

M-Series & Roline-L Series

The measurement of temperature and humidity in HVAC/BMS applications becomes more demanding with almost every year. Heating, air conditioning and ventilation get more and more sophisticated. Cooled ceilings provide an agreeable atmosphere, where hardly any draught may be felt. The exchange of air in buildings is reduced to the minimum in order to save energy. The temperature and humidity values are regulated within ever-smaller margins. Obviously, the accuracy of the measuring instruments must be better than a few years ago. In such demanding environments, the measuring equipment had to compete with the demands. ROTRONIC has developed new instruments that suit the requirements of today and certainly also of the future. However, there are still other applications, where the utmost accuracy is not asked for. For these, ROTRONIC has developed a new line of economically priced instruments also: The Roline-L.

The new M-Line of ROTRONIC represents the latest development in digital humidity measurement. The well known and established FT and FH series are now replaced by the new instruments, which offer much greater application flexibility due to the fact that the output signals are scaleable. Hence, the resolution becomes better, because it is possible to scale the output of e.g. 0...10 °C to 4...20 mA. In fact, any range may be scaled exactly according to your needs. For applications in which the range of the measured values is always in a limited range, this represents a remarkable advantage. Control can be made much more efficient and accurate. ROTRONIC provides a number of standard versions types usually from stock. However, customized instruments are available on request from your distributor.

Key features

- Compact, modern instruments
- Optional display with good contrast
- Accuracy and long term stability
- Interchangeable sensor module
- Scaleable output signals
- All standard signals available
- Aesthetic housing
- Psychrometric Calculations

Your benefits

- Easy to handle and flexible
- Easy observation of measured values
- Reliable data and reduced maintenance
- Easy calibration & maintenance
- Better resolution, more precise control
- One instrument for different control systems
- Use also in living spaces
- No need for external calculators



This section contains

Page

New M-Series

48 to 52

- ✓ Interchangeable probes
- ✓ Optional Display
- ✓ Scaleable Output Signals
- ✓ Psychrometric Calculations
- ✓ High Accuracy
- ✓ Remote Adjustment with Handheld

New Roline-L Series

53 to 54

- ✓ Best price-performance ratio
- ✓ Fixed probe
- ✓ 2x2 wire technology
- ✓ Single signal use
- ✓ Remote adjustment with handheld

M-Series Applications Overview



Storage rooms



Cold stores



Museums



Railway stations



Green houses



Computer/Server rooms



Climate control
in office buildings



Snow Guns



Libraries

ROTRONIC M-Series Transmitters

General Description

The new ROTRONIC M-series transmitters are the latest development of combined humidity / temperature transmitters, based on HygroClip technology. Output signals of 0...1 V, 0...5 V, 0...10 V, 0...20 mA or 4...20 mA are available. The M-Series consists of three models; each offering different features to suit the application needs, and with the facilities which can be reprogrammed by the customer or reseller. The main differentiation between the three M Series is as follows:

- M1** Humidity and temperature transmitters with fixed probe, with electronics based on digital technology
- M2** Humidity and temperature transmitter with interchangeable HygroClip probes
- M3** Humidity, calculated humidity (e.g. dew point, enthalpy) and temperature transmitter with interchangeable HygroClip probes



M1

Key features

- Fixed probe
- Wall, space and duct mounting versions
- Combined relative humidity and temperature measurement
- Digital technology
- Wide measuring range
- Excellent long-term stability
- High accuracy
- Remote diagnosis with handheld instrument
- Temperature range -40...60°C
- Standard output signals (current / voltage)
- Wire mesh filter provides sensor protection against dust and high air velocity.
- IP rating: IP65; IP52 for space version

Ordering Information Standard M1 with fixed probes

Order code	Description	Electrical connection	Applications
M12D2HT-1X	Duct-mount, 0...50 °C / 0...100 %rh	2 wire 4...20 mA, 10...35 VDC	HVAC Applications Cold Rooms
M12D2HT-4X	Duct-mount, -30...70 °C / 0...100 %rh		
M12W2HT-1X	Wall-mount, 0...50 °C / 0...100 %rh		
M12W2HT-4X	Wall-mount, -30...70 °C / 0...100 %rh		
M12S2HT-1X	Space mount, 0...50 °C / 0...100 %rh		
M12S2HT-4X	Space mount, -30...70 °C / 0...100 %rh		
M12S2HT-2X	Space mount, 10...40 °C / 0...100 %rh	12...35 VDC/24 VAC / 4...20 mA 3/4 wires	Storage rooms Semicond. Industry
M13D2HT-1X	Duct-mount, 0...50 °C / 0...100 %rh		
M13D2HT-4X	Duct-mount, -30...70 °C / 0...100 %rh		
M13W2HT-1X	Wall-mount, 0...50 °C / 0...100 %rh		
M13W2HT-4X	Wall-mount, -30...70 °C / 0...100 %rh		
M13S2HT-1X	Space mount, 0...50 °C / 0...100 %rh		
M13S2HT-4X	Space mount, -30...70 °C / 0...100 %rh	12...35 VDC/24 VAC / 0...10 V 3/4 wires	Any application, where probes must not be removed or exchanged.
M13D5HT-1X	Duct-mount, 0...50 °C / 0...100 %rh		
M13W5HT-4X	Wall-mount, -30...70 °C / 0...100 %rh		
M13S5HT-1X	Space mount, 0...50 °C / 0...100 %rh		
M13D5HT-4X	Duct-mount, -30...70 °C / 0...100 %rh		
M13W5HT-4X	Wall-mount, -30...70 °C / 0...100 %rh		
M13S5HT-4X	Space mount, -30...70 °C / 0...100 %rh		

The probe length of all duct mount transmitters is 207 mm; 52 mm for wall mount types

For non-standard ordering information, please see table on page 51.

HW3 software

The HW3 software package has a comprehensive range of functions which are compatible with the M-Series, see chapter HW3 Software for full information.

M2

Humidity and temperature transmitter with interchangeable HygroClip S probes

Key features

- Probe interchangeable within seconds
- Wall and duct mounting types
- Measures humidity and temperature simultaneously
- Use of digital technology
- Wide measuring range
- Excellent long-term stability
- High accuracy $\pm 1.5\%rh$, $0.3K$
- Optional display
- Remote diagnosis with handheld instrument
- Temperature range $-40...60^{\circ}C$ / $-30...60^{\circ}C$ with display
- Wire mesh filter provides sensor protection against dust and high air velocity.
- IP rating: IP65



HygroClip Probes for M-Series transmitters

HygroClip S

Standard sensor module for humidity and temperature. A wire mesh filter provides sensor protection against dust and high air velocity. Dimensions $\varnothing 15 \times 100$ mm.

