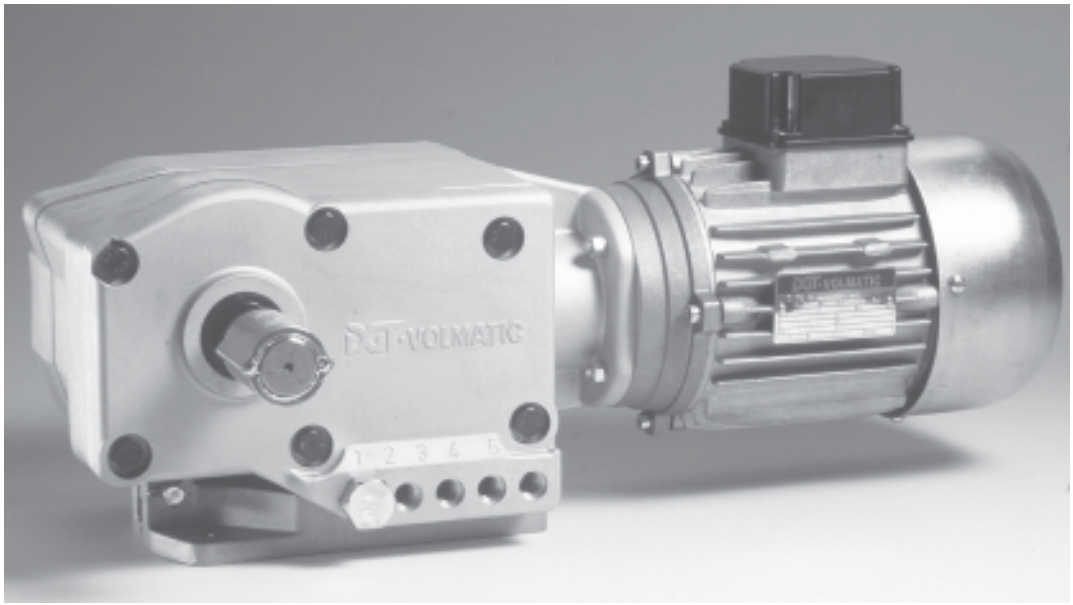
SENMATIC
DGT-Volmatic

Operating Instructions for Gear Motor LG403, LG405, and the LG403/5 combination



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Overensstemmelseserklæring
Vi, DGT Volmatic A/S, erklærer med henvisning til Maskindirektivet 89/392/EØF, Art. 1, stk 5, at gearmotorer af type LG403 og LG405 bestemt for anvendelse med mekanisk opluk af ventilationslemme er i overensstemmelse med

- Rådets direktiv 89/392 om indbyrdes tilnærmelse af EF medlemstaternes lovgivning om maskiner.

Denne erklæring omfatter gearmotorer type LG403 fra serienummer 2740 til serienumer 9999 og gearmotor LG405 fra serienummer 3585 til serienummer 9999.

Disse maskiner må kun tages i brug, indbygget i anlæg der som helhed er blevet erklæret i overensstemmelse med direktivet 89/392.

Declaration of Conformity
We, DGT*Volmatic A/S, declare under our sole responsibility that gear motors type LG403 and LG405 intended for mechanical opening of ventilation hatches, are in conformity with the

- Council Directive 89/392 on the approximation of the laws of the EEC Member States relating to machinery

This declaration covers gear motor type LG403 from serial number 2740 to serial number 9999 and gear motor LG405 from serial number 3585 to serial number 9999.

These machines must not be put into service, until the installation, into which they are to be incorporated, has been declared in conformity with the provisions of the Directive 89/392.

Konformitätserklärung
Wir, DGT*Volmatic A/S, erklären in alleiniger Verantwortung, dass Getriebemotoren der den Typen LG403 und LG405, die für mechanisches Aufschliessen der Ventilationsdeckel bestimmt sind, mit der folgenden Richtlinie übereinstimmen:

- Richtlinie des Rates zur Angleichung der Rechts-vorschriften der EG-Mitgliedstaaten für Maschinen: 89/392 EWG.

Diese Erklärung umfasst Getriebemotor LG403 von Seriennummer 2740 bis Seriennummer 9999 und Getriebemotor LG405 von Seriennummer 3585 bis Seriennummer 9999.

Die Inbetriebnahme dieser Motoren ist so lange untersagt, bis festgestellt wird, dass die Maschine, in die sie eingebaut werden sollen, den Bestimmungen der Richtlinie 89/392/EWG entspricht.

Attestation de Conformité
Nous, DGT*Volmatic A/S, déclarons sous notre seule responsabilité que les motoréducteurs LG403 et LG405, déstinés à l'ouverture mécanique d'ouvrant d'aération sont conformes à la

- Directive du Conseil 89/392 concernant le rapprochement des législations des Etats membres CEE relatives aux machines

Cette déclaration comprend les motoréducteurs LG403 du numéro de série 2740 au numéro de série 9999 et le motoréducteur du numéro de série 3585 au numéro de série 9999.

Ces moteurs ne doivent pas être mis en service avant que l'installation, dans laquelle ils seront incorporés, aît été déclarée conforme à la Directive 89/392.

Declaration de conformidad

Nosotros, DGT*Volmatic A/S, declaramos bajo nuestra responsabilidad que los motorreductores modelos LG403 y LG405, destinados para apertura mecánica de elementos de ventilación, son conformes con la

- Directiva del Consejo 89/392 relativo a la aproximación de las legislaciones de los Estados Miembros de la CEE sobre maquinaria.

Esta declaración cubre motorreductores modelo LG403, desde el número de serie 2740 hasta el número de serie 9999, y motorreductores modelo LG405, desde el número de serie 3585 hasta el número de serie 9999.

Estas máquinas no deben ser pucstas en funcionamiento hasta que la instalación en la que van a ser incorporados, haya sido declarada de conformidad según las normas de la Directiva 89/392.

Dichiarazione di Conformita
Noi, DGT*Volmatic A/S dichiariamo, con riferimento alla direttiva CEE 89/392 per il funzionamento delle macchine, art. 1, paragrafo 5, che i riduttori (dispositivi) del tipo LG403 e LG405 destinati ad essere impiegati per l'apertura automatica del portelli di ventilazione, sono conformi a:

- Direttiva del consiglio 89/392 concernente il ravvicinamento delle legislazioni degli Stati membri CEE relative alle macchine.

Questa dichiarazione riguarda tutti i riduttori tipo LG403 con numero di serie compreso tra 2740 e 9999 e tutti i motori tipo LG405 con numero di serie compreso tra 3585 e 9999.

Questi motori possono essere utilizzati solo se incorporati in macchine che nel complesso sono state dichiarate conformi alla Direttiva 89/392.

Overeenkomstigheidsverklaring
Wij DGT*Volmatic A/S verklaren geheel onder eigen verantwoordelijkheid dat de motorreductor's LG405 en LG405 bedoeld zijn voor het openen van de ramen en luiken in overeenstemming met

- de richtlijn van de raad inzake de onderlinge aanpassing van de wetgevingen van de Lid-Staten betreffende machines (89/392/EEG)

Deze verklaring betreft de Motorreductor type: LG403 van serienummer 2740 tot serienummer 9999, LG405 van serienummer 3585 tot serienummer 9999.

Deze motorreductor's mogen niet in bedrijf genomen worden, voordat de machine waarin de motorreductor's worden ingebouwd, in overeenstemming met de bepalingen van deze richtlijn 89/392 is verklaard.

Declaração de Conformidade
Nós DGT*Volmatic A/S declaramos sob nossa única responsabilidade que os motores tipo LG403 e LG405 que se destinam a mecanismos para abertura de comporta de ventilação, está em conformidade com

- Directiva do Concelho des Comunidades Europeias 89/392 relativa à aproximação das legislações dos Estados Membros respeitantes ás máquinas.

Esta declaração cobre motores tipo LG403 desde o número de serie 2740 ao número de serie 9999 e motores tipo LG405 desde o número de serie 3585 ao número de serie 9999.

Estes motores não devem ser postos em serviço antes de a máquina onde vão ser incorporados ser declarada conforme com as disposições da Directiva 89/392.

Försakran om overensstammelse

Vi, DGT*Volmatic A/S, försäkrar med hänvisning till Maskindirektivet 89/392 EÖF, Art. 1,5 stycket, att kuggväxelmotorer typ LG403 och LG405 tillverkade för användning i samband med mekanisk öppning av ventilationsluckor överensstämmer med

- Rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning avseende maskinell utrustning.

Denna försäkran omfattar kuggväxelmotorer typ LG403 fr.o.m. serienummer 2740 t.o.m. serienummer 9999 och LG405 fr.o.m. serienummer 3585 t.o.m. serienummer 9999.

Dessa maskiner får endast användas/tagas i bruk under förutsättning att den utrustning i vilken de byggts in helt stämmer överens med bestämmelserna i direktivet 89/392

Äéáêýñçîç Óõìììüñöùóçò

Åìåßò ç **DGT* Volmatic A/S** äçëþíïõìå ìå áðïêëåéóôéêÞ ìáò åõèýíç üôé ïé çëåêôñïêéíçôÞñåò ôýðïõ **LG403** êáé **LG405** ïé ïðïßïé åöáñìüæïíôáé ãéá áõôüìáôï Üíïéãìá ðáñáèýñùí åîáåñéóìïý, óõììïñöþíïíôáé ìå :

- Ôçí ïäçãßá 89/392 ôïõ Óõìâïõëßïõ åðß ôçò óõãêëßóçò ôùí íüìùí ôùí Êñáôþí ìåëþí ôçò Åõñùðáéêçò êïéíüôçôáò óå ó÷åóç ìå ôá ìç÷áíÞìáôá.

ÁõôÞ ç óõììüñöùóç êáëýðôåé ôïõò çëåêôñïêéíçôÞñåò ôýðïõ LG403 áðü áýîïíôá áñéèìü 2740 ùò áýîïíôá áñéèìü 9999 êáé ôïõò çëåêôñïêéíçôÞñåò ôýðïõ LG405 áðü áýîïíôá áñéèìü 3585 ùò áýîïíôá áñéèìü 9999.

ÁõôÜ ôá ìç÷áíÞìáôá äåí ðñÝðåé íá ëåéôïõñãÞóïõí Ýùò üôïõ ç åãêáôÜóôáóç óôçí ïðïßá åíóùìáôþíïíôáé, äçëùèåß üôé óõììïñöþíåôáé ìå ôéò ðñïâëÝøåéò ôçò Ïäçãßáò 89/392..

