

Axially Split Volute Casing Pump

**Omega / Omega V**

**Type Series Booklet**



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Type Series Booklet Omega / Omega V

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## Water Supply

### Axially Split Volute Casing Pump

## Omega / Omega V



#### Main applications

- Water supply systems
- Desalination plants
- Pressure boosting
- Water transport
- Service and cooling water for power stations and industry
- Irrigation and drainage pumping stations
- Fire-fighting systems
- Shipbuilding
- District heating and cooling systems

#### Fluids handled

OMEGA / OMEGA V pumps are designed for pumping water and other fluids with a low solids content. The pumps are very versatile and can be used for the following fluids, for example:

- Brackish water
- River, lake and groundwater
- Stormwater
- Service water
- Fire-fighting water
- Cooling water
- Condensate
- Heating water
- Drinking water

#### Operating data

Operating properties

Characteristic	Value	
Sizes	DN	80-350 mm [3-14 inch]
Flow rate <sup>1)</sup>	Q	Up to 2880 m <sup>3</sup> /h [12,680 US.gpm]
Head <sup>2)</sup>	H	Up to 210 m [689 ft]
Operating pressure <sup>2)</sup>	p	Up to 25 bar [363 psi]
Fluid temperature <sup>3)</sup>	t	Up to 140 °C [284 °F]

#### Designation

**Example: Omega V 150 - 460 A GB P M**

Key to the designation

Code	Description	
<b>Omega</b>	Type series	
<b>V</b>	<b>Installation type</b>	
	4)	Horizontal installation
	V	Vertical installation
<b>150</b>	Nominal discharge nozzle diameter [mm]	
<b>460</b>	Nominal impeller diameter [mm]	
<b>A</b>	Impeller type	
<b>GB</b>	<b>Material variant</b> (⇒ Page 5)	
	GB	Gray cast iron / bronze
	GC	Gray cast iron / chrome steel
	SB	Nodular cast iron / bronze
	SC	Nodular cast iron / chrome steel
	DD <sub>35</sub>	Duplex stainless steel / duplex stainless steel
<b>P</b>	<b>Shaft seal</b>	
	P	Gland packing
	G	Mechanical seal
<b>M</b>	<b>Bearing lubrication</b>	
	F	Grease
	M	Product-lubricated

#### Design details

##### Design

- Volute casing pump
- Horizontal/vertical installation
- Single-stage
- Nominal diameter of the discharge nozzles: 80 mm to 350 mm

##### Pump casing

- Axially split volute casing
- Volute casing with integrally cast pump feet
- Replaceable casing wear rings
- Mating dimensions to DIN EN or ASME

##### Impeller type

- Double-entry radial impeller optionally with impeller wear rings

1) For larger flow rates see the RDLO / RDLOV type series.

2) Depending on the material and size

3) Standard design up to 80 °C [176 °F] max.

4) Blank

### Pump shaft

- Completely dry shaft for design with rolling element bearings
- Shaft protecting sleeves in the seal area

### Shaft seal

- Gland packing
- Mechanical seal

### Bearings

For horizontal installation:

- Rolling element bearings, greased for life

For vertical installation:

- Lower bearing: product-lubricated plain bearing / Upper bearing: rolling element bearing, greased for life

### Materials

Overview of available materials (standard design)<sup>5)</sup>

Part No.	Description	Material variant				
		GB	GC	SB	SC	DD <sub>35</sub> <sup>6)</sup>
<b>Available for all variants</b>						
102	Volute casing	Gray cast iron	Gray cast iron	Nodular cast iron	Nodular cast iron	Duplex stainless steel
211	Pump shaft	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel
234	Impeller	Bronze	Duplex stainless steel	Bronze	Duplex stainless steel	Duplex stainless steel
350.1	Bearing housing	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron
360	Bearing cover	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron
441	Shaft seal housing	Gray cast iron	Gray cast iron	Nodular cast iron	Nodular cast iron	Duplex stainless steel
502	Casing wear ring	Bronze	Bronze	Bronze	Bronze	Duplex stainless steel
503	Impeller wear ring (optional)	Bronze	Stainless steel	Bronze	Stainless steel	Duplex stainless steel
524.1	Shaft protecting sleeve	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel
<b>For pump sets with product-lubricated plain bearing only</b>						
160	Cover	Gray cast iron	Gray cast iron	Nodular cast iron	Nodular cast iron	Duplex stainless steel
350.2	Bearing housing	Gray cast iron	Gray cast iron	Nodular cast iron	Nodular cast iron	Duplex stainless steel
545	Bearing bush	Silicon carbide	Silicon carbide	Silicon carbide	Silicon carbide	Silicon carbide
524.2	Shaft protecting sleeve	Silicon carbide	Silicon carbide	Silicon carbide	Silicon carbide	Silicon carbide
550.3	Disc	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel
525.1	Spacer sleeve	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel
<b>For pump sets with gland packing only</b>						
452	Gland follower	Unalloyed steel	Unalloyed steel	Unalloyed steel	Unalloyed steel	-
455	Stuffing box insert	Bronze	Bronze	Bronze	Bronze	-
457	Neck ring	Bronze	Bronze	Bronze	Bronze	-
458	Lantern ring	Bronze/ thermosetting plastics <sup>7)</sup>	Bronze/ thermosetting plastics <sup>7)</sup>	Bronze/ thermosetting plastics <sup>7)</sup>	Bronze/ thermosetting plastics <sup>7)</sup>	-

<sup>5)</sup> Max. fluid temperatures ≤ 80 °C [176 °F]

<sup>6)</sup> For duplex stainless steel with special PREN values contact the manufacturer.

<sup>7)</sup> For OMEGA: 80-210 / 80-270 / 80-370 / 100-250 / 100-310 / 100-375 only

Part No.	Description	Material variant				
		GB	GC	SB	SC	DD <sub>35</sub> <sup>6)</sup>
461	Packing ring	Ramie fiber PTFE-impregnated	Ramie fiber PTFE-impregnated	Ramie fiber PTFE-impregnated	Ramie fiber PTFE-impregnated	-
<b>For pump sets with mechanical seal only</b>						
433	Balanced mechanical seal	Carbon / silicon carbide	Carbon / silicon carbide	Carbon / silicon carbide	Carbon / silicon carbide	Carbon / silicon carbide
433	Unbalanced mechanical seal	Silicon carbide / silicon carbide	Silicon carbide / silicon carbide	Silicon carbide / silicon carbide	Silicon carbide / silicon carbide	Silicon carbide / silicon carbide
457.2	Neck ring	Bronze	Bronze	Bronze	Bronze	Duplex stainless steel
471	Seal cover	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron	Duplex stainless steel
525.2	Spacer sleeve	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel

Overview of available materials (hot water variant)

Part No.	Description	Material variant				
		GB	GC <sup>8)</sup>	SB	SC <sup>9)</sup>	DD <sub>35</sub>
<b>Available for all variants</b>						
102	Volute casing	-	Gray cast iron	-	Nodular cast iron	-
211	Pump shaft	-	Stainless steel	-	Stainless steel	-
234	Impeller	-	Duplex stainless steel	-	Duplex stainless steel	-
350.1	Bearing housing	-	Gray cast iron	-	Gray cast iron	-
360	Bearing cover	-	Gray cast iron	-	Gray cast iron	-
441	Shaft seal housing	-	Gray cast iron	-	Nodular cast iron	-
502	Casing wear ring	-	Stainless steel	-	Stainless steel	-
503	Impeller wear ring (optional)	-	-	-	-	-
524.1	Shaft protecting sleeve	-	Stainless steel	-	Stainless steel	-
<b>For pump sets with product-lubricated plain bearing only</b>						
160	Cover	-	-	-	-	-
350.2	Bearing housing, non-drive end	-	-	-	-	-
545	Bearing bush	-	-	-	-	-
524.2	Shaft protecting sleeve	-	-	-	-	-
550.3	Disc	-	-	-	-	-
525.1	Spacer sleeve	-	-	-	-	-
<b>For pump sets with gland packing only</b>						
452	Gland follower	-	-	-	-	-
455	Stuffing box insert	-	-	-	-	-
457	Neck ring	-	-	-	-	-
458	Lantern ring	-	-	-	-	-
461	Packing ring	-	-	-	-	-
<b>For pump sets with mechanical seal only</b>						
433	Balanced mechanical seal <sup>8)</sup>	-	Silicon carbide / carbon	-	Silicon carbide / carbon	-
433	Unbalanced mechanical seal <sup>8)</sup>	-	-	-	-	-
457.2	Neck ring	-	Stainless steel	-	Stainless steel	-
471	Seal cover	-	Gray cast iron	-	Gray cast iron	-
525.2	Spacer sleeve	-	Stainless steel	-	Stainless steel	-

<sup>6)</sup> For duplex stainless steel with special PREN values contact the manufacturer.

