

USE AND MAINTENANCE MANUAL



ALUMINUM WORM GEARBOXES

The VFD Series



CLEAN-GEARTECH

USE AND MAINTENANCE

Uso e manutenzione

GENERALITY

The gearboxes do not fall within the scope of Machinery Directive 2006/42 / EC, as they are identified as components of the machine.

Article. 35 of the guide to the Machinery Directive states:

"The Machinery Directive does not apply directly to the components of the machines, such as, for example, the speed reducers, which does not have a specific application as such, but are intended to be incorporated in machines, although the design and construction of such components must be such as to make the machine completed in compliance with the relevant requirements and basic safety and health protection. "

Smooth operation and the right to request under guarantee require compliance with the information contained in this manual, which must be read before starting up the group.

The gearboxes, which are not an integral part of a machine properly defined, are not nearly machines, but they are only components, therefore do not fall in the purposes of Machinery Directive 2006/42 / EC.e 2006/42 / EC.

GENERALITA'

I riduttori di velocità non ricadono nel campo d'applicazione della Direttiva Macchine 2006/42/CE, in quanto sono identificati come componenti di macchina.

L'art. 35 della guida alla Direttiva Macchine stabilisce:

"La Direttiva Macchine non si applica direttamente ai componenti delle macchine, quali, per esempio i riduttori di velocità, che non hanno un'applicazione specifica in quanto tali, ma sono destinati ad essere incorporati nelle macchine, sebbene la progettazione e la costruzione di detti componenti devono essere tali da rendere la macchina completata conforme ai requisiti pertinenti e fondamentali in materia di sicurezza e di tutela della salute."

Il funzionamento regolare ed il diritto alla richiesta di prestazioni in garanzia richiedono il rispetto delle informazioni contenute nel presente manuale che deve essere letto prima della messa in funzione del gruppo.

I Riduttori, che non sono parte integrante di una macchina propriamente definita, non sono quasi macchine, ma sono solo componenti, pertanto non ricadono negli scopi della Direttiva Macchine 2006/42/CE.

USE AND MAINTENANCE

Uso e manutenzione

SAFETY

- Written authorization is required to operate or use reducers in man lift or people moving devices.
- Check to make sure that certain applications do not exceed the allowable load capacities published in the current catalog.
- Buyer shall be solely responsible for determining the adequacy of the product for any and all uses to which Buyer shall apply the product. The application by Buyer shall not be subject to any implied warranty of fitness for a particular purpose.
- For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.
- Gearboxes operating in high position should have a protective shield for any possible parts falling down for casual accidents where people are moving under them.
- Hot oil and reducers can cause severe burns. Use extreme care when removing lubrication plugs and vents.
- Make certain that the power supply is disconnected before attempting to service or remove any components. Lock out the power supply and tag it to prevent unexpected application power.
- Reducers are not to be considered fail safe or selflocking devices. If these features are required, a properly sized, independent holding device should be utilized. Reducers should not be used as a brake.
- Any brakes that are used in conjunction with a reducer must be sized or positioned in such a way so as to not subject the reducer to loads beyond the catalog rating.
- Lifting supports including eyebolts are to be used for vertically lifting the gearbox only and not other associated attachments or motors.
- Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.
- Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and or shaft breakage from bending fatigue, it not sized properly.

SICUREZZA

- *E' richiesta autorizzazione scritta per azionare riduttori in ascensori o dispositivi per il movimento delle persone.*
- *Controllare che alcune applicazioni non eccedano la massima capacità di carico ammessa pubblicata in questo catalogo.*
- *L'acquirente è l'unico responsabile per la determinazione dell'adeguatezza del prodotto per qualcuna o tutte le utilizzazioni che l'acquirente stesso farà del riduttore. L'applicazione dell'acquirente non potrà essere soggetta ad alcuna implicita garanzia di montaggio per uno scopo particolare.*
- *Per ragioni di sicurezza l'acquirente dovrà provvedere a porre protezioni adeguate su tutta la lunghezza dell'albero a tutti gli organi in movimento. L'utilizzatore è responsabile del controllo di tutti i codici di sicurezza e la predisposizione di protezioni adeguate. In assenza di tali precauzioni si possono verificare incidenti alle persone e danni agli apparati.*
- *Su riduttori installati in posizioni elevate utilizzare protezioni adeguate per qualsiasi distacco accidentale di parti nel caso di passaggio di persone al di sotto.*
- *Olio e riduttori bollenti possono causare gravi ustioni. Usare estrema cautela nella rimozione dei tappi e delle ventole.*
- *Assicurarsi che la corrente di alimentazione sia scollegata prima di riparare o rimuovere alcun componente. Chiudere l'alimentazione e contrassegnare tale operazione per evitare accensioni accidentali.*
- *I riduttori non devono essere considerati esenti da guasti o a bloccaggio automatico. Se sono indispensabili queste caratteristiche, deve essere utilizzato un dispositivo indipendente della dimensione adatta. I riduttori non devono essere utilizzati come freni.*
- *Qualsiasi freno sia utilizzato insieme al riduttore deve essere della giusta grandezza e posizionato in modo da non causare carichi eccessivi non previsti dai dati forniti nel catalogo.*
- *I dispositivi di sollevamento come le golfare devono essere usati solo per sollevare verticalmente il riduttore e non altri di spositivi associati o motori.*
- *L'utilizzo di un olio con un additivo EP su gruppi provvisti di dispositivo di arresto possono inficiare l'uso corretto del freno e provocare danni alle persone, alle cose ed al riduttore stesso nonché ad altri apparecchi.*
- *I Carichi sospesi assoggettano i cuscinetti della vite e la vite stessa a sollecitazioni che possono causare, se non adeguatamente dimensionati, l'usura prematura dei cuscinetti e/o la rottura della vite a causa della resistenza alla flessione.*

USE AND MAINTENANCE

Uso e manutenzione

SAFETY

Gearboxes in this manual are intended for use in industrial applications and meet the standards and regulations that can be adopted.

The performance and specifications are traceable on the nameplate and related documentation.

Transport

Carefully check the status upon receipt and any damage immediately to the carrier.

SICUREZZA

I riduttori presenti in questo manuale sono rivolti ad uso in applicazioni industriali e corrispondono agli standard e alle regolamentazioni adottabili.

Le prestazioni e i dati tecnici sono rintracciabili sulla targhetta e sulla relativa documentazione .

Trasporto

Verificare con attenzione lo stato al ricevimento e contestare immediatamente eventuali danni al trasportatore.

ASSEMBLY OF PRODUCTS

The following assembly drawings are meant to assist in the search of the main components of the various types of gearbox.

The various designs and dimensions, assembling versions, number of stages, actually generate multiple solutions and therefore we invite you to apply for specific documentation.

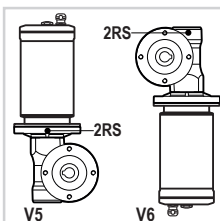
ASSEMBLAGGIO DEI PRODOTTI

I seguenti disegni di assieme hanno come fine di aiutare nella ricerca dei componenti principali dei vari tipi di riduttore.

Le varie forme costruttive e dimensionali, delle versioni di montaggio, del numero di coppie di riduzione, generano in realtà molteplici soluzioni e pertanto si invita a richiedere la documentazione specifica.

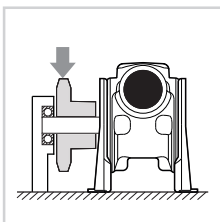


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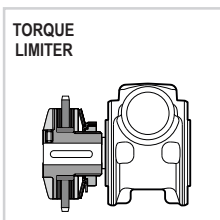
Please specify when ordering if reducer are used in Vertical V5 or V6 mounting position. We normally mount a 2RS self lubricated bearings (see picture).

Specificare in fase d'ordine se i riduttori richiesti vengono utilizzati per posizioni di montaggio verticali V5÷V6. Per queste posizioni va previsto un cuscinetto schermato 2RS come in figura.



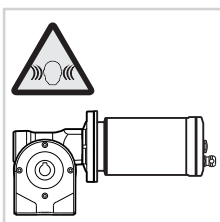
For very heavy radial load, additional output shaft support may be required to prevent premature bearing failure or shaft breakage from bending fatigue.

In applicazioni con un carico radiale molto elevato si consiglia di prevedere un supporto supplementare sull'albero per impedire l'usura prematura del cuscinetto o la rottura dell'albero.



If the application is with high shock loads and sudden stops it's suggested to use mechanical or electronic torque limiting devices.

Se nell'applicazione si prevedono sovraccarichi prolungati, urti o bloccaggi improvvisi, installare sistemi meccanici o elettronici di limitazione della coppia.



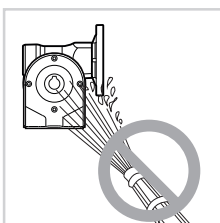
Specify when ordering if you require particular low noise level.

Segnalare in fase d'ordine se sono richiesti particolari livelli di rumorosità.



It's compulsory to request HYDOR-MEC authorization to use our gearboxes when the units are used in a man lift or people moving devices.

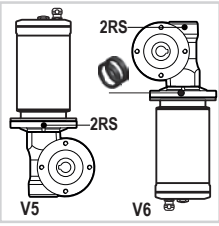
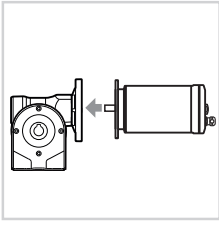
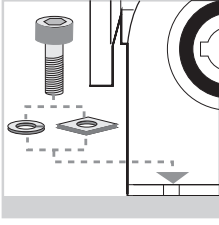
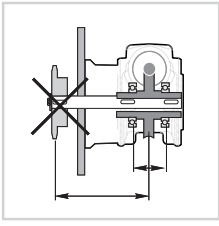
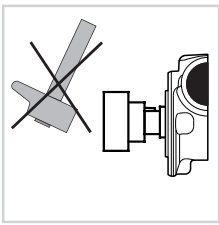
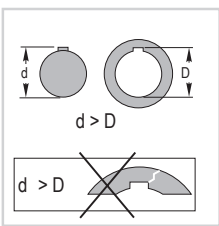
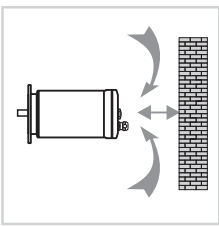
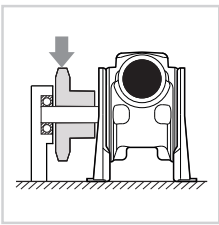
E' obbligatorio richiedere in fase d'ordine la autorizzazione scritta per usare i nostri riduttori in applicazioni che possono coinvolgere delle persone.



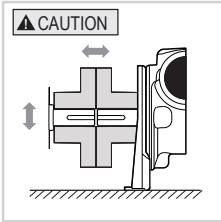
Please don't clean oil seals and gaskets directly with high pressure water otherwise the gearbox seal could loose shortly.

Si prega di non pulire direttamente anelli di tenuta e guarnizioni con acqua ad alta pressione, in tal caso potrebbero verificarsi delle perdite dopo poco tempo.

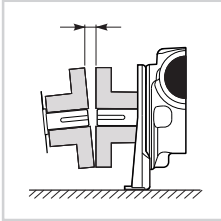
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- | | | |
|--------------------------|---|--|
| ☐ |  | <p>Do not change mounting positions without contacting our factory. Altering the mounting position may require special lubrication provisions which must be installed from the factory. When reducers are mounted in positions V5 or V6 and used in continuous duty applications, replace the upper bearing with a self lubricated style bearing, and we suggest double input seal for V6.</p> <p><i>Specificare in fase d'ordine se i riduttori devono essere forniti per posizioni di montaggio V5÷V6 per prevedere eventuali cuscinetti 2RS (schermati), ed eventuali anelli di tenuta ag giuntivi. Per la posizione V6 è consigliato usare 2 anelli di tenuta. (posizione non adatta per motori 2 poli).</i></p> |
| ☐ |  | <p>When mounting a motor to reducers, the fastening bolts should not be tightened until both the reducer flange and motor face are in contact. When mounting is complete check by manually rotating the fan to be sure the assembly turns freely.</p> <p><i>L'accoppiamento al motore deve essere libero e scorrevole. Il serraggio delle viti di fissaggio deve essere effettuato solo quando le due flange saranno a contatto. Ad assemblaggio avvenuto controllare che il motore ruoti liberamente agendo manualmente sulla ventola.</i></p> |
| ☐ |  | <p>Mount the reducer on a flat surface free of vibration. If high overhung loads are expected, it is advisable to reinforced bolt heads with washers as shown in picture.</p> <p><i>Assicurarsi che il fissaggio del riduttore sia effettuato su un basamento rigido, in piano e non soggetto a vibrazioni. Se si prevedono elevate sollecitazioni utilizzare rosette spaccate sotto la testa delle viti di fissaggio al basamento.</i></p> |
| ☐ |  | <p>Make sure that mounting of pulleys or pinions does not create overhung loads exceeding the capacity of the reducer.</p> <p><i>Accertarsi che l'eventuale montaggio di pignoni o pulegge a sbalzo su gli alberi sia stato convalidato da precedenti verifiche di ammissibilità dei carichi risultanti.</i></p> |
| ☐ |  | <p>When mounting pinions, pulleys or couplings on the reducer's shaft, protect the bearings from impact by using the appropriate pullers and threaded holes in the end of the reducer shaft.</p> <p><i>Nel montaggio di pignoni, giunti o pulegge sugli alberi del riduttore evitare urti facendo uso di appropriati estrattori ancorati nei fori filettati presenti all'estremità degli alberi stessi.</i></p> |
| ☐ |  | <p>When mounting items to the reducer shaft, appropriate anti-seize and oxidizer compounds should be used, and keys dimensions are correct.</p> <p><i>In tutti gli accoppiamenti albero/mozzo spalmare le superfici a contatto con adeguati protettivi antiossidazione e verificare che le linguette non siano forzate onde evitare la rottura del mozzo.</i></p> |
| ☐ |  | <p>Make sure there is sufficient space between any obstructions and the motor's air intake area to provide adequate cooling for the motor.</p> <p><i>Lasciare fra il copriventola del motore e l'eventuale parete uno spazio sufficiente a garantire il passaggio dell'aria di raffreddamento.</i></p> |
| ☐ |  | <p>For very heavy radial load, additional output shaft support may be required to prevent premature bearing failure or shaft breakage from bending fatigue.</p> <p><i>In applicazioni con un carico radiale molto elevato si consiglia di prevedere un supporto supplementare sull'albero.</i></p> |

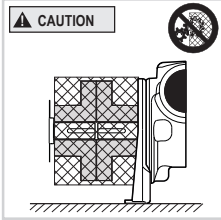
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- ☐


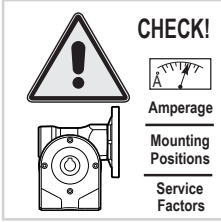
The system of connected rotating parts must be free from critical speed, torsional or other type vibration, no matter how induced. The responsibility for this system analysis lies with the purchaser of the speed reducer.

