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MP2Plus

**PANEL MOUNTING
PROFESSIONAL INDICATOR
with 1, 2 channels**

Measurement of WEIGHT, FORCE, PRESSURE, TORQUE, DISPLACEMENT and TEMPERATURE

RISOLUZIONE STANDARD ± 100.000 div RESOLUTION STANDARD	ACCURATEZZA ≤ ± 0.01% ACCURACY
VERSIONE K ± 300.000 div K VERSION	ACCURATEZZA ≤ ± 0.005% ACCURACY
15 Stabilità a lungo termine Long term high stability	CE RoHS
Smart	Alta Affidabilità High Reliability

"THE EVOLUTION OF THE SPECIES" : after more than 20 years of service in the various versions the new **MP2Plus** is born.

MP2Plus is a Professional Digital Laboratory Indicator with **1** (standard) or **2** (option) **inputs**, suitable for receiving signals from strain gauge sensors, transmitters with voltage or current output and PT100.

Particularly suitable for both static and dynamic applications, for calibration and verification in metrology laboratories or industrial environments where it is necessary to make measurements of weight, force, pressure, torque, displacement and temperature.

To **FIT EVERY APPLICATION** the instrument can be configured and customized: the function keys F1, F2, F3 and F4 can be programmed for the function of interest such as: PEAK, HOLD, RELEASE, TX DATA DATALOG, DISCHARGE, ZOOM.

The instrument works with a resolution of ±100.000 divisions and an accuracy better than 0.005% due to an internal 24-bit Sigma-Delta AD converter and a measurement control that is carried out for switching at a frequency equal to that of sampling: this system provides a better suppression of interference due to offset drift and to the connecting cables.

The sampling frequency can be set from 2.5 samples per second up to 4800 samples per second therefore the instrument meets the needs of applications that require a considerable speed of response.

Each input channels can be supplied in 4 different configurations:

- Version with **input for strain gauge transducers** with standard resolution of ±100.000 div. suitable for working with load cells or force transducers with output ±2mV/V or ±3mV/V and 4 wires or 6 wires connection.
- Version with **voltage input** with standard resolution of ±100.000 div. suitable for working with pressure, torque transmitters, etc ... with output ±10V or ±5V.
- Version with **current input** with a standard resolution of ±160.000 div. suitable for working with pressure, torque transmitters, etc ... with output 4-20mA or 0-20mA and 2- and 3-wires.
- Version with **temperature input** for PT100 eligible to work in the range from -50 °C to + 250 °C with 0.1 °C resolution and accuracy ± 1 °C.

MP2Plus has in the standard configuration:

- **4 DIGITAL INPUT** 24Vdc with function programmable.
- **5** programmable **SET POINT**.
- **4 RELAYS** type DPDT. The relays can be programmed, in combination of the setpoint, to create a simple automation or logics of intervention.
- A rear **USB** port to connect directly to a PC or Tablet.

As **OPTIONS** the instrument can be equipped with:

- **Additional input channel CH2** with a synchronization system that allows to acquire at the same instant the measurement of CH1 and CH2 channels. The refresh rate of the analog signals is equal to the frequency of acquisition of the respective channels in input.
- One or two **Analog Outputs** programmable as voltage (± 10V, 0/5V, 0/10V, ±5V) or current (4-20mA, 0-20mA, 0-24mA) that can be associated to different channels or to the TOTAL (sum of two channels).
- A serial **RS232** line to directly connect the device to a PC, PLC or a serial **PRINTER**. Moreover **MP2Plus** can be programmed to work as **REPEATER.**
- A serial **RS485** line with protocol MODBUS RTU normally used to connect multiple instruments in a same network to a PLC.
- **WIRELESS** transmission designed to transmit measurements to other devices by radio at a distance up to 100m.
- A powerful **DATALOGGER** with non-volatile memory, which allows to store data at the maximum acquisition speed, synchronize recordings with an internal clock-calendar and eventually export data to a file using an USB stick in .csv file format that can be transferred directly to Microsoft Excel.

