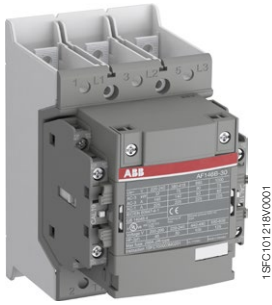




# AF116B ... AF146B 3-pole contactors

## 55 to 75 kW

### DC operated - connection with standard ferrules



AF146B-30-22

1SFC101218W0001

#### Description

AF116B ... AF146B 3-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. AF116B ... AF140B are mainly used for controlling 3-phase motors and power circuits up to 690 V AC, AF146B up to 1000 V AC and AF116B ... AF146B up to 220 V DC. These contactors are of the block type design with 3 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting a wide DC control voltage range (0.85 Uc min. ... 1.1 Uc max. according to IEC 60947-4-1) including several Uc control voltages (0.7 ... 1.25 Uc according to IEC 60077) used for battery supply
- low coil consumption
- built-in surge suppression
- side by side mounting without restriction from -40 °C up to +70 °C
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

#### Ordering details

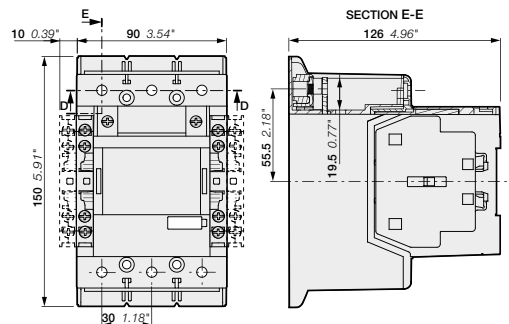
IEC	UL / CSA		Supply control voltage	Rated control circuit voltage	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	3-phase motor rating	General use rating	Uc (IEC 60077)	Uc min. ... Uc max. (IEC 60947-4-1)				Pkg (1 pce)
400 V AC-3	480 V AC-1	600 V AC	(1)	(1)				kg
kW	A	hp	A	V DC	V DC			

#### With bar connections

55	160	75	160	24, 33, 48	20...60	2 2	AF116B-30-22-11	1SFL427063R1122	1.5
				72, 96, 110	48...130	2 2	AF116B-30-22-12	1SFL427063R1222	1.5
				220	100...250	2 2	AF116B-30-22-13	1SFL427063R1322	1.5
75	200	100	200	24, 33, 48	20...60	2 2	AF140B-30-22-11	1SFL447063R1122	1.5
				72, 96, 110	48...130	2 2	AF140B-30-22-12	1SFL447063R1222	1.5
				220	100...250	2 2	AF140B-30-22-13	1SFL447063R1322	1.5
75	225	100	200	24, 33, 48	20...60	2 2	AF146B-30-22-11	1SFL467063R1122	1.5
				72, 96, 110	48...130	2 2	AF146B-30-22-12	1SFL467063R1222	1.5
				220	100...250	2 2	AF146B-30-22-13	1SFL467063R1322	1.5

(1) Other control voltages, see voltage code table.

#### Main dimensions mm, inches



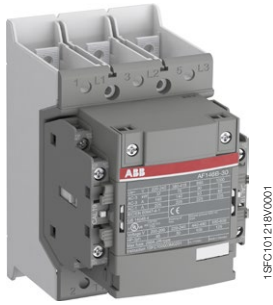
AF116B, AF140B, AF146B-30-22

1SFC101270C0201

# AF116B ... AF146B 3-pole contactors

## 55 to 75 kW

### AC operated - connection with standard ferrules



AF146B-30-22

1SFC101218V0001

#### Description

AF116B ... AF146B 3-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. AF116B ... AF140B are mainly used for controlling 3-phase motors and power circuits up to 690 V AC, AF146B up to 1000 V AC and AF116B ... AF146B up to 220 V DC. These contactors are of the block type design with 3 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting sinusoidal AC 50/60 Hz control supplies included inside the wide control voltage range  $U_c$  min. ...  $U_c$  max. of the contactor. Max. permitted control voltage must not be exceeded during voltage fluctuation defined according to IEC 60077 or EN 50155 (see technical data)
- built-in surge suppression
- side by side mounting without restriction from -40 °C up to +70 °C
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

