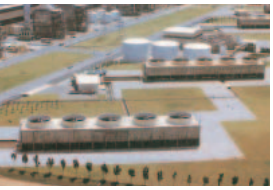
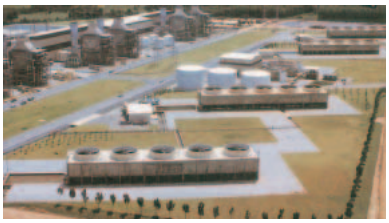
powerful solutions for cooling towers and air cooled condensers




Hansen® TRANSMISSIONS



COMPLETE AND POWERFUL SOLUTIONS FOR COOLING TOWERS

Because of the severe demands placed on cooling tower fan drives, Hansen Transmissions' drives are specially equipped to withstand exacting operating conditions, while still using a maximum of standard components. Taking these operating conditions into account, several accessories are included as standard. Hansen Transmissions designs, creates and services flexible gear units that can be adapted to specific requirements. This way Hansen Transmissions created a range of drive solutions suitable for the international cooling tower market. Proof of the products' reliability is the ISO 9001 quality certificate, showing outstanding quality, supported by an international network of after-sales Services Centres. Using standard components, we offer a range of gear units fully customised to the specific needs of the industry applications.

cooling tower

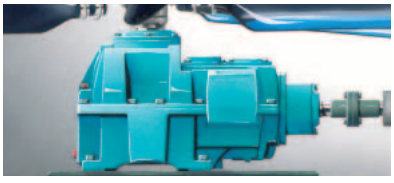
HANSEN P4: BEVEL HELICAL GEAR UNIT

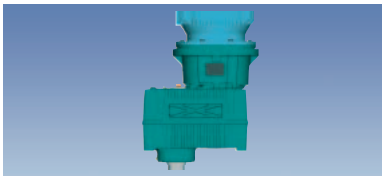
For vertical housings, the extended bearing span of the low speed shaft has been standardised to meet the particular needs of the cooling tower industry: the extended bearing span increases the dynamic stability of the gear unit. The increased distance between the propeller and the high speed input shaft reduces vibrations. A motor can be connected to the outside of the cooling tower using an all-metal disc coupling at the high-speed shaft.

HANSEN M4 ACC HELICAL GEAR UNIT

Based upon Hansen P4 and Hansen M4 technology, a dedicated design has been developed. Applying the same high quality standards, this gear unit offers a cost efficient solution with optimised gear geometry for lower noise levels. The monobloc concept ensures higher stiffness of the housing. As a standard, these units come with a lantern housing that allows for connection of a motor on the top of the gear unit.

This model is used mainly in air-cooled steam condensation plants which are ideal in dry environments where water resources are scarce. The cooling fan's motor is located in the air stream of the air-cooled refrigerant condenser.



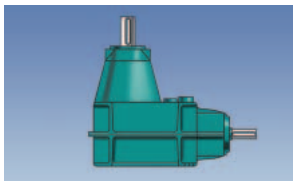


industry

HANSEN P4: SMALL IS BEAUTIFUL

The Hansen P4 "Z – B" range caters for 3 sizes available in two different assembly arrangements, with or without extended bearing housing at the low speed shaft.
With nominal power ratings up to 180 kW at 1500 min^{-1} and 12 ratios between 3,55 and 12,55.

- The horizontal split housing is designed for optimal strength, stiffness and oil tightness.
  A drain hole is provided to accommodate piping routed to the outside of the cooling tower.
- Optional features include a built-in backstop on the high speed shaft to prevent the fan from "wind-milling"; a high resistant paint for hostile environments; external hardware in stainless steel; special corrosion protection on the low speed shaft; breather and dipstick for 100% humidity.



WHY HANSEN?

- ***Hansen matches the drive to the application and offers proven reliability under the most severe conditions.***

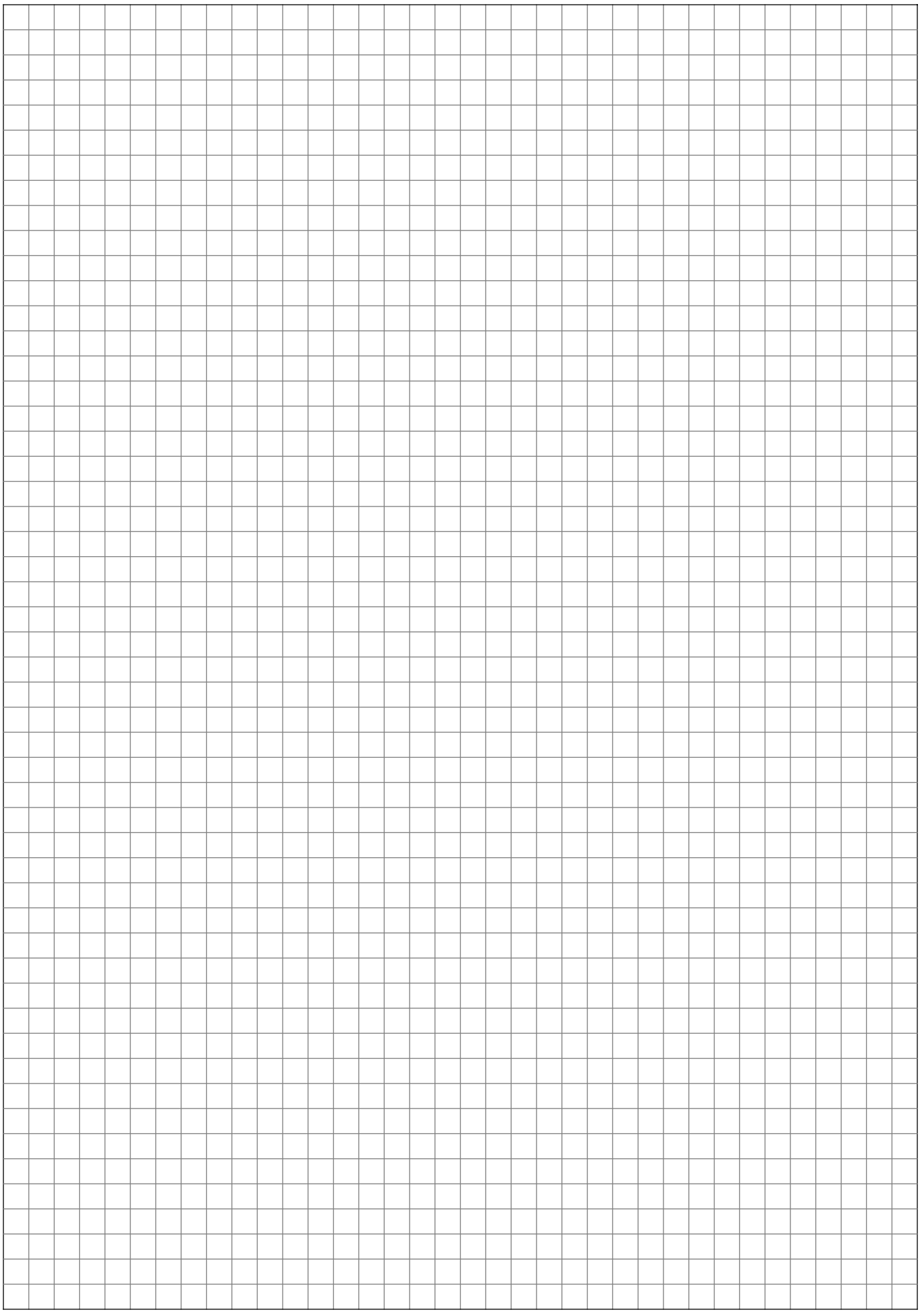
- ***Carburised and ground gearing of both bevel and helical gears excels in strength, torque capacity, surface durability and low noise performance.***
- ***Large overhung load capacity of the gear unit.***
- ***A wide range of bearing configurations meet any application requirement, while still providing a cost effective solution.***
- ***Bearings and shafts are dimensioned to go the distance, ensuring long bearing life under heavy loads.***

- ***Continuous oil circulation through the bearings ensures a long, trouble-free working life for the gear unit.***
- ***Hansen P4's unique Oil-Lock™ and Oil-Guard™ systems offer a maintenance-free sealing on high-speed shaft extensions as a standard.***
- ***A greased labyrinth seal on the low speed shaft prevents water and moisture from entering the housing of the gear unit.***
- ***The drywell, available on all models, prevents oil leakage on vertical down shafts***
- ***The internal construction of the gear unit housing allows for simple and complete oil drainage.***

- ***Positioning of the aerating, drainage and filling plugs makes it easy to connect service piping towards the outside of the cooling tower.***
- ***The larger units can be easily inspected and serviced on the spot, thanks to covers above the oil level.***

- ***One-stop-shopping for complete drive package solutions.***
- ***In-depth engineering support and complete documentation before and after the order.***
- ***Hansen's global service capability significantly reduces downtime.***

Hansen P4



AIR COOLED CONDENSER DRIVES

COOLING TOWER DRIVES

CONTENTS

Programme - Selection A1 - A2

Section A

Air cooled condenser drives

Hansen M4 ACC standardized gear units

Description A3 - A6

Request for quotation A7

Selection A8

Rating Table

Mechanical power ratings & rated thrust load

Exact ratios i_{ex} and moments of inertia J

Hansen M4 ACC gear units with vertical low speed shaft

Parallel shafts, two stages A10

Dimensional drawings

Hansen M4 ACC gear units without oil filter A11

Hansen M4 ACC gear units with oil filter A12

Section B

Cooling tower drives

Hansen P4 standardized gear units

Description B1 - B5

Request for quotation B6

Selection B7

Rating Tables

Mechanical power ratings & rated thrust load

Exact ratios i_{ex} and moments of inertia J

Hansen P4 gear units with vertical low speed shaft

Parallel shafts, two stages B8

Right-angle shafts, two stages B9 - B10

Dimensional drawings

Hansen P4, parallel shafts, two stages B11

Hansen P4, right-angle shafts, two stages B12 - B14

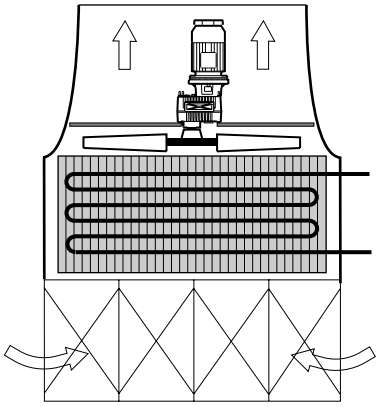
Options B15

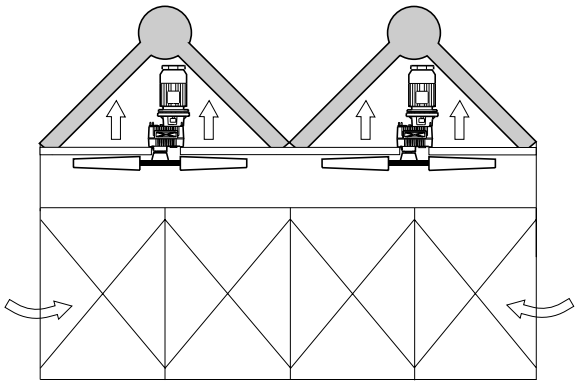
Hansen M4 ACC

Hansen P4

Standardized gear units for cooling tower drives	Réducteurs standard pour commandes d' aéroréfrigérants	Normzahnradgetriebe für Ventilatorantriebe in Kühltürmen	Standaard tandwielkasten voor ventilatoraandrijvingen van koeltorens
Programme Selection	Programme Sélection	Programm Auswahl	Programma Selectie

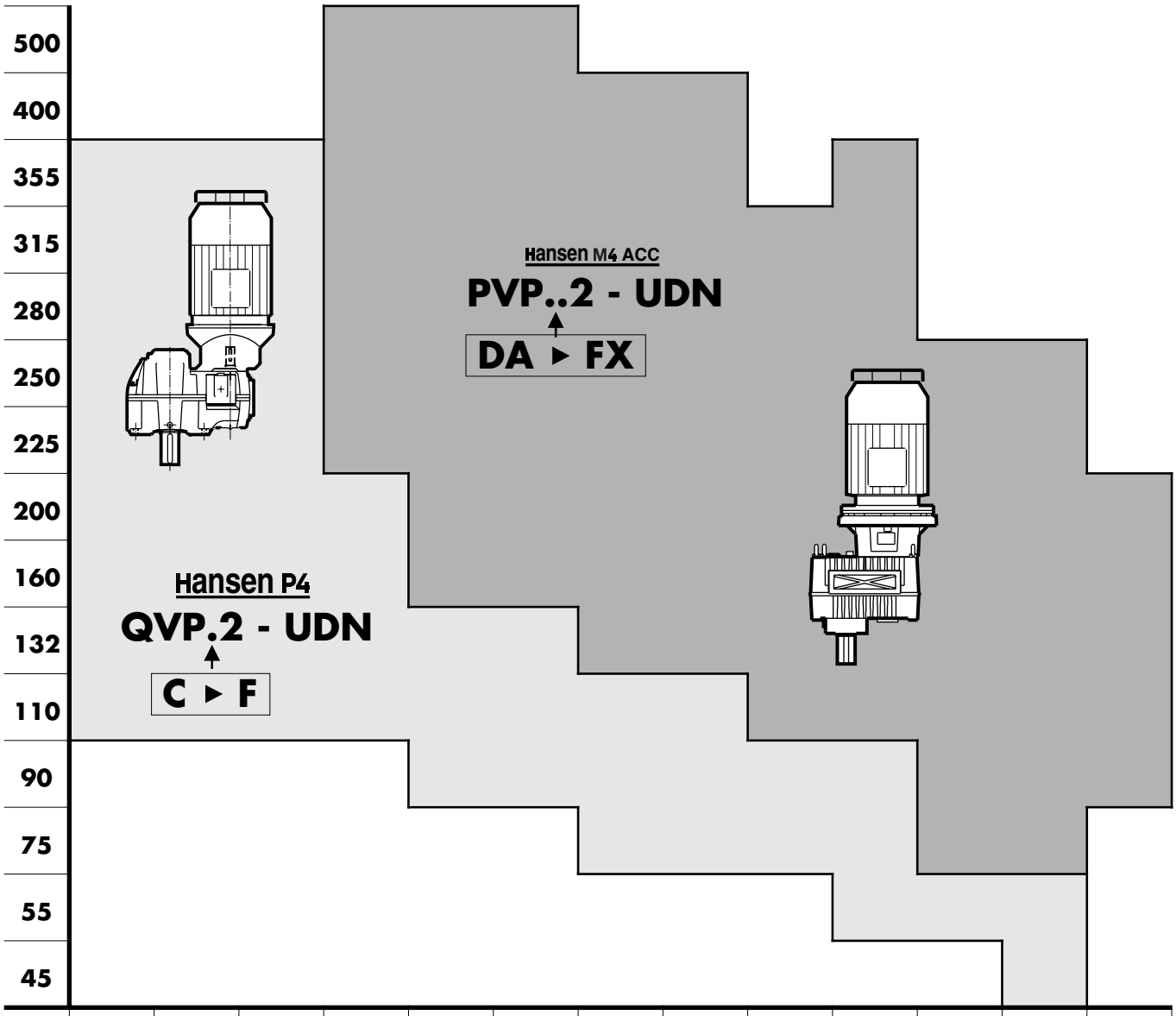
Parallel shafts | **Arbres parallèles** | **Stirnräder** | **Evenwijdige assen**





Motor Power
Puissance motrice
Motorleistung
Motorvermogen

P_m (kW - 1500 min^{-1})

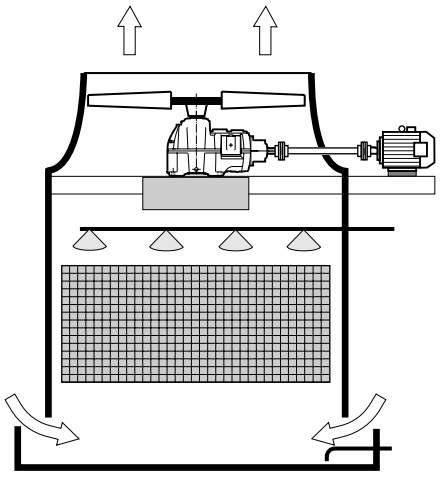


Nominal ratio - Rapport nominal - Nennübersetzung - Nominale verhouding

Hansen® TRANSMISSIONS

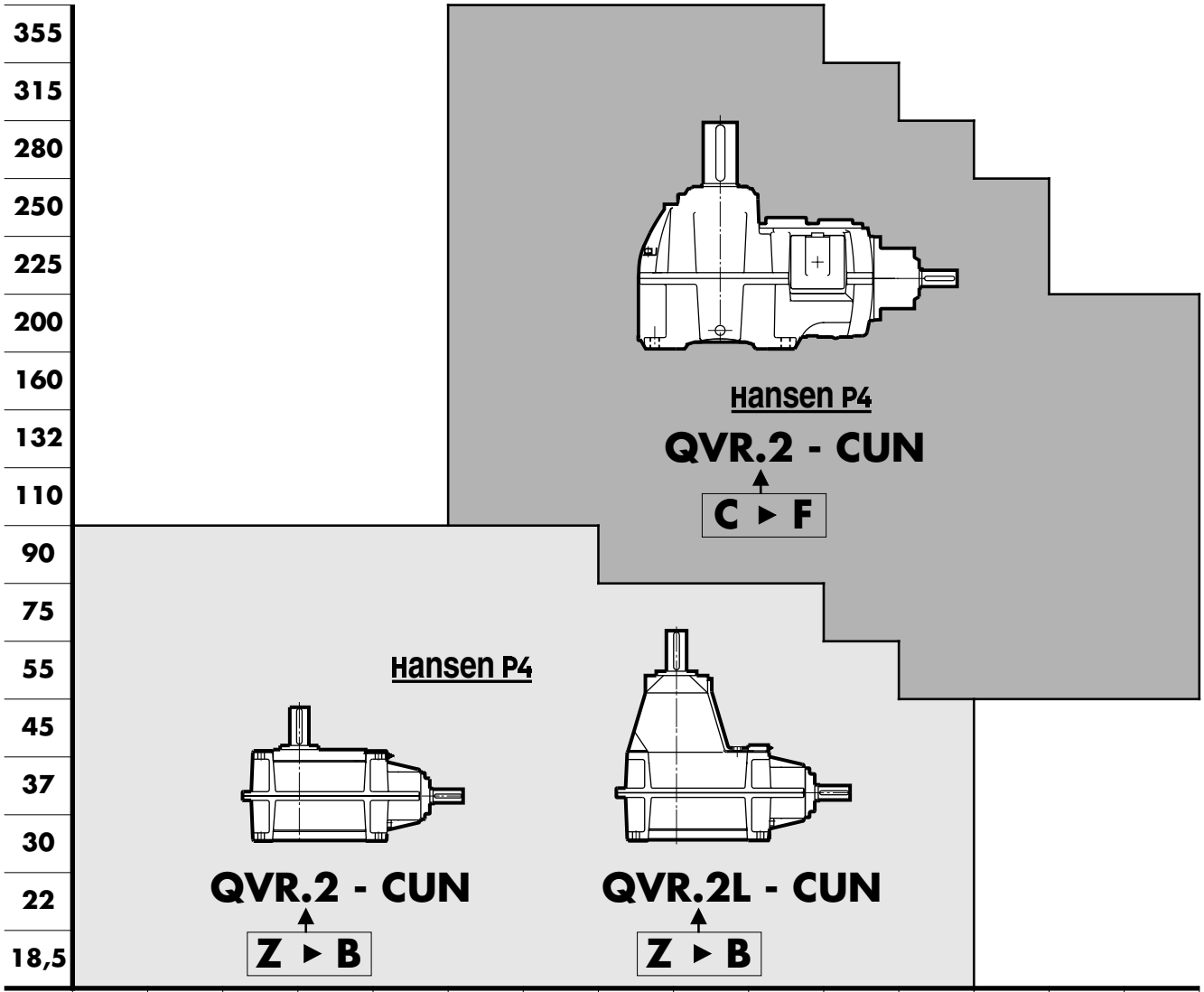
Standardized gear units for cooling tower drives	Réducteurs standard pour commandes d' aéroréfrigérants	Normzahnradgetriebe für Ventilatorantriebe in Kühltürmen	Standaard tandwielkasten voor ventilatoraandrijvingen van koeltorens
Programme Selection	Programme Sélection	Programm Auswahl	Programma Selectie

Right-angle shafts | Arbres perpendiculaires | Kegel- und Stirnräder | Haakse assen



Motor Power
Puissance motrice
Motorleistung
Motorvermogen

P_m (kW - 1500 min^{-1})



Nominal ratio - Rapport nominal - Nennübersetzung - Nominale verhouding

DESCRIPTION
HANSEN M4 ACC GEAR UNITS
FOR AIR COOLED CONDENSER DRIVES

Coding

1	2	3	4	5		6		7	8	9		10		11		12
P	V	P		2	-	ACC	-	U	D	N	-		-	K	-	

Type
1 : Series **P : Hansen M4**
2 : **V :** Vertical low speed shaft
3 : **P :** Parallel shafts
4 : **Size :** DA-> FX
5 : **Number of stages:** 2

Application
6 : **ACC:** Air Cooled Condenser

Shaft arrangement
7 : High speed shaft extension: **U :** up
8 : Low speed shaft extension : **D :** down
9 : Low speed shaft type : **N:** normal solid shaft

Ratio
10 : Nominal ratio of the gear unit

Drive package
11 : **K:** lantern drive package

Motor
12 : motor size and number of poles

The gear unit

Units are designed to comply with the standard CTI-111 specifications for gear units.
The mechanical power ratings shown in the tables relate respectively to input speeds of 1800, 1500, 1200, 1000, 900 and 750 RPM at the high speed shaft. They are also valid for asynchronous speeds which are max. 3% lower than the synchronous speeds.
Interpolation will yield power rating values for intermediate speeds.
The power rating for speeds lower than 750 RPM is based on the continuous torque rating of that speed.
For input speeds exceeding 1800 RPM, please refer to us.

