

## 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

### Conformance

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

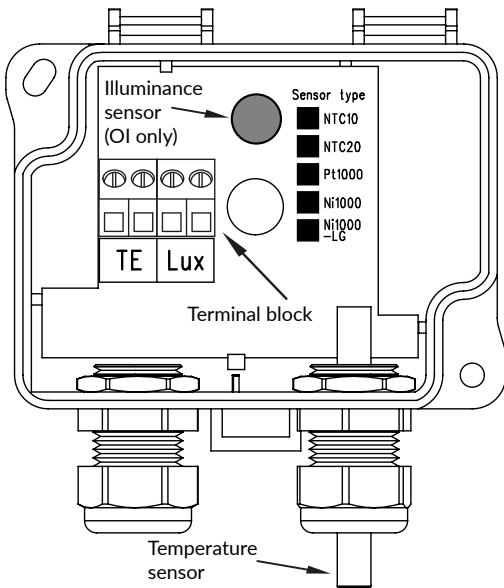
## ⚠ WARNING

- 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.

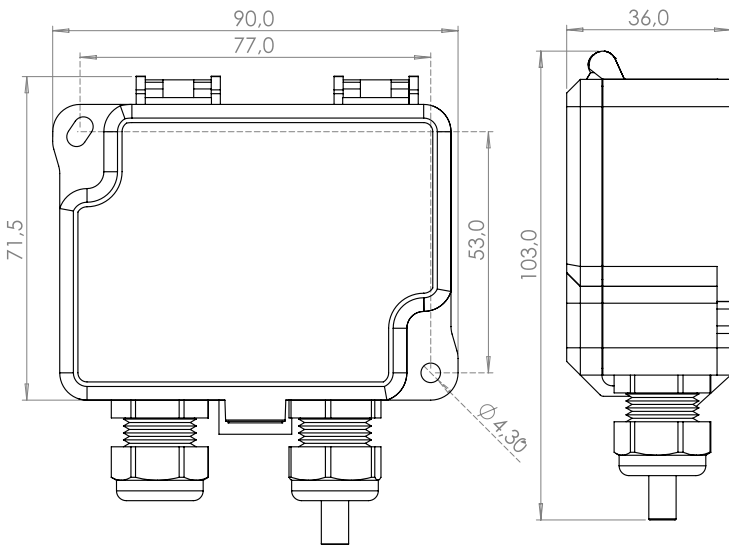
COMPANY WITH  
MANAGEMENT SYSTEM  
CERTIFIED BY DNV GL  
= ISO 9001 = ISO 14001 =



## 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.

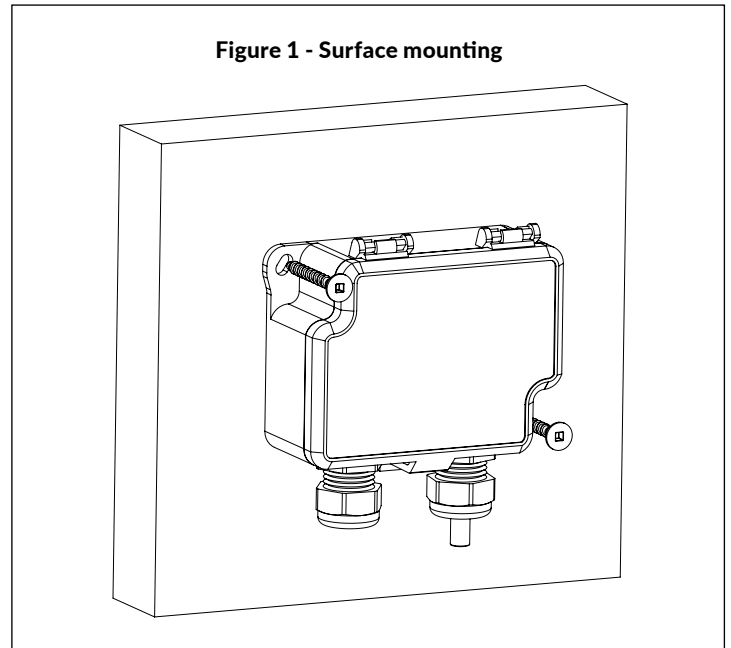
Do not locate PTE-O/OI where it can be affected by:

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

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

## MOUNTING THE DEVICE CONTINUED

Figure 1 - 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

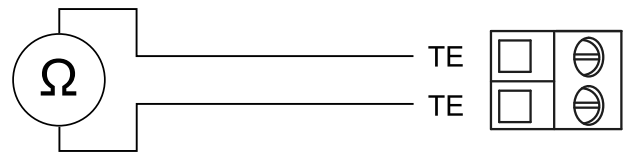
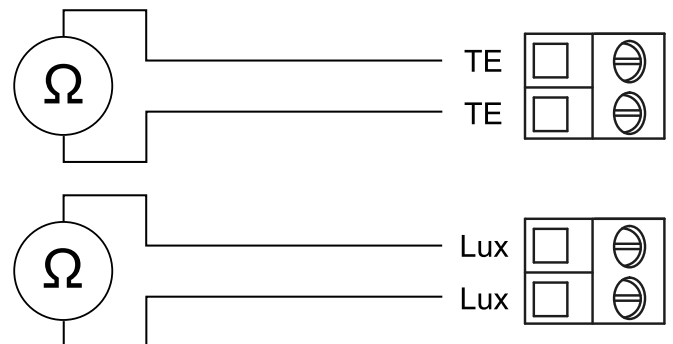


Figure 2b - Wiring diagram: PTE-OI



## 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	27248	250	11425	500	8682	750	7180
10	23875	260	11264	510	8607	760	7133
20	21802	270	11110	520	8534	770	7086
30	20325	280	10963	530	8462	780	7039
40	19187	290	10821	540	8391	790	6994
50	18267	300	10684	550	8322	800	6949
60	17499	310	10552	560	8255	810	6904
70	16841	320	10424	570	8188	820	6861
80	16267	330	10302	580	8123	830	6817
90	15759	340	10183	590	8060	840	6775
100	15305	350	10068	600	7997	850	6733
110	14894	360	9956	610	7936	860	6691
120	14519	370	9848	620	7876	870	6650
130	14176	380	9743	630	7817	880	6610
140	13858	390	9641	640	7759	890	6570
150	13564	400	9542	650	7701	900	6531
160	13290	410	9446	660	7645	910	6492
170	13033	420	9352	670	7590	920	6454
180	12791	430	9261	680	7536	930	6416
190	12564	440	9172	690	7483	940	6378
200	12349	450	9085	700	7430	950	6341
210	12146	460	9001	710	7379	960	6305
220	11952	470	8918	720	7328	970	6269
230	11768	480	8838	730	7278	980	6233
240	11593	490	8759	740	7229	990	6198
						1000	6163

## 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