

## APPLICATIONS

The centrifugal fans LSV, MSV and HSV are designed for marine use.

The fans can be used for both as supply and exhaust fans.

Typical applications for low and medium pressure fans are galley fans, mess room, sanitary spaces, dayroom, technical rooms etc.

Often it can be used as a central with a plenum suction chamber for multiple duct connections.

High pressure fans are often used for gas freeing for LPG tankers, chemical tankers etc.

## DESIGN

The MSV / LSV / HSV fans are single inlet centrifugal fans with direct drive as standard.

The design is based on three main groups, low, medium and high pressure.

- **LSV** - Low pressure: pressures up to 4000Pa, capacities up to 120.000m<sup>3</sup>/h with duct connection ø250 to ø1200mm.
- **MSV** - Medium pressures up to 8.000Pa, capacities up to 95.000 m<sup>3</sup>/h with duct connection ø125 to ø900mm.
- **HSV** - High pressure up to 30.000 Pa. capacities up to 45.000 m<sup>3</sup>/h with duct connection ø60 to ø500mm.

## EXECUTION

The fan housings and impeller are as standard manufactured in sea water resistant aluminium and painted. This gives a corrosion resistant fan and a spark proof design.

## OPTIONAL EXECUTION

Fan housing and impeller in aisi316L execution. Steel - galvanized or galvanized and painted execution are delivered on request.

## IMPELLERS:

The impeller is as standard delivered in the same material as the fan housing, as standard salt- and ammonia resistant aluminium, dynamically balanced. The impellers are divided into four main groups:

**B - type:** The standard impeller for the centrifugal fans. This is a cost effective impeller with high efficiency.

**Z – type:** Self cleaning impeller, ideal for applications where dust or material in the air stream can build up on the impeller and cause imbalance.

**F – type:** Forward curved blades (sciroccio impeller) for applications where high air flow are required.

This impeller is only delivered for the smaller centrifugal fans.

**R – type:** heavy duty impeller with radial blades for transport applications (e.g. saw dust for wood industry or similar).

## ELECTRIC MOTOR

The motors are as standard TEFC squirrel caged inductive electric motors in marine execution.

Motors are IP55 and insulation class F as standard.

The fans can also be equipped with EX motors for hazardous applications.

Motor options:

- IP56, IP65 or IP66,
- anti condensing heating element
- offshore painting
- Vibration monitoring



## PERFORMANCE

Fan curves are given for standard air 1,2kg/m<sup>3</sup> and temperature 20deg.

## ACCESSORIES

- Vibration dampers
- Flexible connections inlet/outlet
- Protection grid inlet/outlet
- Base frame
- Motor pedestal (required for heavy motors)
- Flanged inlet
- Counter flange inlet/outlet
- Inspection hatch
- Drain plug
- Earthing plug for fan / motor pedestal
- Ex – execution with anti-spark track (for stainless steel and steel execution)
- Suction chamber on inlet
- Iris / regulating damper  
(Diffuser on outlet)

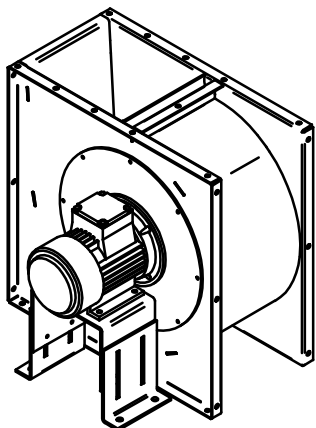
## SPECIAL DESIGNS

- Belt driven execution
- With gas tight motor flange (for EX applications where motor can be placed outside hazardous area)
- With coupling drive
- With coupling drive and cooling wheel (air cooled) for high temperature applications.
- Portable execution (only smaller fans)
- With water-, air- or hydraulic driven motor.