Other features and functions of importance are:
- Graphical, large and high resolution LCD display with backlit.
- Automatic **UNIT CONVERSIONS** in many specific units for each type of transducers.
- Function **MULTIMETER** which displays the signal of the sensor directly in mV/V, V or mA.
- User selectable language : **ITALIAN or ENGLISH**.
- Function **ZERO** and **AUTOZERO** to reset automatically the measure if the measurement is below a set threshold.
- Function of **HOLD**, **PEAK**, programmable **FILTER**.
- Function of **DISCHARGE** in order to measure the amount of product discharged for example from a tank.
- Function **TOTAL** to perform the sum of channels CH1 and CH2.
- Function **KEY LOCK** to protect the instrument settings by unauthorized persons.
- Function **CLOCK-CALENDAR** (Option) with date and time.
- 24 columns **PRINTER** (option) connected to the serial port through which it is possible to print the measuring points with the date and time and the data of the company that carried out the survey.
- **REPEATER** Function: The instrument can be configured to display (in the form passive as Slave) measures from the RS232 serial port (for example from another **MP2Plus** - Master) to a remote view of the measures.
  In this case all the features enabled on the **MP2Plus** Slave will be active (Setpoint, USB, printer, logger etc). The **REPEATER** function is active for one channel.

For each input channel, you can calibrate the signal coming from the sensor both in the **POSITIVE RANGE** and in the **NEGATIVE RANGE** (Example in tension and compression) through 3 different modes:
- Calibration with **Full Scale**: characterization through the programming of the transducer full scale and sensitivity in both the positive and negative range.
- Calibration for **POINTS**: linearity correction by programming 5 known points in both the positive and negative range.
- **Known Weight**: practice characterization (in the field) by imposing a known weight, pressure, torque to the sensor and calibrating the transducer output to this reference value.

To increase security the instrument has the ability to perform a **BACKUP** of all calibrations data so that you can recall them in case of accidental tampering.

MP2Plus can be accompanied by the PC program **MP Supervisor** (Option) which allows immediate interface via the USB port with the instrument and allows you to display graphs, export to Microsoft Excel.
The program also allows you to download the data logger performed using the internal memory and those on performed on USB stick and view their acquisition curves.
Typical applications:
Automatic weighing systems and small dosages.
Systems for monitoring levels of tanks, silos and hoppers.
Integrated measuring systems on test benches and testing.
Measurement systems integrated into automated processes.
Control systems of industrial processes.
Automatic systems Testing and Quality Control in production lines.
Control measures on board for materials testing machines.
Control measures on springs, friction detection, breakout forces, leakage tests.
Tests on protective and safety devices.

STANDARD CONFIGURATION

INPUT

CH1

±2mV/V, ±3mV/V
±5V, ±10V
0-20mA, 4-20mA

FUNCTION

POWER SUPPLY 220 Vac

NO External Power Supply

USB 2.0

PEAK

TOTAL

DISCHARGE

DIGITAL FILTER

ZERO and AUTOZERO

DIGITAL CALIBRATIONS

UNIT CONVERSION

5 Set Point 4 RELAYS programmable

Can be used for:

• motors ON / OFF
• solenoid ON / OFF

4 Programmabile Digital Inputs

| ZERO | PRINT | HOLD | UNLOAD |

Used for:

• Remote Function key
• PLC Commands

ADDITIONAL OPTIONS

INPUT

CH2 **OPTION**

±2mV/V, ±3mV/V
±5V, ±10V
0-20mA, 4-20mA
PT100 (temperature)

OPTION

RS232C RS485 MODBUS

PRINTER **REPEATER**

ANALOG OUPUT N° 1

Associated to CH1, CH2 or to TOTAL (CH1+CH2)

The refresh rate of the analog signals is equal to the frequency of acquisition of the respective channels in input.

