

Ridder – Drive Systems

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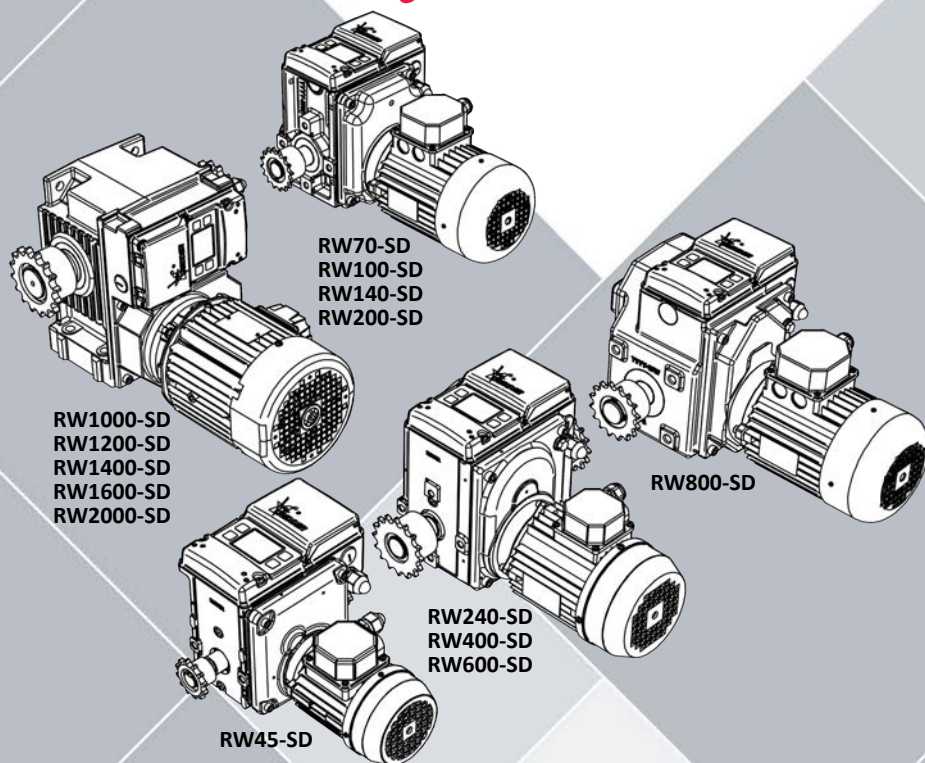


Product Manual

Ridder SmartDrive RW-SD Motor Gearboxes 3-phase

Original product-manual
265004EN - 2023.07 - V00

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your way



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1. GUIDELINES, STANDARDS AND CONDITIONS

1.1 Applicable guidelines and standards

This product complies with the provisions of the European guidelines that follow:

Machinery Directive 2006/42/EC | Low Voltage Directive 2014/35/EU | EMC directive 2004/108/EC

The harmonized standards (or parts of these standards) that follow are applicable:

NEN-EN-ISO 12100:2010 | NEN-EN-IEC 60204-1 |

NEN 82079-1 (62079: 2001) | NEN5509 | ISO 3864-2

Compliance statement (part 15.19)

This device complies with part 15 of the FCC Rules and to RSS of Industry Canada.

Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Warning (part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Information to the User (Part 15.105 (b))

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.



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If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Make sure that this product is only put into operation if the system (in which it will be installed) complies with the provisions of the applicable standards and guidelines.

Regulatory Conformity



1.2 Approved personnel

This product manual contains important information for installers about the installation and commissioning of a Ridder SmartDrive RW-SD Motor-Gearbox. Read this product manual and instructions first before the work starts. Approved mechanical and/or electrical installers, with professional competence, must do all work safely and responsibly.

TARGET GROUP FOR EACH CHAPTER	CHAPTER (refer to Table of Contents)														
TARGET GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
User (operator)	•	•	•			•	(•)	•		(•)	(•)		(•)	(•)	
Installer / Approved personnel	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
(•) = Not fully applicable (for users/operators). Read the chapters/sections.															

Keep this product manual with the product during the lifespan. Make sure it is available for users (operators), installers and approved personnel.

1.3 Warning about discouraged use

The conditions that follow are applicable:

- Do not change (the construction of) the SmartDrive RW-SD Motor-Gearbox.
- It is not permitted to weld to the RW-SD motor gearbox or its parts.
- It is not permitted to use the RW-SD motor gearbox to lift or move people.
- Do not let the torque of the RW-SD motor gearbox be more than its maximum.
- Do not let the duty cycle of the RW-SD motor gearbox be more than its maximum.
- It is not permitted to use the RW-SD motor gearbox in operating conditions, systems or configurations which do not comply with the technical specifications (in this manual). Also refer to §3.5.

Refer to §3.3 for a description of the intended use.



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1.4 Special tools and equipment

Bluetooth

To use Bluetooth the special tools and equipment that follow are necessary:

- ① A **mobile device** with SmartPhone functionality
- ② The Ridder **SD app**. Go to Google Play Store or Apple App Store for download and setup.

Use the app (after commissioning) to:

- Copy range-of-travel configuratons to other SD units
- Read out data/statistics
- Do motor control after commissioning.

General



Make sure that the correct equipment and tools are used.

1.5 Warranty provisions

For the warranty period and conditions refer to the 'Conditions' section on our website at **ridder.com**, or in the Ridder catalog.

DISCLAIMERS - OPEN SOURCE SOFTWARE

BASIC SETTINGS - Safety processor [MIT]

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BLUETOOTH/BASIC SETTINGS - Application processor [nRF5 Nordic]

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2. SAFETY, PRECAUTIONS AND SYMBOLS

2.1 Signal words, instructions and warnings

Signal words (ISO 3864-2)

This product manual contains safety instructions with different signal words. The list that follows gives the risk levels and possible effects of each signal word.

 TIP	Suggestion to perform an operation more effectively.
 ATTENTION	May result in damage or problems if an action is performed incorrectly.
 CAUTION	May result in minor injury if the hazard is not avoided.
 WARNING	Significant injury, possible death, if the hazard is not avoided.
 DANGER	Severe injury and possible death if the hazard is not avoided.



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Instructions and warnings on the product

	Read the product manual to fully know all product properties, before it is used or work starts!	Grease lubrication RW45-SD RW240SD
	It is not permitted to use high-pressure cleaners (and related cleaning agents)! Use a soft brush with a small quantity of water without cleaning agents.	
	Warning - Electrical voltage	
	After installation interchange the plug in the highest position with the vent plug! Refer to the permitted mounting positions in the product manual.*	Oil lubrication RW240/400/600SD RW800SD RW1000/1200/1400/1600/2000-SD RW70/100/140/200-34\68-SD
* Not applicable to motor gearboxes filled with grease!		

2.2 Precautions and safety instructions

Precautions

GENERAL

A system can be dangerous. Safety precautions and instructions are important.

- If these precautions cannot be obeyed, then use warnings.
- The responsibility for precautions and warnings lies with the installer of the system. Refer to the local or national laws and regulations of the country if a certification (mark) is necessary.
- Parts of the electrical or electronic installations are connected to dangerous electrical voltages. This is also applicable if the drive unit is not in operation or the motor does not turn. Work without professional competence or not obeyed warning instructions could cause injury and/or material damage.
- Make sure that no foreign particles, loose parts, moisture or dust go into the components (EM, gearbox, SD unit) during all work. There is a risk of short circuit, fire and corrosion.
- Take sufficient precautions to prevent ElectroStatic Discharge (ESD).
- Ridder is not responsible for injury, material damage or consequential damage if accessories are used that Ridder did not make.

TRANSPORT, STORAGE AND PACKAGING

The conditions and instructions that follow are applicable.

- Ambient temperature: -15 to +60 °C (+5 to +140 °F).
- Ambient: A not-condensed relative humidity is necessary.
- Do a check for transport damage and missing parts immediately on incoming goods.

- Tell damages and missing parts immediately to the transport company and to your local After Sales contact person.
- Do not use damaged products and if necessary do not start the work.
- Do not remove the product from the (sealed) packaging before it is sent to the installation site. This prevents damage (from mechanical shocks) to the product.
- Use applicable means-of-transport with dimensions which are sufficient. Use (if necessary) the correct work equipment and accessories. Refer to “Dimensions” and “Technical specifications”. Make sure that the working conditions comply with the, local or national, laws and regulations.
- Make sure that storage areas and the areas in the means-of-transport are dry and the airflow is sufficient.
- Make sure that the products do not touch the (moist) bottom surface of storage areas and of the means-of-transport (use pallets or such). The bottom surfaces must be smooth.
- Make sure that the products are protected from dust, dirt and direct sunlight.
- Apply an applicable corrosion-preventive agent to metal surfaces that are not painted.
- After installation discard the packaging and obey the applicable national and/or local regulations.

Safety instructions



If you do not obey the safety instructions that follow it can be dangerous and cause injury.

- **IF NECESSARY: For a fail-safe function install redundant safety systems to prevent that loads or system parts fall uncontrolled. Install (if necessary) protection from system parts that move. Obey the applicable national and/or local standards and guidelines of the related type of operated system.**
- Use (if applicable) personal protective-equipment for protection which agrees with the different types of work.
- Do not let persons and not approved personnel be near controls and systems in operation.
- Damaged systems must be stopped immediately until they are repaired.
- Use safety barriers for system parts that move. Refer to the applicable standards and guidelines.
- The safety distance to the danger zone (if applicable) must agree with applicable standards and guidelines (for example ISO 13857:2008).
- Do not operate systems when the motor gearbox (internally and/or externally) is frozen in cold and moist conditions (for example because of snow or ice). NVT SMART DRIVE
- Do not operate systems when persons are in the danger zone and can touch the system.
- Monitor the danger zone when you work with or near the system.
- Stop and de-energize systems during maintenance and cleaning work on or near the system.
- Make sure that there is sufficient space between parts that move and adjacent objects.
- Stay away from or safety areas where there is a risk to become caught in a system that moves.
- The torque and the duty cycle of the system must be in the range of the motor gearbox parameters.



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2.3 Residual risks

Automatic controls

The Ridder drive-units are usually used in automatic controlled systems. Persons who do work or stay near the system must know about that. If persons or their clothes touch the system during operation, it can be dangerous.



DANGER

Persons can be in danger of life if they touch a system that is in operation.

Forces

Ridder cannot be sure that there will be no injury to persons or damage to the system because of the forces in the systems (in which the drive unit is installed).

2.4 Symbols and abbreviations

This section tells about used symbols and abbreviations in this manual. The table that follows gives the descriptions.

Symbol	Description	Symbol	Description
A1	SDU cover	PE	Protective earth
A2	SDU circuit board	PH	Cross head "Phillips"
A3	SDU closing cover	PLC	PLC Control
A4	Locking system	PU	Panel unit
A5	PU circuit board	PZ	Cross head "Pozidriv"
ACS	Automatic control-system	P21/1	Auxiliary contact K21
BOS	Basic Output Shafts (RW-SD)	P22/1	Auxiliary contact K22
CM	Common connection	P71, P72	Automatic-control contacts (ACS)
CS	Control screen	rpm	revolutions per minute
D	Model with continuous worm-shaft	RPT	Ridder PolyTelescope
DIP	DIP-switch	RRD	Ridder RackDrive
EM, M	Electric motor, Motor	RSD	Ridder ScreenDrive
EMC	Electromagnetic compatibility	RW	Motor gearbox
ESD	ElectroStatic Discharge	SBI	Standard Bolt-Installation
FTL	Free Thread-Length	SD	SmartDrive
F1	Fuse	SDU	SD unit
HEX	Hexagonal width-across-flats	SID	Screw-in depth
I	Current in Amperes (A)	SS (S21)	System switch (S21)
IP	International Protection Rating	SU	Sensor unit
K	Designation sprocket (assembled configuration)	SW	Width-across-flats
		S1–S4	SDU operating buttons
kb	Maximum running time in minutes (kb = KurzBetrieb/ Short operation)	S11	Manual switch (bridged safety circuit)
		S21 (SS)	System switch (SS)
K11	Auxiliary relays (safety contact)	S111	Manual switch (MC)



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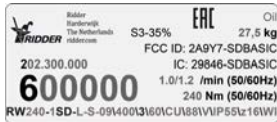
K21, K22	Reversing relay (sufficiently specified) for direction-of-rotation	TRA	Model for built-on rack unit
		TRI	Rack drives TRI
L	Model with winch shaft	TRN	Rack drives TRN
L1, L2, L3	Voltage source	TX	Screw head "Torx"
MC	Manual Control	T1	Safety transformer (EN 61558)
MPCB/ Q41	Motor-Protection Circuit-Breaker	U1	Motor connection
		V1	Motor connection
N	Neutral wire	W1	Motor connection
NC	"normally closed"	X1	Terminal strip (1–10)
NO	"normally open"	X2	Terminal strip (11–16)



3. PRODUCT DETAILS

3.1 Identification

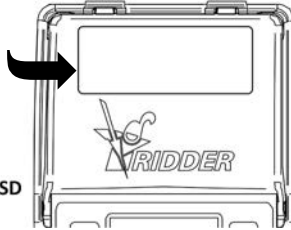
EXAMPLE



This product manual is only applicable to:

- Ridder SmartDrive **RW-SD** Motor Gearboxes 3-phase
- Serial numbers from 202.300.000
- Item numbers from 600000.

Closing cover
(A3)



FCC ID: 2A9Y7-SDBASIC

Identification FCC product certification

IC: 29846-SDBASIC

Certification number "Industry Canada"

RW45-SD

RW240/400/600-SD

RW800-SD

RW1000/1200/1400/1600/2000-SD

RW70/100/140/200-SD

Identification is possible from the sticker on the location shown. Refer to the explanation that follows on how to read the information. For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.

RW240-1SD-L-S-09\400\3\60\CU\88\V\IP55\z16\W\I

- WI:** White color finish
- z16:** Optional sprockets
Alternatives: z12/3z16 (3x for D model)
- IP55:** Protection rating
No symbol in identification = IP54
- V:** Grease lubrication
No symbol in identification = Oil lubrication
- 88:** Switching range motor-gearbox
Alternatives: 55/100/110/155/1100
- CU:** CSA/UL certification mark
Alternatives: 3C (CCC)/C (CSA)/U (UL)
- 60:** Mains frequency [Hz]
No symbol in identification = 50 Hz
- 3:** 3-phase mains voltage
- 400:** Mains voltage [V]
Alternatives: 208–480/380/600
- 09:** Motor power at 50/60 Hz [daW]
Alternatives: 11/12/14/25/29/30/37/42/44/55/63/66/75/85/
90/110/125/132/150/180/200/216/240/300/360
- S** = Wire-screen system
- L:** Model with winch shaft
- TRA:** Model for built-on rack unit
- D:** Model with continuous worm-shaft
- No symbol in identification = Sprockets (K)*
- 1:** Rotational speed of drive shaft at 50(60) Hz [rpm]
Alternatives: 2/3/5/34(41)/68(82)
- 240:** Torque [Nm]
Alternatives: 70/100/140/200/400/600/
800/1000/1200/1400/1600/2000
- 45** = Torque 120, 90 or 60 Nm
- RW-SD:** General designation RW SmartDrive motorgearboxes

----- = If not applicable: No symbol in identification.

NOTE: Possibly the sequence of symbols is different and/or other symbols are included in the identification. Not all symbols and assembled configurations (such as LK, LD, ...) are included in the explanation.

* K = Sprocket in an assembled configuration.



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3.2 Description

RW-SD motor gearboxes are drive units to operate systems in greenhouses, livestock houses, crop-storage buildings and such. The RW-SD motor gearboxes are applicable at ambient temperatures between 0 and 60 °C. RW-SD motor gearboxes have a self-braking worm-gear transmission which stops the drive unit (worm shaft) when not operated and then locks the output shaft. To operate manually (externally) is possible with (electric) tools and a hexagon socket in the shaft of the electric motor.

RW-SD motor gearboxes use the end position system of the SD unit. The built-in sensor unit gives position feedback to sense the digitally set end positions. These digital end positions are used to enable contacts. The circuitboard of the SD unit has duty contacts (end positions) and a safety contact (safety stop). If an SD panel unit is connected, the control contacts (motor control) and a safety contact of the panel unit are used. Then the contacts of the SDU circuitboard become disabled.

