

Modular DIN rail components Installation contactors



Power and productivity for a better world™

ESB / EN installation contactors Overview, features and benefits

Introduction

ABB offers a complete range of equipment for controlling, remote switching and protecting electrical installations in buildings as hotels, hospitals, shopping centers, office centers and domestic applications.

ESB and EN installation contactors are designed to match the Modular DIN rail components for common use in dedicated panels providing high safety and finger protection.

The range

The ESB range includes 4 ratings from 20 A to 63 A with 2 to 4-pole version. The EN contactor range offers 3 types from 20 A to 40 A with an additional manual switch in front.

Features and benefits

Flexible use for many application

ESB20 ... ESB63 can be used for DIN rail as well as for industrial applications:

- Resistive loads such as electric heaters, water heaters, etc.Motors, pumps
- Lamp switching and controls (Building installation)

High comfort due to hum-free operation

The installation contactor types ESB24/EN24...ESB63/EN63 operate free from vibration, thanks to their DC coil technology. This feature has high value in building installations where hum-free and silent operations are important for people's farewell.

High protection against overvoltages and current peaks

- Built-in surge protection for ESB24 ... ESB63
- ABB tested lamp table provides secure planning

Approvals available

Certificates for CE, CCC, UL/CSA, GOST, as well as household or ship approvals available. Other approvals on request.

Compact and optimized design

Installation contactors with MDRC design have a very compact size. A powerful ESB63, max. operating current 63 A fits in a small enclosure with only 60 mm depth.

Cost savings

- Low power consumption of DC coils (ESB24, ESB40, ESB63)
- Better logistics, because AC/DC coil supply requires less variants
- Significantly reduced space compared to industrial contactors

High availability and safety of EN types

EN types have contactor properties, but also have a special hand operating function. This provides customers with the following features

- Manual control in case of failure is always available
- Easier and faster commissioning
- Time savings on maintenance and testing of equipment





Contacto	r types							
Remote c	controlled			ESB20	ESB24	ESB40	ESB63	
Remote and manually controlled				EN20	EN24	EN40	-	
Module width			mm	18	36 54		54	
coil types			AC operated	AC / DC operated	AC / DC operated	AC / DC operated		
Main Pole	e - Utilization Char	acteristics accordin	g to IE	C	•		.	
Rated operational voltage U _e max.			v	AC: 250, DC: 220	AC: 400, DC: 220			
Utilization	category AC-1 / AC	C-7a						
for air tem	perature close to c	ontactor < 55 °C						
Max. rated operational current I _e AC-1 / AC-7a N.O.								
		N.O.	Α	20	24	40	63	
		N.C.	Α	20	24	30	30	
Jtilization	category AC-3 / AC	C-7b						
or air tem	perature close to c	ontactor < 55 °C						
Max. rated operational current I _e AC-3 / AC-7b 230 V - 1 phase								
		Α	9	9	22	30		
		400 V - 3 phases	Α	-	9	22	30	
Rated ope	erational power AC-	3						
230 V - 1 phase		kW	1.1	1.3	3.7	5		
		400 V - 3 phases	kW	-	4	11	15	
Accessor	ies							
	Aux. switches	2 NO		-	EH04-20			
		1 NO + 1 NC		-	EH04-11			
۳	Distance piece		•••••	-	ESB-DIS		•••••	





Functions:

- Switch in position "AUTO": standard control
- Switch in position "O": Supply to coil interrupted
- Switch in position "I": Manually switched on
- (a trigger signal to the coil terminal initiates the switch moving into "AUTO" position)

Applications with load behavior diagrams

Resistive loads

Motor loads



Resistive loads

Resistive loads such as heaters, water heaters, etc., according to utilization category AC-1, IEC60947-4-1 have a constant operating current as well as the same inrush current.

Motor loads

Motor starts cause high inrush currents that can reach 6 to 8 times the operating current in a time range up to 10 sec. The technical data take into account those starting phases according to the utilization category AC-3 referring to IEC60947-4-1

Mixed loads

Lamp loads



Mixed loads

Load shedding circuits and access control with card readers for example, apartments, houses or shops can be realized with ESB20, ESB24, ESB40 and ESB63. When leaving the facilities a complete shutdown of the whole power supply or even individual circuits can be realized.

