

INSTRUCTION MANUAL

INTELLIGENT SLIDING SYSTEM DRIVES

ISA1 SERIES

Rev.-, April 2019

THE INTELLIGENT SLIDING SYSTEM DRIVE
ISA1 ENSURES COMPACT AND POWERFUL
BUILDING AUTOMATION
IN PERFECTION.

1 Generalities

Compliance with these operating instructions is required for safe use and smooth operation of the sliding system drive. Only persons who have read and understood these operating instructions are allowed to work with and on the sliding system drive.

2 Safety

2.1 Intended use

The sliding system drive is intended for stationary mounting on sliding systems. The sliding system drive may only be used for safety functions if it is integrated into a higher-level safety system. The sliding system drive may only be used indoors and within the value range defined in the performance data.

Any other use than that described is not considered the intended use. The manufacturer shall not be held responsible for any personal injury or damage to property resulting from improper use.

2.2 Target group

These operating instructions are intended for the qualified personnel of the manufacturers of motor-operated sliding systems.

2.3 Safety regulations

The sliding system drive has been built on the basis of applicable regulations, laws and standards and, thus, corresponds to the technical state of the art. During operation, however, residual risks may arise or impairments of the equipment may occur.

The safety regulations and warnings in these operating instructions must be complied with to prevent any possible residual risks.

2.3.1 Generalities

- These operating instructions must have been read and understood prior to mounting, commissioning, and utilisation of the sliding system drive.
- Comply with the general and national safety and accident prevention regulations.
- Keep these operating instructions during the life-cycle of the sliding system drive and pass them on to subsequent users.
- Disconnect the sliding system drive from the power supply prior to any work.

2.3.2 Transport and mounting

- The sliding system drive is sensitive to shock. Handle the sliding system drive with care during transport and mounting activities.
- Electrostatically sensitive parts inside the housing can be damaged due to electrostatic charge in case of contact. Do not open the housing. Any damage caused by non-compliance will invalidate the warranty agreement.
- Unless otherwise agreed upon with the manufacturer, only fasten the sliding system drive at the place of destination (e.g. window frame) via the mounting threads in the housing.

2.3.3 Commissioning

Ensure that the commissioning is only carried out by qualified electricians or by instructed persons under the direction and supervision of a qualified electrician.

2.4 Safety devices

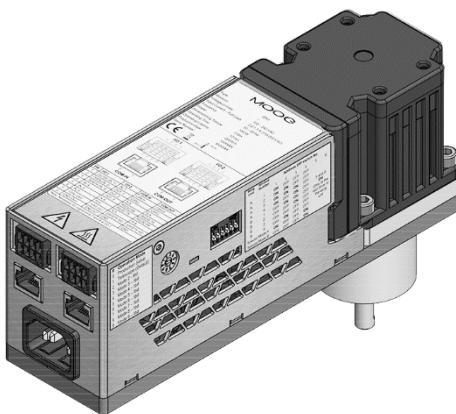
Depending on the use intended, the requirements for safe behaviour of the sliding system drive may vary. If required or desired, a deadman mode is possible for all operating modes: thus, the movement of the sliding system can be stopped immediately by releasing the operating push button.

As a protection against crushing, an overload value can be defined via the permissible maximum torque setting. The sliding system drive is switched off when reaching the overload value and the sliding system stops.

In the event of a power failure, the sliding system can still be moved manually.

2.5 Signs

Warning signs on the sliding system drive call attention to possible danger.



MOM00002

Fig. 1 Warning signs and nameplate

MOOG

Type ISA1
 Revision -
 Voltage primary 100 - 240 VAC
 Input Current - Full Load 2.2/1.1 A (1/15/2/30 VAC)
 Frequency 50 - 60 Hz
 Power 150 W
 Dimensioning Torque 3 Nm
 Operating Time 10 min
 Operating Lifetime 20000h
 Production Date XXXXXX
 Serial Number XXXXXX