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Preface

This manual covers the DGT*Volmatic standard gear motor types LG403, LG405, and the LG403/5 combination.

The DGT*Volmatic gear motors are quality products, developed and constructed for operation of mechanical vent opening systems and screen systems in greenhouses. During the construction and production of the products great importance has been attached to reliability and a long working life.

Prior to installation, running in, and putting into service it is recommendable to read this manual thoroughly as observance of our guidelines is a condition of obtaining optimum benefit from the product. Also the guarantee may no longer apply in case our directions are disregarded.

The LG403 and LG405 gear motors are from standard available in many types. Therefore, in advance of the installation please ensure that the delivered product type corresponds to the type ordered and required. Likewise the LG403/5 combination is delivered in several types.

This is a general manual not listing instructions included by special local or national legislations. The instructions describe the mounting to DGT*Volmatic motor relays.

In the event of problems during the installation, running in, or operation we ask you kindly to contact your local DGT*Volmatic dealer.

DGT*Volmatic A/S

Contents

1.0 Safety Regulations

1.1 Installation

When choosing the place of installation of the gear the following circumstances should be considered:

- Strengthwise the place of installation must be able to carry the self-weight of the gear motor, and furthermore iv must be able to take up the forces created when operating. It is advisable to place the gear motor on the bearing part of the construction, i.e. at columns or rafters. We **dissuade** from choosing e.g. vent bars unless an acceptance from the greenhouse builder has been obtained.

- We recommend use of DGT*Volmatic consoles and adjusting bolts for the installation as this gives the possibility to obtain an accurate assembling in proportion to the drive pipe. By the assembling of the gear all 4 assembling threadholes in the console and on the gear **must** be used.

- The gear motor **must not** be installed at a place exposed to water flushing or continued dripping from e.g. valleys or drains.

- The gear motor **must not** be installed so that the ventilator jacket is covered or blocked as such an installation may cause superheating of the el motor.

- Please study point 2.0 for further instructions.

1.2 El Connection

Connection of the power current connection of the gear motor is to be carried out by an authorized electrician. The power current connection is to be disconnected by dismantling the fuses before connecting the power current.

The gear motor is to be secured with a motor protection. We recommend to use DGT*Volmatic motor relays which all have a built-in motor protection and are designed for the DGT*Volmatic gear motors.

The endstop system of the gear motor **must not** be connected to power current (please study specifications).

1.3 Running in and Operation

The gear motor **must not** be put into service until the endstop system has been connected and the motor relay adjusted. Operating the gear motor without a connected endstop could cause serious damage to the construction.

Running in of the gear motor is to be carried out by an authorized DGT*Volmatic service technician, or by a technician or dealer approved by DGT*Volmatic.

By all service on systems with the gear motor in use, e.g. vent opening, the gear motor is to be disconnected electrically by dismantling the fuses. Running the gear motor during service on systems may cause serious personal injury.

By assembling, electrical connection, operation, and service national as well as local legislation is to be observed by the person responsible for the installation.

2.0 Assembling Instructions

2.1 Mechanical Assembling

By assembling of the gear motor the following instructions must be observed to obtain a safe and durable operation.

2.1.1 Mounting Methods.

The A and B mounting methods is standard. Depending on the type of mounting the correct vent screws has to be demounted. The mounting methods G and H must not be used. All other mounting methods C, D and F can be used in agreement with DGT*Volmatic, but it need some adjustment.

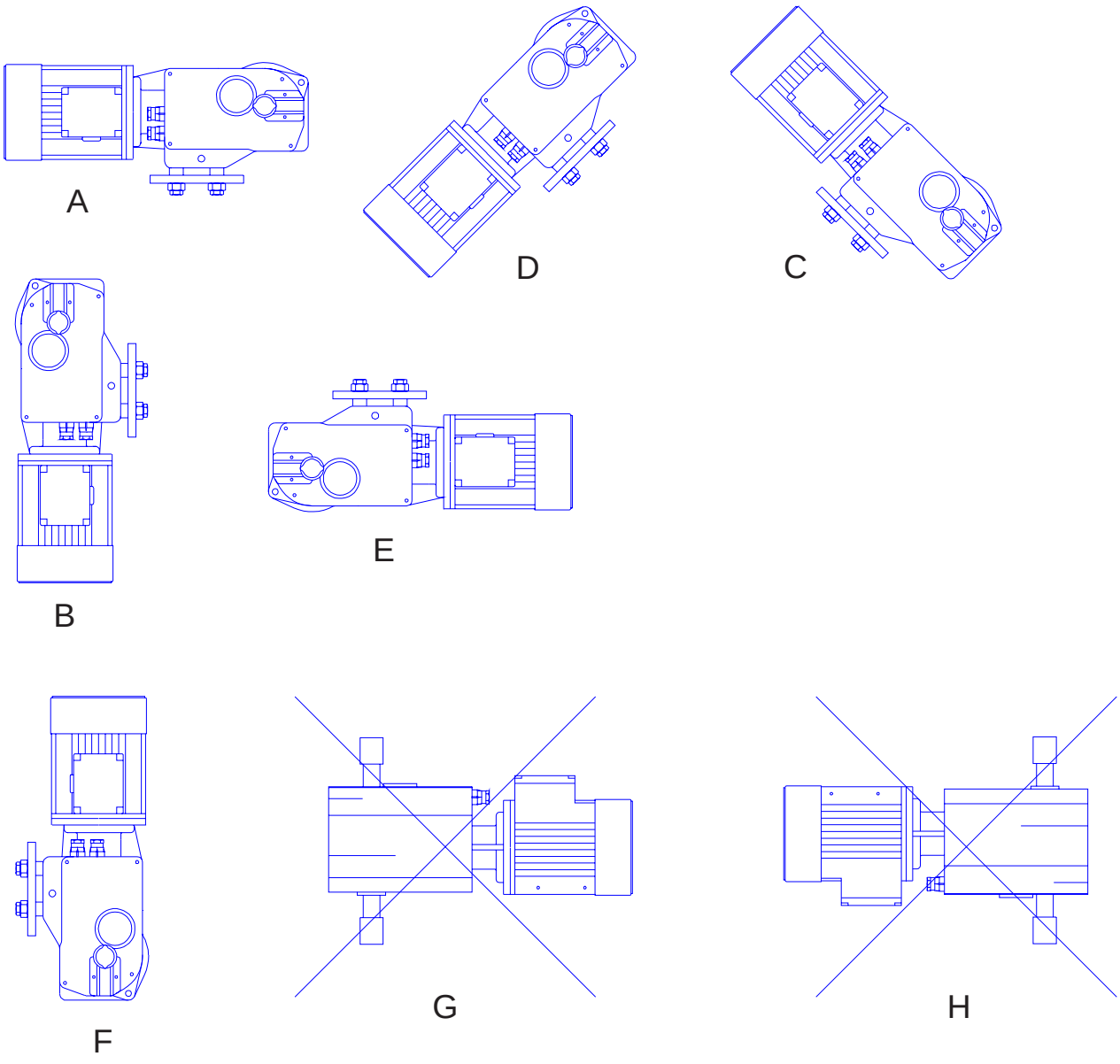


Fig. 2.1 Different mounting methods. The gear is illustrated from the side.

2.1.2 How to Install the Gear

The gear must always be mounted so that the drive pipe forms a right angle (90°) with the sides of the gear box (figure 2.2), and the central axis of the drive pipe must coincide with the central axis of the gear output shaft.

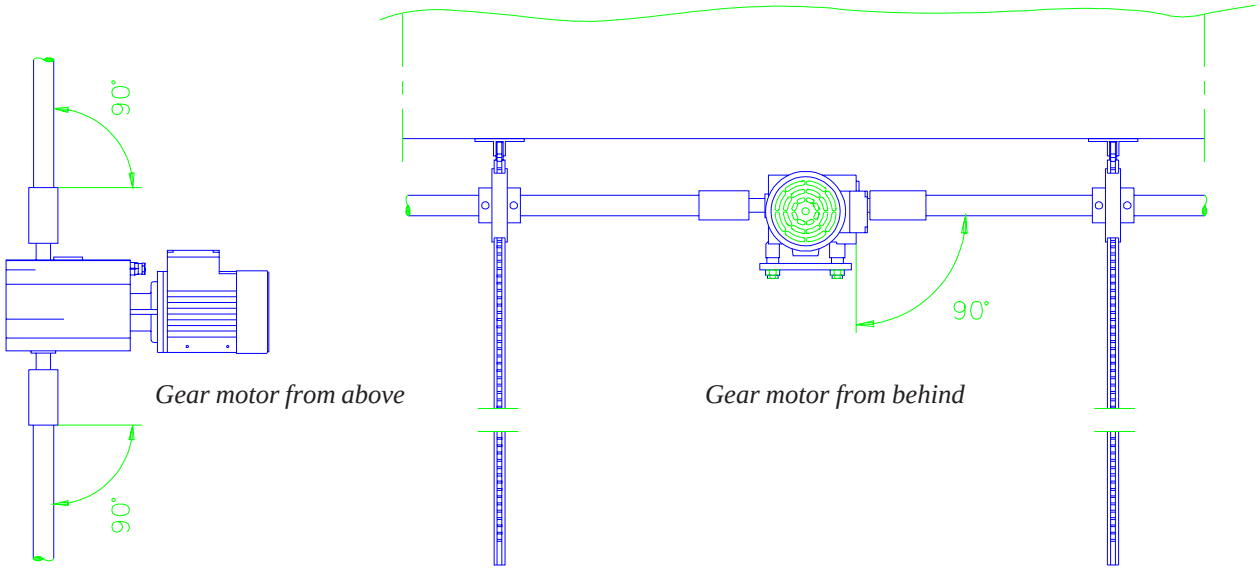


Fig. 2.2 Assembling of the Gear

For the assembling of DGT*Volmatic gear motors it is recommendable to use original mounting consoles.
The mounting console gives the possibility to obtain a safe mounting and also the possibility of fine adjustment of the gear position (fig. 2.3).

NB! All 4 mounting threadholes must be used when assembling the gear.

NB! When assembling it is important always to make sure that the gear motor rests on 4 points by the threadholes for mounting. These 4 points must be on the same level. The best way to secure this is by using the DGT*Volmatic mounting consoles (fig. 2.3).