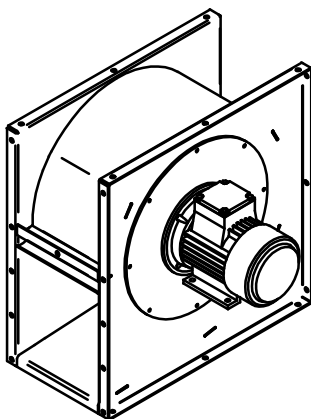


# CENTRIFUGAL FANS

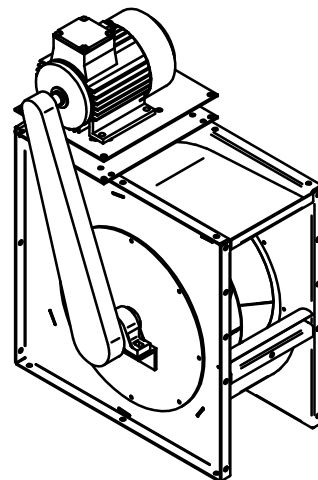
LSV - B1



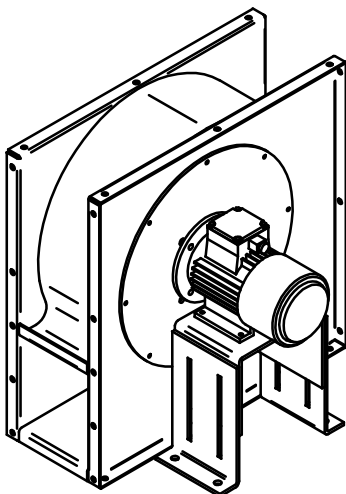
LSV - B1



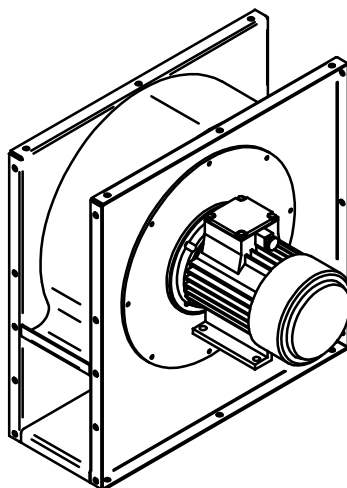
LSV - B3



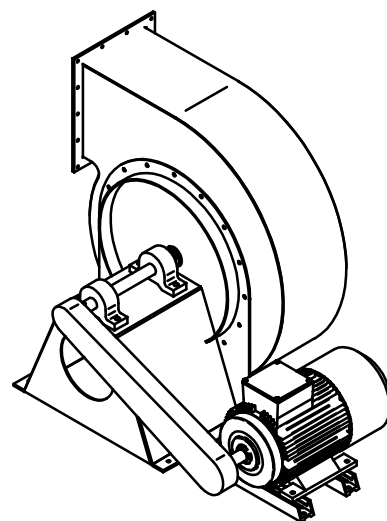
MSV - B1



