Innovative vacuum for automation

SCHMALZ

Schmalz X-Pump – SXP / SXMP

Vacuum compact ejectors for automation solutions

Schmalz X-Pump – SXP / SXMP

The future of vacuum generation!

Schmalz X-Pump in use on a press line

Single SXMP ejector plate

Two SXP on one block

Schmalz X-Pump: the new generation of vacuum compact ejectors for automation applications.

The innovative X-Pump is designed, developed and built for the special tasks and requirements which exist in the automotive sector – assembly and press shops – and for use in automated vacuum systems in the sheet-metal and plastics industries and many other industrial sectors.

X-Pump – innovations for your success!

…eXtra strong!

- extremely high suction capacity and powerful blow-off pulse
- safe and economical operation
- maximum availability

…eXtra robust!

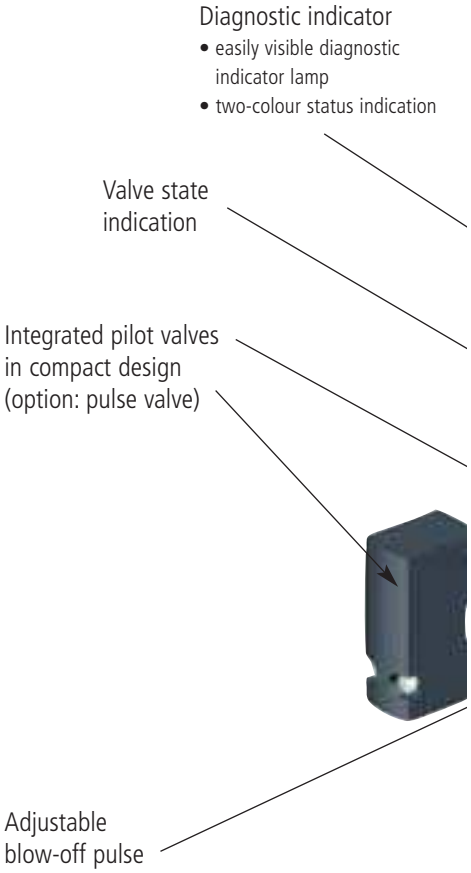
- compact design and simple connection facilities
- resistance to faults
- degree of protection IP65

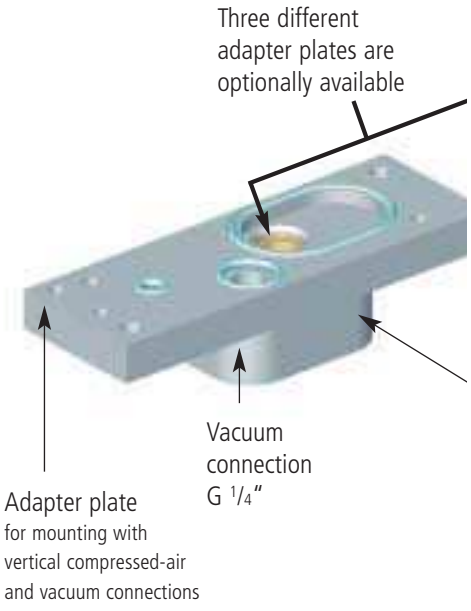
…eXtra intelligent!

- condition monitoring
- integrated diagnostic functions
- intelligent detection of and compensation for leaks and other faults

Schmalz X-Pump …

Construction, functions and p





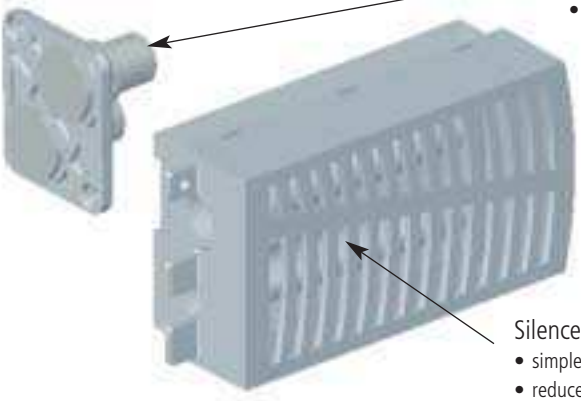
eXtra strong! ...eXtra robust! …eXtra intelligent!