RW-SD motor gearboxes are applicable to use intermittently (duty class s3-35%) with a maximum duty cycle of 25 minutes.

The SDU cover has a display which shows the control screen and has four pushbuttons. The control screen tells you the steps of the setting procedures (or commissioning) in a selected language. You can download all settings (end positions and more) of the first set SD unit, and upload these to other units with Bluetooth and the SD app (on a Smartphone). The sensor unit monitors the positions of the drive unit and transmits the data to the automatic control-system (ACS). The SD app can read out and monitor information of the SD system such as statistics, load and more. This information is available for predictive maintenance of the operated system.

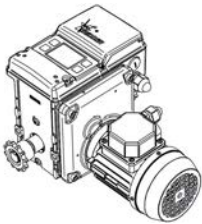
Operation is possible, usually in automated systems, with:

- An external manual control (only when **no** SD panel unit is connected)
- The control screen on the SDU cover
- The SD panel unit:
 - INTERNAL - Manual control (knob S8)
 - EXTERNAL - Automatic control (ACS) **or** Modbus control (PLC).
- The SD app on a Smartphone (only enabled with connected SD panel unit).

The RW-SD motor gearboxes have connections (terminal block/terminal strips) to connect the cables and are supplied with cable glands for the power cables and control cables. The gearbox housing of the RW-SD motor gearbox has a powder-coating. RW-SD motor gearboxes are supplied with fixing bolts and spring washers*.

* For RW1000–RW2000-SD motor gearboxes bolts (M12), spring washers and nuts are accessories.

RW45-SD series

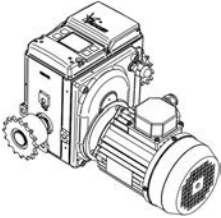


- RW45-SD: 12-tooth 1/2"x5/16" zinc-plated sprockets for chain couplings are installed. **Optionally** 16-tooth 1/2"x5/16" sprockets are installed to compensate for larger angle differences (to a maximum of 6°).

- RW45-SD-L: Has a one-sided output shaft to install a belt drum or cable drum.
- RW45-SD-TRA: Has a one-sided output shaft to install a TRA520 rack-drive.
- RW45-SD-D: An RW45-SD with a continuous worm-shaft. **Optionally** a 16-tooth 1/2"x5/16" zinc-plated sprocket for chain couplings is installed.

The switching range of the end position system is 55 or 100 revolutions of the drive shaft. The range is related to different models.

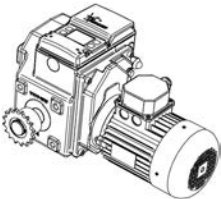
RW240–600-SD series



- RW240/400/600-SD: 16-tooth 5/8"x3/8" zinc-plated sprockets for chain couplings are installed.
- RW240/400/600-SD-L: Has a one-sided output shaft to install a belt drum or cable drum.
- RW240/400/600-SD-TRA: Has a one-sided output shaft to install a TRA520 rack-drive.
- RW240/400/600-SD-D: An RW240/400/600-SD equipped with a continuous worm-shaft. **Optionally** a 16-tooth 1/2"x5/16" zinc-plated sprocket for chain couplings is installed.

The switching range of the end position system is 88 revolutions of the drive shaft.

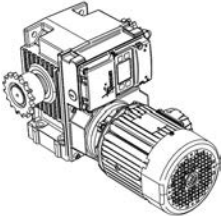
RW800-SD series



- RW800-SD: 16-tooth 5/8"x3/8" zinc-plated sprockets for chain couplings are installed.

The switching range of the end position system is 155 revolutions of the drive shaft.

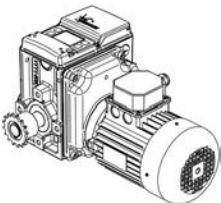
RW1000–2000-SD series



- RW1000/1200/1400/1600/2000-SD: 16-tooth 3/4"x7/16" zinc-plated sprockets for chain couplings are installed.

The switching range of the end position system is 110 revolutions of the drive shaft.

RW70–200-SD series



- RW70/100/140/200-SD: 16-tooth 1/2"x5/16" zinc-plated sprockets for chain couplings are installed.

The switching range of the end position system is 1100 revolutions of the drive shaft.



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Make sure that (with RW-SD motor gearboxes) operated systems comply with the provisions of the applicable safety standards and safety guidelines.

This prevents (for example) the risk:

- **To become caught in a system that moves**
- **That loads or system parts that fall can hit persons.**

- The RW45-SD motor gearboxes are drive units to operate ventilation systems and screen systems in greenhouses and livestock houses or crop-storage buildings.
- The RW45-SD-L\RW240/400-SD-L motor gearboxes with drums (belt or cable) are drive units to hoist feeding lines and drinking lines and to open air inlets in livestock houses or crop-storage buildings.
- The RW45-SD-TRA\RW240-SD-TRA motor gearboxes with a TRA520 rack drive are drive units to operate ventilation systems and hoisting systems in greenhouses and livestock houses or crop-storage buildings.
- The RW45-SD-D\RW400/600-SD-D motor gearboxes are drive units to operate ventilation systems and hoisting systems in greenhouses and livestock houses or crop-storage buildings.
- The RW240-600-SD\RW800-SD motor gearboxes are drive units to operate ventilation systems, screen systems and hoisting systems in greenhouses and livestock houses or crop-storage buildings.
- The RW1000/1400-SD motor gearboxes are drive units to operate ventilation systems, screen systems and hoisting systems in greenhouses.
- The RW1200/1600/2000-SD-S motor gearboxes are drive units to operate wire screen systems in greenhouses.
- The RW70-200-34/68SD motor gearboxes are drive units to operate indirectly-operated ventilation-systems in greenhouses and livestock houses or crop-storage buildings.

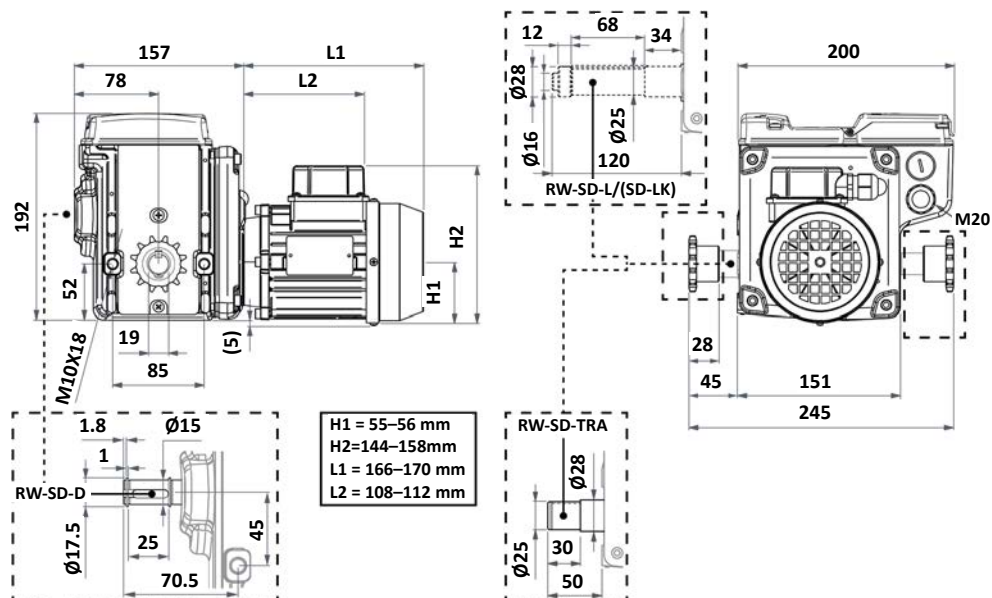
This section tells about usual configurations of motor gearboxes and operated systems. Possibly other configurations (or applications) are applicable.

For other (different) applications, approval from **Ridder** is necessary.

3.4 Dimensions

The dimensions and illustrations are approximate. In this product manual shown illustrations can be different than the components and/or systems.

RW45-SD:



[illegible]

Technical drawing of the M12x25 motor showing front and top views with dimensions.

Front View Dimensions:

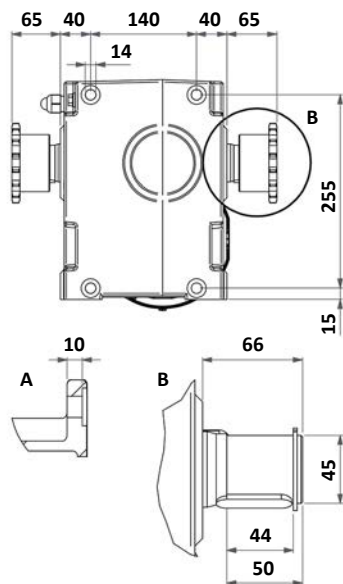
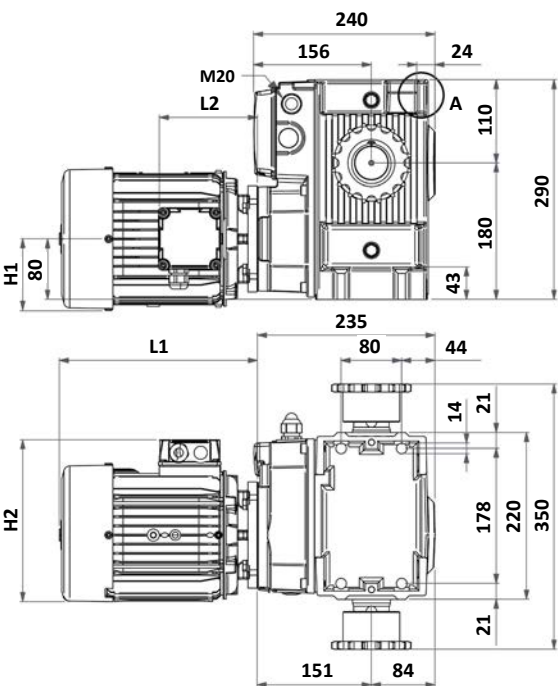
- Overall width: 260 mm
- Distance from left edge to first mounting hole: 112 mm
- Distance between mounting holes: 134 mm
- Overall height: 100 mm
- Distance from bottom edge to mounting holes: 75 mm
- Distance from bottom edge to gear teeth: 16.5 mm
- Mounting hole size: M12x25
- Distance from gear teeth to center: 34 mm
- Distance from gear teeth to mounting holes: 100 mm
- Motor body length: L1
- Motor body diameter: L2
- Motor body height: H1
- Motor body diameter: H2

Top View Dimensions:

- Overall width: 201 mm
- Distance from left edge to mounting hole: 15 mm
- Distance from left edge to mounting hole: 3.5 mm
- Distance from left edge to mounting hole: 42 mm
- Distance from left edge to mounting hole: 62.5 mm
- Mounting hole size: M20
- Overall height: 340 mm

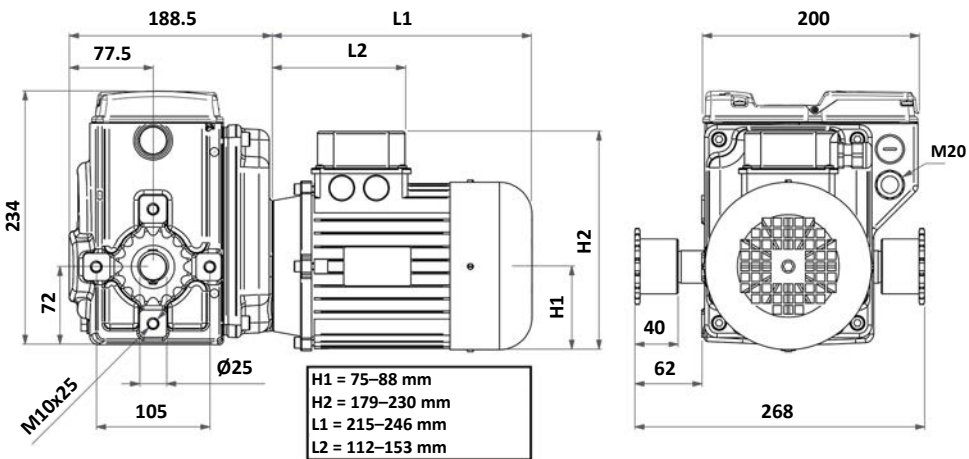
Motor Body Dimensions:

- H1 = 72.5–89 mm
- H2 = 190–213 mm
- L1 = 217–246 mm
- L2 = 160–215 mm

RW1000/1200/1400/1600/2000-SD:

H1 = 75–95 mm
H2 = 205–230 mm
L1 = 248–315 mm
L2 = 130–210 mm

RW70/100/140/200-34\68SD:



3.5 Technical specifications

Mechanical

RW-SD series	RW45	RW240–600	RW800	RW1000–2000	RW70–200
Torque [Nm]	60 90 120	240 400 600	800	1000 1200 1400 1600 2000	70 100 140 200
Mains frequency [Hz]	50/60		50/60		50/60
Rotational speed [revolutions per minute]	1/1.2* 2/2.4* 3/3.6 5/6.0		3/3.6 5/6.0		34/41 68/82
* Not applicable:	-	RW600	-	-	-
Switching range [revolutions of drive shaft]	55 100	88	155	110	1100
Drive unit	Self-braking				
Operate manually (externally):	With (electric) tools and a hexagon socket in the shaft of the electric motor.				
Dimensions [mm] WxHxD	Refer to §3.4 (minimum–maximum).				
Weight [kg]	15.5–17	27.5–42	40.5–44	54.5–68	30–40

Ambient

RW-SD series	RW45	RW240–600	RW800	RW1000–2000	RW70–200
Protection rating	IP54*				
Ambient temperature [°C (°F)]	0–60 °C (32–140 °F)				
Maximum relative humidity	A not-condensed relative humidity is necessary.				

* IP55 only applicable if in identification.

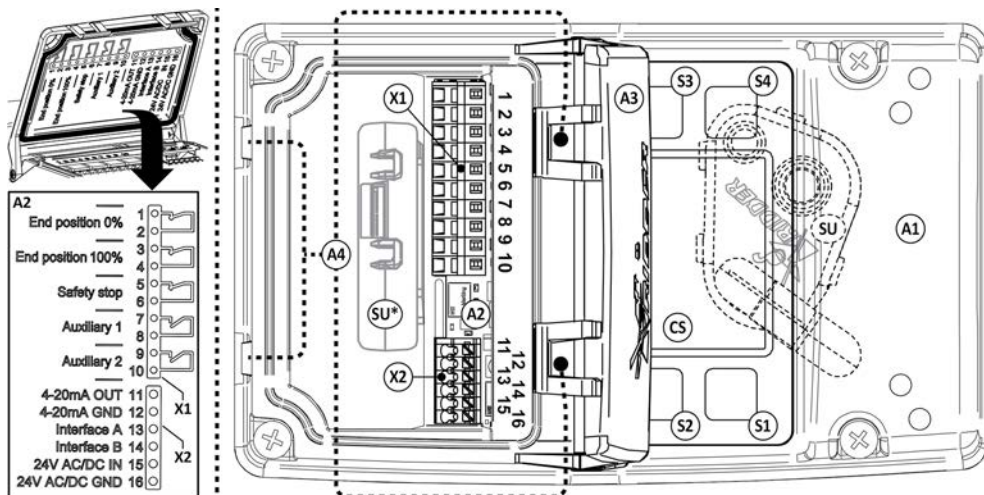


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Electrical - SD unit (SDU)

Refer to the illustration and table that follows for abbreviations, technical specifications and descriptions of all components and connections.