ANALOG OUPUT N° 2

Associated to CH1, CH2 or to TOTAL (CH1+CH2)

Wireless DATA TRANSMISSION

OPTION

Data Logger

+ Internal CLOCK CALENDAR

Front panel USB port to download data logger using a USB sticks and to bring data directly to a PC. File type : csv or txt

POWER SUPPLY

115 Vac

24Vdc

APPLICATION SOFTWARE

MP Supervisor

Instrument Configuration
Data Analysis
DataLogger Management
Graphics

TECHNICAL DATA

STARDARD NUMBER OF CHANNELS	**1** (CH1)
ACCURACY	≤± 0,005%
LINEARITY ERROR	≤± 0,005%
INTERNAL DIVISIONS	24bit
CH1 INPUT : STRAIN GAUGE TRANSDUCERS	**± 2mV/V, ±3mV/V** (max ±3.5mV/V)
RESOLUTION	± 100.000div
TRANSDUCERS POWER SUPPLY	5Vdc switching (±3%)
TYPE OF CONNECTION	4 or 6 wires
TRANSDUCER RESISTANCE	from 100Ω to 2000Ω
CH1 INPUT : VOLTAGE AMPLIFIED TRANSDUCERS	**± 10V** and **± 5V**
RESOLUTION	± 100.000div
TRANSDUCERS POWER SUPPLY	20Vdc (±1Vdc)
CH1 INPUT : CURRENT AMPLIFIED TRANSDUCERS	**0-20mA** │ **4-20mA**
RESOLUTION	+200.000div │ +160.000div
TRANSDUCERS POWER SUPPLY	20Vdc (±1Vdc)
Unit Conversions for **WEIGHT** and **FORCE**	kg, t, N, daN, kN, MN, lb, klb
Unit Conversions for **PRESSURE**	bar, mbar, psi, MPa, kPa, Pa, mH_2O inH_2O kg/cm^2, mmHg, cmHg, inHg, atm
Unit Conversions for **TORQUE**	N·m, N·mm, kN·m, kg·m, g·cm, kg·mm, ft·lbf, in·lbf
Unit Conversions for **DISPLACEMENT**	mm, m, foot, inch, cm, dm, µm
MULTIMETER FUNCTION	Direct Display in mV/V, Volt o mA
BACKLIT GRAPHIC DISPLAY	128 x 64 dots
CHARACTER SIZE	~ 13 mm
TRANSDUCER CALIBRATION	Both in the POSITIVE and NEGATIVE range
TYPE OF DIGITAL CALIBRATION	Full Scale, Point Interpolation, Known Weight
FIELD LINEARITATION	On 1 … 5 measurement point
BACKUP AND RESTORE FUNCTION	Save and restore all configuration data
FUNCTION OF ZERO	100% (on all the measurement range)
FUNCTION OF AUTOZERO	With TIME and THRESHOLD programming
FUNCTION OF PEAK	POSITIVE and NEGATIVE
FUNCTION OF DISCHARGE	YES
FUNCTION OF KEY BLOCK	Enabled through a Password
FUNCTION OF TOTAL (CH1+CH2)	YES
PROGRAMMABLE RESOLUTION	1 … 100
DIGITAL FILTER	0 … 5
PROGRAMMABLE CONVERSION RATE	from 2.5 to 4800 samples for second
INSTRUMENT LANGUAGE	ITALIAN and ENGLISH
Function Keys programmable in configuration	F1 – F2 – F3 – F4
SET POINT PROGRAMMABLE	5
PROGRAMMABLE DIGITAL INPUTS	4
RELAY OUTPUT (DPDT form)	4
• MAX TENSION	220Vdc – 250Vac
• MAX CURRENT	2A
• MAX POWER	60W – 62,5VA
Rear Panel USB output, Connector type B	Max Cable Length 3.5m
NOMINAL WORKING TEMPERATURE	0... +50°C
MAX WORKING TEMPERATURE	0... +50°C
STORAGE TEMPERATURE	-20... +70°C
TEMPERATURE EFFECTS on the measurements	
a) on zero (10°C variation)	≤±0,005%
b) on full scale (10°C variation)	≤±0,005%
POWER SUPPLY	230 Vac +/-10%
FREQUENCY	50/60 Hz
EXTERNAL PROTECTION FUSE	250mA / 250 V
MAX. POWER REQUIRED	10VA
PANEL MOUNTING CASE	DIN 43700
CASE MATERIAL	NORYL UL94 V-O
FRONT AND REAR PANEL MATERIAL	UL94 V-2
PROTECTION CLASS (EN 60529)	IP40 (only front panel)
DEGREE OF ENVIRONMENTAL CONT.	1
DIMENSIONS (HxLxD) mm	72 x 144 x 150 mm
DRILLING TEMPLATE (A x L) mm	68 x 138 mm

