PX4
METAL

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Unit 16, Upminster Trading Park, Warley St, Upminster, Essex, RM14 3PJ, ENGLAND

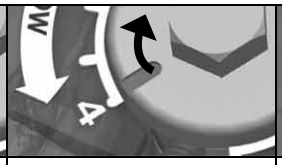
WILDEN®
A DOVER COMPANY

PRO-FLO™ X
PROGRESSIVE PUMP TECHNOLOGY

PX4 PERFORMANCE

Pro-Flo X™ Operating Principal

The Pro-Flo X™ air distribution system with the revolutionary Efficiency Management System (EMS) offers flexibility never before seen in the world of AODD pumps. The patent-pending EMS is simple and easy to use. With the turn of an integrated control dial, the operator can select the optimal balance of flow and efficiency that best meets the application needs. Pro-Flo X™ provides higher performance, lower operational costs and flexibility that exceeds previous industry standards.

				
Turning the dial changes the relationship between air inlet and exhaust porting.	Each dial setting represents an entirely different flow curve	Pro-Flo X™ pumps are shipped from the factory on setting 4, which is the highest flow rate setting possible	Moving the dial from setting 4 causes a decrease in flow and an even greater decrease in air consumption.	When the air consumption decreases more than the flow rate, efficiency is improved and operating costs are reduced.

HOW TO USE THIS EMS CURVE

Example 1

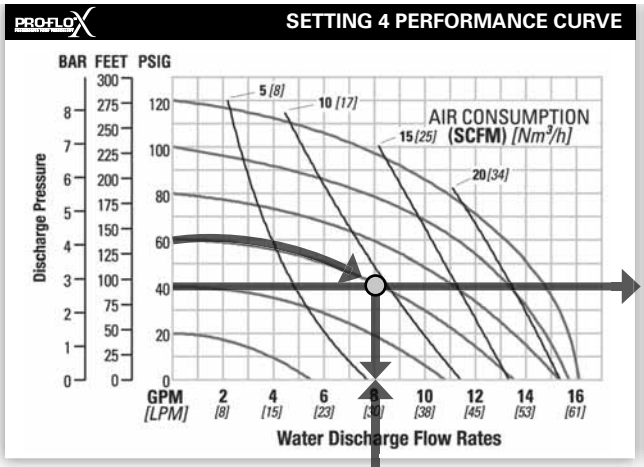


Figure 1

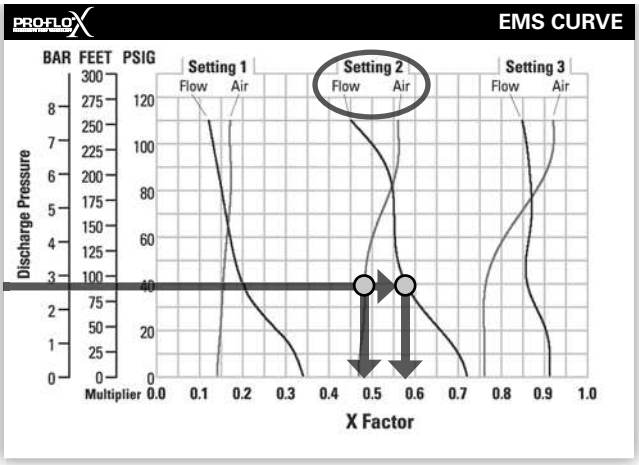


Figure 2

Example data point = 8.2 GPM

Example data point = 0.58 flow multiplier, 0.48 air multiplier

This is an example showing how to determine flow rate and air consumption for your Pro-Flo X™ pump using the Efficiency Management System (EMS) curve and the performance curve. For this example we will be using 4.1 bar (60 psig) inlet air pressure and 2.8 bar (40 psig) discharge pressure and EMS setting 2.

Step 1: ***Identifying performance at setting 4.*** Locate the curve that represents the flow rate of the pump with 4.1 bar (60 psig) air inlet pressure. Mark the point where this curve crosses the horizontal line representing 2.8 bar (40 psig) discharge pressure. (Figure 1). After locating your performance point on the flow curve, draw a vertical line downward until reaching the bottom scale on the chart. Identify the flow rate (in this case, 8.2 gpm). Observe location of performance point relative to air consumption curves and approximate air consumption value (in this case, 9.8 scfm).

Step 2: ***Determining flow and air X Factors.*** Locate your discharge pressure (40 psig) on the vertical axis of the EMS curve (Figure 2). Follow along the 2.8 bar (40 psig) horizontal line until intersecting both flow and air curves for your desired EMS setting (in this case, setting 2). Mark the points where the EMS curves intersect the horizontal discharge pressure line. After locating your EMS points on the EMS curve, draw vertical lines downward until reaching the bottom scale on the chart. This identifies the flow X Factor (in this case, 0.58) and air X Factor (in this case, 0.48).

Step 3: ***Calculating performance for specific EMS setting.*** Multiply the flow rate (8.2 gpm) obtained in Step 1 by the flow X Factor multiplier (0.58) in Step 2 to determine the flow rate at EMS setting 2. Multiply the air consumption (9.8 scfm) obtained in Step 1 by the air X Factor multiplier (0.48) in Step 2 to determine the air consumption at EMS setting 2 (Figure 3).

8.2	**gpm**	***(flow rate for Setting 4)***
.58		***(Flow X Factor setting 2)***
4.8	**gpm**	***(Flow rate for setting 2)***
9.8	**scfm**	***(air consumption for setting 4)***
.48		***(Air X Factor setting 2)***
4.7	**scfm**	***(air consumption for setting 2)***

Figure 3

The flow rate and air consumption at Setting 2 are found to be 18.2 lpm (4.8 gpm) and 7.9 Nm³/h (4.7 scfm) respectively.

