Smart sensor
COMATE

CATALOGUE 2021

Professional and innovative
flow measuring & monitoring solutions

For steam, air, natural gas & process gas

- Vortex flow meter
- Thermal mass flow meter
- Pitot tube flow meter
- Micro flow meter
- Efficiency measurement
- IoT monitoring

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Comate Intelligent Sensor
VFM60 Vortex flow meter

Working principle

VFM60 is a powerful flow meter utilizing “Karman vortex” theory, which can meet the requirement of measuring the flow rate of various fluids such as gas, steam and liquid.

Special features

- Super low flow measurement down to 2m/s
- Unique dual sensor technology excellent in anti-vibration
- Multi-variable flow meter, measures flow rate, temperature , pressure, FAD measurement available
- Blue tooth function optional, can read and set on COMATE APP with and smart phone or pad
- Self-diagnose function plus remote diagnose function, ensure easier trouble-shooting.
- No mechanical wear part

Features

Process Fluids	Used in liquid, gas, and steam applications. Fluids must be homogeneous and single-phase.
Line Sizes	The wafer and flanged type cover line sizes as below. 0.5", 0.75",1", 1.5", 2", 2.5", 3", 4", 5", 6", 8",10" ,12", (DN15, DN20, DN25, DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300) The insertion type covers DN300~1000.
Process connection	Flange, wafer, insertion, ANSI, JIS, DIN Standard flanges are optional for flanged connection
Displayer	Integral or remote.3 buttons control. 2 lines LCD displayer. 1st line has 5 digits to display mass flow or volume flow or frequency or temperature or pressure 2nd line has 8 digits to displayer total flow A small extra line above 1st line will indicate what parameter being displayed in 1st line.
Measurable parameter	Standard version: Volume flow rate in pipe (Can measure mass flow rate, temperature and pressure if wired to separate RTD and pressure transmitter.) Multi-variable version: Mass flow rate, volume flow rate in standard condition, temperature, pressure, volume flow rate in pipe, velocity.
Output signal	Pulse, high level ⩾ 5V, low level < 1V, 50% duty ratio 4~20mA (HART@4~20mA) ModBus-RTU RS485
Pressure allowance	1.6MPa (232 psiG)、2.5MPa (362 psiG)、4.0MPa (580 psiG)、6.3Mpa (913 psiG) for option

Measurement range

Medium	Min Velocity	Max Velocity
Gas	6m/s for DN15、DN20 (19.7 ft/s) for 0.5" and 0.75" 4m/s，DN25、DN32 (13.1 ft/s) for 1" and 1.25" 2m/s，DN40 ~ DN300 (6.7 ft/s) for 1.5" ~ 1.2"	60m/s (196.9 ft/s)
Steam	6m/s for DN15、DN20 (19.7 ft/s) for 0.5" and 0.75" 4m/s，DN25、DN32 (13.1 ft/s) for 1" and 1.25" 2m/s，DN40 ~ DN300 (6.7 ft/s) for 1.5" ~ 1.2"	70m/s (229.7 ft/s)
Liquid	0.3m/s (1 ft/s)	7m/s (23 ft/s)

VFM60N Standard type vortex meter without temperature & pressure compensation

Specification

Process connection	Flange Wafer	DN15~DN300 or 0.5 inch to 12 inch DN15~DN300 or 0.5 inch to 12 inch
Medium temperature	Standard Medium High	–40 ~ 150 ℃ or –40 ~ 302 ℉ –40 ~ 250 ℃ or –40 ~ 482 ℉ –40 ~ 350 ℃ or –40 ~ 662 ℉
Power supply	4~20mA 2 wise system VFM60MV with 4~20mA (2 wire) Modbus RTU	13.5 ~ 42V 15.5 ~ 42V Current Iq < 9mA 13.4 ~ 42V
Reynolds and accuracy	Gas/steam (m^3/h)	±1%RD (Re ⩾ 20000) ±2%RD (10000 < Re < 20000)
	Liquid (m^3/h)	±0.75%RD (Re ⩾ 20000) ±2%RD (10000 < Re < 20000)
	Gas/steam (m^3/h)	±1.5%RD (Re ⩾ 20000) ±2.5%RD (10000 < Re < 20000)
Turndown ratio	Gas Steam Liquid	1:30 1:35 1:35
Repeatability	Volume flow Mass flow Temperature Pressure	±0.3% ±0.3% ±0.05 ℃ ±0.05%FS

Upstream/Downstream requires	15 x D / 5 x D Details please check in manual
Viscosity allowance	DN15 or 0.5 inch ⩽ 4mPas DN25 or 1 inch ⩽ 5mPas DN40~DN300 or 1.5~12 inch ⩽ 7mPas
Anti–vibration (both punch and fixed freq)	0.5g
Display	LCD displayer
Saturated /superheated steam measurement	Support
Natural gas/Biogas, ect	Support
Communication	HART(V5、V7)/ Modbus–RTU/ Pulse
Explosive proof	NEPSI Ex d II c T3 Gb

VFM60MV Multi–variable Vortex Meter standard type support up to 150 ˚C

VFM60MV Multi–variable Vortex Meter high temperature support up to 350˚C

Actual flow measuring range

Pipe size		Steam/gas actual flow				liquid actual flow			
		Min flow m^3/hr	Max flow m^3/hr	Min flow cu.ft/min	Max flow cu.ft/min	Min flow m^3/hr	Max flow m^3/hr	Min flow GPM	Max flow GPM
15mm	0.5 inch	3.8	44.5	2.2	26.2	0.2	4.4	0.8	19.6
20mm	0.75 inch	6.8	79.1	4	46.6	0.3	7.9	1.5	34.8
25mm	1 inch	7.1	123.6	4.2	72.7	0.5	12.4	2.3	54.4
32mm	1.25 inch	9	202.5	5.3	119.2	0.9	20.2	3.8	89.2
40mm	1.5 inch	11.6	316.4	6.8	186.2	1.4	31.6	6.0	139.3
50mm	2 inch	14.1	494.4	8.3	291	2.1	49.4	9.3	217.7
65mm	2.5 inch	23.9	835.5	14	491.7	3.6	83.5	15.8	367.8
80mm	3 inch	36.2	1265.5	21.3	744.9	5.4	126.6	23.9	557.2
100mm	4 inch	56.5	1977.4	33.3	1163.9	8.5	197.7	37.3	870.6
125mm	5 inch	88.3	3089.7	52	1818.5	13.2	309.0	58.3	1360.4
150mm	6 inch	127.1	4449.2	74.8	2618.7	19.1	444.9	84.0	1958.9
200mm	8 inch	226	7909.6	133	4655.4	33.9	791.0	149.3	3482.5
250mm	10 inch	353.1	12358.8	207.8	7274.1	53.0	1235.9	233.2	5441.4
300mm	12 inch	508.5	17796.6	299.3	10474.7	76.3	1779.7	335.8	7835.6

Saturated steam measuring range——Metric unit flow rate in kg/hr

Pipe size		T=121 dgrC P=1 barG D=1.155 kg/m^3		T=144 dgrC P=3 barG D=2.185 kg/m^3		T=159 dgrC P=5 barG D=3.182 kg/m^3		T=165 dgrC P=6 barG D=3.671 kg/m^3		T=171 dgrC P=7 barG D=4.218 kg/m^3	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	4.4	51.4	8.3	97.2	12.1	141.6	14	163.3	16.1	187.7
20mm	0.75 inch	7.8	91.4	14.8	172.8	21.6	251.7	24.9	290.4	28.6	333.6
25mm	1 inch	8.2	142.7	15.4	270	22.5	393.3	25.9	453.7	29.8	521.3
32mm	1.25 inch	10.4	233.9	19.8	442.4	28.8	644.3	33.2	743.3	38.1	854.1
40mm	1.5 inch	13.4	365.4	25.3	691.3	36.8	1006.7	42.5	1161.4	48.8	1334.5
50mm	2 inch	16.3	571	30.9	1080.2	44.9	1573	51.9	1814.8	59.6	2085.2
65mm	2.5 inch	27.6	964.9	52.2	1825.5	76	2658.4	87.6	3066.9	100.7	3523.9
80mm	3 inch	41.8	1461.7	79	2765.2	115.1	4026.9	132.7	4645.8	152.5	5338
100mm	4 inch	65.3	2283.9	123.4	4320.6	179.8	6292.1	207.4	7259	238.3	8340.7
125mm	5 inch	102	3568.6	192.9	6751	280.9	9831.4	324.1	11342.2	372.4	13032.3
150mm	6 inch	146.8	5138.8	277.8	9721.4	404.5	14157.2	466.7	16332.8	536.2	18766.5
200mm	8 inch	261	9135.6	493.8	17282.5	719.1	25168.4	829.6	29036.2	953.2	33362.7
250mm	10 inch	407.8	14274.4	771.5	27003.9	1123.6	39325.6	1296.3	45369	1489.4	52129.2
300mm	12 inch	587.3	20555.1	1111	38885.6	1618	56628.8	1866.6	65331.4	2144.7	75066.1

Pipe size		T=176 dgrC P=8 barG D=4.723 kg/m^3		T=185 dgrC P=10 barG D=5.752 kg/m^3		T=192 dgrC P=12 barG D=6.671 kg/m^3		T=199 dgrC P=14 barG D=7.706 kg/m^3		T=215 dgrC P=20 barG D=10.57 kg/m^3	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	18	210.1	21.9	255.9	25.4	296.8	29.4	342.9	40.3	470.3
20mm	0.75 inch	32	373.6	39	455	45.2	527.6	52.2	609.5	71.7	836
25mm	1 inch	33.4	583.7	40.6	710.9	47.1	824.5	54.4	952.4	74.6	1306.3
32mm	1.25 inch	42.7	956.3	52	1164.7	60.3	1350.8	69.7	1560.4	95.5	2140.3
40mm	1.5 inch	54.6	1494.3	66.6	1819.8	77.2	2110.6	89.2	2438.1	122.3	3344.2
50mm	2 inch	66.7	2334.8	81.2	2843.5	94.2	3297.8	108.8	3809.5	149.3	5225.3
65mm	2.5 inch	112.7	3945.8	137.3	4805.5	159.2	5573.3	183.9	6438	252.3	8830.7
80mm	3 inch	170.8	5977.1	208	7279.4	241.2	8442.4	278.6	9752.2	382.2	13376.7
100mm	4 inch	266.8	9339.3	325	11374	376.9	13191.2	435.4	15237.9	597.2	20901.1
125mm	5 inch	416.9	14592.6	507.8	17771.9	588.9	20611.3	680.3	23809.1	933.1	32658
150mm	6 inch	600.4	21013.3	731.2	25591.5	848	29680.3	979.6	34285.2	1343.6	47027.5
200mm	8 inch	1067.3	37357.1	1299.9	45496	1507.6	52765	1741.5	60951.4	2388.7	83604.5
250mm	10 inch	1667.7	58370.4	2031.1	71087.6	2355.6	82445.3	2721	95236.6	3732.3	130632.1
300mm	12 inch	2401.5	84053.4	2924.7	102366.1	3392	118721.2	3918.3	137140.7	5374.6	188110.2

