



DriveController4820

Control unit for roller drive using external control

The DriveController4820 is a control unit for a roller drive that uses external control. This control unit was specifically designed for the operation of roller drives of the type EC5000 AI from Interroll. The control unit enables effortless operation of up to two roller drives with 48V and 20W via a comprehensive IO interface, which can be easily managed and analyzed by a PLC.

The control unit is equipped with an integrated brake chopper, an electrical fuse, a specially designed roller drive IO interface and IO signals per channel. These IO signals can be individually switched per channel between basic and advanced external control and are galvanically isolated from the load voltage. This design allows the control unit to be seamlessly operated with two separate power supplies that do not share a common ground. Within the roller drive IO interface, all signals are internally converted by the control unit according to IO specifications to achieve the specific values required for operating the roller drive in compliance with the manufacturer's specifications. The control unit includes two channels for roller drives. Detailed information can be found under technical data electrical, PIN assignment and the functionality of the device.



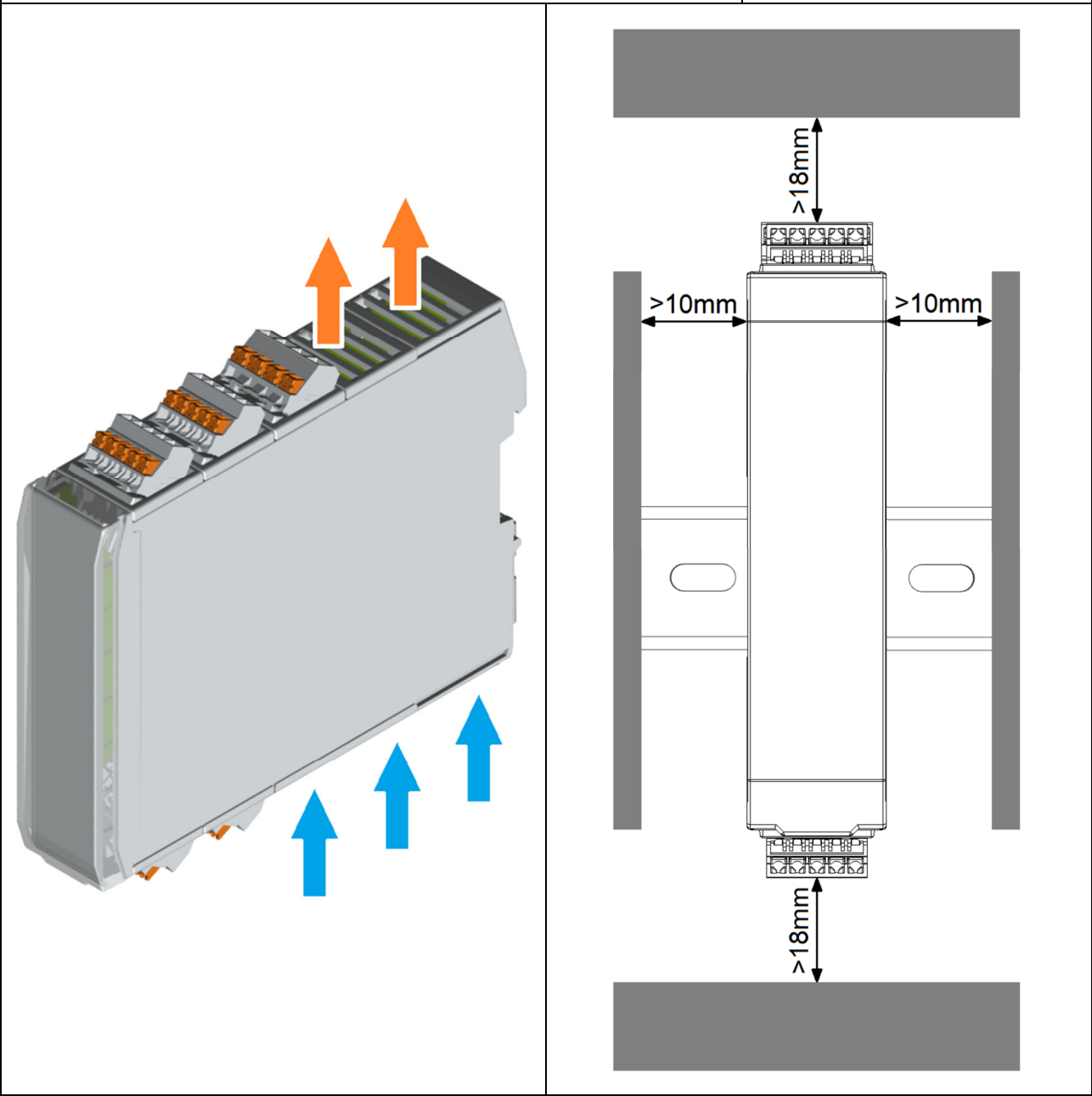
Key commercial data

Packing unit	1 pc
Weight per piece (excluding packing)	300g
Weight per piece (including packing)	350g
Country of origin	Germany