Il collegamento delle parti in rotazione deve essere esente da qualsiasi tipo di torsione o di vibrazione dovuta alla velocità.
- ☐


Check shaft and coupling alignment. Check proper coupling gap before to lock all foundation bolts that should be routinely checked.

Si consiglia di controllare l'allineamento delle parti in rotazione (collegamenti, alberi etc.) prima della messa in funzione del riduttore e periodicamente controllare il fissaggio dei bulloni di collegamento.
- ☐


For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.

Per la sicurezza, il compratore o l'utente dovrebbero prevedere delle protezioni sopra tutti gli alberi e tutti gli apparecchi messi in rotazione montati sul riduttore.
- ☐


Test run the first unit to verify proper operation.

Si consiglia di eseguire un check-up di prova prima della messa in funzione per assicurare un funzionamento adeguato, controllando la Potenza Assorbita.
- ☐


Assembled with glue
Montare con bloccante

In applications where multiple starts, stops or reverses occurs, it is recommended to block the fastening bolts of the output flange and feet.

In applicazioni caratterizzate da numerosi avviamenti/arresti o inversioni, è consigliabile bloccare le viti di fissaggio delle flange.

Maintenance

Manutenzione

Gearboxes that are lubricated for life do not require any maintenance. For others, the lubricant needs to be periodically refilled and eventually changed with a suitable grade.

I riduttori lubrificati a vita non necessitano di manutenzione. Per gli altri è necessario effettuare una verifica periodica del livello dell'olio eventualmente ripristinandolo con un tipo compatibile.

Avoid mixing synthetic and mineral lubricants.

Evitare di mescolare olii sintetici con olii minerali.

It is advisable to carry out the first mineral oil change after 150 operating hours and the subsequent ones every 4000 operating hours.

Effettuare il primo cambio dell'olio minerale dopo 150 ore e i successivi dopo 4000 ore di funzionamento.

From time to time check that the fan cowl is not clogged with dust or fibres.

Verificare che la griglia posteriore del motore non sia ostruita da polvere, filamenti o altro.

For brake motors it is also necessary to periodically check the air gap and replace the brake lining if the values exceed permissible ones. Also check the brake torque using a torque meter.

Nei motori autofrenanti controllare periodicamente il valore del traferro effettuando la sostituzione del ferodo se i valori sono superiori a quelli ammessi. Verificare la coppia frenante con chiave dinamometrica.

Supply terms

Condizioni di fornitura

Gearboxes are supplied as follows:

I riduttori vengono forniti come segue:

- prearranged to be installed in the ordered mounting position.
• già prediisposti per essere installati nella posizione di montaggio come definito in fase di ordine.
- tested as per internal specifications.
• collaudati secondo specifiche interne.
- with appropriate packing.
• appositamente imballati.
- without nuts and bolts for motor mounting as per IEC version.
• sprovvisti di dadi e bulloni per montaggio motori per la versione IEC.
- already filled in with lubricant where specified.
• già provvisti di lubrificante (dove previsto).
- already painted where specified.
• già verniciati (dove previsto).
- already equipped with lifting eyebolts.
• già provvisti di golfare di sollevamento (dove previsto).

For a proper selection of the required gearbox it is important to follow the following table:

Per una corretta selezione del riduttore o motoriduttore è importante rispettare le seguenti indicazioni:

Service factor

Fattore di servizio

1 Find out the application service factor through the following table.

Determinare tramite la seguente tabella il fattore di servizio **fs** relativo all'applicazione.

Type of load and stars per hour Tipo di carico e avviamenti per ora		Oper. hours per day Ore di funz. giorn.		
		<2 h	2 - 8 h	8 - 16 h
Continuous or intermittent appl. with start/hour <i>Applicazione cont. o interm. con n.ro operazioni/ora</i>	Uniform / <i>Uniforme</i>	0.9	1	1.25
	Moderate / <i>Moderato</i>	1	1.25	1.5
	Heavy / <i>Forte</i>	1.25	1.5	1.75
Intermittent application with start/hour <i>Applicazione intermittente con n.ro operazioni/ora</i>	Uniform / <i>Uniforme</i>	1.25	1.5	1.75
	Moderate / <i>Moderato</i>	1.5	1.75	2
	Heavy / <i>Forte</i>	1.75	2	2.25

N.B. For applications with flameproof motors or instantaneous reversal, multiply the service coefficient by 1.15.

N.B. Per azionamenti con motore a scoppio o per funzionamento alternato istantaneo, moltiplicare il valore del coefficiente di servizio per 1.15.

Gearbox selection

Scelta di un riduttore



2 A gearbox version R (or B) is to be found from the selection tables, considering the required power P_{1r} (or torque M_{2r} required) and output speed n_2 referred to 1400 min^{-1} (or to gearbox ratio). Once the gearbox has been chosen, P_{1r} power and n_1 speed (given in the table), it should comply with the following conditions:

Un riduttore nella configurazione R (o B) dovrà essere ricercato nelle tabelle di selezione riduttori in base alla potenza richiesta P_{1r} (o alla coppia richiesta M_{2r}) e ai giri uscita n_2 riferiti a 1400 min^{-1} (o al rapporto di trasmissione i).

Il riduttore selezionato in base alla potenza P_{1r} (indicata in tabella) e a n_1 , dovrà soddisfare le seguenti condizioni:

2 Poles 2 Poli	N.B.	$n_1 = 1400 \text{ min}^{-1}$	$P_{1r} \geq P_{1r} \times f_s$
		$n_1 = 2800 \text{ min}^{-1}$	$P_{1r} \times 1.6 \geq P_{1r} \times f_s$
6 Poles 6 Poli	N.B.	$n_1 = 900 \text{ min}^{-1}$	$P_{1r} / 1.5 \geq P_{1r} \times f_s$

Where 2 pole motors are required, specify when placing order to foresee lubricant and synthetic oil.
Per l'abbinamento a motori a 2800 min^{-1} , specificare sempre tale caratteristica in fase di ordine per prevedere lubrificante e olio sintetico.

Following symbols will be found in the selection tables of the gearboxes:

Alle tabelle di selezione dei riduttori è associata la seguente simbologia:

n_2 [min^{-1}] output speed ($n_1 = 1400 \text{ min}^{-1}$)	
n_2 [min^{-1}] giri in uscita ($n_1 = 1400 \text{ min}^{-1}$)	
i — reduction ratio	
i — rapporto di riduzione	
P_{1M} [kW] motor input power ($n_1 = 1400 \text{ min}^{-1}$)	
P_{1M} [kW] potenza nominale motore ($n_1 = 1400 \text{ min}^{-1}$)	
M_{2M} [Nm] output torque ($n_1 = 1400 \text{ min}^{-1}$)	
M_{2M} [Nm] coppia in uscita ($n_1 = 1400 \text{ min}^{-1}$)	
P_{1R} [kW] Transmitted power at input gearbox	
P_{1R} [kW] potenza trasmessa in entrata	
M_{2R} [Nm] Transmitted output torque	
M_{2R} [Nm] coppia trasmessa in uscita	
RD — Dynamic efficiency	
RD — rendimento dinamico	
Mn — Tooth normal module	
Mn — modulo normale del dente	

Output speed n_2 [min^{-1}]	Ratio i	Motor power P_{1M} [kW]	Output torque M_{2M} [Nm]	Service factor f.s.	Nominal power P_{1R} [kW]	Nominal torque M_{2R} [Nm]
280	5	0.18	5	3.3	0.60	17
200	7	0.18	7	2.4	0.44	17
140	10	0.18	10	1.8	0.32	17
93	15	0.18	13	1.4	0.25	19
70	20	0.18	17	1.1	0.20	19
47	30	0.12	15	1.4	0.17	21



- 3 Selection tables can be used also for the mounting version P (With IEC B5 - B14 motor flange). In this case, besides carrying out all previous checks, it is also necessary to verify the availability of the required motors (56, 63, 71, etc.) in the shaded columns.

Associated symbols are the following:

Le tabelle per la selezione riduttori possono essere utilizzate anche per i riduttori nella configurazione P (predisposti per attacco motore IEC B5 o B14). Oltre alle verifiche precedentemente illustrate è necessario controllare, nelle colonne retinate, l'applicabilità della grandezza (56, 63, 71, ecc.) del motore desiderato. La simbologia aggiuntiva associata è la seguente:

Output speed n_2 [min ⁻¹]	Ratio i	Motor power	Output torque	Service factor	Nominal power	Nominal torque	B5 motor flanges		B14 motor flanges	
		P_{1M} [kW]	M_{2M} [Nm]	f.s.	P_{1R} [kW]	M_{2R} [Nm]	-	-	-O 56	-P 63
280	5	0.18	5	3.3	0.60	17			B-C	
200	7	0.18	7	2.4	0.44	17			B-C	
140	10	0.18	10	1.8	0.32	17			B-C	
93	15	0.18	13	1.4	0.25	19			B-C	
70	20	0.18	17	1.1	0.20	19			B-C	
47	30	0.12	15	1.4	0.17	21			B-C	

 **Motor flanges available**
Flange motore disponibili

 **B) Supplied with reduction bushing**
Fornito con bussola di riduzione

B) Available on request without reduction bushing
Disponibile a richiesta senza bussola di riduzione

 **C) Motor flange holes position**
Posizione fori flangia motore

Selection of a motorized gearbox Scelta di un motoriduttore

- 4 An easier selection of the motorized gearbox (closer as possible to sf 1) can be done through our gear selection table (Point 2). In fact only 4 pole motors (1400 min⁻¹) are listed here .

Una selezione semplificata del motoriduttore in base ad un unico fattore di servizio (il più prossimo a 1) può essere effettuata tramite le tabelle di selezione riduttori (punto 2).

In questo caso sono riportati solo motoriduttori con motori a 4 poli (1400 min⁻¹).

Gearbox coupled to a speed variator Riduttore con variatore di velocità

- 5 Where a hydraulic or mechanic variator is connect to a gearbox, it is necessary to consider if there is a low output speed, when the input speed is decreasing, M_2 torques can easily exceed their nominal values.

In high reduction ratios this effect should be taken even in more consideration.

Qualora al riduttore venga abbinato un variatore idraulico o meccanico, è necessario considerare che a bassi giri, al diminuire della velocità d'ingresso, le coppie M_2 possono superare anche notevolmente il valore nominale. Tale effetto deve essere maggiormente tenuto in considerazione nei rapporti elevati.

Gearbox equipped with a brake motor Riduttore con motore autofrenante

- 6 For selection with brake motors, make sure that the torque generated by the load inertia during braking does not exceed the gearbox limits; check (with the appropriate torquemeter) that brake torque matches the data given in the project.

Nella selezione con motori autofrenanti, potendo essere considerevole l'effetto inerziale delle masse, è opportuno scegliere riduttori con $f_s \geq 1$.

Selections not listed in the catalogue Selezioni fuori catalogo

- 7 In cases where higher powers than the ones given in this catalogue have to be used, our factory cannot guarantee the proper operation of the gearbox.

Nel caso vengano applicate potenze superiori a quelle indicate a catalogo, la nostra ditta non può garantire il corretto funzionamento del gruppo.

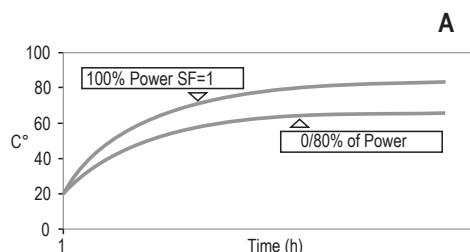
Notes

Note

- 8 It is necessary to refer the following the applications to our technical service.
Occorre tenere nella giusta considerazione e valutare attentamente le seguenti applicazioni consultando il ns. Servizio Tecnico.
- Applications where gearbox failure is critical.
— Utilizzo in servizi che potrebbero risultare pericolosi per l'uomo in caso di rottura del riduttore.
 - Applications with particularly high inertias
— Applicazioni con inerzie particolarmente elevate.
 - Lifting devices.
— Utilizzo come organo di sollevamento.
 - High dynamic stress on gearbox housing.
— Applicazioni con elevate sollecitazioni dinamiche sulla cassa del riduttore.
 - Particular environment conditions with temperatures lower than 5°C or higher than 40°C.
— Utilizzo in ambiente con temperatura inferiore a 5°C o superiore a 40°C.
 - Highly chemical aggressive environment.
— Utilizzo in ambiente con presenza di aggressivi chimici.
 - Salty environment.
— Utilizzo in ambiente salmastro.
 - Applications not considered in the catalogue.
— Posizioni di piazzamento non previste a catalogo.
 - Radioactive environment.
— Utilizzo in ambiente radioattivo.
 - Pressure different to atmospheric.
— Utilizzo in ambiente con pressione diversa da quella atmosferica.
 - Avoid those applications where total or partial immersion of the gearbox is required.
— Evitare applicazioni dove è prevista l'immersione, anche parziale, del riduttore.

Thermal limit

Limite termico



Worm gearboxes, because of their inside design, transform part of their installed power into heat which is subsequently disposed of throughout the housing and may result into values, measured onto the gear case in the area of the worm shaft, in the range of 80 - 100 °C without this affecting the operation of the gear unit adversely.