Saturated steam measuring range——Imeprial unit flow rate in lb/hr

Pipe size		T=249.8 dgrF P=14.5 pisG D=0.0721 lb/ft³		T=291.2 dgrF P=43.5 pisG D=0.1364 lb/ft³		T=318.2 dgrF P=72.5 pisG D=0.1986 lb/ft³		T=329 dgrF P=87 pisG D=0.2292 lb/ft³		T=339.8 dgrF P=101.5 pisG D=0.2633 lb/ft³	
		Min	Max	Max	Min	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	9.7	113.3	18.4	214.3	26.8	312.1	30.9	360.1	35.5	413.7
20mm	0.75 inch	17.3	201.4	32.7	381	47.6	554.9	54.9	640.1	63	735.5
25mm	1 inch	18	314.7	34	595.3	49.5	867	57.2	1000.2	65.7	1149.3
32mm	1.25 inch	23	515.6	43.5	975.4	63.4	1420.5	73.2	1638.8	84.1	1882.9
40mm	1.5 inch	29.5	805.6	55.7	1524.1	81.2	2219.5	93.6	2560.6	107.6	2942.1
50mm	2 inch	36	1258.8	68	2381.3	99.1	3467.9	114.3	4000.9	131.3	4597
65mm	2.5 inch	60.8	2127.3	115	4024.5	167.5	5860.8	193.2	6761.5	222	7768.9
80mm	3 inch	92.1	3222.5	174.2	6096.2	253.7	8877.9	292.6	10242.2	336.2	11768.4
100mm	4 inch	143.9	5035.1	272.2	9525.3	396.3	13871.7	457.2	16003.4	525.4	18388
125mm	5 inch	224.8	7867.4	425.2	14883.3	619.3	21674.5	714.4	25005.4	820.9	28731.3
150mm	6 inch	323.7	11329.1	612.3	21432	891.8	31211.3	1028.8	36007.7	1182.1	41373.1
200mm	8 inch	575.4	20140.5	1088.6	38101.4	1585.3	55486.7	1829	64013.8	2101.5	73552.2
250mm	10 inch	899.1	31469.6	1701	59533.4	2477.1	86698	2857.8	100021.5	3283.6	114925.3
300mm	12 inch	1294.7	45316.2	2449.4	85728.1	3567	124845.2	4115.2	144031	4728.4	165492.4

Pipe size		T=348.8 dgrF P=116 pisG D=0.2948 lb/ft³		T=365 dgrF P=145 pisG D=0.3591 lb/ft³		T=377.6 dgrF P=174 pisG D=0.4165 lb/ft³		T=390.2 dgrF P=203 pisG D=0.4811 lb/ft³		T=419 dgrF P=290 pisG D=0.6599 lb/ft³	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	39.7	463.3	48.4	564.2	56.1	654.3	64.8	755.9	88.9	1036.8
20mm	0.75 inch	70.6	823.6	86	1003	99.7	1163.3	115.2	1343.7	158	1843.2
25mm	1 inch	73.5	1286.8	89.6	1567.2	103.9	1817.6	120	2099.6	164.6	2879.9
32mm	1.25 inch	94.1	2108.4	114.6	2567.7	132.9	2978	153.6	3440	210.6	4718.5
40mm	1.5 inch	120.5	3294.3	146.7	4012.1	170.2	4653.1	196.6	5375	269.6	7372.7
50mm	2 inch	147.1	5147.4	179.1	6268.9	207.7	7270.4	240	8398.4	329.1	11519.8
65mm	2.5 inch	248.5	8699.1	302.7	10594.4	351.1	12287	405.5	14193.3	556.2	19468.4
80mm	3 inch	376.5	13177.3	458.5	16048.3	531.8	18612.3	614.3	21500	842.6	29490.6
100mm	4 inch	588.3	20589.6	716.4	25075.4	830.9	29081.7	959.8	33593.7	1316.5	46079.1
125mm	5 inch	919.2	32171.2	1119.4	39180.3	1298.3	45440.2	1499.7	52490.2	2057.1	71998.6
150mm	6 inch	1323.6	46326.5	1612	56419.7	1869.5	65433.9	2159.6	75585.9	2962.2	103678
200mm	8 inch	2353.1	82358.2	2865.8	100301.6	3323.6	116326.8	3839.3	134374.9	5266.2	184316.4
250mm	10 inch	3676.7	128684.7	4477.8	156721.3	5193.2	181760.7	5998.9	209960.7	8228.4	287994.4
300mm	12 inch	5294.5	185306	6448	225678.6	7478.2	261735.4	8638.4	302343.4	11848.9	414711.9

saturated steam measuring range——Imeprial unit flow rate in lb/hr

The standard model number is usually VFM60MV–2–WC–1–N–N–ML1–M–N–XXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	General model	VFM60–MV	Vortex mass flowmeter with integral RTD and pressure sensor	Standard
		VFM60–N	Vortex flowmeter without integral RTD and pressure sensor	Option
2	Fluid type	1	Liquid	Option
		2	Gas	Standard
		3	Steam	Option
3	Process connection	IN	Insertion (only for DN300 ~ DN1000 or 12 inch ~ 40 inch)	Option
		WC	Wafer with carbon steel flanges up to 16 barG (232 psiG) (DN15 ~ DN300)	Standard
		WF	Wafer with stainless steel flanges up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		D1	Flanged DIN PN16 up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		D2	Flanged DIN PN25 up to 25 barG (362 psiG) (DN15 ~ DN300)	Option
		D3	Flanged DIN PN40 up to 40 barG (580 psiG) (DN15 ~ DN300)	Option
		D4	Flanged DIN PN63 up to 63 barG (913 psiG) (DN15 ~ DN300)	Option
		C1	Flanged ANSI CL150 up to 16 barG (232 psiG) (0.5 inch ~ 12 inch)	Option
		C2	Flanged ANSI CL300 up to 40 barG (580 psiG) (0.5 inch ~ 12 inch)	Option
		C3	Flanged ANSI CL400 up to 63 barG (913 psiG) (0.5 inch ~ 12 inch)	Option
		J1	JIS 10K up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		J2	JIS 20K up to 40 barG (580 psiG) (DN15 ~ DN300)	Option
		J3	JIS 30K up to 63 barG (913 psiG) (DN15 ~ DN300)	Option
4	Wetted part material	1	OCr18Ni9 (304)	Standard
		2	316	Option
5	Degreased	Q	Other	Option
		N	Wet part not degreased	Standard
		D	Wet part degreased for Oxygen measurement	Option
6	Medium Temperature	N	T≤150℃	Standard
		S	T≤250℃ (wafer or flanged)	Option
		H	T≤350℃ (wafer or flanged)	Option
7	Transmitter	ML1	Integral transmitter, multi–variable, bluetooth, RS485, pulse,	Standard
		ML2	Integral transmitter, multi–variable, bluetooth, pulse, 4 wire 4~20mA	Option
		ML3	Integral transmitter, multi–variable, bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		ML4	Integral transmitter, multi–variable, bluetooth, pulse, 4 wire HART@4~20mA	Option

7	Transmitter	ML5	Integral transmitter, multi–variable, pulse, 2 wire 4~20mA	Option
		ML6	Integral transmitter, multi–variable, pulse, 2 wire HART@4~20mA	Option
		MR1	Remote transmitter (dual display), multi–variable, bluetooth, RS485, pulse	Option
		MR2	Remote transmitter (dual display), multi–variable, bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		NL1	Integral transmitter, bluetooth, RS485, pulse,	Option
		NL2	Integral transmitter, bluetooth, pulse, 4 wire 4~20mA	Option
		NL3	Integral transmitter, bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		NL4	Integral transmitter, bluetooth, pulse, 4 wire HART@4~20mA	Option
		NL6	Integral transmitter, pulse, 2 wire HART@4~20mA	Option
		NR1	Remote transmitter (dual display), bluetooth, RS485, pulse,	Option
		NR2	Remote transmitter (single display), bluetooth, pulse, 4 wire 4~20mA	Option
		NR3	Remote transmitter (dual display), bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		NR4	Remote transmitter (single display), bluetooth, pulse, 4 wire HART@4~20mA	Option
		NR6	Remote transmitter (single display), pulse, 2 wire HART@4~20mA	Option
8	Cable grinder	M	M20x1.5	Standard
		N	NPT 1/2	Option
9	Ex–proof	N	No Ex–proof	Standard
		1	NEPSI Ex d IIC T3 Gb	Option
10	Pipe size	015	DN15 or 0.5 inch	
		020	DN20 or 0.75 inch	
		025	DN25 or 1 inch	
		032	DN32 or 1.25 inch	
		040	DN40 or 15 inch	
		050	DN50 or 2 inch	
		065	DN65 or 2.5 inch	
		080	DN80 or 3 inch	
		100	DN100 or 4 inch	
		125	DN125 or 5 inch	
		150	DN150 or 6 inch	
		200	DN200 or 8 inch	
		250	DN250 or 10 inch	
		300	DN300 or 12 inch	

TGF600 Thermal mass flow meter

Working principle

TGF600 Series Thermal Mass Flowmeter measures the gas mass flow base on thermal diffusion theory. It has two filmed RTDs as its sensors, one of which sense the velocity of the gas flow (RH) and the other one will detect the temperature shift of the gas flow (RMG). When the two RTD are in the gas flow ,the RH will be heated while the RMG will sense the temperature changing of the gas flow. More heat will be taken away as the velocity of the gas flow increasing, so the temperature on RH will decline.

