VAISALA

Certificate report nr. H15-02320138

CALIBRATION CERTIFICATE

Instrument	Humidity and temperature transmitter HMD60YO
Serial number	X3220003
Manufacturer	Vaisala Oyj, Finland
Calibration date	6th August 2002
Test procedure	Doc210426-A

The above instrument was calibrated by comparing the relative humidity and temperature readings to two HMP233 factory working standards. At the time of shipment, the instrument described above met its operating specifications.

The relative humidity readings of the two HMP233 factory working standards have been calibrated at the Vaisala factory by using Hygro M-3 dewpoint meter. Hygro M-3 dewpoint meter has been calibrated at the NIST laboratories by using the NIST primary standard. The temperature readings of the two HMP233 factory working standards have been calibrated at Vaisala Measurement Standards Laboratory (MSL) by using the MSL working standard traceable to the NIST. MSL has been accredited by the FINAS according to the ISO/IEC 17025 (K008).

Calibration results

Reference humidity* % RH	**Observed humidity** % RH	**Difference** %RH	**Permissible difference** %RH
0.6	0.6	0.0	±2.0
38.7	38.3	-0.4	±2.0
75.9	75.9	0.0	± 2.0
Reference temperature* °C	**Observed temperature** °C	**Difference** °C	**Permissible difference** °C
+ 21.61	+21.67	0.06	± 0.1

*Average of two references.

Equipment used in calibration

Type	Serial number	Calibration date	Certificate number
HMP233 / RH	S0120017	2002-07-11	H15-02280231
HMP233 / RH	S0120018	2002-07-11	H15-02280232
HYGRO M-3	0351095	2001-12-07	266299-02
HMP233 / T	S0120017	2001-12-12	K008-J12121
HMP233 / T	S0120018	2001-12-12	K008-J12122
HP 34401A	3146A73362	2002-07-12	K004-02S463

Uncertainties (95 % confidence level, k=2)
Humidity ±1.0%RH @ 0..15%RH, ±1.5%RH @ 15..78%RH
Temperature ± 0.15 °C
Ambient conditions / Humidity 46 ± 5%RH, Temperature 22 ± 1 °C, Pressure 1018 ± 1 hPa.

For Vaisala Oyj

Anu Koivisto

 Doc210425-A

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VAISALA

Certificate report nr. H15-02330012

CALIBRATION CERTIFICATE

Instrument	Temperature transmitter HMD60T
Serial number	X3310002
Manufacturer	Vaisala Oyj, Finland
Calibration date	12th August 2002
Test procedure	Doc210426-A

The above instrument was calibrated by comparing the temperature readings to two HMP233 factory working standards. At the time of shipment, the instrument described above met its operating specifications.

The temperature readings of the two HMP233 factory working standards have been calibrated at Vaisala Measurement Standards Laboratory (MSL) by using the MSL working standard traceable to the NIST. MSL has been accredited by the FINAS according to the ISO/IEC 17025 (K008).

Calibration results

Reference temperature* °C	Observed temperature °C	Difference °C	Permissible difference °C
+ 23.74	+23.74	0.00	± 0.1

*Average of two references.

Equipment used in calibration

Type	Serial number	Calibration date	Certificate number
HMP233 / T	S0120017	2001-12-12	K008-J12121
HMP233 / T	S0120018	2001-12-12	K008-J12122
HP 34401A	3146A73362	2002-07-12	K004-02S463

Uncertainties (95 % confidence level, k=2)
Temperature ± 0.15 °C

Ambient conditions / Humidity 42 ± 5%RH, Temperature 24 ± 1 °C, Pressure 1007 ± 1 hPa.