Example 2.1

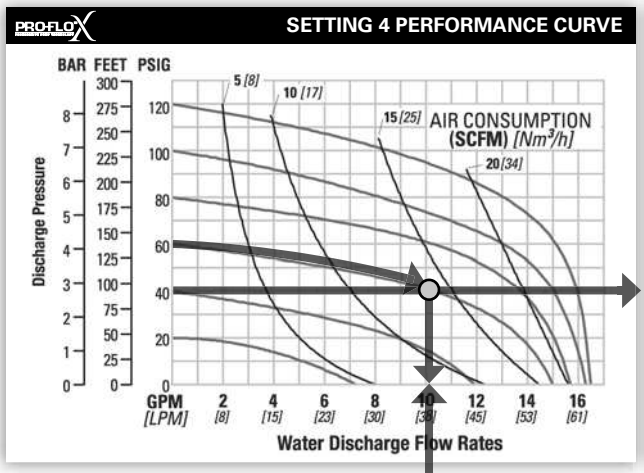


Figure 4

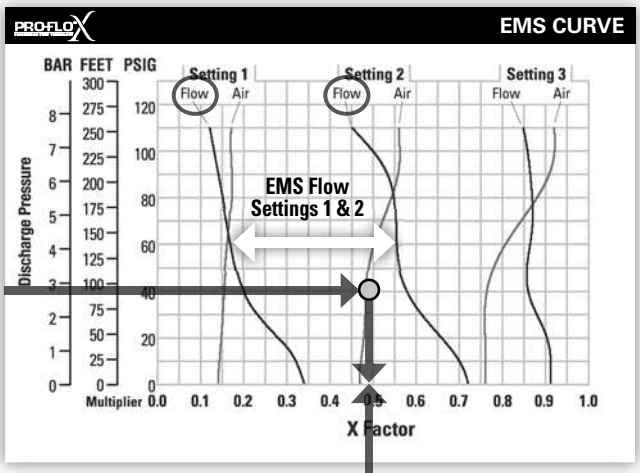


Figure 5

Example data point = 10.2 gpm

0.49 flow multiplier

This is an example showing how to determine the inlet air pressure and the EMS setting for your Pro-Flo X™ pump to optimize the pump for a specific application. For this example we will be using an application requirement of 18.9 lpm (5 gpm) flow rate against 2.8 bar (40 psig) discharge pressure. This example will illustrate how to calculate the air consumption that could be expected at this operational point.

DETERMINE EMS SETTING

Step 1*: **Establish inlet air pressure.*** Higher air pressures will typically allow the pump to run more efficiently, however, available plant air pressure can vary greatly. If an operating pressure of 6.9 bar (100 psig) is chosen when plant air frequently dips to 6.2 bar (90 psig) pump performance will vary. Choose an operating pressure that is within your compressed air systems capabilities. For this example we will choose 4.1 bar (60 psig).

Step 2*: **Determine performance point at setting 4.*** For this example an inlet air pressure of 4.1 bar (60 psig) inlet air pressure has been chosen. Locate the curve that represents the performance of the pump with 4.1 bar (60 psig) inlet air pressure. Mark the point where this curve crosses the horizontal line representing 2.8 bar (40 psig) discharge pressure. After locating this point on the flow curve, draw a vertical line downward until reaching the bottom scale on the chart and identify the flow rate. In our example it is 38.6 lpm (10.2 gpm). This is the setting 4 flow rate. Observe the location of the performance point relative to air consumption curves and approximate air consumption value. In our example setting 4 air consumption is 24 Nm^3/h (14 scfm). See figure 4.

Step 3*: **Determine flow X Factor.*** Divide the required flow rate 18.9 lpm (5 gpm) by the setting 4 flow rate 38.6 lpm (10.2 gpm) to determine the flow X Factor for the application.

5 gpm / 10.2 gpm = 0.49 (flow X Factor)

Step 4*: **Determine EMS setting from the flow X Factor.*** Plot the point representing the flow X Factor (0.49) and the application discharge pressure 2.8 bar (40 psig) on the EMS curve. This is done by following the horizontal 2.8 bar (40 psig) psig discharge pressure line until it crosses the vertical 0.49 X Factor line. Typically, this point lies between two flow EMS setting curves (in this case, the point lies between the flow curves for EMS setting 1 and 2). Observe the location of the point relative to the two curves it lies between and approximate the EMS setting (figure 5). For more precise results you can mathematically interpolate between the two curves to determine the optimal EMS setting.

For this example the EMS setting is 1.8.

