

Tender text

OJ DRHX FOR ROTARY HEAT EXCHANGERS

OJ DRHX Series
1~230V (1-8 Nm)
1~230V (14 Nm)

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1. General specifications

OJ-DRHX is the new generation of drives for the control of rotary heat exchangers – based on new technology. OJ-DRHX covers motors rated from 1 Nm to 14 Nm with both Modbus and analogue controllers and a constant speed version. OJ-DRHX is also available in a variant with a 3x7 segment display. In contrast to traditional geared motors which lose torque at low and high speeds, the stepper motor maintains the same high rotational torque for the entire rated speed. The linear torque curve of the stepper motor allows highly precise rotor speed control over a much larger range. This results in energy-efficient heat recycling and more precise temperature control. OJ-DRHX is equipped with advanced software to monitor rotor rotation, which means that no physical or optical rotor guard is required. Not only does this mean fewer components, but also makes it easier for you to install. The combination of the high torque of the stepper motor with FOC (Field Oriented Controls) technology results in a uniquely innovative solution and increased efficiency. The drive uses the feedback signal from the motor to ensure that the motor receives exactly the required amount of current to achieve the required speed and torque.

1.1. Important requirements

The DRHX complies with the product standard EN 61800-3, Good EMC Engineering Practices in the Installation of "Power Drive Systems" (PDS).

CE marking:

- LVD – Low voltage: 2014/35/EU
- EMC – Electromagnetic compatibility: 2014/30/EU
- RoHS – Restriction of the use of certain hazardous substances in electrical and electronic equipment: 2011/65/EU

Product standard:

- Complies with the product standard EN 61800-5-1 which covers rating specifications, EMC and functional safety. The product standard includes Mechanical, Electrical, Material, Environmental and Markings tests.
- In accordance with EN 61800-2 – Adjustable speed stepper motor drive, general requirements.
- In accordance with EN 61800-5-1 – Adjustable speed stepper motor drive: Safety requirements – Electrical, thermal and energy.
- In accordance with EN 61800-3 (C1 and C2) – Adjustable speed stepper motor drive. Part 3. EMC requirements and specific test methods.
- Contains no hazardous substances as defined by the RoHS Directive.
- The DRHX and MRHX are manufactured according to ISO 9001 certified quality production.

1.2. Built-in protection

- If the temperature inside OJ-DRHX exceeds 95°C, OJ-DRHX will attempt to reduce its internal heat generation by reducing the amount of current sent to the stepper motor.
- The DRHX has built-in current limitation for the protection of the stepper motor and cables and can therefore not supply more current than allowed to the motor.
- The DRHX is short-circuit protected against motor phase-phase short-circuits on the OJ-DRHX connector terminals for the stepper motor (U, V, W).
- The DRHX is also equipped with short-circuit protection on the input phases.

1.3.Functions:

- Sensorless rotation monitor
- Sensorless closed loop control
- QuickPlug Modbus and analogue control
- Stepper motor solution
- Short-circuit protection
- EMC filter integrated
- Alarm
- Ramp-up and ramp-down.

1.4.The following inputs/outputs are available on analogue variants:

- 1 x Analogue control (0-10 V DC)
- 1 x Analogue out (+10 V DC)
- 10 V DC output
- 2 x RJ12 connector for Modbus RTU
- 2 x spring terminals for Modbus RTU
- 3 x Digital Inputs: (Internal Pull up)
 - In1: Start / Stop (configurable)
 - In2: Alarm reset (configurable)
 - In3: External rotor guard (configurable)
- 3 terminals for SPDT relay 1A 30VDC/24VAC
- 3x7-segment red LED display
- Test button

1.5.The following inputs/outputs are available on Modbus variants:

- 2 x RJ12 connector for Modbus RTU
- 2 x spring terminals for Modbus RTU
- Test button

1.6.The following inputs/outputs are available on Modbus variants:

- 2 x spring terminals for Start/Stop
- Test button

1.7.The following inputs/outputs are available on the 790 W/14 Nm variant

- 1 x Analogue control (0-10 V DC)
- 1 x Analogue out (+10 V DC)
- 10 V DC output
- 2 x RJ12 connector for Modbus RTU
- 2 x spring terminals for Modbus RTU
- 3 x Digital Inputs: (Internal Pull up)
 - In1: Start / Stop (configurable)
 - In2: Alarm reset (configurable)
 - In3: External rotor guard (configurable)
- IO – Module allows a number of A/D inputs and outputs to be added to the DRHX.
 - 2 x Digital input (Configurable)
 - 2 x 3 terminals for SPDT relay output; max 24V AC /30V DC / 1A
 - 1 x 0-10V analogue input
 - 1 x 0-10V analogue output (actual motor speed out)
 - 1 x +10V DC out
 - 1 x +24V DC out
 - 1 x Thermistor input (motor temperature sensor)
 - 1 x Rotary switch (for changing max speed setting)

1.8. Testing

The DRHX series is provided with a test function in the form of a built-in test pushbutton. The test button is located inside the drive in the upper right corner and must be operated with the drive open.

- The drive will enter test mode and stay in test mode until the button is pressed again. The rotor will start rotating in a sequence from 0–100 rpm according to the selected ramp-up time and remain at 100 rpm. Pressing the button a second time will cause the drive to leave test mode and stop the rotor according to the selected ramp-down time.
- Pressing and holding the button will cause the drive to enter test mode where it will remain until the button is released. The signal to the rotor will override to 100 rpm according to the selected ramp-up time. The test button works when Modbus control is activated.

2. Technical Data

2.1. Rotary heat exchanger controller: 55W

General specifications: described on pages 3–4
Power supply: 1 x 230 V AC 50/60 Hz, -10%/+10%
Max. fuse: 10 A
Rated input power: 0.3 / 0.6 A
Nominal motor power: 27 / 55 kW
Nominal motor torque: 1 / 2 Nm
Efficiency: $\geq 90\%$
Dimensions (H x B x T): 183 x 143 x 55 mm
Protection rating: IP 54
Weight : 0.9 kg
Type:

- OJ-DRHX-1055-NCN5
- OJ-DRHX-1055-MNN5
- OJ-DRHX-1055-MAD5

2.2. Rotary heat exchanger controller: 220W

General specifications: described on pages 3–4
Power supply: 1 x 230 V AC 50/60 Hz, -10%/+10%
Max. fuse: 10 A
Rated input power: 1.2 / 2.4 A
Nominal motor power: 110 / 220 kW
Nominal motor torque: 4 / 8 Nm
Efficiency: $\geq 90\%$
Dimensions (H x B x T): 183 x 143 x 55 mm
Protection rating: IP 54
Weight: 0.9 kg
Type:

- OJ-DRHX-1220-NCN5
- OJ-DRHX-1220-MNN5
- OJ-DRHX-1220-MAD5

2.3. Rotary heat exchanger controller: 790W

General specifications: described on pages 3–4
Power supply: 1 x 230 V AC 50/60 Hz -10%/+10%
Max. fuse: 10 A
Rated input power: 4.4 A
Nominal motor power: 790 kW
Nominal motor torque: 14 Nm
Efficiency: $\geq 94\%$
Dimensions (H x B x T): 185 x 220 x 90 mm
Protection rating: IP 54
Weight: 2.0 kg
Type:

- OJ-DRHX-1790-MAN5