erformance of the new X-Pump*

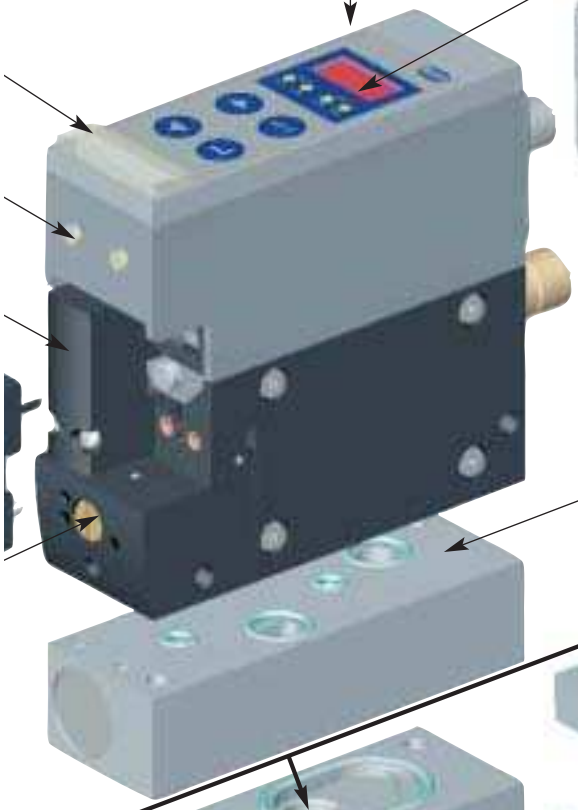
Condition Monitoring
- control module with versatile diagnostic functions
- intelligent and timely detection of faults for maximum process safety

Controls and indicators
- very easy to operate
- large, easy-to-use keypad
- easily legible display

Electrical connections
- M12 (8-pole) or 2xM12 (5-pole), (optionally with potential isolation)
- option: direct connection to all common bus systems