IP rating: IP65

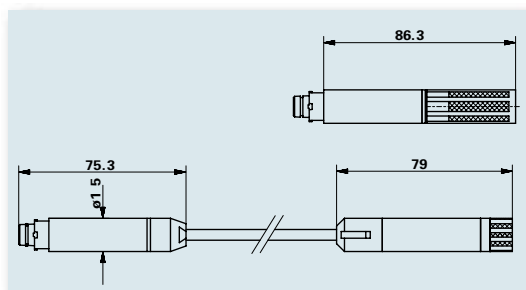
Measurement range: $-40...85^{\circ}C$, $0...100\%rh$
 Accuracy: $\pm 1.5\%rh$, $\pm 0.3K$ (at $23^{\circ}C$)

Order code:
HygroClip S

Extension cable with 1 / 2 / 5 m cable length

for HygroClip S probes and M-Series transmitters

Order code:
MOK-01-DAT05 1 m
MOK-02-DAT05 2 m
MOK-05-DAT05 5 m



Ordering Information Standard M2 with interchangeable probes

Order code	Specification	Power supply	Applications
M22D2HT-1X	Duct-mount, $0...50^{\circ}C$ / $0...100\%rh$	2 wire $4...20$ mA, $10...35$ VDC	HVAC Applications Cold Rooms Storage rooms
M22D2HT-4X	Duct-mount, $-30...70^{\circ}C$ / $0...100\%rh$		
M22W2HT-1X	Wall-mount, $0...50^{\circ}C$ / $0...100\%rh$		
M22W2HT-4X	Wall-mount, $-30...70^{\circ}C$ / $0...100\%rh$		
M23D2HT-1X	Duct-mount, $0...50^{\circ}C$ / $0...100\%rh$	12...35 VDC/24 VAC / $4...20$ mA 3/4 wires	Semiconductor Industry Light industry
M23D2HT-4X	Duct-mount, $-30...70^{\circ}C$ / $0...100\%rh$		
M23W2HT-1X	Wall-mount, $0...50^{\circ}C$ / $0...100\%rh$	15...35 VDC/24 VAC / $0...10$ V 3/4 wires	Any application, where probes must be easy to exchange.
M23W2HT-4X	Wall-mount, $-30...70^{\circ}C$ / $0...100\%rh$		
M23D5HT-1X	Duct-mount, $0...50^{\circ}C$ / $0...100\%rh$		
M23D5HT-4X	Duct-mount, $-30...70^{\circ}C$ / $0...100\%rh$		
M23W5HT-1X	Wall-mount, $0...50^{\circ}C$ / $0...100\%rh$		
M23W5HT-4X	Wall-mount, $-30...70^{\circ}C$ / $0...100\%rh$		

The probe length of all M2 standard duct-type transmitters is 250 mm; 100 mm for wall mount types.

Order Codes Non-Standard Types M2 –please see table on page 51

ROTRONIC M-Series Transmitters



M3

Humidity, calculated humidity (e.g. dewpoint, enthalpy) and temperature transmitter with interchangeable HygroClip S probes

Key Features

- Psychrometric calculations available (dewpoint, enthalpy etc.)
 - Probe interchangeable within seconds
 - Wall- and duct-mounting types
 - Measures humidity and temperature simultaneously
 - Use of digital technology
 - Large measuring range
 - Excellent long-term stability
 - High accuracy
 - Optional display
 - Remote diagnosis with handheld instrument
 - Temperature range -40...60°C; -30...60°C with display
 - Wire mesh filter provides sensor protection against dust and high air velocity.
- IP rating: IP65

Ordering Information Standard Types M3 with Calculations & interchangeable Probes

Order code	Specification	Power supply	Applications
M33D2TC-4XW09	Duct-mount -30...70°C, -25...25°C / Dew-Point	12...35 VDC/24VAC / 4...20 mA 3/4 wires	Snow Guns Drying processes
M33D2TC-4XW0B	Duct-mount -30...70°C, -50...50°C / Dew-Point		
M33D2TC-4XW24	Duct-mount -30...70°C, 0...100 kJ/kg / Enthalpy		
M33D2TC-4XW53	Duct-mount -30...70°C, 0...50 g/kg / Mixing Ratio (R)		
M33D2TC-4XW54	Duct-mount -30...70°C, 0...100 g/kg / Mixing Ratio (R)		
Wall mount-types are available on request; see order code table on next page			

The probe length of all M3 standard duct-type transmitters is 250 mm; 100 mm for wall mount types.

Order Codes Non-Standard Types M3 – please see table on page 51.

HygroClip Probes for M-Series transmitters

HygroClip S
Standard sensor module for humidity and temperature. A wire mesh filter provides sensor protection against dust and high air velocity. Dimensions: Ø15 x 100 mm. IP rating: IP65

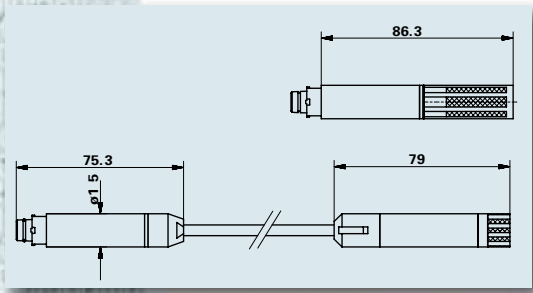
Measurement range: -40...85°C , 0...100% rh
Accuracy: ±1.5% rh, ±0.3 K (at 23°C)

Order code:
HygroClip S

Extension cable with 1 / 2 / 5 m cable length

for HygroClip S probes and M-Series transmitters

Order code:
MOK-01-DAT05 1 m
MOK-02-DAT05 2 m
MOK-05-DAT05 5 m



Order Codes Non-Standard M Series

Specification		1	2	3	4	5	6	7	8	9	10	11	12	13
Type M1 & M2	Integrated probe	M	1				-							
	Interchangeable probe		2											
Type of connection	2-wire 4...20 mA			2										
	12...35 VDC, 24 VAC 3/4 wire			3										
Mounting	Duct				D									
	Wall				W									
	Space				S	(M1 only)								
Output signal type	0...20 mA					1								
	4...20 mA					2								
	0...1 V					3								
	0...5 V					4								
	0...10 V					5								
Output parameters	Humidity & temperature						H	T						
	Humidity only						H	X						
	Temperature only						X	T						
Output range	0...50°C / 0...100 %rh								-	1				
Temperature & humidity	10...40°C / 0...100 %rh										2			
	-40...60°C / 0...100 %rh											3		
	-30...70°C / 0...100 %rh												4	
	-40...85°C / 0...100 %rh													5
	0...100°F													
Options	Display (not for M1)											D		
	No Display											X		