	No.	Designation	Description
X1	1–2	End position 0%	End position 0%: duty contact
	3–4	End position 100%	End position 100%: duty contact
	5–6	Safety stop	Safety stop: safety contact
	7–8	Auxiliary 1	Auxiliary contact 1
	9–10	Auxiliary 2	Auxiliary contact 2
X2	11	4–20 mA OUT	Output: feedback signal
	12	4–20 mA GND	Ground: feedback signal
	13	Interface A	Communication channel A
	14	Interface B	Communication channel B
	15	24 V AC/DC IN	Input: power supply
	16	24 V AC/DC GND	Ground: power supply
A1	-	-	SDU cover (of motor gearbox)
A2	-	-	SDU circuit board
A3	-	-	SDU closing cover
A4	-	-	Locking system of SDU closing cover
CS	-	-	Control screen
S1–S4	-	-	SDU operating buttons
SU/SU*	-	-	Sensor unit (position feedback)

* The illustration shows two sensor units (SU), but SD motor gearboxes have **only one** sensor unit. Only the **RW45-SD** and **RW240–600-SD** series have the mounting location **SU***.

Electrical - RW-SD motor gearbox

RW-SD series	RW45	RW240–600	RW800	RW1000–2000	RW70–200
Duty cycle [kb]	Applicable for intermittent duty, duty class s3-35%, with a maximum running time of 25 minutes.				
Maximum current	Refer to the nameplate of the electric motor.				
Power					
Cable glands	M16x1.5 mm/M20x1.5 mm. Also refer to §5.2.				

Mains voltage

400 V - 50 Hz 480 V - 60 Hz	•	•	•	•	•
200–415 V - 50 Hz 200–480 V - 60 Hz	•	•	•	•	•*
380 V - 60 Hz	-	•*	-	-	-
600 V - 60 Hz	-	•	•	•	•**
* Not applicable:	-	RW600	-	-	RW100
** Not applicable:	-	-	-	-	RW70–140

Flash memory

The Flash Memory has a maximum number of times to erase or write without faults. You can erase or write (without faults) approximately 10,000 times. The lifespan of the flash memory extends when the erase/write cycles are kept to a minimum.



4. INSTALL INSTRUCTIONS

Installation is only permitted to approved personnel.

This chapter tells about the install instructions without installed SD panel unit (PU). Refer to the PU product manual if an SD panel unit is installed.

Do a check of the supplied parts in the table that follows. Use these parts with the mounting plate (selection) which is applicable. Refer to §4.3.

Parts list *	
600000 RW-SD Motor Gearbox 3-phase **	1x
* Minimum parts list: Motor gearbox without optional parts and accessories.	
** Motor gearboxes have spring washers and bolts M10x20 (2x), M10x25 (3x) or M12x25 (4x). Item numbers from 600000.	
NOTE: Bolts (M12), spring washers and nuts are accessories for RW1000-SD thru RW2000-SD motor gearboxes.	

Installation (general)

- This product manual gives **only** information about the installation of RW-SD motor gearboxes and related connections to output-shafts (installation options).
- Information about the different operated systems is **not** (or not fully) given or gives only general information.

Installation options for output shafts

Refer to (if applicable):

- §4.4.1 for the (most) used connections of **basic output shafts** to operated systems (installation options A–F)
- §4.4.2 for the installation options (A–F) of **special output shafts**
- §4.4.3 for the installation of **chains** onto sprockets (for installation options A–D)
- §4.5 for **TRA** models with TRA drive-unit (installation options G, H, I)
- §4.6 for **L** models with belt drum (installation option J)
- §4.7 for **L** models with cable drum (installation option K).



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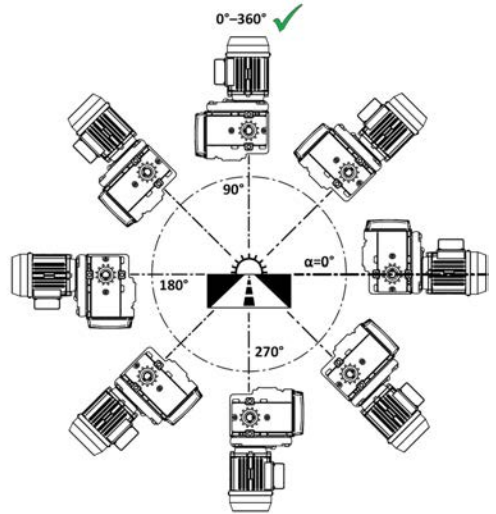
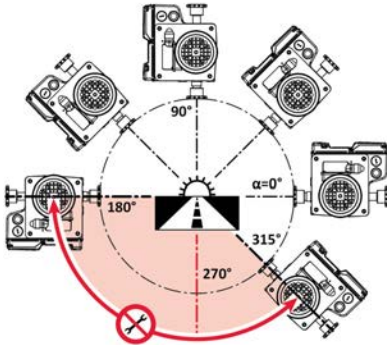
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4.1 Mounting positions

- Refer to the illustrations and use only a permitted mounting position for installation!
- **After installation** interchange the plug in the highest position with the vent plug! This is **not** applicable to motor gearboxes that are filled with grease!

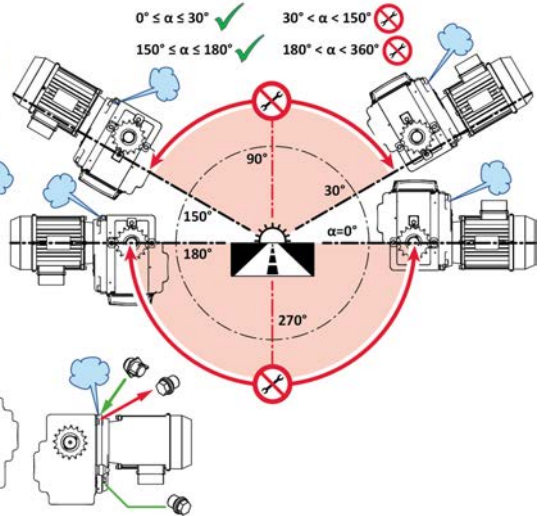
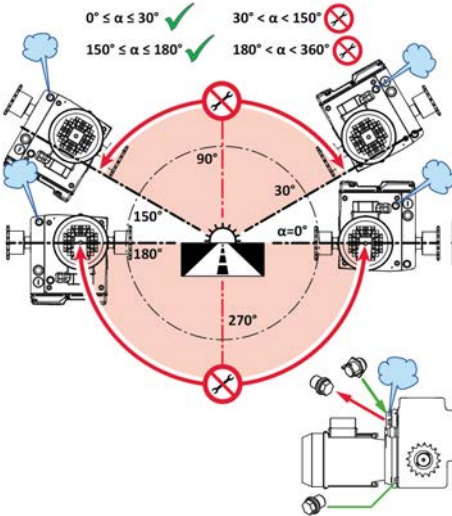
RW45-SD [grease lubrication]:

$315^\circ \leq \alpha \leq 180^\circ$ ✓ $180^\circ < \alpha < 315^\circ$ ✗



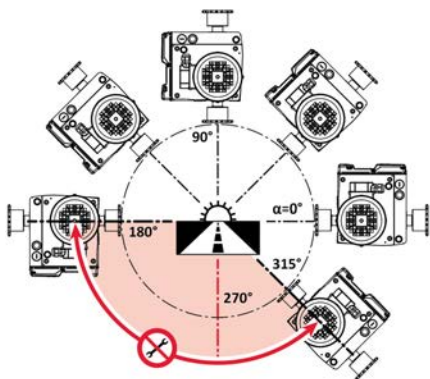
RW240/400/600-SD [oil lubrication]:

$0^\circ \leq \alpha \leq 30^\circ$ ✓ $30^\circ < \alpha < 150^\circ$ ✗
 $150^\circ \leq \alpha \leq 180^\circ$ ✓ $180^\circ < \alpha < 360^\circ$ ✗

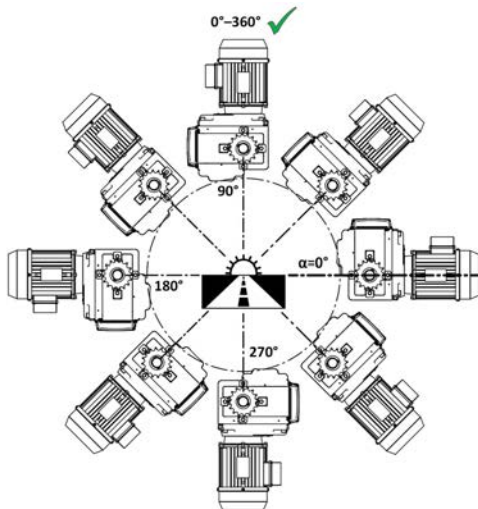


RW240-SD [grease lubrication]:

$315^\circ \leq \alpha \leq 180^\circ$ ✓ $180^\circ < \alpha < 315^\circ$ ✗

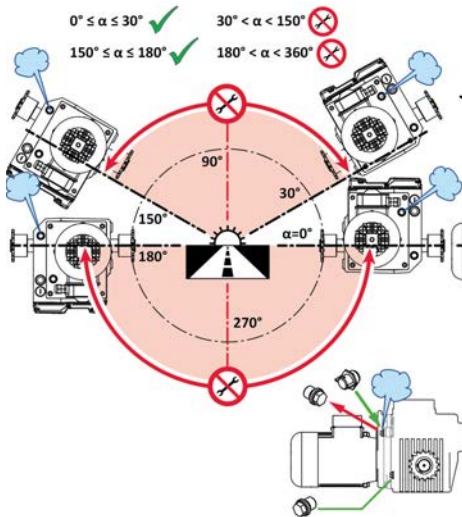


$0^\circ - 360^\circ$ ✓

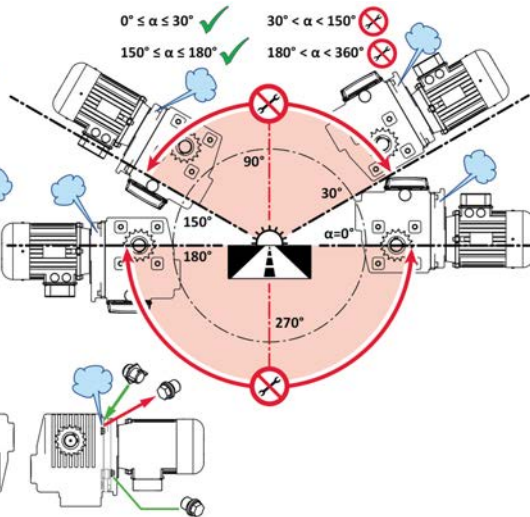


RW800-SD [oil lubrication]:

$0^\circ \leq \alpha \leq 30^\circ$ ✓ $30^\circ < \alpha < 150^\circ$ ✗
 $150^\circ \leq \alpha \leq 180^\circ$ ✓ $180^\circ < \alpha < 360^\circ$ ✗



$0^\circ \leq \alpha \leq 30^\circ$ ✓ $30^\circ < \alpha < 150^\circ$ ✗
 $150^\circ \leq \alpha \leq 180^\circ$ ✓ $180^\circ < \alpha < 360^\circ$ ✗



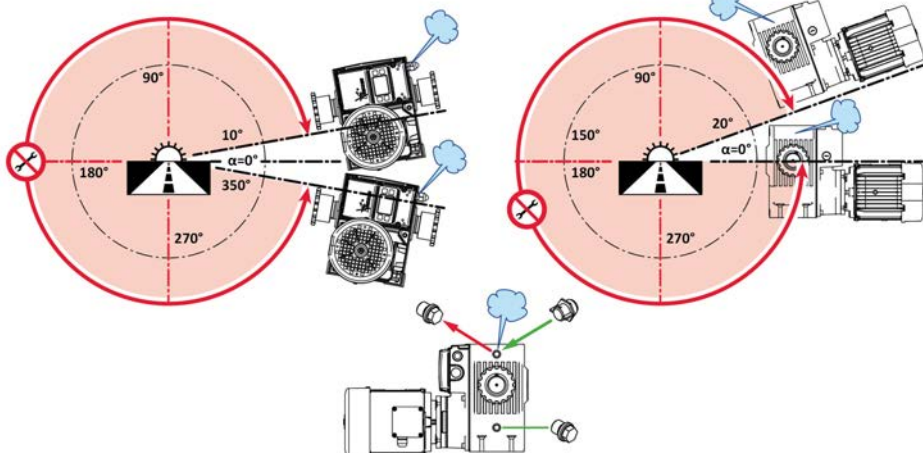
RW1000/1200/1400/1600/2000-SD [oil lubrication]:

$350^\circ \leq \alpha \leq 10^\circ$ ✓

$10^\circ < \alpha < 350^\circ$ ✗

$0^\circ \leq \alpha \leq 20^\circ$ ✓

$20^\circ < \alpha < 0^\circ$ ✗



RW70/100/140/200-34\68SD [oil lubrication]:

$355^\circ \leq \alpha \leq 5^\circ$ ✓

$5^\circ < \alpha < 175^\circ$ ✗

$175^\circ \leq \alpha \leq 185^\circ$ ✓

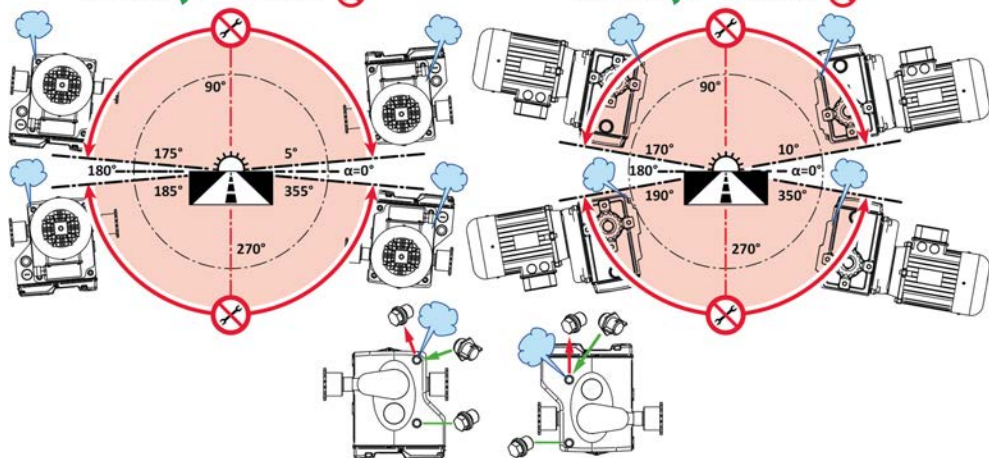
$185^\circ < \alpha < 355^\circ$ ✗

$350^\circ \leq \alpha \leq 10^\circ$ ✓

$10^\circ < \alpha < 170^\circ$ ✗

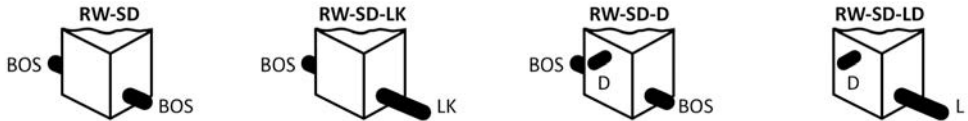
$170^\circ \leq \alpha \leq 190^\circ$ ✓

$190^\circ < \alpha < 350^\circ$ ✗



4.2 Sprockets

- **Usually** Ridder installs sprockets onto the **two basic output shafts (BOS)** of most models (general designation: RW-SD).
- Some models (such as RW-SD-LK, RW-SD-D, RW-SD-LD) have:
 - **One** special output-shaft (**LK**) plus **one** basic output shaft (**BOS**)
 - **One** special output-shaft (**D**) plus **two** basic output shafts (**BOS**)
 - **Two** special output-shafts (**L + D**). (The L-shaft is for installation of a drum.)
- Some models or shafts (BOS and/or special shafts) are supplied without sprockets.



Thus it is possibly necessary, if applicable for the configuration, to:

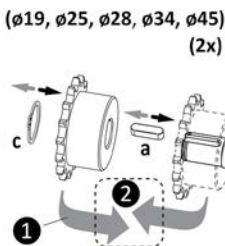
- ① Install necessary (optional) sprockets on output shafts **OR**
- ② Interchange sprockets with necessary (optional) sprockets on output shafts.

Refer to the illustration (step ① and ②) that follows for the configuration of shaft keys (a, b), retaining rings (c) and ring (d).

For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.

