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APPLICATIONS

Used for general water supply duties and in industry as a boiler feed pump and condensate pump, and also in power water, fire-fighting and district heating installation for pumping of clean water.

CONSTRUCTION

Horizontal, radially split ring section pump, single flow, multistage. The casings are sealed by flat gaskets and held together by tie bolts. The stage casing and the tie bolts are encased in a steel cladding. The pump feet are arranged either below the pump or at centre line according to the number of stages and temperature.

BEARINGS

The bearings are located in two bearing housing which are adjusted at both sides of the pump. MMK pumps are fitted with a cylindrical rolled bearing at the suction end and with a deep groove ball bearing at the discharge end. On construction with heavy bearing housing matched angular contact ball bearings are fitted at the discharge end. On construction with heavy bearing housing matched angular contact ball bearings are fitted at the discharge side in X-arrangement.

On MML pump model, cylindrical rolled bearing are fitted on both ends.

BALANCING DEVICE

MMK Pumps are fitted with deep groove ball bearings or angular contact ball bearings which absorb the residual thrust by provision of balance holes drilled in the back shrouds of the impellers.

On MML Pumps the unbalanced axial thrust of the rotating assembly is absorbed by a hydraulic balancing device, consisting of balance disc and balance disc seat.

SHAFT SEAL

The shaft is fitted with renewable protecting sleeves in the region of the shaft seal. The uncooled packing stuffing box can be used for operating temperatures up to 105°C, above this figure, a cooled packing stuffing box is used, in which a supply of cooling water ensures that the temperature is kept within of stuffing boxes or mechanical seals can be fitted as required.

NOZZLE ORIENTATION

For arrangement "feet below the casing" the suction nozzle or the discharge nozzle re radial, pointing to the right or left hand side; to the top from 2 stages onwards. Arrangement "feet in centreline" only possible for casings of chrome steel or cast steel. In the case nozzle orientation only top, from 2 stages onwards.

FLANGES

Standard Construction :

Suction Flange : JIS10 kgf/cm²

Discharge Flange : JIS20 kgf/cm²

Special constructions of flanges according to ANSI, BS and other standards are available on request.

DRIVE

The drive is by direct couple electric motor, using a flexible coupling. The suction end is the drive end, and the direction of rotation is clockwise. The stub shaft is fitted at the discharge end (in this case the direction of rotation in anti clockwise) or the pump can be fitted with a stub shaft at each end.