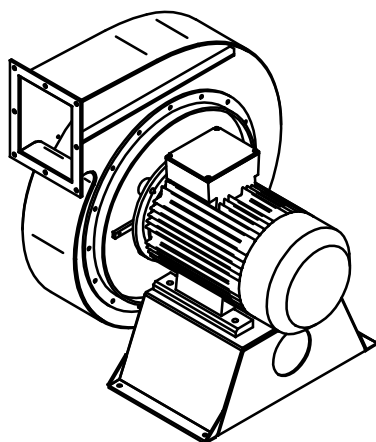
MSV - B1



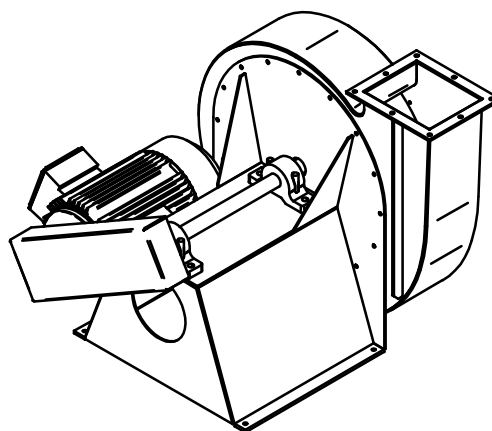
MSV - B2



HSV - B1



HSV - B3



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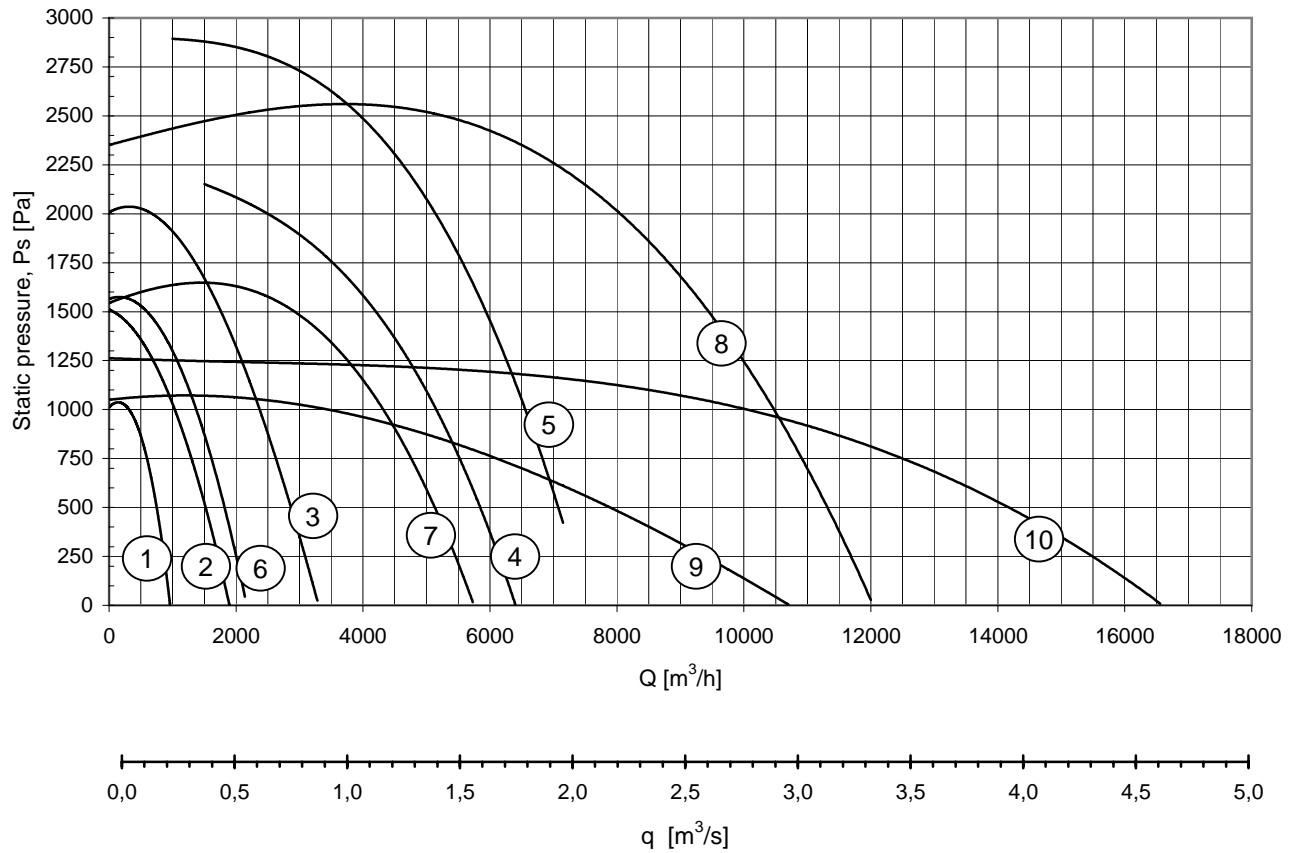
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# CENTRIFUGAL FANS