Basic components

Helical gears
Designed and rated in accordance with AGMA for maximum load capacity, minimum losses and quiet operation.
All geared components are manufactured from alloy steel, gas carburized, hardened and precision ground.

Low speed shafts
The low speed shafts are in solid version.
Length of the shaft extension according to customer's specification.

Bearings
Heavy duty roller bearings of the tapered, cylindrical or spherical roller type.
Calculated in compliance with ISO and renowned bearing manufacturers.
The low speed shaft bearings are selected to allow considerable thrust loads. The nominal permissible thrust load FxN mentioned in the table, page A10, is defined for a SFmin = 2 and guarantees a calculated bearing life of 100 000h.

Housings, lantern housings and covers
Made from grey pearlitic cast iron.
Machined on CNC machining centers.
Designed to ensure strength and rigidity.
Unused tapped holes are plugged.
Monobloc housing.

Systems

Lubrication
Lubricants: mineral oils are normally used. Lubricants should always contain adequate EP-additives (refer to Service Manual).
Pump lubrication for the upper bearings is standard available.
The lubrication is guaranteed for input speeds down to 50 min^{-1} (windmilling conditions).
The gear unit housing acts as a large oil sump.
Grease point with nipple according to DIN 71412 for grease lubrication of the bearing at side of the low speed shaft end.
Checking of the oil level is done by means of the gear unit dipstick (always in the plugged position).

Cooling
Heat generated in the gear unit due to losses, can be dissipated by:
- natural cooling through the housing.
- additional fan cooling, shaft driven axial fan incorporated in the lantern housing

- Thermal checks to be carried out by Hansen.
  Fill in "Request for quotation" on page A7.

Sealing
Static:
- Generalized use of sealing compound
- Inspection cover on the gear unit: re-usable flat seal

Rotary:
- High speed shaft: standard : dust lip oil seal
  option: - double dust lip oil seal
  - regreasable labyrinth
- Low speed shaft: standard : dust lip oil seal
  option: - double dust lip oil seal
  - regreasable labyrinth

Hansen® TRANSMISSIONS

DESCRIPTION
HANSEN M4 ACC GEAR UNITS
FOR AIR COOLED CONDENSER DRIVES

Motors

The gear units are to be fitted with standard flange mounted IEC motors (type B5). For more information on motors, refer to motor catalogues.
For Nema motors, refer to Hansen.
Use of two speed motors: when changing speed with two speed motors, the fan has to be slowed down below the low speed, before energising the slow speed winding.

Optional devices

Some devices can optionally be provided (refer to pages A5 - A6). More detailed information about the optional devices is mentioned in separate technical manuals. Refer to Hansen.

Backstop
Built-in backstop to prevent the fan from "windmilling". Internal lubrication is assured. The backstop is accessible after removing the motor and the lantern housing.

Filter
With incorporated pressure relief valve.
A filter with incorporated pressure relief valve and visual or electrical contamination indicator is available as an option.

Heaters
Electrical heating devices for low temperature start-up are available for Hansen M4 ACC gear units.

Oil level switch
To control the oil level in the gear unit, an oil level switch can be provided. This switch can trigger an alarm signal when the oil level falls beneath a specified limit.

Pressure switch or pressure transmitter
To control the oil pressure, a pressure switch or pressure transmitter can be provided. They can trigger an alarm signal when the oil pressure falls beneath a specified limit.

Pt 100 meter
To control the oil bath temperature. The Pt 100 meter can trigger an alarm signal when the oil temperature is higher than a specified limit.

Shipping conditions

Inspection prior to shipment
- Test run: all gear units are tested under no load
- Conformity Check

Protection
- Shaft extension: greased and protected with waxed waterproof paper

Lubricants
- Hansen M4 ACC gear units are shipped without oil.
- Grease lubrication points are factory filled

For information relating to **storage, handling, installation, start-up and maintenance**, refer to the service manual which is supplied together with each gear unit.

Protection

Standard protection systems
All units are standard provided with **humidity resistant painting**.

Aggressive environment
For air cooled condenser drives in aggressive environment, Hansen can offer additional protection systems such as:
- **high resistant painting**
- QPQ-protection of low speed shaft end

Explanation of protection systems

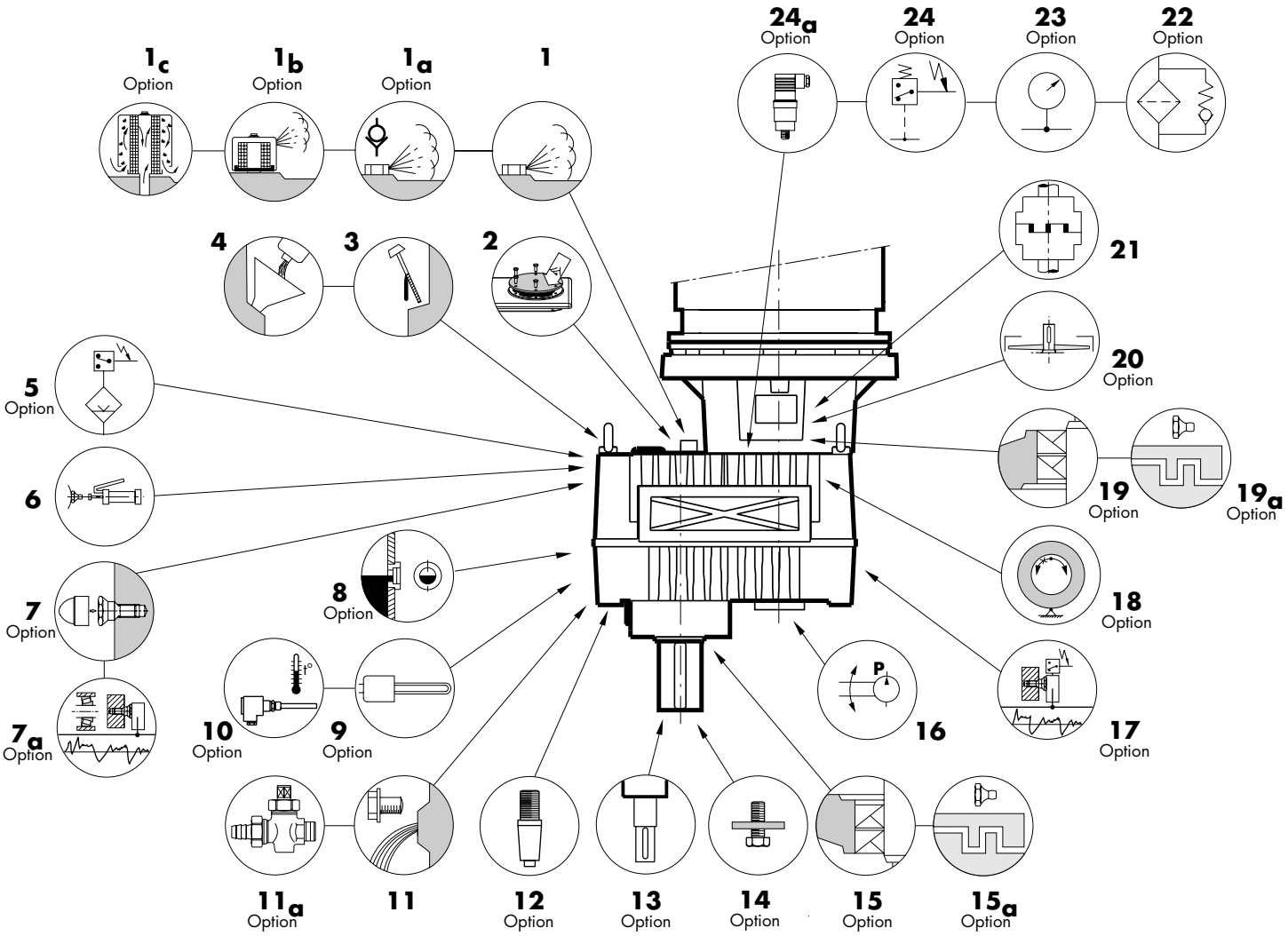
Paint systems
• Basic epoxy painting
A two-component primer with excellent oil resistance and good adherence properties overcoated by a two-component high built epoxy coating with excellent corrosion protection properties in a dry environment.
Total average dry film thickness : 100 µm
• Humidity resistant painting
A two-component high built epoxy paint applied on top of the basic painting.
Total average dry film thickness: 80 µm + 100 µm = 180 µm
• High resistant painting
A two-component polyurethan paint applied on top of the humidity resistant paint.
Total average dry film thickness: 30 µm + 180 µm = 210 µm

Bolts and nuts provided with appropriate protection.

Output shaft extension: QPQ anti-corrosion process as an alternative to stainless steel execution.
The Quench-Polish-Quench diffusion process is a salt-bath nitriding process consisting of quenching, surface smoothing and subsequent quenching.
The result is a wear resistant protective coat with a thickness of 10 to 20 µm.
Proven corrosion resistance of over 200 hours (salt spray test according to DIN 50021) favourably compares with a typical 62 hour corrosion resistance offered by a normal protective chrome coating and even with hard chromium protection (immersion test according to DIN 50905/4).

Standardized gear units for air cooled condenser fan drives	Réducteurs standard pour commandes des condensateurs à air	Normzahnradgetriebe für Ventilatorantriebe in Luftkondensatoren	Standaard tandwielkasten voor ventilatoraandrijvingen van luchtcondensatoren
Description	Description	Beschreibung	Beschrijving

DA
PVP ▼ 2 - UDN - ..
FX



Hansen® TRANSMISSIONS

Standardized gear units for air cooled condenser fan drives	Réducteurs standard pour commandes des condensateurs à air	Normzahnradgetriebe für Ventilatorantriebe in Luftkondensatoren	Standaard tandwielkasten voor ventilatoraandrijvingen van luchtcondensatoren
Description	Description	Beschreibung	Beschrijving

DA
PVP ▼ 2 - UDN - ..
FX

mark option required with [X]	marquer l'option requise de [X]	erforderliche Option mit [X] bezeichnen	vereiste optie aanduiden met [X]
1 breather plug or	1 reniflard ou	1 Entlüftungsschraube oder	1 verluchtingsstop of
1a ☐ anti-humidity breather plug or	1a ☐ reniflard anti-humidité ou	1a ☐ Entlüftungsschraube für feuchte Umgebung oder	1a ☐ antivochtverluchtingsstop of
1b ☐ dust-proof breather plug or	1b ☐ reniflard anti-poussière ou	1b ☐ Entlüftungsschraube mit Staubfilter oder	1b ☐ verluchtingsstop met stoffilter of
1c ☐ special breather with anti-humidity filter	1c ☐ reniflard spécial avec filtre anti-humidité	1c ☐ Entlüftungsschraube mit Feuchtigkeitsfilter	1c ☐ speciale verluchtingsstop met antivochtfilter
2 gear unit inspection cover	2 couvercle d'inspection du réducteur	2 Getriebe-Schaulochdeckel	2 inspectiedeksel van de tandwielkast
3 dipstick with magnet	3 jauge d'huile avec aimant	3 Ölmeßstab mit Magnet	3 oliepeilstang met magneet
4 oil filler plug	4 bouchon de remplissage	4 Öleinfüllschraube	4 vulstop
5 ☐ oil level switch	5 ☐ contacteur de niveau d'huile	5 ☐ Ölstandschalter	5 ☐ olieniveauschakelaar
6 grease point (DIN 71412)	6 point de graissage (DIN 71412)	6 Fettschmierpunkt (DIN 71412)	6 vetsmeerpunt (DIN 71412)
7 ☐ SPM nipple or	7 ☐ nipple SPM ou	7 ☐ SPM Nippel oder	7 ☐ SPM nippel of
7a ☐ vibration sensor	7a ☐ détecteur de vibrations	7a ☐ Schwingungsfühler	7a ☐ trillingssensor
8 ☐ oil sight glass	8 ☐ voyant d'huile	8 ☐ Ölschauglas	8 ☐ oliekijkglas
9 ☐ heater	9 ☐ échauffeur	9 ☐ Heizstab	9 ☐ verwarmingselement
10 ☐ Pt 100 meter for oil sump temperature	10 ☐ appareil de mesure Pt 100 pour la température du bain d'huile	10 ☐ Pt 100 für Ölbadtemperaturmessung	10 ☐ Pt 100 meter voor de oliebadtemperatuur
11 draining plug	11 bouchon de vidange	11 Ölablaßschraube	11 afloopstop
11a ☐ drain cock with hose coupling	11a ☐ robinet de vidange avec raccord pour tuyau	11a ☐ Ölablaßhahn mit Rohranschluß	11a ☐ aftapkraan met slangpilaar
12 ☐ mounting pin	12 ☐ goujon de montage	12 ☐ Montagestift	12 ☐ montagestift
13 ☐ extended low speed shaft end	13 ☐ bout d'arbre petite vitesse allongé	13 ☐ verlängertes Abtriebswellenende	13 ☐ verlengd langzaamdraaiend aseind
14 ☐ thrust washer with bolt	14 ☐ rondelle de butée avec boulon	14 ☐ Scheibe mit Schraube	14 ☐ sluitring met bout
15 ☐ double oil seal or	15 ☐ double bague d'étanchéité ou	15 ☐ doppelte Wellendichtung oder	15 ☐ dubbele afdichting of
15a ☐ regreasable labyrinth (DIN 71412)	15a ☐ labyrinthe regraissable (DIN 71412)	15a ☐ nachtschmierbares Labyrinth (DIN 71412)	15a ☐ nasmeerbaar labyrinth (DIN 71412)
16 pump lubrication	16 lubrification par pompe	16 Pumpenschmierung	16 pompsmering
17 ☐ vibration switch for condenser fan	17 ☐ interrupteur de vibrations pour le ventilateur du condensateur	17 ☐ Schwingungsschalter für Ventilator in Luftkondensator	17 ☐ trillingsschakelaar voor de ventilator van de luchtcondensator
18 ☐ built-in backstop, accessible after removal of motor lantern	18 ☐ antidévireur incorporé, accessible après demontage de la lanterne moteur	18 ☐ eingebaute Rücklaufsperre, erreichbar nach Entfernung der Motorlaterne	18 ☐ ingebouwde terugloopblokkering, bereikbaar na wegnemen van de motorlantaarn
19 ☐ double oil seal or	19 ☐ double bague d'étanchéité ou	19 ☐ doppelte Wellendichtung oder	19 ☐ dubbele afdichting of
19a ☐ regreasable labyrinth (DIN 71412)	19a ☐ labyrinthe regraissable (DIN 71412)	19a ☐ nachtschmierbares Labyrinth (DIN 71412)	19a ☐ nasmeerbaar labyrinth (DIN 71412)
20 ☐ axial fan	20 ☐ ventilateur axial	20 ☐ Axiallüfter	20 ☐ axiale ventilator
21 ☐ standard elastic block-type coupling	21 ☐ accouplement élastique standard à tampons	21 ☐ Standard elastische Klauenkupplung	21 ☐ standaard elastische blokkenkoppeling
22 ☐ oil filter	22 ☐ filtre d'huile	22 ☐ Ölfilter	22 ☐ oliefilter
23 ☐ pressure gauge	23 ☐ indicateur de pression	23 ☐ Druckmeßgerät	23 ☐ manometer
24 ☐ pressure switch or	24 ☐ contacteur de pression of	24 ☐ Druckschalter oder	24 ☐ drukschakelaar of
24a ☐ pressure transmitter	24a ☐ transmetteur de pression	24a ☐ Drucksensor	24a ☐ druksensor

REQUEST FOR QUOTATION
AIR COOLED CONDENSER DRIVES

Ref : Date : Name : Signature :

1. LOAD PARAMETERS

Motor power Pm = kW at min^{-1}

Absorbed power Pa = kW

Absorbed torque Ta = kNm

Running time in h/day ≤3 ☐ ≤10 ☐ >10 ☐

Peak torque in excess of 200% Ta = %

Number of starts/stops per 10 hours : .....

2. SPEED

One constant speed ☐ **two constant speeds** ☐

Variable speed ☐

High speed shaft (HSS) n1: variable : .... ≤ min^{-1} ≤ ....

constant : .... min^{-1}

.... min^{-1}

direction of rotation : CW ☐ CCW ☐

Low speed shaft (LSS) n2: .... ≤ min^{-1} ≤ ....

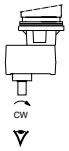
.... ≤ min^{-1} ≤ ....

direction of rotation : CW ☐ CCW ☐

solid shaft extension : up ☐ down ☐

Gear unit shaft configuration : parallel shafts

Backstop required Y ☐ N ☐



3. THRUST LOAD ON LOW SPEED SHAFT Y ☐ N ☐

Weight of fan and coupling = kN

Aerodynamic thrust load towards gear unit = + kN

away from gear unit = - kN

4. INSTALLATION PARAMETERS

Ambient temperature (°C) near the gear unit :

min: ..... max: .....

Structure (see page A8) open ☐ closed ☐

Air speed near the gear unit : ..... m/s

Location

Direct sun exposure Y ☐ N ☐

Max. noise power: dBA

Max. noise pressure: dBA at ..... m

Atmosphere: humid ☐

dusty ☐

aggressive, to specify ☐

Electric installation AC / 3 Ph V Hz

Main power supply ☐ ....

Auxiliary power supply ☐ ....

Protection requirement: .....

Insulation: .....

Max. motor noise power: dBA

Max. motor noise pressure: dBA at ..... m

5. OPTIONAL SPECIFICATIONS

Options to be indicated on pages A5 - A6

Motor mount IEC frame:

(if not IEC, add dimensional drawing)

Shafts inch ☐

extended shaft end: indicate on sketch of application

Corrosion protection (see page A4)

solid LSS : QPQ treatment ☐

Painting (see page A4)

humidity resistant painting ☐

high resistant painting ☐

Not allowable materials Al ☐

Cu ☐

Other .....

6. SHIPMENT

Transport by

vessel ☐

train ☐

truck ☐

Sketch of application

TOP VIEW

SIDE VIEW

please indicate tilt angles if ≥ 5/1000

Other data available in :

Hansen® TRANSMISSIONS

SELECTION

AIR COOLED CONDENSOR DRIVES

Procedure

Reference Data

SELECTION

SELECTION DATA

Pm , Pa , n_{HSS} , n_{LSS} , i_N, Shaft configuration

refer to page A7 : "Request for quotation of air cooled condenser drives"

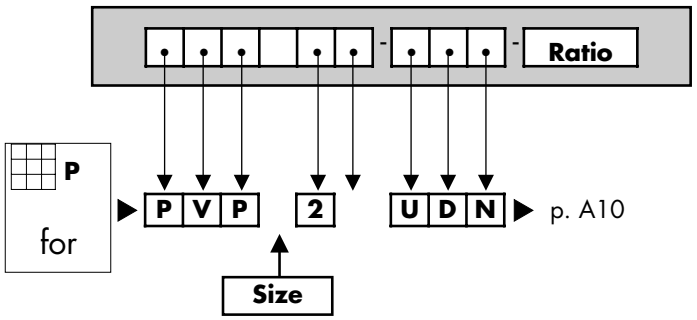
PROGRAMME SELECTION

refer to pages A1

Hansen M4 ACC

for ratios ≤ 8 refer to Hansen

P ≥ Motor Power **Pm** x SF = 1,75 and Absorbed Power **Pa** x SF = 2



Mechanical power rating **P**

Number of stages

Ratio

P → Size

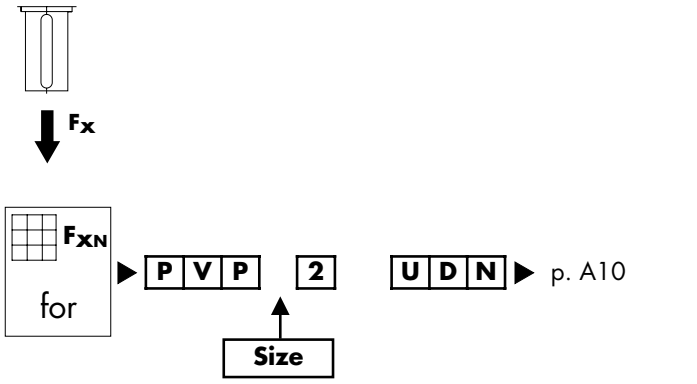
CHECK

Thrust load

F_x: ... kN

Check with F_{xN} : $F_x \leq F_{xN}$

Pay attention to direction of F_x !



