

## INTRODUCTION

Thank you for choosing an HK Instruments PTE-O/OI series passive temperature sensor. The PTE-O/OI series is intended for use in commercial environments in HVAC/R applications.

PTE-O is used to sense outside air temperature. The temperature sensor is housed inside a stainless steel sleeve that protects it from the environment and condensation, ensuring long service life.

PTE-OI is used to sense outside air temperature and ambient lighting conditions. In addition to the outside air temperature, the PTE-OI includes an ambient illuminance sensor. The illuminance sensor is hermetically sealed for protection.

The design approach has been to offer user-friendly and premium quality products with economical pricing. PTE products are available with wide range of sensor types: NTC10k, NTC20k, PT1000, Ni1000 and Ni1000-LG.

## APPLICATIONS

PTE-O is commonly used in HVAC systems for:

- measuring outside air temperature
- measuring temperature in cold storages
- measuring inside air temperature in warehouses

PTE-OI is commonly used in HVAC systems for:

- measuring outside air temperature
- controlling the outside lighting of buildings

## SPECIFICATIONS

### Performance

**Illuminance**  
**measurement range (-OI only):**  
0...1000 lx

**Accuracy:**  
NTC10k  
± 0.25 °C @ 25 °C  
NTC20k  
± 0.25 °C @ 25 °C  
Pt1000  
± 0.3 °C @ 0 °C  
Ni1000  
± 0.4 °C @ 0 °C  
Ni1000-LG  
± 0.4 °C @ 0 °C

**Illuminance sensor (-OI only):**  
± 20 % @ 100 lx

**Protection class:**  
IP54

### Technical Specifications

**Environment:**  
Operating temperature:  
-50 ... +50 °C

### Physical

**Housing material:**

ABS

**Cover material:**

PTE-O: PC

PTE-OI: PMMA

**Housing dimensions:**

90.0 x 95.0 x 36.0 mm

**Weight:**

PTE-O: 90 g

PTE-OI: 95 g

## WARNING

- READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS DEVICE.
- Failure to observe safety information and comply with instructions can result in PERSONAL INJURY, DEATH AND/OR PROPERTY DAMAGE.
- To avoid electrical shock or damage to equipment, disconnect power before installing or servicing and use only wiring with insulation rated for full device operating voltage.
- To avoid potential fire and/or explosion do not use in potentially flammable or explosive atmospheres.
- Retain these instructions for future reference.
- This product, when installed, will be part of an engineered system whose specifications and performance characteristics are not designed or controlled by HK Instruments. Review applications and national and local codes to assure that the installation will be functional and safe. Use only experienced and knowledgeable technicians to install this device.

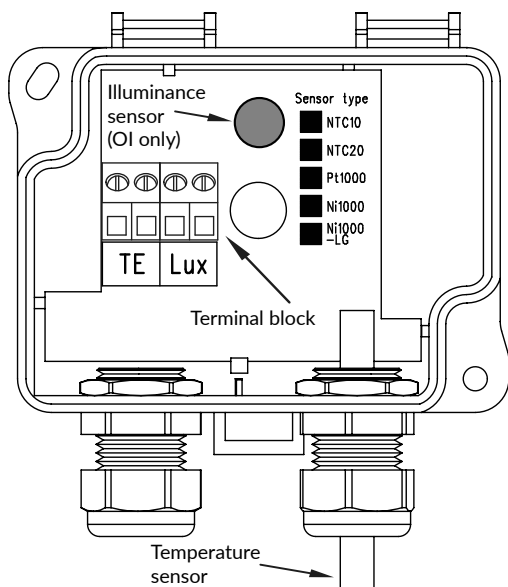
### Conformance

Meets the requirements for CE marking:  
RoHS Directive 2011/65/EU  
WEEE Directive 2012/19/EU

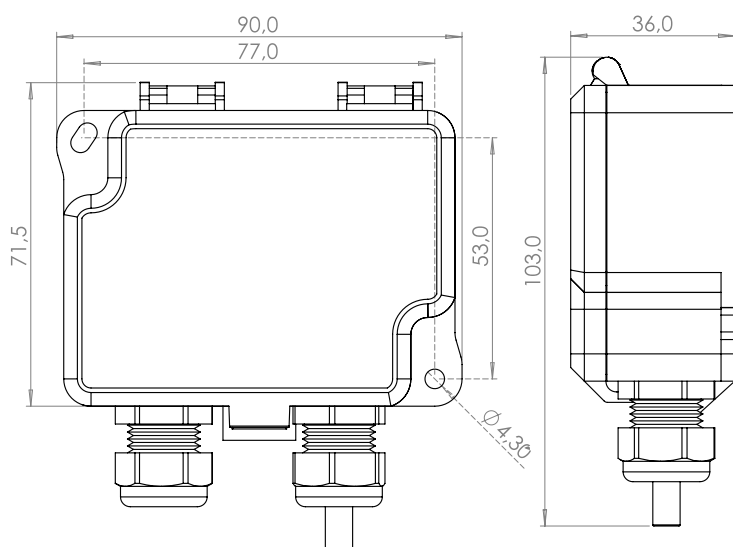
COMPANY WITH  
MANAGEMENT SYSTEM  
CERTIFIED BY DNV GL  
= ISO 9001 = ISO 14001 =



## SCHEMATICS



## DIMENSIONAL DRAWINGS



## INSTALLATION

- 1) Mount the device in the desired location (see step 1).
- 2) Route the cables and connect the wires (see step 2).
- 3) The device is now ready to be used.