After the assembling of the gear in the correct position the output shaft of the gear (shafts) is connected to the drive pipe for vent opening or a screen system. In this connection a flexible coupling is required. For this purpose it is recommendable to use the DGT*Volmatic coupling systems.
For a standard 1" shaft a profile pipe coupling (fig. 2.4) or a chain coupling (fig. 2.5) is available. It is an advantage to push the profile coupling onto the shaft before assembling the motor.

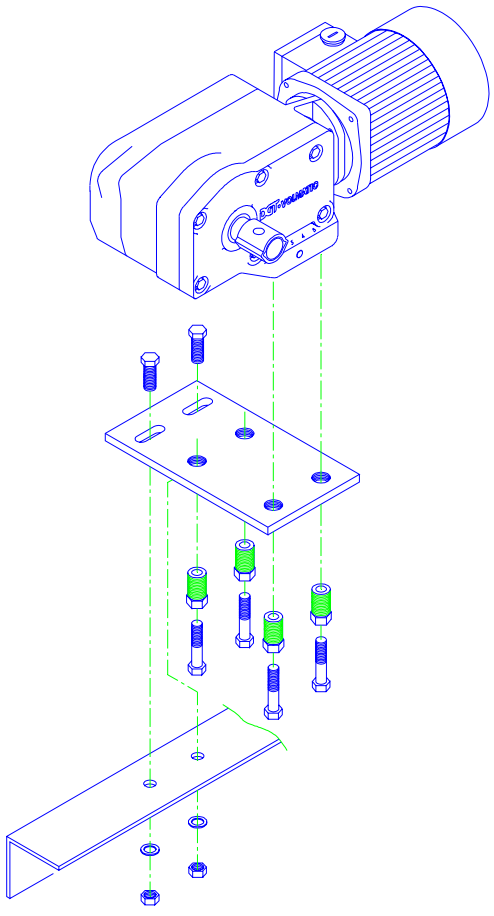


Fig. 2.3 Gear assembling

If a profile pipe coupling is used the shaft must be secured against axial travelling by installing adjusting rings (fig. 2.6).

Both types of couplings should be greased with temperature resistant grease before assembling.

NB! There can be no use of stationary couplings (e.g. a flange coupling) for connection of the gear and the drive shaft as these cannot take up inaccuracies and temperature expansions in the drawing system.

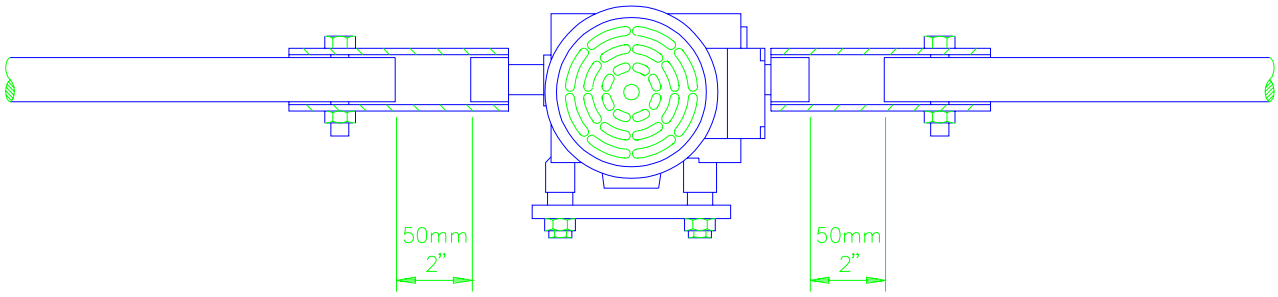


Fig. 2.4 Gear motor mounted with profile pipe couplings

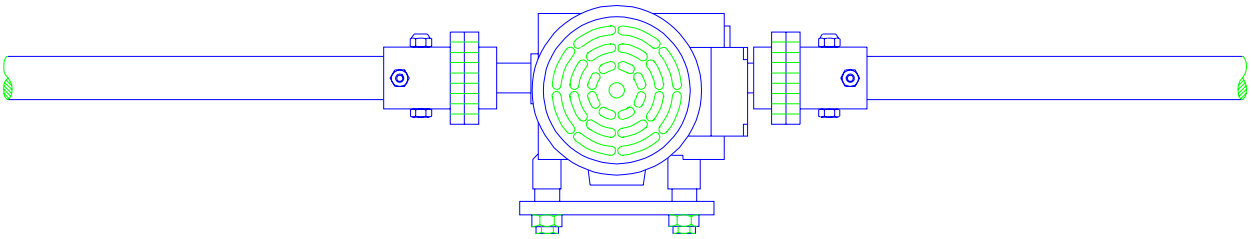


Fig. 2.5 Gear motor mounted with chain couplings

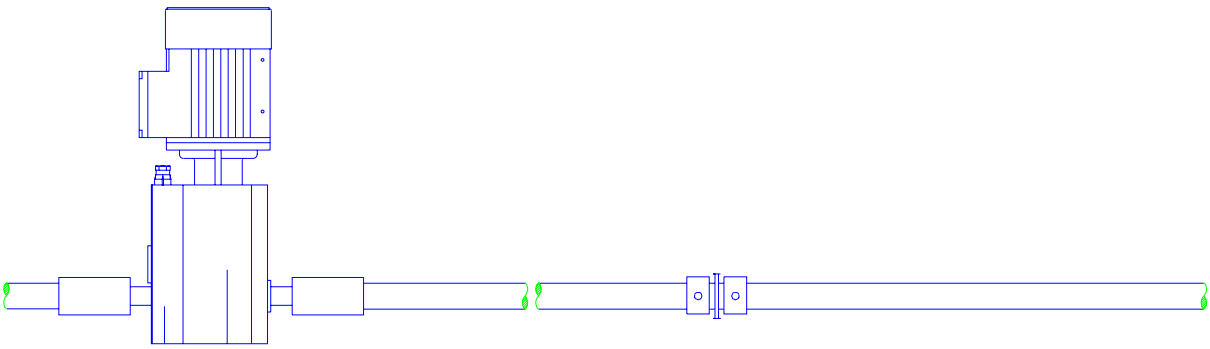


Fig. 2.6 Adjusting rings with bearing for reduction of axial travelling.

2.2 Electrical Assembling

2.2.1 Power Current

The DGT*Volmatic gear motors can be delivered for different operation voltages. Before establishment of the power current connection the electric data of the el-motor, which have been stamped into the rating plate of the motor, are to be checked to ensure that they correspond to the local electricity supply.
By three-phase operation it may under some circumstances be necessary to change the internal terminal box connection from Y (star connection) to Δ (delta connection) in order to readjust the motor to the present voltage. Please study the diagrams at the back of the manual.

NB! The net supply must always correspond to the data on the rating plate of the motor, or lie within the voltage range of the motor in case it has been delivered with an extended voltage area.

The power current connection to the DGT*Volmatic motor relay is carried out according to the diagram enclosed with the motor relay.

NB! The el motor of the gear must be secured with a motor protection. We recommend to use DGT*Volmatic motor relays which are all delivered with a built-in motor protection.

NB! All power current connections are to be carried out by a skilled electrician or by an authorized electrician where the legislation demands this.

When the power current connection has been set up you must check if the direction of rotation of the gear shaft corresponds to the specifications on the motor relay; direction of rotation **anticlockwise** to open (↑) and **clockwise** to close (↓).

NB! It is important that the drive shaft is disconnected from the output shaft of the gear when this control is carried out as serious damage to the system may be the result if the direction of rotation does not follow the relay setting.

If the control shows that it is necessary to turn the direction of rotation the two phase connections between motor relay and gear motor are switched.

2.2.2. Control Current

The end-stop system of the gear motor is connected to the DGT*Volmatic motor relay according to the enclosed diagrams.

NB! The end-stop system of the gear may only be connected to low current, max. 24 V AC or DC.

Hereafter please follow the instructions for final setting of the gear type in question.

3.0 End-stop Setting

3.1 LG403

Gear motor type LG403 is delivered with a torque dependent load stop. This means that the stop is activated when a load of the output shaft of the gear exceeds the load set on the gear.

NB! The load at which the end-stop is activated is from standard adapted to the direction of rotation of the gear shaft. The gear is delivered with a high torque load in the 'open' direction of rotation, and a lower torque in the 'close' direction of rotation. (fig. 3.1). It is therefore important to mount the gear correctly as regards the open/close direction of rotation as a reversed installation would result in a high closing torque which may cause damage to the greenhouse construction.

Before running in the end-stop this must be electrically connected, please study passage 2.2 electrical assembling.

The torque at which the end-stop is activated is adjustable in 5 steps (fig. 3.1-3.2). If the torque required for opening is already known the torque is set to the next higher torque by mounting both torque bolts in the holes for this torque.

Example *We have been informed that the required opening torque is 300 Nm; the gear is therefore set to an opening torque of 320 Nm, hole position 3.*

If the torque required for opening the vents is unknown the gear is first set to the lowest torque. Hereafter one must try if the gear reacts to manual opening of the vent by means of the motor relay. If the gear starts the adjusted torque is adequate and the setting is maintained. If the gear stops immediately after the opening signal has been given the set torque is insufficient and the torque bolts are moved to the next higher torque. This procedure is repeated until the gear can be started.

Example *The required torque is unknown. The gear is set to 230 Nm, hole position 1. The gear stops immediately after the relay has been set to 'open'(↑). The relay is set to 'close'(↓). After the vents have closed completely and the gear declutches on the stop the torque bolts are moved to 280 Nm, hole position 2. The gear now runs up to fully open position without problems. The gear has been set to the correct torque. The hole positions 3,4, and 5 can be used correspondingly if necessary.*

NB! If the gear cannot be started at the highest torque setting this may be caused by overloading. This is tested by disconnecting the drive pipe mechanically. If the gear runs with a disconnected drive pipe the load on the vent has been too heavy and the opening system will have to be split into more gear motors. Please study Trouble shooting page 19 if the gear does not run with a disconnected drive pipe.

NB! **Both** torque bolts must be placed in the same hole position before start. By normal use the stop system of the gear is not operational if the two torque bolts have been mounted in different hole positions.

