



## Peristaltic condensate pumps CPsingle X2, CPdouble X2

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.

Many applications require equipment suitable for explosive areas. This is where CPsingle X2 and CPdouble X2 provides solutions for Zone 2 or Cl.1/Div.2

The CPsingle X2 and CPdouble X2 pump series were developed specifically for these severe operating conditions.

Versions with ATEX 2, IECEx and Cl.1 Div.2 approval

Built-in and housing version

Pumps available with single or double head

Separate installation possible

Various flow rates

Easy to replace hoses

Various hose materials available for demanding applications

115/230 V AC

Reliable



### Pump models for the USA and Canada 4492\*\*\*2\*\*\* in 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 temperature ranges of -20 °C to min. 52 °C (US) and 0 °C to min. 52 °C (Canada).

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 operating temperature ranges of -20 °C to min. 52 °C (US) and 0 °C to min. 52 °C (Canada).

Water and contaminants must be prevented from entering the unit.

### ATEX and IECEx certified pump models 4492\*\*22\*\*

Wiring incl. earth conductor must be carried out using connection terminals and inside a housing which meets the requirements under EN/IEC 60947-7-1, 60947-7-2, or 60999-1 (if applicable) or is approved for the nominal voltage, nominal current and the operating temperature of 0 °C to at least 52 °C and is Ex e certified.

The earth conductor wiring must meet the earth conductor requirements per EN 60079-0 /IEC 60079-0.

The equipment must be installed in a lockable housing. The housing must have a minimum degree of protection of IP54 and meet the requirements under EN 60079-0 (IEC 60079-0) or be Ex e certified. The housing must require a tool to open. Install according to the installation requirements of IEC/EN 60079-14.

The housing must further meet the requirements of the overall installation with respect to the housing, layout, space requirement and condensate separation. The housing must be suitable for operating temperatures of 0 °C to min. 52 °C.

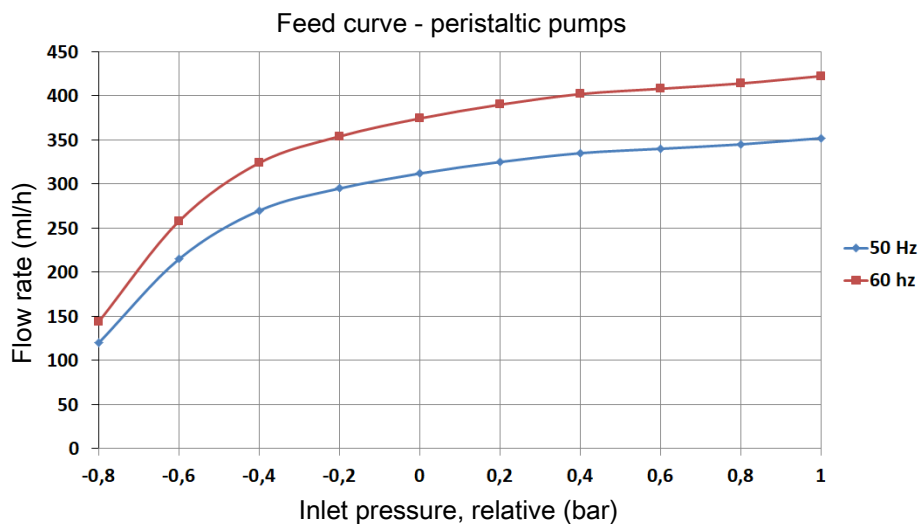
Water and contaminants must be prevented from entering the unit.

### Technical data

#### Technical data peristaltic pumps CPsingle X2/CPdouble X2

Supply voltage/power input: at T <sub>amb</sub> = 20 °C and under load	230 V 50/60 Hz, 0.028 A 115 V 50/60 Hz, 0.046 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)
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 CPdouble-SA: 0.74 kg CPdouble-OEM: 0.51 kg
Protection class:	IP 44 (housing version) IP 40 (built-in version)
Ambient temperatures:	T <sub>amb</sub> = 0 ... 50 °C
Cable lengths:	2 m (housing version 115/230 V) 500 mm (Built-in version 115/230 V)
Parts in Contact with Mediums	
Hose:	Tygon (Norpren) (Standard), Marprene, Fluran
Connections:	PVDF
Markings:	FM16ATEX0030X II 3G Ex nA IIC T4 Gc IECEX FMG 16.0018X Ex nA IIC T4 Gc USA/Canada: CL1/Div. 2 Gps: A,B,C,D T4

## 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 NI/h/cooled air	2.2	4	6.5	12	22	44	$\frac{\text{ml}}{\text{h}}$ per 100 NI

**Total condensate accumulation formula:**

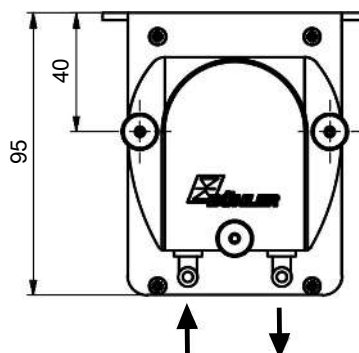
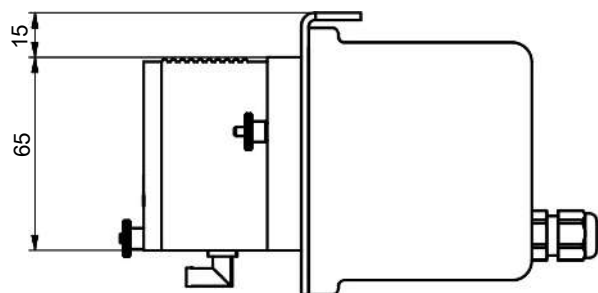
$$w_{\text{tl}} = \frac{\text{Cooled air flow}}{100 \text{ NI/h}} \cdot w \text{ (inlet dew point)}$$