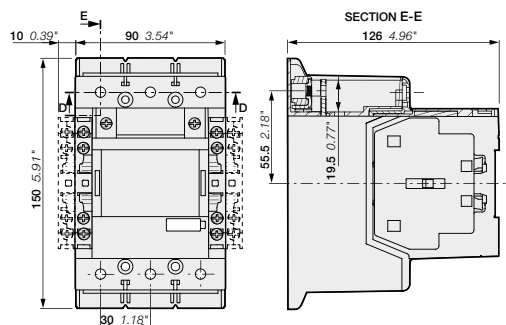
#### Ordering details

IEC	UL / CSA	Rated control circuit voltage $U_c$ min. ... $U_c$ max. (IEC 60947-4-1)	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power 400 V AC-3 kW	3-phase motor rating 480 V hp	General use rating 600 V AC V AC 50/60 Hz				Pkg (1 pce) kg

#### With bar connections

Rated operational power (kW)	3-phase motor rating (hp)	General use rating (V AC 50/60 Hz)	Auxiliary contacts fitted	Type	Order code	Weight (kg)	
55	160	75	160	24...60	2 2 AF116B-30-22-11	1SFL427063R1122	1.5
				48...130	2 2 AF116B-30-22-12	1SFL427063R1222	1.5
				100...250	2 2 AF116B-30-22-13	1SFL427063R1322	1.5
				250...500	2 2 AF116B-30-22-14	1SFL427063R1422	1.5
75	200	100	200	24...60	2 2 AF140B-30-22-11	1SFL447063R1122	1.5
				48...130	2 2 AF140B-30-22-12	1SFL447063R1222	1.5
				100...250	2 2 AF140B-30-22-13	1SFL447063R1322	1.5
				250...500	2 2 AF140B-30-22-14	1SFL447063R1422	1.5
75	225	100	200	24...60	2 2 AF146B-30-22-11	1SFL467063R1122	1.5
				48...130	2 2 AF146B-30-22-12	1SFL467063R1222	1.5
				100...250	2 2 AF146B-30-22-13	1SFL467063R1322	1.5
				250...500	2 2 AF146B-30-22-14	1SFL467063R1422	1.5

#### Main dimensions mm, inches



AF116B, AF140B, AF146B-30-22

1SFC101271C0201

# AF190B ... AF370B 3-pole contactors

## 90 to 200 kW

### DC operated - connection with standard ferrules



AF205B-30-22



AF370B-30-22

#### Description

AF190B ... AF370B 3-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. They are mainly used for controlling 3-phase motors and power circuits up to 1000 V AC and up to 220 V DC. These contactors are of the block type design with 3 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting a wide DC control voltage range (0.85  $U_c$  min. ... 1.1  $U_c$  max. according to IEC 60947-4-1) including several  $U_c$  control voltages (0.7 ... 1.25  $U_c$  according to IEC 60077) used for battery supply
- low coil consumption
- built-in surge suppression
- side by side mounting without restriction from -40 °C up to +70 °C
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

#### Ordering details

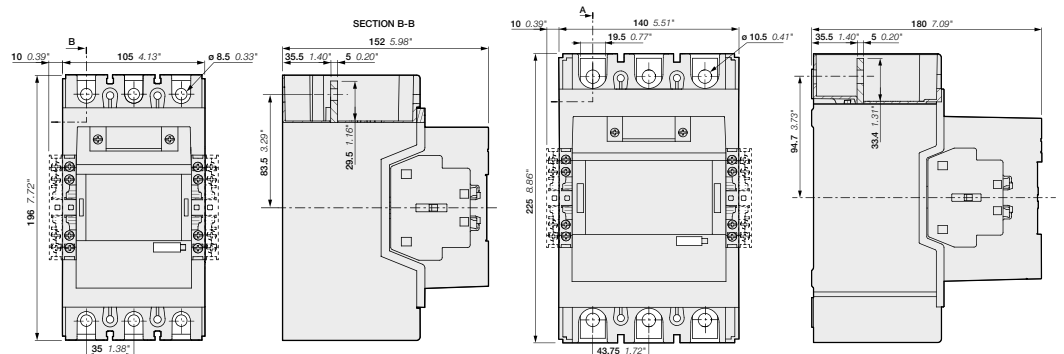
IEC	UL / CSA	Supply control voltage	Rated control circuit voltage	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	3-phase motor rating	General use rating	Rated control circuit voltage				Pkg (1 pce)
400 V AC-3	AC-1	600 V AC	$U_c$ (IEC 60077)	$U_c$ min. ... $U_c$ max. (IEC 60947-4-1)			kg
kW	A	hp	V DC	V DC			

