-53, CLM-36 are numbered (1 and 2). Hydrostatic level meter HLM has color-coded wires:
RD = 1, BK = 2.
The unit MGU–800 can be connected in the same way with other types of level sensors (level meters, gauges). Specific connections are always given in instruction manuals of the product.

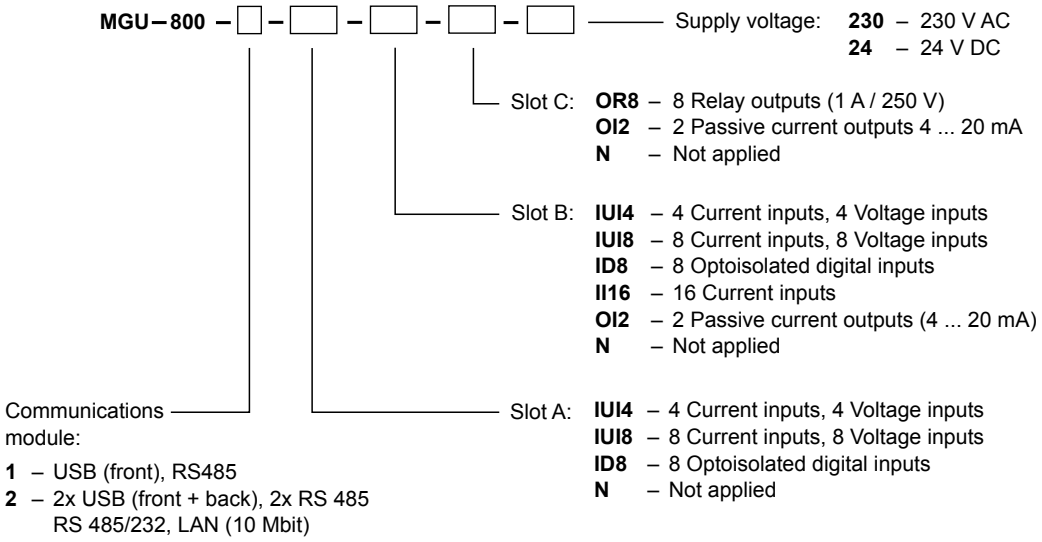


Legend:
BU – Blue
RD – Red
BK – Black

Fig. 7: Examples of the connection Dinel level meters (output 4...20 mA and 0...10 V)

To terminals A4 ... A16 can be connected in the same way next level sensors (gauges). In the configuration with the module IUI8 it can be 8 pieces of level sensors with the current output and 8 pieces with voltage output.

Order code



Correct specification example

MGU–800–1–IUI4–N–N–230V	–	**(1)** USB + RS485; **(IUI4)** 4 Current inputs + 4 Voltage inputs; Supply voltage **230 V**
MGU–800–2–N–ID8–N–24V	–	**(2)** 2x USB + 2x RS485 + RS485/232 + LAN; **(ID8)** 8 Digital inputs; Supply voltage **24V**
MGU–800–1–IUI8–OI2–OR8–230V	–	**(1)** USB + RS485; **(IUI8)** 8 Current inputs + 8 Voltage inputs; **(OI2)** 2 Passive current outputs; **(OR8)** 8 Relay outputs; Supply voltage **230 V**
MGU–800–2–IUI8–II16–OR8–230V	–	**(2)** 2x USB + 2x RS485 + RS485/232 + LAN; **(IUI8)** 8 Current inputs + 8 Voltage inputs; **(II16)** 16 Current inputs; **(OR8)** 8 Relay outputs; Supply voltage **230 V**

Accessories

Standard – included in the unit price

- 1pc of Touch pen
- 2pcs of Assembly brackets
- 1pc of USB Protective cover

Safety, protection and compatibility

Connection to supply voltages must be done through fuse or circuit breaker (2 A). Electrical equipment of protection group II. Electrical safety according to EN 61010-1.

Electromagnetic compatibility is provided by conformity with standards EN 61326-1.

Insulation resistance >20M□, insulation strength between power supply and input/output terminal: 2300 V (1 min).

Version 02/2012

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