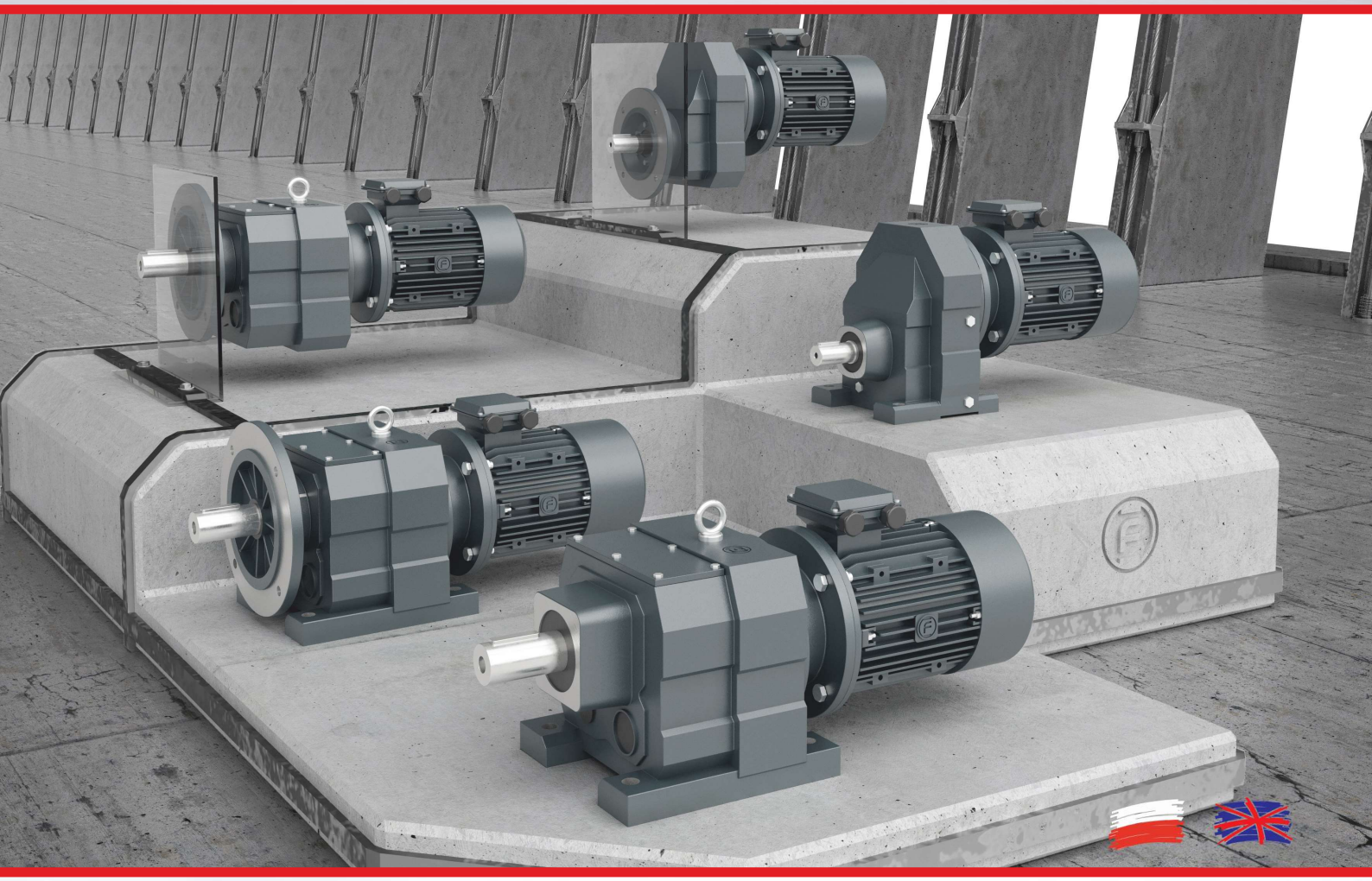
HF INVERTER®
drive solutions



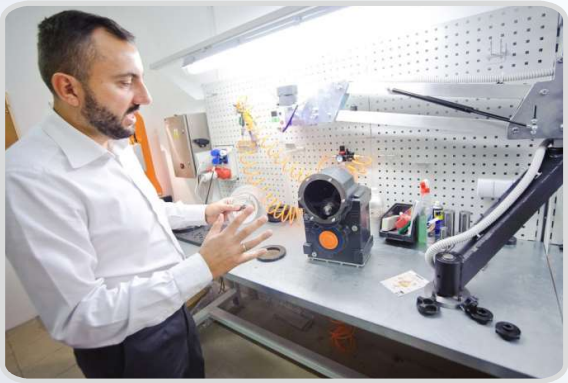
IRON-G MOTION

Motoreduktory walcowe żeliwne WHF
IRON Helical in-line gearmotors WHF

GREEN SOLUTIONS

ver. 01/2022

Montownia przekładni mechanicznych



W 2016 roku uruchomiliśmy linię montażową przekładni mechanicznych aluminiowych i żeliwnych. Montujemy przekładnie walcowe, walcowo-stożkowe, hipoidalne, ślimakowe i planetarne. Linia montażowa posiada wydajność do 500 sztuk przekładni miesięcznie. W ramach rozwoju przewidziane jest uruchomienie kolejnych linii montażowych. Montujemy przekładnie jednostkowe jak i wielkoseryjne. Istnieje również możliwość wykonania i montażu przekładni specjalnych, przygotowanych pod parametry określone przez klienta (dla ilości powyżej 500 sztuk rocznie). W naszej firmie funkcjonuje dział techniczny świadczący profesjonalną pomoc w zakresie doboru, montażu i serwisu przekładni mechanicznych.

Stale poszukujemy nowych rozwiązań, inwestujemy w rozwój naszych produktów i naszą firmę, wprowadzone systemy obsługi Klientów i przyjęta polityka jakości są gwarancją rzetelnej realizacji umów oraz ciągłego wzbogacania oferty w innowacyjne produkty.

Naszą firmę tworzy zespół wspaniałych ludzi, zaangażowanych w doradztwo techniczne, dobór urządzeń i świadczenie usług spełniających indywidualne wymagania naszych Klientów. Oferujemy koncepcję układu napędowego, wdrażamy go i zapewniamy wsparcie techniczne.

Gearmotors assembly line

In 2016, we launched an assembly line of aluminum and iron gearmotors. We assemble helical, helical-bevel, hypoid, worm and planetary gearmotors. The monthly capacity of the assembly line is up to 500 gearmotors units. We would like to develop further and launch other assembly lines.

We assemble single gearmotors as well as whole batches. There is a possibility to assemble a special gearmotor, prepared according to parameters provided by the customer (for more than 500 units annually). The technical department in our company is ready to provide professional support with the selection of gearmotors, their assembly and service.

We constantly pursue new solutions and we invest in the development of our products and company. The implemented Customer service systems and quality policy guarantee reliable realizations of contracts and constant improvement of our offer by introducing innovative products.

Our company is run by a team of wonderful people, involved in the technical support, selection support and providing services according to the individual needs of our Customers. We offer a concept of a drive train, we implement it and ensure technical support.

IRON-G MOTION

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Silniki indukcyjne **HMM**	Induction motors **HMM**	C1...

WHF-Lx3

WHF-Lx1

WHF-LKx3

WHF-Kx3

WHF-Kx1

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Informacje w tym katalogu są opatrzone symbolami w celu zrozumienia tematyki i danych. Te symbole mają na celu pomóc użytkownikowi w wyborze odpowiednich motoreduktorów.

General information

This catalogue supersedes any previous edition and revision. We reserve the right to implement modifications without notice. If you obtained this catalogue other than through controlled distribution channels, the most up to date content is not guaranteed. In this case the latest version is available on our web site www.hfinverter.com

Information in this catalogue is provided with symbols in order to understand the subject matter and data. These symbols are intended to aid the user in selecting the right gearmotors.

Prędkość wejściowa

n_1 [rpm]

Jest to prędkość wejściowa na przekładni związana z wybranym typem jednostki napędowej.
Jako standardową jednostkę napędową przyjęto silnik elektryczny asynchroniczny $n_1 = 1400$ rpm.

Gdy wymagane będą inne prędkości lub jednostki napędowe, skontaktuj się z naszym Działem Technicznym.

Input speed

This is the input speed at the gearbox related to the type of drive unit selected.
AC motor n_1 = 1400 rpm was adopted as the standard input drive unit.

When different speeds or input drive units are required, contact our Technical Department please.

Przełożenie

i =

Przełożenie jest podstawową wielkością charakteryzującą przekładnie. Jest to stosunek prędkości kątowej wału napędzającego ω_1 do prędkości kątowej wału napędzanego ω_2,według wzoru:

$$i = \frac{\omega_1}{\omega_2}$$

lub odpowiednio, jest to stosunek liczby obrotów w jednostce czasu, wału napędowego n_1 do liczby obrotów n_2 wału napędzanego, według wzoru:

$$i = \frac{n_1}{n_2}$$

Gear ratio

The gear ratio is the basic value that characterizes the gearboxs. It is the ratio of the angular speed of the driving shaft ω_1 to the angular speed of the driven shaft ω_2, according to the formula:

or respectively, the ratio of the number of rotations per unit of time of the drive shaft n_1 to the number of rotations n_2 of the driven shaft, according to the formula:

Prędkość wyjściowa

n_2 [rpm]

Jest to prędkość wyjściowa przekładni obliczona przy użyciu poniższego wzoru:

$$n_2 = \frac{n_1}{i}$$

Output speed

This is the gearbox output speed calculated using the formula given below:

Wyjściowy moment obrotowy — M_2 [Nm] — *Output torque*

Wyjściowy moment obrotowy to podstawowy parametr techniczny charakteryzujący przekładnie. Jest ściśle powiązany z mocą wejściową P_1 zainstalowanej jednostki napędowej, jej wyjściową prędkością obrotową n_1 i sprawnością dynamiczną Rd. Parametr ten można obliczyć za pomocą następującego wzoru:

This is the gearbox's output torque. It is strictly related to power P_1 of the motor installed, output rpm n_1 and dynamic efficiency Rd. It can be calculated with the following formula:

$$M_2 = \frac{9550 \cdot P_1 \cdot Rd}{n_2} \quad [Nm]$$

Sprawność — Rd ; Rs — *Efficiency*

Sprawność dynamiczna przekładni - Rd - jest określana przez producenta głównie w oparciu o tarcie w zazębieniach i łożyskach. Należy wziąć pod uwagę, że sprawność przekładni przy rozruchu jest mniejsza niż sprawność przy roboczej prędkości obrotowej. Szczególnie wyraźne jest to w motoreduktorach ślimakowych. Sprawności dynamiczne Rd przekładni będących w ofercie HF INVERTER® znajdują się w tabeli T1 na stronie A2.

The dynamic efficiency of the gear unit - Rd - is determined by the manufacturer mainly based on the friction in the gears and bearings. It must be taken into account that the gear unit efficiency at start-up is lower than the efficiency at operating speed. This is particularly true for worm gearmotors. The values of dynamic efficiency Rd of the gear unit is shown in Table T1.

Tabela T1 — Sprawność / *Efficiency* — *Table T1*

Typ / *Type*	1 Stopień / 1'st Stages	2 Stopień / 2'nd Stages	3 Stopień / 3'rd Stages
Przekładnie walcowe WHF-...3 *Helical in-line gearmotors WHF-...3*	n/d	97 %	96 %
Przekładnie walcowe WHF-...1 *Helical in-line gearmotors WHF-...1*	98 %	n/d	n/d

Należy również mieć na względzie wpływ czynników pracy przekładni na ich sprawność dynamiczną. Takimi czynnikami są: rodzaj środka smarnego, temperatura przekładni oraz prędkość obrotowa elementów napędowych.

The influence of the gear unit operating factors on the dynamic efficiency must also be considered. These factors include the type of lubricant, gear unit temperature and the rotational speed of the drive elements.

Sprawność przekładni określona została przez producenta przy ich obciążeniu znamionowym. Jednak w wielu maszynach obciążenie zmienia się podczas dobowego cyklu pracy, a tym samym przekładnia obciążana jest częściowo. Sprawność przy obciążeniu częściowym przekładni Rd_2 będzie miała wpływ na całkowity bilans energetyczny maszyny. Dla określenia sprawności przy obciążeniu częściowym przekładni Rd_2 należy wyliczyć stosunek obciążenia częściowego do znamionowego *x* oraz uwzględnić wartość zastępczego współczynnika strat biegu jałowego *s* - patrz tabela T2.

The efficiency of the gear unit has been determined by the manufacturer under rated load. However, in many machines, the load changes during the daily operating cycle and thus the gear unit is loaded partially. The efficiency under partial load of gear unit Rd2 will affect the overall energy balance of the machine. To determine the efficiency under partial load of gear unit Rd2, the ratio of partial load to rated x must be calculated and the value of the equivalent idle time loss factor s must be taken into account - see Table T2.

$$x = \frac{M_2'}{M_2}$$

M_2' - obciążenie częściowe przekładni [Nm]
M_2 - obciążenie znamionowe przekładni [Nm]

$$Rd_2 = \frac{1}{\frac{1}{Rd} + \frac{s}{x} - s}$$

Tabela T2	Współczynnik strat biegu jałowego *s* / *Idle loss factor* s		*Table T2*
Typ / *Type*	1 Stopień / 1'st Stages	2 Stopień / 2'nd Stages	3 Stopień / 3'rd Stages
Przekładnie walcowe WHF-...3 *Helical in-line gearmotors WHF-...3*	n/d	0.06	0.08
Przekładnie walcowe WHF-...1 *Helical in-line gearmotors WHF-...1*	0.04	n/d	n/d

Moc wyjściowa — P_2 [kW] — *Output power*

Aby określić uzyskaną moc wyjściową P_2 przekładni należy najpierw wyliczyć utratę mocy P_2s.

To determine output power P_2 of the gear unit, first power loss P_2s must be calculated.

$$P_2s = \frac{1 - Rd}{Rd} \cdot \frac{M_2 \cdot n_2}{9550} \quad [kW]$$

$$P_2 = P_1 - P_2s \ [kW]$$

Współczynnik pracy — fs — *Service factor*

Współczynnik pracy fs, zwany również współczynnikiem przeciążenia, uwzględnia z wystarczającą dokładnością wszystkie czynniki wpływające na żywotność motoreduktora i dlatego jest taki istotny podczas jego doboru do napędzanej maszyny.

Określenia warunków pracy wymaga od przyszłego użytkownika motoreduktora sprecyzowania:

- Klasy obciążenia - informująca o warunkach rozruchu i pracy napędzanego urządzenia/maszyny;
- Zastosowania - to szczegółowa informacja dotycząca użycia dobieranego motoreduktora w konkretnym procesie technologicznym;
- Ilości załączeń - informująca o przewidywanej liczbie uruchomień motoreduktora w trakcie jednej godzinie jego pracy;
- Dziennej ilości godzin pracy - informująca o planowanym dobowym czasie pracy motoreduktora.

Na potrzeby właściwego doboru współczynnika pracy *fs*, a tym samym poprawnego doboru motoreduktora, urządzenie napędzane należy przypisać do jednej z trzech klas obciążenia zgodnie z jego charakterystyką pracy.

Właściwy dla określonych warunków pracy współczynnik pracy fs można odczytać z wykresów na stronie A4 i A5.

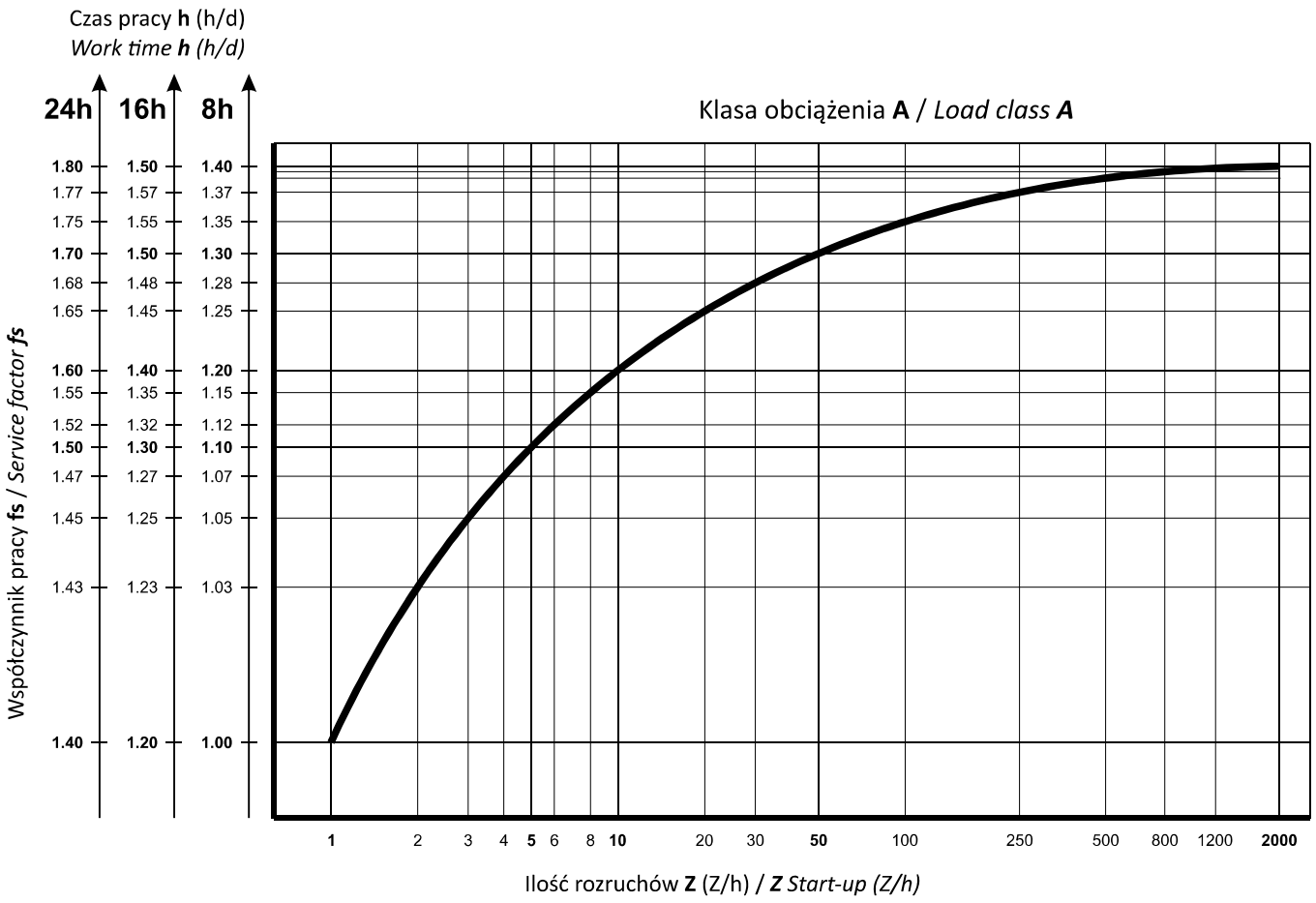
Service factor fs, also known as the overload factor, takes all factors affecting the service life of the gearmotor with sufficient accuracy into account and is therefore important when selecting it for the driven machine.

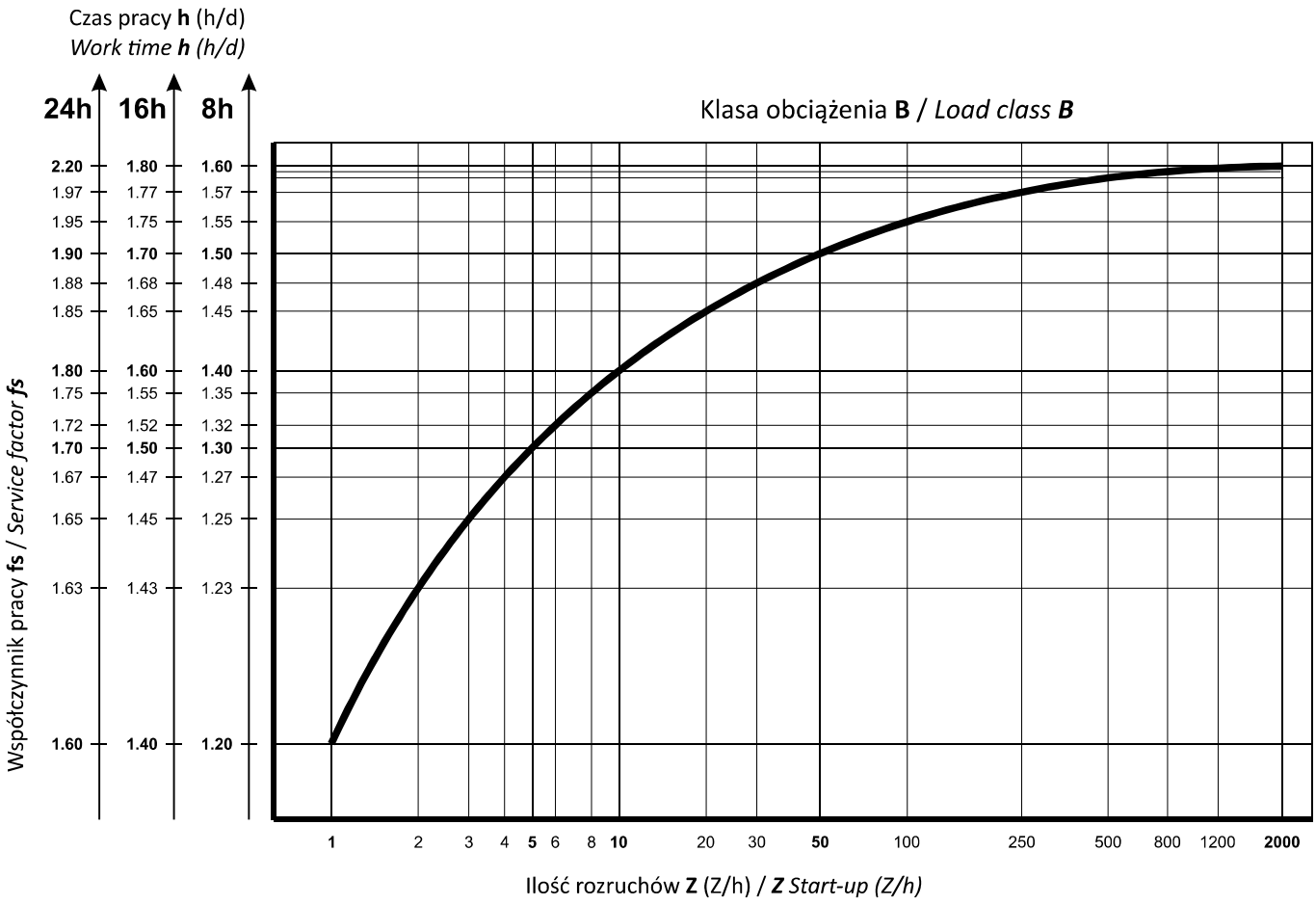
The determination of operating conditions requires the future user of the gearmotor to specify:

- *Load class - indicating the starting and operating conditions of the driven device/machine;*
- *Applications - this is detailed information on the use of the selected gearmotor in a specific technological process;*
- *Number of switching cycles - informing about the expected number of starts of the gearmotor during one hour of its operation;*
- *Daily working hours - informing about the planned daily working time of the gearmotor.*

For the purposes of proper selection of operating coefficient fs, and thus correct selection of the gearmotor, the driven device should be assigned to one of three load classes according to its operating characteristics.

Operating coefficient fs for specific conditions can be read from the graphs below - see on page A4 and A5.


Czas pracy **h** (h/d)
*Work time **h** (h/d)*
24h 16h 8h
Klasa obciążenia **A** / *Load class **A***
1.80 1.50 1.40
1.77 1.57 1.37
1.75 1.55 1.35
1.70 1.50 1.30
1.68 1.48 1.28
1.65 1.45 1.25
1.60 1.40 1.20
1.55 1.35 1.15
1.52 1.32 1.12
1.50 1.30 1.10
1.47 1.27 1.07
1.45 1.25 1.05
1.43 1.23 1.03
1.40 1.20 1.00
Współczynnik pracy **fs** / *Service factor **fs***
1 2 3 4 5 6 8 10 20 30 50 100 250 500 800 1200 2000
Ilość rozruchów **Z** (Z/h) / ***Z** Start-up (Z/h)*


Czas pracy **h** (h/d)
*Work time **h** (h/d)*
24h 16h 8h
Klasa obciążenia **B** / *Load class **B***
2.20 1.80 1.60
1.97 1.77 1.57
1.95 1.75 1.55
1.90 1.70 1.50
1.88 1.68 1.48
1.85 1.65 1.45
1.80 1.60 1.40
1.75 1.55 1.35
1.72 1.52 1.32
1.70 1.50 1.30
1.67 1.47 1.27
1.65 1.45 1.25
1.63 1.43 1.23
1.60 1.40 1.20
Współczynnik pracy **fs** / *Service factor **fs***
1 2 3 4 5 6 8 10 20 30 50 100 250 500 800 1200 2000
Ilość rozruchów **Z** (Z/h) / ***Z** Start-up (Z/h)*

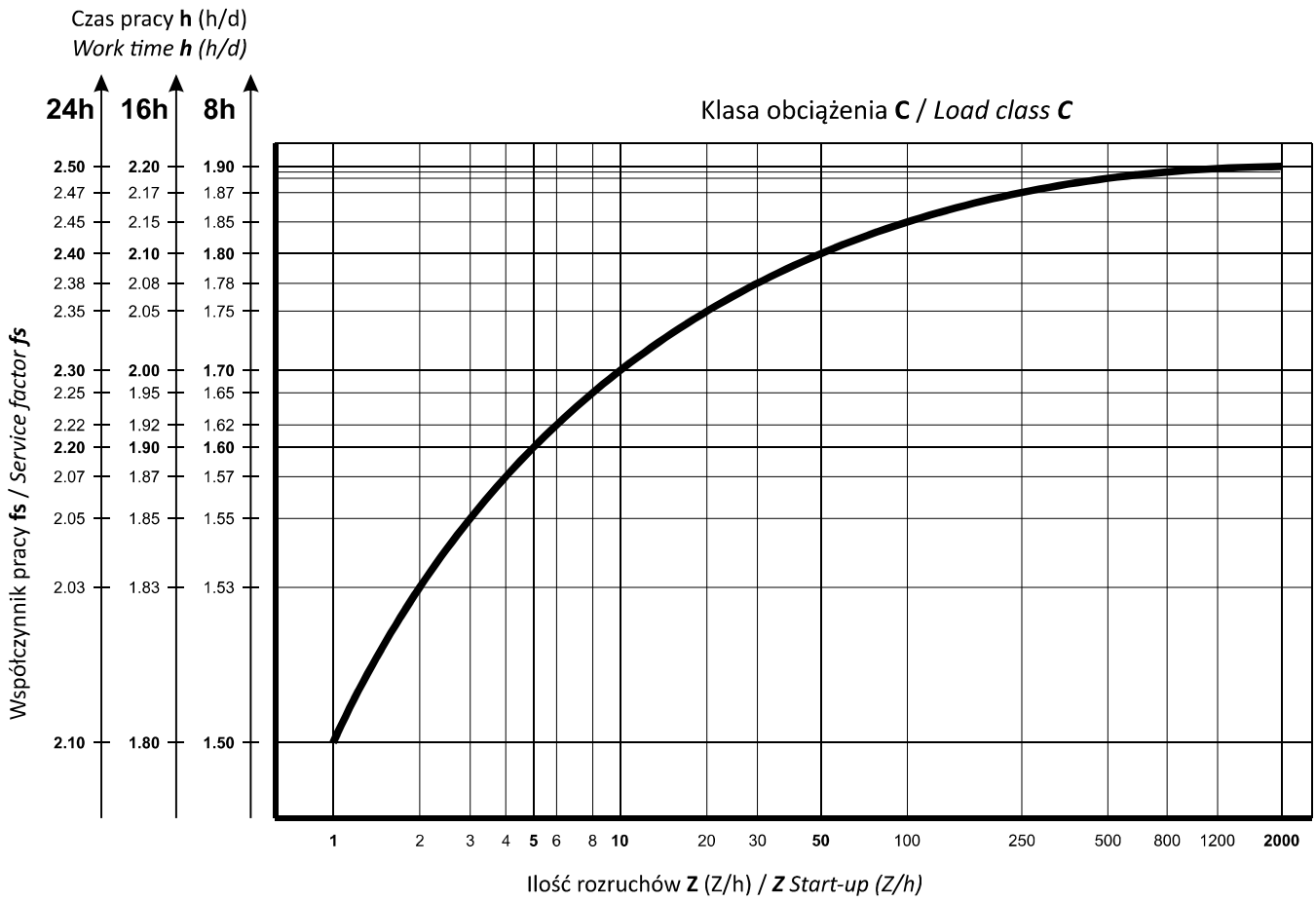


Tabela K_A	Współczynnik K_A dla przekładni / *Coefficient K_A for gearbox*			*Table K_A*
Typ maszyny roboczej *Type of work machine*	rodzaj silnika / *type of motor*			
	elektryczny *electric*	hydrauliczny *hydraulic*	spalinowy wielocylindrowy *multi-cylinder engine*	spalinowy jednocylindrowy *single-cylinder engine*
praca równomierna / *uniform work* generatory *(generators)*, przenośniki taśmowe *(belt conveyorus)*, wentylatory *(fans)* itp.. *(e.t.c.)*	**1.00**	**1.10**	**1.25**	**1.50**
nieznaczne przeciążenia / *slight overload* pompy *(pumps)*, sprężarki *(compressors)*, itp.. *(e.t.c.)*	**1.25**	**1.35**	**1.50**	**1.75**
średnie przeciążenia / *medium overload* obrabiarki *(CNC machine)*, suwnice *(cranes)*, itp.. *(e.t.c.)*	**1.50**	**1.60**	**1.75**	**2.00**
znaczne przeciążenia / *high overload* walcarki *(rolling mills)*, prasy *(press)*, itp.. *(e.t.c.)*	**1.75**	**1.85**	**>2.00**	**>2.25**

W każdym układzie napędowym można wyodrębnić trzy fazy jego pracy: rozruchu, pracy ustalonej i zatrzymania. Dla ustalenia wpływu odchyłu rzeczywistego obciążenia zewnętrznego od wartości nominalnej należy uwzględnić współczynnik K_A.
Zatem współczynnik K_A jest liczbą, przez którą należy pomnożyć obciążenie nominalne, aby otrzymać wartość obciążenia równoważnego, którego działanie na przekładnię wywiera podobne skutki jak obciążenie zewnętrzne rzeczywiste.

Each drive system can be divided into three phases of its operation: starting, steady operation and stopping. To determine the influence of the deviation of the actual external load from the nominal value, the K_A coefficient should be taken into account.
Thus, the K_A coefficient is the number by which the nominal load must be multiplied to obtain the value of the equivalent load, the action of which on the gearbox has a similar effect as the actual external load.

Klasyfikacja obciążeń

Obciążenia działające na motoreduktor podzielono na trzy klasy odpowiadające natężeniu mas wirujących *fa*.

Klasa A - obciążenie jednostajne - *fa* ≤ 0.2
lekkie przenośniki śrubowe, napęd taśm montażowych, lekkie przenośniki taśmowe, lekkie podnośniki, urządzenia do napełniania, maszyny czyszczące, urządzenia kontrolne, wentylatory osiowe, wentylatory promieniowe, dmuchawy (osiowe lub promieniowe), turbowentylatory, mieszadła do cieczy, lekkie wirówki, podajniki szpulowe, pompy wirowe do cieczy.

Klasa B - umiarkowane obciążenie udarowe - *fa* ≤ 3.0
pompy zębate, pompy wirowe do pół-cieczy, pompy wirowe wielostopniowe, pompy łopatkowe, pompy śrubowe, młyny, średniej wielkości mieszadła (do pół-cieczy), wciągarki, wyciągarki, mechanizmy podawania, podajniki, windy towarowe, gwinciarki, frezarki, przecinarki, giętarki, żłobiarki, zwijarki, wrota i drzwi przesuwne, zgarniacze, urządzenia pakujące, betoniarki, mechanizmy jezdne dźwignic, wentylatory wież chłodniczych, sprężarki śrubowe, turbo-kompresory, przenośniki płytowe, przenośniki zgrzebłowe, przenośniki łańcuchowe, przenośniki taśmowe (obciążenie częściowe), przenośniki kubełkowe, przenośniki rolkowe, przenośniki śrubowe i ślimakowe, podnośniki śrubowe.

Klasa C - wysokie obciążenie udarowe - *fa* ≤ 10
walcarki, duże mieszalniki, nożyce i nożyce krążkowe, prasy, wirówki, ciężkie wyciągarki i windy, kruszarki, młyny udarowe, prasy odśrodkowe, krawędziarki, bieżnie rolkowe, oczyszczarki bębnowe, rozdrabniacze, wibratory, sprężarki tłokowe, duże przenośniki taśmowe i przenośniki taśmowe z obciążeniem na całej długości przenośnika, pompy tłokowe, pompy jednośrubowe.

Przy wysokim współczynniku przyspieszenia masy *fa* > 10, dużym luzie w elementach przełożenia lub wysokich siłach poprzecznych mogą wystąpić współczynniki pracy *fs* > 1.8. W takim przypadku należy skonsultować się z doradcą technicznym firmy HF Inverter®.

Właściwy dobór motoreduktora z uwzględnieniem prawidłowo określonego współczynnika pracy *fs* znacząco wpływa na żywotność zastosowanego napędu.

Dzięki współczynnikowi pracy *fs* ≥ 1.0 motoreduktory i reduktory HF Inverter® oferują już na wstępie najwyższy stopień bezpieczeństwa i niezawodności w zakresie trwałości dla normalnych warunków pracy, tzn. gdy rzeczywisty moment wymagany przez urządzenie napędzane (M_2) idealnie pokrywa się z danymi katalogowymi, czyli $M_2 = M_2n$ - wyjątek: naturalne zużycie ślimacznicy w przekładniach ślimakowych.
Zależnie od okoliczności, współczynnik pracy *fs* nie jest porównywalny z danymi motoreduktorów i reduktorów innych producentów.

Load class

The loads acting on the gearmotor are divided into three classes corresponding to the intensity of rotating masses fa.

Class A - uniform load - fa ≤ 0.2
lightweight screw conveyors, assembly belt drive, lightweight belt conveyors, light elevators, filling machines, cleaning machines, inspection equipment, axial fans, radial fans, blowers (axial or radial), turbo fans, liquid mixers, light centrifuges, spool feeders, liquid centrifugal pumps.

Class B - moderate impact load - fa ≤ 3.0
gear pumps, half liquid centrifugal pumps, multistage centrifugal pumps, vane pumps, screw pumps, mills, medium mixers (up to half liquid), winches, winches, feeding mechanisms, feeders, freight elevators, bending machines, milling machines, cutters, bending machines, gougers, coilers, sliding gates and doors, scrapers, packaging equipment, concrete mixers, crane chassis, cooling tower fans, screw compressors, turbo-compressors, plate conveyors, scraper conveyors, chain conveyors, belt conveyors (partial load), bucket conveyors, roller conveyors, screw and worm conveyors.

Class C - high impact load - fa ≤ 10
rolling mills, large mixers, shears and roller cutters, presses, centrifuges, heavy winches and elevators, crushers, impact mills, centrifugal presses, benders, roller tracks, drum cleaners, shredders, vibrators, reciprocating compressors, large belt conveyors and belt conveyors with a load along the entire length of the conveyor, piston pumps, single screw pumps

With a high mass acceleration factor fa > 10, high backlash in the transmission elements or high lateral forces, operating factors fs > 1.8 may occur. In this case, please consult your technical advisor of HF Inverter®.

The correct selection of the gearmotor with respect to the correctly specified operating factor fs significantly affects the service life of the drive used.

With an operating factor fs ≥ 1.0, HF Inverter® reducers and gearmotors offer the highest degree of safety and reliability in terms of durability under normal operating conditions, i.e. when the actual torque required by the driven device (M_2) corresponds perfectly to the catalogue data, i.e. $M_2 = M_{2n}$ - exception: natural wear of the worm gear in worm drives.

Depending on the circumstances, operating coefficient fs is not comparable with the data for gearmotors and reducers of other manufacturers.

Współczynnik pracy fs - przykład doboru

Jeżeli moment katalogowy (M_2n) jest wyższy od rzeczywistego zapotrzebowania to obliczeniową wartość współczynnika pracy *fso* można wyznaczyć za pomocą poniższej zależności:

$$f_{so} = \frac{f_s \cdot M_2n}{M_2}$$

Jeżeli moc katalogowa (P_1n) jest wyższa od rzeczywistego zapotrzebowania to obliczeniową wartość współczynnika pracy *fso* można wyznaczyć za pomocą poniższej zależności:

$$f_{so} = \frac{f_s \cdot P_1n}{P_2}$$

Dobieramy motoreduktor do przenośnika taśmowego. Dla tego przenośnika taśmowego współczynnik mas wirujących fa = 2, stąd w klasyfikacji obciążeń znajduje się on w klasie B. Zapotrzebowanie na moment rzeczywisty M_2 = 100Nm oraz na moc P_2 = 0.75kW. Przenośnik załączany jest raz na dobę i pracuje on przez 8h dziennie. Ze względów konstrukcyjnych (montaż bezpośrednio na wale przenośnika taśmowego) dobrany został motoreduktor walcowy o parametrach nominalnych:
P_1n = 1.1kW / M_2n = 145Nm / fs = 0.9 / i = 19.35.
Typ motoreduktora: WHF-L23-P90B5-i19.35-M1-1.10-4
Z wykresu współczynnika pracy fs (str. A4) odczytujemy jego wartość, dla zadanych warunków pracy współczynnik ten wynosi fs = 1.20. Dlatego dobrany motoreduktor powinien posiadać współczynnik pracy o tej lub wyższej wartości. Natomiast wartość tego współczynnika dla dobranego motoreduktora wynosi fs=0.9, ale parametry nominalne dobranego motoreduktora są znacząco wyższe niż rzeczywiste zapotrzebowanie, stąd dla parametrów pracy dobranego motoreduktora współczynnik ten wynosi:

- z uwzględnieniem momentu obrotowego:

$$f_{so} = \frac{f_s \cdot M_2n}{M_2} = \frac{0.9 \cdot 145\ [Nm]}{100\ [Nm]} = 1.305$$

- z uwzględnieniem mocy:

$$f_{so} = \frac{f_s \cdot P_1n}{P_2} = \frac{0.9 \cdot 1.10\ [kW]}{0.75\ [kW]} = 1.320$$

Dla tej aplikacji dobrano właściwy motoreduktor pod względem współczynnika pracy, ponieważ został spełniony warunek:

$$fs \leq fso$$

Service factor fs - *example*

If the catalogue torque (M_{2n}) is higher than the actual demand, the calculation value of operating factor fs can be determined using the following dependence:

If the catalogue power (P_{1n}) is higher than the actual demand, the calculation value of operating factor fs can be determined using the following dependence:

We select a gearmotor for the conveyor belt. For this belt conveyor, coefficient of rotating masses fa = 2, hence it is in class B in the load classification. The actual torque requirement M_2 = 100Nm and the power requirement P_2 = 0.75kW. The conveyor is switched on once a day and operates for 8 hours a day. For constructional reasons (mounting directly on the belt conveyor shaft) a helical in-line gearmotor with nominal parameters was selected:
P_{1n} = 1.1kW / M_{2n} = 145Nm / fs = 0.9 / i = 19.35.
Type of gearmotor: WHF-L23-P90B5-i19.35-M1-1.10-4

From the graph of operating coefficient fs (p. A4), we read its value, for the given operating conditions this coefficient is fs = 1.20. Therefore, the selected gearmotor should have an operating coefficient of this or higher value. However, the value of this coefficient for the selected gearmotor is fs=0.9, but the nominal parameters of the selected gearmotor are significantly higher than the actual demand, so for the operating parameters of the selected gearmotor the coefficient is:

- *including torque:*

- *including power:*

For this application, the correct gearmotor was selected in terms of the operating factor because the condition was met:

$$fs \leq fso$$

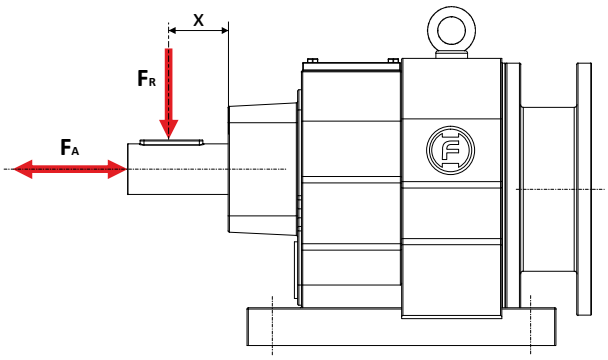
Siły poprzeczne i osiowe

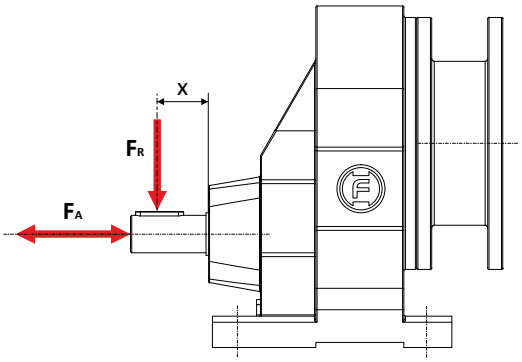
F_R ; F_A

Radial and axial load

Działanie siły poprzecznej i osiowej na wał przekładni definiowane jest w oparciu o poniższe rysunki.

The effect of radial and axial force on the gear shaft is defined based on the following figures.





F_A - dopuszczalna siła osiowa [N]
F_R - dopuszczalna siła poprzeczna w punkcie x [N]

F_A - admissible axial force [N]
F_R - admissible radial force at point x [N]

Dla określenia siły poprzecznej F_R działającej na wał przekładni, należy uwzględnić współczynnik f_z. Współczynnik f_z określony został w tabeli T3 i zależy od rodzaju części transmisyjnej zainstalowanej na wale przekładni.

To determine the radial force F_R acting on the gear shaft, the factor f_z must be taken into account. Coefficient f_z is specified in Table T3 and depends on the type of transmission part installed on the gear shaft.

Tabela T3 Współczynnik f_z dla elementu transmisyjnego / *Coefficient f_z in relation to type of transmission* *Table T3*

Typ elementu transmisyjnego / *Type of transmission*	Współczynnik f_z / *Coefficient f_z*	Uwagi / *Comments*
Koła zębate / *Gears*	1.00	≥ 17 zębów / *teeth*
	1.15	< 17 zębów / *teeth*
Koła łańcuchowe / *Chain sprockets*	1.00	≥ 20 zębów / *teeth*
	1.25	< 20 zębów / *teeth*
	1.40	< 13 zębów / *teeth*
Koło pasowe, pas klinowy / *V-belt pulleys*	1.75	z siłą naciągu / *twith tensile force*
Koło pasowe, pas płaski / *Flat belt pulleys*	2.50	z siłą naciągu / *twith tensile force*
Koło pasowe, pas zębaty / *Toothed belt pulleys*	2.50	z siłą naciągu / *twith tensile force*

Obciążenie poprzeczne działające na wał przekładni (lub silnika elektrycznego) obliczane jest z poniższego wzoru:

The radial load acting on the gear unit (or electric motor) shaft is calculated from the following formula:

$$F_R = \frac{M_d \cdot 2000}{d_0} \cdot f_z \quad [N]$$

F_R - siła poprzeczna działająca na wał [N]
M_d - moment obrotowy na wale [Nm]
d_0 - średnica zamontowanego elementu transmisyjnego
f_z - współczynnik dodatkowy (patrz tabela T3)

F_R - radial force acting on the shaft [N]
M_d - shaft torque [Nm]
d_0 - diameter of the installed transmission element
f_z - additional coefficient (see Table T3)

Dopuszczalna siła poprzeczna F_R wyznaczana jest m.in. na podstawie wymaganej trwałości łożysk. Nominalna żywotność łożysk L_{h10} określona jest zgodnie z normą ISO281. Dla specjalnych warunków pracy, żywotność łożysk może być obliczana bazując na procedurze obliczeń dla zmodyfikowanej trwałości L_{na}.

The admissible radial force F_R is determined, among others, by the required bearing life. Nominal life of L_{h10} bearings is determined according to ISO281. For special operating conditions, the bearing life can be calculated based on the calculation procedure for modified life L_{na}.

Wartości sił poprzecznych F_R określonych w katalogu odpowiadają punktom przyłożenia siły w połowie wału i są wartościami minimalnymi, stosowanymi dla najbardziej niekorzystnych warunków dla motoreduktora (pozycja montażowa, kąt siły i kierunek obrotów). Wartość ta dotyczy także wałów o średnicach w wykonaniu standardowym.

The values of lateral forces F_R specified in the catalogue correspond to the force application points in the middle of the shaft and are the minimum values used for the most unfavorable conditions for the gearmotor (mounting position, force angle and direction of rotation). *This value also applies to shafts with diameters in standard design.*

W przypadku działania siły poza środkiem długości wału, dopuszczalne siły poprzeczne należy obliczyć przy użyciu poniższego wzoru zawierającego wartości stałych przekładni. Wartości stałych przekładni posiadają różną wartość w zależności od typu przekładni, jej wielkości mechanicznej oraz średnicy wału.

If a force is applied outside the centre of the shaft length, the acceptable lateral forces must be calculated using the following dependence including fixed gear unit values. The fixed gear unit values have different values depending on the gear unit type, its mechanical size and shaft diameter.

$$F_{xL} = F_{Ra} \cdot \frac{a}{b + x} \quad [N]$$

F_{xL} - siła poprzeczna działająca poza środkiem długości wału przekładni (lub silnika elektrycznego) w zależności od żywotności łożysk [N]
F_{Ra} - dopuszczalna siła poprzeczna działająca dokładnie w środku wału przekładni (lub silnika elektrycznego) w wersji na łapach - wartość siły została określona przez producenta [N]
a - stała przekładni do obliczenia siły poprzecznej - patrz tabela na stronie A10 [mm]
b - stała przekładni do obliczenia siły poprzecznej - patrz tabela na stronie A10 [mm]
x - odległość od odsady wału do punktu działania siły [mm]

F_{xL} - lateral force acting outside the center of the gear unit (or electric motor) shaft length depending on the bearing life [N].
F_{Ra} - acceptable lateral force acting exactly in the centre of the gear unit (or electric motor) shaft in the foot-mounted version - the value of the load is specified by the manufacturer [N].
a - gearmotor constant for calculating the lateral force - see table [mm].
b - gearmotor constant for calculating the lateral force - see table [mm].
x - distance from the shaft offset to the force point [mm].

W katalogu podane są informacje na temat dopuszczalnych sił poprzecznych F_{Ra} dla wałów pełnych wejściowych i wyjściowych przekładni w wersji na łapach. W przypadku innych wersji należy skonsultować się z doradcą technicznym HF Inverter®.

The catalogue provides information on the permitted lateral forces F_{Ra} for solid input and output shafts of foot-mounted gear units. For other versions, please consult your technical advisor HF Inverter®.

Dla przekładni walcowych WHF w położeniu pracy M1 (B3) z mocowaniem czołowym (mocowanie kołnierzowe) dopuszczalna siła poprzeczna F_{Ra} nie może przekroczyć 50% siły poprzecznej wskazanej w tabeli.

For WHF helical gear units in the M1 (B3) mounting position with flange mounting, the admissible lateral force F_{Ra} must not exceed 50% of the lateral force indicated in table.

W przypadku mocowania przekładni w sposób inny niż przedstawiony w tym katalogu, dopuszczalna jest siła o wartości 50% siły poprzecznej F_{Ra} podanej w tabelach w tym katalogu.

If the gear unit is mounted in a manner other than that specified in this catalogue, a force of 50% of the lateral force F_{Ra} specified in the tables in this catalogue is admissible.

W przypadku przenoszenia momentu obrotowego za pośrednictwem mocowania kołnierzowego dopuszcza się maksymalnie 50% siły poprzecznej F_{Ra} podanej w tabelach w tym katalogu.

In the case of torque transmission via flange mounting, a maximum of 50% of lateral force F_{Ra} given in the tables in this catalogue is admissible.

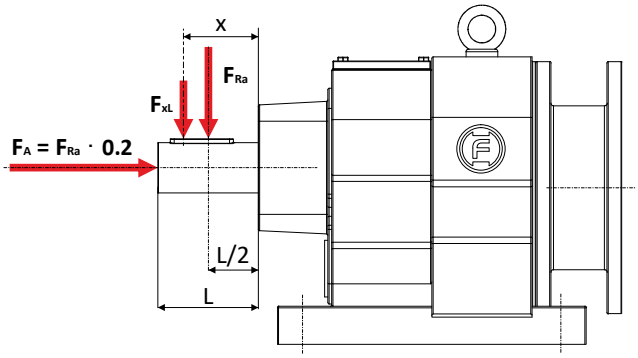
Siły poprzeczne i osiowe

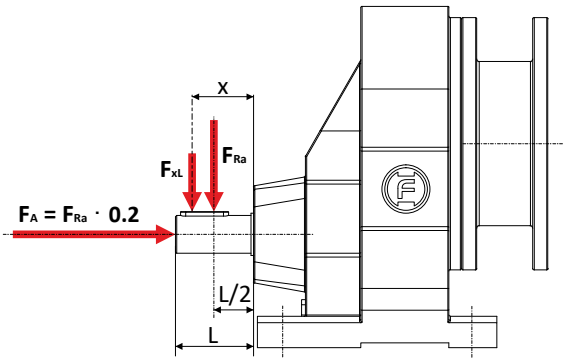
F_R ; F_A

Radial and axial load

Wartości stałych przekładni *a* i *b*, oraz maksymalna siła poprzeczna F_{Ra} dla przekładni walcowych WHF.

Values of fixed gear units a and b, and maximum lateral force F_{Ra} for WHF helical in-line gear units.





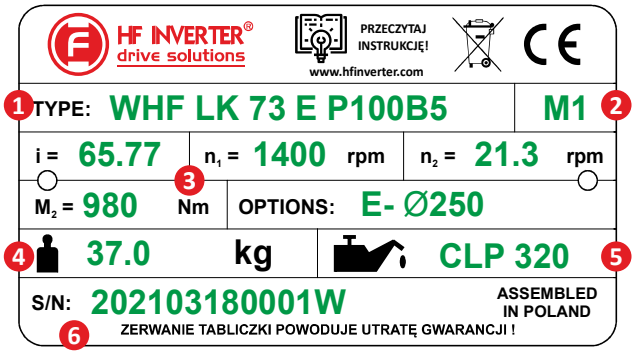
Dopuszczalna siła poprzeczna na wale wyjściowym przekładni *Output shafts radial loads*						
Typ / *Type*		a [mm]	b [mm]	ød [mm]	L [mm]	$F_{Ra_{max}}$
WHF 51		43.5	23.5	20 k6	40	3100
WHF 61		52.5	27.5	25 k6	50	4000
WHF 71		60.5	30.5	30 k6	60	6200
WHF 81		73.5	33.5	40 k6	80	7500
WHF 91		86.5	36.5	50 k6	100	9500
WHF 101		102.5	42.5	60 m6	120	9600
WHF 13		88.5	68.5	20 k6	40	1770
WHF 23		106.5	81.5	25 k6	50	4200
WHF 33		118	93	25 k6	50	4900
WHF 43		137	107	30 k6	60	5400
WHF 53		147.5	112.5	35 k6	70	7100
WHF 63		168.5	133.5	35 k6	70	8200
WHF 73		173.7	133.7	40 k6	80	9900
WHF 83		216.7	166.7	50 k6	100	16900
WHF 93		255.5	195.5	60 m6	120	19800
WHF 103		285.5	215.5	70 m6	140	29500
WHF 133		343.5	258.5	90 m6	170	53500
WHF 143		402	297	110 m6	210	65000
WHF 163		450	345	120 m6	210	120000

Tabliczka znamionowa

Nameplate

Każda przekładnia walcowa WHF posiada tabliczkę znamionową zainstalowaną na jej korpusie. Tabliczka znamionowa zawiera podstawowe informacje o produkcie. Zerwanie tabliczki znamionowej powoduje utratę gwarancji producenta.

Each WHF helical gear unit has a nameplate installed on its housing. The nameplate provides basic information about the product. Breaking the nameplate voids the manufacturer's warranty.



1. Typ / *Type*
2. Pozycja montażowa / *Mounting positions*
3. Parametry techniczne / *Technical data*
4. Masa / *Weight*
5. Typ oleju / *Oil type*
6. Numer fabryczny / *Serial number*

Dobór motoreduktora

Aby prawidłowo dobrać motoreduktor warto wykonać poniższe kroki:

- Określić wartość współczynnika fs właściwy dla maszyny w której będzie zainstalowany motoreduktor. Należy określić klasę obciążeń, dobowy czas pracy motoreduktora oraz przewidywaną liczbę uruchomień motoreduktora w trakcie jednej godziny jego pracy. Więcej informacji znajduje się na kartach A3 do A6.
- Jeżeli znane jest zapotrzebowanie na moc silnika i moment obrotowy, wtedy można przejść do następnego punktu. Jeżeli nie, to należy skorzystać ze wzorów na wyznaczenie tych parametrów - patrz karty A1 do A3.
- Dobrać właściwy motoreduktor zgodnie z potrzebnymi parametrami technicznymi.

Selecting the gearmotors

To select the right gearmotor, it is advisable to follow these steps:

- *Determine the value of coefficient fs appropriate for the machine in which the gearmotor will be installed. Specify the load class, the daily operating time of the gearmotor and the expected number of starts of the gearmotor during one hour of its operation. For more information, refer to sheets A3 to A6.*
- *If the engine power and torque requirements are known, then you can proceed to the next point. If not, use the formulae for determining these parameters - see sheets A1 to A3.*
- *Select the right gearmotor according to the required technical parameters.*

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.50						**4p**
n_1=1400 [rpm]	**78.3**	182	1.60	17.89	**L 43**	**P90B5**
	86.3	165	1.65	16.22	**K 43**	
	96.2	148	1.80	14.56		
	112	127	1.95	12.54		
	119	120	2.00	11.79		
	138	103	2.20	10.15		
	155	92	2.40	9.07		
	175	81	2.50	8.01		

Przykład doboru motoreduktora.

Należy dobrać motoreduktor do walcarki, która pracuje 8 h/dzień, ilość załączeń na godzinę - 200. Określono zapotrzebowanie na moc silnika P_1 = 1.50kW oraz zapotrzebowanie na moment obrotowy M_2 = 118Nm.

Zgodnie z informacjami zawartymi na kartach od A3 do A6 dobrano współczynnik fs dla tej aplikacji na poziomie fs ≥ 1.75

Dobierany motoreduktor powinien posiadać poniższe parametry techniczne:

P_1 = 1.50kW
M_2 ≥ 118Nm
fs ≥ 1.75
n_2 ≈ 110 rpm

W powyższych tabelach z danymi motoreduktorów, kolorem szarym zaznaczono parametry techniczne, które spełniają wymagania techniczne.

Z katalogu dobrano motoreduktor walcowy (tabela powyżej) :

WHF-L43-P90B5-i12.54-M1-1.50-4

Parametry techniczne tego motoreduktora:

P_1 = 1.50kW
M_2 = 127Nm
fs = 1.95
n_2 = 112 rpm

Example of gearmotor selection.

Select the gearmotor for a rolling mill that operates 8 h/day, number of starts per hour - 200. The power requirement of the motor P_1 = 1.50kW and the torque requirement M_2 = 118Nm were determined.

According to the information contained in sheets A3 to A6, coefficient fs for this application was selected at fs ≥ 1.75

The selected gearmotor should have the following technical parameters:

P_1 = 1.50kW
M_2 ≥ 118Nm
fs ≥ 1.75
n_2 ≈ 110 rpm

In the above tables with data of gearmotors, technical parameters that meet technical requirements are marked in grey colour.

A helical gearmotor was selected from the catalogue (table on the top) :

WHF-L43-P90B5-i12.54-M1-1.50-4

technical parameters:

P_1 = 1.50kW
M_2 = 127Nm
fs = 1.95
n_2 = 112 rpm

Program doboru HF-DriveSelect™

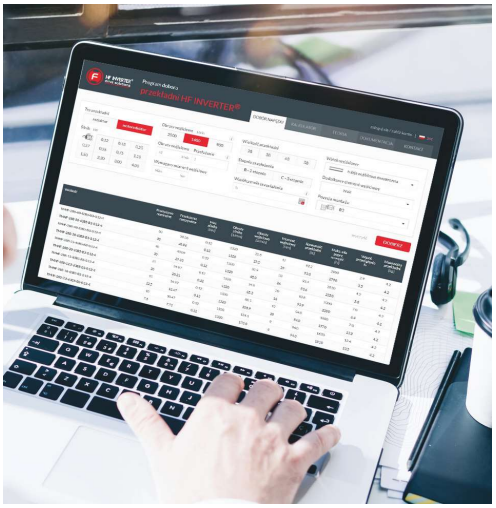
Wraz z wprowadzeniem nowych produktów firma HF INVERTER udostępniła narzędzie służące do szybkiego doboru napędów według zadanych parametrów technicznych. Program HF-DriveSelect™ działa na każdym systemie operacyjnym podłączonym do sieci internetowej. Program HF-DriveSelect™ umożliwia obecnie generowanie kart katalogowych dobranych napędów i zapisywanie ich w formacie PDF, oraz moduł pobierania modeli CAD 3D (format STP i STEP) dobranych napędów. Firma planuje rozwój tego narzędzia chociażby przez uzupełnienie o poradniki dla użytkowników napędów oraz dla konstruktorów maszyn i urządzeń.

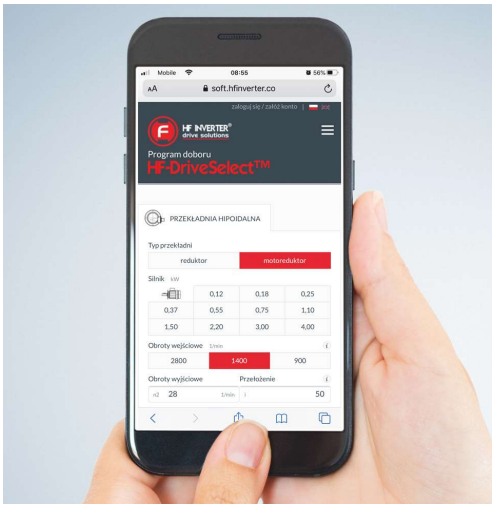
https://hfinverter.com

On-line configurator HF-DriveSelect™

With the introduction of new products, HF INVERTER has released a tool for quick selection of drives according to given technical parameters. The HF-DriveSelect™ works on any operating system connected to the Internet. The HF-DriveSelect™ software now allows you to generate catalog cards of selected drives and save them in PDF format; the module for downloading CAD 3D models (STP and STEP format) of selected drives will also be available. The company plans to develop this tool adding manuals for drive users and for machine and equipment engineers.

https://hfinverter.com



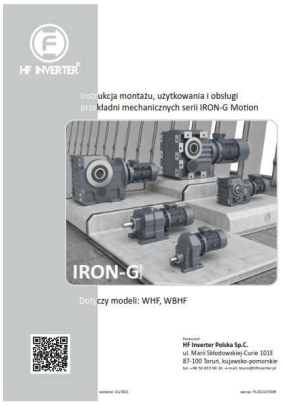


Wsparcie

Technika napędowa jest obecna w naszym życiu przez całą dobę. Wentylacja, klimatyzacja, ogrzewanie, dostęp do wody, prądu i żywność wszystko to uzależnione jest od sprawnie działających napędów. Dlatego pożądane jest mieć w pobliżu partnera, który specjalizuje się w technice napędowej i w swojej ofercie posiada niezawodne produkty. Każdą potrzebę naszych Klientów traktujemy jako niepowtarzalne wyzwanie, któremu sprostamy dzięki naszej kreatywności, sprawności w działaniu i szerokiej ofercie. Jesteśmy technicznie autentyczni, gdy zaczynamy zajmować się powierzonym zadaniem, wykonujemy je z pełnym zaangażowaniem i pasją. Nasi Klienci mogą liczyć na nasze pełne wsparcie techniczne. Zapraszamy do współpracy!

