Axial fan fasteners / fan sleeves

With the patented elastic sleeves you can fasten axial fans quickly and safely without tools and screws on a mounting plate or housing wall. Made of elastic material the sleeves absorb vibrations, so that the noise level can be reduced up to 9 db (see also the noise measurement report, page 3).
The sleeves are available in two different types and are applicable with all standardized axial fans from various manufacturers.

Type LM with plug-in pegs
(recommended for new developments)

Using type LM fan sleeves is the fastest way to mount and dismount axial fans.

In addition, suitable accessories are available like fan guard-EMI-shields, coarse dust filters, insect screens and guard grills. All in combination with the fan sleeve type LM can be mounted without tools fast and safety.

Type SLM with plug-in nipples
(recommended for subsequent installations)

Type SLM is perfect for the subsequent installations/ retrofittings of present devices as the plug-in nipples are compatible to the **existing hole** cut-outs.
They can be pulled through the present standard drilled holes in the housing wall.

In addition, suitable accessories are available like fan guard-EMI-shields and insect screens.

Noise measurement report

concerning elastic fan sleeves

Date:	10.06.2003
Place:	Edel and Unedel Metall BG Sennfeld
Condition:	Sound cabin 31° C
Measuring equipment:	Brühl & Kjaer Type 2233
Level before measurement:	0 dB (A)
Instrument setting:	L_T
Frequency range (FSD):	70 - (90)
Processing:	Planning office HK, Prof. Urban Str. 9a, 83043 Bad Aibling
Operator:	Mr. Holger Korb
Technical Support:	Mr. Kaiser

Processing:	
Set-up 1:	Into a standard PC housing of metal, (460 x 420 x 190 l/h/b) fan model PAPST TYPE 8412 NG 12V; DC170 mA was attached directly in the housing with 4 screws. Power supply transformer with 12 volt level.
Measurement 1:	From a distance of 100 cm (**X**) and 150 cm (**Y**) with fixed measurement device
Set-up 2:	Into a standard PC housing of metal, (460 x 420 x 190 l/h/b) fan model PAPST TYPE 8412 NG 12V; DC170 mA was attached with the elastic sleeve by THOPTEC GmbH into four 6 mm large mounting holes. Power supply transformer with 12 Volt level.
Measurement 2:	From a distance of 100 cm (**X**) and 150 cm (**Y**) with fixed measurement device.

Measurement results:	(X) 100 cm db (A)	(Y) 150 cm db (A)	Delta 100 cm db (A)	Delta 150 cm db (A)
Set-up/Measurement 1 attached directly with four screws	**58,70**	**50,60**		
Set-up/Measurement 2 attached with fan sleeve	**49,65**	**47,00**	**- 9,05**	**- 3,60**

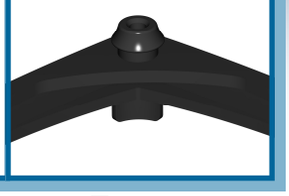
Comment: With the elastic fan sleeve from THOPTEC the noise level could be reduced up to 9,05 db (A). This equates a noise reduction of 15,42 percent and a perceived reduction of one-third to human ears.

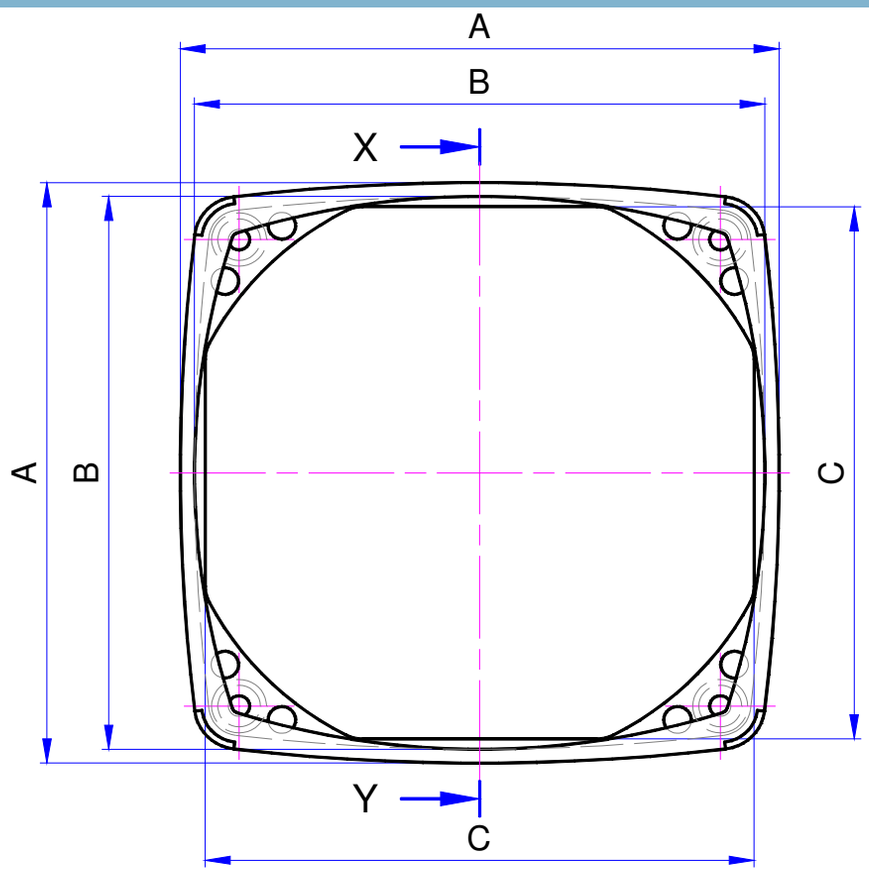
Explanation: The resonating cavity and the vibration behaviour of the material to which the fan is attached are the deciding factors in noise development. Different frequencies, high or low, determine the subjective noise perception. A fan which develops noise at a higher frequency is perceived to be quieter than a fan which develops noise at a lower frequency.