Specification		1	2	3	4	5	6	7	8	9	10	11	12	13
Type M3	Interchangeable probe & calculation	M	3											
Type of connection	12...35 VDC, 24 VAC 3/4 wire			3										
Mounting	Duct				D									
	Wall				W									
Output signal type	0...20 mA					1								
	4...20 mA					2								
	0...1 V					3								
	0...5 V					4								
	0...10 V					5								
Output parameters	Humidity & calculated value						H	C						
	Temperature & calculated Value						T	C						
Output range	-30...70°C / 0...100 %rh								-	4				
Temperature & humidity	0...100°F / 0...100 %rh										6			
Options	Display											D		
	No display											X		
	Standard wire communication												W	
	Radio communication (M3 only)												R	
Calculated parameter	Dew-Point Dp in °C													0
	Wet-Bulb temperature Tw in °C													1
	Enthalpy H in kJ/kg													2
	Mixing ratio R in g/kg													5
Output range	0...20													1
Calculated value	0...25													2
	0...50													3
	0...100													4
	0...200													5
	0...500													6
	0...1000													7
	-20...20													8
	-25...25													9
	-40...40													A
	-50...50													B

Technical Data Summary M-Line

Features	M 1	M 2	M 3
Humidity sensor	AC-1		
Temperature sensor	Pt100 B	Pt100 1/3 DIN	
Probe connections (combined %rh/°C)	Fixed probe	1 for exchangeable HygroClip probes	
RS232 Service Interface	Yes, by HygroPalm		
Display	No	Option	
Display units	%rh, °C, °F, calculated parameters (M3 only)		
Resolution	0.1 %rh / 0.1 °C		
Output signal type	0...1/5/10 V; 0/4...20 mA		
Trend indicator	No	Yes, with display option	
RS485 vernetzbar	No	Option	
Radio transmission	No	Option	
Serial number stored in EE-Prom	Yes		
Scaleable analogue outputs	Yes, with HW3 Software		
Remote Functions with HygroPalm			
1 point %rh, °C probe adjustment	Yes		
4 point %rh, 2 point °C probe adjustm.	Yes		
Reference adjustment	Yes		
Calculation & Unit Display			
Psychrometric calculations	No	Yes	
Pressure compens. of calculated values	No	Possible with HW3 Software	
Standard pressure constant value	No	1013.25 hPa	
Remote Transmitter Control			
Transmitter adjustment	1 point	1 point	Multiple points
Transmitter adjustment against reference probe	Yes, with HygroPalm		
Transmitter measurement display	Yes, with HygroPalm		
Transmitter status display	Yes, with HygroPalm		
Operating range			
Operating range of electronics	-40...60°C, with display -30...60°C		
Measuring Ranges (probes)			
Humidity	0...100 %rh		
Temperature	Probe dependent; max. -40...100°C		
Accuracy at 23°C	±1.5 %rh / ± 0.3 K		
Reproducibility	< 0.5%		
Long term stability	< 1% rh / year		
Electrical Data			
Power supply	10(15)...35 VDC / 12...24 VAC or 2 wire 4...20 mA, 10...35 VDC		
Maximum load	Current Output: < 250 Ohm; Voltage Output > 1000 Ohms		
Automatic load compensation	No	Yes	
Electrical connection	Screw terminals on connection plate		
Mechanical Data			
Type of enclosure/ IP rating	IP 65		
Sensor protection	Type SP-W15 Wire mesh filter, stainless steel		
Housing material	ABS		
Probe length/diameter for Duct type / Wall type	207/15/52/15 mm	250/15 mm/100/15 mm	
Dimensions	154 x 73 x 48 mm		
Weight	Ca. 300 g		

Schematics and dimensional diagrams see page 55 + 57

Roline-L Series Transmitters

The Roline L transmitter has been designed for cost sensitive applications where the highest accuracy or widest measuring ranges are not required. Two versions are available, 2 wire 4...20mA loop and 3/4 wire formats for current and voltage signals.

L12

- 2 wire or 2x2 wire loop powered 4...20 mA
- Integrated probe
- Duct and wall mounting versions
- Combined humidity and temperature measurement
- Humidity or temperature only versions
- Use of digital technology
- Excellent long-term stability
- Good accuracy
- Temperature range 0...50 °C
- Humidity range 10...100 %rh

L13

- 3/4 wire model for 10...35 VDC / 12...24 VAC supply
- 4...20 mA, 0...20 mA, 0...10 V outputs
- Integrated probe
- Duct and wall mounting versions
- Combined humidity and temperature measurement
- Humidity or temperature only versions
- Use of digital technology
- Excellent long-term stability
- Good accuracy
- Temperature range 0...50 °C
- Humidity range 0...100 %rh



Key features

- Compact, modern instruments
- Good long term stability
- All standard output signals available
- Aesthetic housing

Your benefits

- Easy to install
- Reliable data and reduced maintenance
- Compatible with most control systems
- Suitable for public areas

Ordering Information Standard Versions Roline L

Roline-L Serie

The transmitters that are defined in the table below represent the most popular versions. Customized versions may be ordered according to the table on the next page.

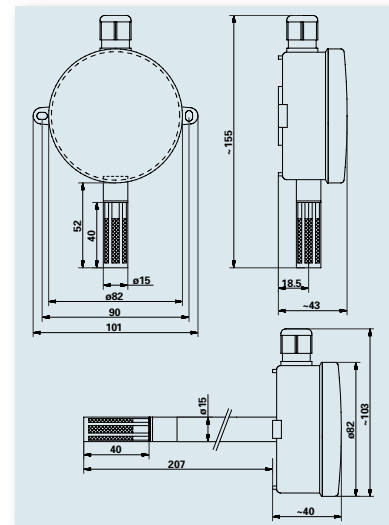
Orde code	Description	Supply / Output	Applications
L12DHT2	Duct-mount, 0...50 °C / 0...100 %rh	2-wire 4...20 mA ; 10...28 VDC	HVAC applications, low installation costs
L12DHX2	Duct-mount, 0...100 %rh		Humidity measurem. only
L12DTX2	Duct-mount, 0...50 °C		Temp. measurement only
L12WHT2	Wall mount, 0...50 °C / 0...100 %rh		HVAC applications, low installation costs
L12WHX2	Wall mount, 0...100 %rh		Humidity measurem. only
L12WTX2	Wall mount, 0...50 °C		Temp. measurement only
L13DHT2	Duct-mount, 0...50 °C / 0...100 %rh	3/4-wire 4...20 mA; 10 (15)...35 VDC; 12...24 VAC	HVAC applications, low installation costs
L13DHX2	Duct-mount, 0...100 %rh		Humidity measurem. only
L13DTX2	Duct-mount, 0...50 °C		Temp. measurement only
L13WHT2	Wall mount, 0...50 °C / 0...100 %rh		HVAC applications, low installation costs
L13WHX2	Wall mount, 0...100 %rh		Humidity measurem. only
L13WTX2	Wall mount, 0...50 °C		Temp. measurement only
L13DHT5	Duct-mount, 0...50 °C / 0...100 %rh	3/4-wire 0...10 V; 10 (15)...35 VDC; 12...24 VAC	HVAC applications, low installation costs
L13DHX5	Duct-mount, 0...100 %rh		Humidity measurem. only
L13DTX5	Duct-mount, 0...50 °C		Temp. measurement only
L13WHT5	Wall mount, 0...50 °C / 0...100 %rh		HVAC applications, low installation costs
L13WHX5	Wall mount, 0...100 %rh		Humidity measurem. only
L13WTX5	Wall mount, 0...50 °C		Temp. measurement only