The diagram of the temperature increase depending on the operating time is illustrated in graph A. Final temperature is given by the sum of several components :

- Installed power and percentage of usage
- Ambient temperature
- Lubrication
- Cooling method
- Input speed

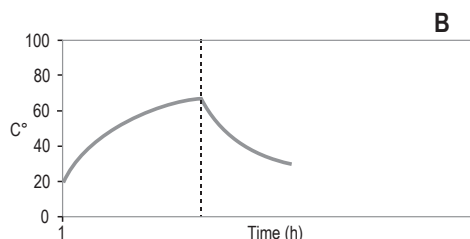
I riduttori a vite senza fine, dato lo schema costruttivo, trasformano parte della potenza installata in calore che viene smaltito dalla carcassa e in corrispondenza della vite senza fine può raggiungere valori misurati nell'intorno di 80 - 100 °C senza che questo pregiudichi la meccanica del riduttore.

Il diagramma dell'incremento della temperatura in funzione del tempo di funzionamento è illustrato nel grafico A. La temperatura finale raggiunta è data dalla somma di varie componenti:

- Potenza installata e percentuale di utilizzo
- Temperatura ambiente
- Tipo di lubrificazione
- Tipo di raffreddamento
- Velocità in ingresso

Thermal limit with intermittent duty

Limite termico per funzionamento intermittente

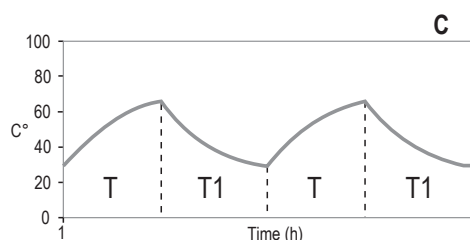


In this case the temperature increase curve is similar to the one for continuous duty. In fact the peak is reached in approximately 20/30 minutes using 100% of the power.

The gearbox can be stopped at any point of this curve then following a cooling curve whose shape depends on the ambient temperature (graph B).

In questo caso la curva di aumento temperatura è simile a quella del funzionamento continuo e normalmente viene raggiunto il valore massimo in 20/30 minuti circa e con il 100% della potenza utilizzata.

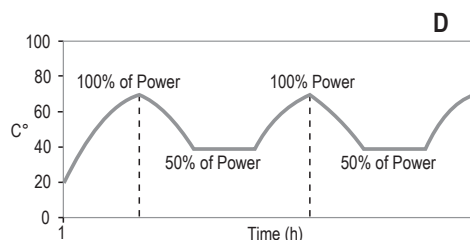
In qualsiasi punto di tale curva venga quindi a fermarsi il riduttore, si crea una curva di raffreddamento che è più o meno rapida a seconda della temperatura ambiente (grafico B).



Should the gearbox have several starts and stops cycles, the final temperature depends on starts and stops times (very similar to electric motors with operation S3 and S6 see graphs C and D). Service factor values indicated in this catalogue refer to an intermittent duty.

Se il riduttore ha poi cicli di arresti ed avviamenti, la temperatura finale dipende dal tempo di arresto e di funzionamento (con un comportamento molto simile a quello dei motori elettrici con funzionamento S3 o S6, vedi grafici C e D).

I valori del fattore di servizio $f_s=1$ riportati in questo catalogo si riferiscono ad un tipo di funzionamento intermittente.



Geared motor selections with 2800 min⁻¹ input speed are tolerated for intermittent duty applications only, because of the high temperature increase resulting from the input rotation speed. For these cases please contact technical department.

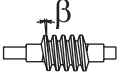
La selezione di motorizzazioni con velocità in entrata a 2800 min⁻¹ è ammessa per applicazioni intermittenti, dato l'elevato aumento della temperatura di funzionamento derivante dalla elevata velocità di rotazione. In questo caso interpellare il nostro Servizio tecnico Commerciale.

Irreversibility *Irreversibilità*

With worm gearboxes it is always important to consider the several levels of reversibility (or irreversibility) of the worm gear set, in order to guarantee a correct selection in applications where these requirements are essential for the operation of the machine.

The following table shows the different tables of reversibility for worm gearboxes according to helix angle β and reduction ratio i .

Nei riduttori a vite senza fine è importante tenere in considerazione i vari gradi di reversibilità (o irreversibilità) della coppia vite-corona, per garantire una corretta selezione nelle applicazioni dove queste esigenze sono determinanti al fine del buon funzionamento dell'impianto. La tabella seguente riporta i vari gradi di reversibilità nei riduttori a vite senza fine definiti in base all'angolo d'elica β e al rapporto di riduzione i .

	D30	D45	D50	D63	D85	3D3	4D3	5D3	6D3	6D4	8D4
	i					i					
>25°		7		7	7						
12° - 25°	5 7 10 15	10 14	7 10	10 15	10 14 20 22						140
8° - 12°	20	21	14 18	19 24			140 200 280 420				
5° - 8°	30	28	26 30 36	30 36 40	28 38 46 52	150 210 300 450 600 900	560	252 360 540 720	252 360 540 720 1080	252 360 504 756 1008	196 280 392 588 784
3° - 5°	40	37 46 60	43 50 60 68	45 60 67 80	67 74 96	1200	740 920 1120 1480 1840 2400	860 1200 1440 1720 2400	1440	1332 1656 2160	1036 1288
1° - 3°	61 80 100	70 102	80 100	94		1830 2400			2745	2520	1960 2856

>25°	Totally reversible - <i>Reversibilità totale</i>
12° - 25°	Statically reversible - <i>Staticamente reversibile</i> Quick return - <i>Ritorno rapido</i> Dynamically reversible - <i>Dinamicamente reversibile</i>
8° - 12°	Variable static non-reversing - <i>Irreversibilità statica incerta</i> Quick return in case of vibrations - <i>Ritorno rapido in caso di vibrazioni</i> Dynamically reversible - <i>Dinamicamente reversibile</i>
5° - 8°	Statically non-reversing - <i>Staticamente irreversibile</i> Return in case of vibrations - <i>Ritorno in caso di vibrazioni</i> Bad dynamic reversing - <i>Cattiva reversibilità dinamica</i>
3° - 5°	Statically non-reversing - <i>Staticamente irreversibile</i> Slow movement return in case of vibrations - <i>Ritorno a scatti lenti in caso di vibrazioni</i> Low dynamic reversing* - <i>Reversibilità dinamica quasi nulla*</i>
1° - 3°	Statically non-reversing - <i>Staticamente irreversibile</i> No return - <i>Nessun ritorno</i> Low dynamic reversing* - <i>Reversibilità dinamica quasi nulla*</i>

*** We would like to draw your attention on the fact that the total irreversibility cannot be guaranteed, therefore, where it is required, it is recommended to arrange an external braking device.**

** Ci teniamo ad evidenziare che l'irreversibilità totale non può essere garantita pertanto, dove essa è richiesta, è necessario predisporre di un sistema di frenatura esterno al riduttore.*

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

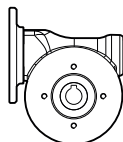
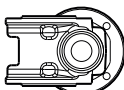
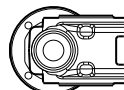
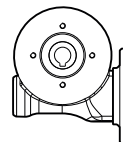
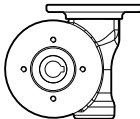
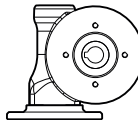
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

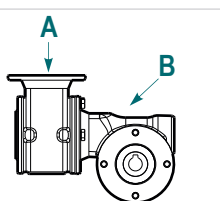
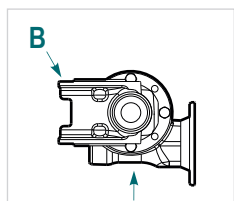
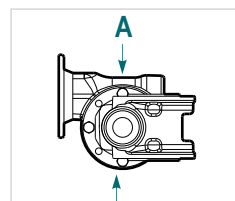
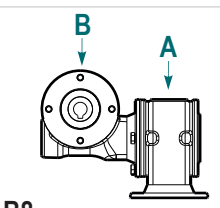
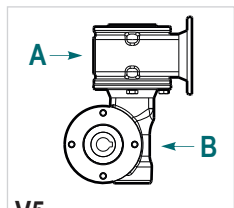
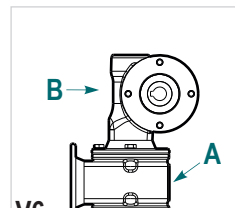
Standard

Standard

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Combined

Combinato

 B3	<table><tr><th>Type</th><th>3D3</th></tr><tr><td>Oil q.ty (Lt.) A</td><td>0.03</td></tr><tr><td>Oil q.ty (Lt.) B</td><td>0.03</td></tr><tr><td colspan="2">Standard without oil plug</td></tr></table>	Type	3D3	Oil q.ty (Lt.) A	0.03	Oil q.ty (Lt.) B	0.03	Standard without oil plug		 B6	<table><tr><th>Type</th><th>3D3</th></tr><tr><td>Oil q.ty (Lt.) A</td><td>0.03</td></tr><tr><td>Oil q.ty (Lt.) B</td><td>0.03</td></tr><tr><td colspan="2">Standard without oil plug</td></tr></table>	Type	3D3	Oil q.ty (Lt.) A	0.03	Oil q.ty (Lt.) B	0.03	Standard without oil plug		 B7	<table><tr><th>Type</th><th>3D3</th></tr><tr><td>Oil q.ty (Lt.) A</td><td>0.03</td></tr><tr><td>Oil q.ty (Lt.) B</td><td>0.03</td></tr><tr><td colspan="2">Standard without oil plug</td></tr></table>	Type	3D3	Oil q.ty (Lt.) A	0.03	Oil q.ty (Lt.) B	0.03	Standard without oil plug	
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Tappi nel lato posteriore

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Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



H TO1/8SCA
Closed plug 1/8



I TO1/4SCA
Closed plug 1/4

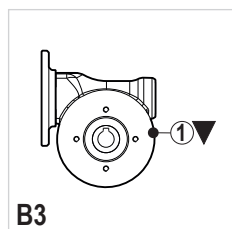
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
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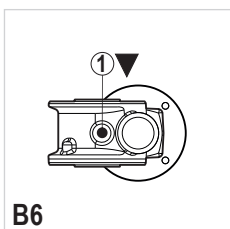
Standard

Standard



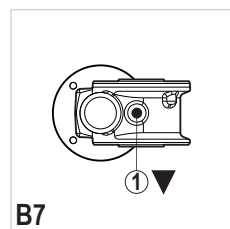
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On request (1)	I



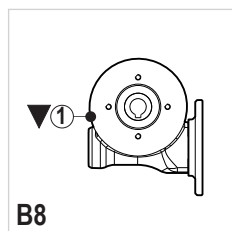
B6

Type	D45
Oil q.ty (Lt.)	0.09
Standard without oil plug	
On request (1)	I



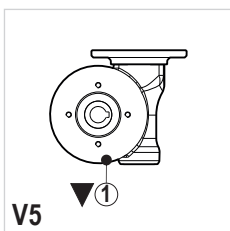
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Type	D45
Oil q.ty (Lt.)	0.09
Standard without oil plug	
On request (1)	I



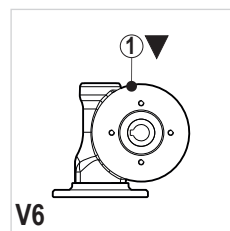
B8

Type	D45
Oil q.ty (Lt.)	0.09
Standard without oil plug	
On request (1)	I



V5

Type	D45
Oil q.ty (Lt.)	0.09
Standard without oil plug	
On request (1)	I

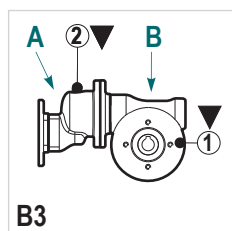


V6

Type	D45
Oil q.ty (Lt.)	0.09
Standard without oil plug	
On request (1)	I

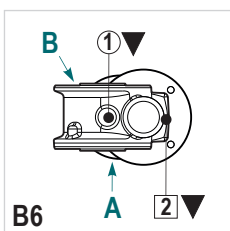
First stage

Precoppia



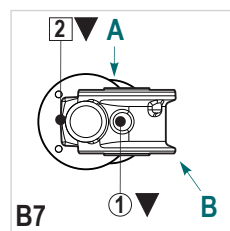
B3

Type	D45+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.09
Standard (2)	H
On request (1)	I



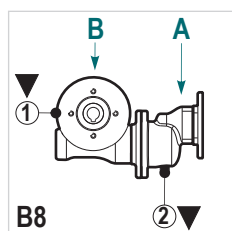
B6

Type	D45+211D
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Oil q.ty (Lt.) B	0.09
Standard (2)	H
On request (1)	I



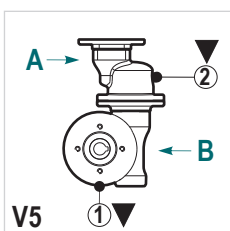
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Type	D45+211D
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Oil q.ty (Lt.) B	0.09
Standard (2)	H
On request (1)	I



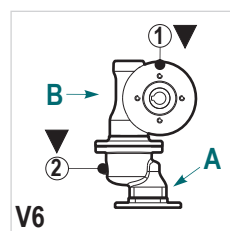
B8

Type	D45+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.09
Standard (2)	H
On request (1)	I



V5

Type	D45+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.09
Standard (2)	H
On request (1)	I



V6

Type	D45+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.09
Standard (2)	H
On request (1)	I

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



I TO1/4SCA
Closed plug 1/4

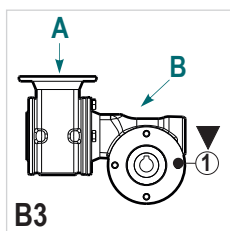
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

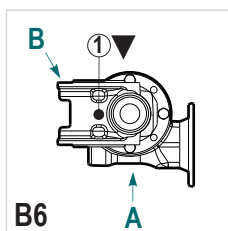
Combined

Combinato



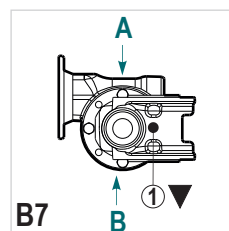
B3

Type	4D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.09
Standard without oil plug	
On request ①	I