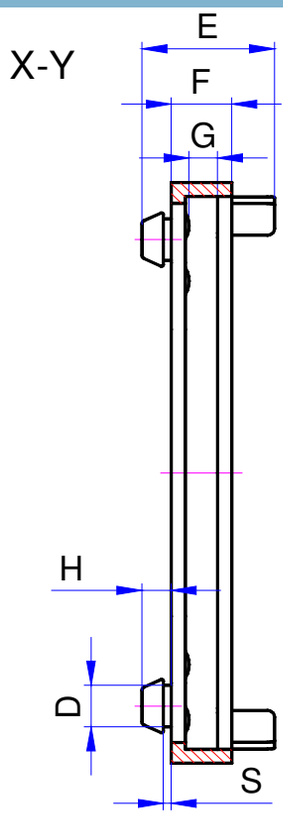
Signed: Holger Korb Bad Aibling June 12, 2003

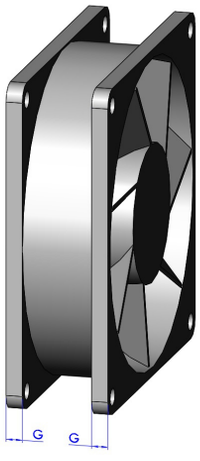
Fan sleeves type LM

Material:	TPE (Thermoplastic elastomer)
Colour:	black
Hardness:	ca. 65° Shore A
Temperature resistance:	from -40 to +100° C
Fire resistance:	UL94-V-0
Equals guideline:	EG 2002/95 (RoHS) & EG 1907/2006 (REACH)





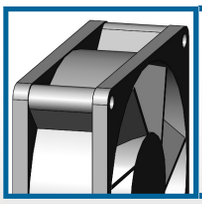




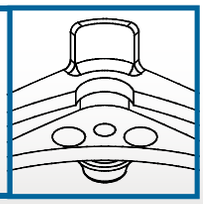
For the article definition you need the fan size (size B), the flange thickness (size G/ see picture left) and also the panel thickness.

Small fans do not have an extra flange (see picture right).
For this fans the flange means the height of the fan (size G).

With * marked fan-types size G equals the fan height.



For **rip type** fans you need the sleeve-types with **„-F“** *(free edges)*
*i.e. LM-80-40-10-**F***



Article number:

LM	40	20	10 oder 20	(F)
Article	fan size B	fan flange thick-ness size G	panel thickness 10 = from 0,75 to 1,25 mm 20 = from 1,50 to 2,50 mm	free edges for rip type fans