<sup>8)</sup> Only permissible up to fluid temperatures ≤ 120 °C [248 °F]

<sup>9)</sup> Only permissible up to fluid temperatures ≤ 140 °C [284 °F]

### Coating and preservation

Coating for indoor installation

Coating type	Material variant					Casing			Base frame
	GB	GC	SB	SC	DD <sub>35</sub>	Exterior	Interior	Bearing housing	
A1 <sup>10)</sup>	X	X	X	X	–	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>	Epoxy resin base primer, color at our discretion	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>
A1-E <sup>10)12)</sup>	X	X	X	X	–	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>	Epoxy resin base paint, color RAL 5015 (sky blue) <sup>13)</sup>	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>
B1-E <sup>10)</sup>	–	–	–	–	X	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>	None; sand-blasted SA 2 ½	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>	Epoxy resin base paint, color RAL 5002 (ultramarine blue) <sup>11)</sup>

Coating for outdoor installation

Coating type	Material variant					Casing			Base frame
	GB	GC	SB	SC	DD <sub>35</sub>	Exterior	Interior	Bearing housing	
A2	X	X	X	X	–	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>	Epoxy resin base primer, color at our discretion	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>
A2-E <sup>10)12)</sup>	X	X	X	X	–	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>	Epoxy resin base paint, color RAL 5015 (sky blue) <sup>13)</sup>	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>
B2-E <sup>10)</sup>	–	–	–	–	X	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>	None; sand-blasted SA 2 ½	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>	Polyurethane base paint, color RAL 5002 (ultramarine blue) <sup>14)</sup>

10) Only permissible for fluid temperatures ≤ 80 °C [176 °F]

11) For indoor use in industry and in a marine atmosphere; other colors only in coating variants A2 or B2 and on request.

12) Surcharge

13) Approved for drinking water (KTW, DVGW, ACS). The impeller and its components are generally not coated. No other colors available. Max. permissible temperature for drinking water approved coating = 60 °C [140 °F]. Only approved for drinking water up to 25 °C [77 °F].

14) For indoor and outdoor use in industry and in a marine atmosphere; other colors on request.

### Product benefits

- Low maintenance costs:
  - Fast and easy to install thanks to self-centering components (upper casing part, rotor, casing cover)
  - Materials resistant to corrosion and abrasion
  - Smooth operation with low vibration levels
  - Replacement and spare parts fit several pump sizes
- Long service life:
  - Sealed and dry shaft
  - Short bearing distances and a short shaft
  - Protected rolling element bearings greased for life
  - Optional impeller wear rings
  - Replaceable shaft protecting sleeve
- High operating reliability:
  - Rigid shaft without threads between the bearings
  - Generously sized bearings ( $L_{h_{10}} = 100,000$  hours)
  - Reliable sealing thanks to solid casing split flange
  - Double-entry impeller for axial thrust balancing
  - Double volute design
- Highly flexible:
  - Drive can be positioned to the left or right of the pump
  - Shaft sealed by gland packing or mechanical seals
  - Various horizontal and vertical installation options
  - Flanges to DIN or ASME
- Excellent efficiencies and NPSH values:
  - Computer-optimized impellers
  - Large impeller inlet diameters for optimum suction behavior
  - Cost-effective replacing of casing wear rings and impeller wear rings
  - Vortex-free intake elbow with low energy losses
  - Impeller trimmed to match the specified duty point
  - Several hydraulic systems per pump size

### Acceptance tests

- Functional and acceptance tests
  - For information on acceptance tests and inspections refer to the QCPs (see KSB Standard ZN56555-1A / ZN56555-1B / ZN56555-1C)
- Quality assurance system
  - DIN ISO 9001 / EN 29001



## Design and selection information

### Solids content

Solids content [ppm] or [mg/l] depending on the shaft seal and material variant

Shaft seal	Material variant					
	Max. permissible solids content for variants with barrier and flushing water line without cyclone separator			Max. permissible solids content for variants with barrier and flushing water line with cyclone separator <sup>15)</sup>		
	Gray cast iron (GB/GC)	Nodular cast iron (SB/SC)	Cast steel (DD <sub>35</sub> )	Gray cast iron (GB/GC)	Nodular cast iron (SB/SC)	Cast steel (DD <sub>35</sub> )
Gland packing	50	50	50	100	100	100
Unbalanced mechanical seal	50	50	50	100	100	100
Balanced mechanical seal	50	50	50	100	100	100

### Directions of rotation and flow

Directions of rotation and flow

Horizontal installation		Vertical installation	
Direction of rotation when looking at the shaft stub "left" = anti-clockwise	Direction of rotation when looking at the shaft stub "right" = clockwise	Direction of rotation when looking at the shaft stub "left" = anti-clockwise	Direction of rotation when looking at the shaft stub "right" = clockwise

The pumps are designed symmetrically, which means that the designs for clockwise and anti-clockwise rotation are identical. The direction of rotation can be reversed at a later stage without retrofitting or modifying components.

<sup>15)</sup> Higher solids contents on request

**Overview of product features / selection tables**

**Standard design**

Overview of product features of the standard design

Features	Material variant					Type of installation				
	GB	GC	SB	SC	DD <sub>35</sub>	Fig.0	3E	DB/DK	DP	DJ
<b>Direction of rotation</b>										
"Right": clockwise	•	•	•	•	•	•	•	•	•	•
"Left": anti-clockwise	•	•	•	•	•	•	•	•	•	•
<b>Flange</b>										
Drilled to DIN EN 1092 – flat face (type A)	•	•	•	•	•	•	•	•	•	•
Drilled to DIN EN 1092 – raised face (type B)	□	□	□	□	□	□	□	□	□	□
Drilled to ASME B16 – flat face (type FF)	•	•	•	•	•	•	•	•	•	•
Drilled to ASME B16 – raised face (type RF)	□	□	□	□	□	□	□	□	□	□
Special flange	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
<b>Bearings</b>										
Grease-lubricated rolling element bearing at the drive end (greased for life)	•	•	•	•	•	•	•	•	•	•
Grease-lubricated rolling element bearing at the non-drive end (greased for life)	•	•	•	•	•	•	-	-	-	-
Grease-lubricated rolling element bearing at the non-drive end (greased for life)	16)	16)	16)	16)	16)	-	-	16)	16)	16)
Product-lubricated plain bearing at the non-drive end	•	•	•	•	-	-	-	•	•	•
Oil-lubricated rolling element bearings at both ends	-	-	-	-	-	-	-	-	-	-
<b>Wear rings</b>										
Casing with wear rings / impeller without wear rings	•	•	•	•	•	•	•	•	•	•
Casing with wear rings / impeller with wear rings	○	○	○	○	○	○	○	○	○	○
<b>Shaft seal</b>										
Gland packing	•	•	•	•	-	•	•	•	•	•
Single mechanical seal (unbalanced)	○	○	○	○	○	○	○	○	○	○
Single mechanical seal (balanced)	○	○	○	○	○	○	○	○	○	○
Special shaft seal (make/design different to KSB specifications)	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
<b>Piping</b>										
Barrier/flushing water line made of flexible PTFE (malleable cast iron)	•	•	•	•	•	•	•	•	•	•
Barrier/flushing water line made of flexible PTFE (stainless steel)	□	□	□	□	-	□	□	□	□	□
Barrier/flushing water line made of flexible PTFE (duplex)	-	-	-	-	•	•	•	•	•	•
Special piping (to customer requirements)	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
<b>Coating</b>										
Coating for indoor installation (KSB blue / RAL 5002)	•	•	•	•	•	•	•	•	•	•
Coating for outdoor installation (KSB blue / RAL 5002)	□	□	□	□	□	□	□	□	□	□
Coating approved for drinking water (can be selected for fluid temperatures ≤ 60 °C)	□	□	□	□	□	□	□	□	□	□
Coating for outdoor installation (special color)	□	□	□	□	□	□	□	□	□	□
Special coating (customized coating system/composition)	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
<b>Accessories</b>										
Cyclone separator	○	○	○	○	-	○	○	○	○	○
Manually actuated vent valve (without additional piping) <sup>17)</sup>	○	○	○	○	○	○	○	○	○	○
Automatically actuated vent valve (without additional piping) <sup>17)</sup>	□	□	□	□	□	□	□	□	□	□
Manually actuated drain valves (without additional piping) <sup>17)</sup>	○	○	○	○	○	○	○	○	○	○
PumpMeter	○	○	○	○	○	○	○	○	○	○
PT100 temperature sensor <sup>17)18)</sup>	○	○	○	○	○	○	○	○	○	○
Limit switch for PT100 <sup>17)18)</sup>	○	○	○	○	○	○	○	○	○	○
Transmitter for PT100 <sup>17)18)</sup>	○	○	○	○	○	○	○	○	○	○
Measuring nipple (SPM) for manual vibration measurement <sup>17)18)</sup>	○	○	○	○	○	○	○	○	○	○
Vibration sensor including vibration monitoring device <sup>17)18)</sup>	○	○	○	○	○	○	○	○	○	○
Pressure gage nominal size 100 including valves (without attenuation) <sup>17)18)</sup>	○	○	○	○	-	○	○	○	○	○
Pressure gage nominal size 100 including valves (with attenuation) <sup>17)18)</sup>	○	○	○	○	○	○	○	○	○	○
<b>Installation parts</b>										