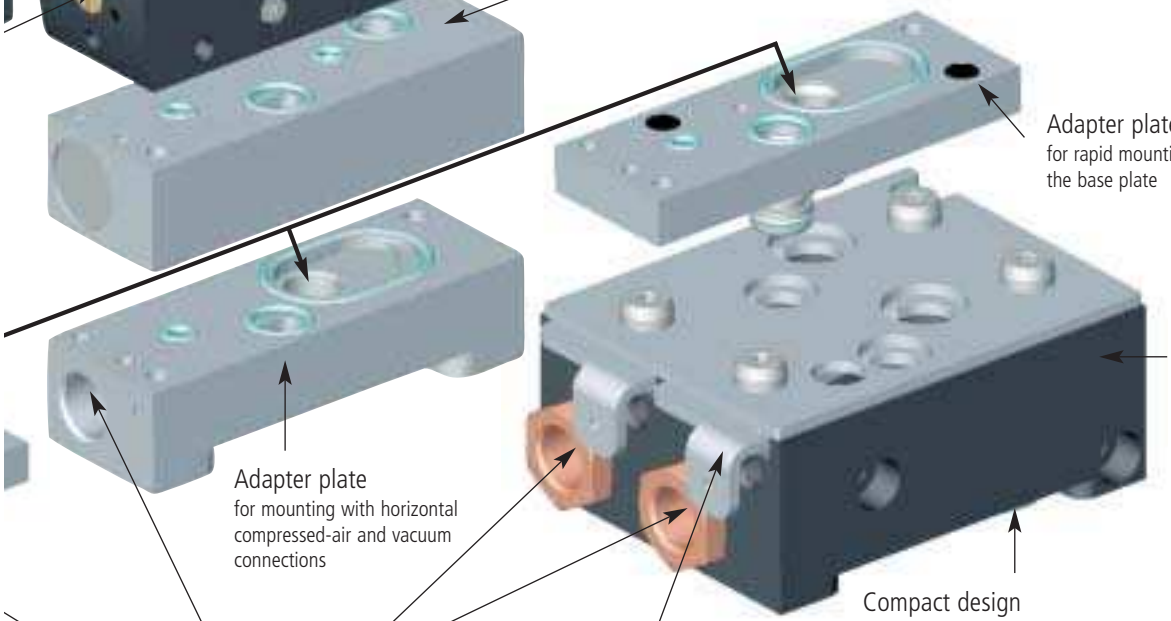


Silencer:
- simple quick-change facility
- reduced noise level (63-72 db (A))
- open system, unaffected by dirt



Option:
Power module (SXMP version)
- maximum blow-off power
- very short cycle times

Adapter plate
for rapid mounting on the base plate



Adapter plate
for mounting with horizontal compressed-air and vacuum connections

Compressed-air connection
G 3/8"
- only one connection for one or more ejectors

Compact design
- no protruding edges
- extreme robustness

Vacuum connection
G 3/8"

Base plate with quick-change system
- safe and fast connection of ejector blocks
- can accommodate multiple ejectors
- including safety interlock when compressed air is connected

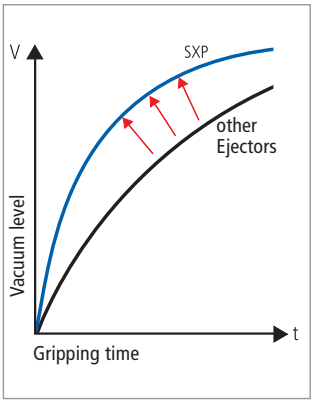
* Patent pending

Schmalz X-Pump ... eXtra strong!

The Schmalz X-Pump offers many possibilities...

Quick changing of SXP pumps on a dual block

SXP: short cycle times



SXP: considerably faster

During the development of the X-Pump, emphasis was placed on high performance coupled with good flexibility.

Our highlights	Your benefits
• High suction capacity and powerful blow-off pulse thanks to optimised nozzles and the power module	> Rapid evacuation and a powerful blow-off pulse permit very short cycle times
• Integrated automatic air saving function	> Economical operation even in continuous use
• Flexible modular system	> Optimum adaptation to specific tasks
• Wide power range	> Optimum power ratings for all applications, resulting in cost savings
• Very simple construction of multiple-ejector blocks	> Blocks of two to six ejectors can be constructed with standard components
• Quick-change system	> Quick changing of ejectors for evaluation purposes
• Clever mounting and connection facilities	> Simple mounting on all types of industrial robots and handling units
• Option: direct bus connection	> No need for I/O ports and external components – reduced costs

Schmalz X-Pump ... eXtra robust!

The X-Pump is designed specially for use on very rough operating environments.

The X-Pump withstands even difficult ambient conditions

During the manufacture of sheet-metal parts, particularly in press shops, vacuum generators are exposed to extreme stresses. The X-Pump withstands these dirty (oily and dusty) surroundings and is equally resistant to strong mechanical forces (high positive and negative acceleration values).

Our highlights	Your benefits
• Compact design	> No projecting parts or edges
• Extremely resistant to wear thanks to a friction-free piston system	> High availability and very low maintenance costs
• Extreme resistance to dirt	> Maximum process safety
• Needs no filter	> Maintenance-free operation
• Degree of protection IP 65	> Protected against splash-water

Schmalz X-Pump ... eXtra intelligent!

NEW: **Condition Monitoring** – fault detection before the system shuts down!

Many diagnostic functions are integrated as standard features into the new Schmalz X-Pump to permit preventive maintenance. Parameters such as the evacuation time and the limit values for the generated vacuum are permanently monitored.

The intelligent vacuum generator detects faults, evaluates them and generates the appropriate signals. The X-Pump also immediately initiates any necessary countermeasures.

If, for example, the defined leakage rate is exceeded, the automatic air-saving function is immediately deactivated and the X-Pump generates full power.