#### With bar connections

90	275	125	250	24, 33, 48	20...60	2 2	AF190B-30-22-11	1SFL487063R1122	3
				72, 96, 110	48...130	2 2	AF190B-30-22-12	1SFL487063R1222	3
				220	100...250	2 2	AF190B-30-22-13	1SFL487063R1322	3
110	350	150	300	24, 33, 48	20...60	2 2	AF205B-30-22-11	1SFL527063R1122	3
				72, 96, 110	48...130	2 2	AF205B-30-22-12	1SFL527063R1222	3
				220	100...250	2 2	AF205B-30-22-13	1SFL527063R1322	3
132	400	200	350	24, 33, 48	20...60	2 2	AF265B-30-22-11	1SFL547063R1122	4.675
				72, 96, 110	48...130	2 2	AF265B-30-22-12	1SFL547063R1222	4.675
				220	100...250	2 2	AF265B-30-22-13	1SFL547063R1322	4.675
160	500	250	400	24, 33, 48	20...60	2 2	AF305B-30-22-11	1SFL587063R1122	4.675
				72, 96, 110	48...130	2 2	AF305B-30-22-12	1SFL587063R1222	4.675
				220	100...250	2 2	AF305B-30-22-13	1SFL587063R1322	4.675
200	600	300	520	24, 33, 48	20...60	2 2	AF370B-30-22-11	1SFL607063R1122	4.675
				72, 96, 110	48...130	2 2	AF370B-30-22-12	1SFL607063R1222	4.675
				220	100...250	2 2	AF370B-30-22-13	1SFL607063R1322	4.675

(1) Other control voltages, see voltage code table.

#### Main dimensions mm, inches



AF190B, AF205B-30-22

AF265B, AF305B, AF370B-30-22

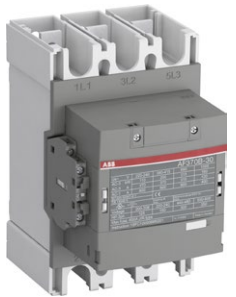
# AF190B ... AF370B 3-pole contactors

## 90 to 200 kW

### AC operated - connection with standard ferrules



AF205B-30-22



AF370B-30-22

#### Description

AF190B ... AF370B 3-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. They are mainly used for controlling 3-phase motors and power circuits up to 1000 V AC and up to 220 V DC.

These contactors are of the block type design with 3 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting sinusoidal AC 50/60 Hz control supplies included inside the wide control voltage range  $U_c \text{ min.} \dots U_c \text{ max.}$  of the contactor. Max. permitted control voltage must not be exceeded during voltage fluctuation defined according to IEC 60077 or EN 50155 (see technical data)
- built-in surge suppression
- side by side mounting without restriction from  $-40\text{ }^\circ\text{C}$  up to  $+70\text{ }^\circ\text{C}$
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

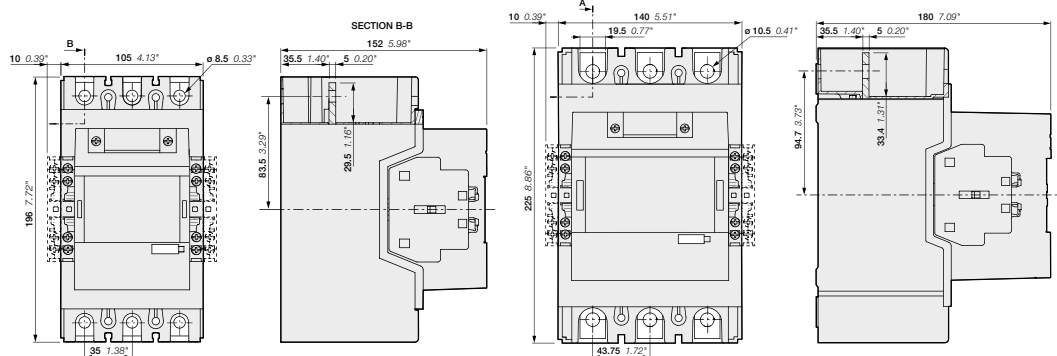
#### Ordering details

IEC	UL / CSA	Rated operational power	Rated operational current $\theta \leq 40\text{ }^\circ\text{C}$	3-phase motor rating	General use rating	Rated control circuit voltage $U_c \text{ min.} \dots U_c \text{ max.}$ (IEC 60947-4-1)	Auxiliary contacts fitted	Type	Order code	Weight
400 V AC-3	AC-1	kW	A	hp	A	V AC 50/60 Hz				Pkg (1 pce)
										kg