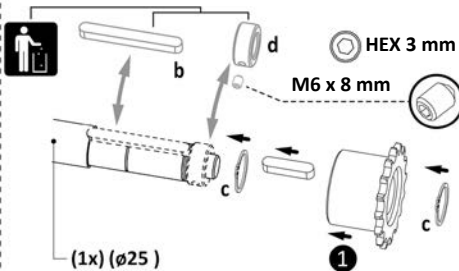
Basic output shafts [BOS]

Model: RW-SD
2x BOS



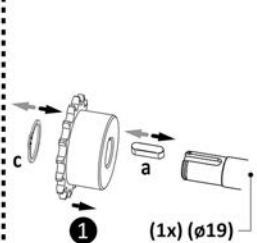
Output shaft LK

Model: RW-SD-LK
1x Shaft-LK*
+ 1x BOS



Output shaft D

Model
RW-SD-D: 1x Shaft-D
+ 2x BOS
RW-SD-LD: 1x Shaft-D
+ 1x Shaft-[L]**



* Shaft LK-model: Installation of a drum is also possible. Refer to §4.6/4.7.

** Shaft L-model is for installation of a drum. Refer to §4.6/4.7.

4.3 Installation

The conditions and starting points that follow are applicable for installation. Make sure that the working conditions comply with the, local or national, laws and regulations.

- Do not remove the product from the packaging until a short time before the installation.
- Use the correct work equipment and accessories (belts, chains, pallets or such) if it is not permitted or possible to put the product manually in position.
- Only use a permitted mounting position when you install the RW-SD motor gearbox. Refer to §4.1.
- The mounting plates are available in different dimensions for different configurations. Refer to “Optional mounting plates ①”.

Install the RW-SD motor gearbox onto the mounting plate OR an alternative (refer to “Optional mounting plates ②”):

- With the supplied spring washers and bolts M10x20 (2x) for an RW45-SD drive unit
- With the supplied spring washers and bolts M10x25 (3x) for RW240–600-SD and RW70–200-SD drive units
- With the supplied spring washers and bolts M12x25 (4x) for an RW800-SD drive unit
- With nuts, spring washers and bolts M12(4x) for RW1000–2000-SD drive units (supplied as accessories).

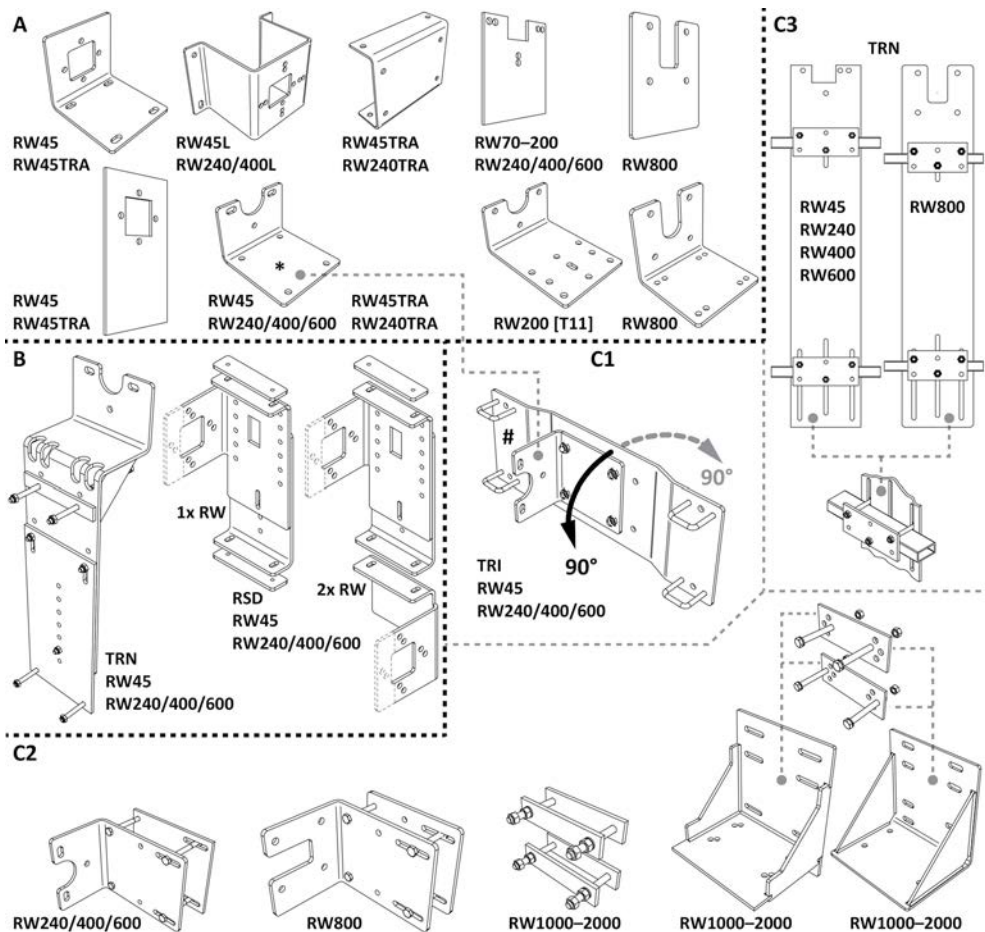
Refer to “**Minimum Screw-in depth/Free thread-length (SID/FTL)**” which also shows the **standard bolt-installation (SBI)**.

- The control screen (CS) on the SDU cover (A1) can give information “in operation” and/or during commissioning. Thus, easy access and a satisfactory view is recommended for the location of the RW-SD motor gearbox.
- In the factory the reductor is filled with the necessary quantity of grease (usually only RW45-SD) or oil. After installation interchange (of reducers filled with oil) the plug in the highest position with the vent plug! Refer to §4.1.



Optional mounting plates

- ① **A. Mounting plates:** Do bolt attachment or welded attachment to a structure. Use wedge bolts (or such) for wall mounting.
- B. Mounting plates:** Do bolt attachment to a structure (different lattice heights possible).
- C. Clamp mounting plates:**
 - C1.** Use a base plate (#) and a type A mounting plate (*) on C-profiles.
 - C2.** Do clamp mounting on posts.
 - C3.** Do clamp mounting on lattices (different lattice widths and lattice heights possible).



In this product manual shown illustrations can be different than the components and/or systems. For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.



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- 2 Do the **standard bolt-installation (SBI)** of the motor gearbox on the applicable mounting plate OR an alternative.



Make sure that the drive unit is installed in a stable condition. The structure must have sufficient strength for the applied forces.



Make sure that easy access to the SDU cover [closing cover (A3) and display (CS)] of the RW-SD motor gearbox is possible for all work.

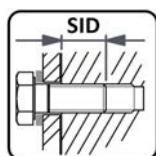


Installation **OUTDOORS** of RW-SD motor gearboxes is only permitted with **PROTECTION** from RAIN (protection covers or such) at a minimum temperature of 0 °C. Problems with moisture and/or the IP protection rating (if applicable) must be prevented.

Minimum Screw-in depth/Free thread-length (SID/FTL)

- For the tightening torque of the used fixing bolts a **minimum** screw-in depth (**SID**) or a **minimum** free thread-length (**FTL**) is necessary. Refer to the illustrations (Standard Bolt-Installations [SBI]) that follow.
- Possibly fixing bolts with more length are necessary if a larger sheet thickness is used!
- Tighten the bolts crosswise and gradually with the correct tightening torque (**Nm**).

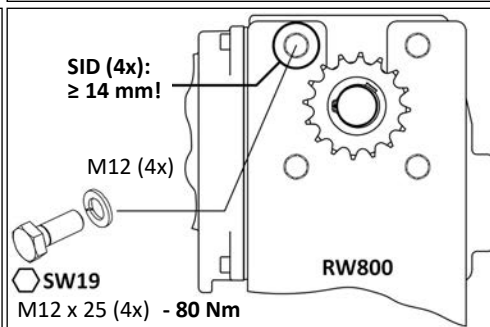
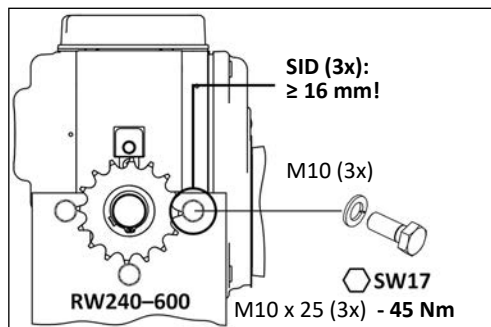
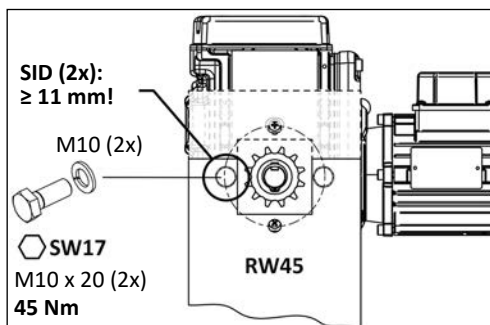
Standard Bolt-installations (SBI)

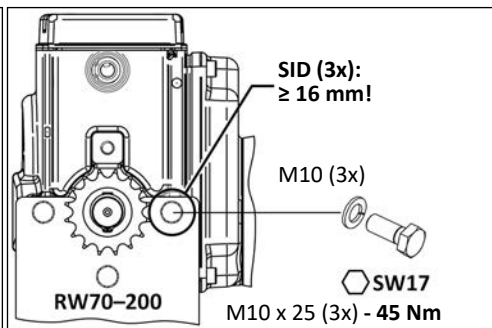
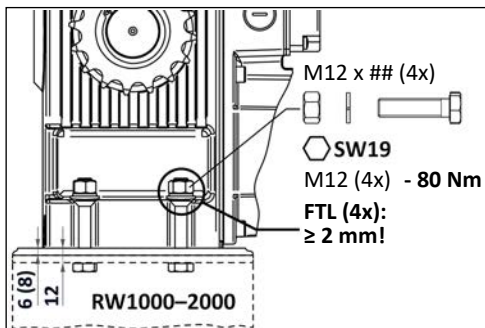


RW45-800-SD



RW1000-2000-SD





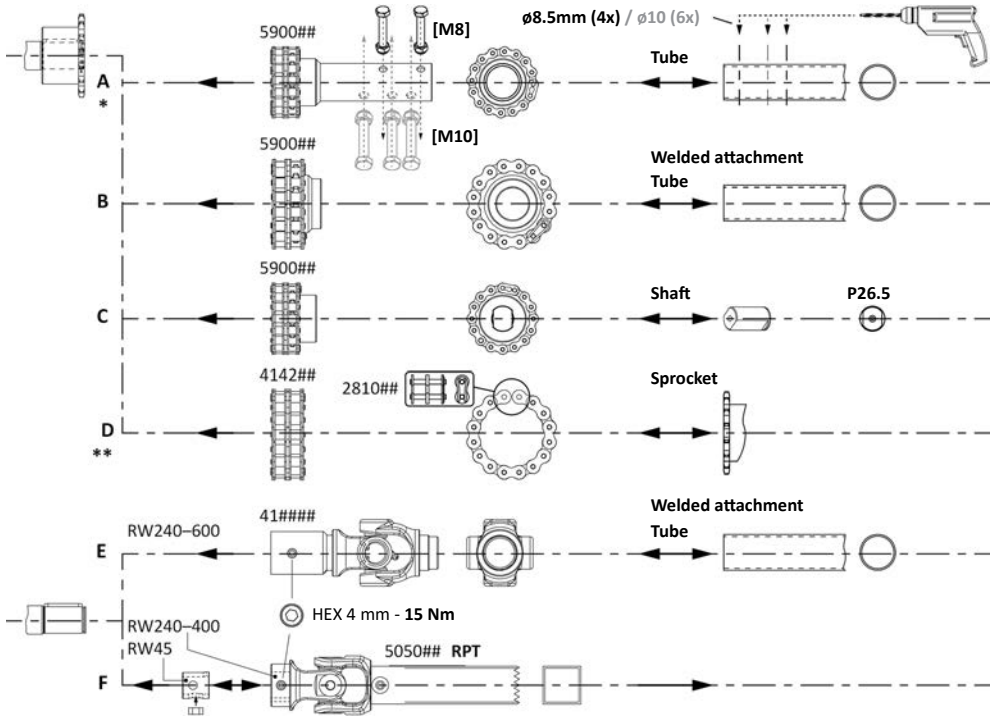
CAUTION

Do the check of the minimum screw-in depth/free thread-length (SID/FTL) of the configuration that follows:
SHEET THICKNESS and fixing-bolt LENGTH.
This prevents damage or injury (breakage risk).

4.4 Installation options A–F for output shafts

4.4.1 Basic output shafts (BOS)

Installation options A–F show the (most) used connections (chain couplings/universal joints) of **basic output shafts (BOS)** to operated systems.



* M8 and M10 bolts with lock nuts (and related tightening torque) are recommended for the applicable configuration.

** D is supplied as two parts (chain, chain connector).

In this product manual shown illustrations can be different than the components and/or systems. For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.

4.4.2 Special output-shafts (D, LD, LK)

Installation options A–F are (possibly) also applicable, if necessary for the operated system, for models such as **D, LD** or **LK** (or other designations).

NOTE: Make sure that the configuration, together with the operated system, agrees with §1.3 “Warning about discouraged use” and §3.3 “Application” (intended use). Possibly approval from Ridder is necessary.



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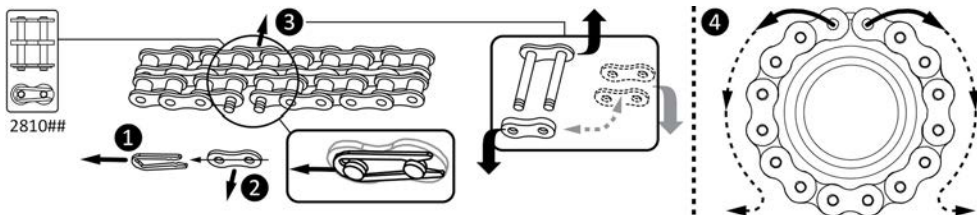
4.4.3 Installation chain (for A–D)

This section shows, for installation options A–D (if applicable), the installation of **chains** onto sprockets.

Preparing components

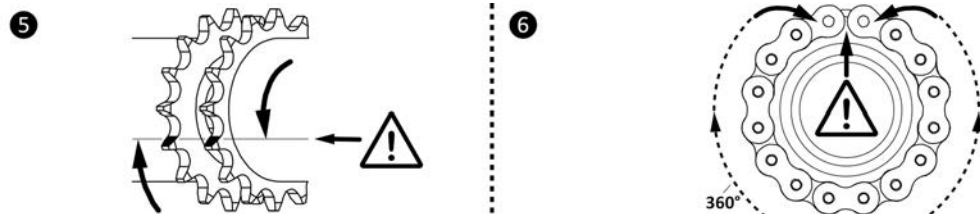
- Remove the chain connector (2810##) from the (installed) chain (1–3).
- If installed, remove the chain from the sprocket of the chain coupling (4).

1–4 Remove the chain connector (and the chain from the sprocket).



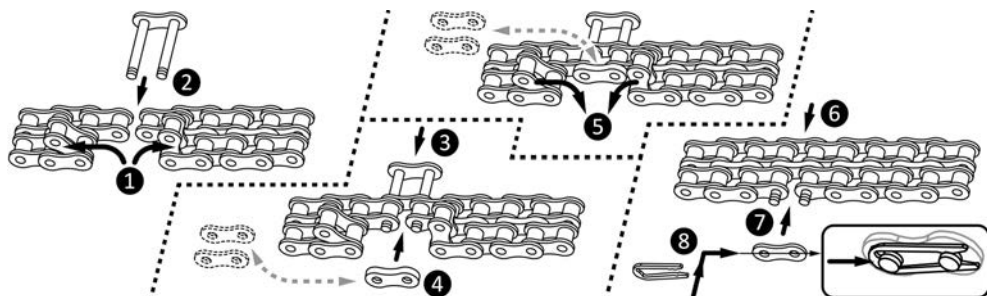
5 Turn the sprockets and make sure that the teeth are aligned.