<sup>16)</sup> On request

<sup>17)</sup> If no valve or measuring equipment is selected as accessory the corresponding connection is closed with a plug.

<sup>18)</sup> Measuring equipment is supplied with the pump but not fitted. It has to be connected at the time of commissioning. This connection is closed with a plug when the pump is supplied.

Features	Material variant					Type of installation				
	GB	GC	SB	SC	DD <sub>35</sub>	Fig.0	3E	DB/DK	DP	DJ
Without installation parts	●	●	●	●	●	●	-	-	-	-
Base frame for pump and motor including foundation bolts <sup>19)</sup>	●	●	●	●	●	-	●	-	-	-
Special base frame for pump and motor including foundation bolts	16)	16)	16)	16)	16)	-	16)	-	-	-
Pump foundation (foot) including foundation blocks and drive lantern	●	●	●	●	●	-	-	●	●	-
Special design of pump foundation (foot) including foundation blocks and motor pedestal	16)	16)	16)	16)	16)	-	-	16)	16)	-
Pump foundation (foot) including foundation blocks	●	●	●	●	●	-	-	-	-	●
Pump foundation (foot) including foundation blocks and motor support frame with foundation rails and foundation bolts	16)	16)	16)	16)	16)	-	-	-	-	16)
<b>Coupling</b>										
Without coupling and coupling guard	●	●	●	●	●	●	-	-	-	●
Without coupling and coupling guard	□	□	□	□	□	-	□	-	-	-
Torsionally flexible 3-piece jaw coupling (coupling guard not tread-proof)	□	□	□	□	□	□	-	-	-	-
Torsionally flexible 3-piece jaw coupling (coupling guard not tread-proof)	●	●	●	●	●	-	●	●	●	-
Torsionally flexible 3-piece jaw coupling (coupling guard tread-proof)	16)	16)	16)	16)	16)	-	16)	-	-	-
Torsion-resistant flexible disc coupling with spacer (coupling guard not tread-proof)	□	□	□	□	□	□	□	-	-	-
Torsion-resistant flexible disc coupling with spacer (coupling guard not tread-proof)	16)	16)	16)	16)	16)	-	-	16)	16)	-
Torsion-resistant flexible disc coupling with spacer (coupling guard tread-proof)	16)	16)	16)	16)	16)	-	16)	-	-	-
Cardan shaft / coupling with spacer (with/without intermediate bearing)	16)	16)	16)	16)	16)	-	-	-	-	16)
<b>Motor</b>										
Without motor	●	●	●	●	●	●	●	●	●	●
Low-voltage motor to IEC or NEMA Standard (make selected by KSB) <sup>17)20)21)</sup>	□	□	□	□	□	□	-	-	-	-
Low-voltage motor to IEC or NEMA standard (make selected by KSB) <sup>17)20)21)</sup>	●	●	●	●	●	-	●	●	●	●
Low-voltage motor to IEC or NEMA standard (make to KSB standard) <sup>17)20)21)</sup>	□	□	□	□	□	□	-	-	-	-
Low-voltage motor to IEC or NEMA standard (make to KSB standard) <sup>17)20)21)</sup>	●	●	●	●	●	-	●	●	●	●
Special motor (motor size ≤ IEC 280M or ≤ NEMA 444/5T) to customer requirements (make not documented) <sup>17)21)</sup>	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
Special motor (motor size > IEC 280M or NEMA 444/5T) to customer requirements (make not documented) <sup>17)20)21) 22)</sup>	16)	16)	16)	16)	16)	16)	16)	-	-	16)
Special motor (motor size > IEC 280M or > NEMA 444/5T) to customer requirements (make not documented) <sup>17)20)21)22)</sup>	16)	16)	16)	16)	16)	-	-	16)	16)	-
<b>Acceptance tests</b>										
Hydraulic acceptance test to KSB standard DIN ISO 9906 - 2B (equivalent to ANSI HI 14.6-2011/2B)	●	●	●	●	●	●	●	●	●	●
Hydraulic acceptance test to DIN ISO 9906 - 1B (equivalent to ANSI HI 14.6-2011/1B)	○	○	○	○	○	○	○	○	○	○
Hydraulic acceptance test to DIN ISO 9906 - 1U (equivalent to ANSI HI 14.6-2011/1U or Hydraulic Institute A)	○	○	○	○	○	○	○	○	○	○
NPSH test (to DIN ISO 9906 or Hydraulic Institute)	○	○	○	○	○	○	○	○	○	○
Sound measurement	○	○	○	○	○	○	○	○	○	○
Vibration measurement	○	○	○	○	○	○	○	○	○	○
Bearing temperature measurement	□	□	□	□	□	□	□	□	□	□
Visual inspection after test run (strip test)	○	○	○	○	○	○	○	○	○	○
Hydrostatic testing	○	○	○	○	○	○	○	○	○	○
Impeller balancing test	□	□	□	□	□	□	□	□	□	□
Coating inspection	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
Dimensional inspection	16)	16)	16)	16)	16)	16)	16)	16)	16)	16)
<b>Replacement and spare parts</b>										
Replacement and spare parts for 2 years of operation	○	○	○	○	○	○	○	○	○	○

19) Only supplied assembled as a pump set up to motor size ≤ IEC 280M or max. total weight ≤ 1500 kg  
20) The motor can be supplied by the customer and mounted at the site of installation. Motors supplied by KSB can also be mounted by the customer.  
21) On request, customer-supplied motors can be mounted by KSB.  
22) From motor size > IEC 280M the motor dimensions depend on the make. KSB uses motors made by Siemens. When using other makes or designs the base frame / motor pedestal must be adjusted (special base frame).

Key to the symbols

Symbol	Description
•	Standard design
○	Standard variant <sup>23)</sup>
□	Special design <sup>23)</sup>
-	Selection unavailable

---

<sup>23)</sup> A surcharge and longer delivery times apply to standard variants and special designs.