Thermal rating: refer to Hansen

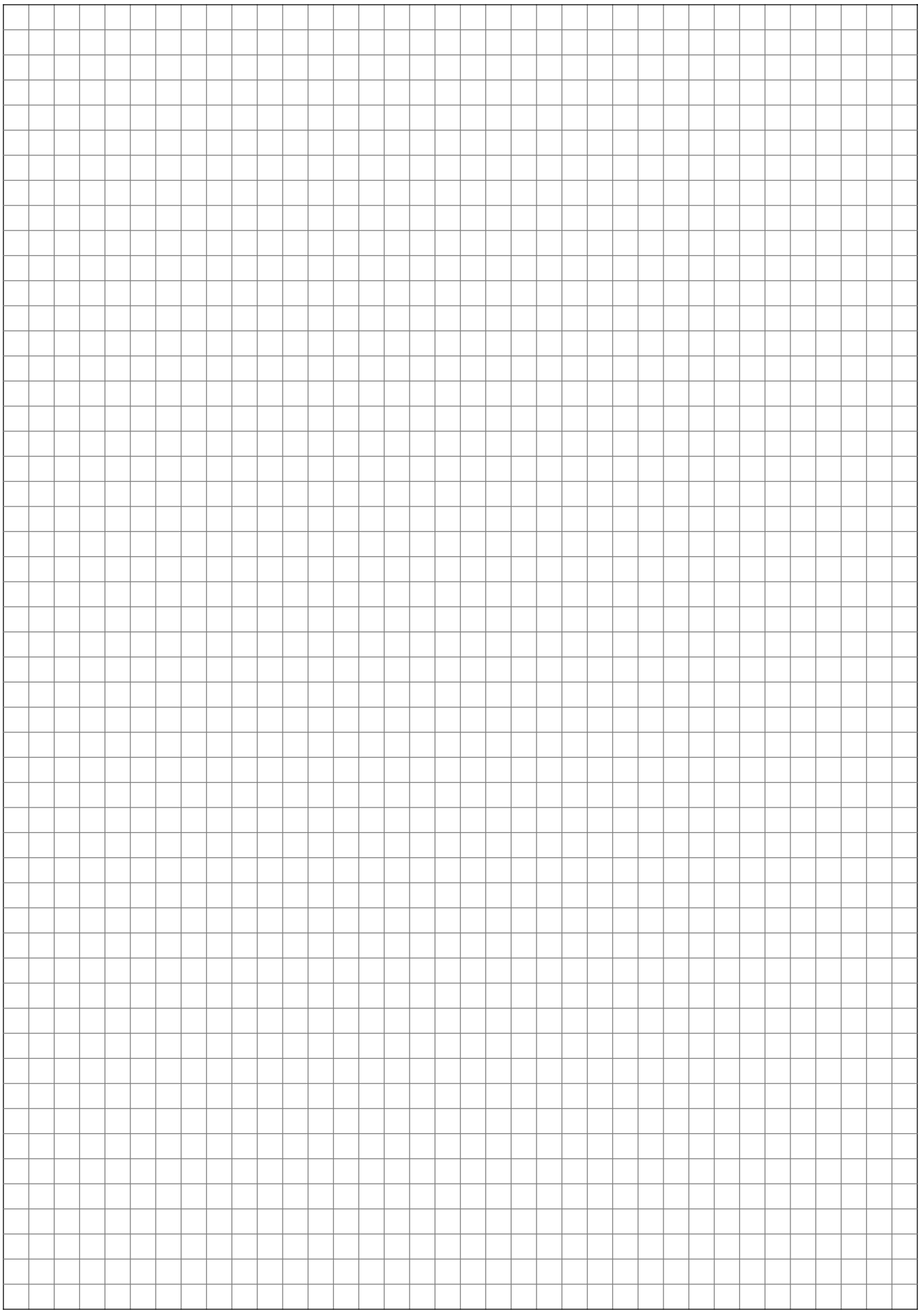
Thermal rating depends on:

- service factor
- ratio
- input speed
- ambient temperature
- open / closed structure
- air speed
- wet/dry atmosphere
- direct sun exposure

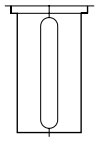
→ In order to allow Hansen to perform an adequate thermal check of the gear unit, please describe the exact ambient conditions on the 'Request for quotation' sheet page A7.

Open structure: gear units installed in an open steel frame structure allowing the cooling tower air flow to pass over the gear unit's housing.

Closed structure: gear units installed on a solid concrete plinth or enclosed steel frame. This structure prevents the cooling tower air flow from passing over the gear unit's housing.



Hansen M4 ACC



FXN

Gear unit	**Réducteur à engrenages**	**Zahnradgetriebe**	**Tandwielkast**	**P**
Low speed shaft	**Arbre petite vitesse**	**Langsamdrehende Welle**	**Langzaamdraaiende as**	**V**
Parallel shafts	**Arbres parallèles**	**Stirnräder**	**Evenwijdige assen**	**P**
Size	**Taille**	**Baugröße**	**Grootte**	**DA ▶ FX**
Two stages	**Deux étages**	**Zweistufig**	**Tweetraps**	**2**
Mechanical power ratings	**Puissances mécaniques nominales**	**Nennleistungen**	**Nominale mechanische vermogens**	**P (kW)**
Rated thrust load	**Charge axiale nominale**	**Nennaxialbelastung**	**Nominale axiale belasting**	**FXN (kN)**

			P (kW)						FXN (kN)						i_{ex}				J (kgm²)	
	min⁻¹		Size - Taille - Baugröße - Grootte						Size - Taille - Baugröße - Grootte						Size - Taille - Baugröße - Grootte					
i_N	n_1	n_2	DA	DX	EA	EX	FA	FX	DA	DX	EA	EX	FA	FX	DA	DX	EA	EX	FA	FX
9	1800	200	480	580	700	870	1050	1300	25	21,5	36	32	70	69						
	1500	165	400	500	600	770	930	1150	26,5	24	40	35	74	73	8,7468	8,5447	8,9662	8,621	8,7546	8,2989
	1200	135	320	410	480	620	750	960	28	26	42	40	80	78						
	1000	110	270	340	400	520	630	810	29	27	43	41	82	81						
	900	100	245	310	360	470	570	740	29,5	28	44	42	83	82	0,0639	0,0983	0,125	0,196	0,256	0,4
	750	83	205	255	310	390	470	620	31	29	46	44	85	84						
10	1800	180	370	470	570	750	810	1100	33	29	45	40	73	71						
	1500	150	310	400	480	630	680	900	34	31	48	44	78	75	10,059	9,6993	9,7903	9,3592	10,326	9,7047
	1200	120	245	320	390	500	550	730	35	33	50	48	81	80						
	1000	100	205	270	320	420	460	610	36	34	51	49	83	82						
	900	90	185	240	295	380	410	550	37	34	52	50	84	83	0,0607	0,0919	0,121	0,188	0,24	0,367
	750	75	155	200	245	320	350	460	38	36	54	52	86	85						
11,2	1800	160	380	480	580	700	890	1050	27	25	40	36	75	74						
	1500	135	320	400	490	610	740	940	28	26	42	40	80	79	11,070	10,788	11,152	11,068	11,022	10,731
	1200	105	255	320	390	490	600	770	29,5	27,5	44	42	82	81						
	1000	89	215	270	330	410	500	640	30	28,5	45	43	84	83						
	900	80	195	245	295	370	450	580	31	29	46	44	85	84	0,0477	0,0711	0,0945	0,139	0,189	0,279
	750	67	160	205	245	310	380	490	32	30	48	46	87	86						
12,5	1800	145	290	380	460	590	650	840	34	32	48	45	79	77						
	1500	120	245	320	390	490	550	700	35	33	50	48	81	80	12,730	12,246	12,176	12,015	13	12,549
	1200	96	195	255	310	400	440	570	36	34	52	50	83	82						
	1000	80	165	215	260	330	370	470	37	35	53	51	85	84						
	900	72	150	190	235	300	330	430	38	36	54	52	86	85	0,0457	0,067	0,0919	0,133	0,179	0,259
	750	60	125	160	200	250	275	360	40	37	56	54	88	87						
14	1800	130	295	380	450	590	720	890	28,5	26,5	42	40	80	80						
	1500	105	250	320	380	490	610	760	29,5	27,5	44	42	82	84	14,314	13,652	14,420	13,765	13,596	13,511
	1200	86	200	255	300	390	490	610	31	29	46	44	84	84						
	1000	71	165	215	255	330	410	510	32	30	47	45	86	86						
	900	64	150	195	230	300	370	460	33	31	48	46	87	87	0,0359	0,0522	0,0708	0,103	0,149	0,204
	750	54	125	160	190	250	310	390	35	32	50	48	89	89						
16	1800	115	225	300	360	470	530	670	35	33	50	48	81	81						
	1500	94	190	250	300	400	440	560	37	34	52	50	83	82	16,461	15,497	15,745	14,944	16,036	15,8
	1200	75	150	200	245	320	360	450	38	36	54	52	85	85						
	1000	63	130	170	205	265	300	380	39	37	56	53	87	87						
	900	56	115	155	185	240	270	340	41	37	56	54	89	88	0,0347	0,0496	0,0692	0,1	0,143	0,191
	750	47	96	130	155	200	225	285	44	39	59	56	91	90						
18	1800	100	245	295	360	460	540	740	29,5	28	44	42	83	82						
	1500	83	205	250	300	380	450	620	31	29	46	44	84	84	17,451	17,654	18,015	17,799	17,007	16,667
	1200	67	165	200	240	310	360	500	32	30	48	46	87	86						
	1000	56	135	165	205	255	300	420	34	32	49	47	89	88						
	900	50	125	150	185	230	275	380	36	32	51	48	90	89	0,0285	0,0385	0,0546	0,0761	0,114	0,159
	750	42	105	125	155	195	230	320	39	35	55	51	92	91						
20	1800	90	185	235	290	370	430	550	37	35	52	50	84	83						
	1500	75	155	195	245	310	360	460	38	36	54	52	85	85	20,069	20,039	19,671	19,324	20,059	19,49
	1200	60	125	155	195	250	285	370	39	37	56	54	88	87						
	1000	50	105	130	165	210	240	310	42	39	58	56	90	89						
	900	45	95	120	150	185	215	280	44	40	60	57	91	90	0,0277	0,037	0,0537	0,0741	0,11	0,151
	750	38	79	99	125	155	180	235	48	44	65	60	95	94						
22,4	1800	80	160	245	245	360	370	540	37	29	53	44	84	84						
	1500	67	135	205	205	300	310	450	38	30	55	46	86	86	22,686	21,523	22,631	22,237	21,725	20,847
	1200	54	110	165	165	240	250	360	41	32	57	48	89	88						
	1000	45	91	140	135	205	210	300	44	34	61	50	91	90						
	900	40	82	125	125	185	190	275	46	36	64	52	92	91	0,0271	0,0303	0,0523	0,0581	0,108	0,12
	750	33	69	105	105	155	160	230	50	39	69	56	97	96						
25	1800	72		195		295		440		36		52		85						
	1500	60		160		250		370		37		54		87		24,431		24,141		24,379
	1200	48		130		200		295		39		56		89						
	1000	40		110		165		250		42		58		92						
	900	36		98		150		225		44		61		95		0,0293		0,0568		0,115
	750	30		82		125		185		48		66		100						

Thermal check: see p. A8
iN Nominal ratio
iex Exact ratio
J Moments of inertia J related to the HSS
n1,2 Nominal speed (rpm)

Contrôle thermique: voir p. A8
iN Rapport nominal
iex Rapport exact
J Moments d'inertie J rapportés à l'arbre G.V.
n1,2 Vitesse nominale

Thermische Kontrolle: siehe S.A8
iN Nennübersetzung
iex Exakte Übersetzung
J Massenträgheitsmomente J beziehen sich auf die SDW
n1,2 Nenndrehzahl

Thermische controle: zie p. A8
iN Nominale verhouding
iex Exacte verhouding
J Massatraagheitsmomenten J berekend aan de SDA
n1,2 Nomin. toerentallen

Hansen M4 ACC

97PU0-VP2N4001N0-A

mm

Gear unit	**Réducteur à engrenages**	**Zahnradgetriebe**	**Tandwielkast**	**P**
Vertical L.S.S.	**Arbre P.V. vertical**	**Langsamdr. Welle: vert.**	**Langz. dr. as: vertic.**	**V**
Parallel shafts	**Arbres parallèles**	**Stirnräder**	**Evenwijdige assen**	**P**
Size	**Taille**	**Baugröße**	**Grootte**	**DA ▶ FX**
Two stages	**Deux étages**	**Zweistufig**	**Tweetraps**	**2**

Without filter	**Sans filtre**	**Ohne Filter**	**Zonder filter**
For air cooled condenser fan drives	**Pour commandes des ventilateurs des condensateurs à air**	**Für Ventilatorantriebe in Luftkondensatoren**	**Voor ventilatoraandrijvingen van luchtcondensatoren**

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

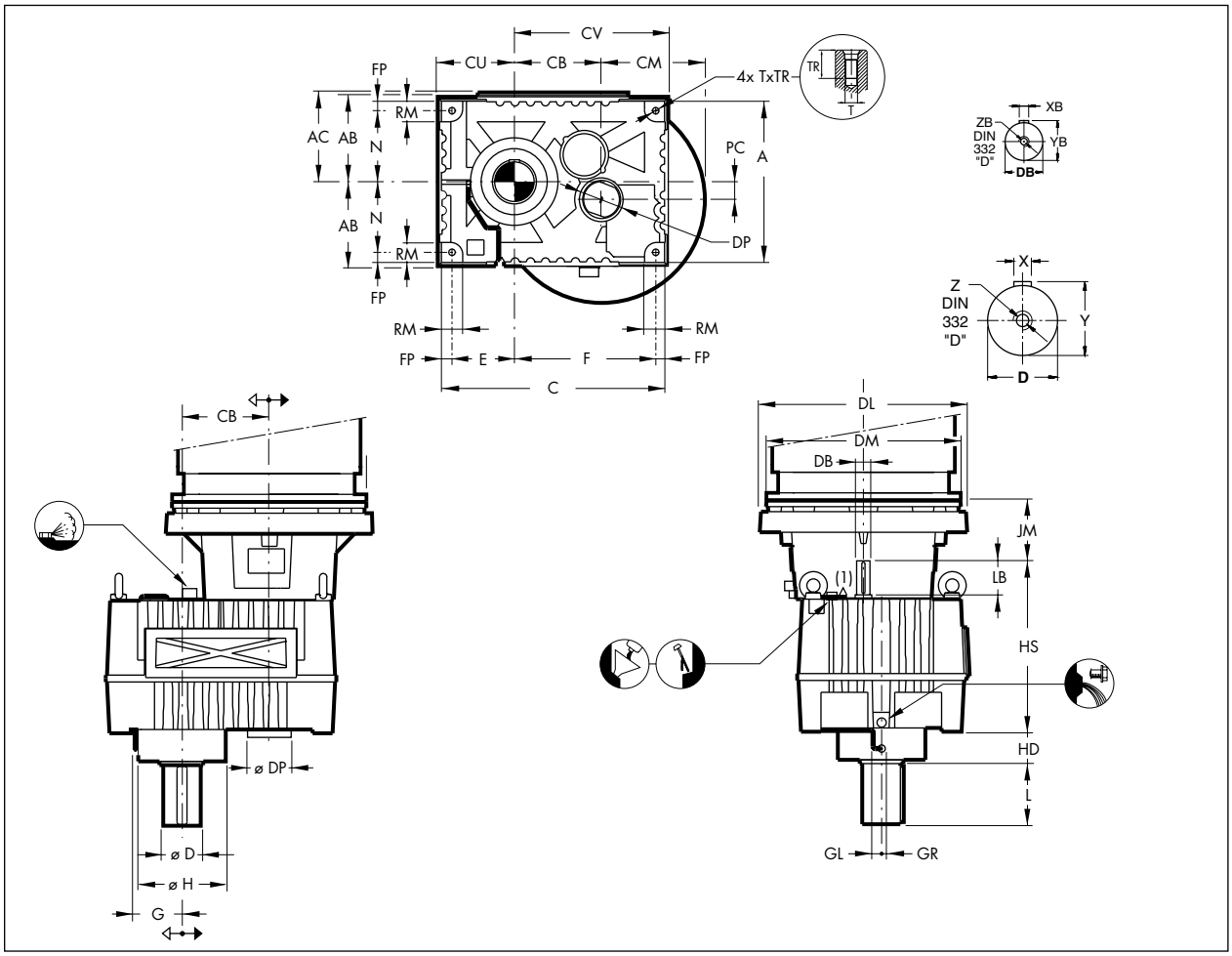
Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting.

Bindende afmetingen op verzoek.



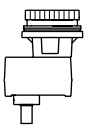
(1) Centralised grease points

(1) Points de graissage centralisés

(1) Zentralschmierstellen

(1) Gecentraliseerde smeerpunten

UDN



Shaft arrangement (front view) **Disposition des arbres** (vue en élévation) **Wellenanordnung** (Vorderansicht) **Asschikking** (vooraanzicht)

Type	A	AB	AC	C	CB	CU	CV	E	F	FP	G	GL	GR	H	HD	HS	N	RM	T	TR	kg	Litres Liter
PVPDA2	590	315	328	770	281	250	555	190	500	40	180	50	20	320	141	695	255	85	M30	53	750	27
PVPDX2	590	315	328	845	323	280	590	225	530	45	190	50	20	340	141	695	255	85	M30	53	820	33
PVPEA2	670	350	365	850	321	280	595	220	540	45	210	50	20	380	156	735	290	90	M30	53	950	30
PVPEX2	670	350	365	925	359	315	635	255	580	45	210	50	20	380	156	735	290	90	M30	53	1060	32
PVPFA2	720	375	390	920	364	310	635	240	570	55	215	50	20	390	111	820	305	105	M36	64	1320	47
PVPFX2	720	375	390	1015	407	355	685	285	620	55	215	50	20	390	111	820	305	105	M36	64	1430	54

Type	Shafts - Arbres - Wellen - Assen Keys Clavettes Paßfeder Spieën DIN 6885-T1										Pump - Pompe - Pumpe - Pomp		Motor - Moteur				
	D-m7	L	X	Y	Z	DB-m6	LB	XB	YB	ZB	DP	PC	IEC	DM	DL	CM	JM
PVPDA2	115	210	32	122	M24	58	145	16	62	M20	160	40	**250**	550	710	355	145
PVPDX2	135	250	36	143	M30	58	145	16	62	M20	160	38	**280**	550	710	355	145
PVPEA2	135	250	36	143	M30	65	145	18	58	M20	160	68	**315**	660	710	355	175
PVPEX2	155	250	40	164	M30	65	145	18	58	M20	160	74	**355**	800	850	425	215
PVPFA2	175	300	45	185	M30	75	145	20	79,5	M20	160	91					
PVPFX2	175	300	45	185	M30	75	145	20	79,5	M20	160	93					

Hansen® TRANSMISSIONS

Hansen M4 ACC

97PU0-VP2N4011N0-A

mm

Gear unit	**Réducteur à engrenages**	**Zahnradgetriebe**	**Tandwielkast**	**P**
Vertical L.S.S.	**Arbre P.V. vertical**	**Langsamdr. Welle: vert.**	**Langz. dr. as: vertic.**	**V**
Parallel shafts	**Arbres parallèles**	**Stirnräder**	**Evenwijdige assen**	**P**
Size	**Taille**	**Baugröße**	**Grootte**	**DA ▶ FX**
Two stages	**Deux étages**	**Zweistufig**	**Tweetraps**	**2**

With filter	**Avec filtre**	**Mit Filter**	**Met filter**
For air cooled condenser fan drives	**Pour commandes des ventilateurs des condensateurs à air**	**Für Ventilatorantriebe in Luftkondensatoren**	**Voor ventilatoraandrijvingen van luchtcondensatoren**