#### With bar connections

Rated power (kW)	Rated current (A)	3-phase motor rating (hp)	General use rating (A)	Rated control circuit voltage (V AC 50/60 Hz)	Auxiliary contacts fitted	Type	Order code	Weight (kg)
90	275	125	250	24...60	2 2	AF190B-30-22-11	1SFL487063R1122	3
				48...130	2 2	AF190B-30-22-12	1SFL487063R1222	3
				100...250	2 2	AF190B-30-22-13	1SFL487063R1322	3
				250...500	2 2	AF190B-30-22-14	1SFL487063R1422	3
110	350	150	300	24...60	2 2	AF205B-30-22-11	1SFL527063R1122	3
				48...130	2 2	AF205B-30-22-12	1SFL527063R1222	3
				100...250	2 2	AF205B-30-22-13	1SFL527063R1322	3
				250...500	2 2	AF205B-30-22-14	1SFL527063R1422	3
132	400	200	350	24...60	2 2	AF265B-30-22-11	1SFL547063R1122	4.675
				48...130	2 2	AF265B-30-22-12	1SFL547063R1222	4.675
				100...250	2 2	AF265B-30-22-13	1SFL547063R1322	4.675
				250...500	2 2	AF265B-30-22-14	1SFL547063R1422	4.675
160	500	250	400	24...60	2 2	AF305B-30-22-11	1SFL587063R1122	4.675
				48...130	2 2	AF305B-30-22-12	1SFL587063R1222	4.675
				100...250	2 2	AF305B-30-22-13	1SFL587063R1322	4.675
				250...500	2 2	AF305B-30-22-14	1SFL587063R1422	4.675
200	600	300	520	24...60	2 2	AF370B-30-22-11	1SFL607063R1122	4.675
				48...130	2 2	AF370B-30-22-12	1SFL607063R1222	4.675
				100...250	2 2	AF370B-30-22-13	1SFL607063R1322	4.675
				250...500	2 2	AF370B-30-22-14	1SFL607063R1422	4.675