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Technical data mechanically

Width (W)	25mm
Height (H)	118mm
Depth (D)	140mm
Ambient temperature (operation)	0°C ... 35°C
Ambient temperature (storage/transport)	-20°C ... 70°C
Relative humidity	90% without condensation
Mounting position	horizontal





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Technical data electric

Nominal voltage U_{VCC}	44V ... 54V DC
Nominal current I_{VCC} – per channel	max 760mA
Nominal power P_{VCC} – per channel	max 33,6W
Nominal voltage U_{V+}	24V DC ($\pm 15\%$)
Nominal current I_{V+}	max 140mA
Nominal power P_{V+}	max 4W
Reverse polarity protection – VCC/V+	Yes
Nominal voltage U_{DI} – X1/X2	24V DC ($\pm 15\%$)
Output current I_{DQ} (short-circuit proof) – X2	max 40mA
Internal resistance R_{AI} 4...20mA – X2	440 Ω + diode voltage 1,25V
Internal resistance brake chopper – per channel	89 Ω
Nominal power brake chopper – per channel	max 35W
Temperature monitoring brake chopper	Yes, integrated
Trip current $I_{VCC Out}$ – per channel	1,2A
Short-circuit proof – VCC Out	Yes, resettable fuse
Load R_{DQ} (short-circuit proof) – X5/X6	$\geq 2,5k\Omega$
Load R_{AQ} 0...10V (conditionally short-circuit proof) – X5/X6	$\geq 2,5k\Omega$
Protection class	IP20
Connection data connectors X1/X2/X5/X6	
Connection type	Push-in spring connection
Conductor cross section solid	0,25mm ² ... 1,5mm ²
Conductor cross section flexible	0,25mm ² ... 1,5mm ²
Conductor cross section with ferrule, without plastic sleeve	0,25mm ² ... 1mm ²
Conductor cross section with ferrule, with plastic sleeve	0,25mm ² ... 0,75mm ²
Stripping length	10mm
Connection data connectors X3	
Connection type	Push-in spring connection
Conductor cross section solid	0,25mm ² ... 2,5mm ²
Conductor cross section flexible	0,25mm ² ... 2,5mm ²
Conductor cross section with ferrule, with/ without plastic sleeve	0,25mm ² ... 2,5mm ²
Conductor cross section with TWIN-ferrule, with plastic sleeve	0,5mm ² ... 1,5mm ²
Stripping length	10mm