### STEP 1: MOUNTING THE DEVICE

- 1) Select a mounting location on the Northern wall of the building.

Do not locate PTE-O/OI where it can be affected by:

- Direct sunlight
- Radiant heat from appliances
- Ventilation shafts
- Powerful light sources

- 2) Mount the device with screws (see Figure 1).

**NOTE!** Incorrect installation may cause shift to outputs and compromise the ingress protection.

## MOUNTING THE DEVICE CONTINUED

Figure 1a - Surface mounting

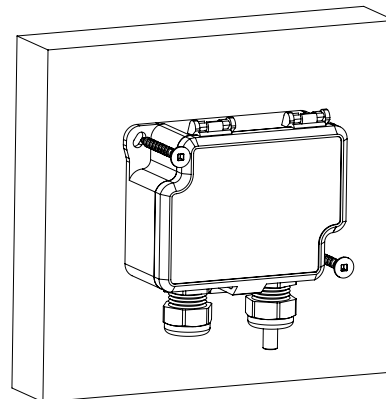
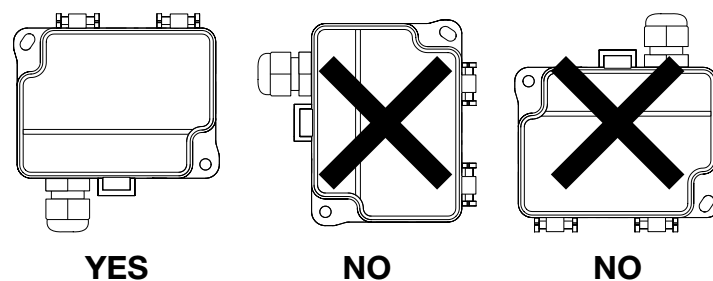


Figure 1b - Surface mounting



## STEP 2: WIRING DIAGRAMS

- 1) Unscrew the strain relief and route the cable.
- 2) Connect the wires as shown in Figure 2a or 2b.
- 3) Tighten the strain relief.

Figure 2a - Wiring diagram: PTE-O

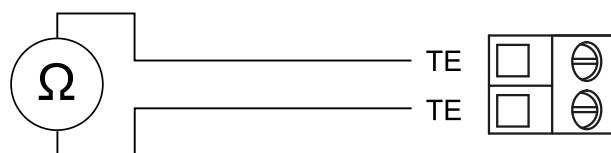
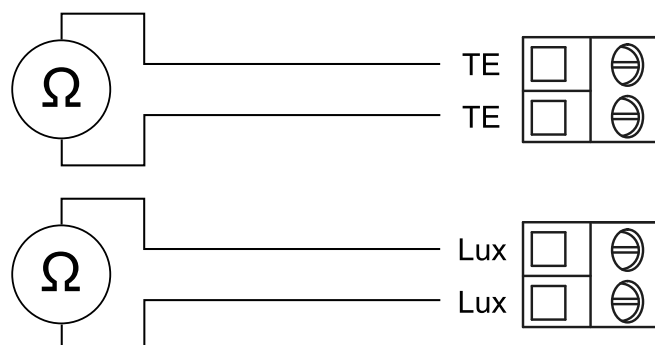


Figure 2b - Wiring diagram: PTE-OI



## RECYCLING/DISPOSAL

The parts left over from installation should be recycled according to your local instructions. Decommissioned devices should be taken to a recycling site that specializes in electronic waste.



## WARRANTY POLICY

The seller is obligated to provide a warranty of five years for the delivered goods regarding material and manufacturing. The warranty period is considered to start on the delivery date of the product. If a defect in raw materials or a production flaw is found, the seller is obligated, when the product is sent to the seller without delay or before expiration of the warranty, to amend the mistake at his/her discretion either by repairing the defective product or by delivering free of charge to the buyer a new flawless product and sending it to the buyer. Delivery costs for the repair under warranty will be paid by the buyer and the return costs by the seller. The warranty does not comprise damages caused by accident, lightning, flood or other natural phenomenon, normal wear and tear, improper or careless handling, abnormal use, overloading, improper storage, incorrect care or reconstruction, or changes and instal-

lation work not done by the seller or his/her authorized representative. The selection of materials for devices prone to corrosion is the buyer's responsibility, unless otherwise is legally agreed upon. Should the manufacturer alter the structure of the device, the seller is not obligated to make comparable changes to devices already purchased. Appealing for warranty requires that the buyer has correctly fulfilled his/her duties arisen from the delivery and stated in the contract. The seller will give a new warranty for goods that have been replaced or repaired within the warranty, however only to the expiration of the original product's warranty time. The warranty includes the repair of a defective part or device, or if needed, a new part or device, but not installation or exchange costs. Under no circumstance is the seller liable for damages compensation for indirect damage.