Condition Monitoring – timely detection of faults

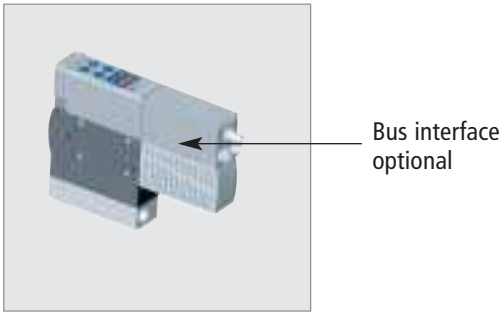
Our highlights	Your benefits
• Optical status indication with an easily visible indicator lamp (various states: OK/warning/fault)	> Permanent and continuous monitoring of the complete vacuum system > In the case of a leak (due to a worn suction pad or a faulty hose), the fault indicator remains active even when the system is switched off in order to permit fast fault-finding.
• Integrated counter module	> Counting of production cycles (e.g. per shift or day)
• Diagnostic output for external monitoring	> Permits fault detection by an external controller
• Time-based monitoring of the vacuum curve and the regulation rate	> For identification of defective vacuum spiders

The advantages of the X-Pump:

- Lower operating costs due to reduced maintenance and preventive maintenance
- Increased process safety thanks to the automatic detection of and compensation for faults
- Simple setup procedure saves time
- The X-Pump combines high intelligence with ease of use

Intelligent connection facilities:

The signals generated by the versatile diagnostic functions of the X-Pump can be transmitted via a M12 plug connector or a direct bus connection (suitable for all common protocols) to an external controller for evaluation.



Ejector SXMP with bus module

Schmalz X-Pump ... eXtra intelligent!

Simple operation and versatile diagnostic facilities...

The key pad, the 3-digit display, 4 additional LEDs and the diagnostic indicator make adjustment and use of the ejector very simple.

Diagnostic indicator

The easily visible diagnostic indicator permits rapid and unambiguous recognition of the status of the vacuum system.

Steady green light: vacuum system is free of leaks

Blinking green light: the vacuum system has a small leak, but can still be used.

Blinking red light: the vacuum is generated too slowly or the desired value is not reached. There are leaks in the vacuum system and it should not be used until these have been repaired.

Steady red light: vacuum too low or non-existent. The vacuum system must be checked and repaired immediately.

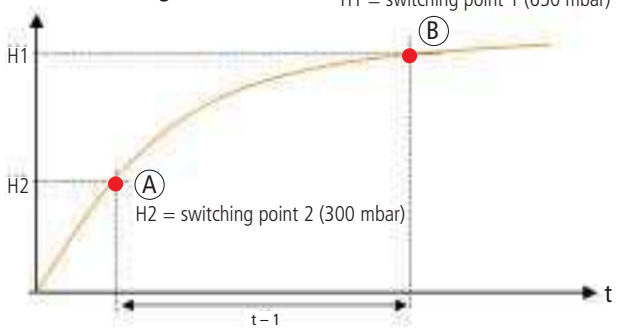
① Display
② LEDs
③ MENU key
④ ENTER key
⑤ UP key
⑥ DOWN key
⑦ Diagnostic indicator

Two examples: Condition Monitoring

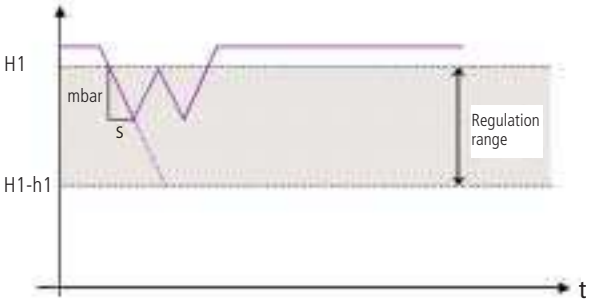
Monitoring of the evacuation time (see the diagram below).
The evacuation time between the switching points H2 and H1 is measured when the vacuum is generated for the first time. If the time for this is greater than t – 1, the diagnostic indicator blinks with a red light and a diagnostic signal is generated at the connector.
This monitoring function is permanently active!