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

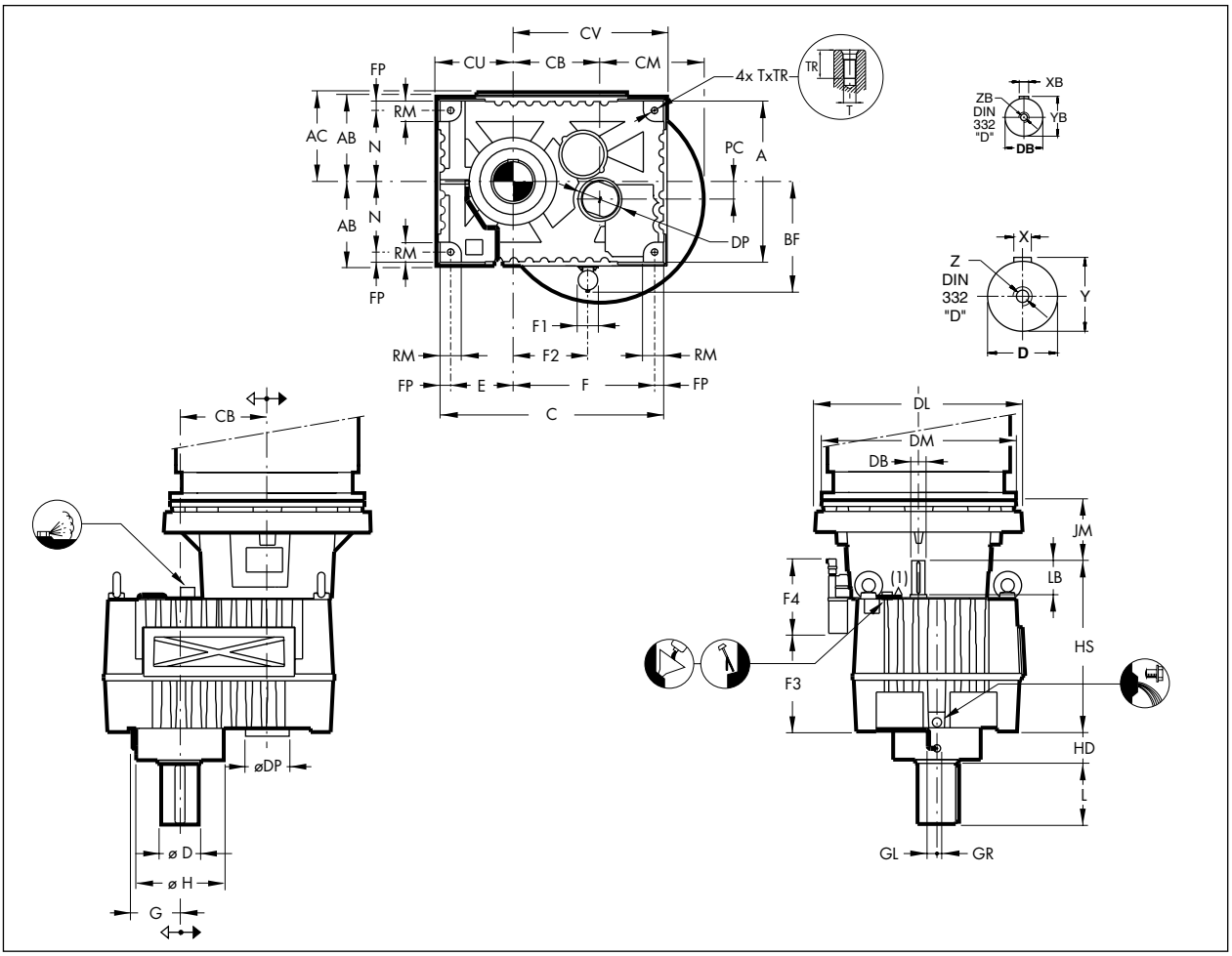
Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting.

Bindende afmetingen op verzoek.



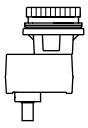
(1) Centralised grease points

(1) Points de graissage centralisés

(1) Zentralschmierstellen

(1) Gecentraliseerde smeerpunten

UDN



Shaft arrangement (front view) | **Disposition des arbres** (vue en élévation) | **Wellenanordnung** (Vorderansicht) | **Asschikking** (vooraanzicht)

Type	A	AB	AC	BF	C	CB	CU	CV	E	F	FP	F1	F2	F3	F4	G	GL	GR	H	HD	HS	N	RM	T	TR	kg	Litres Liter
PVPDA2	590	315	328	425	770	281	250	555	190	500	40	420	231	362	306	180	50	20	320	141	695	255	85	M30	53	750	27
PVPDX2	590	315	328	425	845	323	280	590	225	530	45	420	273	362	306	190	50	20	340	141	695	255	85	M30	53	820	33
PVPEA2	670	350	365	450	850	321	280	595	220	540	45	450	271	402	306	210	50	20	380	156	735	290	90	M30	53	950	30
PVPEX2	670	350	365	450	925	359	315	635	255	580	45	450	309	402	306	210	50	20	380	156	735	290	90	M30	53	1060	32
PVPFA2	720	375	390	475	920	364	310	635	240	570	55	470	314	487	306	215	50	20	390	111	820	305	105	M36	64	1320	47
PVPFX2	720	375	390	475	1015	407	355	685	285	620	55	470	357	487	306	215	50	20	390	111	820	305	105	M36	64	1430	54

Type	Shafts - Arbres - Wellen - Assen Keys - Clavettes - Paßfeder - Spieën DIN 6885-T1										Pump - Pompe - Pumpe - Pomp	
	D-m7	L	X	Y	Z	DB-m6	LB	XB	YB	ZB	DP	PC
PVPDA2	115	210	32	122	M24	58	145	16	62	M20	160	40
PVPDX2	135	250	36	143	M30	58	145	16	62	M20	160	38
PVPEA2	135	250	36	143	M30	65	145	18	58	M20	160	68
PVPEX2	155	250	40	164	M30	65	145	18	58	M20	160	74
PVPFA2	175	300	45	185	M30	75	145	20	79,5	M20	160	91
PVPFX2	175	300	45	185	M30	75	145	20	79,5	M20	160	93

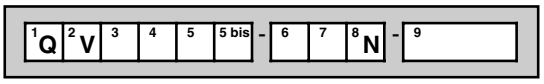
Motor - Moteur				
IEC	DM	DL	CM	JM
250	550	710	355	145
280	550	710	355	145
315	660	710	355	175
355	800	850	425	215

DESCRIPTION
HANSEN P4 GEAR UNITS
FOR COOLING TOWER DRIVES

The gear unit

Units are designed to comply with the standard CTI specifications.
The mechanical power ratings shown in the tables relate respectively to input speeds of 1800, 1500, 1200, 1000, 900 and 750 RPM at the high speed shaft. They are also valid for asynchronous speeds which are max. 3% lower than the synchronous speeds.
Interpolation will yield power rating values for intermediate speeds.
The power rating for speeds lower than 750 RPM is based on the continuous torque rating of that speed.
For input speeds exceeding 1800 RPM, please refer to Hansen.

Coding



Type

1 : Series — **Q** : **Hansen P4**
2 : — **V** : Vertical low speed shaft
3 : — **P** : Parallel shafts
R : Right-angle shafts
4 : — Size: Z, A, B, ..., F
5 : — Number of stages: 2
5 bis : — **L** : Extended bearing housing (sizes Z, A, B)
/ : Normal execution (no code)

Shaft arrangement

6 : High speed shaft extension: **C**: right-angle
D: down
U: up
7 : Low speed shaft extension: **D**: down
U: up
8 : Low speed shaft type: **N**: normal solid shaft

Ratio

9 : Nominal ratio

Basic components

Helical and spiral bevel gears
Designed and rated in accordance with AGMA, ISO for maximum load capacity, minimum losses and quiet operation.
All geared components are manufactured from alloy steel, gas carburized, hardened and precision ground.

Low speed shafts
The low speed shafts are in solid version.
Extended shafts are available upon request.
For all executions, input and output shafts are located in the same vertical plane.

Bearings
Heavy duty roller bearings of the tapered, cylindrical or spherical roller type.
Calculated in compliance with AGMA, ISO and renowned bearing manufacturers.
The low speed shaft bearings are selected to allow considerable thrust loads. The nominal permissible thrust load FxN mentioned in the tables, pages B8 - B10, is defined for a SFmin = 2 and guarantees a calculated bearing life of 100 000h.

Housings, bearing housings and covers
Made from grey pearlitic cast iron.
Machined on NC machine-tools.
Designed to ensure strength and rigidity.
Unused tapped holes are plugged.
Horizontal split housing.

Systems

Lubrication
Lubricants: mineral oils are normally used. Lubricants should always contain adequate EP-additives (refer to Service Manual).
Pump lubrication for the upper bearings is standard or optionally available.
The gear unit housing acts as a large oil sump.
Grease points are centralised with automatic grease lubricators as an option.
Low speed shafts extending upwards are provided with a regreasable labyrinth. Nipples if any are according to DIN 71412. When using external service piping, the nipple can be moved outside the fan stack.
Checking of the oil level is done either by means of the gear unit dipstick (always in the plugged position) or the oil level plug.
To expedite routine maintenance of wet cooling tower fan drives, service piping outside the fan stack (not provided by Hansen), is recommended. This piping is arranged so that the oil can be drained and refilled from outside the stack. The standard breather and draining plug, fitted in the gear unit on delivery, should be removed and plugged in outside the stack (away from the direct stream of moist air).
For ease of maintenance a dipstick outside the fan stack is recommended.
Periodically, the external dipstick should be checked against the gear unit dipstick.

Cooling
Heat generated in the gear unit due to losses, can be dissipated by:
- natural cooling through the housing.
- additional fan cooling. Depending on the gear unit type, a shaft driven axial fan or an electrically driven axial fan can be incorporated (see pages B3 or B5)
  Characteristics of electrically driven fans: Standard 3 phase, 50 Hz, 400 V ± 10%, Insulation class: IP 55.

- Thermal checks to be carried out by Hansen.
  Fill in "Request for quotation" on page B6.

Sealing
Static:
- Generalized use of sealing compound
- Inspection cover on the gear unit: O-ring

Rotary:
- High speed shaft: depending on gear unit type.
  Refer to description of each type of gear unit on pages B3 up to B5.
  Oil Lock™: - dual purpose labyrinth
  - maintenance free
  - oil return to sump
- Low speed shaft: - dust lip oil seal
  - labyrinth seal for upward directed shafts
- High speed or low speed downward directed shaft: dry-well.

Hansen® TRANSMISSIONS

DESCRIPTION
HANSEN P4 GEAR UNITS
FOR COOLING TOWER DRIVES

Motors

Right-angle gear units are driven by foot mounted IEC motors (type B3).
Parallel shaft gear units are to be fitted with standard flange mounted IEC motors (type B5).
For more information on motors, refer to motor catalogues.
For Nema motors, refer to Hansen
Use of two speed motors: when changing speed with two speed motors, the fan has to be slowed down below the low speed, before energising the slow speed winding.

Optional devices

Some devices can optionally be provided (refer to pages B3 up to B5). More detailed information about the heater, the flow switch and the oil level switch is mentioned in separate technical manuals. Refer to us.

Backstop
Built-in backstop to prevent the fan from "wind-milling". Internal lubrication is assured.

Heaters
Electrical heating devices for low temperature start-up are available for Hansen P4 gear units from sizes C to F.

Flow switch
When gear units are pump lubricated a flow switch can be provided to check the oil flow to the gear unit. This switch can trigger an alarm signal when the oil supply is inadequate. The gear unit has to be stopped at once and the cause of the interruption of the oil supply has to be removed.

Oil level switch
To control the oil level in the gear unit, an oil level switch can be provided. This switch can trigger an alarm signal when the oil bath falls beneath a specified limit.

Shipping conditions

Inspection prior to shipment
- Test run: all gear units are tested under no load
- Conformity Check

Protection
- Shaft extension: greased and protected with waxed waterproof paper

Lubricants
- Hansen P4 gear units are shipped without oil.
- Grease lubrication points are factory filled

For information relating to **storage, handling, installation, start-up and maintenance**, refer to the service manual which is supplied together with each gear unit.

Protection

Standard protection systems
All units are standard provided with **humidity resistant painting**.

Aggressive environment
For cooling tower drives in aggressive environment, Hansen can offer additional protection systems such as:
- **high resistant painting**
- QPQ-protection of low speed shaft end

Explanation of protection systems

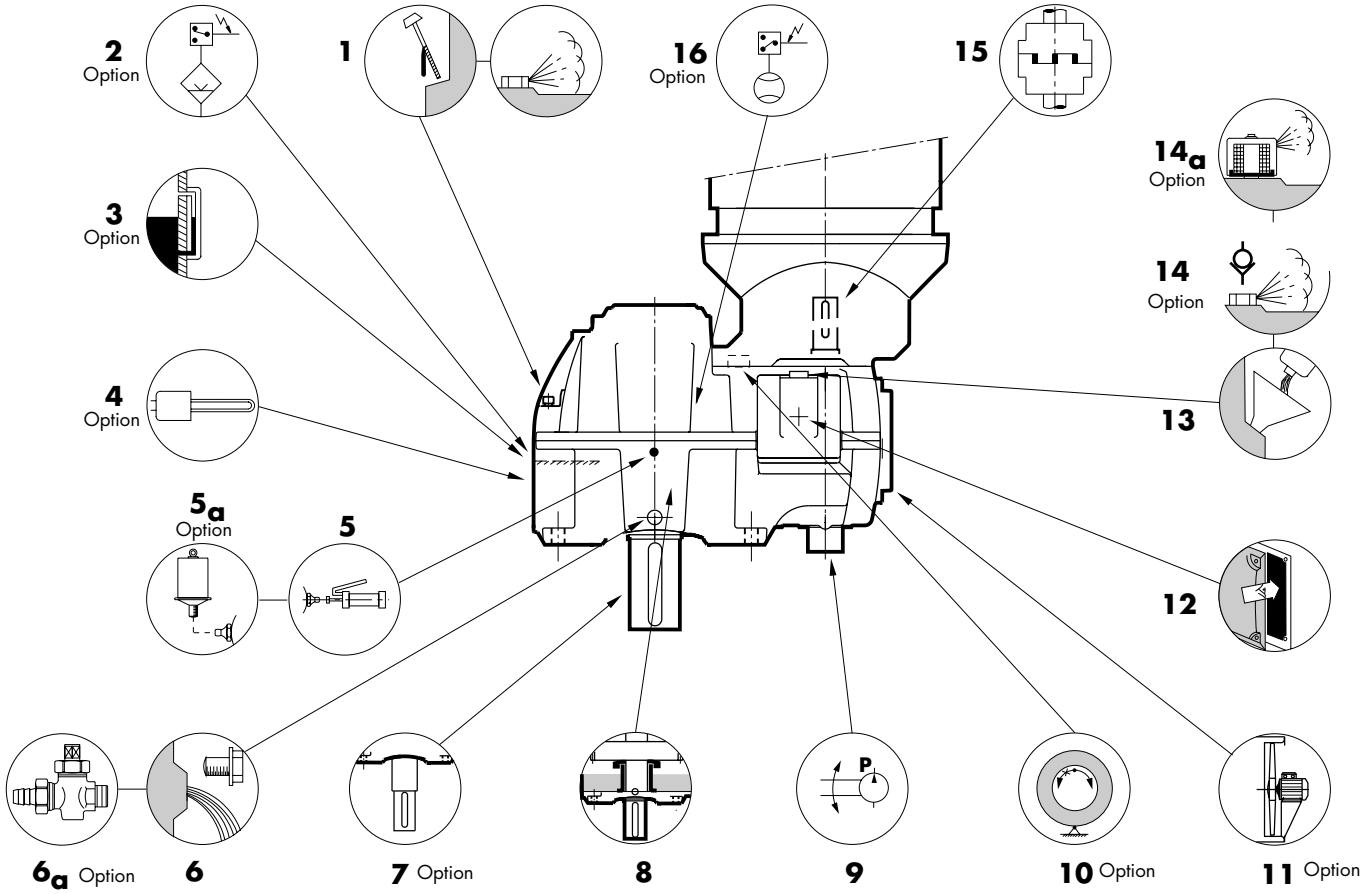
Paint systems
• Basic epoxy painting
A two-component primer with excellent oil resistance and good adherence properties overcoated by a two-component high built epoxy coating with excellent corrosion protection properties in a dry environment.
Total average dry film thickness : 100 µm
• Humidity resistant painting
A two-component high built epoxy paint applied on top of the basic painting.
Total average dry film thickness: 80 µm + 100 µm = 180 µm
• High resistant painting
A two-component polyurethan paint applied on top of the humidity resistant paint.
Total average dry film thickness: 30 µm + 180 µm = 210 µm

Bolts and nuts provided with appropriate protection.

Output shaft extension: QPQ anti-corrosion process as an alternative to stainless steel execution.
The Quench-Polish-Quench diffusion process is a salt-bath nitriding process consisting of quenching, surface smoothing and subsequent quenching.
The result is a wear resistant protective coat with a thickness of 10 to 20 µm.
Proven corrosion resistance of over 200 hours (salt spray test according to DIN 50021) favourably compares with a typical 62 hour corrosion resistance offered by a normal protective chrome coating and even with hard chromium protection (immersion test according to DIN 50905/4).

Standardized gear units for cooling tower drives	Réducteurs standard pour commandes d' aéroréfrigérants	Normzahnradgetriebe für Ventilatorantriebe in Kühltürmen	Standaard tandwielkasten voor ventilatoraandrijvingen van koeltorens
Description	**Description**	**Beschreibung**	**Beschrijving**

QVP C/F 2 - UDN - ..

