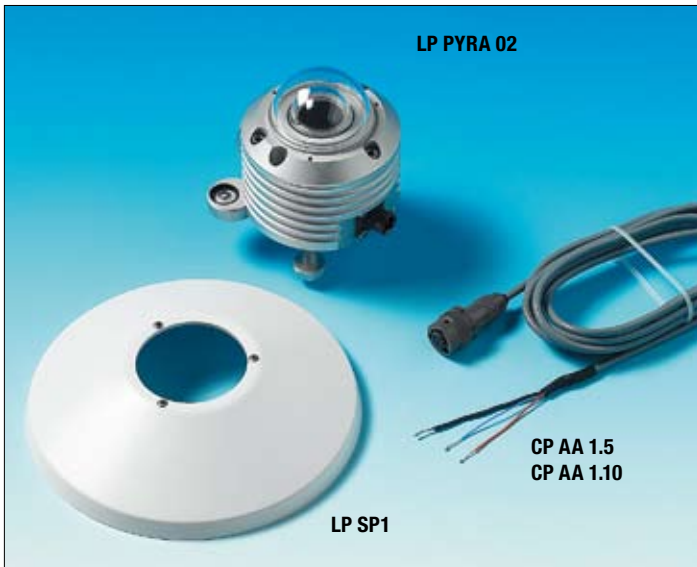




**LP PYRA 02 - LP PYRA 03 - LP PYRA 12  
PYRANOMETERS**

Delta Ohm manufactures First Class **LP PYRA 02** and **LP PYRA 12** and Second Class **LP PYRA 03** pyranometers which fully comply with ISO 9060 standards, and meet the requirements defined by the World Meteorological Organization (WMO). These are strong and reliable ground-based instruments, especially designed to be used under all weather conditions. They are suitable for installation on the field.

**Recommended use:** atmospheric research, weather stations, climatology, energy saving research, productive efficiency test of photovoltaic plants, etc...



LP PYRA 02

Pyranometers LP PYRA 02 and LP PYRA 03 are well suited for the measurement of incoming global solar radiation (0.3µm ÷ 3µm spectral range). LP PYRA 12 shadow ring is designed to shield the instrument sensor from direct radiation; by that, an exact measurement of the diffuse sky radiation is possible.

No power supply is needed; pyranometers generate a voltage which is usually equal to:

$$10 \frac{\text{mV}}{\text{kW} \cdot \text{m}^2}$$

Every pyranometer is calibrated separately and is supplied standard with a WRR (World Radiometric Reference) Report of Calibration.

Technical Specification	LP PYRA 02 / LP PYRA 12*	LP PYRA 03
Typical sensitivity	10 µV/(W/m <sup>2</sup> )	
Impedance	33 Ω ÷ 45 Ω	
Measuring range	0 ÷ 2000 W/m <sup>2</sup>	
Viewing field	2π sr	
Spectral field	305 nm ÷ 2800 nm W/m <sup>2</sup> (50%)	
Operating temperature	-40 °C ÷ 80 °C	
Weight	0.90 Kg	0.45 Kg
<b>ISO 9060 Specifications</b>		
Response time 95%	< 28 sec	< 30sec
Zero Off-set		
a) Response to thermal radiation (200Wm <sup>-2</sup> )	15 W/m <sup>2</sup>	25 W/m <sup>2</sup>
b) Response to temperature change 5K/h	<± 4IW/m <sup>2</sup>	<± 6IW/m <sup>2</sup>
3a) Non stability over 1 year	<± 1.51%	<± 2.51%
3b) Non linearity	<± 11%	<± 21%
3c) Cosine response	<±18IW/m <sup>2</sup>	<±22IW/m <sup>2</sup>
3d) Spectral selectivity	<±51%	<±71%
3e) Response with regard to temperature	< 4 %	< 8 %
3f) Tilt response	<± 21%	<± 41%
<b>Shadow ring for LP PYRA 12</b>		
Weight	5.90 Kg	
Diameter	570 mm	
Height	54 mm	
Basis diameter	300 mm	