Monitoring the system for leaks (see diagram).
After the switching point H1 has been reached, the automatic air-saving function is activated and the system monitors the leakage from the gripper. If a preset leakage rate is exceeded, the automatic air-saving function is (if necessary) deactivated and the diagnostic indicator lights to signal the fault. The diagnostic output is also activated.

Time monitoring



Leakage monitoring



Ⓐ = robot can start to move (for example)
Ⓑ = automatic air-saving function can be activated

Ordering designation Schmalz X-Pump

Type	Nozzle size	Idle state of suction valve	Compressed-air connection	Electrical connections
Example: SXMP	**25**	**NO**	**Q**	**M12**
SXP ... without Power Modul	15... 1.5 mm	NO... normally open	H... horizontal	M12... M12 connector (8-pole)
	20... 2.0 mm	NC... normally closed	V... vertical	2xM12... 2xM12 connectors (5-pole)
	25... 2.5 mm	IMP...bistable, switched with pulse	Q... quick change	
SXMP ... with Power Modul	30... 3.0 mm			

Ordering data Schmalz X-Pump

SXP 15		SXP 20		SXP 25		SXP 30	
Type	**Article No.**	**Type**	**Article No.**	**Type**	**Article No.**	**Type**	**Article No.**
SXP15 NO H M12	10.02.02.02192	**SXP20 NO H M12**	10.02.02.02210	**SXP25 NO H M12**	10.02.02.02228	**SXP30 NO H M12**	10.02.02.02246
SXP15 NO H 2xM12	10.02.02.02193	**SXP20 NO H 2xM12**	10.02.02.02211	**SXP25 NO H 2xM12**	10.02.02.02229	**SXP30 NO H 2xM12**	10.02.02.02247
SXP15 NO V M12	10.02.02.02194	**SXP20 NO V M12**	10.02.02.02212	**SXP25 NO V M12**	10.02.02.02230	**SXP30 NO V M12**	10.02.02.02248
SXP15 NO V 2xM12	10.02.02.02195	**SXP20 NO V 2xM12**	10.02.02.02213	**SXP25 NO V 2xM12**	10.02.02.02231	**SXP30 NO V 2xM12**	10.02.02.02249
SXP15 NO Q M12	10.02.02.02196	**SXP20 NO Q M12**	10.02.02.02214	**SXP25 NO Q M12**	10.02.02.02232	**SXP30 NO Q M12**	10.02.02.02250
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SXMP 15		SXMP 20		SXMP 25		SXMP 30	
Type	**Article No.**	**Type**	**Article No.**	**Type**	**Article No.**	**Type**	**Article No.**
SXMP15 NO H M12	10.02.02.02264	**SXMP20 NO H M12**	10.02.02.02282	**SXMP25 NO H M12**	10.02.02.02300	**SXMP30 NO H M12**	10.02.02.02318
SXMP15 NO H 2xM12	10.02.02.02265	**SXMP20 NO H 2xM12**	10.02.02.02283	**SXMP25 NO H 2xM12**	10.02.02.02301	**SXMP30 NO H 2xM12**	10.02.02.02319
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SXMP15 NO Q M12	10.02.02.02268	**SXMP20 NO Q M12**	10.02.02.02286	**SXMP25 NO Q M12**	10.02.02.02304	**SXMP30 NO Q M12**	10.02.02.02322
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SXMP15 NC V M12	10.02.02.02272	**SXMP20 NC V M12**	10.02.02.02290	**SXMP25 NC V M12**	10.02.02.02308	**SXMP30 NC V M12**	10.02.02.02326
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SXMP15 IMP H 2xM12	10.02.02.02277	**SXMP20 IMP H 2xM12**	10.02.02.02295	**SXMP25 IMP H 2xM12**	10.02.02.02313	**SXMP30 IMP H 2xM12**	10.02.02.02331
SXMP15 IMP V M12	10.02.02.02278	**SXMP20 IMP V M12**	10.02.02.02296	**SXMP25 IMP V M12**	10.02.02.02314	**SXMP30 IMP V M12**	10.02.02.02332
SXMP15 IMP V 2xM12	10.02.02.02279	**SXMP20 IMP V 2xM12**	10.02.02.02297	**SXMP25 IMP V 2xM12**	10.02.02.02315	**SXMP30 IMP V 2xM12**	10.02.02.02333
SXMP15 IMP Q M12	10.02.02.02280	**SXMP20 IMP Q M12**	10.02.02.02298	**SXMP25 IMP Q M12**	10.02.02.02316	**SXMP30 IMP Q M12**	10.02.02.02334
SXMP15 IMP Q 2xM12	10.02.02.02281	**SXMP20 IMP Q 2xM12**	10.02.02.02299	**SXMP25 IMP Q 2xM12**	10.02.02.02317	**SXMP30 IMP Q 2xM12**	10.02.02.02335