Roline-L Series Transmitters

Ordering Information & dimensional diagrams Roline-L Series

Features	1	2	3	4	5	6	7
Roline-L types with integrated probes	L	1					
Type of connection	2 wire loop power 4...20 mA		2				
	12*...35 VDC, 3/4 wire		3				
Mounting	Duct (Probe length 205 mm)			D			
	Wall (Probe length 55 mm)			W			
Output Parameters	Humidity & Temperature				H	T	
	Humidity only				H	X	
	Temperature only				T	X	
Output Signal Type	0...20 mA (not for L12)						1
	4...20 mA						2
	0...1 V (not for L12)						3
	0...5 V (not for L12)						4
	0...10 V (not for L12)						5

* for 0/4...20 mA and 0...10 V outputs



Technical Data Summary Roline-L Series

Specifications	L 12	L13
Humidity sensor	Hygromer AC-1	
Temperature sensor	Pt 100 B	
Output signal type	2 x 2 wire 4...20 mA loop power	0...1/5/10 V; 0/4...20 mA
Probe adjustment	In conjunction with HygroPalm handheld instrument	
Operating & measuring ranges		
Humidity	0...100 %rh, non condensing	
Temperature	-40...60°C	
Air speed duct type	20 m/s max.	
Temperature compensation	Yes	
Accuracy at 23°C	±3 %rh; ±0.5 K	
Reproducibility	< 0.6 %rh / 0.5 K	
Long Term Stability	< 1.5 %rh/Year	
Power Supply	2 wire 4...20mA loop power; 10...28 VDC	10(15)...35 VDC
Power consumption	Max. 20 mA /output	< 50 mA
Max. load	<500 Ohms	<250 Ohms
Min. load for voltage outputs	N/A	>1000 Ohms/ V
Type of enclosure/ IP Rating	Duct or wall mount, IP 65	
Housing material	ABS	
Dimensions	Ø 82 x 43 mm; probe length: 207 mm duct type, 52 mm wall mount type 15 mm	
Weight	Ca. 200 g	

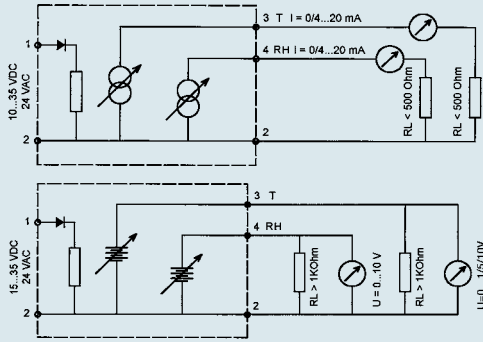
Configuration cables for M-series & Roline-L series transmitters

Order code	For transmitter	Output signal	Connectors	To be used for
ACML232	M2xx, M3xx	all Signal types	D-sub 9/HE14-10	Scaling, adjustment & programming of transmitters with PC and HW3. (Monitoring possible with M3xx)
ACRL001	M1xx, Roline-L	0...1 V	DAT05/HE14-10	Probe adjustment, scaling and comparison of the analogue signals with a PC and HW3, using a handheld HygroPalm 2,3 or a benchtop instrument HygroLab2,3. Validation of the analogue signals(M-series and Roline-L) with HygroPalm 2,3 or benchtop instrument HygroLab2,3.
ACRL005		0...5 V		
ACRL010		0...10 V		
ACRL020		0(4)...20 mA		
ACRL420		4...20 mA 2x 2 wire		
ACRLXB5	MXxx, Roline-L	N/A	B5-DIO/HE14-10	Probe adjustment with HygroPalm or HygroLab, no scaling of outputs. Probe adjustment, scaling and programming with PC and HW3 is possible, when a HygroPalm 2,3 or HygroLab2,3 are used.
ACRLYB5	M1xx, Roline-L		1 x MOK, 1 x B5 1 x DAT 05	Probe adjustment and validation of outputs with HygroPalm or HygroLab. Works only in combination with ACRL001 to -ACRL420