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**Hot water variant**

Overview of product features of the hot water variant<sup>24)</sup>

Features	Material variant					Type of installation				
	GB	GC	SB	SC	DD <sub>35</sub>	Fig.0	3E	DB/DK	DP	DJ
<b>Direction of rotation</b>										
"Right": clockwise	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
"Left": anti-clockwise	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
<b>Flange</b>										
Drilled to DIN EN 1092 – flat face (type A)	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
Drilled to DIN EN 1092 – raised face (type B)	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Drilled to ASME B16 – flat face (type FF)	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
Drilled to ASME B16 – raised face (type RF)	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Special flange	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
<b>Bearings</b>										
Grease-lubricated rolling element bearing at the drive end (greased for life)	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
Grease-lubricated rolling element bearing at the non-drive end (greased for life)	-	● <sup>25)</sup>	-	●	-	●	●	-	●	-
Grease-lubricated rolling element bearing at the non-drive end (greased for life)	-	26)25)	-	26)	-	-	-	26)	26)	26)
Product-lubricated plain bearing at the non-drive end	-	-	-	-	-	-	-	-	-	-
Oil-lubricated rolling element bearings at both ends	-	-	-	-	-	-	-	-	-	-
<b>Wear rings</b>										
Casing with wear rings / impeller without wear rings	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
Casing with wear rings / impeller with wear rings	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
<b>Shaft seal</b>										
Gland packing	-	-	-	-	-	-	-	-	-	-
Single mechanical seal (unbalanced)	-	-	-	-	-	-	-	-	-	-
Single mechanical seal (balanced)	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Special shaft seal (make/design different to KSB specifications)	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
<b>Piping</b>										
Barrier/flushing water line made of flexible PTFE (malleable cast iron)	-	● <sup>25)</sup>	-	●	-	●	●	●	●	●
Barrier/flushing water line made of flexible PTFE (stainless steel)	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Barrier/flushing water line made of flexible PTFE (duplex)	-	-	-	-	-	-	-	-	-	-
Special piping (to customer requirements)	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
<b>Coating</b>										
Coating for indoor installation (KSB blue / RAL 5002)	-	-	-	-	-	-	-	-	-	-
Coating for outdoor installation (KSB blue / RAL 5002)	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Coating approved for drinking water (can be selected for fluid temperatures ≤ 60 °C)	-	-	-	-	-	-	-	-	-	-
Coating for outdoor installation (special color)	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Special coating (customized coating system/composition)	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
<b>Accessories</b>										
Cyclone separator	-	-	-	-	-	-	-	-	-	-
Manually actuated vent valve (without additional piping) <sup>27)</sup>	-	○ <sup>25)28)</sup>	-	○ <sup>28)</sup>	-	○ <sup>28)</sup>	○ <sup>28)</sup>	○ <sup>28)</sup>	○ <sup>28)</sup>	○ <sup>28)</sup>
Automatically actuated vent valve (without additional piping) <sup>27)</sup>	-	-	-	-	-	-	-	-	-	-
Manually actuated drain valves (without additional piping) <sup>27)</sup>	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
PumpMeter	-	-	-	-	-	-	-	-	-	-
PT100 temperature sensor <sup>27)29)</sup>	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Limit switch for PT100 <sup>27)29)</sup>	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Transmitter for PT100 <sup>27)29)</sup>	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Measuring nipple (SPM) for manual vibration measurement <sup>27)29)</sup>	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○

24) Max. fluid temperature ≤ 140 °C [284 °F]

25) Max. fluid temperatures ≤ 120 °C [248 °F]

26) On request

27) If no valve or measuring equipment is selected as accessory the corresponding connection is closed with a plug.

28) Only permissible up to 16 bar

29) Measuring equipment is supplied with the pump but not fitted. It has to be connected at the time of commissioning. This connection is closed with a plug when the pump is supplied.

Features	Material variant					Type of installation				
	GB	GC	SB	SC	DD <sub>35</sub>	Fig.0	3E	DB/DK	DP	DJ
Vibration sensor including vibration monitoring device <sup>27)29)</sup>	-	○25)	-	○	-	○	○	○	○	○
Pressure gage nominal size 100 including valves (without attenuation) <sup>27)29)</sup>	-	○25)	-	○	-	○	○	○	○	○
Pressure gage nominal size 100 including valves (with attenuation) <sup>27)29)</sup>	-	○25)	-	○	-	○	○	○	○	○
<b>Installation parts</b>										
Without installation parts	-	●25)	-	●	-	●	-	-	-	-
Base frame for pump and motor including foundation bolts <sup>30)</sup>	-	□25)	-	□	-	-	□	-	-	-
Special base frame for pump and motor including foundation bolts	-	26)25)	-	26)	-	-	26)	-	-	-
Pump foundation (foot) including foundation blocks and drive lantern	-	26)25)	-	26)	-	-	-	26)	26)	-
Special design of pump foundation (foot) including foundation blocks and motor pedestal	-	26)25)	-	26)	-	-	-	26)	26)	-
Pump foundation (foot) including foundation blocks	-	26)25)	-	26)	-	-	-	-	-	26)
Pump foundation (foot) including foundation blocks and motor support frame with foundation rails and foundation bolts	-	26)25)	-	26)	-	-	-	-	-	26)
<b>Coupling</b>										
Without coupling and coupling guard	-	●25)	-	●	-	●	-	-	-	●
Without coupling and coupling guard	-	□25)	-	□	-	-	□	-	-	-
Torsionally flexible 3-piece jaw coupling (coupling guard not tread-proof)	-	-	-	-	-	-	-	-	-	-
Torsionally flexible 3-piece jaw coupling (coupling guard not tread-proof)	-	-	-	-	-	-	-	-	-	-
Torsionally flexible 3-piece jaw coupling (coupling guard tread-proof)	-	-	-	-	-	-	-	-	-	-
Torsion-resistant flexible disc coupling with spacer (coupling guard not tread-proof)	-	□25)	-	□	-	□	□	-	-	-
Torsion-resistant flexible disc coupling with spacer (coupling guard not tread-proof)	-	26)25)	-	26)	-	-	-	26)	26)	-
Torsion-resistant flexible disc coupling with spacer (coupling guard tread-proof)	-	26)25)	-	26)	-	-	26)	-	-	-
Cardan shaft / coupling with spacer (with/without intermediate bearing)	-	26)25)	-	26)	-	-	-	-	-	26)
<b>Motor</b>										
Without motor	-	●25)	-	●	-	●	●	●	●	●
Low-voltage motor to IEC or NEMA standard (make selected by KSB) <sup>30)31)32)</sup>	-	□25)	-	□	-	□	-	-	-	-
Low-voltage motor to IEC or NEMA standard (make selected by KSB) <sup>30)31)32)</sup>	-	●25)	-	●	-	-	●	●	●	●
Low-voltage motor to IEC or NEMA standard (make to KSB standard) <sup>30)31)32)</sup>	-	□25)	-	□	-	□	-	-	-	-
Special motor (motor size > IEC 280M or NEMA 444/5T) to customer requirements (make not documented) <sup>30)31)32) 33)</sup>	-	●25)	-	●	-	-	●	●	●	●
Special motor (motor size ≤ IEC 280M or ≤ NEMA 444/5T) to customer requirements (make not documented) <sup>30)32)</sup>	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
Special motor (motor size > IEC 280M or NEMA 444/5T) to customer requirements (make not documented) <sup>30)31) 32)33)</sup>	-	26)25)	-	26)	-	26)	26)	-	-	26)
Special motor (motor size > IEC 280M or NEMA 444/5T) to customer requirements (make not documented) <sup>30)31)32) 33)</sup>	-	26)25)	-	26)	-	-	-	26)	26)	-
<b>Acceptance tests</b>										
Hydraulic acceptance test to KSB standard DIN ISO 9906 - 2B (equivalent to ANSI HI 14.6-2011/2B)	-	●25)	-	●	-	●	●	●	●	●
Hydraulic acceptance test to DIN ISO 9906 - 1B (equivalent to ANSI HI 14.6-2011/1B)	-	○25)	-	○	-	○	○	○	○	○
Hydraulic acceptance test to DIN ISO 9906 - 1U (equivalent to ANSI HI 14.6-2011/1U or Hydraulic Institute A)	-	○25)	-	○	-	○	○	○	○	○
NPSH test (to DIN ISO 9906 or Hydraulic Institute)	-	○25)	-	○	-	○	○	○	○	○

<sup>30)</sup> Only supplied assembled as a pump set up to motor size ≤ IEC 280M or max. total weight ≤ 1500 kg

<sup>31)</sup> The motor can be supplied by the customer and mounted at the site of installation. Motors supplied by KSB can also be mounted by the customer.

<sup>32)</sup> On request, customer-supplied motors can be mounted by KSB.

<sup>33)</sup> From motor size > IEC 280M the motor dimensions depend on the make. KSB uses motors made by Siemens. When using other makes or designs the base frame / motor pedestal must be adjusted (special base frame).

Features	Material variant					Type of installation				
	GB	GC	SB	SC	DD <sub>35</sub>	Fig.0	3E	DB/DK	DP	DJ
Sound measurement	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Vibration measurement	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Bearing temperature measurement	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Visual inspection after test run (strip test)	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Hydrostatic testing	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○
Impeller balancing test	-	□ <sup>25)</sup>	-	□	-	□	□	□	□	□
Coating inspection	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
Dimensional inspection	-	26)25)	-	26)	-	26)	26)	26)	26)	26)
<b>Replacement and spare parts</b>										
Replacement and spare parts for 2 years of operation	-	○ <sup>25)</sup>	-	○	-	○	○	○	○	○

Key to the symbols

Symbol	Description
●	Standard design
○	Standard variant <sup>34)</sup>
□	Special design <sup>34)</sup>
-	Selection unavailable

**Related documents**

- General Arrangement Drawings DIN/IEC Motors 1384.3940
- General Arrangement Drawings NEMA Motors 1384.3946
- Characteristic Curves Booklet 50 Hz 1384.450
- Characteristic Curves Booklet 60 Hz 1384.460

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<sup>34)</sup> A surcharge and longer delivery times apply to standard variants and special designs.