Ordering data spare parts / accessories

Type	Article No.
Connecting cable M12, 8-pole, 5 m, PUR	21.04.05.00079
Connecting cable M12, 5-pole, 5 m, PUR	21.04.05.00080
Double base plate with quick-change connections	10.02.02.02154

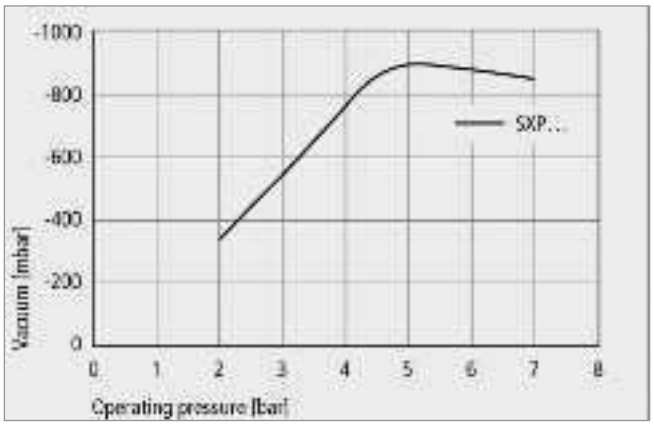
Technical data Schmalz X-Pump

Type	Nozzle size [mm]	Max. vacuum at 4.5 bar [%]	Suction capacity at 4.5 bar [l/min]	Max. blow-off pulse at 4.5 bar [l/min]	Air consumption at 4.5 bar [l/min]	Noise level* at 4.5 bar [dbA]	Weight [kg]
SXP15	1.5	85	70	200	115	63	0.98
SXP20	2.0	85	135	200	180	65	0.98
SXP25	2.5	85	185	200	290	67	0.98
SXP30	3.0	85	220	200	380	72	0.98
SXMP15	1.5	85	70	320	115	63	1.13
SXMP20	2.0	85	135	320	180	65	1.13
SXMP25	2.5	85	185	320	290	67	1.13
SXMP30	3.0	85	220	320	380	72	1.13

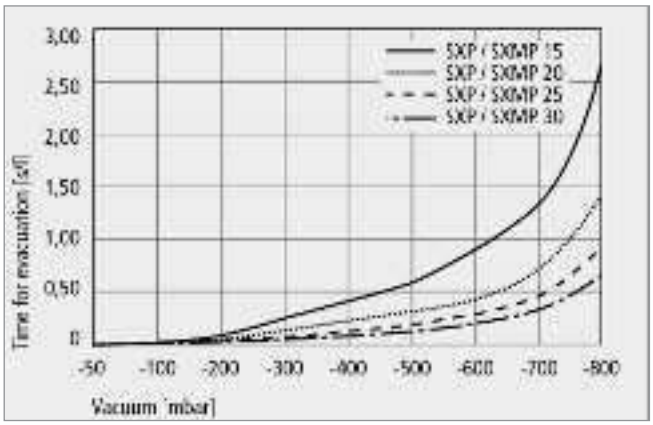
Ambient temperature 0-50 °C, pressure range 3-6 bar, supply and control voltage 24 V DC