Special features

- Direct mass flow or normal flow measurement
- 100:1 turn down ratio in 5 ranges: 0.3~30Nm/s, 0.6Nm/s～60 Nm/s, 0.9~90Nm/s, 1.2~120Nm/s, or 1.5~~150Nm/s
- No pressure loss, suitable for pipe in any shape with known sectional area
- For the insertion type, installation and maintenance can be finished on line
- High accuracy data acquisition circuit to ensure outstanding repeatability and accuracy
- High efficiency design of power supply, the total power consumption is only 60mA@24VDC
- 16V~32V wide voltage range input to fit in all electricity environment
- Self-diagnose function plus remote diagnose function, ensure easier trouble-shooting
- Ex-proof version optional
- Bluetooth communication for reading, setting and diagnosis and COMMATE APP
- No mechanical wear part

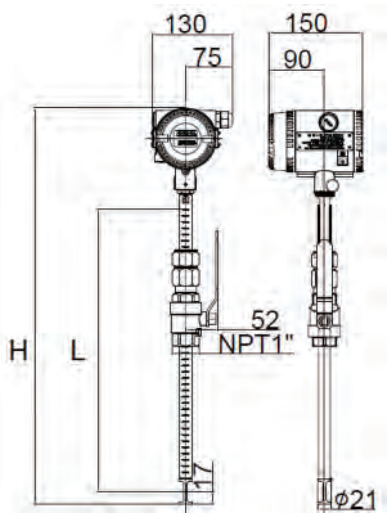
TGF600 Thermal mass flow meter

Specification

Media Compatibility	Air, Nitrogen, O_2, CO_2, Argon, CH_4, Natural gas, biogas, and almost all dry and clean air
Pipe diameter	Insertion: DN25 ~ 2500mm Inline: DN25 ~ 300mm
Flow velocity range	0.3~30Nm/s 0.6~60Nm/s 0.9~90Nm/s 1.2~120Nm/s 1.5~150Nm/s
Accuracy	1.5% RD ± 0.5% FS
Temperature of medium	Standard: −40 ~ +150°C Middle: −40 ~ +250°C High: −40 ~ +450°C
Pressure of medium	Insertion: 1.6 MPa Flanged insertion: 6.3 MPa Flanged in-line: 6.3 MPa
Power supply	AC85～264V or DC16～32V
Response time	1 second
Output	Frequency and 4~20mA as standard
Communication	RS~485 + Bluetooth as standard , 4~20mA@HART as optional
Date displayed	Mass flow, Total flow Volume flow in normal condition
Ingress protection grade	IP65 (GB China)
Ex-proof	NEPSI EX d II c T3 Gb

Insertion type with ball valve

Install/remove the meter without stopping the flow



Probe	H	L
290 mm	433.5 mm	255.5 mm
440 mm	583.5 mm	405.5 mm
690 mm	833.5 mm	655.5 mm
1000 mm	1143.5 mm	965.5 mm
1500 mmt	1643.6 mm	1465.5 mm

Max pipe size that each probe can adapt to

Probe length	290mm	440mm	690mm	1000mm	1500mm
T < 50 dgr C	DN150	DN450	DN900	DN1500	DN2500
50 °C < T < 150 °C	/	DN100	DN600	DN1200	DN2200
150 °C < T < 250 °C	/	/	DN400	DN1000	DN2000
250 °C < T < 450 °C	/	/	DN300	DN600	DN1000
T < 122 °F	6"	18"	36"	60"	100"
122 °F < T < 302 °F	/	4"	24"	48"	88"
302 °F < T < 482 °F	/	/	16"	40"	80"
482 °F < T < 842 °F	/	/	12"	24"	40"

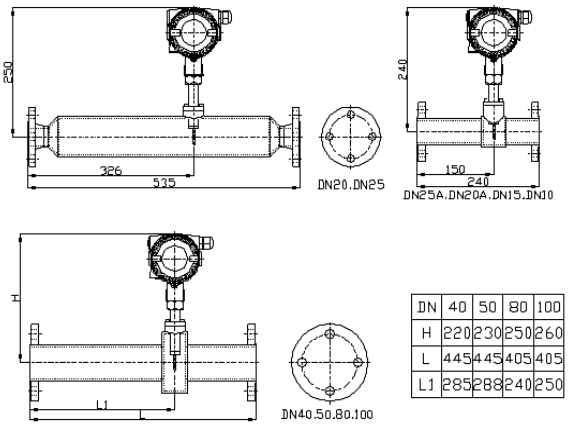
Other process connection

Flanged insertion type

For applications with pressure higher than 1.6MPa

Flanged type

For in–line connection, 1.6 ~ 6.3 MPa and different flanged standard available



DN	40	50	80	100
H	220	230	250	260
L	445	445	405	405
L1	285	288	240	250

Dimension of Flanged type thermal mass flow meter

Standard Volume flow rate range in popular sizes

Pipe size (mm)	Pipe size (inch)	Option 1 (0.3~30 Nm/s)		Standard (0.6~60 Nm/s)		Option 2 (0.9~90 Nm/s)		Option 3 (1.2~120 Nm/s)	
		Min flow Nm³/hr	Max flow Nm³/hr	Min flow Nm³/hr	Max flow Nm³/hr	Min flow Nm³/hr	Max flow Nm³/hr	Min flow Nm³/hr	Max flow Nm³/hr
25 mm	1"	0.53	53	1.05	105.9	1.58	158.8	2.11	211.8
32 mm	1 1/4"	0.87	86.7	1.73	173.5	2.6	260.3	3.47	347.1
40 mm	1 1/2"	1.36	135.6	2.71	271.1	4.06	406.7	5.42	542.3
50 mm	2"	2.12	211.9	4.23	423.7	6.35	635.5	8.47	847.4
65 mm	2 1/2"	3.58	358.1	7.1	716.1	10.7	1074.1	14.3	1432.2
80 mm	3"	5.42	542.3	10.8	1084.7	16.2	1627.1	21.6	2169.4
100 mm	4"	8.47	847.5	16.9	1694.9	25.4	2542.3	33.8	3389.8
125 mm	5"	13.2	1324.2	26.4	2648.3	39.7	3972.4	52.9	5296.6
150 mm	6"	19.1	1906.8	38.1	3813.5	57.2	5720.3	76.2	7627.1
200 mm	8"	33.9	3389.8	67.7	6779.6	101.6	10169.4	135.5	13559.3
250 mm	10"	53	5296.6	105.9	10593.2	158.8	15889.8	211.8	21186.4
300 mm	12"	76.3	7627.1	152.5	15254.2	228.8	22881.3	305	30508.4

Mode number

The standard model number is usually TGF600–1–2–I2–1–N–T–M–N–1–1–XXXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	General model	TGF600		Standard
2	Fluid type	1	Air/nitrogen	Standard
		2	Oxygen (sensor will be degreased)	Option
		3	Other (Please advsise gas composition)	Option
3	Measurement range	1	0.3~30 Nm/s	Option
		2	0.6~60 Nm/s	Standard
		3	0.9~90 Nm/s	Option
		4	1.2~120 Nm/s	Option
		5	1.5~150 Nm/s	Option
		6	1.8~180 Nm/s	Option
4	Process connection	I1	Insertion type with 290mm probe	Option
		I2	Insertion type with 440mm probe	Standard
		I3	Insertion type with 690mm probe	Option
		I4	Insertion type with 1000mm probe	Option
		I5	Insertion type with 1500mm probe	Option
		F1	Flanged insertion type up to 25 barG (362 psiG)	Option
		F2	Flanged insertion type up to 40 barG (580 psiG)	Option
		F2	Flanged insertion type up to 63 barG (913 psiG)	Option
		D1	Flanged DIN PN16 up to 16 barG (232 psiG) (DN15~DN300)	Option
		D2	Flanged DIN PN25 up to 25 barG (362 psiG) (DN15~DN300)	Option
		D3	Flanged DIN PN40 up to 40 barG (580 psiG) (DN15~DN300)	Option
		D4	Flanged DIN PN63 up to 63 barG (913 psiG) (DN15~DN300)	Option
		C1	Flanged ANSI CL150 up to 16 barG (232 psiG) (0.5 inch~12 inch)	Option
		C2	Flanged ANSI CL300 up to 40 barG (580 psiG) (0.5 inch~12 inch)	Option
		C3	Flanged ANSI CL400 up to 63 barG (913 psiG) (0.5 inch~12 inch)	Option
		J1	JIS 10K up to 16 barG (232 psiG) (DN15~DN300)	Option
		J2	JIS 20K up to 40 barG (580 psiG) (DN15~DN300)	Option
		J3	JIS 30K up to 63 barG (913 psiG) (DN15~DN300)	Option
5	Wet part material	1	316ss sensor with 304ss wet parts	Standard
		2	316ss sensor with 316ss wet parts	Option

6	Medium temp range	N	< 150°C	Standard
		Q	< 250°C	Option
		H	< 450°C (please select remote display also)	Option
7	Transmitter	T	Integral	Standard
		R	Remote	Option
8	Cable grinder	M	M20 x 1.5	Standard
		N	NPT 1/2	Option
9	Ex-proof	N	No Ex-proof	Standard
		1	NEPSI Ex d IIC T3 Gb	Option
10	Transmitter	1	pulse/frequency + 4~20mA + RS485 + Bluetooth	Standard
		2	pulse/frequency + 4~20mA@HART + Bluetooth	Option
11	Power supply	1	13.5~42VDC	Standard
		2	13.5~42VDC with 85~265VAC 50/60Hz power converter	Option
12	Pipe size	xxxx	please use 4 digit pipe size, such as DN50=0050, DN300=0300	xxxx

Working principle

TGF460 Series Thermal Mass Flowmeter is COMATE's latest technology specially designed for air and N2 applications. It has more compact design, which means smaller enclosure and thinner insertion tube probe. It can be installed / removed without stopping the fluid, as the pipe is thinner, field engineers will be able to insert the meter to pipe very easily. Also, TGF460 will be the most cost–effect model in the market.