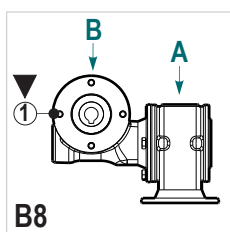
B6

Type	4D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.09
Standard without oil plug	
On request ①	I



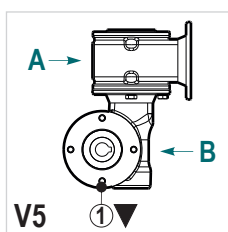
B7

Type	4D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.09
Standard without oil plug	
On request ①	I



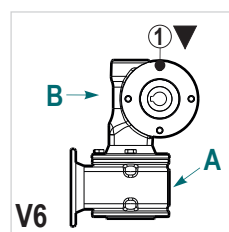
B8

Type	4D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.09
Standard without oil plug	
On request ①	I



V5

Type	4D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.09
Standard without oil plug	
On request ①	I



V6

Type	4D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.09
Standard without oil plug	
On request ①	I

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



H TO1/8SCA
Closed plug 1/8



I TO1/4SCA
Closed plug 1/4

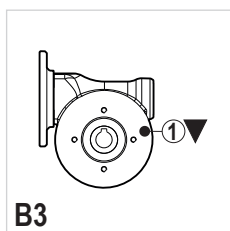
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

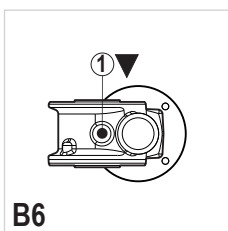
Standard

Standard



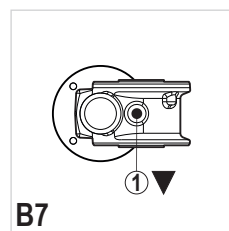
B3

Type	D50
Oil q.ty (Lt.)	0.14
Standard without oil plug	
On request (1)	I



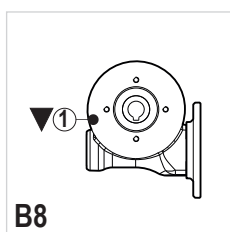
B6

Type	D50
Oil q.ty (Lt.)	0.14
Standard without oil plug	
On request (1)	I



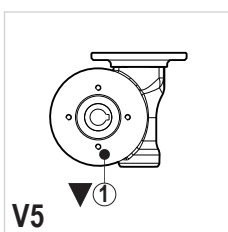
B7

Type	D50
Oil q.ty (Lt.)	0.14
Standard without oil plug	
On request (1)	I



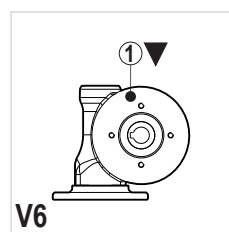
B8

Type	D50
Oil q.ty (Lt.)	0.14
Standard without oil plug	
On request (1)	I



V5

Type	D50
Oil q.ty (Lt.)	0.14
Standard without oil plug	
On request (1)	I

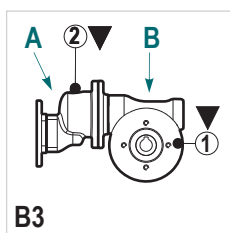


V6

Type	D50
Oil q.ty (Lt.)	0.14
Standard without oil plug	
On request (1)	I

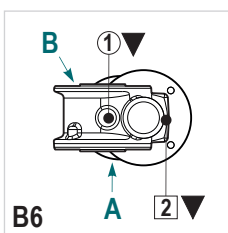
First stage

Precoppia



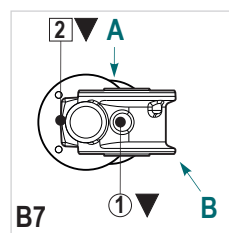
B3

Type	D50+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.14
Standard (2)	H
On request (1)	I



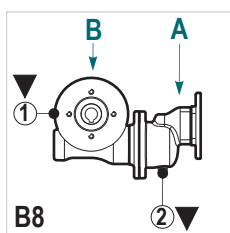
B6

Type	D50+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.14
Standard (2)	H
On request (1)	I



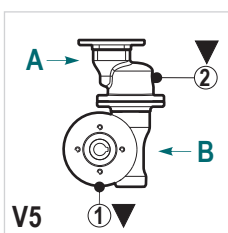
B7

Type	D50+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.14
Standard (2)	H
On request (1)	I



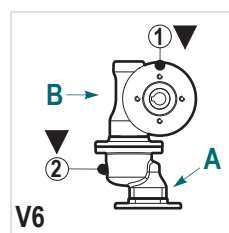
B8

Type	D50+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.14
Standard (2)	H
On request (1)	I



V5

Type	D50+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.14
Standard (2)	H
On request (1)	I



V6

Type	D50+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.14
Standard (2)	H
On request (1)	I

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



I TO1/4SCA
Closed plug 1/4

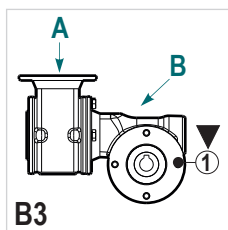
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

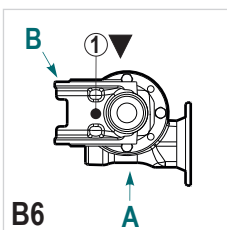
Combined

Combinato



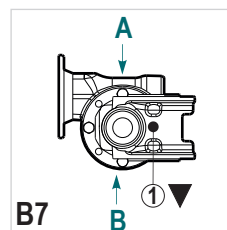
B3

Type	5D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.14
Standard without oil plug	
On request ①	I



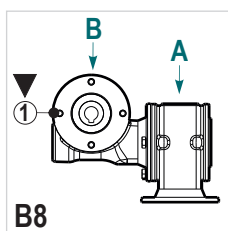
B6

Type	5D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.14
Standard without oil plug	
On request ①	I



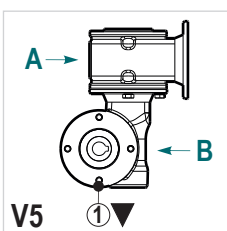
B7

Type	5D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.14
Standard without oil plug	
On request ①	I



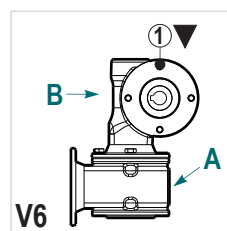
B8

Type	5D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.14
Standard without oil plug	
On request ①	I



V5

Type	5D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.14
Standard without oil plug	
On request ①	I



V6

Type	5D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.14
Standard without oil plug	
On request ①	I

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



H TO1/8SCA
Closed plug 1/8



I TO1/4SCA
Closed plug 1/4

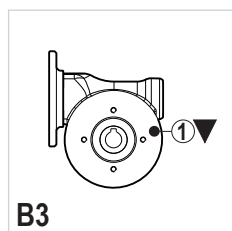
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

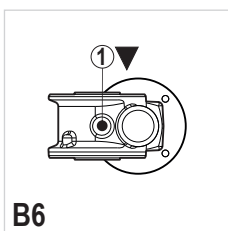
Standard

Standard



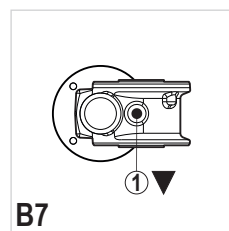
B3

Type	D63
Oil q.ty (Lt.)	0.40
Standard without oil plug	
On request (1)	I



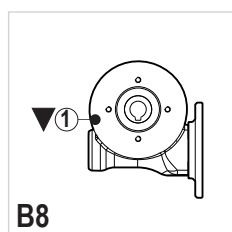
B6

Type	D63
Oil q.ty (Lt.)	0.40
Standard without oil plug	
On request (1)	I



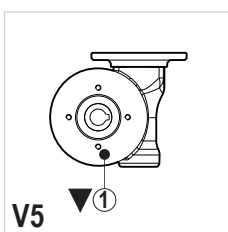
B7

Type	D63
Oil q.ty (Lt.)	0.40
Standard without oil plug	
On request (1)	I



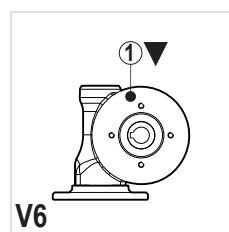
B8

Type	D63
Oil q.ty (Lt.)	0.40
Standard without oil plug	
On request (1)	I



V5

Type	D63
Oil q.ty (Lt.)	0.40
Standard without oil plug	
On request (1)	I

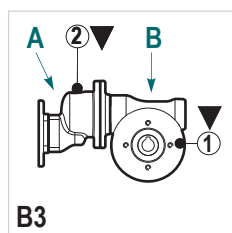


V6

Type	D63
Oil q.ty (Lt.)	0.40
Standard without oil plug	
On request (1)	I

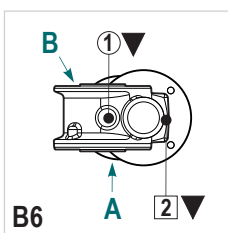
First stage

Precoppia



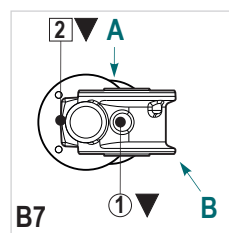
B3

Type	D63+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.40
Standard (2)	H
On request (1)	I



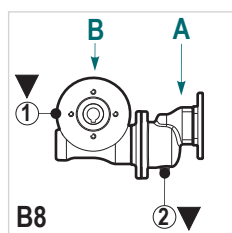
B6

Type	D63+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.40
Standard (2)	H
On request (1)	I



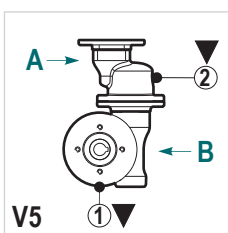
B7

Type	D63+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.40
Standard (2)	H
On request (1)	I



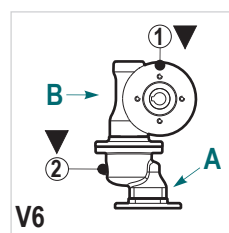
B8

Type	D63+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.40
Standard (2)	H
On request (1)	I



V5

Type	D63+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.40
Standard (2)	H
On request (1)	I



V6

Type	D63+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	0.40
Standard (2)	H
On request (1)	I

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



I TO1/4SCA
Closed plug 1/4

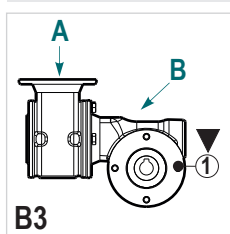
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

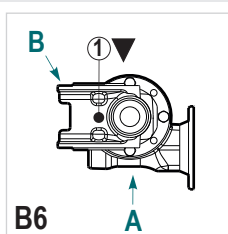
Combined

Combinato



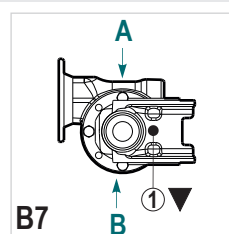
B3

Type	6D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



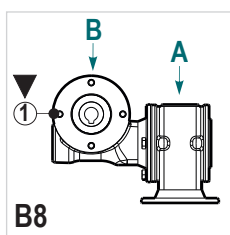
B6

Type	6D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



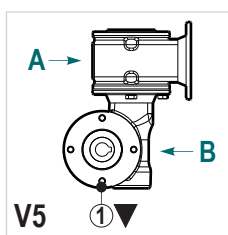
B7

Type	6D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



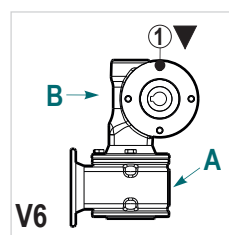
B8

Type	6D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



V5

Type	6D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I

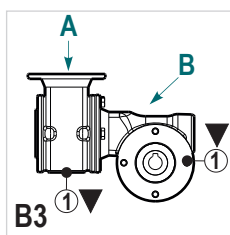


V6

Type	6D3
Oil q.ty (Lt.) A	0.03
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I

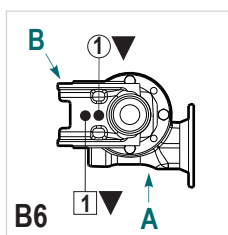
Combined

Combinato



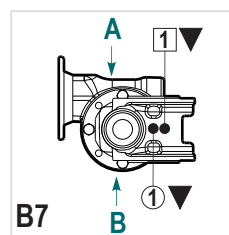
B3

Type	6D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



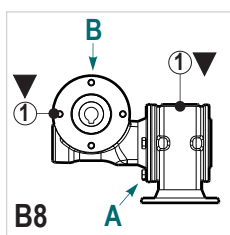
B6

Type	6D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



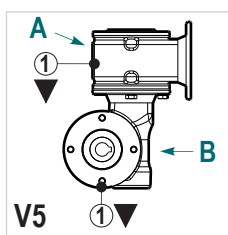
B7

Type	6D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



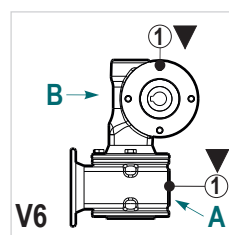
B8

Type	6D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



V5

Type	6D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I



V6

Type	6D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	0.40
Standard without oil plug	
On request ①	I

