

Applications for:

Fast Vessels WVS/WLS
Engine Rating up to 1,400 kW

Fast Vessels WVS/WLS
Engine Rating up to 5,000 kW

Fast Ferries VLJ
Engine Rating up to 13,200 kW

Work Boats WAF/LAF
Engine Rating up to 1,200 kW

Work Boats WAF/LAF
Engine Rating up to 8,500 kW

Work Boats 650-3,650 kW

WAF/LAF 665-1963

Work Boats VA
Engine Rating up to 6,000 kW

Work Boats DLG/DLGF
Engine Rating up to 15,000 kW

Work Boats SVA¹/SVAL²
Engine Rating¹ up to 20,000 kW
Engine Rating² up to 13,000 kW



Y O U R P A R T N E R F O R T H E F U T U R E

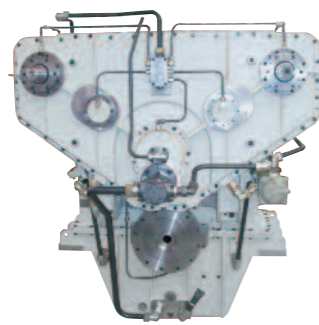


Applications for Work Boats

WAF/LAF 665 - 1963



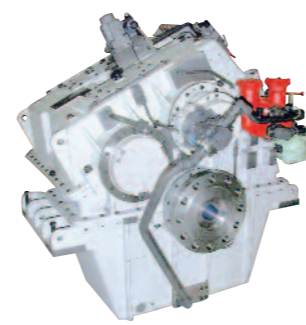
Reverse-reduction gearbox, vertically offset



Reduction gearbox with built-in clutch (Ptos for special application), vertically offset



Reverse-reduction gearbox, horizontally offset



Reduction gearbox with built-in clutch, vertically offset

Advantages

Gearboxes of the WAF and LAF series have been specially developed for work boats such as tugs, fishing vessels, inland waterway crafts, ferries and special-purpose ships with similarly high performance demands.

We have the backing of over 75 years of experience in marine gearbox production and use state-of-the-art computation tools and production technologies.

Owing to their design for specific areas of deployment, the hydraulically operated reverse-reduction gearboxes of the WAF series, as well as the reduction gearboxes of the LAF series offer various special advantages:

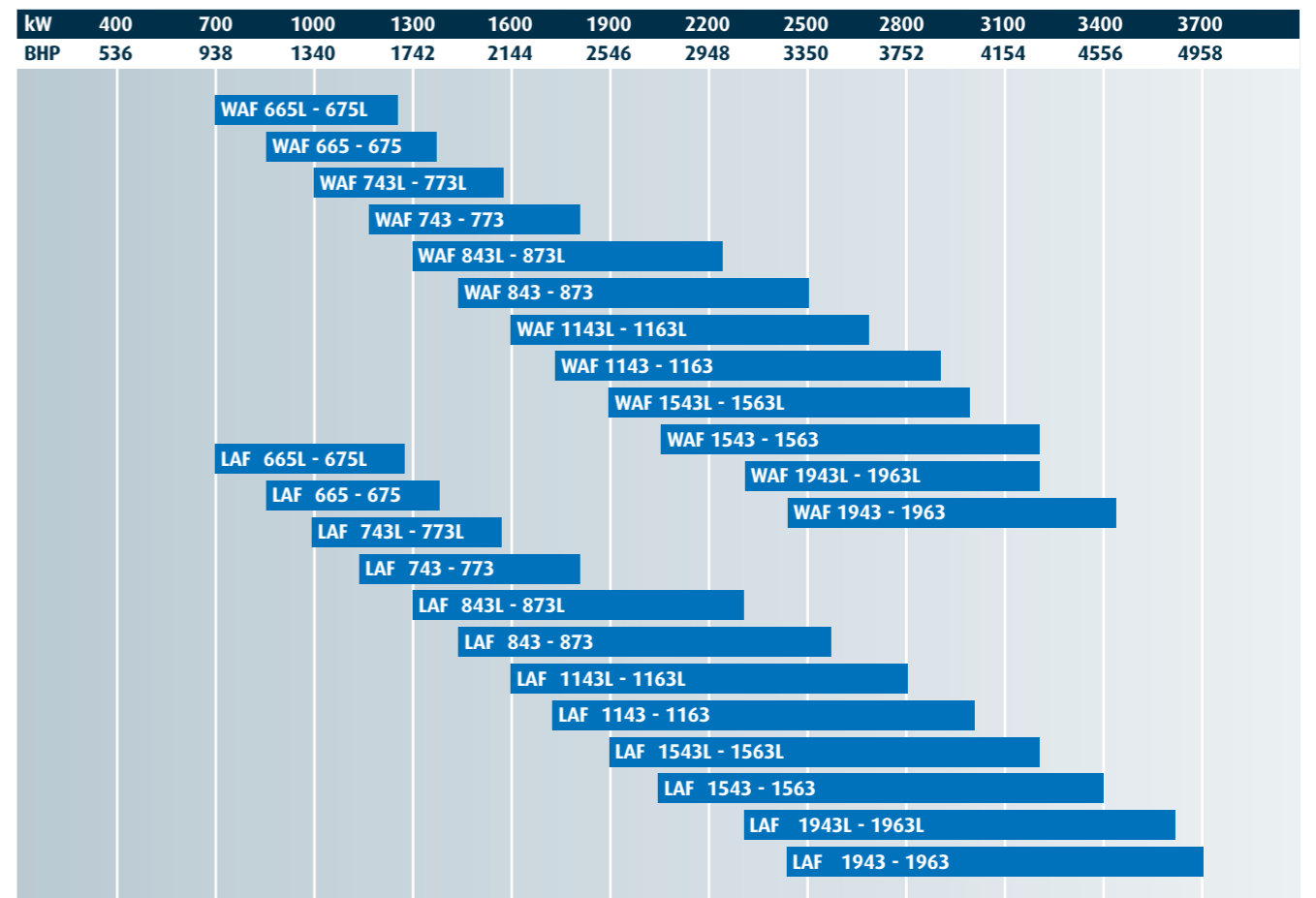
- High operating reliability
- Simple operation and maintenance
- Compact dimensions
- Low operating noise