## selection curves (50Hz)

**LSV and MSV**



| Curve | Fan        | rpm  | Fan power cons. [kW] | Sound press. [dBA] 1m | Motor   | Motor power [kW] | Current [A] (400V) | Current [A] (230V) |
|-------|------------|------|----------------------|-----------------------|---------|------------------|--------------------|--------------------|
| 1     | MSV 125 B1 | 2900 | 0,34                 | 70                    | 71M02K  | 0,37             | 1,05               | 1,9                |
| 2     | MSV 160 B1 | 2900 | 0,58                 | 75                    | 80M02K  | 0,86             | 1,85               | 3,35               |
| 3     | MSV 200 B1 | 2900 | 1,18                 | 79                    | 90S02   | 1,5              | 3,5                | 6,1                |
| 4     | MSV 250 B1 | 2900 | 3,4                  | 85                    | 112M02  | 4                | 8,2                | 14,2               |
| 5     | MSV 315 B1 | 2900 | 5,5                  | 88                    | 132S02K | 5,5              | 11,7               | 19,6               |
| 6     | LSV 250 B1 | 2900 | 0,88                 | 75                    | 80M02   | 1,1              | 2,55               | 4,4                |
| 7     | LSV 315 B1 | 2900 | 1,92                 | 81                    | 90L02   | 2,2              | 4,8                | 8,4                |
| 8     | LSV 400 B1 | 2900 | 7,5                  | 88                    | 132S02  | 7,5              | 15                 | 25,5               |
| 9     | LSV 500 B1 | 1450 | 2,4                  | 76                    | 100L04  | 3                | 7                  | 12                 |
| 10    | LSV 600 B1 | 1450 | 3,8                  | 81                    | 112M04  | 4                | 9,3                | 16                 |

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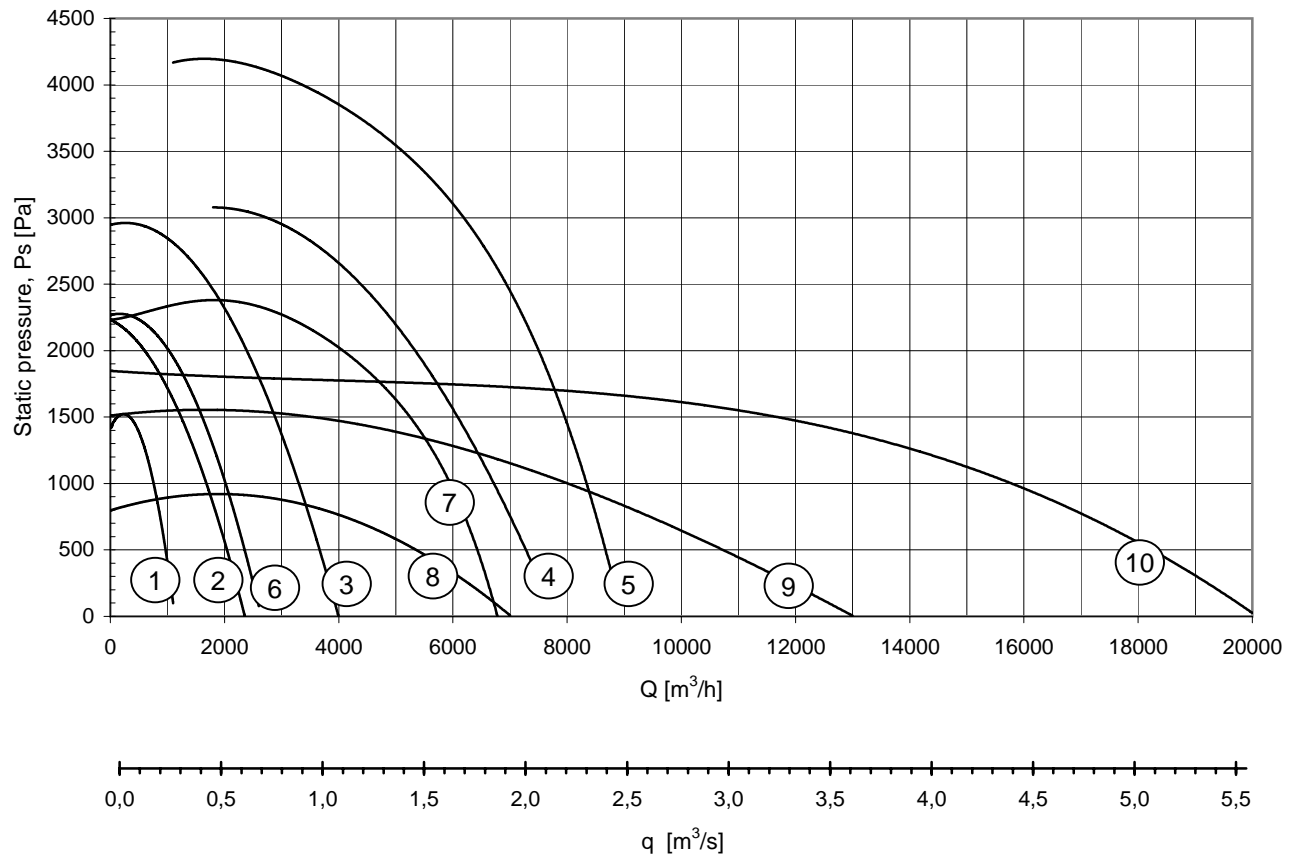
**LSV and MSV**