### Specifications required for enquiries/orders

#### Pump:

- Designation of the pump (see section Designation)
- Maximum and minimum inlet pressure
- Flow rate  $Q$ , head  $H_{\text{total}}$
- Flange design
- Shaft seal
- Type and temperature of fluid handled
- Solids content
- Direction of rotation / motor position
- Accessories required
- Special inspections and acceptance tests
- Quantity and language of operating manuals

#### Drive (selected by KSB):

- Type of construction
- Enclosure
- Voltage, frequency, starting method
- Ambient temperature
- Thermal class
- Accessories required

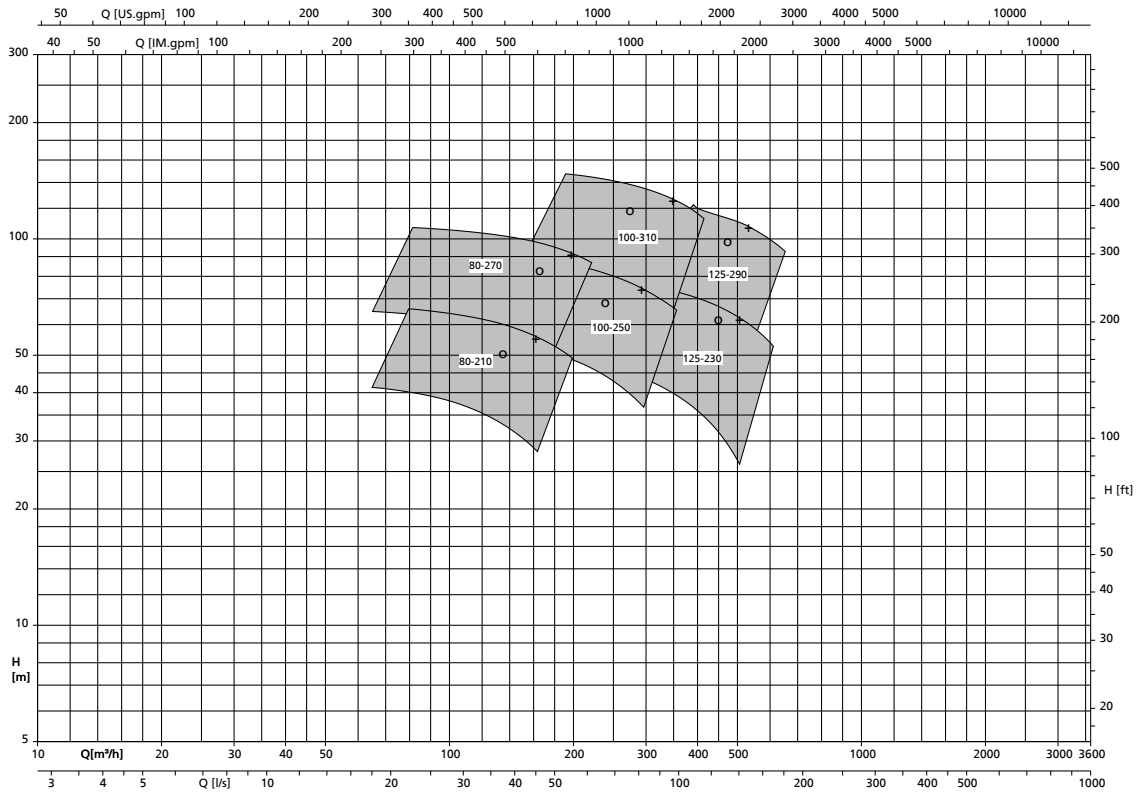
#### Drive (selected by the customer):

- Binding data sheet with motor dimensions and effective speed



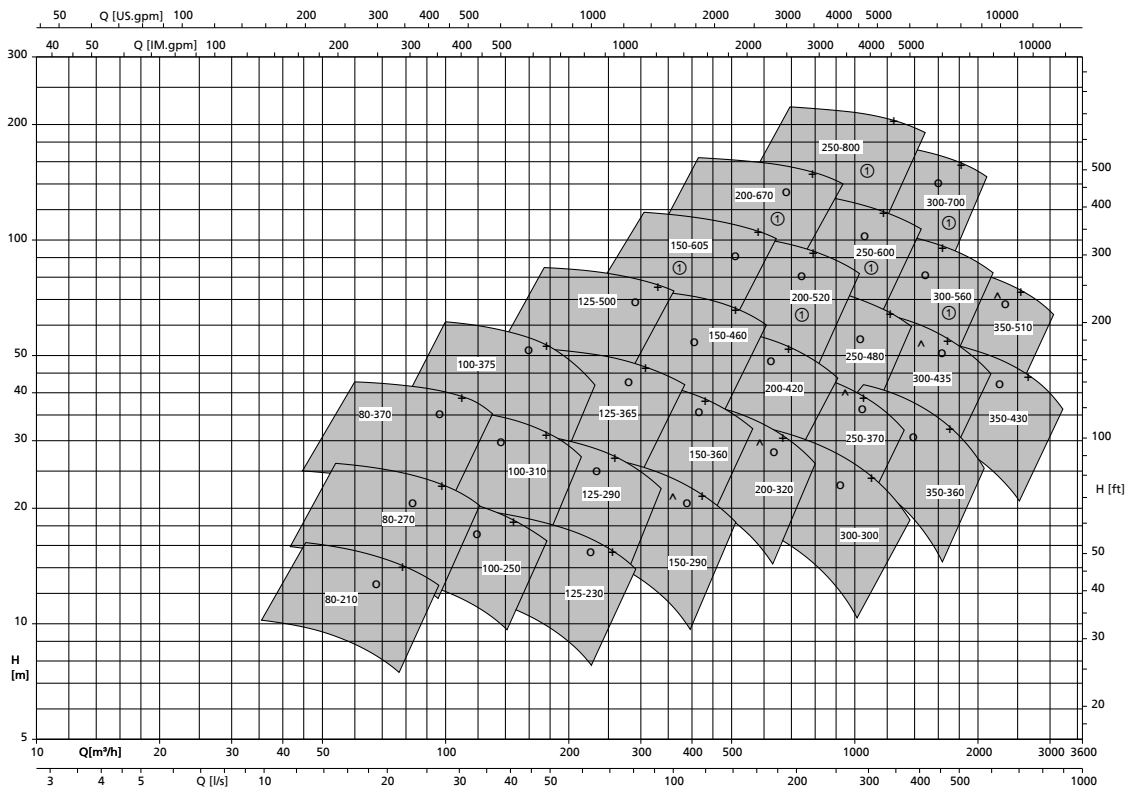
Selection charts

Omega / Omega V; 50 Hz; n = 2900 rpm



+ =  $\eta_{opt}$  A impeller / o =  $\eta_{opt}$  B impeller / ^ =  $\eta_{opt}$  C impeller

