

HYGROPHIL-F, Monisture Analyser, type 5673-10, -11, -12, -13

- Measurement of moisture in gases and liquids
- Combined moisture and temperature sensor
- Multiple channel analyser, max. 3 sensors can be connected
- Measurement under high pressure up to 200 bar (pressure dew point) and in vacuum
- Application of the sensor in the hazardous location (Cl. I/Div. 1)
- Maintenance-free and long-term stable



Description

The sensor Type L1660, consists of a robust multi-layer of optically high refractive and low refractive layers connected with 2 glass fibre cables. Due to a special thermal coating technology, pores with the diameter of a water molecule (approx. 0,3 nm) are generated.

Due to the equilibrium, water is deposited in the layer and consequently changes the refraction index of the light rays (air: 1,00/water 1,33).

In the layer system this results in a shift of the wave length in proportion to the humidity prevalent in the medium. This shift (i.e. no intensity → route-neutral) is recorded by the evaluation unit and assigned to a dew point.

HYGROPHIL-F 5673 is temperature-compensated (integrated Pt100) and pressure-compensated in order to increase the measuring precision.

Application

HYGROPHIL-F 5673 works with a combination sensor which by means of a fibre optical method measures the moisture content and by means of a PT100 measures the temperature in the medium. The very robust construction of the sensor and the measurement procedure itself offer several decisive advantages.

Among the advantages of this measurement principle which is protected by patents are the following:

- High measurement safety including precision, reproducibility and low hysteresis
- Long-term stability of the sensor (no drift!)
- Measurement directly in the pressured pipe is possible (pressure dew point!)
- Application in hazardous locations (Class I/Div. 1)
- Simple installation and integration (Swagelok, Parker, ...)

HYGROPHIL-F 5673 was particularly designed for the natural gas industry. In the meantime it is used for moisture measurement in a diversity of gases and liquids.

Due to the high-quality materials used the sensor is extremely robust and resistant to almost all mediums.

Features

- **Readings:**
DT: -80 ... +20 °C
mg/m³: 1 ... 10.000
(customised calibration is possible, e.g. 0 ... 10 ppm)
- **3 sensors can be connected**
- **Values that can be displayed:**
DT, FP, PPMV/PPMW, Vol %, VP, MC, TT, SP
- **Graphical display**
- **Data logger**
- **Max. length of optical fibre cable: 800 m**
- **Ethernet**

Technical data Hygrophil-F, type 5673-xx, evaluation unit

Device-specific data			
Range of indication	Reading	Range start	Range end
	Vol %	0 %	1 %
	PPMV	0 ppm	15.000 ppm
	VP	0 hPa	10 hPa
	MC	0 mg/m ³	20.000 mg/m ³
	DT/FP	-120 °C	75 °C
	SP	0 bar	250 bar
	TT	-50 °C	100 °C
Calibrated Range	-80 ... +20 DT		
Accuracy	+/- 1°C		
Display	Graphic display 320 x 240 dots		
Keyboard	Touch-screen with red background illumination		
Electrical data			
Auxiliary energy	DC 10 – 36 V max. 50 W (Si 6,3 A MT) AC 100 – 240 V max. 110 VA (Si 1 AT)		
Auxiliary quantities	Temperature (TT) at the measurement spot is measured by means of a Pt 100 sensor integrated in the humidity probe or entered manually as a constant factor. Pressure (SP) is measured via a 4-20-mA signal from an external pressure transmitter or entered manually as a constant factor. CO ₂ content (0 – 100 %) is measured via a 4–20mA signal or entered manually as a constant factor.		
Measurement channels	1,2 or 3		
Measurement rate	Approx. 30 measurements / minute per channel		
Inputs per measurement channel	Light conductor connection for optical humidity probe 9-pole D-SUB plug for characteristic curve of sensor Clamp connection for PT-100 measurement sensor in the sensor head Clamp connection for signal from a pressure transmitter 0/4 - 20 mA Clamp connection for signal 0/4 - 20 mA (e.g. CO ₂ content) All inputs Ex ia, galvanically separated		
Analog output per measurement channel	Clamp connection 0/4 – 20 mA, Ex ia, galvanically separated Source and sink Resolution 0,0003 mA Burden 500 Ω Precision 0,03 mA Temperature drift < 0,001 mA/°C		
Control outputs	1 switch output for Open Collector, Ex ia, galvanically separated Switch voltage 20 ... 30 V, switch current max. 0,2 A Insulation voltage VCM = 1.500 V max. 1 relay changeover contact Intrinsically safe, 30 V, min.20 mA Connection via plug-in terminals		
Interfaces	Ethernet, RS 232, RS 485 (Modbus, Profibus in preparation)		
Ambient conditions			
Operating temperature	0 ... +50 °C		
Storage temperature	-25 ... +60 °C		
Climatic classification	IWI in accordance with DIN 40040		
Mechanical data			
Weight	Approx. 8,5 kg		
Dimensions	Width x height x depth 483 x 192 x 212		
Casing	Applicable for 19" installation and as desktop device		