# CENTRIFUGAL FANS

## selection curves (60Hz)

**LSV and MSV**



| Curve | Fan        | rpm  | Fan power cons. [kW] | Sound press. [dBA] 1m | Motor  | Motor power [kW] | Current [A] (440V) |
|-------|------------|------|----------------------|-----------------------|--------|------------------|--------------------|
| 1     | MSV 125 B1 | 3500 | 0,58                 | 75                    | 71M02  | 0,63             | 1,4                |
| 2     | MSV 160 B1 | 3500 | 1,02                 | 80                    | 80M02  | 1,3              | 2,5                |
| 3     | MSV 200 B1 | 3500 | 2,08                 | 83                    | 90L02  | 2,55             | 4,8                |
| 4     | MSV 250 B1 | 3500 | 6,1                  | 89                    | 112M02 | 6,3              | 11                 |
| 5     | MSV 315 B1 | 3500 | 9,6                  | 93                    | 132M02 | 12,6             | 20,6               |
| 6     | LSV 250 B1 | 3500 | 1,55                 | 82                    | 90S02  | 1,75             | 3,4                |
| 7     | LSV 315 B1 | 3500 | 3,4                  | 85                    | 100L02 | 3,45             | 6,3                |
| 8     | LSV 400 B1 | 1750 | 1,55                 | 72                    | 90L04  | 1,75             | 3,6                |
| 9     | LSV 500 B1 | 1750 | 4,2                  | 79                    | 112M04 | 4,6              | 8,8                |
| 10    | LSV 600 B1 | 1750 | 6,7                  | 84                    | 132M04 | 8,6              | 16                 |