WEIGHT	~ 0,8 kg

OPTIONS

K VERSION ACCURACY LINEARITY ERROR **STRAIN GAUGE INPUT** RESOLUTION TRANSDUCERS POWER SUPPLY TRANSDUCER RESISTANCE	Only for Strain Gauge Inputs ≤± 0.005% ≤± 0.005% **± 2mV/V** **± 300.000 div** 5Vdc switching (±3%) n° 1 (350Ω o 700Ω)
INPUT CH2: STRAIN GAUGE RESOLUTION TRANSDUCERS POWER SUPPLY TYPE OF CONNECTION TRANSDUCER RESISTANCE MAX NUMBER OF TRANSDUCERS IN PARALLEL	**± 2mV/V** (max ±3.5mV/V) ± 100.000div 5Vdc switching (±3%) 4 or 6 wires from 100Ω to 2000Ω 4 @350Ω or 8 @ 700Ω
INPUT CH2 VOLTAGE AMPLIFIED TRANSDUCERS RESOLUTION TRANSDUCERS POWER SUPPLY	**± 10V** e **± 5V** ± 100.000 div 20Vdc
INPUT CH2 : CURRENT AMPLIFIED TRANSDUCERS RESOLUTION TRANSDUCERS POWER SUPPLY	**0-20mA** | **4-20mA** +200.000 div | +160.000 div 20Vdc
INPUT CH2 : TEMPERATURE ACCURACY RESOLUTION UNITS	**PT100** 2 fili (range -50 +250°C) ±1°C ±0.1°C° C°, °F
RS232 SERIAL LINE **RS485 MODBUS RTU** (max 32 in multipoint) **PRINTER**	MAX cable Lenght 13m MAX cable Lenght 1000m 24 columns (RS232)
Analog Outputs Current Output Voltage Output (max 20mA – RL min: 1kΩ)	1 or 2 outputs independent 0-20mA, 4-20mA, 0-24mA 0-5V, 0-10V, ±10V, ±5V
WIRELESS transmission Max distance in free space	433MHz 100m
DATA LOGGER (INTERNAL) Max Storing Points MAX PROGRAMMABLE TIME CLOCK - CALENDAR	 1 channel enabled : max. 130.000 2 channels enabled: max. 65.000 2 channels enabled +TOTAL: max. 43.000 100 days Year, Month, Day, Hour, Minute,Seconds
FRONT PANEL USB to download data logger USB Flash Drive (Flash Memory) and take them directly to a PC.	File types csv or txt
OUTPUT RELAYS DPDT type	5° Relay
POWER SUPPLY	115 Vac or 24Vdc