Technical data of the moisture sensor, type L1660			
Device-specific data			
Integrated Pt100	-50 ... + 100 °C, DIN IEC 751, 4 conductor connections		
Ambient conditions			
Operating temperature	-30... +95		
Storage temperature	-30 ... +50 °C		
Maximally admissible working pressure	100 bar, 200 bar test certificate is available		
Protection type	IP 65 (in installed state)		
Mechanical data			
Material	Shaft:	1.4571	
	Sensor head:	POM	
Dimensions of probe			
Ordering details			
Designation	Type	Specification	Order no.
Evaluation unit			
	5673-10	100 – 240 VAC Class I/Div. 2 1 channel pre-installed	246 121
	5673-11	100 – 240 VAC Class I/Div. 1 in flame proof box 1 channel pre-installed	242 057
	5673-12	10 – 36 VDC Class I/Div. 2 1 channel pre-installed	246 119
	5673-13	10 – 36 VDC Class I/Div. 1 in flame proof box 1 channel pre-installed	242 056
	5673-104	Channel extension	242 084
	5673-107	Wall mount / mounting plate	246 120
Sensor with integrated Pt100			
Shaft diameter 10 mm, 100 bar, calibrated from – 80...+ 20 °C			
	L 1660	Immersion depth 36 mm	221 288
		Immersion depth 100 mm	221 227
		Immersion depth 225 mm	222 168
		Special calibration in natural gas (with DAP test certificate, calibrated from –20...0° DT, for 40 bar)	232 340
		Special calibration for hexane (measurement range freely selectable)	232 165
		Special calibration in several gases and fluids (measurement range selectable)	239 022
Fibre-optic cable, suitable for field installation			
Including ST plug and adapter			
	1631	Length 5 m	U 011 20 051631
		Length 10 m	U 011 20 101631
		Length 20 m	U 011 20 201631
		Length 50 m	U 011 20 501631
		Length 100 m	U 011 21 001631
		Special lengths in steps of 5 m, up to 100 m Special lengths in steps of 10 m, from a length of 100 m, max. length 800 m	U 011 2x xx1631 (xxx = length in m)
Ordering details			