Support

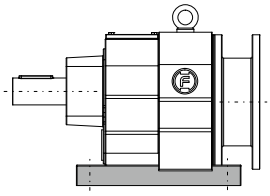
We consider every need of our clients as a unique challenge, which we are able to meet thanks to our creativity, efficiency, and rich offer. Our head office is located in Toruń, Poland. We are authentic in technical terms, when we begin to handle a commissioned task, we carry it out with absolute commitment and passion. Our Clients can count on our complete technical support. We are quick to implement our ideas. We know that our Clients' needs and our commitment to work allow us to turn ideas into reality. You can look at our business as a conversation with the market. Sometimes it is us who propose new solutions, often it is a response to the needs of Clients. But it always constitutes the following step on a common path of development.



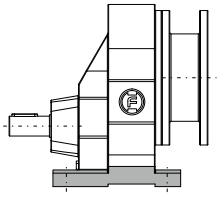
Oznaczenie kodowe

Classification

WHF-Lx3



WHF-Lx1



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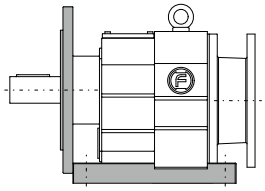

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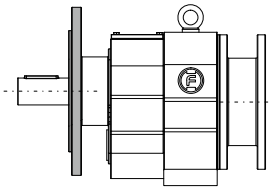

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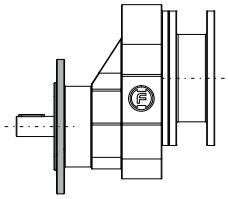
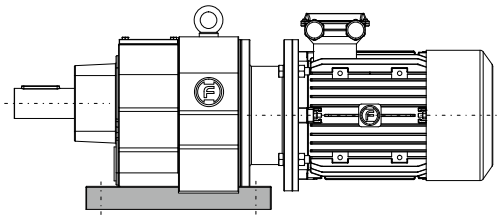


Przekładnia walcowa / *Helical in-line gearbox*						
WHF	**L**	**163**	**J**	**P315B5**	**i229.71**	**M1**
Typ / *Type*	Wersja / *Version*	Wielkość / *Size*	Kołnierz wyjściowy *Output flange*	Kołnierz wejściowy *Input flange*	Przełożenie *Ratio*	Pozycja montażowa *Mounting positions*
WHF	**L** **K** **LK**	**13 23 33** **43 53 63 73** **83 93 103** **133 143 163** **51 61 71** **81 91 101**	**A - ø120** **B - ø140** **C - ø160** **D - ø200** **E - ø250** **F - ø300** **G - ø350** **H - ø450** **I - ø550** **J - ø660**		Zgodnie z doborem *See tables*	

WHF-Lx3



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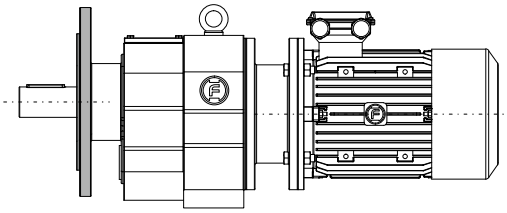

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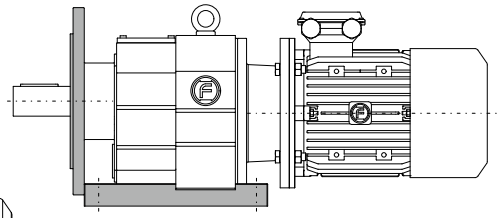

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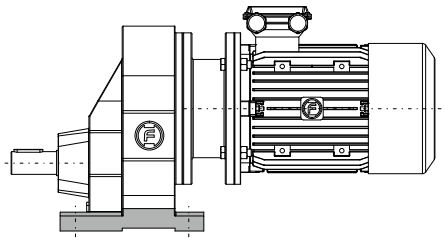

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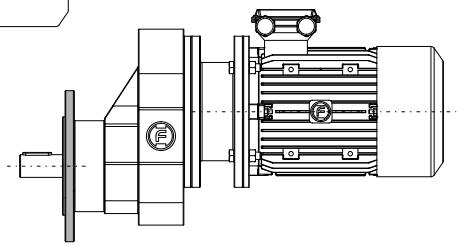


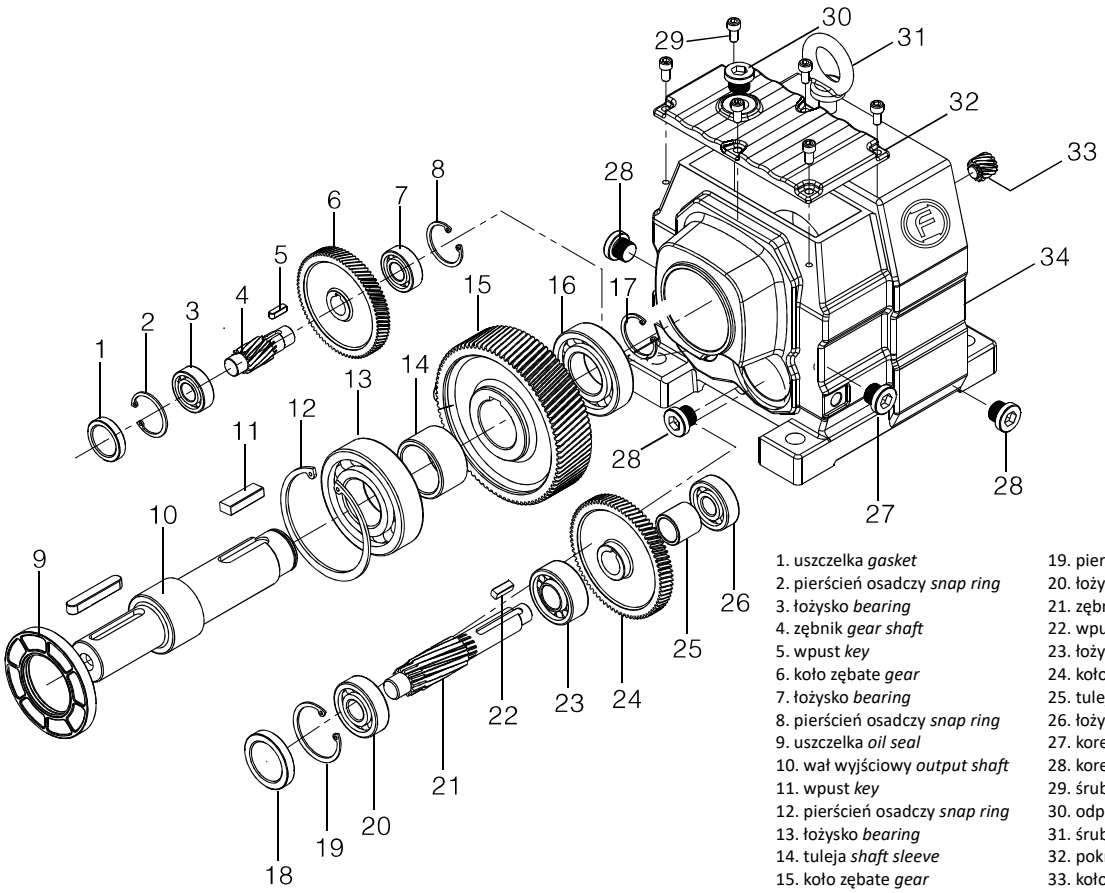
Motoreduktor walcowy / *Helical in-line gearmotors*								
WHF	**L**	**163**	**J**	**P315B5**	**i229.71**	**M1**	**132**	**4**
Typ / *Type*	Wersja *Version*	Wielkość *Size*	Kołnierz wyjściowy *Output flange*	Kołnierz wejściowy *Input flange*	Przełożenie *Ratio*	Pozycja montażowa *Mounting positions*	Moc silnika *Motor power* [kW]	Pola *Poles*
WHF	**L** **K** **LK**	**13 23 33** **43 53 63** **73 83 93** **103 133** **143 163** **51 61 71** **81 91 101**	**A - ø120** **B - ø140** **C - ø160** **D - ø200** **E - ø250** **F - ø300** **G - ø350** **H - ø450** **I - ø550** **J - ø660**		Zgodnie z doborem *See tables*			**2** **4** **6** **8**

Określ pozycję puszki przyłączeniowej silnika
Terminal box position is required

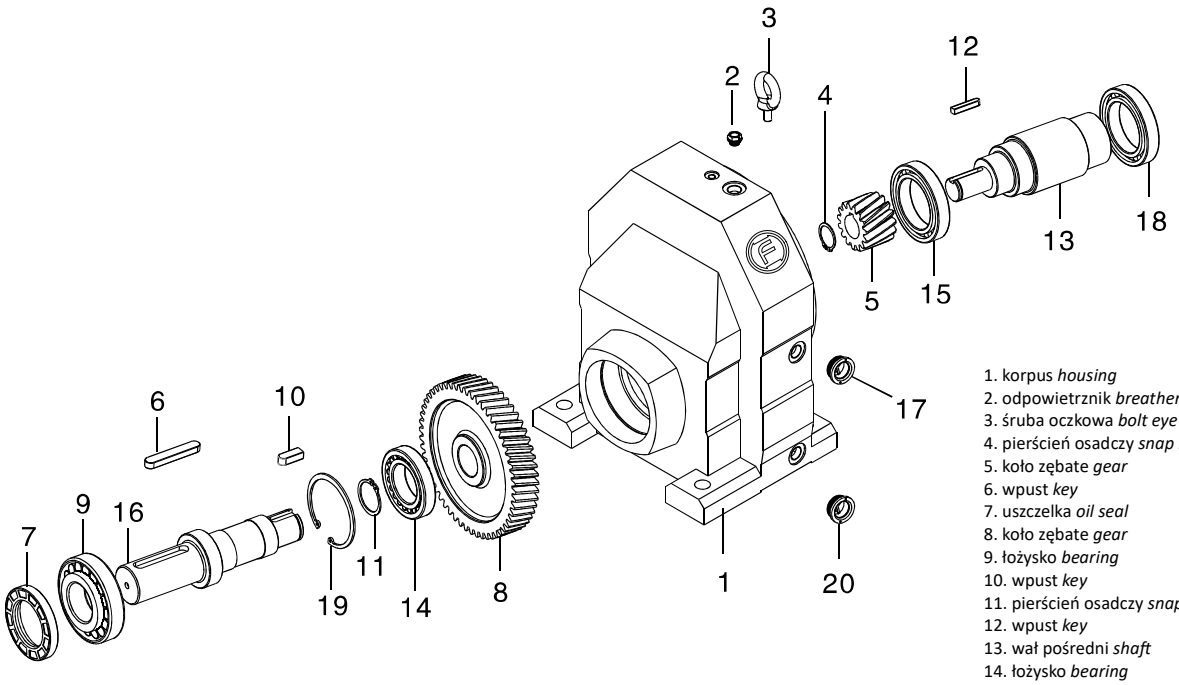
B3
B4

Budowa

Structure drawing



1. uszczelka *gasket*
2. pierścień osadczy *snap ring*
3. łożysko *bearing*
4. zębnik *gear shaft*
5. wpust *key*
6. koło zębate *gear*
7. łożysko *bearing*
8. pierścień osadczy *snap ring*
9. uszczelka *oil seal*
10. wał wyjściowy *output shaft*
11. wpust *key*
12. pierścień osadczy *snap ring*
13. łożysko *bearing*
14. tuleja *shaft sleeve*
15. koło zębate *gear*
16. łożysko *bearing*
17. pierścień osadczy *snap ring*
18. uszczelka *gasket*
19. pierścień osadczy *snap ring*
20. łożysko *bearing*
21. zębnik *gear shaft*
22. wpust *key*
23. łożysko *bearing*
24. koło zębate *gear*
25. tuleja *shaft sleeve*
26. łożysko *bearing*
27. korek *oil plug*
28. korek *oil plug*
29. śruba *screw*
30. odpowietrznik *breather*
31. śruba oczkowa *bolt* eye
32. pokrywka *cover plate*
33. koło zębate *gear*
34. korpus *housing*

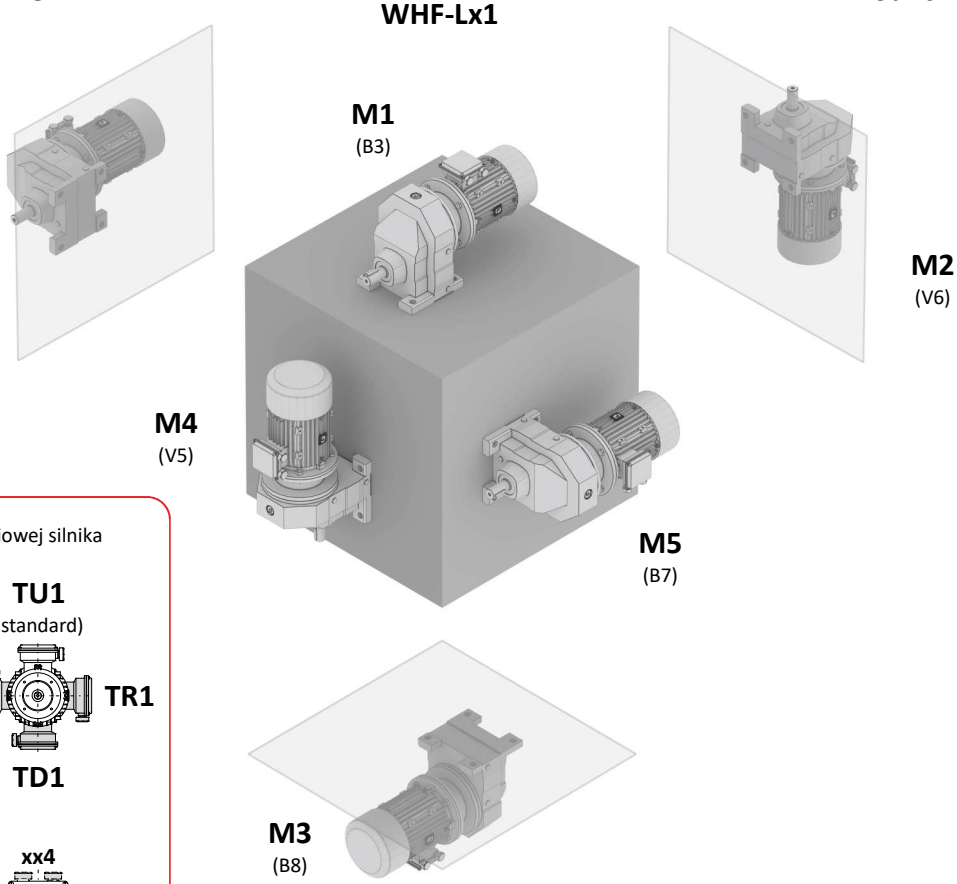


1. korpus *housing*
2. odpowietrznik *breather*
3. śruba oczkowa *bolt eye*
4. pierścień osadczy *snap ring*
5. koło zębate *gear*
6. wpust *key*
7. uszczelka *oil seal*
8. koło zębate *gear*
9. łożysko *bearing*
10. wpust *key*
11. pierścień osadczy *snap ring*
12. wpust *key*
13. wał pośredni *shaft*
14. łożysko *bearing*
15. łożysko *bearing*
16. wał wyjściowy *output shaft*
17. korek *oil plug*
18. łożysko *bearing*
19. pierścień osadczy *snap ring*
20. korek *oil plug*

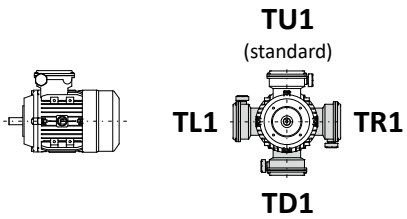
Pozycje montażowe

Mounting positions

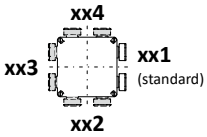
WHF-Lx1



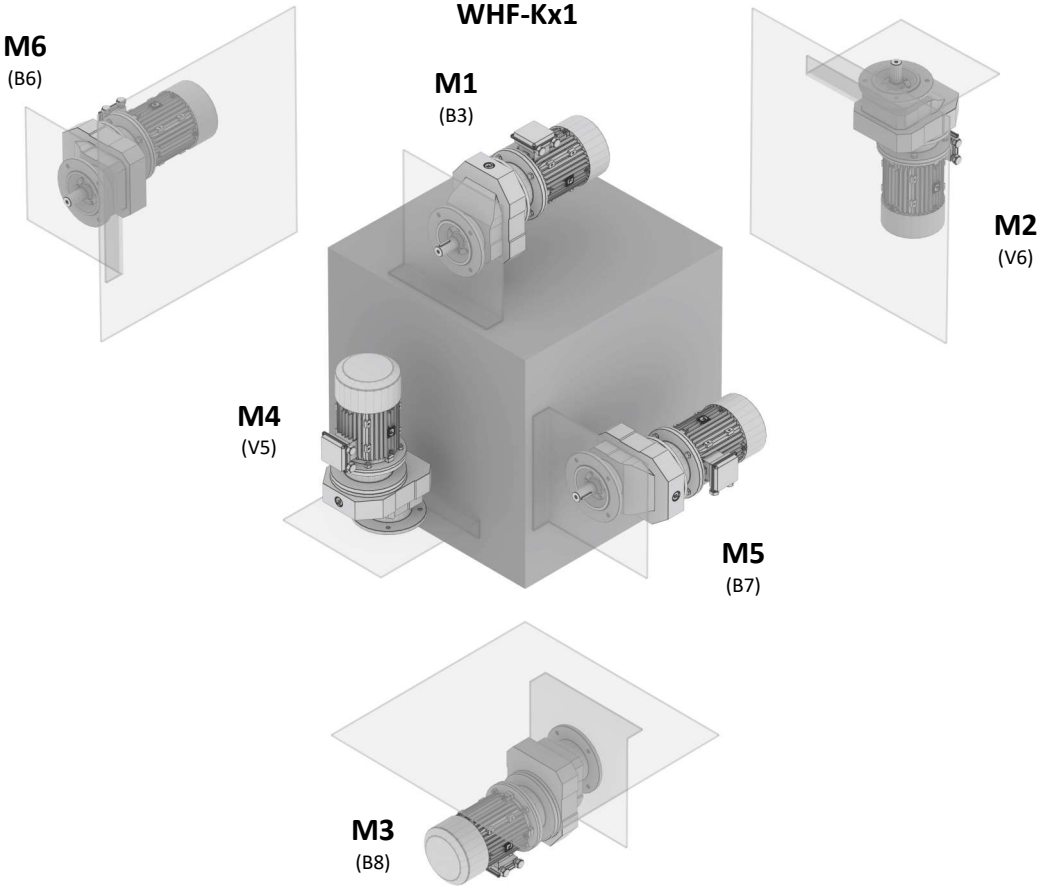
Pozycja puszki przyłączeniowej silnika
Terminal box position



Pozycja dławików puszki
Chokes position



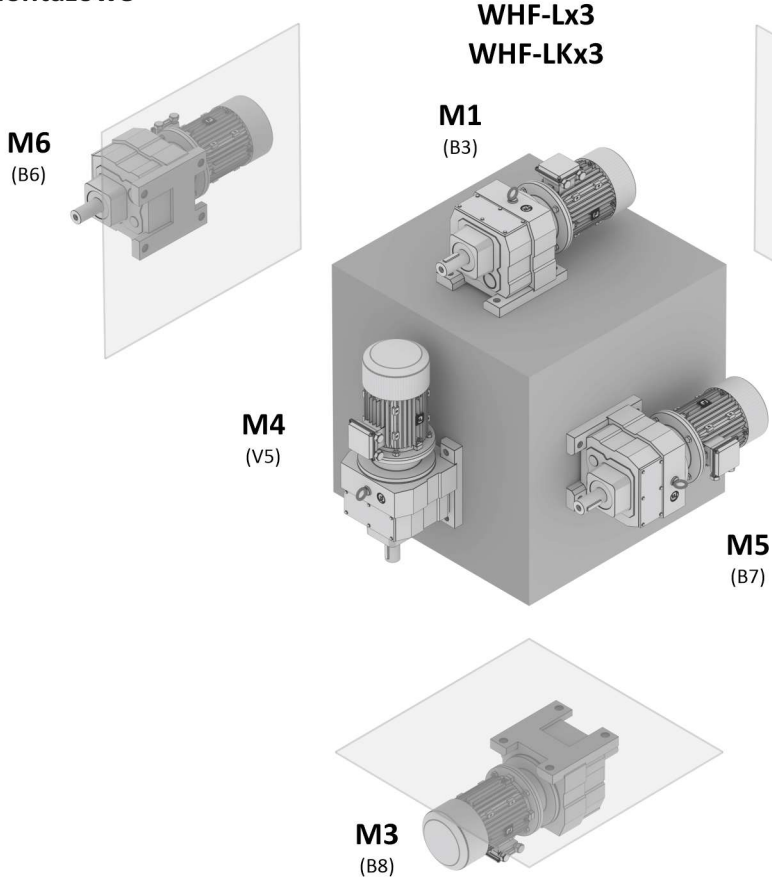
WHF-Kx1



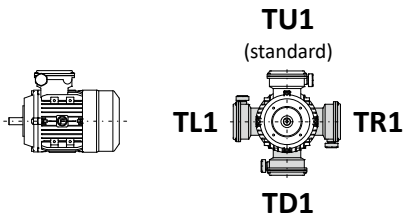
Pozycje montażowe

Mounting positions

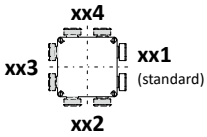
WHF-Lx3
WHF-LKx3



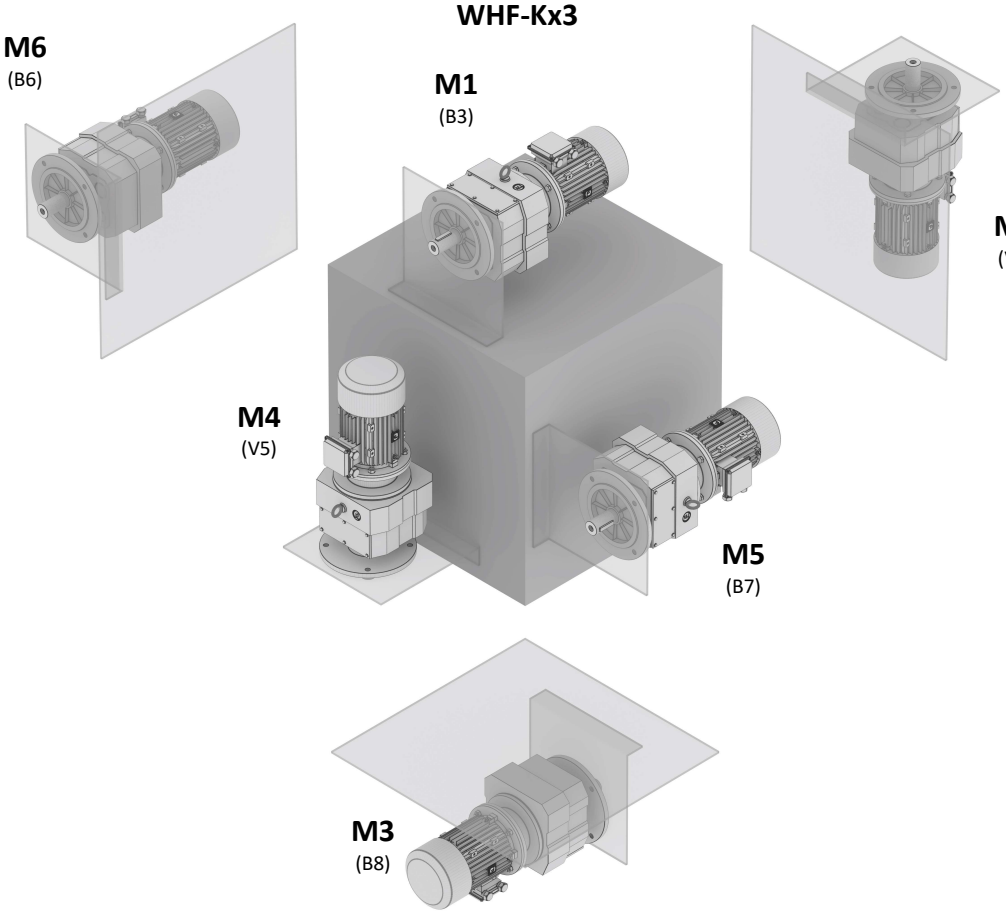
Pozycja puszki przyłączeniowej silnika
Terminal box position



Pozycja dławików puszki
Chokes position



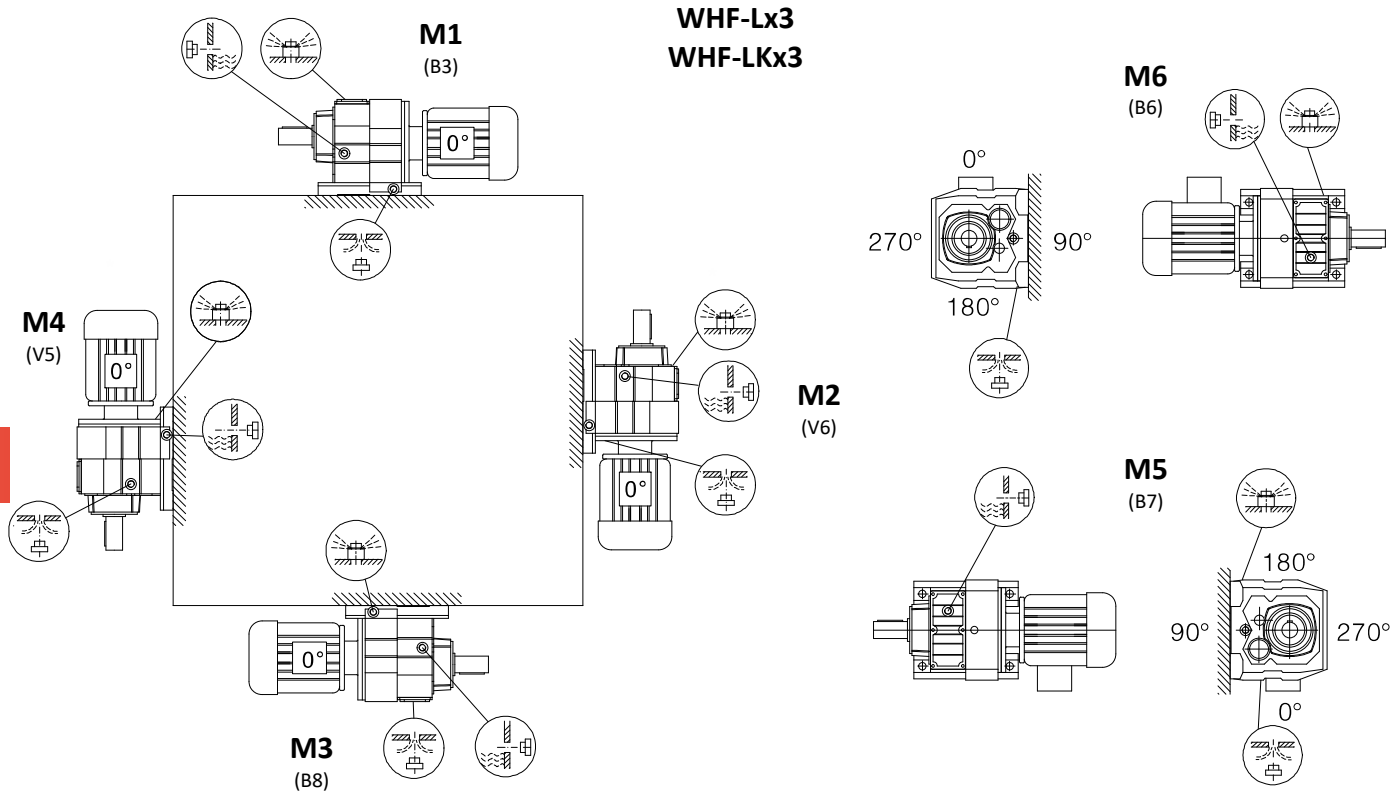
WHF-Kx3



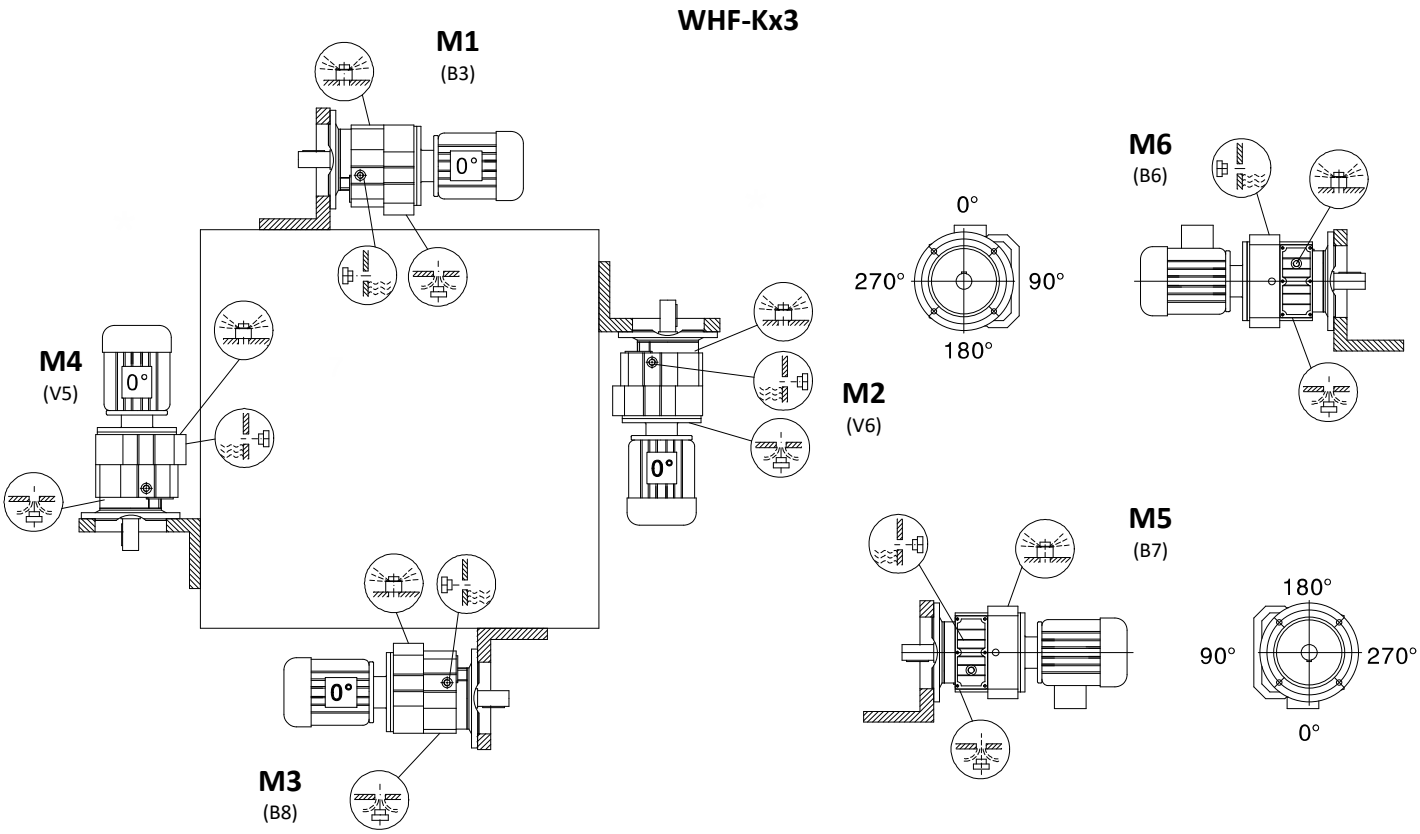
Pozycje korków i odpowietrznika

Positions of oil plugs and breather

WHF-Lx3
WHF-LKx3



WHF-Kx3



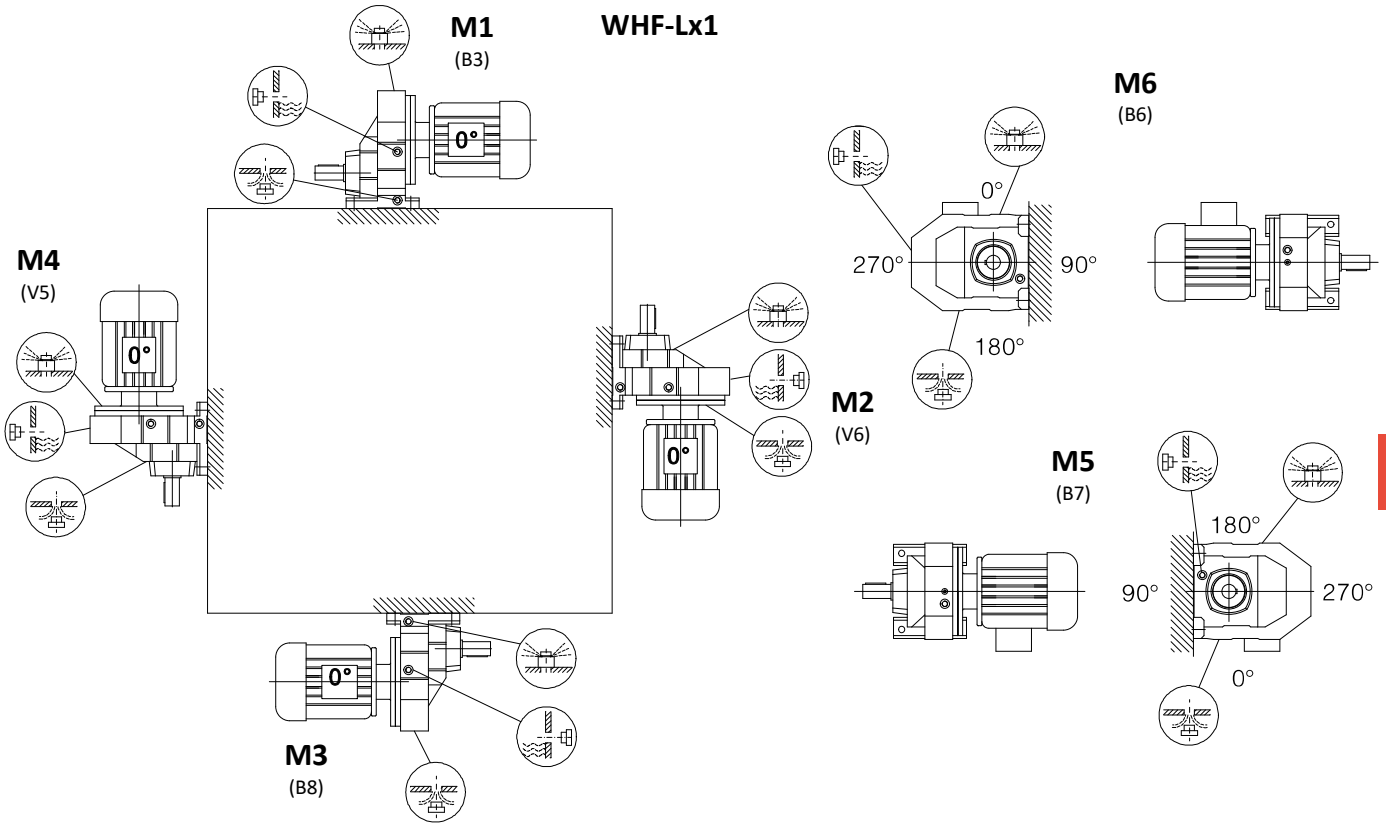
odpowietrznik *breather*

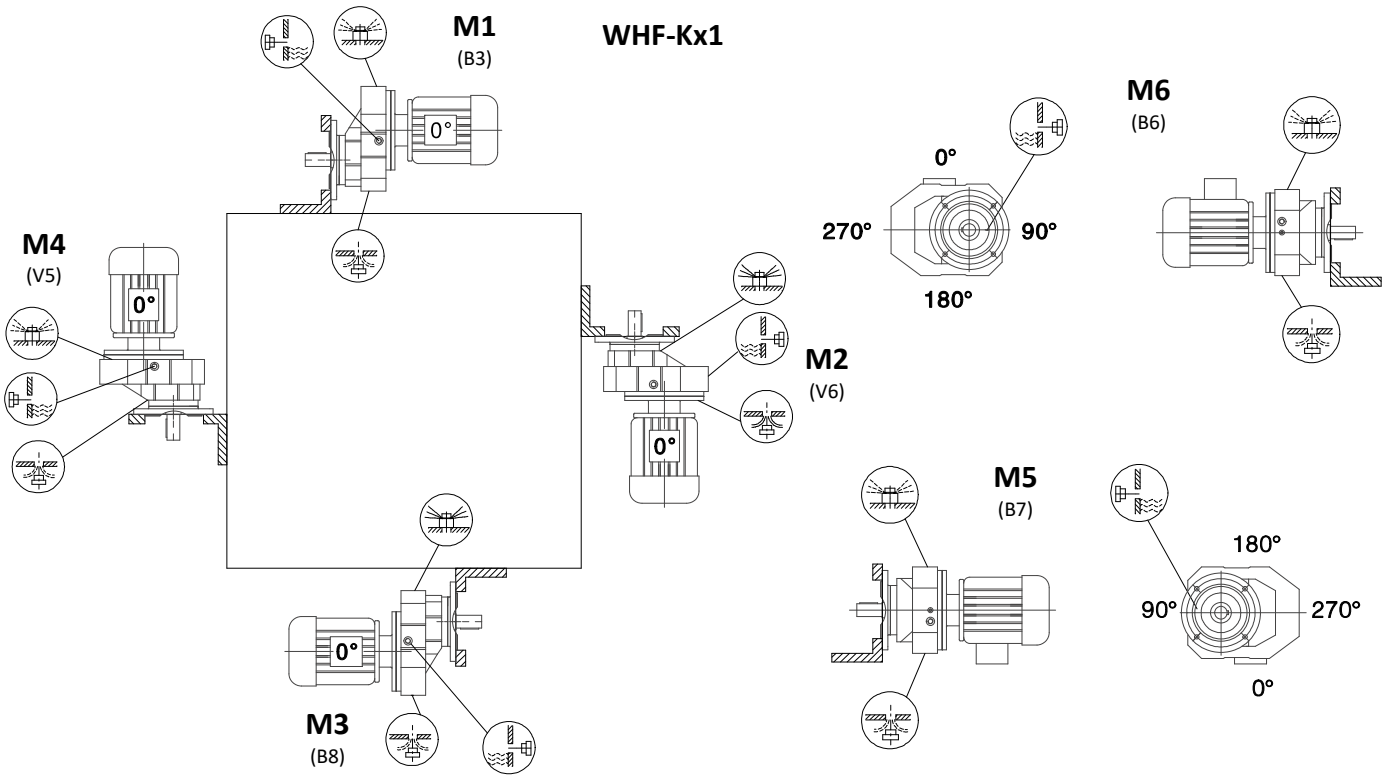
wziernik *speculum*

korek *oil plug*

Pozycje korków i odpowietrznika

Positions of oil plugs and breather



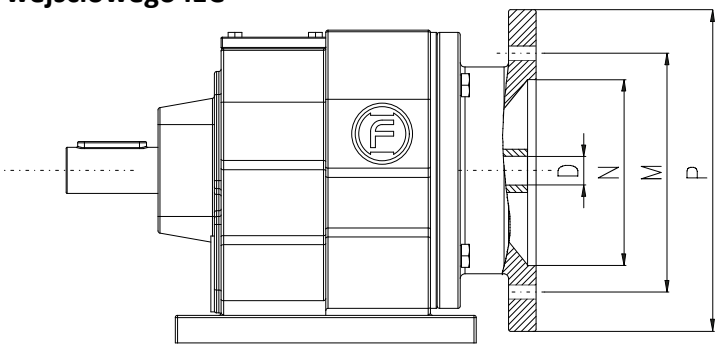


odpowietrznik *breather* wziernik *speculum* korek *oil plug*

Ilość oleju / *Oil capacity*

Ilość (L) i rodzaj zastosowanego oleju / *Amount (L) and type of oil used*							
Typ / *Type*	**M1** (B3)	**M2** (V6)	**M3** (B8)	**M4** (V5)	**M5** (B7)	**M6** (B6)	Typ oleju / *Oil type*
WHF 13	0.30	0.60	0.40	0.70	0.40	0.40	ISO VG 320
WHF 23	0.80	0.80	1.00	1.10	0.80	1.00	ISO VG 320
WHF 33	0.80	0.80	1.00	1.10	0.80	1.00	ISO VG 320
WHF 43	1.00	1.60	1.50	1.70	1.50	1.50	ISO VG 320
WHF 53	1.10	1.90	1.70	2.10	1.70	1.70	ISO VG 320
WHF 63	1.30	2.60	2.80	3.20	1.80	2.00	ISO VG 320
WHF 73	1.60	3.00	3.00	3.30	2.10	2.30	ISO VG 320
WHF 83	3.60	6.00	6.50	7.00	5.70	5.90	ISO VG 320
WHF 93	4.50	10.9	10.7	12.5	10.3	10.6	ISO VG 320
WHF 103	6.40	17.4	18.0	20.5	14.0	17.0	ISO VG 320
WHF 133	10.0	28.0	29.0	31.0	25.0	25.0	ISO VG 320
WHF 143	16.0	45.0	48.0	52.0	40.0	41.0	ISO VG 320
WHF 163	29.0	80.0	78.0	88.0	66.0	69.0	ISO VG 320
WHF 51	0.60	0.40	0.60	0.72	0.32	0.40	ISO VG 320
WHF 61	0.65	0.50	0.72	0.80	0.40	0.50	ISO VG 320
WHF 71	1.20	0.90	1.20	1.60	0.80	0.80	ISO VG 320
WHF 81	2.00	1.80	2.00	2.80	1.20	1.20	ISO VG 320
WHF 91	3.00	2.00	2.80	3.60	1.80	2.00	ISO VG 320
WHF 101	5.50	3.80	6.00	6.80	3.60	3.20	ISO VG 320

Wymiary kołnierza wejściowego IEC / *IEC motor adapters*



Wymiary kołnierza wejściowego IEC / IEC motor adapters											
IEC	**P63B5**	**P71B5**	**P80B5**	**P90B5**	**P100B5**	**P112B5**	**P132B5**	**P160B5**	**P180B5**	**P200B5**	**P225B5**
D E8 [mm]	11	14	19	24	28	28	38	42	48	55	60
P [mm]	140	160	200	200	250	250	300	350	350	400	450
M [mm]	115	130	165	165	215	215	265	300	300	350	400
N [mm]	95	110	130	130	180	180	230	250	250	300	350

IEC	**P250B5**	**P280B5**	**P315B5**
D E8 [mm]	65	75	80
P [mm]	550	550	660
M [mm]	500	500	600
N [mm]	450	450	550

Dopuszczalne konfiguracje

Acceptable configurations

WHF 13 — M_n 85 Nm

i =	0.12kW 4P P63B5	0.18kW 4P P63B5	0.18kW 2P P63B5	0.25kW 4P P71B5	0.25kW 2P P63B5	0.37kW 4P P71B5	0.37kW 2P P71B5	0.55kW 4P P80B5	0.55kW 2P P71B5	0.75kW 4P P80B5	0.75kW 2P P80B5	1.10kW 2P P80B5
3.83	■	■	■	■	■	■	■	■	■	■	■	■
4.51	■	■	■	■	■	■	■	■	■	■	■	■
5.09	■	■	■	■	■	■	■	■	■	■	■	■
5.76	■	■	■	■	■	■	■	■	■	■	■	■
6.15	■	■	■	■	■	■	■	■	■	■	■	■
7.04	■	■	■	■		■	■	■	■	■	■	■
7.55	■	■	■	■		■	■	■	■	■	■	■
8.63	■	■	■	■		■	■	■	■	■	■	■
10.15	■	■	■	■		■	■	■		■	■	■
11.45	■	■		■		■	■	■		■	■	■
12.98	■	■		■		■	■	■		■		■
13.84	■	■		■		■	■	■		■		■
15.81	■	■		■		■		■		■		■
16.99	■	■		■		■		■		■		■
19.71	■	■		■		■		■		■		■
23.15	■	■		■		■						
24.07	■	■		■		■						
25.23	■	■		■		■						
28.32	■	■		■		■						
31.94	■	■		■		■						
36.20	■	■		■		■						
38.61	■	■		■		■						
44.18	■	■		■								
47.44	■	■		■								
53.76	■	■		■								
57.35	■	■		■								
65.61	■	■										
70.39	■	■										
81.64	■	■										

WHF 23 — M_n 130 Nm

i =	0.12kW 6P P71B5	0.12kW 4P P63B5	0.18kW 4P P63B5	0.25kW 4P P71B5	0.37kW 4P P71B5	0.55kW 4P P80B5	0.55kW 2P P71B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.10kW 2P P80B5	1.50kW 4P P90B5	1.50kW 2P P90B5	2.20kW 4P P100B5	2.20kW 2P P90B5	3.00kW 4P P100B5	3.00kW 2P P100B5
3.37				■		■			■	■	■	■	■	■	■	■
4.00				■		■			■	■	■	■	■	■	■	■
4.27				■		■			■	■	■	■	■	■	■	■
5.00				■		■		■	■	■	■	■	■	■	■	■
5.60				■		■		■	■	■	■	■	■	■	■	■
6.59				■		■		■	■	■	■	■	■	■		■
7.63				■		■		■	■	■	■	■	■	■		
8.16				■		■		■	■	■	■	■	■	■		
9.41				■		■		■	■	■	■	■	■	■		
10.13				■		■		■	■	■	■	■	■	■		
11.86				■		■		■	■	■	■	■		■		
13.28			■	■	■	■		■	■	■	■			■		
15.63			■	■	■	■		■	■		■					
18.08			■	■	■	■		■	■							
19.35			■	■	■	■		■	■							
22.32			■	■	■	■		■								
24.47			■	■	■	■		■								
26.09			■	■	■	■		■								
28.37			■	■	■	■		■								
28.78			■	■	■	■		■								
32.47			■	■	■	■										
36.79			■	■	■	■										
39.25			■	■	■	■	■									
44.90		■	■	■	■		■									
48.17		■	■	■	■		■									
55.87		■	■	■	■		■									
61.30		■	■	■	■											
69.47		■	■	■												
74.11	■	■	■	■												
84.78	■	■	■	■												
90.96	■	■	■													
105.49	■	■	■													
123.91	■	■	■													
135.09	■	■	■													

Dopuszczalne konfiguracje

Acceptable configurations

WHF 33 — M_n 205 Nm

i =	0.12kW 6P P71B5	0.12kW 4P P63B5	0.18kW 6P P71B5	0.18kW 4P P63B5	0.25kW 4P P71B5	0.37kW 4P P71B5	0.55kW 4P P80B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	1.50kW 2P P90B5	2.20kW 4P P100B5	2.20kW 2P P90B5	3.00kW 4P P100B5	3.00kW 2P P100B5
3.41										■		■	■	■	■
4.05										■		■	■	■	■
4.32										■		■	■	■	■
5.06									■	■		■	■	■	■
5.67									■	■		■	■	■	■
6.67									■	■		■	■	■	■
7.97									■	■	■	■	■	■	■
9.47								■	■	■	■	■	■	■	■
10.11								■	■	■	■	■	■	■	■
11.83						■	■	■	■	■	■	■	■		
13.25						■	■	■	■	■	■	■	■		
15.60						■	■	■	■	■	■	■	■		
18.05						■	■	■	■	■		■	■		
19.31						■	■	■	■	■		■	■		
22.27						■	■	■	■						
24.42						■	■	■	■						
26.03						■	■	■	■						
28.32						■	■	■	■						
28.73						■	■	■	■						
32.40					■	■	■	■	■						
36.72					■	■	■	■							
39.17					■	■	■	■							
44.81					■	■	■	■							
48.08				■	■	■	■	■							
55.76				■	■	■	■								
61.18				■	■	■	■								
69.33				■	■	■									
73.96	■	■		■	■	■									
84.61	■	■	■	■	■	■									
90.77	■	■	■	■	■	■									
105.28	■	■	■	■	■										
123.66	■	■	■	■	■										
134.82	■	■	■	■	■										

WHF 43 — M_n 300 Nm

i =	0.12kW 6P P71B5	0.12kW 4P P63B5	0.18kW 4P P63B5	0.25kW 4P P71B5	0.37kW 4P P71B5	0.55kW 4P P80B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	2.20kW 2P P90B5	3.00kW 4P P100B5	3.00kW 2P P100B5	4.00kW 4P P112B5	4.00kW 2P P112B5	5.50kW 4P P132B5	5.50kW 2P P132B5
3.83									■	■		■	■	■	■	■	■
4.34									■	■		■	■	■	■	■	■
4.85									■	■		■	■	■	■	■	■
5.64									■	■		■	■	■	■		■
6.00									■	■		■	■	■	■		■
6.96									■	■		■	■	■	■		■
7.76									■	■		■	■	■	■		■
8.01									■	■	■	■	■	■	■		■
9.07								■	■	■	■	■	■	■	■		■
10.15								■	■	■	■	■	■	■	■		■
11.79								■	■	■	■	■	■		■		■
12.54					■			■	■	■	■	■			■		■
14.56					■			■	■	■	■	■			■		
16.22					■		■	■	■	■	■	■			■		
17.89					■		■	■	■	■	■						
19.27					■		■	■	■	■	■						
21.81					■	■	■	■	■		■						
23.28					■	■	■	■	■		■						
23.59					■	■	■	■	■								
26.70					■	■	■	■	■								
26.74					■	■	■	■	■								
29.88					■	■	■	■	■								
31.12					■	■	■	■	■								
33.79					■	■	■	■	■								
34.73					■	■	■	■	■								
36.93					■	■	■	■									
42.87					■	■	■	■									
47.75				■	■	■	■	■									
52.69				■	■	■	■										
56.73				■	■	■	■										
64.21				■	■	■	■										
68.54				■	■	■	■										
76.23			■	■	■	■											
84.90			■	■	■	■											
93.68		■	■	■	■	■											
100.86		■	■	■	■												
114.17		■	■	■	■												
121.87	■	■	■	■	■												
139.99	■	■	■	■													
162.94	■	■	■	■													
176.88	■	■	■	■													

Dopuszczalne konfiguracje

Acceptable configurations

WHF 53 — M_n 450 Nm

i =	0.12kW 6P P71B5	0.12kW 4P P63B5	0.18kW 6P P71B5	0.18kW 4P P63B5	0.25kW 6P P71B5	0.25kW 4P P71B5	0.37kW 6P P80B5	0.37kW 4P P71B5	0.55kW 4P P80B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	2.20kW 2P P90B5	3.00kW 4P P100B5	3.00kW 2P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	5.50kW 2P P132B5	7.50kW 4P P132B5	7.50kW 2P P132B5
4.39															■		■	■	■	■	■
5.05															■		■	■	■	■	■
5.82															■		■	■	■	■	■
6.41															■		■	■	■	■	■
7.53															■		■	■	■	■	■
7.97													■		■		■	■	■	■	■
9.06													■		■		■	■	■	■	■
9.35													■		■		■	■	■	■	■
10.79													■		■	■	■	■	■	■	■
11.88												■	■		■	■	■	■	■	■	■
13.95												■	■	■	■	■	■	■	■	■	■
14.77												■	■	■	■	■	■	■	■	■	■
16.79											■	■	■	■	■	■	■	■	■	■	■
18.60									■	■	■	■	■	■	■	■	■	■	■	■	■
21.93									■	■	■	■	■	■	■	■	■	■	■	■	■
24.99									■	■	■	■	■	■	■	■	■	■	■	■	■
26.31									■	■	■	■	■	■	■	■	■	■	■	■	■
35.07									■	■	■	■	■	■	■	■	■	■	■	■	■
37.30									■	■	■	■	■	■	■	■	■	■	■	■	■
43.30									■	■	■	■	■	■	■	■	■	■	■	■	■
48.23								■	■	■	■	■	■	■	■	■	■	■	■	■	■
53.22								■	■	■	■	■	■	■	■	■	■	■	■	■	■
57.29								■	■	■	■	■	■	■	■	■	■	■	■	■	■
64.85								■	■	■	■	■	■	■	■	■	■	■	■	■	■
69.23						■		■	■	■	■	■	■	■	■	■	■	■	■	■	■
80.55						■		■	■	■	■	■	■	■	■	■	■	■	■	■	■
87.71				■		■		■	■	■	■	■	■	■	■	■	■	■	■	■	■
89.71				■		■		■	■	■	■	■	■	■	■	■	■	■	■	■	■
98.99	■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
106.58	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
120.63	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
128.77	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
147.92	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■
172.17	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■
186.89	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■

WHF 63 — M_n 595 Nm

i =	0.12kW 6P P71B5	0.12kW 4P P63B5	0.18kW 6P P71B5	0.18kW 4P P63B5	0.25kW 8P P80B5	0.25kW 6P P71B5	0.25kW 4P P71B5	0.37kW 6P P80B5	0.37kW 4P P71B5	0.55kW 4P P80B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	5.50kW 2P P132B5	7.50kW 4P P132B5
4.29																■	■	■	■
4.93																■	■	■	■
5.70																■	■	■	■
6.27																■	■	■	■
7.36																■	■	■	■
7.79														■		■	■	■	■
8.70														■		■	■	■	■
10.00														■	■	■	■	■	■
11.54														■	■	■	■	■	■
12.70														■	■	■	■	■	■
14.91														■	■	■	■	■	
15.79														■	■	■	■	■	
17.95													■	■	■	■	■		
19.89												■	■	■	■	■	■		
23.44												■	■	■	■	■	■		
26.72												■	■	■					
28.13												■	■	■					
28.83												■	■	■					
32.27												■	■	■					
37.50												■	■	■					
39.88												■	■	■					
46.29											■	■	■						
51.56											■	■	■						
56.89									■	■	■	■							
61.26									■	■	■	■							
69.75			■						■	■	■	■							
74.17			■						■	■	■	■							
86.11			■				■		■	■	■	■							
95.91			■	■			■		■	■	■	■							
105.83			■	■		■	■		■	■	■	■							
113.94	■		■	■	■	■	■	■	■	■	■								
128.97	■		■	■	■	■	■	■	■	■									
137.67	■		■	■	■	■	■	■	■	■									
158.14	■		■	■	■	■	■	■	■	■									
184.07	■	■	■	■		■	■		■										
199.81	■	■	■	■		■	■		■										

Dopuszczalne konfiguracje

Acceptable configurations

WHF 73 — M_n 710 Nm

i =	0.12kW 6P P71B5	0.18kW 6P P71B5	0.18kW 4P P63B5	0.25kW 8P P80B5	0.25kW 6P P71B5	0.25kW 4P P71B5	0.37kW 8P P90B5	0.37kW 6P P80B5	0.37kW 4P P71B5	0.55kW 4P P80B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P132B5
5.31																■	■	■	■
5.99																■	■	■	■
6.79															■	■	■	■	■
7.74															■	■	■	■	■
8.59															■	■	■	■	■
9.64															■	■	■	■	■
10.88															■	■	■	■	■
12.33															■	■	■	■	
14.05														■	■	■	■	■	
15.60														■	■	■	■	■	
17.82														■	■	■	■	■	
18.80													■	■	■	■	■	■	
21.43													■	■	■	■			
23.37													■	■	■	■			
25.23													■	■	■	■			
29.00													■	■	■	■			
33.47												■	■	■	■	■			
36.83												■	■	■	■	■			
43.26											■	■	■	■	■				
45.81											■	■	■	■	■				
52.07											■	■	■	■					
57.68											■	■	■	■					
65.77										■	■	■	■	■					
77.24										■	■	■	■						
81.80										■	■	■	■						
92.97									■	■	■	■							
102.99									■	■	■	■							
121.42		■		■		■	■		■	■	■	■							
138.39		■	■	■		■	■	■	■	■	■								
145.67	■	■	■	■	■	■		■	■	■	■								
166.59	■	■	■		■	■		■	■	■									
195.24	■	■			■				■										

WHF 83 — M_n 1580 Nm

i =	0.25kW 8P P80B5	0.37kW 8P P90B5	0.37kW 6P P80B5	0.55kW 6P P80B5	0.55kW 4P P80B5	0.75kW 6P P90B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5	15.0kW 4P P160B5	18.5kW 4P P180B5	22.0kW 4P P180B5
5.30														■	■	■	■	■
6.39														■	■	■	■	■
7.13													■	■	■	■	■	■
8.22													■	■	■	■	■	■
9.14													■	■	■	■	■	■
9.90													■	■	■	■	■	■
11.93												■	■	■	■	■	■	
13.33												■	■	■	■	■	■	
15.35											■	■	■	■	■	■		
17.08											■	■	■	■	■	■		
19.10											■	■	■	■	■			
21.51										■	■	■	■	■	■			
23.40										■	■	■	■	■				
27.84										■	■	■	■	■				
31.40										■	■	■	■	■				
34.40										■	■	■	■	■				
32.66										■	■	■	■	■				
36.84									■	■	■	■	■	■				
41.74									■	■	■	■	■					
47.58									■	■	■	■	■					
52.82								■	■	■	■	■						
60.35								■	■	■	■	■						
63.68								■	■	■	■	■						
72.57								■	■	■	■							
81.92								■	■	■	■							
93.38							■	■	■	■								
103.65					■		■	■	■	■								
118.43					■		■	■	■	■								
124.97					■		■	■	■	■								
142.41			■		■	■	■	■	■									
155.34			■	■	■	■	■	■	■									
181.77	■	■	■	■	■	■	■	■										
205.71	■		■	■	■	■	■	■										
216.54	■		■	■	■		■	■										
246.54	■		■	■	■		■											

Dopuszczalne konfiguracje

Acceptable configurations

WHF 93 — M_n 3050 Nm

i =	0.25kW 8P P80B5	0.37kW 8P P90B5	0.37kW 6P P80B5	0.55kW 8P P90B5	0.55kW 6P P80B5	0.75kW 8P P100B5	0.75kW 6P P90B5	0.75kW 4P P80B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5	15.0kW 4P P160B5	18.5kW 4P P180B5	22.0kW 4P P180B5	30.0kW 4P P200B5
4.50																		■	■	■
5.20																		■	■	■
6.21																■	■	■	■	■
7.12																■	■	■	■	■
8.39																■	■	■	■	■
9.29																■	■	■	■	■
10.83																■	■	■	■	■
12.39																■	■	■	■	■
14.62																■	■	■	■	■
16.17														■		■	■	■	■	■
18.24														■	■	■	■	■	■	■
20.14													■	■	■	■	■	■	■	■
22.37													■	■	■	■	■	■	■	■
25.03													■	■	■	■	■	■	■	■
27.19													■	■	■	■	■	■	■	■
32.05													■	■	■	■	■	■	■	■
33.25												■	■	■	■	■	■	■	■	■
37.13												■	■	■	■	■	■	■	■	■
42.78												■	■	■	■	■	■	■	■	■
47.58											■	■	■	■	■	■	■	■	■	■
53.21											■	■	■	■	■	■	■	■	■	■
59.92											■	■	■	■	■	■	■	■	■	■
65.21											■	■	■	■	■	■	■	■	■	■
72.17											■	■	■	■	■	■	■	■	■	■
83.15										■	■	■	■	■	■	■	■	■	■	■
92.48										■	■	■	■	■	■	■	■	■	■	■
103.44										■	■	■	■	■	■	■	■	■	■	■
116.48									■	■	■	■	■	■	■	■	■	■	■	■
126.75									■	■	■	■	■	■	■	■	■	■	■	■
150.78									■	■	■	■	■	■	■	■	■	■	■	■
170.02						■		■	■	■	■	■	■	■	■	■	■	■	■	■
186.30		■				■		■	■	■	■	■	■	■	■	■	■	■	■	■
216.28	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
241.25	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
255.71	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
289.74	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