**ORDERING CODE**

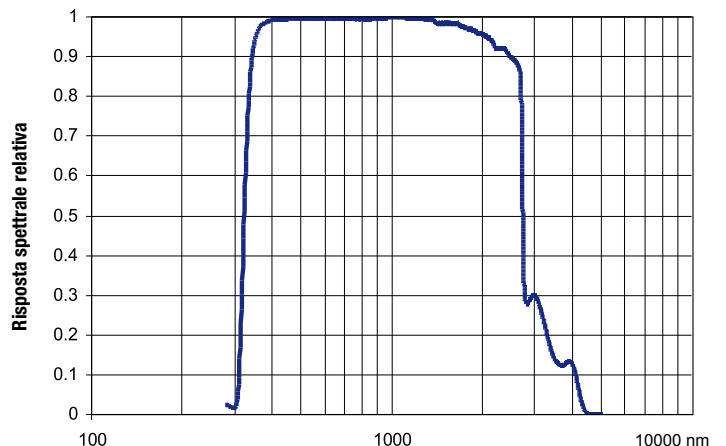
**LP PYRA 02:** First class pyranometer according to ISO 9060. Complete with: shade disk LP SP1, desiccant sachet with silica-gel crystals, 2 cartridges, spirit level, 4-pole flying connector and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connection cable has to be ordered separately.**

**LP PYRA 02AC:** First class pyranometer according to ISO 9060. Complete with shade disk LP SP 1, desiccant sachet with silica-gel crystals, 2 cartridges, spirit level, 4-pole flying connector and Report of Calibration. **Connection cable has to be ordered separately. Current output 4...20mA.** 4mA = 0W/m<sup>2</sup>, 20mA = 2000W/m<sup>2</sup>. Power supply: 10...30Vdc.

**LP PYRA 02AV:** First class pyranometer according to ISO 9060. Complete with shade disk LP SP 1, desiccant sachet with silica-gel crystals, 2 cartridges, spirit level, 4-pole flying connector and Report of Calibration. **Connection cable has to be ordered separately. Voltage output 0...1Vdc, 0...5Vdc, 0...10Vdc.** 0V = W/m<sup>2</sup>, 1/5/10Vdc = 2000W/m<sup>2</sup>. Power supply: 10...30Vdc (15...30Vdc for models with output 0...10Vdc).

**LP S1:** Mounting kit for LP PYRA 02: bracket for attachment to a mast, including fasteners and leveling screws.

**LP SP1:** Shade disk for LP PYRA 02



Risposta spettrale tipica dei Piranometri

**LP SG:** Drying cartridge with silicagel crystals, complete with O-ring.

**LP G:** Pack of 5 cartridges of silicagel.

**LP PYRA 03:** Second class pyranometer according to ISO 9060. Complete with spirit level, 4-pole flying connector and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connection cable has to be ordered separately.**

**LP PYRA 03AC:** Second class pyranometer according to ISO 9060. Complete with spirit level, 4-pole flying connector and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connection cable has to be ordered separately. Current output 4...20mA.** 4mA = 0W/m<sup>2</sup>, 20mA = 2000W/m<sup>2</sup>. Power supply: 10...30Vdc.

**LP PYRA 03AV:** Second class pyranometer according to ISO 9060. Complete with spirit level, 4-pole flying connector and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connection cable has to be ordered separately. Voltage output 0...1Vdc, 0...5Vdc, 0...10Vdc.** 0V = W/m<sup>2</sup>, 1/5/10Vdc = 2000W/m<sup>2</sup>. Power supply: 10...30Vdc (15...30Vdc for models with output 0...10Vdc).

**LP S2:** Mounting kit: spirit level and stud for mounting LP PYRA 03 on a support which is also part of the kit. Fasteners, shade disk LP SP2 are included.

**LP SP2:** Shade disk.

**LP PYRA 12:** First Class Pyranometer (LP PYRA 02) according to ISO 9060. Complete with shade disk, shadow ring for diffuse radiation, drying cartridge for silicagel crystals, 2 silicagel cartridges and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connecting cable has to be ordered separately.**

**LP PYRA 12AC:** First Class Pyranometer (LP PYRA 02) according to ISO 9060. Complete with shade disk, shadow ring for diffuse radiation, drying cartridge for silicagel crystals, 2 silicagel cartridges and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connection cable has to be ordered separately. Current output 4...20mA.** 4mA = 0W/m<sup>2</sup>, 20mA = 2000W/m<sup>2</sup>. Power supply: 10...30Vdc.

**LP PYRA 12AV:** First Class Pyranometer (LP PYRA 02) according to ISO 9060. Complete with shade disk, shadow ring for diffuse radiation, drying cartridge for silicagel crystals, 2 silicagel cartridges and Report of Calibration. Typical sensitivity 10µV/(W/m<sub>2</sub>). **Connection cable has to be ordered separately. Voltage output 0...1Vdc, 0...5Vdc, 0...10Vdc.** 0V = W/m<sup>2</sup>, 1/5/10Vdc = 2000W/m<sup>2</sup>. Power supply: 10...30Vdc (15...30Vdc for models with output 0...10Vdc).