For Vaisala Oyj

Vesa Heikkinen

 Doc210485-A

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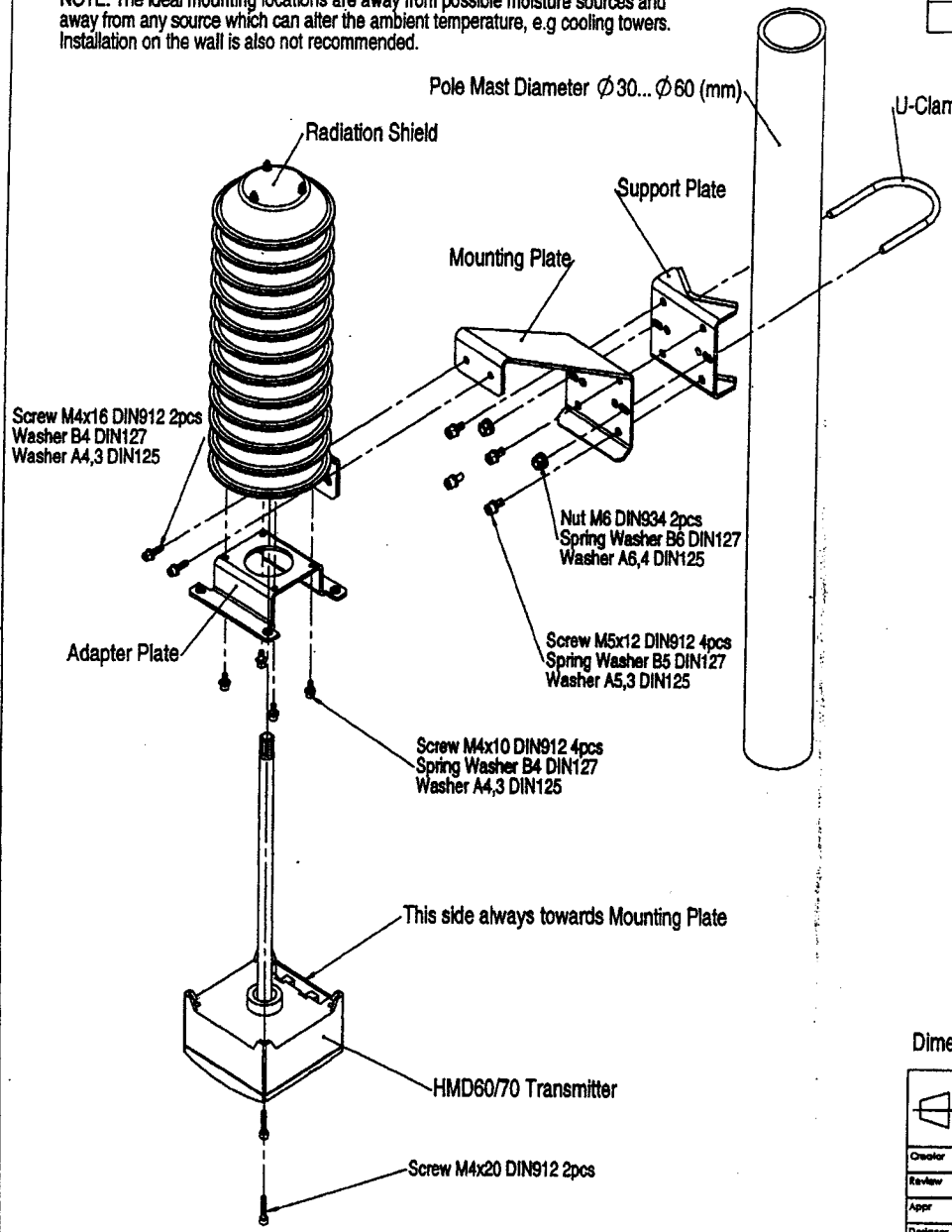
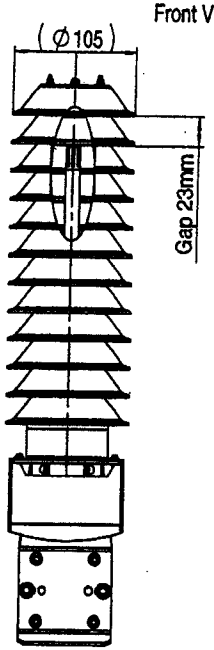
NOTE: The ideal mounting locations are away from possible moisture sources and away from any source which can alter the ambient temperature, e.g cooling towers. Installation on the wall is also not recommended.