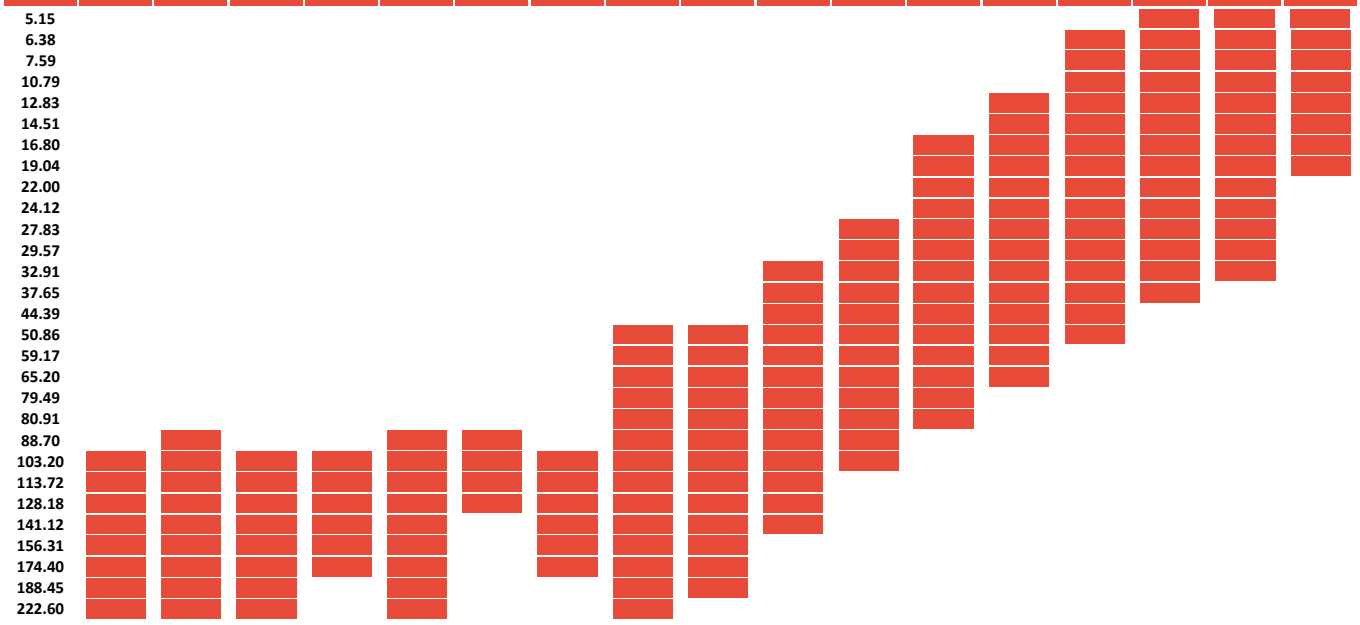
WHF 103 — M_n 4300 Nm

i =	0.75kW 8P P100B5	1.10kW 8P P100B5	1.50kW 8P P112B5	1.50kW 6P P100B5	2.20kW 6P P112B5	2.20kW 4P P100B5	3.00kW 6P P132B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5	15.0kW 4P P160B5	18.5kW 4P P180B5	22.0kW 4P P180B5	30.0kW 4P P200B5	37.0kW 4P P225B5	45.0kW 4P P225B5
4.92															■	■	■	■
5.82														■	■	■	■	■
6.66													■	■	■	■	■	■
7.86													■	■	■	■	■	■
10.13													■	■	■	■	■	■
11.59													■	■	■	■	■	■
13.66													■	■	■	■	■	■
15.65													■	■	■	■	■	■
18.21												■	■	■	■	■	■	■
20.07												■	■	■	■	■	■	
22.62											■	■	■	■	■			
24.90											■	■	■	■	■			
27.58											■	■	■	■	■			
29.49											■	■	■	■	■			
30.77											■	■	■	■	■			
35.26											■	■	■	■	■			
40.37										■	■	■	■	■				
47.63										■	■	■	■					
52.68									■	■	■	■						
59.41									■	■	■	■						
65.60									■	■	■							
72.88								■	■	■	■							
78.57								■	■	■	■							
92.70						■		■	■	■								
102.53						■		■	■	■								
115.63						■		■	■	■								
127.68						■	■	■	■									
141.83				■	■	■	■	■	■									
158.68			■	■	■	■	■	■	■									
172.32		■	■	■	■	■	■	■										
203.16	■	■	■	■		■		■										
229.95	■	■	■	■		■												
251.15	■	■		■		■												

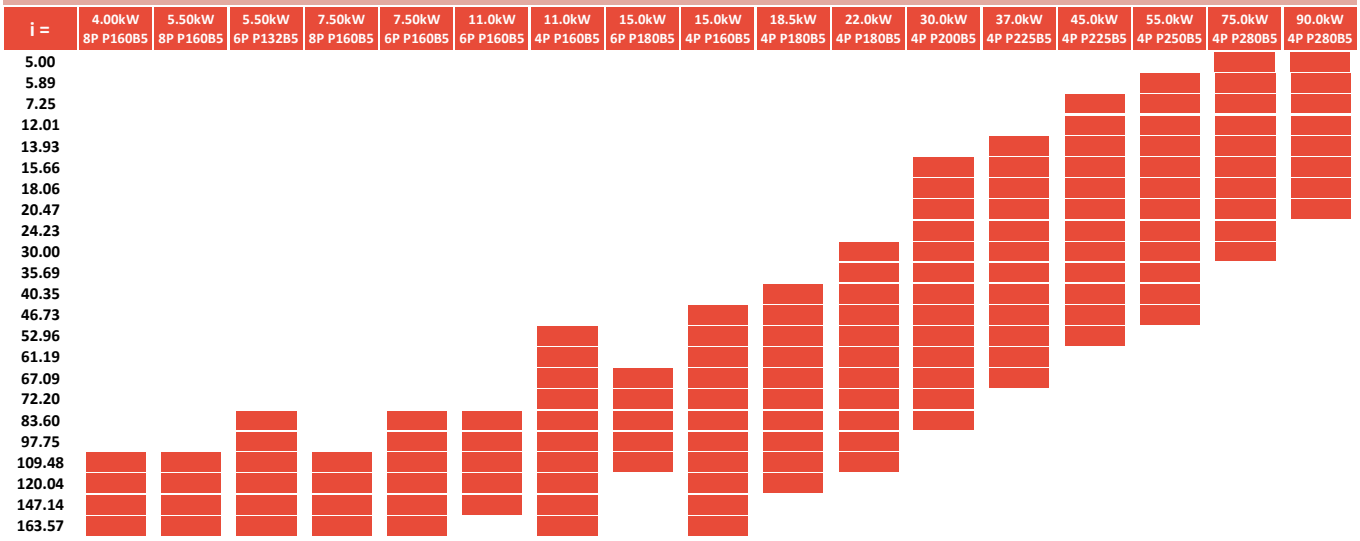
Dopuszczalne konfiguracje

Acceptable configurations

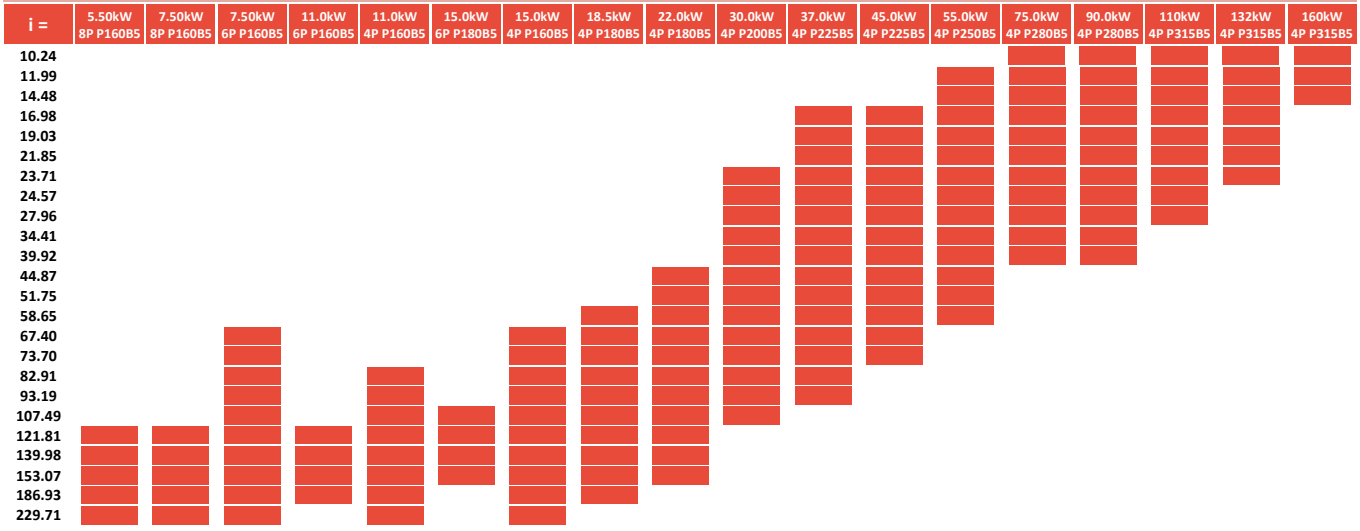
WHF 133 — M_n 8200 Nm



WHF 143 — M_n 13200 Nm



WHF 163 — M_n 18300 Nm



Dopuszczalne konfiguracje

Acceptable configurations

WHF 51 — M_n 65 Nm

i =	0.12kW 4P P63B5	0.18kW 6P P71B5	0.18kW 4P P63B5	0.25kW 6P P71B5	0.25kW 4P P71B5	0.37kW 6P P80B5	0.37kW 4P P71B5	0.55kW 6P P80B5	0.55kW 4P P80B5	0.75kW 6P P90B5	0.75kW 4P P80B5	1.10kW 6P P90B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5
1.30									■		■		■	■	■	■	■	■
1.48									■		■		■	■	■	■	■	■
1.65	■		■		■		■		■		■		■	■	■	■	■	■
1.92	■		■		■		■		■		■		■	■	■	■	■	■
2.04	■		■		■		■		■		■		■	■	■	■	■	■
2.37	■		■		■		■		■		■		■	■	■	■	■	
2.64	■		■		■		■		■	■	■	■	■	■	■	■	■	
2.91	■		■		■		■	■	■	■	■	■	■	■	■	■		
3.14	■		■		■		■	■	■	■	■	■	■	■	■	■		
3.55	■		■		■	■	■	■	■	■	■	■	■	■				
3.79	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
4.35	■	■	■	■	■	■	■	■	■									
5.07	■	■	■	■	■		■											
5.50	■	■	■	■	■		■											

WHF 61 — M_n 120 Nm

i =	0.12kW 4P P63B5	0.18kW 6P P71B5	0.18kW 4P P63B5	0.25kW 6P P71B5	0.25kW 4P P71B5	0.37kW 6P P80B5	0.37kW 4P P71B5	0.55kW 6P P80B5	0.55kW 4P P80B5	0.75kW 6P P90B5	0.75kW 4P P80B5	1.10kW 6P P90B5	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5
1.40									■		■		■	■	■	■	■	■	■
1.61									■		■		■	■	■	■	■	■	■
1.86									■		■		■	■	■	■	■	■	■
2.04			■		■		■		■		■		■	■	■	■	■	■	■
2.40			■		■		■		■		■		■	■	■	■	■	■	■
2.54			■		■		■		■		■		■	■	■	■	■	■	■
2.89			■		■		■		■		■		■	■	■	■	■		
3.20			■		■		■		■	■	■		■	■	■	■	■		
3.77			■		■	■	■		■	■	■		■	■	■	■			
4.30	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
4.53	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
5.18	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
6.07	■	■	■	■	■	■	■	■	■	■	■	■	■	■					

WHF 71 — M_n 220 Nm

i =	1.10kW 4P P90B5	1.50kW 4P P90B5	2.20kW 4P P100B5	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5
1.42			■		■	■	■	■
1.67			■		■	■	■	■
1.88			■		■	■	■	■
2.13			■		■	■	■	■
2.43		■	■		■	■	■	
2.70		■	■		■	■	■	
3.08		■	■	■	■	■	■	
3.25		■	■	■	■	■	■	
3.70		■	■	■				
4.04		■	■	■				
4.73	■	■	■	■				
5.35	■	■						
5.63	■	■						

WHF 81 — M_n 400 Nm

i =	3.00kW 4P P100B5	4.00kW 4P P112B5	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5	15.0kW 4P P160B5	18.5kW 4P P180B5	22.0kW 4P P180B5
1.39				■	■	■	■	■
1.60				■	■	■	■	■
1.93				■	■	■	■	■
2.15			■	■	■	■	■	■
2.48			■	■	■	■	■	■
2.76			■	■	■	■	■	■
3.09			■	■	■	■		
3.78	■	■	■	■	■	■		
4.50	■	■	■	■				
5.07	■	■						
5.56	■	■						
6.45	■							

WHF 91 — M_n 600 Nm

i =	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5	15.0kW 4P P160B5	18.5kW 4P P180B5	22.0kW 4P P180B5	30.0kW 4P P200B5
1.42	■		■	■	■	■	■
1.64	■		■	■	■	■	■
1.96	■		■	■	■	■	■
2.24	■		■	■	■	■	■
2.64	■		■	■	■	■	■
2.92	■	■	■	■	■	■	
3.30	■	■	■	■	■	■	
3.64	■	■	■	■	■	■	
4.04	■	■	■	■			
4.52	■	■	■	■			
4.91	■	■					
5.79	■	■					

WHF 101 — M_n 810 Nm

i =	5.50kW 4P P132B5	7.50kW 4P P132B5	11.0kW 4P P160B5	15.0kW 4P P160B5	18.5kW 4P P180B5	22.0kW 4P P180B5	30.0kW 4P P200B5	37.0kW 4P P225B5	45.0kW 4P P225B5
1.44				■	■	■	■	■	■
1.71				■	■	■	■	■	■
1.95				■	■	■	■	■	■
2.30				■	■	■	■	■	■
2.64			■	■	■	■	■	■	■
3.07			■	■	■	■	■	■	■
3.38			■	■	■	■	■	■	■
3.81			■	■	■	■			
4.20		■	■	■	■	■			
4.65	■	■	■	■					
5.19	■	■	■	■					
5.61	■	■							
6.63	■	■							

Tabela z danymi technicznymi

Technical data table

Poniżej znajduje się przykładowy wygląd i opis tabeli z danymi technicznymi przekładni WHF.

The following is an example of the design and description of the table with the WHF gear unit technical data.

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.12						**6p**
n_1=900 [rpm]	**4.60**	250	3.30	195.24	**L 73**	**P63B5**
	5.40	210	3.90	166.59	**K 73**	
	6.20	186	4.40	145.67	**LK 73**	

P_1 - moc silnika elektrycznego [kW]
n_1 - obroty wejściowe [rpm]
n_2 - obroty wyjściowe [rpm]
M_2 - wyjściowy moment obrotowy [Nm]
f_s - współczynnik pracy
i = - przełożenie
- typ przekładni (zobacz oznaczenie kodowe)
- typ kołnierza wejściowego IEC (pod silnik)

P_1 - *rated power driving motor [kW]*
n_1 - *input speed [rpm]*
n_2 - *output speed [rpm]*
M_2 - *rated output torque [Nm]*
f_s - *service factor*
i = - *gear unit ratio*
- *gear unit type (see classification)*
- *input flange IEC (for AC motor)*