Lamp loads

Lamp loads cause capacitive inrush current peaks that can be a multiple of the operating current. Depending on the types of lamps and wiring strategies, the main contacts of a contactor will be loaded very different. The use of conventional or electronic ballasts have an additional big impact. The ABB lamp table takes into account the various parameters.

Lamp table for ESB / EN installation contactors

Please notice:

Switching lamps is a capacitor load application where high inrush current peaks could occur. These are influenced by the length and cross section of the wire as well as the type of power supply unit and specifications of the lamp brand. For example long cables can increase the possible number of lamps per pole. The table shows the allowed max. current for 1 pole and considers already the startup current peaks.

The following selection table shows the current values and the maximum switchable capacitor load for compensated lamps. These two limits have to be considered in the selection of contactors.

		ESB20/EN20	ESB/EN24	ESB/EN40	ESB63			
Permitted compensating capacity per phase	C _{max} [µF]	75	100	350	500			
Lamp types		Maximum load of the current paths during switching of electric lamps ${\sf I}_{\sf e}\left[{\sf A}\right]$						
Incandescent and halogen lamps (230 V)	I _e [A]	6	7	20	30			
Mixing lamps without ballast	I _e [A]	6	7	20	30			
Fluorescent lamps with conventional ballast								
single lamp uncompensated	I _e [A]	9	22	36	56			
single lamp parallel compensated	I _e [A]	3	3.5	10	15			
series compensation, duo circuit	I _e [A]	9	22	36	56			
Fluorescent lamps with electronic ballast or CFL	I _e [A]	3	7	20	30			
LED lamps	I _e [A]	3	7	20	30			
High pressure mercury-vapor lamps								
single lamp without compensation	I _e [A]	9	11	18	28			
single lamp with parallel compensation	I _e [A]	3	3.5	10	15			
Halogen metal-vapor lamps								
single lamp without compensation	I _e [A]	9	11	18	28			
single lamp with parallel compensation	I _e [A]	3	3.5	10	15			
High pressure sodium-vapor lamps								
single lamp without compensation	I _e [A]	9	11	18	28			
single lamp with parallel compensation	I _e [A]	3	3.5	10	15			
Low pressure sodium-vapor lamps								
single lamp without compensation	I _e [A]	9	11	18	28			
single lamp with parallel compensation	I _e [A]	3	3.5	10	15			
Electronic ballast devices	I _e [A]	3	7	20	30			

Example for lamp load calculation:

Due to many varieties of lamps and ballasts we advice to take the current load as base for reference. The lamp table considers already the inrush peaks and other lamp parameters. The formula I=P/U can be used for calculation if only the voltage and power is known.

Please see the following examples for a reliable project lamp calculation

- Fluorescent lamp with conventional ballast, uncompensated,
 - the lamp operating current I = 1.5 A, voltage U = 230 V
 - 1 pole of ESB24 can be loaded with max. 22 A, see lamp table => 22A/1.5A = 14.66 => 14 lamps
 - 1 pole of ESB20 can be loaded with max. 9 A, see lamp table => 9A/1.5A = 6 lamps
- Fluorescent lamp with conventional ballast, uncompensated,
 - the lamp power P = 140 W, U = 230 V,
 - I = P/U = 140/230 = 0.6 A
 - 1 pole of ESB24 can be loaded with max. 22 A, see lamp table => 22A/0.6A = 36.66 => 36 lamps
 - 1 pole of ESB20 can be loaded with max. 9 A, see lamp table => 9A/0.6A = 15 lamps

ESB / EN installation contactors AC / AC-DC operated - with screw terminals

Introduction





ESB24



ESB40



ESB63



EN20



EN24



EN40



L'S

ESB-PLK 24

- Hum-free operating system, low power consumption, integrated high overvoltage protection 5 kV.