Omega / Omega V; 50 Hz; n = 1450 rpm

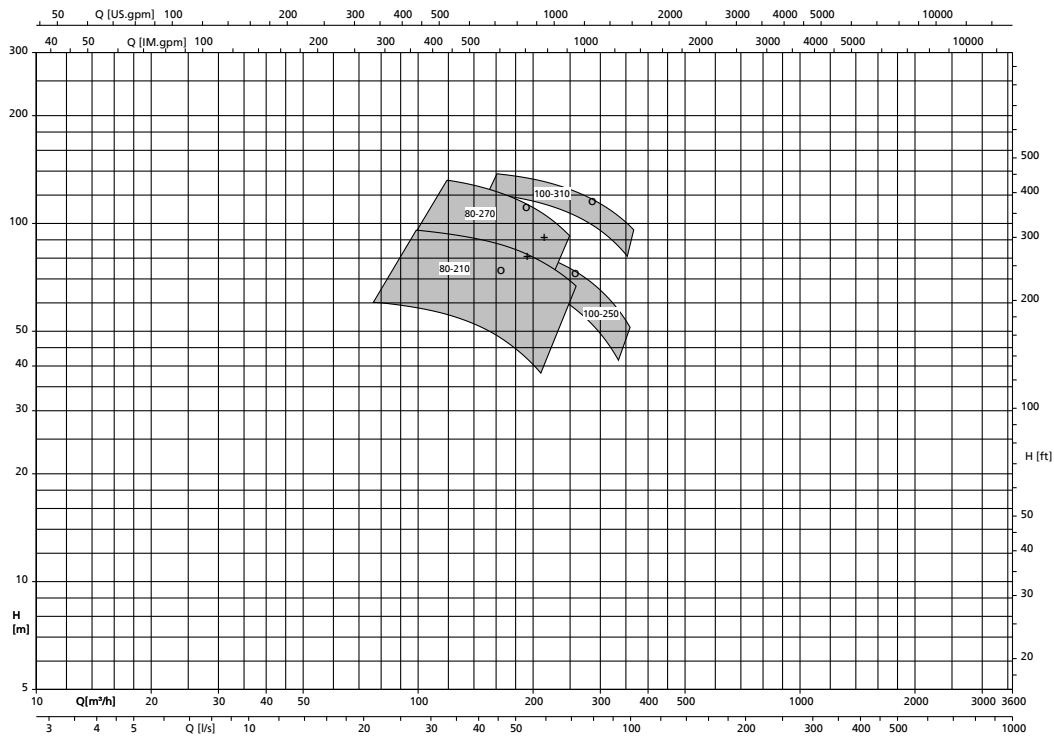


+ =  $\eta_{opt}$  A impeller / o =  $\eta_{opt}$  B impeller / ^ =  $\eta_{opt}$  C impeller

⊙: Pump casing with double volute

Omega / Omega V; 60 Hz; n = 3500 rpm

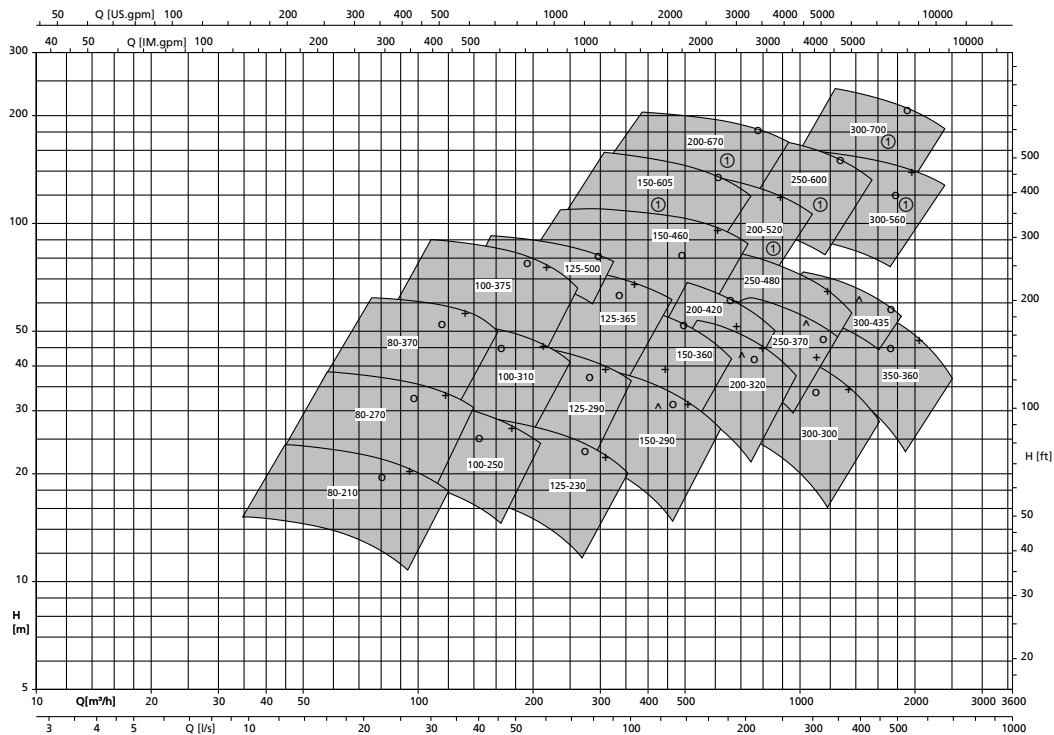
n = 3500 rpm



+ =  $\eta_{opt}$  A - impeller / o =  $\eta_{opt}$  B - impeller / ^ =  $\eta_{opt}$  C - impeller

Omega / Omega V, 60 Hz, n = 1750 rpm

n = 1750 rpm



+ =  $\eta_{opt}$  A - impeller / o =  $\eta_{opt}$  B - impeller / ^ =  $\eta_{opt}$  C - impeller  
⊙: Pump casing with double volute

**Types of installation**

**Fig. 0**

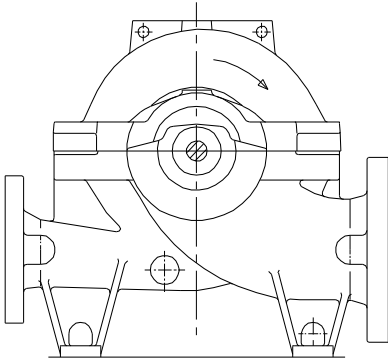


Fig. 0: Bare shaft pump

**Options of installation parts:**

- None

**Coupling options:**

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling (on request)

**Coupling guard options:**

- Light-duty design, not tread-proof

**Delivery / transport:**

- Pump

- Torsion-resistant flexible disc coupling with spacer<sup>36)</sup>

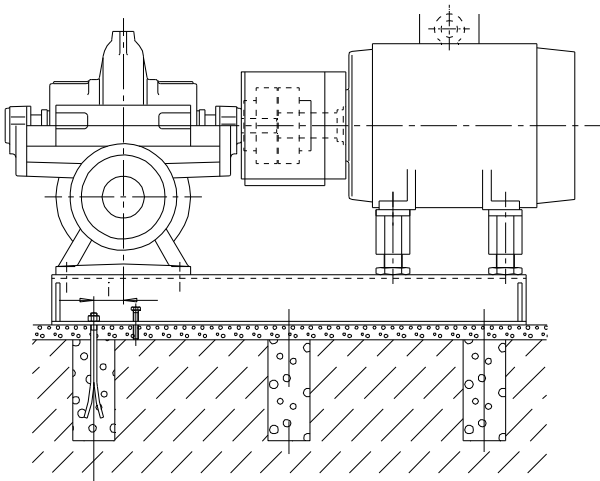
**Coupling guard options:**

- Light-duty design, not tread-proof
- Heavy-duty, tread-proof design (on request)

**Delivery/transport:**

- Up to motor size  $\leq$  IEC 280M or NEMA 444/5T or a max. total weight  $\leq$  1500 kg [3307 lbs] pump and motor are supplied on the base frame.
- With a motor size  $>$  IEC 280M or NEMA 444/5T or a max. total weight  $>$  1500 kg [3307 lbs] pump, motor and base frame are supplied as separate units.

**3E**



3E: Pump and motor on a common base frame

**Options of installation parts:**

- Base frame for pump and motor including foundation bolts
- Special base frame for pump and motor including foundation bolts<sup>35)</sup>

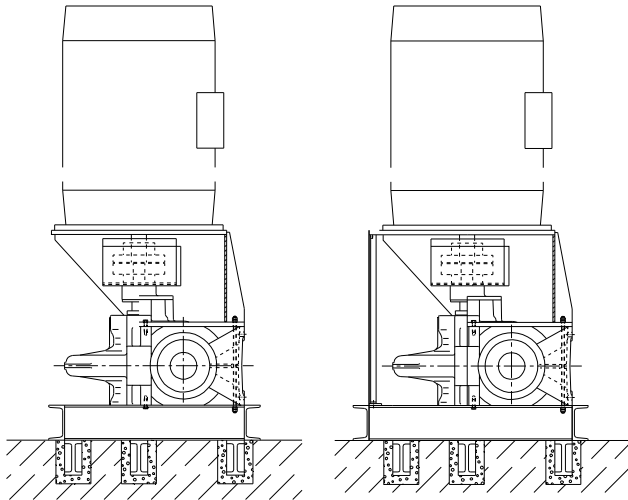
**Coupling options:**

- Torsionally flexible 3-piece jaw coupling

<sup>35)</sup> On request only; for motors  $>$  IEC 280M or NEMA 444/5T or outside KSB standard as well as for other customer-specific versions, special base frame for transporting pump sets with motors  $>$  IEC 280M or NEMA 444/5T

<sup>36)</sup> On request only; special base frame required

**DB/DK**



DB installation

DK installation

DB/DK: motor mounted on the drive lantern

**Options of installation parts:**

- Pump foundation including foundation blocks and motor pedestal
- Pump foundation including foundation blocks and special motor pedestal<sup>37)</sup>

**Coupling options:**

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling with spacer<sup>37)</sup>

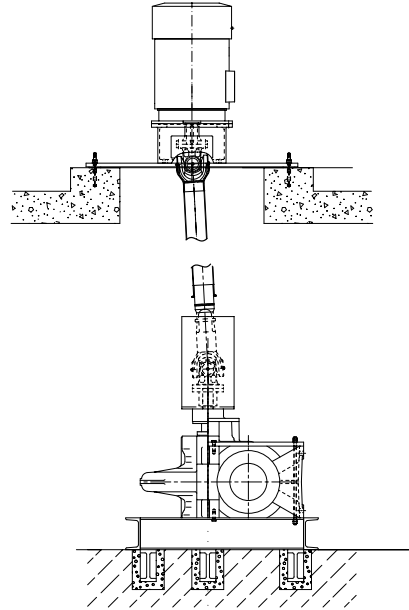
**Coupling guard options:**

- Light-duty design, not tread-proof

**Delivery/transport:**

- Pump supplied on pump foundation with drive lantern mounted. The motor is supplied separately.