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.12						**6p**
n_1=900 [rpm]	**4.60**	250	3.30	195.24	**L 73**	**P71B5**
	5.40	210	3.90	166.59	**K 73**	
	6.20	186	4.40	145.67	**LK 73**	
0.12						**6p**
n_1=900 [rpm]	**4.50**	255	2.40	199.81	**L 63**	**P71B5**
	4.90	235	2.60	184.07	**K 63**	
	5.70	200	3.00	158.14	**LK 63**	
	6.50	175	3.40	137.67		
	7.00	164	3.70	128.97		
	7.90	145	4.10	113.94		
0.12						**4p**
n_1=1400 [rpm]	**6.90**	166	3.60	199.81	**L 63**	**P63B5**
	7.50	153	3.90	184.07	**K 63 LK 63**	
0.12						**6p**
n_1=900 [rpm]	**4.80**	240	1.90	186.89	**L 53**	**P71B5**
	5.20	220	2.00	172.17	**K 53**	
	6.10	188	2.40	147.92		
	7.00	164	2.70	128.77		
	7.50	154	2.90	120.63		
	8.40	136	3.30	106.58		
	9.10	126	3.60	98.99		
0.12						**4p**
n_1=1400 [rpm]	**7.40**	155	2.90	186.89	**L 53**	**P63B5**
	8.00	143	3.20	172.17	**K 53**	
	9.30	123	3.70	147.92		
	11.0	107	4.20	128.77		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.12						**6p**
n_1=900 [rpm]	**5.10**	225	1.35	176.88	**L 43**	**P71B5**
	5.50	210	1.45	162.94	**K 43**	
	6.40	178	1.70	139.99		
	7.40	155	1.95	121.87		
0.12						**4p**
n_1=1400 [rpm]	**7.80**	147	2.00	176.88	**L 43**	**P63B5**
	8.50	135	2.20	162.94	**K 43**	
	9.90	116	2.60	139.99		
	11.0	101	3.00	121.87		
	12.0	95	3.20	114.17		
	14.0	84	3.60	100.86		
	15.0	78	3.90	93.68		
0.12						**6p**
n_1=900 [rpm]	**6.70**	172	1.15	134.82	**L 33**	**P71B5**
	7.30	157	1.25	123.66	**K 33**	
	8.60	134	1.550	105.28		
	9.90	116	1.75	90.77		
	11.0	108	1.85	84.61		
	12.0	94	2.10	73.96		
0.12						**4p**
n_1=1400 [rpm]	**10.0**	112	1.80	134.82	**L 33**	**P63B5**
	11.0	103	1.95	123.66	**K 33**	
	13.0	87	2.30	105.28		
	15.0	75	2.70	90.77		
	16.0	70	2.80	84.61		
	19.0	61	3.30	73.96		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.12						**6p**
n_1=900 [rpm]	**7.30**	158	0.80	123.91	**L 23**	**P71B5**
	8.50	134	0.95	105.49	**K 23**	
	9.90	116	1.10	90.96		
	10.6	108	1.20	84.78		
	12.1	94	1.40	74.11		
0.12						**4p**
n_1=1400 [rpm]	**10.3**	112	1.15	135.09	**L 23**	**P63B5**
	11.3	103	1.25	123.91	**K 23**	
	13.3	88	1.50	105.49		
	15.4	76	1.70	90.96		
	16.5	70	1.85	84.78		
	19.9	62	2.10	74.11		
	20.1	58	2.20	69.47		
	22.8	51	2.50	61.30		
	25.0	46	2.80	55.87		
	29.0	40	3.20	48.17		
	31.2	37	3.50	44.90		
0.12						**6p**
n_1=900 [rpm]	**11.0**	104	0.80	81.64	**L 13**	**P71B5**
	12.8	90	0.95	70.39	**K 13**	
	13.7	84	1.00	65.61		
	15.7	73	1.15	57.35		
	16.7	68	1.25	53.76		
	18.9	60	1.40	47.44		
0.12						**4p**
n_1=1400 [rpm]	**17.1**	68	1.25	81.64	**L 13**	**P63B5**
	19.8	58	1.45	70.39	**K 13**	
	21.3	55	1.55	65.61		
	24.4	48	1.80	57.35		
	26.0	45	1.90	53.76		
	29.5	39	2.20	47.44		
	31.7	37	2.30	44.18		
	36.3	32	2.70	38.61		
	38.7	30	2.80	36.20		
	43.8	27	3.20	31.94		
	49.4	24	3.60	28.32		
	58.2	20	4.20	24.07		
	55.5	21	4.10	25.23		
	60.5	19	4.40	23.15		
	71.0	16	5.20	19.71		
	82.4	14	6.00	16.99		
	88.4	13	6.40	15.84		
	100	12	7.40	13.84		
	106	11	7.90	12.98		
	121	9.5	8.50	11.45		
	136	8.4	9.20	10.15		
	160	7.2	9.90	8.63		
	183	6.3	8.90	7.55		
	196	5.8	9.50	7.04		
	224	5.1	11.0	6.15		
	239	4.8	11.0	5.76		
	271	4.2	12.0	5.09		
	306	3.7	13.0	4.51		
	360	3.2	14.0	3.83		
0.12						**4p**
n_1=1400 [rpm]	**227**	5.0	8.60	6.07	**L 61**	**P63B5**
	267	4.3	17.0	5.18	**K 61**	
	305	3.8	22.0	4.53		
	321	3.6	22.0	4.30		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.12						**4p**
n_1=1400 [rpm]	**251**	4.60	8.50	5.50	**L 51**	**P63B5**
	272	4.20	8.60	5.07	**K 51**	
	317	3.60	19.0	4.35		
	364	3.10	22.0	3.79		
	389	2.90	24.0	3.55		
	440	2.60	25.0	3.14		
	474	2.40	28.0	2.91		
	523	2.20	31.0	2.64		
	582	2.00	35.0	2.37		
	676	1.70	41.0	2.04		
	719	1.60	43.0	1.92		
	835	1.40	49.0	1.65		
0.18						**6p**
n_1=900 [rpm]	**4.60**	385	2.10	195.24	**L 73**	**P71B5**
	5.40	330	2.50	166.59	**K 73**	
	6.20	290	2.80	145.67	**LK 73**	
	6.50	275	3.00	138.39		
	7.40	240	3.40	121.42		
0.18						**4p**
n_1=1400 [rpm]	**7.20**	255	3.20	195.24	**L 73**	**P63B5**
	8.40	215	3.80	166.59	**K 73**	
	9.60	190	4.30	145.67	**LK 73**	
	10.1	180	4.60	138.39		
0.18						**6p**
n_1=900 [rpm]	**4.50**	395	1.50	199.81	**L 63**	**P71B5**
	4.90	365	1.65	184.07	**K 63**	
	5.70	310	1.90	158.14	**LK 63**	
	6.50	270	2.20	137.67		
	6.80	255	2.30	128.97		
	7.60	225	2.70	113.94		
	8.20	210	2.90	105.83		
	9.10	190	3.20	95.91		
	10.4	170	3.50	86.11		
	12.1	147	4.10	74.17		
	12.9	138	4.30	69.75		
0.18						**4p**
n_1=1400 [rpm]	**6.60**	260	2.30	199.81	**L 63**	**P63B5**
	7.20	240	2.50	184.07	**K 63**	
	8.40	205	2.90	158.14	**LK 63**	
	9.60	179	3.30	137.67		
	10.8	168	3.60	128.97		
	12.3	148	4.00	113.94		
	13.2	138	4.30	105.83		
0.18						**6p**
n_1=900 [rpm]	**4.70**	370	1.20	186.89	**L 53**	**P71B5**
	5.10	340	1.30	172.17	**K 53**	
	5.90	290	1.55	147.92		
	6.80	255	1.75	128.77		
	7.20	240	1.90	120.63		
0.18						**4p**
n_1=1400 [rpm]	**7.10**	245	1.85	186.89	**L 53**	**P71B5**
	7.70	225	2.00	172.17	**K 53**	
	8.90	193	2.30	147.92		
	10.8	168	2.70	128.77		
	11.6	157	2.90	120.63		
	13.1	139	3.20	106.58		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.18						**4p**
n_1=1400 [rpm]	**14.1**	129	3.50	98.99	**L 53**	**P63B5**
	15.6	117	3.80	89.71	**K 53**	
0.18						**4p**
n_1=1400 [rpm]	**7.90**	230	1.30	176.88	**L 43**	**P63B5**
	8.60	210	1.40	162.94	**K 43**	
	10.0	182	1.65	139.99		
	11.5	159	1.90	121.87		
	12.3	149	2.00	114.17		
	13.9	131	2.30	100.86		
	14.9	122	2.50	93.68		
	16.5	111	2.70	84.90		
	18.4	99.0	3.00	76.23		
0.18						**6p**
n_1=900 [rpm]	**7.30**	245	0.80	123.66	**L 33**	**P71B5**
	8.50	210	0.95	105.28	**K 33**	
	9.90	179	1.10	90.77		
	10.6	167	1.20	84.61		
0.18						**4p**
n_1=1400 [rpm]	**10.4**	176	1.15	134.82	**L 33**	**P63B5**
	11.3	161	1.25	123.66	**K 33**	
	13.3	137	1.45	105.28		
	15.4	118	1.70	90.77		
	16.5	110	1.80	84.61		
	18.9	96.0	2.10	73.96		
	20.2	90.0	2.20	69.33		
	22.9	80.0	2.50	61.18		
	25.1	73.0	2.80	55.76		
	29.1	63.0	3.20	48.08		
0.18						**4p**
n_1=1400 [rpm]	**11.3**	161	0.80	123.91	**L 23**	**P63B5**
	13.3	137	0.95	105.49	**K 23**	
	15.4	118	1.10	90.96		
	16.5	110	1.20	84.78		
	18.9	97.0	1.35	74.11		
	20.1	91.0	1.45	69.47		
	22.8	80.0	1.65	61.30		
	25.0	73.0	1.80	55.87		
	29.1	63.0	2.10	48.17		
	31.2	59.0	2.20	44.90		
	35.7	51.0	2.50	39.25		
	38.0	48.0	2.70	36.79		
	43.1	42.0	3.10	32.47		
	48.6	38.0	3.50	28.78		
	49.3	37.0	3.50	28.37		
	53.7	34.0	3.80	26.09		
	57.2	32.0	4.10	24.47		
	62.7	29.0	4.50	22.32		
	72.3	25.0	5.20	19.35		
	77.4	24.0	5.50	18.08		
	89.6	20.0	6.40	15.63		
	105	17.0	7.50	13.28		
0.18						**4p**
n_1=1400 [rpm]	**17.1**	106	0.80	81.64	**L 13**	**P63B5**
	19.9	92.0	0.95	70.39	**K 13**	
	21.3	85.0	1.00	65.61		
	24.4	75.0	1.15	57.35		
	26.0	70.0	1.20	53.76		
	29.5	62.0	1.40	47.44		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.18						**4p**
n_1=1400 [rpm]	**31.7**	58.0	1.50	44.18	**L 13**	**P63B5**
	36.3	50.0	1.70	38.61	**K 13**	
	38.7	47.0	1.80	36.20		
	43.8	42.0	2.00	31.94		
	49.4	37.0	2.30	28.32		
	55.5	33.0	2.60	25.23		
	58.2	31.0	2.70	24.07		
	60.5	30.0	2.80	23.16		
	71.0	26.0	3.30	19.71		
	82.4	22.0	3.80	16.99		
	88.4	21.0	4.10	15.84		
	101	18.0	4.70	13.84		
	108	17.0	5.00	12.98		
	122	15.0	5.40	11.45		
	138	13.0	5.80	10.15		
	162	11.0	6.40	8.63		
	185	9.80	5.70	7.55		
	199	9.20	6.00	7.04		
	228	8.00	6.80	6.15		
	243	7.50	7.10	5.76		
	275	6.60	7.70	5.09		
	310	5.90	8.10	4.51		
	365	5.00	9.00	3.83		
0.18						**2p**
n_1=2800 [rpm]	**276**	6.40	12.0	10.15	**L 13**	**P63B5**
	324	5.50	13.0	8.63	**K 13**	
	371	4.80	12.0	7.55		
	398	4.40	13.0	7.04		
	455	3.90	14.0	6.15		
	486	3.60	15.0	5.76		
	550	3.20	16.0	5.09		
	621	2.80	17.0	4.51		
	731	2.40	19.0	3.83		
0.18						**6p**
n_1=900 [rpm]	**148**	12.0	3.60	6.07	**L 61**	**P71B5**
	174	10.0	7.30	5.18	**K 61**	
	199	8.90	9.20	4.53		
	209	8.50	9.40	4.30		
0.18						**4p**
n_1=1400 [rpm]	**231**	7.90	5.40	6.07	**L 61**	**P63B5**
	270	6.70	11.0	5.18	**K 61**	
	309	5.90	14.0	4.53		
	325	5.60	14.0	4.30		
	371	4.90	18.0	3.77		
	437	4.20	24.0	3.20		
	484	3.80	28.0	2.89		
	551	3.30	36.0	2.54		
	583	3.10	40.0	2.40		
	686	2.70	50.0	2.04		
0.18						**6p**
n_1=900 [rpm]	**164**	11.0	3.60	5.50	**L 51**	**P71B5**
	177	10.0	3.60	5.07	**K 51**	
	207	8.60	7.90	4.35		
	237	7.50	9.20	3.79		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.18						**4p**
n_1=1400 [rpm]	**254**	7.20	5.40	5.50	**L 51**	**P63B5**
	276	6.60	5.40	5.07	**K 51**	
	322	5.70	12.0	4.35		
	369	4.90	14.0	3.79		
	394	4.60	15.0	3.55		
	446	4.10	16.0	3.14		
	481	3.80	18.0	2.91		
	530	3.40	20.0	2.64		
	591	3.10	22.0	2.37		
	686	2.70	26.0	2.04		
	729	2.50	28.0	1.92		
	848	2.20	31.0	1.65		
0.25						**8p**
n_1=700 [rpm]	**2.40**	1020	3.00	289.74	**L 93**	**P80B5**
	2.70	900	3.30	255.71	**K 93**	
	2.90	850	3.50	241.25		
	3.20	760	4.00	216.28		
0.25						**8p**
n_1=700 [rpm]	**2.80**	870	1.80	246.54	**L 83**	**P80B5**
	3.20	760	2.00	216.54	**K 83**	
	3.40	720	2.20	205.71	**LK 83**	
	3.80	640	2.40	181.77		
0.25						**8p**
n_1=700 [rpm]	**4.20**	585	1.40	166.49	**L 73**	**P80B5**
	4.80	510	1.60	145.67	**K 73**	
	5.00	485	1.70	138.39	**LK 73**	
	5.80	425	1.90	121.42		
0.25						**6p**
n_1=900 [rpm]	**4.60**	530	1.55	195.24	**L 73**	**P71B5**
	5.40	450	1.80	166.59	**K 73**	
	6.20	395	2.10	145.67	**LK 73**	
0.25						**4p**
n_1=1400 [rpm]	**7.20**	360	2.30	195.24	**L 73**	**P71B5**
	8.40	305	2.70	166.59	**K 73**	
	9.60	270	3.10	145.67	**LK 73**	
	10.0	255	3.20	138.39		
	11.5	225	3.70	121.42		
0.25						**8p**
n_1=700 [rpm]	**4.40**	555	1.10	158.14	**L 63**	**P80B5**
	5.10	485	1.25	137.67	**K 63**	
	5.40	455	1.35	128.97	**LK 63**	
	6.10	400	1.50	113.94		
0.25						**6p**
n_1=900 [rpm]	**4.50**	540	1.10	199.81	**L 63**	**P71B5**
	4.90	500	1.20	184.07	**K 63**	
	5.70	430	1.40	158.14	**LK 63**	
	6.50	375	1.60	137.67		
	7.00	350	1.70	128.97		
	7.90	310	1.95	113.94		
	8.50	285	2.10	105.83		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.25						**4p**
n_1=1400 [rpm]	**7.00**	365	1.65	199.81	**L 63**	**P71B5**
	7.60	340	1.80	184.07	**K 63**	
	8.80	290	2.10	158.14	**LK 63**	
	10.2	255	2.40	137.67		
	10.8	235	2.50	128.97		
	12.3	210	2.90	113.94		
	13.2	194	3.10	105.83		
	14.6	176	3.40	95.91		
	16.2	158	3.80	86.11		
0.25						**6p**
n_1=900 [rpm]	**4.80**	505	1.90	186.89	**L 53**	**P71B5**
	5.20	465	1.95	172.17	**K 53**	
	6.10	400	1.10	147.92		
	7.00	350	1.30	128.77		
	7.50	325	1.35	120.63		
	8.40	290	1.55	106.58		
	9.10	270	1.70	98.99		
0.25						**4p**
n_1=1400 [rpm]	**7.50**	345	1.30	186.89	**L 53**	**P71B5**
	8.10	315	1.40	172.17	**K 53**	
	9.50	270	1.65	147.92		
	10.9	235	1.90	128.77		
	11.6	220	2.00	120.63		
	13.1	196	2.30	106.58		
	14.1	182	2.50	98.99		
	15.6	165	2.70	89.71		
	17.4	148	3.00	80.55		
	20.2	127	3.50	69.23		
0.25						**4p**
n_1=1400 [rpm]	**7.90**	325	0.90	176.88	**L 43**	**P71B5**
	8.60	300	1.00	162.94	**K 43**	
	10.0	255	1.15	139.99		
	11.5	225	1.35	121.87		
	12.3	210	1.45	114.17		
	13.9	185	1.60	100.86		
	14.9	172	1.75	93.68		
	16.5	156	1.90	84.90		
	18.4	140	2.10	76.23		
	20.4	126	2.40	68.54		
	21.8	118	2.50	64.21		
	24.7	104	2.90	56.73		
	26.6	97	3.10	52.69		
	29.3	88	3.40	47.75		
0.25						**4p**
n_1=1400 [rpm]	**10.4**	250	0.80	134.82	**L 33**	**P71B5**
	11.3	225	0.90	123.66	**K 33**	
	13.3	193	1.05	105.28		
	15.4	167	1.20	90.77		
	16.5	155	1.30	84.61		
	18.9	136	1.45	73.96		
	20.2	127	1.55	69.33		
	22.9	112	1.80	61.18		
	25.1	102	1.95	55.76		
	29.1	88	2.30	48.08		
	31.2	82	2.40	44.81		
	35.7	72	2.80	39.17		
	38.1	67	3.00	36.72		
	43.2	60	3.40	32.40		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.25						**4p**
n_1=1400 [rpm]	**16.5**	156	0.85	84.78	**L 23**	**P71B5**
	18.9	136	0.95	74.11	**K 23**	
	20.1	128	1.00	69.47		
	22.8	113	1.15	61.30		
	25.0	103	1.25	55.87		
	29.0	89	1.45	48.17		
	31.2	83	1.60	44.90		
	35.7	72	1.80	39.25		
	38.0	68	1.90	36.79		
	43.1	60	2.20	32.47		
	48.6	53	2.50	28.78		
	49.3	52	2.50	28.37		
	53.7	48	2.70	26.09		
	57.2	45	2.90	24.47		
	62.7	41	3.20	22.32		
	72.3	36	3.70	19.35		
	77.4	33	3.90	18.08		
	89.6	29	4.50	15.63		
	105	24	5.30	13.28		
	118	22	5.90	11.86		
	138	19	6.60	10.13		
	149	17	7.10	9.41		
	171	15	7.70	8.16		
	183	14	8.00	7.63		
	212	12	8.80	6.59		
	250	10	9.60	5.60		
	280	9.20	10.0	5.00		
	328	7.80	11.0	4.27		
	350	7.30	12.0	4.00		
	415	6.20	13.0	3.37		
0.25						**4p**
n_1=1400 [rpm]	**24.4**	105	0.80	57.35	**L 13**	**P71B5**
	26.0	99	0.85	53.76	**K 13**	
	29.5	87	1.00	47.44		
	31.7	81	1.05	44.18		
	36.3	71	1.20	38.61		
	38.7	67	1.30	36.20		
	43.8	59	1.45	31.94		
	49.4	52	1.65	28.32		
	55.5	46	1.85	25.23		
	58.2	44	1.90	24.07		
	60.5	43	2.00	23.15		
	71.0	36	2.30	19.71		
	82.4	31	2.70	16.99		
	88.4	29	2.90	15.84		
	101	25	3.30	13.84		
	108	24	3.60	12.98		
	122	21	3.90	11.45		
	138	19	4.10	10.15		
	162	16	4.60	8.63		
	185	14	4.00	7.55		
	199	13	4.30	7.04		
	228	11	4.80	6.15		
	243	11	5.00	5.76		
	275	9.30	5.50	5.09		
	310	8.30	5.80	4.51		
	365	7.00	6.40	3.83		
0.25						**2p**
n_1=2800 [rpm]	**455**	5.50	9.80	6.15	**L 13**	**P63B5**
	486	5.20	10.0	5.76	**K 13**	
	550	4.60	11.0	5.09		
	621	4.00	12.0	4.51		
	731	3.40	13.0	3.83		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.25						**6p**
n_1=900 [rpm]	**148**	17	2.60	6.07	**L 61**	**P71B5**
	174	14	5.40	5.18	**K 61**	
	199	12	6.70	4.53		
	209	12	6.80	4.30		
0.25						**4p**
n_1=1400 [rpm]	**231**	11	3.90	6.07	**L 61**	**P71B5**
	270	9.50	7.90	5.18	**K 61**	
	309	8.30	9.90	4.53		
	325	7.90	10.0	4.30		
	371	6.90	13.0	3.77		
	437	5.90	17.0	3.20		
	484	5.30	20.0	2.89		
	551	4.70	25.0	2.54		
	583	4.40	28.0	2.40		
	686	3.80	35.0	2.04		
0.25						**6p**
n_1=900 [rpm]	**164**	15	2.60	5.50	**L 51**	**P71B5**
	177	14	2.60	5.07	**K 51**	
	207	12	5.80	4.35		
	237	10	6.70	3.79		
0.25						**4p**
n_1=1400 [rpm]	**254**	10	3.90	5.50	**L 51**	**P71B5**
	276	9.30	3.90	5.07	**K 51**	
	322	8.00	8.50	4.35		
	369	7.00	9.90	3.79		
	394	6.50	11.0	3.55		
	446	5.80	11.0	3.14		
	481	5.30	13.0	2.91		
	530	4.80	14.0	2.64		
	591	4.40	16.0	2.37		
	686	3.70	19.0	2.04		
	729	3.50	20.0	1.92		
	848	3.00	23.0	1.65		
0.37						**8p**
n_1=700 [rpm]	**2.70**	1330	2.30	255.71	**L 93**	**P90B5**
	2.90	1250	2.40	241.25	**K 93**	
	3.20	1120	2.70	216.28		
	3.70	970	3.10	186.30		
0.37						**6p**
n_1=900 [rpm]	**3.10**	1140	2.60	289.74	**L 93**	**P80B5**
	3.50	1000	3.00	255.71	**K 93**	
	3.70	950	3.20	241.25		
	4.20	850	3.50	216.28		
0.37						**8p**
n_1=700 [rpm]	**3.20**	1130	1.40	216.54	**L 83**	**P90B5**
	3.40	1070	1.45	205.71	**K 83**	
	3.80	940	1.65	181.77	**LK 83**	
0.37						**6p**
n_1=900 [rpm]	**3.70**	970	1.60	246.54	**L 83**	**P80B5**
	4.20	850	1.80	216.54	**K 83**	
	4.40	810	1.90	205.71	**LK 83**	
	4.90	715	2.20	181.77		
	5.80	610	2.50	155.34		
	6.30	560	2.80	142.41		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.37						**8p**
n_1=700 [rpm]	**4.80**	755	1.10	145.67	**L 73**	**P90B5**
	5.10	720	1.15	138.39	**K 73**	
	5.80	630	1.30	121.42	**LK 73**	
0.37						**6p**
n_1=900 [rpm]	**5.40**	655	1.25	166.59	**L 73**	**P80B5**
	6.20	570	1.45	145.67	**K 73**	
	6.50	545	1.50	138.39	**LK 73**	
0.37						**4p**
n_1=1400 [rpm]	**7.20**	500	1.65	195.24	**L 73**	**P71B5**
	8.40	425	1.90	166.59	**K 73**	
	9.60	375	2.20	145.67	**LK 73**	
	10.0	355	2.30	138.39		
	11.5	310	2.60	121.42		
	13.6	265	3.10	102.99		
	15.0	240	3.50	92.97		
0.37						**6p**
n_1=900 [rpm]	**5.70**	620	0.95	158.14	**L 63**	**P80B5**
	6.50	540	1.10	137.67	**K 63**	
	7.00	505	1.20	128.97	**LK 63**	
	7.90	445	1.35	113.94		
0.37						**4p**
n_1=1400 [rpm]	**7.00**	510	1.15	199.81	**L 63**	**P71B5**
	7.60	470	1.25	184.07	**K 63**	
	8.80	405	1.550	158.14	**LK 63**	
	10.2	355	1.70	137.67		
	10.8	330	1.80	128.97		
	12.3	290	2.10	113.94		
	13.2	270	2.20	105.83		
	14.6	245	2.40	95.91		
	16.2	220	2.70	86.11		
	18.9	190	3.20	74.17		
	20.0	179	3.40	69.75		
	22.8	157	3.80	61.26		
	24.6	146	4.10	56.89		
0.37						**6p**
n_1=900 [rpm]	**7.00**	505	0.90	128.77	**L 53**	**P80B5**
	7.50	475	0.95	120.63	**K 53**	
	8.40	420	1.10	106.58		
	9.10	390	1.15	98.99		
0.37						**4p**
n_1=1400 [rpm]	**7.50**	480	0.95	186.89	**L 53**	**P71B5**
	8.10	440	1.00	172.17	**K 53**	
	9.50	380	1.20	147.92		
	11.0	330	1.35	128.77		
	11.6	310	1.45	120.63		
	13.1	275	1.65	106.58		
	14.1	255	1.80	98.99		
	15.6	230	1.95	89.71		
	17.4	205	2.20	80.55		
	20.2	177	2.50	69.23		
	21.6	166	2.70	64.85		
	24.4	147	3.10	57.29		
	26.3	136	3.30	53.22		
	29.0	124	3.60	48.23		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.37						**4p**
n_1=1400 [rpm]	**10.0**	360	0.85	139.99	**L 43**	**P71B5**
	11.5	310	0.95	121.87	**K 43**	
	12.3	290	1.05	114.17		
	13.9	260	1.15	100.86		
	14.9	240	1.25	93.68		
	16.5	215	1.40	84.90		
	18.4	195	1.55	76.23		
	20.4	176	1.70	68.54		
	21.8	164	1.80	64.21		
	24.7	145	2.10	56.73		
	26.6	135	2.20	52.69		
	29.3	122	2.50	47.75		
	32.6	110	2.70	42.87		
	37.9	95	3.20	36.93		
	40.3	89	3.40	34.73		
	41.4	87	2.80	33.79		
	45.0	80	2.80	31.12		
	52.3	69	4.40	26.74		
	64.2	60	5.40	21.81		
	105	56	5.00	13.28		
0.37						**4p**
n_1=1400 [rpm]	**15.4**	230	0.85	90.77	**L 33**	**P71B5**
	16.5	215	0.90	84.61	**K 33**	
	19.0	189	1.05	73.96		
	20.2	178	1.15	69.33		
	22.9	157	1.30	61.18		
	25.1	143	1.40	55.76		
	29.1	123	1.60	48.08		
	31.2	115	1.75	44.81		
	35.7	100	2.00	39.17		
	38.1	94	2.10	36.72		
	43.2	83	2.40	32.40		
	48.7	74	2.70	28.73		
	49.4	73	2.80	28.32		
	53.8	67	2.80	26.03		
	57.3	63	3.20	24.42		
	62.9	57	3.50	22.27		
	72.5	49	4.10	19.31		
	77.6	46	4.30	18.05		
	89.7	40	5.00	15.60		
	106	34	5.60	13.25		
	118	30	6.00	11.83		
0.37						**4p**
n_1=1400 [rpm]	**22.8**	157	0.85	61.30	**L 23**	**P71B5**
	25.0	143	0.90	55.87	**K 23**	
	29.1	123	1.05	48.17		
	31.2	115	1.15	44.90		
	35.7	101	1.30	39.25		
	38.0	94	1.40	36.79		
	43.1	83	1.55	32.47		
	48.6	74	1.75	28.78		
	49.3	73	1.80	28.37		
	53.7	67	1.95	26.09		
	57.2	63	2.10	24.47		
	62.7	57	2.30	22.32		
	72.3	50	2.60	19.35		
	77.4	46	2.80	18.08		
	89.6	40	3.20	15.63		
	105	34	3.80	13.28		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.37						**4p**
n_1=1400 [rpm]	**36.2**	99	0.85	38.61	**L 13**	**P71B5**
	38.7	93	0.90	36.20	**K 13**	
	43.8	82	1.05	31.94		
	49.4	73	1.15	28.32		
	55.5	65	1.30	25.23		
	58.2	62	1.40	24.07		
	60.5	59	1.45	23.15		
	71.0	51	1.70	19.71		
	82.4	44	1.95	16.99		
	88.4	41	2.10	15.84		
	101	35	2.40	13.84		
	108	33	2.60	12.98		
	122	29	2.80	11.45		
	138	26	3.00	10.15		
	162	22	3.30	8.63		
	185	19	2.90	7.55		
	199	18	3.10	7.04		
	228	16	3.40	6.15		
	243	15	3.60	5.76		
	275	13	3.90	5.09		
	310	12	4.20	4.51		
	365	9.8	4.60	3.83		
0.37						**2p**
n_1=2800 [rpm]	**202**	19	4.60	13.84	**L 13**	**P71B5**
	216	17	4.90	12.98	**K 13**	
	244	15	5.30	11.45		
	276	14	5.70	10.15		
	324	12	6.30	8.63		
	371	10	5.50	7.55		
	398	9.40	5.80	7.04		
	455	8.20	6.60	6.15		
	486	7.70	6.90	5.76		
	550	6.80	7.50	5.09		
	621	6.00	8.00	4.51		
	731	5.10	8.80	3.83		
0.37						**6p**
n_1=900 [rpm]	**174**	20	3.70	5.18	**L 61**	**P80B5**
	199	18	4.60	4.53	**K 61**	
	209	17	4.70	4.30		
	239	15	5.90	3.77		
0.37						**4p**
n_1=1400 [rpm]	**231**	16	2.80	6.07	**L 61**	**P71B5**
	270	13	5.60	5.18	**K 61**	
	309	12	7.10	4.53		
	325	11	7.30	4.30		
	371	9.70	9.00	3.77		
	437	8.20	12	3.20		
	484	7.40	14	2.89		
	551	6.50	18	2.54		
	583	6.10	20	2.40		
	686	5.20	26	2.04		
0.37						**6p**
n_1=900 [rpm]	**207**	17	4.00	4.35	**L 51**	**P80B5**
	238	15	4.60	3.79	**K 51**	
	253	14	5.00	3.55		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.37						**4p**
n_1=1400 [rpm]	**254**	14	2.80	5.50	**L 51**	**P71B5**
	276	13	2.80	5.07	**K 51**	
	322	11	6.10	4.35		
	369	9.70	7.10	3.79		
	394	9.10	7.60	3.55		
	446	8.00	8.10	3.14		
	481	7.50	8.90	2.91		
	530	6.80	10	2.64		
	591	6.10	11	2.37		
	686	5.20	13	2.04		
	729	4.90	14	1.92		
	848	4.20	16	1.65		
0.55						**8p**
n_1=700 [rpm]	**2.70**	1980	1.50	255.71	**L 93**	**P90B5**
	2.90	1860	1.60	241.25	**K 93**	
	3.20	1670	1.80	216.28		
0.55						**6p**
n_1=900 [rpm]	**3.10**	1690	1.75	289.74	**L 93**	**P80B5**
	3.50	1490	2.00	255.71	**K 93**	
	3.70	1410	2.10	241.25		
	4.20	1260	2.40	216.28		
0.55						**4p**
n_1=1400 [rpm]	**4.80**	1120	2.70	289.74	**L 93**	**P80B5**
	5.50	990	3.00	255.71	**K 93**	
	5.80	930	3.20	241.25		
	6.50	840	3.60	216.28		
0.55						**6p**
n_1=900 [rpm]	**3.60**	1440	1.10	246.54	**L 83**	**P80B5**
	4.10	1260	1.25	216.54	**K 83**	
	4.40	1200	1.30	205.71	**LK 83**	
	4.90	1060	1.45	181.77		
	5.80	910	1.70	155.34		
0.55						**4p**
n_1=1400 [rpm]	**5.70**	950	1.65	246.54	**L 83**	**P80B5**
	6.50	840	1.85	216.54	**K 83**	
	6.80	795	1.95	205.71	**LK 83**	
	7.70	700	2.20	181.77		
	9.00	600	2.60	155.34		
	9.80	550	2.80	142.41		
	11.2	485	3.20	124.97		
	11.8	455	3.40	118.43		
	13.5	400	3.90	103.65		
0.55						**4p**
n_1=1400 [rpm]	**8.40**	645	1.25	166.59	**L 73**	**P80B5**
	9.60	565	1.45	145.67	**K 73**	
	10.1	535	1.55	138.39	**LK 73**	
	11.5	470	1.75	121.42		
	13.6	400	2.10	102.99		
	15.0	360	2.30	92.97		
	17.1	315	2.60	81.80		
	18.1	300	2.80	77.24		
	21.3	255	3.20	65.77		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.55						**4p**
n_1=1400 [rpm]	**8.80**	610	1.00	158.14	**L 63**	**P80B5**
	10.2	530	1.15	137.67	**K 63**	
	10.8	500	1.20	128.97	**LK 63**	
	12.3	440	1.35	113.94		
	13.2	410	1.45	105.83		
	14.6	370	1.60	95.91		
	16.2	335	1.80	86.11		
	18.9	285	2.10	74.17		
	20.1	270	2.20	69.75		
	22.8	235	2.50	61.26		
	24.6	220	2.70	56.89		
0.55						**4p**
n_1=1400 [rpm]	**11.6**	465	0.95	120.63	**L 53**	**P80B5**
	13.1	410	1.10	106.58	**K 53**	
	14.1	380	1.20	98.99		
	15.6	345	1.30	89.71		
	17.4	310	1.45	80.55		
	20.2	265	1.70	69.23		
	21.6	250	1.80	94.85		
	24.4	220	2.00	57.29		
	26.3	205	2.20	53.22		
	29.0	186	2.40	48.23		
	32.3	167	2.70	43.30		
	37.5	144	3.10	37.30		
	39.9	136	3.30	35.07		
	53.2	102	4.40	26.31		
	56.0	97	4.70	24.99		
	63.8	85	5.30	21.93		
	75.3	72	6.30	18.60		
0.55						**4p**
n_1=1400 [rpm]	**14.9**	360	0.85	93.68	**L 43**	**P80B5**
	16.5	330	0.90	84.90	**K 43**	
	18.4	295	1.00	76.23		
	20.4	265	1.15	68.54		
	21.8	250	1.20	64.21		
	24.7	220	1.35	56.73		
	26.6	205	1.45	52.69		
	29.3	184	1.65	47.75		
	32.6	166	1.80	42.87		
	37.9	143	2.10	36.93		
	40.3	134	2.20	34.73		
	46.8	115	2.60	29.88		
	52.3	103	2.90	26.74		
	60.1	90	3.30	23.28		
	64.2	84	3.60	21.81		
0.55						**4p**
n_1=1400 [rpm]	**22.9**	235	0.85	61.18	**L 33**	**P80B5**
	25.1	215	0.95	55.76	**K 33**	
	29.1	186	1.10	48.08		
	31.2	173	1.15	44.81		
	35.7	151	1.30	39.17		
	38.1	142	1.40	36.72		
	43.2	125	1.60	32.40		
	48.7	111	1.80	28.73		
	57.3	94	2.10	24.42		
	62.9	86	2.30	22.27		
	72.5	75	2.70	19.31		
	77.6	70	2.90	18.05		
	89.7	60	3.03	15.60		
	106	51	3.70	13.25		
	118	46	4.00	11.83		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.55						**4p**
n_1=1400 [rpm]	**35.7**	152	0.85	39.25	**L 23**	**P80B5**
	38.0	142	0.90	36.79	**K 23**	
	43.1	125	1.05	32.47		
	48.6	111	1.15	28.78		
	57.2	95	1.40	24.47		
	62.7	86	1.50	22.32		
	72.3	75	1.75	19.35		
	77.4	70	1.85	18.08		
	89.6	60	2.20	15.63		
	105	51	2.50	13.28		
	118	46	2.80	11.86		
	138	39	3.10	10.13		
	149	36	3.40	9.41		
	172	32	3.70	8.16		
	183	29	3.80	7.63		
	212	26	4.20	6.59		
	250	22	4.60	5.60		
	280	19	4.90	5.00		
	328	17	5.30	4.27		
	350	15	5.50	4.00		
	415	13	6.10	3.37		
0.55						**2p**
n_1=2800 [rpm]	**52.1**	105	0.80	53.76	**L 23**	**P71B5**
	59.0	92	0.90	47.44	**K 23**	
	63.4	86	1.00	44.18		
	72.5	75	1.15	38.61		
0.55						**4p**
n_1=1400 [rpm]	**71.0**	76	1.10	19.71	**L 13**	**P80B5**
	82.4	66	1.30	16.99	**K 13**	
	88.4	61	1.40	15.84		
	101	54	1.60	13.84		
	108	50	1.70	12.98		
	122	44	1.85	11.45		
	138	39	1.95	10.15		
	162	33	2.20	8.63		
	185	29	1.90	7.55		
	199	27	2.00	7.04		
	228	24	2.30	6.15		
	243	22	2.40	5.76		
	275	20	2.60	5.09		
	310	17	2.80	4.51		
	365	15	3.00	3.83		
0.55						**2p**
n_1=2800 [rpm]	**324**	17	4.30	8.63	**L 13**	**P71B5**
	371	15	3.80	7.55	**K 13**	
	398	14	4.00	7.04		
	455	12	4.50	6.15		
	486	11	4.70	5.76		
	550	9.90	5.20	5.09		
	621	8.80	5.40	4.51		
	731	7.50	6.00	3.83		
0.55						**6p**
n_1=900 [rpm]	**174**	30	2.50	5.18	**L 61**	**P80B5**
	199	26	3.10	4.53	**K 61**	
	209	25	3.20	4.30		
	239	22	4.00	3.77		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.55						**4p**
n_1=1400 [rpm]	**270**	20	3.80	5.18	**L 61**	**P80B5**
	309	18	4.70	4.53	**K 61**	
	325	17	4.80	4.30		
	371	15	6.00	3.77		
	437	12	8.10	3.20		
	484	11	9.50	2.89		
	551	9.80	12.0	2.54		
	583	9.30	13.0	2.40		
	686	7.90	17.0	2.04		
	753	7.20	18.0	1.86		
	869	6.20	18.0	1.61		
0.55						**6p**
n_1=900 [rpm]	**207**	25	2.70	4.35	**L 51**	**P80B5**
	238	22	3.10	3.79	**K 51**	
	253	21	3.30	3.55		
	287	18	3.50	3.14		
	309	17	3.90	2.91		
0.55						**4p**
n_1=1400 [rpm]	**322**	17	4.10	4.35	**L 51**	**P80B5**
	369	15	4.70	3.79	**K 51**	
	394	14	5.00	3.55		
	446	12	5.40	3.14		
	481	11	6.00	2.91		
	530	10	6.80	2.64		
	591	9.20	7.50	2.37		
	686	7.90	8.70	2.04		
	729	7.40	9.30	1.92		
	848	6.40	11.0	1.65		
	946	5.70	12.0	1.48		
	1077	5.00	13.0	1.30		
0.75						**8p**
n_1=700 [rpm]	**2.80**	2610	1.65	251.15	**L 93**	**P100B5**
	3.00	2390	1.80	229.95	**K 93**	
	3.40	2110	2.00	203.16		
	3.20	2240	1.35	216.28		
	3.70	1930	1.55	186.30		
	4.10	1760	1.70	170.02		
0.75						**6p**
n_1=900 [rpm]	**3.50**	2030	1.45	255.71	**L 93**	**P90B5**
	3.70	1920	1.55	241.25	**K 93**	
	4.20	1720	1.75	216.28		
0.75						**4p**
n_1=1400 [rpm]	**4.80**	1500	2.00	289.74	**L 93**	**P80B5**
	5.50	1330	2.30	255.71	**K 93**	
	5.80	1250	2.40	241.25		
	6.50	1120	2.70	216.28		
	7.50	970	3.10	186.30		
	8.20	880	3.40	170.02		
0.75						**6p**
n_1=900 [rpm]	**4.20**	1720	0.90	216.54	**L 83**	**P90B5**
	4.40	1640	0.95	205.71	**K 83**	
	4.90	1450	1.05	181.77	**LK 83**	
	5.80	1240	1.25	155.34		
	6.30	1130	1.35	142.41		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.75						**4p**
n_1=1400 [rpm]	**5.70**	1280	1.20	246.54	**L 83**	**P80B5**
	6.50	1120	1.40	216.54	**K 83**	
	6.80	1070	1.45	205.71	**LK 83**	
	7.70	940	1.65	181.77		
	9.00	810	1.90	155.34		
	9.80	740	2.10	142.41		
	11.2	650	2.40	124.97		
	11.8	615	2.50	118.43		
	13.5	540	2.90	103.65		
	15.0	485	3.20	93.38		
0.75						**4p**
n_1=1400 [rpm]	**8.40**	860	0.95	166.59	**L 73**	**P80B5**
	9.60	755	1.10	145.67	**K 73**	
	10.1	720	1.15	138.39	**LK 73**	
	11.5	630	1.30	121.42		
	13.6	535	1.55	102.99		
	15.1	485	1.70	92.97		
	17.1	425	1.95	81.80		
	18.1	400	2.00	77.24		
	21.3	340	2.40	65.77		
	24.3	300	2.70	57.68		
	26.9	270	3.00	52.07		
	30.6	240	3.50	45.81		
	32.4	225	3.70	43.26		
0.75						**4p**
n_1=1400 [rpm]	**10.8**	670	0.90	128.97	**L 63**	**P80B5**
	12.3	590	1.00	113.94	**K 63**	
	13.2	550	1.10	105.83	**LK 63**	
	14.6	500	1.20	95.91		
	16.2	445	1.35	86.11		
	18.9	385	1.55	74.17		
	20.1	360	1.65	69.75		
	22.8	320	1.90	61.26		
	24.6	295	2.00	56.89		
	27.1	270	2.20	51.56		
	30.2	240	2.50	46.29		
0.75						**4p**
n_1=1400 [rpm]	**13.1**	555	0.80	106.58	**L 53**	**P80B5**
	14.1	515	0.90	98.99	**K 53**	
	15.6	465	0.95	89.71		
	17.4	420	1.10	80.55		
	20.2	360	1.25	69.23		
	21.6	335	1.35	64.85		
	24.4	295	1.50	57.29		
	26.3	275	1.65	53.22		
	29.0	250	1.80	48.23		
	32.3	225	2.00	43.30		
	37.5	194	2.30	37.30		
	39.9	182	2.50	35.07		
	46.4	157	2.90	30.18		
	51.9	140	3.20	26.97		
	53.2	137	3.30	26.31		
	56.0	130	3.50	24.99		
	63.8	114	4.00	21.93		
	75.3	97	4.70	18.60		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.75						**4p**
n_1=1400 [rpm]	**20.4**	355	0.85	68.54	**L 43**	**P80B5**
	21.8	335	0.90	64.21	**K 43**	
	24.7	295	1.00	56.73		
	26.6	275	1.10	52.69		
	29.3	250	1.20	47.75		
	32.6	225	1.35	42.87		
	37.9	192	1.55	36.93		
	40.3	180	1.65	34.73		
	46.8	155	1.95	29.88		
	52.4	139	2.20	26.70		
	59.3	122	2.50	23.59		
	64.2	113	2.70	21.81		
	72.6	100	3.00	19.27		
	78.3	93	3.10	17.89		
	86.3	84	3.30	16.22		
0.75						**4p**
n_1=1400 [rpm]	**29.1**	250	0.80	48.08	**L 33**	**P80B5**
	31.2	235	0.85	44.81	**K 33**	
	35.7	205	1.00	39.17		
	38.1	191	1.05	36.72		
	43.2	168	1.20	32.40		
	48.7	149	1.35	28.73		
	57.3	127	1.60	24.42		
	62.9	116	1.75	22.27		
	72.5	100	2.00	19.31		
	77.6	94	2.10	18.05		
	89.7	81	2.50	15.60		
	106	69	2.80	13.25		
	118	61	3.00	11.83		
	138	53	3.20	10.11		
	148	49	3.40	9.47		
0.75						**4p**
n_1=1400 [rpm]	**48.6**	149	0.85	28.78	**L 23**	**P80B5**
	57.2	127	1.00	24.47	**K 23**	
	62.7	116	1.10	22.32		
	72.3	100	1.30	19.35		
	77.4	94	1.40	18.08		
	89.6	81	1.60	15.63		
	105	69	1.90	13.28		
	118	62	2.10	11.86		
	138	53	2.30	10.13		
	149	49	2.50	9.41		
	172	42	2.70	8.16		
	183	40	2.80	7.63		
	212	34	3.10	6.59		
	250	29	3.40	5.60		
	280	26	3.70	5.00		
0.75						**4p**
n_1=1400 [rpm]	**71.0**	102	0.85	19.71	**L 13**	**P80B5**
	82.4	88	0.95	16.99	**K 13**	
	88.4	82	1.05	15.84		
	101	72	1.20	13.84		
	108	67	1.25	12.98		
	122	59	1.35	11.45		
	138	53	1.45	10.15		
	162	45	1.60	8.63		
	185	39	1.45	7.55		
	199	37	1.50	7.04		
	228	32	1.70	6.15		
	243	30	1.75	5.76		
	275	26	1.95	5.09		
	310	23	2.00	4.51		
	365	20	2.30	3.83		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
0.75						**2p**
n_1=2800 [rpm]	**244**	30	2.70	11.45	**L 13**	**P80B5**
	276	27	2.90	10.15	**K 13**	
	324	23	3.10	8.63		
	371	20	2.80	7.55		
	398	19	2.90	7.04		
	455	16	3.30	6.15		
	486	15	3.50	5.76		
	550	14	3.80	5.09		
	621	12	4.00	4.51		
	731	10	4.40	3.83		
0.75						**6p**
n_1=900 [rpm]	**199**	36	2.30	4.53	**L 61**	**P90B5**
	209	34	2.30	4.30	**K 61**	
	239	30	2.90	3.77		
	281	26	3.90	3.20		
0.75						**4p**
n_1=1400 [rpm]	**270**	27	2.80	5.18	**L 61**	**P80B5**
	309	24	3.50	4.53	**K 61**	
	326	22	3.60	4.30		
	371	20	4.40	3.77		
	437	17	6.00	3.20		
	484	15	7.10	2.89		
	551	13	8.90	2.54		
	583	13	9.80	2.40		
	686	11	13.0	2.04		
	753	9.60	13.0	1.86		
	870	8.30	14.0	1.61		
0.75						**6p**
n_1=900 [rpm]	**237**	30	2.30	3.79	**L 51**	**P90B5**
	253	28	2.40	3.55	**K 51**	
	287	25	2.60	3.14		
	309	23	2.90	2.91		
	341	21	3.30	2.64		
0.75						**4p**
n_1=1400 [rpm]	**322**	23	3.00	4.35	**L 51**	**P80B5**
	369	20	3.50	3.79	**K 51**	
	394	18	3.80	3.55		
	446	16	4.00	3.14		
	481	15	4.40	2.91		
	530	14	5.00	2.64		
	591	12	5.60	2.37		
	686	11	6.50	2.04		
	729	10	6.90	1.92		
	848	8.60	8.00	1.65		
	946	7.70	8.80	1.48		
	1077	6.80	9.30	1.30		
1.10						**8p**
n_1=700 [rpm]	**2.80**	3880	1.10	251.15	**L 103**	**P100B5**
	3.00	3550	1.20	229.95	**K 103**	
	3.40	3140	1.35	203.16		
	4.10	2660	1.60	172.34		
1.10						**6p**
n_1=900 [rpm]	**3.50**	2920	1.05	255.71	**L 93**	**P90B5**
	3.70	2750	1.10	241.25	**K 93**	
	4.20	2470	1.20	216.28		
	4.80	2130	1.40	186.30		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.10						**4p**
n_1=1400 [rpm]	**5.50**	1920	1.55	255.71	**L 93**	**P90B5**
	5.80	1810	1.65	241.25	**K 93**	
	6.50	1620	1.85	216.28		
	7.50	1400	2.20	186.30		
	8.20	1280	2.30	170.02		
	9.30	1130	2.70	150.78		
	11.0	950	3.20	126.75		
	12.0	870	3.40	116.48		
1.10						**4p**
n_1=1400 [rpm]	**6.50**	1620	0.95	216.54	**L 83**	**P90B5**
	6.80	1540	1.00	205.71	**K 83**	
	7.70	1360	1.15	181.77	**LK 83**	
	9.00	1170	1.35	155.34		
	9.80	1070	1.45	142.41		
	11.2	940	1.65	124.97		
	11.8	890	1.75	118.43		
	13.5	745	2.00	103.65		
	15.0	700	2.20	93.38		
	17.1	615	2.50	81.92		
	19.3	545	2.80	72.57		
	22.0	480	3.20	63.68		
	23.2	455	3.40	60.35		
	26.5	395	3.90	52.82		
1.10						**4p**
n_1=1400 [rpm]	**11.5**	910	0.90	121.42	**L 73**	**P90B5**
	13.6	775	1.05	102.99	**K 73**	
	15.1	700	1.20	92.97	**LK 73**	
	17.1	615	1.35	81.80		
	18.1	580	1.40	77.24		
	21.3	495	1.65	65.77		
	24.3	435	1.90	57.68		
	26.9	390	2.10	52.07		
	30.6	345	2.40	45.81		
	32.4	325	2.50	43.26		
	38.0	275	3.00	36.83		
	41.8	250	3.30	33.47		
1.10						**4p**
n_1=1400 [rpm]	**16.3**	645	0.95	86.11	**L 63**	**P90B5**
	18.9	555	1.10	74.17	**K 63**	
	20.1	525	1.15	69.75	**LK 63**	
	22.8	460	1.30	61.26		
	24.6	425	1.40	56.89		
	27.0	385	1.55	51.89		
	30.2	345	1.75	46.29		
	35.1	300	1.95	39.88		
	37.3	280	2.00	37.50		
	43.4	240	2.20	32.27		
	48.6	215	2.40	28.83		
	49.8	210	2.60	28.13		
	52.4	200	2.70	26.72		
	59.7	176	3.20	23.44		
	70.4	149	4.00	19.89		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.10						**4p**
n_1=1400 [rpm]	**20.2**	520	0.85	69.23	**L 53**	**P90B5**
	21.6	485	0.90	64.85	**K 53**	
	24.4	430	1.05	57.29		
	26.3	400	1.15	53.22		
	29.0	360	1.25	48.23		
	32.3	325	1.40	43.30		
	37.5	280	1.60	37.30		
	39.9	265	1.70	35.07		
	46.4	225	2.00	30.18		
	51.9	200	2.20	26.97		
	53.2	197	2.30	26.31		
	56.0	188	2.40	24.99		
	63.8	165	2.70	21.93		
	75.3	140	3.20	18.60		
	83.4	126	3.60	16.79		
1.10						**4p**
n_1=1400 [rpm]	**29.3**	360	0.85	47.75	**L 43**	**P90B5**
	32.7	320	0.95	42.87	**K 43**	
	37.9	275	1.10	36.93		
	40.3	260	1.15	34.73		
	46.8	225	1.35	29.88		
	52.4	200	1.50	26.70		
	59.3	177	1.70	23.59		
	60.1	175	1.70	23.28		
	64.2	164	1.85	21.81		
	72.6	145	2.00	19.27		
	78.3	134	2.20	17.89		
	86.3	122	2.30	16.22		
	96.2	109	2.40	14.56		
	112	94	2.70	12.54		
	119	89	2.80	11.79		
	138	76	3.00	10.15		
	154	68	3.20	9.07		
1.10						**4p**
n_1=1400 [rpm]	**43.2**	245	0.80	32.40	**L 33**	**P90B5**
	48.7	215	0.95	28.73	**K 33**	
	57.3	183	1.10	24.42		
	72.5	145	1.40	19.31		
	77.6	135	1.50	18.05		
	89.7	117	1.70	15.60		
	106	99	1.90	13.25		
	118	89	2.10	11.83		
	138	76	2.20	10.11		
	148	71	2.30	9.47		
	176	60	2.60	7.97		
	210	50	2.90	6.67		
	247	43	3.30	5.67		
	277	38	3.50	5.06		
1.10						**4p**
n_1=1400 [rpm]	**72.3**	145	0.90	19.35	**L 23**	**P90B5**
	77.4	136	0.95	18.08	**K 23**	
	89.6	117	1.10	15.63		
	105	100	1.30	13.28		
	118	89	1.45	11.86		
	138	76	1.60	10.13		
	172	61	1.90	8.16		
	184	57	1.95	7.63		
	212	50	2.10	6.59		
	250	42	2.40	5.60		
	280	38	2.50	5.00		
	328	32	2.70	4.27		
	350	30	2.80	4.00		
	415	25	3.10	3.37		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.10						**2p**
n_1=2800 [rpm]	**211**	52	2.50	13.28	**L 23**	**P80B5**
	236	46	2.80	11.86	**K 23**	
	276	39	3.10	10.13		
	297	37	3.30	9.41		
	343	32	3.70	8.16		
	367	30	3.80	7.63		
	425	26	4.10	6.59		
	500	22	4.50	5.60		
	560	20	4.90	5.00		
	656	17	5.20	4.27		
	700	16	5.40	4.00		
	831	13	6.00	3.37		
1.10						**2p**
n_1=2800 [rpm]	**142**	77	1.10	19.71	**L 13**	**P80B5**
	165	66	1.30	16.99	**K 13**	
	177	62	1.40	15.84		
	202	54	1.60	13.84		
	216	51	1.70	12.98		
	245	45	1.80	11.45		
	276	40	1.95	10.15		
	324	34	2.10	8.63		
	371	29	1.90	7.55		
	398	27	2.00	7.04		
	455	24	2.30	6.15		
	486	22	2.40	5.76		
	550	20	2.60	5.09		
	621	18	2.70	4.51		
	731	15	3.00	3.83		
1.10						**4p**
n_1=1400 [rpm]	**249**	42	2.60	5.63	**L 71**	**P90B5**
	262	40	2.60	5.35	**K 71**	
	296	36	3.50	4.73		
1.10						**6p**
n_1=900 [rpm]	**199**	52	1.60	4.53	**L 61**	**P90B5**
	209	49	1.65	4.30	**K 61**	
	239	43	2.00	3.77		
1.10						**4p**
n_1=1400 [rpm]	**309**	34	2.40	4.53	**L 61**	**P90B5**
	326	32	2.50	4.30	**K 61**	
	371	28	3.10	3.77		
	438	24	4.20	3.20		
	484	22	4.90	2.89		
	551	19	6.20	2.54		
	583	18	6.80	2.40		
	686	15	8.80	2.04		
	753	14	9.10	1.86		
	870	12	9.40	1.61		
	1000	11	9.90	1.40		
1.10						**6p**
n_1=900 [rpm]	**238**	43	1.60	3.79	**L 51**	**P90B5**
	254	41	1.70	3.55	**K 51**	
	287	36	1.80	3.14		
	309	33	2.00	2.91		
	341	30	2.30	2.64		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.10						**4p**
n_1=1400 [rpm]	**369**	28	2.40	3.79	**L 51**	**P90B5**
	394	27	2.60	3.55	**K 51**	
	446	24	2.80	3.14		
	481	22	3.10	2.91		
	530	20	3.50	2.64		
	591	18	3.90	2.37		
	686	15	4.50	2.04		
	729	14	4.80	1.92		
	849	12	5.60	1.65		
	946	11	6.10	1.48		
	1077	9.80	6.40	1.30		
1.50						**8p**
n_1=700 [rpm]	**3.00**	4710	0.90	229.95	**L 103**	**P112B5**
	3.50	4160	1.05	203.15	**K 103**	
	4.10	3530	1.20	172.34		
	4.40	3250	1.30	158.68		
1.50						**6p**
n_1=900 [rpm]	**3.60**	3910	1.10	251.15	**L 103**	**P100B5**
	3.90	3580	1.20	229.95	**K 103**	
	4.40	3160	1.35	203.16		
	5.20	2680	1.60	172.34		
	5.70	2470	1.75	158.68		
	6.30	2210	1.95	141.83		
1.50						**4p**
n_1=1400 [rpm]	**5.50**	2600	1.15	255.71	**L 97**	**P90B5**
	5.80	2450	1.20	241.25	**K 97**	
	6.50	2200	1.35	216.28		
	7.50	1890	1.60	186.30		
	8.20	1730	1.75	170.02		
	9.30	1530	1.95	150.78		
	11.0	1290	2.30	126.75		
	12.0	1180	2.50	116.48		
	13.5	1050	2.80	103.44		
	15.1	940	3.20	92.48		
1.50						**4p**
n_1=1400 [rpm]	**7.70**	1850	0.85	181.77	**L 83**	**P90B5**
	9.00	1580	1.00	155.34	**K 83**	
	9.80	1450	1.05	142.41	**LK 83**	
	11.2	1270	1.20	124.97		
	11.8	1200	1.30	118.43		
	13.5	1050	1.45	103.65		
	15.0	950	1.65	93.38		
	17.1	830	1.85	81.92		
	19.3	735	2.10	72.57		
	22.0	645	2.40	63.68		
	23.2	615	2.50	60.35		
	26.5	535	2.90	52.82		
	29.4	485	3.20	47.58		
	33.5	425	3.70	41.74		
	38.0	375	4.10	36.84		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.50						**4p**
n_1=1400 [rpm]	**15.0**	940	0.85	92.97	**L 73**	**P90B5**
	17.0	830	1.00	81.80	**K 73**	
	18.0	785	1.05	77.24	**LK 73**	
	21.3	670	1.25	65.77		
	24.3	585	1.40	57.68		
	26.9	530	1.55	52.07		
	30.6	465	1.75	45.81		
	32.4	440	1.85	43.26		
	38.0	375	2.20	36.83		
	41.8	340	2.40	33.47		
	48.3	295	2.80	29.00		
	55.5	255	3.00	25.23		
	59.9	240	3.50	23.37		
	65.3	220	3.80	21.43		
	74.5	191	4.10	18.80		
1.50						**4p**
n_1=1400 [rpm]	**22.8**	620	0.95	61.26	**L 63**	**P90B5**
	24.6	580	1.05	56.89	**K 63**	
	27.2	525	1.15	51.56	**LK 63**	
	30.2	470	1.30	46.29		
	35.1	405	1.45	39.88		
	37.3	380	1.50	37.50		
	43.3	330	1.65	32.37		
	49.0	295	1.80	28.83		
	49.8	285	1.90	28.13		
	52.4	270	2.00	26.72		
	59.7	240	2.30	23.44		
	70.4	200	3.00	19.89		
	78.0	182	3.20	17.95		
1.50						**4p**
n_1=1400 [rpm]	**26.3**	540	0.85	53.22	**L 53**	**P90B5**
	29.0	490	0.90	48.23	**K 53**	
	32.3	440	1.00	43.30		
	37.5	380	1.20	37.30		
	40.0	355	1.25	35.07		
	46.4	305	1.45	30.18		
	51.9	275	1.65	26.97		
	53.2	265	1.70	26.31		
	56.0	255	1.75	24.99		
	63.8	225	2.00	21.93		
	75.3	189	2.40	18.60		
	83.4	171	2.60	16.79		
	94.8	150	2.90	14.77		
	100	142	3.00	13.95		
	118	121	3.40	11.88		
1.50						**4p**
n_1=1400 [rpm]	**37.9**	375	0.80	36.93	**L 43**	**P90B5**
	40.3	355	0.85	34.73	**K 43**	
	46.9	305	1.00	29.88		
	52.3	270	1.10	26.77		
	59.3	240	1.25	23.59		
	60.1	235	1.25	23.28		
	64.2	220	1.35	21.81		
	72.6	196	1.50	19.27		
	78.3	182	1.60	17.89		
	86.3	165	1.65	16.22		
	96.2	148	1.80	14.56		
	112	127	1.95	12.54		
	119	120	2.00	11.79		
	138	103	2.20	10.15		
	155	92	2.40	9.07		
	175	81	2.50	8.01		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.50						**4p**
n_1=1400 [rpm]	**181**	79	2.10	7.76	**L 43**	**P90B5**
	201	71	2.20	6.96	**K 43**	
	234	61	2.60	6.00		
	248	57	2.70	5.64		
	289	49	3.00	4.85		
	323	44	3.30	4.34		
	366	39	3.70	3.83		
1.50						**4p**
n_1=1400 [rpm]	**72.5**	196	1.00	19.31	**L 33**	**P90B5**
	77.6	183	1.10	18.05	**K 33**	
	89.8	159	1.25	15.60		
	106	135	1.40	13.25		
	118	120	1.50	11.83		
	139	103	1.65	10.11		
	148	96	1.75	9.47		
	176	81	1.95	7.97		
	210	68	2.10	6.67		
	247	58	2.50	5.67		
	277	51	2.60	5.06		
	324	44	2.90	4.32		
	346	41	3.00	4.05		
	411	35	3.20	3.41		
1.50						**2p**
n_1=2800 [rpm]	**211**	70	2.70	13.25	**L 33**	**P90B5**
	237	63	2.90	11.83	**K 33**	
	277	54	3.20	10.11		
	296	50	3.30	9.47		
	351	42	3.70	7.97		
1.50						**4p**
n_1=1400 [rpm]	**89.6**	159	0.80	15.63	**L 23**	**P90B5**
	106	135	0.95	13.28	**K 23**	
	118	121	1.05	11.86		
	138	103	1.20	10.13		
	172	83	1.40	8.16		
	184	78	1.45	7.63		
	213	67	1.60	6.59		
	250	57	1.75	5.60		
	280	51	1.85	5.00		
	328	43	2.00	4.27		
	350	41	2.10	4.00		
	416	34	2.30	3.37		
1.50						**2p**
n_1=2800 [rpm]	**236**	63	2.00	11.86	**L 23**	**P90B5**
	277	54	2.30	10.13	**K 23**	
	343	43	2.70	8.16		
	367	41	2.80	7.63		
	425	35	3.00	6.59		
	500	30	3.30	5.60		
	560	27	3.60	5.00		
	656	23	3.80	4.27		
	700	21	4.00	4.00		
	831	18	4.40	3.37		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
1.50						**4p**
n_1=1400 [rpm]	**249**	57	1.90	5.63	**L 71**	**P90B5**
	262	54	1.90	5.35	**K 71**	
	296	48	2.60	4.73		
	347	41	3.50	4.04		
	379	38	4.10	3.70		
	431	33	5.50	3.25		
	455	31	6.20	3.08		
	519	27	7.80	2.70		
	276	25	8.70	2.43		
1.50						**4p**
n_1=1400 [rpm]	**309**	46	1.80	4.53	**L 61**	**P90B5**
	326	44	1.85	4.30	**K 61**	
	372	38	2.30	3.77		
	438	33	3.10	3.20		
	485	29	3.60	2.89		
	551	26	4.60	2.54		
	584	24	5.00	2.40		
	686	21	6.40	2.04		
	753	19	6.70	1.86		
	870	16	7.00	1.61		
	1000	14	7.30	1.40		
1.50						**4p**
n_1=1400 [rpm]	**370**	39	1.80	3.79	**L 51**	**P90B5**
	395	36	1.90	3.55	**K 51**	
	446	32	2.00	3.14		
	481	30	2.30	2.91		
	531	27	2.60	2.64		
	591	24	2.90	2.37		
	687	21	3.30	2.04		
	730	20	3.50	1.92		
	849	17	4.10	1.65		
	946	15	4.50	1.48		
	1077	13	4.70	1.30		
2.20						**8p**
n_1=700 [rpm]	**3.20**	6680	1.20	222.60	**L 133**	**P132B5**
	3.70	5660	1.40	188.45	**K 133**	
	4.00	5230	1.55	174.40		
	4.50	4690	1.70	156.31		
	5.00	4240	1.90	141.12		
	5.50	3850	2.10	128.18		
	6.20	3410	2.30	113.72		
	6.80	3100	2.60	103.20		
2.20						**6p**
n_1=900 [rpm]	**4.50**	4540	0.95	203.16	**L 103**	**P112B5**
	5.30	3850	1.10	172.34	**K 103**	
	5.70	3550	1.20	158.68		
	6.40	3170	0.95	141.83		
2.20						**4p**
n_1=1400 [rpm]	**5.60**	3740	1.15	251.15	**L 103**	**P100B5**
	6.10	3430	1.25	229.95	**K 103**	
	6.90	3030	1.40	203.16		
	8.20	2570	1.65	172.34		
	8.90	2360	1.80	158.68		
	9.90	2110	2.00	141.83		
	11.0	1900	2.30	127.68		
	12.1	1720	2.50	115.63		
	13.7	1530	2.80	102.53		
	15.1	1380	3.10	92.70		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
2.20						**4p**
n_1=1400 [rpm]	**6.50**	3220	0.95	216.28	**L 93**	**P100B5**
	7.60	2780	1.10	186.30	**K 93**	
	8.30	2530	1.20	170.02		
	9.30	2250	1.35	150.78		
	11.1	1890	1.60	126.75		
	12.1	1740	1.75	116.48		
	13.6	1540	1.95	103.44		
	15.2	1380	2.20	92.48		
	16.9	1240	2.40	83.15		
	19.4	1080	2.80	72.17		
	21.5	970	3.10	65.21		
	23.4	890	3.40	59.92		
	26.3	795	3.80	53.21		
	29.5	710	4.20	47.58		
2.20						**4p**
n_1=1400 [rpm]	**11.2**	1860	0.85	124.97	**L 83**	**P100B5**
	11.8	1760	0.90	118.43	**K 83**	
	13.5	1540	1.00	103.65	**LK 83**	
	15.0	1390	1.10	93.38		
	17.1	1220	1.25	81.92		
	19.3	1080	1.45	72.57		
	22.0	950	1.65	63.68		
	23.2	900	1.70	60.35		
	26.5	785	1.95	52.82		
	29.4	710	2.20	47.58		
	33.5	620	2.50	41.74		
	38.0	550	2.80	36.84		
	42.9	485	3.20	32.66		
	40.7	515	2.90	34.40		
	44.6	470	3.30	31.40		
	50.3	415	3.70	27.84		
	59.9	350	4.40	23.40		
	65.1	320	4.70	21.51		
2.20						**4p**
n_1=1400 [rpm]	**21.3**	980	0.85	65.77	**L 73**	**P100B5**
	24.3	860	0.95	57.68	**K 73**	
	27.0	775	1.05	52.07	**LK 73**	
	30.6	685	1.20	45.81		
	32.4	645	1.25	43.26		
	38.0	550	1.50	36.83		
	41.8	500	1.65	33.47		
	48.3	430	1.90	29.00		
	55.5	375	2.10	25.23		
	60.0	350	2.30	23.37		
	65.3	320	2.60	21.43		
	74.5	280	2.80	18.80		
	78.6	265	2.90	17.82		
	89.8	230	3.20	15.60		
	99.7	210	3.40	14.05		
2.20						**4p**
n_1=1400 [rpm]	**35.1**	595	1.00	39.88	**L 63**	**P100B5**
	37.3	560	1.00	37.50	**K 63**	
	43.4	480	1.10	32.27	**LK 63**	
	48.6	430	1.20	28.83		
	59.8	350	1.60	23.44		
	70.4	295	2.00	19.89		
	78.0	270	2.20	17.95		
	88.7	235	2.40	15.79		
	93.9	220	2.50	14.91		
	111	189	2.80	12.70		
	122	172	2.90	11.54		
	140	149	3.20	10.00		
	161	130	3.40	8.70		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
2.20						**4p**
n_1=1400 [rpm]	**37.5**	555	0.80	37.30	**L 53**	**P100B5**
	40.0	525	0.85	35.07	**K 53**	
	46.4	450	1.00	30.18		
	51.9	400	1.10	26.97		
	63.9	325	1.40	21.93		
	75.3	275	1.60	18.60		
	83.4	250	1.80	16.79		
	94.8	220	2.00	14.77		
	101	210	2.10	13.95		
	118	17	2.30	11.88		
	130	161	2.40	10.79		
	150	139	2.70	9.35		
	155	135	2.80	9.06		
	176	119	3.00	7.97		
2.20						**2p**
n_1=2800 [rpm]	**107**	205	2.20	26.31	**L 53**	**P90B5**
	112	192	2.30	24.99	**K 53**	
	128	169	2.70	21.93		
	151	143	3.10	18.60		
	167	129	3.50	16.79		
	190	114	3.80	14.77		
	201	107	4.00	13.95		
2.20						**4p**
n_1=1400 [rpm]	**72.7**	285	1.05	19.27	**L 43**	**P100B5**
	86.3	240	1.15	16.22	**K 43**	
	96.2	215	1.20	14.56		
	112	187	1.35	12.54		
	119	176	1.40	11.79		
	138	151	1.50	10.15		
	155	135	1.65	9.07		
	175	119	1.70	8.01		
	181	116	1.40	7.76		
	201	104	1.55	6.96		
	234	89	1.75	6.00		
	249	84	1.85	5.64		
	289	72	2.10	4.85		
	323	65	2.30	4.34		
	366	57	2.50	3.83		
2.20						**2p**
n_1=2800 [rpm]	**121**	179	1.70	23.28	**L 43**	**P90B5**
	129	168	1.80	21.81	**K 43**	
	146	148	2.00	19.27		
	157	138	2.10	17.89		
	173	125	2.20	16.22		
	193	112	2.40	14.56		
	224	97	2.60	12.54		
	238	91	2.70	11.79		
	276	78	2.90	10.15		
	309	70	3.20	9.07		
	350	62	3.30	8.01		
2.20						**4p**
n_1=1400 [rpm]	**89.7**	230	0.85	15.60	**L 33**	**P100B5**
	106	198	0.95	13.25	**K 33**	
	119	176	1.05	11.83		
	139	151	1.15	10.11		
	148	141	1.20	9.47		
	176	119	1.30	7.97		
	210	99	1.45	6.67		
	247	84	1.70	5.67		
	277	75	1.80	5.06		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
2.20						**4p**
n_1=1400 [rpm]	**324**	64	1.95	4.32	**L 33**	**P100B5**
	346	60	2.00	4.05	**K 33**	
	411	51	2.20	3.41		
2.20						**2p**
n_1=2800 [rpm]	**145**	149	1.35	19.31	**L 33**	**P90B5**
	155	139	1.45	18.05	**K 33**	
	180	120	1.65	15.60		
	211	102	1.85	13.25		
	237	91	2.00	11.83		
	277	78	2.20	10.11		
	296	73	2.30	9.47		
	351	61	2.50	7.97		
	420	51	2.80	6.67		
	494	44	3.30	5.67		
	553	39	3.50	5.06		
	648	33	3.80	4.32		
	691	31	3.90	4.05		
	821	26	4.30	3.41		
2.20						**4p**
n_1=1400 [rpm]	**138**	151	0.80	10.13	**L 23**	**P100B5**
	213	98	1.10	6.59	**K 23**	
	250	83	1.20	5.60		
	280	75	1.30	5.00		
	328	64	1.35	4.27		
	350	60	1.45	4.00		
	416	50	1.55	3.37		
2.20						**2p**
n_1=2800 [rpm]	**211**	102	1.25	13.28	**L 23**	**P90B5**
	236	91	1.40	11.86	**K 23**	
	277	78	1.55	10.13		
	343	63	1.85	8.16		
	367	59	1.90	7.63		
	425	51	2.10	6.59		
	500	43	2.30	5.60		
	560	39	2.50	5.00		
	656	33	2.60	4.27		
	700	31	2.80	4.00		
	831	26	3.00	3.37		
2.20						**4p**
n_1=1400 [rpm]	**296**	70	1.75	4.73	**L 71**	**P100B5**
	347	60	2.40	4.04	**K 71**	
	378	55	2.80	3.70		
	431	48	3.80	3.25		
	455	46	4.20	3.08		
	519	40	5.30	2.70		
	576	36	5.90	2.43		
	657	32	6.30	2.13		
	745	28	6.70	1.88		
	838	25	7.00	1.67		
	986	21	7.30	1.42		
2.20						**4p**
n_1=1400 [rpm]	**371**	56	1.55	3.77	**L 61**	**P100B5**
	438	48	2.10	3.20	**K 61**	
	485	43	2.50	2.89		
	551	38	3.10	2.54		
	583	36	3.40	2.40		
	686	30	4.40	2.04		
	753	28	4.60	1.86		
	870	24	4.80	1.61		
	1000	21	5.00	1.40		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
2.20						**4p**
n_1=1400 [rpm]	**446**	47	1.40	3.14	**L 51**	**P100B5**
	530	39	1.75	2.64	**K 51**	
	591	35	1.95	2.37		
	686	30	2.30	2.04		
	729	29	2.40	1.92		
	849	25	2.80	1.65		
	946	22	3.10	1.48		
	1077	19	3.20	1.30		
3.00						**8p**
n_1=700 [rpm]	**3.20**	8860	0.90	222.60	**L 133**	**P132B5**
	3.70	7500	1.05	188.45	**K 133**	
	4.00	6940	1.15	174.40		
	4.50	6220	1.30	156.31		
	5.00	5620	1.40	141.12		
	5.50	5100	1.55	128.18		
	6.20	4520	1.75	113.72		
	6.80	4110	1.95	103.20		
	7.90	3530	2.30	88.70		
3.00						**6p**
n_1=900 [rpm]	**4.00**	6780	1.20	222.60	**L 133**	**P132B5**
	4.80	5740	1.40	188.45	**K 133**	
	5.20	5320	1.50	174.40		
	5.80	4760	1.70	156.31		
	6.40	4300	1.85	141.12		
	7.00	3910	2.00	128.18		
	7.90	3470	2.30	113.72		
	8.70	3150	2.50	103.20		
3.00						**6p**
n_1=900 [rpm]	**5.70**	4840	0.90	158.68	**L 103**	**P132B5**
	6.40	4320	1.00	141.83	**K 103**	
	7.10	3890	1.10	127.68		
3.00						**4p**
n_1=1400 [rpm]	**6.10**	4710	0.90	229.95	**L 103**	**P100B5**
	6.90	4160	1.05	203.16	**K 103**	
	8.10	3530	1.20	172.34		
	8.80	3250	1.30	158.68		
	9.90	2900	1.50	141.83		
	11.0	2610	1.65	127.68		
	12.1	2370	1.80	115.63		
	13.7	2100	2.00	102.53		
	15.1	1900	2.30	92.70		
	17.8	1610	2.70	78.57		
	19.2	1490	2.90	72.88		
3.00						**4p**
n_1=1400 [rpm]	**9.30**	3090	0.95	150.78	**L 93**	**P100B5**
	11.1	2590	1.15	126.75	**K 93**	
	12.0	2380	1.25	116.48		
	13.5	2120	1.40	103.44		
	15.2	1890	1.60	92.48		
	16.8	1700	1.75	83.15		
	19.4	1480	2.00	72.17		
	21.5	1330	2.20	65.21		
	23.4	1230	2.50	59.92		
	26.3	1090	2.80	53.21		
	29.4	970	3.10	47.58		
	32.7	880	3.40	42.78		
	37.7	760	4.00	37.13		
	42.1	680	4.20	33.25		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
3.00						**4p**
n_1=1400 [rpm]	**15.0**	1910	0.80	93.38	**L 83**	**P100B5**
	17.1	1680	0.90	81.92	**K 83**	
	19.3	1490	1.05	72.57	**LK 83**	
	22.0	1300	1.20	63.68		
	23.2	1230	1.25	60.35		
	26.5	1080	1.45	52.82		
	29.4	970	1.60	47.58		
	33.5	850	1.80	41.74		
	38.0	755	2.10	36.84		
	42.9	670	2.30	32.66		
	50.2	570	2.60	27.88		
	40.7	705	2.10	34.40		
	44.6	640	2.40	31.40		
	50.3	570	2.70	27.84		
	59.8	480	3.20	23.40		
	65.1	440	3.40	21.51		
	73.3	390	3.70	19.10		
	82.0	350	4.00	17.08		
	91.2	315	4.30	15.35		
3.00						**4p**
n_1=1400 [rpm]	**30.6**	940	0.85	45.81	**L 73**	**P100B5**
	32.4	890	0.95	43.26	**K 73**	
	38.0	755	1.10	36.83	**LK 73**	
	41.8	685	1.20	33.47		
	48.3	595	1.40	29.00		
	55.5	515	1.50	25.23		
	59.9	480	1.70	23.37		
	65.3	440	1.85	21.43		
	74.5	385	2.00	18.80		
	78.6	365	2.10	17.82		
	89.7	320	2.30	15.60		
	99.6	290	2.50	14.05		
	114	250	2.70	12.33		
	129	225	3.00	10.88		
	145	197	3.20	9.64		
	163	176	3.60	8.59		
	181	158	3.80	7.74		
	206	139	4.20	6.79		
3.00						**4p**
n_1=1400 [rpm]	**59.7**	480	1.15	23.44	**L 63**	**P100B5**
	70.4	405	1.45	19.89	**K 63**	
	78.0	365	1.60	17.95	**LK 63**	
	88.7	325	1.75	15.79		
	93.9	305	1.80	14.91		
	110	260	2.00	12.70		
	121	235	2.10	11.54		
	140	205	2.30	10.00		
3.00						**4p**
n_1=1400 [rpm]	**51.9**	550	0.80	26.97	**L 53**	**P100B5**
	63.8	450	1.00	21.93	**K 53**	
	75.3	380	1.20	18.60		
	83.4	345	1.30	16.79		
	94.8	300	1.45	14.77		
	100	285	1.50	13.95		
	118	245	1.65	11.88		
	130	220	1.75	10.79		
	150	191	1.95	9.35		
	155	185	2.00	9.06		
	176	163	2.20	7.97		
	186	154	2.30	7.53		
	218	131	2.60	6.41		
	241	119	2.70	5.82		
	277	103	3.00	5.05		
	319	90	3.10	4.39		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
3.00						**2p**
n_1=2800 [rpm]	**128**	225	2.00	21.93	**L 53**	**P100B5**
	151	190	2.40	18.60	**K 53**	
	167	172	2.60	16.79		
	190	151	2.90	14.77		
	201	143	3.00	13.95		
	236	122	3.30	11.88		
	259	110	3.50	10.79		
3.00						**4p**
n_1=1400 [rpm]	**86.3**	330	0.85	16.22	**L 43**	**P100B5**
	96.2	300	0.90	14.56	**K 43**	
	112	255	0.95	12.54		
	119	240	1.00	11.79		
	138	210	1.10	10.15		
	154	186	1.20	9.07		
	175	164	1.25	8.01		
	181	159	1.05	7.76		
	201	143	1.10	6.96		
	233	123	1.25	6.00		
	248	115	1.35	5.64		
	289	99	1.50	4.85		
	323	89	1.65	4.34		
	366	78	1.85	3.83		
3.00						**2p**
n_1=2800 [rpm]	**238**	121	2.00	11.79	**L 43**	**P100B5**
	276	104	2.20	10.15	**K 43**	
	309	93	2.40	9.07		
	350	82	2.50	8.01		
	361	79	2.10	7.76		
	402	71	2.20	6.96		
	467	61	2.50	6.00		
	496	58	2.70	5.64		
	577	50	3.00	4.85		
	645	44	3.30	4.34		
	731	39	3.70	3.83		
3.00						**4p**
n_1=1400 [rpm]	**139**	205	0.80	10.11	**L 33**	**P100B5**
	148	194	0.85	9.47	**K 33**	
	176	163	0.95	7.97		
	210	137	1.05	6.67		
	247	116	1.25	5.67		
	277	104	1.30	5.06		
	324	88	1.45	4.32		
	346	83	1.45	4.05		
	411	70	1.60	3.41		
3.00						**2p**
n_1=2800 [rpm]	**277**	103	1.65	10.11	**L 33**	**P100B5**
	296	97	1.70	9.47	**K 33**	
	351	82	1.90	7.97		
	420	68	2.10	6.67		
	494	58	2.50	5.67		
	553	52	2.60	5.06		
	648	44	2.80	4.32		
	691	41	3.00	4.05		
	821	35	3.20	3.41		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
3.00						**4p**
n_1=1400 [rpm]	**250**	115	0.85	5.60	**L 23**	**P100B5**
	280	102	0.95	5.00	**K 23**	
	328	87	1.00	4.27		
	350	82	1.05	4.00		
	415	69	1.15	3.37		
3.00						**2p**
n_1=2800 [rpm]	**425**	67	1.55	6.59	**L 23**	**P100B5**
	500	57	1.75	5.60	**K 23**	
	560	51	1.85	5.00		
	656	44	2.00	4.27		
	700	41	2.10	4.00		
	831	35	2.30	3.37		
3.00						**4p**
n_1=1400 [rpm]	**217**	132	1.45	6.45	**L 81**	**P100B5**
	252	114	2.00	5.56	**K 81**	
	276	104	2.40	5.07		
	311	92	3.20	4.50		
	370	77	3.90	3.78		
3.00						**4p**
n_1=1400 [rpm]	**296**	97	1.25	4.73	**L 71**	**P100B5**
	347	83	1.75	4.04	**K 71**	
	378	76	2.00	3.70		
	431	67	2.70	3.25		
	455	63	3.10	3.08		
3.00						**4p**
n_1=1400 [rpm]	**371**	77	1.15	3.77	**L 61**	**P100B5**
	438	66	1.55	3.20	**K 61**	
	485	59	1.80	2.89		
	551	52	2.30	2.54		
	583	49	2.50	2.40		
	686	42	3.20	2.04		
	753	38	3.30	1.86		
	870	33	3.50	1.61		
	1000	29	3.60	1.40		
3.00						**4p**
n_1=1400 [rpm]	**446**	64	1.00	3.14	**L 51**	**P100B5**
	530	54	1.30	2.64	**K 51**	
	591	49	1.40	2.37		
	686	42	1.65	2.04		
	729	39	1.75	1.92		
	848	34	2.00	1.65		
	946	30	2.20	1.48		
	1077	27	2.40	1.30		
4.00						**8p**
n_1=700 [rpm]	**4.30**	8660	1.50	163.57	**L 143**	**P160B5**
	4.80	7790	1.65	147.14	**K 143**	
	5.80	6360	2.00	120.04		
	6.40	5800	2.20	109.48		
4.00						**8p**
n_1=700 [rpm]	**4.00**	9250	0.85	174.40	**L 133**	**P160B5**
	4.50	9290	0.95	156.31	**K 133**	
	5.00	7490	1.05	141.12		
	5.50	6800	1.20	128.18		
	6.20	6030	1.35	113.72		
	6.80	5470	1.45	103.20		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
4.00						**6p**
n_1=900 [rpm]	**4.10**	8860	0.90	222.60	**L 133**	**P132B5**
	4.80	7500	1.05	188.45	**K 133**	
	5.20	6940	1.15	174.40		
	5.80	6220	1.30	156.31		
	6.40	5620	1.40	141.12		
	7.00	5100	1.55	128.18		
	7.90	4520	1.75	113.72		
	6.90	4110	1.95	103.20		
	10.1	3530	2.30	88.70		
4.00						**4p**
n_1=1400 [rpm]	**8.10**	4640	0.95	172.34	**L 103**	**P112B5**
	8.80	4270	1.00	158.68	**K 103**	
	9.90	3820	1.15	141.83		
	11.0	3430	1.25	127.68		
	12.1	3110	1.40	115.63		
	13.7	2760	1.55	102.53		
	15.1	2490	1.70	92.70		
	17.8	2110	2.00	78.57		
	19.2	1960	2.20	72.88		
	21.3	1760	2.40	65.60		
	23.6	1600	2.70	59.41		
	26.6	1420	3.00	52.68		
4.00						**4p**
n_1=1400 [rpm]	**12.0**	3130	0.95	116.48	**L 93**	**P112B5**
	13.5	2780	1.10	103.44	**K 93**	
	15.1	2490	1.20	92.48		
	16.8	2240	1.35	83.15		
	19.4	1940	1.55	72.17		
	21.5	1750	1.70	65.21		
	23.4	1610	1.85	59.92		
	26.3	1430	2.10	53.21		
	29.4	1280	2.30	47.58		
	32.7	1150	2.60	42.78		
	37.7	1000	3.00	37.13		
	42.1	890	3.20	33.25		
	43.7	860	3.00	32.05		
	51.5	730	3.50	27.19		
	56.0	675	4.20	25.03		
	62.6	600	4.50	22.37		
	69.5	540	4.80	20.14		
4.00						**4p**
n_1=1400 [rpm]	**22.0**	1710	0.90	63.68	**L 83**	**P112B5**
	23.2	1620	0.95	60.35	**K 83**	
	26.5	1420	1.10	52.82	**LK 83**	
	29.4	1280	1.20	47.58		
	33.5	1120	1.40	41.74		
	38.0	990	1.55	36.84		
	40.7	930	1.60	34.40		
	42.9	880	1.75	32.66		
	44.6	840	1.85	31.40		
	50.2	750	2.00	27.88		
	50.3	750	2.10	27.84		
	59.8	630	2.50	23.40		
	65.1	580	2.60	21.51		
	73.3	515	2.80	19.10		
	82.0	460	3.00	17.08		
	91.2	415	3.20	15.35		
	105	360	3.60	13.33		
	117	320	3.80	11.93		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
4.00						**4p**
n_1=1400 [rpm]	**38.0**	990	0.85	36.83	**L 73**	**P112B5**
	41.8	900	0.90	33.47	**K 73**	
	48.3	780	1.05	29.00	**LK 73**	
	55.5	680	1.15	25.23		
	59.9	630	1.30	23.37		
	65.3	575	1.40	21.43		
	74.5	505	1.55	18.80		
	78.6	480	1.65	17.82		
	89.7	420	1.75	15.60		
	99.6	380	1.90	14.05		
	114	330	2.10	12.33		
	129	295	2.30	10.88		
	145	260	2.40	9.64		
	163	230	2.70	8.59		
	181	210	2.90	7.74		
	206	183	3.20	6.79		
	234	161	3.30	5.99		
	264	143	3.60	5.31		
4.00						**4p**
n_1=1400 [rpm]	**70.4**	535	1.10	19.89	**L 63**	**P112B5**
	78.0	485	1.20	17.95	**K 63**	
	88.7	425	1.30	15.79	**LK 63**	
	93.9	400	1.35	14.91		
	110	340	1.50	12.70		
	122	310	1.60	11.54		
	140	270	1.75	10.00		
	161	235	1.90	8.70		
	180	210	1.80	7.79		
	190	198	1.85	7.36		
	223	169	1.95	6.27		
	246	153	2.00	5.70		
	284	133	2.20	4.93		
	326	116	2.30	4.29		
4.00						**4p**
n_1=1400 [rpm]	**75.3**	500	0.90	18.60	**L 53**	**P112B5**
	83.4	450	1.00	16.79	**K 53**	
	94.8	395	1.10	14.77		
	101	375	1.15	13.95		
	118	320	1.25	11.88		
	130	290	1.35	10.79		
	150	250	1.45	9.35		
	155	245	1.55	9.06		
	176	215	1.65	7.97		
	186	205	1.75	7.53		
	219	172	1.95	6.41		
	241	157	2.00	5.82		
	277	136	2.20	5.05		
	319	118	2.40	4.39		
4.00						**4p**
n_1=1400 [rpm]	**138**	275	0.85	10.15	**L 43**	**P112B5**
	155	245	0.90	9.07	**K 43**	
	175	215	0.95	8.01		
	201	187	0.85	6.96		
	234	161	0.95	6.00		
	248	152	1.00	5.64		
	289	131	1.15	4.85		
	323	117	1.25	4.34		
	366	103	1.40	3.83		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
4.00						**2p**
n_1=2800 [rpm]	**173**	215	1.25	16.22	**L 43**	**P112B5**
	192	195	1.35	14.56	**K 43**	
	223	168	1.50	12.54		
	238	158	1.55	11.79		
	276	136	1.70	10.15		
	309	121	1.80	9.07		
	350	107	1.90	8.01		
	361	104	1.55	7.76		
	402	93	1.70	6.96		
	467	80	1.95	6.00		
	496	75	2.10	5.64		
	577	65	2.30	4.85		
	645	58	2.50	4.34		
	731	51	2.80	3.83		
4.00						**4p**
n_1=1400 [rpm]	**252**	150	1.50	5.56	**L 81**	**P112B5**
	276	137	1.85	5.07	**K 81**	
	311	121	2.40	4.50		
	370	102	3.00	3.78		
4.00						**4p**
n_1=1400 [rpm]	**346**	109	1.30	4.04	**L 71**	**P112B5**
	379	100	1.55	3.70	**K 71**	
	431	87	2.10	3.25		
	455	83	2.30	3.08		
	519	73	3.00	2.70		
	576	65	3.30	2.43		
	657	57	3.50	2.13		
	745	51	3.70	1.88		
	838	45	3.90	1.67		
	986	38	4.10	1.42		
4.00						**4p**
n_1=1400 [rpm]	**438**	86	1.15	3.20	**L 61**	**P112B5**
	485	78	1.35	2.89	**K 61**	
	551	68	1.75	2.54		
	583	65	1.90	2.40		
	686	55	2.40	2.04		
	753	50	2.50	1.86		
	870	43	2.60	1.61		
	1000	38	2.80	1.40		
4.00						**4p**
n_1=1400 [rpm]	**530**	71	0.95	2.64	**L 51**	**P112B5**
	591	64	1.10	2.37	**K 51**	
	686	55	1.25	2.04		
	729	52	1.35	1.92		
	849	44	1.55	1.65		
	946	40	1.70	1.48		
	1077	35	1.80	1.30		
5.50						**8p**
n_1=700 [rpm]	**3.10**	17000	1.05	229.71	**L 163**	**P160B5**
	3.80	13800	1.30	186.93	**K 163**	
	4.60	11300	1.60	153.07		
	5.00	10400	1.75	139.98		
	5.80	9010	2.00	121.81		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
5.50						**8p**
n_1=700 [rpm]	**4.30**	12100	1.10	163.31	**L 143**	**P160B5**
	4.80	10900	1.20	146.91	**K 143**	
	5.80	8870	1.45	119.86		
	6.40	8090	1.60	109.31		
5.50						**6p**
n_1=900 [rpm]	**5.50**	8930	1.45	163.57	**L 143**	**P132B5**
	6.20	8040	1.60	147.14	**K 143**	
	7.50	6560	2.00	120.14		
	8.20	5980	2.20	109.48		
	9.50	5180	2.50	94.75		
	10.8	4570	2.80	83.60		
5.50						**8p**
n_1=700 [rpm]	**5.50**	9480	0.85	128.18	**L 133**	**P160B5**
	6.20	8410	0.95	113.72	**K 133**	
	6.80	7630	1.05	103.20		
	7.90	6560	1.20	88.70		
5.50						**6p**
n_1=900 [rpm]	**5.20**	9540	0.85	174.40	**L 133**	**P132B5**
	5.80	8550	0.95	156.31	**K 133**	
	6.40	7720	1.05	141.12		
	7.00	7010	1.15	128.18		
	7.90	6220	1.30	113.72		
	8.70	5650	1.40	103.20		
5.50						**4p**
n_1=1400 [rpm]	**6.30**	8180	1.00	222.60	**L 133**	**P132B5**
	7.50	6920	1.15	188.45	**K 133**	
	8.00	6410	1.25	174.40		
	9.00	5740	1.40	156.31		
	9.90	5180	1.55	141.12		
	11.0	4710	1.70	128.18		
	12.3	4180	1.90	113.72		
	13.6	3790	2.10	103.20		
	15.8	3260	2.50	88.70		
	17.3	2970	2.70	80.91		
	19.0	2700	3.00	73.49		
	21.5	2390	3.30	65.20		
	23.7	2170	3.70	59.17		
	27.5	1870	4.30	50.86		
5.50						**4p**
n_1=1400 [rpm]	**11.0**	4690	0.90	127.68	**L 103**	**P132B5**
	12.1	4250	1.00	115.63	**K 103**	
	13.7	3770	1.15	102.53		
	15.1	3400	1.25	92.70		
	17.8	2890	1.50	78.57		
	19.2	2680	1.60	72.88		
	21.4	2410	1.80	65.60		
	23.6	2180	1.95	59.41		
	26.6	1930	2.20	52.68		
	29.4	1750	2.50	47.63		
	34.7	1480	2.90	40.37		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
5.50						**4p**
n_1=1400 [rpm]	**16.8**	3050	1.00	83.15	**L 93**	**P132B5**
	19.4	2650	1.15	72.17	**K 93**	
	21.5	2390	1.25	65.21		
	23.4	2200	1.35	59.92		
	26.3	1950	1.55	53.21		
	29.4	1750	1.70	47.58		
	32.7	1570	1.90	42.78		
	37.7	1360	2.20	37.13		
	42.1	1220	2.40	33.25		
	43.7	1180	2.20	32.05		
	50.8	1010	2.60	27.58		
	51.5	1000	2.60	27.19		
	55.9	920	3.10	25.03		
	62.6	820	3.30	22.37		
	69.5	740	3.50	20.14		
	76.8	670	3.70	18.24		
	86.6	595	4.00	16.17		
5.50						**4p**
n_1=1400 [rpm]	**29.4**	1750	0.90	47.58	**L 83**	**P132B5**
	33.5	1530	1.00	41.74	**K 83**	
	38.0	1350	1.15	36.84	**LK 83**	
	42.9	1200	1.30	32.66		
	50.2	1020	1.45	27.88		
	50.3	1020	1.50	27.84		
	59.8	860	1.80	23.40		
	65.1	790	1.90	21.51		
	73.3	700	2.00	19.10		
	82.0	625	2.20	17.08		
	91.2	565	2.40	15.35		
	105	490	2.60	13.33		
	117	440	2.80	11.93		
	142	365	3.20	9.90		
	153	335	3.60	9.14		
	171	300	3.80	8.22		
	196	260	4.10	7.13		
5.50						**4p**
n_1=1400 [rpm]	**74.5**	690	1.15	18.80	**L 73**	**P132B5**
	78.6	655	1.20	17.82	**K 73**	
	89.7	575	1.30	15.60	**LK 73**	
	99.6	515	1.40	14.05		
	114	455	1.50	12.33		
	129	400	1.65	10.88		
	145	355	1.80	9.64		
	163	315	2.00	8.59		
	181	285	2.20	7.74		
	206	250	2.30	6.79		
	234	220	2.50	5.99		
	264	195	2.60	5.31		
5.50						**4p**
n_1=1400 [rpm]	**88.7**	580	0.95	15.79	**L 63**	**P132B5**
	93.9	550	1.00	14.91	**K 63**	
	110	465	1.10	12.70	**LK 63**	
	121	425	1.20	11.54		
	140	365	1.30	10.00		
	161	320	1.40	8.70		
	180	285	1.35	7.79		
	190	270	1.35	7.36		
	223	230	1.45	6.27		
	246	210	1.50	5.70		
	284	181	1.60	4.93		
	327	158	1.70	4.29		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
5.50						**2p**
n_1=2800 [rpm]	**322**	159	2.80	8.70	**L 63**	**P132B5**
	359	142	2.70	7.79	**K 63**	
	381	134	2.80	7.36	**LK 63**	
	447	114	2.90	6.27		
	491	104	3.00	5.70		
	568	90	3.20	4.93		
	653	78	3.50	4.29		
5.50						**4p**
n_1=1400 [rpm]	**94.8**	545	0.80	14.77	**L 53**	**P132B5**
	101	510	0.85	13.95	**K 53**	
	118	435	0.95	11.88		
	130	395	1.00	10.79		
	150	345	1.10	9.35		
	176	295	1.20	7.97		
	186	275	1.25	7.53		
	219	235	1.40	6.41		
	241	215	1.50	5.82		
	277	185	1.65	5.05		
	319	161	1.75	4.39		
5.50						**2p**
n_1=2800 [rpm]	**300**	171	2.20	9.35	**L 53**	**P132B5**
	351	145	2.40	7.97	**K 53**	
	372	137	2.50	7.53		
	437	117	2.90	6.41		
	481	106	3.00	5.82		
	554	92	3.30	5.05		
	638	80	3.50	4.39		
5.50						**4p**
n_1=1400 [rpm]	**289**	178	0.85	4.85	**L 43**	**P132B5**
	323	159	0.90	4.34	**K 43**	
	366	141	1.00	3.83		
5.50						**2p**
n_1=2800 [rpm]	**223**	230	1.10	12.54	**L 43**	**P132B5**
	238	215	1.15	11.79	**K 43**	
	276	185	1.25	10.15		
	309	165	1.35	9.07		
	350	146	1.40	8.01		
	467	109	1.45	6.00		
	496	103	1.50	5.64		
	577	89	1.70	4.85		
	645	79	1.85	4.34		
	731	70	2.10	3.83		
5.50						**4p**
n_1=1400 [rpm]	**211**	245	1.90	6.63	**L 101**	**P132B5**
	250	205	2.20	5.61	**K 101**	
	270	191	3.70	5.19		
	301	171	4.10	4.65		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
5.50						**4p**
n_1=1400 [rpm]	**242**	215	1.95	5.79	**L 91**	**P132B5**
	285	180	2.20	4.91	**K 91**	
	310	166	3.60	4.52		
	347	149	4.00	4.04		
	385	134	4.40	3.64		
	424	121	4.90	3.30		
	480	107	5.50	2.92		
	530	97	6.10	2.64		
	625	82	7.20	2.24		
	714	72	7.90	1.96		
	854	60	8.40	1.64		
	986	52	8.80	1.42		
5.50						**4p**
n_1=1400 [rpm]	**311**	165	1.75	4.50	**L 81**	**P132B5**
	370	139	2.20	3.78	**K 81**	
	402	128	3.20	3.48		
	453	113	3.60	3.09		
	507	101	4.00	2.76		
	565	91	4.40	2.48		
	651	79	4.90	2.15		
5.50						**4p**
n_1=1400 [rpm]	**431**	119	1.50	3.25	**L 71**	**P132B5**
	455	113	1.70	3.08	**K 71**	
	519	99	2.20	2.70		
	576	89	2.40	2.43		
	658	78	2.60	2.13		
	745	69	2.70	1.88		
	838	61	2.80	1.67		
	986	52	3.00	1.42		
5.50						**4p**
n_1=1400 [rpm]	**551**	93	1.25	2.54	**L 61**	**P132B5**
	583	88	1.40	2.40	**K 61**	
	686	75	1.80	2.04		
	753	68	1.85	1.86		
	870	59	1.95	1.61		
	1000	51	2.00	1.40		
5.50						**4p**
n_1=1400 [rpm]	**686**	75	0.90	2.04	**L 51**	**P132B5**
	729	71	1.00	1.92	**K 51**	
	849	61	1.15	1.65		
	946	54	1.25	1.48		
	1077	48	1.30	1.30		
7.50						**8p**
n_1=700 [rpm]	**3.10**	22900	0.80	229.71	**L 163**	**P160B5**
	3.80	18600	0.95	186.93	**K 163**	
	4.60	15200	1.20	153.07		
	5.00	13900	1.30	139.98		
	5.80	12100	1.50	121.81		
7.50						**6p**
n_1=900 [rpm]	**3.90**	17100	1.05	229.71	**L 163**	**P160B5**
	4.80	13900	1.30	186.93	**K 163**	
	5.90	11400	1.60	153.07		
	6.50	10400	1.70	139.98		
	7.40	9090	2.00	121.81		
	8.40	8020	2.20	107.49		
	9.70	6950	2.60	93.19		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
7.50						**6p**
n_1=900 [rpm]	**11.0**	6190	2.90	82.91	**L 163**	**P160B5**
	12.0	5500	3.30	73.70	**K 163**	
	14.0	5030	3.60	67.40		
7.50						**8p**
n_1=700 [rpm]	**4.30**	16200	0.80	163.57	**L 143**	**P160B5**
	4.80	14600	0.90	147.14	**K 143**	
	5.90	11900	1.10	120.14		
	6.40	10900	1.20	109.48		
7.50						**6p**
n_1=900 [rpm]	**5.50**	12200	1.05	163.57	**L 143**	**P160B5**
	6.20	11000	1.20	147.14	**K 143**	
	7.50	8940	1.45	120.04		
	8.30	8150	1.60	109.48		
	9.50	7060	1.85	84.75		
	11.0	6230	2.10	83.60		
7.50						**4p**
n_1=1400 [rpm]	**7.50**	9440	0.85	188.45	**L 133**	**P132B5**
	8.00	8730	0.90	174.40	**K 133**	
	9.00	7830	1.00	156.31		
	10.0	7070	1.15	141.12		
	11.0	6420	1.25	128.18		
	12.3	5700	1.40	113.72		
	13.6	5170	1.55	103.20		
	15.8	4440	1.80	88.70		
	17.3	4050	1.95	80.91		
	19.0	3680	2.20	73.49		
	21.5	3270	2.50	65.20		
	23.7	2960	2.70	59.17		
	27.5	2550	3.10	50.86		
7.50						**4p**
n_1=1400 [rpm]	**15.1**	4640	0.95	92.70	**L 103**	**P132B5**
	17.8	3940	1.10	78.57	**K 103**	
	19.2	3650	1.20	72.88		
	21.3	3290	1.30	65.60		
	23.6	2980	1.45	59.41		
	26.6	2640	1.65	52.68		
	29.4	2390	1.80	47.63		
	34.7	2020	2.10	40.37		
	39.7	1770	2.40	35.26		
	45.5	1540	2.80	30.77		
	47.5	1480	2.90	29.49		
	50.8	1380	3.10	27.58		
	56.2	1250	3.50	24.90		
	61.9	1130	3.80	22.62		
7.50						**4p**
n_1=1400 [rpm]	**23.4**	3000	1.00	59.92	**L 93**	**P132B5**
	26.3	2670	1.15	53.21	**K 93**	
	29.4	2380	1.25	47.58		
	32.8	2140	1.40	42.78		
	37.7	1860	1.60	37.13		
	42.1	1670	1.75	33.25		
	43.7	1610	1.60	32.05		
	50.8	1380	1.95	27.58		
	51.5	1360	1.90	27.19		
	56.0	1250	2.30	25.03		
	62.6	1120	2.40	22.37		
	69.5	1010	2.60	20.14		
	76.8	910	2.70	18.24		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
7.50						**4p**
n_1=1400 [rpm]	**38.0**	1840	0.85	36.84	**L 83**	**P132B5**
	42.9	1640	0.95	32.66	**K 83**	
	50.2	1400	1.05	27.88	**LK 83**	
	50.3	1390	1.10	27.84		
	59.8	1170	1.30	23.40		
	65.1	1080	1.40	21.51		
	73.3	960	1.50	19.10		
	82.0	860	1.65	17.08		
	91.2	770	1.75	15.35		
	105	670	1.90	13.33		
	118	600	2.10	11.93		
	142	495	2.40	9.90		
	153	460	2.60	9.14		
	170	410	2.80	8.22		
	196	355	3.00	7.13		
	219	320	3.20	6.39		
	264	265	3.40	5.30		
7.50						**4p**
n_1=1400 [rpm]	**74.5**	940	0.85	18.80	**L 73**	**P132B5**
	78.6	890	0.85	17.82	**K 73**	
	89.8	780	0.95	15.60	**LK 73**	
	99.7	705	1.00	14.05		
	114	615	1.10	12.33		
	129	545	1.20	10.88		
	145	485	1.30	9.64		
	163	430	1.45	8.59		
	181	390	1.55	7.74		
	206	340	1.70	6.79		
	234	300	1.80	5.99		
	264	265	1.90	5.31		
7.50						**4p**
n_1=1400 [rpm]	**110**	635	0.80	12.70	**L 63**	**P132B5**
	122	580	0.85	11.54	**K 63**	
	140	500	0.95	10.00	**LK 63**	
	161	435	1.00	8.70		
	180	390	0.95	7.79		
	190	370	1.00	7.36		
	223	315	1.05	6.27		
	246	285	1.10	5.70		
	284	245	1.15	4.93		
	327	215	1.25	4.29		
7.50						**4p**
n_1=1400 [rpm]	**176**	400	0.90	7.97	**L 53**	**P132B5**
	186	375	0.95	7.53	**K 53**	
	219	320	1.05	6.41		
	241	290	1.10	5.82		
	277	255	1.20	5.05		
	319	220	1.25	4.39		
7.50						**2p**
n_1=2800 [rpm]	**190**	365	1.20	14.77	**L 53**	**P132B5**
	201	345	1.25	13.95	**K 53**	
	236	295	1.40	11.88		
	260	265	1.45	10.79		
	300	230	1.60	9.35		
	352	197	1.80	7.97		
	372	186	1.90	7.53		
	437	158	2.10	6.41		
	481	144	2.20	5.82		
	555	125	2.50	5.05		
	638	108	2.60	4.39		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
7.50						**4p**
n_1=1400 [rpm]	**212**	330	1.40	6.63	**L 101**	**P132B5**
	250	280	1.60	5.61	**K 101**	
	270	260	2.70	5.19		
	301	235	3.00	4.65		
	334	210	3.90	4.20		
7.50						**4p**
n_1=1400 [rpm]	**242**	290	1.45	5.79	**L 91**	**P132B5**
	285	245	1.60	4.91	**K 91**	
	310	225	2.60	4.52		
	347	205	2.90	4.04		
	385	182	3.30	3.64		
	424	165	3.60	3.30		
	480	146	4.10	2.92		
7.50						**4p**
n_1=1400 [rpm]	**311**	225	1.30	4.50	**L 81**	**P132B5**
	371	189	1.60	3.78	**K 81**	
	402	174	2.30	3.48		
	453	155	2.60	3.09		
	507	138	2.90	2.76		
	565	124	3.30	2.48		
	651	108	3.60	2.15		
	726	97	3.70	1.93		
	875	80	3.90	1.60		
	1007	70	4.20	1.39		
7.50						**4p**
n_1=1400 [rpm]	**431**	163	1.10	3.25	**L 71**	**P132B5**
	455	154	1.25	3.08	**K 71**	
	519	135	1.60	2.70		
	576	122	1.75	2.43		
	657	107	1.85	2.13		
	745	94	2.00	1.88		
	838	84	2.10	1.67		
	986	71	2.20	1.42		
7.50						**4p**
n_1=1400 [rpm]	**551**	127	0.95	2.54	**L 61**	**P132B5**
	583	120	1.00	2.40	**K 61**	
	686	102	1.30	2.04		
	753	93	1.35	1.86		
	870	81	1.40	1.61		
	1000	70	1.50	1.40		
11.0						**6p**
n_1=900 [rpm]	**4.80**	20500	0.90	186.93	**L 163**	**P160B5**
	5.90	16700	1.05	153.07	**K 163**	
	6.50	15300	1.20	139.98		
	7.40	13300	1.35	121.81		
11.0						**4p**
n_1=1400 [rpm]	**6.10**	16800	1.05	229.71	**L 163**	**P160B5**
	7.50	13600	1.30	186.93	**K 163**	
	9.20	11200	1.60	153.07		
	10.0	10200	1.75	139.98		
	11.5	8890	2.00	121.81		
	13.0	7840	2.30	107.49		
	15.0	6800	2.70	93.19		
	16.9	6050	3.00	82.91		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
11.0						**6p**
n_1=900 [rpm]	**6.10**	16100	0.80	147.14	**L 143**	**P160B5**
	7.50	13100	1.00	120.04	**K 143**	
	8.20	12000	1.10	109.48		
	9.50	10400	1.25	94.75		
	11.0	9130	1.40	83.60		
11.0						**4p**
n_1=1400 [rpm]	**8.60**	11900	1.10	163.57	**L 143**	**P160B5**
	9.50	10700	1.20	147.14	**K 143**	
	11.7	8740	1.50	120.04		
	12.8	7970	1.65	109.48		
	14.8	6900	1.90	94.75		
	16.7	6090	2.10	83.60		
	19.4	5260	2.50	72.20		
	20.9	4890	2.70	67.09		
	22.9	4460	2.90	61.19		
	26.4	3860	3.40	52.96		
11.0						**4p**
n_1=1400 [rpm]	**9.90**	10300	0.80	141.12	**L 133**	**P160B5**
	11.0	9350	0.85	128.18	**K 133**	
	12.3	8300	0.95	113.72		
	13.6	7530	1.05	103.20		
	15.8	6470	1.25	88.70		
	17.3	5900	1.35	80.91		
	19.0	4360	1.50	73.49		
	21.5	4760	1.70	65.20		
	23.7	4320	1.85	59.17		
	27.5	3710	2.20	50.86		
	31.5	3240	2.50	44.39		
	37.2	2750	2.90	37.65		
	42.5	2400	3.30	32.91		
11.0						**4p**
n_1=1400 [rpm]	**21.3**	4790	0.90	65.60	**L 103**	**P160B5**
	23.6	4330	1.00	59.41	**K 103**	
	26.6	3840	1.10	52.68		
	29.4	3470	1.25	47.63		
	34.7	2940	1.45	40.37		
	39.7	2570	1.65	35.26		
	45.5	2240	1.90	30.77		
	47.5	2150	2.00	29.49		
	50.8	2010	2.10	27.58		
	56.2	1820	2.40	24.90		
	61.9	1650	2.60	22.62		
	69.8	1460	2.90	20.07		
	76.9	1330	3.20	18.21		
11.0						**4p**
n_1=1400 [rpm]	**32.7**	3120	0.95	42.78	**L 93**	**P160B5**
	37.7	2710	1.10	37.13	**K 93**	
	42.1	2430	1.20	33.25		
	50.8	2010	1.35	27.58		
	55.9	1830	1.55	25.03		
	62.6	1630	1.65	22.37		
	69.5	1470	1.80	20.14		
	76.8	1330	1.90	18.24		
	86.6	1180	2.00	16.17		
	95.8	1070	2.20	14.62		
	113	900	2.40	12.39		
	129	790	2.70	10.83		
	151	675	3.00	9.29		
	167	610	3.30	8.39		
	197	520	3.80	7.12		
	225	455	4.20	6.21		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
11.0						**4p**
n_1=1400 [rpm]	**65.1**	1570	0.95	21.51	**L 83**	**P160B5**
	73.3	1390	1.05	19.10	**K 83**	
	82.0	1250	1.10	17.08	**LK 83**	
	91.2	1120	1.20	15.35		
	105	970	1.30	13.33		
	117	870	1.40	11.93		
	141	720	1.65	9.90		
	153	665	1.80	9.14		
	170	600	1.95	8.22		
	196	520	2.10	7.13		
	219	465	2.20	6.39		
	264	385	2.30	5.30		
11.0						**4p**
n_1=1400 [rpm]	**129**	795	0.85	10.88	**L 73**	**P160B5**
	145	705	0.90	9.64	**K 73**	
	181	565	1.10	7.74	**LK 73**	
	206	495	1.15	6.79		
	234	435	1.25	5.99		
	264	390	1.30	5.31		
11.0						**4p**
n_1=1400 [rpm]	**270**	380	1.85	5.19	**L 101**	**P160B5**
	301	340	2.00	4.65	**K 101**	
	333	305	2.70	4.20		
	367	280	3.00	3.81		
	414	245	3.40	3.38		
	456	225	3.70	3.07		
	530	193	4.30	2.64		
11.0						**4p**
n_1=1400 [rpm]	**310**	330	1.80	4.52	**L 91**	**P160B5**
	347	295	2.00	4.04	**K 91**	
	385	265	2.20	3.64		
	424	240	2.50	3.30		
	479	215	2.80	2.92		
	530	193	3.10	2.64		
	625	163	3.60	2.24		
	714	143	4.00	1.96		
	854	119	4.20	1.64		
	986	103	4.40	1.42		
11.0						**4p**
n_1=1400 [rpm]	**402**	255	1.60	3.48	**L 81**	**P160B5**
	453	225	1.80	3.09	**K 81**	
	507	200	2.00	2.76		
	565	181	2.20	2.48		
	651	157	2.50	2.15		
	725	141	2.50	1.93		
	875	117	2.70	1.60		
	1007	102	2.90	1.39		
11.0						**4p**
n_1=1400 [rpm]	**576**	177	1.20	2.43	**L 71**	**P160B5**
	657	155	1.30	2.13	**K 71**	
	745	137	1.35	1.88		
	838	122	1.40	1.67		
	986	104	1.50	1.42		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
15.0						**6p**
n_1=900 [rpm]	**5.90**	22600	0.80	153.07	**L 163**	**P180B5**
	6.50	20700	0.85	139.98	**K 163**	
	7.40	18000	1.00	121.81		
	8.40	15900	1.15	107.49		
15.0						**4p**
n_1=1400 [rpm]	**6.10**	22500	0.80	229.71	**L 163**	**P160B5**
	7.50	18300	1.00	186.93	**K 163**	
	9.20	15000	1.20	153.07		
	10.0	13700	1.30	139.98		
	11.5	12000	1.50	121.81		
	13.0	10500	1.70	107.49		
	15.0	9140	1.95	93.19		
	16.9	8130	2.20	82.91		
	19.0	7230	2.50	73.70		
	20.8	6610	2.70	67.40		
15.0						**6p**
n_1=900 [rpm]	**8.20**	16100	0.80	109.48	**L 143**	**P180B5**
	9.50	14000	0.95	94.75	**K 143**	
	10.8	12300	1.05	83.60		
	12.5	10600	1.20	72.20		
	13.4	9890	1.30	67.09		
15.0						**4p**
n_1=1400 [rpm]	**8.60**	16000	0.80	163.57	**L 143**	**P160B5**
	9.50	14400	0.90	147.14	**K 143**	
	11.7	11800	1.10	120.04		
	12.8	10700	1.20	109.48		
	14.8	9280	1.40	94.75		
	16.8	8190	1.60	83.60		
	19.4	7070	1.85	72.20		
	21.0	6570	2.00	67.09		
	23.0	5990	2.20	61.19		
	26.5	5190	2.50	52.96		
	30.0	4580	2.80	46.73		
15.0						**4p**
n_1=1400 [rpm]	**13.6**	10100	0.80	103.20	**L 133**	**P160B5**
	15.8	8700	0.90	88.70	**K 133**	
	17.3	7940	1.00	80.91		
	19.0	7210	1.10	73.49		
	21.5	6400	1.25	65.20		
	23.7	5800	1.40	59.17		
	27.5	4990	1.60	50.86		
	31.5	4360	1.85	44.39		
	37.2	3690	2.20	37.65		
	42.5	3230	2.50	32.91		
	50.3	2730	2.80	27.83		
15.0						**4p**
n_1=1400 [rpm]	**29.4**	4670	0.90	47.63	**L 103**	**P160B5**
	34.7	3960	1.10	40.37	**K 103**	
	39.7	3460	1.25	35.26		
	45.5	3020	1.40	30.77		
	47.5	2890	1.50	29.49		
	50.8	2710	1.60	27.58		
	56.2	2440	1.75	24.90		
	61.9	2220	1.95	22.62		
	69.8	1970	2.20	20.07		
	76.9	1790	2.40	18.21		
	89.5	1540	2.80	15.65		
	103	1340	3.20	13.66		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
15.0						**4p**
n_1=1400 [rpm]	**50.8**	2710	1.00	27.58	**L 93**	**P160B5**
	56.0	2460	1.15	25.03	**K 93**	
	62.6	2200	1.25	22.37		
	69.5	1980	1.30	20.14		
	76.8	1790	1.40	18.24		
	86.6	1590	1.50	16.17		
	95.8	1430	1.60	14.62		
	113	1220	1.80	12.39		
	129	1060	1.95	10.83		
	151	910	2.20	9.29		
	167	820	2.50	8.39		
	197	700	2.90	7.12		
	226	610	3.10	6.21		
15.0						**4p**
n_1=1400 [rpm]	**82.0**	1680	0.85	17.08	**L 83**	**P160B5**
	91.2	1510	0.90	15.35	**K 83**	
	105	1310	1.00	13.33	**LK 83**	
	117	1170	1.05	11.93		
	142	970	1.20	9.90		
	153	900	1.35	9.14		
	170	810	1.45	8.22		
	196	700	1.55	7.13		
	219	625	1.65	6.39		
	264	520	1.75	5.30		
15.0						**4p**
n_1=1400 [rpm]	**270**	510	1.35	5.19	**L 101**	**P160B5**
	301	455	1.50	4.65	**K 101**	
	333	410	2.00	4.20		
	368	375	2.20	3.81		
	414	330	2.50	3.38		
	456	300	2.80	3.07		
	530	260	3.20	2.64		
	609	225	3.70	2.30		
	718	192	4.00	1.95		
	819	168	4.20	1.71		
	972	142	4.60	1.44		
15.0						**4p**
n_1=1400 [rpm]	**310**	445	1.35	4.52	**L 91**	**P160B5**
	347	395	1.50	4.04	**K 91**	
	385	355	1.65	3.64		
	424	325	1.85	3.30		
	480	285	2.10	2.92		
	530	260	2.30	2.64		
	625	220	2.70	2.24		
	714	192	3.00	1.96		
	854	161	3.20	1.64		
	986	139	3.30	1.42		
15.0						**4p**
n_1=1400 [rpm]	**402**	340	1.20	3.48	**L 81**	**P160B5**
	453	305	1.35	3.09	**K 81**	
	507	270	1.50	2.76		
	565	245	1.65	2.48		
	651	210	1.80	2.15		
	725	189	1.90	1.93		
	875	157	2.00	1.60		
	1007	137	2.10	1.39		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
18.5						**4p**
n_1=1400 [rpm]	**7.50**	22500	0.80	186.93	**L 163**	**P180B5**
	9.20	18500	1.00	153.07	**K 163**	
	10.0	16900	1.05	139.98		
	11.5	14700	1.25	121.81		
	13.0	13000	1.40	107.49		
	15.0	11200	1.60	83.19		
	16.9	10000	1.80	82.91		
	19.0	8890	2.00	73.70		
	20.8	8130	2.20	67.40		
	23.9	7070	2.50	58.65		
18.5						**4p**
n_1=1400 [rpm]	**11.7**	14500	0.90	120.04	**L 143**	**P180B5**
	12.8	13200	1.00	109.48	**K 143**	
	14.8	11400	1.15	94.75		
	16.8	10100	1.30	83.60		
	19.4	8690	1.50	72.20		
	21.0	8080	1.60	67.009		
	23.0	7370	1.75	61.19		
	26.4	6380	2.00	52.96		
	30.0	5630	2.30	46.73		
	34.7	4860	2.70	40.35		
18.5						**4p**
n_1=1400 [rpm]	**17.3**	9760	0.80	80.91	**L 133**	**P180B5**
	19.0	8860	0.90	73.49	**K 133**	
	21.5	7860	1.00	65.20		
	23.7	7140	1.10	59.17		
	27.5	6130	1.30	50.86		
	31.5	5350	1.50	44.39		
	37.2	4540	1.75	37.65		
	42.5	3970	2.00	32.91		
	47.3	3570	2.20	29.57		
	50.3	3360	2.30	27.83		
	58.0	2910	2.80	24.12		
	63.7	2650	3.00	22.00		
	73.5	2300	3.50	19.04		
	83.3	2030	4.00	16.80		
18.5						**4p**
n_1=1400 [rpm]	**34.7**	4870	0.90	40.37	**L 103**	**P180B5**
	39.7	4250	1.00	35.26	**K 103**	
	47.5	3560	1.20	29.49		
	56.2	3000	1.45	24.90		
	61.9	2730	1.60	22.62		
	69.8	2420	1.80	20.07		
	76.9	2200	1.95	18.21		
	89.5	1890	2.30	15.65		
	103	1650	2.60	13.66		
	121	1400	3.10	11.59		
	138	1220	3.50	10.13		
	178	950	3.10	7.86		
	210	800	3.70	6.66		
18.5						**4p**
n_1=1400 [rpm]	**69.5**	2430	1.05	20.14	**L 93**	**P180B5**
	76.8	2200	1.15	18.24	**K 93**	
	86.6	1950	1.25	16.17		
	95.8	1760	1.30	14.62		
	113	1490	1.45	12.39		
	129	1310	1.60	10.83		
	151	1120	1.80	9.29		
	167	1010	2.00	8.39		
	197	860	2.30	7.12		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
18.5						**4p**
n_1=1400 [rpm]	**226**	750	2.50	6.21	**L 93**	**P180B5**
	269	625	2.80	5.20	**K 93**	
	311	545	3.00	4.50		
18.5						**4p**
n_1=1400 [rpm]	**105**	1610	0.80	13.33	**L 83**	**P160B5**
	117	1440	0.85	11.93	**K 83**	
	142	1190	1.00	9.90	**LK 83**	
	153	1100	1.10	9.14		
	171	990	1.15	8.22		
	197	860	1.25	7.13		
	219	770	1.30	6.39		
	264	640	1.40	5.30		
18.5						**4p**
n_1=1400 [rpm]	**333**	505	1.65	4.20	**L 101**	**P180B5**
	368	460	1.80	3.81	**K 101**	
	414	410	2.00	3.38		
	456	370	2.20	3.07		
	530	320	2.60	2.64		
	609	280	3.00	2.30		
	718	235	3.20	1.95		
	819	205	3.40	1.71		
	972	174	3.70	1.44		
18.5						**4p**
n_1=1400 [rpm]	**385**	440	1.35	3.64	**L 91**	**P180B5**
	424	400	1.50	3.30	**K 91**	
	479	355	1.70	2.92		
	530	320	1.85	2.64		
	625	270	2.20	2.24		
	714	235	2.40	1.96		
	854	197	2.60	1.64		
	986	171	2.70	1.42		
18.5						**4p**
n_1=1400 [rpm]	**507**	335	1.20	2.76	**L 81**	**P180B5**
	565	300	1.35	2.48	**K 81**	
	651	260	1.50	2.15		
	725	235	1.55	1.93		
	875	193	1.65	1.60		
	1007	168	1.75	1.39		
22.0						**4p**
n_1=1400 [rpm]	**9.20**	22000	0.80	153.07	**L 163**	**P180B5**
	10.0	20100	0.90	139.98	**K 163**	
	11.5	17500	1.05	121.81		
	13.0	15400	1.15	107.49		
	15.0	13400	1.35	93.19		
	16.9	11900	1.50	82.91		
	19.0	10600	1.70	73.70		
	20.8	9670	1.85	67.40		
	23.9	8410	2.10	58.65		
	27.0	7420	2.40	51.76		
	31.2	6430	2.80	44.87		
22.0						**4p**
n_1=1400 [rpm]	**12.8**	15700	0.85	109.48	**L 143**	**P180B5**
	14.8	13600	0.95	94.75	**K 143**	
	16.8	12000	1.10	83.60		
	19.4	10300	1.25	72.20		
	20.9	9610	1.35	67.09		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
22.0						**4p**
n_1=1400 [rpm]	**23.0**	8760	1.50	61.19	**L 143**	**P180B5**
	26.4	7580	1.70	52.96	**K 143**	
	30.0	6690	1.95	46.73		
	34.7	5780	2.20	40.35		
	39.2	5110	2.50	35.69		
	47.0	4300	3.00	30.00		
22.0						**4p**
n_1=1400 [rpm]	**21.5**	9350	0.85	65.20	**L 133**	**P180B5**
	23.7	8480	0.95	59.17	**K 133**	
	27.5	7290	1.10	50.86		
	31.5	6370	1.25	44.39		
	37.2	5400	1.50	37.65		
	42.5	4720	1.70	32.91		
	47.3	4240	1.85	29.57		
	50.3	3990	1.90	27.83		
	58.0	3460	2.30	24.12		
	63.6	3150	2.50	22.00		
	73.5	2730	2.90	19.04		
	83.3	2410	3.30	16.80		
	96.5	2080	3.80	14.51		
	109	1840	4.30	12.83		
22.0						**4p**
n_1=1400 [rpm]	**39.7**	5060	0.85	35.26	**L 103**	**P180B5**
	47.5	4230	1.00	29.49	**K 103**	
	56.2	3570	1.20	24.90		
	61.9	3240	1.35	22.62		
	69.8	2880	1.50	20.07		
	76.9	2610	1.65	18.21		
	89.5	2240	1.90	15.65		
	103	1960	2.20	13.66		
	121	1660	2.60	11.59		
	138	1450	3.00	10.13		
	164	1230	3.50	8.56		
	178	1130	2.60	7.86		
	210	960	3.10	6.66		
	241	840	3.60	5.82		
22.0						**4p**
n_1=1400 [rpm]	**69.5**	2890	0.90	20.14	**L 93**	**P180B5**
	76.8	2620	0.95	18.24	**K 93**	
	86.6	2320	1.05	16.17		
	95.8	2100	1.10	14.62		
	113	1780	1.25	12.39		
	129	1550	1.35	10.83		
	151	1330	1.50	9.29		
	167	1200	1.70	8.39		
	197	1020	1.95	7.12		
	226	890	2.10	6.21		
	269	745	2.40	5.20		
	311	645	2.50	4.50		
22.0						**4p**
n_1=1400 [rpm]	**142**	1420	0.85	9.90	**L 83**	**P180B5**
	153	1310	0.90	9.14	**K 83**	
	170	1180	1.00	8.22	**LK 83**	
	197	1020	1.05	7.13		
	219	920	1.10	6.39		
	264	760	1.20	5.30		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
22.0						**4p**
n_1=1400 [rpm]	**333**	600	1.40	4.20	**L 101**	**P180B5**
	368	545	1.50	3.81	**K 101**	
	414	485	1.70	3.38		
	456	440	1.90	3.07		
	530	380	2.20	2.64		
	609	330	2.50	2.30		
	718	280	2.70	1.95		
	819	245	2.90	1.71		
	972	205	3.10	1.44		
22.0						**4p**
n_1=1400 [rpm]	**385**	520	1.15	3.64	**L 91**	**P180B5**
	424	475	1.25	3.30	**K 91**	
	480	420	1.40	2.92		
	530	380	1.55	2.64		
	625	320	1.85	2.24		
	714	280	2.00	1.96		
	854	235	2.20	1.64		
	986	205	2.20	1.42		
22.0						**4p**
n_1=1400 [rpm]	**507**	395	1.00	2.76	**L 81**	**P180B5**
	565	355	1.15	2.48	**K 81**	
	651	310	1.25	2.15		
	725	275	1.30	1.93		
	875	230	1.35	1.60		
	1007	200	1.45	1.39		
30.0						**4p**
n_1=1400 [rpm]	**13.0**	20900	0.85	107.49	**L 163**	**P200B5**
	15.0	18200	1.00	93.19	**K 163**	
	16.9	16200	1.10	82.91		
	19.0	14400	1.25	73.70		
	20.8	13100	1.35	67.40		
	23.9	11400	1.55	58.65		
	27.0	10100	1.80	51.76		
	31.2	8740	2.10	44.87		
	35.0	7780	2.30	39.92		
	40.7	6710	2.70	34.41		
	50.0	5450	3.30	27.96		
	59.1	4620	3.90	23.71		
30.0						**4p**
n_1=1400 [rpm]	**16.7**	16300	0.80	83.60	**L 143**	**P200B5**
	19.4	14000	0.95	72.20	**K 143**	
	21.0	13100	1.00	67.09		
	23.0	11900	1.10	61.19		
	26.4	10300	1.25	52.96		
	30.0	9090	1.45	46.73		
	34.7	7850	1.65	40.35		
	39.2	6950	1.85	35.69		
	47.0	5840	2.20	30.00		
	57.8	4710	2.50	24.23		
	68.4	3980	3.00	20.47		
	77.5	3510	3.00	18.06		
	89.4	3050	4.30	15.66		