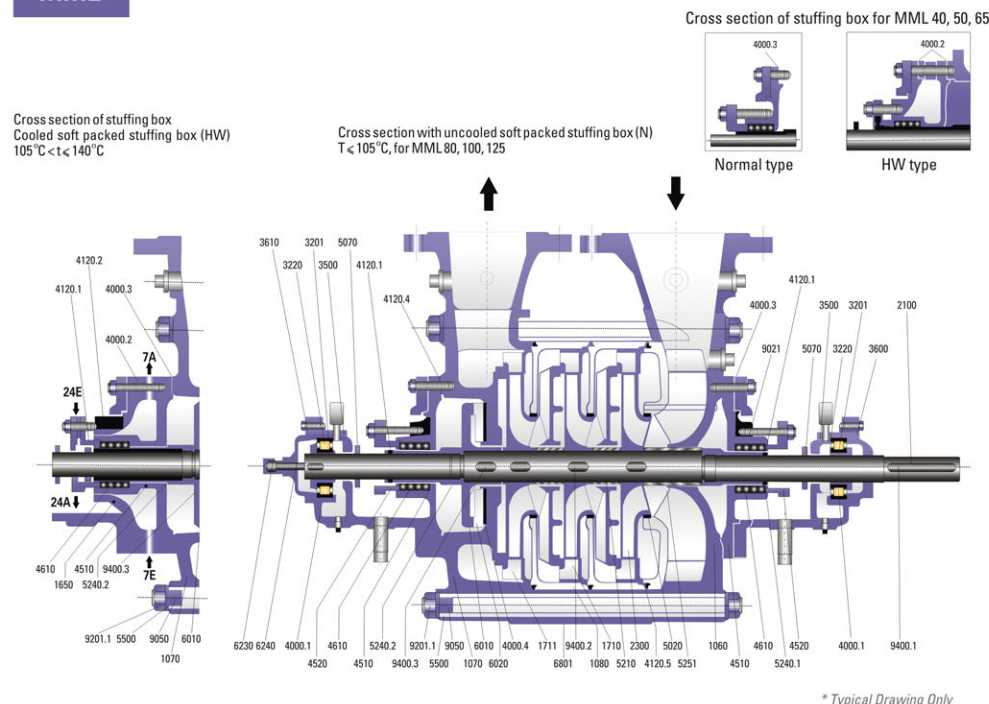
MATERIALS

The following materials are used for standard material combinations;

| | |
|--|-----------------------------|
| Suction, Discharge and Stuffing Box Casing | : FC250, BC6, SC450, FCD400 |
| Stage Casing | : FC250, BC6, SC450, FCD400 |
| Impellers and Diffusers | : FC250, BC6, SCS14, NiFC |
| Casing Wear Ring | : FC200, BC6, 2.5 NiFC |
| Shaft Protecting Sleeve | : FC200, BC6, SUS420J2 |
| Balancing Disc / Balance Disc Seat | : FC250, 13%Cr, 18%Cr |
| Shaft | : S45C, SUS420J2 |
| Tie Bolts | : S45C, SCM435 |

SECTIONAL DRAWINGS AND LIST OF COMPONENTS

MML



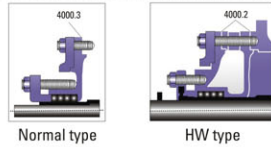
| PART NO. | DESIGNATION | PART NO. | DESIGNATION | PART NO. | DESIGNATION | PART NO. | DESIGNATION |
|----------|----------------------------|----------|----------------------|----------|--------------------------|----------|----------------------|
| 1060 | Suction Casing | 3610 | Bearing End Cover | 5020 | Casing Wearing Ring | 6801 | Cladding |
| 1070 | Discharge Casing | 4000.1 | Flat Gasket | | | 9021 | Gland Bolt |
| 1080 | Stage Casing | 4000.2 | Flat Gasket | 5070 | Deflector | 9050 | Tie Bolt |
| 1650 | Cooling Cover | 4000.3 | Flat Gasket | 5210 | Stage sleeve | 9201.1 | Hexagonal Nut |
| 1710 | Diffuser | 4000.4 | Flat Gasket | 5240.1 | Packing Sleeve | 9400.1 | Key |
| 1711 | Diffuser, Last Stage | 4120.1 | O-ring | 5240.2 | Packing Sleeve | 9400.2 | Key |
| 2100 | Shaft | 4120.2 | O-ring | 5251 | Spacer Sleeve | 9400.3 | Key |
| 2300 | Impeller | 4120.5 | O-ring | 5500 | Washer | 7E | Cooling Water Inlet |
| 3201 | Clamping Sleeve | 4510 | Stuffing Box Housing | 6010 | Balance Disc | 7A | Cooling Water Outlet |
| 3220 | Cylindrical Roller Bearing | 4520 | Stuffing Box Gland | 6020 | Balance Disc Seat | 24E | Quenching Inlet |
| 3500 | Bearing Hosing | 4610 | Stuffing Box Packing | 6230 | Rotor Position Indicator | 24A | Quenching Outlet |
| 3600 | Bearing Cover | | | 6240 | Pivot for Indicator | | |



