Peristaltic condensate and metering pumps CPsingle, CPdouble

Condensate accumulates when conditioning gas in gas conditioning. It always accumulates when cooling moist sample gas. On one hand this may occur inadvertently if thermal bridges occur in the sample gas lines. On the other hand the deposit of moisture is necessary to protect the measuring cells in the analyser from damage and/ or stabilise measurements.

Since the sample gas is often conveyed through the analysis system with suction, the condensate must be pumped off to remove it.

So-called peristaltic pumps are particularly suited for this purpose. They systemically protect the sample gas system from external air and based on the hose material used offer high resistance against the often times highly corrosive condensate.

The CPsingle and CPdouble pump series were developed specifically for these severe operating conditions.

- Built-in and housing version
- FM approval optional
- Separate installation possible
- Various flow rates
- Metering pumps with low flow rates
- Easy to replace hoses
- Various hose materials available for demanding applications
- 115/230 V AC or 24 V DC
- Used in **DNV-GL and LR type-tested** conditioning unit
- Can be used in a system to maintain **the IMO MARPOL MEPC.259(68)** .
- Special design for use in high vibration environments

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Pump models for the USA and Canada 4492***1*** in non-explosive areas

The peristaltic pumps must be installed inside a housing which requires a tool to open and meets the requirements of the overall installation with respect to the housing, layout, space requirement and condensate separation.

Select a housing which meets the requirements of the pump's intended use with respect to mounting, spacing and creepage paths. The housing must be suitable for operating temperatures of 0 °C to min. 52 °C.

It must be fully wired inside the housing. The cables and terminals used must be US-listed or (if applicable) CSA certified. They must be designed for the nominal voltage, the nominal current and an operating temperature range of 0 °C to 52 °C.

Water and contaminants must be prevented from entering the unit.