CE

WD 1



WD 2

COM IN

COM OUT

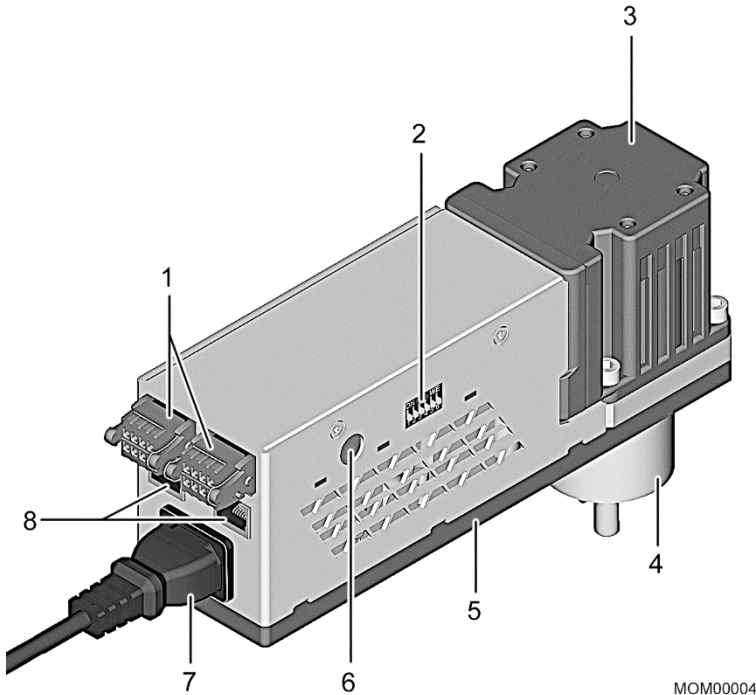
Pin	WD 1	WD 2	COM IN	COM OUT
1	CLOSE (N_1)	N_7	CAN_H	CAN_H
2	OPEN (N_2)	OUT_1	CAN_L	CAN_L
3	TEACH (N_3)	OUT_2	N.A.	N.A.
4	In_4	OUT_3	RES22 RX	RES22 TX
5	In_5	N.A.	RES22 TX	RES22 RX
6	In_6	N.A.	N.A.	N.A.
7	+24V (Out)	-24V (In)	SAFETY_BIS	SAFETY_BIS
8	GND (Out)	GND (In)	GND	GND

*Note: Necessary for output ports 7 and 8 at WD 1

	Hot surface warning The drive may become hot during operation.
	Voltage warning There is voltage present inside the housing.

The nameplate informs about the exact type of the drive and the most important performance data of the sliding system drive.

3 Description



MOM00004

Fig. 2 Structure of the sliding system drive

- | | | | |
|---|---------------------------|---|-------------------------------------|
| 1 | Communication ports I/O | 5 | Logic component with housing |
| 2 | DIP switch for addressing | 6 | Operating mode selector switch |
| 3 | Servomotor | 7 | Mains connection |
| 4 | Gearbox with pinion shaft | 8 | Communication ports to other drives |

3.1 Structure of the sliding system drive

The sliding system drive consists of a servomotor (Fig. 2/3), a logic component with housing (Fig. 2/5), and a gearbox (Fig. 2/4). Via the communication ports (Fig. 2/1) and the mains connection (Fig. 2/7) at the back of the housing, the sliding system drive is connected to the peripherals provided by the customer and the power supply. Additional drives can be connected via the other communication ports (Fig. 2/8).

The operating mode and addressing can be set via the DIP switch (Fig. 2/2) and the operating mode selector switch (Fig. 2/6).

3.2 Operating principle

The pinion shaft transmits a torque to the driving element of the sliding system. The transmission can take place e.g. to a toothed belt drive via a toothed pulley (optional).