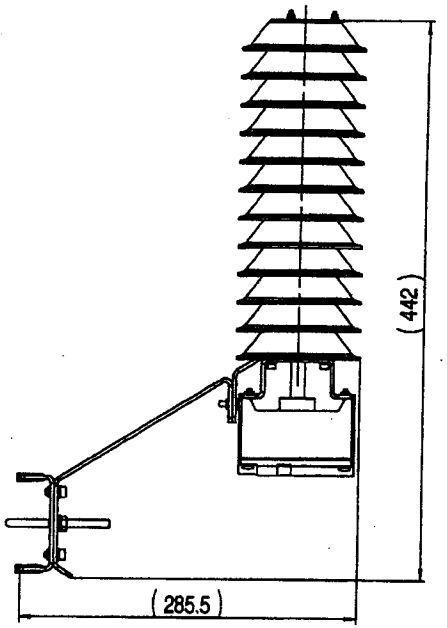
Ltr	Qty	Change	Reason/ ECO no	Design	Date Review	Date Appr



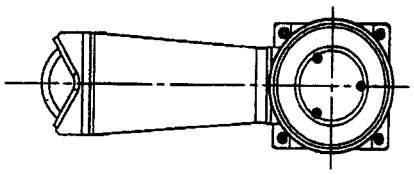
Front View



Side View



Top View



Dimensions in mm.

NOTE: Verify that the conduit adapter and the cover of the HMD60/70 transmitter are tightened so that they are waterproof.

Material	Weight	Finish	General tolerance
			Sheet 1/1
Creator 2001-08-24 PP	Status		
Review	Title		
Appr	DTR503B RADIATION SHIELD INSTALLATION DRAWING		VAISALA
Designer PP	Scale 1:4		
Replaces			Code DRW211819
Replaced by			Rev A

HUMIDITY TRANSMITTER HMD60U

HUMIDITY AND TEMPERATURE TRANSMITTER HMD60Y

MOUNTING

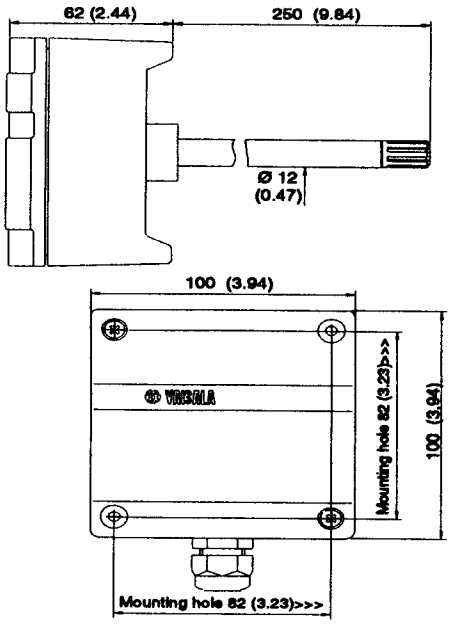


Figure 1 Dimensions of the HMD60U/Y

The HMD60U/Y humidity and temperature transmitters are two-wire transmitters. They are duct mounted, and the electronics can be disconnected without dismantling the installation.

Mount the transmitter with two screws. Place the drilling template on the duct surface and drill the holes as indicated. Remember to drill an additional hole for calibration purposes. The calibration can be conveniently performed on site with the HMI41 indicator equipped with an appropriate probe and optional calibration cable.

GROUNDING

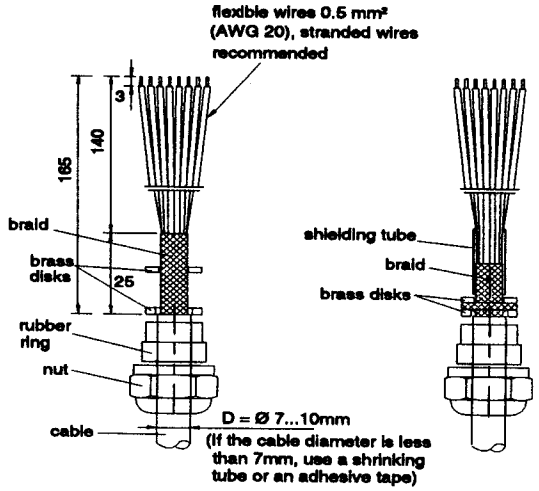


Figure 2 Signal cable grounding with bushing 18941HM

Open the lid and mount the cable bushing set 18941HM. Do the grounding according to Figure 2. When connecting the signal cable to the transmitter housing, fold the cable braid between the brass disk in order to achieve the best EMC performance. **Do not leave the bare shield of the connected wires so that it can shortcircuit the electronics!**