Gearbox Selection

The selection diagram opposite gives an overview of the performance ratings of the basic WAF and LAF types.

However, for the final selection of gearboxes only the ratings of the applicable gearbox selection table are binding.

DESIGNED FOR HEAVY DUTY APPLICATIONS



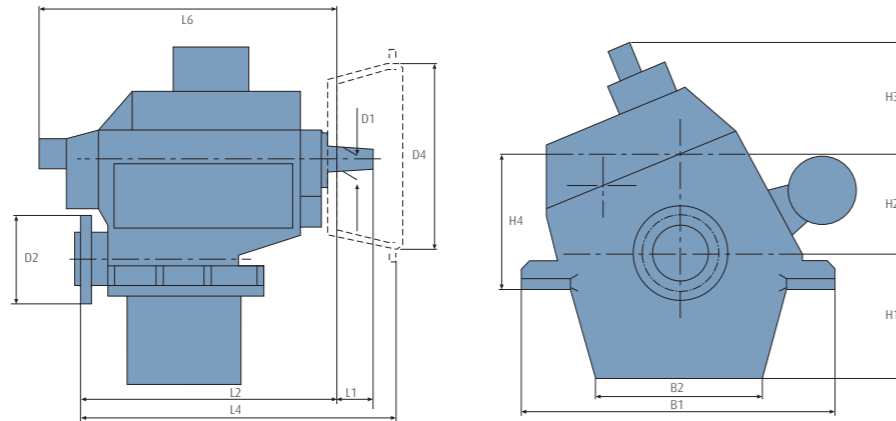


Marine gearboxes

WAF/LAF 665 - 1963

WAF/LAF 665 - 773

Reverse-reduction/
Reduction gearbox with
hydraulically operated
clutches.
Vertically offset

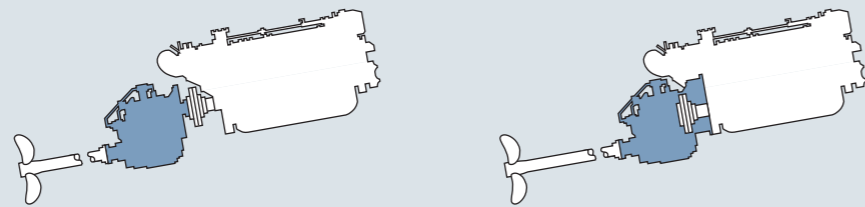


Gearbox WAF/ LAF	Main dimensions (mm)											Weight kg ¹⁾					
	B1	B2	D1	D2	D4 SAE 0	D4 SAE 00	H1	H2	H3	H4	L1	L2	L4 SAE 0	L4 SAE 00	L6	WAF	LAF
665	1160	430	85	420	647,7	787,4	490	430	540	560	101	881	1042	1042	1200	1950	1800
674	1480	830	82	375	647,7	787,4	620	550	550	680	101	860	1021	1021	1090	1800	1680
675	1480	650	85	420	647,7	787,4	610	550	540	680	101	892	1053	1053	1200	2600	2450
743	1160	610	92	350	-	787,4	490	380	550	510	107	933	-	1142	1190	1800	1600
763	1300	680	92	375	-	787,4	530	490	550	630	107	934	-	1143	1190	2300	2100
773	1670	790	92	420	-	787,4	680	620	550	760	107	951	-	-	1190	3200	3000

¹⁾ Gearbox standard design (dry). Dimensions and weights not strictly binding. Subject to changes.