Special features

- Direct mass flow or normal flow measurement
- 100:1 turn down ratio in 5 ranges: 0.3~30 Nm/s, 0.6~60 Nm/s, 0.9~90Nm/s , 1.2~120Nm/s, 1.5~150Nm/s,1.8~180Nm/s
- Large LCD screen with dual–line display and 3 setting button. Easy to read or set
- Low cost economical model.
- No pressure loss, suitable for pipe in any shape with known sectional area
- Available for hot tapping installation
- High accuracy data acquisition circuit to ensure outstanding repeatability and accuracy of the flow meter
- High efficiency design of power supply, the total power consumption is only 60mA@24VDC
- 15V~32V wide voltage range input to fit in all electricity environment
- Self–diagnose function makes trouble shooting easier

Specification

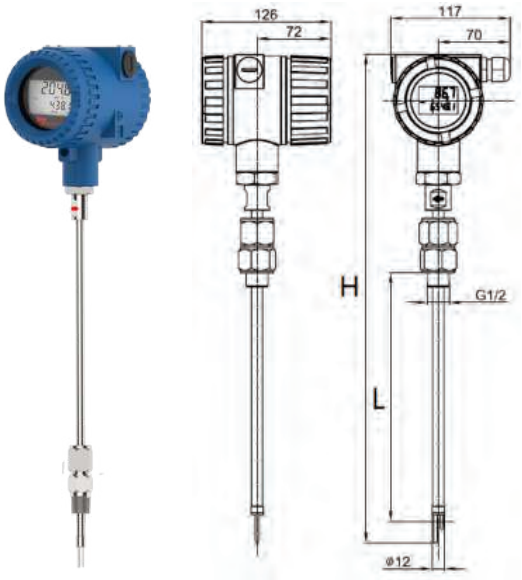
Media Compatibility	Air, Nitrogen
Pipe diameter	Insertion: DN25 ~ DN400 Inline: DN25 ~ DN300
Flow velocity range	0.3 ~ 30Nm/s 0.6 ~ 60Nm/s 0.9 ~ 90Nm/s 1.2 ~ 120Nm/s 1.5 ~ 150Nm/s 1.8 ~ 180Nm/s
Accuracy	1.5% RD ± 0.5% FS
Temperature of medium	−40 ~ +150℃
Pressure of medium	Insertion: 1.6 MPa Flanged insertion: 4 MPa Flanged in-line: 4 MPa
Power supply	AC85～264V or DC16～32V
Response time	1 second
Output	Frequency and 4~20mA as standard
Communication	RS~485+Bluetooth as standard , 4~20mA@HART as optional
Date displayed	Mass flow, Total flow Volume flow in normal condition
Ingress protection grade	IP65 (GB China)

Max pipe size that each probe can adapt to			
Probe length	255mm	320mm	395mm
T < 50 dgr C	DN100	DN250	DN350
50 ℃ < T < 150 ℃	/	/	DN50
T < 122 ℉	4"	10"	14"
122 ℉ < T < 302 ℉	/	/	2"

If with remote display, there is no difference on max pipe size in different temperature

Insertion type with ball valve

Install/remove the meter without stopping the flow



Probe	H	L
255 mm	412 mm	180 mm
320 mm	477 mm	245 mm
395 mm	552 mm	320 mm

Flanged type

Standard Volume flow rate range in popular sizes

Pipe size (mm)	Pipe size (inch)	Option 1 (0.3~30 Nm/s)		Standard (0.6~60 Nm/s)		Option 2 (0.9~90 Nm/s)	
		Min Nm³/min	Max Nm³/min	Min Nm³/min	Max Nm³/min	Min Nm³/min	Max Nm³/min
25 mm	1"	0.01	0.88	0.02	1.77	0.03	2.65
32 mm	1 1/4"	0.01	1.45	0.03	2.89	0.04	4.34
40 mm	1 1/2"	0.02	2.26	0.05	4.52	0.07	6.78
50 mm	2"	0.04	3.53	0.07	7.06	0.11	10.59
65 mm	2 1/2"	0.06	5.97	0.12	11.94	0.18	17.90
80 mm	3"	0.09	9.04	0.18	18.08	0.27	27.12
100 mm	4"	0.14	14.12	0.28	28.25	0.42	42.37
125 mm	5"	0.22	22.07	0.44	44.14	0.66	66.21
150 mm	6"	0.32	31.78	0.64	63.56	0.95	95.34
200 mm	8"	0.56	56.50	1.13	112.99	1.69	169.49
250 mm	10"	0.88	88.28	1.77	176.55	2.65	264.83
300 mm	12"	1.27	127.12	2.54	254.24	3.81	381.36

Pipe size (mm)	Pipe size (inch)	Option 3 (1.2~120 Nm/s)		Option 4 (1.5~150 Nm/s)		Option 5 (1.8~180 Nm/s)	
		Min Nm³/min	Max Nm³/min	Min Nm³/min	Max Nm³/min	Min Nm³/min	Max Nm³/min
25 mm	1"	0.04	3.53	0.04	4.41	0.05	5.30
32 mm	1 1/4"	0.06	5.79	0.07	7.23	0.09	8.68
40 mm	1 1/2"	0.09	9.04	0.11	11.30	0.14	13.56
50 mm	2"	0.14	14.12	0.18	17.66	0.21	21.19
65 mm	2 1/2"	0.24	23.87	0.30	29.84	0.36	35.81
80 mm	3"	0.36	36.16	0.45	45.20	0.54	54.24
100 mm	4"	0.56	56.50	0.71	70.62	0.85	84.75
125 mm	5"	0.88	88.28	1.10	110.35	1.32	132.42
150 mm	6"	1.27	127.12	1.59	158.90	1.91	190.68
200 mm	8"	2.26	225.99	2.82	282.49	3.39	338.98
250 mm	10"	3.53	353.11	4.41	441.38	5.30	529.66
300 mm	12"	5.08	508.47	6.36	635.59	7.63	762.71

Mode number

The standard model number is usually TGF460–2–I1–1–T–M–1–1–XXXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	General model	TGF460		Standard
2	Measurement range	1	0.3 ~ 30 Nm/s	Option
		2	0.6 ~ 60Nm/s	Standard
		3	0.9 ~ 90Nm/s	Option
		4	1.2 ~ 120Nm/s	Option
		5	1.5 ~ 150Nm/s	Option
		6	1.8 ~ 180Nm/s	Option
3	Process connection	I1	Insertion type with 255mm probe	Standard
		I2	Insertion type with 320mm probe	Option
		I3	Insertion type with 395mm probe	Option
		F1	Flanged insertion type up to 25 barG (362 psiG)	Option
		D1	Flanged DIN PN16 up to 16 barG (232 psiG) (DN15~DN300)	Option
		D2	Flanged DIN PN25 up to 25 barG (362 psiG) (DN15~DN300)	Option
		D3	Flanged DIN PN40 up to 40 barG (580 psiG) (DN15~DN300)	Option
		C1	Flanged ANSI CL150 up to 16 barG (232 psiG) (0.5 inch~12 inch)	Option
		C2	Flanged ANSI CL300 up to 40 barG (580 psiG) (0.5 inch~12 inch)	Option
		J1	JIS 10K up to 16 barG (232 psiG) (DN15~DN300)	Option
		J2	JIS 20K up to 40 barG (580 psiG) (DN15~DN300)	Option
4	Wet part material	1	316ss sensor with 304ss wet parts	Standard
		2	316ss sensor with 316ss wet parts	Option
5	Transmitter	T	Integral	Standard
		R	Remote	Option
6	Cable grinder	M	M20 x 1.5	Standard
		N	NPT 1/2	Option
7	Transmitter	1	pulse/frequency + 4~20mA + RS485 + Bluetooth	Standard
		2	pulse/frequency + 4~20mA@HART + Bluetooth	Option
8	Power supply	1	13.5 ~ 42VDC	Standard
		2	13.5 ~ 42VDC with 85~265VAC 50/60Hz power converter	Option
9	Pipe size	xxxx	please use 4 digit pipe size, such as DN50=0050, DN300=0300	xxxx

PTF520 Pitot tube flow meter

Working principle

PTF520 Pitot tube flow meter is COMATE's latest technology base on different pressure technology specially designed for compressed air applications. As it has 1/2" insertion connection probe and compact designed sensor , it can be used on pipes from DN25~DN300. In some higher pressure applications, it can be installed / removed without stop-ping the fluid, as the pipe is thinner, field engineers will be able to insert the meter to pipe very easily. Also, due to its working principle, it is less effected by the water contents in the compressed air.

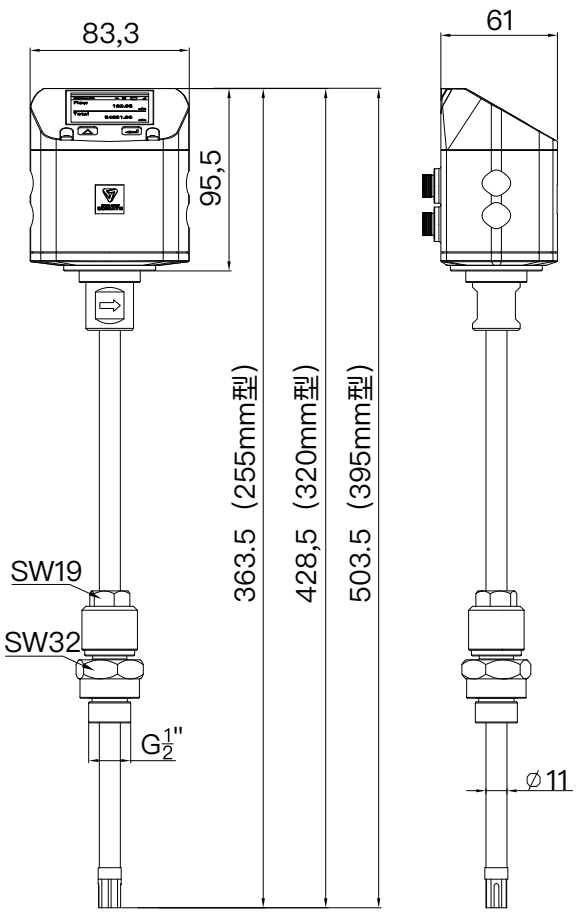
PTF520 Pitot tube flow meter also has integral temperature and pres-sure compensation, so it can measure standard flow, temperature and pressure also.