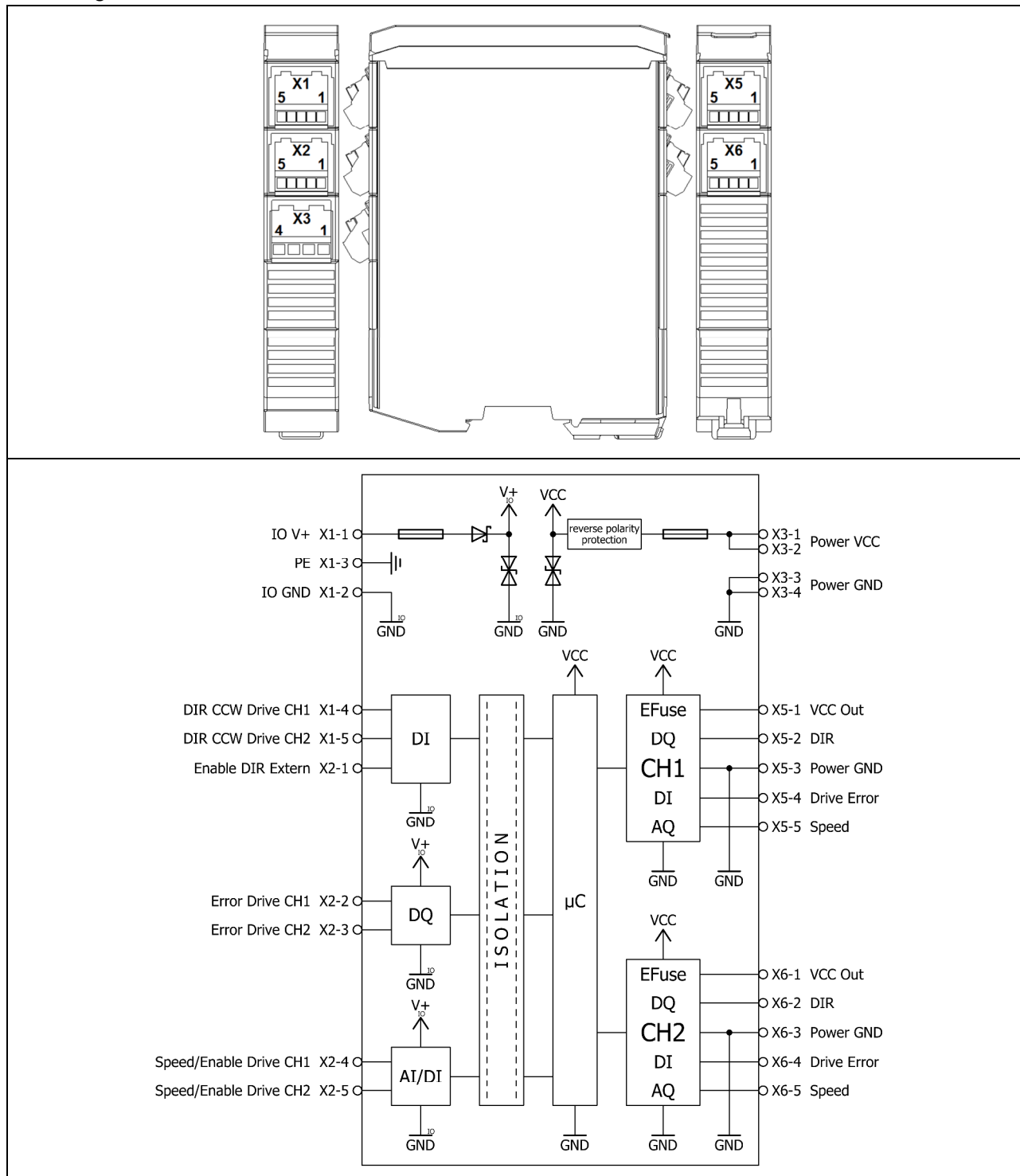
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Standards and Regulations

Standards/regulations	EN IEC 61000-6-2: 2019
	EN 61000-6-3: 2007 +A1:2011 +AC:2012
	EN 50178: 10/97

PIN assignment





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PIN	Designation	Functional description
X1-1	IO V+	Power supply for the IO interface for external control.
X1-2	IO GND	
X1-3	PE	Protective earth connection
X1-4	DIR CCW Drive CH1	When the digital input is high, the drive's rotation direction is immediately switched to counterclockwise, without using an acceleration or deceleration ramp. (logical „0“ ≤ 5V, logical „1“ ≥ 15V)
X1-5	DIR CCW Drive CH2	
X2-1	Enable DIR Extern	When the digital input is high, only in basic external control mode, the drive's rotation direction of the respective channel is changed via the digital inputs. The value applied to the input is only adopted by the control unit during a reset or restart. (logical „0“ ≤ 5V, logical „1“ ≥ 15V)
X2-2	Error Drive CH1	The digital output can be used as feedback to determine whether the roller drive or the control unit channel has an error, thus indirectly providing feedback on whether the respective roller drive is running. The exact switching states are listed under functionality of the device.
X2-3	Error Drive CH2	
X2-4	Speed/Enable Drive CH1	Depending on the selected operating mode, the input is switched between digital and analog. In the basic external control mode, it is used as a digital input, allowing the roller drive to be switched on and off using an enable signal. When the advanced external control mode is used, the speed of the roller drive can be freely adjusted using a 4...20mA signal. The 4...20mA signal corresponds to 0 to 100%. (logical „0“ ≤ 5V, logical „1“ ≥ 15V or 4...20mA)
X2-5	Speed/Enable Drive CH2	
X3-1/2	Power VCC	Power supply for the roller drives and the electronics of the control unit.
X3-3/4	Power GND	
X5-1	VCC Out	For each channel, there is a protected power supply for the roller drive. The electronic fuse is self-resetting and the power supply is switched off if the nominal voltage limits are not met or in the case of internal device errors.
X6-1		
X5-2	DIR	Depending on the selected operating mode and the specified rotation direction, the respective output is switched accordingly. (CCW logical „0“ < 4V, CW logical „1“ > 7V)
X6-2		
X5-3	Power GND	Ground potential
X6-3		
X5-4	Drive Error	For each channel, the digital input is evaluated and output via the respective digital output.
X6-4		