SECTIONAL DRAWINGS AND LIST OF COMPONENTS

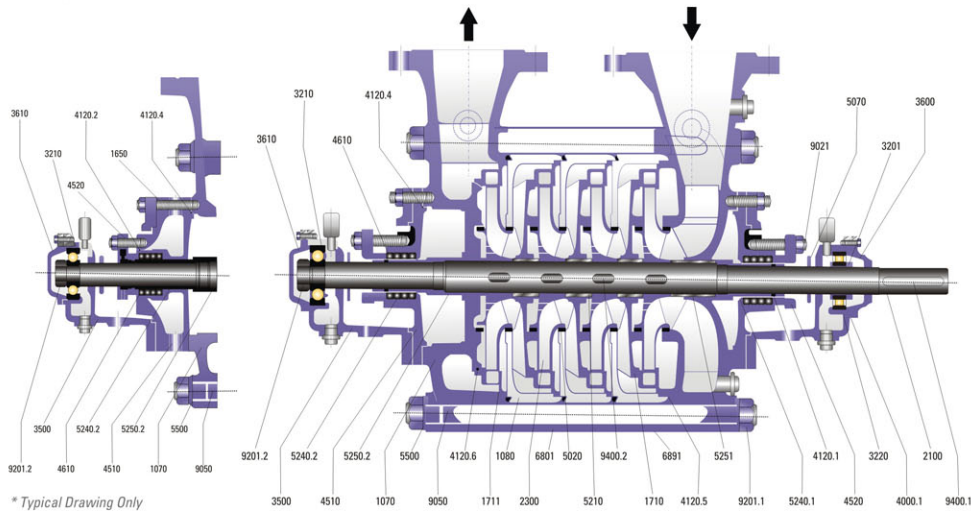
MMK

Cross section of stuffing box for MMK 40, 50, 65



Cross section of stuffing box
Cooled soft packed stuffing box (HW)
105°C < t < 140°C

Cross section with uncooled soft packed stuffing box (N)
T < 105°C, for MMK 80, 100, 125



* Typical Drawing Only

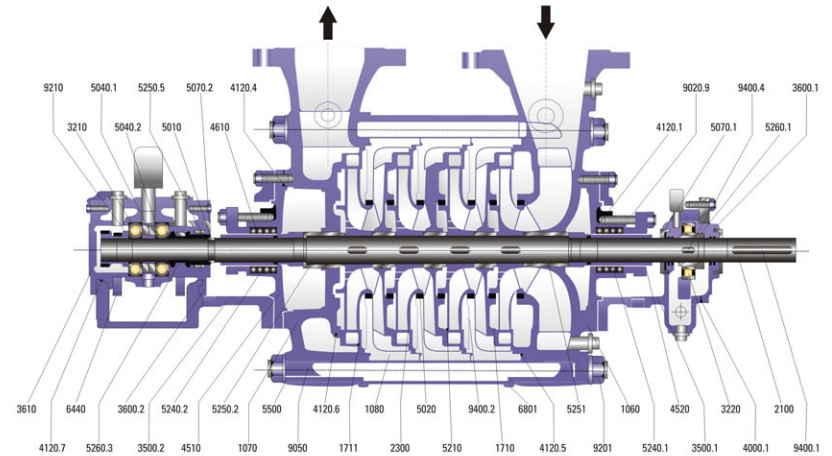
| PART NO. | DESIGNATION | PART NO. | DESIGNATION | PART NO. | DESIGNATION | PART NO. | DESIGNATION |
|----------|------------------|----------|-------------------|----------|-----------------|----------|----------------|
| 1070 | Discharge Casing | 3500 | Bearing Bracket | 4510 | Stuffing Box | 6801 | Gladding |
| 1060 | Suction Casing | 3600 | Bearing Cover | 4520 | Gland | 6891 | Strapping Band |
| 1080 | Stage Casing | 3610 | Bearing End Cover | 4610 | Gland Packing | 9021 | Gland Bolt |
| 1650 | Jacket | 4000.1 | Flat Gasket | 5020 | Casing Wearing | 9201.1 | Fine Hex-Nut |
| 1710 | Diffuser | 4000.2 | Flat Gasket | 5070 | Deflector | 9201.2 | Fine Hex-Nut |
| 1711 | Last Diffuser | 4000.3 | Flat Gasket | 5210 | Stage Sleeve | 9400.1 | Key |
| 2100 | Shaft | 4120.1 | O-ring | 5240.1 | Packing Sleeve | 9400.2 | Key |
| 2300 | Impeller | 4120.2 | O-ring | 5240.2 | Packing Sleeve | | |
| 3201 | Clamping Sleeve | 4120.4 | O-ring | 5250.2 | Distance Sleeve | | |
| 3210 | Ball Bearing | 4120.5 | O-ring | 5251 | Suction Sleeve | | |
| 3220 | Roller Bearing | 4120.6 | O-ring | 5500 | Washer | | |