Dane techniczne

Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
30.0						**4p**
n_1=1400 [rpm]	**27.5**	9910	0.80	50.86	**L 133**	**P200B5**
	31.5	8650	0.90	44.39	**K 133**	
	37.2	7340	1.10	37.65		
	42.5	6410	1.25	32.91		
	50.3	5420	1.40	27.83		
	58.0	4700	1.70	24.12		
	63.6	4290	1.85	22.00		
	73.5	3710	2.20	19.04		
	83.3	3270	2.40	16.80		
	96.5	2830	2.80	14.51		
	109	2500	3.20	12.83		
	130	2100	3.80	10.79		
	185	1480	3.50	7.59		
	220	1240	4.10	6.38		
30.0						**4p**
n_1=1400 [rpm]	**70.0**	3910	1.10	20.07	**L 103**	**P200B5**
	77.0	3550	1.20	1.821	**K 103**	
	89.5	3050	1.40	15.65		
	103	2660	1.60	13.66		
	121	2260	1.90	11.59		
	138	1970	2.20	10.13		
	164	1670	2.60	8.56		
	178	1530	1.95	7.86		
	210	1300	2.30	6.66		
	241	1140	2.60	5.82		
	285	960	3.00	4.92		
30.0						**4p**
n_1=1400 [rpm]	**96.0**	2850	0.80	14.62	**L 93**	**P200B5**
	113	2420	0.90	12.39	**K 93**	
	129	2110	1.00	10.83		
	151	1810	1.10	9.29		
	167	1640	1.25	8.39		
	197	1390	1.45	7.12		
	226	1210	1.55	6.21		
	269	1010	1.75	5.20		
	311	880	1.85	4.50		
30.0						**4p**
n_1=1400 [rpm]	**414**	660	1.25	3.38	**L 101**	**P200B5**
	456	600	1.40	3.07	**K 101**	
	530	515	1.60	2.64		
	609	450	1.85	2.30		
	718	380	2.00	1.95		
	819	335	2.10	1.71		
	972	280	2.30	1.44		
30.0						**4p**
n_1=1400 [rpm]	**479**	570	1.05	2.92	**L 91**	**P200B5**
	531	515	1.15	2.64	**K 91**	
	625	435	1.35	2.24		
	714	380	1.50	1.96		
	854	320	1.60	1.64		
	986	275	1.65	1.42		
37.0						**4p**
n_1=1400 [rpm]	**15.0**	22400	0.80	93.19	**L 163**	**P225B5**
	17.0	19900	0.90	82.91	**K 163**	
	19.0	17700	1.00	73.70		
	21.0	16200	1.10	67.40		
	24.0	14100	1.30	58.65		
	27.0	12400	1.45	51.76		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
37.0						**4p**
n_1=1400 [rpm]	**31.2**	10800	1.65	44.87	**L 163**	**P225B5**
	35.0	9600	1.90	39.92	**K 163**	
	40.7	8270	2.20	34.41		
	45.6	7380	2.35	30.71		
	50.0	6720	2.70	27.96		
	57.0	5900	2.40	24.57		
	64.0	5250	2.50	21.85		
	73.6	4580	3.50	19.03		
	82.5	4080	3.70	16.98		
37.0						**4p**
n_1=1400 [rpm]	**21.0**	16100	0.80	67.09	**L 143**	**P225B5**
	23.0	14700	0.90	61.19	**K 143**	
	26.4	12700	1.00	52.96		
	30.0	11200	1.15	46.73		
	34.7	9680	1.35	40.35		
	39.2	8570	1.50	35.69		
	47.0	7200	1.80	30.00		
	58.0	5810	2.00	24.23		
	68.4	4910	2.40	20.47		
	77.5	4340	2.40	18.06		
	89.4	3760	3.50	15.66		
	101	3340	3.80	13.93		
37.0						**4p**
n_1=1400 [rpm]	**37.2**	9050	0.90	37.65	**L 133**	**P225B5**
	42.5	7910	1.00	32.91	**K 133**	
	50.3	6690	1.15	27.83		
	58.0	5800	1.40	24.12		
	63.7	5290	1.50	22.00		
	73.5	4580	1.75	19.04		
	83.3	4040	2.00	16.80		
	96.5	3490	2.30	14.51		
	109	3080	2.60	12.83		
	130	2590	3.10	10.79		
	161	2090	3.70	8.71		
	185	1820	2.80	7.59		
	219	1530	3.30	6.38		
	272	1240	3.70	5.15		
37.0						**4p**
n_1=1400 [rpm]	**70.0**	4820	0.90	20.07	**L 103**	**P225B5**
	77.0	4380	1.00	18.21	**K 103**	
	90.0	3760	1.15	15.65		
	103	3280	1.30	13.66		
	121	2790	1.55	11.59		
	138	2430	1.75	10.13		
	164	2060	2.10	8.56		
	178	1890	1.55	7.86		
	210	1600	1.85	6.66		
	241	1400	2.10	5.82		
	285	1180	2.50	4.92		
37.0						**4p**
n_1=1400 [rpm]	**414**	810	1.00	3.38	**L 101**	**P225B5**
	456	740	1.10	3.07	**K 101**	
	530	635	1.30	2.64		
	609	555	1.50	2.30		
	718	470	1.65	1.95		
	819	410	1.70	1.71		
	972	345	1.85	1.44		

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Technical data

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
45.0						**4p**
n_1=1400 [rpm]	**19.0**	21500	0.85	73.70	**L 163**	**P225B5**
	21.0	19700	0.90	67.40	**K 163**	
	24.0	17100	1.05	58.65		
	27.0	15100	1.20	51.76		
	31.2	13100	1.35	44.87		
	35.0	11700	1.55	39.92		
	40.7	10100	1.80	34.41		
	45.6	8980	2.10	30.71		
	50.0	8170	2.20	27.96		
	57.0	7180	1.95	24.57		
	59.0	6930	2.60	23.71		
	64.0	6390	2.00	21.85		
	73.6	5560	2.90	19.03		
	82.4	4960	3.00	16.98		
45.0						**4p**
n_1=1400 [rpm]	**26.4**	15500	0.85	52.96	**L 143**	**P225B5**
	30.0	13600	0.95	46.73	**K 143**	
	34.7	11800	1.10	40.35		
	39.2	10400	1.25	35.69		
	47.0	8760	1.50	30.00		
	58.0	7070	1.70	24.23		
	68.4	5970	2.00	20.47		
	77.5	5270	2.00	18.06		
	89.4	4570	2.80	15.66		
	101	4070	3.10	13.93		
	117	3510	3.70	12.01		
	193	2120	4.10	7.25		
45.0						**4p**
n_1=1400 [rpm]	**42.5**	9620	0.85	32.91	**L 133**	**P225B5**
	50.3	8130	0.95	27.83	**K 133**	
	58.0	7050	1.15	24.12		
	63.6	6430	1.25	22.00		
	73.5	5570	1.45	19.04		
	83.3	4910	1.65	16.80		
	96.5	4240	1.90	14.51		
	109	3750	2.10	12.83		
	130	3150	2.50	10.79		
	161	2550	3.10	8.71		
	185	2220	2.30	7.59		
	220	1860	2.70	6.38		
	272	1510	3.00	5.15		
45.0						**4p**
n_1=1400 [rpm]	**89.5**	4580	0.95	15.65	**L 103**	**P225B5**
	103	3990	1.10	13.66	**K 103**	
	121	3390	1.25	11.59		
	138	2960	1.45	10.13		
	164	2500	1.70	8.56		
	178	2300	1.30	7.86		
	210	1950	1.50	6.66		
	241	1700	1.75	5.82		
	285	1440	2.00	4.92		
45.0						**4p**
n_1=1400 [rpm]	**414**	990	0.85	3.38	**L 101**	**P225B5**
	456	900	0.90	3.07	**K 101**	
	530	770	1.10	2.64		
	609	675	1.25	2.30		
	718	570	1.35	1.95		
	819	500	1.40	1.71		
	972	420	1.55	1.44		

P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
55.0						**4p**
n_1=1400 [rpm]	**24.0**	20900	0.85	58.65	**L 163**	**P250B5**
	27.0	18400	1.00	51.76	**K 163**	
	31.2	16000	1.15	44.87		
	35.0	14200	1.25	39.92		
	41.0	12300	1.45	34.41		
	50.0	9960	1.80	27.96		
	57.0	8750	1.60	24.57		
	59.0	8440	2.10	23.71		
	64.0	7780	1.65	21.85		
	73.6	6780	2.40	19.03		
	82.4	6050	2.50	16.98		
	97.0	5450	3.50	14.48		
	117	4270	4.00	11.99		
55.0						**4p**
n_1=1400 [rpm]	**30.0**	16600	0.80	46.73	**L 143**	**P250B5**
	34.7	14300	0.90	40.35	**K 143**	
	39.2	12700	1.00	35.69		
	47.0	10700	1.20	30.00		
	57.8	8610	1.40	24.23		
	68.4	7280	1.65	20.47		
	77.5	6420	1.65	18.06		
	89.4	5570	2.30	15.66		
	101	4950	2.50	13.93		
	117	4270	3.00	12.01		
	143	3470	3.80	9.76		
	193	2580	3.40	7.25		
	238	2100	4.10	5.89		
55.0						**4p**
n_1=1400 [rpm]	**73.5**	6780	1.20	19.04	**L 133**	**P250B5**
	83.3	5980	1.35	1.680	**K 133**	
	96.5	5170	1.55	1.451		
	109	4570	1.75	12.83		
	130	3840	2.10	10.79		
	161	3100	2.50	8.71		
	185	2700	1.90	7.59		
	219	2270	2.20	6.38		
	272	1830	2.50	5.15		
75.0						**4p**
n_1=1400 [rpm]	**31.2**	21700	0.85	44.87	**L 163**	**P280B5**
	35.0	19300	0.95	39.92	**K 163**	
	41.0	16700	1.10	34.41		
	50.0	13500	1.35	27.96		
	57.0	11900	1.20	24.57		
	59.0	11500	1.55	23.71		
	64.0	10600	1.55	21.85		
	73.6	9210	1.75	19.03		
	82.4	8220	1.85	16.98		
	97.0	7000	2.60	14.48		
	117	5800	2.90	11.99		
	137	4950	3.40	10.24		
75.0						**4p**
n_1=1400 [rpm]	**47.0**	14500	0.90	30.00	**L 143**	**P280B5**
	58.0	11700	1.00	24.23	**K 143**	
	68.4	9890	1.20	20.47		
	77.5	8730	1.20	18.06		
	89.4	7570	1.70	15.66		
	101	6730	1.85	13.93		
	117	5800	2.20	12.01		
	143	4710	2.80	9.76		
	169	4000	3.20	8.28		

Dane techniczne

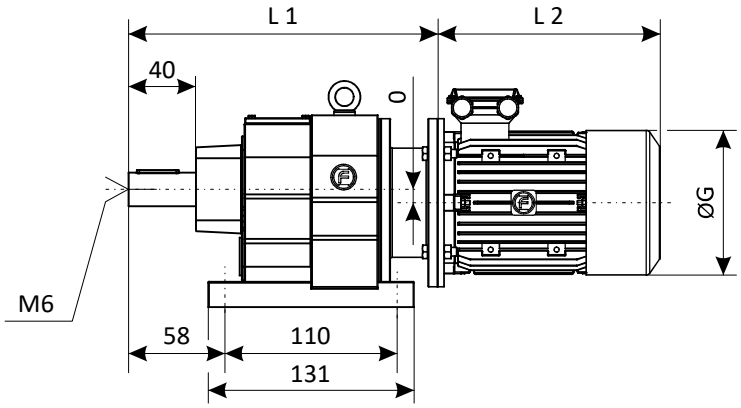
Technical data

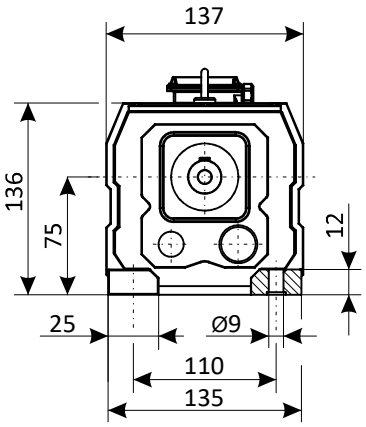
P_1 [kW]	n_2 [rpm]	M_2 [Nm]	f_s	i =		
75.0						**4p**
n_1=1400 [rpm]	**193**	3510	2.50	7.25	**L 143**	**P280B5**
	238	2850	3.00	5.89	**K 143**	
	280	2420	3.60	5.00		
90.0						**4p**
n_1=1400 [rpm]	**35.0**	23200	0.80	39.92	**L 163**	**P280B5**
	41.0	20000	0.90	34.41	**K 163**	
	50.0	16200	1.10	27.96		
	57.0	14300	1.00	24.57		
	59.0	13800	1.30	23.71		
	64.0	12700	1.30	21.85		
	73.6	11100	1.45	19.03		
	82.4	9860	1.50	16.98		
	97.0	8410	2.10	14.48		
	117	6330	2.40	11.99		
	137	5940	2.90	10.24		
90.0						**4p**
n_1=1400 [rpm]	**68.4**	11900	1.00	20.47	**L 143**	**P280B5**
	77.5	10500	1.00	18.06	**K 143**	
	89.4	9080	1.45	15.66		
	101	8080	1.55	13.93		
	117	6960	1.85	12.01		
	143	5660	2.30	9.76		
	169	4800	2.70	8.28		
	193	4210	2.40	7.25		
	238	3420	2.50	5.89		
	280	2900	3.00	5.00		
110						**4p**
n_1=1400 [rpm]	**50.0**	19800	0.90	27.96	**L 163**	**P315B5**
	59.0	16800	1.05	23.71	**K 163**	
	73.6	13500	1.20	19.03		
	82.4	12000	1.25	16.98		
	97.0	10200	1.75	14.48		
	117	8480	2.00	11.99		
	137	7240	2.30	10.24		
132						**4p**
n_1=1400 [rpm]	**59.0**	20100	0.90	23.71	**L 163**	**P315B5**
	73.6	16200	1.00	19.03	**K 163**	
	82.4	14400	1.05	16.98		
	97.0	12300	1.45	14.48		
	117	10200	1.65	11.99		
	137	8690	1.95	10.24		
160						**4p**
n_1=1400 [rpm]	**97.0**	14900	1.20	14.48	**L 163**	**P315B5**
	117	12300	1.40	11.99	**K 163**	
	137	10500	1.60	10.24		

Wymiary przekładni

Dimensions

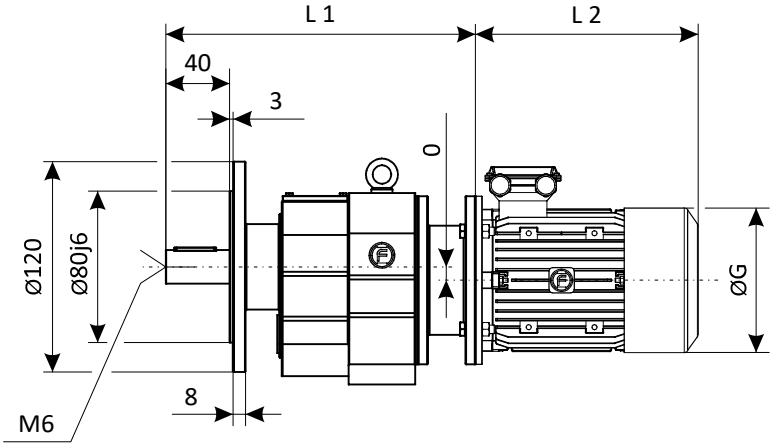
WHF - L - 13 - P(IEC) - ...

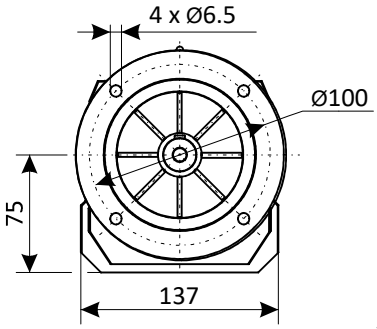




Kg
5.00
masa przekładni
bez silnika i oleju
without oil and motor

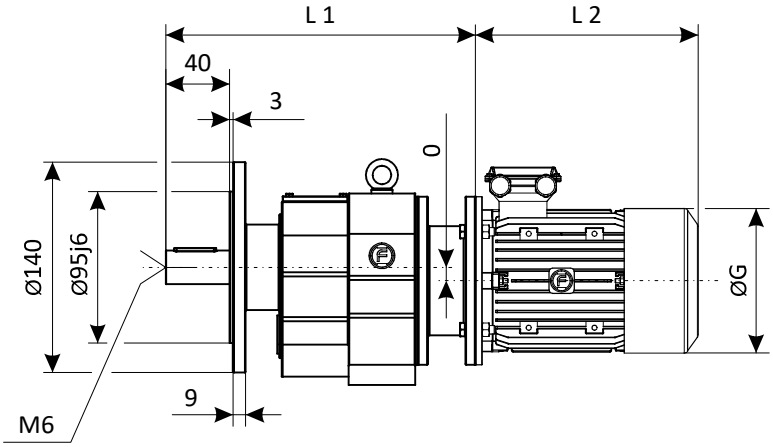
WHF - K - 13 - A (Ø120) - P(IEC) - ...

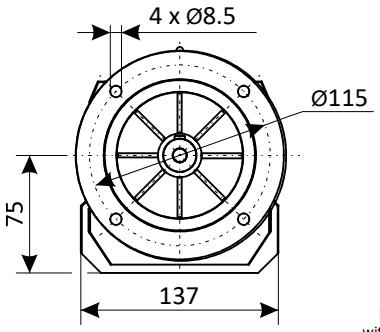




Kg
5.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 13 - B (Ø140) - P(IEC) - ...



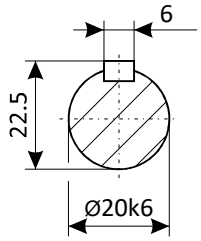


Kg
5.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 13

P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P63B5	**0.12**	1400	223	189	120
P63B5	**0.18**	1400	223	189	120
P63B5	**0.18**	2800	223	189	120
P71B5	**0.25**	1400	223	210	133
P63B5	**0.25**	2800	223	189	120
P71B5	**0.37**	1400	223	210	133
P71B5	**0.37**	2800	223	210	133
P80B5	**0.55**	1400	241.5	250	153
P71B5	**0.55**	2800	223	210	133
P80B5	**0.75**	1400	241.5	250	153
P80B5	**0.75**	2800	241.5	250	153
P80B5	**1.10**	2800	241.5	250	153

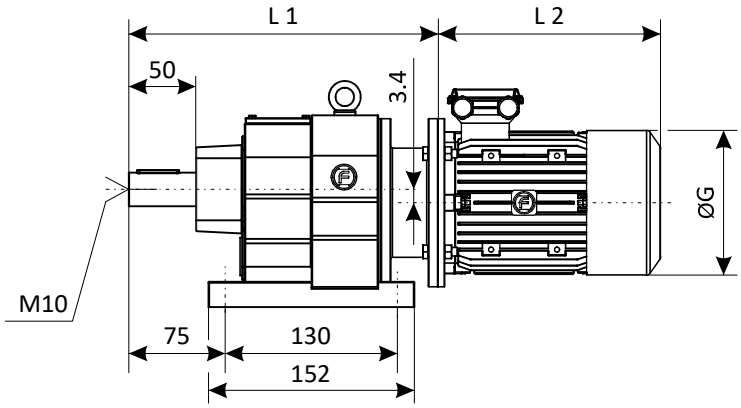
Wał wyjściowy / *Output shaft* WHF - ... - 13

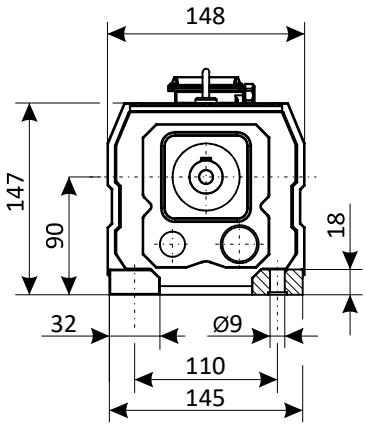


Wymiary przekładni

Dimensions

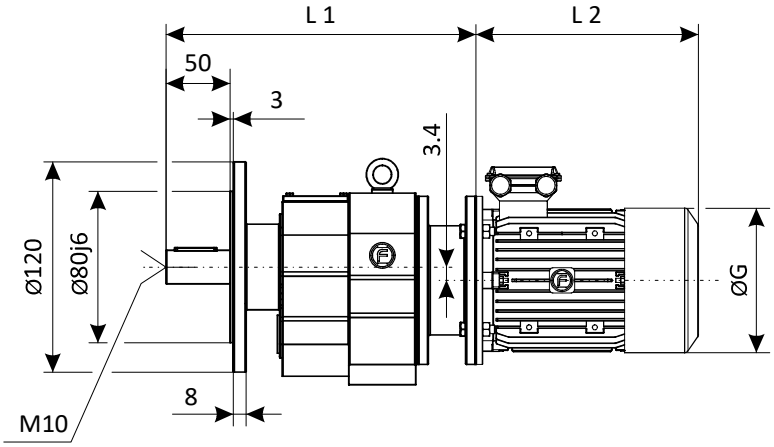
WHF - L - 23 - P(IEC) - ...

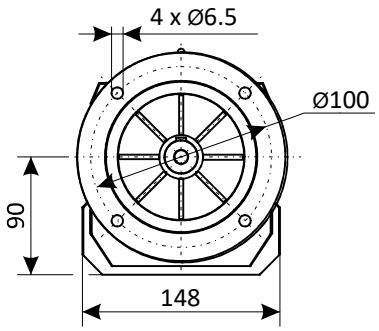




Kg
9.00
masa przekładni
bez silnika i oleju
without oil and motor

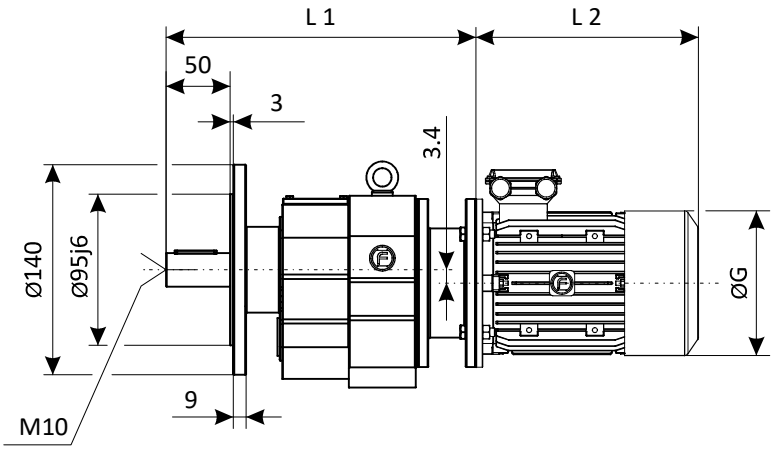
WHF - K - 23 - A (Ø120) - P(IEC) - ...

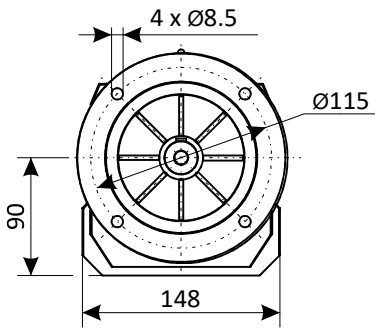




Kg
9.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 23 - B (Ø140) - P(IEC) - ...

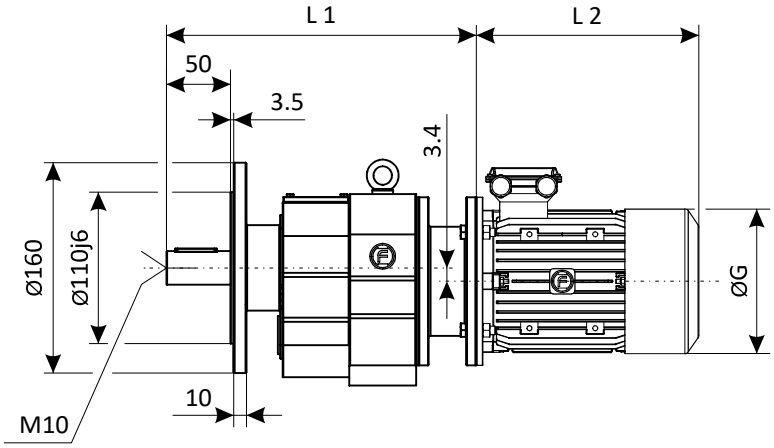


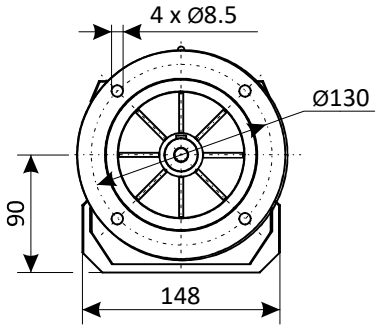


Kg
9.50
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - K - 23 - C (Ø160) - P(IEC) - ...



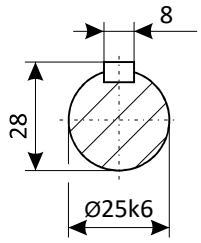


Kg
9.90
masa przekładni
bez silnika i oleju
without oil and motor

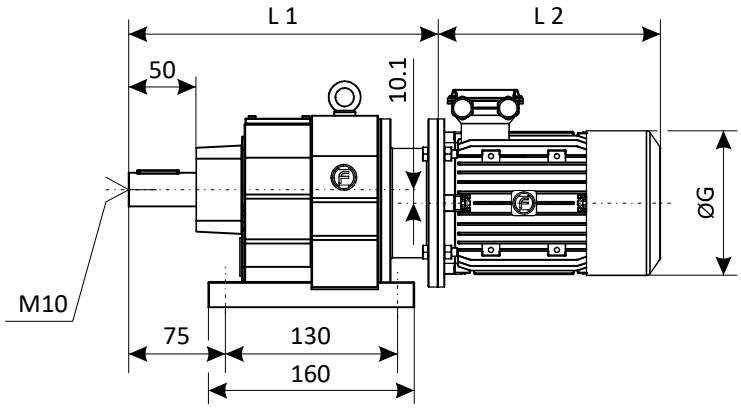
WHF - ... - 23

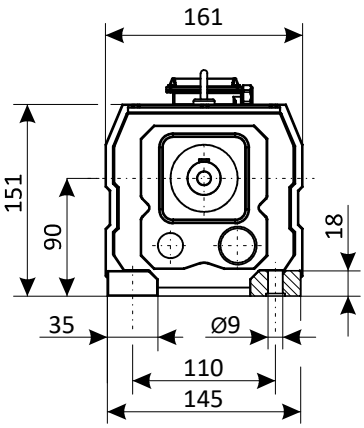
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P71B5	**0.12**	900	259.5	210	133
P63B5	**0.12**	1400	259.5	189	120
P63B5	**0.18**	1400	259.5	189	120
P71B5	**0.25**	1400	259.5	210	133
P71B5	**0.37**	1400	259.5	210	133
P80B5	**0.55**	1400	278	250	153
P71B5	**0.55**	2800	259.5	210	133
P80B5	**0.75**	1400	278	250	153
P90B5	**1.10**	1400	278	265	172
P80B5	**1.10**	2800	278	250	153
P90B5	**1.50**	1400	278	290	172
P90B5	**1.50**	2800	278	265	172
P100B5	**2.20**	1400	296	310	193
P90B5	**2.20**	2800	278	290	172
P100B5	**3.00**	1400	296	310	193
P100B5	**3.00**	2800	296	310	193

Wał wyjściowy / *Output shaft* WHF - ... - 23



WHF - L - 33 - P(IEC) - ...



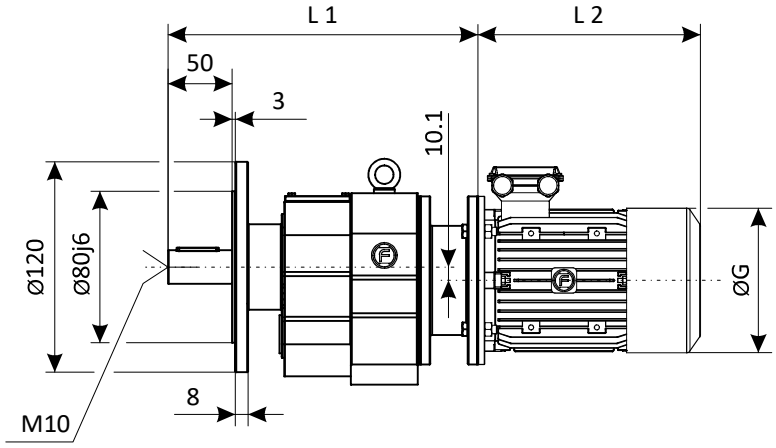


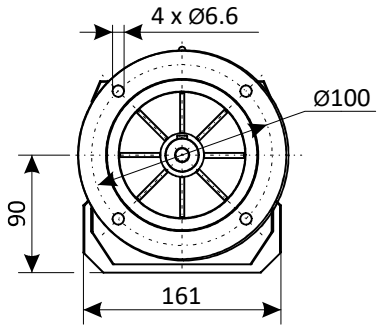
Kg
10.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

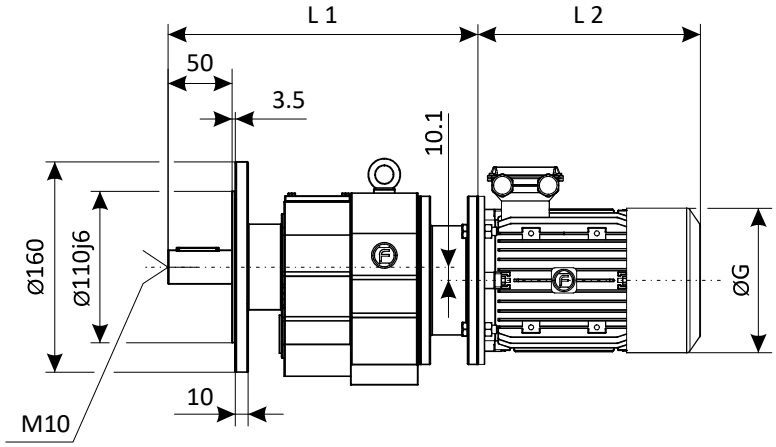
WHF - K - 33 - A (ø120) - P(IEC) - ...

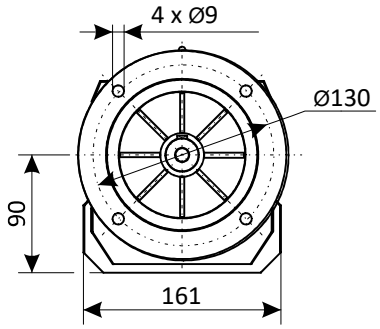




Kg
10.50
masa przekładni
bez silnika i oleju
without oil and motor

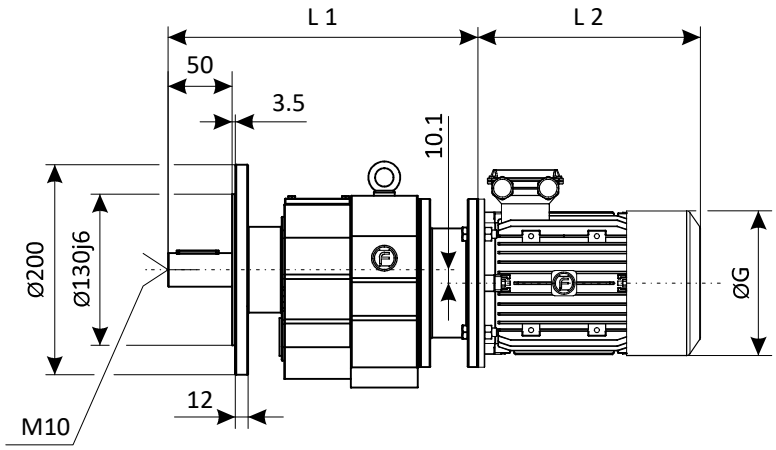
WHF - K - 33 - C (ø160) - P(IEC) - ...

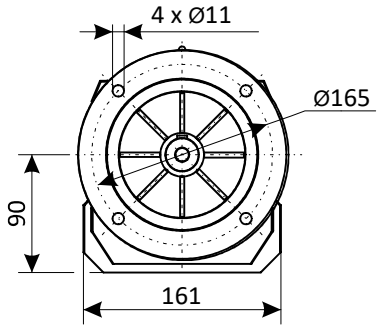




Kg
10.70
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 33 - D (ø200) - P(IEC) - ...





Kg
11.0
masa przekładni
bez silnika i oleju
without oil and motor

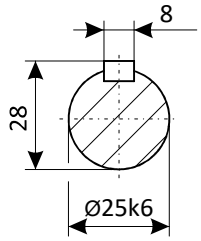
Wymiary przekładni

Dimensions

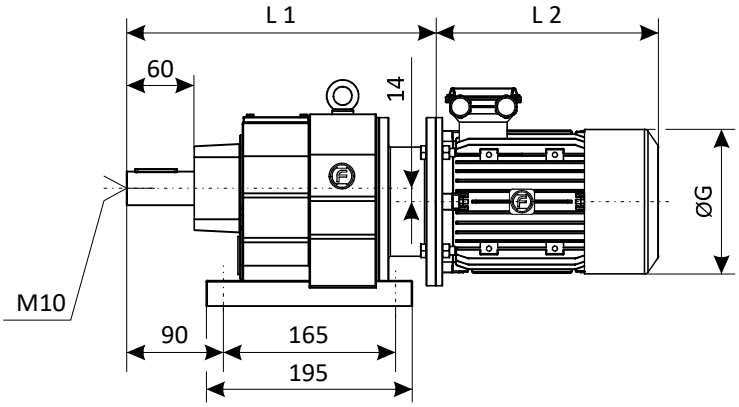
WHF - ... - 33

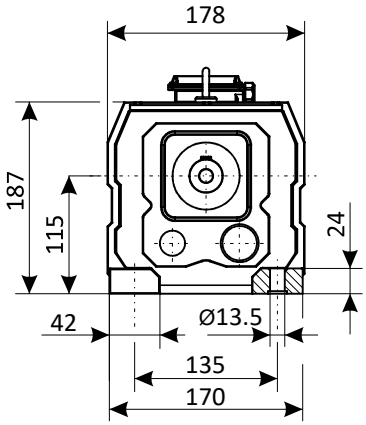
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P71B5	**0.12**	900	259.5	210	133
P63B5	**0.12**	1400	259.5	189	120
P71B5	**0.18**	900	259.5	210	133
P63B5	**0.18**	1400	259.5	189	120
P71B5	**0.25**	1400	259.5	210	133
P71B5	**0.37**	1400	259.5	210	133
P80B5	**0.55**	1400	278	250	153
P80B5	**0.75**	1400	278	250	153
P90B5	**1.10**	1400	278	265	172
P90B5	**1.50**	1400	278	290	172
P90B5	**1.50**	2800	278	265	172
P100B5	**2.20**	1400	296	310	193
P90B5	**2.20**	2800	278	290	172
P100B5	**3.00**	1400	296	310	193
P100B5	**3.00**	2800	296	310	193

Wał wyjściowy / *Output shaft* WHF - ... - 33



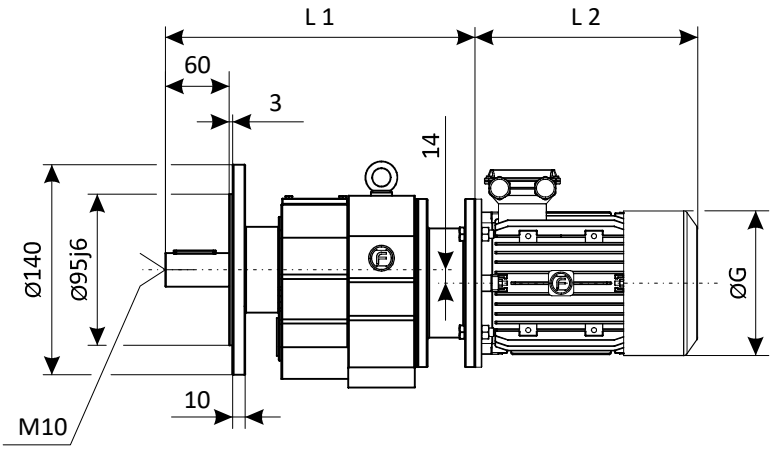
WHF - L - 43 - P(IEC) - ...

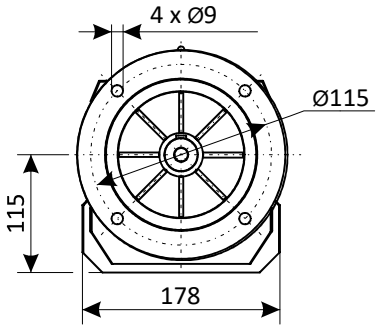




Kg
15.0
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 43 - B (Ø140) - P(IEC) - ...