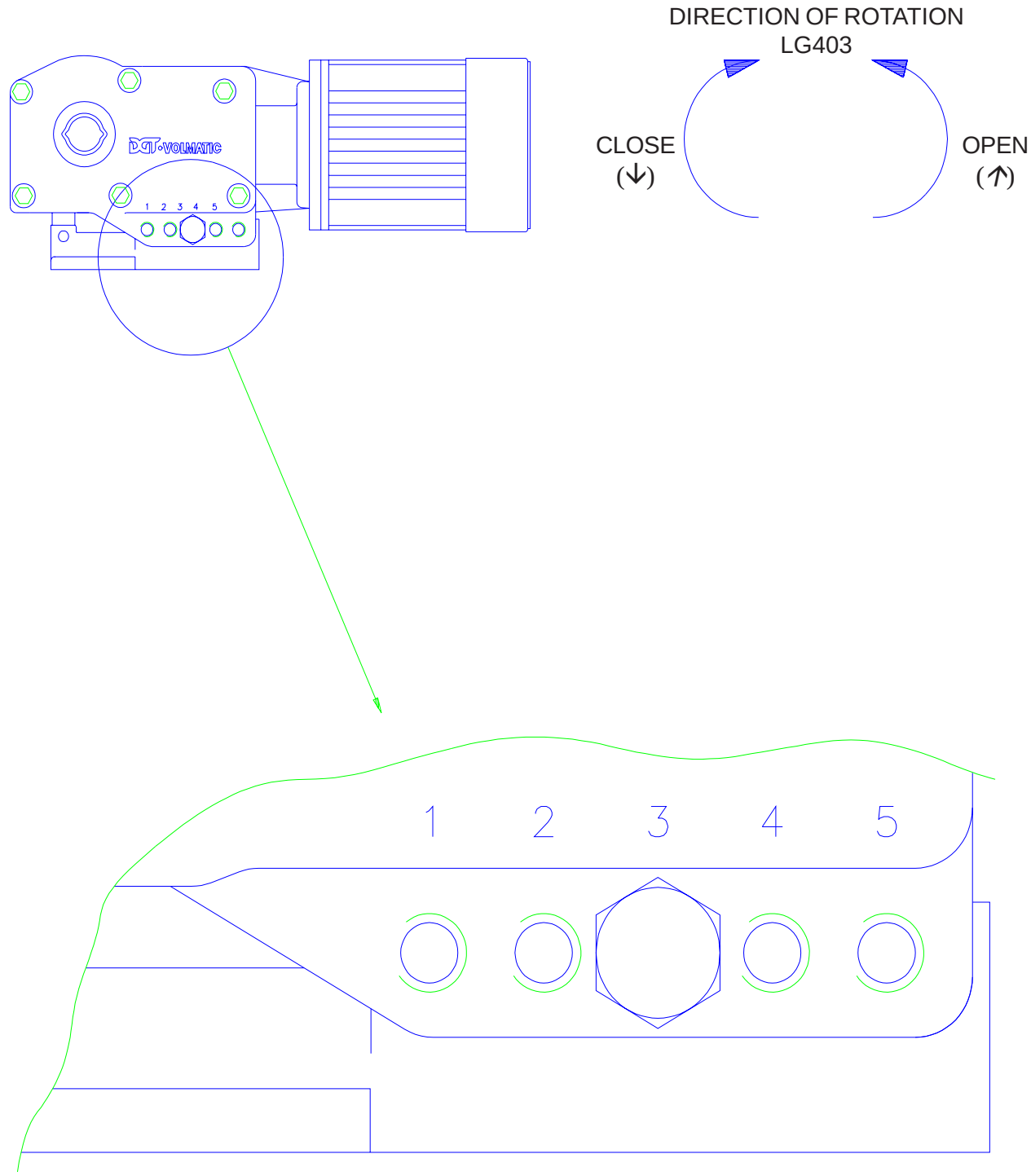


Fig. 3.1 Torque setting

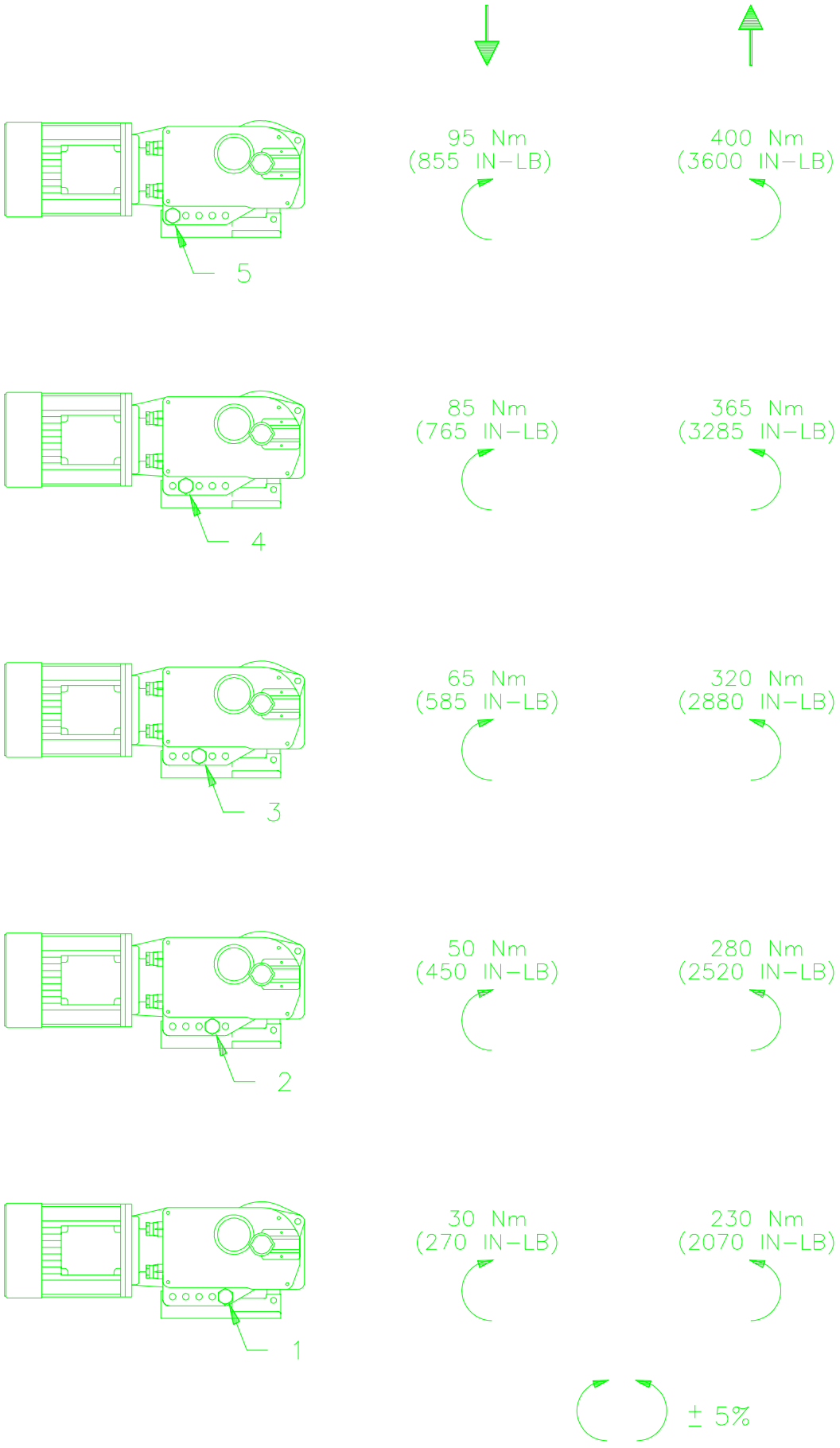


Fig. 3.2 Torque setting in 5 steps

3.2 LG405

Gear motor type LG405 is delivered with a fixed end-stop as well as an electrical safety stop. This means that the gear at the running in is set to stop in both directions of rotation and in the same position every time. The system has been equipped with two safety switches which can be connected to a safety circuit which switches off the control current in case of **electrical** errors. Use of DGT*Volmatic motor relays is recommendable as they have been prepared for connection of the supplementary safety stop function.

Before running in the end-stop this must be electrically connected, please study Electrical assembling (2.2).

Remember to check if the el-motor of the gear has been correct connected before the actual setting of the end-stop.

NB! During control of the direction of rotation of the gear the end-stop system must be mechanically disconnected. The end-stop system is mechanically disconnected if you can turn the contact wheel of the end-stop.

The manual operation button of the motor relay is set to 'open' (↑). The output shaft of the gear must now turn anticlockwise (fig. 3.1 p. 16). If the output shaft runs clockwise the electrical connection to the el-motor is to be changed, please study Electrical Assembling (2.2.1).

The gear motor is delivered with two toothed wheels for 13 and 19 revolution travels respectively. A DGT*Volmatic rack has a travel of 13 cm. per rotation. If a toothed wheel z28/z20 (13 rotations) or z28/z14 (19 rotations) is used, then the end-stop is to be adjusted according to the description in passage 3.2.1. In those cases where neither 13 nor 19 gives sufficient travel both toothed wheels may be used in a combination. This gives the possibility of having 40 rotations. As the up- and down- direction has been turned due to the extra toothed wheel in relation to the standard erection the setting of the end-stop must now be carried out according to the description in point 3.2.2. Please also remember that the electrical connection between the gear motor and motor relay RO901/RO902 is to be changed so that terminal 2 and 3 on the gear motor are connected to terminal screws 5 and 6 respectively on the RO901/RO902 relay.

For exchange of the toothed wheel by change of travel, please study drawing 8-SKI--3117 at the back of the manual.

3.2.1 Setting for Ventilation, travels 13, 19, and 200 (Multivent) rotations

Setting of Closing Direction

The output shaft of the gear is now attached to the drive pipe. Remember to check if the vents are completely closed.

The contact wheel of the end-stop is now turned anticlockwise until the lowest contact breaker is activated. The contact wheel is kept in this position at the same time as the whole end-stop is put in gear. If the position of the teeth does not match the point of contact the fine tune screw is turned until the micro switch is activated. The end-stop is now set in the 'close' (↓) direction. Now let the gear run in the 'open' (↑) direction for about 30 seconds. Hereafter run downward and check that the gear stops when the lowest contact breaker is activated with a screw driver.

NB! If the gear does not stop when the contact breaker is activated it is important immediately to switch off on the relay either by turning the rotary switch to 'Stop' or by pressing the declutching button of the motor protection. Hereafter the electrical connections are checked.