Special features

- Cellphone APP for reading and setting
- Self-diagnose and remote diagnose function to provide with best support
- Bid-directional flow measurement
- No need to set 0 point
- Measures flow rate, temperature, pressure, FAD measurement available
- Wide measurement range
- Fast response time
- No mechanical wear part
- Insertion mounting, available for hot tapping.
- For both dry and wet air measurement, possible for measuring compressed air at output of compressor

Specification

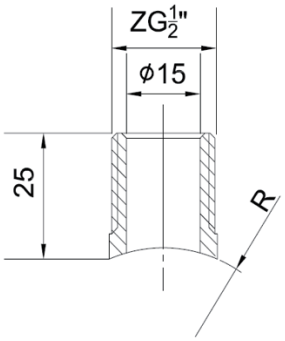
Medium	Air and none–corrosive gas
Enclosure	Nylon
Pipe size range	1"~12" (DN25~DN300)
Ambient temperature	–20~60℃
Atmosphere pressure	86~106 Kpa
Ambient humidity	5~100%
Process connection	1/2 G insertion with ball valve
Pressure rating	10 barG
Fluid temperature	–40~ 150℃
Wet part material	304ss
Parameter measured	Flow rate, temperature , pressure
Power	13.5~32V DC,150mA max
Analog	4 wire passive 4~20mA
Communication	RS485@Modbus–RTU, blue tooth
Flow Accuracy	±1.5%RD±0.3%FS
Flow Repeatability	±0.5%RD
Response time	1 second



Standard flow range for compressed air @ 50 ℃ and different pressure, unit is Normal flow Nm³/min ref to 1.01325 barA, 0 ℃

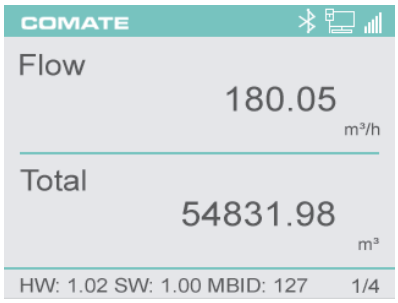
Pipe innder diameter			0 Bar G		4 Bar G		6 Bar G		7 Bar G		8 Bar G	
DN	mm	inch	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
DN25	27.3	1"	0.19	1.93	0.43	4.29	0.51	5.08	0.54	5.43	0.58	5.76
DN32	36	1 1/4"	0.34	3.36	0.75	7.47	0.88	8.83	0.94	9.44	1.00	10.01
DN40	41.9	1 1/2"	0.45	4.55	1.01	10.11	1.20	11.96	1.28	12.79	1.36	13.56
DN50	53.1	2"	0.73	7.30	1.62	16.24	1.92	19.21	2.05	20.53	2.18	21.78
DN65	68.9	2 1/2"	1.23	12.29	2.73	27.34	3.23	32.34	3.46	34.57	3.67	36.66
DN80	80.9	3"	1.69	16.95	3.77	37.70	4.46	44.59	4.77	47.66	5.05	50.55
DN100	110	4"	3.13	31.33	6.97	69.70	8.24	82.44	8.81	88.12	9.35	93.45
DN125	133.7	5"	4.63	46.29	10.30	102.97	12.18	121.78	13.02	130.18	13.81	138.06
DN150	159.3	6"	6.57	65.71	14.62	146.17	17.29	172.89	18.48	184.80	19.60	195.99
DN200	200	8"	10.36	103.58	23.04	230.40	27.25	272.52	29.13	291.30	30.89	308.94
DN250	250	10"	16.18	161.85	36.00	360.01	42.58	425.80	45.52	455.15	48.27	482.72
DN300	300	12"	23.31	233.06	51.84	518.41	61.32	613.16	65.54	655.42	69.51	695.11

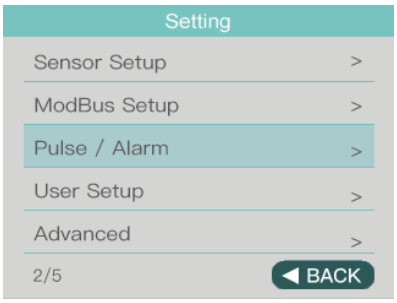
Socket tube (Material according to pipeline)

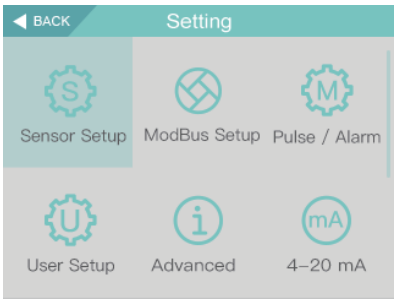


Read & Set on Screen

PTF520 has integral TFT 2" High Resolution display with two capacitive key for setting







Read & Set on in COMATE APP

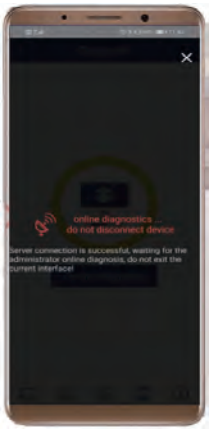
Instead of traditional keyboard, COMATE PTF500 implement a cellphone setting system.All PTF500 have Bluetooth communi–cation. Users can install COMATE APP on their cellphone or tablet and use the APP to connect with a PTF520 flow meter to read or set the flow meter.

This APP also support a remote diagnose function. Whenever there is anything wrong with the flow meter, customer can ask for a remote diagnose support. When this function is working, COMATE engineer back in office can remotely check the setting of the meter, and the signal of sensor, to provide users with most accurate trouble shooting advise.

COMATE APP has made the using of the product simple and efficient .

Device list

Setting interface



Remote diagnose interface

Mode number

The standard model number is usually PTF600–I1–T–1–1–XXXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	General model	D	Insertion (G 1/2) ,anti–ejection design with ball valve	Standard
2	Probe Length	1	255mm, 11mm dia (1“~4" or DN25~DN100)	Option
		2	320mm, 11mm dia (1“~8" or DN25~DN200)	Option
		3	395mm, 11mm dia (1“~12" or DN25~DN300)	Standard
3	Probe Material	1	304 SS	Standard
4	Socket material	1	Carbon steel	Standard
		2	304 SS	Option
		3	316 SS	Option
5	Transmitter	T	Integral	Standard
6	Pressure Rating	1	10 Bar G	Standard
		2	150 KpaA	Option
7	Display and output	1	Local display, RS485, Bluetooth	Standard
		2	Local display, 4wire 4~20mA, RS485, Bluetooth	Option
8	Power supply	1	13.5~42VDC	Standard
		N	13.5~42VDC with 24VDC to AC power concerter	N
9	Pipe size	XXX	please use 3 digit pipe size, such as DN50=050, DN200=200	XXX

Remark:

1. Hot–tap hole opener are as accessories, please remark if you need any of them
2. Please indicate flow rate along with the model number selected
3. If anything beyond this chart, please check with us to see the availability
4. The model selected in 1st line is the standard configuration with no accessories

PTF600 Pitot tube flow meter

Working principle

PTF600 Pitot tube flow meter is COMATE's heavy duty designed flow meter for wet and dry air. It has an wide turn down DP transmitter which ensures it a 33:1 wide measurement range and better stability. It has an unique water–proof design which can solve the problem that caused by condensing water in capillary.

PTF600 Pitot tube flow meter also has integral temperature and pressure compensation, so it can measure standard flow, temperature and pressure also.

Special features

- Cellphone APP for reading and setting
- Self–diagnose and remote diagnose function to provide with best support
- For both dry and wet air measurement, possible for measuring compressed air at output of compressor
- Multi–variable flow meter, measures flow rate, temperature, pressure, FAD measurement available
- Super wide turn down of 33:1, best in market
- Fast response time
- No mechanical wear part
- Insertion mounting, available for hot tapping.
- Special water proof design, no worry about condensing water blocking the capillary
- Heavy duty design, more durable in tough measurement environment

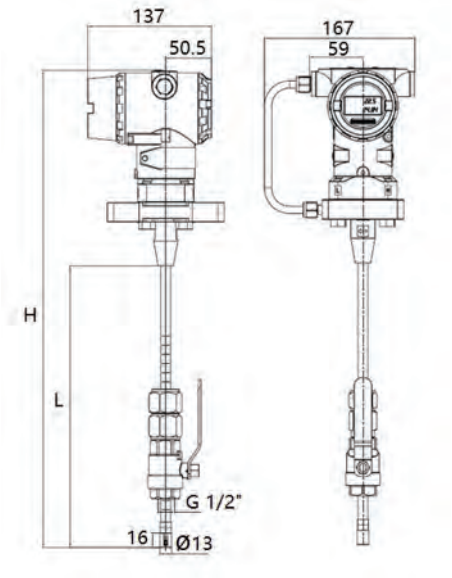
PTF600 Pitot tube flow meter

Standard flow range for compressed air @ 50 ℃ and different pressure, unit is Normal flow Nm3/min ref to 1.01325 barA, 0 ℃												
Pipe innder diameter			2 Bar G		3 Bar G		4 Bar G		5 Bar G		6 Bar G	
DN	mm	inch	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
DN25	27.3	1"	0.13	4.28	0.15	4.79	0.16	5.24	0.18	5.66	0.19	6.05
DN32	36	1 1/4"	0.23	7.45	0.26	8.33	0.28	9.12	0.31	9.85	0.33	10.53
DN40	41.9	1 1/2"	0.31	10.09	0.35	11.28	0.38	12.35	0.41	13.34	0.44	14.26
DN50	53.1	2"	0.50	16.21	0.56	18.11	0.62	19.84	0.67	21.43	0.71	22.90
DN65	68.9	2 1/2"	0.85	27.29	0.95	30.50	1.04	33.40	1.12	36.07	1.20	38.56
DN80	80.9	3"	1.17	37.62	1.31	42.05	1.43	46.05	1.54	49.73	1.65	53.16
DN100	110	4"	2.16	69.55	2.41	77.74	2.64	85.14	2.86	91.94	3.05	98.28
DN125	133.7	5"	3.19	102.75	3.57	114.84	3.91	125.78	4.22	135.83	4.51	145.19
DN150	159.3	6"	4.53	145.87	5.06	163.03	5.55	178.55	5.99	192.83	6.40	206.12
DN200	200	8"	7.14	229.93	7.98	256.98	8.74	281.45	9.44	303.95	10.09	324.90
DN250	250	10"	11.16	359.26	12.47	401.53	13.66	439.76	14.75	474.92	15.77	507.65
DN300	300	12"	16.07	517.33	17.96	578.21	19.67	633.25	21.24	683.89	22.70	731.02