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X5-5	Speed	2,3...10V	For each channel, the analog output is provided accordingly, regardless of the operating mode. The voltage range of 2,3...10V corresponds to 0 to 100%. If the value is $\leq 2,3V$, the roller drive does not rotate.
		1,9V	Regardless of the operating mode, the analog output switches to a standby value. This value is output at a logical „0“ $\leq 5V$ or 4mA.
X6-5		0V	In the control unit, all error states are not only output via the respective digital output but also internally locked. This means the roller drive is correspondingly locked and no voltage is output at the analog output. This locking takes effect in all error states that are indicated by a blinking code.

Functionality of the device

Nominal voltage VCC/V+	Status LED green	Error LED red	Contact Error X2-2/3	Output side VCC Out	Function
VCC < 21V V+ 0V				0V	Normal
VCC < 21V V+ 24V $\pm 15\%$				0V	Normal
21V \leq VCC \leq 42V V+ 0V				0V	Normal
21V \leq VCC \leq 42V V+ 24V $\pm 15\%$				0V	Normal
42V < VCC < 56V V+ 0V				0V	Error
42V < VCC < 56V V+ 24V $\pm 15\%$				0V	Error
42V < VCC < 56V V+ 0V				VCC	Normal
42V < VCC < 56V V+ 24V $\pm 15\%$				VCC	Normal
VCC \geq 56V V+ 0V				0V	Normal
VCC \geq 56V V+ 24V $\pm 15\%$				0V	Normal



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Error condition CH01	Status LED green	Error LED red	Diag CH1 LED orange	Contact Error X2-2	Function
There is no error.					Normal
The roller drive is not activated by the external signal. This state is independent of the operating mode.					Normal
The roller drive either has an internal error or is not connected or plugged in.					Normal
In advanced external control mode, the value of the Speed/Enable input is below 3mA or above 21mA.					Normal
The supply voltage for the roller drive was switched off because either the electrical fuse was triggered or the nominal voltage limits were not observed.					Error
The temperature monitoring of the brake chopper has been triggered or the temperature sensor is defective.					Error
During the cyclic test, a defect in the brake chopper resistor was detected.					Error
An internal device error has occurred. It is possible that the trip currents of the electrical fuses are no longer correct.					Error
An internal device error has occurred. It is possible that one or more components are defective.					Error
The nominal voltage limits have not been observed.					Normal



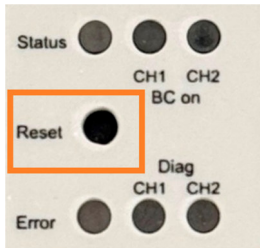
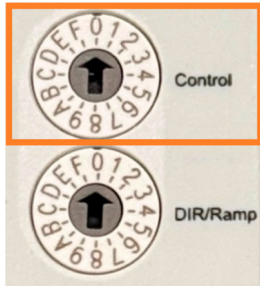
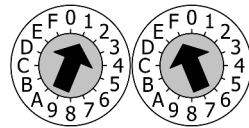
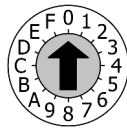
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Error condition CH02	Status LED green	Error LED red	Diag CH2 LED orange	Contact Error X2-3	Function
There is no error.					Normal
The roller drive is not activated by the external signal. This state is independent of the operating mode.					Normal
The roller drive either has an internal error or is not connected or plugged in.					Normal
In advanced external control mode, the value of the Speed/Enable input is below 3mA or above 21mA.					Normal
The supply voltage for the roller drive was switched off because either the electrical fuse was triggered or the nominal voltage limits were not observed.					Error
The temperature monitoring of the brake chopper has been triggered or the temperature sensor is defective.					Error
During the cyclic test, a defect in the brake chopper resistor was detected.					Error
An internal device error has occurred. It is possible that the trip currents of the electrical fuses are no longer correct.					Error
An internal device error has occurred. It is possible that one or more components are defective.					Error
The nominal voltage limits have not been observed.					Normal