SECTIONAL DRAWING AND LIST OF COMPONENTS

MMK

DOUBLE BEARINGS

Cross section with uncooled soft packed stuffing box (N)
T < 105°C, for MMK 80, 100, 125

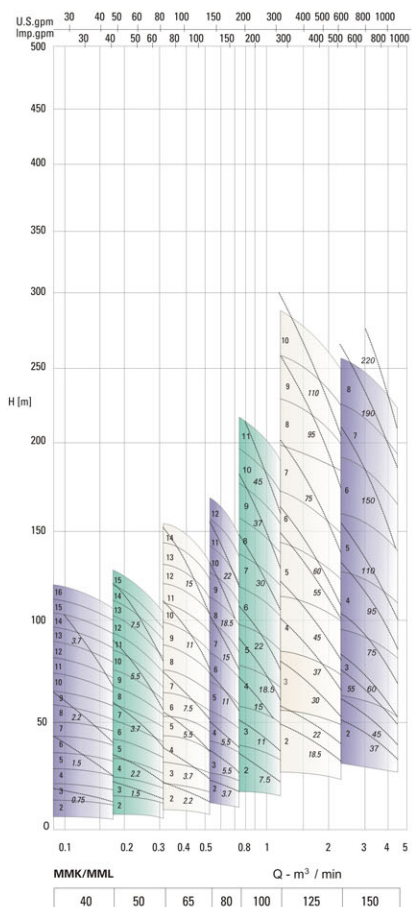


* Typical Drawing Only

| PART NO. | PART NAME | MATERIAL | PC | PART NO. | PART NAME | MATERIAL | PC |
|----------|----------------------|-------------|----|----------|---------------------|----------|----|
| 1060 | Suction Casing | | 1 | 5020 | Casing Wearing Ring | | |
| 1070 | Discharge Casing | | 1 | 5040.1 | Spacer Ring | FC200 | 1 |
| 1080 | Stage Casing | | | 5040.2 | Spacer Ring | FC200 | 1 |
| 1710 | Diffuser | | | 5070.1 | Deflector | SUS316 | 2 |
| 1711 | Diffuser, Last Stage | | 1 | 5070.2 | Deflector | SUS316 | 1 |
| 2100 | Shaft | | 1 | 5210 | Interstage Sleeve | | |
| 2300 | Impeller | | | 5240.1 | Packing Sleeve | | 1 |
| 3210 | Ball Bearing | No. 73 | 1 | 5240.2 | Packing Sleeve | | 1 |
| 3220 | Roller Bearing | NU C3 | 1 | 5250.2 | Spacer Sleeve | | 1 |
| 3500.1 | Bearing Bracket | FC200 | 1 | 5250.5 | Spacer Sleeve | FC200 | 1 |
| 3500.2 | Bearing Bracket | FC200 | 1 | 5251 | Suction Sleeve | | 1 |
| 3600.1 | Bearing Cover | FC200 | 1 | 5260.1 | Bearing Bushing | S45C | 1 |
| 3600.2 | Bearing Cover | FC200 | 1 | 5260.3 | Bearing Bushing | FC200 | 1 |
| 3610 | Bearing End Cover | FC200 | 1 | 5500 | Washer | SS400 | 16 |
| 4000.1 | Gasket | TOMBO 1995 | 1 | 6440 | Oil Ring | SS400 | 2 |
| 4120.1 | O-Ring | NBR70 | 2 | 6801 | Cladding | SPCC | 1 |
| 4120.4 | O-Ring | NBR70 | 2 | 9020.9 | Stud Bolt | SUS316 | 4 |
| 4120.5 | O-Ring | NBR70 | | 9050 | Tie Bolt | S45C | 8 |
| 4120.6 | O-Ring | NBR70 | 1 | 9201 | Hexagonal Nut | SS400 | 16 |
| 4120.7 | O-Ring | NBR70 | 2 | 9210 | Shaft Nut | S45C | 1 |
| 4510 | Stuffing Box Housing | | 2 | 9400.1 | Key | S45C | 1 |
| 4520 | Gland | | 2 | 9400.2 | Key | | |
| 4610 | Gland Packing | VALQUA 7202 | 8 | 9400.4 | Key | S45C | 1 |
| 5010 | Split Ring | SUS420J2 | 1 | | | | |