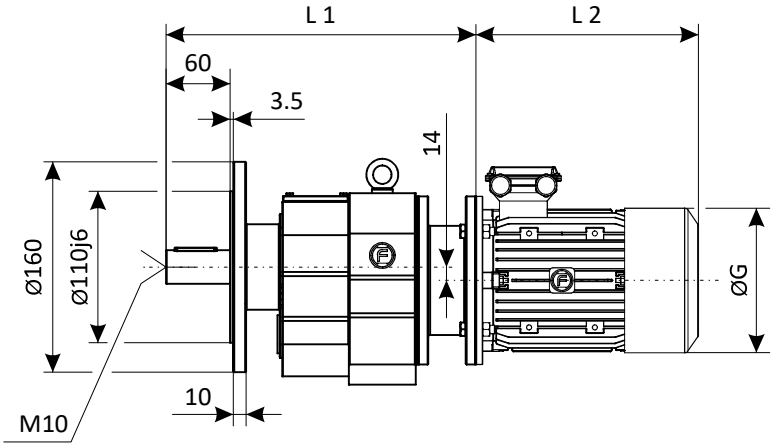


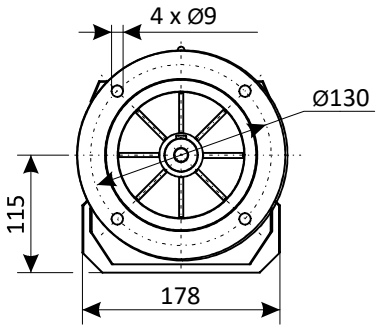


Kg
15.5
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

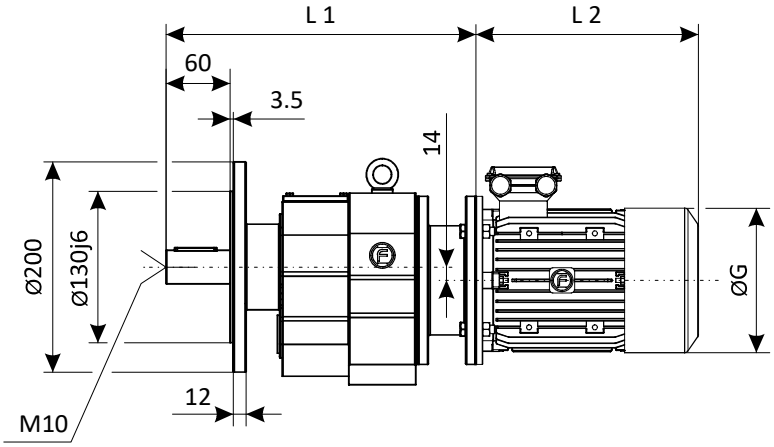
WHF - K - 43 - C (ø160) - P(IEC) - ...

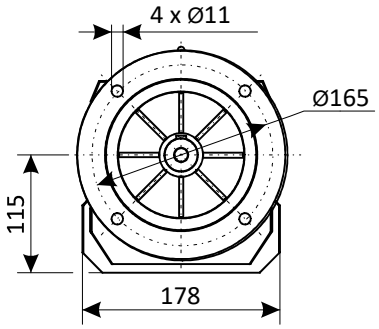




Kg
15.70
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 43 - D (ø200) - P(IEC) - ...



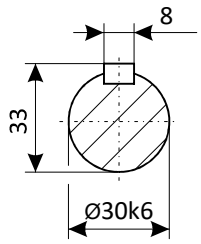


Kg
16.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 43

P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P71B5	**0.12**	900	291	210	133
P63B5	**0.12**	1400	291	189	120
P63B5	**0.18**	1400	291	189	120
P71B5	**0.25**	1400	291	210	133
P71B5	**0.37**	1400	291	210	133
P80B5	**0.55**	1400	309.5	250	153
P80B5	**0.75**	1400	309.5	250	153
P90B5	**1.10**	1400	309.5	265	172
P90B5	**1.50**	1400	309.5	290	172
P100B5	**2.20**	1400	325.5	310	193
P90B5	**2.20**	2800	309.5	290	172
P100B5	**3.00**	1400	325.5	310	193
P100B5	**3.00**	2800	325.5	310	193
P112B5	**4.00**	1400	325.5	335	223
P112B5	**4.00**	2800	325.5	335	223
P132B5	**5.50**	1400	358	390	255
P132B5	**5.50**	2800	358	390	255

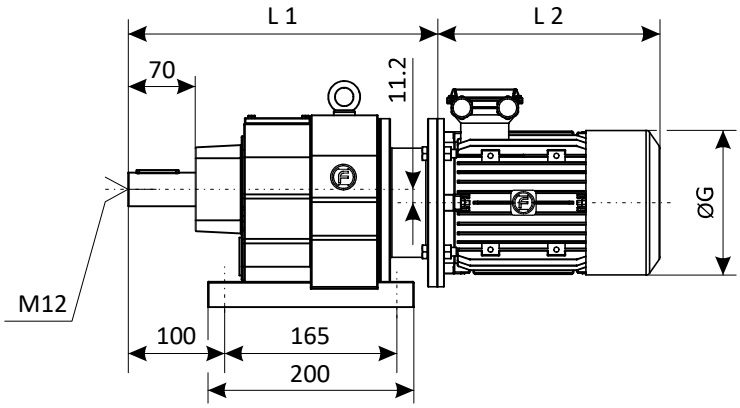
Wał wyjściowy / *Output shaft* WHF - ... - 43

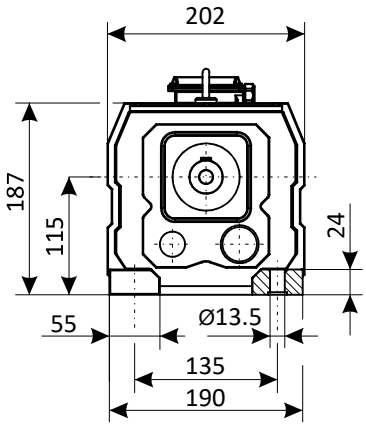


Wymiary przekładni

Dimensions

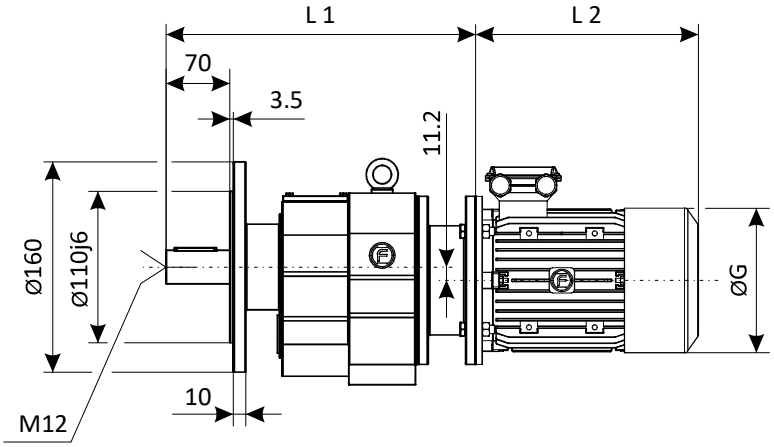
WHF - L - 53 - P(IEC) - ...

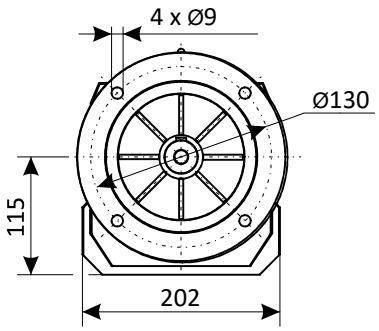




Kg
21.00
masa przekładni
bez silnika i oleju
without oil and motor

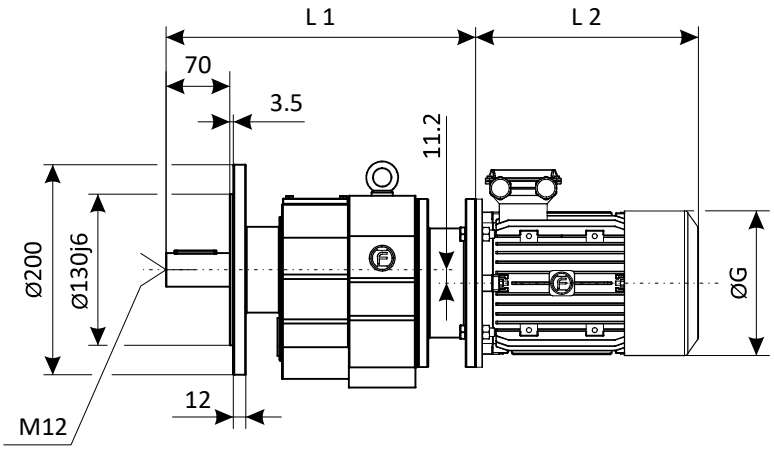
WHF - K - 53 - C (Ø160) - P(IEC) - ...

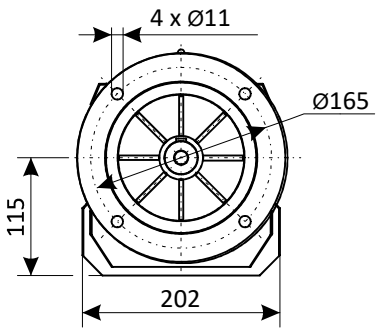




Kg
21.70
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 53 - D (Ø200) - P(IEC) - ...

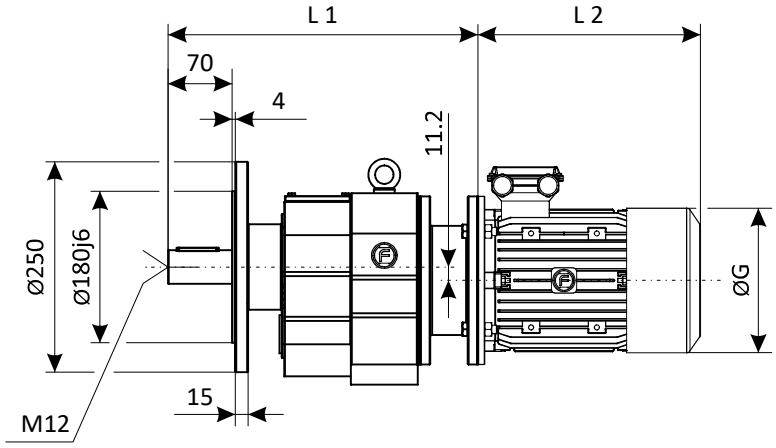


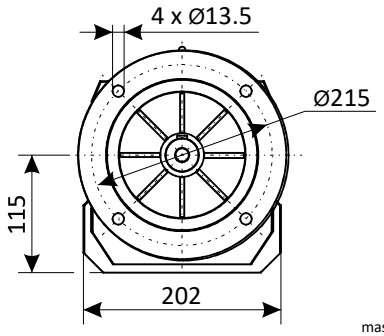


Kg
22.50
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - K - 53 - E (ø250) - P(IEC) - ...



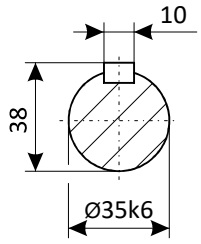


Kg
23.0
masa przekładni
bez silnika i oleju
without oil and motor

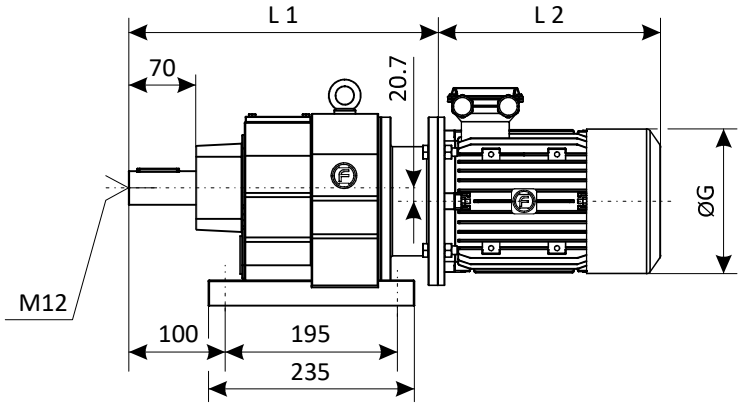
WHF - ... - 53

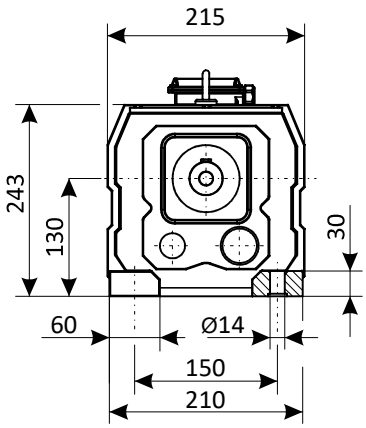
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P71B5	**0.12**	900	313	210	133
P63B5	**0.12**	1400	313	189	120
P71B5	**0.18**	900	313	210	133
P63B5	**0.18**	1400	313	189	120
P71B5	**0.25**	900	313	210	133
P71B5	**0.25**	1400	313	210	133
P80B5	**0.37**	900	331.5	250	153
P71B5	**0.37**	1400	313	210	133
P80B5	**0.55**	1400	331.5	250	153
P80B5	**0.75**	1400	331.5	250	153
P90B5	**1.10**	1400	331.5	265	172
P90B5	**1.50**	1400	331.5	290	172
P100B5	**2.20**	1400	347.5	310	193
P90B5	**2.20**	2800	331.5	290	172
P100B5	**3.00**	1400	347.5	310	193
P100B5	**3.00**	2800	347.5	310	193
P112B5	**4.00**	1400	347.5	335	223
P132B5	**5.50**	1400	380	390	255
P132B5	**5.50**	2800	380	390	255
P132B5	**7.50**	1400	380	420	255
P132B5	**7.50**	2800	380	420	255

Wał wyjściowy / *Output shaft* WHF - ... - 53



WHF - L - 63 - P(IEC) - ...



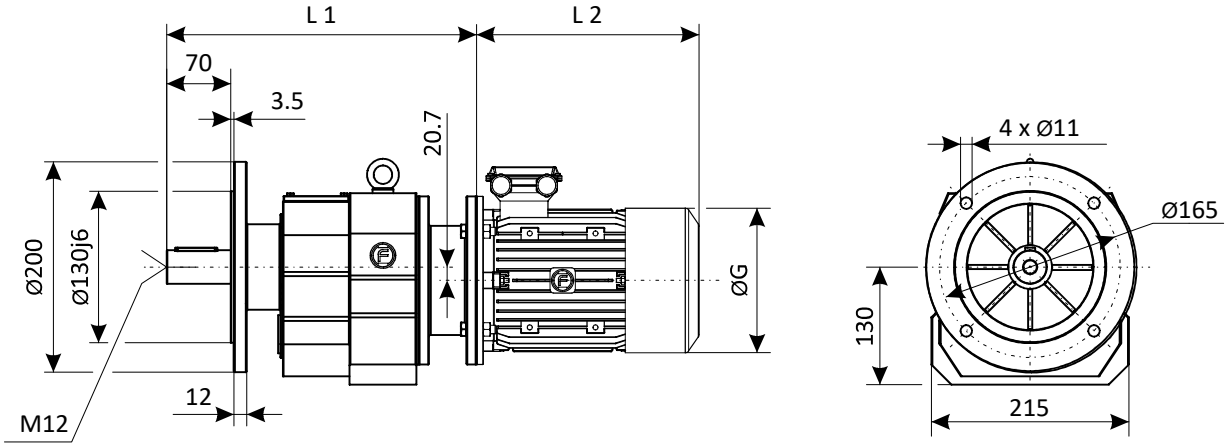


Kg
27.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

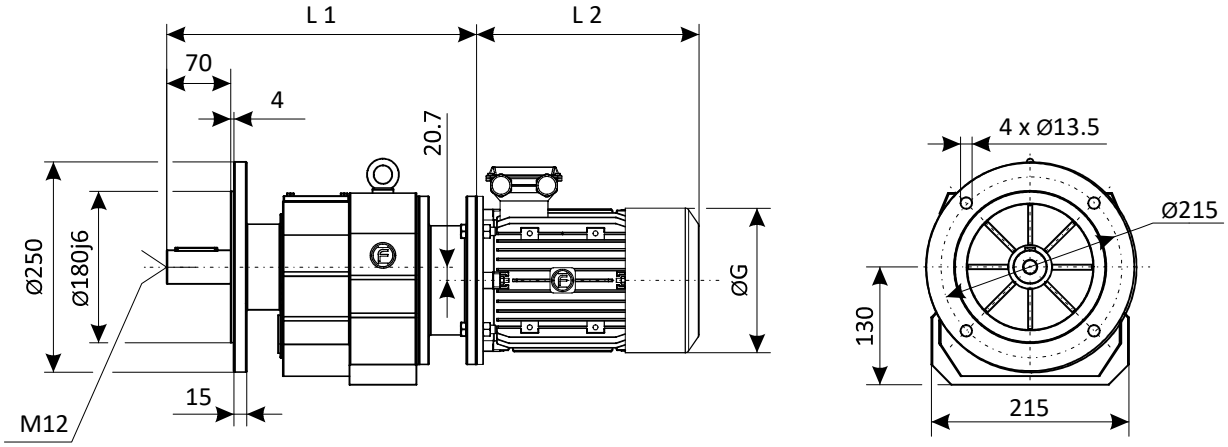
Dimensions

WHF - K - 63 - D (ø200) - P(IEC) - ...



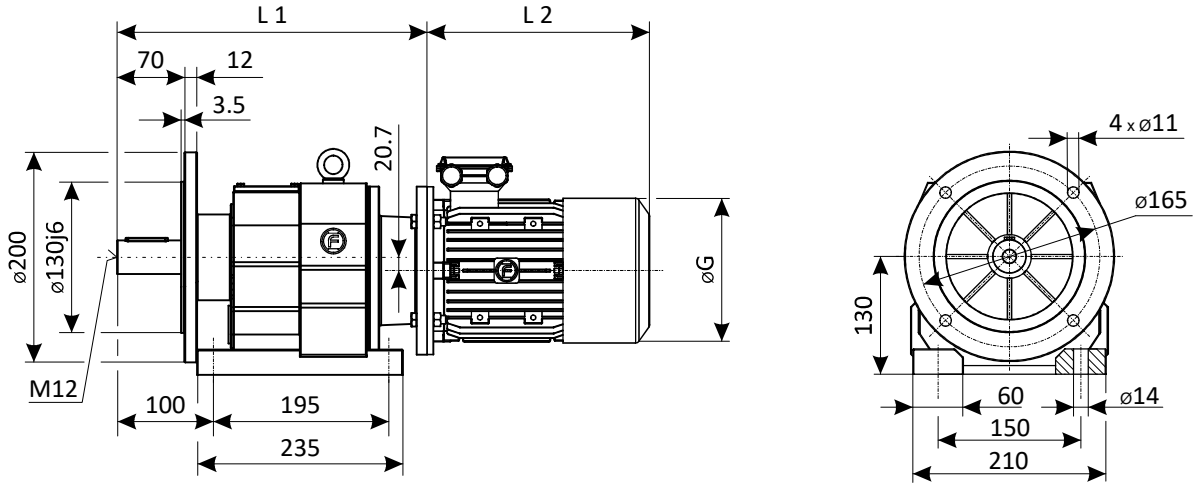
Kg
28.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 63 - E (Ø250) - P(IEC) - ...



Kg
29.00
masa przekładni
bez silnika i oleju
without oil and motor

WHF - LK - 63 - D (Ø200) - P(IEC) - ...

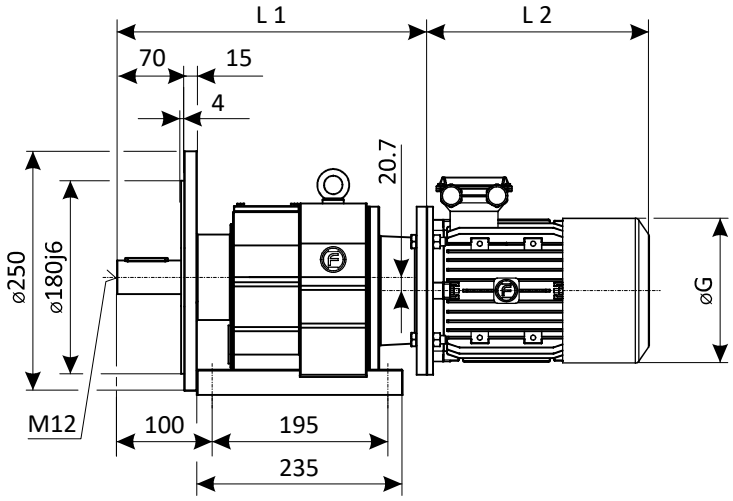


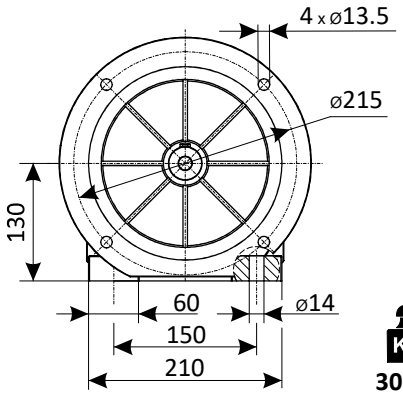
Kg
29.50
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

WHF - LK - 63 - E (ø250) - P(IEC) - ...



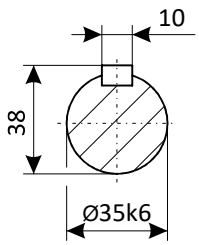


Kg
30.00
masa przekładni
bez silnika i oleju
without oil and motor

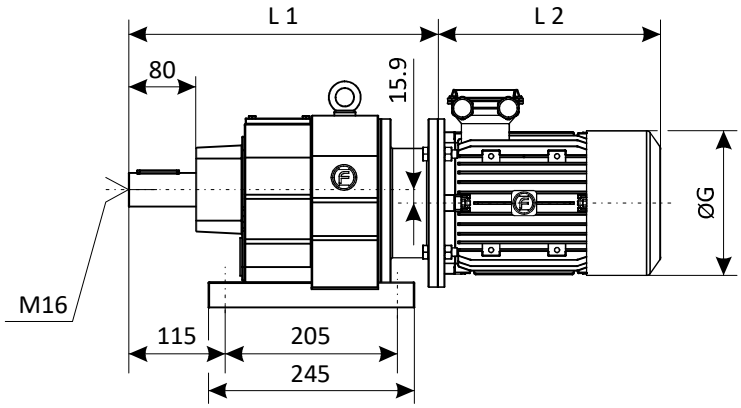
WHF - ... - 63

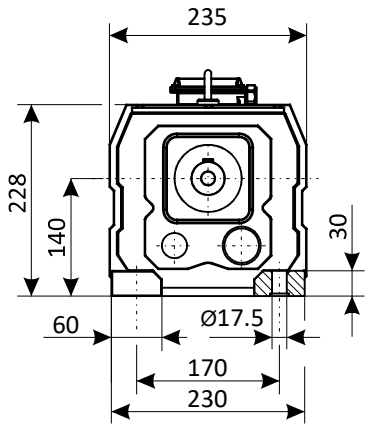
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P71B5	**0.12**	900	336	210	133
P63B5	**0.12**	1400	336	189	120
P71B5	**0.18**	900	336	210	133
P63B5	**0.18**	1400	336	189	120
P80B5	**0.25**	700	354.5	250	153
P71B5	**0.25**	900	336	210	133
P71B5	**0.25**	1400	336	210	133
P80B5	**0.37**	900	354.5	250	153
P71B5	**0.37**	1400	336	210	133
P80B5	**0.55**	1400	354.5	250	153
P80B5	**0.75**	1400	354.5	250	153
P90B5	**1.10**	1400	354.5	265	172
P90B5	**1.50**	1400	354.5	290	172
P100B5	**2.20**	1400	370.5	310	193
P100B5	**3.00**	1400	370.5	310	193
P112B5	**4.00**	1400	370.5	335	223
P132B5	**5.50**	1400	403	390	255
P132B5	**5.50**	2800	403	390	255
P132B5	**7.50**	1400	403	420	255

Wał wyjściowy / *Output shaft* WHF - ... - 63



WHF - L - 73 - P(IEC) - ...



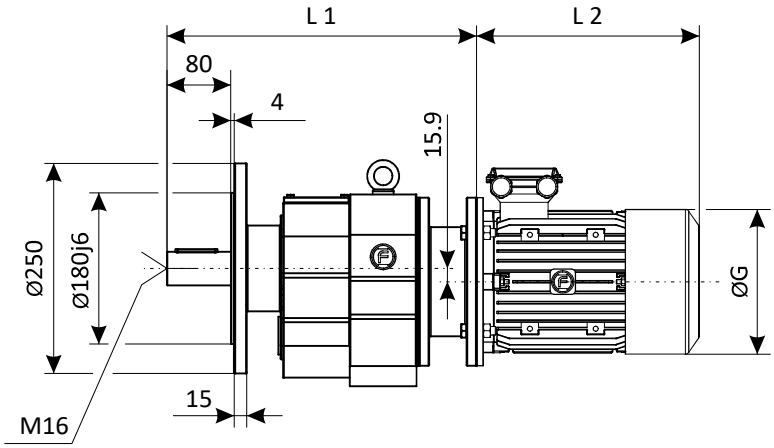


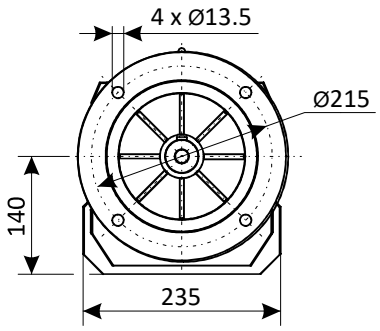
Kg
35.00
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

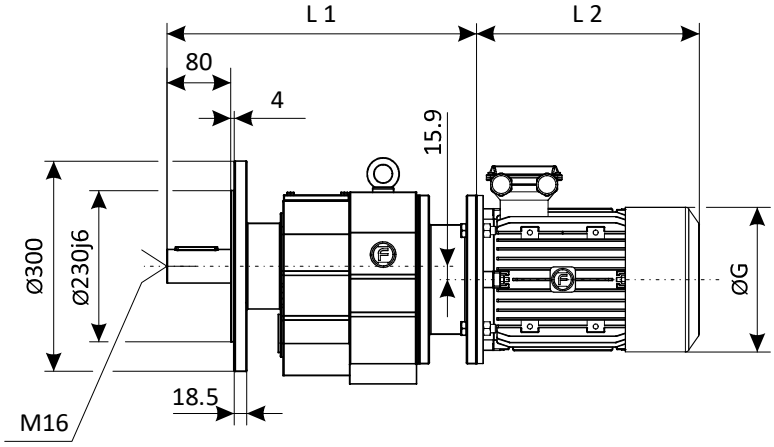
WHF - K - 73 - E (Ø250) - P(IEC) - ...

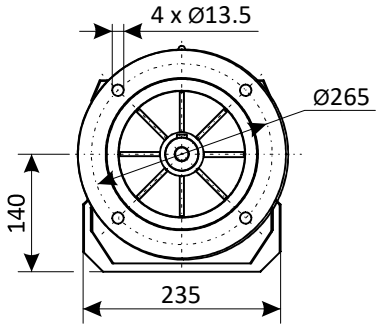




Kg
37.00
masa przekładni
bez silnika i oleju
without oil and motor

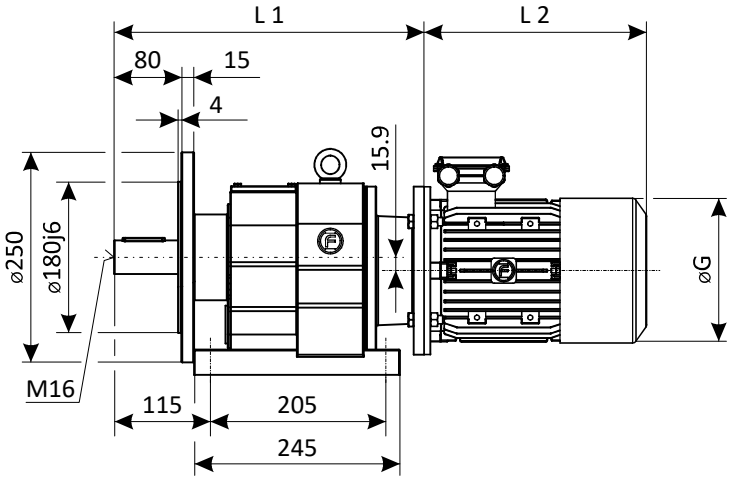
WHF - K - 73 - F (Ø300) - P(IEC) - ...

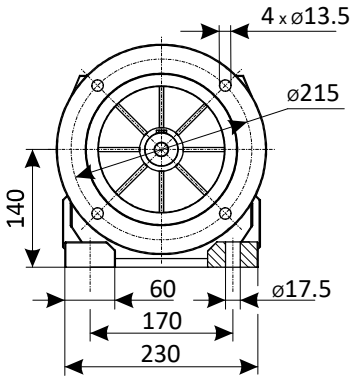




Kg
37.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - LK - 73 - E (Ø250) - P(IEC) - ...

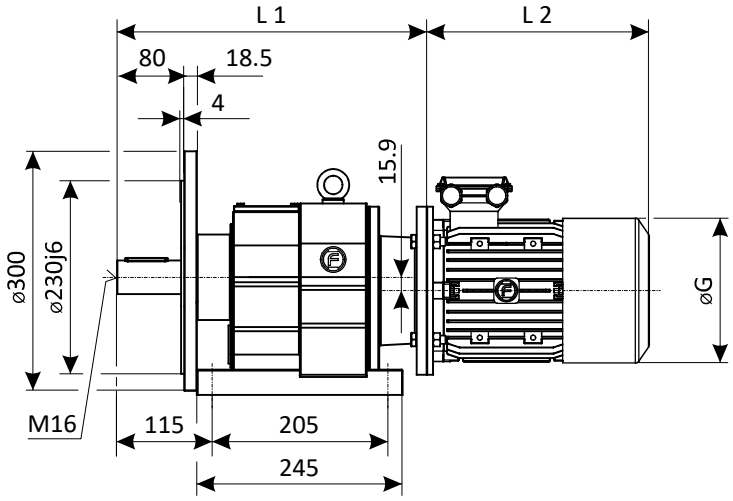


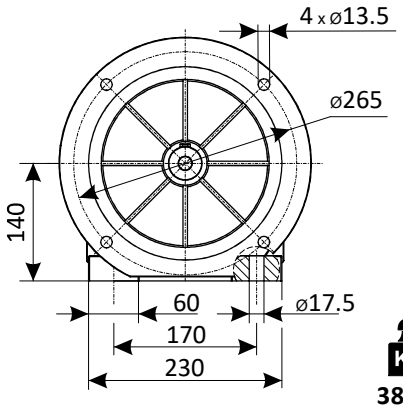


Kg
37.50
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - LK - 73 - F (ø300) - P(IEC) - ...



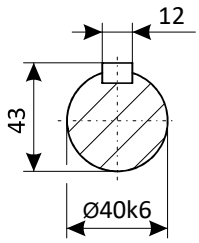


Kg
38.00
masa przekładni
bez silnika i oleju
without oil and motor

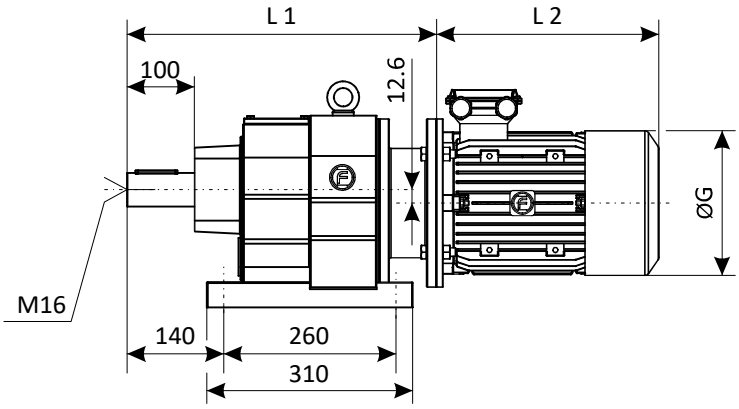
WHF - ... - 73

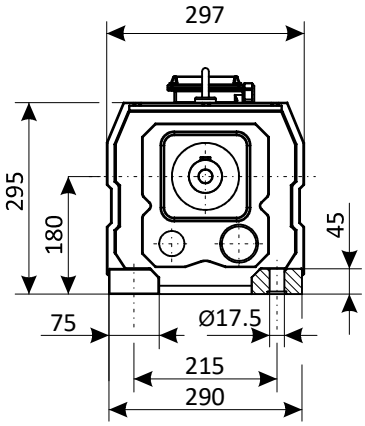
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P71B5	**0.12**	900	350	210	133
P71B5	**0.18**	900	350	210	133
P63B5	**0.18**	1400	350	189	120
P80B5	**0.25**	700	368.5	250	153
P71B5	**0.25**	900	350	210	133
P71B5	**0.25**	1400	350	210	133
P90B5	**0.37**	700	368.5	265	172
P80B5	**0.37**	900	368.5	250	153
P71B5	**0.37**	1400	350	210	133
P80B5	**0.55**	1400	368.5	250	153
P80B5	**0.75**	1400	368.5	250	153
P90B5	**1.10**	1400	368.5	265	172
P90B5	**1.50**	1400	368.5	290	172
P100B5	**2.20**	1400	382.5	310	193
P100B5	**3.00**	1400	382.5	310	193
P112B5	**4.00**	1400	382.5	335	223
P132B5	**5.50**	1400	411	390	255
P132B5	**7.50**	1400	411	420	255
P160B5	**11.0**	1400	452.5	495	330

Wał wyjściowy / *Output shaft* WHF - ... - 73



WHF - L - 83 - P(IEC) - ...



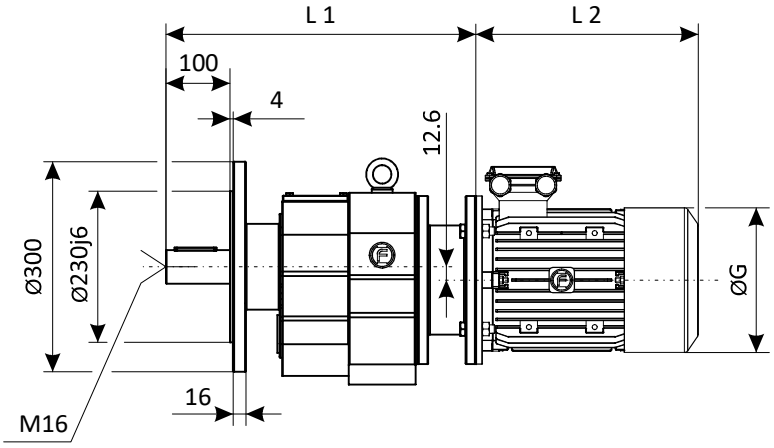


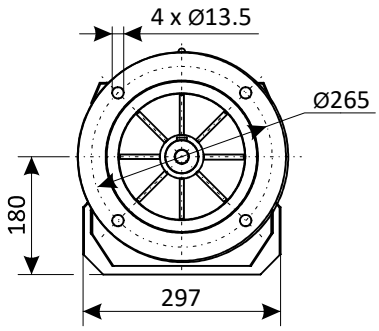
Kg
65.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

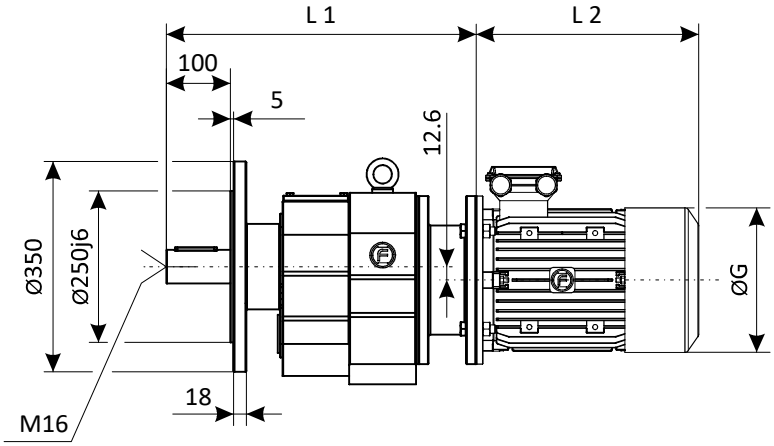
WHF - K - 83 - F (Ø300) - P(IEC) - ...

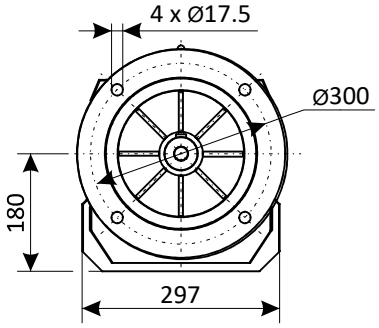




Kg
67.5
masa przekładni
bez silnika i oleju
without oil and motor

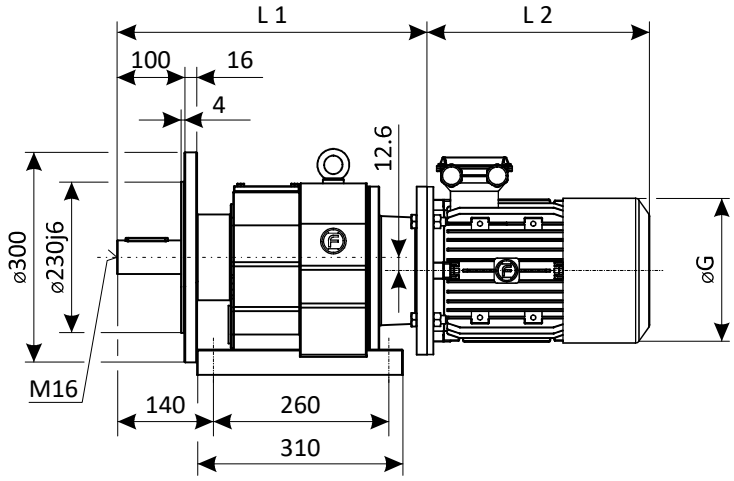
WHF - K - 83 - G (ø350) - P(IEC) - ...

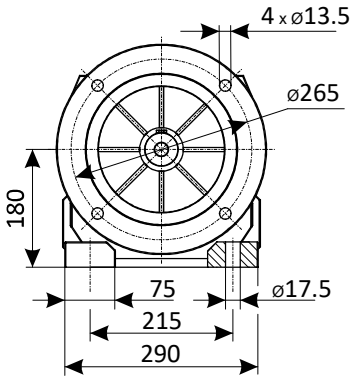




Kg
68.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - LK - 83 - F (Ø300) - P(IEC) - ...

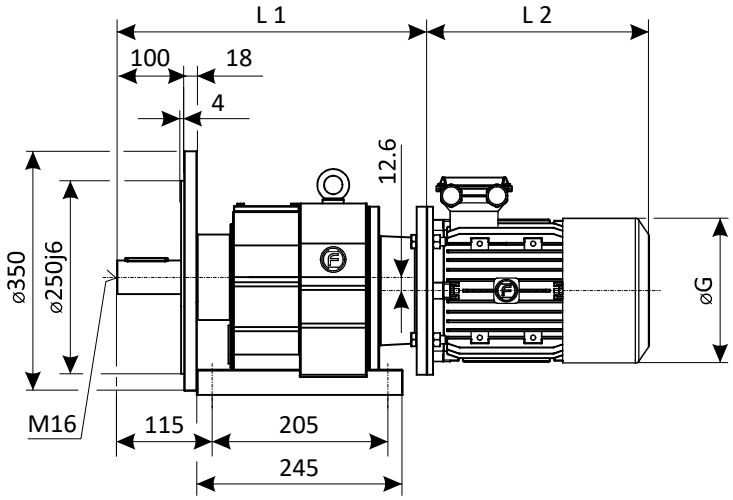


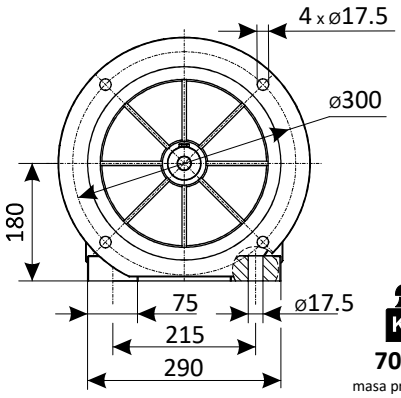


Kg
68.00
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - LK - 83 - G (ø350) - P(IEC) - ...



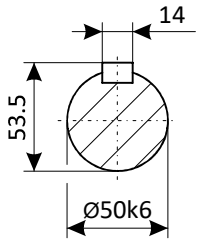


Kg
70.50
masa przekładni
bez silnika i oleju
without oil and motor

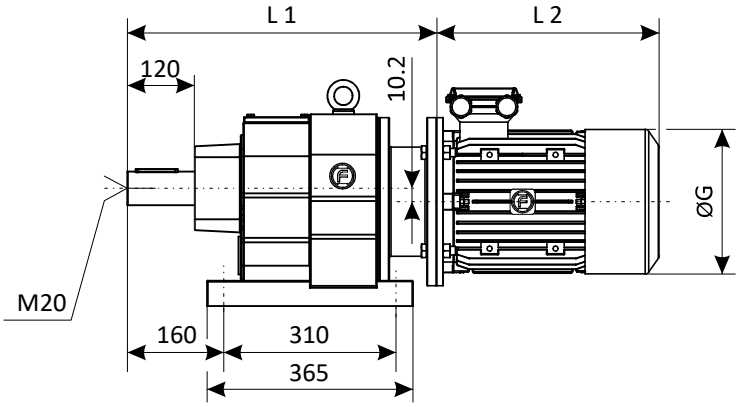
WHF - ... - 83

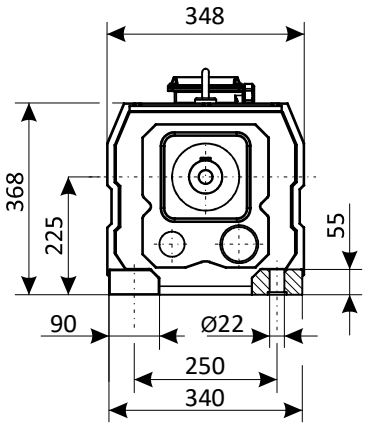
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P80B5	**0.25**	700	435.5	250	153
P90B5	**0.37**	700	435.5	265	172
P80B5	**0.37**	900	435.5	250	153
P80B5	**0.55**	900	435.5	250	153
P80B5	**0.55**	1400	435.5	250	153
P90B5	**0.75**	900	435.5	265	172
P80B5	**0.75**	1400	435.5	250	153
P90B5	**1.10**	1400	435.5	265	172
P90B5	**1.50**	1400	435.5	290	172
P100B5	**2.20**	1400	450.5	310	193
P100B5	**3.00**	1400	450.5	310	193
P112B5	**4.00**	1400	450.5	335	223
P132B5	**5.50**	1400	478	390	255
P132B5	**7.50**	1400	478	420	255
P160B5	**11.0**	1400	519.5	495	330
P160B5	**15.0**	1400	519.5	570	330
P180B5	**18.5**	1400	519.5	584	352
P180B5	**22.0**	1400	519.5	622	352

Wał wyjściowy / *Output shaft* WHF - ... - 83



WHF - L - 93 - P(IEC) - ...



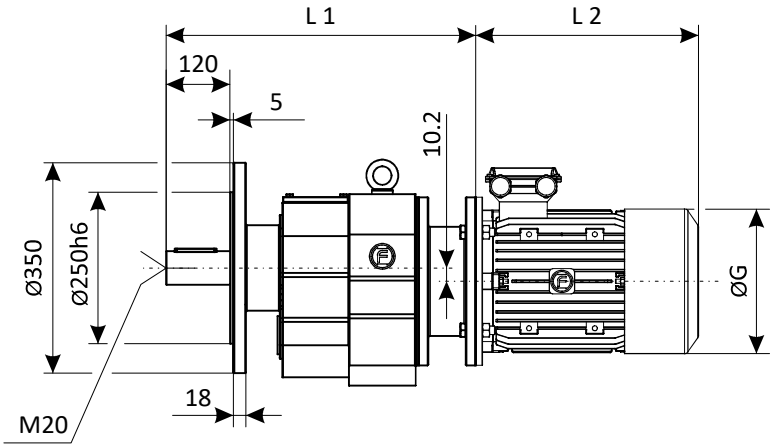


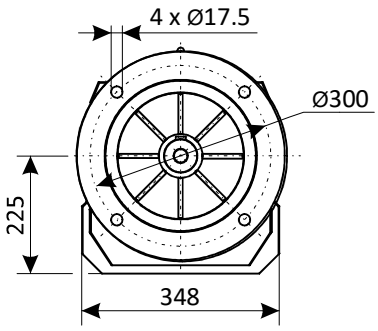
Kg
120.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

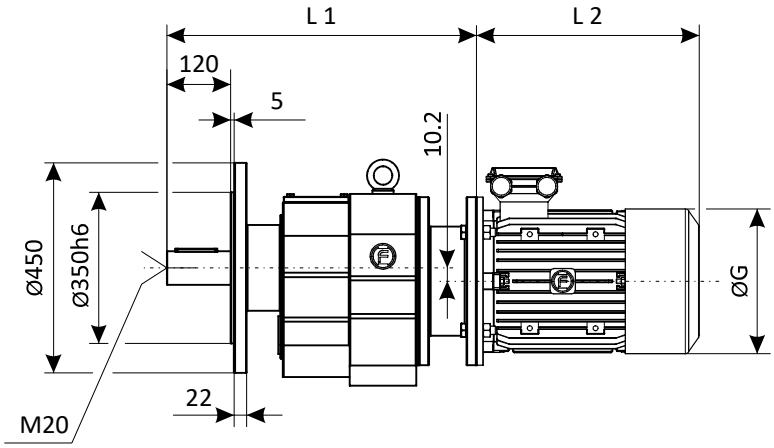
WHF - K - 93 - G (ø350) - P(IEC) - ...

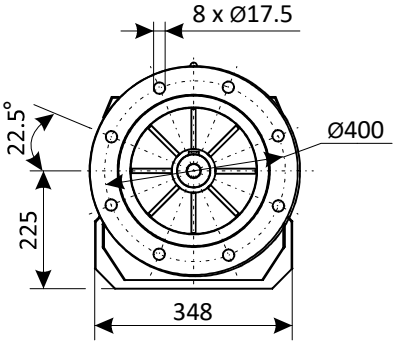




Kg
123.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 93 - H (Ø450) - P(IEC) - ...



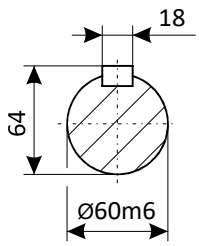


Kg
124.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 93

P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P80B5	**0.25**	700	497.5	250	153
P90B5	**0.37**	700	497.5	265	172
P80B5	**0.37**	900	497.5	250	153
P90B5	**0.55**	700	497.5	265	172
P80B5	**0.55**	900	497.5	250	153
P100B5	**0.75**	700	512.5	310	193
P90B5	**0.75**	900	497.5	265	172
P80B5	**0.75**	1400	497.5	250	153
P90B5	**1.10**	1400	497.5	265	172
P90B5	**1.50**	1400	497.5	290	172
P100B5	**2.20**	1400	512.5	310	193
P100B5	**3.00**	1400	512.5	310	193
P112B5	**4.00**	1400	512.5	335	223
P132B5	**5.50**	1400	541	390	255
P132B5	**7.50**	1400	541	420	255
P160B5	**11.0**	1400	582.5	495	330
P160B5	**15.0**	1400	582.5	570	330
P180B5	**18.5**	1400	582.5	584	352
P180B5	**22.0**	1400	582.5	622	352
P200B5	**30.0**	1400	584.5	664	394

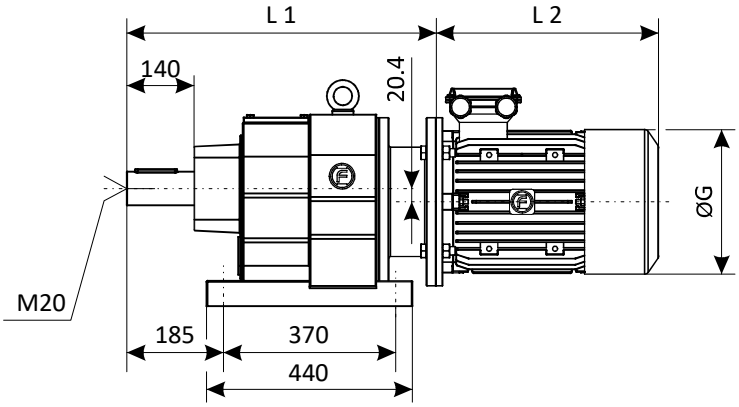
Wał wyjściowy / *Output shaft* WHF - ... - 93

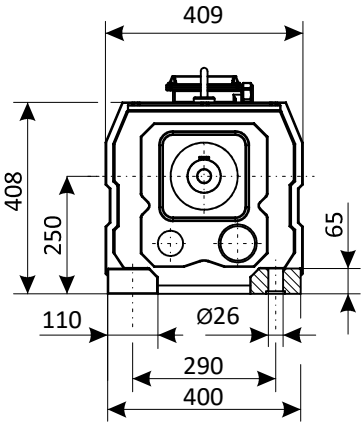


Wymiary przekładni

Dimensions

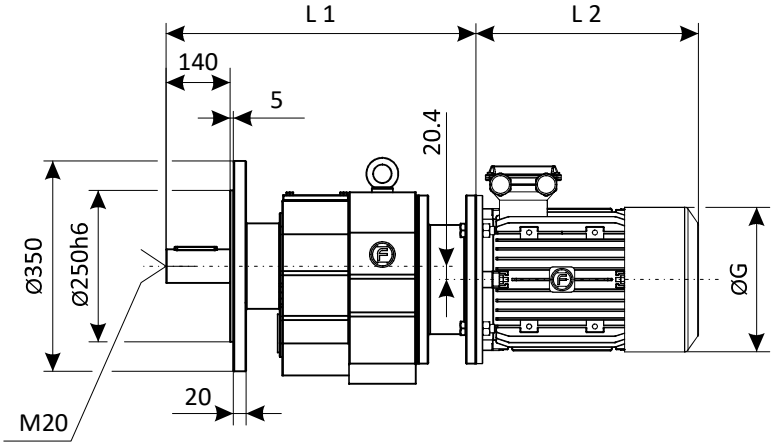
WHF - L - 103 - P(IEC) - ...

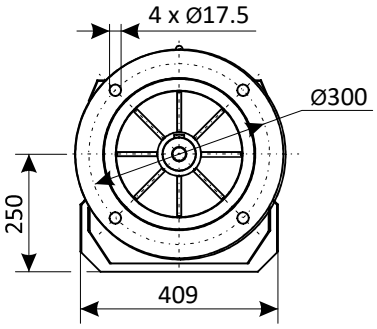




Kg
165.0
masa przekładni
bez silnika i oleju
without oil and motor

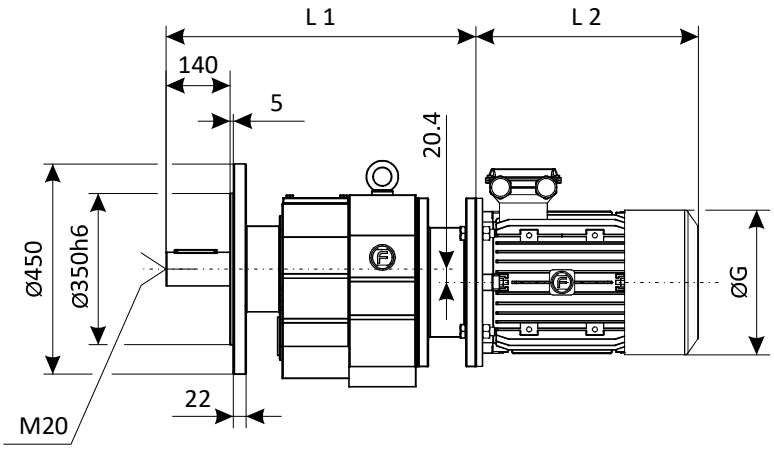
WHF - K - 103 - G (Ø350) - P(IEC) - ...

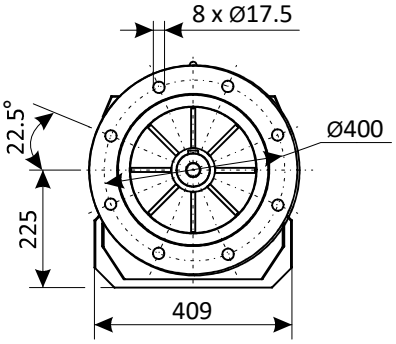




Kg
168.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 103 - H (Ø450) - P(IEC) - ...





Kg
169.5
masa przekładni
bez silnika i oleju
without oil and motor

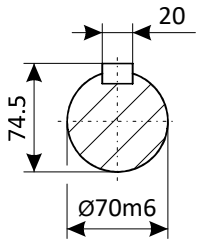
Wymiary przekładni

Dimensions

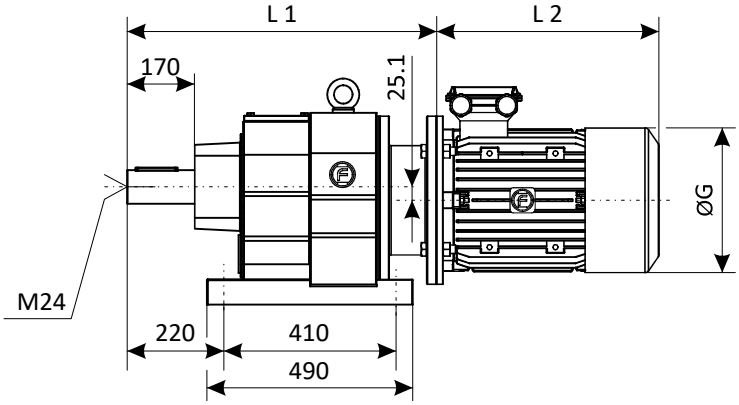
WHF - ... - 103

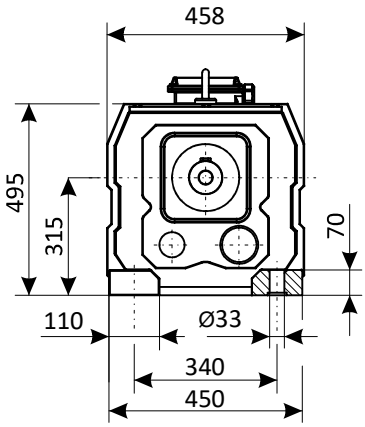
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P100B5	**0.75**	700	561.5	310	193
P100B5	**1.10**	700	561.5	310	193
P112B5	**1.50**	700	561.5	335	223
P100B5	**1.50**	900	561.5	310	193
P112B5	**2.20**	900	561.5	335	223
P100B5	**2.20**	1400	561.5	310	193
P132B5	**3.00**	900	590	390	255
P100B5	**3.00**	1400	561.5	310	193
P112B5	**4.00**	1400	561.5	335	223
P132B5	**5.50**	1400	590	390	255
P132B5	**7.50**	1400	590	420	255
P160B5	**11.0**	1400	631.5	495	330
P160B5	**15.0**	1400	631.5	570	330
P180B5	**18.5**	1400	631.5	584	352
P180B5	**22.0**	1400	631.5	622	352
P200B5	**30.0**	1400	633.5	664	394
P225B5	**37.0**	1400	663.5	680	442
P225B5	**45.0**	1400	663.5	733	442

Wał wyjściowy / *Output shaft* WHF - ... - 103



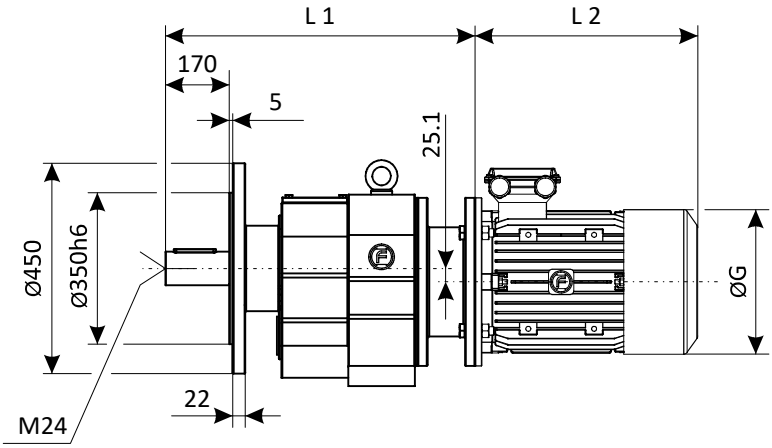
WHF - L - 133 - P(IEC) - ...

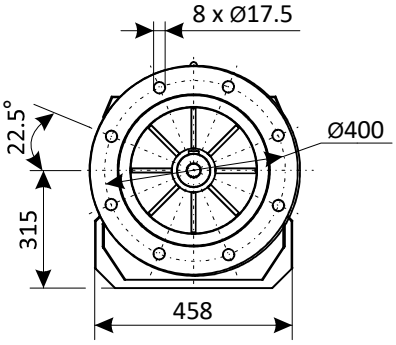




Kg
255.0
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 133 - H (Ø450) - P(IEC) - ...

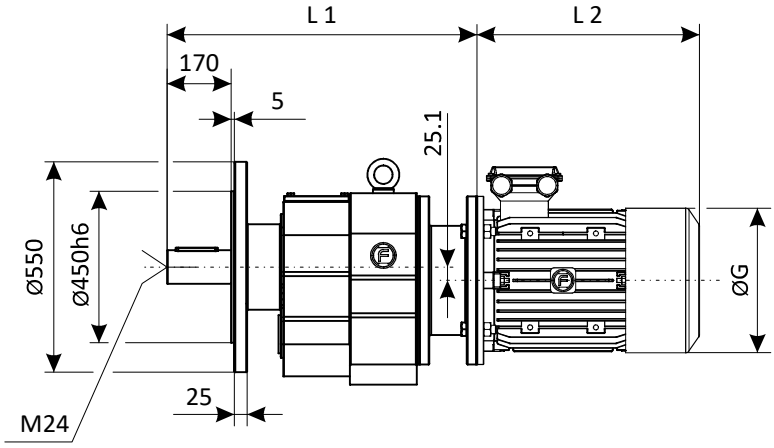


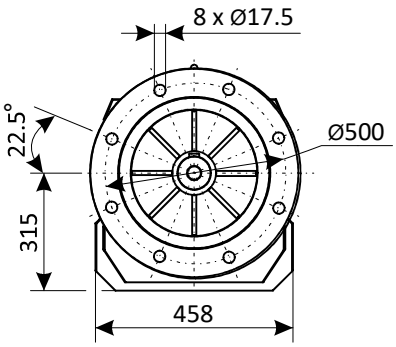


Kg
259.5
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - K - 133 - I (ø550) - P(IEC) - ...



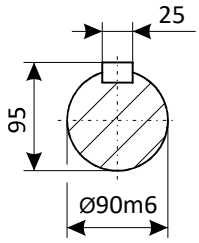


Kg
260.5
masa przekładni
bez silnika i oleju
without oil and motor

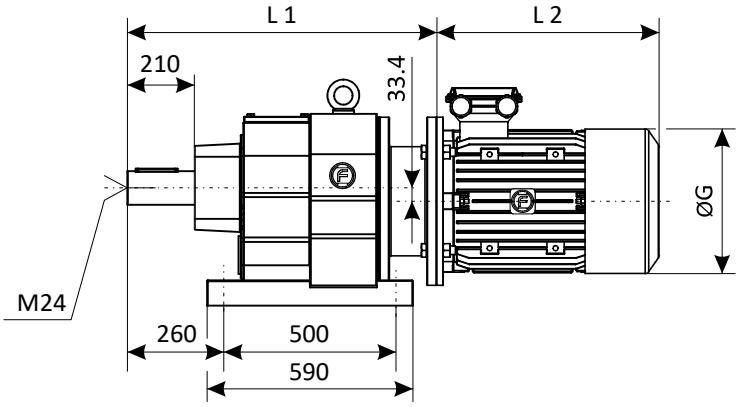
WHF - ... - 133

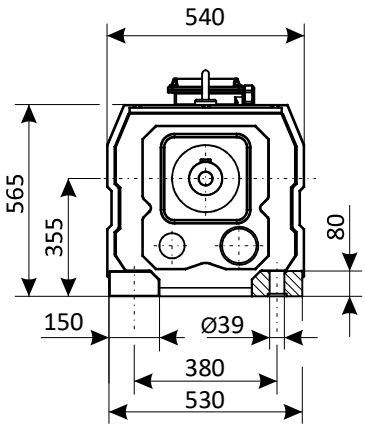
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P132B5	**2.20**	700	677	390	255
P132B5	**3.00**	700	677	390	255
P132B5	**3.00**	900	677	390	255
P160B5	**4.00**	700	718.5	495	330
P132B5	**4.00**	900	677	390	255
P160B5	**5.50**	700	718.5	495	330
P132B5	**5.50**	900	677	420	255
P132B5	**5.50**	1400	677	390	255
P132B5	**7.50**	1400	677	420	255
P160B5	**11.0**	1400	718.5	495	330
P160B5	**15.0**	1400	718.5	570	330
P180B5	**18.5**	1400	718.5	584	352
P180B5	**22.0**	1400	718.5	622	352
P200B5	**30.0**	1400	720.5	664	394
P225B5	**37.0**	1400	750.5	680	442
P225B5	**45.0**	1400	750.5	733	442
P250B5	**55.0**	1400	752	782	481

Wał wyjściowy / *Output shaft* WHF - ... - 133



WHF - L - 143 - P(IEC) - ...