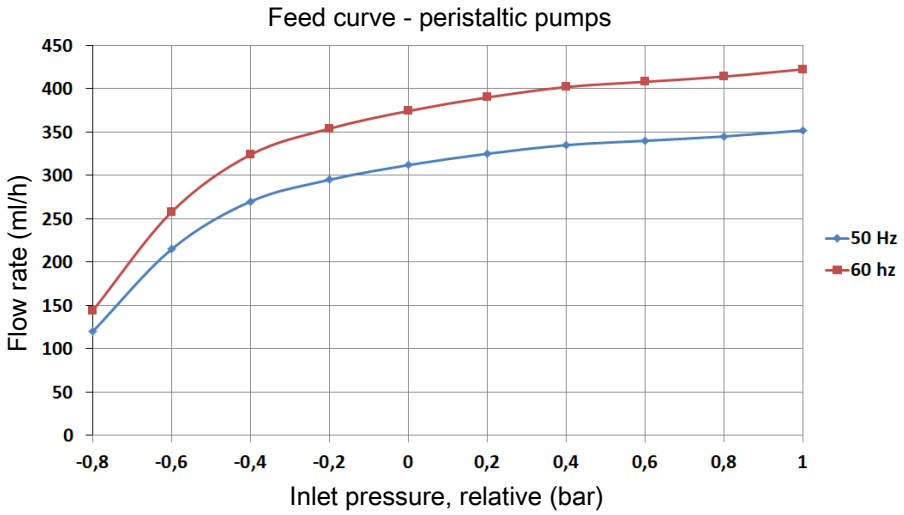
Technical data

Technical Data CPsingle/CPdouble Peristaltic Pumps

Supply voltage/power input: at T_{amb} = 20 °C and under load	230 V 50/60 Hz, 0.028 A 115 V 50/60 Hz, 0.046 A 24 V DC, 0.1 A *	
Flow rate:	0.3 L/h (50 Hz)/0.36 L/h (60 Hz) with standard hose 13 ml/h (50 Hz)/15 ml/h (60 Hz) 61 ml/h (50 Hz)/73 ml/h (60 Hz) 25 ml/min or 1.5 L/h (at 24 V DC)	
Mechanical load	Tested based on DNV-GL CG0339 vibration class A (0.7g) 2 Hz-13.2 Hz Amplitude ± 1.0 mm 13.2 Hz -100 Hz 0.7g acceleration	
Inlet vacuum:	max. 0.8 bar	
Inlet pressure:	max. 1 bar	
Outlet pressure:	1 bar	
Weight:	CPsingle-SA: 0.7 kg CPsingle-OEM: 0.47 kg CPsingle-24V: 0.44 kg	CPdouble-SA: 0.74 kg CPdouble-OEM: 0.51 kg CPdouble-24V: 0.49 kg
Protection class:	IP 44 (housing version) IP 40 (built-in version)	
Ambient temperatures:	T_{max} = 55 °C (housing version) T_{max} = 60 °C (built-in version) T_{amb} = 0 ... 50 °C (FM versions)	
Cable lengths:	2 m (housing version 115/230 V) 500 mm (Built-in version 115/230 V) 250 mm (24 V DC)	
Parts in Contact with Mediums Hose: Connections:	 Tygon (Norprene) (standard), Marprene, Fluran PVDF Straight 5 mm (recommended hose 4/6) Elbow 6 mm (recommended hose 5/8) Screw-in connection DN 4/6 or 1/6" – 1/4"	
FM no.:	3058168	

* Lifetime 24 V DC 3000 h

Flow rate



When operating the pumps with 60 Hz, the values increase by 20 %.

Calculating condensate accumulation

Dew point	30	40	50	60	70	80	°C
Moisture content Vol %	4	7	12	20	31	47	Vol %
Moisture accumulation (w) per 100 Nl/h/cooled air	2.2	4	6.5	12	22	44	$\frac{ml}{h}$ per 100 Nl

Total condensate accumulation formula:

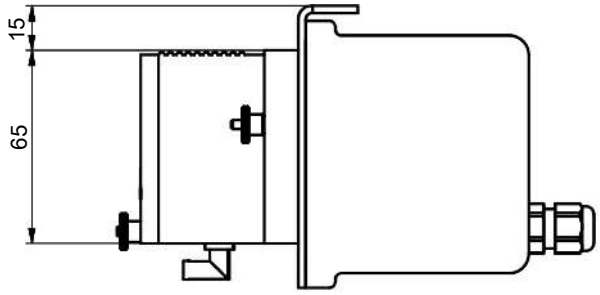
$$w_{tl} = \frac{\text{Cooled air flow}}{100\ \text{Nl/h}} \cdot w\ (\text{inlet dew point})$$

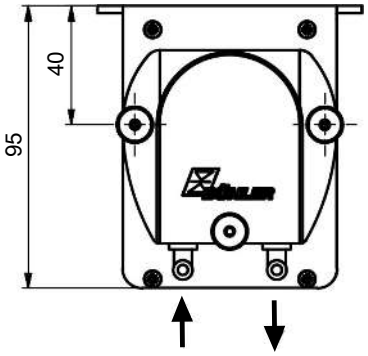
Example: 180 Nl/h behind the cooler; Inlet dew point 50 °C

$$w_{tl} = \frac{180\ \text{Nl/h}}{100\ \text{Nl/h}} \cdot 6.5\ \frac{ml}{h} = 12\ \frac{ml}{h}$$

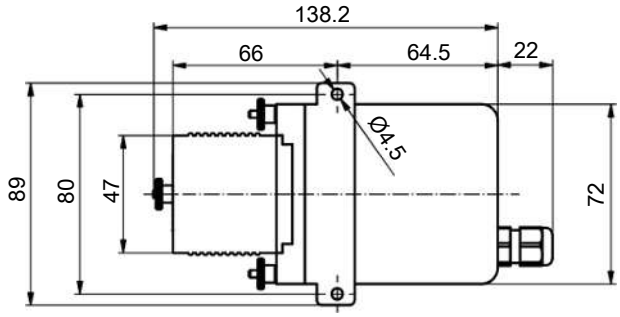
Dimensions of peristaltic pumps 115 / 230 V