COMPONENTS SUPPLIED

Mounting Brackets

DB9 Male Connector
for transducer

CD with
Manual and USB Driver

COMPONENTS IN OPTION (purchased separately)
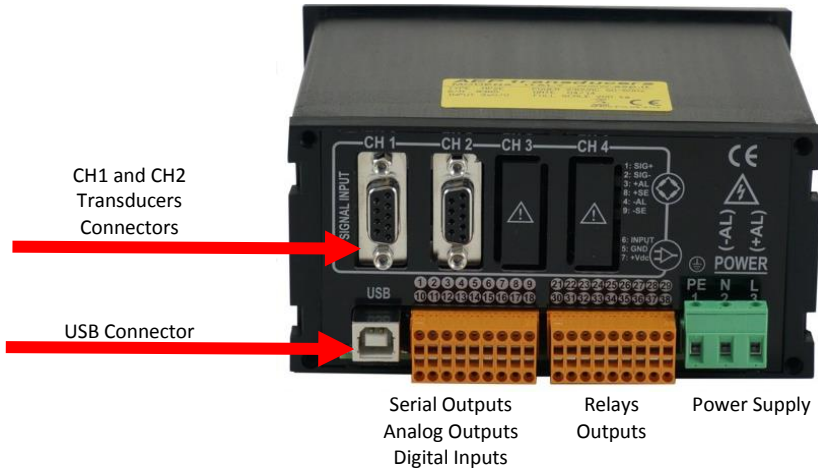

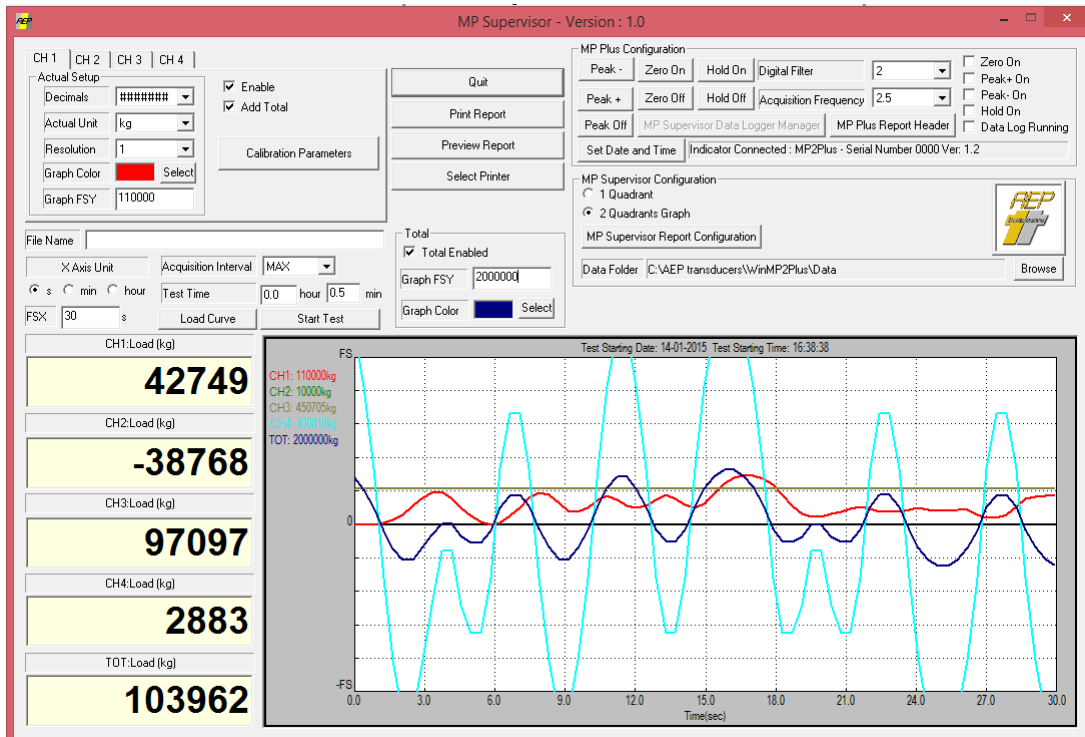| USB Cable | RS232 Serial Cable | DB9 Male Connector for transducers | Desktop 24 columns printer |