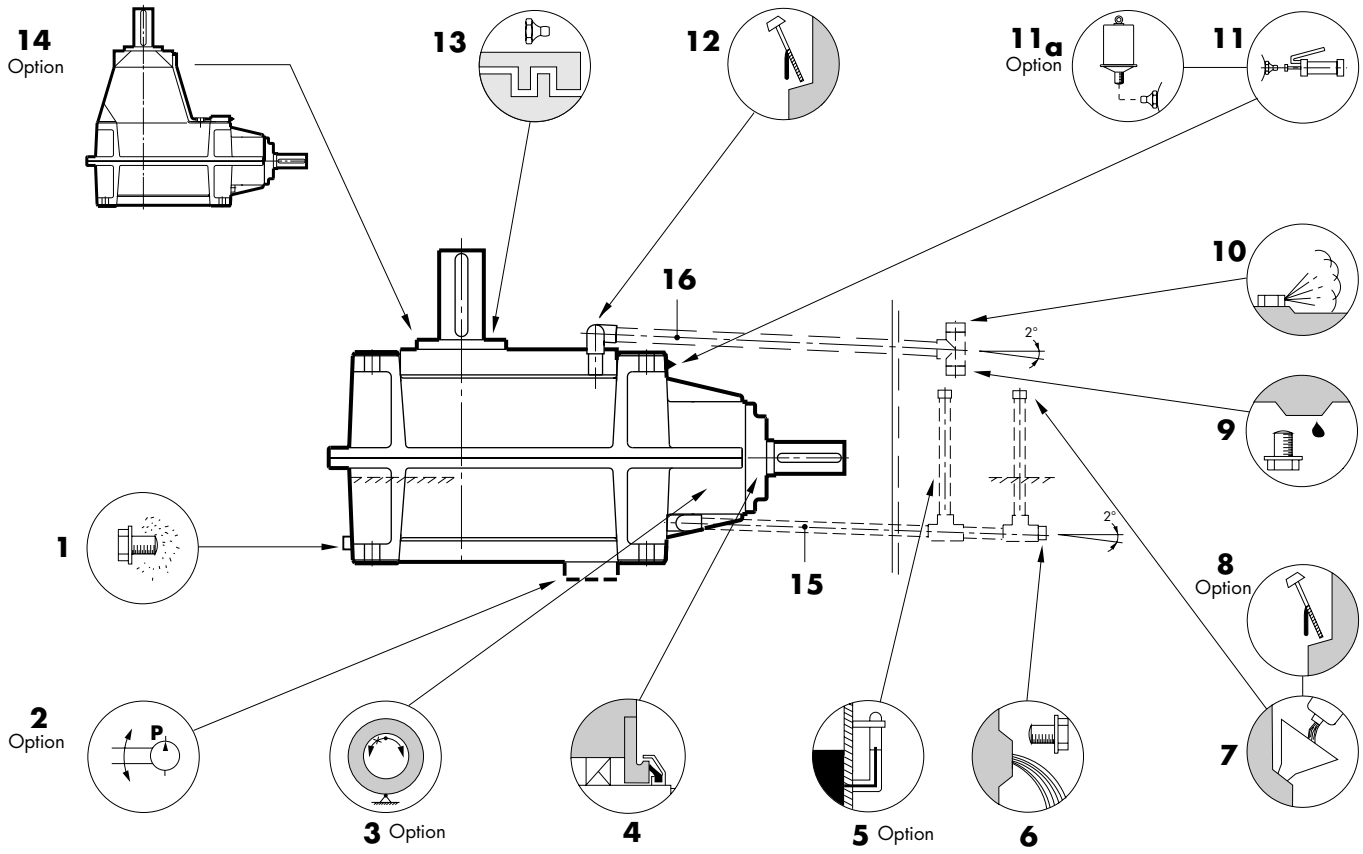


mark option required with X	marquer l'option requise de X	erforderliche Option mit X bezeichnen	vereiste optie aanduiden met X
1 dipstick with breather plug	1 jauge d'huile avec reniflard	1 Ölmeßstab mit Entlüftungsschraube	1 oliepeilstang met verluchtingsstop
2 ☐ oil level switch	2 ☐ contacteur de niveau d'huile	2 ☐ Ölstandschalter	2 ☐ olieniveauschakelaar
3 ☐ oil level glass	3 ☐ indicateur de niveau d'huile	3 ☐ Ölstandglas	3 ☐ oliepeilglas
4 ☐ heater	4 ☐ réchauffeur	4 ☐ Heizstab	4 ☐ verwarmingselement
5 grease point (DIN 71412) of	5 point de graissage (DIN 71412) ou	5 Fettschmierpunkt (DIN 71412) oder	5 vetsmeerpunt (DIN 71412) of
5a ☐ automatic grease lubricator	5a ☐ graisseur automatique	5a ☐ automatische Fettschmierpresse	5a ☐ automatische vetsmeerpot
6 oil drain cock (with magnet) or	6 bouchon de vidange (avec aimant) ou	6 Ablaßschraube (mit Magnet) oder	6 aflaatstop (met magneet) of
6a ☐ drain cock with hose coupling	6a ☐ robinet de vidange avec raccord pour tuyau	6a ☐ Ölablaßhahn mit Rohranschluß	6a ☐ aftapkraan met slangpilaar
7 ☐ extended low speed shaft end	7 ☐ bout d'arbre petite vitesse allongé	7 ☐ verlängertes Abtriebswellenende	7 ☐ verlengd langzaamdraaiend aseind
8 drywell	8 buselure à rebord	8 Steigrohr	8 olieslot
9 pump lubrication	9 lubrification par pompe	9 Pumpenschmierung	9 pompsmering
10 ☐ built-in backstop, accessible after removal of motor lantern	10 ☐ antidévireur incorporé, accessible après demontage de la lanterne moteur	10 ☐ eingebaute Rücklaufsperre, erreichbar nach Entfernung der Motorlaterne	10 ☐ ingebouwde terugloopblokkering, bereikbaar na wegnemen motorlantaarn
11 ☐ axial fan with electric motor	11 ☐ ventilateur axial avec moteur électrique	11 ☐ Axiallüfter mit Elektromotor	11 ☐ axiale ventilator met elektrische motor
12 gear unit inspection cover	12 couvercle d'inspection du réducteur	12 Getriebe-Schaulochdeckel	12 inspectiedeksel van de tandwielkast
13 oil filler plug	13 bouchon de remplissage	13 Öleinfüllschraube	13 vulstop
14 ☐ anti-humidity breather plug or	14 ☐ reniflard anti-humidité ou	14 ☐ Entlüftungsschraube für feuchte Umgebung oder	14 ☐ antivochtverluchtingsstop of
14a ☐ dust-proof breather plug	14a ☐ reniflard anti-poussière	14a ☐ Entlüftungsschraube mit Staubfilter	14a ☐ verluchtingsstop met stoffilter
15 standard elastic block-type coupling	15 accouplement élastique standard à tampons	15 Standard elastische Klauenkupplung	15 standaard elastische blokkenkoppeling
16 ☐ flow switch	16 ☐ contacteur de débit	16 ☐ Strömungsschalter	16 ☐ debietschakelaar

Hansen® TRANSMISSIONS

Standardized gear units for cooling tower drives	Réducteurs standard pour commandes d' aéroréfrigérants	Normzahnradgetriebe für Ventilatorantriebe in Kühltürmen	Standaard tandwielkasten voor ventilatoraandrijvingen van koeltorens
Description	Description	Beschreibung	Beschrijving

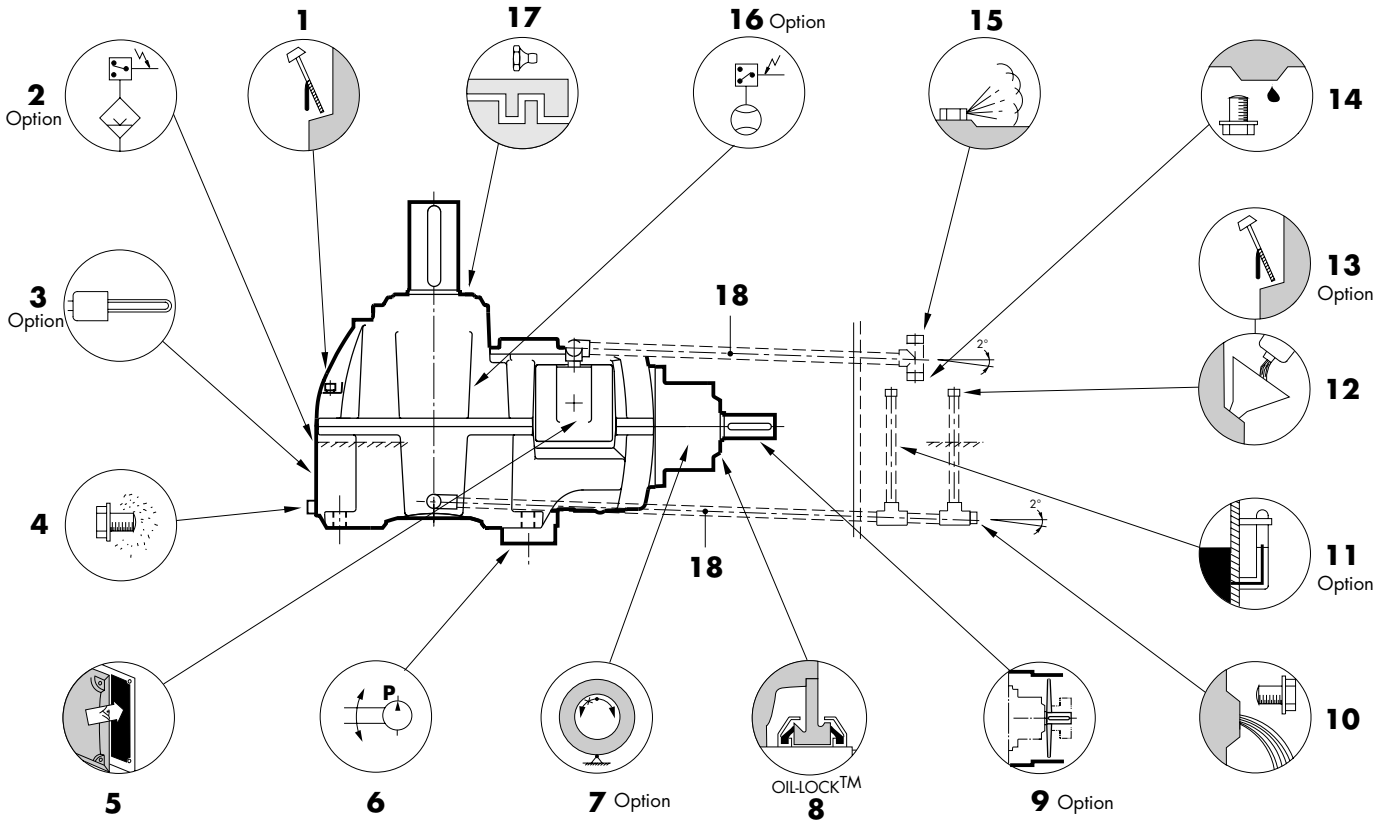
QVR Z/B 2(L) - CUN - ..



mark option required with X	marquer l'option requise de X	erforderliche Option mit X bezeichnen	vereiste optie aanduiden met X
1 magnetic plug	1 bouchon aimanté	1 Magnetschraube	1 magneetstop
2 ☐ pump lubrication	2 ☐ lubrification par pompe	2 ☐ Pumpenschmierung	2 ☐ pompsmering
3 ☐ backstop, centrifugally disengaging type	3 ☐ antidévireur à galets, à soulèvement centrifuge	3 ☐ Rücklaufsperre mit fliehkraftabhebenden Klemmkörpern	3 ☐ terugloopblokkering met centrifugale klemstukken
4 oil seal and labyrinth	4 bague d'étanchéité et labyrinthe	4 Afdichtungsring und Labyrinth	4 afdichtring en labyrinth
5 ☐ oil level glass, not to be used together with anti-humidity breather. Supplied loose.	5 ☐ indicateur de niveau d'huile, ne pas utiliser ensemble avec reniflard anti-humidité. Livraison séparée.	5 ☐ Ölstandglas, nicht zusammen mit Entlüftung für feuchte Umgebung verwenden. Lose mitgeliefert.	5 ☐ oliepeilglas, niet samen gebruiken met antivocht verluchting. Los meegeleverd.
6 draining plug	6 bouchon de vidange	6 Ablaßschraube	6 afloopstop
7 oil filler plug	7 bouchon de remplissage	7 Öleinfüllschraube	7 vulstop
8 ☐ external dipstick. To be calibrated with gear unit dipstick. Supplied loose.	8 ☐ jauge d'huile externe. A calibrer suivant la jauge du réducteur. Livraison séparée.	8 ☐ externer Ölmeßstab. Mit Getriebe-Ölmeßstab abzustimmen. Lose mitgeliefert.	8 ☐ externe oliepeilstang. Te kalibreren met oliepeilstang van tandwielkast. Los meegeleverd.
9 draining plug for water of condensation. Not of Hansen supply.	9 bouchon de vidange de l'eau de condensation. Ne fait pas partie de la livraison de Hansen.	9 Ablaßschraube für Kondenzwasser. Gehört nicht zum Hansen Lieferumfang.	9 afloopstop voor condensatievocht. Geen Hansen levering.
10 breather plug	10 reniflard	10 Entlüftungsschraube	10 verluchtingsstop
11 centralized lubrication points (DIN 71412) of	11 points de graissage centralisés (DIN 71412) ou	11 zentrale Schmierpunkte (DIN 71412) oder	11 gecentraliseerde vetsmeerpunten (DIN 71412) of
11a ☐ automatic grease lubricator	11a ☐ graisseur automatique	11a ☐ automatische Fettschmierpresse	11a ☐ automatische vetsmeerpot
12 gear unit dipstick	12 jauge d'huile du réducteur	12 Getriebe-Ölmeßstab	12 oliepeilstang van tandwielkast
13 regreasable labyrinth (DIN 71412)	13 labyrinthe regraissable (DIN 71412)	13 nachschmierbares Labyrinth (DIN 71412)	13 nasmeerbaar labyrinth (DIN 71412)
14 ☐ extended bearing housing: QVR.2L	14 ☐ palier allongé: QVR.2L	14 ☐ verlängertes Lagergehäuse: QVR.2L	14 ☐ verlengd lagerhuis: QVR.2L
15 ☐ Pipes are not of Hansen supply. Recommended min. pipe diameter: 1". Pipe connections on gear unit: 1" BSP female thread as an option. Elbows at the gear unit are supplied by Hansen	15 ☐ Les tubes ne font pas partie de la livraison de Hansen. Diamètre min. recommandé du tube: 1". Taraudage intérieur des raccords du réducteur: R1" en option. Les coudes au réducteur sont livrés par Hansen	15 ☐ Die Rohre gehören nicht zum Hansen Lieferumfang. Empfohlener Mindest-Rohrduchmesser: 1". Rohrverbindungen am Hansen Getriebe: R1" - Innengewinde als Option. Knierohre am Getriebe gehören zum Hansen Lieferumfang	15 ☐ De buizen worden niet door Hansen geleverd. Minimum aanbevolen buisdiameter: 1". Aansluitpunten op tandwielkast: R1" binnendraad kunnen optioneel voorzien worden. De bochten aan de tandwielkast worden door Hansen geleverd.

Standardized gear units for cooling tower drives	Réducteurs standard pour commandes d' aéroréfrigérants	Normzahnradgetriebe für Ventilatorantriebe in Kühltürmen	Standaard tandwielkasten voor ventilatoraandrijvingen van koeltorens
Description	**Description**	**Beschreibung**	**Beschrijving**

QVR C/F 2 - CUN - ..



mark option required with X	marquer l'option requise de X	erforderliche Option mit X bezeichnen	vereiste optie aanduiden met X
1 gear unit dipstick	1 jauge d'huile du réducteur	1 Getriebe-Ölmeßstab	1 oliepeilstang van tandwielkast
2 ☐ oil level switch	2 ☐ contacteur de niveau d'huile	2 ☐ Ölstandschalter	2 ☐ olieniveauschakelaar
3 ☐ heater	3 ☐ réchauffeur	3 ☐ Heizstäbe	3 ☐ verwarmingselement
4 magnetic plug	4 bouchon aimanté	4 Magnetschraube	4 magneetstop
5 gear unit inspection cover	5 couvercle d'inspection du réducteur	5 Getriebe-Schaulochdeckel	5 inspectiedeksel van de tandwielkast
6 pump lubrication	6 lubrification par pompe	6 Pumpenschmierung	6 pompsmering
7 ☐ backstop, centrifugally disengaging type	7 ☐ antidévireur à galets, à soulèvement centrifuge	7 ☐ Rücklaufsperre mit fliehkraftabhebenden Klemmkörpern	7 ☐ terugloopblokkering met centrifugale klemstukken
8 Oil-Lock TM seal	8 étanchéité Oil-Lock TM	8 Oil-Lock TM Dichtung	8 Oil-Lock TM afdichting
9 ☐ axial fan	9 ☐ ventilateur axial	9 ☐ axialer Lüfter	9 ☐ axiale ventilator
10 draining plug	10 bouchon de vidange	10 Ablaßschraube	10 afloopstop
11 ☐ oil level glass, not to be used together with anti-humidity breather. Supplied loose.	11 ☐ indicateur de niveau d'huile, ne pas utiliser ensemble avec reniflard anti-humidité. Livraison séparée.	11 ☐ Ölstandglas, nicht zusammen mit Entlüftung für feuchte Umgebung verwenden. Lose mitgeliefert.	11 ☐ oliepeilglas, niet samen gebruiken met antivocht verluchting. Los meegeleverd.
12 oil filler plug	12 bouchon de remplissage	12 Öleinfüllschraube	12 vulstop
13 ☐ external dipstick. To be calibrated with gear unit dipstick. Supplied loose.	13 ☐ jauge d'huile externe. A calibrer suivant la jauge du réducteur. Livraison séparée.	13 ☐ externer Ölmeßstab. Mit Getriebe-Ölmeßstab abzustimmen. Lose mitgeliefert.	13 ☐ externe oliepeilstang. Te kalibreren met oliepeilstang van tandwielkast. Los meegeleverd.
14 draining plug for water of condensation Not of Hansen supply.	14 bouchon de vidange de l'eau de condensation. Ne fait pas partie de la livraison de Hansen.	14 Ablaßschraube für Kondenzwasser. Gehört nicht zum Hansen Lieferumfang.	14 afloopstop voor condensatievocht. Geen Hansen levering.
15 breather plug	15 reniflard	15 Entlüftungsschraube.	15 verluchtingsstop
16 ☐ flow switch	16 ☐ contacteur de débit	16 ☐ Strömungsschalter	16 ☐ debietschakelaar
17 regreasable labyrinth (DIN 71412)	17 labyrinthe regraissable (DIN 71412)	17 nachschmierbares Labyrinth (DIN 71412)	17 nasmeerbaar labyrinth (DIN 71412)
18 ☐ Pipes are not of Hansen supply. Recommended min. pipe diameter: 1". Pipe connections on gear unit: 1" BSP female thread as an option. Elbows at the gear unit are supplied by Hansen	18 ☐ Les tubes ne font pas partie de la livraison de Hansen. Diamètre min. recommandé du tube: 1". Taraudage intérieur des raccords du réducteur: R1" en option. Les coudes au réducteur sont livrés par Hansen	18 ☐ Die Rohre gehören nicht zum Hansen Lieferumfang. Empfohlener Mindest-Rohrduchmesser: 1". Rohrverbindungen am Hansen Getriebe: R1" - Innengewinde als Option. Knierohre am Getriebe gehören zum Hansen Lieferumfang	18 ☐ De buizen worden niet door Hansen geleverd. Minimum aanbevolen buisdiameter: 1". Aansluitpunten op tandwielkast: R1" binnendraad kunnen optioneel voorzien worden. De bochten aan de tandwielkast worden door Hansen geleverd.

Hansen® TRANSMISSIONS

REQUEST FOR QUOTATION
COOLING TOWER DRIVES

Ref : Date : Name : Signature :

1. LOAD PARAMETERS

Motor power Pm = kW at min^{-1}

Absorbed power Pa = kW

Absorbed torque Ta = kNm

Running time in h/day ≤3 ☐ ≤10 ☐ >10 ☐

Peak torque in excess of 200% Ta = %

Number of starts/stops per 10 hours : .....

2. SPEED

One constant speed ☐ **two constant speeds** ☐

Variable speed ☐

High speed shaft (HSS) n1: variable : .... ≤ min^{-1} ≤ ....

constant : .... min^{-1}

.... min^{-1}

direction of rotation : CW ☐ CCW ☐

Low speed shaft (LSS) n2: .... ≤ min^{-1} ≤ ....

.... ≤ min^{-1} ≤ ....

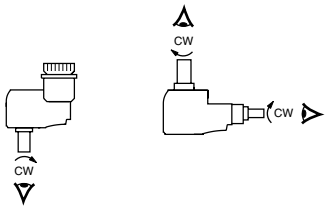
direction of rotation : CW ☐ CCW ☐

solid shaft extension : up ☐ down ☐

Gear unit shaft configuration : Parallel ☐

Right-angle ☐

Backstop required Y ☐ N ☐



3. THRUST LOAD ON LOW SPEED SHAFT Y ☐ N ☐

Weight of fan and coupling = kN

Aerodynamic thrust load towards gear unit = + kN

away from gear unit = - kN

4. INSTALLATION PARAMETERS

Ambient temperature (°C) near the gear unit :

min: ..... max: .....

Structure (see page B7) open ☐ closed ☐

Air speed near the gear unit : ..... m/s

Location

Direct sun exposure Y ☐ N ☐

Max. noise power: dBA

Max. noise pressure: dBA at ..... m

Atmosphere: humid ☐

dusty ☐

aggressive, to specify ☐

Electric installation AC / 3 Ph V Hz

Main power supply ☐ ....

Auxiliary power supply ☐ ....

Protection requirement: .....

Insulation: .....

Max. motor noise power: dBA

Max. motor noise pressure: dBA at ..... m

If additional cooling is required, what is not allowed:

Fan ☐

Oil to air cooler ☐

Cooling coil ☐

Oil to water cooler ☐

Availability of water Y ☐ N ☐

if aggressive, specify

5. OPTIONAL SPECIFICATIONS

Options to be indicated on pages B3 up to B5

Motor mount IEC frame:

(if not IEC, add dimensional drawing)

Shafts inch ☐

extended shaft end: indicate on sketch of application

Corrosion protection (see page B2)

solid LSS : QPQ treatment ☐

Painting (see page B2)

humidity resistant painting ☐

high resistant painting ☐

Not allowable materials Al ☐

Cu ☐

Other .....

Sketch of application

TOP VIEW

SIDE VIEW

please indicate tilt angles if ≥ 5/1000

Other data available in :

SELECTION

COOLING TOWER DRIVES

Procedure

Reference Data

SELECTION

SELECTION DATA

Pm , Pa , n_{HSS} , n_{LSS} , i_N, Shaft configuration

refer to page B6 : "Request for quotation of cooling tower drives"

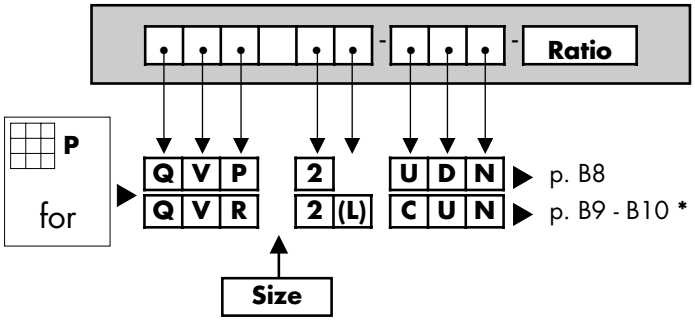
PROGRAMME SELECTION

refer to pages A1 - A2

Hansen P4

for ratios ≤ 5 refer to Hansen

P ≥ Motor Power **Pm** x SF = 1,75 and Absorbed Power **Pa** x SF = 2



Mechanical power rating **P**

Number of stages

Ratio

P → Size

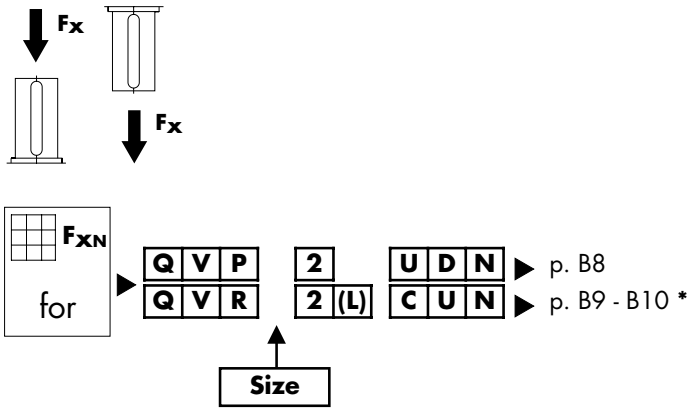
CHECK

Thrust load

F_x: ... kN

Check with F_{xN} : $F_x \leq F_{xN}$

Pay attention to direction of F_x !



