



# Solid State Motor Contactor 3 Phase Motor Reversing Types REC2R



- AC electronic motor reversing relay
- Instantaneous switching
- Three phase with two pole switching
- Control status LED indication
- Two control input ranges: 15-32 VDC, 90-253 VAC
- Motor rating up to 3 kW (3.0 HP) @ 400 VAC
- Rated operational voltage up to 530 VAC
- Opto-isolation at 4 kVrms
- Mechanical contactor resemblance with covered heatsink
- DIN-rail and panel mounting



## Product Description

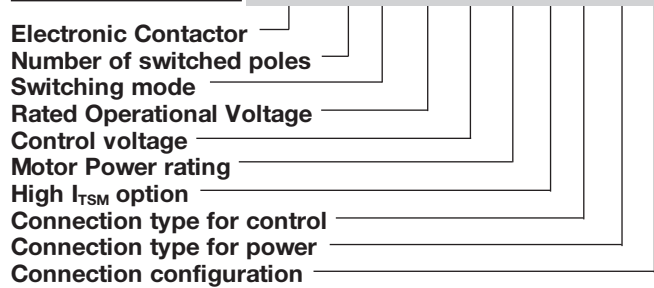
REC2R is a 3-phase electronic motor reversing relay. L1-T1 and L3-T3 poles are switched while L2, T2 pole is a direct connection from L2 phase to the motor. A front dual colour LED, lights green when the motor is running in the forward direction upon application of control voltage to A2-A3 terminals.

Motor runs in the reverse direction when control voltage is applied to terminals A1- A2 and the LE lights red. The integrated electronic interlock pre-

vents short circuit between phases in case a control signal is applied for forward and reverse directions simultaneously through the pluggable connector on the front. In such a case REC switches off until one of the control signals is removed.

REC can control motors up to 7.6 AAC. An adaptor for underlying overload modules is available. Specifications are stated at 25°C unless specified.

## Ordering Key **REC 2 R 48 A 3 0 G K E**



## Ordering Key

Switching poles	Switching mode	Rated operational voltage	Control voltage	Motor power rating	I <sub>TSM</sub> control	Connection control	Connection power	Configuration
REC2: 2 poles	R: Reversing	48: 48-530 VAC	D: 24 VDC, -15%, + 20% A: 90 - 253 VAC	3: 3.0 kW	0: Standard I <sub>TSM</sub>	G: Clamp	K: Screws	E: Contactor

## Selection Guide

Rated Voltage	No. of Poles	Control voltage	Power Rating @ 400 VAC 3.0 kW
48-530 VAC	2	24 VDC	REC2R48D30GKE
		90-253 VAC	REC2R48A30GKE

## General Specifications

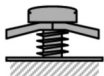
Rated operational voltage	480 VAC
Operational voltage range	48 - 530 VAC
Blocking voltage	1200 Vp
Operational frequency range	45 - 65 Hz
Power factor	>0.5 @ rated voltage

## Control Specifications

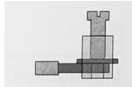
	REC...D..	REC...A..
Rated control input voltage	24 VDC	230 VAC
Control voltage range	15 - 32 VDC (according to EN61131-2)	90 - 253 VAC
Maximum Input current	10 mA	15 mA
Pick-up voltage	15 VDC	90 VAC
Maximum reverse voltage	32 VDC	N/A
Drop-out voltage	1 VDC	10 VAC
Response time pick-up	5 ms	30 ms
Response time drop-out	15 ms	30 ms
Operational frequency range	N/A	45 - 65 Hz
Maximum time delay F- -> R, F <-- R	80 ms	100 ms
LEDs	Forward: Green Reverse: Red	Forward: Green Reverse: Red