ELECTRICAL CONNECTION

CH1 and CH2 Transducers Connectors

USB Connector

Serial Outputs
Analog Outputs
Digital Inputs
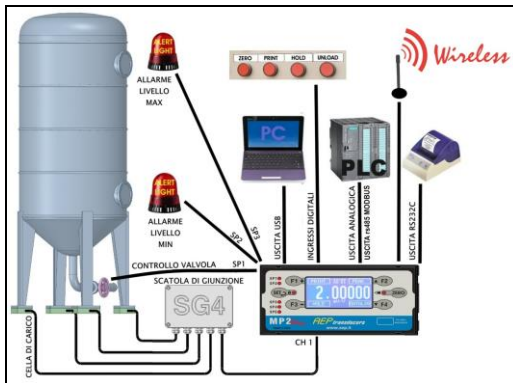
Relays
Outputs

Power Supply

MP *Supervisor* (Option)

A dedicated program that allows an immediate interfacing through the USB port with the MP2Plus and allows you to view graphs, export data to Microsoft Excel directly from the PC and set all configuration parameters.
The program also allows you to download a Data Logger carried out using the internal memory or the USB Flash Memory and display the respective curves of acquisition.
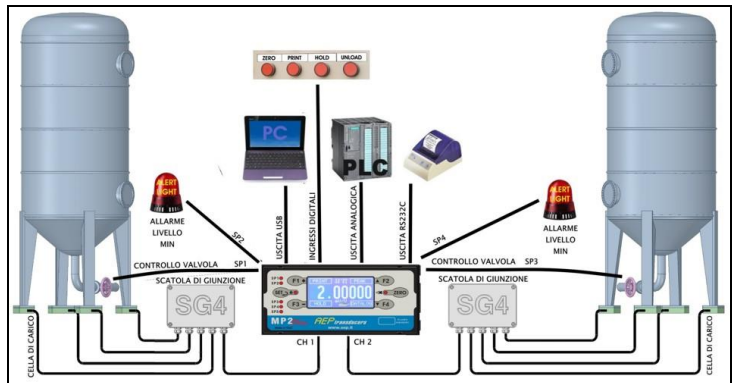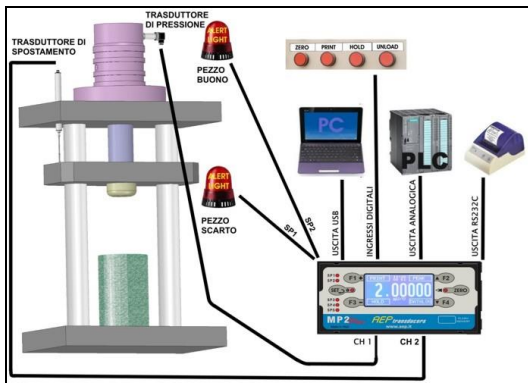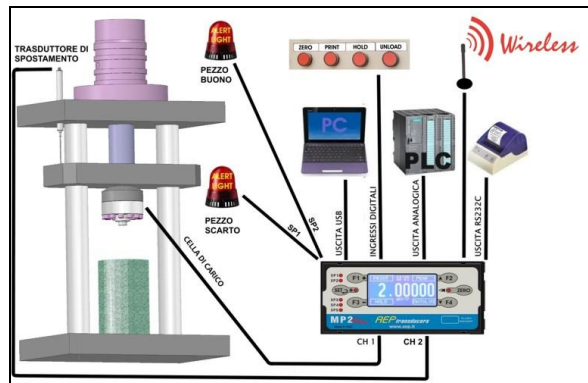
TYPICAL APPLICATION
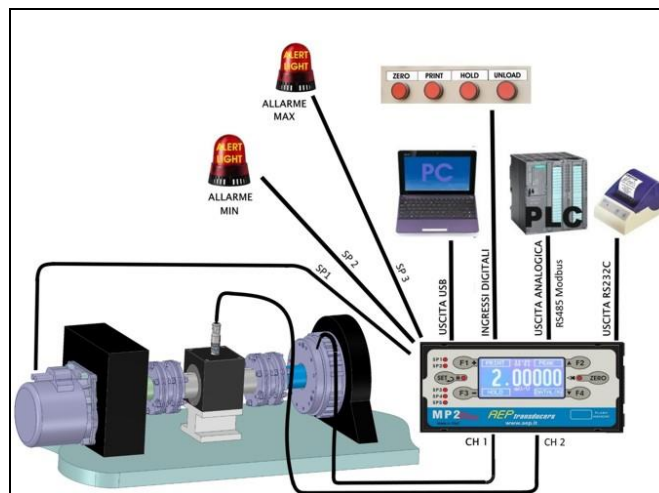