Overview fan sleeves type LM

Article no.	A	B	C	D	E	F	G	H	S	Panel thickness
LM-25-100-10	27	25	24	3,5	20,25	12,25	10,0	2,0	1,0	0,75 to 1,25
LM-25-100-20	27	25	24	3,5	21,25	12,25	10,0	2,0	2,0	1,50 to 2,50
LM-30-100-10	33	30	28	4,0	22,25	13,25	10,0 *	3,0	1,0	0,75 to 1,25
LM-30-100-20	33	30	28	4,0	23,25	13,25	10,0 *	4,0	2,0	1,50 to 2,50
LM-40-20-10-F	43	40	38	4,5	14,75	5,25	2,0	3,5	1,0	0,75 to 1,25
LM-40-20-20-F	43	40	38	4,5	15,75	5,25	2,0	4,5	2,0	1,50 to 2,50
LM-40-40-10-F	43	40	38	4,5	16,75	7,25	4,0	3,5	1,0	0,75 to 1,25
LM-40-40-20-F	43	40	38	4,5	17,75	7,25	4,0	4,5	2,0	1,50 to 2,50
LM-40-100-10	43	40	38	4,5	22,75	13,25	10,0 *	3,5	1,0	0,75 to 1,25
LM-40-100-20	43	40	38	4,5	23,75	13,25	10,0 *	4,5	2,0	1,50 to 2,50
LM-40-150-10	43	40	38	4,5	27,75	18,25	15,0 *	3,5	1,0	0,75 to 1,25
LM-40-150-20	43	40	38	4,5	28,75	18,25	15,0 *	4,5	2,0	1,50 to 2,50
LM-40-200-10	43	40	38	4,5	32,75	23,25	20,0 *	3,5	1,0	0,75 to 1,25
LM-40-200-20	43	40	38	4,5	33,75	23,25	20,0 *	4,5	2,0	1,50 to 2,50
LM-50-25-10-F (-B40/42)	53	50	48	4,5	15,25	5,75	2,5	3,5	1,0	0,75 to 1,25
LM-50-25-20-F (-B40/42)	53	50	48	4,5	16,5	5,75	2,5	4,5	2,0	1,50 to 2,50
LM-50-100-10 (-B40/42)	53	50	48	4,5	22,75	13,25	10,0 *	3,5	1,0	0,75 to 1,25
LM-50-100-20 (-B40/42)	53	50	48	4,5	23,75	13,25	10,0 *	4,5	2,0	1,50 to 2,50
LM-50-150-10 (-B40/42)	53	50	48	4,5	27,75	18,25	15,0 *	3,5	1,0	0,75 to 1,25
LM-50-150-20 (-B40/42)	53	50	48	4,5	28,75	18,25	15,0 *	4,5	2,0	1,50 to 2,50
LM-50-200-10 (-B40/42)	53	50	48	4,5	32,75	23,35	20,0 *	3,5	1,0	0,75 to 1,25
LM-50-200-20 (-B40/42)	53	50	48	4,5	33,75	23,25	20,0 *	4,5	2,0	1,50 to 2,50
LM-60-30-10 (-F)	64	60	58	5,0	17,50	7,50	3,0	4,0	1,0	0,75 to 1,25
LM-60-30-20 (-F)	64	60	58	5,0	18,50	7,50	3,0	5,0	3,0	1,50 to 2,50
LM-60-40-10 (-F)	64	60	58	5,0	18,50	8,50	4,0	4,0	1,0	0,75 to 1,25
LM-60-40-20 (-F)	64	60	58	5,0	19,50	8,50	4,0	5,0	3,0	1,50 to 2,50
LM-80-30-10 (-F)	84	80	77	5,8	17,50	7,50	3,0	4,0	1,0	0,75 to 1,25
LM-80-30-20 (-F)	84	80	77	5,8	18,50	7,50	3,0	5,0	1,0	1,50 to 2,50
LM-80-40-10 (-F)	84	80	77	5,8	18,50	8,50	4,0	4,0	1,0	0,75 to 1,25
LM-80-40-20 (-F)	84	80	77	5,8	19,50	8,50	4,0	5,0	2,0	1,50 to 2,50
LM-80-50-10 (-F)	84	80	77	5,8	20,50	9,50	5,0	4,0	1,0	0,75 to 1,25
LM-80-50-20 (-F)	84	80	77	5,8	21,50	9,50	5,0	5,0	2,0	1,50 to 2,50
LM-92-40-10(-F)	97	92	89	6,0	19,50	9,50	4,0	4,0	1,0	0,75 to 1,25
LM-92-40-20 (-F)	97	92	89	6,0	20,50	9,50	4,0	5,0	2,0	1,50 to 2,50
LM-92-50-10 (-F)	97	92	89	6,0	21,50	10,50	5,0	4,0	1,0	0,75 to 1,25
LM-92-50-20 (-F)	97	92	89	6,0	22,50	10,50	5,0	5,0	2,0	1,50 to 2,50
LM-92-60-10 (-F)	97	92	89	6,0	23,50	11,50	6,0	4,0	1,0	0,75 to 1,25
LM-92-60-20 (-F)	97	92	89	6,0	24,50	11,50	6,0	5,0	2,0	1,50 to 2,50
LM-119-40-10 (-F)	125	119	116	8,0	22,00	9,50	4,0	4,5	1,0	0,75 to 1,25
LM-119-40-20 (-F)	125	119	116	8,0	23,00	9,50	4,0	5,5	2,0	1,50 to 2,50
LM-119-50-10 (-F)	125	119	116	8,0	24,00	10,50	5,0	4,5	1,0	0,75 to 1,25
LM-119-50-20 (-F)	125	119	116	8,0	25,00	10,50	5,0	5,5	2,0	1,50 to 2,50
LM-119-60-10 (-F)	125	119	116	8,0	26,00	11,50	6,0	4,5	1,0	0,75 to 1,25
LM-119-60-20 (-F)	125	119	116	8,0	27,00	11,50	6,0	5,5	2,0	1,50 to 2,50

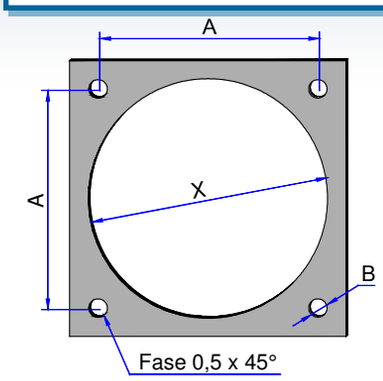
All dimensions in mm! *Other sleeves/dimensions on request!* *CAD-Data-sheets at www.thoptec.de*

Legend:

Size A:	max. outside dimension	**Size D:**	diameter of the plug-in peg	**Size G:**	flange thickness or fan height
Size B:	fan size	**Size E:**	overall height of the fan sleeve	**Size H:**	height of the plug-in peg over the fan sleeve
Size C:	min. inside dimension	**Size F:**	height of the fan sleeve without plug-in peg	**Size S:**	clearance of the plug-in peg

6 Mounting styles and hole cut-outs for type LM

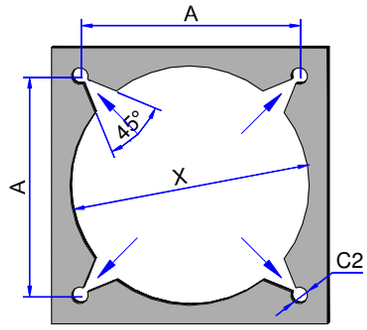
The fan sleeves for type LM can be fixed in 4 different ways, depending on the hole cut-outs and space circumstances. It has to be used just one hole cut-out possibility to mount the sleeve on a mounting plate or housing wall.