Example 2.2

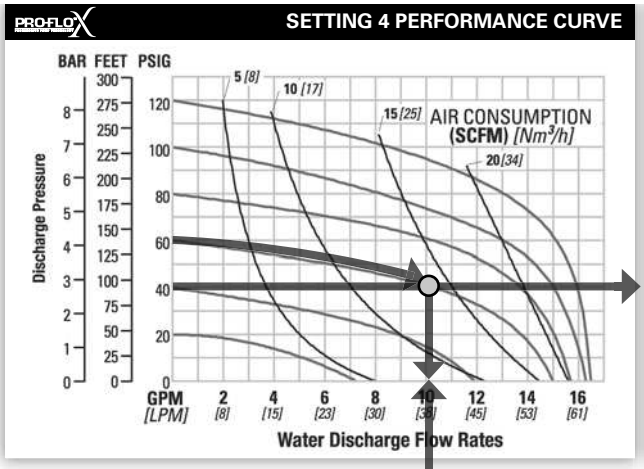


Figure 6

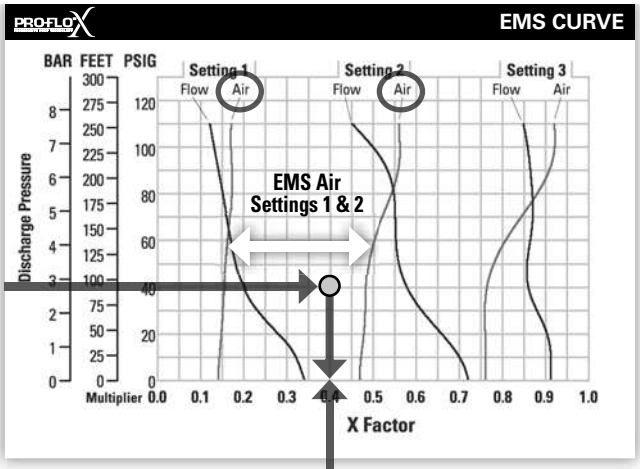


Figure 7

Example data point = 10.2 gpm

Example data point = 0.40 air multiplier

Determine air consumption at a specific EMS setting.

Step 1*: **Determine air X Factor.*** In order to determine the air X Factor, identify the two air EMS setting curves closest to the EMS setting established in example 2.1 (in this case, the point lies between the air curves for EMS setting 1 and 2). The point representing your EMS setting (1.8) must be approximated and plotted on the EMS curve along the horizontal line representing your discharge pressure (in this case, 40 psig). This air point is different than the flow point plotted in example 2.1. After estimating (or interpolating) this point on the curve, draw a vertical line downward until reaching the bottom scale on the chart and identify the air X Factor (figure 7).

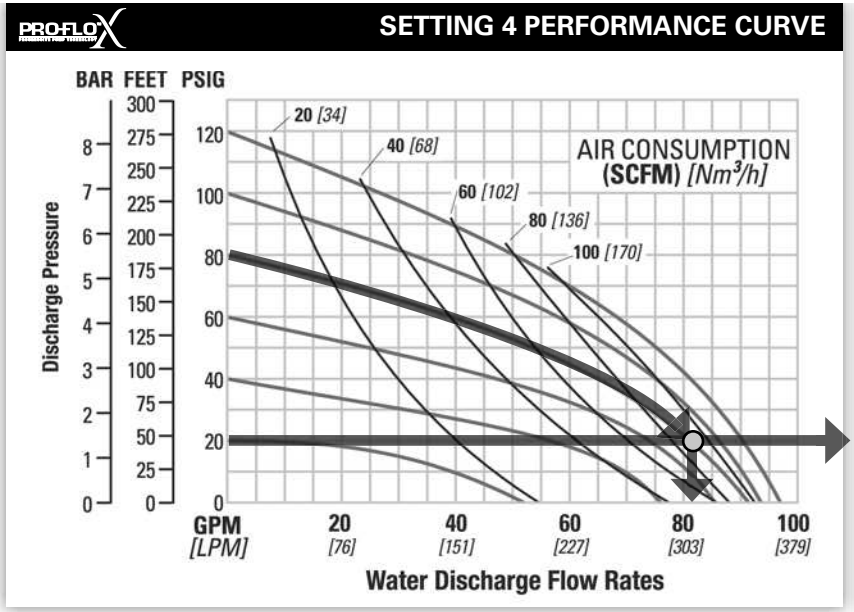
For this example the air X Factor is **0.40**

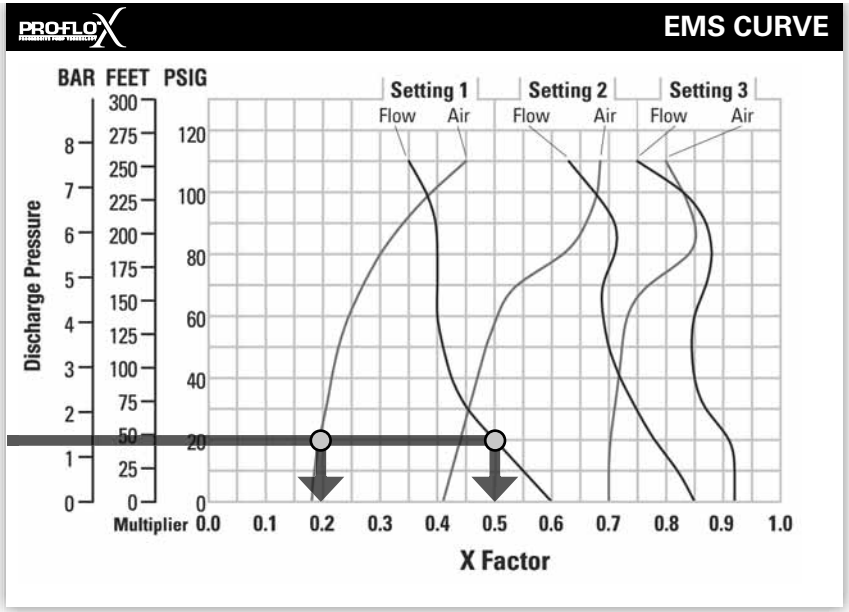
Step 2*: **Determine air consumption.*** Multiply your setting 4 air consumption (14 scfm) value by the air X Factor obtained above (0.40) to determine your actual air consumption.

14 scfm x **0.40** = 5.6 SCFM

In summary, for an application requiring 18.9 lpm (5 gpm) against 2.8 bar (40 psig) discharge pressure, the pump inlet air pressure should be set to 4.1 bar (60 psig) and the EMS dial should be set to 1.8. The pump would then consume 9.5 Nm^3/h (5.6 scfm) of compressed air.