Housing versions

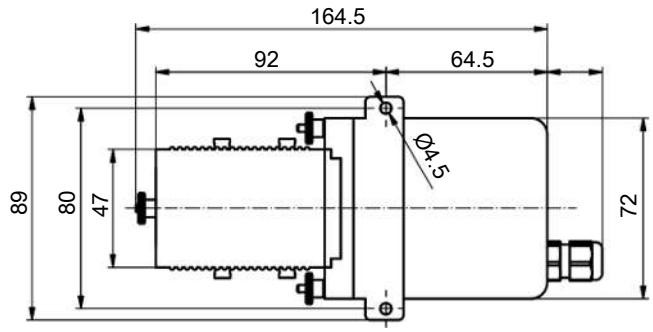




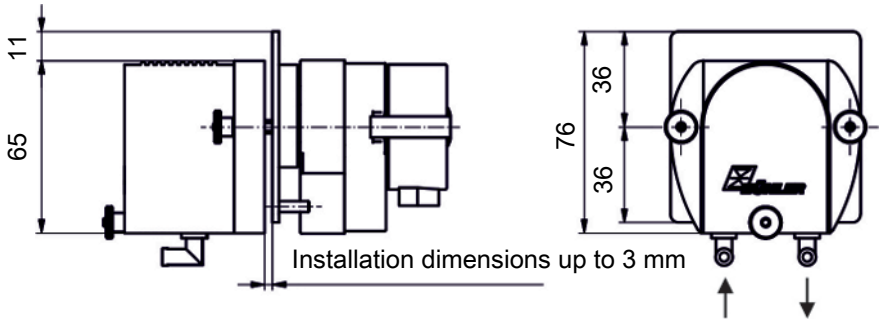
Housing version with 1 gas path



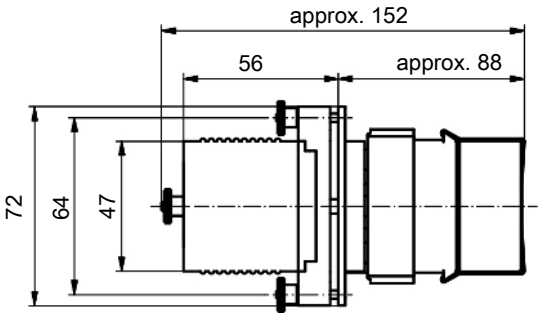
Housing version with 2 gas paths



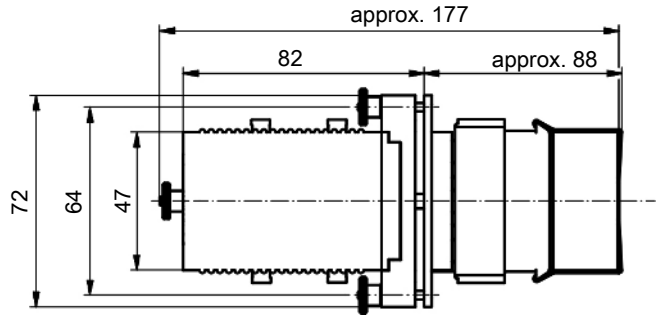
Built-in versions



Built-in version with 1 gas path



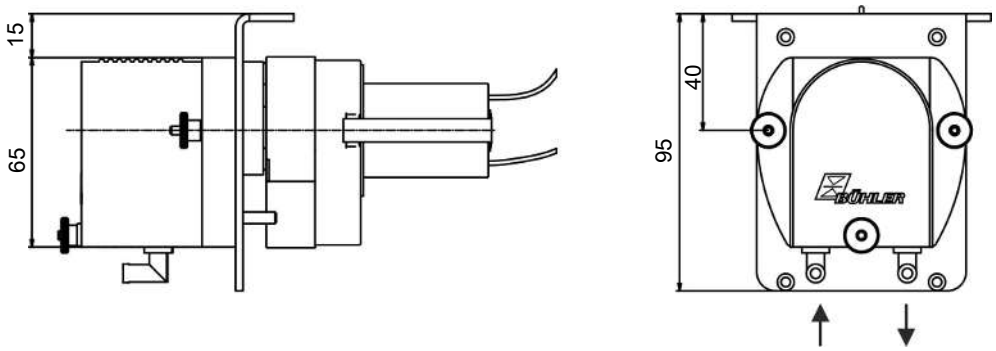