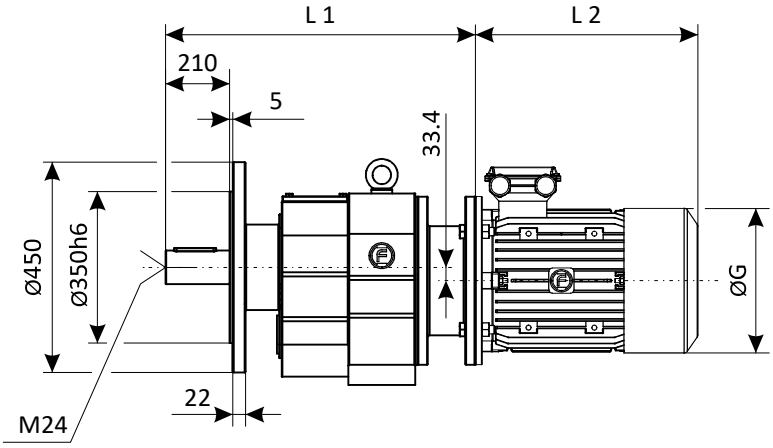


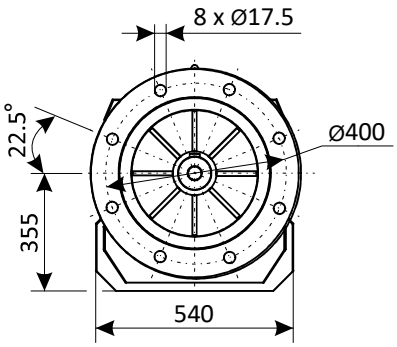
Kg
370.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

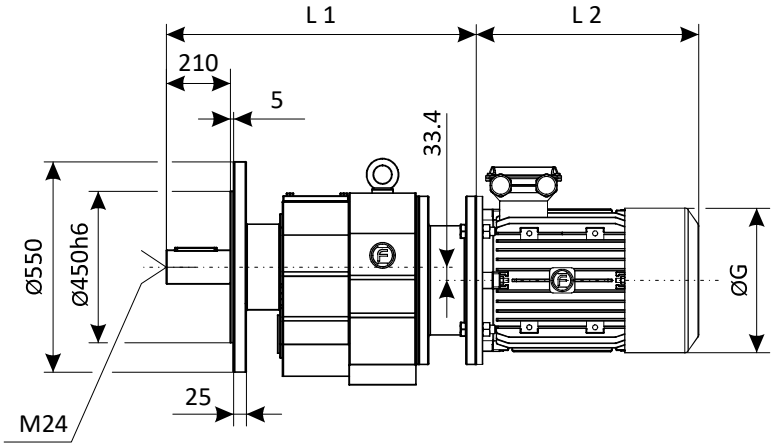
WHF - K - 143 - H (ø450) - P(IEC) - ...

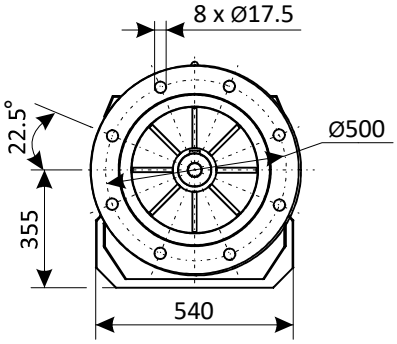




Kg
374.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 143 - I (ø550) - P(IEC) - ...



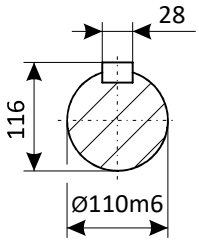


Kg
375.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 143

P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P160B5	**4.00**	700	816.5	495	330
P160B5	**5.50**	700	816.5	495	330
P132B5	**5.50**	900	775	420	255
P160B5	**7.50**	700	816.5	495	330
P160B5	**7.50**	900	816.5	495	330
P160B5	**11.0**	900	816.5	570	330
P160B5	**11.0**	1400	816.5	495	330
P180B5	**15.0**	900	816.5	622	352
P160B5	**15.0**	1400	816.5	570	330
P180B5	**18.5**	1400	816.5	584	352
P180B5	**22.0**	1400	816.5	622	352
P200B5	**30.0**	1400	818.5	664	394
P225B5	**37.0**	1400	848.5	680	442
P225B5	**45.0**	1400	848.5	733	442
P250B5	**55.0**	1400	848.5	782	481
P280B5	**75.0**	1400	848.5	851	550
P280B5	**90.0**	1400	848.5	900	550

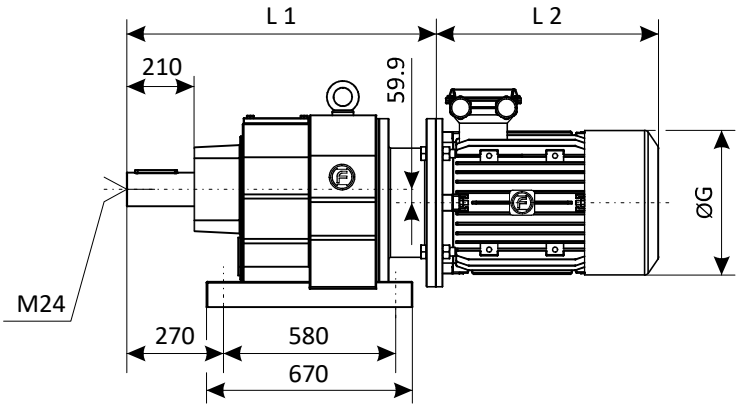
Wał wyjściowy / *Output shaft* — WHF - ... - 143

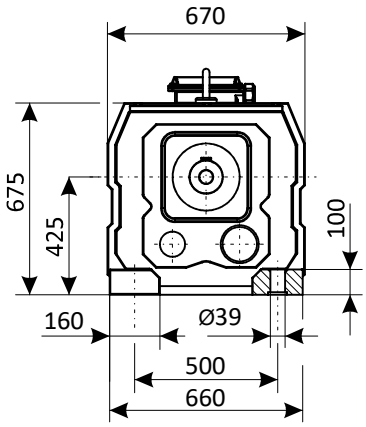


Wymiary przekładni

Dimensions

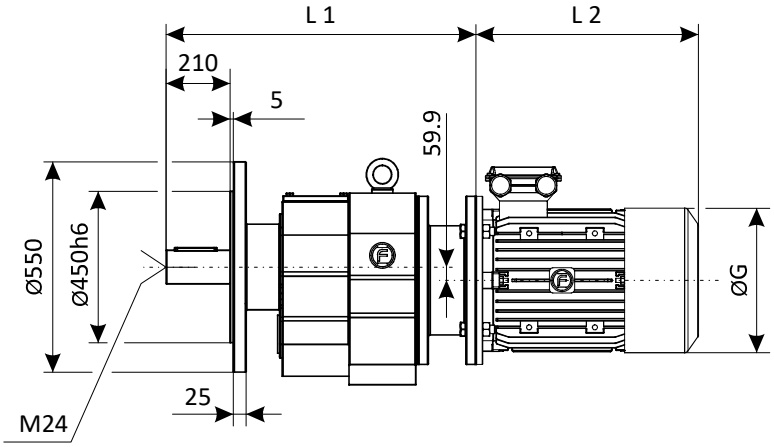
WHF - L - 163 - P(IEC) - ...

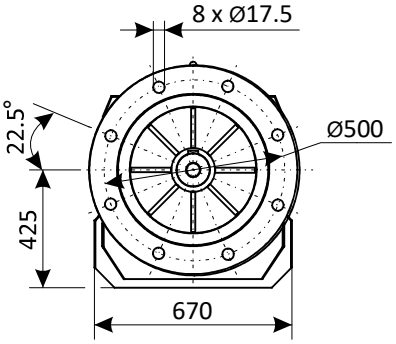




Kg
700.0
masa przekładni
bez silnika i oleju
without oil and motor

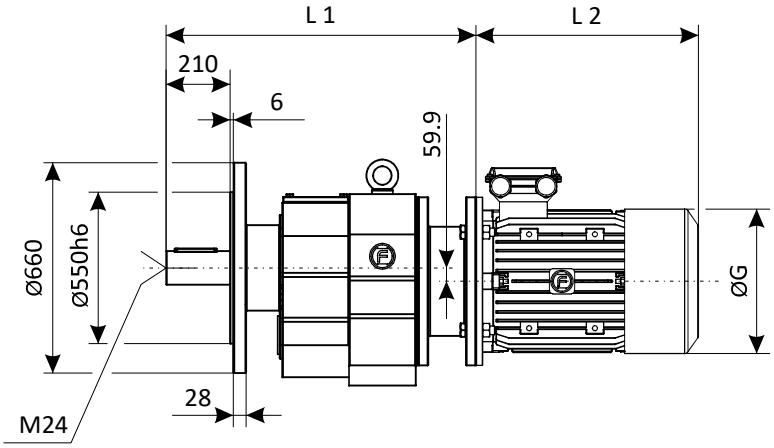
WHF - K - 163 - I (Ø550) - P(IEC) - ...

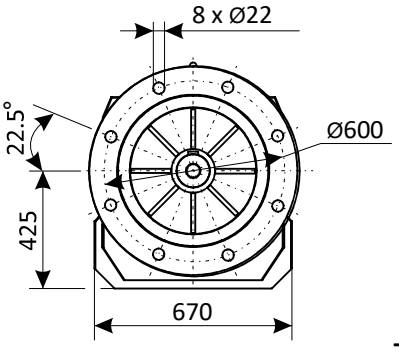




Kg
705.5
masa przekładni
bez silnika i oleju
whitout oil and motor

WHF - K - 163 - J (Ø660) - P(IEC) - ...





Kg
706.5
masa przekładni
bez silnika i oleju
whitout oil and motor

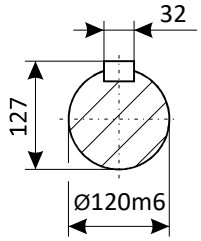
Wymiary przekładni

Dimensions

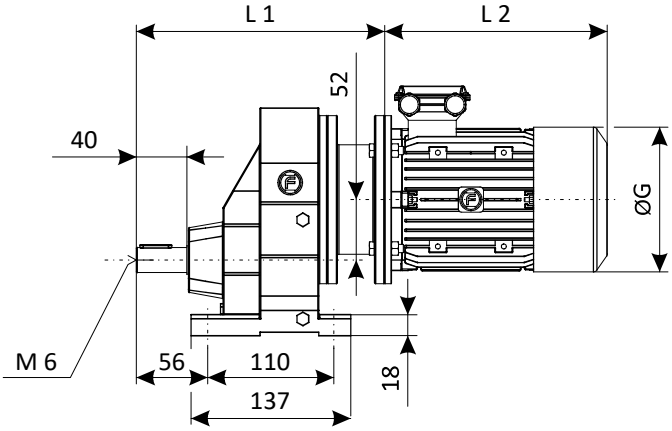
WHF - ... - 163

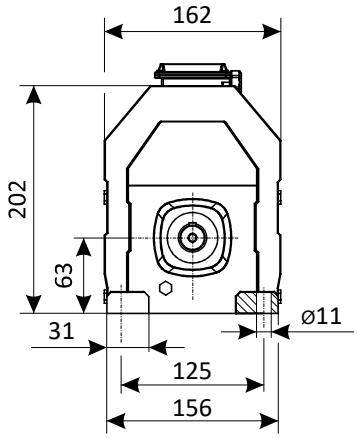
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P160B5	**5.50**	700	903.5	495	330
P160B5	**7.50**	700	903.5	495	330
P160B5	**7.50**	900	903.5	495	330
P160B5	**11.0**	900	903.5	570	330
P160B5	**11.0**	1400	903.5	495	330
P180B5	**15.0**	900	903.5	622	352
P160B5	**15.0**	1400	903.5	570	330
P180B5	**18.5**	1400	903.5	584	352
P180B5	**22.0**	1400	903.5	622	352
P200B5	**30.0**	1400	905.5	664	394
P225B5	**37.0**	1400	935.5	680	442
P225B5	**45.0**	1400	935.5	733	442
P250B5	**55.0**	1400	935.5	782	481
P280B5	**75.0**	1400	935.5	851	550
P280B5	**90.0**	1400	935.5	900	550
P315B5	**110**	1400	974	1020	600
P315B5	**132**	1400	974	1130	600
P315B5	**160**	1400	974	1130	600

Wał wyjściowy / *Output shaft* **WHF - ... - 163**



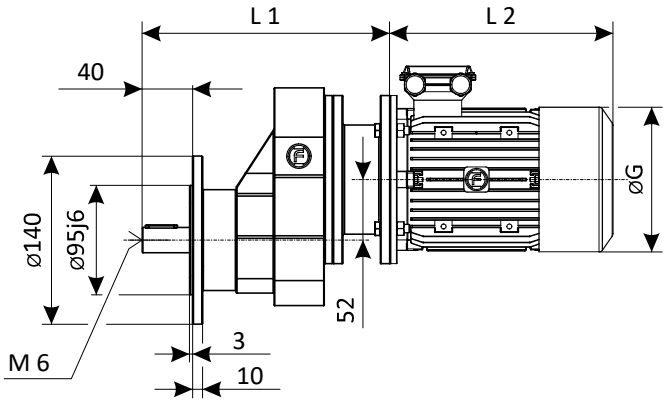
WHF - L - 51 - P(IEC) - ...

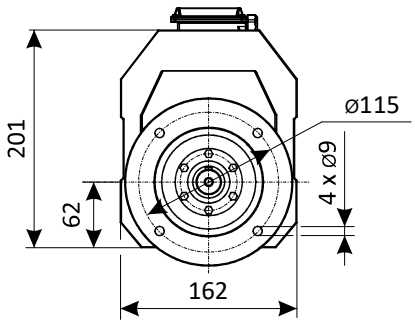




Kg
7.50
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 51 - B (Ø140) - P(IEC) - ...

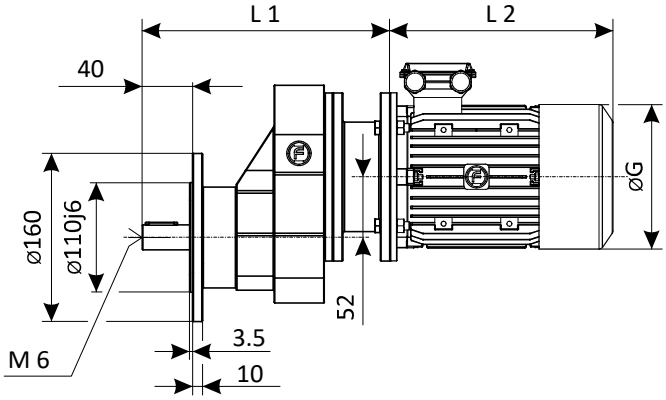


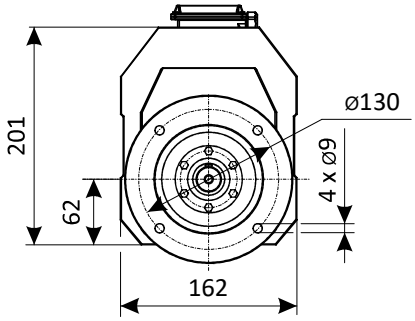


Kg
8.00
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

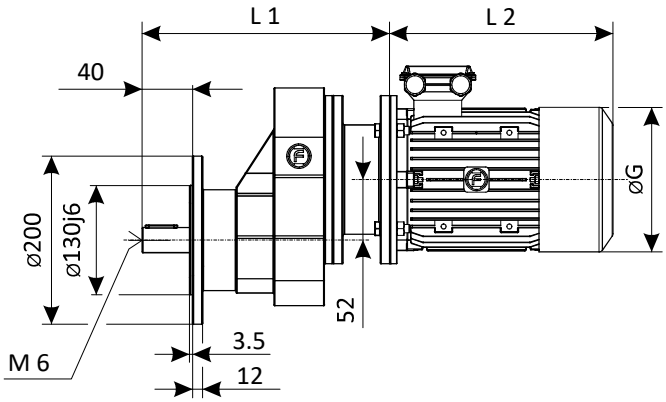
WHF - K - 51 - C (Ø160) - P(IEC) - ...

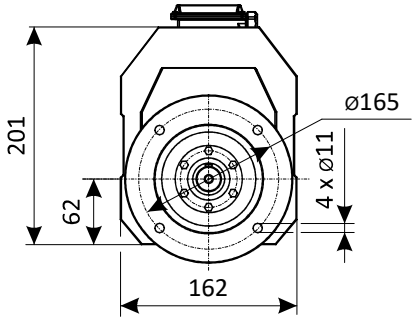




Kg
8.20
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 51 - D (Ø200) - P(IEC) - ...



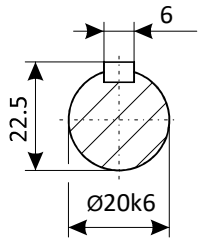


Kg
9.00
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 51

P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P63B5	**0.12**	1400	230	189	120
P71B5	**0.18**	900	230	210	133
P63B5	**0.18**	1400	230	189	120
P71B5	**0.25**	900	230	210	133
P71B5	**0.25**	1400	230	210	133
P80B5	**0.37**	900	248.5	250	153
P71B5	**0.37**	1400	230	210	133
P80B5	**0.55**	900	248.5	250	153
P80B5	**0.55**	1400	248.5	250	153
P90B5	**0.75**	900	248.5	265	172
P80B5	**0.75**	1400	248.5	250	153
P90B5	**1.10**	900	248.5	290	172
P90B5	**1.10**	1400	248.5	265	172
P90B5	**1.50**	1400	248.5	290	172
P100B5	**2.20**	1400	264.5	310	193
P100B5	**3.00**	1400	264.5	310	193
P112B5	**4.00**	1400	264.5	335	223
P132B5	**5.50**	1400	297	390	255

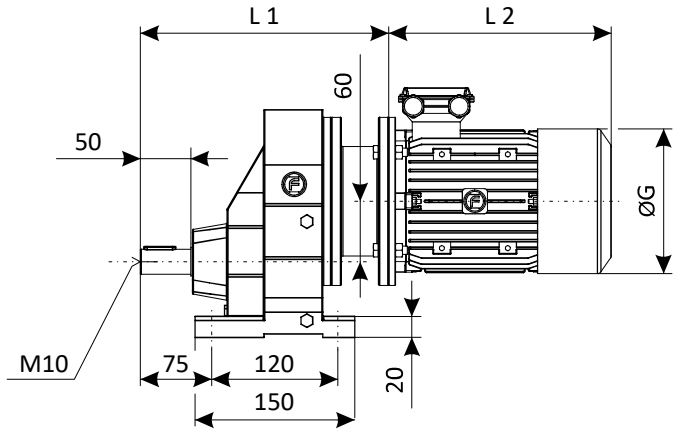
Wał wyjściowy / *Output shaft* WHF - ... - 51

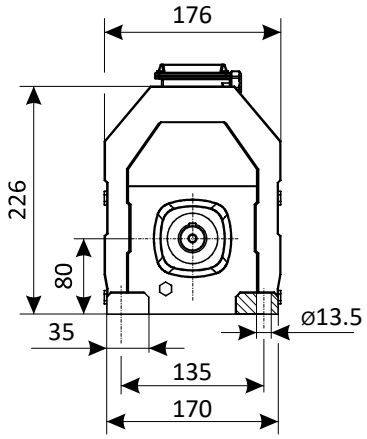


Wymiary przekładni

Dimensions

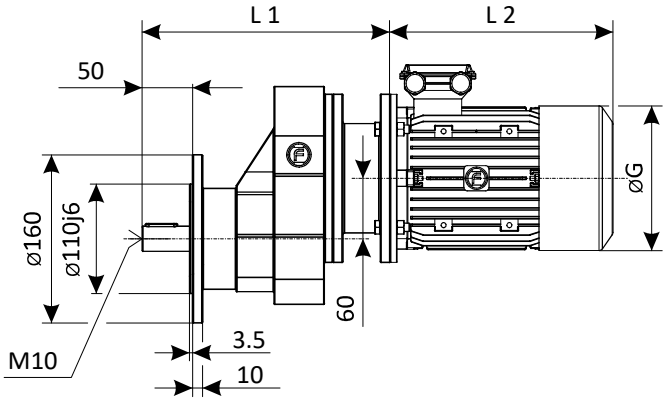
WHF - L - 61 - P(IEC) - ...

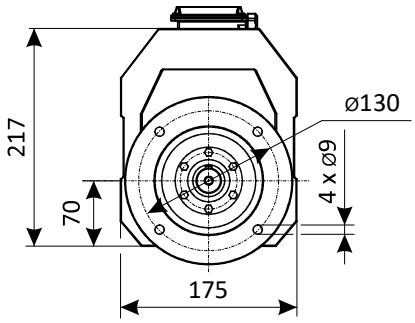




Kg
13.0
masa przekładni
bez silnika i oleju
without oil and motor

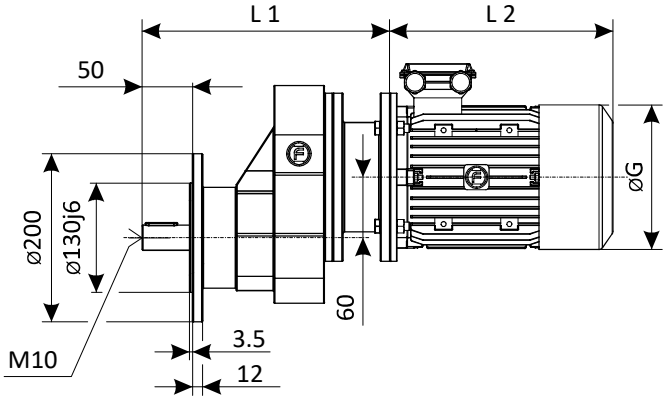
WHF - K - 61 - C (Ø160) - P(IEC) - ...

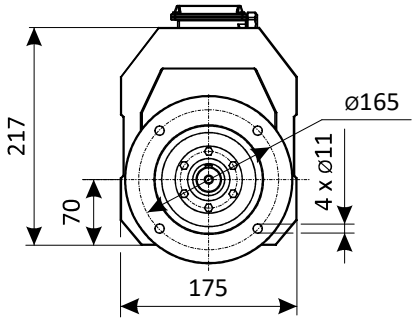




Kg
13.7
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 61 - D (Ø200) - P(IEC) - ...

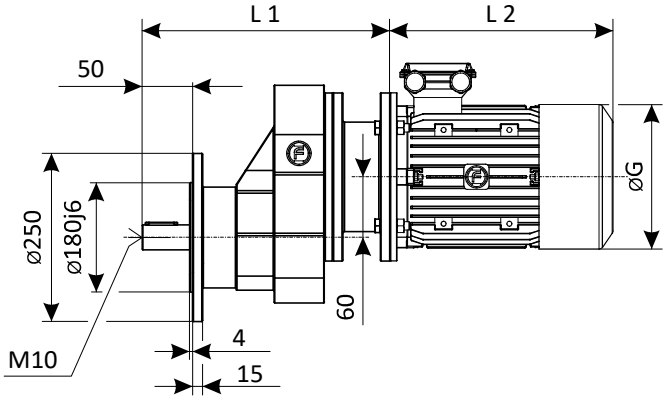


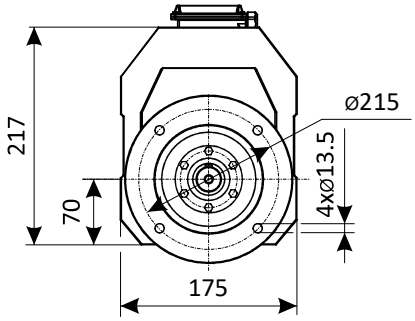


Kg
14.5
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - K - 61 - E (Ø250) - P(IEC) - ...

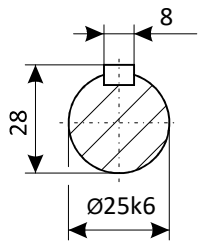




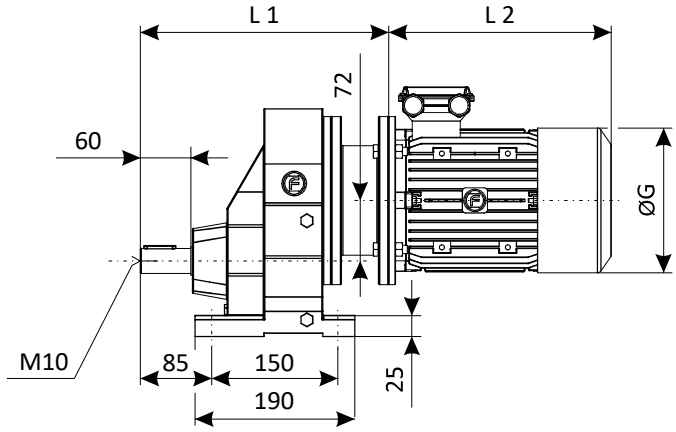
Kg
15.0
masa przekładni
bez silnika i oleju
without oil and motor

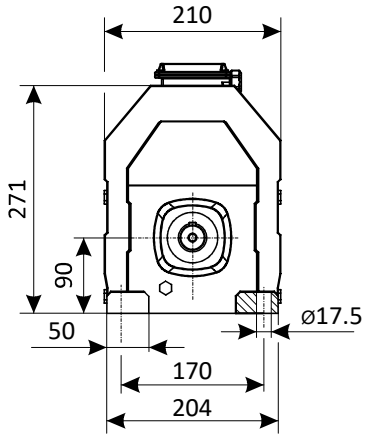
WHF - ... - 61					
P [IEC]	**P₁** [kW]	**n₁** [rpm]	**L 1** [mm]	**L 2** [mm]	**øG** [mm]
P63B5	**0.12**	1400	249	189	120
P71B5	**0.18**	900	249	210	133
P63B5	**0.18**	1400	249	189	120
P71B5	**0.25**	900	249	210	133
P71B5	**0.25**	1400	249	210	133
P80B5	**0.37**	900	267.5	250	153
P71B5	**0.37**	1400	249	210	133
P80B5	**0.55**	900	267.5	250	153
P80B5	**0.55**	1400	267.5	250	153
P90B5	**0.75**	900	267.5	265	172
P80B5	**0.75**	1400	267.5	250	153
P90B5	**1.10**	900	267.5	290	172
P90B5	**1.10**	1400	267.5	265	172
P90B5	**1.50**	1400	267.5	290	172
P100B5	**2.20**	1400	283.5	310	193
P100B5	**3.00**	1400	283.5	310	193
P112B5	**4.00**	1400	283.5	335	223
P132B5	**5.50**	1400	316	390	255
P132B5	**7.50**	1400	316	420	255

Wał wyjściowy / *Output shaft* **WHF - ... - 61**



WHF - L - 71 - P(IEC) - ...



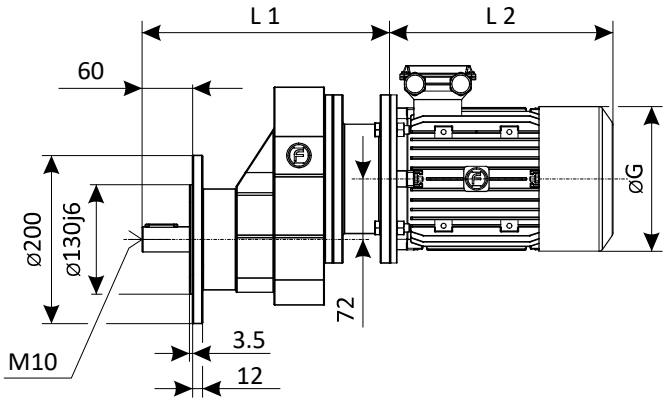


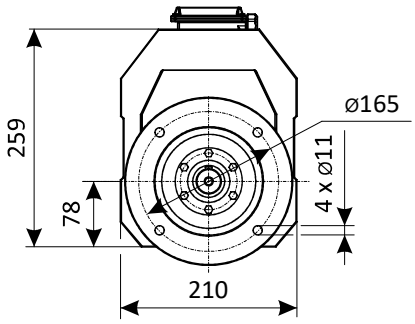
Kg
22.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

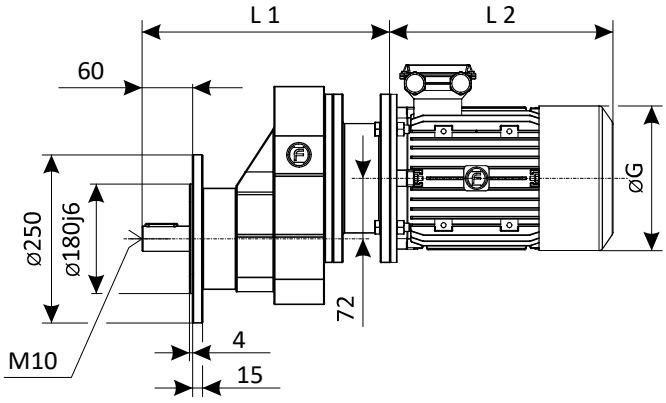
WHF - K - 71 - D (ø200) - P(IEC) - ...

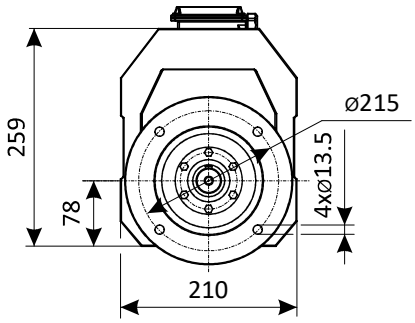




Kg
23.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 71 - E (Ø250) - P(IEC) - ...



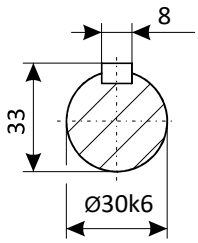


Kg
24.0
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 71

P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P90B5	**1.10**	1400	295.5	265	172
P90B5	**1.50**	1400	295.5	290	172
P100B5	**2.20**	1400	309.5	310	193
P100B5	**3.00**	1400	309.5	310	193
P112B5	**4.00**	1400	309.5	335	223
P132B5	**5.50**	1400	338	390	255
P132B5	**7.50**	1400	338	420	255
P160B5	**11.0**	1400	379.5	495	330

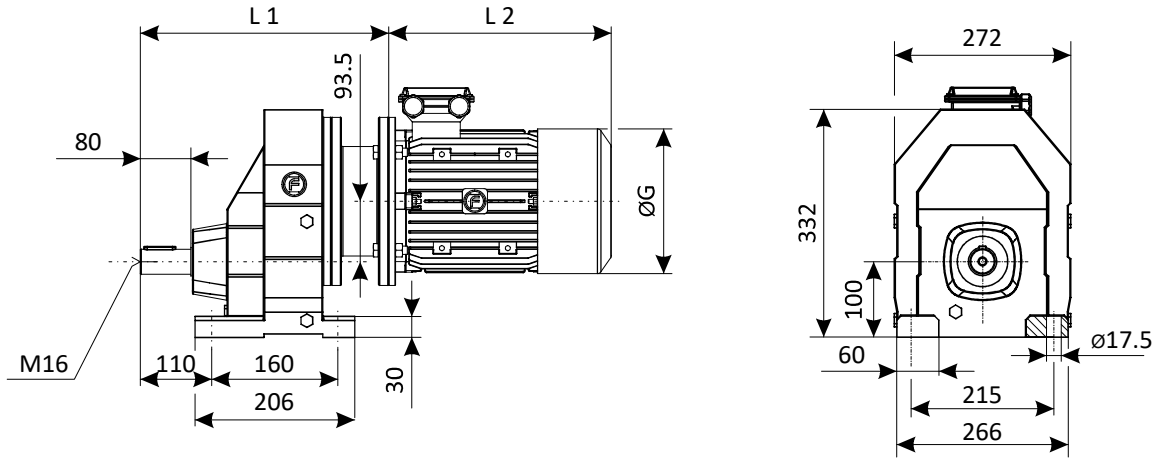
Wał wyjściowy / *Output shaft* WHF - ... - 71



Wymiary przekładni

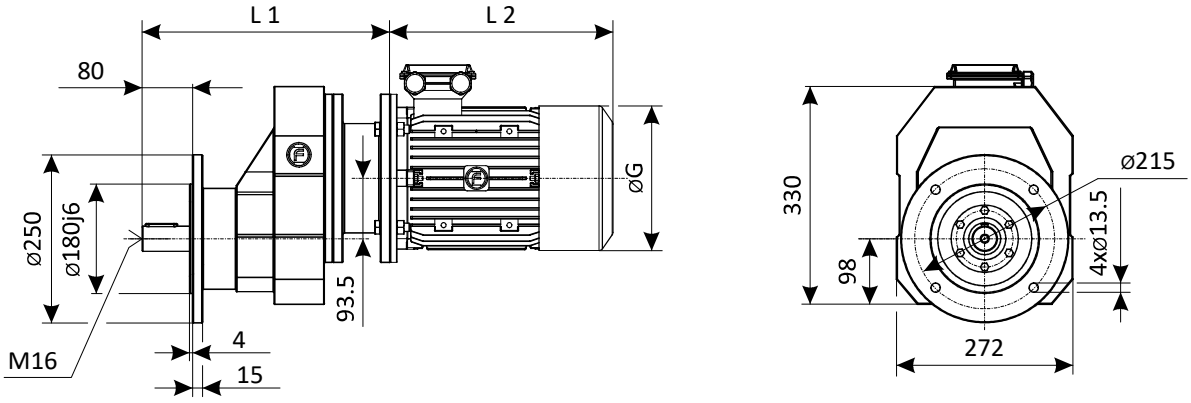
Dimensions

WHF - L - 81 - P(IEC) - ...



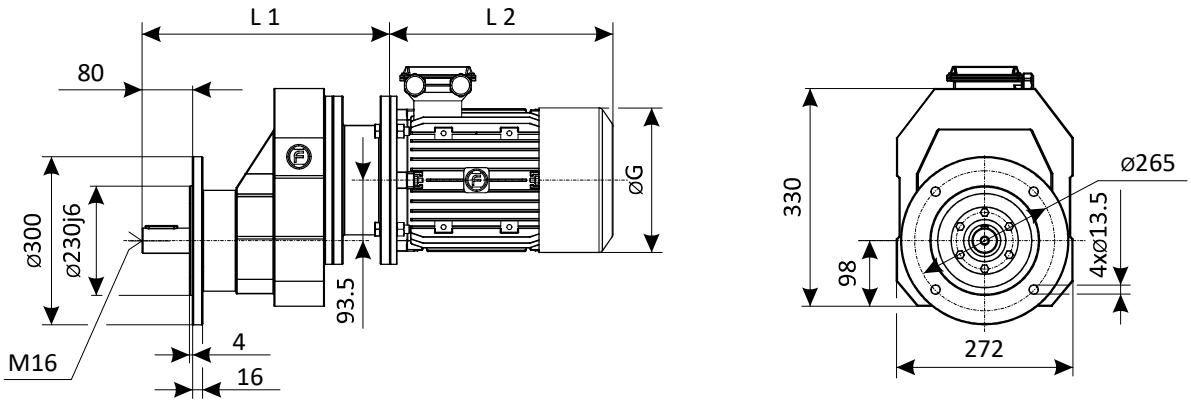
Kg
33.0
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 81 - E (Ø250) - P(IEC) - ...



Kg
35.0
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 81 - F (Ø300) - P(IEC) - ...



Kg
35.5
masa przekładni
bez silnika i oleju
without oil and motor

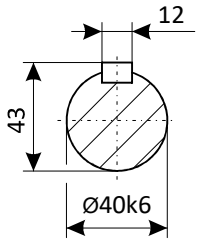
Wymiary przekładni

Dimensions

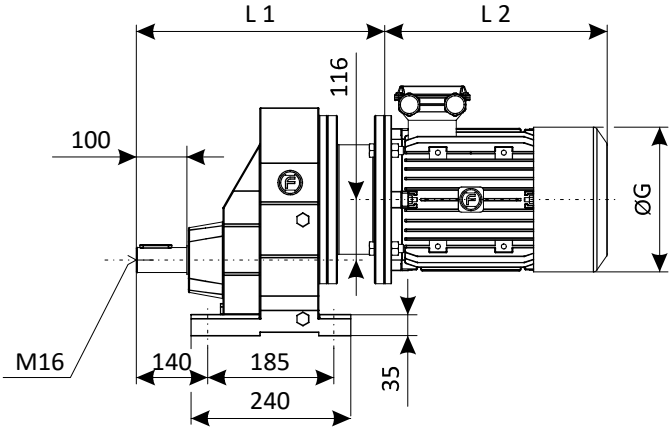
WHF - ... - 81

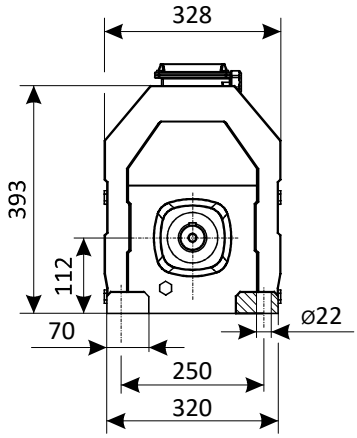
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	øG [mm]
P100B5	**3.00**	1400	347.5	310	193
P112B5	**4.00**	1400	347.5	335	223
P132B5	**5.50**	1400	375	390	255
P132B5	**7.50**	1400	375	420	255
P160B5	**11.0**	1400	416.5	495	330
P160B5	**15.0**	1400	416.5	570	330
P180B5	**18.5**	1400	416.5	584	352
P180B5	**22.0**	1400	416.5	622	352

Wał wyjściowy / *Output shaft* WHF - ... - 81



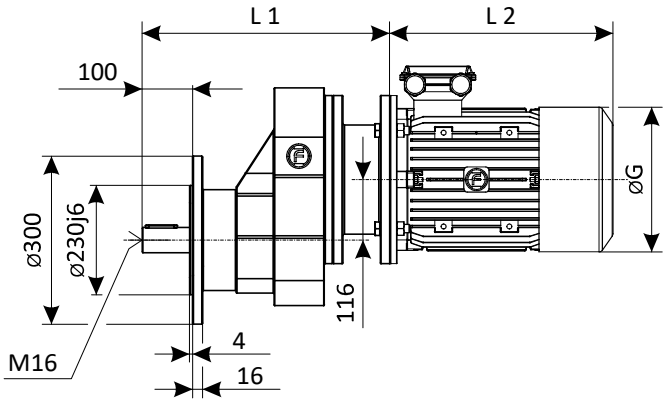
WHF - L - 91 - P(IEC) - ...

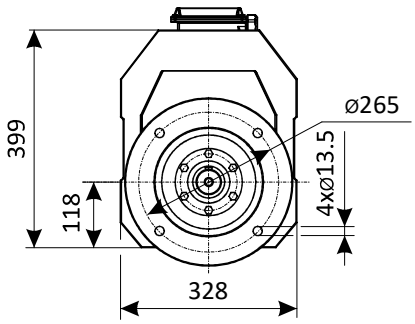




Kg
61.0
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 91 - F (Ø300) - P(IEC) - ...

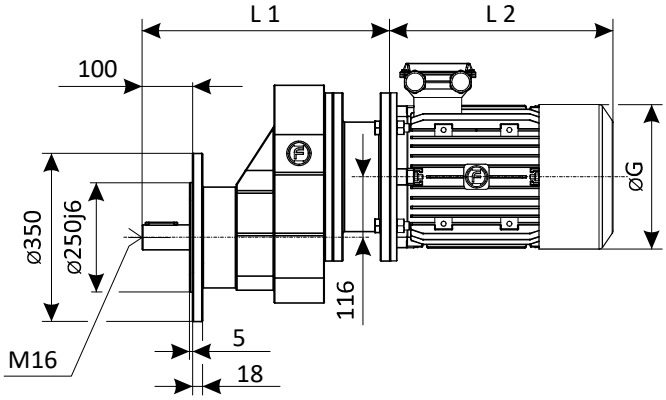


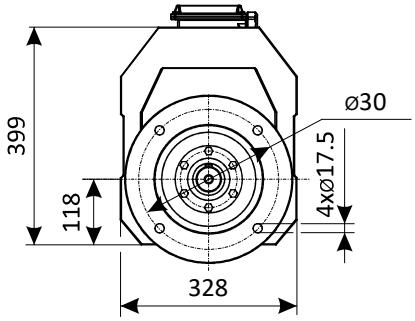


Kg
63.50
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni *Dimensions*

WHF - K - 91 - G (Ø350) - P(IEC) - ...

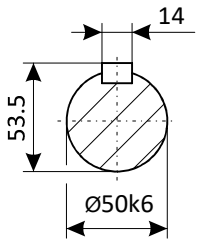




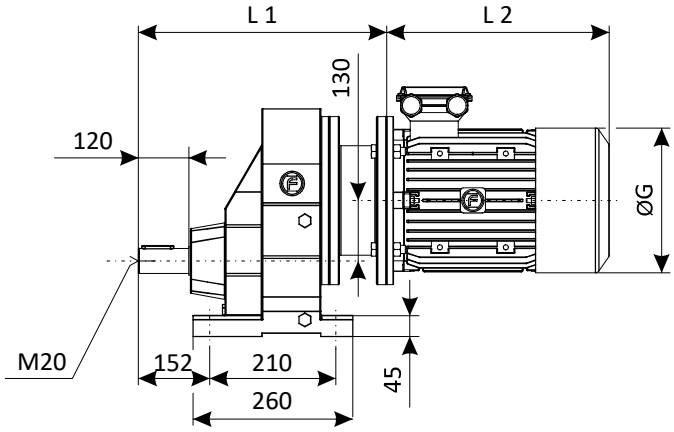
Kg
64.5
masa przekładni
bez silnika i oleju
without oil and motor

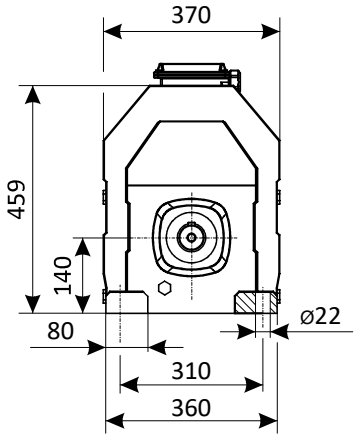
WHF - ... - 91					
P [IEC]	**P_1** [kW]	**n_1** [rpm]	**L 1** [mm]	**L 2** [mm]	**ØG** [mm]
P132B5	**5.50**	1400	417	390	255
P132B5	**7.50**	1400	417	420	255
P160B5	**11.0**	1400	458.5	495	330
P160B5	**15.0**	1400	458.5	570	330
P180B5	**18.5**	1400	458.5	584	352
P180B5	**22.0**	1400	458.5	622	352
P200B5	**30.0**	1400	460.5	664	394

Wał wyjściowy / *Output shaft* **WHF - ... - 91**



WHF - L - 101 - P(IEC) - ...



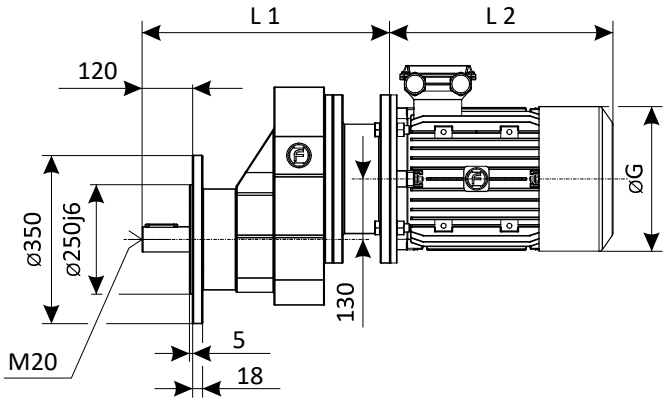


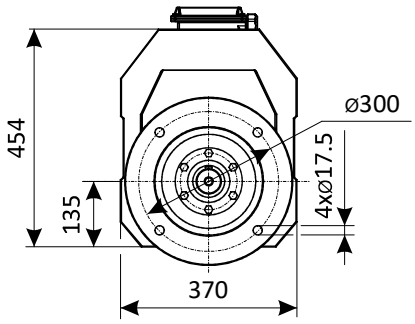
Kg
80.0
masa przekładni
bez silnika i oleju
without oil and motor

Wymiary przekładni

Dimensions

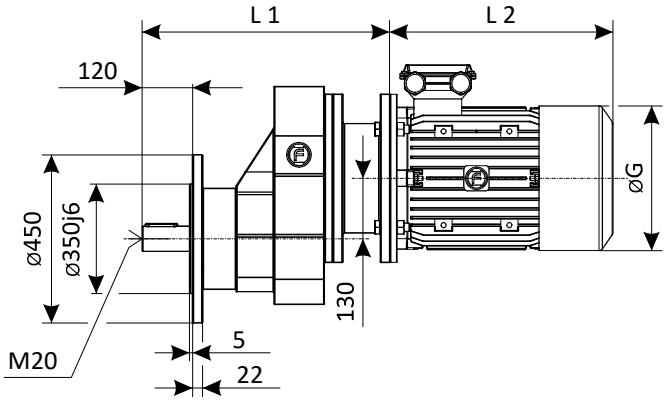
WHF - L - 101 - G (⌀350) - P(IEC) - ...

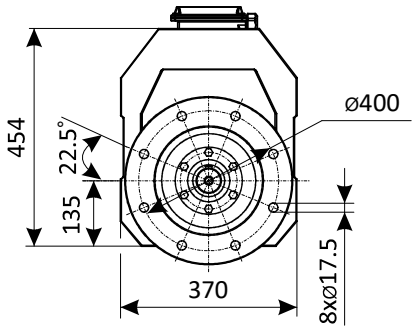




Kg
83.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - K - 101 - H (Ø450) - P(IEC) - ...



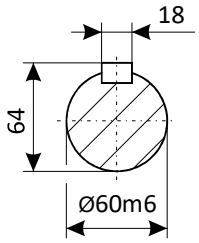


Kg
84.5
masa przekładni
bez silnika i oleju
without oil and motor

WHF - ... - 101

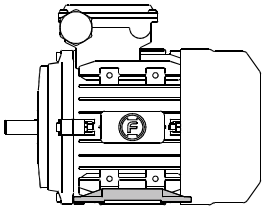
P [IEC]	P_1 [kW]	n_1 [rpm]	L 1 [mm]	L 2 [mm]	ØG [mm]
P132B5	**5.50**	1400	459	390	255
P132B5	**7.50**	1400	459	420	255
P160B5	**11.0**	1400	500.5	495	330
P160B5	**15.0**	1400	500.5	570	330
P180B5	**18.5**	1400	500.5	584	352
P180B5	**22.0**	1400	500.5	622	352
P200B5	**30.0**	1400	502.5	664	394
P225B5	**37.0**	1400	532.5	680	442
P225B5	**45.0**	1400	532.5	733	442

Wał wyjściowy / *Output shaft* WHF - ... - 101

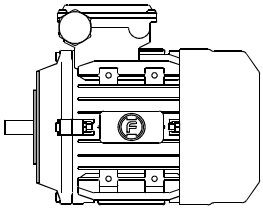


Oznaczenie kodowe / *Classification*

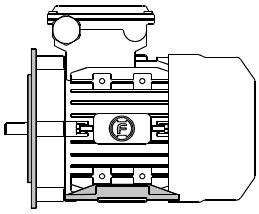
HMM...P□B3



HMM...P□B5
HMM...P□B14



HMM...P□B35
HMM...P□B34



Silnik indukcyjny / *Induction motors*						
HMM	**2**	**A1**	**025**	**P2**	**S1**	**P63B14**
Typ / *Type*	Klasa sprawności *Efficiency class*	Typ obudowy *Housing type*	Moc nominalna *Rated output*	Prędkość *Speed*	Tryb pracy *Operating duty*	Obudowa IEC *Housing IEC*
HMM	**1** - IE1 **2** - IE2 **3** - IE3 **4** - IE4	**A1** - ALU RAL9006 **A2** - ALU RAL5010 **A3** - ALU RAL7031 **Y1** - IRON RAL9006 **Y2** - IRON RAL5010 **Y3** - IRON RAL7031	Zgodnie z doborem *See tables*		**S1** - Praca ciągła *Continuous work* **S3** - Praca przerywana *Intermittent work*	Zgodnie z doborem *See tables*

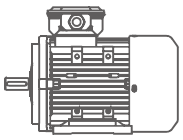
Tabela	Moc nominalna / *Rated output*	*Table*

009 - 0.09 kW / **012** - 0.12 kW / **018** - 0.18 kW / **025** - 0.25 kW / **037** - 0.37 kW / **055** - 0.55 kW / **075** - 0.75 kW
110 - 1.10 kW / **150** - 1.50 kW / **220** - 2.20 kW / **300** - 3.00 kW / **400** - 4.00 kW / **550** - 5.50 kW / **750** - 7.50 kW
111 - 11.0 kW / **151** - 15.0 kW / **185** - 18.5 kW / **221** - 22.0 kW / **301** - 30.0 kW / **371** - 37.0 kW / **451** - 45.0 kW
551 - 55.0 kW / **751** - 75.0 kW / **901** - 90.0 kW / **112** - 110. kW / **132** - 132. kW / **162** - 160. kW / **202** - 200. kW
252 - 250. kW / **315** - 315. kW

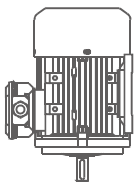
Tabela	Prędkość obrotowa / *Synchronous speed*	*Table*

P2 - 2800 rpm / **P4** - 1400 rpm / **P6** - 900 rpm

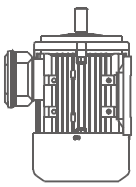
Pozycje montażowe / *Mounting positions*



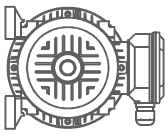
IM B3
IM 1001



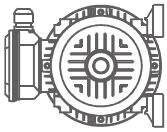
IM V5
IM 1011



IM V6
IM 1031

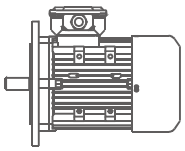


IM B6
IM 1051

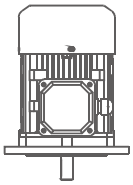


IM B7
IM 1061

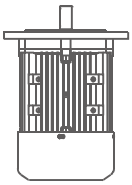
IM B8
IM 1071



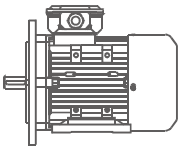
IM B5
IM 3001



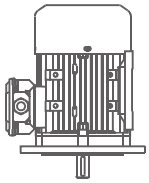
IM V1
IM 3011



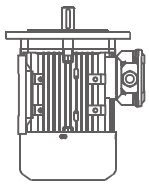
IM V3
IM 3031



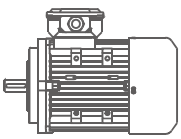
IM B35
IM 2001



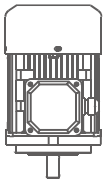
IM V15
IM 2011



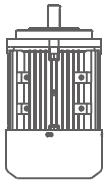
IM V36
IM 2031



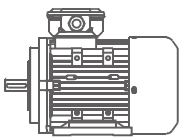
IM B14
IM 3601



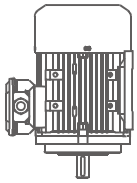
IM V18
IM 3611



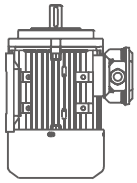
IM V19
IM 3631



IM B34
IM 2101



IM V15
IM 2111

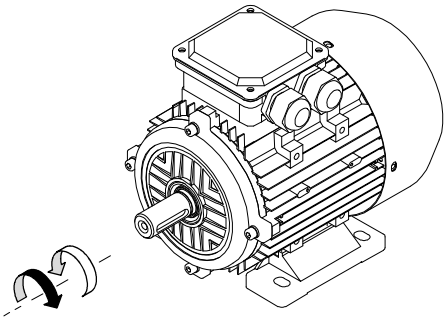


IM V36
IM 2131

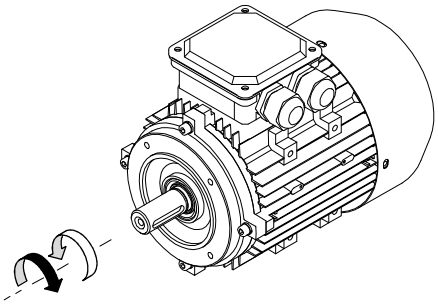
Sprawność silników

Efficiency motors

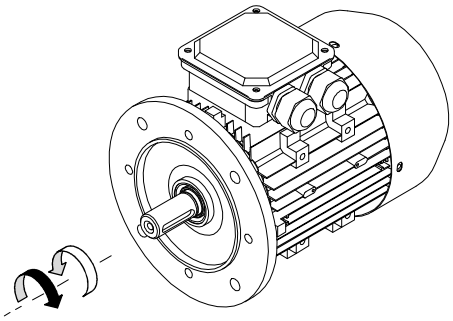
Moc *Power* [kW]	2800 rpm			1400 rpm			900 rpm		
	HMM 1	HMM 2	HMM 3	HMM 1	HMM 2	HMM 3	HMM 1	HMM 2	HMM 3
	IE 1	IE 2	IE 3	IE 1	IE 2	IE 3	IE 1	IE 2	IE 3
0.09	50.0 %	61.4 %	66.1 %	50.0 %	67.9 %	71.8 %	---	---	---
0.12	53.6 %	64.0 %	68.5 %	53.6 %	69.7 %	73.5 %	---	---	---
0.18	58.3 %	67.4 %	71.6 %	58.3 %	72.1 %	75.7 %	57.3 %	66.3 %	70.0 %
0.25	61.9 %	69.9 %	74.0 %	61.9 %	74.0 %	77.4 %	60.5 %	68.7 %	72.3 %
0.37	65.8 %	72.8 %	76.6 %	65.8 %	76.1 %	79.3 %	64.1 %	71.4 %	74.8 %
0.55	69.4 %	75.5 %	79.0 %	69.4 %	78.1 %	81.2 %	67.5 %	74.0 %	77.2 %
0.75	72.1 %	77.4 %	80.7 %	72.1 %	79.6 %	82.5 %	70.0 %	75.9 %	78.9 %
1.10	75.0 %	79.6 %	82.7 %	75.0 %	81.4 %	84.1 %	72.9 %	78.1 %	81.0 %
1.50	77.2 %	81.3 %	84.2 %	77.2 %	82.8 %	85.3 %	75.2 %	79.8 %	82.5 %
2.20	79.7 %	83.2 %	85.9 %	79.7 %	84.3 %	86.7 %	77.7 %	81.8 %	84.3 %
3.00	81.5 %	84.6 %	87.1 %	81.5 %	85.5 %	87.7 %	79.7 %	83.3 %	85.6 %
4.00	83.1 %	85.8 %	88.1 %	83.1 %	86.6 %	88.6 %	81.4 %	84.6 %	86.8 %
5.50	84.7 %	87.0 %	89.2 %	84.7 %	87.7 %	89.6 %	83.1 %	86.0 %	88.0 %
7.50	86.0 %	88.1 %	90.1 %	86.0 %	88.7 %	90.4 %	84.7 %	87.2 %	89.1 %
11.0	87.6 %	89.4 %	91.2 %	87.6 %	89.8 %	91.4 %	86.4 %	88.6 %	90.3 %
15.0	88.7 %	90.3 %	91.9 %	88.7 %	90.6 %	92.1 %	87.7 %	89.7 %	91.2 %
18.5	89.3 %	90.9 %	92.4 %	89.3 %	91.2 %	92.6 %	88.6 %	90.3 %	91.7 %
22.0	89.9 %	91.3 %	92.7 %	89.9 %	91.6 %	93.0 %	89.2 %	90.8 %	92.2 %
30.0	90.7 %	92.0 %	93.3 %	90.7 %	92.3 %	93.6 %	90.2 %	91.7 %	92.9 %
37.0	91.2 %	92.5 %	93.7 %	91.2 %	92.7 %	93.9 %	90.8 %	92.2 %	93.3 %
45.0	91.7 %	92.9 %	94.0 %	91.7 %	93.1 %	94.2 %	91.4 %	92.6 %	93.7 %
55.0	92.1 %	93.2 %	94.3 %	92.1 %	93.5 %	94.6 %	91.9 %	93.1 %	94.1 %
75.0	92.7 %	93.8 %	94.7 %	92.7 %	94.0 %	95.0 %	92.6 %	93.6 %	94.6 %
90.0	93.0 %	94.1 %	95.0 %	93.0 %	94.2 %	95.2 %	92.9 %	93.9 %	94.9 %
110	93.3 %	94.3 %	95.2 %	93.3 %	94.5 %	95.4 %	93.3 %	94.2 %	95.1 %
132	93.5 %	94.6 %	95.4 %	93.5 %	94.7 %	95.6 %	93.5 %	94.4 %	95.4 %
160	93.8 %	94.8 %	95.6 %	93.8 %	94.9 %	95.8 %	93.8 %	94.6 %	95.6 %
200	94.0 %	95.0 %	95.8 %	94.0 %	95.1 %	96.0 %	94.0 %	94.8 %	95.8 %
250	94.3 %	95.3 %	96.0 %	94.3 %	95.3 %	96.2 %	94.2 %	95.0 %	95.9 %
315	94.5 %	95.5 %	96.2 %	94.5 %	95.5 %	96.3 %	94.3 %	95.1 %	96.1 %



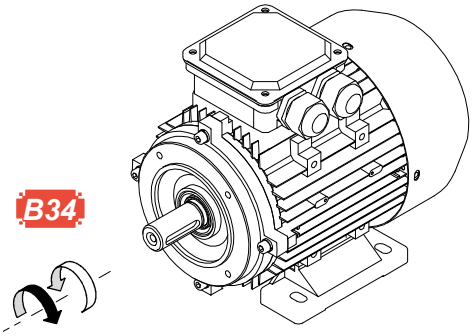
B3



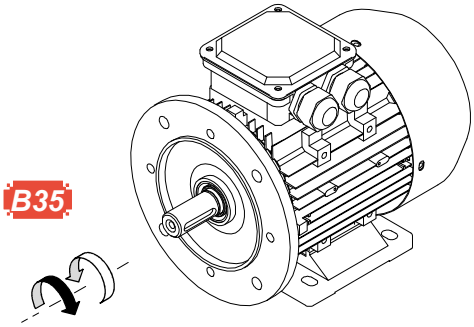
B14



B5



B34



B35

Dane techniczne

Technical data

2-pole, 2800 rpm, 50Hz, class F, IP55, S1 — **IE 1**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.09	**2750**	0.31	50.0 %	IE 1	0.70	0.39	0.37	0.40	P56□	**HMM1A□009P2S1□**	3.60
0.12	**2750**	0.42	53.6 %	IE 1	0.72	0.47	0.45	0.40	P56□	**HMM1A□012P2S1□**	3.90
0.18	**2730**	0.63	58.3 %	IE 1	0.80	0.59	0.56	0.50	P63□	**HMM1A□018P2S1□**	4.80
0.25	**2800**	0.85	61.9 %	IE 1	0.81	0.76	0.72	0.70	P63□	**HMM1A□025P2S1□**	5.10
0.37	**2756**	1.28	65.8 %	IE 1	0.81	1.05	1.00	1.00	P71□	**HMM1A□037P2S1□**	6.00
0.55	**2792**	1.88	69.4 %	IE 1	0.82	1.47	1.40	1.30	P71□	**HMM1A□055P2S1□**	6.50