**DJ**



DJ: Pump and motor on separate levels

**Options of installation parts:**

- Pump foundation (foot) including foundation blocks
- Pump foundation (foot) including foundation blocks, motor support frame, foundation rails and foundation bolts (on request)

**Coupling options:**

- Cardan shaft with/without intermediate bearing (on request)
- Coupling with spacer (on request)

**Coupling guard options:**

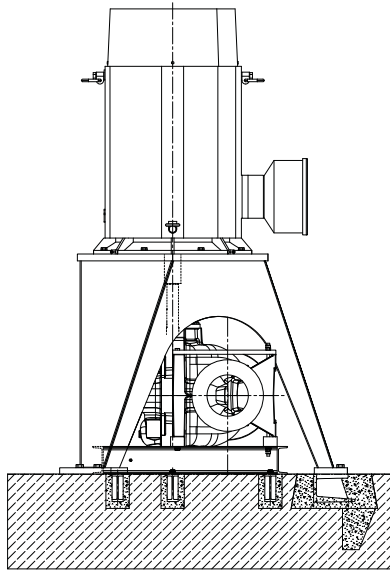
- Light-duty design, not tread-proof

**Delivery/transport:**

- Pump on corresponding pump foot. Motor and motor support frame are supplied separately.

<sup>37)</sup> On request only; for motors > IEC 280M or NEMA 444/5T or outside KSB standard as well as for other customer-specific versions, special motor pedestal for motors > IEC 280M or NEMA 444/5T

DP



DP: Motor mounted on separate drive lantern

**Options of installation parts:**

- Base frame for pump (foot) incl. foundation bolts and drive lantern (incl. foundation rails and foundation bolts)

**Coupling options:**

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling with spacer<sup>38)</sup>

**Coupling guard options:**

- Light-duty design, not tread-proof

**Delivery/transport:**

- Pump with base frame (foot). Motor and drive lantern (individual components) are supplied separately.

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<sup>38)</sup> On request only: for motors > IEC 280M and motors outside KSB standard as well as for other customer-specific versions, special motor pedestal for motors > IEC 280M

## Scope of supply

### Omega (standard design)

- Bare shaft pump (without accessories)
- With casing wear rings
- Shaft sealed by gland packing
- Grease-packed rolling element bearings
- Barrier/flushing water line made of flexible material, without cyclone separator
- KSB standard coating for indoor installation
- 2 operating manuals (EU languages)

### Omega V (standard design)

- Bare shaft pump (without accessories, with pump foundation)
- With casing wear rings
- Shaft sealed by gland packing
- One grease-lubricated and one product-lubricated bearing
- Barrier and flushing water line made of flexible material, without cyclone separator
- KSB standard coating for indoor installation
- 2 operating manuals (EU languages)

### Components for completing the pump set:

- For horizontal installation: baseplate / base frame for pump and motor (including foundation bolts)
- For vertical installation: drive lantern and foot (including support feet and foundation bolts, depending on the motor size)
- Motor
- Coupling and coupling guard

### Accessories:

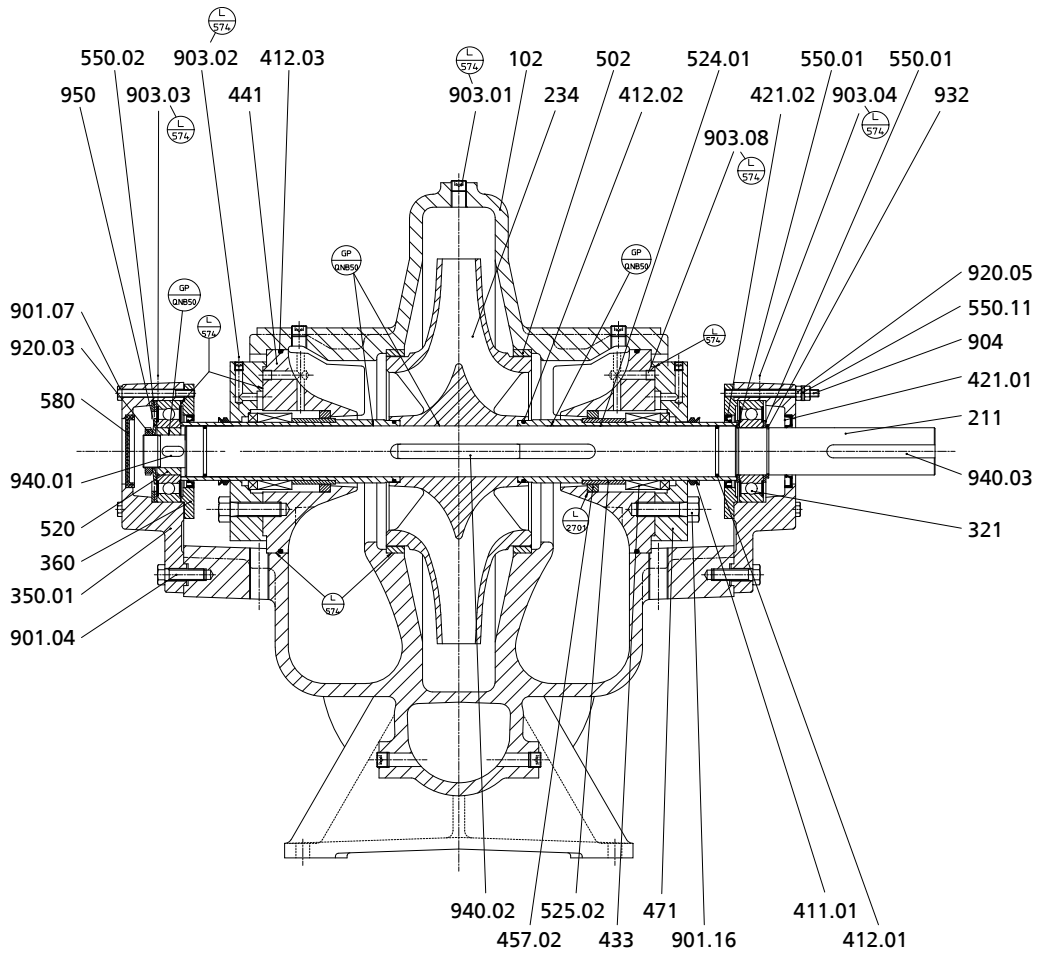
- Barrier/flushing water line with cyclone separator
- Vent valves and/or drain valves
- Pressure gages
- Temperature sensor for rolling element bearings (PT100)
- Limit switch or transmitter for PT100
- PumpMeter
- SPM nipple or vibration monitoring device

### Shipment/transport and packaging

After the pump sets have been completely assembled at the factory to be adapted to the specific requirements, they are partly dismantled again for shipment. The assembly status a pump set is supplied in depends on the type of pump set, its dimensions and its weight. Pump, baseplate / base frame and motor are supplied ex works without packaging. On request, a variety of packaging options can be provided against a surcharge. More information (⇒ Page 19) .

