



## Portable sample gas conditioning PCS.smart

Carrying out accurate and reliable gas analyses in changing locations requires a small, compact gas conditioning system. We developed a complete sample gas conditioning system protected inside a case for this application.

The basic version of this system consists of a gas cooler with condensate pump and a filter. A gas pump, moisture detector, flow meter or temperature controller are optional.

The sample gas cooler cools the sample gas to the preset dew point (factory preset 41 °F) regardless of the ambient temperature. The safety circuit only activates the sample gas pump once the cooler has reached its operating point.

The selected materials are fit for conditioning corrosive gases. This also applies to the filter element.

Adjustable outlet dew point and alarm thresholds

TC-Standard OEM Cooling system with 76 Btu/h nominal capacity

Optional moisture detector, sample gas pump, flow meter, bypass

Optimal for Smartline heated line or alternative heated lines

Optionally available with built-in controller up to max. 1600 W

Successor of the TGAK3



**Description and Function**

The PCS.smart series portable gas conditioners offer a variety of options and other useful features for a variety of applications.

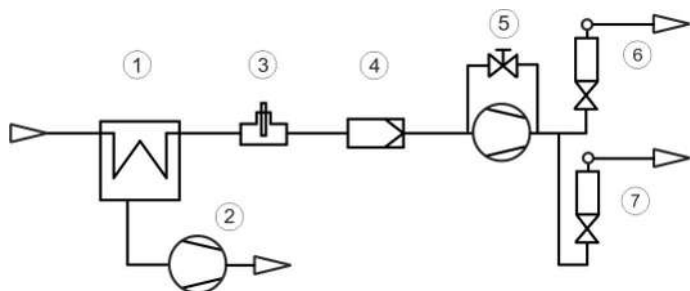
An optional built-in type P1 sample gas pump with bypass valve and flow meters is available to supply up to two gas outputs separately.

A heated line can be connected directly. An unregulated or regulated sample gas line can be connected. The PCS.smart will also control the temperature. The Smartline is specially coordinated and as a heated line with panel filter can simultaneously also be used as a portable probe. We offer a variety of gas inlet or outlet fittings which can be mixed and matched.

The "cold start" function ensures it is ready for use quickly if the storage temperature before use is 41 °F.

**Flow chart**

PCS.Smart, Item No. CSPS 1xxx



1 Cooler	5 Sample gas pump with bypass (optional)
2 Condensate pump	6 Flow meter (optional)
3 Moisture detector (optional)	7 Flow meter (optional)
4 Filter	

**Technical Data**

**Technical Data PCS.smart**

Ambient temperature:	41 °F to 122 °F <sup>1)</sup>
Gas output dew point:	adjustable, 36 °F ... 68 °F
Warning thresholds:	adjustable, -3 ... -1 K and +1 ... +7 K around dew point
Flow rate:	approx. 0.8 ... 4.7 lpm <sup>2)</sup>
Operating pressure:	3 ... 29 psi abs. <sup>2)</sup>
Dew point static throughout the range:	0.1 K ±1.5 K
Max. inlet dew point:	158 °F <sup>1)</sup>
Gas inlet temperature:	max. 356 °F <sup>1) 4)</sup>
Rated cooling capacity (at 77 °F):	76 Btu/h <sup>2) 3)</sup>
Electric supply:	230/115 V, 50/60 Hz
IEC connector, termination length:	8.2 ft
Power input:	max. 250 VA (without heated line)
Operational readiness:	after approx. 10 min.
Dimensions without line (h x w x d):	approx. 18.1 x 14.2 x 10.2 in
Weight standard version:	approx. 29.8 lb
Parts in contact with media:	PVDF, glass, stainless steel, PTFE, Norprene, Viton, epoxy resin, sintered PTFE <sup>2)</sup>
IP rating:	IP 20 D

<sup>1)</sup> Considering the available total cooling capacity (see Technical Data TC-Standard OEM). Please also refer to our calculation program or contact our sales department for guidance.

<sup>2)</sup> May vary due to optional add-on parts.

<sup>3)</sup> Subject to installation conditions.

<sup>4)</sup> Varies by device configuration.

## Technical Data - Options

### Technical Data Sample Gas Pump P1

Inlet:	7 ... 19 psi abs.
Outlet:	Back-pressure max. 15 psi rel.
Nominal output:	4.7 lpm (at p = 15 psi abs.)