When the gear stops by activation of the contact breaker it is run all the way down. Now check if the gear stops in closed position as wanted. If this is not the case the stop is fine-tuned on the adjusting screw.

Setting of Opening Direction

Hereafter the gear is run to full opening position, about 95 % of the length of the rack, by means of the pilot relay which is then set to 'stop' in this position.

NB! There must always be a person ready by the pilot relay when the gear is operated during the setting of the end-stop to be able to activate the emergency stop if necessary. A gear that has not been set to stop in the correct position and therefore runs too far may cause serious damage to the greenhouse and its contents.

With the gear in open position the end-stop is adjusted for opening position. The four screws which lock the loose contact ring are loosened. Then the contact ring is turned clockwise until the top contact breaker is activated. The contact ring is fixed again with the four screws. The end-stop is now adjusted for the 'up' direction.

The gear is now run 'down' for about 30 seconds by means of the pilot relay. Hereafter run upward and check that the gear stops by activation of the top contact breaker. If the gear does not stop by activation of this contact breaker then switch off immediately on the relay either by turning the rotary switch to 'Stop' by pressing the declutching button of the motor protection. Hereafter the electrical connections are to be checked. The stop point for the 'up' direction may be adjusted with the fine tune screw.

3.2.2 Setting for Screens, travel 40 and 80 rotations

For running in of gears with travel 40 and 80 rotations the same procedure is followed as by running in of gears with the travels 13, 19 and 200 (Multivent) with the exception that the 'open' (↑) direction is run in first. Observe if the 'open'(↑) direction now activates the lowest contact breaker, and the 'close' (↓) direction activates the upper contact breaker, please also study diagram 970303-02 at the back of the manual. If the indicated contact breakers are not activated it is necessary to check if the toothed wheels are correct installed, please study drawing 8-skl-3117 at the back of the manual.

3.3 LG403/5 - LG403 with Supplementary Safety Stop

LG403/5 with Supplementary Torque Safety Stop

LG403/5 is an LG403 gear delivered with a supplementary safety stop which means that there are two types of stop functions built in. The torque activated end-stop (LG403) is connected so that it is used as a safety stop. The fixed end-stop, which is used under normal operation, is from standard connected as LG405. The safety stop is two contacts in serial connection which by activation, regardless of the direction of rotation of the gear, break a circuit. We recommend to use the DGT*Volmatic pilot relays as these have been prepared for the connection of safety stops.

Before the running in of the end-stop this has to be electrically connected, please study diagram 970527-01 at the back of the manual.

Before the actual setting of the end-stop it is necessary to check if the el-motor of the gear has been correctly connected.

NB! When controlling the direction of rotation of the gear the end-stop system must be mechanically declutched (the fixed end-stop).

NB! The torque stop of the gear (safety stop) is adjusted to the highest torque by mounting the torque bolts in hole position 5 (please study fig. 3.1 p. 16).

Hereafter the fixed end-stop of the gear is run in according to the running in instructions for LG405 (please read passage 3.2 p. 17).

NB! If the gear cannot be operated in the 'open' (↑) direction this could mean that the torque safety stop has been activated. Since the gear has been set to maximum torque there is a possibility of overloading.

When the fixed end-stop of the gear is run in the torque safety stop is to be run in. This is carried out according to the running in instructions for LG403.

NB! When the torque has been set so that the gear declutches by too high loading the gear cannot be activated directly with the pilot relay. To be able to operate the gear the terminals 7 and 9 are short-circuited either on the end-stop set on the gear or in the relay. The torque is now to be set one no. up according to the running in instructions for LG403.

4.0 Trouble Shooting/Rectification

4.1 General for all LG40X gear motors

Error	Cause	Rectificaton
Motor does not run, but ‘hums’?	Error in the power supply, possibly lacking phase. Defect motor.	Check fuses, change possible defect fuses. Check electric connections. Call an authorized electrician.
Motor does not run, and no ‘humming’?	Error in the power supply. Declutched motor protection. Error in connection of end-stop. Defect motor.	Check fuses, change possible defect fuses. Check motor protection, if declutched this is coupled in again. Check the end-stop connection, perhaps you should call an authorized electrician. Call an authorized service technician.
Motor protection declutches repeatedly?	Motor protection is maladjusted. Gear motor is overloaded. Error in the power supply. El-motor is defect. Motor protection is defect.	Check the setting of the motor protection, adjust to the current indicated on the rating plate of the motor. Maintain the system, grease bearings and racks. Check fuses, change possible defect fuses. Call an authorized electrician. Call an authorized service technician. Call an authorized service technician.

5.0 Technical specifications

/ski/2015-9

TYPE / TYP / TYPE	VARE NR. / WAREN-NR. / ITEM NO.	HAST. o/min. / GESCHW. UMDR./MIN. / SPEED R/min.	MOMENT Nm / MOMENT Nm / TORQUE Nm	MOMENT IN-LB / MOMENT IN-LB / TORQUE IN-LB	FAST STOP / END-STOPP / FIXED LIMIT	MOMENT STOP / MOMENT-STOPP / TORQUE LIMIT	VANDRING OMDR. / WEG UMDR. / TRAVEL REV.	VANDRING POT. OMDR. / WEG POT. UMDR. / TRAVEL POT.REV.	UDV. i / ÜBER-SETZUNG / RATIO	EFFEKT kW / MOTOR-LEISTUNG kW / INPUT POWER KW	EFFEKT HP / MOTOR-LEISTUNG HP / INPUT POWER HP	FASE / PHASE / PHASE	SPÆNDING V / SPANNUNG V / VOLTAGE V	STRØM A / STROM A / CURRENT A	FREK. Hz / FREQ. Hz / FREK. Hz	COS φ / COS φ / COS φ	KOND. µF/V / KOND. µF/V / COND. µF/V	OMDR. o/min. / GESCHW. UMDR./MIN. / REV. R/min.	KONSOL TYPE / RAHMEN TYP / FRAME TYPE	FLANGE TYPE / FLANSCH TYP / FLANGE TYPE	AKSEL mm / WELLE mm / SHAFT mm	CSA / CSA / CSA	GRUNDFOS / GRUNDFOS / GRUNDFOS
LG 403	12402	1.3	350	3150		X		12/17	993	0.37	0.50	3	220-240/380-415 220-254/380-440	1.96-2.04/1.14-1.10 1.84-1.78/1.06-1.02	50 60	0.77-0.68 0.80-0.70		1390-1410 1660-1710	MG 71	B14F85	Ø14		87102701
LG 403	12400	3.4	400	3600		X		12/17	414	0.37	0.50	3	220-240/380-415 220-254/380-440	1.96-2.04/1.14-1.10 1.84-1.78/1.06-1.02	50 60	0.77-0.68 0.80-0.70		1390-1410 1660-1710	MG 71	B14F85	Ø14		87102701
LG 403	12401	6.8	350	3150		X		12/17	414	0.55	0.75	3	220-240/380-415	2.50-1.44	50 60	0.84-0.76 0.88-0.82		2800-2840 3370-3450	MG 71	B14F85	Ø14		87100203
LG 403	12432	1.6	350	3150		X		12/17	993	0.37	0.50	3	220-254/380-440	1.88-1.90/1.08-1.10	60			1700	MG 71	B14F85	Ø14	X	87103412
LG 403	12435	3.8	275	2475		X		12/17	414	0.37	0.50	1	220-230	3.90	60		30/400	1620	MG 80	B14F85	Ø14	X	87103734
LG 403	12430	4.1	400	3600		X		12/17	414	0.37	0.50	3	220-254/380-440	1.88-1.90/1.08-1.10	60			1700	MG 71	B14F85	Ø14	X	87103412 87103814
LG 403	12405	3.2	275			X		12/17	414	0.37		1	220	3.40	50		30/400	1290	MG 80	B14F85	Ø14		87102133
LG 403		3.8	200	1800		X		12/17	414	0.37	0.50	1	115	6.80	60		100/260	1650	MG 80	B14F85	Ø14	X	87103841
LG 405	12452	1.3	350	3150	X		13/19	12/17	993	0.37	0.50	3	220-240/380-415 220-254/380-440	1.96-2.04/1.14-1.10 1.84-1.78/1.06-1.02	50 60	0.77-0.68 0.80-0.70		1390-1410 1660-1710	MG 71	B14F85	Ø14		87102701
LG 405	12450	3.4	400	3600	X		13/19	12/17	414	0.37	0.50	3	220-240/380-415 220-254/380-440	1.96-2.04/1.14-1.10 1.84-1.78/1.06-1.02	50 60	0.77-0.68 0.80-0.70		1390-1410 1660-1710	MG 71	B14F85	Ø14		87102701
LG 405	12451	6.8	350	3150	X		13/19	12/17	414	0.55	0.75	3	220-240/380-415	2.50-1.44	50 60	0.84-0.76 0.88-0.82		2800-2840 3370-3450	MG 71	B14F85	Ø14		87100203
LG 405	12482	1.6	350	3150	X		13/19	12/17	993	0.37	0.50	3	208-254/380-440	1.88-1.90/1.08-1.10	60			1700	MG 71	B14F85	Ø14	X	87103412
LG 405	12485	3.8	275	2475	X		13/19	12/17	414	0.37	0.50	1	220-230	3.90	60		30/400	1620	MG 80	B14F85	Ø14	X	87103734
LG 405	12480	4.1	400	3600	X		13/19	12/17	414	0.37	0.50	3	208-254/380-440	1.88-1.90/1.08-1.10	60			1700	MG 71	B14F85	Ø14	X	87103412
LG 405	12455	3.2	275		X		13/19	12/17	414	0.37		1	220-230	2.85/2.85	50		20/400	1350-1370	MG 80	B14F85	Ø14		87102133
LG 405		3.8	200	1800	X				414	0.37	0.50	1	115	6.80	60			1650	MG 80	B14F85	Ø14	X	87103841
LG 405		4.1						12/17		0.37	0.50	3	330/575	1.44-0.83	60					B14F85	Ø14	X	87103889
LG 405 MV	12500	30	100	900	X		200	180	47	0.55	0.75	3	208/380 208-254/380-440	3.30/1.90 2.90-3.10/1.68-1.80	50 60	0.76 0.82-0.68		1400 1640-1660	MG 71	B14F85	Ø14		87103747
LG 405 MV	12505	28	47		X		200	180	47	0.55		1	220-230	4.00	50		25/400	1350-1370	MG 80	B14F85	Ø14		87100273
LG 405 MV	12530	36	100	900	X		200	180	47	0.75	1.0	3	200-230/346-400	3.80-3.85/2.20-2.22	60			1680	MG 80	B14F85	Ø14	X	87103720
LG 405 MV	12535	34	47	423	X		200	180	47	0.55	0.75	1	220-240	4.30-4.80	60		25/400	1680	MG 80	B14F85	Ø14	X	87103814

MAX. DRIFT TEMPERATUR: 90°C
MIN. DRIFT TEMPERATUR: 0°C
Andre temperaturer kan opnås ved anvendelse af anden type olie.