WEIGHING system of a silo.

WEIGHING system of two silos.

Measurement system of hydraulic or pneumatic press
with direct control of PRESSURE and DISPLACEMENT.

Measurement system on the press
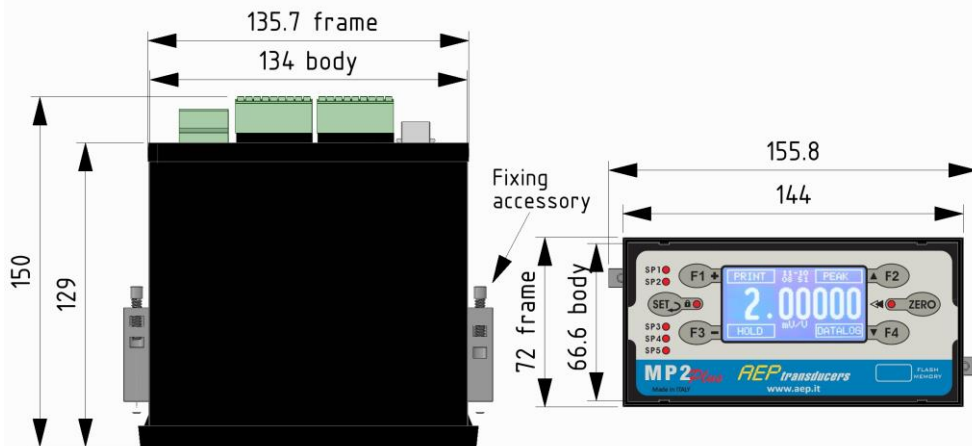with direct control of FORCE and DISPLACEMENT

Measuring system on the test bench brake torque control and temperature developed by the brake.

Wireless Transmission

Dimensions (mm)

MOUNTING PANEL APPLICATION

PURCHASE CODES

MP2P	Version	Inputs	Power	Analog Outputs	Serial Outputs	Relays Output	Data logger
	X	X	XXX	XX	X	XX	X
	K Version ±300.000	2 2 channels	230 230 Vac	A1 1° Output	S RS232, RS458 Modbus, Printer	R5 5 Relay	D Datalogger Clock Calendar
			115 115Vac	A2 2° Output	W Wireless Transmission		F Datalogger Clock Calendar USB Flash Memory
			24 24Vdc				

Example: MP2P230 (MP2Plus – power supply 230Vac – base version)
Example: MP2P224A2S (MP2Plus 2 Channels – power supply 24Vdc + 2 analog outputs + Serial output)
Example: MP2P2115SF (MP2Plus 2 Channels – power supply 115Vac + Serial output + DATALOGGER+ USB Flash Memory)

<u>ALWAYS SPECIFY</u> in the puchase order how to configure the input channels:
Example: CH1 = 4-20mA   CH2 = 2mV/V   CH1 = 10V   CH2 = PT100