Plug-in mounting style/ hole cut-out no.1

First of all pull the sleeve over the flange of the fan. Then plug-in the four pegs through the drilled holes B of the mounting panel and pull them out on the backside. Therefore the drilled holes need to be chamfered slightly from the installation-side.

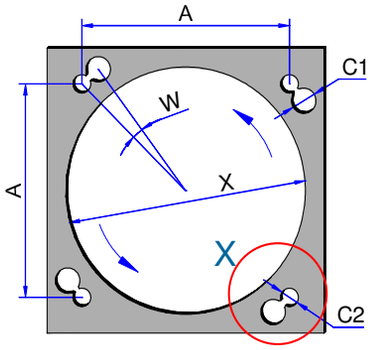
This hole cut-out is preferred, if space circumstances are very tight. The **backside however needs to be accessible** for being able to pull out the pegs.



Plug-and-pull mounting style/ hole cut-out no.2

First of all plug in the four pegs through the 45° outbreaks in the mounting panel and then pull them lateral into the holes C2. Now put the fan into the sleeve and pull the corners over the flange of the fan.

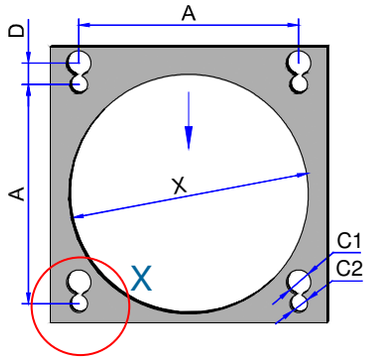
This hole cut-out is preferred, if there is enough space arround the fan for being able to pull the sleeve over the flange. The backside needs not to be accessible.



Plug-and-turn mounting style/ hole cut-out no.3

First of all pull the sleeve over the flange of the fan. Then plug in the four pegs into the larger holes C1 of the mounting panel and turn them into the smaller holes C2.

This hole cut-out is the most popular one. However there must be enough space for installation for being able to turn the fan including the fan sleeve. The backside needs not to be accessible.



Plug-and-push/ pull mounting style/ hole cut-out no.4

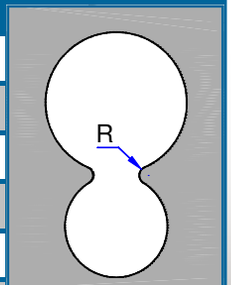
First of all pull the sleeve over the flange of the fan. Then plug in the four pegs into the larger holes C1 of the mounting panel and push or pull them into the smaller holes C2.

This hole cut-out is also a very popular one. However there must be enough space for installation for being able to push/ pull the fan including the fan sleeve in one direction. The backside needs not to be accessible.

Dimensions hole cut-outs	A	B	C1	C2	D	R	W
Für LM-25...	20,0	3,8	3,5	4,5	3,50	0,2-0,5	14,5°
Für LM-30...	24,0	4,5	5,5	4,0	5,00	0,5-1,0	16,5°
Für LM-40...	32,0	5,0	6,5	4,5	5,75	0,5-1,0	14,5°
Für LM-50...	40,0 / 42,0	5,0	6,5	4,5	5,75	0,5-1,0	11,0°
Für LM-60...	50,0	5,5	7,5	5,0	6,50	0,5-1,0	10,5°
Für LM-80...	71,5	6,5	8,0	6,0	7,00	0,5-1,0	8,00°
Für LM-92...	82,5	6,5	8,5	6,0	7,25	0,5-1,0	7,00°
Für LM-119...	105,0	8,5	11,0	8,0	9,50	1,0-2,0	7,00°

All dimensions in mm! *Downloads for CAD-datas of hole cut-outs at: www.thoptec.com*