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



H TO1/8SCA
Closed plug 1/8



L TO3/8SCA
Closed plug 3/8

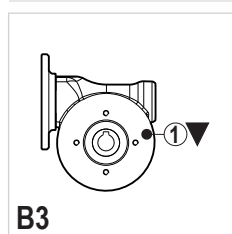
Synthetic oil

Olio sintetico

Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

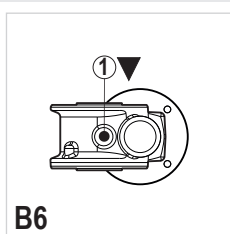
Standard

Standard



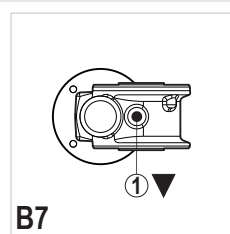
B3

Type	D85
Oil q.ty (Lt.)	1.20
Standard without oil plug	
On request ①	L



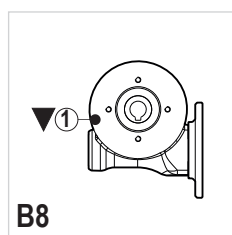
B6

Type	D85
Oil q.ty (Lt.)	1.20
Standard without oil plug	
On request ①	L



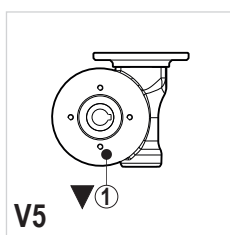
B7

Type	D85
Oil q.ty (Lt.)	1.20
Standard without oil plug	
On request ①	L



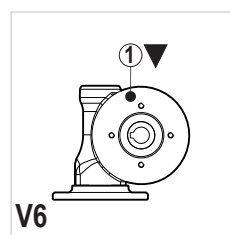
B8

Type	D85
Oil q.ty (Lt.)	1.20
Standard without oil plug	
On request ①	L



V5

Type	D85
Oil q.ty (Lt.)	1.20
Standard without oil plug	
On request ①	L

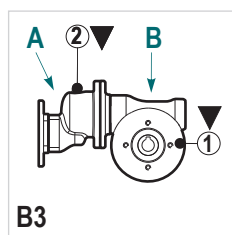


V6

Type	D85
Oil q.ty (Lt.)	1.20
Standard without oil plug	
On request ①	L

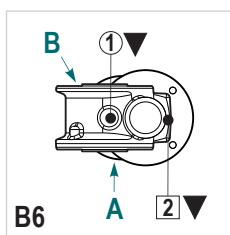
First stage

Precoppia



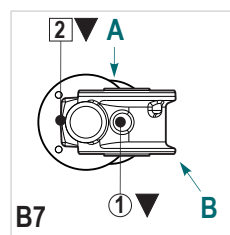
B3

Type	D85+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	1.20
Standard ②	H
On request ①	L



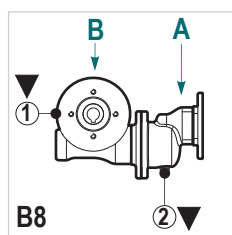
B6

Type	D85+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	1.20
Standard ②	H
On request ①	L



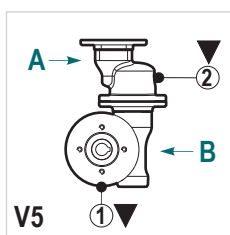
B7

Type	D85+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	1.20
Standard ②	H
On request ①	L



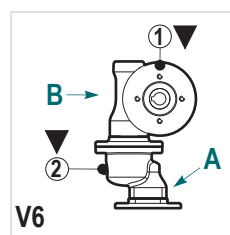
B8

Type	D85+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	1.20
Standard ②	H
On request ①	L



V5

Type	D85+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	1.20
Standard ②	H
On request ①	L



V6

Type	D85+211D
Oil q.ty (Lt.) A	0.05
Oil q.ty (Lt.) B	1.20
Standard ②	H
On request ①	L

□ These plugs are on the back side
Tappi nel lato posteriore

▼ Filling & Breather
Riempimento e sfiato

▼ Filling closed
Chiuso

△ Emptying
Scarico

● Level
Livello

Oil plug

Tappo olio



I TO1/4SCA
Closed plug 1/4



L TO3/8SCA
Closed plug 3/8

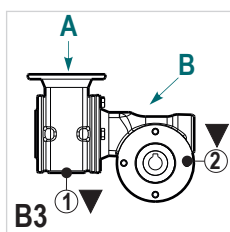
Synthetic oil

Olio sintetico

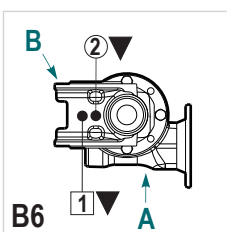
Code	Description
LUOTVSF320 (Standard)	Shell Omala S4 WE320 Eni Telium VSF320
LUOBLAS150 (Low temperature)	Shell Omala S4 WE150 Eni Blasias S 150
LUOFOOD320 (Food)	Mobil SHC Cibus 320

Combined

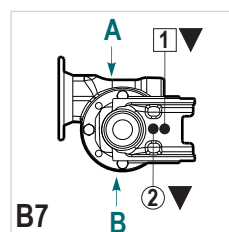
Combinato



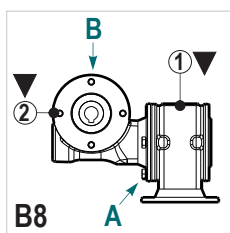
Type	8D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	1.20
Standard without oil plug	
On request	1 I 2 L



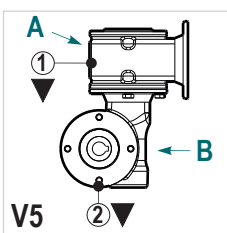
Type	8D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	1.20
Standard without oil plug	
On request	1 I 2 L



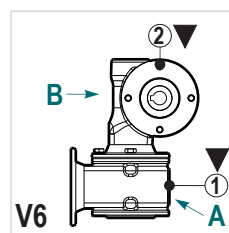
Type	8D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	1.20
Standard without oil plug	
On request	1 I 2 L



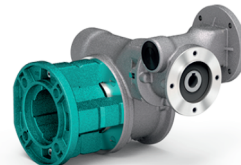
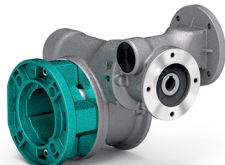
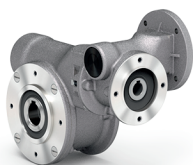
Type	8D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	1.20
Standard without oil plug	
On request	1 I 2 L



Type	8D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	1.20
Standard without oil plug	
On request	1 I 2 L



Type	8D4
Oil q.ty (Lt.) A	0.09
Oil q.ty (Lt.) B	1.20
Standard without oil plug	
On request	1 I 2 L



UNI

FLC / FLL

FLC / FLL

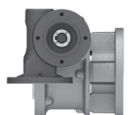
P1

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●							●	●					
4D3														
5D3								●	●					
6D3	●							●	●					
6D4		●						●		●				
8D4		●						●	●	●				



P1R

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●							●	●					
4D3								●	●					
5D3								●	●					
6D3	●							●	●					
6D4		●						●	●		●			
8D4		●						●	●	●				



P1L

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3								●	●					
4D3								●	●					
5D3								●	●					
6D3	●							●	●					
6D4		●						●	●	●				
8D4		●						●	●	●				



P2

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●	●						●	●					
4D3								●						
5D3		●						●	●					
6D3	●	●						●	●					
6D4		●	●					●	●	●				
8D4	●	●	●					●	●	●				



P2R

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	•	•						•	•					
4D3	•	•						•	•					
5D3	•	•						•	•					
6D3	•							•	•					
6D4		•	•					•	•	•				
8D4		•	•					•	•	•				



P2L

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●	●						●	●					
4D3	●	●						●	●					
5D3	●	●						●	●					
6D3	●	●						●	●					
6D4		●	●					●	●	●				
8D4		●	●					●	●	●				



Q1

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●	●						●	●					
4D3														
5D3														
6D3	●	●						●	●					
6D4			●								●			
8D4			●	●							●	●		



Q1R

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	•	•						•	•					
4D3	•	•						•	•					
5D3	•	•						•	•					
6D3	•	•						•	•					
6D4			•								•			
8D4		•	•						•	•	•			



Q1L

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3														
4D3														
5D3														
6D3														
6D4														
8D4														



Q2

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●	●						●	●					
4D3	●							●						
5D3	●	●						●	●					
6D3	●	●						●						
6D4			●					●						
8D4			●	●				●	●	●				



Q2R

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3														
4D3														
5D3														
6D3														
6D4														
8D4														



Q2L

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	●	●						●	●					
4D3	●	●						●	●					
5D3	●	●						●	●					
6D3	●	●						●	●					
6D4			●	●				●	●	●	●			
8D4		●	●					●	●	●				



R1

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	•	•						•	•					
4D3								•						
5D3		•						•	•					
6D3	•	•						•						
6D4		•	•					•	•	•				
8D4	•	•	•					•	•	•				



R1R

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	•	•						•	•					
4D3	•	•						•	•					
5D3	•	•						•	•					
6D3	•							•	•					
6D4		•	•					•	•	•				
8D4		•	•					•	•	•				



R1L

	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
3D3	•	•						•	•					
4D3			•							•				
5D3			•							•				
6D3		•								•				
6D4			•							•		•		
8D4			•	•						•		•	•	



R2

|--|



PAB PAI

PBB

PVB PVI

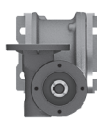
P1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3							•	•					
	4D3							•	•					
	5D3							•	•					
	6D3	•						•	•					
	6D4		•					•	•	•				
	8D4		•					•	•	•				

P1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3	●						●						
	5D3	●						●						
	6D3	●						●						
	6D4			●				●		●				
	8D4		●	●					●	●	●			

P1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	•	•						•	•				
	4D3	•	•						•	•				
	5D3	•	•						•	•				
	6D3	•	•						•	•				
	6D4	•	•								•			
	8D4	•	•								•	•		

P2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3													
	5D3	●	●					●	●					
	6D3	●						●						
	6D4		●	●				●	●	●				
	8D4		●	●					●	●	●			

P2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●						●	●					
	4D3													
	5D3								●	●				
	6D3	●							●					
	6D4		●							●	●			
	8D4		●							●	●	●		

P2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●							●	●				
	4D3													
	5D3									●				
	6D3	●								●				
	6D4		●								●	●		
	8D4		●								●	●		

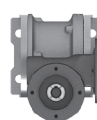
Q1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3													
	5D3	●	●					●	●					
	6D3	●						●						
	6D4		●	●				●	●	●				
	8D4		●	●					●	●	●			

Q1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3													
	5D3	●	●					●	●					
	6D3							●	●					
	6D4									●	●			
	8D4		●	●						●	●	●		

Q1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●							●					
	4D3	●							●					
	5D3	●							●					
	6D3	●							●					
	6D4	●	●							●	●			
	8D4	●	●							●	●	●		

Q2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3													
	5D3	●	●					●	●					
	6D3	●						●						
	6D4		●	●				●	●	●				
	8D4		●	●					●	●	●			

Q2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3	●	●					●	●					
	5D3	●	●					●	●					
	6D3	●	●					●	●					
	6D4							●	●	●				
	8D4		●	●					●	●	●			

Q2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	•	•						•	•				
	4D3	•	•						•	•				
	5D3	•	•						•	•				
	6D3	•	•						•	•				
	6D4	•	•	•	•					•	•	•		
	8D4	•	•	•	•					•	•	•		

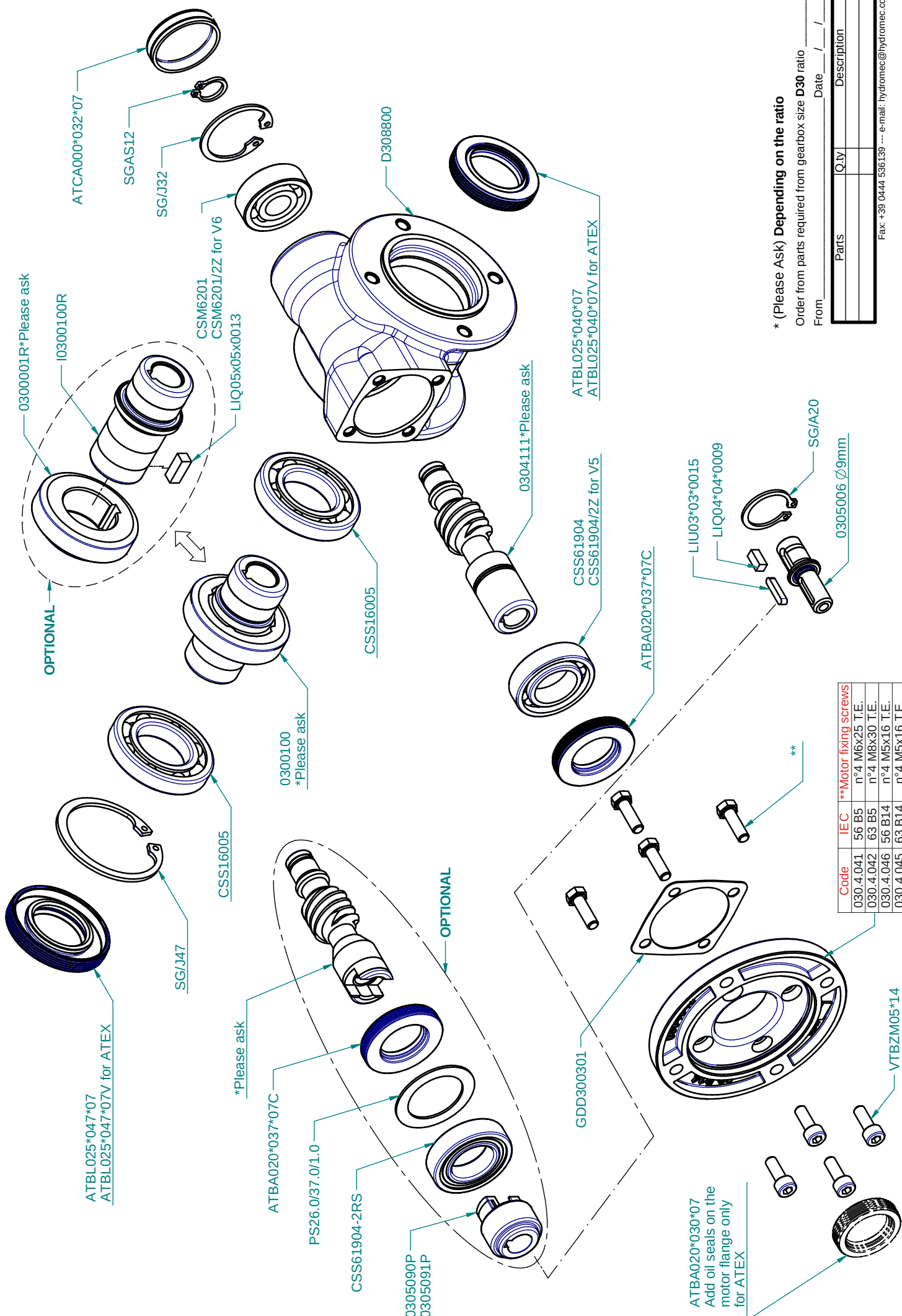
R1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3	●	●					●	●					
	5D3	●	●					●	●					
	6D3	●						●						
	6D4							●	●	●				
	8D4		●	●						●	●	●		