#### Main dimensions mm, inches



AF190B, AF205B-30-22

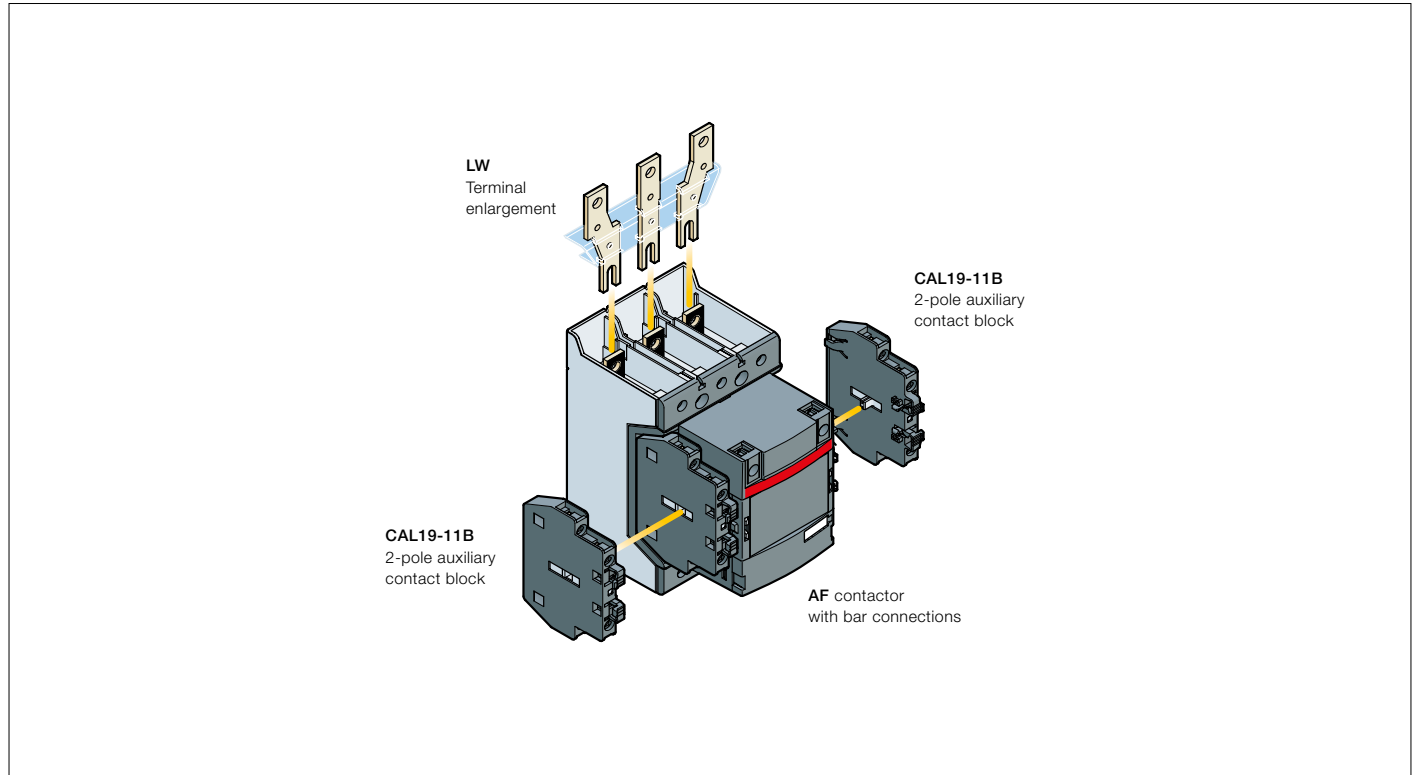
AF265B, AF305B, AF370B-30-22

1SFC101273C0201

# AF116B ... AF370B 3-pole contactors

## Main accessories

**Main accessories** (other accessories available)



### Main accessory fitting details

Contactor types	Main poles	Available auxiliary contacts	Side-mounted accessories	
			Auxiliary contact blocks	
			CAL19-11	CAL19-11B
AF116B ... AF370B	3	0 2 2	2 x CAL19-11 included	+ 2 x CAL19-11B

# AF116B ... AF370B 3-pole contactors



## Main accessories



1SFC101071V0001

CAL19-11

### Ordering details (1)

For contactors	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce) kg
	 				

### Side-mounted instantaneous auxiliary contact blocks

AF116B ... AF370B	1st block	1	1	CAL19-11	1SFN010820R1011	2	0.04
	2nd block	1	1	CAL19-11B	1SFN010820R3311	2	0.04

### Mechanical interlock unit

AF116B ... AF370B	VM19	1SFN030300R1000	1	0.054
AF116B ... AF146B and AF190B, AF205B	VM140/190	1SFN034403R1000	1	0.088
AF190B, AF205B and AF265B ... AF370B	VM205/265	1SFN035203R1000	1	0.09

Note: To mount VM mechanical interlock unit, remove CAL19-11.

### Terminal shrouds

AF116B ... AF146B, with compression lugs	LT140-30L	1SFN124203R1000	2	0.07
AF190B, AF205B, with cable clamps	LT205-30C	1SFN124801R1000	2	0.05
AF190B, AF205B, with compression lugs	LT205-30L	1SFN124803R1000	2	0.22
AF190B, AF205B, with shorting bar or between contactor and TOL/EOL in DOL-starters	LT205-30Y	1SFN124804R1000	1	0.05
AF265B ... AF370B, with cable clamps	LT370-30C	1SFN125401R1000	2	0.035
AF265B ... AF370B, with compression lugs	LT370-30L	1SFN125403R1000	2	0.28
AF265B ... AF370B, with shorting bar or between contactor and TOL/EOL in DOL-starters	LT370-30Y	1SFN125404R1000	1	0.075
AF265B ... AF370B, for use with extending cable clamps, ATK300/2 and OZXB4	LT370-30D	1SFN125406R1000	1	0.15



1SFC101035V0001

VM19



1SFC101041V0001

LT370-30C

For contactors	Dimensions		Type	Order code	Pkg qty	Weight (1 pce) kg
	hole Ø mm	bar mm				

### Terminal enlargements

AF116B ... AF146B	6.5	13 x 3	LW140	1SFN074207R1000	1	0.115
AF190B ... AF205B	10.5	17.5 x 5	LW205	1SFN074807R1000	1	0.26
AF265B ... AF370B	10.5	20 x 5	LW370	1SFN075407R1000	1	0.34

### Terminal extension

AF116B ... AF146B	6.5	13 x 3	LX140	1SFN074210R1000	1	0.072
AF190B ... AF205B	8.5	17.5 x 5	LX205	1SFN074810R1000	1	0.18
AF265B ... AF370B	10.5	20 x 5	LX370	1SFN075410R1000	1	0.234



1SFC101049V0001

LX140

(1) For more information, refer to "Accessories" section.