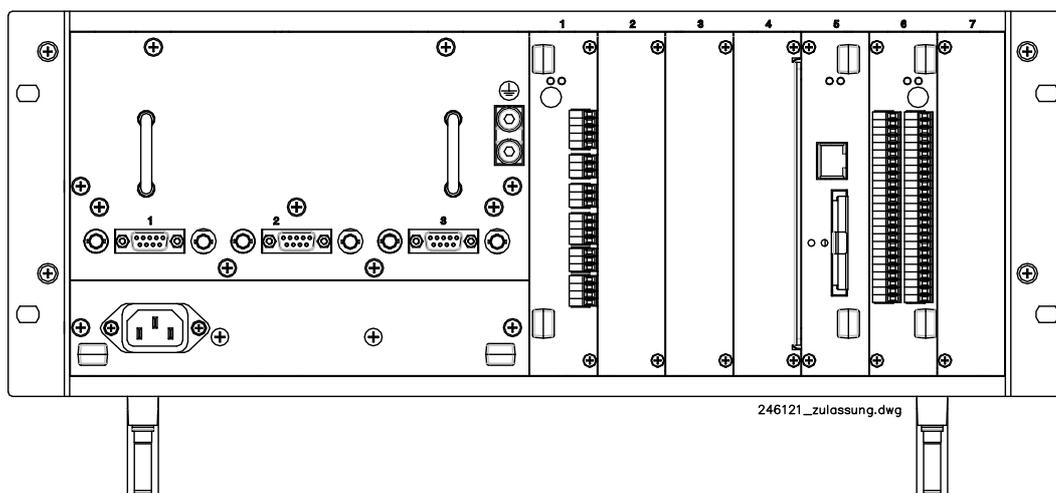
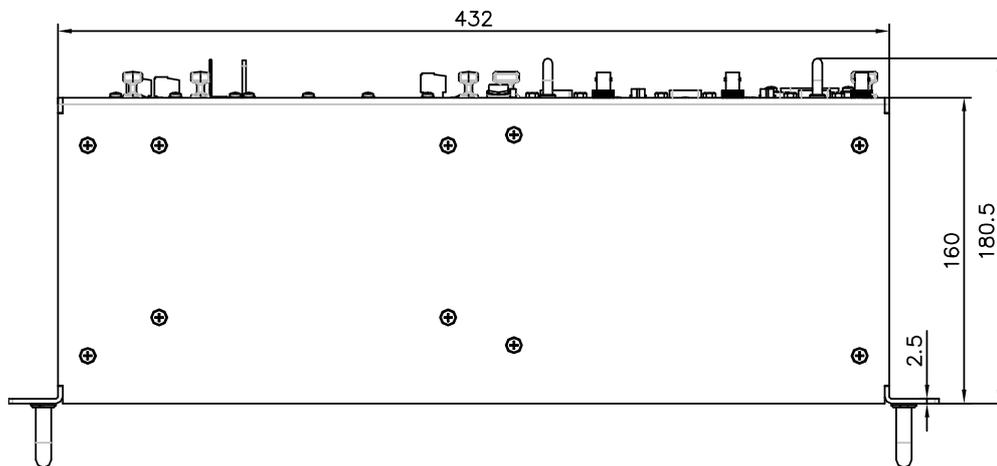
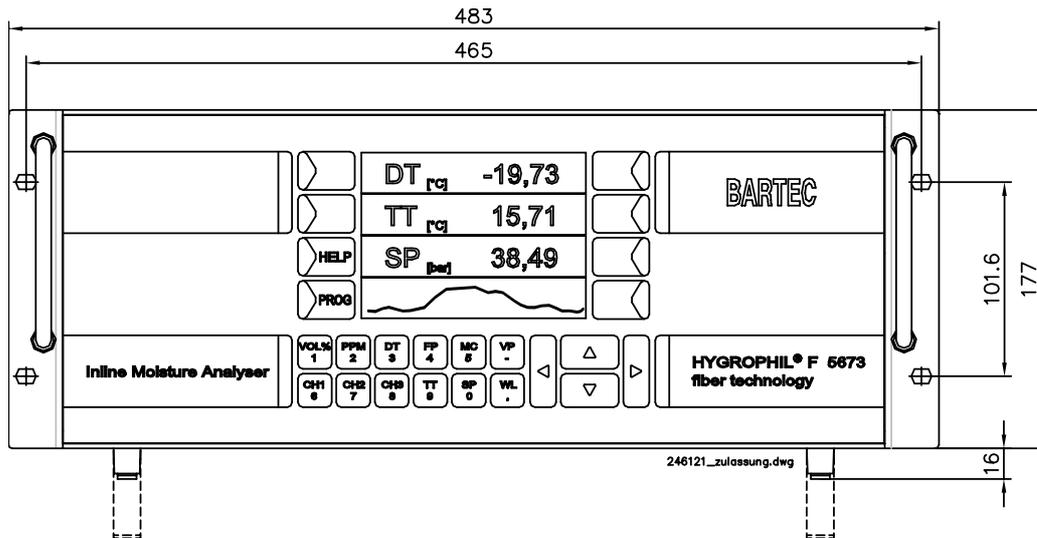
Designation	Type	Specification	Order no.
Pt100 cable, suitable for field installation			
4-wire, shielded		Can be delivered in any length	232 128
Combined fibre-optic cable			
Including ST plug and adapter 2 optical fibres + 6 Cu lines for Pt100 and for pressure sensor Shielded, protected and flame-retardant in accordance with IEC 332-3A Suitable for field application			
	1631-112	Length 2 m	242 445
		Length 5 m	247 283
		Length 10 m	245 449
		Length 20 m	240 821
		Length 100 m	239 954
		Special lengths in steps of 5 m, up to 100 m Special lengths in steps of 10 m, from a length of 100 m Max. length 800 m	xxx xxx
Accessories			
Sample Taker (Swagelok –T)	5672-111	For analysis line with 6 mm	221 715
	5672-112	For analysis line with 10 mm	221 717
Retraction Tool WA 3HD-US/EU 225	ZM-WA-010-025-EST	PBCompac flange PN 200 Material: stainless steel	246 703
Blind plug	ZM-BB-007-015-EST	For sensor retraction tool Material: stainless steel	246 711
CF alternatively CF welding socket	ZM-CF-356-025-EST	For Retraction Tool Material: stainless steel	246 706
	ZM-CF-356-025-ST	For Retraction Tool Material: steel	246 707
Compac blind flange alternatively Compac blind flange	ZM-CF-357-025-EST	For Retraction Tool Material: stainless steel	246 708
	ZM-CF-357-025-ST	For Retraction Tool Material: steel	246 720
Assembling Set	ZM-WZ-003	1x hook wrench 4x screws for PBCompac PN200 1x O-ring for PBCompac PN200 1x set of O-rings for retraction tool 1x Swagelok screwing 1/2"	246 721
Sample conditioning (SCS) system for natural gas applications	5985-13	316 SS /up to 170 bar /ATEX, CENELEC EEx d/e IIC T5 heated with pressure reduction, filter and gas/liquid separator opt. self-standing support frame, 316SS opt. roof, 316SS	247 595
			246019
			274206
Test equipment			
Field test DT	5672-104	Humidity standard generates dew point of approx. – 10°, incl. temperature measurement device, application in Ex area EEx ib IIB T4 Delivered in portable case	206 068
	5672-110	Humidity standard generates dew point of approx. – 10°, including temperature measurement device, application in general purpose area Delivered in portable case	221 587
Moisture generator	DPG-59	Approx. 20ppm / 50ppm / 100ppm	239 611