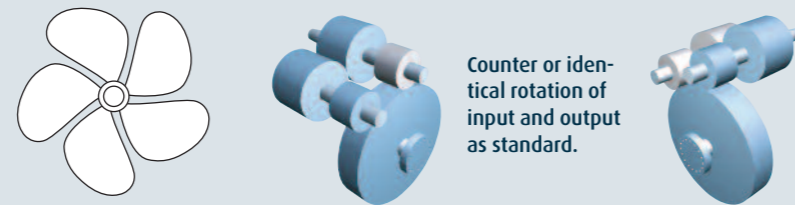
WAF series

Free-standing
Close-coupled



WAF series

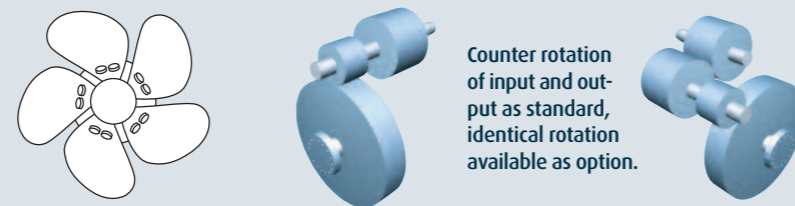
Reverse-reduction
gearbox for propulsion
with fixed pitch propeller



Counter or identical rotation of input and output as standard.

LAF series

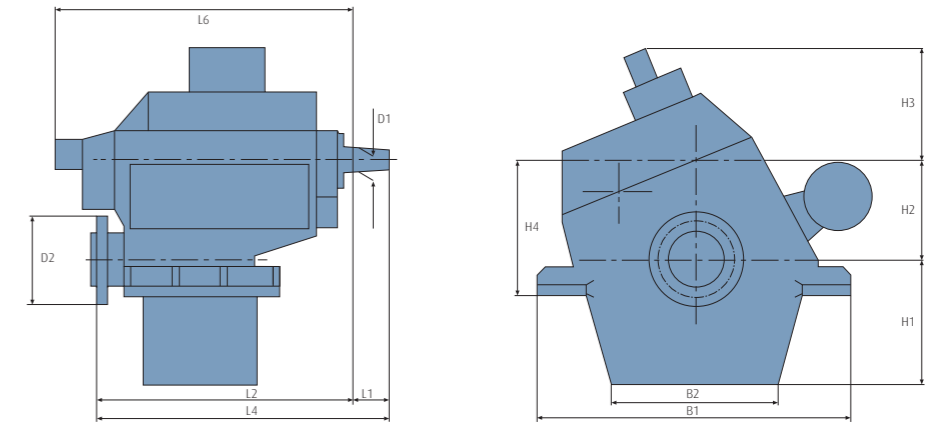
Reduction gearbox for
propulsion with controll-
able pitch propeller



Counter rotation of input and output as standard, identical rotation available as option.

WAF/LAF 843 - 1963

Reverse-reduction/
Reduction gearbox with
hydraulically operated
clutches.
Vertically offset