R1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●						●	●					
	4D3							●						
	5D3							●						
	6D3	●						●						
	6D4		●					●	●	●				
	8D4			●					●	●	●			

R1	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●							●	●				
	4D3									●	●			
	5D3									●	●			
	6D3	●								●	●			
	6D4		●								●	●		
	8D4										●	●		

R2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3							●	●					
	4D3							●	●					
	5D3							●	●					
	6D3	●						●	●					
	6D4		●					●	●	●				
	8D4			●				●	●	●	●			

R2	B5							B14						
	56	63	71	80	90	100	112	56	63	71	80	90	100	112
	3D3	●	●					●	●					
	4D3	●						●						
	5D3	●						●						
	6D3							●						
	6D4							●	●	●				
	8D4		●	●					●	●	●			



* (Please Ask) **Depending on the ratio**

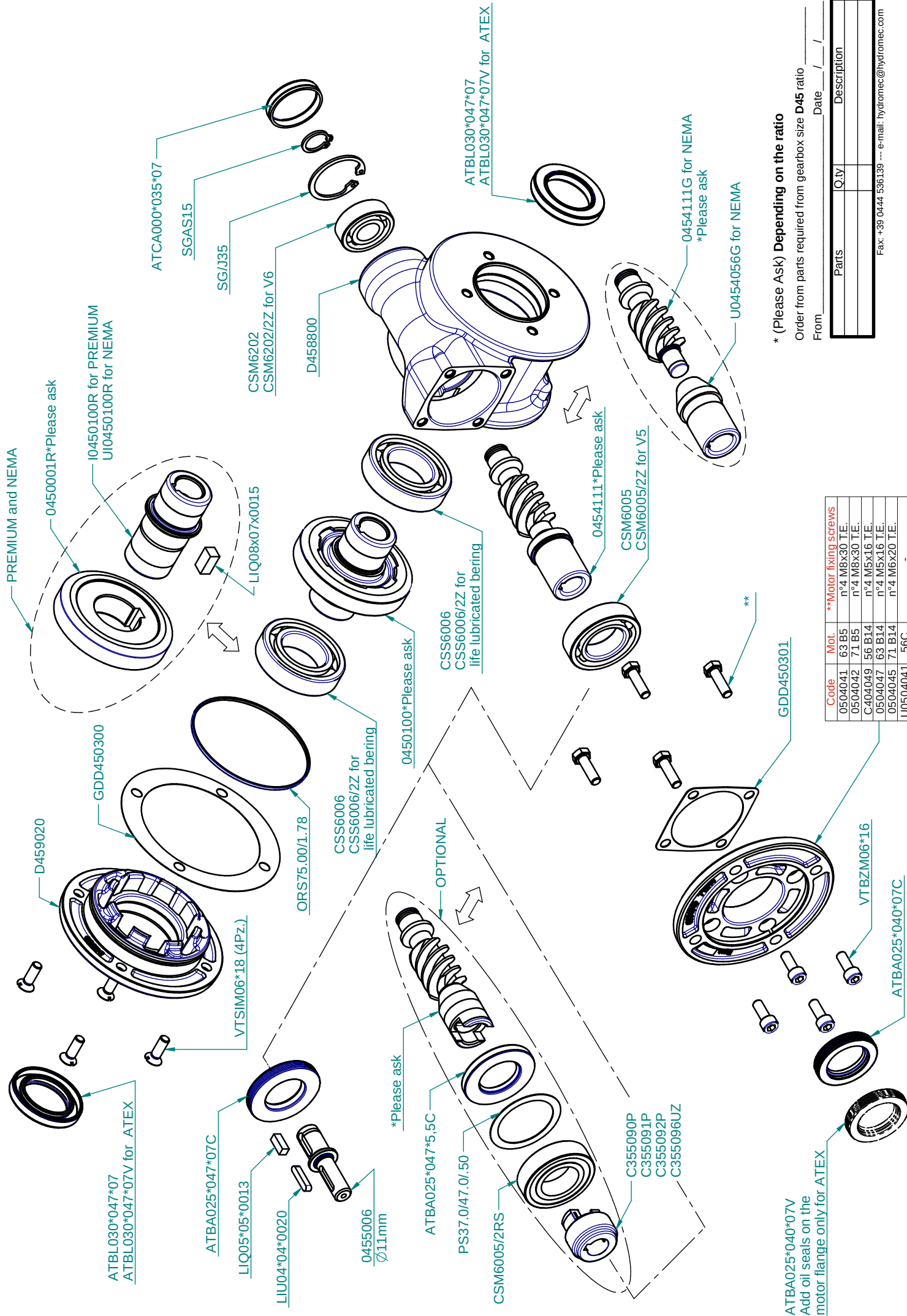
Order from parts required from gearbox size **D30** ratio _____

From _____ Date _____ / _____ / _____

Parts	Qty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com

Code	IEC	**Motor fixing screws
030.4.041	56 B5	n°4 M6x25 T.E.
030.4.042	63 B5	n°4 M8x30 T.E.
030.4.046	56 B14	n°4 M5x16 T.E.
030.4.045	63 B14	n°4 M5x16 T.E.



ATBA025*040*07V
Add oil seals on the

* (Please Ask) Depending on the ratio

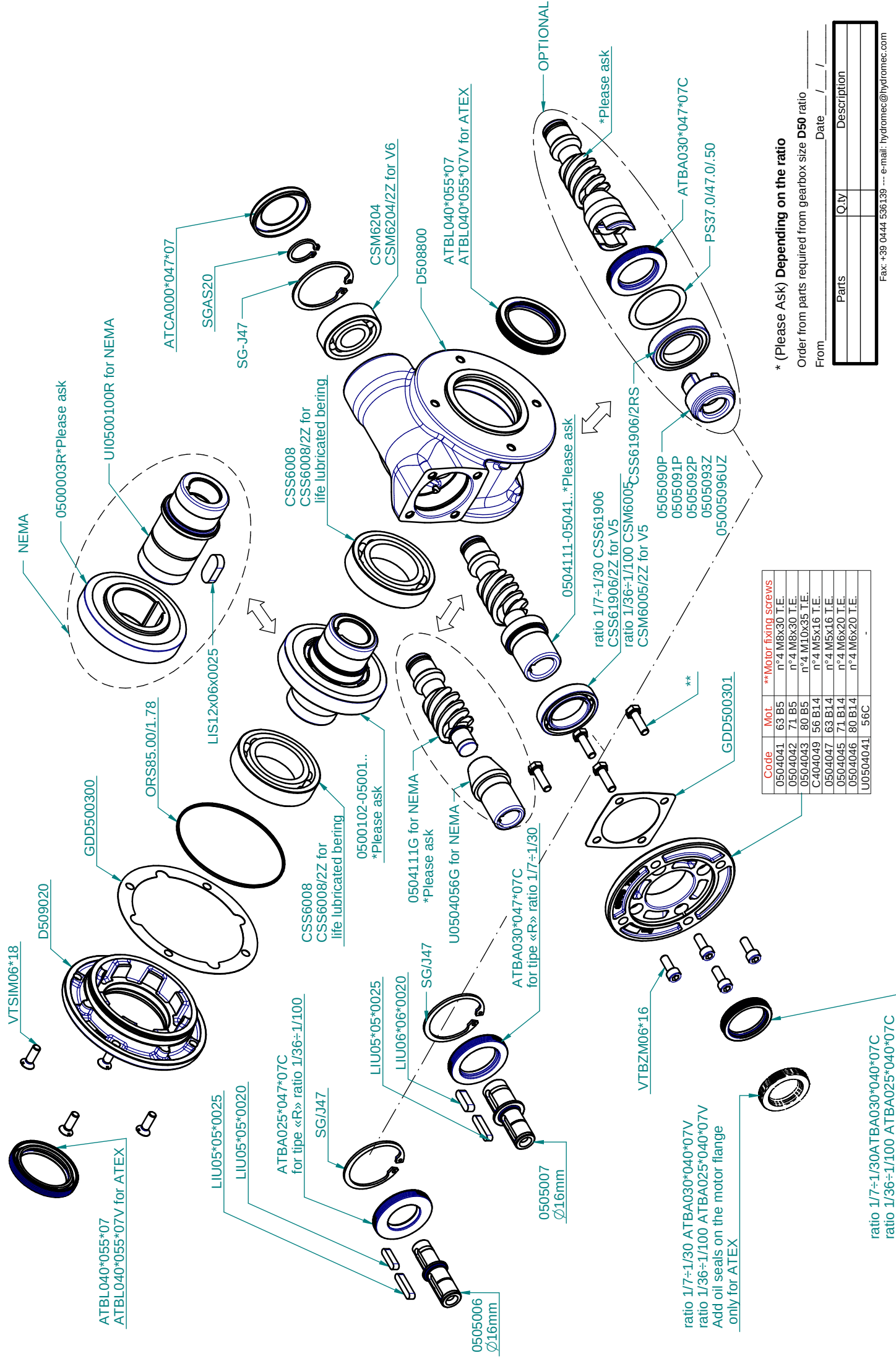
Order from parts required from gearbox size **D45** ratio

From _____ Date ____/____/____

Code	Mat.	**Motor fixing screws
0504041	63 B5	n°4 M8x30 T.E.
0504042	71 B5	n°4 M8x30 T.E.
C404049	56 B14	n°4 M5x16 T.E.
0504047	63 B14	n°4 M5x16 T.E.
0504045	71 B14	n°4 M6x20 T.E.
I0504041	56C	

Parts	Q.ty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com



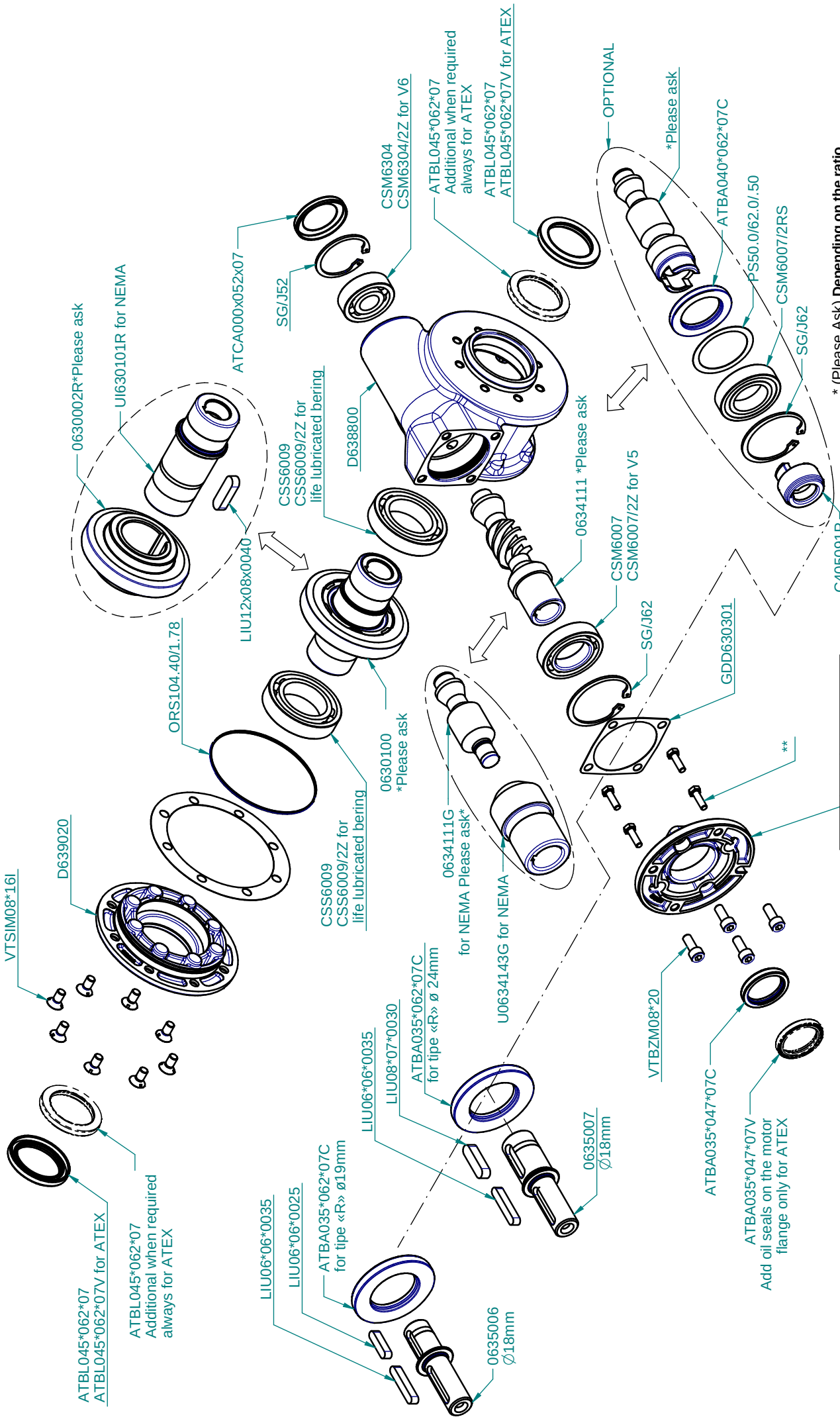
* (Please Ask) Depending on the ratio

Order from parts required from gearbox size **D50** ratio

From _____ Date ____ / ____ / ____

Parts	Q.ty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com



Code	Mot.	**Motor fixing screws
0634041	63 B5	n°4 M8x30 T.E.
0634042	71 B5	n°4 M8x30 T.E.
0634043	80 B5	n°4 M10x35 T.E.
0634043	90 B5	n°4 M10x35 T.E.
0634043	90 B5	n°4 M10x35 T.E.
0634047	71 B14	n°4 M6x20 T.E.
0634046	80 B14	n°4 M6x20 T.E.
0634041	90 B14	n°4 M8x20 T.E.
U0634041	1143/5TC	-