4 Mounting

4.1 Scope of delivery

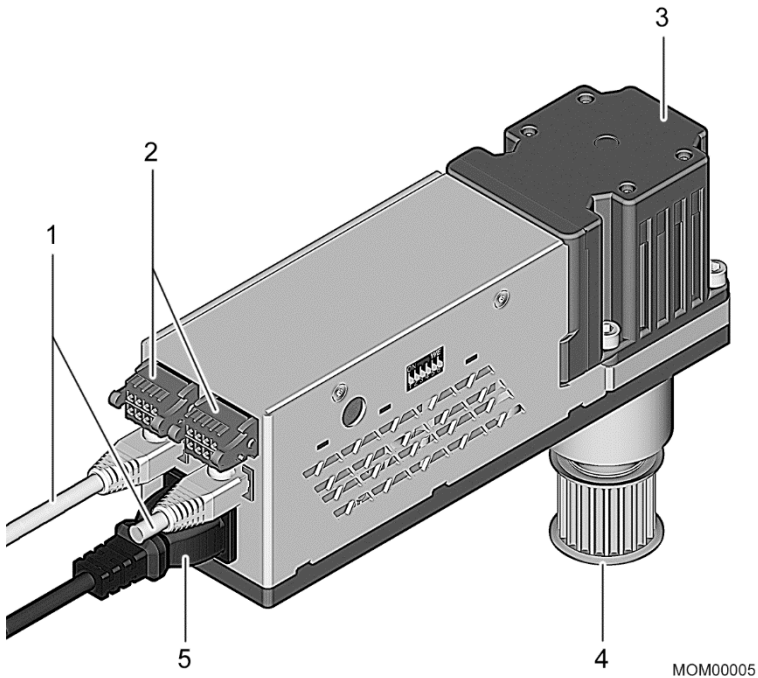


Fig. 3 Scope of delivery

- | | |
|--|-----------------------------|
| 1 Patch cable with RJ45 plug connector (optional) | 4 Toothed pulley (optional) |
| 2 Pluggable terminal block WAGO 713-1104/037-000 (2 ea.) | 5 Mains cable (optional) |
| 3 Sliding system drive | |

4.2 Mounting the sliding system drive

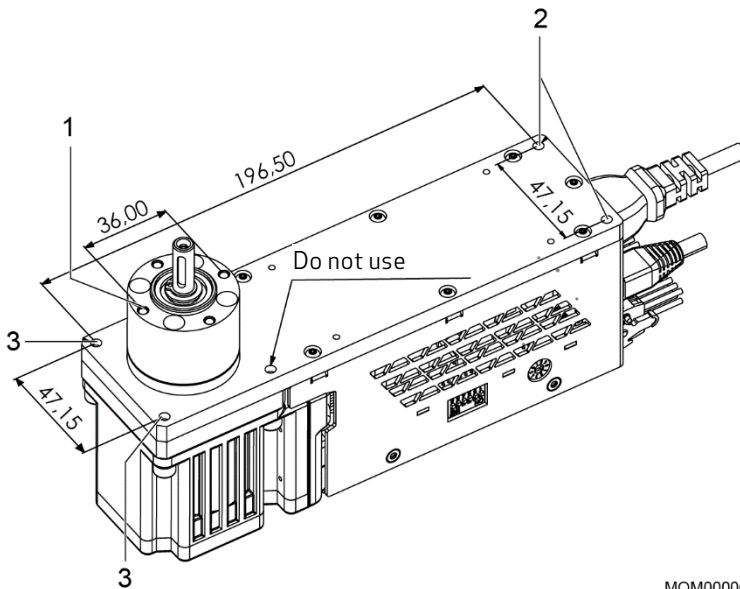
The sliding system drive may only be mounted in horizontal position.

Prerequisites:

- The mounting location is level and clean.
- The mounting location is suitable for the weight of the sliding system drive.
- Connection for power supply and to the signal transmitters is present at the mounting location.
- A suitable system for the transmission of the torque can be reached from the mounting location via the pinion shaft (splined shaft) (e.g. the toothed pulley reaches the toothed belt drive on the sliding system).

The sliding system drive can be fitted to the frame of the sliding system via threaded holes in the base plate or via threaded holes in the gearbox flange (Fig. 4/1). The base plate has 2 threaded holes M5 with a maximum screw-in depth of 7 mm (Fig. 4/2) and 2 threaded holes M5 with a maximum screw-in depth of 3 mm (Fig. 4/3).

- Align the sliding system drive in the frame of the sliding system.
- Drill the holes in accordance with the mounting drawing (Fig. 4).
- Position the sliding system drive and fasten it with bolts.
- Put drive element (e.g. toothed pulley) on the gear shaft and couple it to the drive system (e.g. toothed belt).