# AF116B ... AF370B 3-pole contactors

## Technical data

### Main pole - Utilization characteristics according to IEC

Contactor types	AF116B	AF140B	AF146B	AF190B	AF205B	AF265B	AF305B	AF370B	
Standards	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 IEC 60077-1, IEC 60077-2, EN 50155 (applicable parts)								
Fire and smoke	EN 45545 (HL2)								
Rated operational voltage $U_e$ max.	690 V	690 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	
Rated frequency (without derating)	50 / 60 Hz								
Conventional free-air thermal current $I_{th}$									
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$	160 A	200 A	225 A	275 A	350 A	400 A	500 A	600 A	
With conductor cross-sectional area	70 mm <sup>2</sup>	95 mm <sup>2</sup>	95 mm <sup>2</sup>	150 mm <sup>2</sup>	240 mm <sup>2</sup> (3)	240 mm <sup>2</sup>	300 mm <sup>2</sup> (4)	2 x 185 mm <sup>2</sup> (4)	
<b>AC-1 Utilization category</b>									
For air temperature close to contactor									
<b><math>I_e</math> / Rated operational current AC-1</b>									
$U_e$ max. $\leq 690$ V, 50/60 Hz	$\theta \leq 40^\circ\text{C}$	160 A	200 A	225 A	275 A	350 A	400 A	500 A	600 A
	$\theta \leq 60^\circ\text{C}$	145 A	175 A	200 A	250 A	300 A	350 A	400 A	500 A
	$\theta \leq 70^\circ\text{C}$	130 A	160 A	175 A	200 A	240 A	290 A	325 A	400 A
<b><math>I_e</math> / Rated operational current AC-1</b>									
$U_e$ max. $\leq 1000$ V, 50/60 Hz	$\theta \leq 40^\circ\text{C}$	—	—	225 A	250 A	275 A	350 A	375 A	400 A
	$\theta \leq 60^\circ\text{C}$	—	—	200 A	225 A	250 A	300 A	325 A	350 A
	$\theta \leq 70^\circ\text{C}$	—	—	175 A	185 A	200 A	240 A	260 A	290 A
With conductor cross-sectional area		70 mm <sup>2</sup>	95 mm <sup>2</sup>	95 mm <sup>2</sup>	150 mm <sup>2</sup>	240 mm <sup>2</sup> (3)	240 mm <sup>2</sup>	300 mm <sup>2</sup> (4)	2 x 185 mm <sup>2</sup> (4)
<b>AC-3 Utilization category</b>									
For air temperature close to contactor $\theta \leq 60^\circ\text{C}$									
<b><math>I_e</math> / Max. rated operational current AC-3 (1)</b>									
	220-230-240 V	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A
	380-400 V	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A
	415 V	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A
	440 V	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A
	500 V	110 A	130 A	130 A	135 A	165 A	250 A	290 A	315 A
	690 V	65 A	80 A	93 A	135 A	165 A	250 A	290 A	315 A
	1000 V	—	—	60 A	85 A	100 A	100 A	100 A	100 A
<b>Rated operational power AC-3 (1)</b>									
	220-230-240 V	30 kW	37 kW	45 kW	55 kW	55 kW	75 kW	90 kW	110 kW
	380-400 V	55 kW	75 kW	75 kW	90 kW	110 kW	132 kW	160 kW	200 kW
	415 V	55 kW	75 kW	75 kW	90 kW	110 kW	132 kW	160 kW	200 kW
	440 V	75 kW	90 kW	90 kW	110 kW	132 kW	160 kW	160 kW	200 kW
	500 V	75 kW	90 kW	90 kW	90 kW	110 kW	200 kW	200 kW	250 kW
	690 V	55 kW	75 kW	90 kW	132 kW	160 kW	200 kW	250 kW	315 kW
	1000 V	—	—	75 kW	110 kW	132 kW	132 kW	132 kW	132 kW
<b>Rated making capacity AC-3</b>	10 x $I_e$ AC-3 acc. to IEC 60947-4-1								
<b>Rated breaking capacity AC-3</b>	8 x $I_e$ AC-3 acc. to IEC 60947-4-1								
<b>Short-circuit protection device for contactors</b>									
without thermal overload relay - Motor protection excluded (2)									
$U_e \leq 500$ V AC - gG type fuse		250 A	315 A	315 A	355 A	400 A	500 A	500 A	630 A
<b>Rated short-time withstand current <math>I_{cw}</math></b>									
at $40^\circ\text{C}$ ambient temperature,	1 s	1300 A	1460 A	1460 A	1900 A	2050 A	2650 A	3050 A	3700 A
in free air from a cold state	10 s	928 A	1168 A	1168 A	1520 A	1640 A	2120 A	2440 A	2960 A
	30 s	536 A	674 A	674 A	878 A	947 A	1224 A	1409 A	1709 A
	1 min	379 A	477 A	477 A	621 A	670 A	865 A	996 A	1208 A
	15 min	160 A	200 A	225 A	275 A	350 A	400 A	500 A	600 A
<b>Maximum breaking capacity</b>									
$\cos \varphi = 0.45$	at 440 V	2000 A	3000 A	3000 A	3300 A	3500 A	3800 A	4600 A	5000 A
( $\cos \varphi = 0.35$ for $I_e > 100$ A)	at 690 V	1000 A	1500 A	1500 A	2200 A	2500 A	3300 A	3800 A	4000 A
<b>Power dissipation per pole</b>									
	$I_e$ / AC-1	12 W	18 W	23 W	15 W	25 W	32 W	50 W	72 W
	$I_e$ / AC-3	6 W	9 W	10 W	7 W	8 W	14 W	19 W	27 W
<b>Maximum electrical switching frequency</b>									
	AC-1	300 cycles/h							
	AC-3	300 cycles/h							
	AC-2, AC-4	150 cycles/h							