**CP AA 2.5:** Flying 7-pole connector, complete with UV-resistant cable L=5m. For the instruments LP PYRA 05- LP PYRA 06 - LP UVB 02.

**CP AA 2.10:** Flying 7-pole connector, complete with UV-resistant cable L=10m. For the instruments LP PYRA 05- LP PYRA 06 - LP UVB 02.

#### ORDER CODE:

**HD978TR3:** Configurable signal converter amplifier with 4÷20mA (20÷4mA) output. Input measuring range -10...+60mV. Default setting 0÷20mV. Minimum measuring range 2mV.

**HD978TR4:** Configurable signal converter amplifier with 0÷10 (10÷0Vdc) output. Input measuring range -10...+60mV. Default setting 0÷20mV. Minimum measuring range 2mV.

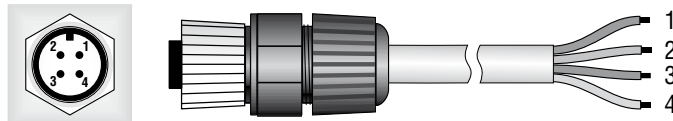
**HD978TR5:** Wall configurable, signal converter amplifier with 4÷20mA (20÷4mA) output. Input measuring range -10...+60mV. Default settings 0÷20mV. Minimum measuring range 2mV.

**HD978TR6:** Wall configurable, signal converter amplifier with 0÷10 (10÷0Vdc) output. Input measuring range -10...+60mV. Default settings 0÷20mV. Minimum measuring range 2mV.



HD978TR3, HD978TR4, HD978TR5, HD978TR6

#### WIRING DIAGRAM LP PYRA 02 - LP PYRA 03 - LP PYRA 12



Fixed 4-pole plug M12

Flying 4-pole M12 socket

#### LP PYRA 02 - LP PYRA 03 - LP PYRA 12

Connector	Function	Color
1	Positive signal (+)	Red
2	Negative signal (-)	Blue
3	Not connected (LP PYRA 03) Container (LP PYRA 02 - LP PYRA 12)	White
4	Shield (≡)	Black

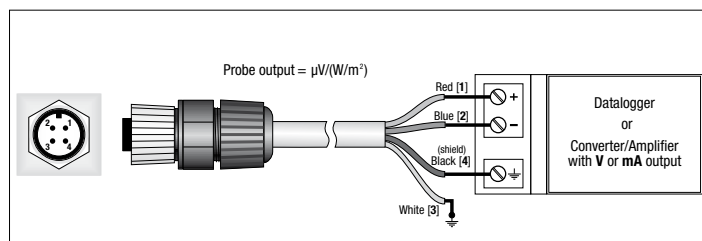
#### LP PYRA 02AC - LP PYRA 03AC - LP PYRA 12AC

Connector	Function	Color
1	Positive signal (+)	Red
2	Negative signal (-), -Vdc	Blue
3	Not connected (LP PYRA 03) Container (LP PYRA 02 - LP PYRA 12)	White
4	Shield (≡)	Black

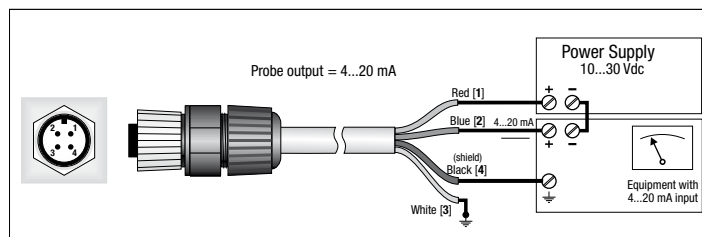
#### LP PYRA 02AV - LP PYRA 03AV - LP PYRA 12AV

Connector	Function	Color
1	(+) Vout	Red
2	(-) Vout e (-) Vcc	Blue
3	(+) Vcc	White
4	Shield (≡)	Black