Drawings and dimensions

Dimensions of evaluation unit: 19" rack-version / desktop version (Class I/Div. 2)

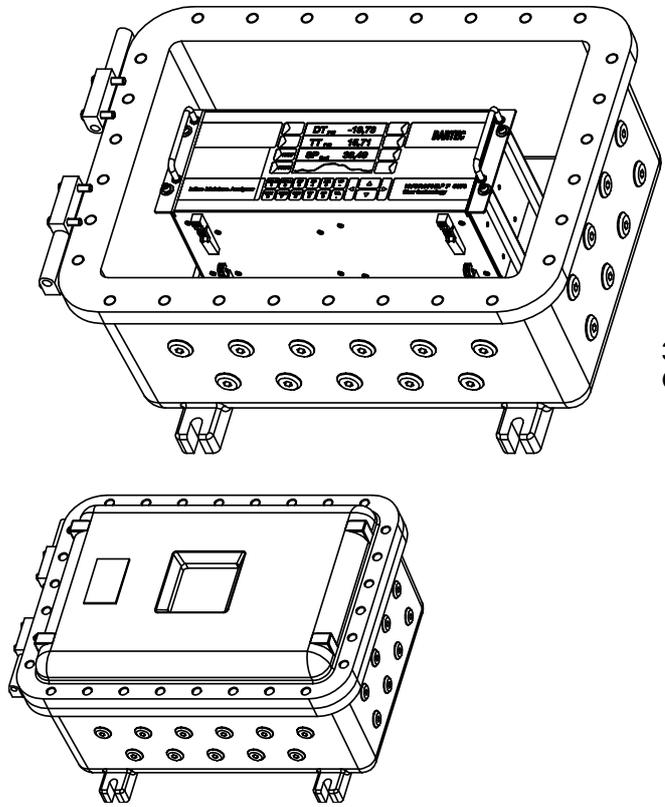
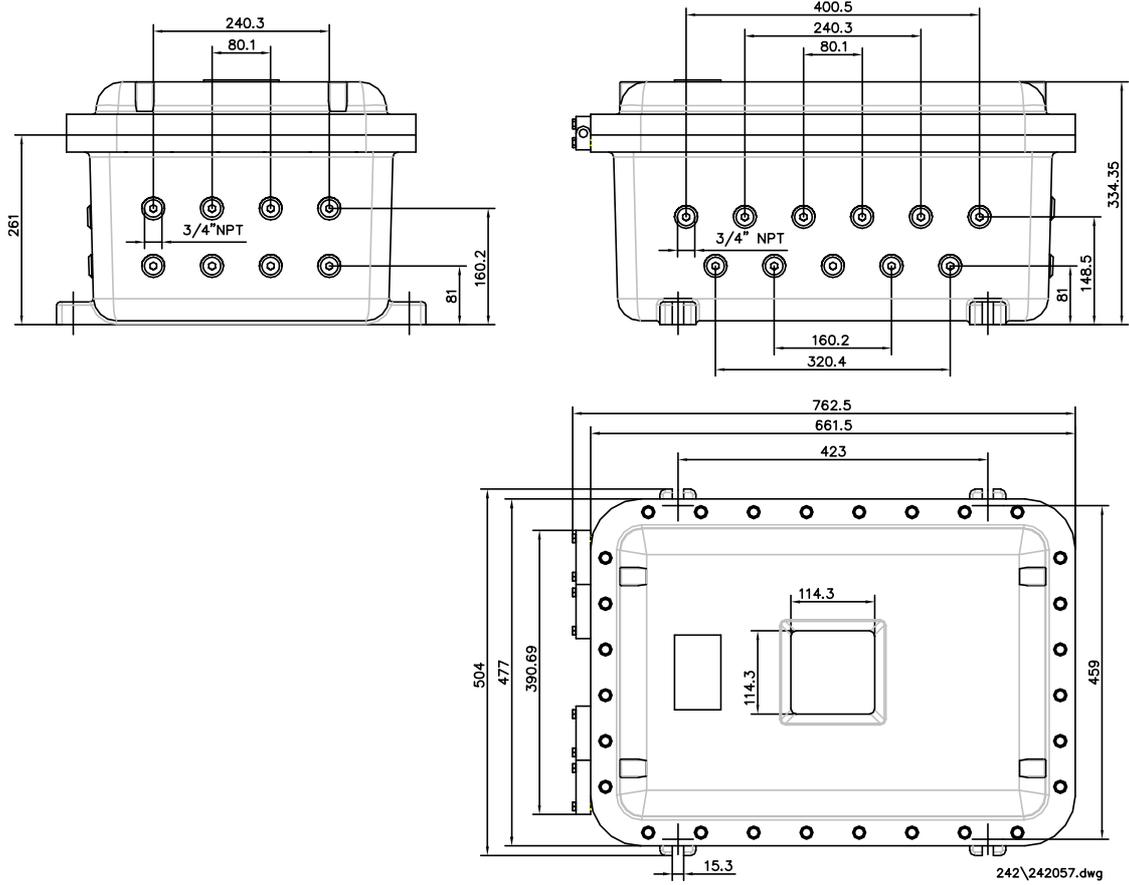
Type: 5673-10 5673-12