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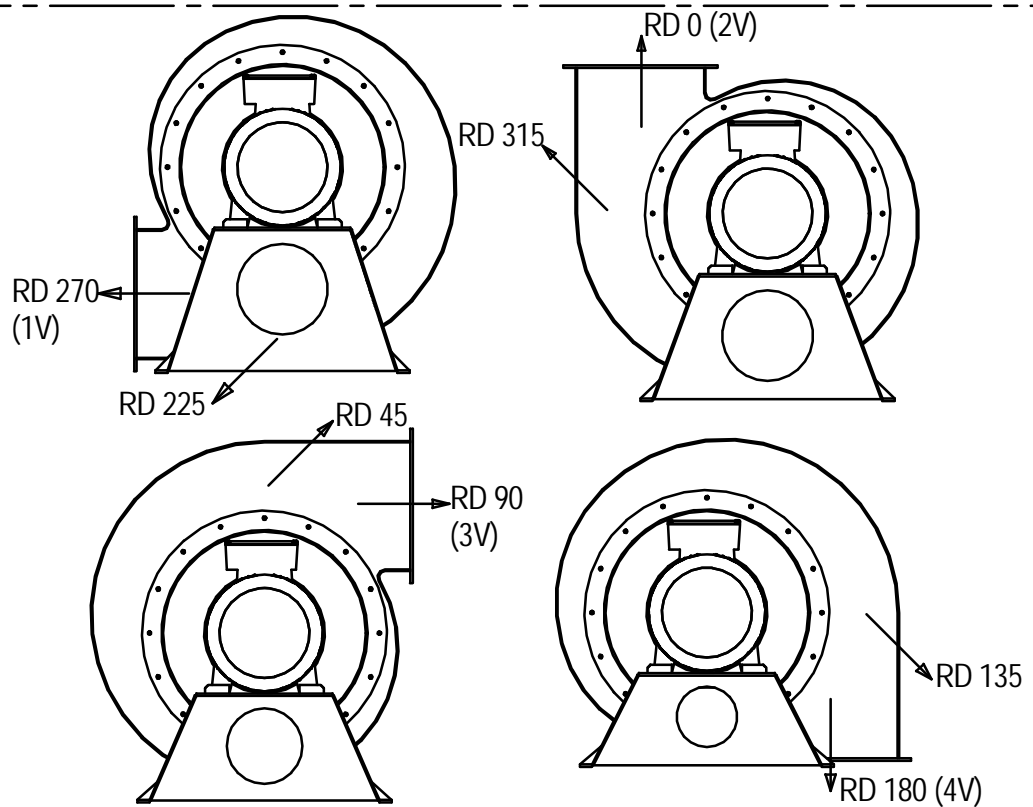
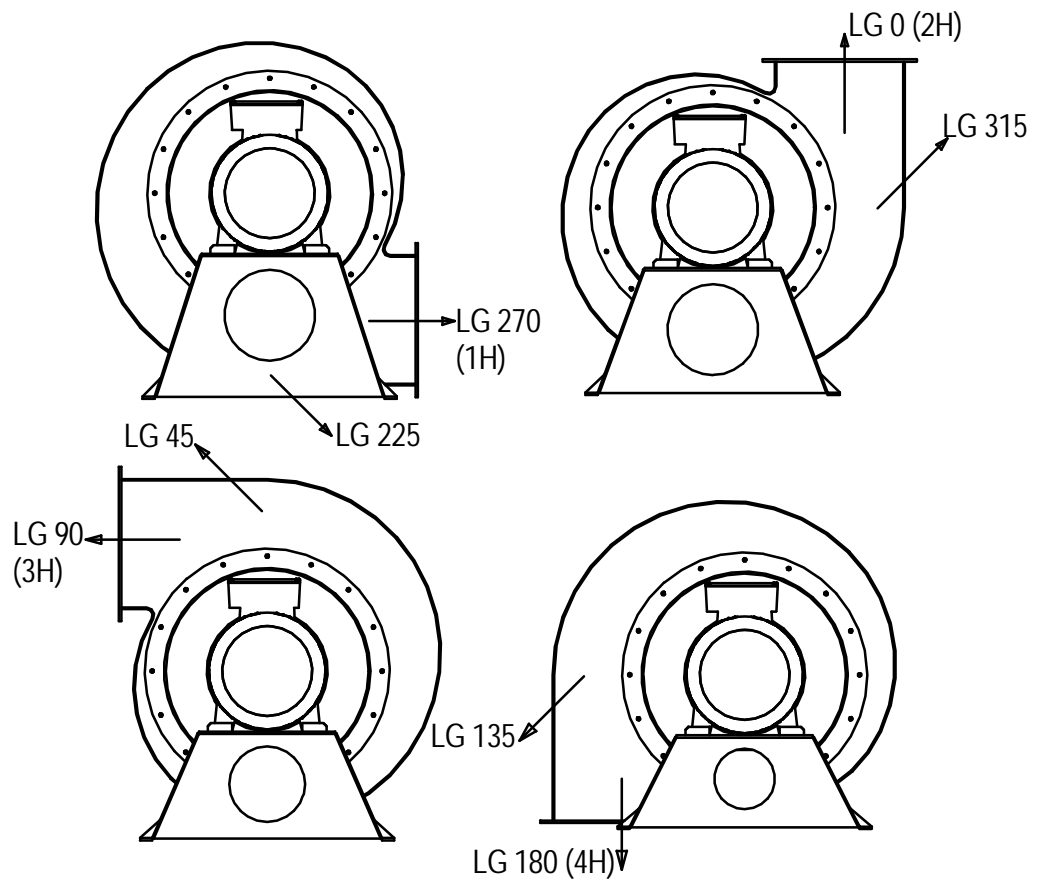
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**LSV and MSV**