### Technical Data DK 702 Flow Meter

Standard measuring tubes:	Air 68 °F, 17 psi abs.
Meas. range:	25 ... 250 NL/h
Options:	Built-in needle valve

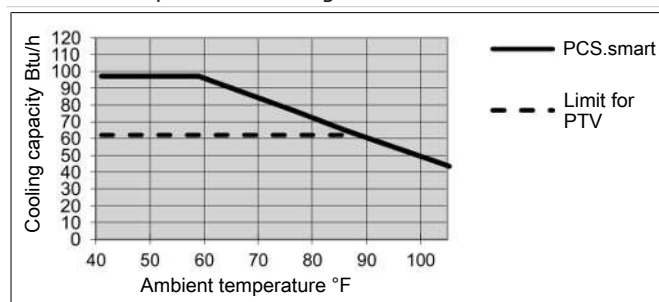
### Technical Data Controller for heated line

Temperature, preset:	212 °F
adjustable:	104 °F ... 392 °F
Motor power:	max. 1600 W (230 V) / 800 W (115 V)
Sensor type:	Pt100, 2-wire
Connection:	693 series socket, 7-pin

## Output

### PCS.smart

Rated cooling capacity (at 77 °F)	76 Btu/h
Max. Ambient temperature	122 °F
Dew point fluctuations static	± 0.1 K
in the entire specification range	± 1.5 K



Remark: The limit curve for the heat exchanger applies to a dew point of 104 °F.

## Heat exchanger description

The energy content of the sample gas and the required cooling capacity of the gas cooler is determined by three parameters: gas temperature  $\vartheta_G$ , dew point  $\tau_e$  (moisture content) and volume flow  $v$ . The outlet dew point rises with increasing energy content of the gas. The following limits for the maximum flow are specified for a standard operating point of  $T_e = 104$  °F and  $\vartheta_G = 158$  °F. The maximum flow  $v_{max}$  in NI/h of cooled air indicated, so after moisture has condensed. Values may differ for other dew points and gas inlet temperatures. However, the physical facts are so vast we decided to omit the illustration. Please contact our experts for clarification or refer to our calculation program.

## Heat exchanger overview

Heat exchanger	PTV
Version / Material	PVDF
Flow rate $v_{max}^{1)}$	4.2 lpm
Inlet dew point $\tau_{e,max}^{1)}$	149 °F
Gas inlet temperature $\vartheta_{G,max}^{1)}$	284 °F
Max. Cooling capacity $Q_{max}$	85 Btu/h

<sup>1)</sup> Max. cooling capacity of the cooler must be considered.

**Ordering instructions**

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

**PCS.smart**

CSP	S	1	X	3	1	X	X	X	1	X	X	X	0	X	X	Product characteristic
																<b>Supply voltage</b>
		1														115 V AC
		2														230 V AC
																<b>Heat exchanger</b>
				3												PVDF
																<b>Filter</b>
																Panel filter, AGF-FE-4
																<b>Moisture detector</b>
																without moisture detector
																with moisture detector
																<b>Sample gas pump and flow meter</b>
																none
																without P1, 1x flow meter with needle valve
																P1 with bypass, without flow meter
																P1 with bypass and 1x flow meter
																P1 with bypass and 2x flow meters with needle valve <sup>1)</sup>
																P1 with bypass, 1x flow meter and 1x flow meter with needle valve
																<b>Condensate pump</b>
																CPsingle with angled adapter
																<b>Gas inlet</b>
																Screw connection, metric, PVDF, DN 4/6 <sup>2)</sup>
																Screw connection, US, PVDF, 1/4" / 1/6" <sup>2)</sup>
																Screw connection, metric, stainless steel, 6 mm <sup>3)</sup>
																Screw connection, US, stainless steel, 1/4" <sup>3)</sup>
																Quick-coupler with counter piece, metric, PVDF, DN 4/6 <sup>2)</sup>
																Quick-coupler with counter piece, US, PVDF, 1/4" / 1/6" <sup>2)</sup>
																Quick-Lock <sup>2)</sup>
																<b>Gas outlet</b>
																Screw connection, metric, PVDF, DN 4/6
																Screw connection, US, PVDF, 1/4" / 1/6"
																Screw connection, metric, stainless steel OD, 6 mm
																Screw connection, US, stainless steel, 1/4"
																Quick-coupler with counter piece, metric, PVDF, DN 4/6
																Quick-coupler with counter piece, US, PVDF, 1/4" / 1/6"
																Quick-Lock
																<b>heated line</b>
																none
																heated line
																<b>Status outputs</b>
																status output only
																Analogue output option, add-on
																<b>Trolley</b>
																0 No
																1 Yes
CSP	S	1		3	1					1					0	Order key

<sup>1)</sup> Version 2 x SM with needle valve includes an additional bypass gas outlet. The connection corresponds with the selected gas outlet configuration.

<sup>2)</sup> Maximum medium temperature 284 °F.

<sup>3)</sup> Recommended for connecting a heated line.

**Spare parts and accessories**

<b>Item no.</b>	<b>Description</b>
CS PX 00012	Removable trolley case with 50 mm (2 in) casters; aluminium
44 92 00 35 012	Norprene replacement hose with angled connections for peristaltic pump 0.3 L/h (0.005 lpm)
41 15 10 50	FE-4 spare filter, 8 count
42 28 00 3	Bellow for P1 pump
90 09 39 8	O-ring for bypass P1 pump
42 28 06 6	Set inlet/outlet valves 70 °C (158 °F) for P1 pump
see data sheet 4640002	Smartline