Standard flow range for compressed air @ 50 ℃ and different pressure, unit is Normal flow Nm3/min ref to 1.01325 barA, 0 ℃												
Pipe innder diameter			7 Bar G		8 Bar G		9 Bar G		10 Bar G		12 Bar G	
DN	mm	inch	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
DN25	27.3	1"	0.20	6.42	0.21	6.77	0.22	7.10	0.23	7.41	0.25	8.01
DN32	36	1 1/4"	0.35	11.16	0.37	11.77	0.38	12.34	0.40	12.89	0.43	13.92
DN40	41.9	1 1/2"	0.47	15.12	0.50	15.94	0.52	16.72	0.54	17.46	0.59	18.86
DN50	53.1	2"	0.75	24.29	0.80	25.60	0.83	26.85	0.87	28.04	0.94	30.29
DN65	68.9	2 1/2"	1.27	40.89	1.34	43.10	1.40	45.20	1.47	47.21	1.58	50.99
DN80	80.9	3"	1.75	56.38	1.85	59.42	1.94	62.32	2.02	65.09	2.18	70.30
DN100	110	4"	3.24	104.23	3.41	109.86	3.58	115.22	3.74	120.34	4.04	129.97
DN125	133.7	5"	4.78	153.99	5.04	162.30	5.29	170.22	5.52	177.78	5.96	192.01
DN150	159.3	6"	6.79	218.60	7.16	230.41	7.51	241.64	7.84	252.37	8.47	272.57
DN200	200	8"	10.70	344.57	11.28	363.19	11.83	380.89	12.36	397.81	13.34	429.65
DN250	250	10"	16.72	538.40	17.62	567.48	18.48	595.14	19.31	621.57	20.85	671.32
DN300	300	12"	24.08	775.29	25.38	817.17	26.62	857.00	27.80	895.06	30.02	966.70

Specification

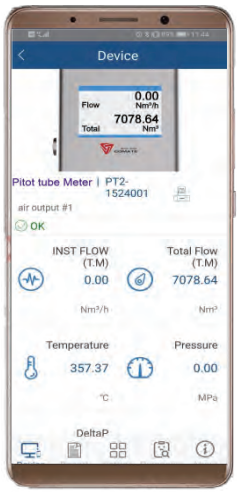
Media Compatibility	Dry and wet air
Pipe diameter	Insertion type: DN25~400mm Inline type: DN15~300mm
Different pressure range	6~6220 Pa, please reference to next subject on how to calculate flow rate range
Accuracy	1% RD+ ±0.5% FS
Temperature of medium	– 25 ~ +120°C
Pressure of medium	Insertion type :16 barG Inline type : 4 MPa
Power supply	DC 15～32V (AC85～264V power converter available)
Response time	1 second
Output / Communication	RS485, Bluetooth (4~20mA optional)
Date displayed	Mass flow, Volume flow in normal condition, Total flow, Temperature of medium. Velocity
Ingress protection grade	IP65 (GB China)



Probe	H	L	Pipe size available
255 mm	460 mm	245 mm	DN150
320 mm	525 mm	310 mm	DN250
395 mm	600 mm	385 mm	DN400

Operation on cellphone

- Reading
- Setting
- 0 point reset
- Remote diagnose



Mode number

The standard model number is usually PTF600–I1–T–1–1–XXXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	General model	PTF600		Standard
		I1	Insertion type with 255mm probe	Standard
2	Process connection	I2	Insertion type with 320mm probe	Option
		I3	Insertion type with 395mm probe	Option
		F1	Flanged insertion type up to 25 barG (362 psiG)	Option
		F2	Flanged insertion type up to 40 barG (580 psiG)	Option
		D1	Flanged DIN PN16 up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		D2	Flanged DIN PN25 up to 25 barG (362 psiG) (DN15 ~ DN300)	Option
		D3	Flanged DIN PN40 up to 40 barG (580 psiG) (DN15 ~ DN300)	Option
		C1	Flanged ANSI CL150 up to 16 barG (232 psiG) (0.5 inch ~ 12 inch)	Option
		C2	Flanged ANSI CL300 up to 40 barG (580 psiG) (0.5 inch ~ 12 inch)	Option
		J1	JIS 10K up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		J2	JIS 20K up to 40 barG (580 psiG) (DN15 ~ DN300)	Option
3	Transmitter	T	Integral	Standard
		R	Remote	Option
4	Transmitter	1	pulse/frequency + RS485 + Bluetooth	Standard
		2	pulse/frequency + 4~20mA + RS485 + Bluetooth	Option
5	Power supply	1	13.5 ~ 42VDC	Standard
		2	13.5 ~ 42VDC with 85~265VAC 50/60Hz power converter	Option
6	Pipe size	xxxx	please use 4 digit pipe size, such as DN50=0050, DN300=0300	xxxx

Working principle

TGF200 series micro flow meter measure dry air and nitrogen and other non-corrosive gas base on thermal mass flow measurement technology. It is designed to measure the mass and standard flow in small pipe lines in general industry and laboratory.

Beside mass/standard flow, TGF200 can also measure temperature and pressure. User can choose 4~20mA output or Modbus@RS485 to upload data to their system. TGF200 also support blue tooth communication, so users can read and set the meter on cellphone with COMATE APP.

Special features

- Thermal mass measuring technology, direct mass/standard flow measurement
- 6 digit dual line LED screen
- Low cost economical model
- Blue tooth for operating on cellphone
- 1.5% reading + 0.3% full scale accuracy in 100:1 measurement range
- 1/2" ~ 1" (8mm~25mm) small pipe line measurement, G or MNPT thread connection optional
- On-line diagnose available
- Require only 3D upstream and 2D downstream straight pipe run

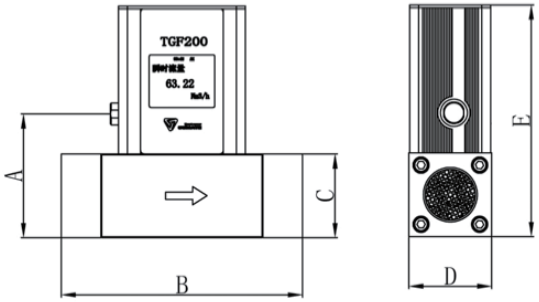
Pipe size (mm)	Pipe size (inch)	Standard (0.3~30 Nm/s)		Standard (0.6~60 Nm/s)		Option 1 (0.9~90 Nm/s)	
		Min (NL/min)	Max (NL/min)	Min (NL/min)	Max (NL/min)	Min (NL/min)	Max (NL/min)
8 mm	1/4“	0.9	90	1.8	180	2.7	270
10 mm	3/8"	1.4	140	2.8	280	4.2	420
15 mm	1/2"	3.2	320	6.4	640	9.5	950
20 mm	3/4"	5.6	560	11.3	1130	16.9	1690
25 mm	1"	8.8	880	17.7	1170	26.5	2650

Smart sensor
COMATE

TGF200 Micro flow meter

Specification

Fluid Compatibility	Air, Nitrogen and other non-corrosive fluid
Pipe diameter	8mm~25mm (1/4" ~ 1")
Flow velocity range	0.3 ~ 30 Nm/s or 0.6~60 Nm/s or 0.9 ~ 90 Nm/s
Accuracy	1.5% of reading + 0.3% of full scale
Repeatability	0.3% of reading
Storage Temperature	−20 ~ +50˚C
Fluid Temperature	−20 ~ +100˚C
Pressure rating	1.6 MPa
Power supply	10 ~ 35 VDC / 200 mA
Response time	160 millisecond
Output	Frequency (4~20 mA optional)
Communication	RS~485, Bluetooth
Date displayed	Mass flow, Normal flowTotal flow
Housing	Aluminum alloy, IP54
Wet part material	Aluminum alloy



Pipe size	A	B	C	D	E
8 mm	60	144	38	38	119.5
10 mm	60	144	38	38	119.5
15 mm	60	179	38	38	119.5
20 mm	68	230	46	46	127.5
25 mm	68	230	46	46	127.5

Operation on cellphone

- Reading
- Setting
- Remote diagnose

Mode number

The standard model number is usually TGF200–2–A–XXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	Model	TGF200	Basic Model	
2	Flow range	1	0.3 ~ 30 Nm/s	Optional
		2	0.6 ~ 60 Nm/s	Standard
		3	0.9 ~ 90 Nm/s	Optional
3	Output	A	frequency, RS485, blue tooth	Standard
		B	frequency, 4~20mA, RS485, blue tooth	Optional
4	Connection	G	G thread female	
5	Pipe size	08	DN8 (1/4")	
		10	DN10 (3/8")	
		15	DN15 (1/2")	
		20	DN20 (3/4")	
		25	DN25 (1")	

CAE520 Compressed air networking auditing system

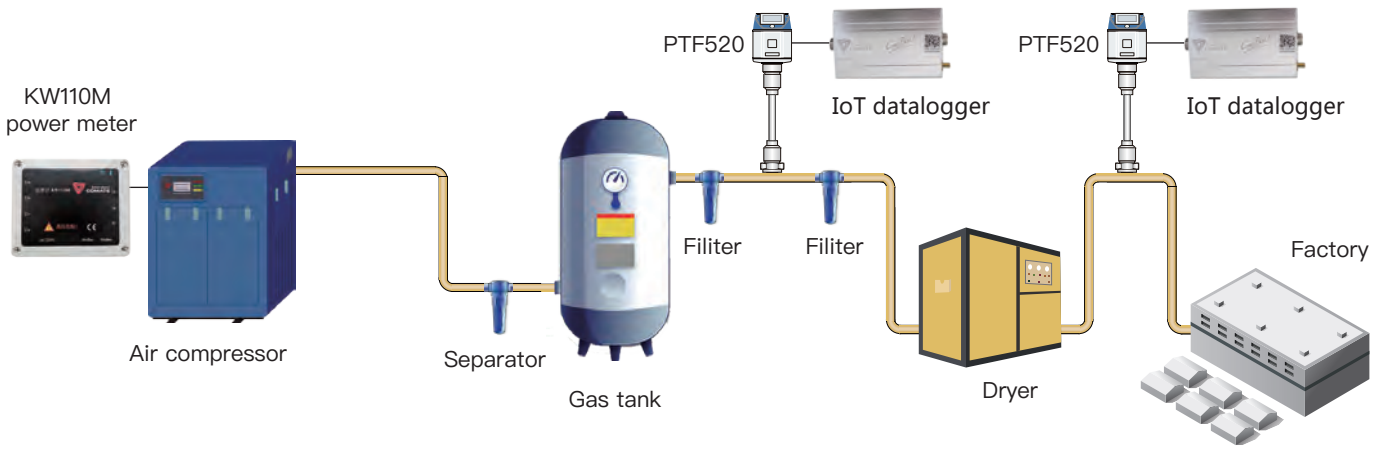
General

CAE520 Compressed air network auditing system is designed as a convenient and efficient method of compressor and compressed network energy efficiency measurement and monitor.