Detail X



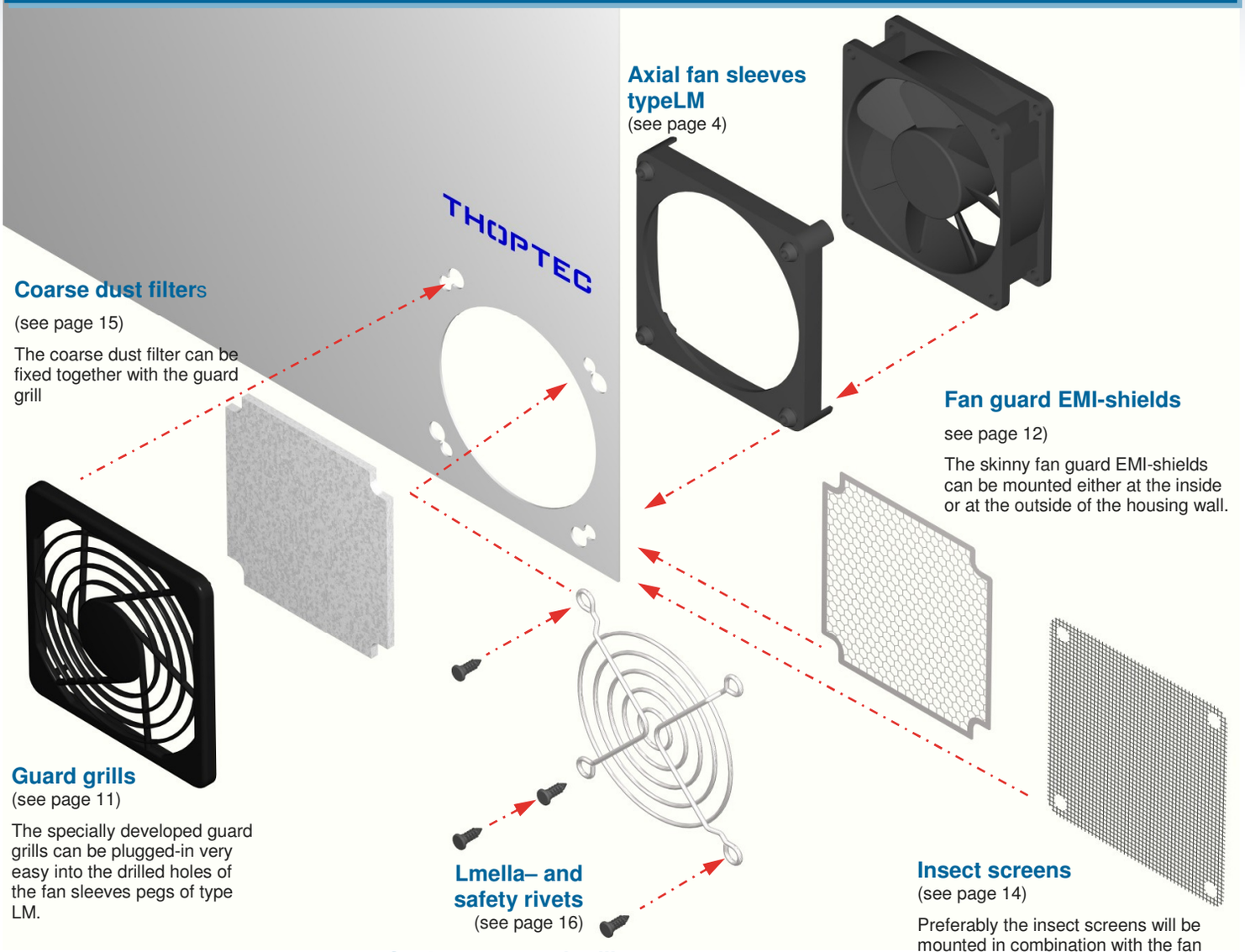
Please Note !!

By adjusting the size D/ W and the size of radius R the resistance of power to mount and dismount the fan including the fan sleeve can be altered.

Form/ dimensions of Ø **X** are depending on the manufacturers of fans

Accessories for fan sleeves type LM

In combination to the fan sleeves type LM various accessories are available, which also can be installed in a very quck way without screws and extra tools.



Axial fan sleeves typeLM
(see page 4)

Coarse dust filters
(see page 15)

The coarse dust filter can be fixed together with the guard grill

Fan guard EMI-shields
see page 12)

The skinny fan guard EMI-shields can be mounted either at the inside or at the outside of the housing wall.

Guard grills
(see page 11)

The specially developed guard grills can be plugged-in very easy into the drilled holes of the fan sleeves pegs of type LM.

Lmella– and safety rivets
(see page 16)

Customary guard grills
can be fixed with our specially developed lemella rivets while plugging-into the drilled holes of the fan sleeves pegs.

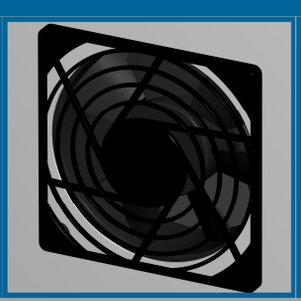
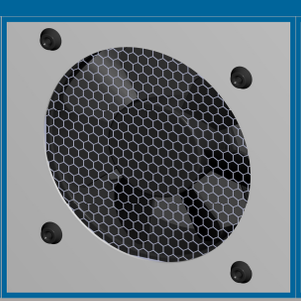
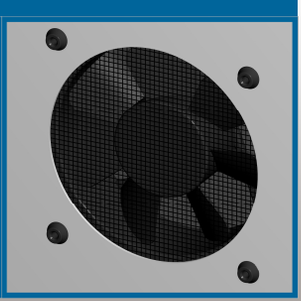
Insect screens
(see page 14)

Preferably the insect screens will be mounted in combination with the fan sleeve at the inside of the housing wall.

Mounting information

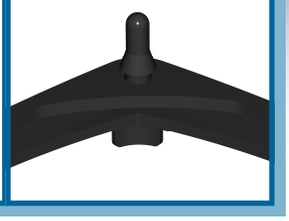
Into the drilled holes of the protruding pegs at the outside of the housing wall you can mount our specially developed accessories like guard grills, coarse dust filters, fan guard-EMI-shields and insect screens.