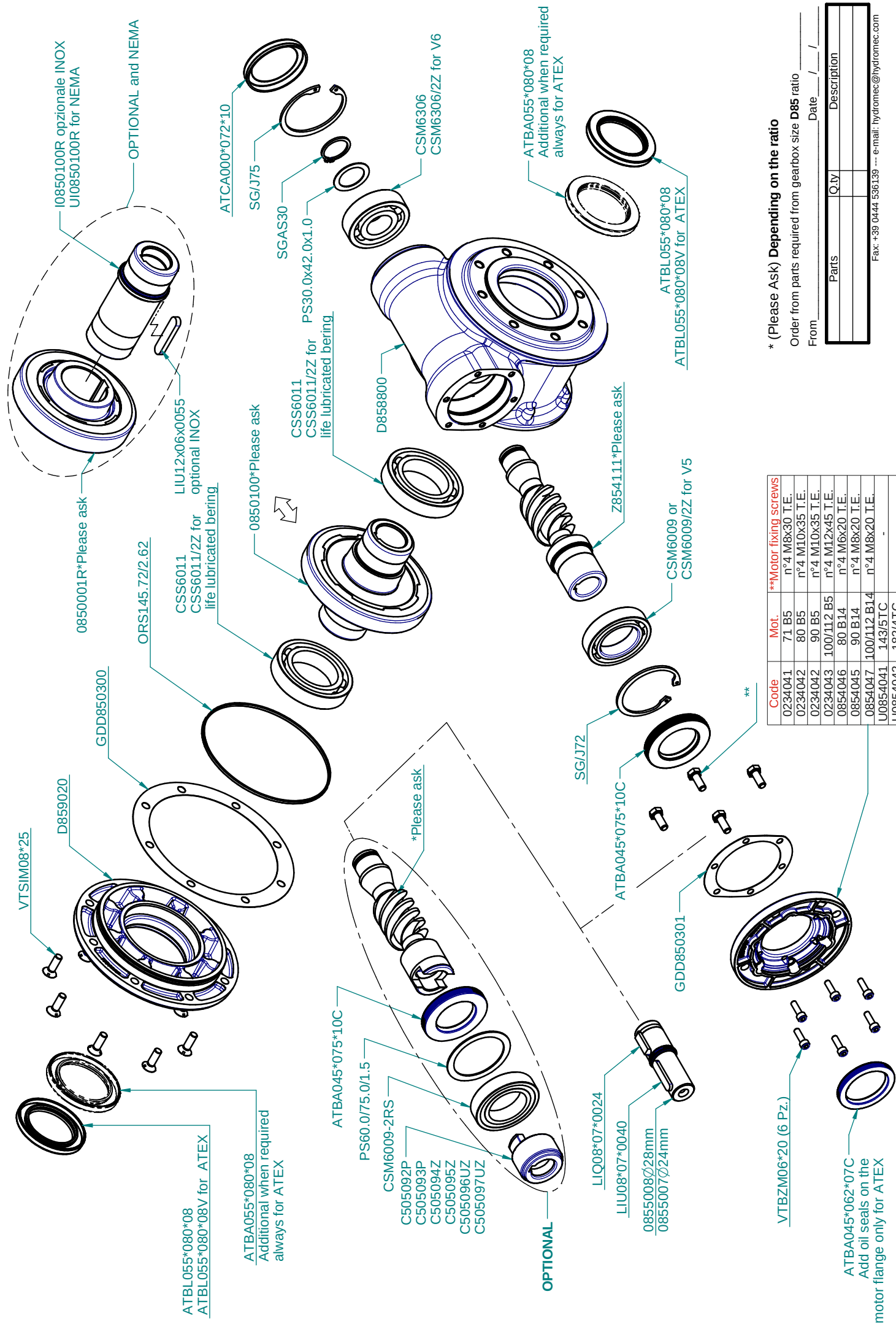
* (Please Ask) Depending on the ratio

Order from parts required from gearbox size D63 ratio

From _____ Date _____ / _____ / _____

Parts	Qty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com

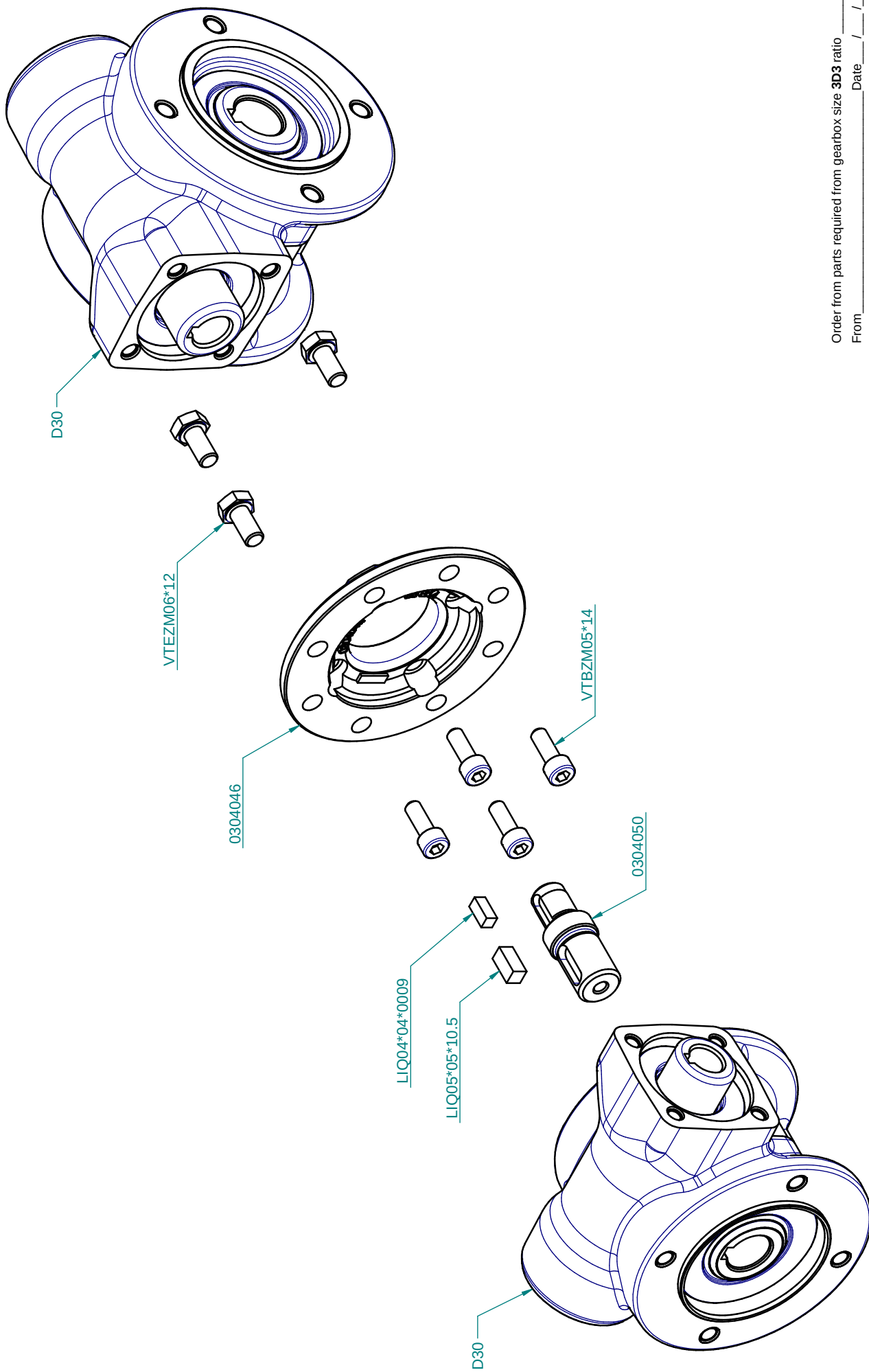


* (Please Ask) Depending on the ratio

Order from parts required from gearbox size **D85** ratio

From _____ Date ____ / ____ / ____	
Parts	Q.ty Description

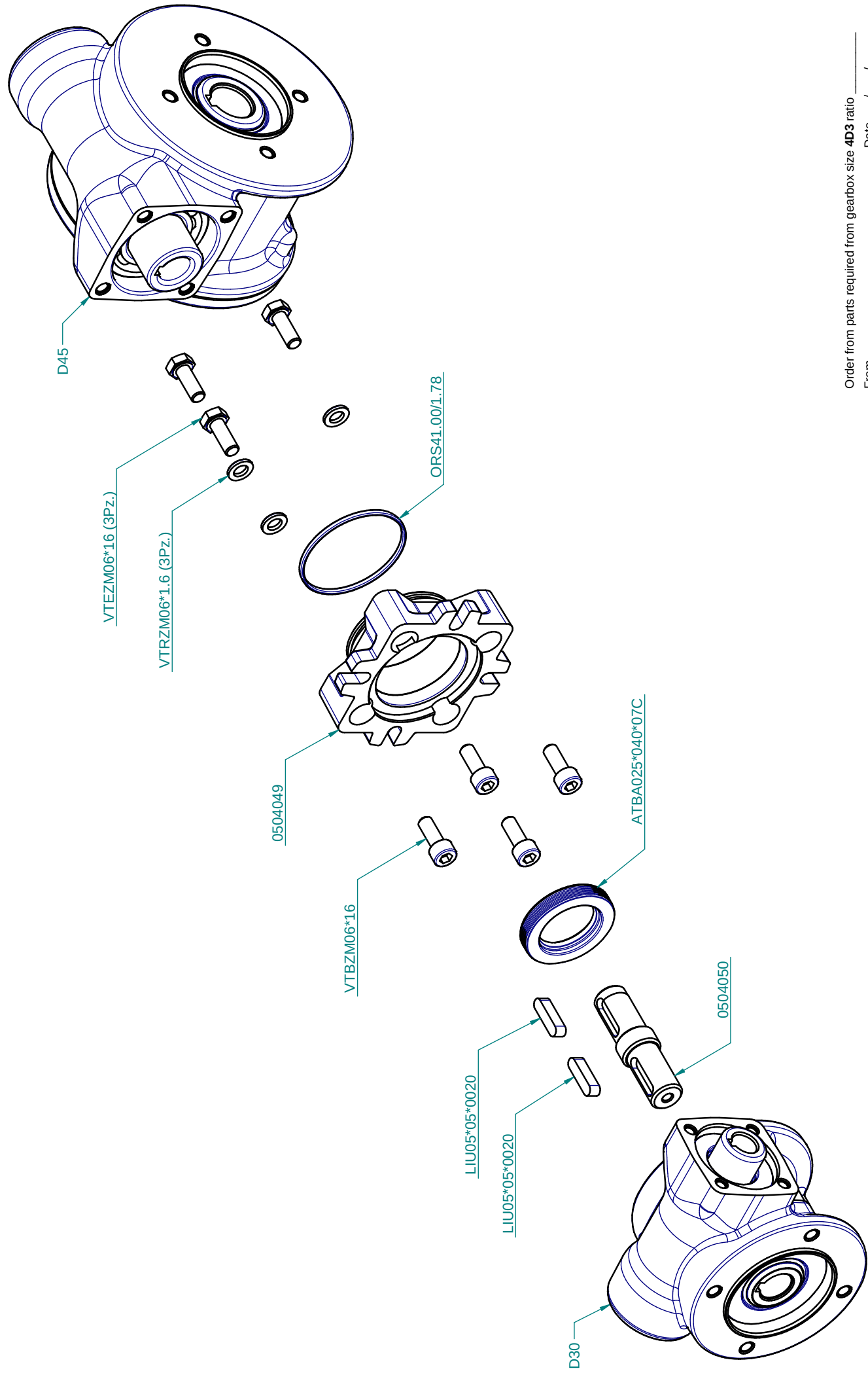
Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com



Order from parts required from gearbox size **3D3** ratio _____
From _____ Date ____/____/____

Parts	Qty	Description

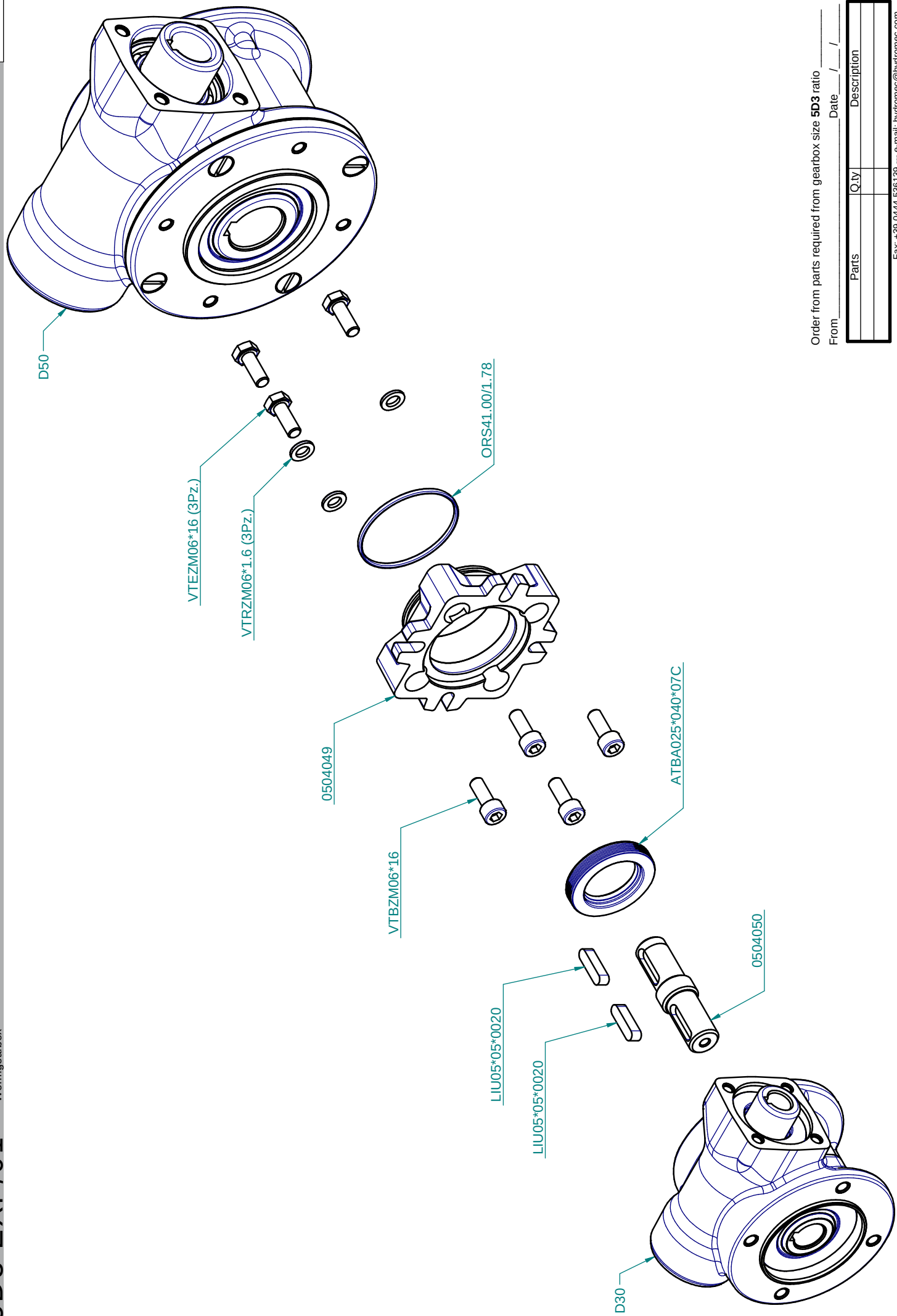
Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com