# MOUNTING POSITIONS IN ACCORDANCE TO EUROVENT CENTRIFUGAL FANS



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# Centrifugal Fans

## Explanation of Fan Model Number

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Fan model number is stated in the following way: Centrifugal Fan model MSV 160 B1.

|               |               |   |   |
|---------------|---------------|---|---|
| MSV           | 160           | B | 1 |
| figure no 1-3 | Figure no 4-6 | 7 | 8 |

### 1. - 3. figure:

LSV : Low pressure centrifugal fan  
MSV : Medium pressure centrifugal fan  
HSV, HZV, HRV : High pressure centrifugal fan

### 4. -6. figure:

The size of the fan.

The numbers refers to nominal diameter (mm) on the fan's suction flange.

### 8.figure

- 1: Direct driven. impeller mounted on motor shaft
- 2: Belt driven. motor placed alongside the fan
- 3: Belt driven. motor mounted on the fan, belt screened



## SOUND POWER LEVELS (SWL) CALC. NYBORG CENTRIFUGAL FANS

| FAN DATA  |      |             | dB values at centre Hz |     |     |     |      |      |      |      | Theor |
|-----------|------|-------------|------------------------|-----|-----|-----|------|------|------|------|-------|
| FAN MODEL | Rpm  | Impeller    | 63                     | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA   |
| LSV 250 B | 1450 | B12x300x80  | 80                     | 72  | 70  | 62  | 62   | 57   | 54   | 52   | 57    |
| LSV 250 B | 2900 | B12x300x80  | 90                     | 93  | 85  | 84  | 76   | 75   | 71   | 67   | 75    |
| LSV 315 B | 1450 | B12x350x100 | 84                     | 76  | 74  | 66  | 66   | 61   | 58   | 56   | 61    |
| LSV 315 B | 2900 | B12x350x100 | 96                     | 99  | 91  | 90  | 82   | 81   | 77   | 73   | 81    |
| LSV 400 B | 1450 | B6x450x100  | 92                     | 84  | 82  | 74  | 74   | 69   | 66   | 64   | 70    |
| LSV 500 B | 1450 | B7x550x125  | 98                     | 90  | 88  | 80  | 80   | 75   | 72   | 70   | 76    |
| LSV 600 B | 1450 | B7x650x140  | 103                    | 95  | 93  | 85  | 85   | 80   | 77   | 75   | 81    |
|           |      |             |                        |     |     |     |      |      |      |      |       |
| MSV 125 B | 2900 | B9x250x50   | 85                     | 88  | 80  | 79  | 71   | 70   | 66   | 62   | 70    |
| MSV 160 B | 2900 | B12x300x60  | 89                     | 92  | 84  | 83  | 75   | 74   | 70   | 66   | 75    |
| MSV 200 B | 1450 | B12x350x70  | 83                     | 75  | 73  | 65  | 66   | 60   | 57   | 55   | 60    |
| MSV 200 B | 2900 | B12x350x70  | 97                     | 100 | 92  | 91  | 83   | 82   | 78   | 74   | 79    |
| MSV 250 B | 1450 | B12x400x80  | 88                     | 80  | 78  | 70  | 70   | 65   | 63   | 60   | 65    |
| MSV 250 B | 2900 | B12x400x80  | 100                    | 103 | 95  | 94  | 86   | 85   | 81   | 77   | 85    |
| MSV 315 B | 1450 | B12x450x90  | 91                     | 83  | 81  | 73  | 73   | 68   | 65   | 63   | 69    |
| MSV 315 B | 2900 | B12x450x90  | 103                    | 106 | 98  | 97  | 89   | 88   | 84   | 80   | 88    |

- Sound power levels in dB. ref.  $10^{-12}$  W, internal values in fan openings.
- dBA values applies to 1 m. distance based on a theoretical free field environment.
- The sound power level values above are only intended as a guide, and may be used for calculations for sound pressure levels. (heard by the human ear).