*Values with an airtight workpiece gripped

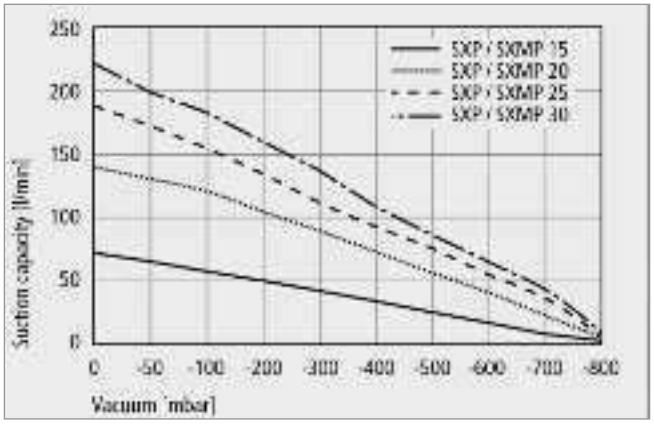
Performance data Schmalz X-Pump



Achieving vacuum at various operating pressures



Evacuation times for various vacuum ranges



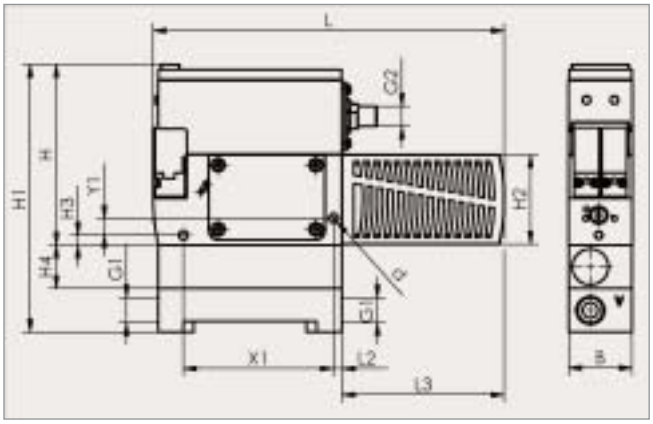
Suction capacity at various degrees of evacuation

Suction capacity in l/min at various degrees of evacuation

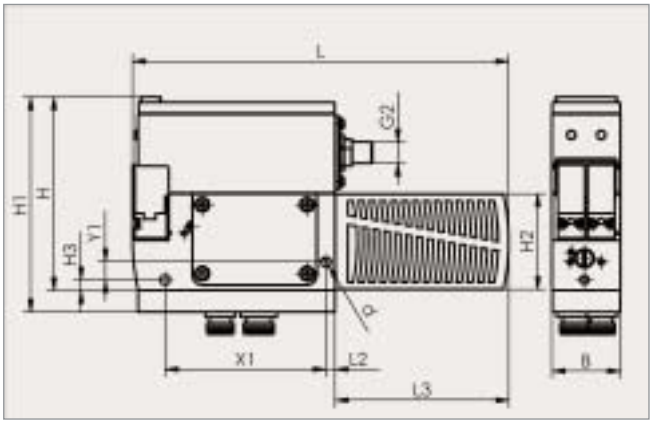
Type	Degree of evacuation in mbar									
	0	-50	-100	-200	-300	-400	-500	-600	-700	-800
SXP 15	70	66	62	52	43	35	26	19	8	3
SXP 20	135	124	113	95	79	65	52	37	22	3
SXP 25	185	170	158	135	114	95	76	56	33	10
SXP 30	220	199	184	160	138	115	91	63	39	15