PX4 SANIFLO HS RUBBER-FITTED





TECHNICAL DATA

Height	759 mm (29.9")
Width	447 mm (17.6")
Depth	363 mm (14.3")
Ship Weight	51 kg (112 lbs.)
Air Inlet	19 mm (3/4")
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	4.5 m Dry (14.8')
	9.0 m Wet (29.5')
Disp. Per Stroke	1.1 l (0.28 gal.)[1]
Max. Flow Rate	367 lpm (97 gpm)
Max. Size Solids	
Mushroom Valve	6.4 mm (1/4")
Ball Valve	12.7 mm (1/2")
Surface Finish	Ra 0.8 µm (32 µ-in)

[1]Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig)head pressure.

The Efficiency Management System (EMS) can be used to optimize the performance of your Wilden pump for specific applications. The pump is delivered with the EMS adjusted to setting 4, which allows maximum flow.

The EMS curve allows the pump user to determine flow and air consumption at each EMS setting. For any EMS setting and discharge pressure, the "X factor" is used as a multiplier with the original values from the setting 4 performance curve to calculate the actual flow and air consumption values for that specific EMS setting. Note: you can interpolate between the setting curves for operation at intermediate EMS settings.

Flow rates indicated on chart were determined by pumping water with a vertically mounted, center ported ball check configuration. When alternate check valve options are used, multiply flow rate by appropriate factor: Mushroom valve = 93%. For optimum life and performance, pumps should be specified so that daily operation parameters fall in the center of the pump performance curve.

EXAMPLE

A PX4 Saniflo HS, Rubber-fitted pump operating at EMS setting 4, achieved a flow rate of 310 lpm (82 gpm) using 150 Nm^3/h (88 scfm) of air when run at 5.5 bar (80 psig) air inlet pressure and 1.4 bar (20 psig) discharge pressure (See dot on performance curve).

The end user did not require that much flow and wanted to reduce air consumption at his facility. He determined that EMS setting 1 would meet his needs. At 1.4 bar (20 psig) discharge pressure and EMS setting 1, the flow "X factor" is 0.50 and the air "X factor" is 0.19 (see dots on EMS curve).

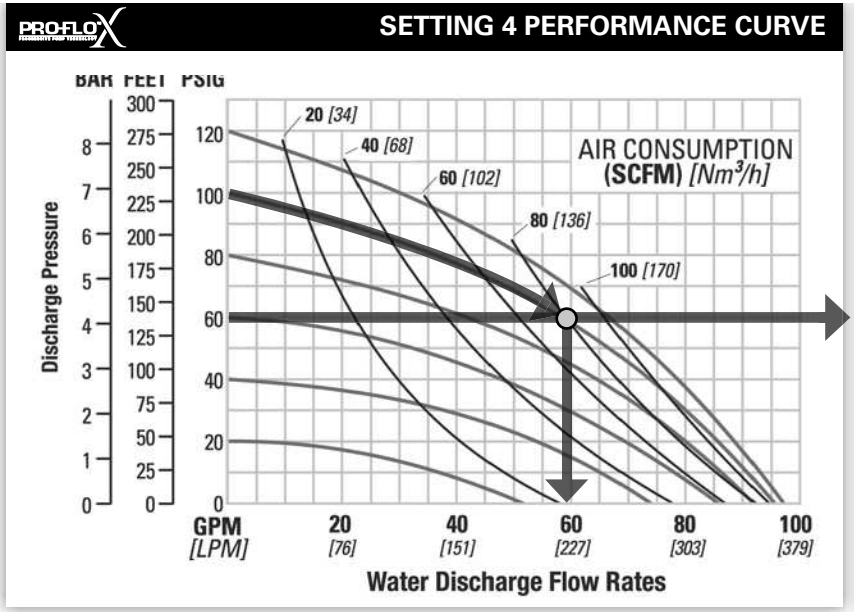
Multiplying the original setting 4 values by the "X factors" provides the setting 1 flow rate of 155 lpm (41 gpm) and an air consumption of 28 Nm^3/h (17 scfm). The flow rate was reduced by 50% while the air consumption was reduced by 81%, thus providing increased efficiency.

For a detailed example for how to set your EMS, see beginning of performance curve section.

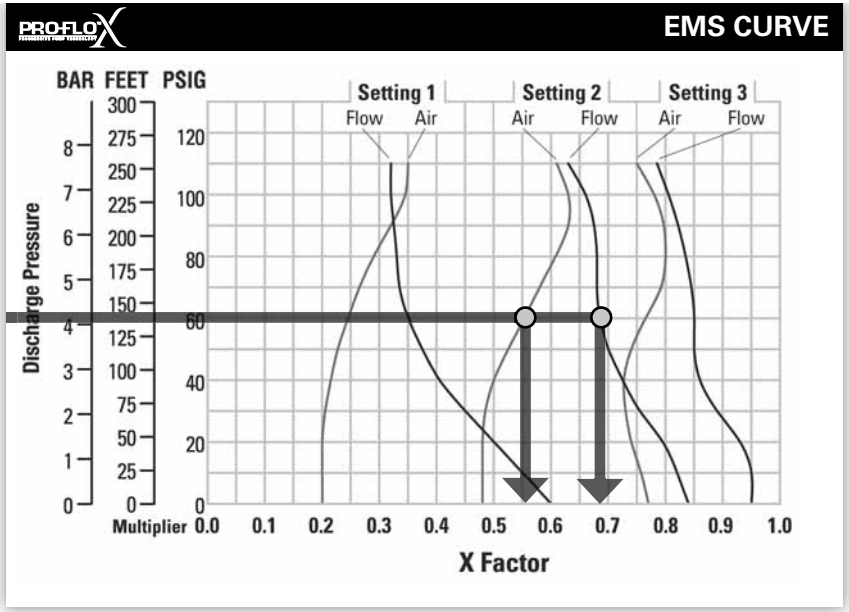
Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.