Built-in version with 2 gas paths



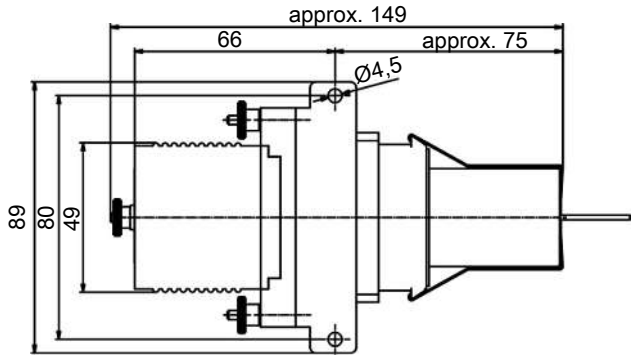
(All dimensions in mm)

Dimensions of peristaltic pumps 24 V

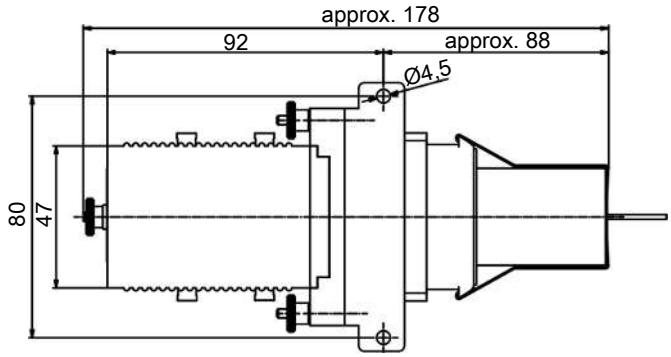
Housing versions



Housing version with 1 gas path

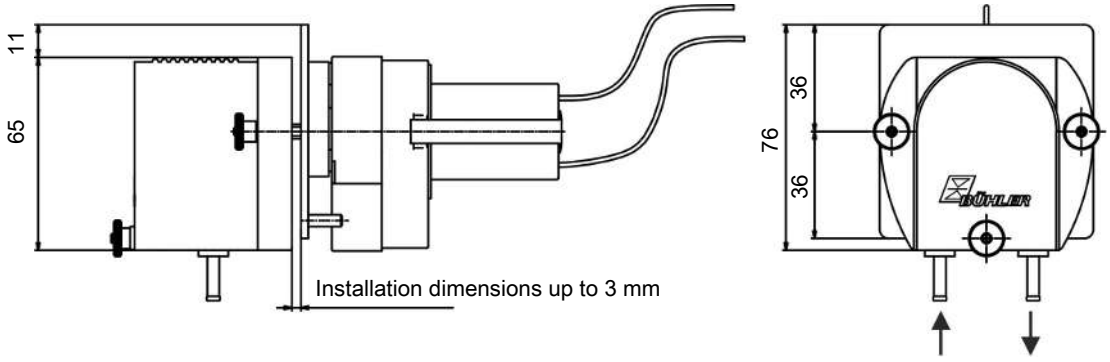


Housing version with 2 gas paths

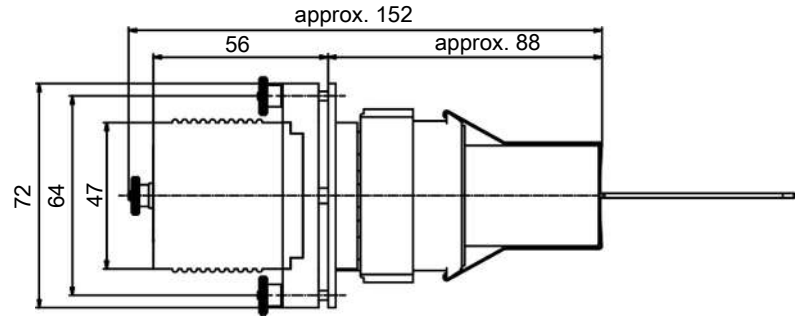


(All dimensions in mm)

