PLYMOVENT®
clean air at work

PUSH-PULL SYSTEM PACKAGES

PLYMOVENT PUSH-PULL SYSTEM (MDB)

A push-pull system is a method of general filtration meant to prevent accumulation of welding or cutting fumes in the workshop air and to reduce fine dust on the workshop floor.

application data sheet

PRINCIPLE

By exploiting its specific behaviour push-pull systems are a very effective way to remove welding fume from the air. Welding fume consists of evaporated and condensed metal oxides and other particulates formed by the reaction with air. It originates for 90% from melting the welding consumable during the welding process. The particulate has an elevated temperature, starts rising and cools down. In this process it will meet air with the same temperature, typically between 4-6 meter height, and forms a blanket of concentrated welding fume. After a while the particulate will cool down and drop back on the floor or on machines.
The push-pull system consists of ductwork with grids, one or two fans and one or two filter systems. The ductwork is installed at a height facing the blanket of concentrated welding fume. It consists of a push and a pull side facing each other, in this way the welding zone is enclosed by the ducting. Filtered air is blown out by means of the fan pushing the concentrated welding fume towards the pull side where it is extracted. The air with welding fume is filtered and used again thus creating an airflow. The welding fume is constantly and efficiently removed so the background concentration in the facility stays below the desired level.
Pressure loss over the filter will fluctuate in time and might influence the efficiency of the system.
The Plymovent push-pull system is fitted with sensors and controls to maintain the airflow constant at all times.
A push-pull system can be installed as a U shaped or as a parallel system functional to the dimensions of the welding area.

SPECIFICATIONS

Physical dimensions and properties	
Dimensions: • min. length • max. length • min. width • max. width	 • 10 m (32.8 ft) • 50 m (164 ft) • 5 m (16.4 ft) • 23 m (75 ft)
Air volume per grid	refer to Table 1 (throw)
Scope of supply	
Refer to Table 2	

Order information	
Article number	*refer to the separate product data sheets*
Shipping data	
Harmonized Tariff Code	various

APPROVALS/CERTIFICATES

CE | cULus ref. UL-508A

CALCULATING SYSTEM CAPACITY

The system capacity in m³/h is calculated by multiplying the air volume captured by the ductwork with the number of air changes made to remain below the desired level of fine dust within the facility. Generally for light applications 3 and for very moderate to heavy applications 6 to 8 air changes might be needed. Important parameter is the type and relevant amount of welding consumable used in a representative working period. From this data (with knowledge of the welding process) the amount of welding fume produced per working period can be calculated leading to the number of air changes needed to arrive on the desired background concentration. On top of this we recommend 50% of general ventilation by means of natural ventilation or additional roof fans. Please consult our Plymovent expert for more information.

Table 1: Throw

Throw		Air volume per grid	
m	ft	m³/h	CFM
5	16.4	250	147
10	32.8	550	323
12	39.4	650	382
15	49.2	800	470
16	52.5	900	529
19	62.3	1000	588
20	65.6	1200	706
23	75.5	1300	765

Table 2: Components push-pull system packages

TYPE OF SYSTEM			U				PARALLEL			
										
NOMINAL CAPACITY m³/h CFM			4000 m³/h 2,350 CFM	8000 m³/h 4,700 CFM	12.000 m³/h 7,060 CFM	16.000 m³/h 9,400 CFM	8000 m³/h 4,700 CFM	16.000 m³/h 9,400 CFM	24.000 m³/h 14,125 CFM	32.000 m³/h 18,800 CFM
COMPONENT	**TYPE**	**ARTICLE NO.**	**NO. NEEDED**				**NO. NEEDED**			
Filter unit incl. ControlPro / ControlGo control equipment	MDB-6 PRO / GO	*depending on the specific type (orientation and control equipment)*	1				2			
	MDB-10 PRO / GO			1				2		
	MDB-16 PRO / GO				1				2	
	MDB-20 PRO / GO					1				2
Filter cartridges [1]	CART (select specific type)	*depending on type*	#	#	#	#	#	#	#	#
Fan	SIF-900/LI	7906061120	1				2			
	SIF-1200/LI	7906060220		1				2		
	SIF-1500/LI	7906060320			1				2	
	SIF-2000/LI	7906060920				1				2
Mounting frame	Frame SIF-900/M	9850070240	1				2			
	Frame SIF-900/1200	9850070250		1				2		
	Frame SIF-1500	9850070260			1				2	
	Frame SIF-2000/M	9850070280				1				2
Frquency inverter	VFD-3/Panel	0000112448	1				2			
	VFD-7.5/Panel	0000112450		1				2		
	VFD-11/Panel	0000112451			1				2	
	VFD-22/Panel	0000112454				1				2
Connection cable [2]	Cable RS-485	*depending on length (10, 20 or 30 m)*	1	1	1	1	2	2	2	2
Pressure transmitter [3]	PT-1000	7900024000	1	1	1	1	2	2	2	2
Duct silencer Alternative: Alternative:	SAS-500 straight SAS-500 elbow 90° SAS-630 straight SAS-630 elbow 90°	0017013010 0017013050 0017014010 0017014050	1	1	1	1	2	2	2	2
Outlet grid [4]	PUSH GRID	7905211200	#	#	#	#	#	#	#	#
Inlet grid (equal to amount of outlet grids)	PULL GRID	7905211210	#	#	#	#	#	#	#	#
US only: connection piece metric to imperial	RP-400/16	0717040040	2	1			4	2		
	RP-500/20	0717040060		1	1	1		2	2	2
	RP-630/24	0717040080			1	1			2	2

[1] **No. of filter cartridges**
The number of filter cartridges corresponds with the specific product type. E.g.: an MDB-16 contains 16 filter cartridges.

[2] **Connection cable**
Dedicated connection cable for use between VFD/Panel and MDB PRO

[3] **Pressure transmitter**
Additionally needed for use with VFD/Panel and MDB GO

[4] **Grid calculation**
The number of grids is based on two variables. The first one is the desired system capacity, the second one is the width of the hall/ductwork being equal to the throw of the air from the push grid. The number of push grids needed is the capacity of the system divided by the air volume per grid, based on the throw of the push pull system. Table 1 shows the relation between throw and air volume per grid.

Example of grid calculation
Desired system capacity is 7000 m³, hall/ductwork width is 16 meter. Table 1 reads for a throw of 16 m, 900 m³/h air volume per grid. So dividing 7000 by 900 makes 8 push and 8 pull grids.

Product type	**Push-pull system packages**
Article no.	n.a.
Product category	general filtration systems
Version	110419/F

Always check the latest version on **www.plymovent.com**