ELECTRICAL CONNECTIONS

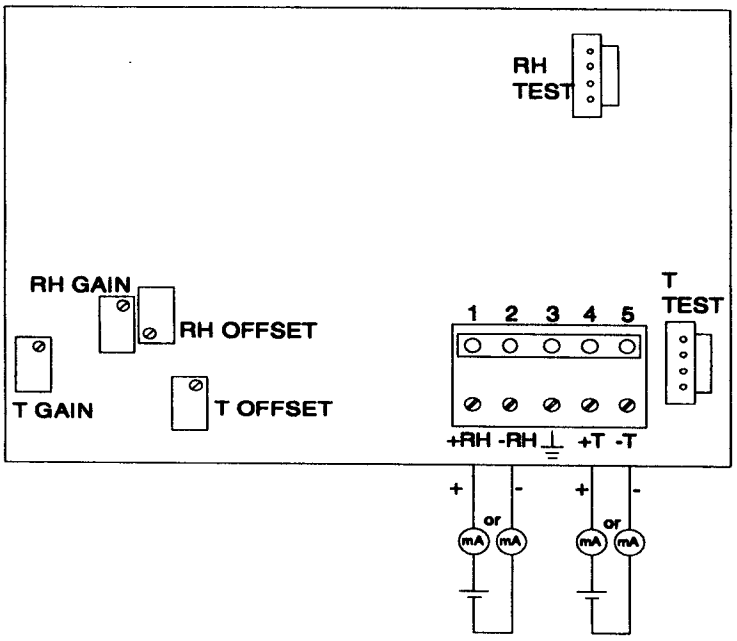
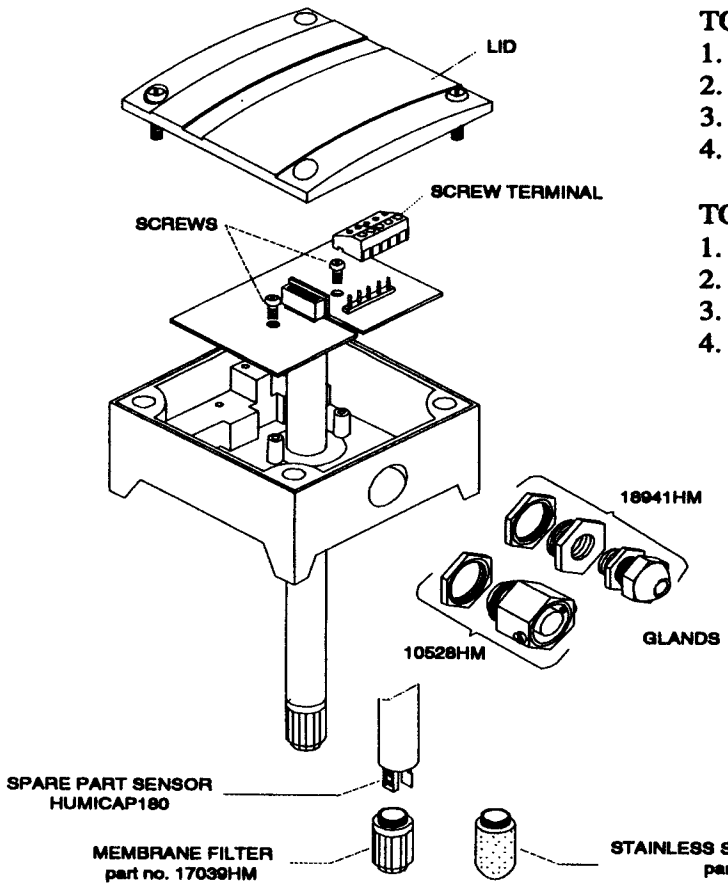


Figure 3: Electrical connections

Signal cables are connected to a removeable 5-pole screw connector. Make the connections according to Figure 3 above. RH test and T test connectors are used with the HMI41 indicator equipped with an appropriate probe and optional calibration cable.