MAX. BETRIEBSTEMPERATUR: 90°C
MIN. BETRIEBSTEMPERATUR: 0°C
Andere Temperaturen können bei Verwendung eines anderen Typ von Öl erreicht werden.

MAX. WORKING TEMPERATURE: 90°C
MIN. WORKING TEMPERATURE: 0°C
Other temperatures may be attained by use of other types of oil.

DGT-VOLMATIC

Emne: SKEMA
Tegn.nr.: 9-SKL-2015
Anvendelse: LG 403/405
Materiale:
Mål:
Vægt:
Rev.: 31.1.96 OM/jrj
Tegn.: 7.12.92 OM/jrj

DGT-Volmatic A/S
2 Vejesvinget
DK-2665 Vallensbæk Strand Denmark
Telefax 43 73 11 42
Tlf. 43 73 11 00

A2

RO901 (RO902)

1/N/PE ~ 115-240V, max 10A, 50/60Hz
2/N/PE ~ 208/115V, max 10A, 60Hz
3/PE ~ 200V, max 10A, 50/60Hz
3/N/PE ~ 208/115-400/230V, max 10A, 50/60Hz
3/PE ~ 600V, max 10A, 60Hz

FUSE: 0.5A

MAIN SUPPLY: L1 L2 L3 N

MOTOR SUPPLIES: MOTOR 1 (U V W), MOTOR 2 (U V W)

DV 558 - CIRCUIT BOARD

JP1 — FUSE: 125mA — JP2

GEAR 1: LIMIT SWITCHES (2_1 3_1 5_1 6_1) | TEMP. CONTRL. (I_1 I_1 C+) | 24V~ 75mA (~ ~) | 24V= (- +)

GEAR 2: LIMIT SWITCHES (2_2 3_2 5_2 6_2 I_2)

Colour A
Colour B
Colour C
Colour 1
Colour 2
Colour 3
Colour 4
Colour 5
Colour 6

COMMON
CLOSE
OPEN

CABLE 1:
5 x 14 AWG
($5x1.5^{\square}$) MIN.

CABLE 2:
4 x 14 AWG
($4x1.5^{\square}$) MIN.

CABLE 3:
6 x 20 AWG
($6x0.5^{\square}$)

CABLE 4:
3 x 20 AWG
($3x0.5^{\square}$)

N (NEUTRAL)
L3 (HOT, PHASE C)
L2 (HOT, PHASE B)
L1 (HOT, PHASE A)
(GROUND)

MAIN SUPPLY

W2 U2 V2
U1 V1 W1

GEAR MOTOR

GEAR BOX LG403/5

OPEN
CLOSE
SAFETY STOP
(PURPLE)
(GRAY)
(WHITE)
A B C
1 2 3 4 5 6 7 8 9

Colour 6
Colour 5
Colour 4
Colour 3
Colour 2
Colour 1

OPTION :
POSITION POTENTIOMETER

SIGNAL FROM TEMP. CONTROLLER OR CLIMATE COMPUTER

UNIT INFO :

1/2/3 = Number of phases
N = Neutral
PE / ⏚ = Protective conductor / Protective Earth / Ground
~ = AC
V = Voltage
A = Current
Hz = Frequency

DOTTED LINES INDICATE RO902

WARNING !
WHEN USING SAFETY STOP,
JUMPER JP1 (JP2) MUST BE REMOVED

FOR CONNECTION OF
"MAIN SUPPLY" AND "MOTOR SUPPLY"
SEE DRAWING : RO901 (RO902) / MOTOR SUPPLY

TO CHANGE DIRECTION
OF THE LIMIT SWITCH !
CHANGE 2_1 ⟷ 5_1 AND 3_1 ⟷ 6_1
CHECK WITH MANUAL

WIRING DIAGRAM FOR GEAR MOTOR LG403/5 + RO901 (RO902)

SENMATIC
Industrivej 8
DK-5471 Søndersø Denmark
Phone +45 6489 2211
Fax +45 6489 3311

Item Description: WIRING DIAGRAM FOR GEAR MOTOR LG403/5 + RO901 (RO902)
Drawing Number: 031114-03
Application:
Tolerance: ISO 2768-fK
Debur and break all edges.
Scale: 1:1
Department:
Revision: 30.01.08 Laj
Date/Designed: / 19.11.03 ML/jtj
Sheet format: A3

WIRING DIAGRAM FOR GEAR MOTOR LG403 + RO901 (RO902)

RO901 (RO902)

1/N/PE ~ 115-240V, max 10A, 50/60Hz
2/N/PE ~ 208/115V, max 10A, 60Hz
3/PE ~ 200V, max 10A, 50/60Hz
3/N/PE ~ 208/115-400/230V, max 10A, 50/60Hz
3/PE ~ 600V, max 10A, 60Hz

FUSE: 0.5A

MAIN SUPPLY: L1 L2 L3 N

MOTOR SUPPLIES: MOTOR 1 (U V W) MOTOR 2 (U V W)

DV 558 - CIRCUIT BOARD

JP1 — FUSE: 125mA — JP2

GEAR 1: LIMIT SWITCHES (2_1 3_1 5_1 6_1) | TEMP. CONTRL. (I_1 $\downarrow_1$ C+) | 24V~ 75mA (~ ~) | 24V= (- +)

GEAR 2: LIMIT SWITCHES (2_2 3_2 5_2 6_2 I_2)

UNIT INFO :

1/2/3 = Number of phases
N = Neutral
PE / ⏚ = Protective conductor / Protective Earth / Ground
~ = AC
V = Voltage
A = Current
Hz = Frequency

DOTTED LINES INDICATE RO902

Colour A
Colour B
Colour C

Colour 1
Colour 2
Colour 3
Colour 4

COMMON
CLOSE
OPEN

CABLE 1:
5 x 14 AWG
($5x1.5^{\square}$) MIN.

CABLE 2:
4 x 14 AWG
($4x1.5^{\square}$) MIN.

CABLE 3:
4 x 20 AWG
($4x0.5^{\square}$)

CABLE 4:
3 x 20 AWG
($3x0.5^{\square}$)

SIGNAL FROM TEMP. CONTROLLER
OR CLIMATE COMPUTER

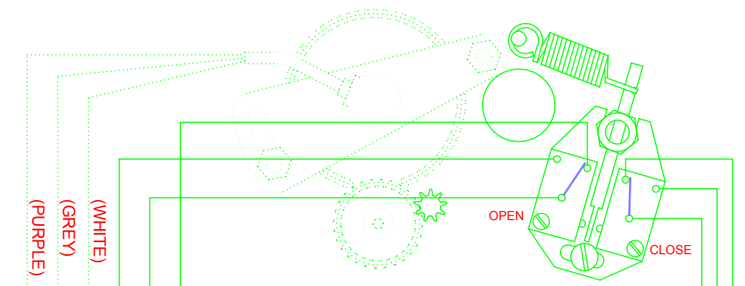
L1 (HOT, PHASE A)
L2 (HOT, PHASE B)
L3 (HOT, PHASE C)
N (NEUTRAL)
(GROUND)

MAIN SUPPLY

W2 U2 V2
U1 V1 W1

GEAR MOTOR

GEAR BOX LG403



Colour 4
Colour 3
Colour 2
Colour 1

OPTION :
POSITION
POTENTIOMETER

TO CHANGE DIRECTION
OF THE LIMIT SWITCH !
CHANGE $2_1 \leftrightarrow 5_1$ AND $3_1 \leftrightarrow 6_1$
CHECK WITH MANUAL

FOR CONNECTION OF
"MAIN SUPPLY" AND "MOTOR SUPPLY"
SEE DRAWING : RO901 (RO902) / MOTOR SUPPLY

SENMATIC
Industrivej 8
DK-5471 Søndersø Denmark
Phone +45 6489 2211
Fax +45 6489 3311

Item Description: WIRING DIAGRAM FOR GEAR MOTOR LG403 + RO901 (RO902)
Drawing Number: 031114-01
Application:
Tolerance: ISO 2768-fK
Debur and break all edges.
Scale: 1:1
Department:
Revision: 31.01.08 Laj
Date/Designed: / 19.11.03 MLJ/rj
Sheet format: A3

WIRING DIAGRAM FOR GEAR MOTOR LG403 + RO901 (RO902)

RO901 (RO902)

1/N/PE ~ 115-240V, max 10A, 50/60Hz
2/N/PE ~ 208/115V, max 10A, 60Hz
3/PE ~ 200V, max 10A, 50/60Hz
3/N/PE ~ 208/115-400/230V, max 10A, 50/60Hz
3/PE ~ 600V, max 10A, 60Hz

FUSE: 0.5A

MAIN SUPPLY: L1 L2 L3 N

MOTOR SUPPLIES: MOTOR 1 (U V W) MOTOR 2 (U V W)

DV 558 - CIRCUIT BOARD

JP1 — FUSE: 125mA — JP2

GEAR 1: LIMIT SWITCHES (2_1 3_1 5_1 6_1) | TEMP. CONTRL. (I_1 $\downarrow_1$ C+) | 24V~ 75mA (~ ~) | 24V= (- +)

GEAR 2: LIMIT SWITCHES (2_2 3_2 5_2 6_2 I_2)

UNIT INFO :

1/2/3 = Number of phases
N = Neutral
PE / ⏚ = Protective conductor / Protective Earth / Ground
~ = AC
V = Voltage
A = Current
Hz = Frequency

DOTTED LINES INDICATE RO902

Colour A
Colour B
Colour C

Colour 1
Colour 2
Colour 3
Colour 4

COMMON
CLOSE
OPEN

CABLE 1:
5 x 14 AWG
($5x1.5^{\square}$) MIN.