MOM00006

Fig. 4 Mounting options

4.3 Mounting the electrical connections

4.3.1 Pin assignment of plug connectors

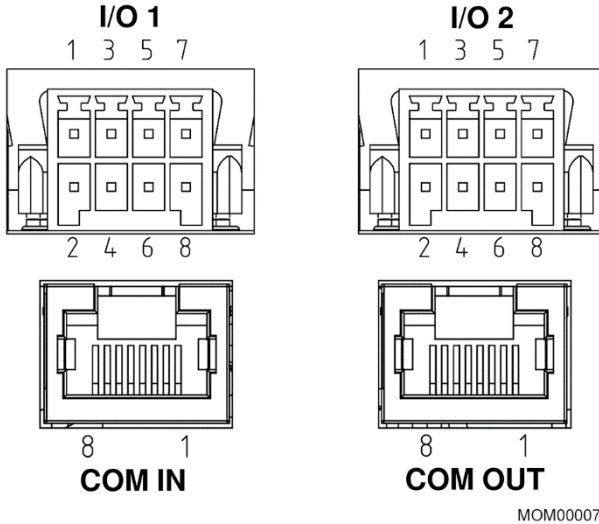


Fig. 5 Pin assignment of I/O connections

Prior to commissioning, the pluggable terminal blocks (Fig. 5) included in the scope of delivery for the IN and OUT connections must be connected to the communication lines of the control / sensor system provided by the customer in deenergised condition. The inputs must be pulled to GND via switching contacts. The outputs are designed as pull-up resistor (inversion at the output).

The following table shall apply to pin assignment.

PIN	I/O_1	I/O_2	IN	OUT
1	Close (IN_1)	IN_7	CAN-H	CAN-H
2	Open (IN_2)	OUT_1	CAN-L	CAN-L
3	Teach (IN_3)	OUT_2	n.a.	n.a.
4	IN_4	OUT_3	RS232_Rx	RS232_Tx
5	IN_5	n.a.	RS232_Tx	RS232_Rx
6	IN_6	n.a.	n.a.	n.a.
7	+24 V (Out)	+24 V (In)*	Safety Sig	Safety Sig
8	GND (Out)	GND (In)*	GND	GND

*If PIN 7 and 8 are assigned to I/O 1, connect the inputs 7 and 8 of I/O 2 first.

4.3.2 Connecting cable to plug connector

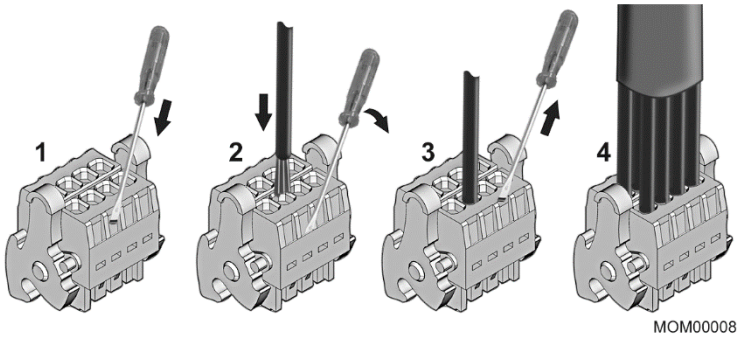


Fig. 6 Plug connector

- Insert a small screwdriver next to the wire orifice and tilt it downward.
- Slide the wire into the orifice.
- Pull out the screwdriver. The wire must be firmly clamped in the plug connector.
- Repeat the procedure for all the wires.

4.4 Setting the addresses

The addresses are set via the DIP switch (Fig. 7) in accordance with the following table. A maximum of four sliding elements per sliding system can be connected to one sliding system drive.

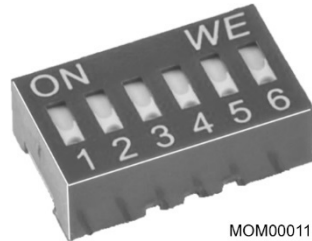


Fig. 7 DIP switch

Wing Unit	Window No.	Address DIP switch No.					
		1	2	3	4	5*	6*
A	1	ON	OFF	OFF	OFF	5 and 6 ON only on the last drive in the wing unit	
A	2	ON	ON	OFF	OFF		
A	3	ON	ON	ON	OFF		
A	4	ON	OFF	ON	OFF		
B	1	OFF	ON	ON	OFF		
B	2	OFF	OFF	ON	OFF		
B	3	OFF	OFF	OFF	OFF		
B	4	OFF	ON	OFF	OFF		
Special Mode A		ON	OFF	OFF	ON		
Special Mode B		OFF	OFF	OFF	ON		

* The addresses "5" and "6" are only set to "ON" for the last sliding system drive connected (irrespective of the number of sliding system drives connected). Address "5" connects Rx and Tx internally for a RS232 connection.

Address "6" represents the bus termination resistor.