ELECTRONICS



TO REMOVE THE SENSOR HEAD:
1. Open the lid
2. Disconnect the screw terminal
3. Open the screws (2 pcs)
4. Pull out carefully

TO REINSTALL THE SENSOR HEAD:
1. Push in the sensor head
2. Fasten the screws
3. Connect the screw terminal
4. Close the lid

Electronics (can be disconnected), accessories, spare parts

ONE-POINT RH-CALIBRATION

The accuracy is recommended to be checked at least once a year; the interval depends on the operating conditions and the required accuracy of the measurement. The transmitter calibration can be conveniently checked with the HMI41 indicator equipped with an appropriate probe and optional calibration cable. If adjustment is needed, use the one-point calibration potentiometer. If you prefer to calibrate the HMD60U/Y transmitters against saturated salt solutions, use LiCl (11 %RH) and NaCl (75 %RH) solutions.

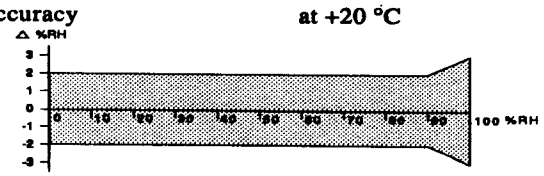
REPLACEMENT OF THE HUMICAP SENSOR AND THE FILTER

Remove the damaged sensor and insert a new one. Recalibrate the transmitter. Replace a dirty filter (membrane or sintered) to ensure a maximum lifetime and a fast response for the sensor. Do not attempt to clean the filter.

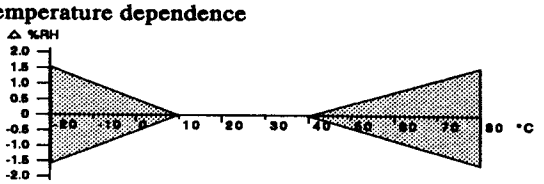
TECHNICAL DATA

Relative humidity

Measurement range	0...100 %RH
Output signal	
Accuracy	at +20 °C



Temperature dependence

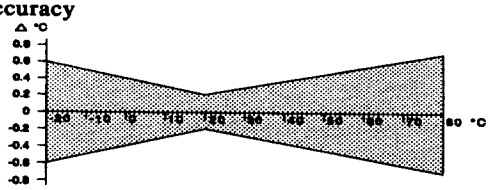


Humidity sensor	HUMICAP®180
Response time (90%)	
at 20 °C in still air	15 s with membrane filter

Temperature (Y model only)

Measurement range	-20...+80 °C

Accuracy



Linearity	better than 0.1 °C
Temperature sensor	Pt 1000 IEC 751 class B

General

Supply voltage	10...35 VDC (R_L= 0Ω) 20...35 VDC (R_L=500Ω)
Output signal	4...20 mA
Operating temperature range:	
electronics	-5...+55 °C
sensor head	-40...+80 °C
Storage temperature range	-40...+80 °C
Housing:	
sensor head	stainless steel
electronics housing	cast aluminium
Cable lead-through:	
bushing	for 7...10 mm (PG9) cable (housing IP65 / NEMA 4), part no. 18941HM
or armoured cable glands	part no. 10528HM
Sensor protection:	
standard	membrane filter (part no. 17039HM)
option	stainless steel sintered filter (part no. HM46670)
Connections	screw terminals 0.5...1.5 mm^2

Electromagnetic compatibility

The emission and immunity tests have been performed according to standards EN50081-1 and EN50082-1.

Emissions:

Test	Setup according to	Performance
Radiated interference	EN55022	class B

Immunity:

Test	Setup according to	Performance
Electrostatic discharge	IEC 801-2:1991	criteria B
Electrical fast transients	IEC 801-4:1988	criteria B
RF-radiated fields	IEC 801-3:1984	criteria A
*GSM-field immunity	ENV50204:1995	criteria A

(*additional test)

CE

GUARANTEE

Vaisala issues a guarantee for the material and workmanship of this product under normal operating conditions for one year from the date of delivery. Exceptional operating conditions, damage due to careless handling or misapplication will void the guarantee.