2-pole, 2800 rpm, 50Hz, class F, IP55, S1 — **IE 2**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**2875**	2.49	77.4 %	IE 2	0.83	1.80	1.70	1.60	P80□	**HMM2A□075P2S1□**	10.5
1.10	**2888**	3.64	79.6 %	IE 2	0.84	2.50	2.40	2.30	P80□	**HMM2A□110P2S1□**	11.2
1.50	**2887**	4.96	81.3 %	IE 2	0.84	3.30	3.20	3.10	P90S□	**HMM2A□150P2S1□**	14.5
2.20	**2889**	7.28	83.2 %	IE 2	0.85	4.70	4.50	4.30	P90L□	**HMM2A□220P2S1□**	16.8
3.00	**2890**	9.92	84.6 %	IE 2	0.87	6.20	5.90	5.70	P100L□	**HMM2A□300P2S1□**	21.5
4.00	**2901**	13.2	85.8 %	IE 2	0.88	8.00	7.60	7.40	P112M□	**HMM2A□400P2S1□**	27.5
5.50	**2915**	18.0	87.0 %	IE 2	0.88	10.9	10.4	10.0	P132S1□	**HMM2A□550P2S1□**	41.5
7.50	**2915**	24.6	88.1 %	IE 2	0.88	14.7	14.0	13.5	P132S2□	**HMM2A□750P2S1□**	47.0
11.0	**2930**	35.9	89.4 %	IE 2	0.89	21.0	20.0	19.2	P160M1□	**HMM2A□111P2S1□**	72.0
15.0	**2940**	48.8	90.3 %	IE 2	0.89	28.4	26.9	26.0	P160M2□	**HMM2A□151P2S1□**	83.0
18.5	**2940**	60.1	90.9 %	IE 2	0.90	34.4	32.6	31.5	P160L□	**HMM2A□185P2S1□**	90.0
22.0	**2945**	71.4	91.3 %	IE 2	0.90	40.7	38.6	37.2	P180M□	**HMM2Y□221P2S1□**	182
30.0	**2950**	97.2	92.0 %	IE 2	0.90	55.1	52.3	50.4	P200L1□	**HMM2Y□301P2S1□**	237
37.0	**2955**	120	92.5 %	IE 2	0.90	67.5	64.2	61.8	P200L2□	**HMM2Y□371P2S1□**	255
45.0	**2975**	144	92.9 %	IE 2	0.90	81.8	77.7	74.9	P225M□	**HMM2Y□451P2S1□**	314
55.0	**2975**	177	93.2 %	IE 2	0.90	99.6	94.6	91.2	P250M□	**HMM2Y□551P2S1□**	413
75.0	**2985**	240	93.8 %	IE 2	0.90	135	128	124	P280S□	**HMM2Y□751P2S1□**	550
90.0	**2972**	289	94.1 %	IE 2	0.91	160	152	146	P280M□	**HMM2Y□901P2S1□**	605
110	**2982**	352	94.3 %	IE 2	0.91	195	185	178	P315S□	**HMM2Y□112P2S1□**	946
132	**2982**	423	94.6 %	IE 2	0.91	233	221	213	P315M□	**HMM2Y□132P2S1□**	1056
160	**2979**	513	94.8 %	IE 2	0.92	279	265	255	P315L1□	**HMM2Y□162P2S1□**	1122
200	**2979**	641	95.0 %	IE 2	0.92	348	330	318	P315L2□	**HMM2Y□202P2S1□**	1188
250	**2979**	800	95.0 %	IE 2	0.92	435	413	398	P355M□	**HMM2Y□252P2S1□**	1870
315	**2979**	1010	95.0 %	IE 2	0.92	548	520	501	P355L□	**HMM2Y□315P2S1□**	2035

2-pole, 2800 rpm, 50Hz, class F, IP55, S3-70% — **IE 1**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**2830**	2.53	72.1 %	IE 1	0.83	1.90	1.80	1.70	P80□	**HMM1A□075P2S3□**	8.70
1.10	**2830**	3.71	75.0 %	IE 1	0.84	2.70	2.50	2.40	P80□	**HMM1A□110P2S3□**	9.50
1.50	**2840**	5.05	77.2 %	IE 1	0.84	3.50	3.30	3.20	P90□	**HMM1A□150P2S3□**	11.8
2.20	**2840**	7.40	79.7 %	IE 1	0.85	4.90	4.70	4.50	P90L□	**HMM1A□220P2S3□**	13.5
3.00	**2860**	10.0	81.5 %	IE 1	0.87	6.40	6.10	5.90	P100L□	**HMM1A□300P2S3□**	21.0
4.00	**2880**	13.3	83.1 %	IE 1	0.88	8.30	7.90	7.60	P112M□	**HMM1A□400P2S3□**	28.0
5.50	**2900**	18.1	84.7 %	IE 1	0.88	11.2	10.7	10.3	P132S1□	**HMM1A□550P2S3□**	39.0
7.50	**2900**	24.7	86.0 %	IE 1	0.88	15.1	14.3	13.8	P132S2□	**HMM1A□750P2S3□**	44.5
11.0	**2930**	35.9	87.6 %	IE 1	0.89	21.4	20.4	19.6	P160M1□	**HMM1A□111P2S3□**	69.5
15.0	**2930**	48.9	88.7 %	IE 1	0.89	28.9	27.4	26.4	P160M2□	**HMM1A□151P2S3□**	78.0

Dane techniczne

Technical data

4-pole, 1400 rpm, 50Hz, class F, IP55, S1 — **IE 1**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.09	**1325**	0.65	50.0 %	IE 1	0.61	0.45	0.43	0.41	P56□	**HMM1A□009P4S1□**	3.90
0.12	**1320**	0.87	53.6 %	IE 1	0.72	0.47	0.45	0.43	P63□	**HMM1A□012P4S1□**	4.80
0.18	**1320**	1.30	58.3 %	IE 1	0.73	0.64	0.61	0.59	P63□	**HMM1A□018P4S1□**	5.10
0.25	**1347**	1.77	61.9 %	IE 1	0.74	0.83	0.79	0.76	P71□	**HMM1A□025P4S1□**	6.00
0.37	**1340**	2.64	65.8 %	IE 1	0.75	1.14	1.08	1.04	P71□	**HMM1A□037P4S1□**	6.30
0.55	**1390**	3.78	69.4 %	IE 1	0.75	1.61	1.53	1.47	P80□	**HMM1A□055P4S1□**	9.40

4-pole, 1400 rpm, 50Hz, class F, IP55, S1 — **IE 2**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**1428**	5.00	79.6 %	IE 2	0.76	1.90	1.80	1.70	P80□	**HMM2A□075P4S1□**	10.5
1.10	**1431**	7.34	81.4 %	IE 2	0.77	2.70	2.50	2.40	P90S□	**HMM2A□110P4S1□**	15.0
1.50	**1438**	9.97	82.8 %	IE 2	0.79	3.50	3.30	3.20	P90L□	**HMM2A□150P4S1□**	17.5
2.20	**1441**	14.6	84.3 %	IE 2	0.81	4.90	4.70	4.50	P100L1□	**HMM2A□220P4S1□**	24.0
3.00	**1429**	20.1	85.5 %	IE 2	0.82	6.50	6.20	6.00	P100L2□	**HMM2A□300P4S1□**	25.0
4.00	**1444**	26.5	86.6 %	IE 2	0.82	8.60	8.10	7.80	P112M□	**HMM2A□400P4S1□**	32.0
5.50	**1456**	36.1	87.7 %	IE 2	0.83	11.5	10.9	10.5	P132S1□	**HMM2A□550P4S1□**	46.0
7.50	**1455**	49.3	88.7 %	IE 2	0.84	15.3	14.5	14.0	P132M□	**HMM2A□750P4S1□**	54.0
11.0	**1470**	71.5	89.8 %	IE 2	0.84	22.2	21.0	20.3	P160M□	**HMM2A□111P4S1□**	77.0
15.0	**1470**	97.5	90.6 %	IE 2	0.85	29.6	28.1	27.1	P160L□	**HMM2A□151P4S1□**	90.0
18.5	**1475**	120	91.2 %	IE 2	0.86	35.8	34.0	32.8	P180M□	**HMM2Y□185P4S1□**	178
22.0	**1475**	142	91.6 %	IE 2	0.86	42.4	40.3	38.9	P180L□	**HMM2Y□221P4S1□**	193
30.0	**1480**	194	92.3 %	IE 2	0.87	57.4	54.6	52.6	P200L□	**HMM2Y□301P4S1□**	250
37.0	**1485**	238	92.7 %	IE 2	0.87	69.7	66.2	63.8	P225S□	**HMM2Y□371P4S1□**	310
45.0	**1485**	289	93.1 %	IE 2	0.87	84.4	80.2	77.3	P225M□	**HMM2Y□451P4S1□**	347
55.0	**1480**	355	93.5 %	IE 2	0.87	103	97.6	94.1	P250M□	**HMM2Y□551P4S1□**	429
75.0	**1485**	482	94.0 %	IE 2	0.87	139	132	128	P280S□	**HMM2Y□751P4S1□**	578
90.0	**1489**	577	94.2 %	IE 2	0.87	167	159	153	P280M□	**HMM2Y□901P4S1□**	649
110	**1492**	704	94.5 %	IE 2	0.88	201	191	184	P315S□	**HMM2Y□112P4S1□**	990
132	**1486**	849	94.7 %	IE 2	0.88	241	229	220	P315M□	**HMM2Y□132P4S1□**	1100
160	**1486**	1029	94.9 %	IE 2	0.89	288	273	264	P315L1□	**HMM2Y□162P4S1□**	1177
200	**1487**	1285	95.1 %	IE 2	0.89	359	341	329	P315L2□	**HMM2Y□202P4S1□**	1254
250	**1485**	1608	95.1 %	IE 2	0.90	444	422	406	P355M□	**HMM2Y□252P4S1□**	1936
315	**1490**	2020	95.1 %	IE 2	0.90	559	531	512	P355L□	**HMM2Y□315P4S1□**	2112

4-pole, 1400 rpm, 50Hz, class F, IP55, S3-70% — **IE 1**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**1390**	5.16	72.1 %	IE 1	0.76	2.10	2.00	1.90	P80□	**HMM1A□075P4S3□**	10.0
1.10	**1390**	7.56	75.0 %	IE 1	0.77	2.90	2.90	2.60	P90S□	**HMM1A□110P4S3□**	12.0
1.50	**1390**	10.3	77.2 %	IE 1	0.79	3.70	3.70	3.40	P90L□	**HMM1A□150P4S3□**	14.0
2.20	**1410**	14.9	79.7 %	IE 1	0.81	5.20	5.20	4.70	P100L1□	**HMM1A□220P4S3□**	21.0
3.00	**1410**	20.3	81.5 %	IE 1	0.82	6.80	6.80	6.20	P100L2□	**HMM1A□300P4S3□**	23.5
4.00	**1435**	26.6	83.1 %	IE 1	0.82	8.90	8.90	8.20	P112M□	**HMM1A□400P4S3□**	29.5
5.50	**1440**	36.5	84.7 %	IE 1	0.83	11.9	11.9	10.9	P132S□	**HMM1A□550P4S3□**	41.0
7.50	**1440**	49.8	86.0 %	IE 1	0.84	15.8	15.8	14.4	P132M□	**HMM1A□750P4S3□**	47.5
11.0	**1460**	72.0	87.6 %	IE 1	0.84	22.7	22.7	20.8	P160M□	**HMM1A□111P4S3□**	72.5
15.0	**1460**	98.1	88.7 %	IE 1	0.85	30.2	30.2	27.7	P160L□	**HMM1A□151P4S3□**	85.5

Dane techniczne

Technical data

6-pole, 900 rpm, 50Hz, class F, IP55, S1 — **IE 1**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.18	**865**	1.99	57.3 %	IE 1	0.66	0.72	0.69	0.66	P71□	**HMM1A□018P6S1□**	6.00
0.25	**863**	2.77	60.5 %	IE 1	0.68	0.92	0.88	0.85	P71□	**HMM1A□025P6S1□**	6.30
0.37	**890**	3.97	64.1 %	IE 1	0.70	1.25	1.19	1.15	P80□	**HMM1A□037P6S1□**	8.90
0.55	**890**	5.90	67.5 %	IE 1	0.72	1.72	1.63	1.57	P80□	**HMM1A□055P6S1□**	10.4

6-pole, 900 rpm, 50Hz, class F, IP55, S1 — **IE 2**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**944**	7.59	75.9 %	IE 2	0.72	2.10	2.00	1.90	P90S□	**HMM2A□075P6S1□**	13.5
1.10	**928**	11.3	78.1 %	IE 2	0.73	2.90	2.80	2.70	P90L□	**HMM2A□110P6S1□**	18.0
1.50	**939**	15.3	79.8 %	IE 2	0.75	3.80	3.60	3.50	P100L□	**HMM2A□150P6S1□**	22.5
2.20	**936**	22.5	81.8 %	IE 2	0.76	5.40	5.10	4.90	P112M□	**HMM2A□220P6S1□**	27.0
3.00	**960**	29.9	83.3 %	IE 2	0.76	7.20	6.80	6.06	P132S□	**HMM2A□300P6S1□**	38.5
4.00	**957**	39.9	84.6 %	IE 2	0.76	9.50	9.00	8.70	P132M1□	**HMM2A□400P6S1□**	44.5
5.50	**962**	54.6	86.0 %	IE 2	0.77	12.6	12.0	11.6	P132M2□	**HMM2A□550P6S1□**	52.5
7.50	**975**	73.5	87.2 %	IE 2	0.77	17.0	16.1	15.5	P160M□	**HMM2A□750P6S1□**	77.0
11.0	**975**	108	88.7 %	IE 2	0.78	24.2	22.9	22.1	P160L□	**HMM2A□111P6S1□**	90.0
15.0	**975**	147	89.7 %	IE 2	0.81	31.4	29.8	28.7	P180L□	**HMM2Y□151P6S1□**	183
18.5	**985**	179	90.4 %	IE 2	0.81	38.4	36.5	35.1	P200L1□	**HMM2Y□185P6S1□**	226
22.0	**980**	214	90.9 %	IE 2	0.83	44.3	42.1	40.6	P200L2□	**HMM2Y□221P6S1□**	242
30.0	**985**	291	91.7 %	IE 2	0.84	59.2	56.2	54.2	P225M□	**HMM2Y□301P6S1□**	319
37.0	**985**	359	92.2 %	IE 2	0.86	70.9	67.4	64.9	P250M□	**HMM2Y□371P6S1□**	407
45.0	**990**	434	92.7 %	IE 2	0.86	85.8	81.5	78.5	P280S□	**HMM2Y□451P6S1□**	539
55.0	**994**	529	93.1 %	IE 2	0.86	104	99.2	95.6	P280M□	**HMM2Y□551P6S1□**	594
75.0	**992**	722	93.7 %	IE 2	0.86	141	134	130	P315S□	**HMM2Y□751P6S1□**	935
90.0	**991**	868	94.0 %	IE 2	0.86	169	161	155	P315M□	**HMM2Y□901P6S1□**	1056
110	**991**	1060	94.3 %	IE 2	0.86	206	196	189	P315L1□	**HMM2Y□112P6S1□**	1166
132	**990**	1274	94.6 %	IE 2	0.87	244	232	223	P315L2□	**HMM2Y□132P6S1□**	1232
160	**990**	1544	94.8 %	IE 2	0.88	291	277	267	P355M1□	**HMM2Y□162P6S1□**	1848
200	**991**	1928	95.0 %	IE 2	0.88	364	345	333	P355M3□	**HMM2Y□202P6S1□**	1958
250	**992**	2408	95.0 %	IE 2	0.88	454	432	416	P355L2□	**HMM2Y□252P6S1□**	2145

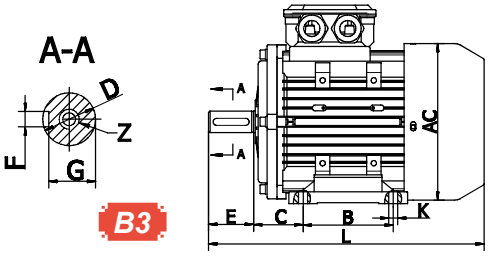
6-pole, 900 rpm, 50Hz, class F, IP55, S3-70% — **IE 1**

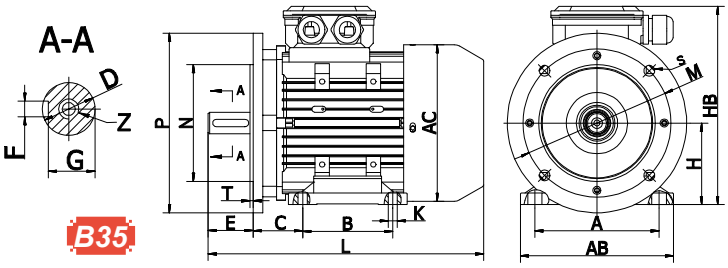
Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**910**	7.87	70.0 %	IE 1	0.72	2.26	2.15	2.07	P90S□	**HMM1A□075P6S3□**	12.1
1.10	**910**	11.5	72.9 %	IE 1	0.73	3.14	2.98	2.88	P90L□	**HMM1A□110P6S3□**	13.7
1.50	**920**	15.6	75.2 %	IE 1	0.75	4.04	3.84	3.70	P100L□	**HMM1A□150P6S3□**	23.0
2.20	**935**	22.5	77.7 %	IE 1	0.76	5.66	5.38	5.18	P112M□	**HMM1A□220P6S3□**	28.2
3.00	**960**	29.9	79.7 %	IE 1	0.76	7.53	7.15	6.89	P132S□	**HMM1A□300P6S3□**	40.3
4.00	**960**	39.8	81.4 %	IE 1	0.76	9.82	9.33	9.00	P132M1□	**HMM1A□400P6S3□**	43.0
5.50	**960**	54.7	83.1 %	IE 1	0.77	13.1	12.4	12.0	P132M2□	**HMM1A□550P6S3□**	47.2
7.50	**970**	73.9	84.7 %	IE 1	0.77	17.5	16.6	16.0	P160M□	**HMM1A□750P6S3□**	70.6
11.0	**970**	108	86.4 %	IE 1	0.78	24.8	23.6	22.7	P160L□	**HMM1A□111P6S3□**	85.0

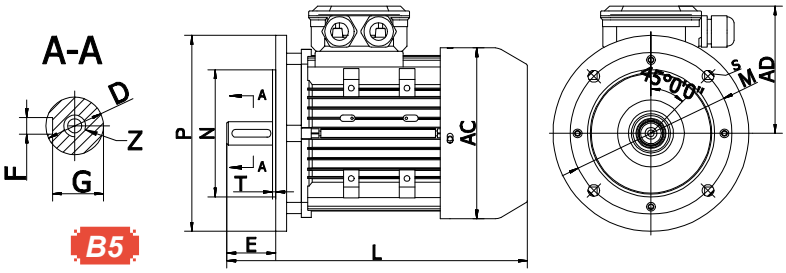
Wymiary silnika

Dimensions

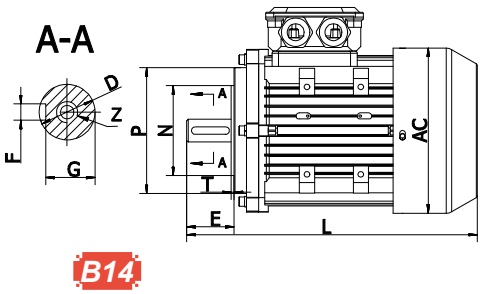
HMM1A□ / HMM2A□

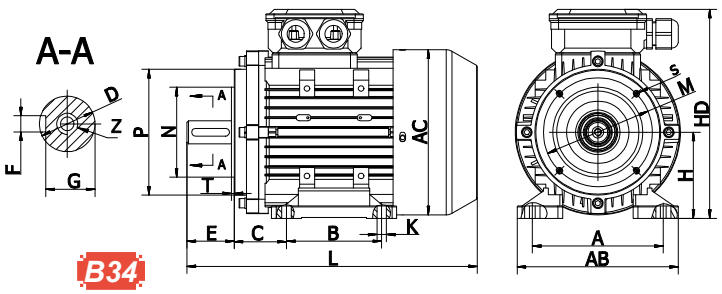






Typ *Type*		Obudowa *Frame*	Wymiary montażowe / *Mounting dimensions*															Wymiary zewnętrzne *Overall dimensions*				
												kołnierz / *flange* B5										
			A	B	C	D	E	F	G	H	K	Z	P	M	N	S	T	AB	AC	AD	HD	L
HMM1		56	90	71	36	9	20	3	7.2	56	5.8	M4×12	120	100	80	7	3	110	111	89	145	197
HMM1		63	100	80	40	11	23	4	8.5	63	7	M4×12	140	115	95	10	3	120	120	107	170	212
HMM1		71	112	90	45	14	30	5	11	71	7	M5×12	160	130	110	10	3.5	132	133	114	185	240
HMM1	HMM2	80	125	100	50	19	40	6	15.5	80	10	M6×16	200	165	130	12	3.5	152	153	122	202	290
HMM1	HMM2	90S	140	100	56	24	50	8	20	90	10	M8×19	200	165	130	12	3.5	168	172	135	225	315
HMM1	HMM2	90L	140	125	56	24	50	8	20	90	10	M8×19	200	165	130	12	3.5	168	172	135	225	340
HMM1	HMM2	100L	160	140	63	28	60	8	24	100	12	M10×22	250	215	180	15	4	192	193	145	245	370
HMM1	HMM2	112M	190	140	70	28	60	8	24	112	12	M10×22	250	215	180	15	4	222	223	165	277	395
HMM1	HMM2	132S	216	140	89	38	80	10	33	132	12	M12×28	300	265	230	15	4	248	255	187	319	470
HMM1	HMM2	132M	216	178	89	38	80	10	33	132	12	M12×28	300	265	230	15	4	248	255	187	319	500
HMM1	HMM2	160M	254	210	108	42	110	12	37	160	15	M16×36	350	300	250	19	5	315	330	255	415	605
HMM1	HMM2	160L	254	254	108	42	110	12	37	160	15	M16×36	350	300	250	19	5	315	330	255	415	680

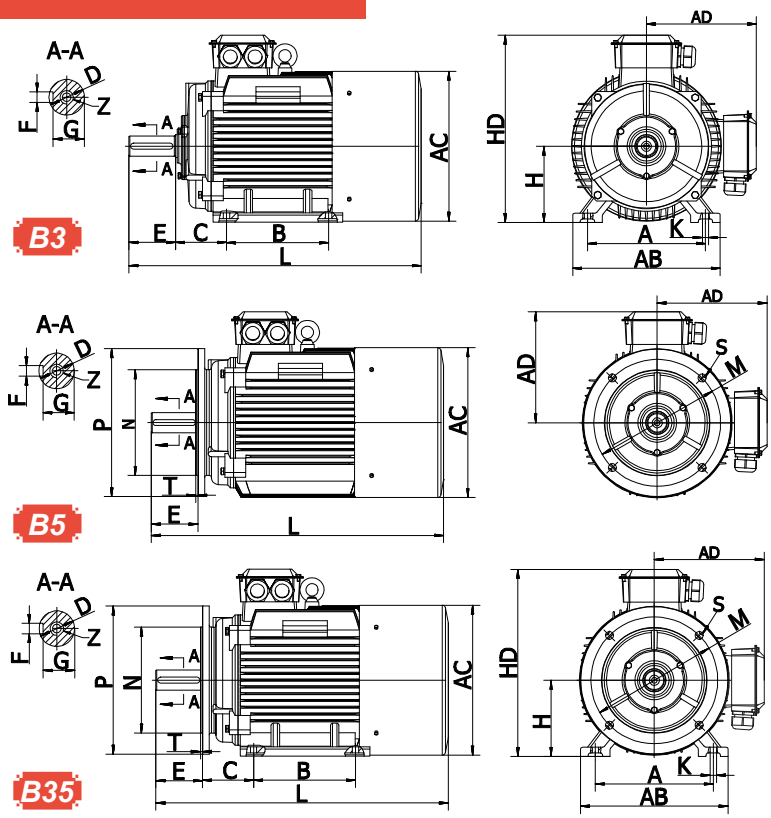




Typ *Type*		Obudowa *Frame*	Wymiary montażowe / *Mounting dimensions*																				Wymiary zewnętrzne *Overall dimensions*				
													B14-A					B14-B									
			A	B	C	D	E	F	G	H	K	Z	P	M	N	S	T	P	M	N	S	T	AB	AC	AD	HD	L
HMM1		56	90	71	36	9	20	3	7.2	56	5.8	M4×12	80	65	50	4-M5	2.5	105	85	70	M6	2.5	110	111	89	145	197
HMM1		63	100	80	40	11	23	4	8.5	63	7	M4×12	90	75	60	4-M5	2.5	120	100	80	M6	3	120	120	107	170	212
HMM1		71	112	90	45	14	30	5	11	71	7	M5×12	105	85	70	4-M6	2.5	140	115	95	M8	3	132	133	114	185	240
HMM1	HMM2	80	125	100	50	19	40	6	15.5	80	10	M6×16	120	100	80	4-M6	3	160	130	110	M8	3.5	152	153	122	202	290
HMM1	HMM2	90S	140	100	56	24	50	8	20	90	10	M8×19	140	115	95	4-M8	3	160	130	110	M8	3.5	168	172	135	225	315
HMM1	HMM2	90L	140	125	56	24	50	8	20	90	10	M8×19	140	115	95	4-M8	3	160	130	110	M8	3.5	168	172	135	225	340
HMM1	HMM2	100L	160	140	63	28	60	8	24	100	12	M10×22	160	130	110	4-M8	3.5	200	165	130	M10	3.5	192	193	145	245	370
HMM1	HMM2	112M	190	140	70	28	60	8	24	112	12	M10×22	160	130	110	4-M8	3.5	200	165	130	M10	3.5	222	223	165	277	395
HMM1	HMM2	132S	216	140	89	38	80	10	33	132	12	M12×28	200	165	130	4-M10	3.5	250	215	180	M12	4	248	255	187	319	470
HMM1	HMM2	132M	216	178	89	38	80	10	33	132	12	M12×28	200	165	130	4-M10	3.5	250	215	180	M12	4	248	255	187	319	500
HMM1	HMM2	160M	254	210	108	42	110	12	37	160	15	M16×36	250	215	180	4-M12	4	300	265	230	M12	4	315	330	255	415	605
HMM1	HMM2	160L	254	254	108	42	110	12	37	160	15	M16×36	250	215	180	4-M12	4	300	265	230	M12	4	315	330	255	415	680

Wymiary silnika *Dimensions*

HMM1Y□ / HMM2Y□



Typ *Type*	Obudowa *Frame*	Wymiary montażowe / *Mounting dimensions*															Wymiary zewnętrzne *Overall dimensions*				
												kołnierz / *flange* B5									
		A	B	C	D	E	F	G	H	K	Z	P	M	N	S	T	AB	AC	AD	HD	L
HMM1 HMM2	80M	125	100	50	19	40	6	15.5	80	10	M6×16	200	165	130	4-Φ12	3.5	152	153	122	202	290
HMM1 HMM2	90S	140	100	56	24	50	8	20	90	10	M8×19	200	165	130	4-Φ12	3.5	168	172	135	225	315
HMM1 HMM2	90L	140	125	56	24	50	8	20	90	10	M8×19	200	165	130	4-Φ12	3.5	168	172	135	225	340
HMM1 HMM2	100L	160	140	63	28	60	8	24	100	12	M10×22	250	215	180	4-Φ15	4	192	193	145	245	370
HMM1 HMM2	112M	190	140	70	28	60	8	24	112	12	M10×22	250	215	180	4-Φ15	4	222	223	165	277	395
HMM1 HMM2	132S	216	140	89	38	80	10	33	132	12	M12×28	300	265	230	4-Φ15	4	248	265	208	340	470
HMM1 HMM2	132M	216	178	89	38	80	10	33	132	12	M12×28	300	265	230	4-Φ15	4	248	265	208	340	500
HMM1 HMM2	160M	254	210	108	42	110	12	37	160	15	M16×36	350	300	250	4-Φ19	5	315	330	260	420	605
HMM1 HMM2	160L	254	254	108	42	110	12	37	160	15	M16×36	350	300	250	4-Φ19	5	315	330	260	420	680
HMM1 HMM2	180M	279	241	121	48	110	14	42.5	180	15	M16×36	350	300	250	4-Φ19	5	350	352	265	445	694
HMM1 HMM2	180L	279	279	121	48	110	14	42.5	180	15	M16×36	350	300	250	4-Φ19	5	350	352	265	445	732
HMM1 HMM2	200L	318	305	133	55	110	16	49	200	19	M20×42	400	350	300	4-Φ19	5	390	394	315	515	774
HMM1 HMM2	225S(4-8P)	356	286	149	60	140	18	53	225	19	M20×42	450	400	350	8-Φ19	5	435	442	335	560	820
HMM1 HMM2	225M(2P)	356	311	149	55	110	16	49	225	19	M20×42	450	400	350	8-Φ19	5	435	442	335	560	813
HMM1 HMM2	225M(4-8P)	356	311	149	60	140	18	53	225	19	M20×42	450	400	350	8-Φ19	5	435	442	335	560	873
HMM1 HMM2	250M(2P)	406	349	168	60	140	18	53	250	24	M20×42	550	500	450	8-Φ19	5	490	481	375	625	922
HMM1 HMM2	250M(4-8P)	406	349	168	65	140	18	58	250	24	M20×42	550	500	450	8-Φ19	5	490	481	375	625	922
HMM1 HMM2	280S(2P)	457	368	190	65	140	18	58	280	24	M20×42	550	500	450	8-Φ19	5	547	550	400	680	991
HMM1 HMM2	280M(2P)	457	419	190	65	140	18	58	280	24	M20×42	550	500	450	8-Φ19	5	547	550	400	680	1040
HMM1 HMM2	280S(4-8P)	457	368	190	75	140	20	67.5	280	24	M20×42	550	500	450	8-Φ19	5	547	550	400	680	991
HMM1 HMM2	280M(4-8P)	457	419	190	75	140	20	67.5	280	24	M20×42	550	500	450	8-Φ19	5	547	550	400	680	1040
HMM1 HMM2	315S(2P)	508	406	216	65	140	18	58	315	28	M20×42	660	600	550	8-Φ24	6	630	600	540	855	1160
HMM1 HMM2	315M(2P)	508	457	216	65	140	18	58	315	28	M20×42	660	600	550	8-Φ24	6	630	600	540	855	1270
HMM1 HMM2	315L(2P)	508	508	216	65	140	18	58	315	28	M20×42	660	600	550	8-Φ24	6	630	600	540	855	1270
HMM1 HMM2	315S(4-10P)	508	406	216	80	170	22	71	315	28	M20×42	660	600	550	8-Φ24	6	630	600	540	855	1190
HMM1 HMM2	315M(4-10P)	508	457	216	80	170	22	71	315	28	M20×42	660	600	550	8-Φ24	6	630	600	540	855	1300
HMM1 HMM2	315L(4-10P)	508	508	216	80	170	22	71	315	28	M20×42	660	600	550	8-Φ24	6	630	600	540	855	1300
HMM1 HMM2	355M(2P)	610	560	254	75	140	20	67.5	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1500
HMM1 HMM2	355L(2P)	610	630	254	75	140	20	67.5	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1500
HMM1 HMM2	355M(4-10P)	610	560	254	95	170	25	86	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1530
HMM1 HMM2	355L(4-10P)	610	630	254	95	170	25	86	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1530

Dane techniczne

Technical data

2-pole, 2800 rpm, 50Hz, class F, IP55, S1 — **IE 3**

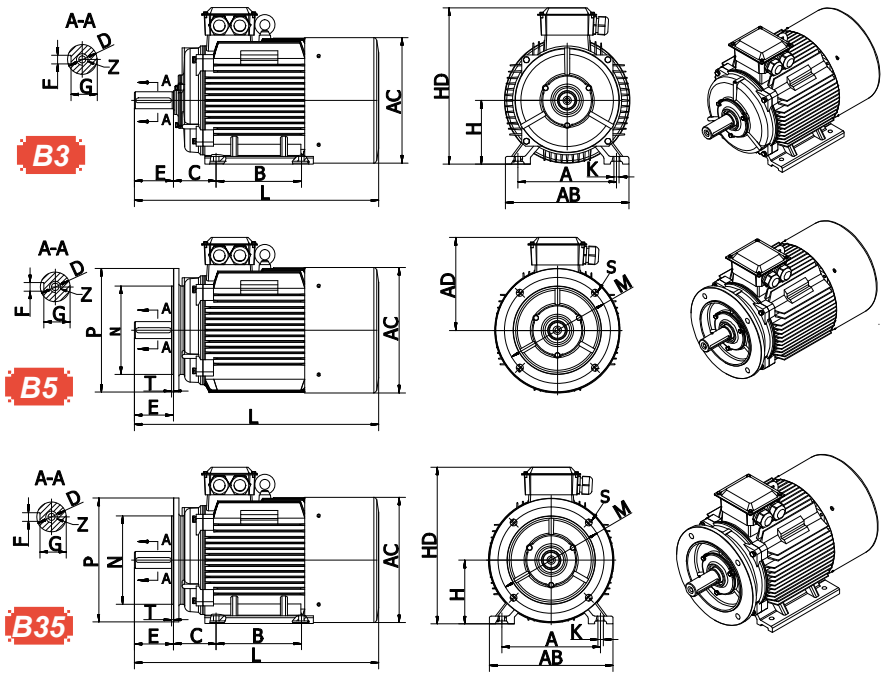
Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**2880**	2.49	80.7 %	IE 3	0.82	1.70	1.60	1.60	P80□	**HMM3A□075P2S1□**	11.0
1.10	**2880**	3.64	82.7 %	IE 3	0.83	2.40	2.30	2.20	P80□	**HMM3A□110P2S1□**	12.0
1.50	**2895**	4.96	84.2 %	IE 3	0.84	3.20	3.10	3.00	P90S□	**HMM3A□150P2S1□**	15.0
2.20	**2895**	7.28	85.9 %	IE 3	0.85	4.60	4.30	4.20	P90L□	**HMM3A□220P2S1□**	16.0
3.00	**2895**	9.92	87.1 %	IE 3	0.87	6.00	5.70	5.50	P100L□	**HMM3A□300P2S1□**	25.0
4.00	**2905**	13.2	88.1 %	IE 3	0.88	7.80	7.40	7.20	P112M□	**HMM3A□400P2S1□**	33.0
5.50	**2930**	18.0	89.2 %	IE 3	0.88	10.6	10.1	9.70	P132S1□	**HMM3A□550P2S1□**	47.0
7.50	**2930**	24.6	90.1 %	IE 3	0.88	14.4	13.7	13.2	P132S2□	**HMM3A□750P2S1□**	53.0
11.0	**2945**	35.9	91.2 %	IE 3	0.89	20.6	19.6	18.9	P160M1□	**HMM3Y□111P2S1□**	124
15.0	**2945**	48.8	91.9 %	IE 3	0.89	27.9	26.5	25.5	P160M2□	**HMM3Y□151P2S1□**	134
18.5	**2955**	60.1	92.4 %	IE 3	0.89	34.2	32.5	31.3	P160L□	**HMM3Y□185P2S1□**	162
22.0	**2955**	71.4	92.7 %	IE 3	0.89	40.5	38.5	37.1	P180M□	**HMM3Y□221P2S1□**	198
30.0	**2960**	97.2	93.3 %	IE 3	0.89	54.9	52.1	50.3	P200L1□	**HMM3Y□301P2S1□**	258
37.0	**2960**	120	93.7 %	IE 3	0.89	67.4	64.0	61.7	P200L2□	**HMM3Y□371P2S1□**	278
45.0	**2965**	144	94.0 %	IE 3	0.90	80.8	76.8	74.0	P225M□	**HMM3Y□451P2S1□**	342
55.0	**2970**	177	94.3 %	IE 3	0.90	98.5	93.5	90.2	P250M□	**HMM3Y□551P2S1□**	450
75.0	**2975**	240	94.7 %	IE 3	0.90	134	127	123	P280S□	**HMM3Y□751P2S1□**	600
90.0	**2975**	289	95.0 %	IE 3	0.90	160	152	146	P280M□	**HMM3Y□901P2S1□**	660
110	**2978**	352	95.2 %	IE 3	0.90	195	185	179	P315S□	**HMM3Y□112P2S1□**	1032
132	**2978**	423	95.4 %	IE 3	0.90	234	222	214	P315M□	**HMM3Y□132P2S1□**	1152
160	**2980**	513	95.6 %	IE 3	0.91	279	266	256	P315L1□	**HMM3Y□162P2S1□**	1224
200	**2980**	641	95.8 %	IE 3	0.91	349	331	319	P315L2□	**HMM3Y□202P2S1□**	1296
250	**2982**	800	96.0 %	IE 3	0.91	435	414	398	P355M□	**HMM3Y□252P2S1□**	2040
315	**2982**	1010	96.2 %	IE 3	0.91	547	519	501	P355L□	**HMM3Y□315P2S1□**	2220

4-pole, 1400 rpm, 50Hz, class F, IP55, S1 — **IE 3**

Moc *Power* [kW]	Prędkość *Speed* [rpm]	Moment *Torque* [Nm]	Klasa sprawności *Efficiency class*		Wsp. mocy *Power factor* [cos ϕ]	Prąd znamionowy [A] *Rated current [A]* 380 V	400 V	415 V	Obudowa *Frame*	Oznaczenie kodowe *Order classification*	Masa *Weight* [kg]
0.75	**1420**	5.00	82.5 %	IE 3	0.75	1.80	1.70	1.70	P80□	**HMM3A□075P4S1□**	12.0
1.10	**1445**	7.34	84.1 %	IE 3	0.76	2.60	2.50	2.40	P90S□	**HMM3A□110P4S1□**	14.0
1.50	**1445**	9.97	85.3 %	IE 3	0.77	3.50	3.30	3.20	P90L□	**HMM3A□150P4S1□**	17.0
2.20	**1435**	14.6	86.7 %	IE 3	0.81	4.80	4.50	4.40	P100L1□	**HMM3A□220P4S1□**	25.0
3.00	**1435**	20.1	87.7 %	IE 3	0.82	6.30	6.00	5.80	P100L2□	**HMM3A□300P4S1□**	28.0
4.00	**1440**	26.5	88.6 %	IE 3	0.82	8.40	7.90	7.70	P112M□	**HMM3A□400P4S1□**	35.0
5.50	**1460**	36.1	89.6 %	IE 3	0.83	11.2	10.7	10.3	P132S1□	**HMM3A□550P4S1□**	49.0
7.50	**1460**	49.3	90.4 %	IE 3	0.84	15.0	14.3	13.7	P132M□	**HMM3A□750P4S1□**	57.0
11.0	**1465**	71.5	91.4 %	IE 3	0.85	21.5	20.4	19.7	P160M□	**HMM3Y□111P4S1□**	128
15.0	**1465**	97.5	92.1 %	IE 3	0.86	28.8	27.3	26.3	P160L□	**HMM3Y□151P4S1□**	156
18.5	**1470**	120	92.6 %	IE 3	0.86	35.3	33.5	32.3	P180M□	**HMM3Y□185P4S1□**	194
22.0	**1470**	142	93.0 %	IE 3	0.86	41.8	39.7	38.3	P180L□	**HMM3Y□221P4S1□**	210
30.0	**1475**	194	93.6 %	IE 3	0.86	56.6	53.8	51.9	P200L□	**HMM3Y□301P4S1□**	272
37.0	**1485**	238	93.9 %	IE 3	0.86	69.6	66.1	63.7	P225S□	**HMM3Y□371P4S1□**	338
45.0	**1485**	289	94.2 %	IE 3	0.86	84.4	80.2	77.3	P225M□	**HMM3Y□451P4S1□**	378
55.0	**1485**	355	94.6 %	IE 3	0.86	103	97.6	94.1	P250M□	**HMM3Y□551P4S1□**	468
75.0	**1486**	482	95.0 %	IE 3	0.88	136	130	125	P280S□	**HMM3Y□751P4S1□**	630
90.0	**1486**	577	95.2 %	IE 3	0.88	163	155	150	P280M□	**HMM3Y□901P4S1□**	708
110	**1488**	704	95.4 %	IE 3	0.89	197	187	180	P315S□	**HMM3Y□112P4S1□**	1080
132	**1488**	849	95.6 %	IE 3	0.89	236	224	216	P315M□	**HMM3Y□132P4S1□**	1200
160	**1488**	1029	95.8 %	IE 3	0.89	285	271	261	P315L1□	**HMM3Y□162P4S1□**	1284
200	**1490**	1285	96.0 %	IE 3	0.90	352	334	322	P315L2□	**HMM3Y□202P4S1□**	1368
250	**1490**	1608	96.0 %	IE 3	0.90	440	418	403	P355M□	**HMM3Y□252P4S1□**	2112
315	**1490**	2020	96.0 %	IE 3	0.90	554	526	507	P355L□	**HMM3Y□315P4S1□**	2304

Wymiary silnika / *Dimensions*

HMM3A□ / HMM3Y□



Typ *Type*	Obudowa *Frame*	Wymiary montażowe / *Mounting dimensions*															Wymiary zewnętrzne *Overall dimensions*				
												kołnierz / *flange* B5									
		A	B	C	D	E	F	G	H	K	Z	P	M	N	S	T	AB	AC	AD	HD	L
HMM3	80M	125	100	50	19	40	6	15.5	80	10	M6×16	200	165	130	4-Φ12	3.5	165	153	122	202	300
HMM3	90S	140	100	56	24	50	8	20	90	10	M8×19	200	165	130	4-Φ12	3.5	180	172	135	225	326
HMM3	90L	140	125	56	24	50	8	20	90	10	M8×19	200	165	130	4-Φ12	3.5	180	172	135	225	381
HMM3	100L	160	140	63	28	60	8	24	100	12	M10×22	250	215	180	4-Φ15	4	200	193	145	245	428
HMM3	112M	190	140	70	28	60	8	24	112	12	M10×22	250	215	180	4-Φ15	4	230	223	165	277	440
HMM3	132S	216	140	89	38	80	10	33	132	12	M12×28	300	265	230	4-Φ15	4	270	255	187	319	510
HMM3	132M	216	178	89	38	80	10	33	132	12	M12×28	300	265	230	4-Φ15	4	270	255	187	319	550
HMM3	160M	254	210	108	42	110	12	37	160	15	M16×36	350	300	250	4-Φ19	5	320	330	255	415	730
HMM3	160L	254	254	108	42	110	12	37	160	15	M16×36	350	300	250	4-Φ19	5	320	330	255	415	760
HMM3	180M	279	241	121	48	110	14	42.5	180	15	M16×36	350	300	250	4-Φ19	5	355	352	265	445	770
HMM3	180L	279	279	121	48	110	14	42.5	180	15	M16×36	350	300	250	4-Φ19	5	355	352	265	445	800
HMM3	200L	318	305	133	55	110	16	49	200	19	M20×42	400	350	300	4-Φ19	5	395	394	315	515	860
HMM3	225S(4-8P)	356	286	149	60	140	18	53	225	19	M20×42	450	400	350	8-Φ19	5	435	442	335	560	830
HMM3	225M(2P)	356	311	149	55	110	16	49	225	19	M20×42	450	400	350	8-Φ19	5	435	442	335	560	830
HMM3	225M(4-8P)	356	311	149	60	140	18	53	225	19	M20×42	450	400	350	8-Φ19	5	435	442	335	560	860
HMM3	250M(2P)	406	349	168	60	140	18	53	250	24	M20×42	550	500	450	8-Φ19	5	490	481	375	625	990
HMM3	250M(4-8P)	406	349	168	65	140	18	58	250	24	M20×42	550	500	450	8-Φ19	5	490	481	375	625	990
HMM3	280S(2P)	457	368	190	65	140	18	58	280	24	M20×42	550	500	450	8-Φ19	5	550	550	400	680	990
HMM3	280M(2P)	457	419	190	65	140	18	58	280	24	M20×42	550	500	450	8-Φ19	5	550	550	400	680	1040
HMM3	280S(4-8P)	457	368	190	75	140	20	67.5	280	24	M20×42	550	500	450	8-Φ19	5	550	550	400	680	990
HMM3	280M(4-8P)	457	419	190	75	140	20	67.5	280	24	M20×42	550	500	450	8-Φ19	5	550	550	400	680	1040
HMM3	315S(2P)	508	406	216	65	140	18	58	315	28	M20×42	660	600	550	8-Φ24	6	635	600	540	855	1180
HMM3	315M(2P)	508	457	216	65	140	18	58	315	28	M20×42	660	600	550	8-Φ24	6	635	600	540	855	1290
HMM3	315L(2P)	508	508	216	65	140	18	58	315	28	M20×42	660	600	550	8-Φ24	6	635	600	540	855	1290
HMM3	315S(4-10P)	508	406	216	80	170	22	71	315	28	M20×42	660	600	550	8-Φ24	6	635	600	540	855	1210
HMM3	315M(4-10P)	508	457	216	80	170	22	71	315	28	M20×42	660	600	550	8-Φ24	6	635	600	540	855	1320
HMM3	315L(4-10P)	508	508	216	80	170	22	71	315	28	M20×42	660	600	550	8-Φ24	6	635	600	540	855	1320
HMM3	355M(2P)	610	560	254	75	140	20	67.5	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1500
HMM3	355L(2P)	610	630	254	75	140	20	67.5	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1500
HMM3	355M(4-10P)	610	560	254	95	170	25	86	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1530
HMM3	355L(4-10P)	610	630	254	95	170	25	86	355	28	M20×42	800	740	680	8-Φ24	6	730	710	655	1010	1530

Helical in-line gearmotors
WAHF
Motoreduktory walcowe

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Wałek wyjściowy *Shaft dimeter*
WAHF01	120 Nm	ϕ 20 [mm]
WAHF02	200 Nm	ϕ 25 [mm]
WAHF03	300 Nm	ϕ 30 [mm]
WAHF04	500 Nm	ϕ 35 [mm]

Zakres dostępnych przełożeń *Range of ratios*	
WAHF01	3.82 ... 53.33
WAHF02	3.66 ... 54.00
WAHF03	3.74 ... 58.09
WAHF04	3.74 ... 58.09

Zakres mocy wejściowej silnika [kW] *Applicable motor power [kW]*
0.12 ... 4.00

Właściwości techniczne
Technical features

Motoreduktory walcowe serii WAHF to produkt nowej generacji, który został zaprojektowany w oparciu o system modułowy.
WAHF series helical in-line gearmotors is a new generation integrated product, which designed basing on the modular system.

Motoreduktory WAHF można w prosty sposób skonfigurować pod własne potrzeby zmieniając kołnierze lub łapy.
It is possible to set up the version required using flanges or feet.

Zastosowane smarowanie olejem syntetycznym umożliwia długą i bezawaryjną pracę bez względu na pozycję montażową motoreduktora WAHF.
Permanent synthetic oil long-life lubrication applied for this reason they can be installed in any assembly position and do not require maintenance.

Hypoid gearmotors
THF
Motoreduktory hipoidalne

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Wałek wyjściowy *Shaft dimeter*
THF 28	130 Nm	ϕ 25 [mm]
THF 38	200 Nm	ϕ 25 [mm]
THF 48	350 Nm	ϕ 28 [mm]
THF 58	500 Nm	ϕ 35 [mm]
THF 68	750 Nm	ϕ 42 [mm]

Zakres dostępnych przełożeń *Range of ratios*	
THF 28	7.73 ... 291.79
THF 38	7.60 ... 302.50
THF 48	7.48 ... 297.21
THF 58	7.48 ... 295.18
THF 68	7.49 ... 296.10

Zakres mocy wejściowej silnika [kW] *Applicable motor power [kW]*
0.12 ... 5.50

Właściwości techniczne
Technical features

Większa obciążalność niż przekładni stożkowych o takich samych wymiarach, dzięki konstrukcji kół zębatych a także dzięki przesunięciu hipoidalnemu – wydłużenie czynnej długości zęba.
Higher load rating than that of bevel gears with the same dimensions, thanks to the design of the toothed gear and also thanks to the hypoid shift – the elongation of the active length of the tooth.

Równomierność (gęstość) przekazywania momentu obrotowego.
Uniformity of (dense) torque transmission.

Utrzymywana prawidłowa praca przekładni nawet przy wystąpieniu chwilowego wzrostu sił.
Gear operates correctly even in case of momentary force growth.

Worm gearmotors
SHF
Motoreduktory ślimakowe

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Wałek wyjściowy *Shaft dimeter*
SHF 025	15 Nm	ϕ 11 [mm]
SHF 030	20 Nm	ϕ 14 [mm]
SHF 040	45 Nm	ϕ 18 [mm]
SHF 050	85 Nm	ϕ 25 [mm]
SHF 063	160 Nm	ϕ 25 [mm]
SHF 075	230 Nm	ϕ 28 [mm]
SHF 090	410 Nm	ϕ 35 [mm]
SHF 110	725 Nm	ϕ 42 [mm]
SHF 130	1050 Nm	ϕ 45 [mm]
SHF 150	1550 Nm	ϕ 50 [mm]

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	7.5 ... 100
podwójna* / *double**	100 ... 5000

* dwie przekładnie ślimakowe skręcone ze sobą
** double reduction wormgearmotors*

Właściwości techniczne
Technical features

Modułowa konstrukcja przekładni SHF wyróżnia się szerokim wyborem akcesoriów wejściowych i wyjściowych.
The high degree of modularity is a design feature of SHF wormgearmotors range thanks to a wide selection of input and output kits.

Podwójne łożysko stożkowe na wejściu przekładni o wielkości mechanicznej 110, 130 i 150.
Double taper roller bearing on sizes 110, 130, 150.

Obudowa aluminiowa w przekładniach o wielkościach mechanicznych od 025 do 090.
Obudowa żeliwna w przekładniach 110, 130 i 150.
Die-cast aluminum housing on sizes from 025 to 090.
Cast iron housing on sizes 110, 130 and 150.

Precision planetary servo gear
ZB / ZE
Precyzyjne przekładnie planetarne

Typ *Type*	Moment T_{2N} (max.) *Torque T_{2N} (max.)*	Luz kątowy (min.) *Backlash (min.)*
060ZB	60 Nm	≤3 arcmin
090ZB	160 Nm	≤3 arcmin
115ZB	330 Nm	≤1 arcmin
142ZB	650 Nm	≤1 arcmin
180ZB	1200 Nm	≤1 arcmin
220ZB	2000 Nm	≤1 arcmin

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	3 ... 10
dwustopniowa / *two-stage*	15 ... 100

Zakres mocy wejściowej silnika serwo [W] *Applicable servo motor power [W]*
50 ... 5000

Typ *Type*	Moment T_{2N} (max.) *Torque T_{2N} (max.)*	Luz kątowy (min.) *Backlash (min.)*
070ZE	60 Nm	≤8 arcmin
090ZE	160 Nm	≤8 arcmin
120ZE	330 Nm	≤8 arcmin
155ZE	650 Nm	≤8 arcmin
205ZE	1200 Nm	≤8 arcmin
235ZE	2000 Nm	≤8 arcmin

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	3 ... 10
dwustopniowa / *two-stage*	15 ... 100

Zakres mocy wejściowej silnika serwo [W] *Applicable servo motor power [W]*
50 ... 5000

Small planetary gearmotor DC/BLDC
DPN / BLDPN
Małe motoreduktory planetarne DC/BLDC

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Moc silnika P_{n1} *Input power P_{n1}*
32DPN	4 Nm	10W / 15W
42DPN	15 Nm	25W / 30W
52DPN	25 Nm	40W / 60W
62DPN	45 Nm	60W / 90W
72DPN	80 Nm	90W / 120W
82DPN	84 Nm	120W / 180W
105DPN	195 Nm	200W / 400W / 600W
120DPN	300 Nm	300W / 600W / 750W

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	3.65 ... 8.63
dwustopniowa / *two-stage*	14 ... 58
trójstopniowa / *three-stage*	67 ... 393

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Moc silnika P_{n1} *Input power P_{n1}*
32BLDPN	4 Nm	10W / 15W
42BLDPN	15 Nm	25W / 30W
52BLDPN	25 Nm	40W / 60W
62BLDPN	45 Nm	60W / 90W
72BLDPN	80 Nm	120W / 150W
82BLDPN	84 Nm	200W / 300W
105BLDPN	195 Nm	350W / 550W / 750W
120BLDPN	300 Nm	400W / 750W / 900W

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	3.65 ... 8.63
dwustopniowa / *two-stage*	14 ... 58
trójstopniowa / *three-stage*	67 ... 393

Small AC/DC gearmotor
IK / ZD
Małe napędy AC/DC

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Moc silnika P_{n1} *Input power P_{n1}*
2IK6	3 Nm	6W / 10W
3IK15	5 Nm	15W
4IK25	8 Nm	25W
5IK40	10 Nm	40W
5IK60	20 Nm	60W
5IK90	20 Nm	90W
5IK120	20 Nm	120W
6IK140	40 Nm	140W
6IK200	40 Nm	200W

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	3.0 ... 18
dwustopniowa / *two-stage*	25 ... 200

Typ *Type*	Moment M_2 (max.) *Torque M_2 (max.)*	Moc silnika P_{n1} *Input power P_{n1}*
Z2D06	3 Nm	6W / 10W
Z2D15	5 Nm	15W
Z3D25	8 Nm	25W
Z4D40	10 Nm	40W
Z5D60	20 Nm	60W
Z5D90	20 Nm	90W
Z5D120	20 Nm	120W
Z55D250	40 Nm	250W
Z55D300	40 Nm	300W

Zakres dostępnych przełożeń *Range of ratios*	
jednostopniowa / *single-stage*	3.0 ... 18
dwustopniowa / *two-stage*	25 ... 200

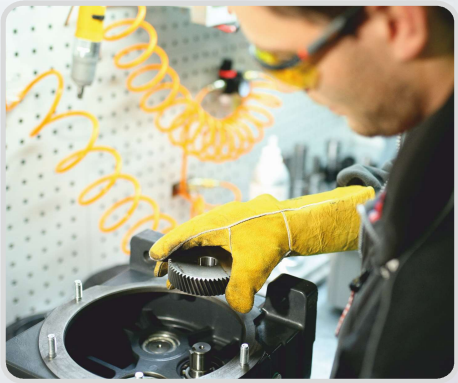
Jesteśmy technicznie autentyczni!

Przejrzyste zasady współpracy, terminowa i rzetelna realizacja umów, indywidualna obsługa oraz partnerskie kontakty, które zapewniają najwyższy poziom zadowolenia i lojalności naszych Klientów. Sposobem na tworzenie przewagi konkurencyjnej jest zapewnienie kompleksowego wsparcia naszych Klientów.

Oferowane przez nas produkty i świadczone usługi spełniają międzynarodowe standardy jakości, normy i dyrektywy, uwzględniając indywidualne potrzeby naszych Klientów oraz wymogi dynamicznie rozwijającego się rynku napędów, automatyki przemysłowej i mechatroniki.

Jesteśmy techniczne autentyczni, gdy zaczynamy zajmować się powierzonym zadaniem, wykonujemy je z pełnym zaangażowaniem i pasją. Klient może liczyć na nasze pełne wsparcie techniczne.

Naszą firmę tworzy zespół wspaniałych ludzi, zaangażowanych w doradztwo techniczne, dobór urządzeń i świadczenie usług spełniających indywidualne wymagania naszych Klientów. Oferujemy koncepcję układu napędowego, wdrażamy go i zapewniamy wsparcie techniczne.



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Our products and services meet international quality standards, norms and directives, taking the individual needs of our Customers and the requirements of the dynamically developing market of drives, industrial automation and mechatronics into account.

We are authentic in technical terms, when we embark on the entrusted task, we do it with full commitment and passion. The Customer can count on our full technical support.

Our company is made up of a team of wonderful people, engaged in technical consulting, equipment selection and provision of services that meet the individual requirements of our Customers. We offer a drive system concept, implement it and provide technical support.

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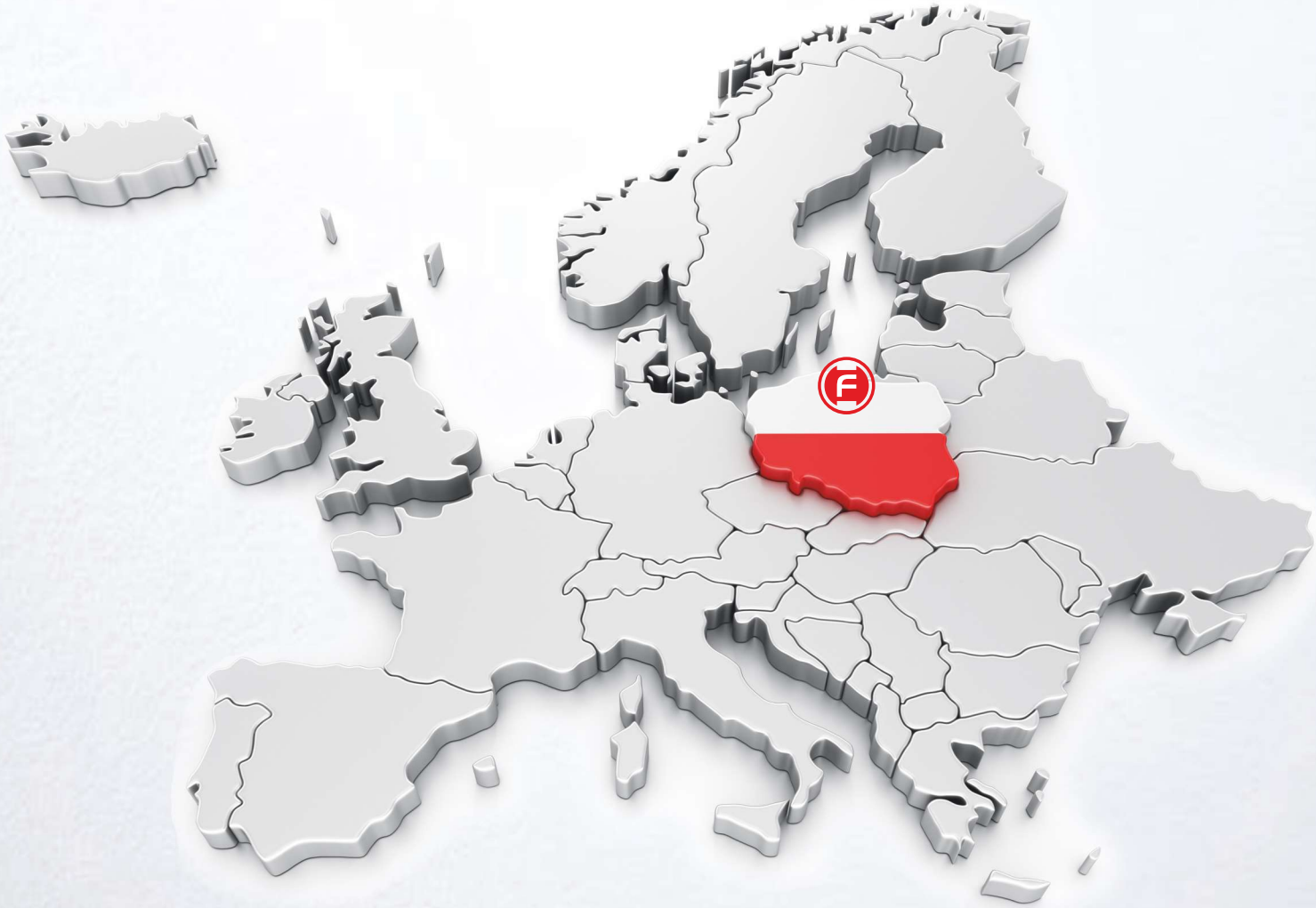

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