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

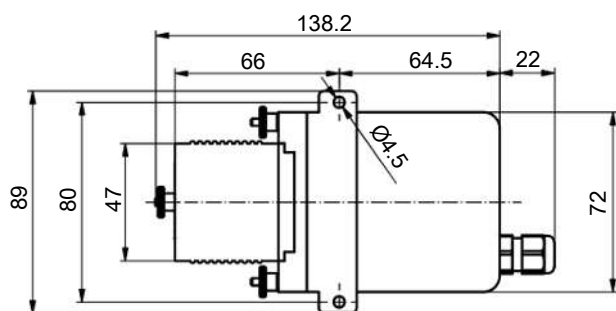
$$w_{\text{tl}} = \frac{180 \text{ NI/h}}{100 \text{ NI/h}} \cdot 6.5 \frac{\text{ml}}{\text{h}} = 12 \frac{\text{ml}}{\text{h}}$$

## Dimensions of peristaltic pumps 115 / 230 V

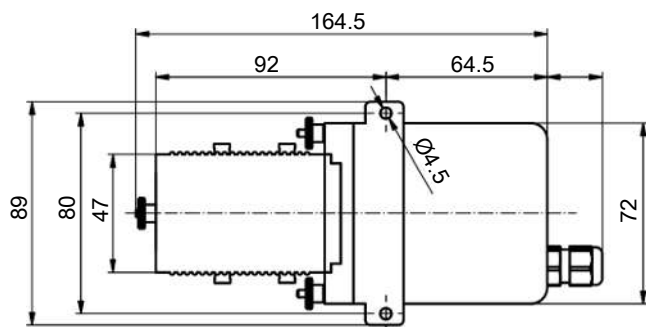
### Housing versions



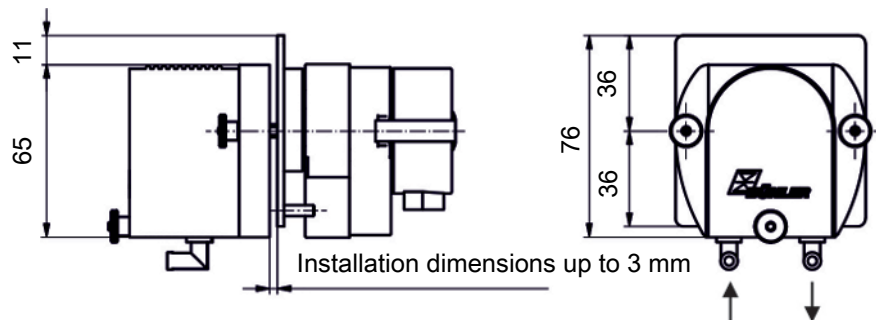
### Housing version with 1 gas path



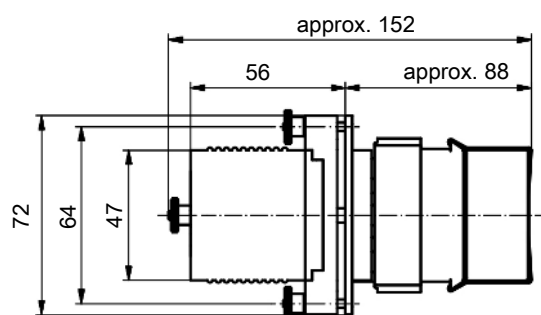
**Housing version with 2 gas paths**



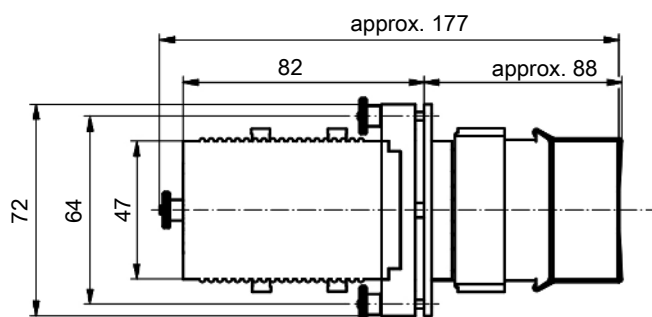
**Built-in versions**



**Built-in version with 1 gas path**



**Built-in version with 2 gas paths**



(All dimensions in mm)

**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-Standard (+) X2	SA (separate installation only)	0.3	S or D
TC-MIDI (+) X2	OEM	0.3	S or D
TC-Double (+) X2	SA	0.3	D
EGK 1 Ex2	OEM	0.3	S or 2x S

## 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	2	2	X	X	X	Product Characteristic
	1							<b>Gas path</b>
								Single gas path
	2							Double gas path
								<b>Version</b>
	1							Housing version
								Built-in version
	2							<b>Supply voltage</b>
								115/230 V AC
								<b>Area of application</b>
								for explosive areas
								<b>Hose material</b> <sup>1) 2)</sup>
								1 Tygon (Norprene)
								2 Fluran
								3 Marprene
								<b>Flow rate/hour</b>
								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)
								<b>Hose connection</b> <sup>3)</sup>
								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)

<sup>1)</sup> Please note hose material information during selection.

<sup>2)</sup> For 13 ml/h and 61 ml/h metering pumps the only hose material option is Tygon (Norprene).

<sup>3)</sup> For 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.