Example:

A sliding system block with four sliding elements and four sliding system drives is mounted:

- Set the address switch "1" in the DIP switch of the first sliding system drive to "ON".
- Set the address switches "1" and "2" in the DIP switch of the second sliding system drive to "ON".
- Set the address switches "1", "2", and "3" in the DIP switch of the third sliding system drive to "ON".
- Set the address switches "1", "3", "5", and "6" in the DIP switch of the fourth sliding system drive to "ON".

4.5 Setting the operating mode

Upon delivery, operating mode "1" is set for the sliding system drives. Other operating modes can be set by turning the operating mode selector switch (provided that they have been configured).



Fig. 8 Operating mode selector switch

5 Commissioning

The following description applies for the commissioning both after first mounting and after the installation of a replacement device.

5.1 Single connection

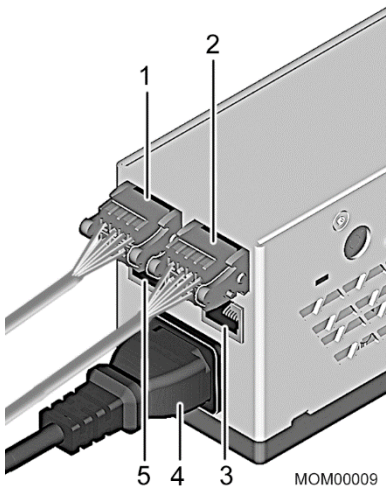


Voltage.

While the housing is open, there is a risk of electrical shock.

- Do not open the housing.
 - Do not put the sliding system drive into operation without housing.
-
- Connect the communication cables from the operating element provided by the customer to the connections I/O 1 (Fig. 9/1) and I/O 2 (Fig. 9/2).
 - Please contact Moog in the event that parameter values have to be set which deviate from the standard values. For the standard parameter values refer to section 5.3.
 - Set address on the DIP switch to A1, and switches 5 + 6 to "ON".
 - Connect mains cable to mains connection (Fig. 9/4) and connect with power supply.
 - Perform a teach-in run.

The RJ45 communication ports (Fig. 9/3, Fig. 9/5) are not assigned in the case of single connection.



- 1 Connection I/O 1
- 2 Connection I/O 2
- 3 RJ45 communication port OUT
- 4 Mains connection
- 5 RJ45 communication port IN

Fig. 9 Single connection

5.2 Multiple connection

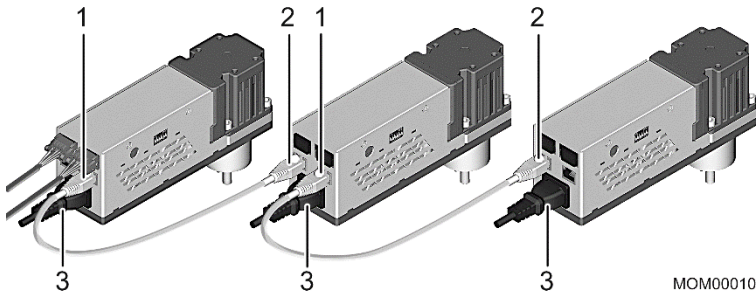


Fig. 10 Multiple connection

The first sliding system drive will act as master and transmits the action signals to the subsequent sliding system drives.

- Connect the first sliding system drive (refer to section 5.1).
- Connect other sliding system drives via the RJ45 communication ports: in each case, connect connection OUT (Fig. 10/1) to connection IN (Fig. 10/2) of the subsequent sliding system drive.
- Set the addresses on the DIP switches in accordance with the table in section 4.4. On the last sliding system drive, additionally set the switches 5 + 6 to "ON".
- Connect all mains connections (Fig. 10/3) to the power supply.
- Perform a teach-in run.

5.3 Adapting parameter values

The sliding system drive is delivered either with default parameter values or (at customer request) with customized parameter values. A change of the parameter values is only allowed after consultation with Moog.