CABLE 2:
4 x 14 AWG
($4x1.5^{\square}$) MIN.

CABLE 3:
4 x 20 AWG
($4x0.5^{\square}$)

CABLE 4:
3 x 20 AWG
($3x0.5^{\square}$)

SIGNAL FROM TEMP. CONTROLLER
OR CLIMATE COMPUTER

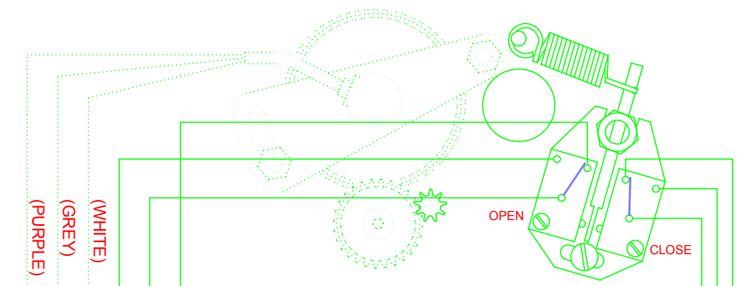
L1 (HOT, PHASE A)
L2 (HOT, PHASE B)
L3 (HOT, PHASE C)
N (NEUTRAL)
(GROUND)

MAIN SUPPLY

W2 U2 V2
U1 V1 W1

GEAR MOTOR

GEAR BOX LG403



Colour 4
Colour 3
Colour 2
Colour 1

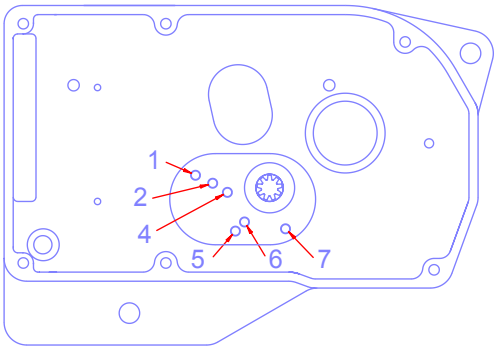
OPTION :
POSITION
POTENTIOMETER

TO CHANGE DIRECTION
OF THE LIMIT SWITCH !
CHANGE $2_1 \leftrightarrow 5_1$ AND $3_1 \leftrightarrow 6_1$
CHECK WITH MANUAL

FOR CONNECTION OF
"MAIN SUPPLY" AND "MOTOR SUPPLY"
SEE DRAWING : RO901 (RO902) / MOTOR SUPPLY

SENMATIC
Industrivej 8
DK-5471 Søndersø Denmark
Phone +45 6489 2211
Fax +45 6489 3311

Item Description: WIRING DIAGRAM FOR GEAR MOTOR LG403 + RO901 (RO902)
Drawing Number: 031114-01
Application:
Tolerance: ISO 2768-fK
Debur and break all edges.
Scale: 1:1
Department:
Revision: 31.01.08 Laj
Date/Designed: / 19.11.03 MLJ/rj
Sheet format: A3

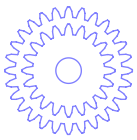


LG405-13, LG403/5-13

MAX TRAVEL 13 REV.

Hul nr. 4
Hole no. 4

Z28 / Z20

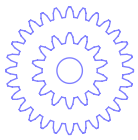


LG405-19, LG403/5-19

MAX TRAVEL 19 REV.

Hul nr. 4
Hole no. 4

Z28 / Z14

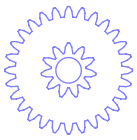


LG405-40, LG403/5-40

MAX TRAVEL 40 REV.

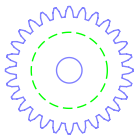
Hul nr. 2
Hole no. 2

Z28 / Z11



Hul nr. 6
Hole no. 6

Z14 / Z28



BEMÆRK !

ÆNDRE MICROSWITCH FUNKTION

WARNING !

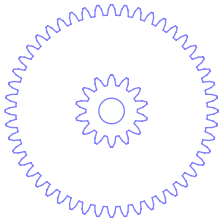
CHANGE OF MICROSWITCH CONNECTION

LG405-80, LG403/5-80

MAX TRAVEL 80 REV.

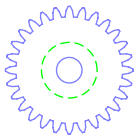
Hul nr. 1
Hole no. 1

Z48 / Z14



Hul nr. 6
Hole no. 6

Z11 / Z28



BEMÆRK !

ÆNDRE MICROSWITCH FUNKTION

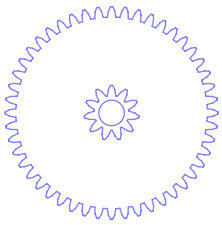
WARNING !

CHANGE OF MICROSWITCH CONNECTION

LG405-200 - Multivent

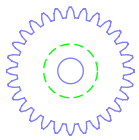
Hul nr. 1
Hole no. 1

Z48 / Z11



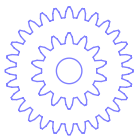
Hul nr. 5
Hole no. 5

Z11 / Z28



Hul nr. 7
Hole no. 7

Z28 / Z14



Alle LG405(Undtagen LG405 MV) og LG403/5 leveres standard med Z28/Z11 + Z28/Z14 monteret som LG405-19.

Alle LG403 leveres standard med Z28/Z20 + Z28/Z14 monteret som LG403-19.

Z = Antal tænder på tandhjul

All LG405 (except LG405 MV) and LG403/5 are as standard supplied with Z28/Z11 + Z28/Z14 mounted as LG405-19.

All LG403 are as standard supplied with Z28/Z20 + Z28/Z14 mounted as LG403-19.

Z = Number of teeth on gearwheel

SENMATIC
DGT-Volmatic

Industrivej 8
DK-5471 Søndersø Denmark
Phone +45 6489 2211
Fax +45 6489 3311

Workpiece:
UDVEKSLING FOR KONTAKTSÆT
GEAR RATIO FOR CONTACT SET

Drawing nr.
8-SKL-3117

Application:
LG405, LG403/5

Material:

Material Nr:

Scale:	Department:	Instruction:
1:1		

Date/Designed: / 7.10.97 HL/jrj

Date/Approved: /

/skl/3117-9

A4

WARNING !

NEUTRAL & HOTLINE MUST BE INSTALLED CORRECT, OTHERWISE FAILURE OF THE UNIT WILL RESOLVE.