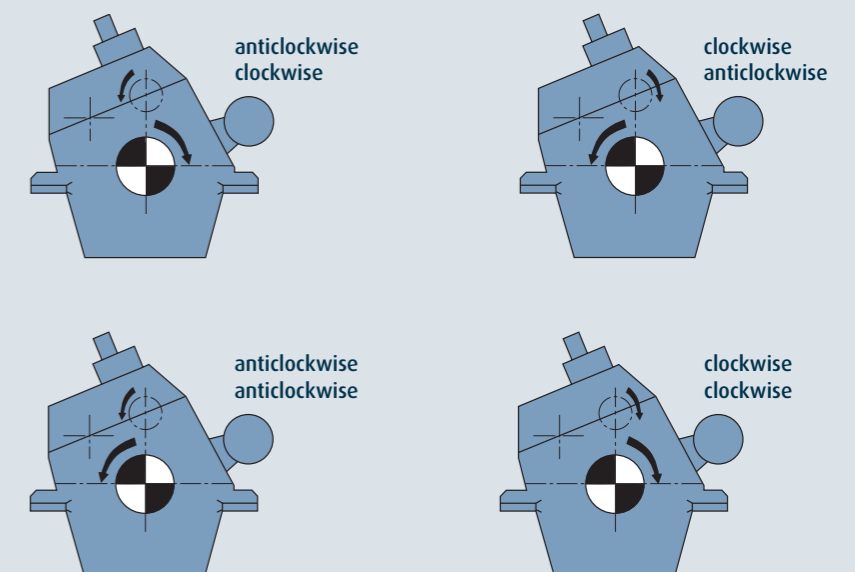


Gearbox WAF/ LAF	Main dimensions (mm)											Weight kg ¹⁾	
	B1	B2	D1	D2	H1	H2	H3	H4	L1	L2	L6	WAF	LAF
843	1300	680	107	375	530	425	550	565	123	970	1280	2300	2050
863	1400	705	107	420	590	540	550	690	123	1000	1280	3050	2300
873	1650	860	107	480	750	670	550	710	123	1030	1280	3100	2800
1143	1400	705	107	420	590	450	650	600	142	1053	1368	2750	2450
1163	1520	855	107	480	660	590	650	750	142	1085	1368	3600	3300
1173	*	*	*	*	*	*	*	*	*	*	*	4750	4400
1543	1520	855	117	480	660	490	650	650	154	1133	1413	3400	3000
1563	1620	925	117	550	675	630	650	790	154	1163	1413	4460	4000
1943	1620	925	127	550	675	485	600	645	162	1261	1556	4460	4060
1963	1680	970	127	600	720	675	600	845	162	1281	1556	5540	4940

¹⁾ Gearbox standard design (dry). Dimensions and weights not strictly binding. Subject to changes. * Dimensions on request.

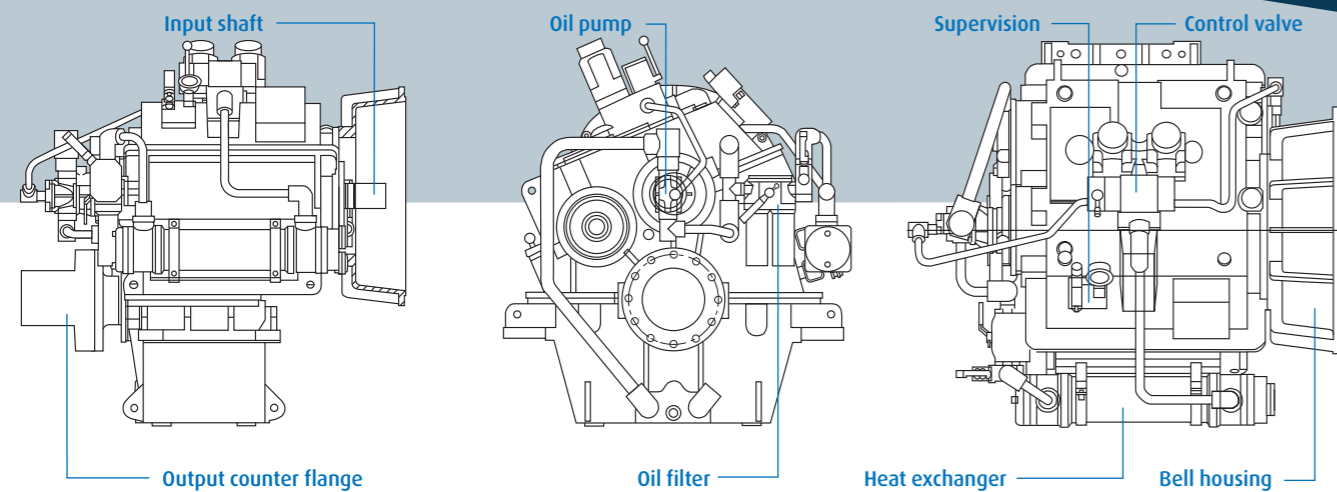
Direction of rotation WAF/LAF

Seen from propeller onto engine flywheel in direction of travel ahead





Standards WAF/LAF 665 -1963



O P T I O N S A N D F E A T U R E S



Basic Equipment

- Housing made from grey cast iron or steel
- Prepared for mounting of SAE-bell housings (WAF/LAF 664-763)
- Spur wheels helically toothed, case hardened and tooth flank ground
- Built-in hydraulically operated disc clutches with steel/sinter friction surface
- Smooth engagement by adapted pressure increase during shifting
- Full power transmission in both output senses of rotation