Order no.: 246121 246119



Dimensions of evaluation unit in flame proof box (Class I/Div. 1)

Type: 5673-11 5673-13
 Order no.: 242057 242056

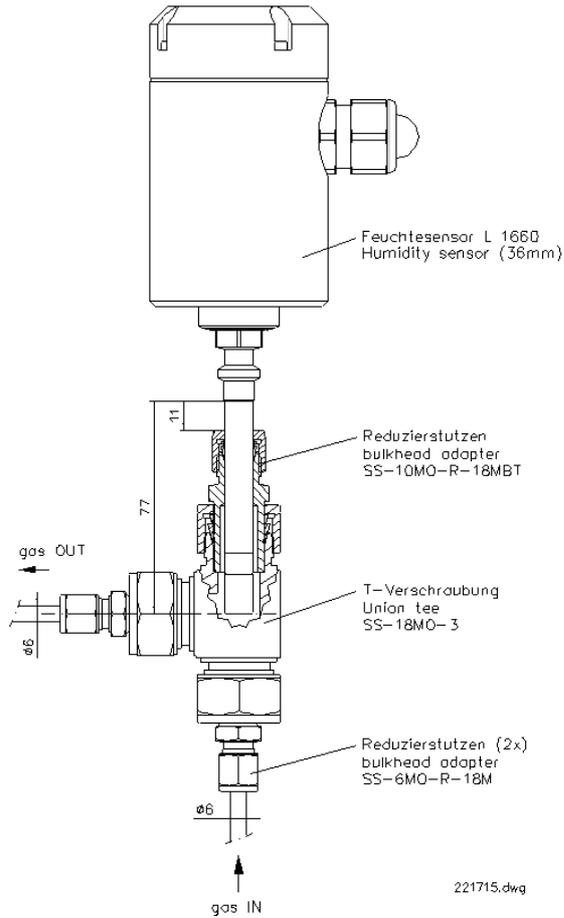


3D – view with integrated HY-GROPHIL F 5673

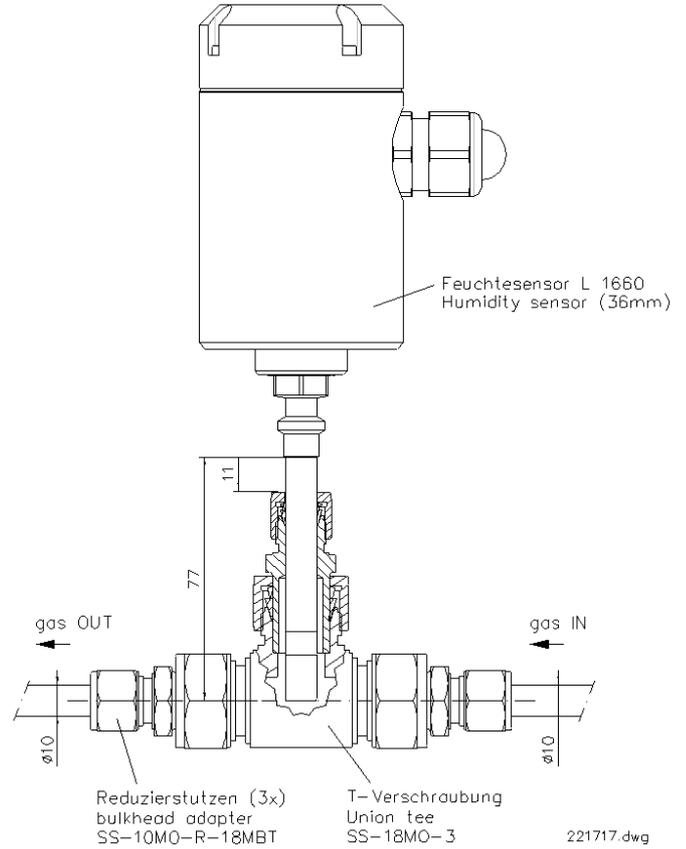
Examples for installation

Installation into an analysis line by means of a flow through cell (union-T)

Type: 5672-111 (6 mm)
Order no.: 221715

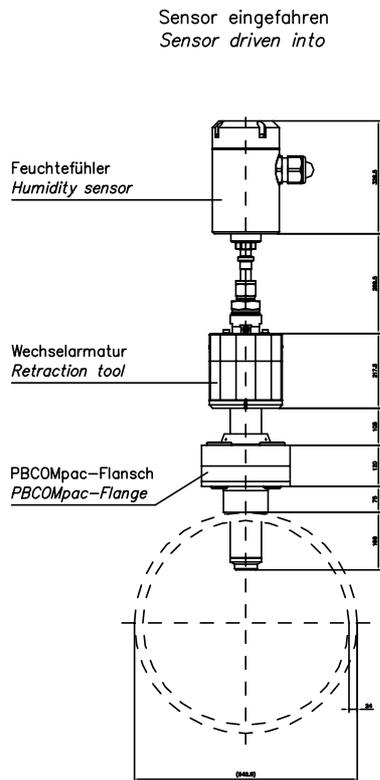


Type: 5672-112 (10 mm)
Order no.: 221717

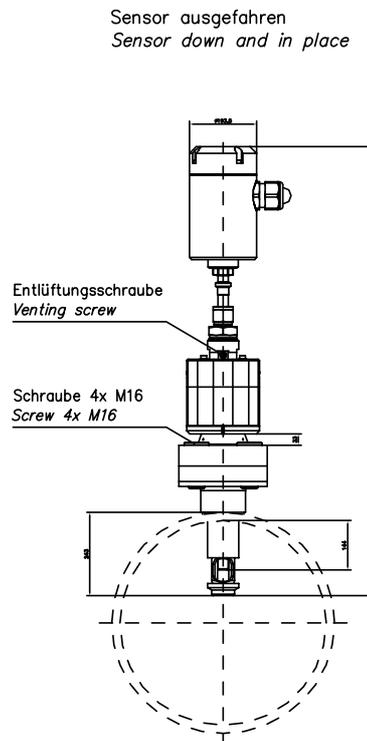


Installation in a pipe line, a pressured line or a bypass line by means of retraction tool