Thermal rating: refer to Hansen

Thermal rating depends on:

- service factor
- ratio
- input speed
- ambient temperature
- open / closed structure
- air speed
- wet/dry atmosphere
- direct sun exposure

→ In order to allow Hansen to perform an adequate thermal check of the gear unit, please describe the exact ambient conditions on the 'Request for quotation' sheet page B6.

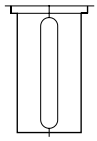
Open structure: gear units installed in an open steel frame structure allowing the cooling tower air flow to pass over the gear unit's housing.

Closed structure: gear units installed on a solid concrete plinth or enclosed steel frame. This structure prevents the cooling tower air flow from passing over the gear unit's housing.

* **Remark**: values for P and F_x (p. B9 - B10) are the same for QVR.2 and QVR.2L

Hansen® TRANSMISSIONS

Hansen P4



Gear unit	Réducteur à engrenages	Zahnradgetriebe	Tandwielkast	Q
Low speed shaft	Arbre petite vitesse	Langsamdrehende Welle	Langzaamdraaiende as	V
Parallel shafts	Arbres parallèles	Stirnräder	Evenwijdige assen	P
Size	Taille	Baugröße	Grootte	C ▶ F
Two stages	Deux étages	Zweistufig	Tweetraps	2

Mechanical power ratings	Puissances mécaniques nominales	Nennleistungen	Nominale mechanische vermogens	P (kW)
Rated thrust load	Charge axiale nominale	Nennaxialbelastung	Nominale axiale belasting	F_{XN} (kN)

			P (kW)				FXN (kN)				i_{ex}			J (kgm²)
	min⁻¹		Size - Taille - Baugröße - Grootte				Size - Taille - Baugröße - Grootte				Size - Taille - Baugröße - Grootte			
i_N	n_1	n_2	C	D	E	F	C	D	E	F	C	D	E	F
6,3	1800	285	357	546	881	1190	16	21,5	31	48				
	1500	240	314	468	745	1050	15,5	22	32	48	6,2296	6,4156	6,1875	6,4699
	1200	190	262	383	600	857	15,5	22,5	34	50				
	1000	160	219	321	503	718	16,5	23,5	35	51				
	900	145	198	289	454	648	17	24,5	36	53	0,0547	0,108	0,213	0,423
	750	120	165	242	380	543	17,5	25,5	38	54				
7,1	1800	255	321	469	743	1110	17	22,5	33	50				
	1500	210	269	402	623	930	17,5	23	34	51	7,1594	7,2524	7,1188	7,0074
	1200	170	216	330	502	750	18,5	23,5	36	54				
	1000	140	181	278	420	628	19,5	24,5	37	56				
	900	125	163	251	379	567	20	25	38	57	0,0514	0,103	0,2	0,408
	750	105	137	210	318	475	20,5	26	40	59				
8	1800	225	310	450	726	982	15	22,5	33	50				
	1500	190	263	383	609	853	15,5	23	34	50	7,7364	7,9673	7,6261	7,9849
	1200	150	212	310	490	699	16,5	24	36	52				
	1000	125	177	259	410	585	17,5	25	37	54				
	900	115	160	234	370	528	17,5	25,5	38	55	0,0415	0,0823	0,162	0,322
	750	94	134	196	310	442	18,5	26,5	39	57				
9	1800	200	260	387	607	906	17,5	23,5	34	52				
	1500	165	218	330	509	759	18,5	24	36	53	8,8911	9,0065	8,7738	8,6483
	1200	135	175	269	410	611	19,5	24,5	37	56				
	1000	110	147	225	343	512	20	25,5	39	58				
	900	100	132	203	309	462	20,5	26,5	40	59	0,0394	0,0787	0,154	0,312
	750	83	111	170	259	387	21,5	27,5	41	61				
10	1800	180	251	363	570	796	16	23	34	51				
	1500	150	210	307	477	676	16,5	24	36	52	9,7673	10,059	9,7903	10,326
	1200	120	169	247	384	544	17,5	25	38	54				
	1000	100	141	207	322	456	18,5	26	39	56				
	900	90	127	186	290	411	19	27	40	58	0,0314	0,0623	0,12	0,236
	750	75	106	156	243	344	19,5	28	41	60				
11,2	1800	160	207	313	476	706	18,5	24	36	54				
	1500	135	174	267	399	591	19,5	24,5	38	56	11,225	11,371	11,264	11,183
	1200	105	140	215	321	476	20,5	26	39	59				
	1000	89	117	179	269	398	21	27	41	61				
	900	80	105	162	242	359	22	27,5	42	62	0,0301	0,0601	0,114	0,23
	750	67	88	135	203	301	23	29	43	64				
12,5	1800	145	196	291	461	645	17	24,5	36	53				
	1500	120	164	244	386	540	17,5	25	37	55	12,54	12,73	12,176	13
	1200	96	132	196	311	435	18,5	26,5	39	57				
	1000	80	111	164	260	364	19,5	27,5	41	59				
	900	72	100	148	234	328	20	28,5	42	61	0,0239	0,048	0,0926	0,181
	750	60	83	124	196	274	22	29,5	43	62				
14	1800	130	162	253	385	564	20	25	38	57				
	1500	105	136	212	323	473	20,5	26	39	59	14,412	14,39	14,009	14,08
	1200	86	109	170	259	380	21,5	27,5	41	61				
	1000	71	91	142	217	318	22,5	28,5	43	64				
	900	64	82	128	196	287	24	29	44	65	0,0231	0,0466	0,0892	0,178
	750	54	69	107	164	240	26	32	45	67				
16	1800	115	159	227	359	526	18	25,5	38	55				
	1500	94	133	190	300	440	18,5	26,5	40	57	15,557	16,461	15,745	16,036
	1200	75	107	152	242	354	19,5	28	41	60				
	1000	63	89	128	202	296	21	29	43	62				
	900	56	81	115	182	267	22,5	31	44	63	0,0191	0,0368	0,0698	0,145
	750	47	67	96	152	223	25	34	47	65				
18	1800	100	132	197	300	460	20,5	26,5	40	59				
	1500	83	110	165	251	385	21,5	27,5	42	61	17,879	18,608	18,115	17,368
	1200	67	88	132	202	310	23	29	43	64				
	1000	56	74	111	169	259	25	31	45	66				
	900	50	67	100	152	233	26,5	33	47	68	0,0186	0,0359	0,0677	0,142
	750	42	56	83	127	195	29	37	51	71				
20	1800	90	125	187	289	423	19	27	40	57				
	1500	75	104	156	242	354	19,5	28	41	60	19,969	20,069	19,671	20,059
	1200	60	84	126	194	284	22	29,5	43	62				
	1000	50	70	105	162	238	24,5	32	45	65				
	900	45	63	95	146	214	26	34	48	66	0,0152	0,0305	0,0555	0,115
	750	38	53	79	122	179	28,5	38	53	72				
22,4	1800	80	103	162	241	370	22	27,5	42	62				
	1500	67	86	136	202	309	23	28,5	43	64	22,949	22,686	22,631	21,725
	1200	54	69	109	162	249	26	32	46	67				
	1000	45	58	91	136	208	28,5	35	49	69				
	900	40	52	82	122	187	30	37	52	72	0,0149	0,0299	0,0542	0,114
	750	33	44	69	102	157	33	40	57	78				

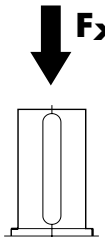
Thermal check: see p. B7
i_N Nominal ratio
i_{ex} Exact ratio
J Moments of inertia J related to the HSS
$n_{1,2}$ Nominal speed (rpm)

Contrôle thermique: voir p. A8
i_N Rapport nominal
i_{ex} Rapport exact
J Moments d'inertie J rapportés à l'arbre G.V.
$n_{1,2}$ Vitesse nominale

Thermische Kontrolle: siehe S.A8
i_N Nennübersetzung
i_{ex} Exakte Übersetzung
J Massenträgheitsmomente J beziehen sich auf die SDW
$n_{1,2}$ Nenndrehzahl

Thermische controle: zie p. A8
i_N Nominale verhouding
i_{ex} Exacte verhouding
J Massatraagheitsmomenten J berekend aan de SDA
$n_{1,2}$ Nomin. toerentallen

Hansen P4



Gear unit	Réducteur à engrenages	Zahnradgetriebe	Tandwielkast	Q
Low speed shaft	Arbre petite vitesse	Langsamdrehende Welle	Langzaamdraaiende as	V
Right-angle shafts	Arbres perpendiculaires	Kegel- und Stirnräder	Haakse assen	R
Size	Taille	Baugröße	Grootte	Z ▶ F
Two stages	Deux étages	Zweistufig	Tweetraps	2
Mechanical power ratings	Puissances mécaniques nominales	Nennleistungen	Nominale mechanische vermogens	P (kW)
Rated thrust load	Charge axiale nominale	Nennaxialbelastung	Nominale axiale belasting	FXN (kN)

			P (kW)							FXN (kN)						
	min-1		Size - Taille - Baugröße - Grootte							Size - Taille - Baugröße - Grootte						
iN	n1	n2	Z	A	B	C	D	E	F	Z	A	B	C	D	E	F
3,55	1800	510	89	135	215					8,2	14,5	18,5				
	1500	420	74	110	180					8,5	15	19				
	1200	340	59	89	140					8,9	15,5	19,5				
	1000	280	49	74	120					9,3	16	20,5				
	900	255	45	66	105					9,5	16	21				
	750	210	37	55	89					9,8	16,5	21,5				
4	1800	450	89	135	215					7,9	14	18				
	1500	380	74	110	180					8,3	14,5	18,5				
	1200	300	59	89	140					8,7	15	19				
	1000	250	49	74	120					9	16	20				
	900	225	45	66	105					9,2	16	20,5				
	750	190	37	55	89					9,5	16,5	21				
4,5	1800	400	89	135	215					7,8	14	17				
	1500	330	74	110	180					8,1	14	18				
	1200	265	59	89	140					8,5	15	18,5				
	1000	220	49	74	120					8,8	15,5	19,5				
	900	200	45	66	105					9	15,5	19,5				
	750	165	37	55	89					9,3	16	20,5				
5	1800	360	89	135	215					7,4	13	16,5				
	1500	300	74	110	180					7,7	13,5	17				
	1200	240	59	89	140					8,1	14,5	18				
	1000	200	49	74	120					8,5	15	18,5				
	900	180	45	66	105					8,7	15	19				
	750	150	37	55	89					9	15,5	20				
5,6	1800	320	89	135	215					6,9	12	15,5				
	1500	270	74	110	180					7,2	12,5	16,5				
	1200	215	59	89	140					7,7	13,5	17				
	1000	180	49	74	120					8	14	18				
	900	160	45	66	105					8,2	14	18,5				
	750	135	37	55	89					8,5	14,5	19				
6,3	1800	285	84	135	215	341	546	703	1010	6,9	13,5	17	17,5	22,5	40	56
	1500	240	73	110	180	287	467	619	885	6,9	14	17,5	18	23	40	56
	1200	190	59	89	140	230	378	529	757	7,1	14,5	18,5	19	24	40	56
	1000	160	49	74	120	192	315	452	633	7,4	15	19	19,5	25	40	58
	900	145	45	66	105	172	283	407	570	7,7	15,5	19,5	20,5	26	41	59
	750	120	37	55	89	144	236	339	475	7,9	16	20	21	27	43	61
7,1	1800	255	74	135	205	310	490	703	1010	7,1	13,5	17,5	18	22,5	36	54
	1500	210	62	110	180	267	411	619	885	7,4	14	18	18,5	23,5	36	54
	1200	170	50	89	140	215	331	503	754	7,7	15	18,5	19,5	24,5	37	54
	1000	140	42	74	120	180	277	421	632	8,2	15,5	19,5	20	25,5	39	56
	900	125	38	66	105	162	250	380	570	8,4	15,5	20	20,5	26	39	57
	750	105	32	55	89	136	209	318	475	9	16,5	20,5	21,5	27	41	59
8	1800	225	67	105	170	291	447	704	967	7,4	14,5	17,5	17	23	35	50
	1500	190	56	86	140	249	378	598	835	7,7	15	18	17,5	24	35	50
	1200	150	45	69	115	205	304	482	672	8,1	15,5	19	17,5	25	37	53
	1000	125	38	58	96	174	255	403	563	8,4	16	19,5	18	26	39	55
	900	115	34	52	86	157	230	364	508	8,7	16	20	18,5	26,5	39	56
	750	94	28,5	44	72	131	192	305	425	9,4	17	20,5	19,5	28	41	58
9	1800	200	58	105	145	255	392	597	871	7,4	14,5	19,5	18,5	23,5	36	53
	1500	165	49	87	130	214	329	500	730	7,8	15	20	19,5	24,5	37	55
	1200	135	39	70	105	172	264	402	588	8,1	15,5	20,5	20	26	39	57
	1000	110	33	58	87	144	221	337	492	8,6	16	21,5	21	27	40	59
	900	100	29,5	53	78	130	200	304	444	9,1	16,5	21,5	21,5	27,5	41	60
	750	83	24,5	44	65	109	167	254	372	10	17,5	22,5	22,5	28,5	43	62
10	1800	180	56	110	150	240	359	569	783	7,2	12	17	17,5	24	36	52
	1500	150	46	91	130	205	301	482	680	7,5	12,5	17	18	25	37	53
	1200	120	37	73	105	168	242	387	547	7,9	13	18	18,5	26,5	39	55
	1000	100	31	61	87	142	203	324	458	8,7	13,5	18,5	19	27,5	40	57
	900	90	28	55	78	128	183	293	413	9,2	14	19	19,5	28	41	58
	750	75	23,5	45	65	107	152	245	346	10,5	15,5	20,5	20,5	29,5	43	60
11,2	1800	160	47	87	140	208	312	480	710	8	14,5	18,5	19,5	25	38	55
	1500	135	39	73	120	174	261	402	595	8,2	15,5	19	20	26	39	57
	1200	105	32	58	95	140	210	324	479	9	16	20	21	27	41	59
	1000	89	26,5	49	79	117	176	271	401	9,9	16,5	20,5	22	28	42	61
	900	80	23,5	44	71	106	159	244	361	10,5	17,5	21	22,5	29	43	63
	750	67	20	37	60	88	133	204	302	11,5	19	23	23,5	30	45	65
12,5	1800	145	42	65	110	182	264	441	584	8,1	15,5	19,5	19,5	28	39	58
	1500	120	35	54	90	151	220	367	487	8,5	16	20	20,5	29	41	60
	1200	96	28,5	44	73	121	176	294	389	9,4	17	21	21,5	30	43	63
	1000	80	23,5	37	61	101	147	245	325	10,5	18	21,5	22,5	32	44	65
	900	72	21,5	33	55	91	132	221	292	11	19	23	23	32	45	67
	750	60	18	27,5	46	76	110	184	244	12,5	20,5	25	25	34	49	70

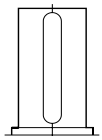
Thermal check: see p. B7
i_N Nominal ratio
i_{ex} Exact ratio
$n_{1,2}$ Nominal speed (rpm)

Contrôle thermique: voir p. B7
i_N Rapport nominal
i_{ex} Rapport exact
$n_{1,2}$ Vitesse nominale

Thermische Kontrolle: siehe S. B7
i_N Nennübersetzung
i_{ex} Exakte Übersetzung
$n_{1,2}$ Nenndrehzahl

Thermische controle: zie p. B7
i_N Nominale verhouding
i_{ex} Exacte verhouding
$n_{1,2}$ Nomin. toerentallen

Hansen® TRANSMISSIONS



Gear unit	Réducteur à engrenages	Zahnradgetriebe	Tandwielkast	Q
Low speed shaft	Arbre petite vitesse	Langsamdrehende Welle	Langzaamdraaiende as	V
Right-angle shafts	Arbres perpendiculaires	Kegel- und Stirnräder	Haakse assen	R
Size	Taille	Baugröße	Grootte	Z ▶ F
Two stages	Deux étages	Zweistufig	Tweetraps	2

Mechanical power ratings	Puissances mécaniques nominales	Nennleistungen	Nominale mechanische vermogens	P (kW)
Rated thrust load	Charge axiale nominale	Nennaxialbelastung	Nominale axiale belasting	FXN (kN)

			P (kW)							FXN (kN)						
	min-1		Size - Taille - Baugröße - Grootte							Size - Taille - Baugröße - Grootte						
iN	n1	n2	Z	A	B	C	D	E	F	Z	A	B	C	D	E	F
14	1800	130				164	253	386	566				20,5	26	39	57
	1500	105				138	212	323	474				21	27	41	59
	1200	86				111	171	260	382				22	28,5	43	62
	1000	71				92	143	217	319				23	29,5	44	64
	900	64				83	129	196	288				24,5	30	45	65
	750	54				70	108	164	241				26,5	33	47	68
16	1800	115				127	187	298	417				23	32	46	65
	1500	94				106	156	248	348				23,5	33	47	67
	1200	75				85	125	199	278				24,5	34	49	70
	1000	63				71	104	166	232				26,5	35	51	73
	900	56				64	94	149	209				27,5	37	52	74
	750	47				53	78	124	174				30	40	55	76
18	1800	100				127	187	298	417				22	29	42	64
	1500	83				106	156	248	348				23	30	44	66
	1200	67				85	125	199	278				24,5	32	46	69
	1000	56				71	104	166	232				26,5	34	47	71
	900	50				64	94	149	209				28	36	49	72
	750	42				53	78	124	174				31	39	54	76

Thermal check: see p. B7
Contrôle thermique: voir p. B7
Thermische Kontrolle: siehe S. B7
Thermische controle: zie p. B7

	iex J (kgm2)													
	Size - Taille - Baugröße - Grootte													
	Z		A		B		C		D		E		F	
iN	iex	J	iex	J	iex	J	iex	J	iex	J	iex	J	iex	J
3,55	3,6184	0,00852	3,6184	0,0185	3,5200	0,0363								
4	3,9130	0,00822	3,9130	0,0166	3,8944	0,0343								
4,5	4,3609	0,00787	4,4361	0,0156	4,4150	0,0322								
5	4,9428	0,00758	5,0239	0,0148	4,9286	0,0307								
5,6	5,5639	0,00724	5,6053	0,0141	5,5786	0,029								
6,3	6,2327	0,00696	6,2171	0,0138	6,2857	0,0282	6,2701	0,0554	6,4572	0,117	6,1765	0,213	6,4323	0,406
7,1	7,1517	0,00664	7,1517	0,0131	7,0252	0,027	7,2059	0,0522	7,2995	0,111	7,1061	0,2	6,9667	0,391
8	7,6974	0,00648	8,0000	0,0123	7,7698	0,0254	7,8824	0,0426	8,1176	0,0872	7,7647	0,175	8,3097	0,303
9	8,9270	0,00529	8,9933	0,0101	8,8750	0,0211	9,0588	0,0406	9,1765	0,0837	8,9333	0,167	9	0,293
10	10,000	0,00518	9,9750	0,01	10,000	0,0208	9,737	0,0305	10,266	0,0576	9,7059	0,112	10,263	0,201
11,2	11,475	0,00506	11,475	0,00975	11,177	0,0203	11,19	0,0292	11,606	0,0554	11,167	0,106	11,116	0,195
12,5	12,350	0,00499	12,836	0,00943	12,361	0,0197	12,387	0,0212	12,718	0,0419	12,165	0,0742	12,949	0,133
14							14,235	0,0203	14,376	0,0405	13,996	0,0707	14,025	0,129
16							15,765	0,0164	16,235	0,0324	15,529	0,0535	16,25	0,0971
18							18,118	0,0159	18,353	0,0316	17,867	0,0513	17,6	0,0947

iN	Nominal ratio	iN	Rapport nominal	iN	Nennübersetzung	iN	Nominale verhouding
iex	Exact ratio	iex	Rapport exact	iex	Exakte Übersetzung	iex	Exacte verhouding
J	Moments of inertia J related to the HSS	J	Moments d'inertie J rapportés à l'arbre G.V.	J	Massenträgheitsmomente J beziehen sich auf die SDW	J	Massatraagheitsmomenten J berekend aan de SDA
n1,2	Nominal speed (rpm)	n1,2	Vitesse nominale	n1,2	Nenndrehzahl	n1,2	Nomin. toerentallen