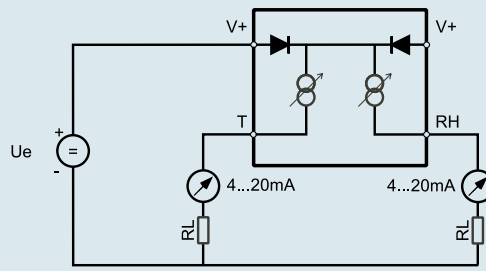
Schematics and dimensional diagrams

M-Series & Roline-L Series

Schematic diagrams 3/4 wire supply

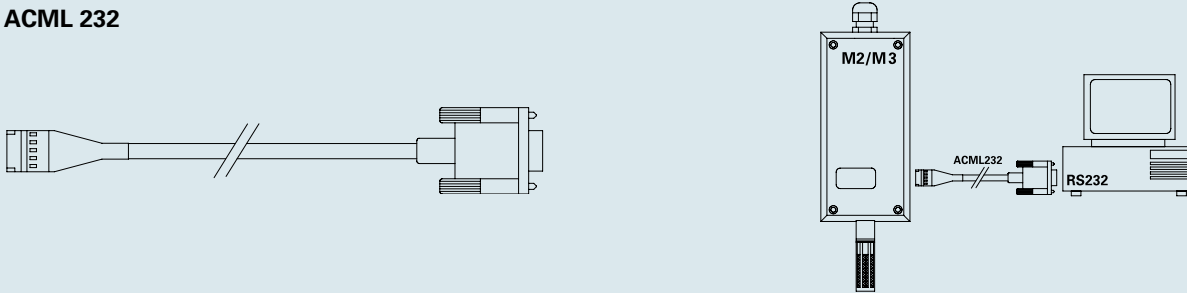


2 or 2x2 wire supply

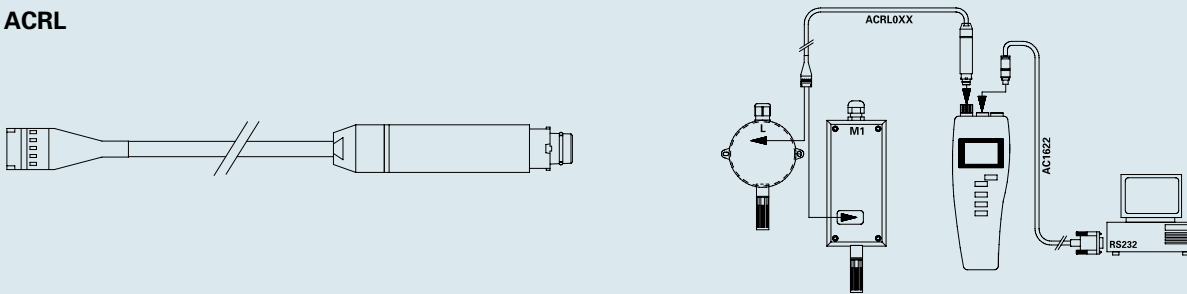


Service cable

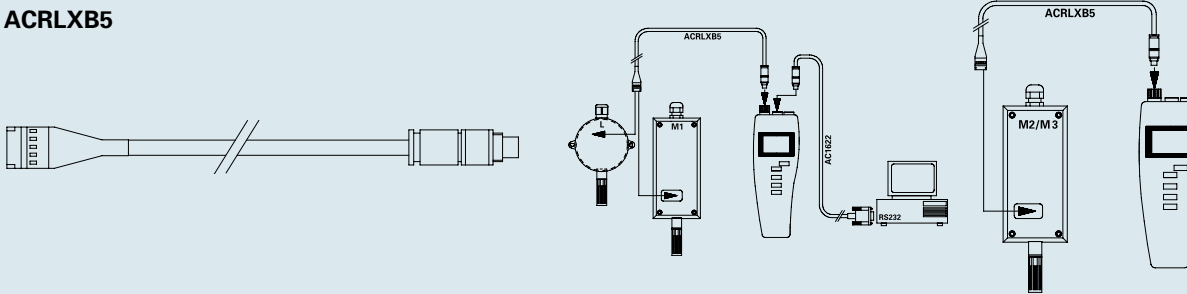
ACML 232



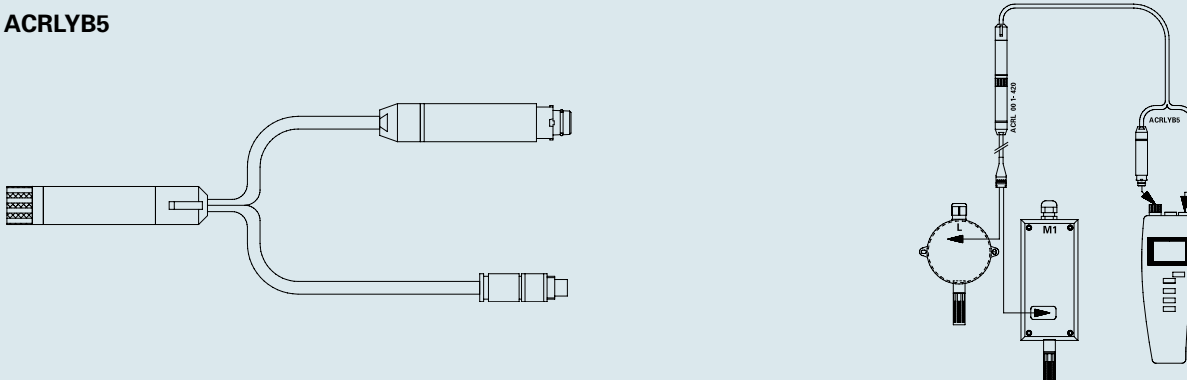
ACRL



ACRLXB5



ACRLYB5



Transmitter I-1020

The I-1020 series has been ROTRONIC's best selling product for industrial applications for many years, and is still in great demand, especially in 2x2 wire loop power applications. This is why ROTRONIC still produces the I-1020 despite of the availability of the HygroFlex series. Its high precision, reliability and extensive range of configuration options make it ideally suited to the most stringent demands of the industrial sector.



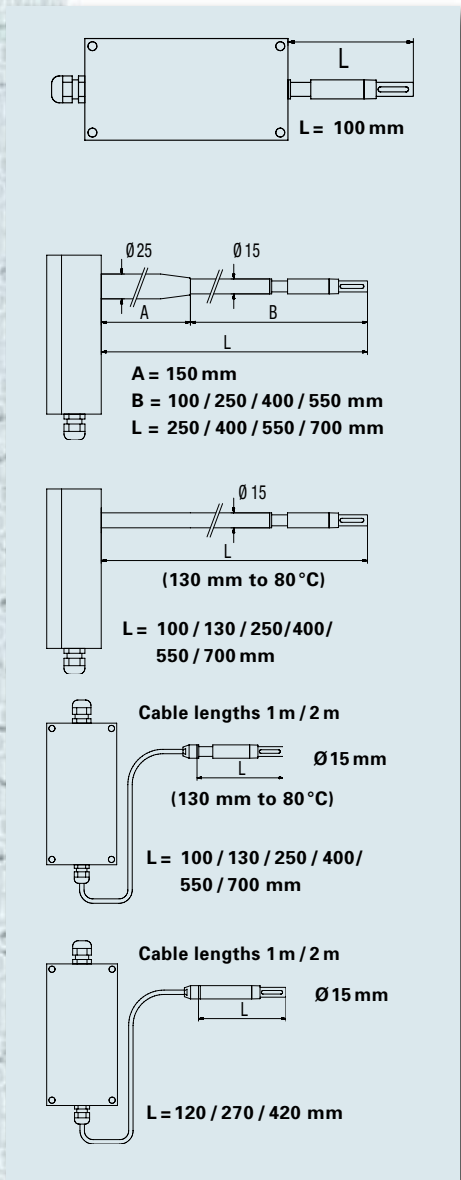
I-1020

- Key features**
- Excellent precision and long-term stability
 - Wall, duct or cable mounting
 - Measurement of relative humidity & temperature
 - Wide operating ranges: 0...100 %rh, -50...150°C
 - 2x2 wire loop power output : 4...20 mA

Probes

Passive PPS probe with sealed cable, used for all three mounting configurations.

Advantage: No hollow spaces, therefore no possibility of leakage or trapped condensation. Various combinations of transmitters and probes are available for the different demands in all types of applications



Wall mount type P

Temperature range: -20...50°C
 Length: 100 mm
 Probe: PPS, sealed against condensation

Duct Mount Type A

Standard probe length: 250 mm
 Temperature range: -50...150°C
 Probe: PPS, sealed against condensation

Duct Mount Type P

Standard probe length: 250 mm
 Temperature range: -50...150°C
 Probe: PPS, sealed against condensation

Cable mount type P

Temperature range: -50...150°C
 Probe: PPS, sealed against condensation
 Cable lengths: 1 or 2 m