PX4 SANIFLO HS TPE-FITTED

SETTING 4 PERFORMANCE CURVE



EMS CURVE



TECHNICAL DATA

Height	759 mm (29.9")
Width	447 mm (17.6")
Depth	363 mm (14.3")
Ship Weight	51 kg (112 lbs.)
Air Inlet	19 mm (3/4")
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	3.1 m Dry (10.2')
	9.0 m Wet (29.5')
Disp. Per Stroke	1.3 l (0.35 gal.)[1]
Max. Flow Rate	220 lpm (58 gpm)
Max. Size Solids	
Mushroom Valve	6.4 mm (1/4")
Ball Valve	12.7 mm (1/2")
Surface Finish	Ra 0.8 µm (32 µ-in)

[1]Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig)head pressure.

The Efficiency Management System (EMS) can be used to optimize the performance of your Wilden pump for specific applications. The pump is delivered with the EMS adjusted to setting 4, which allows maximum flow.

The EMS curve allows the pump user to determine flow and air consumption at each EMS setting. For any EMS setting and discharge pressure, the "X factor" is used as a multiplier with the original values from the setting 4 performance curve to calculate the actual flow and air consumption values for that specific EMS setting. Note: you can interpolate between the setting curves for operation at intermediate EMS settings.

EXAMPLE

A PX4 Saniflo HS, TPE-fitted pump operating at EMS setting 4, achieved a flow rate of 220 lpm (58 gpm) using 133 Nm³/h (78 scfm) of air when run at 6.9 bar (100 psig) air inlet pressure and 4.1 bar (60 psig) discharge pressure (See dot on performance curve).

The end user did not require that much flow and wanted to reduce air consumption at his facility. He determined that EMS setting 2 would meet his needs. At 4.1 bar (60 psig) discharge pressure and EMS setting 2, the flow "X factor" is 0.68 and the air "X factor" is 0.56 (see dots on EMS curve).

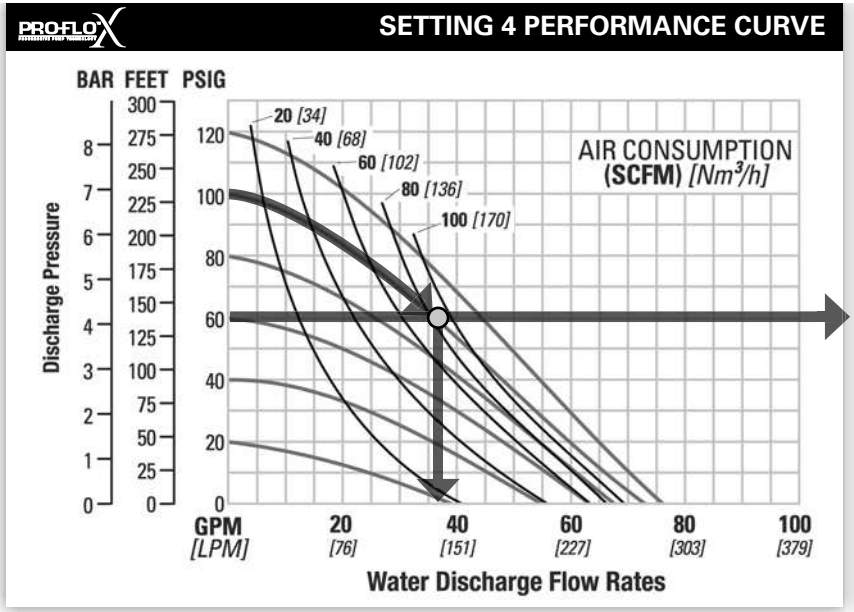
Multiplying the original setting 4 values by the "X factors" provides the setting 2 flow rate of 149 lpm (39 gpm) and an air consumption of 74 Nm³/h (44 scfm). The flow rate was reduced by 32% while the air consumption was reduced by 44%, thus providing increased efficiency..

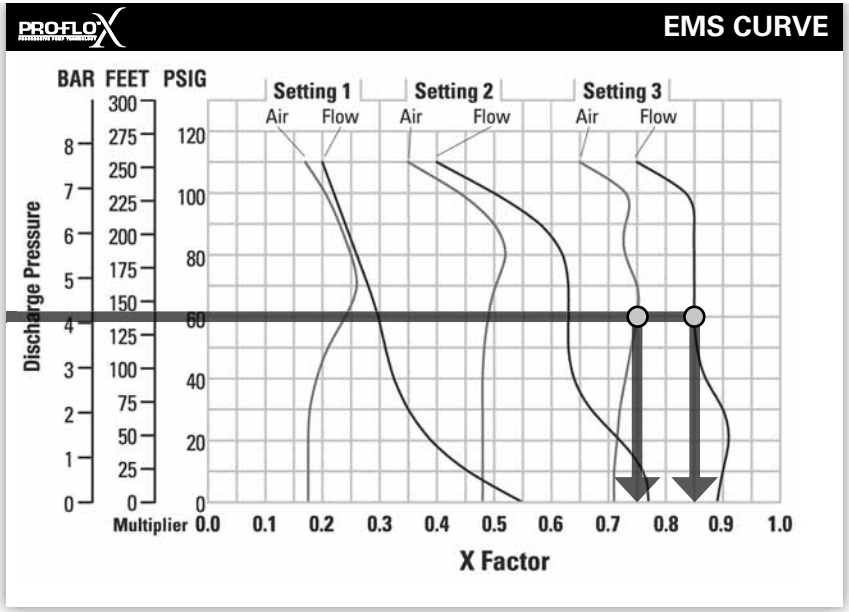
For a detailed example for how to set your EMS, see beginning of performance curve section.

Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.

Flow rates indicated on chart were determined by pumping water with a vertically mounted, center ported ball check configuration. When alternate check valve options are used, multiply flow rate by appropriate factor: Mushroom valve = 93%. For optimum life and performance, pumps should be specified so that daily operation parameters fall in the center of the pump performance curve.

PX4 SANIFLO HS PTFE-FITTED





TECHNICAL DATA

Height	759 mm (29.9")
Width	447 mm (17.6")
Depth	363 mm (14.3")
Ship Weight	51 kg (112 lbs.)
Air Inlet	19 mm (3/4")
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	3.5 m Dry (11.4')
	9.0 m Wet (29.5')
Disp. Per Stroke	0.5 l (0.13 gal.)[1]
Max. Flow Rate	288 lpm (76 gpm)
Max. Size Solids	
Mushroom Valve	6.4 mm (1/4")
Ball Valve	12.7 mm (1/2")
Surface Finish	Ra 0.8 µm (32 µ-in)

[1]Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig)head pressure.

The Efficiency Management System (EMS) can be used to optimize the performance of your Wilden pump for specific applications. The pump is delivered with the EMS adjusted to setting 4, which allows maximum flow.

The EMS curve allows the pump user to determine flow and air consumption at each EMS setting. For any EMS setting and discharge pressure, the "X factor" is used as a multiplier with the original values from the setting 4 performance curve to calculate the actual flow and air consumption values for that specific EMS setting. Note: you can interpolate between the setting curves for operation at intermediate EMS settings.

EXAMPLE

A PX4 Saniflo HS, PTFE-fitted pump operating at EMS setting 4, achieved a flow rate of 136 lpm (36 gpm) using 141 Nm³/h (83 scfm) of air when run at 6.9 bar (100 psig) air inlet pressure and 4.1 bar (60 psig) discharge pressure (See dot on performance curve).

The end user did not require that much flow and wanted to reduce air consumption at his facility. He determined that EMS setting 3 would meet his needs. At 4.1 bar (60 psig) discharge pressure and EMS setting 3, the flow "X factor" is 0.85 and the air "X factor" is 0.75 (see dots on EMS curve).

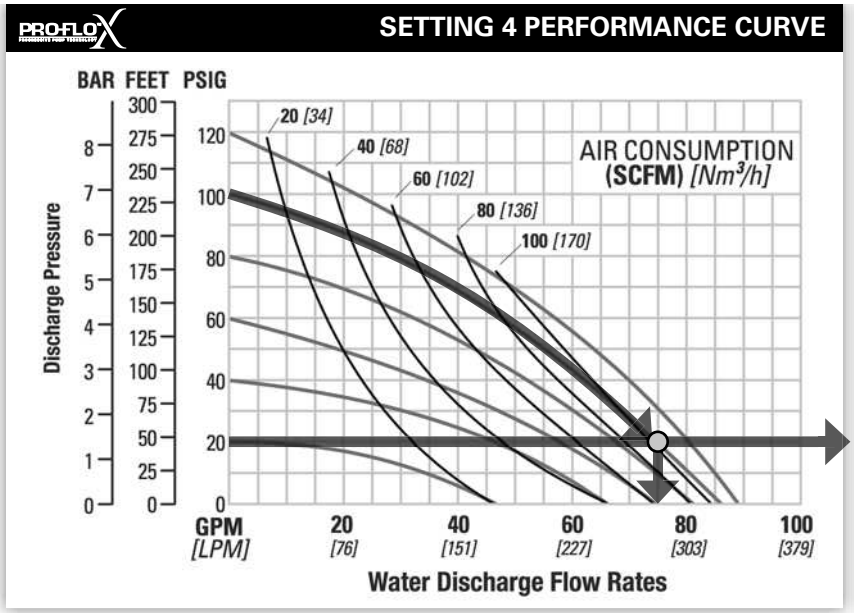
Multiplying the original setting 4 values by the "X factors" provides the setting 3 flow rate of 116 lpm (31 gpm) and an air consumption of 106 Nm³/h (62 scfm). The flow rate was reduced by 15% while the air consumption was reduced by 25%, thus providing increased efficiency.

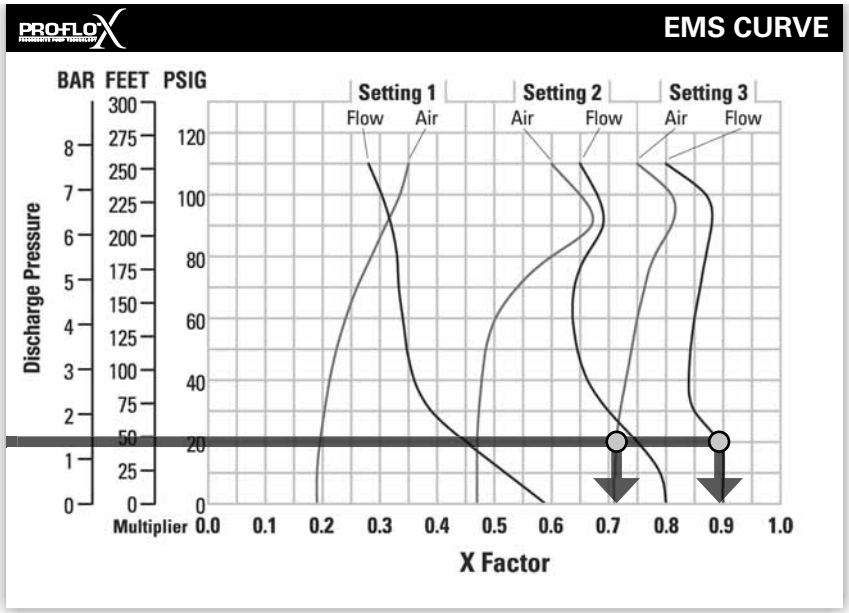
For a detailed example for how to set your EMS, see beginning of performance curve section.

Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.

Flow rates indicated on chart were determined by pumping water with a vertically mounted, center ported ball check configuration. When alternate check valve options are used, multiply flow rate by appropriate factor: Mushroom check valve = 103%For optimum life and performance, pumps should be specified so that daily operation parameters fall in the center of the pump performance curve.

PX4 SANIFLO HS ULTRA-FLEX-FITTED





TECHNICAL DATA

Height	759 mm (29.9")
Width	447 mm (17.6")
Depth	363 mm (14.3")
Ship Weight	51 kg (112 lbs.)
Air Inlet	19 mm (3/4")
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	4.8 m Dry (15.9')
	9.0 m Wet (29.5')
Disp. Per Stroke	0.8 l (0.21 gal.)[1]
Max. Flow Rate	337 lpm (89 gpm)
Max. Size Solids	
Mushroom Valve	6.4 mm (1/4")
Ball Valve	12.7 mm (1/2")
Surface Finish	Ra 0.8 µm (32 µ-in)

[1]Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig)head pressure.

The Efficiency Management System (EMS) can be used to optimize the performance of your Wilden pump for specific applications. The pump is delivered with the EMS adjusted to setting 4, which allows maximum flow.

The EMS curve allows the pump user to determine flow and air consumption at each EMS setting. For any EMS setting and discharge pressure, the "X factor" is used as a multiplier with the original values from the setting 4 performance curve to calculate the actual flow and air consumption values for that specific EMS setting. Note: you can interpolate between the setting curves for operation at intermediate EMS settings.

EXAMPLE

A PX4 Saniflo HS, Ultra-Flex-fitted pump operating at EMS setting 4, achieved a flow rate of 284 lpm (75 gpm) using 178 Nm³/h (105 scfm) of air when run at 6.9 bar (100 psig) air inlet pressure and 1.4 bar (20 psig) discharge pressure (See dot on performance curve).

The end user did not require that much flow and wanted to reduce air consumption at his facility. He determined that EMS setting 3 would meet his needs. At 2.1 bar (30 psig) discharge pressure and EMS setting 3, the flow "X factor" is 0.88 and the air "X factor" is 0.72 (see dots on EMS curve).

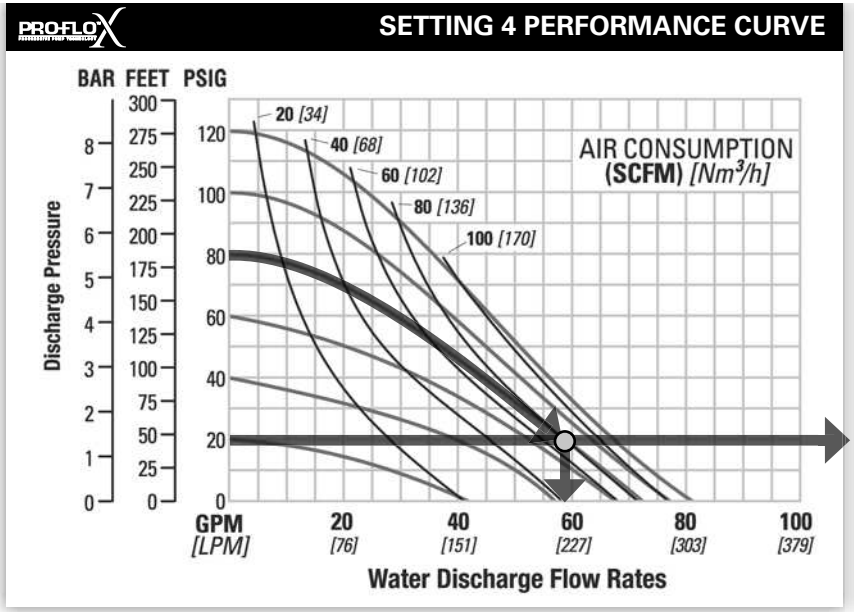
Multiplying the original setting 4 values by the "X factors" provides the setting 3 flow rate of 250 lpm (66 gpm) and an air consumption of 128 Nm³/h (76 scfm). The flow rate was reduced by 12% while the air consumption was reduced by 28%, thus providing increased efficiency.

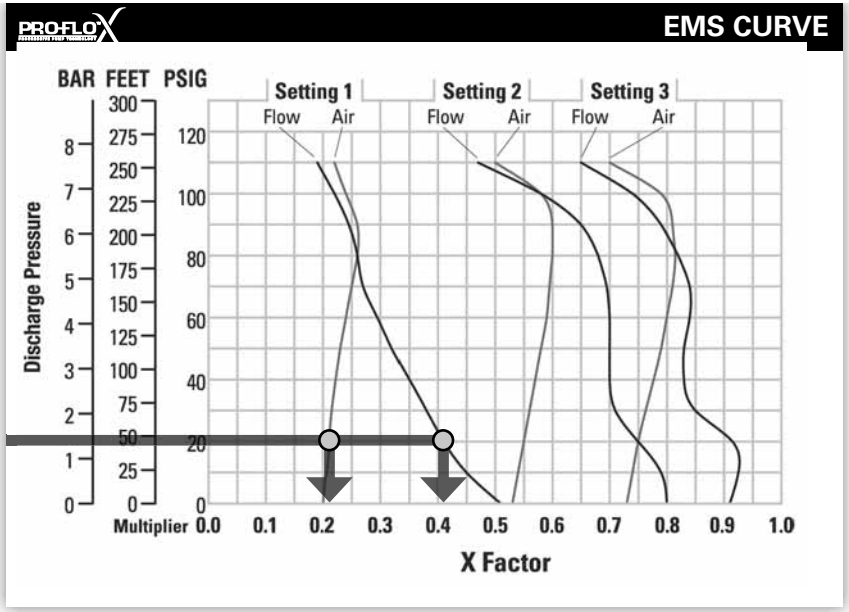
For a detailed example for how to set your EMS, see beginning of performance curve section.

Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.

Flow rates indicated on chart were determined by pumping water with a vertically mounted, center ported ball check configuration. When alternate check valve options are used, multiply flow rate by appropriate factor: Mushroom check valve = 103%. For optimum life and performance, pumps should be specified so that daily operation parameters fall in the center of the pump performance curve.

PX4 SANIFLO HS SIPD-FITTED





TECHNICAL DATA

Height . . . . . .759 mm (29.9")
Width. . . . . .447 mm (17.6")
Depth. . . . . .363 mm (14.3")
Ship Weight . . . . . .51 kg (112 lbs.)
Air Inlet. . . . . 19 mm (3/4")
Inlet . . . . . .38 mm (1-1/2")
Outlet. . . . . .38 mm (1-1/2")
Suction Lift . . . . . .2.6 m Dry (8.5')
. . . . . 9.0 m Wet (29.5')
Disp. Per Stroke. . . . . 0.5 l (0.12 gal.)[1]
Max. Flow Rate . . . . . .307 lpm (81 gpm)
Max. Size Solids . . . . . .
Mushroom Valve . . . . . 6.4 mm (1/4")
Ball Valve. . . . . 12.7 mm (1/2")
Surface Finish . . . . . Ra 0.8 µm (32 µ-in)

[1]Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig)head pressure.

The Efficiency Management System (EMS) can be used to optimize the performance of your Wilden pump for specific applications. The pump is delivered with the EMS adjusted to setting 4, which allows maximum flow.

The EMS curve allows the pump user to determine flow and air consumption at each EMS setting. For any EMS setting and discharge pressure, the "X factor" is used as a multiplier with the original values from the setting 4 performance curve to calculate the actual flow and air consumption values for that specific EMS setting. Note: you can interpolate between the setting curves for operation at intermediate EMS settings.

EXAMPLE

A PX4 Saniflo HS, SIPD-fitted pump operating at EMS setting 4, achieved a flow rate of 220 lpm (58 gpm) using 136 Nm³/h (80 scfm) of air when run at 5.5 bar (80 psig) air inlet pressure and 1.4 bar (20 psig) discharge pressure (See dot on performance curve).

The end user did not require that much flow and wanted to reduce air consumption at his facility. He determined that EMS setting 1 would meet his needs. At 1.4 bar (20 psig) discharge pressure and EMS setting 1, the flow "X factor" is 0.42 and the air "X factor" is 0.21 (see dots on EMS curve).

Multiplying the original setting 4 values by the "X factors" provides the setting 1 flow rate of 92 lpm (24 gpm) and an air consumption of 29 Nm³/h (17 scfm). The flow rate was reduced by 58% while the air consumption was reduced by 79%, thus providing increased efficiency.

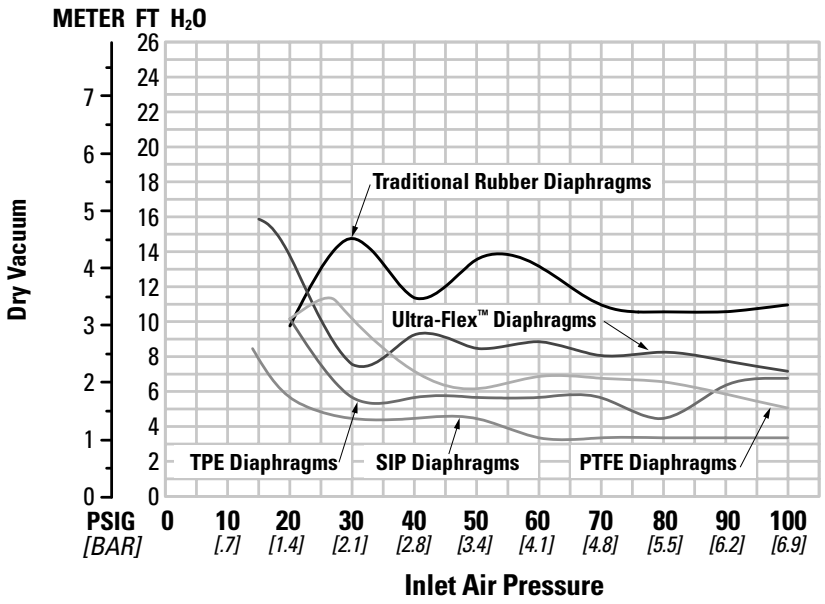
For a detailed example for how to set your EMS, see beginning of performance curve section.

Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.

Flow rates indicated on chart were determined by pumping water with a vertically mounted, center ported ball check configuration. When alternate check valve options are used, multiply flow rate by appropriate factor: Mushroom check valve = 88%. For optimum life and performance, pumps should be specified so that daily operation parameters fall in the center of the pump performance curve.

SUCTION LIFT CURVES

PX4 SANIFLO™ SUCTION LIFT CAPABILITY



Suction lift curves are calibrated for pumps operating at 305 m (1,000') above sea level. This chart is meant to be a guide only. There are many variables which can affect your pump's operating characteristics. The number of intake and discharge elbows, viscosity of pumping fluid, elevation (atmospheric pressure) and pipe friction loss all affect the amount of suction lift your pump will attain.