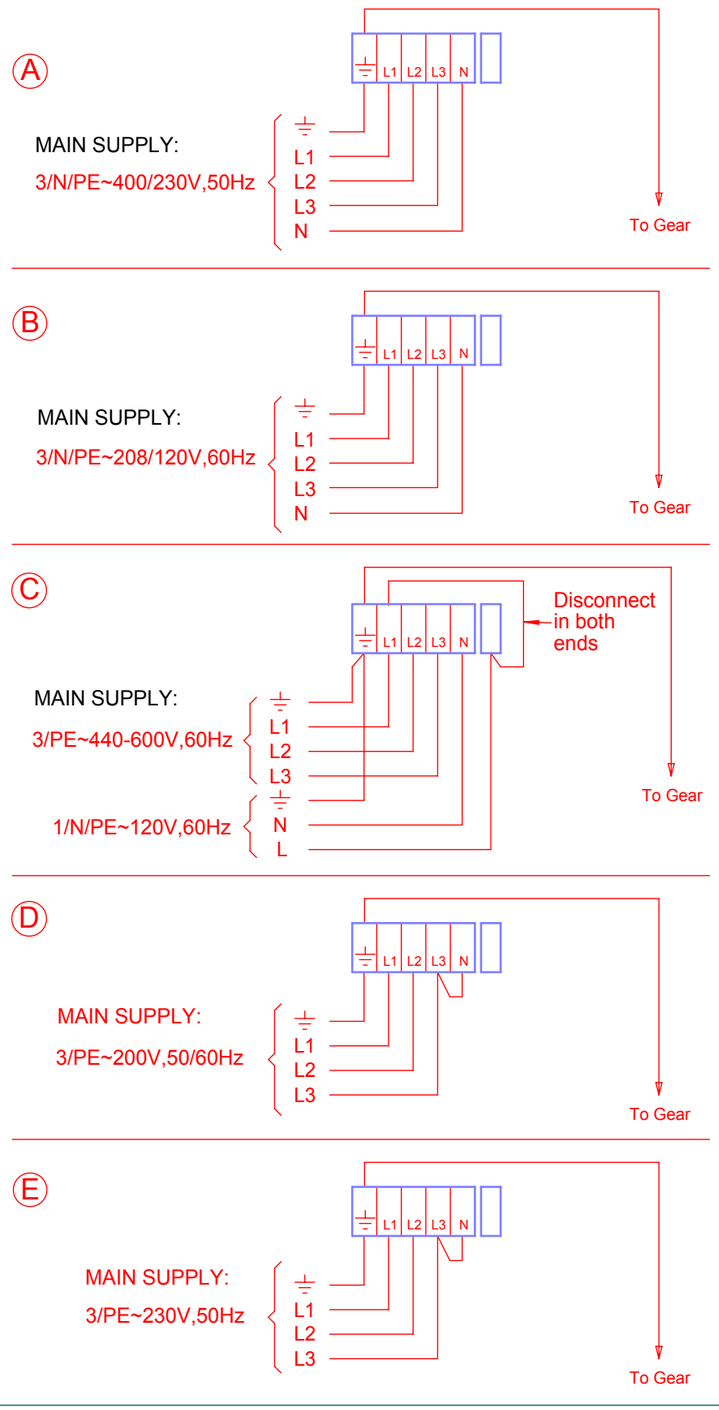
CIRCLE THE RIGHT CONNECTION BELOW BEFORE INSTALLATION

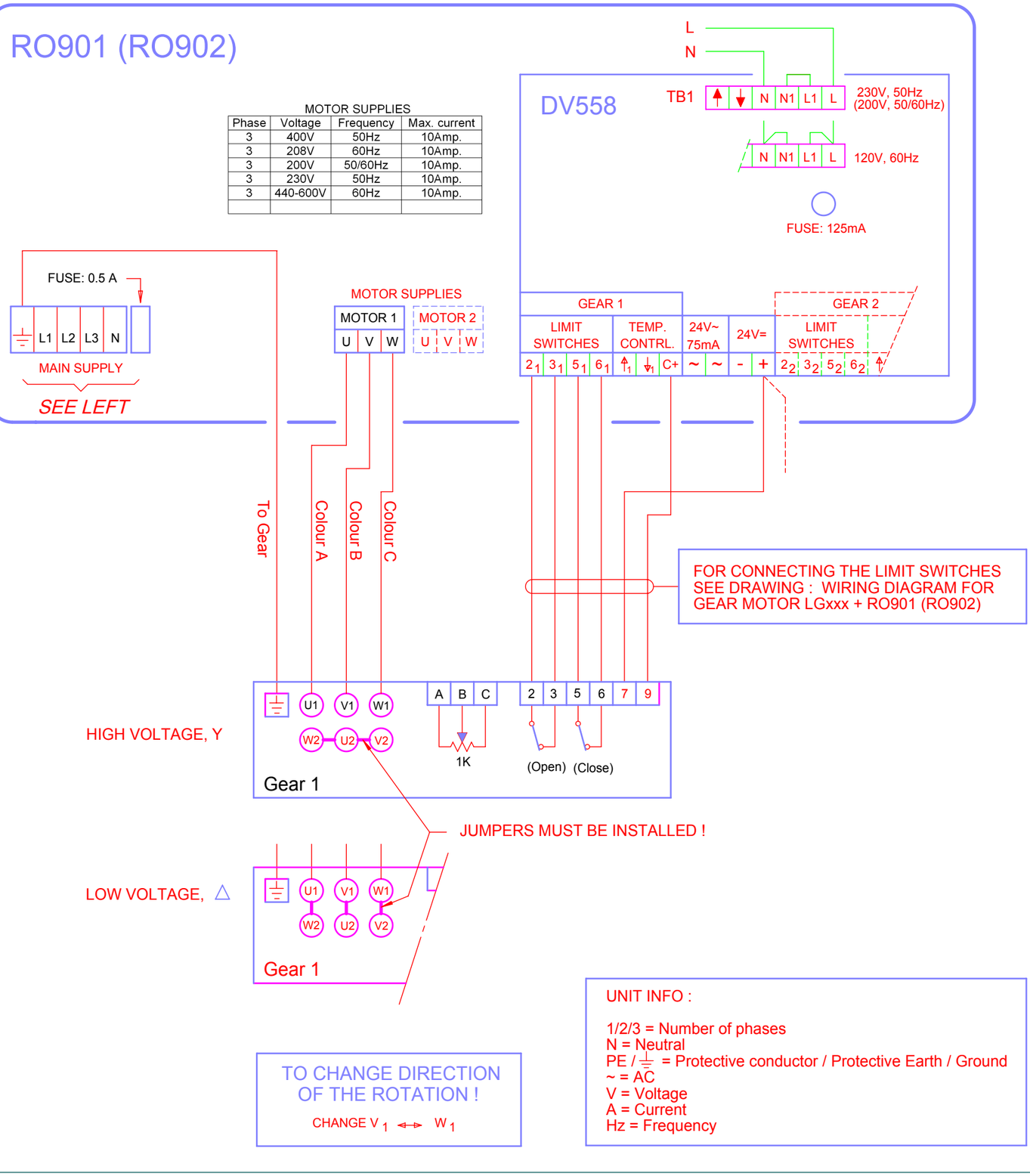
DOTTED LINES INDICATE RO902

RO901 (RO902)

MOTOR SUPPLIES

Phase	Voltage	Frequency	Max. current
3	400V	50Hz	10Amp.
3	208V	60Hz	10Amp.
3	200V	50/60Hz	10Amp.
3	230V	50Hz	10Amp.
3	440-600V	60Hz	10Amp.





TO CHANGE DIRECTION OF THE ROTATION !

CHANGE V 1 ↔ W 1

UNIT INFO :

1/2/3 = Number of phases
N = Neutral
PE / ⏚ = Protective conductor / Protective Earth / Ground
~ = AC
V = Voltage
A = Current
Hz = Frequency

SENMATIC
DGT-Volmatic
Industrivej 8
DK-5471 Sønderø

Subject: RO901 (RO902) / MOTOR SUPPLY, 3 PHASES

Date: 13.11.03 ML/jrj

Rev.: 22.6.04 ML/jrj

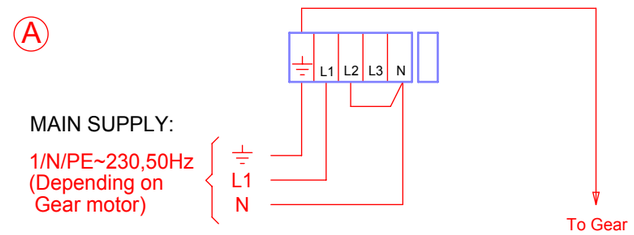
Drawing no.: 031112-03a

DOTTED LINES INDICATE RO902

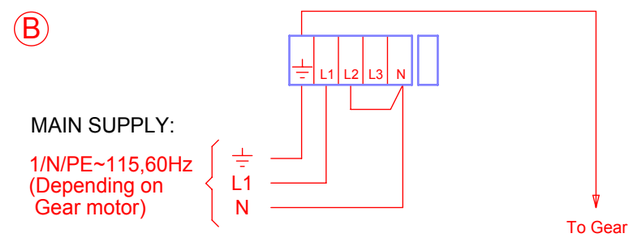
WARNING !
NEUTRAL & HOTLINE MUST BE INSTALLED CORRECT, OTHERWISE FAILURE OF THE UNIT WILL RESOLVE.

CIRCLE THE RIGHT CONNECTION BELOW BEFORE INSTALLATION

Ⓐ



Ⓑ



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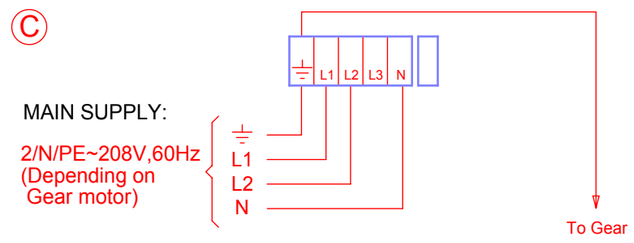
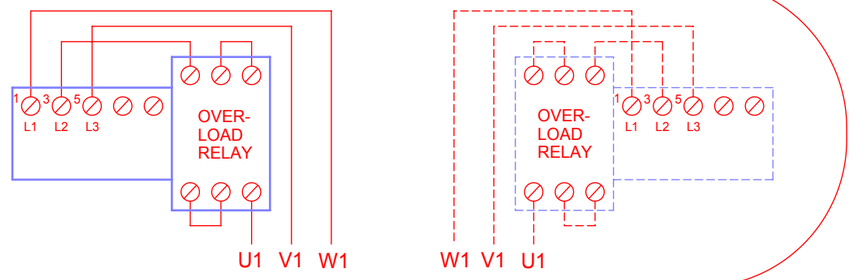


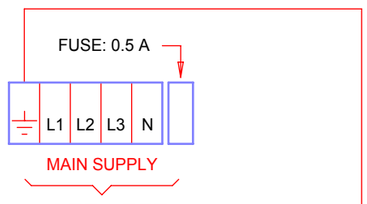
WARNING !
Must be rewired when 1 or 2 phases are used. If not rewired the overload dose not work correctly.



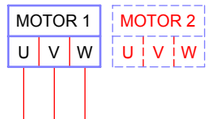
RO901 (RO902)

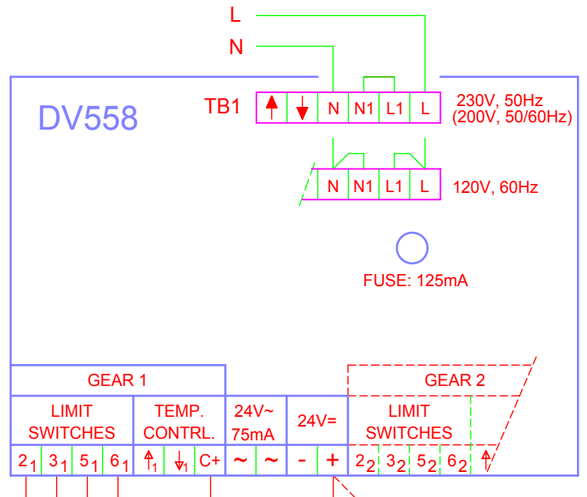
MOTOR SUPPLIES

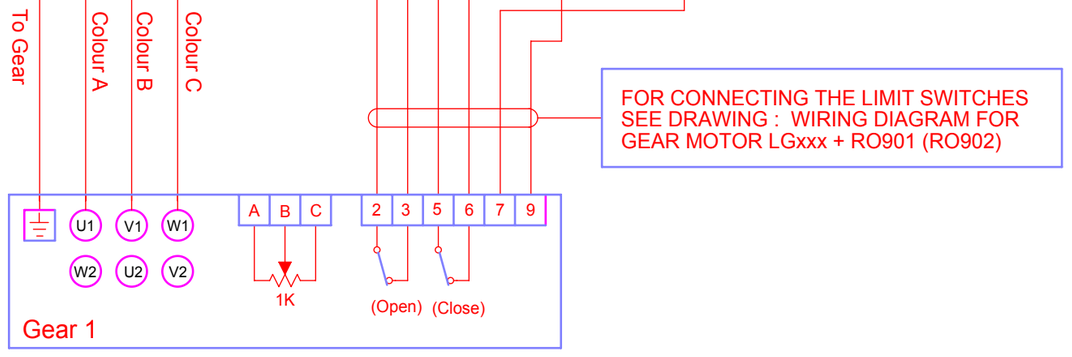
Phase	Voltage	Frequency	Max. current
1	230V	50Hz	10Amp.
1	115V	60Hz	10Amp.
1	208V	60Hz	10Amp.



MOTOR SUPPLIES







FOR CONNECTING THE LIMIT SWITCHES SEE DRAWING : WIRING DIAGRAM FOR GEAR MOTOR LGxxx + RO901 (RO902)

TO CHANGE DIRECTION OF THE ROTATION !

CHANGE V_1 ⇔ W_1

UNIT INFO :

1/2/3 = Number of phases
N = Neutral
PE / ⏚ = Protective conductor / Protective Earth / Ground
~ = AC
V = Voltage
A = Current
Hz = Frequency

SENMATIC
DGT-Volmatic
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Subject
RO901 (RO902) / MOTOR SUPPLY, 1 AND 2 PHASES

Date
18.11.03 ML/jrj

Rev.
22.6.04 ML/jrj

Drawing no.
031112-04a