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| FAN DATA  |      |             | dB values at centre Hz |     |     |     |      |      |      |      | Theor |
|-----------|------|-------------|------------------------|-----|-----|-----|------|------|------|------|-------|
| FAN MODEL | Rpm  | Impeller    | 63                     | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA   |
| LSV 250 B | 1750 | B12x300x80  | 82                     | 76  | 74  | 67  | 65   | 61   | 58   | 55   | 61    |
| LSV 250 B | 3500 | B12x300x80  | 95                     | 98  | 93  | 90  | 84   | 81   | 77   | 74   | 82    |
| LSV 315 B | 1750 | B12x350x100 | 85                     | 79  | 77  | 70  | 68   | 64   | 61   | 58   | 64    |
| LSV 315 B | 3500 | B12x350x100 | 98                     | 101 | 96  | 93  | 87   | 84   | 80   | 77   | 85    |
| LSV 400 B | 1750 | B6x450x100  | 93                     | 87  | 85  | 78  | 76   | 72   | 69   | 66   | 72    |
| LSV 500 B | 1750 | B7x550x125  | 99                     | 93  | 91  | 84  | 82   | 78   | 75   | 72   | 79    |
| LSV 600 B | 1750 | B7x650x140  | 104                    | 98  | 96  | 89  | 87   | 83   | 80   | 77   | 84    |
|           |      |             |                        |     |     |     |      |      |      |      |       |
| MSV 125 B | 3500 | B9x250x50   | 89                     | 92  | 87  | 84  | 78   | 75   | 71   | 68   | 75    |
| MSV 160 B | 3500 | B12x300x60  | 94                     | 97  | 92  | 89  | 83   | 80   | 76   | 63   | 80    |
| MSV 200 B | 1750 | B12x350x70  | 84                     | 78  | 76  | 69  | 67   | 63   | 60   | 57   | 63    |
| MSV 200 B | 3500 | B12x350x70  | 97                     | 100 | 95  | 93  | 86   | 83   | 79   | 76   | 83    |
| MSV 250 B | 1750 | B12x400x80  | 90                     | 84  | 82  | 75  | 73   | 69   | 66   | 63   | 70    |
| MSV 250 B | 3500 | B12x400x80  | 102                    | 105 | 100 | 97  | 91   | 88   | 84   | 81   | 89    |
| MSV 315 B | 1750 | B12x450x90  | 94                     | 88  | 86  | 79  | 77   | 73   | 70   | 67   | 73    |
| MSV 315 B | 3500 | B12x450x90  | 106                    | 109 | 104 | 101 | 95   | 92   | 88   | 85   | 93    |

- Sound power levels in dB. ref.  $10^{-12}$  W, internal values in fan openings.
- dBA values applies to 1 m. distance based on a theoretical free field environment.
- The sound power level values above are only intended as a guide, and may be used for calculations for sound pressure levels. (heard by the human ear).

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## PAINTING SPECIFICATION ALUMINIUM FANS

### Surface preparation:

| Step No | Description | Thickness | Type             | Manufacturer |
|---------|-------------|-----------|------------------|--------------|
|         |             |           |                  |              |
| 1       | Washing     | -         | Aluminate (acid) | Alu-Nor      |
| 2       | Cleaning    | -         | Water            | -            |

### Painting : Color RAL 5012

| Step No | Description | Thickness | Type                | Manufacturer |
|---------|-------------|-----------|---------------------|--------------|
|         |             |           |                     |              |
| 1       | Primer      | 30 my     | Joton Washprimer    | Jotun        |
| 2       | Topcoat     | 40 my     | Jotun Ultra Topcoat | Jotun        |

## GALVANIZE SPECIFICATION STEEL FANS

### Surface preparation:

| Step No | Description | Thickness | Type        | Manufacturer |
|---------|-------------|-----------|-------------|--------------|
|         |             |           |             |              |
| 1       | Cleaning    | -         | Nitric acid | -            |
| 2       | Galvanizing | 80my      | Zn          | -            |