## Connection Specifications

### POWER CONNECTIONS (75°C,Copper Cables)

Connection Type	Screw terminal
Illustration of terminal	
Rigid (Solid)	2 x 1.5..2.5mm <sup>2</sup> (2 x AWG16..14) 2 x 2.5..6mm <sup>2</sup> (2 x AWG14..10)
Finely stranded with end sleeve	2 x 1..2.5mm <sup>2</sup> (2 x AWG17..14) 2 x 2.5..6mm <sup>2</sup> (2 x AWG14..10) 1 x 10mm <sup>2</sup> (1 x AWG8)
Flexible w/o end sleeves	2 x 1.5..2.5mm <sup>2</sup> (2 x AWG16..14) 2 x 2.5..6mm <sup>2</sup> (2 x AWG14..10)
Stripping length	10mm
Tightening torque	2Nm (Pozidriv 2 bit)
Screw size	M4
Aperture for termination lug (fork type)	Max. 11 mm

### CONTROL CONNECTIONS (75°C,Copper Cables)

Connection Type	Captive Clamp
Illustration of terminal	
Type	Pluggable
Stranded	1 x 0.05..1.5mm <sup>2</sup> (1 x AWG30..16)
Solid	1 x 0.05..2.5mm <sup>2</sup> (1 x AWG30..14)
Stripping length	6 - 7.5mm
Tightening torque	0.5Nm (Philips bit)
Screw Size	M3
Withdrawal Force	1.5N
Insertion Force	3N
Max Contact Resistance	15mΩ

## Load Specifications

	@ 40°	@ 50°	@ 60°	@ 40°	@ 50°	@ 60°	I <sub>MIN</sub>	I <sub>TSM</sub>
Rated operational current AC-53a @ 400Vrms, to IEC, for trip classes 10, 20, 30	45 mm			0 mm			All Cases	
Horizontal space between units	7.6A	6.8A	6.2A	5.8A	5.8A	4.9A	400mA	600Ap
No. of poles	2							
Maximum On-state voltage drop @ rated current	1.6 Vrms							
Off-state leakage current @ rated voltage and frequency	< 3 mArms							
Critical dV/dt*	1000 V/μs							

\* Specification @ T<sub>J</sub> (init.) = 25°C and t = 10 ms

## Motor Rating (45 mm space between adjacent units)

HP @ 40 / 50 / 60°C, according to UL508				kW @ 40 / 50 / 60°C, according to IEC 60947-4-2			
230V	400V	480V	600V	230V	400V	480V	600V
2 / 2 / 1	3 / 3 / 3	5 / 3 / 3	-	1.5 / 1.5 / 1.5	3.0 / 2.2 / 2.2	4.0 / 3.0 / 3.0	-

## Environmental Specifications

Operating temperature	-25°C to 60°C (-13°F to +140°F)
Storage temperature	-40°C to 100°C (-40°F to +212°F)
EU RoHS compliant	Yes
China RoHS compliant	Refer to Environmental Information (page 7)
Impact resistance	15/11 g/ms
Vibration resistance	2 g
Relative humidity	< 95% non-condensing @ 40°C
Pollution degree	2
Installation category	III
Degree of finger protection	IP20
Installation altitude	0-1000 m. Above 1000 m derate linearly by 1% of FLC per 100 m up to a maximum of 2000 m

## Housing Specifications

Weight	approx 300 g
Housing material	Nylon PA66
Flame class	UL94-V0
Housing colour	RAL7035
Dimensions (h x w x d) (without input plug)	105 x 45 x 90 mm

## Isolation

Dielectric withstand voltage input to output	≥ 4000 VACrms
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## Short Circuit Protection (according to EN/IEC 60947-4-2 and UL508)

Short Circuit Current Rating	5 kA
Type of coordination: 1	
UL rated short circuit current RK5 fuse	15 A
Type of coordination: 2	
Rated short circuit Semiconductor fuse	Y220913 6.9 CP GRC 22.58 5