## ILLUMINANCE SENSOR ELEMENT: RESISTANCE TABLE

lx	$\Omega$	lx	$\Omega$	lx	$\Omega$	lx	$\Omega$
0	27251	250	10598	500	8526	750	7605
10	24169	260	10464	510	8476	760	7578
20	21542	270	10336	520	8427	770	7552
30	19799	280	10215	530	8381	780	7526
40	18608	290	10100	540	8335	790	7501
50	17567	300	9990	550	8291	800	7476
60	16669	310	9885	560	8248	810	7452
70	15922	320	9785	570	8206	820	7428
80	15260	330	9690	580	8165	830	7405
90	14737	340	9598	590	8125	840	7382
100	14285	350	9511	600	8086	850	7360
110	13848	360	9427	610	8049	860	7338
120	13463	370	9346	620	8012	870	7316
130	13129	380	9268	630	7976	880	7295
140	12845	390	9194	640	7941	890	7274
150	12526	400	9122	650	7907	900	7254
160	12273	410	9053	660	7873	910	7234
170	12030	420	8986	670	7841	920	7214
180	11806	430	8921	680	7809	930	7195
190	11598	440	8859	690	7778	940	7175
200	11404	450	8799	700	7747	950	7157
210	11222	460	8741	710	7717	960	7138
220	11052	470	8684	720	7688	970	7120
230	10892	480	8630	730	7660	980	7102
240	10741	490	8577	740	7632	990	7085
						1000	7068

## TEMPERATURE SENSOR ELEMENT: RESISTANCE TABLE

Resistance ( $\Omega$ )					
	NTC10 $\beta = 3976$	NTC20 $\beta = 3976$	Pt1000 EN 60751	Ni1000 DIN 43760	Ni1000-LG DIN 43760
200 °C	72,1	144,2	1 758,6	2 406,6	2 137,0
175 °C	115,2	230,4	1 666,3	2 189,3	1 963,0
150 °C	194,6	389,2	1 573,2	1 986,3	1 799,3
125 °C	351,1	702,1	1 479,5	1 796,3	1 645,1
100 °C	385,4	1 371	1 385,2	1 617,8	1 500,0
90 °C	919,1	1 838	1 347,2	1 549,3	1 444,4
80 °C	1 253	2 506	1 309,0	1 482,5	1 390,1
70 °C	1 740	3 480	1 270,8	1 417,2	1 337,1
60 °C	2 464	4 927	1 251,7	1 353,4	1 285,4
50 °C	3 564	7 128	1 194,0	1 291,1	1 235,0
40 °C	5 279	10 559	1 155,5	1 230,1	1 185,7
30 °C	8 026	16 051	1 116,8	1 170,6	1 137,6
29 °C	8 382	16 763	1 112,9	1 164,7	1 132,9
28 °C	8 756	17 512	1 109,1	1 158,5	1 128,1
27 °C	9 150	18 299	1 105,2	1 153,0	1 123,4
26 °C	9 564	19 128	1 101,3	1 147,1	1 118,7
25 °C	10 000	20 000	1 097,4	1 141,3	1 114,0
24 °C	10 459	20 918	1 093,5	1 135,5	1 109,3
23 °C	10 942	21 885	1 089,7	1 129,7	1 104,6
22 °C	11 452	22 903	1 085,8	1 123,9	1 100,0
21 °C	11 988	23 977	1 081,9	1 118,1	1 095,3
20 °C	12 554	25 108	1 078,0	1 112,4	1 090,7
15 °C	15 885	31 770	1 058,6	1 083,8	1 067,6
10 °C	20 268	40 536	1 039,1	1 055,5	1 044,8
5 °C	26 088	52 175	1 019,6	1 027,6	1 022,3
0 °C	33 890	67 780	1 000,0	1 000,0	1 000,0
-5 °C	44 458	88 915	980,5	927,7	978,0
-10 °C	58 925	117 850	960,9	945,8	956,2
-15 °C	78 958	157 920	941,3	919,2	934,7
-20 °C	107 030	214 060	921,6	893,0	913,5
-25 °C	146 880	293 750	901,9	867,0	892,5
-30 °C	204 190	408 380	882,2	841,5	871,7
-40 °C	411 750	823 500	842,7	791,3	830,8
-50 °C	884 150	1 768 300	803,0	742,6	790,9
-60 °C	2 039 700	4 079 400	763,2	695,2	751,8

Beta ( $\beta$ ) constant mentioned is of type 25/85