3-phase motors



1500 r.p.m. 50 Hz  
1800 r.p.m. 60 Hz  
3-phase motors

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m., 50 Hz or 1800 r.p.m., 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

(3) For currents above 275A use terminal enlargements or terminal extensions.

(4) For currents above 450A use terminal enlargements or terminal extensions.



# AF116B ... AF370B 3-pole contactors

## Technical data

### Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types		AF116B	AF140B	AF146B	AF190B	AF205B	AF265B	AF305B	AF370B
Standards		UL 60947-1 / 60947-4-1A and CSA 60947-1 / 60947-4-1A							
Maximum operational voltage		600 V							
NEMA size		—	4	—	—	—	5	—	—
NEMA continuous amp rating	Thermal current	—	135 A	—	—	—	270 A	—	—
NEMA maximum horse power ratings									
1-phase, 60 Hz	115 V AC	—	—	—	—	—	—	—	—
	230 V AC	—	—	—	—	—	—	—	—
NEMA maximum horse power ratings									
3-phase, 60 Hz	200 V AC	—	40 hp	—	—	—	75 hp	—	—
	230 V AC	—	50 hp	—	—	—	100 hp	—	—
	460 V AC	—	100 hp	—	—	—	200 hp	—	—
	575 V AC	—	100 hp	—	—	—	200 hp	—	—
UL / CSA general use rating									
600 V AC		160 A	200 A	200 A	250 A	300 A	350 A	400 A	520 A
With conductor cross-sectional area		AWG 2/0	AWG 3/0	AWG 3/0	MCM 250	MCM 350 (2)	MCM 500	2//AWG 3/0	2//MCM 300
UL / CSA maximum 1-phase motor rating									
Full load current	120 V AC	—	—	—	—	—	—	—	—
	240 V AC	—	—	—	—	—	—	—	—
Horse power rating	120 V AC	—	—	—	—	—	—	—	—
	240 V AC	—	—	—	—	—	—	—	—
UL / CSA maximum 3-phase motor rating									
Full load current (1)	200-208 V AC	92 A	120 A	120 A	150 A	177 A	221 A	285 A	359 A
	220-240 V AC	104 A	130 A	130 A	154 A	192 A	248 A	312 A	360 A
	440-480 V AC	96 A	124 A	124 A	156 A	180 A	240 A	302 A	361 A
	550-600 V AC	99 A	125 A	125 A	144 A	192 A	242 A	289 A	336 A
Horse power rating (1)	200-208 V AC	30 hp	40 hp	40 hp	50 hp	60 hp	75 hp	100 hp	125 hp
	220-240 V AC	40 hp	50 hp	50 hp	60 hp	75 hp	100 hp	125 hp	150 hp
	440-480 V AC	75 hp	100 hp	100 hp	125 hp	150 hp	200 hp	250 hp	300 hp
	550-600 V AC	100 hp	125 hp	125 hp	150 hp	200 hp	250 hp	300 hp	350 hp
Short-circuit protection device for contactors									
without thermal overload relay - Motor protection excluded									
High fault current		100 kA							
Fuse rating		225 A	250 A	250 A	450 A	400 A	500 A	600 A	800 A
Fuse type, 600 V		J							
Maximum electrical switching frequency									
For general use		300 cycles/h							
For motor use		300 cycles/h							

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For conductor cross-sectional area above MCM 300 use terminal enlargements LW205.