## Agency Approvals and Conformances

Conformance	IEC/EN 60947-4-2	Agency Approvals	UL508 Listed (E172877), NMFT cUL Listed (E172877), NMFT7
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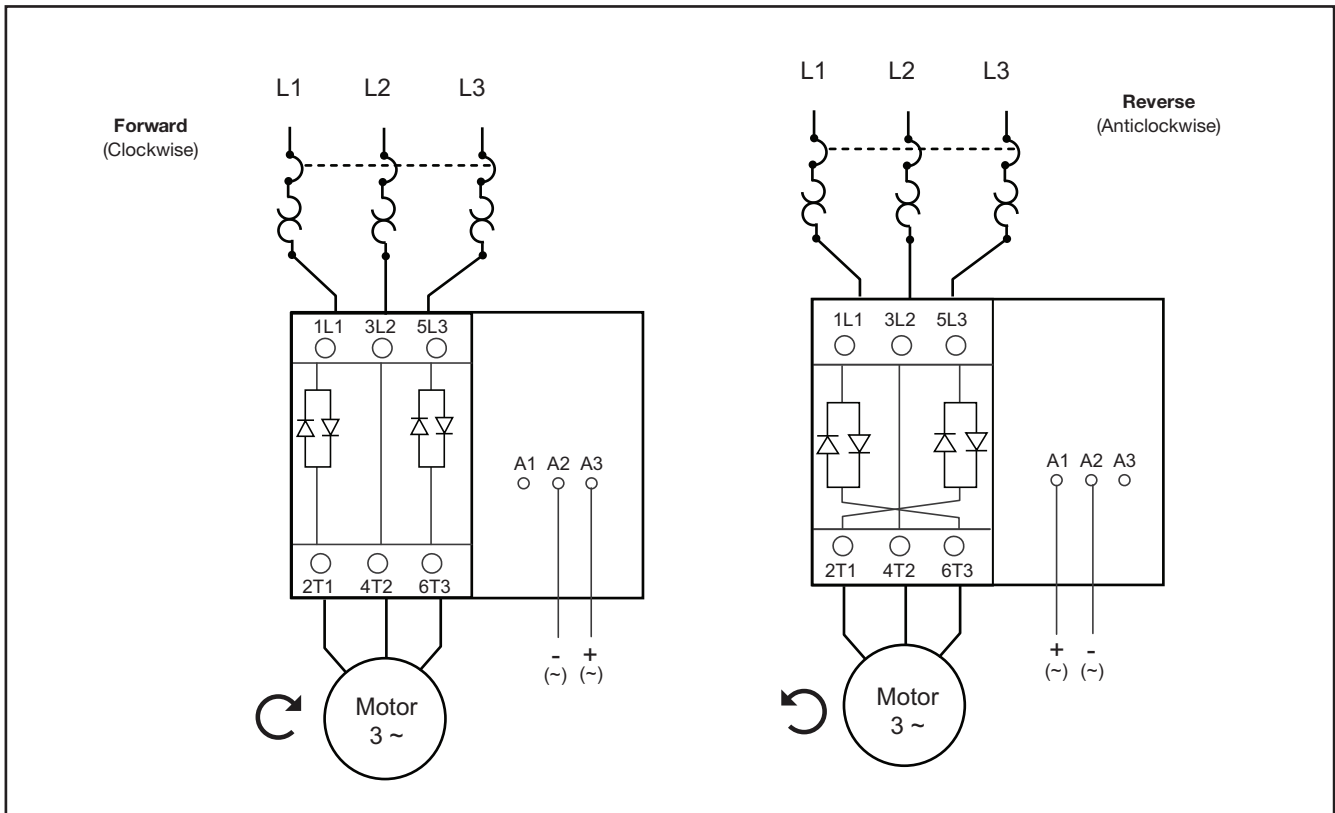