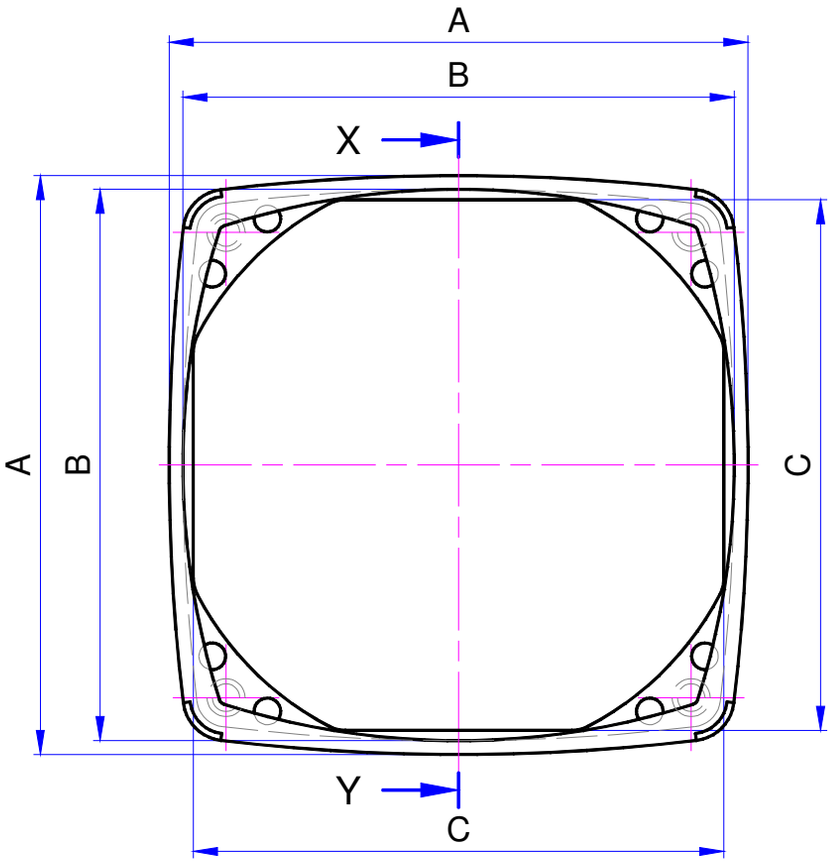
Also you can use customary guard grills, which can be fixed with either screws or our specially developed lamella rivets. Important to know: The protruding pegs ensure sufficient space for air circulation to avoid overheating and possible damage of the device.

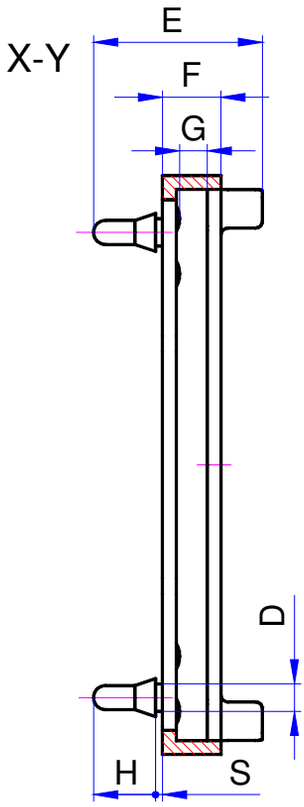
Customary guard grill fixed with lamella rivets	Guard grill	Guard grill with coarse dust filter	Fan guard EMI-shield	Insect screen
				

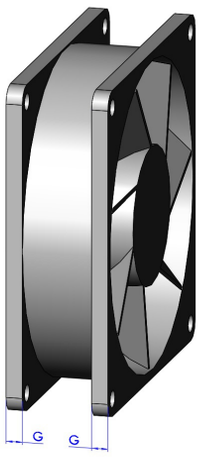
Plug-in fan sleeves type SLM

Material:	TPE (Thermoplastic elastomer)
Colour:	black
Hardness:	ca. 65° Shore A
Temperature resistance:	from -40 to +100° C
Fire resistance:	UL94-V-0
Equals guideline:	EG 2002/95 (RoHS) & EG 1907/2006 (REACH)





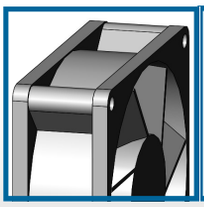




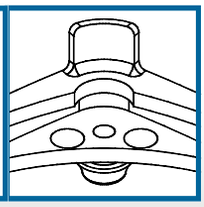
For the article definition you need the fan size (size B), the flange thickness (size G/ see picture left) and also the panel thickness.

Small fans do not have an extra flange (see picture right).
For this fans the flange means the height of the fan (size G).

With * marked fan-types size G equals the fan height.