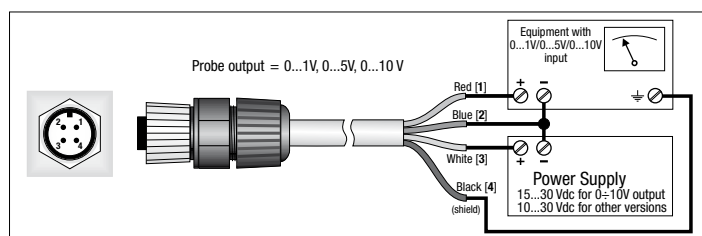
#### LP PYRA 02 - LP PYRA 03 - LP PYRA 12 CONNECTION DIAGRAMMS



#### LP PYRA 02 AC



#### LP PYRA 02 AV



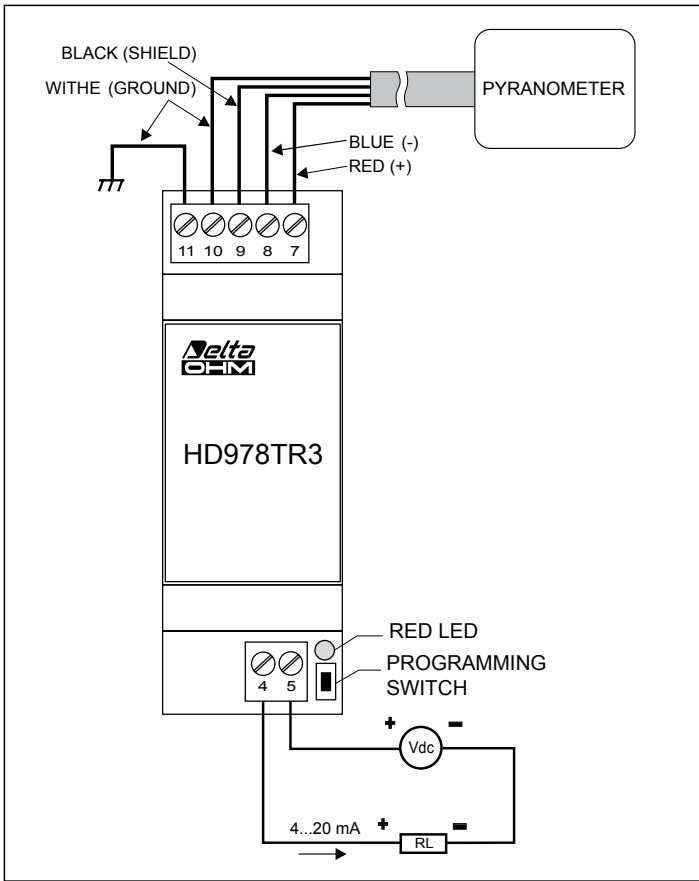


Fig.5 Connection diagram of the HD978TR3 to a pyranometer.