6 Put the chain onto the sprockets with the chain ends at the top.



Install the chain

1–8 Install the chain connector and chain (on the sprockets).



Installation options G, H, I

G: Type A mounting plate installed between the motor gearbox and the TRA drive-unit.

Refer to §4.3: "Optional mounting plates", step ① A.

Do the steps ①, ② + ③, ④, ⑤ of the **two illustrations** that follow.

H: Foot mounting or top mounting of the on the motor gearbox installed TRA drive-unit.

Do the steps ①, ② + ④, ⑤ + ⑥ or ⑦ of the **two illustrations** that follow.

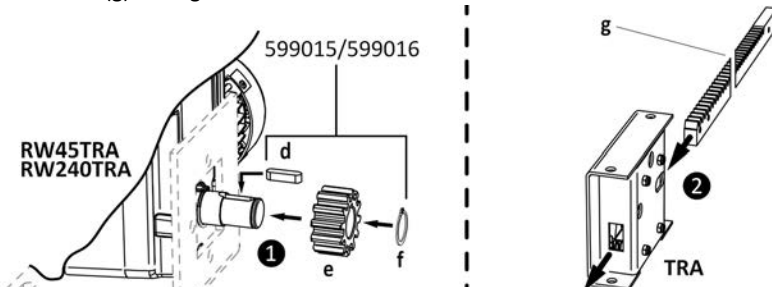
I: Wall mounting with the special wall mounting plate (417910/417953) of the on the motor gearbox installed TRA drive-unit.

Do the steps ①, ② + ④, ⑤, ⑧, ⑨ of the **two illustrations** that follow.

Preparing components (G, H and I)

① Install the shaft key (d), the pinion (e) and the retaining ring (f) onto the output shaft.

② Put the rack (g) through the TRA rack drive-unit.



Installation option G

Note: Possibly there is no mounting plate installed to the structure at this time. Install a (type A) mounting plate or an alternative to the structure first.

Refer to §4.3: "Optional mounting plates", step ① A.

③ Put the (type A) mounting plate (h) or an alternative between the gearbox and the TRA drive-unit.

④ Install the TRA rack drive-unit onto the gearbox (and mounting plate or alternative [h]) with the special M10 bolts ([i] 599015/599016).

⑤ Tighten the bolts (i) gradually with the correct tightening torque. Refer to **SID/SBI** information.

Installation option H

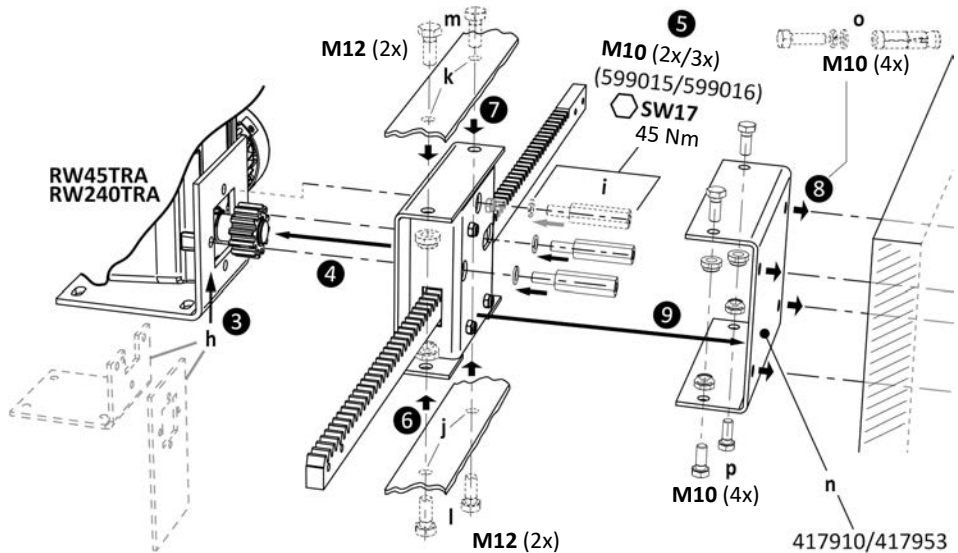
④ Install the TRA rack drive-unit onto the gearbox with the special M10 bolts ([i] 599015/599016).

⑤ Tighten the bolts (i) gradually with the correct tightening torque. Refer to **SID/SBI** information.

⑥/⑦ Drill two holes of Ø13mm for foot mounting (j) or top mounting (k) in the structure. Use M12 fasteners (l or m) to install the TRA system onto the structure. Obey the instructions for installation of M12 fasteners (l or m).

Installation option I

- ④ Install the TRA rack drive-unit onto the gearbox with the special M10 bolts ([i] 599015/599016).
- ⑤ Tighten the bolts (i) gradually with the correct tightening torque. Refer to **SID/SBI** information.
- ⑧ Install the wall mounting plate (n) onto the wall. Use four M10 fasteners ([o] wedge bolts or such) for the wall mounting. Obey the instructions for installation of M10 fasteners ([o] wedge bolts or such).
- ⑨ Install the TRA drive-unit to the wall mounting plate (n) with four M10 bolts (p) and lock nuts. Obey the instructions for installation of M10 fasteners (p).



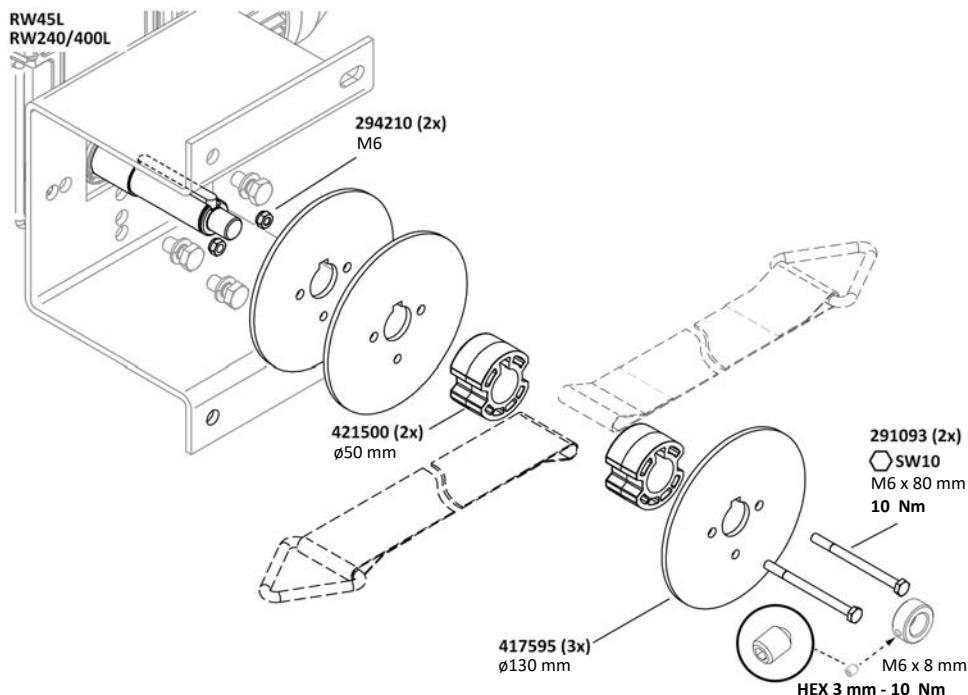
The TRA520 rack-drives have zinc-plated racks with different lengths. Attach the racks to coupling-plates, push-pull tubes, steel cables and/or such.

In this product manual shown illustrations can be different than the components and/or systems. For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.

4.6 Belt drum onto RW45\240/400-SD-L motor gearbox

Installation option J

Install the drum and belt (one or two [with triangle for example]) onto the RW45-SD-L or RW240/400-SD-L drive unit. Refer to the illustration that follows.

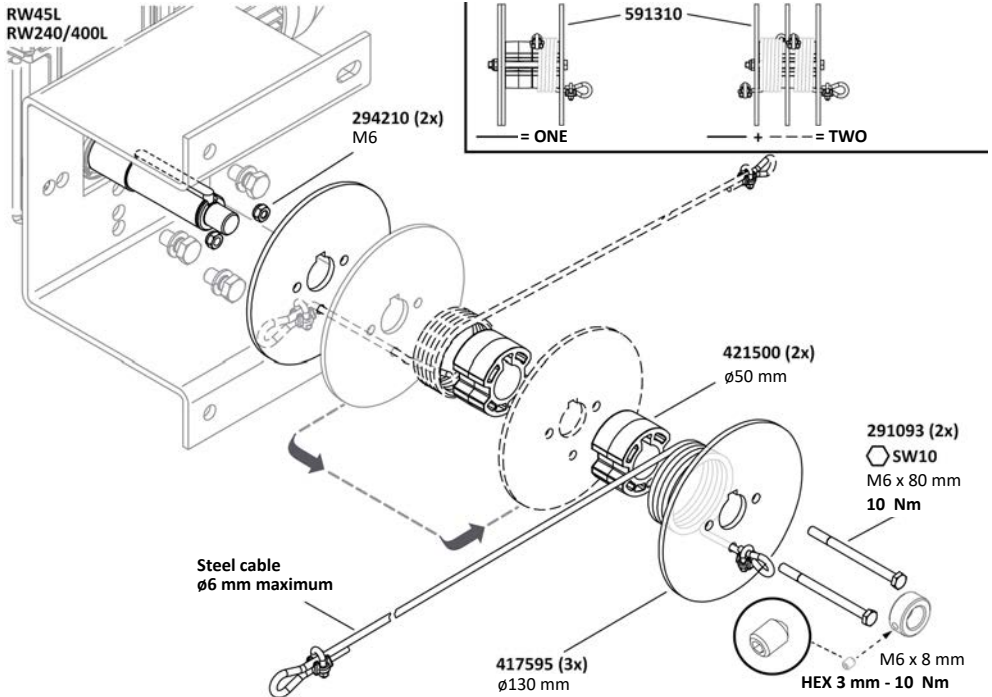


In this manual shown illustrations can be different than the components and/or systems. For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.

4.7 Cable drum onto RW45\240/400-SD-L motor gearbox

Installation option K

Install the drum and cable (one or two) onto the RW45-SD-L or RW240/400-SD-L drive-unit. Refer to the illustration that follows.



In this manual shown illustrations can be different than the components and/or systems. For more information on item numbers and models refer to the Ridder catalog or website at ridder.com.

Note: Ridder does not supply steel cables and steel cable clamps.

5. CONNECT INSTRUCTIONS

Only to approved personnel it is permitted to do the connect instructions.

This chapter tells about the connect instructions without connected SD panel unit (PU). Refer to the PU product manual if an SD panel unit is connected.

The RW-SD motor gearboxes are applicable for use in an industrial environment where electromagnetic interference can have an effect. Usually correct connection makes sure that functional operation is safely possible without problems. Make sure that the connections obey EMC-conformity.

- When you put the cables, make sure that **water flows away** from the motor gearbox (make loops if necessary). Refer to §5.2 "Cable glands".

- Make sure that the **cable routing** to the circuit board (A2) keeps the sensor unit (**SU***) mechanically **tension-free**. Also make sure that cables **cannot** become **caught** when the closing cover (A3) is closed. Refer to §7.5 and §5.2 “Cable glands”.
* Only RW45-SD and RW240–600-SD series.
- Make sure that during connection work all phases of all power connections (power supply) are **de-energized**.



The power supply of the motor gearbox can directly or not directly put the drive unit into movement. This can also cause an electric shock which can kill you if electrical components are touched.



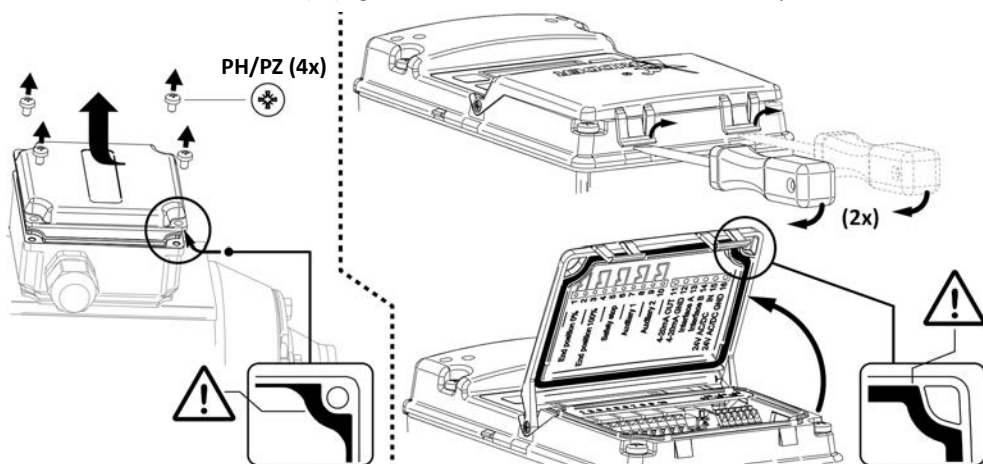
Do not use materials such as tin or solder on cables (where the insulation is removed) that can cause the cable strands to break.

Mains-voltage loop-connection

If a mains-voltage loop-connection is used, make sure that connection terminals, plug connectors and cables are sufficient for the permitted current load. If you do not obey this instruction thermal damage to components or adjacent objects can occur.

5.1 Removal-Opening covers

- Remove the bolts (4x). Use a flat tool to unlock the closing cover. Remove and open the covers (2x) temporarily to do all necessary work. The gaskets (2x) usually stay in their position.
- Make sure that no damage is caused to the gaskets and that they do not become dirty.
- Install and close the covers (2x) again after the work! Refer to the end of chapter 7.



In this product manual shown illustrations can be different than the components and/or systems.

5.2 Electrical material

A minimum conductor cross-section of 1.5 mm² is applicable to the cables in the general wiring diagrams. The table that follows gives the necessary conductor cross-section and maximum cable length for the different cables and voltages.

Cable	Voltage	Minimum conductor cross-section	Maximum cable length at 24 V DC
Power cable	24 V DC	1.5 mm ²	30 m
		2.5 mm ²	50 m
Control cable	0-24 V DC	0.75 mm ²	

Note: If **longer** cable lengths are necessary, **increase** the **supply voltage** of the SD Unit to prevent voltage drop.

- **Conductor cross-section 1.5 mm²:** Increase 1 V DC for each 10 m of cable length added to the maximum in the table.
- **Conductor cross-section 2.5 mm²:** Increase 1 V DC for each 15 m of cable length added to the maximum in the table.

For the used components, electrical material and cable lengths the necessary conductor cross-section can be different.



**Use only applicable components and electrical material.
Always refer to the related information and manuals.**

- Motor-current connection through the SD end position system is **not permitted!**

The end position system (circuit board A2) is applicable for the currents that follow:

- **50 mA–500 mA** at 24 V AC/DC
- A **maximum** of **100 mA** at 115–240 V.



The SD end position system is NOT applicable for motor-current connection through the switching contacts.

Cable glands

The RW-SD motor gearbox has (installed) cable glands M20x1.5 mm and/or M16x1.5 mm to put through the motor connections (EM) and other cables.

The conditions and starting points that follow are applicable:

- Always put only **one cable** through **one cable gland**.
- Use a cable with a conductor-diameter of:
 - **Ø6.0–12.0 mm** and a tightening torque of **5.0 Nm** for cable glands **M20x1.5 mm**
 - **Ø5.0–10.0 mm** and a tightening torque of **2.5 Nm** for cable glands **M16x1.5 mm**.
- Make sure that water **flows away** from the cable glands (cable routing: make loops if necessary).

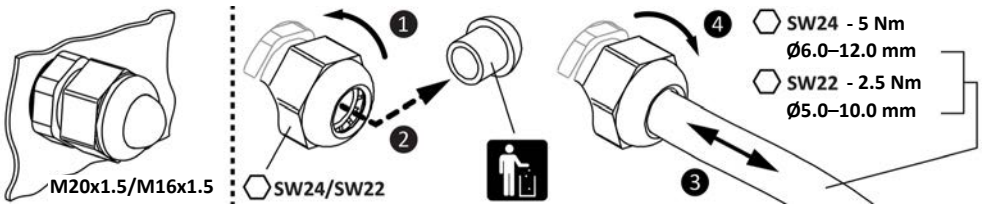


Make sure that all openings are correctly sealed with cable glands or with initially installed blind plugs. This prevents problems with moisture and/or the IP protection rating.