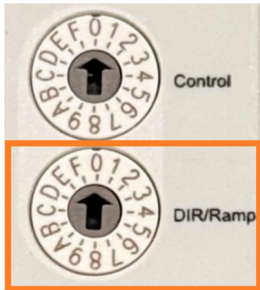
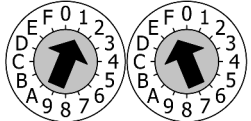


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<p>Function Normal: The function of the device lies in its specified parameters.</p> <p>Function Error: The device is defective and should be replaced.</p> <p>The device first displays the error condition with the highest blink code value.</p>	<ul style="list-style-type: none">● LED does not light● LED lights up green● LED lights up red● LED lights up orange● LED is blinking																
	<p>If the device has an error, a reset by pressing it with a ballpoint pen or similar may help. If the device error persists after a reset and turning off the power, the device should be replaced.</p> <p>Certain errors are only reset by powering off or by removing both Speed/Enable inputs. As soon as a logical „0“ \leq 5V or 4mA is present at both inputs, an internal reset is performed, which may reset the device error.</p>																
	<p>Operating mode basic external control Rotary switch „Control“ in position 1 to F</p> <p>In this mode, the Speed/Enable input is a digital input. The speed can only be set using the rotary switch „Control“ in fixed increments.</p> <table><tr><td>1: Speed 10%</td><td>6: Speed 45%</td><td>B: Speed 70%</td></tr><tr><td>2: Speed 20%</td><td>7: Speed 50%</td><td>C: Speed 75%</td></tr><tr><td>3: Speed 30%</td><td>8: Speed 55%</td><td>D: Speed 80%</td></tr><tr><td>4: Speed 35%</td><td>9: Speed 60%</td><td>E: Speed 90%</td></tr><tr><td>5: Speed 40%</td><td>A: Speed 65%</td><td>F: Speed 100%</td></tr></table>	1: Speed 10%	6: Speed 45%	B: Speed 70%	2: Speed 20%	7: Speed 50%	C: Speed 75%	3: Speed 30%	8: Speed 55%	D: Speed 80%	4: Speed 35%	9: Speed 60%	E: Speed 90%	5: Speed 40%	A: Speed 65%	F: Speed 100%	 <p>Control</p>
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5: Speed 40%	A: Speed 65%	F: Speed 100%															
	<p>Operating mode advanced external control Rotary switch „Control“ in position 0</p> <p>In this mode, the Speed/Enable input is a 4...20mA analog input. The speed can be adjusted freely through this input.</p>	 <p>Control</p>															