Order from parts required from gearbox size **4D3** ratio _____
From _____ Date _____ / _____ / _____

Parts	Qty	Description

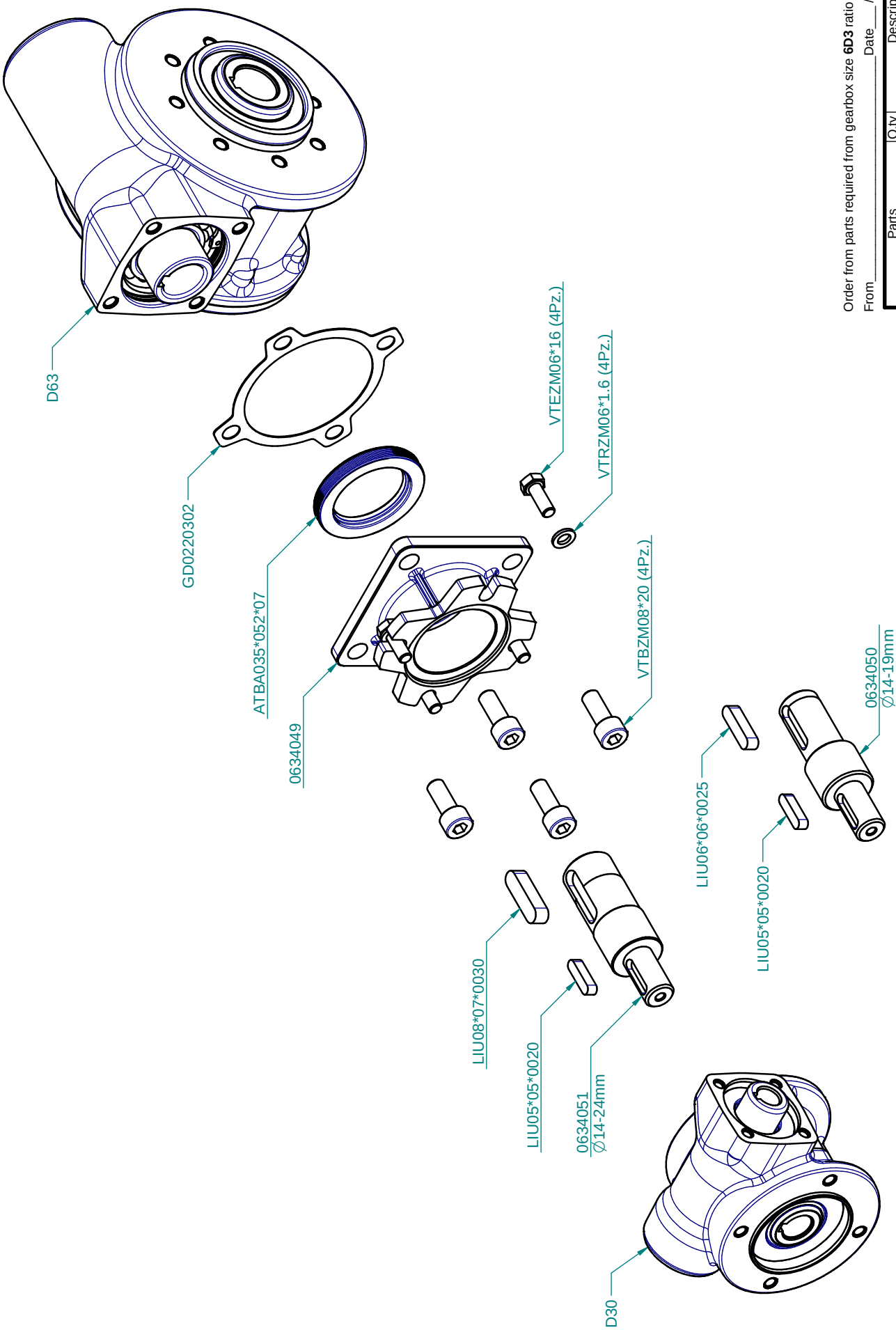
Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com



Order from parts required from gearbox size 5D3 ratio _____
From _____ Date _____ / _____ / _____

Parts	Qty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com

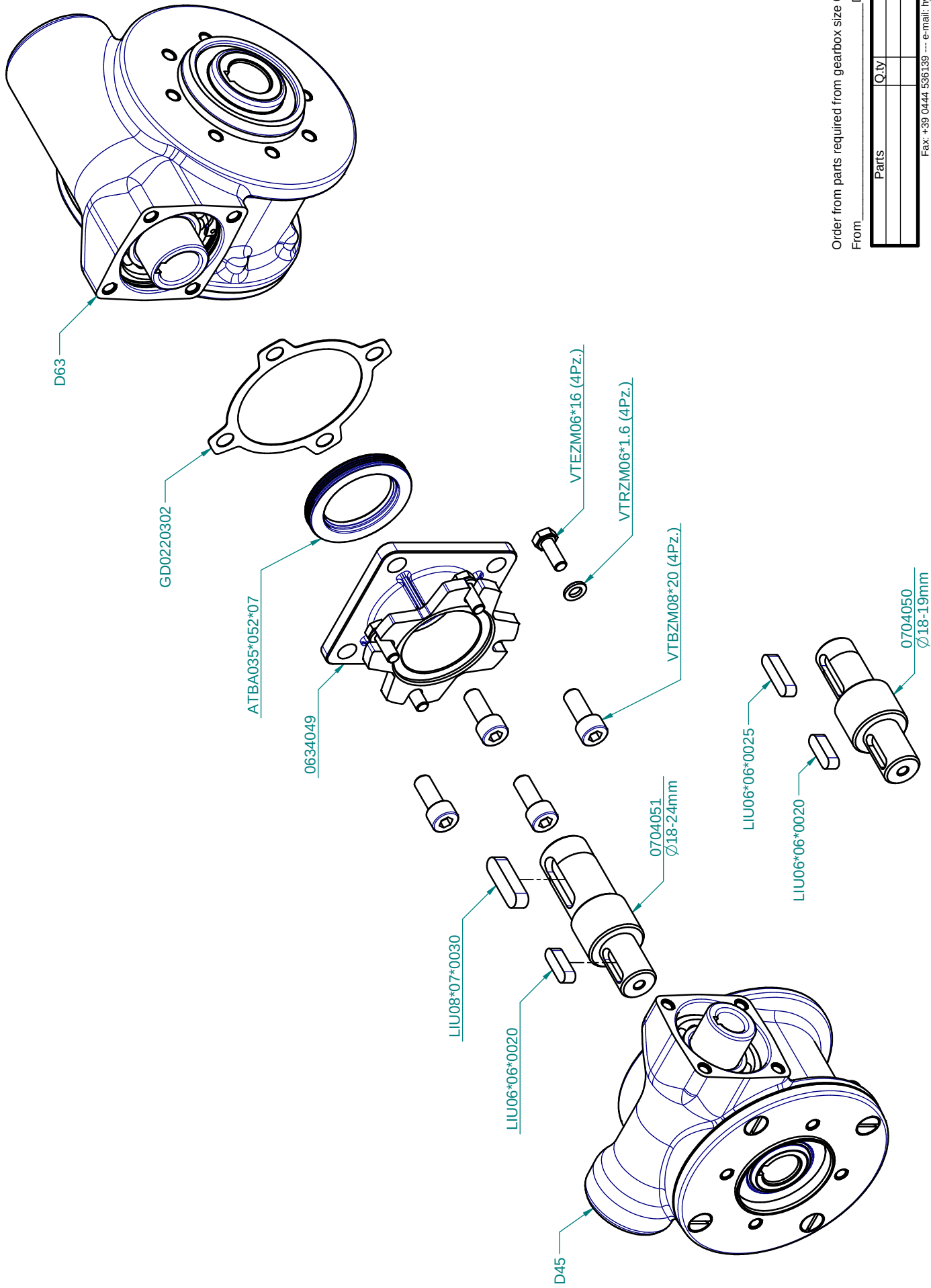


Order from parts required from gearbox size **6D3** ratio _____

From _____ Date _____ / _____ / _____

Parts	Qty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com

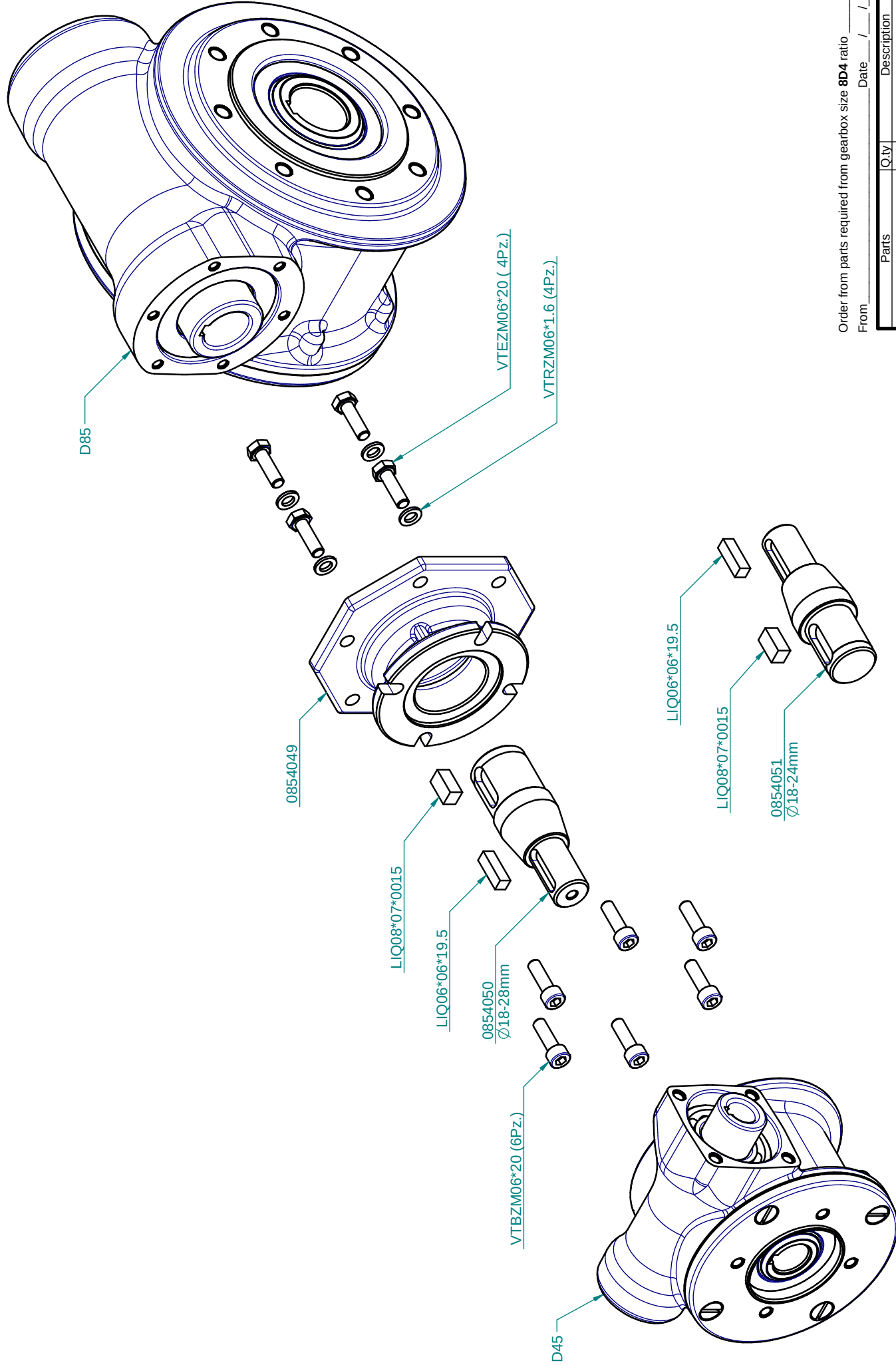


Order from parts required from gearbox size **6D4** ratio _____

From _____ Date ____/____/____

Parts	Qty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com



Order from parts required from gearbox size **8D4** ratio

From _____ Date ____ / ____ / ____

Parts	Q.ty	Description

Fax: +39 0444 536139 --- e-mail: hydromec@hydromec.com

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