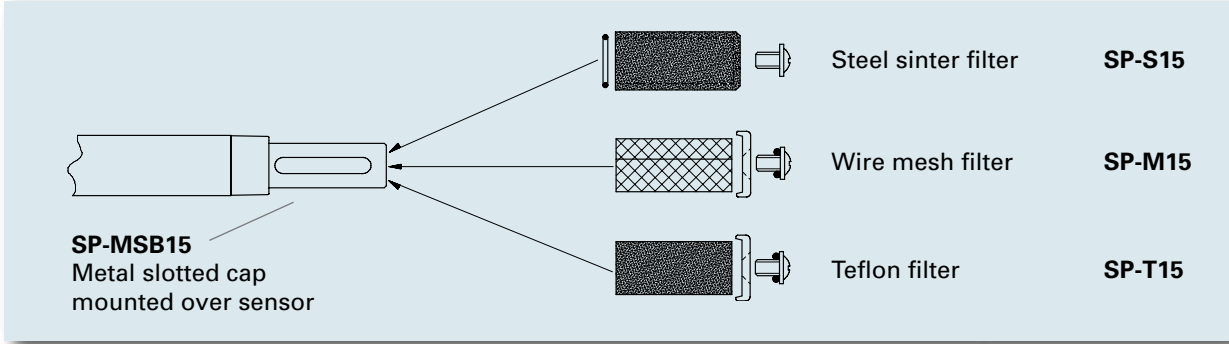
Cable mount type M (option)

Temperature range: -50...150°C
 Probe: Steel V2A
 Cable lengths: 1 or 2 m
 Length: 120/270/420 mm
 Diameter: 15 mm

I-1020 Sensor protection, filters

Sensor protection, filters

The robust slotted cap also functions as a filter holder and provides mechanical protection when the filter element is removed.



Order code, filter, filter type, properties

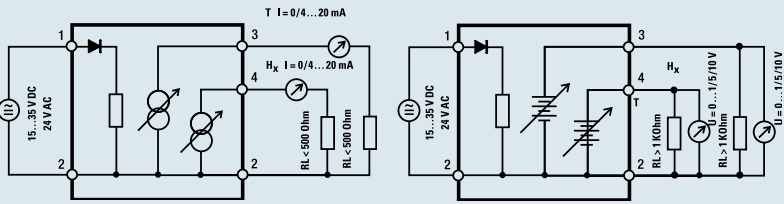
Function: Protects sensors against pollution and high air velocity (up to 40 m/s).
A filter is required for air velocities from 3 m/s.

Order code	Type of filter	Properties	Max. air velocity
SP-S15	Steel sinter filter element pore size ca. 5 μ	High level of filtration Marginal effect on response times Not suitable for very high humidity applications	40 m/s
SP-M15	Wire mesh filter element Mesh size ca. 20–25 μ	Minimal measuring delay Reduced filtration efficiency for small particles. Suitable for high humidity applications	20 m/s
SP-T15	Teflon filter element pore size ca. 10 μ	Good filtration effect Extends response time in low air velocity Water repellent but water vapour permeable	20 m/s

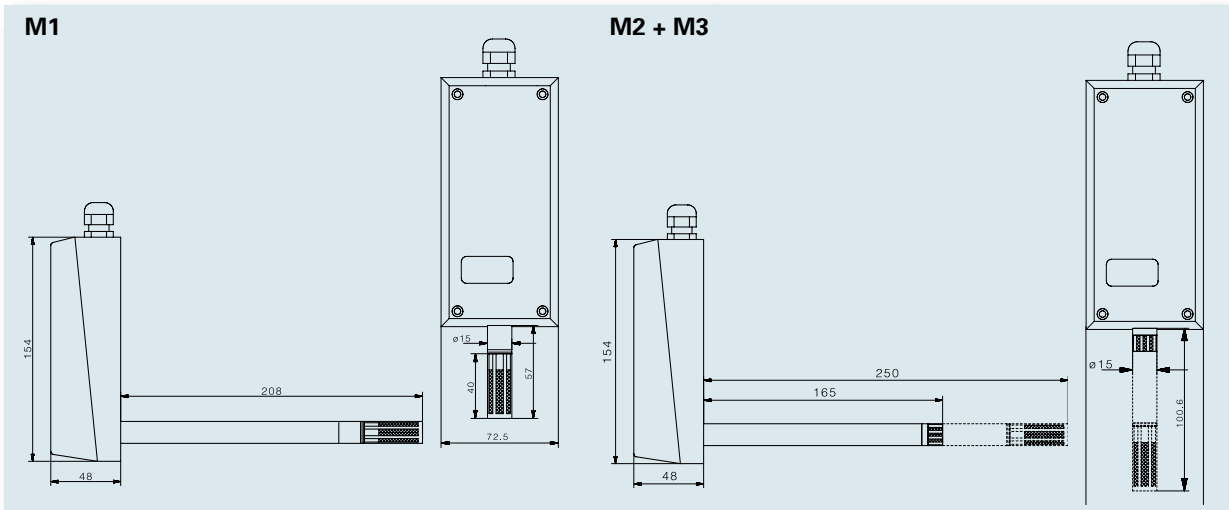
M-Series Schematics Model M3 with calculation

Power Supply

+ ①	Supply, max. 35 VDC, 24 VAC
- ②	GND (common)
+ ③	Temperature [V, mA]
+ ④	Calculated value [V, mA]
+ ⑤] RS485
- ⑥	



Dimensional Diagrams M-Series



Order code table series I-1020

Parameter column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Example:	1	-	1	0	2	2	C	C	0	2	P	3	C	W	1	V	1	X	
Supply voltage: 2x2 wire 4...20 mA					2														
Temperature measuring range																			
No temperature measurement						0	T												
0...50°C						1	C												
0...100°C						2	C												
0...150°C						3	C												
-30...70°C						4	C												
other in °C						9	C												
0...10°F						1	F												
0...200°F						2	F												
other in °F						9	F												
Type of mounting																			
Wall (100 mm probe length)								W	X	X									
Duct								R	X	X									
Cable-probe 1 m (incl. probe)								C	0	1									
Cable-probe 2 m (incl. probe)								C	0	2									
Probe type																			
PPS probe type A 25/15 mm Ø													A						
PPS probe type P 15 mm Ø													P						
Metal probe 15 mm Ø (Cable type only)													M						
Probe length																			
Mounting type W and C: 100 mm Metal probe: 120 mm																		1	
Mounting type R und C: 130 mm (up to 80°C)																		2	
Mounting type R und C: 250 mm																		3	
Mounting type R und C: 400 mm																		4	
Mounting type R und C 550 mm																		5	
Mounting type C 700 mm																		7	
Measured parameter																			
Humidity & Temperature measurement														C	W				
Temperature measurement only														C	T				
Output signal:																			
Current: 4...20 mA, 2 wire																		6	A
Current: 2x4...20mA, 2x2 wire																		8	A
Cable connections:																			
1 M16 cable gland																			1
Tuchel plug 7 pin																			7
Special version																		9	X

Filter options

to be ordered separately

Order code:

SP-S15 Steel sinter filter element

SP-M15 Wire mesh filter element

SP-T15 Teflon filter element

Service cable for adjusting of the transmitters

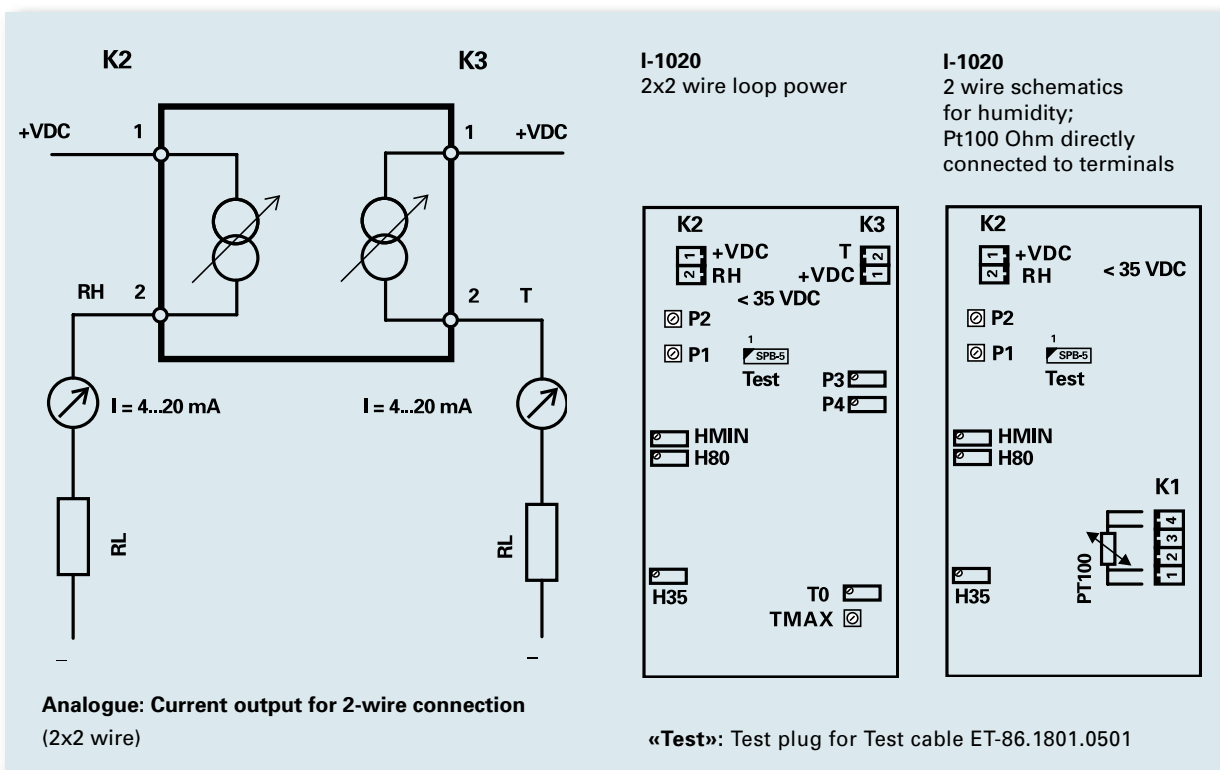
Order code:

ET-86.1708.0501

Technical data series I-1020

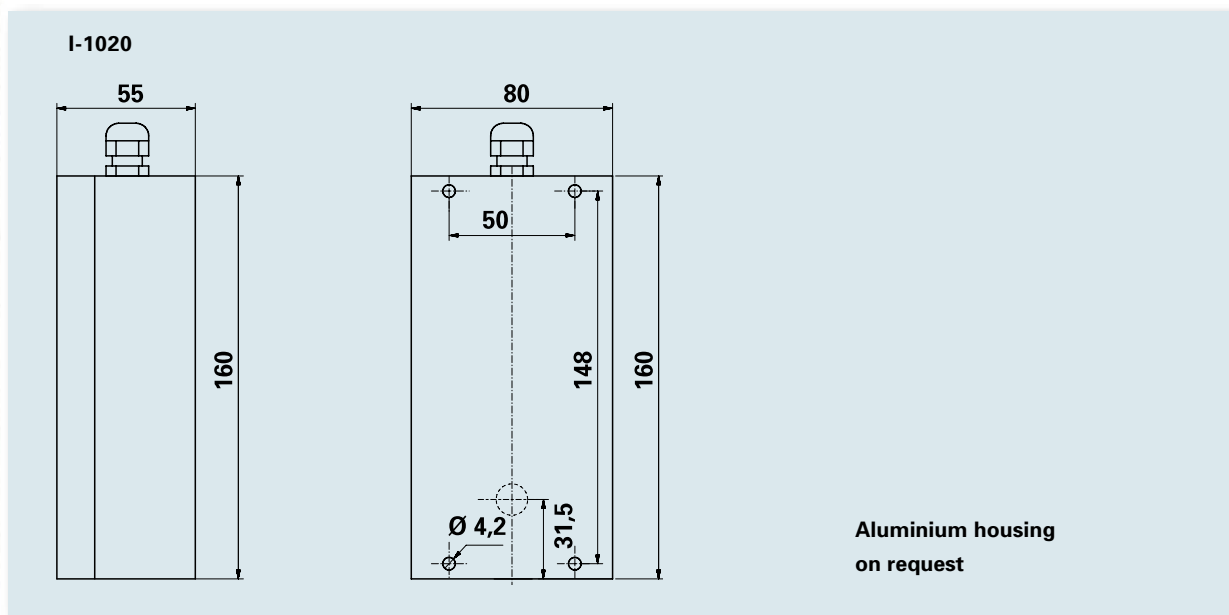
Humidity sensor	HYGROMER® IN-1
Temperature sensor	Pt100 1/3 DIN
Operating range	
Humidity	0...100 %rh
Temperature (sensor)	-50...150 °C
Temperature (Electronics)	-20...50 °C
Air velocity	Without filter up to 3 m/s, with filter up to 40 m/s
Measuring range	
Humidity	0...100 %rh
Temperature	See order code table
Temperature compensation:	Within temperature range 0...100 °C
Output signals humidity and temperature	2-wire loop power 4...20 mA
Accuracy humidity at 23 ±2 °C Humidity	±1.5 %rh, 0...100 %rh
Temperature	±0.3 K
Reproducibility	0.5 %rh, 0.1 K
Long-term stability	<1% rh/year typical under normal conditions
Time constant (t63) at 1 m/s air velocity	
Humidity at 23 °C	1 s without filter
Temperature	1 s without filter
Adjustment points (Potentiometer)	
Humidity	35%, 80%, min%, (10%) rh
Temperature	Tmin, Tmax
Electrical connection	M16 cable gland or plug
Housing material	Makrolon
Service	Test plug
Weight	Ca 400 g
Protection of the electronics housing	IP65