Obey the procedure that follows:

- 1 Loosen the cable gland.
- 2 Remove the sealing plug*.
- 3 Put the cable through the cable gland.
- 4 Tighten the cable glands with the correct tool and tightening torque.

* If your decision is not to use this cable gland, make sure to put the sealing plug back. Tighten the cable gland with the correct tool and tightening torque!



5.3 Protection - Conditions and starting points

The conditions that follow are applicable to the wiring diagrams.

- The installer makes sure that necessary and not shown protections are used and included in the wiring diagrams.
- Make sure that you can see the operated system from all control units and control systems. Put control units and control systems at a height that agrees with applicable standards and guidelines.
- Protect the electric connections from moist conditions.
- Obey the applicable standards, guidelines and/or wiring guidelines for electrical connections.



WARNING

Electrical connections are **only permitted to an electrical installer or an electrician.**



WARNING

A fully and correctly connected wiring diagram is necessary. It is mandatory to connect all safety contacts and duty contacts.



WARNING

ELECTRIC SHOCK

There can be dangerous voltages, also when the drive unit is not in operation.



CAUTION

For installation work, connection work and maintenance work the system must be de-energized.



CAUTION

Make sure that each electric motor (EM) is stopped (only) with its own end position system. This prevents the risk of incorrect control, an incorrect direction-of-rotation or incorrect operation of end position systems of different electric motors.



ATTENTION

The installer sets the Motor-Protection Circuit-Breaker (MPCB[Q41]) to the value of the nominal current of the electric motor.



ATTENTION

Always make sure that the protections comply with the, local or national, laws and regulations of the country.

Induction

Problems with induction must be prevented. Induction can cause an interference with the electronics.

Induction can have many causes such as:

- Cable lengths
- External sources
- Too many cables together.



Separation of cables is necessary. This prevents problems with induction.

EMC Interference

Problems with electromagnetic interference must be prevented. For a correct functional operation possibly precautions, such as an EMC mains-filter, are necessary.

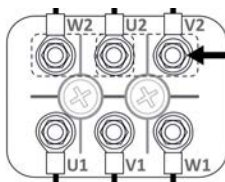


It is necessary to obey EMC-conformity. This prevents problems with electromagnetic interference.

To prevent electromagnetic interference and for a correct functional operation of the components:

- Use a metal control cabinet. Make sure that the control cabinet and the doors have a good ground connection.
- Use cables that have the correct dimensions for the load.
- Use shielded twisted-pair cables for control signals. Do not use the shields for common connections (CM).
- Do the routing of each cable for control signals together with the related common cable.
- Connect each ground connection to the system ground (metal control cabinet is recommended). Use the shortest and thickest cables as possible.
- Connect the ground connections of the cable shields as follows:
 - Connect the cable shields to the system ground (metal control cabinet is recommended). Make sure that the shields only go to ground at one end of the cable. This end of the cable must go to the components.
 - Make sure that shield connections are as short as possible.
 - Make sure that the shields do not divide when the length of shielded cables is increased.

5.4 Tightening-torque motor-connections



SW7\M4
2 Nm!
(6x)

SW8\M5
3 Nm!

Tighten the motor connections with the correct tightening torque!

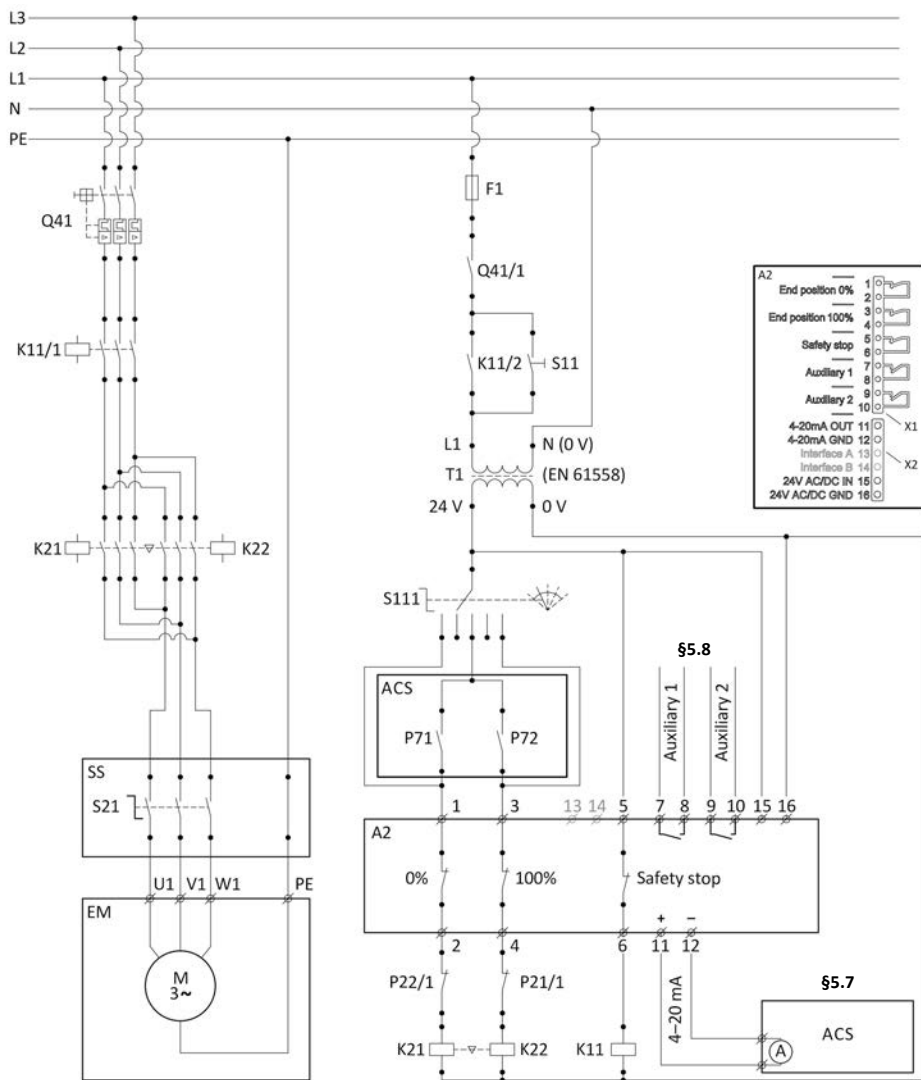
- M4 connections: 2 Nm
- M5 connections: 3 Nm.



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5.5 Control-circuit connection



WARNING

Connect all safety contacts (Safety stop) and duty contacts (0%/100%). This is necessary for safety and correct functional operation. Connections: 1–6

5.6 Change direction-of-rotation

If necessary, it is possible to change the direction-of-rotation.



TIP

Change direction-of-rotation (diagram §5.5):
Interchange U1 and V1 on the terminal block (EM).

5.7 Automatic Control (ACS) (24 V AC/DC)

You can connect the SD unit (SDU) to an automatic control-system (ACS). Refer to the general diagram (§5.5) and connect the ACS. Also refer to the product manual of the ACS that is used.

For the enabled 4–20 mA feedback:

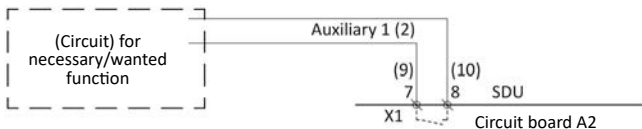
- An own power supply is **not** necessary. The power supply is received from the SD unit (SDU)
- Is the feedback signal **prepared** and **available** to measure.

5.8 Auxiliary 1/2 (SDU)

You can connect and set (§12.2) the auxiliary contacts (Auxiliary 1 and 2) for the **three functions** that follow.

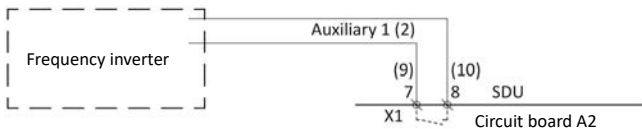
1. Setpoint: enabled auxiliary contact

If necessary, connect and set (refer to §12.2.1) the auxiliary contact (Auxiliary 1 or 2), to use (in a circuit) for a necessary or wanted function.



2. Frequency limiter

If necessary, connect and set (refer to §12.2.2) the auxiliary contact (Auxiliary 1 or 2), to enable the input for high speed of a frequency inverter.



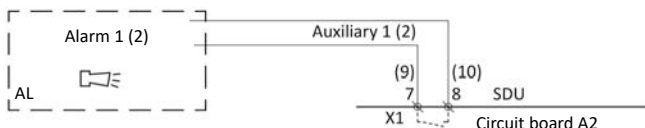
3. Fault contact

As a **minimum** it is **recommended** to connect and set (refer to §12.2.3) Auxiliary 1 or 2 to use the **fault contact** function.

Connect the fault contact (Auxiliary 1 or 2) to an alarm circuit, alarm unit or alarm input of a control system. The fault contact is opened during normal operation and closes when a random fault occurs. You can connect one or more SD units.

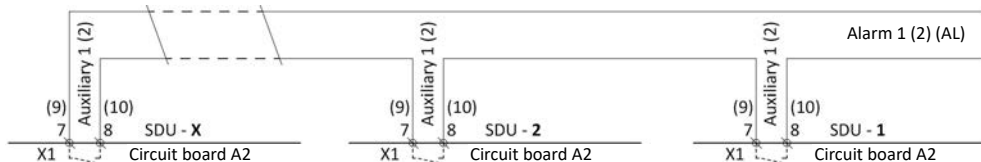
Connecting - One SD unit

Obey the diagram that follows to connect one SD unit (SDU).



Connecting - Two or more SD units

Obey the diagram that follows to connect the fault contacts to two or more SD units (SDU).



6. USER INSTRUCTIONS

If work becomes necessary when you use the drive unit (normal operation), **approved personnel** usually must do the work.

6.1 Usage - Conditions and starting points

The conditions and starting points that follow are applicable when you use the RW-SD motor gearbox.

Automatic Control



The motor can start and stop automatically without a warning. Persons can be in danger of life if they touch a system that is in operation.

Temperature



A drive unit can get high temperatures. If necessary take protective precautions to prevent injuries.

SAFETY STOP



When a “safety stop” (safety contact) occurs:

- Do a check of the condition of the operated system. Make sure that the system can be safely operated.
 - If necessary: Set the end positions again.
- This prevents damage or injury.

6.2 Operation RW-SD motor gearbox

The RW-SD motor gearboxes are usually used in automated systems.

Operation is possible with:

- An external **manual control** (MC)
Note: Only when **no** SD panel unit (PU) is connected.
- The **control screen** (CS) on the SDU cover (A1)
Note: Motor control only when SD panel unit (PU) is connected.
- The **SD panel unit** (PU):
 - INTERNAL - **Manual control** (knob S8)
 - EXTERNAL - **Automatic control** (ACS) or **Modbus control** (PLC)

Note: SD-PU is only enabled after commissioning (“in operation”). Make sure that the SD panel unit (PU) has the correct DIP-switch configuration (for Modbus control). Refer to the PU product manual.

- The **SD app** on a Smartphone

Note: Motor control and copy function only enabled after commissioning (“in operation”) **and** when SD panel unit (PU) is connected. Refer to the PU product manual.

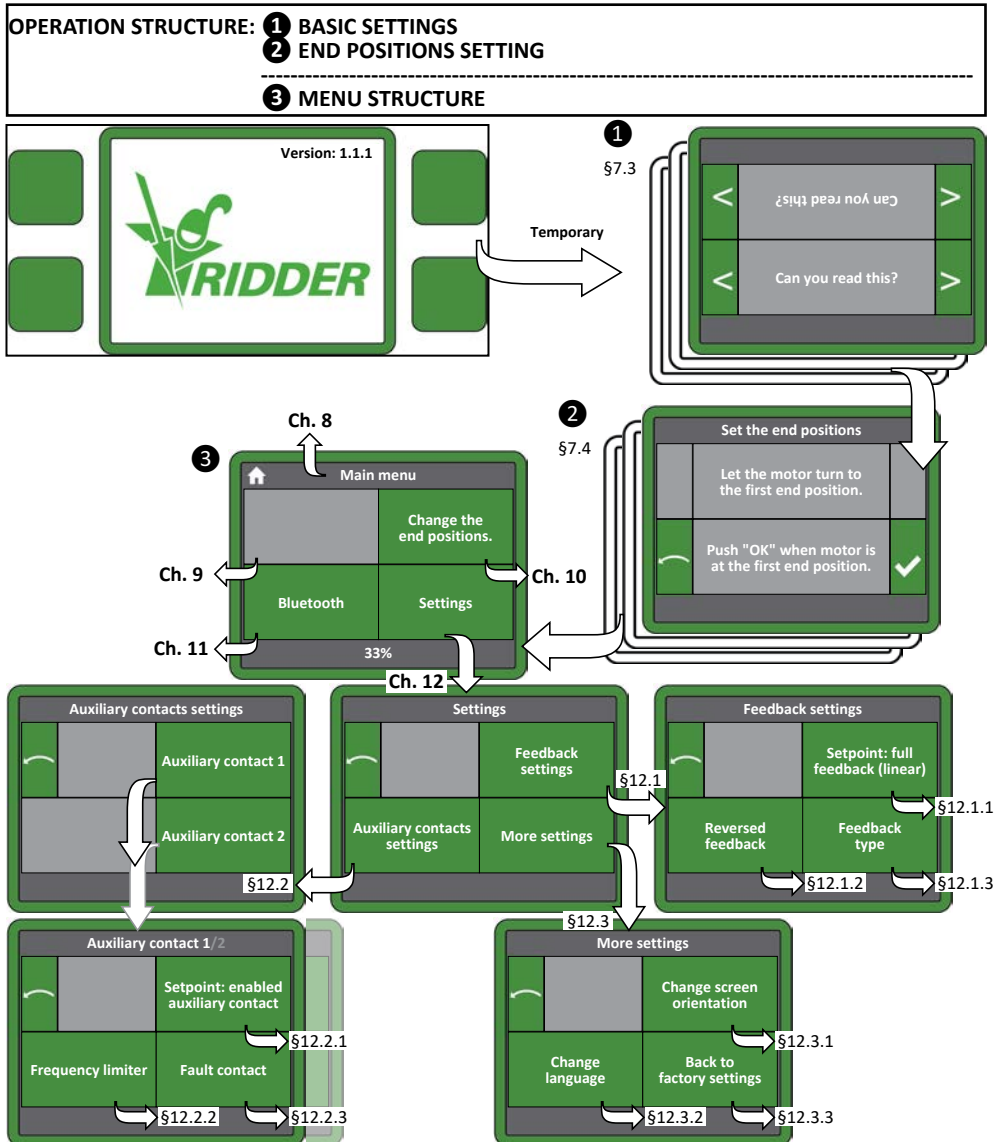
Refer to the Ridder catalog or website **ridder.com** for more information. Always refer to the related information and manuals (ACS and control components).



6.3 Operation Structure - SD Control Screen (CS)

The diagram that follows shows the three parts of the Operation Structure and related sections in this manual (**no** SD panel unit connected).

- **Basic Settings ①** and **End Positions Setting ②** are part of “**Commissioning**”.
- After commissioning, or “**in operation**” (normal operation), the “**Main Menu**” of the **Menu Structure ③** becomes enabled. Refer to Chapter 8.

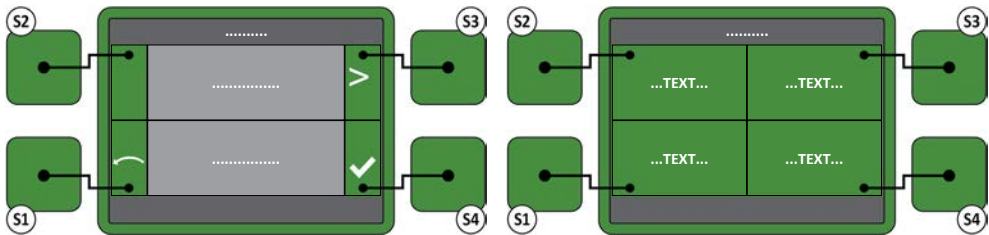


6.4 Operating options: Commissioning - Normal Operation

This section tells about the operating options during commissioning or “normal operation”.
The SDU cover has **four pushbuttons** (S1–S4). The buttons are related to the nearest green field* (empty, with symbol or text) on the control screen.