Hansen P4

97QU-VP2N0101 B

mm

Motor-reducer	**Moto-réducteur**	**Getriebe mit Flanschmotor**	**Motorreduktiekast**	**Q**
Vertical L.S.S.	**Arbre P.V. vertical**	**Langsamdr. Welle: vert.**	**Langz. dr. as: vertic.**	**V**
Parallel shafts	**Arbres parallèles**	**Stirnräder**	**Evenwijdige assen**	**P**
Size	**Taille**	**Baugröße**	**Grootte**	**C ▶ F**
Two stages	**Deux étages**	**Zweistufig**	**Tweetraps**	**2**

For cooling tower fan drives | **Pour commandes d'aéro-réfrigérants** | **Für Ventilatorantriebe in Kühltürmen** | **Voor ventilatoraandrijvingen van koeltorens**

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

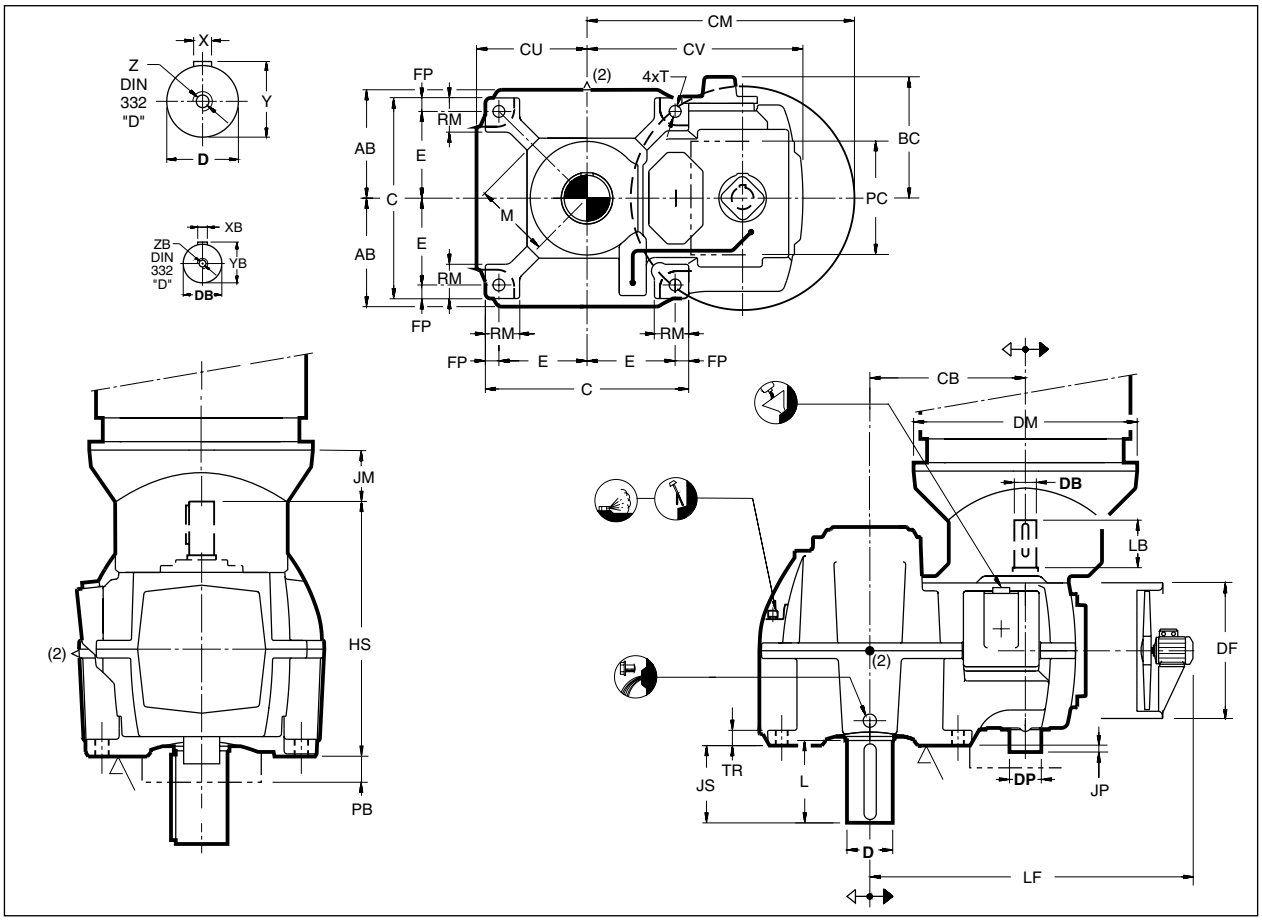
Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

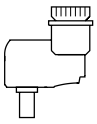
Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting.

Bindende afmetingen op verzoek.



UDN



Shaft arrangement (front view) | **Disposition des arbres** (vue en élévation) | **Wellenanordnung** (Vorderansicht) | **Asschikking** (vooraanzicht)

(1) Space for pump removal
(2) Grease lubrication point
(3) +90mm for explosion proof execution

(1) Espace de dégagement de la pompe
(2) Point de graissage
(3) +90mm pour exécution anti-déflagrante

(1) Freier Raum für Demontage der Pumpe
(2) Fettschmierstelle
(3) +90mm für ex-Schutz Ausführung

(1) Vrije ruimte voor demontage pomp
(2) Vetsmeerpunt
(3) +90mm voor explosievrije uitvoering

Type	AB	BC	C	CB	CU	CV	E	FP	HS	JS	M	RM	T	TR	kg	Litres Liter
QVPC2	255	280	470	345	260	487	200	35	520	204	165	95	28	38	410	30
QVPD2	285	290	530	397	290	553	225	40	605	207	195	95	35	40	590	40
QVPE2	320	335	600	459	326	637	260	40	665	245	225	105	35	45	880	55
QVPF2	365	372	690	525	370	720	295	50	735	243	265	135	42	52	1200	80

Type	Shafts - Arbres - Wellen - Assen Keys Clavettes Paßfeder Spieën ISO/R773-1969										Fan - Ventilateur Lüfter - Ventilator		Pump - Pompe - Pumpe - Pomp			
	D-m6	L	X	Y	Z	DB	LB	XB	YB	ZB	DF	LF (3)	DP (1)	JP	PB (1)	PC (1)
QVPC2	105	210	28	111	M24	48k6	110	14	51,5	M16	390	910	110	29	75	110
QVPD2	115	210	32	122	M24	58m6	140	16	62	M20	465	980	110	19	65	110
QVPE2	135	250	36	143	M30	65m6	140	18	69	M20	507	1050	145	-1	50	145
QVPF2	155	250	40	164	M30	75m6	140	20	79,5	M20	507	1145	145	6	60	145

MOTOR - MOTEUR		Hansen P4								Coupling Accouplement Kupplung Koppeling
IEC CEI V1	DM	QVPC2		QVPD2		QVPE2		QVPF2		
		CM	JM	CM	JM	CM	JM	CM	JM	
225	450	570	145							Refer to us
250	550	620	145	672	145	734	145			Veuillez nous consulter
280	550	620	145	672	145	734	145			Rückfrage zu empfehlen
315	660	675	175	727	175	789	175	855	175	Gelieve ons te raadplegen
355	800					859	215	925	215	

Hansen P4

97QU-VR2N0101 B

mm

Gear unit	**Réducteur à engrenages**	**Zahnradgetriebe**	**Tandwielkast**	**Q**
Vertical L.S.S.	**Arbre P.V. vertical**	**Langsamdr. Welle: vert.**	**Langz. dr. as: vertic.**	**V**
Right-angle shafts	**Arbres perpendiculaires**	**Kegel- und Stirnräder**	**Haakse assen**	**R**
Size	**Taille**	**Baugröße**	**Grootte**	**Z ▶ B**
Two stages	**Deux étages**	**Zweistufig**	**Tweetraps**	**2**

For cooling tower fan drives | **Pour commandes d'aéro-réfrigérants** | **Für Ventilatorantriebe in Kühltürmen** | **Voor ventilatoraandrijvingen van koeltorens**

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

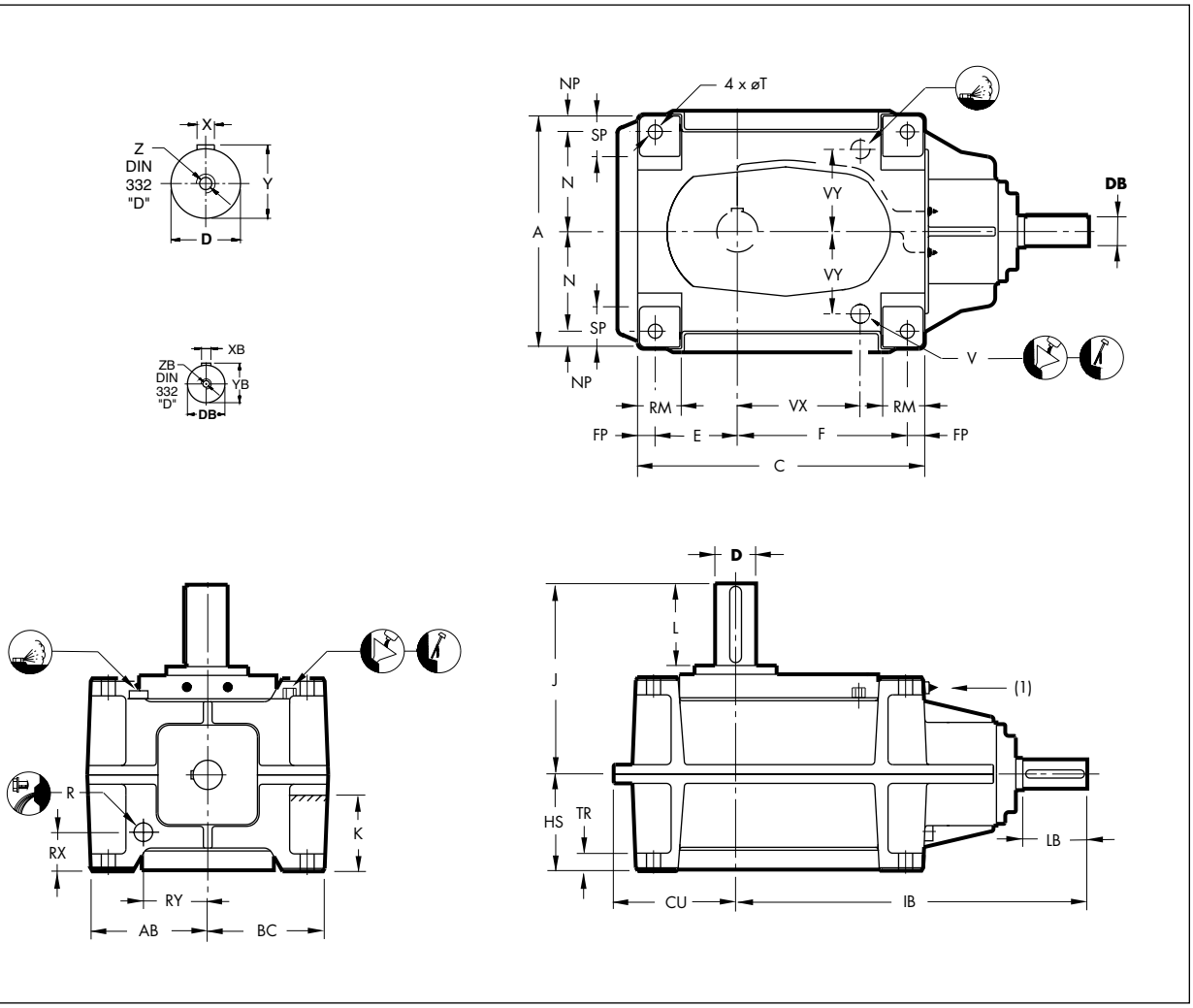
Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting.

Bindende afmetingen op verzoek.

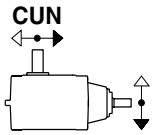


External dimensions are not affected when mounting a backstop
(1) Centralised grease points
(2) Approximate values; only the markings on the gear unit dipstick are determinant for the oil level

Le montage d'un antidéviveur n'affecte pas les dimensions extérieures
(1) Points de graissage centralisés
(2) Valeurs indicatives; marquages sur la jauge d'huile du réducteur sont déterminants pour le niveau d'huile

Montage einer Rücklaufsperre ändert die Außenabmessungen nicht
(1) Zentralschmierstellen
(2) Richtwerte; maßgebend für die Ölmenge sind nur die Markierungen am Getriebe-Ölmeßstab

Uitwendige afmetingen ongewijzigd bij montage van een terugloopblokkering
(1) Gecentraliseerde smeerpunten
(2) Richtwaarden; enkel de markeringen op de peilstang van de tandwielkast zijn bepalend voor het olieniveau



Shaft arrangement (front view) | **Disposition des arbres** (vue en élévation) | **Wellenanordnung** (Vorderansicht) | **Asschikking** (vooraanzicht)

Type	A	AB	BC	C	CU	E	F	FP	HS	IB	J	N	NP	RM	SP	T	TR
QVRZ2	320	165	165	375	165	105	220	25	150	457	310	135	25	60	60	19	25
QVRA2	355	182,5	182,5	425	185	125	250	25	150	550	340	152,5	25	60	60	19	25
QVRB2	400	206	206	490	208	140	290	30	165	602	355	170	30	72	72	24	30

Type	Shafts - Keys / Arbres - Clavettes / Wellen - Paßfeder / Assen - Spieën ISO/R773-1969										Draining Ölablaß / Vidange Afloop			Ventilation Entluftung / Aeration Verluchting			kg	Litres Liter	Oil level Ölniveau / Niveau d'huile Olieniveau
	D	L	X	Y	Z	DB	LB	XB	YB	ZB	R	RX	RY	V	VX	VY			K (2)
QVRZ2	60m6	140	18	64	M20	35k6	80	10	38	M12	R3/4"	65	82	R3/4"	150	108	120	4	120
QVRA2	80m6	170	22	85	M20	40k6	110	12	43	M16	R3/4"	65	100	R3/4"	180	120	170	5	115
QVRB2	90m6	170	25	95	M24	50k6	110	14	53,5	M16	R3/4"	67	110	R3/4"	210	140	230	7	130

Gear unit	Réducteur à engrenages	Zahnradgetriebe	Tandwielkast	Q
Vertical L.S.S.	Arbre P.V. vertical	Langsamdr. Welle: vert.	Langsz. dr. as: vertic.	V
Right-angle shafts	Arbres perpendiculaires	Kegel- und Stirnräder	Haakse assen	R
Size	Taille	Baugröße	Grootte	Z ▶ B
Two stages	Deux étages	Zweistufig	Tweetraps	2
Extended bearing housing	Palier allongé	Verlängertem Lager-gehäuse	Verlengd lagerhuis	L
For cooling tower fan drives	Pour commandes d'aéro-réfrigérants	Für Ventilatorantriebe in Kühltürmen	Voor ventilatoraandrij-vingen van koeltorens	

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

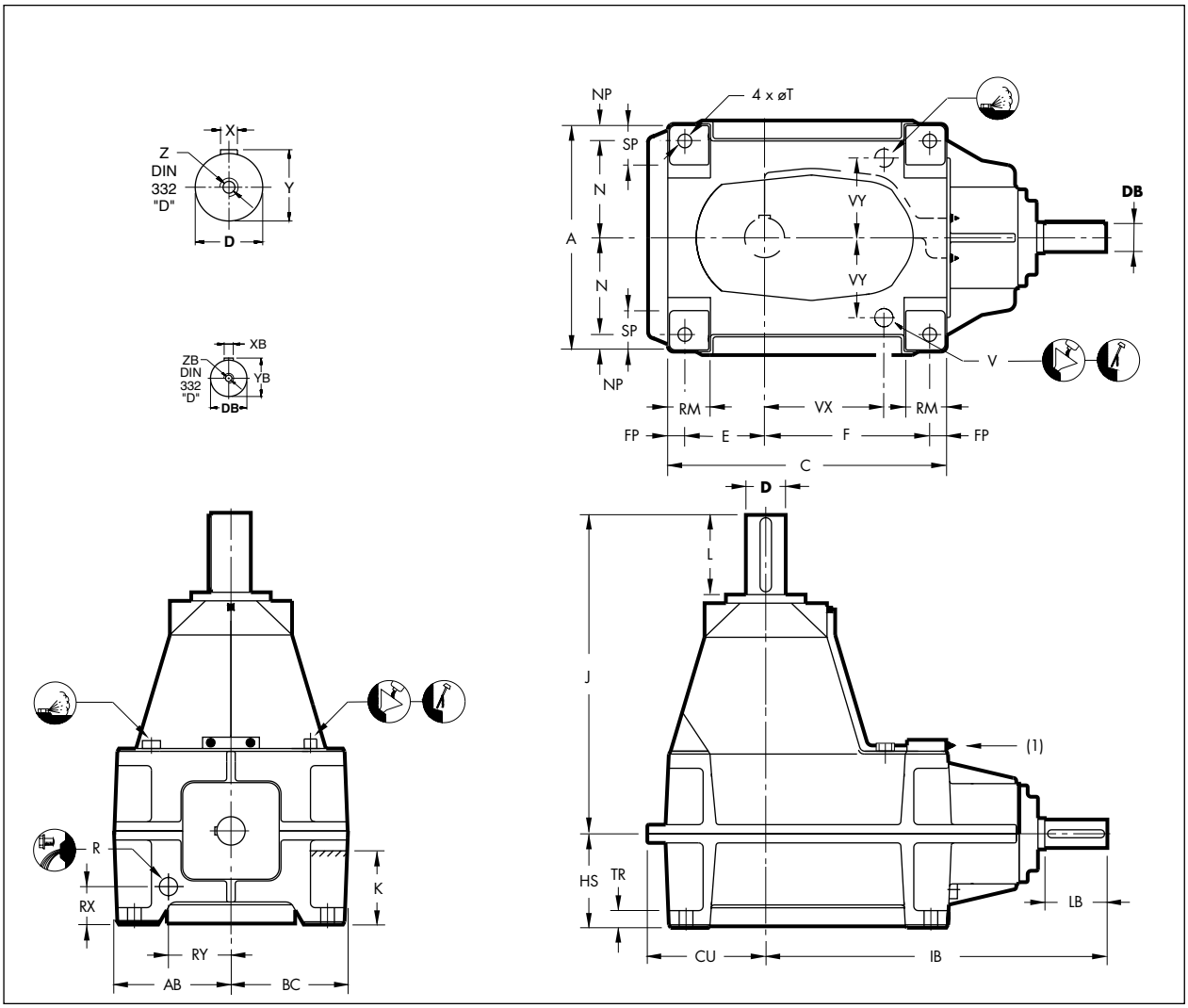
Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting.

Bindende afmetingen op verzoek.