Scope of Supply

STANDARD

- Integrated oil sump. Common circuit for operating pressure and lube oil. Oil pump and oil filter accessible from the outside

- Fitted heat exchanger for cooling water inlet temperature of max. 32 °C, seawater resistant
- Connection facility for remote supervision of pressure and temperature
- Built-on control valve, electrically or pneumatically operated
- Emergency control: in case of failure of operating pressure the disc clutch can be locked mechanically
- Input: free shaft end with taper 1:30
- Output: forged-on-flange
- Supervision
 1. pressure switch – operating pressure too low
 2. thermometer – oil temperature behind heat exchanger
 3. filter contamination – electrical units 1.-3. wired to terminal box
 4. pressure gauge for operating oil pressure
 5. connection facility for pressure switch: clutch ahead/ clutch astern engaged

- Paint coating with synthetic resin varnish. Colour: RAL 7023 concrete grey

EXTRAS

- SAE-bell housing (WAF/LAF 664 – 763 only)
- Output counter flange
- Flexible coupling
- Supervision instruments
- PTO executions incl. SAE pads
- Spare part kit as per classification rules
- Paint coating with synthetic resin varnish in all RAL-colours
- Heat exchanger for cooling water inlet temperature higher than 32 °C
- Trolling valve
- Resilient mounting
- Special reduction ratios
- Connection facility for electrical stand-by or trailing pumps

Subject to changes

Duty Cycle Classification

CONTINUOUS DUTY



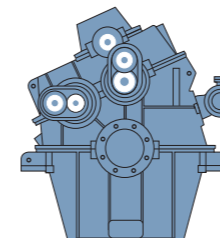
- Continuous operation with little or no variations in engine speed and power
- Average engine operating hours: unlimited
- Allowable hull forms: semi-displacement, displacement
- Allowable applications: commercial vessels

Other duty cycles on request.

Options

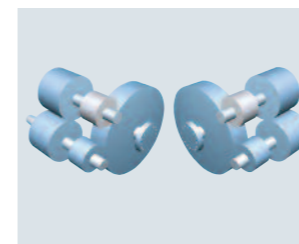
POWER TAKE OFF/IN

If required, the gearboxes can be fitted with additional power take off (PTO) and power take in (PTI) (application: hydraulic pumps and generators).



WAF/LAF SERIES

WAF/LAF gearboxes are also available in horizontally as well as in diagonally offset configuration.



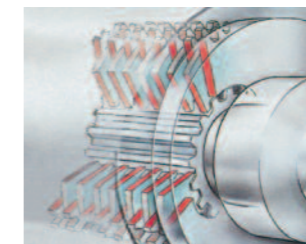
UNATTENDED MACHINERY SPACE

All gearboxes can be supplied with additional supervision instruments, according to classification society rules, enabling the operator to take all necessary information from the bridge.



SHAFT BRAKE

The gearboxes can be fitted with a hydraulically operated multiple disk brake built in for assisting with reversing manoeuvres or serving as fixing/stopping brake on twin-screw vessels.



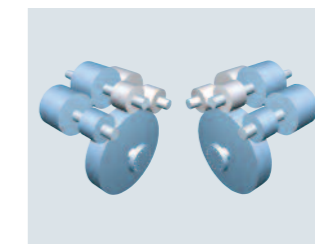
SERVO OIL SYSTEMS

Output shaft can be prepared with centre bore for all common CPP-systems, including interface for oil distributor box on the engine side. For free-standing applications only.



TWO-SPEED GEARBOXES

Two selectable gear ratios are provided between input and output shaft. This ensures optimal operation of the ship.



ADS (ACTIVE SPEED CONTROL SYSTEM) CLOSE LOOP OR CONTROLLED

The ADS is used for travelling at low propeller speeds. Speed is varied via the oil pressure in the clutch.

The ADS can be engaged in both AHEAD and ASTERN propulsion modes. Reversals with operative ADS are also possible at low ship speeds.

*IGS (INTELLIGENT GEARBOX SYSTEM)

Controlled pressure build-up for optimized gear shiftings and minimized drop in engine speed. Thermal monitoring of the clutch for optimized utilization of the thermal limiting value. Preset "back-up"-system to avoid any inadmissibly high drops in engine speed during manoeuvring in "back-up"-mode. Accumulator for mechanical gear shifting in case of voltage failure.

*Available only for modified version



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