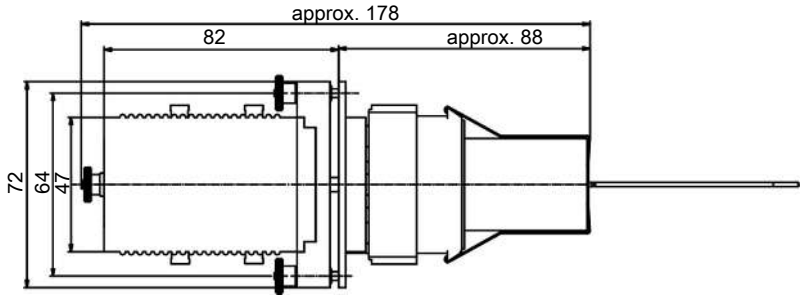
Built-in versions



Built-in version with 1 gas path



Built-in version with 2 gas paths



(All dimensions in mm)

Selection matrix for peristaltic pumps and subsequent add-on cooler

Cooler model	Built-in (OEM)/ Housing version (SA)	Flow rate L/h for 230 V/50 Hz	Single (S)/ Double (D) version
TC-MINI	SA (separate installation only)	0.3	S
TC-Standard (+)	SA	0.3	S or D
TC-Double (+)	SA	0.3	D
TC-MIDI (+)	OEM	0.3	S or D
EGK 1/2	OEM	0.3	S or 2x S
EGK 2-19 (+)	OEM	0.3	S or 2x S
EGK 1SD	SA (separate installation only)	0.3	S or D
EGK 10	SA	1.0	S
TS 10	OEM	1.0	S
RC 1.1	OEM	0.3	S or D
RC 1.2+	OEM	0.3	S or D

Peristaltic pump ordering information

The item number is a code for the configuration of your unit. Please use the following model code:

4492	X	X	X	X	X	X	X	Product Characteristic
								Gas path
	1							Single gas path
	2							Double gas path
								Version
		1						Housing version
		2						Built-in version
								Supply voltage
			2					115/230 V AC
			4					24 V DC
								Area of application
				0				Standard applications – CE
				1				for common locations with FM approval
								Hose material [1) 2)]
					1			Tygon (Norprene)
					2			Fluran
					3			Marprene
								Flow rate/hour
						0		0.3 L/h
						2		13 ml/h (only 115/230 V AC, single gas path)
						3		61 ml/h (only 115/230 V AC, single gas path)
						4		25 ml/min or 1.5 L/h (only 24 V DC, single gas path, for standard applications – CE)
								Hose connection [3)]
							1	straight hose nipple
							2	angled hose nipple
							3	straight and angled hose nipple
							4	Screw connection (metric) DN 4/6
							5	Screw connection (US) 1/6"-1/4"
							6	angled hose nipple and screw connection (metric)
							7	angled hose nipple and screw connection (US)
							8	straight hose nipple and screw connection (metric)
							9	straight hose nipple and screw connection (US)

[1)] Please note hose material information during selection.

[2)] For 1.5 L/h pumps as well as 13 ml/h and 61 ml/h metering pumps the only hose material option is Tygon (Norprene).

[3)] For 1.5 L/h pumps as well as 13 ml/h and 61 ml/h metering pumps the only hose connections choices are "Option 4 and 5".

Information on hose materials

The standard hose in Norprene has excellent mechanical properties with high chemical resistance to many substances.

Marprene offers a long life for many applications with high chemical resistance, particularly when oxidation agents are present. This is therefore the first alternative to the standard Norprene hose.

Fluran is particularly beneficial if the condensate contains oils, petrols and other solvents. The mechanical properties should rather be assessed weaker, so we only recommend this hose material for the specified chemicals.

The flow capacity of Fluran and Marprene hoses is slightly lower.

Other materials are available on request.