- One add-on auxiliary contact block for side mounting can be used with ESB24, ESB40, ESB63 and EN24, EN40

They operate with an AC coil. ESB24/ESB40/ESB63/EN24/EN40 contactors are used for the control of single and three-phases loads up to 63 A. Due to their DC solenoid actuator, they

ESB20/EN20 contactors are used for the control of single phase loads up to 20 A.

can be connected to AC or DC voltages. This provides following benefits:

IEC	IEC	Control volt	age	Туре	Order code	Pkg	Weight
Rated curent	Rated motor	U,	-			qty	(1 pce)
θ ≤ 40°C	load	0					
AC-1/AC-7a	AC-3/AC-7b						
A	kW	V 50Hz	V 60Hz			pce	kq
2 Main Poles	:	:	:	:	÷		
20	1,1	24 V	28 V	ESB20-20	GHE3211102R0001	10	0.14
		230 V	264 V	ESB20-20	GHE3211102R0006	10	0.14
		24 V	28 V	ESB20-02	GHE3211202R0001	10	0.14
		230 V	264 V	ESB20-02	GHE3211202R0006	10	0.14
		24 V	28 V	ESB20-11	GHE3211302R0001	10	0.14
		230 V	264 V	ESB20-11	GHE3211302R0006	10	0.14
24	4	24 V	24 V	ESB24-20	GHE3291402R0001	5	0.28
		230240 V	230240 V	ESB24-20	GHE3291402R0006	5	0.28
40	22	24 V	24 V	ESB40-20	GHE3491402R0001	3	0.38
		230 V	230 V	ESB40-20	GHE3491402R0006	3	0.38
3 or 4 Main Po	oles						•
		24 V	24 V	ESB24-40	GHE 3291102R0001	5	0.28
		230240 V	230240 V	ESB24-40	GHE 3291102R0006	5	0.28
		24 V	24 V	ESB24-04	GHE 3291202R0001	5	0.28
		230240 V	230240 V	ESB24-04	GHE 3291202R0006	5	0.28
		24 V	24 V	ESB24-22	GHE 3291302R0001	5	0.28
		230240 V	230240 V	ESB24-22	GHE 3291302R0006	5	0.28
		24 V	24 V	ESB24-31	GHE 3291602R0001	5	0.28
		230240 V	230240 V	ESB24-31	GHE 3291602R0006	5	0.28
		24 V	24 V	ESB40-40	GHE 3491102R0001	3	0.40
		230240 V	230240 V	ESB40-40	GHE 3491102R0006	3	0.40
		24 V	24 V	ESB40-22	GHE 3491302R0001	3	0.40
		230 V	230 V	ESB40-22	GHE 3491302R0006	3	0.40
		24 V	24 V	ESB40-31	GHE 3491602R0001	3	0.40
		230 V	230 V	ESB40-31	GHE 3491602R0006	3	0.40
		24 V	24 V	ESB40-30	GHE 3491502R0001	3	0.39
		230 V	230 V	ESB40-30	GHE 3491502R0006	3	0.39
		24 V	24 V	ESB63-40	GHE 3691102R0001	3	0.42
		230240 V	230240 V	ESB63-40	GHE 3691102R0006	3	0.42
		230 V	230 V	ESB63-31	GHE 3691602R0006	3	0.42
EN types with	manual switch	, 2-pole and 4	4-pole	·			•
		24 V	28 V	EN20-20	GHE3221101R0001	10	0.14
		230 V	264 V	EN20-20	GHE3221101R0006	10	0.14
		24 V	24 V	EN24-40	GHE3261101R0001	5	0.24
		230240 V	230240 V	EN24-40	GHE3261101R0006	5	0.24
		24 V	24 V	EN24-31	GHE3261601R0001	5	0.24
	1	230240 V	230240 V	EN24-31	GHE3261601R0006	5	0.24
		24 V	24 V	EN40-40	GHE3421101R0001	3	0.41
		230240 V	230240 V	EN40-40	GHE3421101R0006	3	0.41
		24 V	24 V	EN40-31	GHE3421601R0001	3	0.41
		230240 V	230240 V	EN40-31	GHE3421601R0006	3	0.41
	:	: J J J J J J J J J J J J J J J J J	: 2002 10 V			:	

Ordering details accessories

Designation	Туре	Order code	Pkg	Weight
			qty	(1 pce)
			рсе	kg
Aux. 2 N.O.	EH04-20 1	GHE3401321R0001	10	0.023
switches 1 N.O. + 1 N.C.	EH04-11 ①	GHE3401321R0002	10	0.023
Distance piece	ESB-DIS	GHE3201902R0001	10	0.002
Sealing covers	ESB-PLK 24	GHE3201903R0001	10	0.002
	ESB-PLK 40/63	GHE3401903R0001	10	0.003

① Mounting onto ESB/EN 20 not possible.

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