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	<p>Operating mode basic external control Rotary switch „Control“ in position 1 to F The digital input Enable DIR External is not used.</p> <p>In this mode, the rotary switch „DIR/Ramp“ is used to set the direction of rotation as well as the acceleration and deceleration ramp.</p> <table border="0"> <tr> <td>0: CW 0ms</td> <td>6: CW 1000ms</td> <td>A: CCW 800ms</td> </tr> <tr> <td>1: CW 200ms</td> <td>7: CW 1500ms</td> <td>B: CCW 600ms</td> </tr> <tr> <td>2: CW 300ms</td> <td></td> <td>C: CCW 400ms</td> </tr> <tr> <td>3: CW 400ms</td> <td></td> <td>D: CCW 300ms</td> </tr> <tr> <td>4: CW 600ms</td> <td>8: CCW 1500ms</td> <td>E: CCW 200ms</td> </tr> <tr> <td>5: CW 800ms</td> <td>9: CCW 1000ms</td> <td>F: CCW 0ms</td> </tr> </table> <p>Operating mode basic external control Rotary switch „Control“ in position 1 to F The digital input Enable DIR External is used.</p> <p>In this mode, the rotary switch „DIR/Ramp“ is used to adjust the acceleration and deceleration ramp.</p> <table border="0"> <tr> <td>0: 0ms</td> <td>6: 450ms</td> <td>C: 1000ms</td> </tr> <tr> <td>1: 200ms</td> <td>7: 500ms</td> <td>D: 1200ms</td> </tr> <tr> <td>2: 250ms</td> <td>8: 600ms</td> <td>E: 1500ms</td> </tr> <tr> <td>3: 300ms</td> <td>9: 700ms</td> <td>F: 2000ms</td> </tr> <tr> <td>4: 350ms</td> <td>A: 800ms</td> <td></td> </tr> <tr> <td>5: 400ms</td> <td>B: 900ms</td> <td></td> </tr> </table> <p>Operating mode advanced external control Rotary switch „Control“ in position 0 In this mode, the rotary switch „DIR/Ramp“ is not used and is therefore non-functional.</p>	0: CW 0ms	6: CW 1000ms	A: CCW 800ms	1: CW 200ms	7: CW 1500ms	B: CCW 600ms	2: CW 300ms		C: CCW 400ms	3: CW 400ms		D: CCW 300ms	4: CW 600ms	8: CCW 1500ms	E: CCW 200ms	5: CW 800ms	9: CCW 1000ms	F: CCW 0ms	0: 0ms	6: 450ms	C: 1000ms	1: 200ms	7: 500ms	D: 1200ms	2: 250ms	8: 600ms	E: 1500ms	3: 300ms	9: 700ms	F: 2000ms	4: 350ms	A: 800ms		5: 400ms	B: 900ms		 
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<p>The settings on the respective rotary switches only become valid in the control unit when the respective roller drive is not activated and has come to a complete stop. It is recommended to perform a reset when a change in the settings is made.</p>																																						
	<p>The control unit can operate a roller drive that functions in 2- or 4-quadrant operation. For this purpose, the control unit is equipped with an integrated brake chopper, which internally converts the excess braking energy of the roller drive into heat. The brake chopper is activated when the voltage exceeds the threshold of 54,8V and is deactivated when the voltage falls below 54,2V or when the roller drive is activated again. The brake chopper prevents excessive energy from being fed back, thereby protecting the power supply from excessively high voltage spikes.</p> <p>The two blue LEDs on the device indicate whether the brake chopper of the respective channel is currently activated. The brake chopper is internally monitored for temperature and through a cyclic resistance test. If the brake chopper is frequently activated during operation, the temperature protection is triggered when an internal temperature of 60°C is exceeded. This temperature protection is reset upon reaching an internal temperature of 48°C and by removing both Speed/Enable inputs. The restart protection is applied not only in case of temperature protection but also during the resistance test and prevented an unforeseen restart of the roller drive.</p>																																					



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Safety regulations and installation notes

	<p>Note the following:</p> <ul style="list-style-type: none">• When using the control unit in a conveyor system, potential danger zones may arise. These are not covered in this manual and must be addressed through a risk analysis during the planning and implementation of the conveyor system. Appropriate external safety functions must be implemented to achieve a performance level. The control unit does not possess a performance level and cannot be used as a safety-related component in an application.• The manufacturer assumes no liability for damages or malfunctions resulting from failure to follow this manual.
	<p>Before startup please ensure:</p> <ul style="list-style-type: none">• Only skilled persons may install, start up and operate the device.• Observe the national safety and accident prevention regulations.• Before turning on the control unit, it must be ensured that no unauthorized persons are near the conveyor system and that no one is performing work on the conveyor system. Otherwise, there is a high risk of injury.
	<p>WARNING: Danger to life by electric shock!</p> <ul style="list-style-type: none">• Never carry out work when voltage is present.• Establish mains connection correctly and ensure protection against electric shock.• The device must be switched off outside the power supply in accordance with the regulations of EN 60950-1 (e.g. by means of line protection on the primary side).• Cover termination area after installation in order to avoid accidental contact with live parts (e.g. installation in control cabinet).• Protect the device against foreign bodies penetrating it.
	<p>NOTE: Danger if used improperly!</p> <ul style="list-style-type: none">• The device is a built-in device.• The IP20 degree of protection (IEC 60529/EN 60529) of the device is intended for use in a clean and dry environment. Do not subject the device to any load that exceeds the described limits.• Observe mechanical and thermal limits.• Ensure that the primary-side wiring and secondary-side wiring are the correct size and have sufficient fuse protection.
	<ul style="list-style-type: none">• It is not permissible to open or modify the device. Do not repair the device yourself but replace it with an equivalent device. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from violation.• The device may only be used for its intended use.



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Pictures



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Order code

Order number	Execution of the article
DriveController4820L	For two roller drives 48V 20W, with linear acceleration and braking ramp in basic external control mode.
DriveController4820Q	For two roller drives 48V 20W, with quadratic acceleration and braking ramp in basic external control mode.
DriveController4820C	For two roller drives 48V 20W, with cubic acceleration and braking ramp in basic external control mode.

Diagram