General assembly drawing with list of components

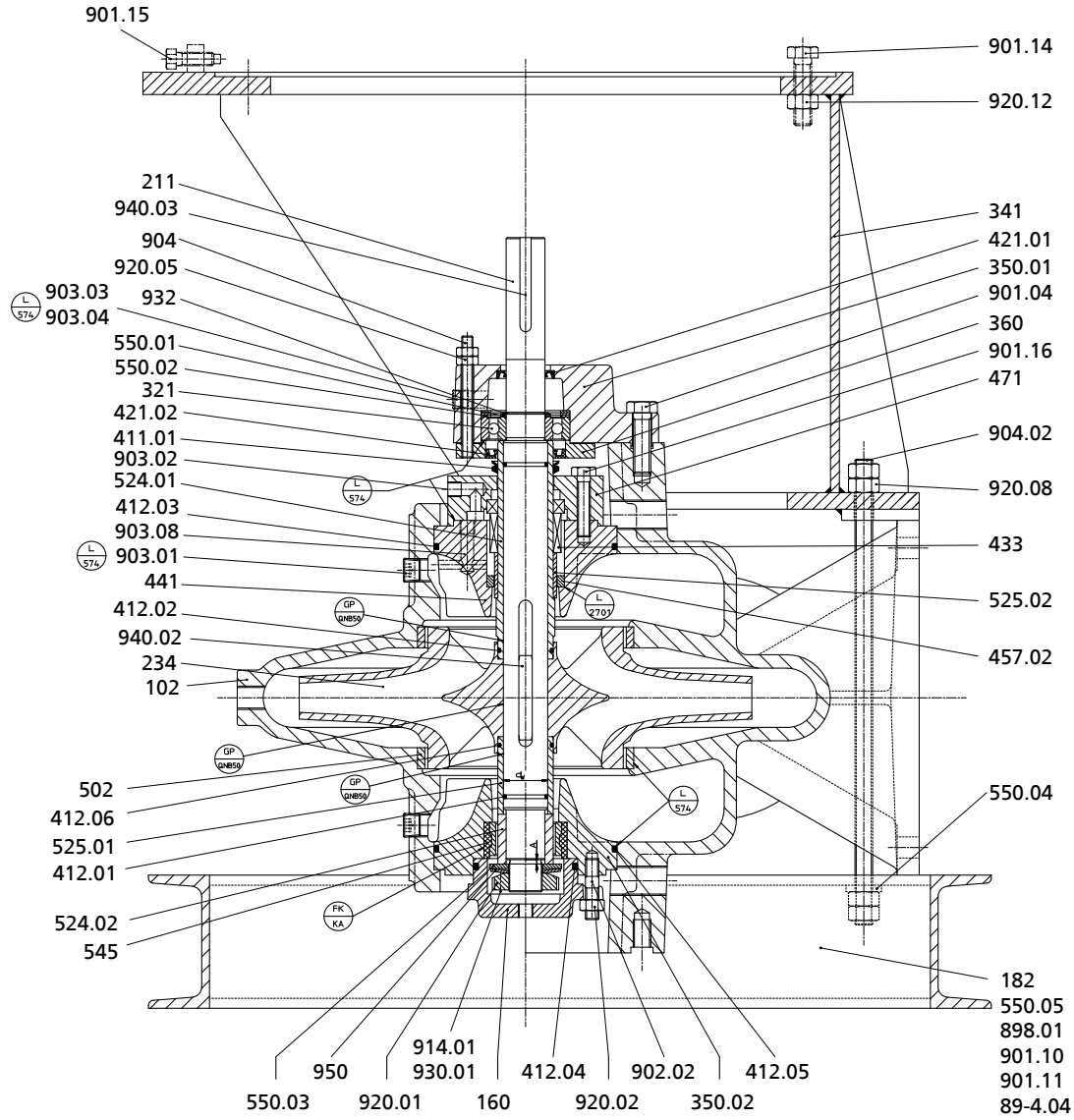
Horizontal installation (example)



List of components

Part No.	Description	Part No.	Description
102	Volute casing	502	Casing wear ring
211	Pump shaft	503	Impeller wear ring
234	Impeller	520	Sleeve
321	Radial ball bearing	524.01	Shaft protecting sleeve
350.01	Bearing housing	525.02	Spacer sleeve
360	Bearing cover	550.01/.02/.11	Disc
411.01	Joint ring	561.01/.02	Grooved pin
412.01/.02/.03	O-ring	580	Cap
421.01/.02	Lip seal	901.01/.02/.03/.04/.7/.16	Hexagon head bolt
433	Mechanical seal	902.01	Stud
441	Shaft seal housing	903.01/.02/.03/.04/.08	Screw plug
452	Gland follower	904	Grub screw
455	Stuffing box insert	920.02/.03/.05	Nut
457.02	Neck ring	932	Circlip
458	Lantern ring	940.01/.02/.03	Key
461	Gland packing	950	Spring
471	Seal cover		

Vertical installation (example)



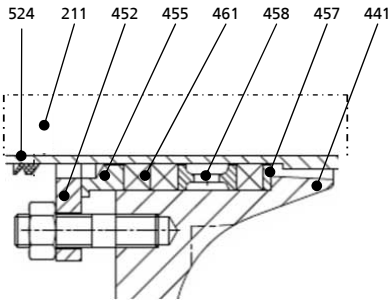
List of components

Part No.	Description	Part No.	Description
102	Volute casing	502	Casing wear ring
160	Cover	503	Impeller wear ring
182	Foot	524.01/.02	Shaft protecting sleeve
211	Pump shaft	525.01/.02	Spacer sleeve
234	Impeller	531.01	Locking sleeve
321	Radial ball bearing	545	Bearing bush
341	Drive lantern	550.01/.02/.03/.04/.05	Disc
350.01/.02	Bearing housing	561.01/.02/.04	Grooved pin
360	Bearing cover	89-4.04	Shim
411.01	Joint ring	898.01	Foundation block
412.01/.02/.03/.04/.05/.06	O-ring	901.01/.02/.03/.04/.10/.11/.12/.13/.14/.15/.16	Hexagon head bolt
421.01/.02	Lip seal	902.01/.02	Stud
433	Mechanical seal	903.01/.02/.03/.04/.08	Screw plug
441	Shaft seal housing	904.02	Grub screw
452	Gland follower	914.01	Hexagon socket head cap screw
455	Stuffing box insert	920.01/.02/.05/.08/.12	Nut
457.02	Neck ring	930.01	Safety device
458	Lantern ring	932	Circlip



Part No.	Description	Part No.	Description
461	Gland packing	940.02/03	Key
471	Seal cover	950	Spring

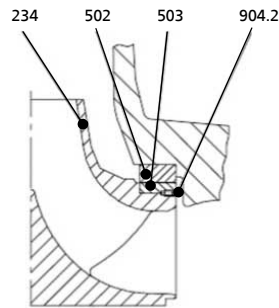
**Standard design: gland packing**



List of components

Part No.	Description
211	Pump shaft
441	Shaft seal housing
452	Gland follower
455	Stuffing box insert
457	Neck ring
458	Lantern ring
461	Packing rings
524	Shaft protecting sleeve

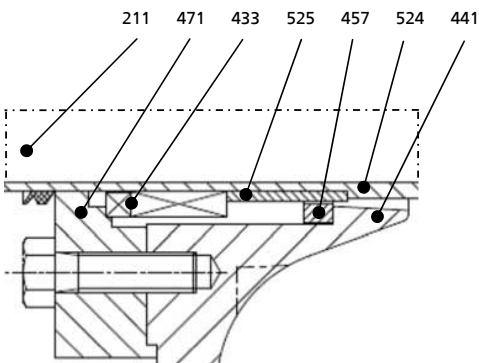
**Standard variant: impeller with impeller wear ring**



List of components

Part No.	Description
234	Double-entry impeller
502	Casing wear ring
503	Impeller wear ring
904.2	Grub screw

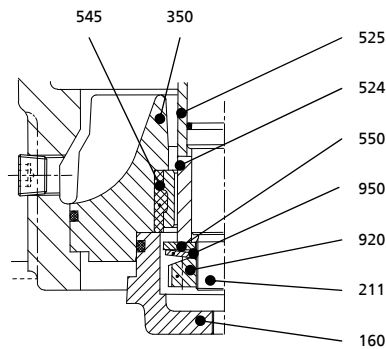
**Standard variant: mechanical seal (schematic)**



List of components

Part No.	Description
211	Pump shaft
433	Mechanical seal
441	Shaft seal housing
457	Neck ring
471	Seal cover
524	Shaft protecting sleeve
525	Spacer sleeve

**Standard design: product-lubricated bearing (Omega V)**



List of components

Part No.	Description
160	Cover
211	Pump shaft
350	Bearing housing
524	Shaft protecting sleeve
525	Spacer sleeve
545	Bearing bush
550	Disc
920	Nut
950	Disc spring



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