Evacuation time in s/l for various vacuum ranges

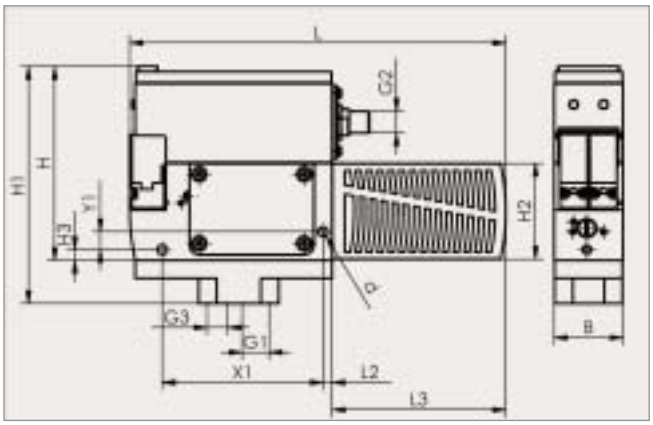
Type	Degree of evacuation in mbar								
	-50	-100	-200	-300	-400	-500	-600	-700	-800
SXP 15	0,03	0,07	0,15	0,25	0,40	0,59	0,86	1,34	2,66
SXP 20	0,02	0,04	0,08	0,14	0,22	0,32	0,46	0,71	1,39
SXP 25	0,02	0,03	0,06	0,10	0,15	0,21	0,30	0,46	0,87
SXP 30	0,01	0,02	0,05	0,08	0,11	0,16	0,24	0,37	0,69



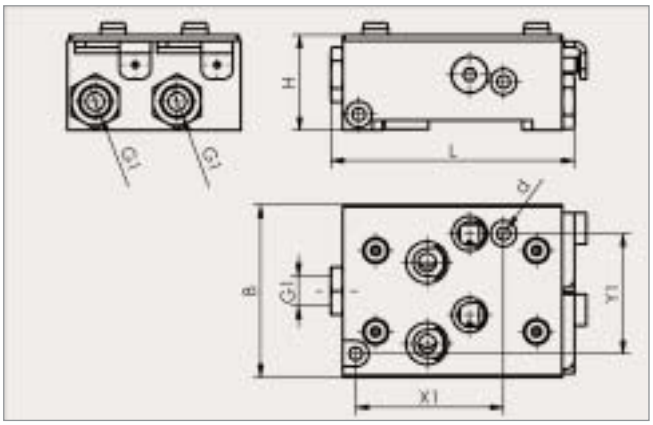
SXMP 25 H



SXP 25 Q



SXP 25 V



GP 2

Type	Dimensions in mm														
	B	d	G1	G2	G3	H	H1	H2	H3	H4	L	L2	L3	X1	Y1
SXP.....H	38	5,5	G3/8"-IG	M12-AG	–	108	134	54	6	–	209	5	97	89	10,0
SXP.....V	38	5,5	G3/8"-IG	M12-AG	G1/4"-IG	108	132	54	6	–	209	5	97	89	10,0
SXP.....Q	38	5,5	–	M12-AG	–	108	120	54	6	–	209	5	97	89	10,0
SXMP...H	38	5,5	G3/8"-IG	M12-AG	–	108	160	54	6	26	209	5	97	89	10,0
SXMP...V	38	5,5	G3/8"-IG	M12-AG	G1/4"-IG	108	158	54	6	26	209	5	97	89	10,0
SXMP...Q	38	5,5	–	M12-AG	–	108	146	54	6	26	209	5	97	89	10,0
GP 2	87	6,6	G3/8"-IG	–	–	48	–	–	–	–	122	–	–	74	60,5

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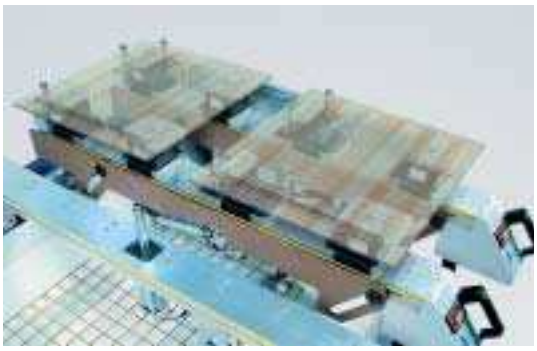

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J. Schmalz GmbH
Aacher Straße 29
D-72293 Glatten
Tel. +49 (0)7443 2403 0
Fax +49 (0)7443 2403 259
schmalz@schmalz.de
www.schmalz.de

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