The pushbuttons can become enabled for:

- Motor control (only if an SD panel unit is connected)
- Selection of operating functions (refer to §6.5)
- Menu selections.



- * 1. When nearest fields are **green**, the related buttons are **enabled**.
- * 2. When nearest fields are **not green**, the related buttons are **not enabled**.

6.5 Operating functions: Commissioning - Normal Operation

This section tells about the operating functions during commissioning or “normal operation”.

Function	Description
	“BACK” selection with related button (S1–S4)
	“OK” selection with related button (S1–S4)
	Selection/Control with related button (S1–S4)
	Menu/Text field selection with related button (S1–S4)

Other symbols (no selection)					
	“Home”: Main Menu		Locked screen		Canceled
			Unlocked screen		Confirmed (OK)



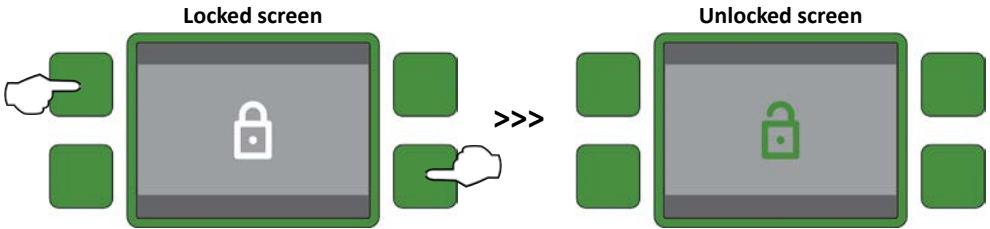
Screen lock

The control screen locks automatically:

- When SD unit is energized
- After a period when there is no operation of the control screen.

Unlock screen

To unlock, push crosswise and at the same time two pushbuttons (S1–S4) for a number of seconds.



6.6 Safety functions and stop functions

The RW-SD motor gearbox has the safety functions and stop functions that follow:

1. Stop at a set end position when a duty contact (0% or 100%) is opened.
2. Stop when the safety contact is opened if a duty contact (0% or 100%) not opens.
3. Stop when not operated and then lock the output shaft because of a self-braking worm-gear transmission.
4. Give App information for predictive maintenance and better safety and reliability.

7. COMMISSIONING INSTRUCTIONS

The commissioning is only permitted to approved personnel.

7.1 Commissioning - Conditions and starting points

- It is important to fully know the working principle of the end position system in §7.2.
- After that obey the procedure in §7.3.



WARNING

Make sure that there is no blockage of the system before the end position system is set. This prevents damage or injury.



CAUTION

Do not go across the limits of the system. This prevents damage or injury.



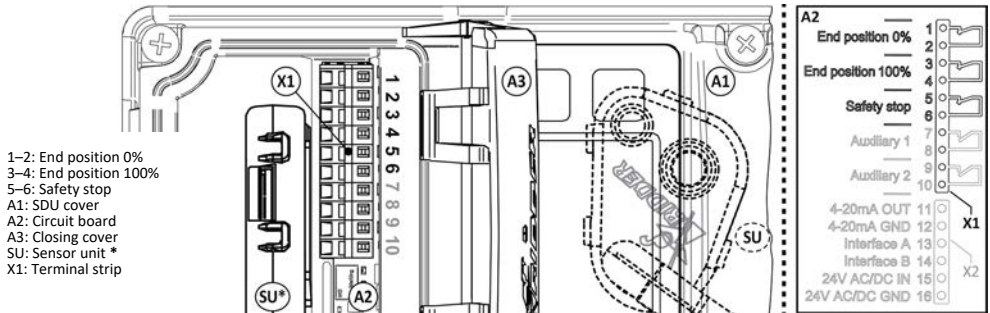
ATTENTION

Before the system is put into operation, the installer must always make sure that the end position system is correctly set.

7.2 End position system

This section tells about the end position system without connected SD panel unit (PU). Refer to the PU product manual if an SD panel unit is connected.

The SDU circuit board (A2) has two duty contacts (0%/100%) and one safety contact (Safety stop). A built-in sensor unit (SU) gives position feedback to the SD system.



* The illustration shows two sensor units (SU), but SD motor gearboxes have only one sensor unit. Only the RW45-SD and RW240–600-SD series have the mounting location SU*.

The switching range is 55, 88, 100, 110, 155 or 1100 revolutions of the drive shaft. The range is related to different models of motor gearboxes.

The drive unit can turn freely, before it is electrically connected **or** until the end positions are set, in the two directions. This can **cause damage** to the operated system when the motor is manually operated or is operated with electric tools!



Do not go across the limits of the operated system when the motor is operated manually or is operated with electric tools (with the hexagon socket in the electric-motor shaft). This prevents damage or injury.

CURRENT (I) IN THE CONTROL CIRCUIT

The end position system (circuit board A2) is applicable for the currents that follow:

- 50 mA–500 mA at 24 V AC/DC
- A maximum of 100 mA at 115–240 V.

CONNECTIONS AND FUNCTIONAL OPERATION

The end position system has six connections (1–6) on the terminal strip X1.

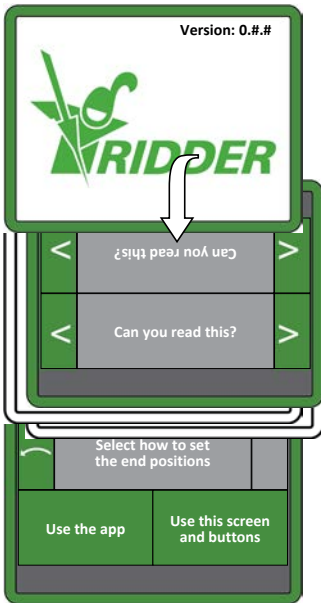
- Starting point for a correct connection and functional operation is the wiring diagram in §5.5, §5.6 or §5.7. **NOTE: The switching contacts in these diagrams show an energized system, within the range-of-travel.**
- Connection of the safety contact and duty contacts is **mandatory**.

WORKING PRINCIPLE

- The gearbox operates the shaft with installed sensor unit (SU), this gives position feedback to the SD system.
- The digitally set (refer to §7.4) end position (0% or 100%) is sensed when the operated system is at an end position.
- Then the end position system **opens** the **duty contact** (0% or 100%). The motor gearbox **stops**.
- If because of a **malfunction** a duty contact **not** opens, then the **safety contact opens**. This makes sure the motor gearbox stops (**safety stop**). It prevents consequential damage to the system.

7.3 Commissioning - Basic Settings [1]

- Before you can set the system (End Positions Setting), a number of basic settings are necessary.
- After the SD unit is connected and energized, the system always starts with the temporary screen that follows.
- Obey the steps on the control screen (CS).



Procedure

1. Set screen orientation

- “Can you read this?” (“Can you read this?”) is shown **two** times.
- Select the best screen orientation for easy readout.

2. Select your language

Select your language   and push “OK” when language is selected.

NO SD PANEL UNIT CONNECTED:

3. Go to the next screen “Set the end positions” (automatically enabled). Refer to §7.4.

SD PANEL UNIT CONNECTED:

3. Select how to set the end positions (“Use the app” or “Use this screen and buttons”).

Use the app:

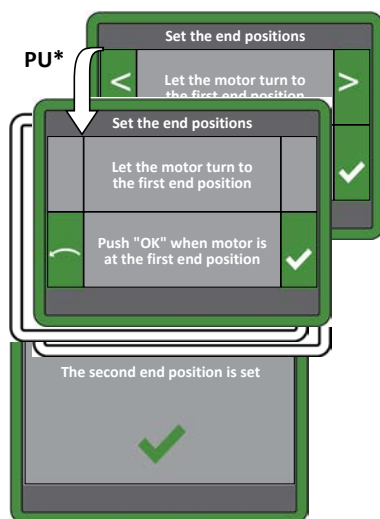
4. Use the SD app on a Smartphone to connect.
Refer to the app for instructions.

Use this screen and buttons:

4. Go to the next screen “Set the end positions” (automatically enabled). Refer to §7.4.

7.4 Commissioning - End Positions Setting [2]

- The first screen is automatically enabled after “Basic Settings”.
- Obey the steps on the control screen (CS).



Procedure

1. **Control to the first end position.**
2. **Selection of the percentage (0% or 100%) and first end position setting.**
3. **Control to the second end position.**
Note: The button “OK” only becomes **enabled** when the displacement is sufficient.
4. **Second end position setting (100% or 0%).**
The Main Menu is enabled. Refer to Ch. 8.

* Applicable screen when an **SD panel unit (PU)** is connected.



WARNING

Do a functional check of the end position system (SDU circuit board [A2] or PU circuit board [A5]) after the two end positions are set.



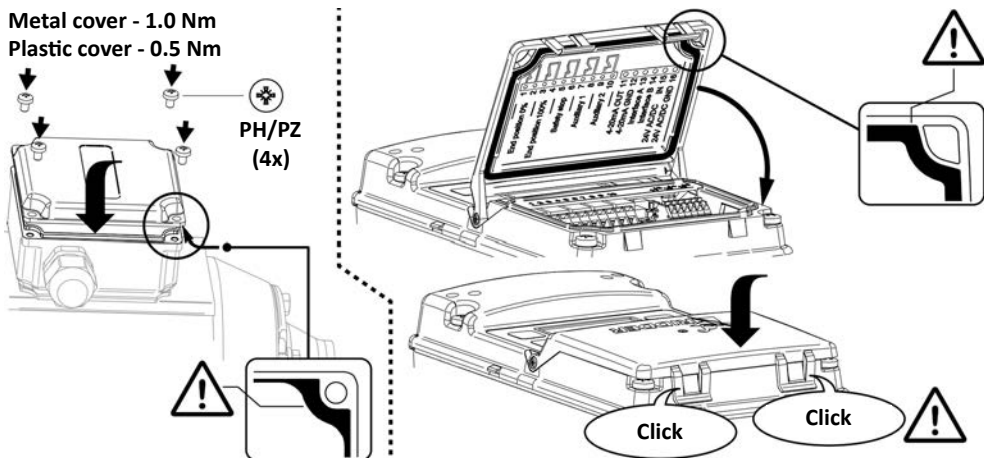
CAUTION

Do not go across set end positions when the motor gearbox is operated manually or with electric tools (externally with the hexagon socket in the electric-motor shaft).
This prevents damage to the operated system.

7.5 Installation-Closing covers

Always put the covers (2x) and the bolts (4x) back after the work. **Problems with moisture and/or the IP protection rating (if applicable) must be prevented!**

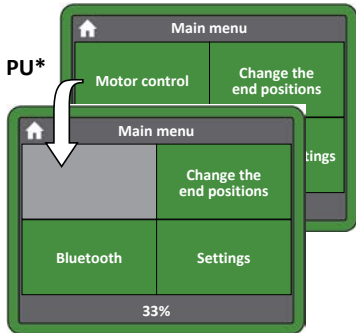
- Do a check of the gaskets (2x) for dirt and damages.
- Put gaskets (if removed) back carefully and make sure that no damage is caused.
- Make sure that **cables do not touch mating surfaces** and do not become **caught** during installation. This prevents damage to the cables and is specially important for the closing cover and the **SDU** cover!
- Tighten the bolts crosswise and gradually with the correct tightening torque (4x).
- Push the closing cover and make sure that it closes with a **click** (2x).



In this product manual shown illustrations can be different than the components and/or systems.

8. MAIN MENU

- The Main Menu is automatically enabled after “Commissioning”.
- When an SD panel unit is connected (PU*), “Motor control” becomes enabled.
- Make a selection (if necessary) and obey the steps on the control screen (CS).



Motor control *

Refer to Ch. 9.

Change the end positions

Refer to Ch. 10 (only approved personnel).

Bluetooth

Refer to Ch. 11.

Settings

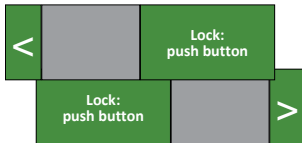
Refer to Ch. 12.

* Applicable screen when an **SD panel unit (PU)** is connected.

9. MOTOR CONTROL

Main menu: **Motor control**

- Motor control of the SD unit with the **control screen (CS)**.



Hold-to-run operation:

Push and hold the button or .

Start-Stop operation:

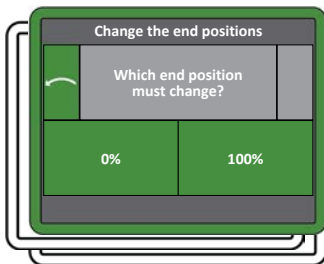
Push the buttons or and “Lock: ...”, at the same time, then release the two buttons. Push **one** button (S1–S4) to **stop** control.

- Motor control is also possible with the SD panel unit (PU). Refer to the PU product manual.
- When an SD panel unit is connected, motor control is possible with the SD app on a Smartphone. Refer to the app for instructions.
- When no SD panel unit is connected an external manual control (MC) is necessary.

10. CHANGE THE END POSITIONS

Main menu: **Change the end positions**

To change the end positions is only permitted to approved personnel. Obey the steps (if necessary) on the control screen (CS).



Procedure

End position 1:

1. **Select which end position must change (0% or 100%).**
2. **Erase the selected end position.**
3. **Control to the new end position.**
Note: The button “OK” only becomes **enabled** when the **displacement is sufficient**.
4. **New end position setting**



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End position 2:

5. **Select which end position must change (100% or 0%).**
6. **Erase the selected end position.**
7. **Control to the new end position.**

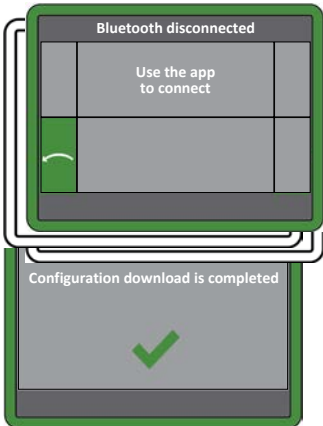
Note: The button "OK" only becomes **enabled** when the **displacement is sufficient**.

8. **New end position setting**

11. BLUETOOTH

Main menu: **Bluetooth**

Obey the steps (if necessary) on the control screen (CS).



Procedure

1. **Use the SD app on a Smartphone to connect.**
Refer to the app for instructions.

NO SD PANEL UNIT CONNECTED:

2. **App:** Read out SmartDrive information (Data/Statistics).

SD PANEL UNIT CONNECTED:

2. **App:** Control the motor with the manual control screen.
3. **App:** Read out SmartDrive information (Data/Statistics).
4. **App:** Copy range-of-travel configurations of the first set SD unit to other units.

To **copy** range-of-travel configurations is only permitted to **approved personnel**.

12. SETTINGS

If necessary (§12.2), remove or open covers to do the work. Refer to chapter 5. Always put removed or opened covers back after the work! Refer to the end of chapter 7.


Also put covers back when work or procedures are not completed temporarily (a known or unknown period).

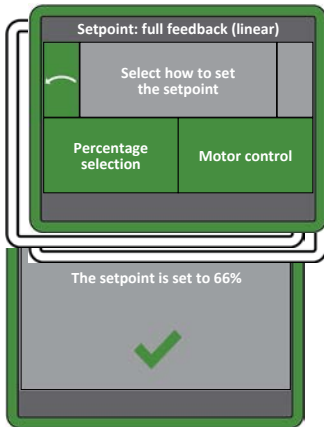
12.1 Feedback settings

Main menu: **Settings\ Feedback settings**

Changes to feedback settings are only permitted to approved personnel.