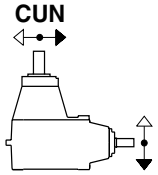


External dimensions are not affected when mounting a backstop
(1) Centralised grease points
(2) Approximate values; only the markings on the gear unit dipstick are determinant for the oil level

Le montage d'un antidévireur n'affecte pas les dimensions extérieures
(1) Points de graissage centralisés
(2) Valeurs indicatives; marquages sur la jauge d'huile du réducteur sont déterminants pour le niveau d'huile

Montage einer Rücklaufsperre ändert die Außenabmessungen nicht
(1) Zentralschmierstellen
(2) Richtwerte; maßgebend für die Ölmenge sind nur die Markierungen am Getriebe-Ölmeßstab

Uitwendige afmetingen ongewijzigd bij montage van een terugloopblokkering
(1) Gecentraliseerde smeerpunten
(2) Richtwaarden; enkel de markeringen op de peilstang van de tandwielkast zijn bepalend voor het olieniveau



Shaft arrangement (front view) | **Disposition des arbres** (vue en élévation) | **Wellenanordnung** (Vorderansicht) | **Asschikking** (vooraanzicht)

Type	A	AB	BC	C	CU	E	F	FP	HS	IB	J	N	NP	RM	SP	T	TR
QVRZ2L	320	165	165	375	165	105	220	25	150	457	440	135	25	60	60	19	25
QVRA2L	355	182,5	182,5	425	185	125	250	25	150	550	520	152,5	25	60	60	19	25
QVRB2L	400	206	206	490	208	140	290	30	165	602	590	170	30	72	72	24	30

Type	Shafts - Keys / Arbres - Clavettes / Wellen - Paßfeder / Assen - Spieën ISO/R773-1969										Draining Ölablaß / Vidange Afloop			Ventilation Entluftung / Aeration Verluchting			kg	Litres Liter	Oil level Ölniveau / Niveau d'huile Olieniveau
	D	L	X	Y	Z	DB	LB	XB	YB	ZB	R	RX	RY	V	VX	VY			K (2)
QVRZ2L	60m6	140	18	64	M20	35k6	80	10	38	M12	R3/4"	65	82	R3/4"	150	103	150	4	120
QVRA2L	80m6	170	22	85	M20	40k6	110	12	43	M16	R3/4"	65	100	R3/4"	180	120	200	5	115
QVRB2L	90m6	170	25	95	M24	50k6	110	14	53,5	M16	R3/4"	67	110	R3/4"	210	140	260	7	130

Hansen® TRANSMISSIONS

Hansen P4

97QU-VR2N0121 B

mm

Gear unit	**Réducteur à engrenages**	**Zahnradgetriebe**	**Tandwielkast**	**Q**
Vertical L.S.S.	**Arbre P.V. vertical**	**Langsamdr. Welle: vert.**	**Langz. dr. as: vertik.**	**V**
Right-angle shafts	**Arbres perpendiculaires**	**Kegel- und Stirnräder**	**Haakse assen**	**R**
Size	**Taille**	**Baugröße**	**Grootte**	**C ▶ F**
Two stages	**Deux étages**	**Zweistufig**	**Tweetraps**	**2**

For cooling tower fan drives | **Pour commandes d'aéro-réfrigérants** | **Für Ventilatorantriebe in Kühltürmen** | **Voor ventilatoraandrijvingen van koeltorens**

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

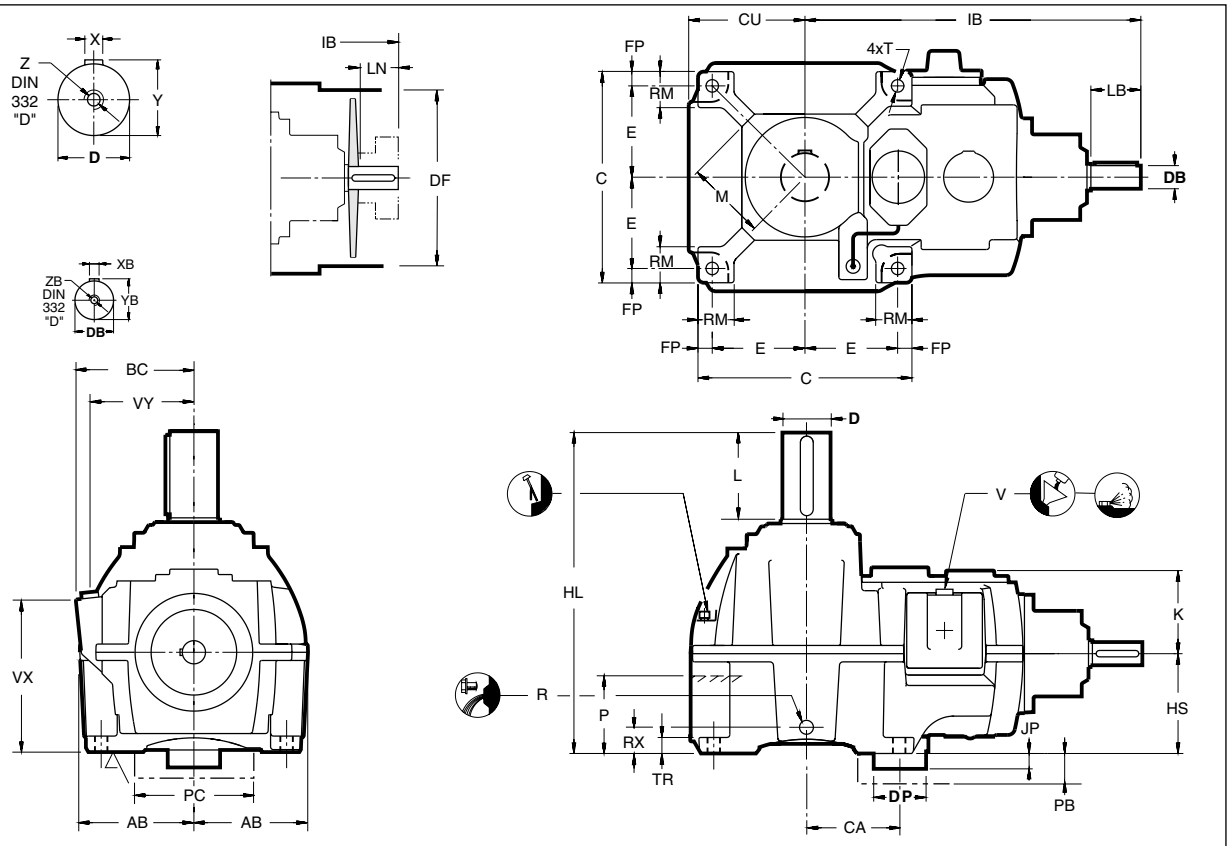
Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

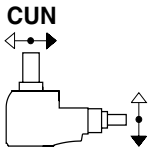
Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting. Bindende afmetingen op verzoek.





Shaft arrangement (front view) | **Disposition des arbres** (vue en élévation) | **Wellenanordnung** (Vorderansicht) | **Asschikking** (vooraanzicht)

External dimensions are not affected when mounting a backstop
(1) Space for pump removal
(2) Approximate values; only the markings on the gear unit dipstick are determinant for the oil level

Le montage d'un antidévireur n'affecte pas les dimensions extérieures
(1) Espace de dégagement de la pompe
(2) Valeurs indicatives; marquages sur la jauge d'huile du réducteur sont déterminants pour le niveau d'huile

Montage einer Rücklaufsperre ändert die Außenabmessungen nicht
(1) Freier Raum für Demontage der Pumpe
(2) Richtwerte; maßgebend für die Ölmenge sind nur die Markierungen am Getriebe-Ölmeßstab

Uitwendige afmetingen ongewijzigd bij montage van een terugloopblokkering
(1) Vrije ruimte voor demontage pomp
(2) Richtwaarden; enkel de markeringen op de peilstang van de tandwielkast zijn bepalend voor het olieniveau

Type	AB	BC	C	CU	E	FP	HL	HS	IB	K	M	RM	T	TR	kg	Litres Liter
QVRC2	255	280	470	260	200	35	709	215	812	183	165	95	28	38	380	22
QVRD2	285	290	530	290	225	40	782	245	916	230	195	95	35	40	560	29
QVRE2	320	335	600	326	260	40	900	280	1012	237	225	105	35	45	840	50
QVRF2	365	372	690	370	295	50	945	320	1119	269	265	135	42	52	1290	75

Type	Shafts - Keys - Arbres - Clavettes - Wellen - Paßfeder - Assen - Spieën ISO/R773-1969										Fan - Ventilateur Lüfter - Ventilator		Pump - Pompe - Pumpe - Pomp				
	D-m6	L	X	Y	Z	DB	LB	XB	YB	ZB	DF	LN	CA	DP (1)	JP	PB (1)	PC (1)
QVRC2	105	210	28	111	M24	50k6	180	14	53,5	M16	400	131	197	145	48	100	250
QVRD2	115	210	32	122	M24	60m6	210	18	64	M20	460	161	226	145	41	95	270
QVRE2	135	250	36	143	M30	65m6	210	18	69	M20	496	152	262	170	43	70	350
QVRF2	155	250	40	164	M30	75m6	210	20	79,5	M20	590	152	299	170	38	65	390

Type	Draining Ölablaß Vidange Afloop		Ventilation Entlüftung Aeration Verluchting			Oil level Ölniveau Niveau d'huile Olieniveau
	R	RX	V	VX	VY	P (2)
QVRC2	R 1/2"	50	R 1"	325	250	172
QVRD2	R 3/4"	53	R 1"	355	260	197
QVRE2	R 3/4"	64	R1 1/4"	440	292	227
QVRF2	R 1"	73	R1 1/4"	460	330	262

Gear unit	Réducteur à engrenages	Zahnradgetriebe	Tandwielkast	Q
Vertical L.S.S.	Arbre P.V. vertical	Langsamdr. Welle: vert.	Langz.dr.as: verticaal	V
Parallel/right-angle shafts	Arbres parallèles/perpend.	Stirn-/Kegelräder	Evenwijdige/haakse assen	P/R
Size	Taille	Baugröße	Grootte	Z ▶ F
Two stages	Deux étages	Zweistufig	Tweetraps	2

Options	Options	Optionen	Opties

The user is responsible for the provision of safety guards and correct installation of all equipment.

Certified dimensions upon request.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

Dimensions définitives sur demande.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.

Verbindl. Abmessungen auf Wunsch.

De gebruiker is verantwoordelijk voor het voorzien van de beschermkappen en het vakkundig installeren van de volledige uitrusting.

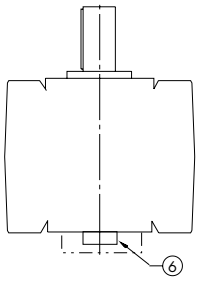
Bindende afmetingen op verzoek.

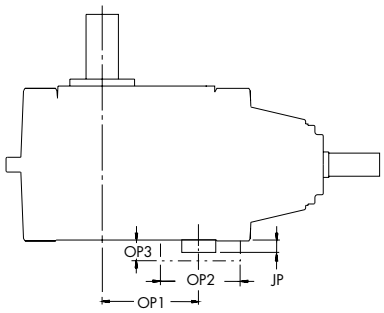
(*) Space for pump removal

(*) Espace de dégagement de la pompe

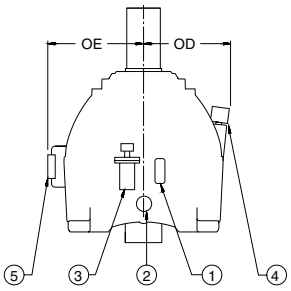
(*) Freier Raum für Demontage der Pumpe

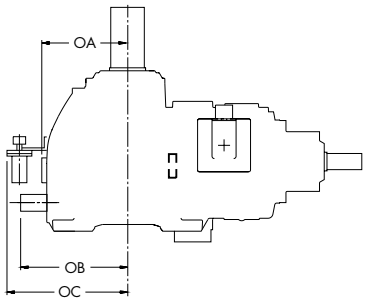
(*) Vrije ruimte voor demontage pomp





Type QVR.2			Size - Taille - Baugröße - Grootte		
Option - Optie	Pos.		Z	A	B
Pump - Pompe Pumpe - Pomp	⑥	JP	60	60	60
		OP1 (*)	126	148	171
		OP2 (*)	165	165	165
		OP3 (*)	80	80	80





Type QV..2		Type			Size - Taille - Baugröße - Grootte			
Option - Optie	Pos.	QVP.2	QVR.2		C	D	E	F
Oil level glass - Indicateur de niveau d'huile Ölstandglas - Oliepeilglas	①	X	-	OA	290	320	355	400
Heater - Réchauffeur Heizstab - Verwarmingselement	②	X	X	OB	355	385	425	450
Oil level switch - Contacteur de niveau d'huile Ölstandschalter - Olieniveauschakelaar	③	X	X	OC	380	410	450	490
Dust-proof breather plug - Reniflard anti-poussière Entlüftungsschraube mit Staubfilter - Verluchtingsstop met stoffilter	④	X	-	OD	360	370	395	435
Flow Switch - Contacteur de débit Strömungsschalter - Debietschakelaar	⑤	X	X	OE	315	345	380	410

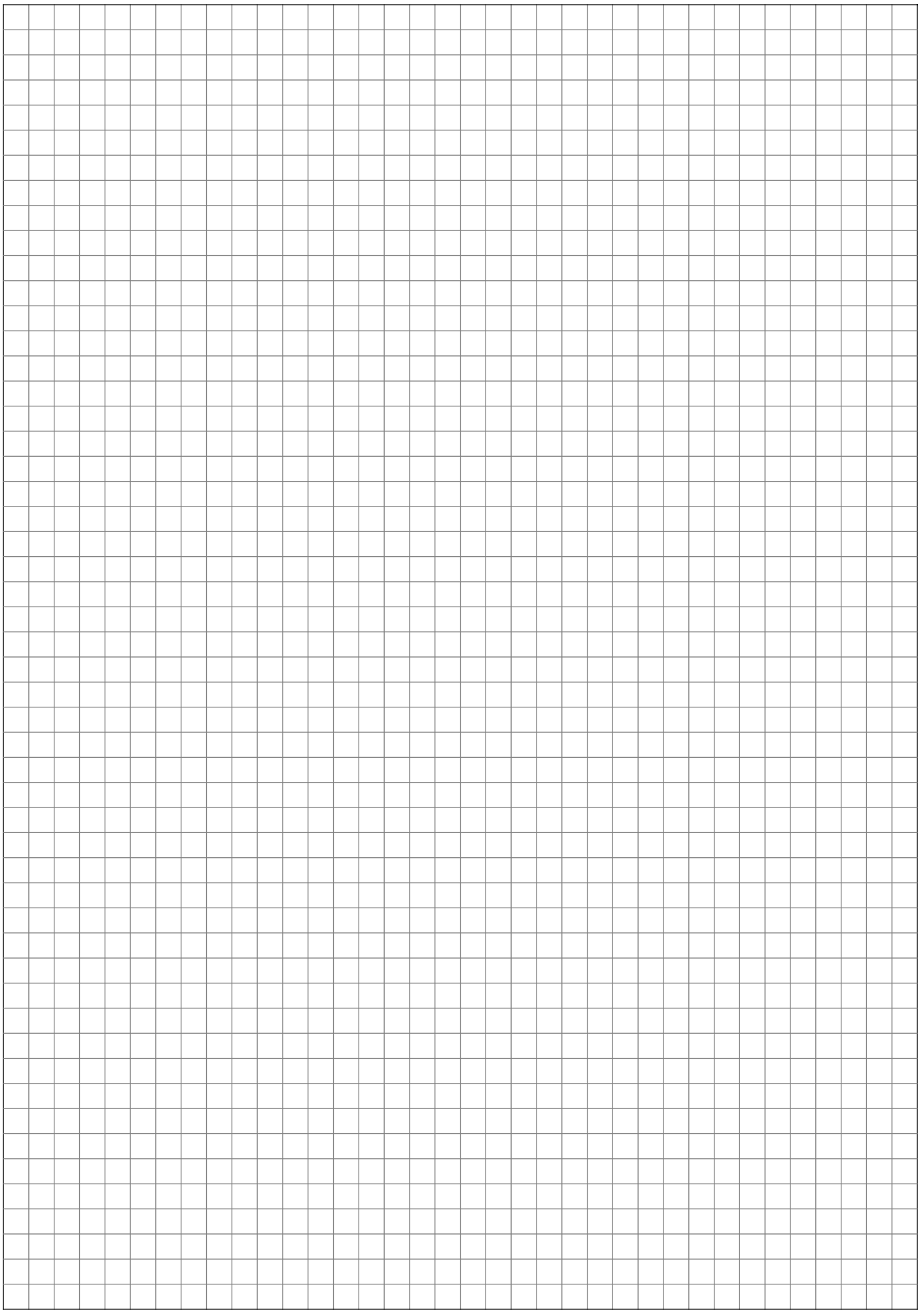
The above mounting positions and dimensions are standard for gear units equipped with one single accessory.
They may vary for units equipped with several accessories.

Les positions de montage et les dimensions standard s'appliquent pour des réducteurs équipés d'un seul accessoire.
Elles peuvent varier, au cas où il y a plusieurs accessoires.

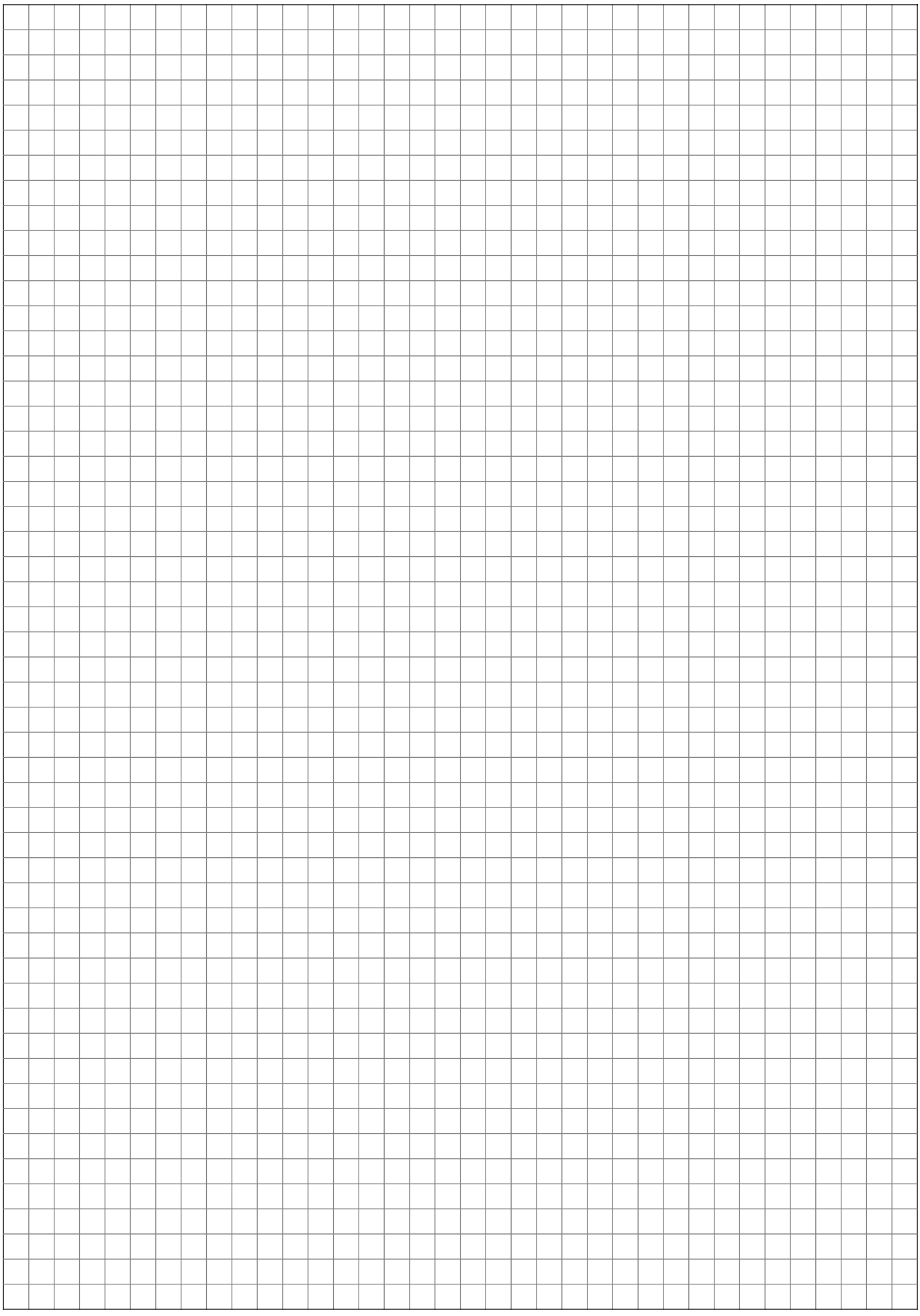
Die obigen standard Einbaulagen und Abmessungen gelten für Getriebe die mit einem einzigen Zusatzgerät ausgerüstet sind.
Bei mehreren Zusatzgeräten könnten sie sich ändern.

De boven vermelde montageposities en afmetingen zijn standaard voor tandwielkasten die met één enkel bijbehoren zijn uitgerust.
Bij meerdere bijbehoren kunnen andere standaard posities en afmetingen gelden.

Hansen P4



Hansen P4



Hansen Transmissions commits to be a pioneering innovator. The production of high performance gear units stems from an interactive partnership with our clients, the end users and the actively engaged manpower of our global enterprise. Embracing design, manufacturing and customer services, Hansen Transmissions has grown into a world leader in its field. Today, we set standards for both product and working environment, inciting a knowing environment to seize all new and inspiring technologies.

See our worldwide sales & service network at
www.hansentransmissions.com

Hansen® TRANSMISSIONS

Hansen Transmissions International nv
Leonardo da Vincilaan 1
2650 Edegem - Antwerp
Belgium

www.hansentransmissions.com
info@hansentransmissions.com

tel. +32 (0)3 450 12 11
fax +32 (0)3 450 12 20

604 Eb / 2005/2