Basic CAE520 includes a PTF520 pitot tube flow meter which support hot tap installation and a IoT data logger which can upload measurement data to cloud server from 4G modular for remote monitoring anywhere in the world with internet access

Optional parts include KW110M IoT power meter for power consumption measurement, hot tape drilling tool for installation, and clamp on socket for installation without welding.

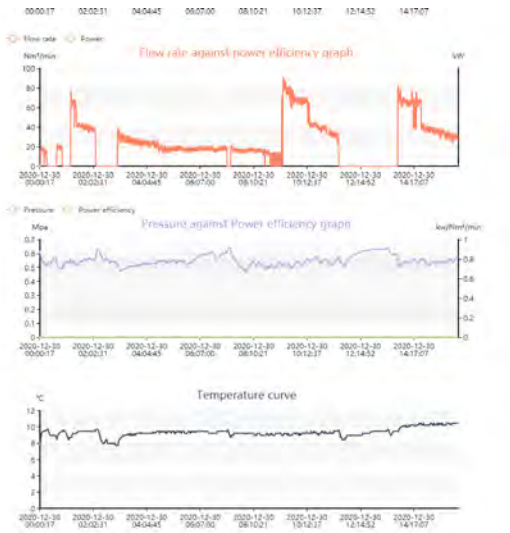
After hardwares are installed and powered, users can log in COMATE compressor monitoring system website to review real time and historical data and download reports. It saves service provider from site visit for acquiring data storage device, and can check dynamic real time data remotely to provide service in time.



Specification

System	Power supply	AC220V +/−5%, or AC/DC 85~265V, or AC380V±5%
	Ambient temperature	−40~80 dgr ℃
APP	For Android PAD	For PAD with resolution of 1920*1200 , Android 4.4 or higher version
Power meter	Wiring	3 phase 3−wire or 3 phase 4−wires
	Voltage measurement range	2nd grade voltage test AC 0~400V
	Voltage accuracy	0.20%
	Current measurement range	2nd grade 0~5A (transformer ratio 500:5)
	Current accuracy	0.20%
	Power efficiency range	up to250KW
	Power efficiency accuracy	0.50%
PTF520 flow meter	Pipe size	DN25~DN300
	Measurement range and accuracy	1.5% of reading+ 0.3% of full scale
	Other	Please reference to PTF520 data

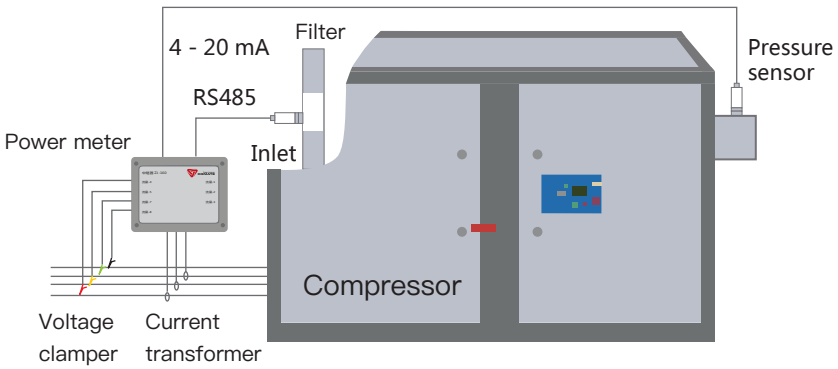
CAE520 sample report



Working principle

CAE350S compressor Analyzing System is Comate Intelligent Sensor's latest solution specially designed for analyzing the performance of compressor. The system integrated flow meter (humidity sensor built inside), pressure sensor, power meter through pad APP and Bluetooth communication technology. Users will be able to read not only the standard flow rate, FAD flow rate, pressure, power consumption and efficiency, but also load/off loading times, unit power (power consumption per unit of compressed air), and power ratio (power efficiency under a certain productivity of compressed air).

TGF350S flow meter, receiver data from power meter and transfer all data to cell phone through bluetooth



CAE350S do not have traditional display and setting system. To read or set the system, customer only need to use an PAD installed COMATE APP. All the hardware ingredients in the system will transfer date to TGF350 flow meter and the flow meter will commu-nicate with cell phone / pad. Anyone can easily read the date or set the system. The APP can also generate an detailed report with curve diagram to help customer to understand the condition of the compressor better or even compare the tested compressor with another compressor. Thanks for the compact design of the system, users are able to bring the whole system anywhere with only a simple wheel box provided by Comate. Engineers or sales person will be able to bring only one wheel box to check the performance of most of the compressor accurately and efficiently

Specification

System	Power supply	AC220V +/-5%, or AC/DC 85~265V, or AC380V±5%
	Ambient temperature	-40 ~ 80 dgr C
APP	For Android PAD	For PAD with resolution of 1920*1200 , Android 4.4 or higher version
Power meter	Wiring	3 phase 3-wire or 3 phase 4-wires
	Voltage measurement range	2nd grade voltage test AC 0 ~ 400V
	Voltage accuracy	0.20%
	Current measurement range	2nd grade 0~5A (transformer ratio 500:5)
	current accuracy	0.20%
	Power efficiency range	up to250KW
	Power efficiency accuracy	0.50%
DN100 TGF350S flow meter	Inlet pipe size	DN40~DN100 (1.5" ~ 4")
	Measurement range and accuracy	2% accuracy in 0.5~35 Nm3/min (17.7~1236 SCFM)
DN200 TGF350S flow meter	Inlet pipe size	DN100~DN200 (4"~ 8")
	Measurement range and accuracy	2% accuracy in 2~90 Nm3/min (70.6~3178.3 SCFM)
Humidity	Accuracy	+/- 4.5 RH
Temperature	Accuracy	0.5 dgrC

System Components

1. TGF350S inlet air flow meter

TGF350S inlet air flow meter is designed base on thermal diffusion theory, can measure the mass flow rate, standard flow rate and FAD flow rate in a 70:1 range with 2% accuracy.

CAE350S system contains 2 TGF350S flow meters, one in 4 (DN100) and one in 8" (DN200). With our rubber hose (pipe size adapter), this two meters can fit in pipe size from 1.5" to 8" (DN40~DN200). TGF350S gather all the data from other components in the system through RS485 and transfer them to pad through blue tooth.

TGF350 flow meter should be installed on the inlet of the compressor, after the filters. Thus it will not be effected by the water contents, which is normally contained in the compressed air in the pressurized pipeline and will greatly effects the measurement result of traditional thermal mass flow meter. Also it will be much easier to install and remove than traditional flow meter which has to be installed on pressurized pipes.

Beside flow rate reading, TGF350S also can provide customer with RH reading and temperature for reference.

2. Power measurement components

One KW110 power meter, 3 current transformers and 4 voltage clampers are the power measurement components in CAE350S system. KW110 gather current and voltage date from the other two components through RS485 and transfer all data to TGF350 flow meter also through RS485. Also, KW110 is the only component that is needed to be pluged to a power source and it will provide power for the whole system.

The power measurement components can be used in both 3 phase 3–wire and 3 phase 4–wire power system, with 1% accuracy in a 5~500A range. All components can be read and set through cell phone / pad APP.

3. Pressure sensor

CAE350S system also include a pressure sensor which can be installed on the pressure tap of the compressor. The pressure sensor will output analog signal for pressure value to flow meter, so the system can compare the efficiency of the compressor under different pressure.

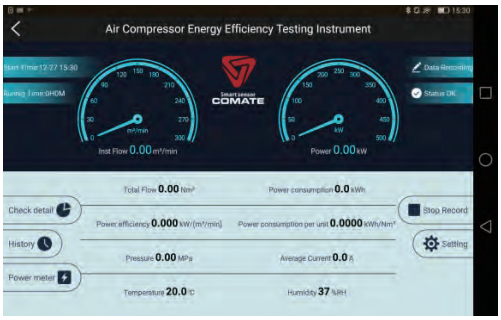
4. COMATE APP

Instead of traditional displaying and setting system, CAE350S system can be read and set on a PAD through blue tooth technology, by installing COMATE APP.

The setting dates are saved in flow meter separately, but all measurement dates are saved in TGF350S flow meter, which is the only component in CAE350S system that can built connection with the pad. Even when the pad is out of the range of the blue tooth of TGF350S, TGF350S itself can save 24 hours measure–ment date in built–in FRAM. So once a cell phone/ pad connect with the system again, it can read the data of latest 24 hours.

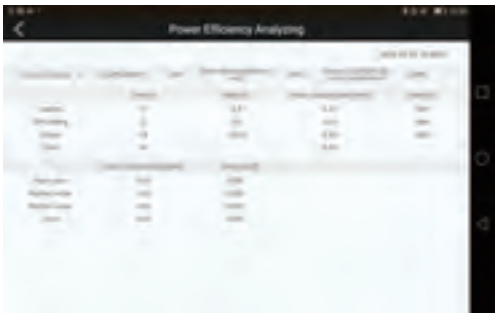
The APP can control the start and the end of a test, when the test stop, the APP will ask if need to save the data. Once the data saved on APP, customer can check it anytime later, and generate a very detailed report with curve diagram. Customer can send the report to mailbox once connected the PAD to internet.

Through the help of Comate Flow Meter APP, customer can operate the system very easily with almost 0 training after registration and understanding some basic terms of the system.