For **rip type** fans you need the sleeve-types with **„-F“** *(free edges)*
*i.e. SLM-80-40-10-**F***



Article number:

SLM	40	20	10 oder 20	(F)
Article	fan size B	fan flange thick-ness size G	panel thickness 10 = from 0,75 to 1,25 mm 20 = from 1,50 to 2,50 mm	free edges for rip type fans

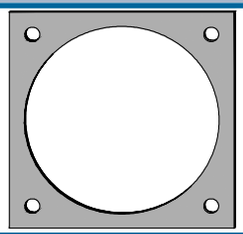
Overview fan sleeves type SLM

Article no.	A	B	C	D	E	F	G	H	S	panel thickness
SLM-25-100-10	27	25	24	2,6	24,00	12,25	10,0	6,0	0,75	0,75 bis 1,50
SLM-25-100-20	27	25	24	2,6	25,00	12,25	10,0	6,0	1,75	2,00 bis 3,50
SLM-30-100-10	33	30	28	2,6	27,00	13,25	10,0 *	7,0	0,75	0,75 bis 1,50
SLM-30-100-20	33	30	28	2,6	28,00	13,25	10,0 *	7,0	1,75	2,00 bis 3,50
SLM-40-20-10-F	43	40	38	4,0	20,00	5,25	2,0	8,0	0,75	0,75 bis 1,50
SLM-40-20-20-F	43	40	38	4,0	21,00	5,25	2,0	8,0	1,75	2,00bis 3,50
SLM-40-40-10-F	43	40	38	4,0	22,00	7,25	4,0	8,0	0,75	0,75 bis 1,50
SLM-40-40-20-F	43	40	38	4,0	23,00	7,25	4,0	8,0	1,75	2,00 bis 3,50
SLM-40-100-10	43	40	38	4,0	28,00	13,25	10,0 *	8,0	0,75	0,75 bis 1,50
SLM-40-100-20	43	40	38	4,0	29,00	13,25	10,0 *	8,0	1,75	2,00 bis 3,50
SLM-40-150-10	43	40	38	4,0	33,00	18,25	15,0 *	8,0	0,75	0,75 bis 1,50
SLM-40-150-20	43	40	38	4,0	34,00	18,25	15,0 *	8,0	1,75	2,00 bis 3,50
SLM-40-200-10	43	40	38	4,0	38,00	23,25	20,0 *	8,0	0,75	0,75 bis 1,50
SLM-40-200-20	43	40	38	4,0	39,00	23,25	20,0 *	8,0	1,75	2,00 bis 3,50
SLM-50-25-10-F (-B40/42)	53	50	48	4,0	20,50	5,75	2,5	8,0	0,75	0,75 bis 1,50
SLM-50-25-20-F (-B40/42)	53	50	48	4,0	21,50	5,75	2,5	8,0	1,75	2,00 bis 3,50
SLM-50-100-10 (-B40/42)	53	50	48	4,0	28,00	13,25	10,0 *	8,0	0,75	0,75 bis 1,50
SLM-50-100-20 (-B40/42)	53	50	48	4,0	29,00	13,25	10,0 *	8,0	1,75	2,00 bis 3,50
SLM-50-150-10 (-B40/42)	53	50	48	4,0	33,00	18,25	15,0 *	8,0	0,75	0,75 bis 1,50
SLM-50-150-20 (-B40/42)	53	50	48	4,0	34,00	18,25	15,0 *	8,0	1,75	2,00 bis 3,50
SLM-50-200-10 (-B40/42)	53	50	48	4,0	38,00	23,25	20,0 *	8,0	0,75	0,75 bis 1,50
SLM-50-200-20 (-B40/42)	53	50	48	4,0	39,00	23,25	20,0 *	8,0	1,75	2,00 bis 3,50
SLM-60-30-10 (-F)	64	60	58	4,0	23,25	7,50	3,0	9,0	0,75	0,75 bis 1,50
SLM-60-30-20 (-F)	64	60	58	4,0	24,25	7,50	3,0	9,0	1,75	2,00 bis 3,50
SLM-60-40-10 (-F)	64	60	58	4,0	24,25	8,50	4,0	9,0	0,75	0,75 bis 1,50
SLM-60-40-20 (-F)	64	60	58	4,0	25,25	8,50	4,0	9,0	1,75	2,00 bis 3,50
SLM-80-30-10 (-F)	84	80	77	4,0	23,25	7,50	3,0	9,0	0,75	0,75 bis 1,50
SLM-80-30-20 (-F)	84	80	77	4,0	24,25	7,50	3,0	9,0	1,75	2,00 bis 3,50
SLM-80-40-10 (-F)	84	80	77	4,0	24,25	8,50	4,0	9,0	0,75	0,75 bis 1,50
SLM-80-40-20 (-F)	84	80	77	4,0	25,25	8,50	4,0	9,0	1,75	2,00 bis 3,50
SLM-80-50-10 (-F)	84	80	77	4,0	25,25	9,50	5,0	9,0	0,75	0,75 bis 1,50
SLM-80-50-20 (-F)	84	80	77	4,0	26,25	9,50	5,0	9,0	1,75	2,00 bis 3,50
SLM-92-40-10 (-F)	97	92	89	4,0	26,25	9,50	4,0	9,0	0,75	0,75 bis 1,50
SLM-92-40-20 (-F)	97	92	89	4,0	27,25	9,50	4,0	9,0	1,75	2,00 bis 3,50
SLM-92-50-10 (-F)	97	92	89	4,0	27,25	10,50	5,0	9,0	0,75	0,75 bis 1,50
SLM-92-50-20 (-F)	97	92	89	4,0	28,25	10,50	5,0	9,0	1,75	2,00 bis 3,50
SLM-92-60-10 (-F)	97	92	89	4,0	28,25	11,50	6,0	9,0	0,75	0,75 bis 1,50
SLM-92-60-20 (-F)	97	92	89	4,0	29,25	11,50	6,0	9,0	1,75	2,00 bis 3,50
SLM-119-40-10 (-F)	125	119	116	4,0	28,25	9,50	4,0	10,0	0,75	0,75 bis 1,50
SLM-119-40-20 (-F)	125	119	116	4,0	29,25	9,50	4,0	10,0	1,75	2,00 bis 3,50
SLM-119-50-10 (-F)	125	119	116	4,0	29,25	10,50	5,0	10,0	0,75	0,75 bis 1,50
SLM-119-50-20 (-F)	125	119	116	4,0	30,25	10,50	5,0	10,0	1,75	2,00 bis 3,50
SLM-119-60-10 (-F)	125	119	116	4,0	30,25	11,50	6,0	10,0	0,75	0,75 bis 1,50
SLM-119-60-20 (-F)	125	119	116	4,0	31,25	11,50	6,0	10,0	1,75	2,00 bis 3,50