Parameter	Standard value
circumference (circumference of pinion)	180 mm
gearRatio (ratio of motor counts to pane distance)	132 (0.1s)
operationAMPS (torque for operation)	1023
teachinAMPS (torque for teaching)	250
operationSpeed (speed of pane in regular open/close movements)	8 s
operationAccel (acceleration of pane in regular open/close movements)	40 mm/§
operationDecel (deceleration of pane in regular open/close movements)	40 mm/§

Parameter	Standard value
searchHSSpeed (speed of pane in teach-in open/close movements)	5 cm
searchHSAccel (acceleration of pane in regular open/close movements)	20 mm/§
searchHSDecel (deceleration of pane in teach-in open/close movements)	20 mm/§
delayBetweenMotors (delay between two motors in one line in 10th of seconds)	5 (0.1s)
testWaitOpen (waiting time after close before close)	3 s
testWaitClose (waiting time after close before open)	3 s
lockPressTime (duration of door pressing into frame to ease unlocking)	3 s
motorPrio (priority of motor for sequencing)	1
safetyDistance (minimum distance the higher prio motor has to move first)	30 cm
safetyTime (minimum duration the higher prio motor has to move first)	5 s
mainTimeout (main timeout for waiting on slaves)	60 s

5.4 Teach-in run

The teach-in run must be started during commissioning and after the installation of a new sliding system drive. During the teach-in run, the sliding system drive moves the sliding element at slow speed. The sliding system drive sets the start and stop parameters autonomously.

5.5 Reference run

After an unexpected stop (e.g. after a fault or in the event of a power failure) and after the teach-in run, the reference run must be started manually.

During the reference run, the sliding system drive moves the sliding element to that reference position which has been defined during the teach-in run. When reaching the reference position, the logic of the sliding system drive parameterizes the reference point again.

6 Operation

6.1 Operating modes

Depending on the control of the sliding system drive and of the operating elements connected by the customer, the sliding system drive can be operated in the following operating modes:

- Start/stop
- Teach-in run
- Reference run

6.2 Start/stop

In case of start/stop, the sliding system drive moves the sliding element to the open or closed position. If a new control signal is sent during the run, the sliding system drive stops and, thus, also stops the movement of the sliding element.

7 Maintenance and care

The sliding system drive can be operated 8000 h in continuous operation without any maintenance or care. After this period of maintenance-free continuous operation, or when the sliding system drive is no longer operative, the sliding system drive must be replaced.

In compliance with the statutory requirements and directives, stationary electrical equipments must be submitted to periodic inspections in accordance with the applicable electrotechnical regulations. The Technical Directive for operational facilities recommends an inspection interval of 4 years.

8 Performance data

Designation	Value	Unit
Type	ISA1	
Revision	-	
Operating voltage	100 to 240	VAC
Input current - full load	2.2/1.1	A (115/230 VAC)
Frequency	50 to 60	Hz
Rating	150	l
Torque limit	3	Nm
Max. duty cycle	10	min
Product lifetime	20	years

9 Faults

The faults listed below mainly occur during commissioning.

A reference run must be performed after having rectified the fault.

Value**	Fault	Cause	Rectification
K	The system stops and reverses briefly The error text "internal Error" is displayed Control is blocked for 5 seconds	Obstacle within the travelling path	The system resets automatically or has to be reset manually by pressing any button
N	The system stops, the error text "internal Error" is displayed Error counter logging	CAN error	Trigger a manual system restart by pressing any button. Connect SMI and read error out with GOSUB???
K	The system stops, the error text "internal Error" is displayed	Drive is missing or wrong address	Check error LED of all drives. Trigger a manual system restart by pressing any button. Connect SMI and read error out with GOSUB???
W	Error LED is flashing	Sensor failure	Check flash code. Trigger a manual system restart by pressing any button. Connect SMI and read error out with GOSUB???

Value**	Fault	Cause	Rectification
W	Error LED is flashing	Locking device failure	Check flash code. Trigger a manual system restart by pressing any button. Connect SMI and read error out with GOSUB???
W	The system stops, the error text "internal Error" is displayed	Drive switches to error status	Trigger a manual system restart by pressing any button. Connect SMI and read error out with GOSUB???
N	The system stops and is ready for reference run The error text "internal Error" is displayed	Power failure	Start reference run by pressing the reference/teach-in push button
K	The system stops The error text "internal Error" is displayed	Broken cable	Disconnect the system from the power supply. Replace the broken cable. Switch the system on

** Weighting of the fault:

N (normal) - not relevant for functioning of the drive

W (important) - error, but drive can still be operated

K (critical) - system failure, drive can no longer be operated

10 Appendix

The declaration of conformity is provided as a separate document in the appendix of these operating instructions.

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WHAT MOVES YOUR WORLD

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