Schematic diagrams series I-1020



I-1020

Dimensions of the electronics housing



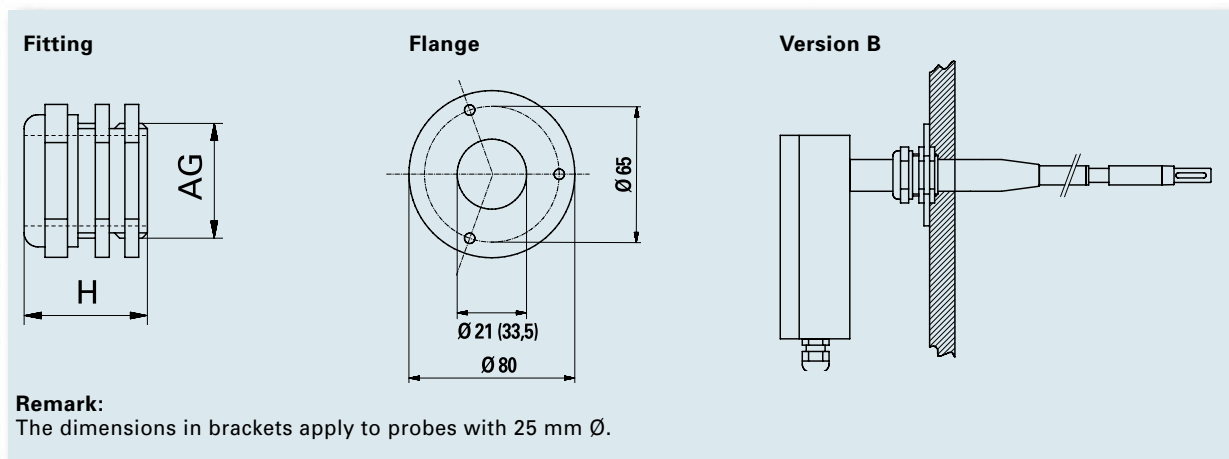
Mounting accessories for all transmitters with 15 mm probes

1. Wall mounting: no accessories required. Electronics housing mounted on wall.
2. Duct mounting:

A: Electronics housing mounted on air duct. No accessories required

B: Probe mounted by AGRO screw fitting and flange (Duct and cable types)

The flange is only required, if the AGRO screw fitting cannot be fixed alone; e.g in small ducts with no access



Order codes	Screw fitting	Probe Ø	max. temperature	AG	H (mm)	Flange
AC1301	Perbunan	15 mm	100 °C	½" G	28	AC 1305
AC1301-M*	Perbunan	15 mm	100 °C	M 25 x 1.5	26	On request
AC1302	Perbunan	25 mm	100 °C	1" G	33	AC 1306
AC1302-M*	Perbunan	25 mm	100 °C	M 32 x 1.5	31.5	On request
AC1303	Viton	15 mm	200 °C	½" G	28	AC 1305
AC1303-M*	Viton D	15 mm	200 °C	M 25 x 1.5	26	On request
AC1304	Viton	25 mm	200 °C	1" G	33	AC 1306
AC1304-M*	Viton	25 mm	200 °C	M 32 x 1.5	31.5	On request

* M = Metric thread

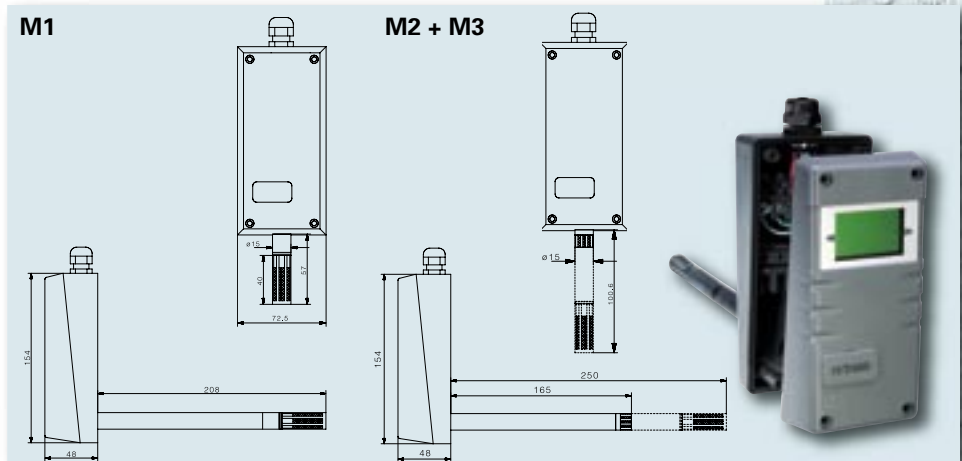
Installation of ROTRONIC transmitters is easy. The various models can be mounted either by a mounting plate, onto which the whole transmitter is fixed, by a connecting plate, which is screwed onto the wall or duct, or by direct mounting onto a duct by fixing the probe with an AGRO fitting. See also previous page.

Mounting of M-Series Transmitters

1. Mount the base/mounting plate onto the wall and connect the wiring.
2. Plug in the probe/electronics module

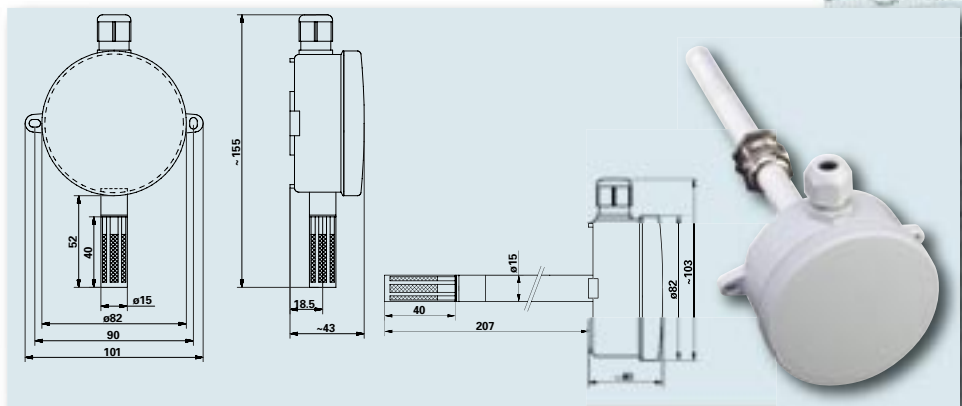
The base/mounting plate is absolutely identical to the old versions of the FTW65, DPT and FH types.

The M1 space mount version features a retractable probe. This is especially convenient for calibration. In areas with no air movement, the measurement is much more accurate due to the better adaptation to the temperature.



Mounting of Roline-L Types

Fix the housing by screwing it directly onto the wall, or by means of an AGRO fitting.



Mounting of I-1020 types

The I-1020 type can be screwed onto a duct or wall by 4 screws located inside of the housing, or by an AGRO fitting in the same manner as M-series or Roline-L series. Fixing by means of a screw-fitting is also possible.

Maintenance

ROTRONIC transmitters require hardly any maintenance. Due to the excellent long term stability, a calibration interval of one year will be sufficient in most cases. However, in some applications, it may be advisable to perform more than one calibration per year. For detailed calibration information, please refer to the chapter calibration.

In dusty and otherwise polluted environments, the sensor protection filters require some maintenance. We recommend to have a spare filter ready and to exchange it on site. The replaced filter may be cleaned in the workshop with soap and water. Ultrasonic cleaners may also be used. Let the filter dry thoroughly before re-use.