## Electromagnetic Compatibility

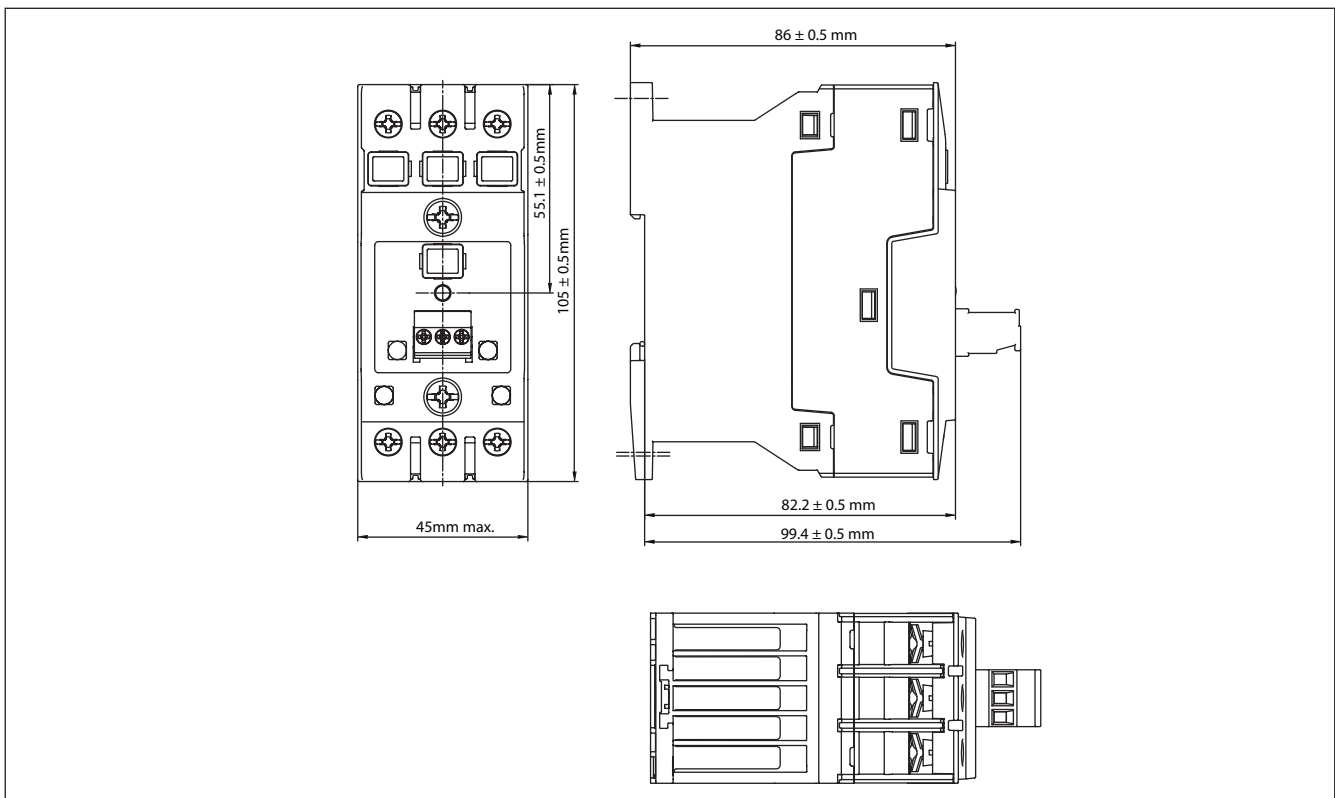
<b>EMC Immunity</b>	EN 60947-4-2	<b>Radiated Radio Frequency Immunity</b>	
<b>Electrostatic Discharge (ESD) Immunity</b>		10 V/m, 80 - 1000 MHz	IEC/EN 61000-4-3
Air discharge, 8 kV	IEC/EN 61000-4-2 Performance Criteria 2	10 V/m, 1.4 - 2 GHz	Performance Criteria 1
Contact, 4 kV	Performance Criteria 1	10 V/m, 2 - 2.7 GHz	Performance Criteria 1
<b>Electrical Fast Transient (Burst) Immunity</b>		<b>Conducted Radio Frequency Immunity</b>	IEC/EN 61000-4-6
Output: 4 kV, 5 kHz	IEC/EN 61000-4-4 Performance Criteria 2	10 V/m, 0.15 - 80 MHz	Performance Criteria 1
Output: 2 kV, 5 kHz	Performance Criteria 1	<b>Voltage Dips Immunity</b>	IEC/EN 61000-4-11
Input: 2 kV, 5 kHz	Performance Criteria 1	0% for 0.5, 1 cycle	Performance Criteria 2
<b>Electrical Surge Immunity</b>	IEC/EN 61000-4-5	40% for 10 cycles	Performance Criteria 2
Output, line to line, 1 kV	Performance Criteria 1	70% for 25 cycles	Performance Criteria 2
Output, line to earth, 2 kV	Performance Criteria 1	80% for 250 cycles	Performance Criteria 2
Input, line to line, 1 kV	Performance Criteria 2	<b>Voltage Interruptions Immunity</b>	IEC/EN 61000-4-11
Input, line to earth, 2 kV	Performance Criteria 2	0% for 5000 ms	Performance Criteria 2
<b>EMC Emission</b>	EN 60947-4-2	<b>Radio Interference</b>	
<b>Radio Interference</b>		<b>Field Emission (Radiated)</b>	IEC/EN 55011
<b>Voltage Emission (Conducted)</b>	IEC/EN 55011	<b>30 - 1000MHz</b>	Class B (light industry)
<b>0.15 - 30MHz</b>	Class A (industrial)*		