SELECTION CHART

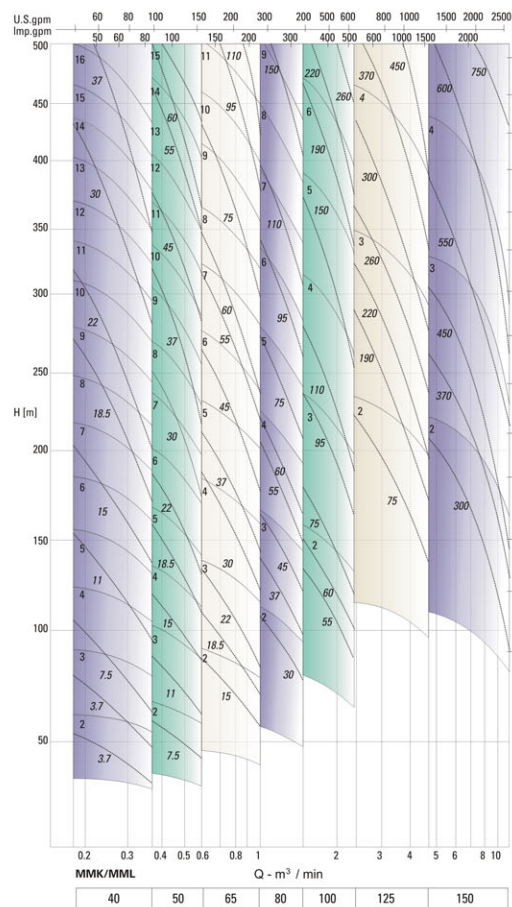
50Hz-4P (1500 r.p.m.)



On MML Pumps, the minimum delivery pressure should not be allowed to drop below 13 bar on account of the balancing device (possible damage to the balancing device).

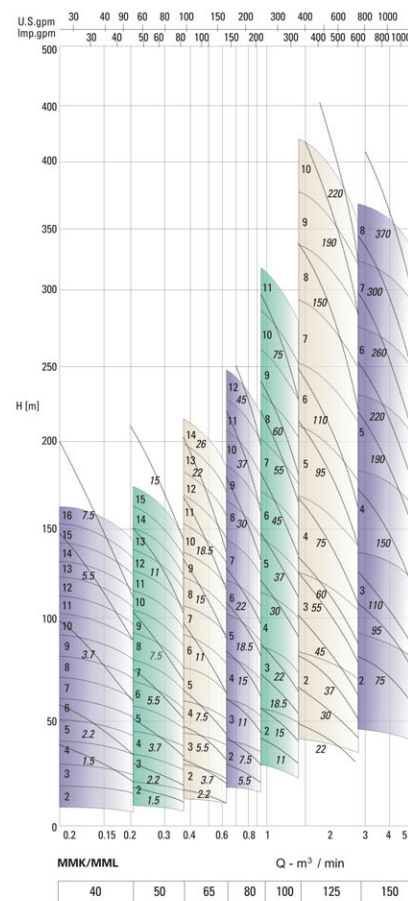
(———) Number of Stage
(- - - - -) Motor Ratings

50Hz-2P (3000 r.p.m.)



SELECTION CHART

60Hz-4P (1800 r.p.m.)



On MML Pumps, the minimum delivery pressure should not be allowed to drop below 13 bar on account of the balancing device (possible damage to the balancing device).

(———) Number of Stage
(- - - - -) Motor Ratings

60Hz-2P (3600 r.p.m.)