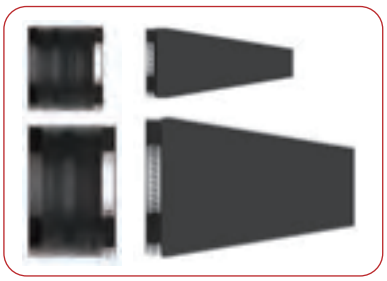
Reading interface of the APP

Setting interface of the APP



power efficiency analyzing page of the APP

5. OTHER COMPONENTS



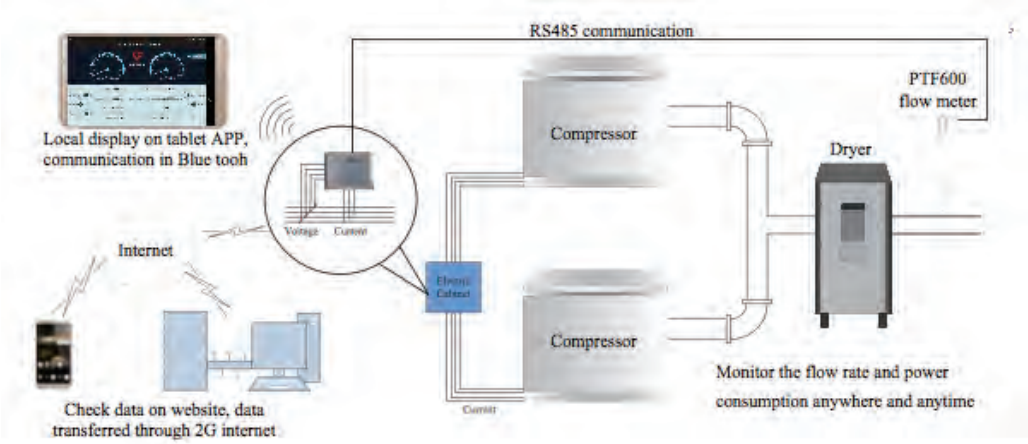
Rubber hose and pipe size adapter with screw clampers. These are for the installation of the flow meter on difference inlet pipe size

Tools set including one knife, one tape meter, one ruler, one pair of gloves and one screw–driver, for cutting rubber hose and installation of flow meter

Plastic box with wheel, holding all components inside with protection. Tough and durable

General

CAE820 compressed Air Network Auditing System is specially designed for analyzing the performance of single compressor or compressor group. The system integrated flow meter (temperature and pressure measurement inside), power meter through tablet APP and Bluetooth communication technology. Users will be able to read not only the standard flow rate, FAD flow rate, pressure, power consumption and efficiency, but also load/off loading times, unit power (power consumption per unit of compressed air), and power ratio (power efficiency under a certain productivity of compressed air).



CAE820 do not rely on traditional display and setting system. To read or set the system, customer only need to use an tablet installed COMATE APP. All the hardware ingredients in the system will transfer date to flow meter and the flow meter will communicate with cell phone / pad. Anyone can easily read the date or set the system. The APP can also generate an detailed report with curve diagram to help customer to understand the condition of the compressor better or even compare the tested compressor with another compressor. The power meter can also upload the measurement data to COMATE compressor monitoring system website. So if the audit take long time, customer do not have to stay at site, but can check the data anywhere by logging the website.

Specification

System	Power supply	AC220V +/−5%, or AC/DC 85~265V, or AC380V ± 5%
	Ambient temperature	−40~80 dgr C
APP	For Android PAD	For PAD with resolution of 1920*1200, Android 4.4 or higher version
Power meter	Wiring	3 phase 3−wire or 3 phase 4−wires
	Voltage measurement range	2nd grade voltage test AC 0~400V
	Voltage accuracy	0.20%
	Current measurement range	2nd grade 0~5A (transformer ratio 500:5)
	current accuracy	0.20%
	Power efficiency range	up to250KW
	Power efficiency accuracy	0.50%
PTF600 flow meter	Pipe size	DN25 ~ DN400
	Measurement range and accuracy	1% RD + 0.5%FS in 1:32 flow range

System Components

1. PTF600 pitot tube flow meter set

CAE820 has one PTF600 pitot pipe flow meter.PTF600 is COMATE'S latest compressed air flow meter base on different pressure principle designed for both dry and wet air. PTF600's can measure a flow range of 32:1 with 1%RD + 0.5%FS accuracy. The min and max flow are base on the pressure and pipe size.

PTF600 should be installed on pressurized compressed air pipeline. With the hot tap drilling tools contained in the package, customer can install and remove the meter without stopping the flow. PTF600 can also measure temperature and pressure, and will communicate with the power meter. All the data will be transferred to power meter and then transferred to tablet or internet

For detail measurement range of this flow meter, please ref to the datasheet of this product.

2. Power measurement components

One KW110M power meter, 3 current transformers and 4 voltage clampers are the power measurement components in CAE820 system. KW110M gather current and voltage date from the other two components through RS485 and flow rate, temperature, pressure data from PTF600 flow meter. It can communicate with tablet through blue tooth or update data to COMATE Compressor Monitoring System website for customer to review. The power measurement components can be used in both 3 phase 3–wire and 3 phase 4–wire power system, with 1% accuracy in a 5~500A range.

3. COMATE APP

Instead of traditional displaying and setting system, CAE820 system can be read and set on a tablet through blue tooth technology, by installing COMATE APP. The setting data and measurement data are firstly saved in KW110M separately (can save 1440 measurement point), only when customer finished a test that the meter will transfer all data to tablet and saved in tablet. Thus even when the pad is out of the range of the blue tooth of KW110M, KW110M itself can save 24 hours measurement date in built–in FRAM (set the time space between each measurement point to 1 minute). Once the tablet connect with the system again, it can read the data of latest 1440 measurement point.

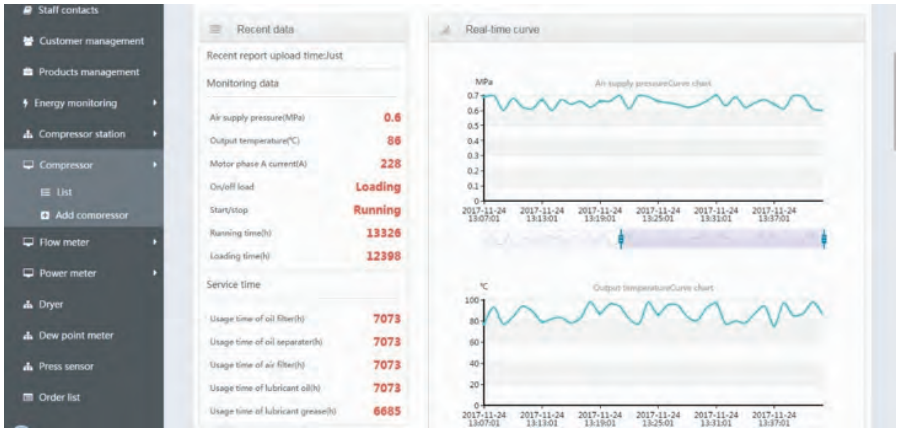
The APP can control the start and the end of a test, when the test stop, the APP will ask if need to save the data. Once the data saved on APP, customer can check it anytime later, and generate a very detailed report with curve diagram. Customer can send the report to mailbox once connected the PAD to internet.

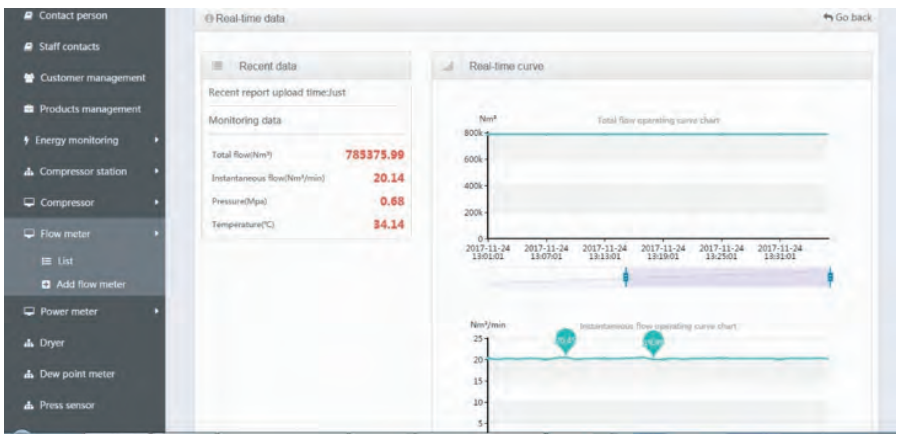
Through the help of Comate Flow Meter APP, customer can operate the system very easily with almost 0 training after registration and understanding some basic terms of the system.

4. Comate Compressor Monitoring System

Comate Compressor Monitoring System is a on–line monitoring system with a remote data server to save all data and a website to show all data.

Any COMATE flow meter or other items can upload data to the remote data server. Customer can logging the website with their unique ID and password to check current measuring data and history data. The website will also provide curve graphic of all available data for customer to compare and know the tendency The English of this system will be on–line soon enough.





One cellphone app FOR All COMATE flow meters

COMATE APP is specially designed user interface for flow meters from Comate Intelligent Sensor. With this application, users can connect their smart phones with the flow meters, to read, set and even remote diagnose it. It has most user friendly interface, and frees users from complicated setting list and troublesome keyboards, makes it easier to user the flow meters.

The unique Remote diagnose function saves the time and cost which happens during trouble shooting process. By some simple operations in the APP, users can upload the setting list and sensor signal to the cloud server of COMATE. Qualified engineers from COMATE will check them and give most proper trouble shooting suggestion. This is a revolutionary innovation for field instruments supporting, that can brings the best experience to users

COMATE APP is universal for all COMATE INTELIIGENT SENSOR flow meter lines. Customer can download the android version on Google Play or IOS version on Appstore.

Search for COMATE flow meterst

Remote diagnose

Setting list

Set everything easily

COMATE Remote Support Package

Support on your measurement issues remotely

Customer relationship is important ! Good support tighten your bond with your customers.

Endless site travel

Shipping here and backcause time and cost waste

Complicated setting check

Troublesome misunderstanding in communication