\* This product is designed and constructed as an EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such applications, additional external filtering may be required.

## Connection Diagrams



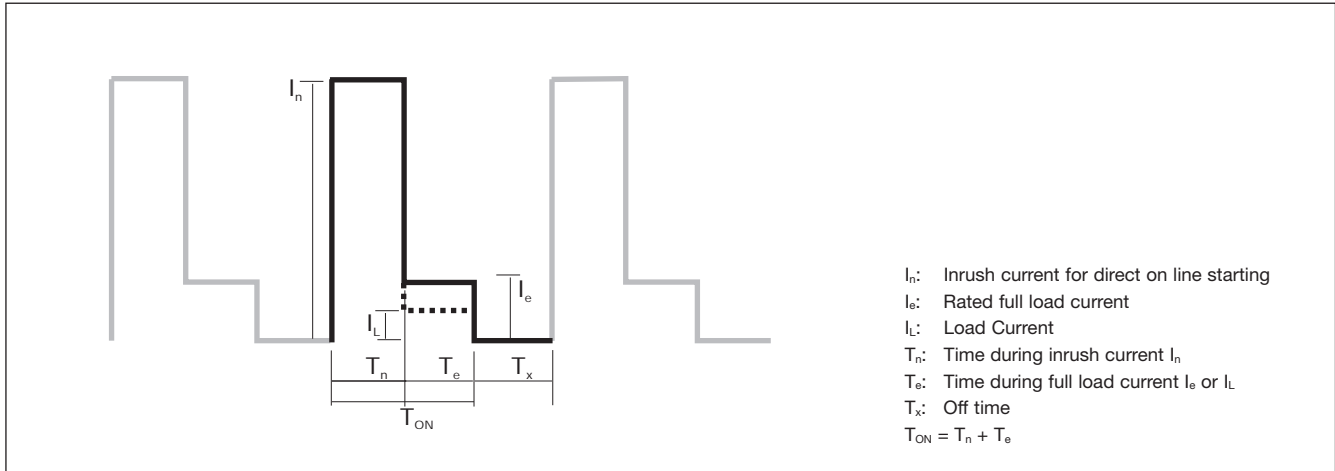
## Dimensions



All dimensions in mm

# Characteristic Curves and Operating Cycles

Maximum allowable number of starts depending on the  $T_n$  and  $T_{on}$



Curves: No. of switching cycles per hour versus  $t_{ON}$

Chart No. 1

$$\frac{I_n}{I_e} = 7.2, \frac{I_L}{I_e} = 1$$

$t_{ON}$ (s)	Number of Switches per Hour						
	$T_n = 0.05s$	$T_n = 0.1s$	$T_n = 0.2s$	$T_n = 0.4s$	$T_n = 0.8s$	$T_n = 1.6s$	$T_n = 3.2s$
0.1	1800	910	-	-	-	-	-
1	1500	800	420	220	102	-	-
10	380	300	250	160	90	40	15
100	38	38	38	35	35	25	6
1000	-	-	-	-	-	-	-

Chart No. 2

$$\frac{I_n}{I_e} = 7.2, \frac{I_L}{I_e} = 0.6$$

$t_{ON}$ (s)	Number of Switches per Hour						
	$T_n = 0.05s$	$T_n = 0.1s$	$T_n = 0.2s$	$T_n = 0.4s$	$T_n = 0.8s$	$T_n = 1.6s$	$T_n = 3.2s$
0.1	1900	900	-	-	-	-	-
1	1800	850	440	120	110	-	-
10	390	390	350	190	100	50	25
100	38	38	38	38	25	25	20
1000	-	-	-	-	-	-	-