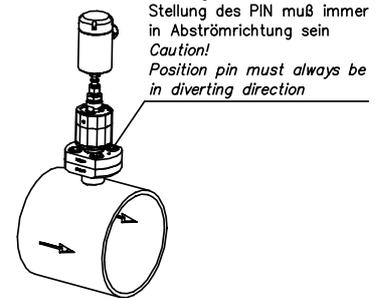
Type: 5672-115
Order no.: 222382



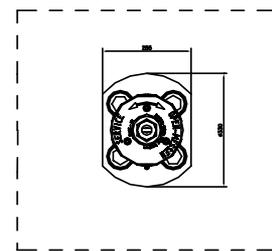
Sensor eingefahren
Sensor driven into



Sensor ausgefahren
Sensor down and in place



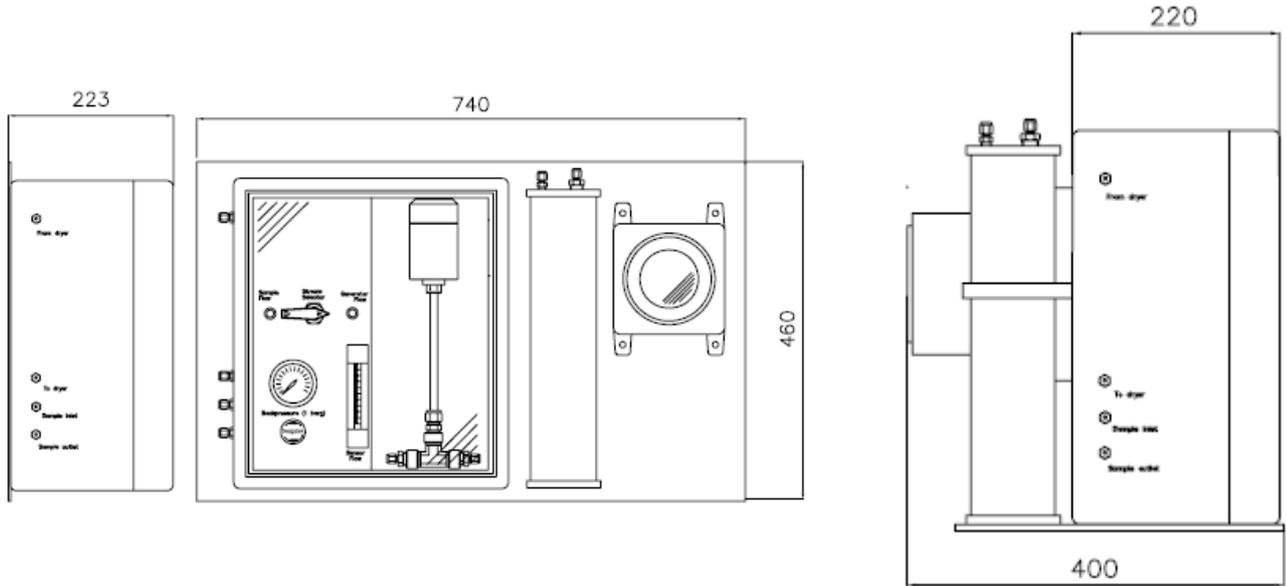
Draufsicht
Top view



Ptc\sonderp\sensorwech..

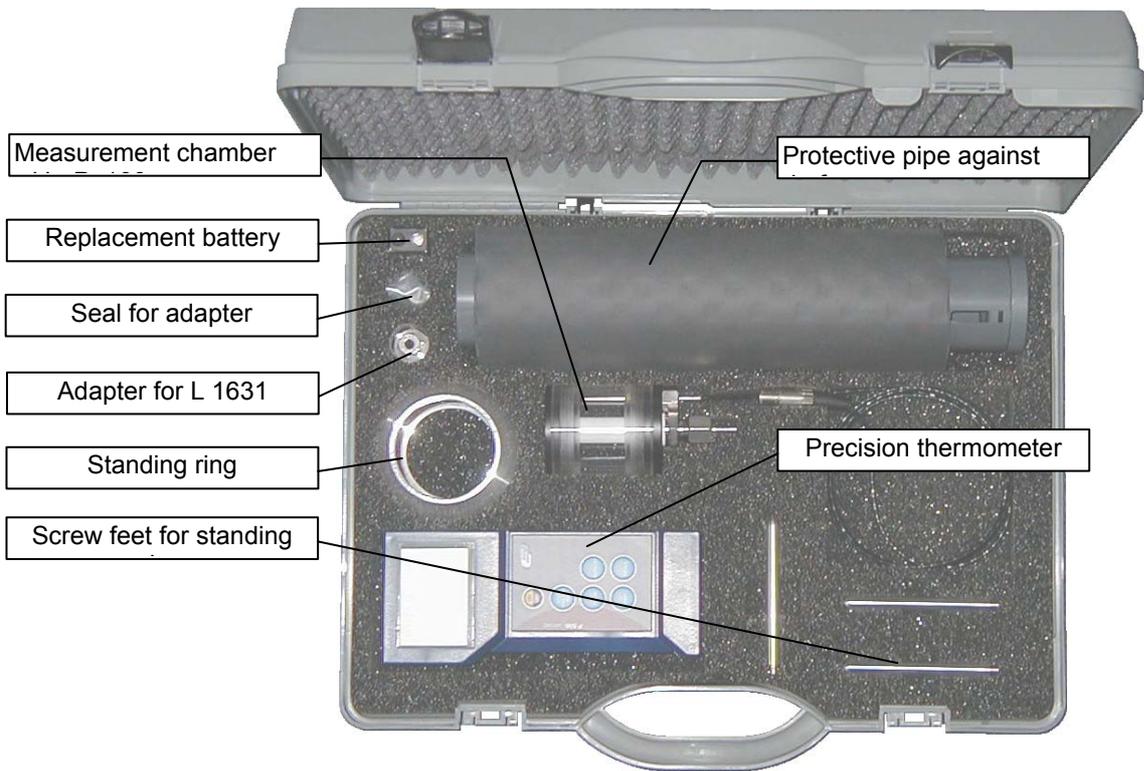
Moisture generator (optionally portable or stationary)