All dimesions in mm! *Other sleeves/dimensions on request!* *CAD-data-sheets at: www.thoptec.de*

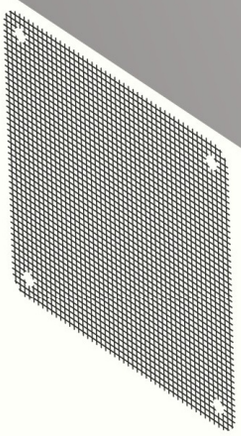
Legend:

Size A:	max.outside dimension	**Size D:**	diameter of the nipples	**Size G:**	flange thickness or fan height
Size B:	fan size	**Size E**	overall height of the fan sleeve	**Size H:**	height of the nipples
Size C:	min.inside dimension	**Size F:**	height of the fan sleeve without nipples	**Size S:**	clearance of the nipples

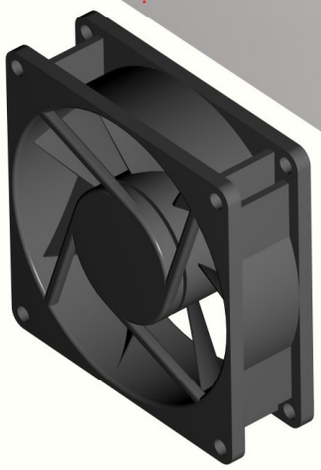


Standard hole cut-out / measurements for mounting panels and housing walls

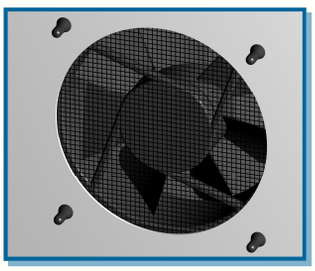
Type SLM is perfect for the subsequent installations/retrofittings of existing devices as the plug-in nipples are compatible to the existing hole cut-outs. They can be pulled through **the existing drilled holes** in the housing wall. In addition, suitable accessories are available like fan guard-EMI -shields and insect screens.

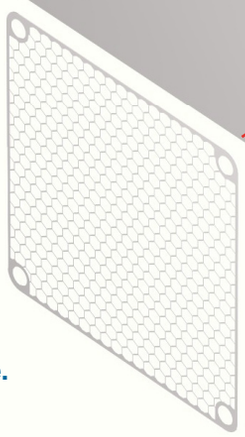


fan sleeves typ SLM
(see page 9)

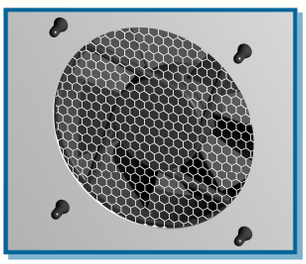


insect screens
(see page 14)





fan guard EMI-shields
(see page 12)

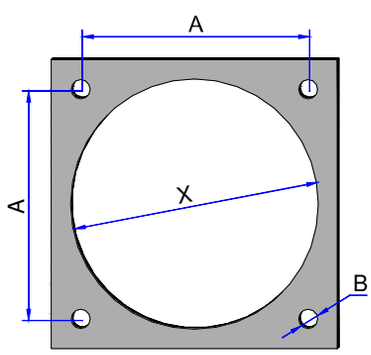


The plug-in fan sleeves type SLM are compatible with the standard hole cut-out in the mounting panel or housing wall.

Inside of the fan sleeves your fan feels comfortable and keeps silence. simply the best: take screws out, put in fan with fan sleeve. Done!

Mounting information

First of all pull the sleeve over the flange of the fan. Then plug in the four nipples through the drilled holes of the mounting panel and pull them out on the backside.

Dimensions for hole-cut-outs		A	B	X
	**for SLM-25...**	20,0	2,8	Form/ dimensions of Ø **X** are depending on the manufacturers of fans
	for SLM-30...	24,0	2,8	
	for SLM-40...	32,0	4,3	
	for SLM-50...	40,0 / 42,0	4,3	
	for SLM-60...	50,0	4,3	
	for SLM-80...	71,5	4,3	
	for SLM-92...	82,5	4,3	
	for SLM-119...	105,0	4,3	

All dimensions in mm!