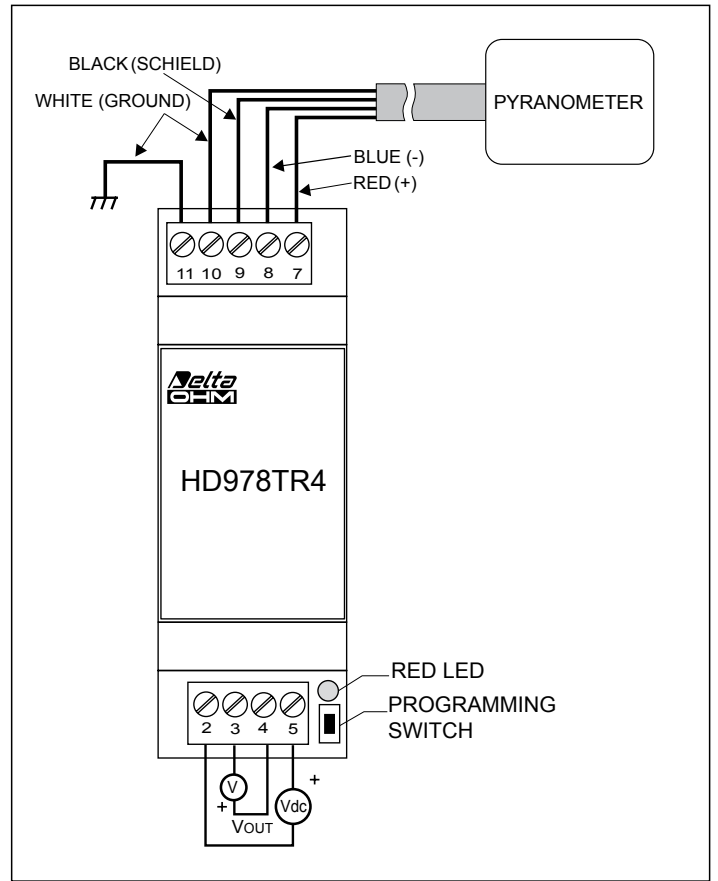
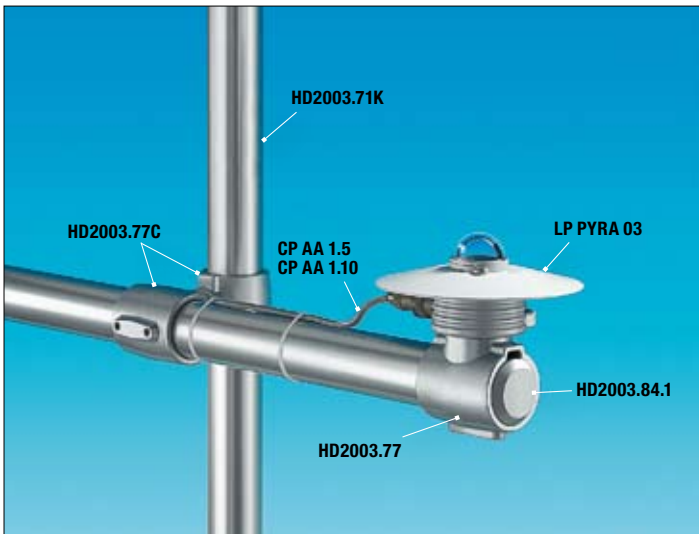
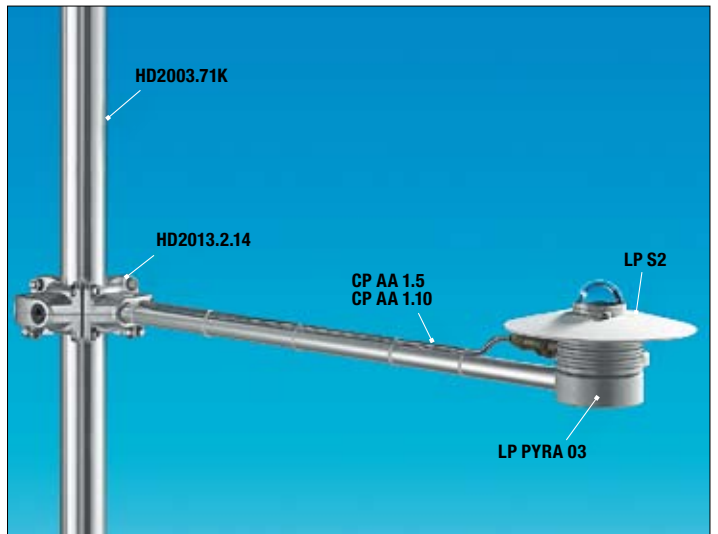


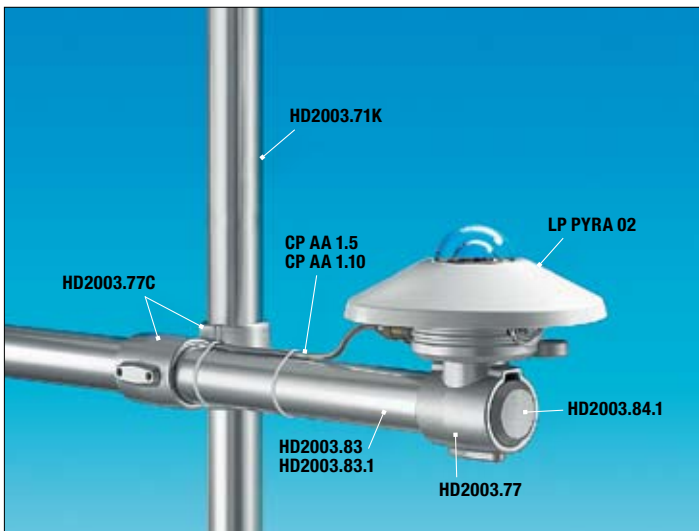
Fig.6 Connection diagram of the HD978TR4 to pyranometer.



LP PYRA 03 + HD2003.77 + HD2003.77C



HD2013.2.14 + LP PYRA 03 + LP SP2 + LP S2



LP PYRA 02 + HD2003.77C + HD2003.77



LP PYRA 02 + HD2003.85K + HD2003.77C