Type DPG-59
Order no.: 239611



Portable field test for dew point – 10 °C

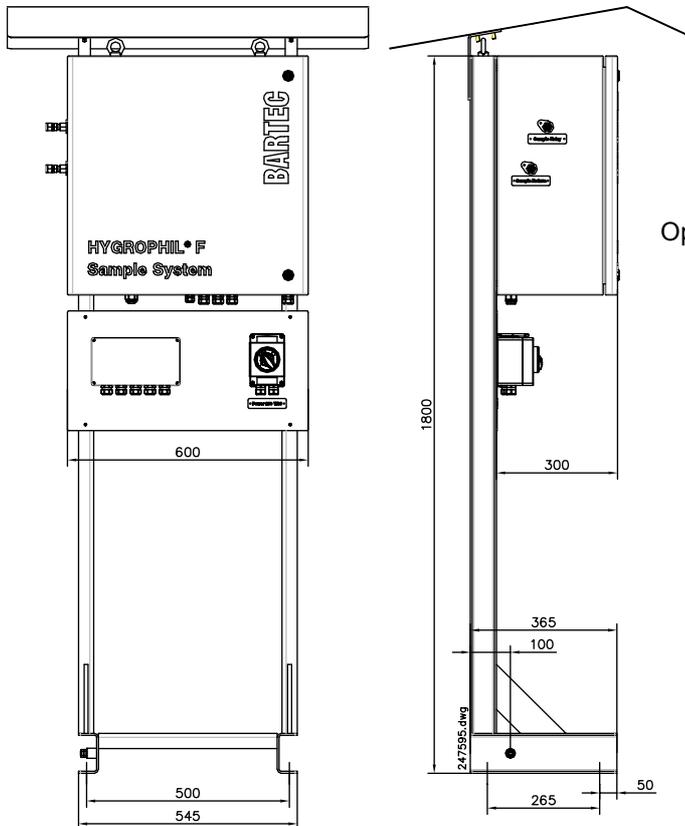
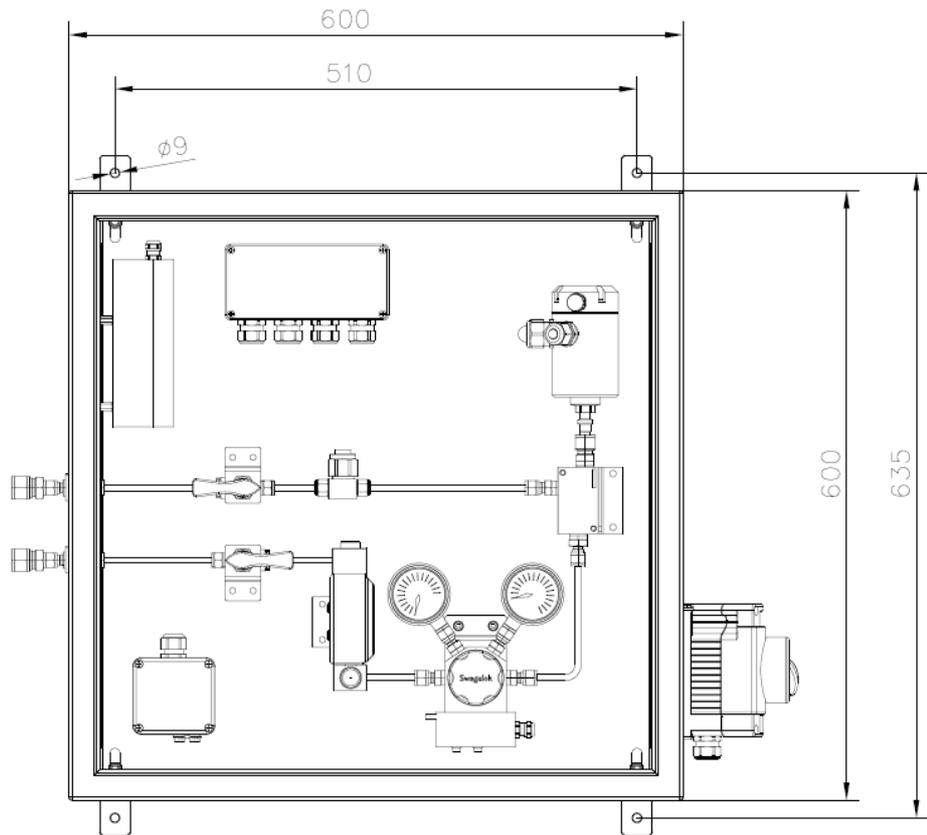
Type: 5672-104 (Ex version) 5672-110 (general purpose version)
Order no.: 206068 221587



Sample and Conditioning System (SCS) for natural gas applications

Type: 5985-13

Order no.: 247595



Optional:

- Self-standing support frame, 316SS
Order-No.: 246019
- Self-standing support frame, zinc plated
Order-No.: 274205
- Roof, 316SS
Order-No.: 274206