Chart No. 3

$$\frac{I_n}{I_e} = 4, \frac{I_L}{I_e} = 1$$

$t_{ON}$ (s)	Number of Switches per Hour						
	$T_n = 0.05s$	$T_n = 0.1s$	$T_n = 0.2s$	$T_n = 0.4s$	$T_n = 0.8s$	$T_n = 1.6s$	$T_n = 3.2s$
0.1	5100	2800	-	-	-	-	-
1	2700	1900	1100	650	350	-	-
10	250	250	250	290	200	140	75
100	36	36	36	36	36	36	30
1000	-	-	-	-	-	-	-

Chart No. 4

$$\frac{I_n}{I_e} = 4, \frac{I_L}{I_e} = 0.6$$

$t_{ON}$ (s)	Number of Switches per Hour						
	$T_n = 0.05s$	$T_n = 0.1s$	$T_n = 0.2s$	$T_n = 0.4s$	$T_n = 0.8s$	$T_n = 1.6s$	$T_n = 3.2s$
0.1	5500	2900	-	-	-	-	-
1	3400	2300	1400	700	350	-	-
10	350	350	350	350	280	170	80
100	36	36	36	36	36	36	36
1000	-	-	-	-	-	-	-

## Environmental Information

The declaration in this section is prepared in compliance with People's Republic of China Electronic Industry Standard SJ/T11364-2014: Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products.

Part Name	Toxic or Harardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Power Unit Assembly	x	○	○	○	○	○

O: Indicates that said hazardous substance contained in homogeneous materials for this part are below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

## 环境特性

这份申明根据中华人民共和国电子工业标准 SJ/T11364-2014：标注在电子电气产品中限定使用的有害物质

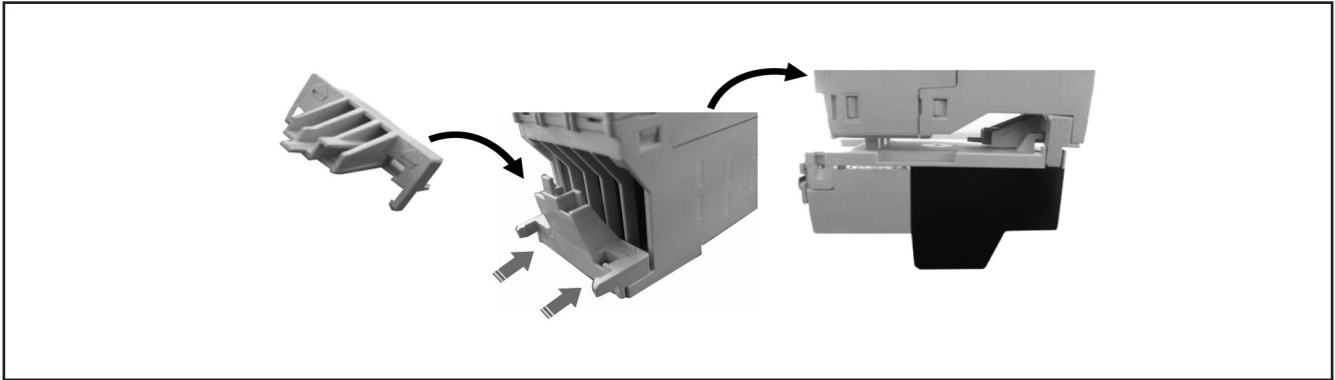
零件名称	有毒或有害物质与元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴化联苯 (PBB)	多溴联苯醚 (PBDE)
功率单元	x	○	○	○	○	○

O:此零件所有材料中含有的该有害物低于GB/T 26572的限定。

X: 此零件某种材料中含有的该有害物高于GB/T 26572的限定。



## Accessories



Motor overload Relay adapter.\*  
 Part Number: REC3ADAPTOR  
 Pack qty.: 5 pcs

Compatible with:

Manufacturer	Series	Example
ABB	TA	TA25DU-8.5
Siemens	3RU11	3RU1126-1FB0

\* 1 adaptor is shipped with every REC unit