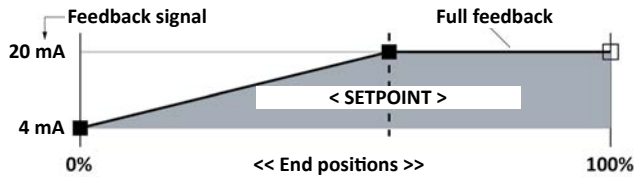
12.1.1 Setpoint: full feedback (linear)

Main menu:  Settings\ Feedback settings\ Setpoint: full feedback (linear)\



Setpoint

If necessary, set a position (setpoint) where to get to the full feedback signal.



Obey the steps (if necessary) on the control screen (CS).

Procedure

1. Select how to set the setpoint (percentage selection or motor control).

Percentage selection:

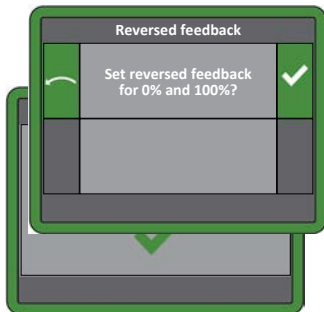
2. Select the wanted percentage of the setpoint.
3. Wanted position setting

Motor control:

2. Control to the wanted position.
3. Wanted position setting

12.1.2 Reversed feedback

Main menu:  Settings\ Feedback settings\ Reversed feedback\



Reversed feedback

If necessary, change the feedback signal of the 0% end position and 100% end position to opposite values (4mA or 20mA).

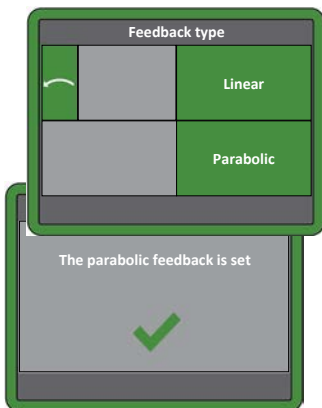
Obey the steps on the control screen (CS).

Procedure

1. Set the reversed feedback.

12.1.3 Feedback type

Main menu:  Settings\ Feedback settings\ Feedback type\



Linear

If necessary, set the linear feedback signal which gets to the full feedback signal at an end position.



Parabolic

If necessary, set the parabolic feedback signal to use for a necessary or wanted function.

Note: This function is **not** enabled at this time. Select “Linear”.

ObeY the steps on the control screen (CS).

Procedure

1. Select the wanted feedback type (linear or parabolic)

12.2 Auxiliary contacts settings


Main menu:  Settings\ Auxiliary contacts settings\

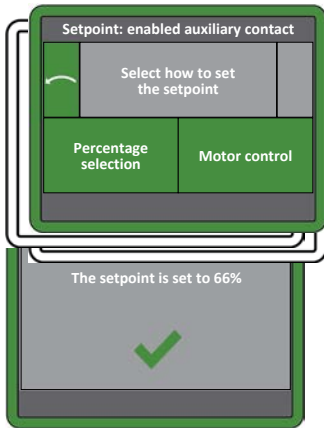
Changes to auxiliary contacts settings are only permitted to approved personnel.

Note: The “Auxiliary contacts settings” are set for “Auxiliary 1/2” of the SD unit (SDU) and “Auxiliary contact 1/2” of the SD panel unit (SD-PU).

It is possible that, for better cable routing (shorter cable lengths), “Auxiliary 1/2” of the SDU or “Auxiliary contact 1/2” of the SD-PU is connected. Refer to the PU product manual.

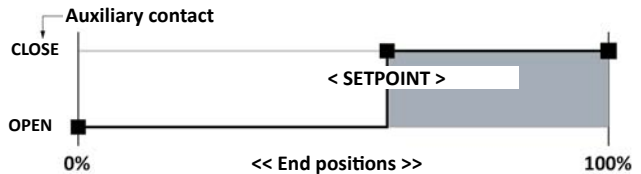
12.2.1 Setpoint: enabled auxiliary contact

Main menu:  Settings\ Auxiliary contacts settings\ Auxiliary contact 1/2\
Setpoint: enabled auxiliary contact\



Setpoint

If necessary set a position (setpoint), where the auxiliary contact must close, to use (in a circuit) for a necessary or wanted function.



Obey the steps (if necessary) on the control screen (CS).

Procedure

1. Select how to set the setpoint (percentage selection or motor control).


Percentage selection:

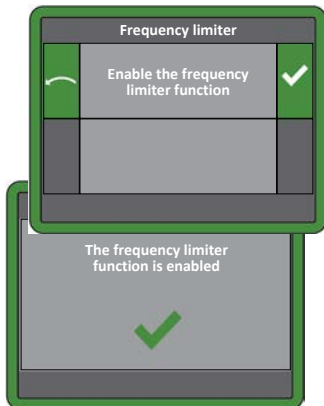
2. Select the wanted percentage of the setpoint.
3. Wanted position setting

Motor control:

2. Control to the wanted position.
3. Wanted position setting

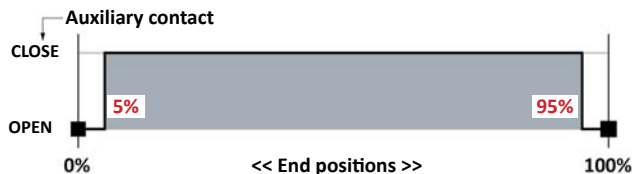
12.2.2 Frequency limiter

Main menu:  Settings\ Auxiliary contacts settings\ Auxiliary contact 1/2\
Frequency limiter\



Frequency limiter

If necessary, enable the frequency limiter function to enable the input for high speed of a frequency inverter.




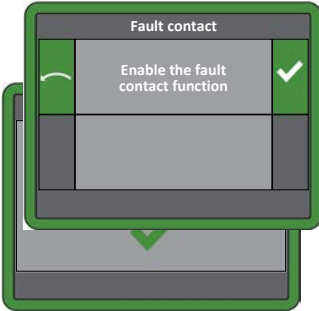
Obey the steps on the control screen (CS).

Procedure

1. Enable the frequency limiter function.

12.2.3 Fault contact

Main menu:  Settings \ Auxiliary contacts settings \ Auxiliary contact 1/2 \ Fault contact \



Fault contact

If necessary, enable the fault contact function to connect to an alarm circuit, alarm unit or alarm input of a control system.

The fault contact is opened during normal operation and closes when a random fault occurs.

Obey the steps on the control screen (CS).


Procedure

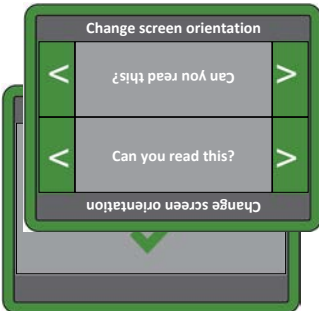
1. Enable the fault contact function.

12.3 More settings

Main menu:  Settings \ More settings \

12.3.1 Change screen orientation

Main menu:  Settings \ More settings \ Change screen orientation \



Change screen orientation

If necessary, select the best screen orientation for easy readout.

“Can you read this?” is shown two times.

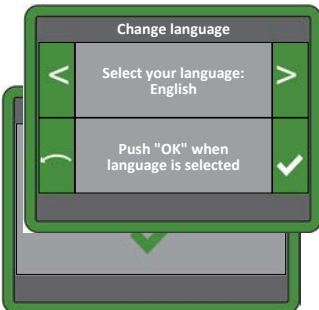
Obey the steps on the control screen (CS).

Procedure

1. Select the wanted screen orientation.

12.3.2 Change language

Main menu:  Settings \ More settings \ Change language \



Change language


If necessary, make a selection from a number of available languages.

Obey the steps on the control screen (CS).

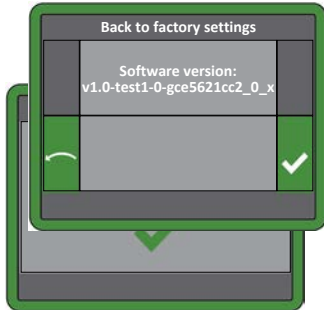
Procedure

1. Select your wanted language.
2. Push “OK” when language is selected.

12.3.3 Back to factory settings

Main menu:  Settings\ More settings\ Back to factory settings\

To set factory settings is only permitted to approved personnel.



Back to factory settings

If necessary, go back to factory settings. The software version is shown on the screen.

Obey the steps on the control screen (CS).

Procedure

1. Push “OK” to set the factory settings again.

13. MAINTENANCE INSTRUCTIONS

Inspection and maintenance work is only permitted to approved personnel. If necessary remove or open covers to do the work. Refer to chapter 5.

For safe and correct maintenance, read (if necessary) the (applicable) sections of:

- Chapter 2, chapter 6, chapter 7, chapter 14 and chapter 15.

Always **put** removed or opened **covers back** after the work! Refer to the end of chapter 7.

13.1 Maintenance

Maintenance on the RW-SD motor gearbox is usually not necessary (“maintenance-free”).

Maintenance RW45-SD

It is recommended to do the checks that follow every 6 months:

- Of the correct operation of the drive unit and the system
- For a satisfactory view of possible malfunctions and easy access to the display
- For error message screens
- For **grease** leakage. Tell your installer if there is a leakage
- Of the mechanical condition (wear and tear, output-shaft connections to the operated system, connectors, connection terminals, fasteners, correctly attached and such)
- Of the set end positions (are they still correct for the system?)
- Of the **app** information for **predictive maintenance** of the operated system.

Maintenance RW240/400/600-SD \ RW800-SD \ RW1000/1200/1400/1600/2000-SD \ RW70/100/140/200-SD

Installation: After installation interchange the plug in the highest position with the vent plug!

It is recommended to do the checks that follow every 6 months:

- Of the correct operation of the drive unit and the system
- For a satisfactory view of possible malfunctions and easy access to the display
- For error message screens
- For **oil** leakage (or **grease** leakage*). Tell your installer if there is a leakage



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- Of the mechanical condition (wear and tear, output-shaft connections to the operated system, connectors, connection terminals, fasteners, correctly attached and such)
 - Of the set end positions (are they still correct for the system?)
 - Of the **app** information for **predictive maintenance** of the operated system.
- * If a selection from more mounting positions is necessary, RW240-SD motor gearboxes are also available filled with grease. Refer to §4.1.

Contact your supplier if:

- Replacement of parts is necessary
- A problem is found with no solution. Refer to chapter 14 first.

Refer to the Ridder catalog or the website at **ridder.com** for more information about spare parts (or accessories) that are available. Also refer to available documentation (maintenance instructions) at **ridder.com** of the Ridder products in the operated system.

14. SERVICE

If necessary remove or open covers to do the work. Refer to chapter 5.

For safe and correct servicing, read the (applicable) sections of:

- Chapter 2, chapter 6, chapter 7 and chapter 15.

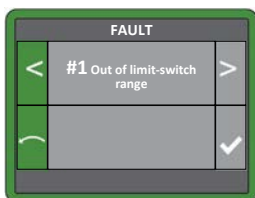
Always **put** removed or opened **covers back** after the work! Refer to the end of chapter 7.

14.1 Troubleshooting

Troubleshooting is only permitted to approved personnel. This section tells about possible malfunctions and their solutions. If a malfunction is not in the list that follows, contact your supplier.

ERROR-MESSAGE SCREENS

Error message 1



Error message 2-7



ERROR-MESSAGE SCREEN 1

Fault 1 **Fault during end positions setting.**

Observation 1 **#1 Out of limit-switch range***

Cause 1 Motor control, manual operation (with [electric] tools and hexagon socket in the shaft of the electric motor) or control with bridged circuit (**discouraged** use!) goes across the maximum position of the range-of-travel.

Solution 1 Control back until motor is within range.

* = switching range

ERROR-MESSAGE SCREEN 2–7 [malfunction 2–7]**Malfunction 2 Malfunction after Fault 1 during end positions setting.**

Observation 2	#2 Out of limit-switch range* plus safety margin
---------------	---

Cause 1	Manual operation (with [electric] tools and hexagon socket in the shaft of the electric motor) or control with bridged circuit (discouraged use!) goes across the maximum position of the range-of-travel plus the safety margin.
----------------	---

Solution 1	Operate back manually or control back until motor is within range.
------------	--

* = switching range

Malfunction 3 It is not possible to complete the copy function.

Malfunction 4	It is not possible to complete the copy function.
---------------	---

Observation 3	#3 Incorrect range-of-travel configuration
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Observation 4	#4 Incorrect range-of-travel configuration
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Cause 1	Bluetooth transmits range-of-travel configuration incorrectly.
----------------	--

Solution 1	Do the download and upload procedures again.
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Malfunction 5 It is not possible to complete end positions setting.

Malfunction 6	It is not possible to complete end positions setting.
---------------	---

Observation 5	#5 Internal fault
---------------	--------------------------

Observation 6	#6 Unknown internal fault
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Cause 1	There is an internal fault in the system.
----------------	---

Solution 1	Contact your supplier.
------------	------------------------

Malfunction 7 The setting procedure stopped

Observation 7	#7 Time limit: The setting procedure stopped
---------------	---

Cause 1	Procedure step not completed in the time limit.
----------------	---

Solution 1	Push one button (S1–S4) to start the procedure again.
------------	---

MALFUNCTION 8–9 [no error-message screen]**Malfunction 8 The motor gearbox does not turn while the electric motor (EM) is in operation.**

Observation 8	The electric motor (EM) turns, while the output shafts of the gearbox do not turn.
---------------	--

Cause 1	The motor gearbox is mechanically defective.
----------------	--

Solution 1	Remove the electric motor (EM). Do a check of the shaft key and replace it if defective. If the shaft key is not defective, then replace the gearbox.
------------	---

Malfunction 9 The direction-of-rotation of the motor gearbox is not correct.

Observation 9	The output shafts turn in the incorrect direction.
---------------	--

Cause 1	The connections on the terminal block of the electric motor are not correct.
----------------	--

Solution 1	Interchange the connections U1 and W1 on the terminal block.
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14.2 Technical support

For technical support contact your local After Sales contact person. You can find your local After Sales contact person on our website at **ridder.com**.

15. ENVIRONMENT

15.1 Decommissioning and removal

Decommissioning and removal is only permitted to approved personnel.

The starting points that follow are possible:

- ① During the work it is necessary to de-energize.
- ② Storage is necessary because of temporary removal.
- ③ The product is at the end of the lifespan.

① Temporary decommissioning: Work

1. Refer to §2.2 “Precautions and safety instructions”.
2. De-energize the product.
3. Do the work (maintenance, service or such).
4. Energize the product.
5. The temporary decommissioning is completed.

② Temporary decommissioning: Product storage

1. Refer to §2.2 “Precautions and safety instructions”.
2. Disconnect the product from the electric circuit.
3. Disconnect the product mechanically from the system and remove the product (usually in opposite sequence of the installation).



Make sure that the system is in a stable and mechanically tension-free condition and loosened parts (or the system) cannot hit persons! This prevents damage or injury.

4. Refer to §2.2 “Transport, storage and packaging” and obey the (applicable) instructions and conditions.
5. The temporary decommissioning is completed.

Note: Obey the product manual for a subsequent installation!

③ Permanent decommissioning: End of lifespan

1. Refer to §2.2 “Precautions and safety instructions”.
2. Disconnect the product from the electric circuit.
3. Disconnect the product mechanically from the system and remove the product (usually in opposite sequence of the installation).



Make sure that the system is in a stable and mechanically tension-free condition and loosened parts (or the system) cannot hit persons! This prevents damage or injury.

4. Make the product unserviceable and make a mark on the product. This prevents that the product is (accidentally) used again.
5. The permanent decommissioning is completed. Refer to §10.2 “Waste disposal”.

15.2 Waste disposal

Discard products of **Ridder** after their lifespan and obey the applicable national and/or local regulations.

This product has built-in semiconductor circuits (PCBs, different electronic components, capacitors and such). Incorrect waste disposal can increase the **risk** that poisonous gases have an effect on the **environment** or cause **injury** (burn chemically or such).

Make sure that after disassembly there is a separation of:

- The collected operating materials (if applicable) such as oil, grease and such
- The different materials (if applicable) such as metals, non-ferrous metals, plastics and such.

It is recommended that approved personnel and/or a company that is specialized in “Waste disposal” do the work.





Solutions for
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