# AF116B ... AF370B 3-pole contactors

## Technical data

### General technical data

Contactor types	AF116B	AF140B	AF146B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Rated insulation voltage Ui</b> acc. to IEC 60947-4-1 acc. to UL / CSA	1000 V 600 V							
<b>Rated impulse withstand voltage Uimp.</b>	8 kV							
<b>Electromagnetic compatibility</b>	AF contactors comply with IEC 60947-1 / EN 60947-1 - Environment A							
<b>Ambient air temperature close to contactor</b>								
Operation	Fitted with thermal overload relay							-25 to +55 °C
Storage	Without thermal overload relay							-40 to +70 °C
<b>Maximum operating altitude (without derating)</b>	3000 m							
<b>Mechanical durability</b>								
Number of operating cycles	5 million operating cycles							
Maximum switching frequency	300 cycles/h							
<b>Shock and vibration withstand</b> acc to IEC 61373	Category 1, class B							

### Magnet system characteristics

Contactor types	AF116B	AF140B	AF146B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Coil operating limits</b> acc. to IEC 60947-4-1	At $\theta \leq 70$ °C 0.85 x Uc min ... 1.1 x Uc max							
<b>Rated control circuit voltage Uc</b>	24...500 V AC, 20...500 V DC							
<b>Coil consumption</b>								
<b>DC control voltage</b>								
20...60 V DC	Average pull-in value		210 W		205 W		400 W	
	Average holding value		2.5 W		2.5 W		3.5 W	
48...130 V DC	Average pull-in value		130 W		130 W		360 W	
	Average holding value		2.5 W		2.5 W		2.5 W	
100...250 V DC	Average pull-in value		135 W		190 W		410 W	
	Average holding value		3 W		2.5 W		4.5 W	
250...500 V DC	Average pull-in value		205 W		190 W		600 W	
	Average holding value		4 W		4 W		4.7 W	
<b>AC control voltage 50/60 Hz</b>								
24...60 V AC	Average pull-in value		225 VA		165 VA		475 VA	
	Average holding value		5.5 VA		6 VA		8.5 VA	
48...130 V AC	Average pull-in value		170 VA		175 VA		340 VA	
	Average holding value		4 VA		4 VA		17 VA	
100...250 V AC	Average pull-in value		130 VA		220 VA		385 VA	
	Average holding value		6 VA		7 VA		17.5 VA	
250...500 V AC	Average pull-in value		205 VA		185 VA		420 VA	
	Average holding value		16 VA		16 VA		21 VA	
Max. permitted control voltage during voltage fluctuation defined acc. to IEC 60077 / EN 50155	Rated control circuit voltage / Max. permitted control voltage 24 ... 60 V AC 50/60 Hz / 66 V AC 50/60 Hz 48 ... 130 V AC 50/60 Hz / 143 V AC 50/60 Hz 100 ... 250 V AC 50/60 Hz / 275 V AC 50/60 Hz 250 ... 500 V AC 50/60 Hz / 550 V AC 50/60 Hz							
<b>Drop-out voltage</b>	55 % of Uc min							
<b>Operating time</b>								
<b>Coil supply between A1 - A2</b>								
Between coil energization and:	N.O. contact closing		20...55 ms		25...60 ms		30...60 ms	
Between coil de-energization and:	N.O. contact opening		40...70 ms		45...80 ms		45...80 ms	

### Mounting characteristics and conditions for use

Contactor types	AF116B	AF140B	AF146B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Mounting positions</b>								
<b>Mounting distances</b>	The contactors can be assembled side by side							
<b>Fixing</b>								
On rail acc. to IEC 60715, EN 60715	-							
By screws (not supplied)	4 x M5							

# AF116B ... AF370B 3-pole contactors

## Technical data

### Connecting characteristics

Contactor types	AC / DC operated	AF116B	AF140B	AF146B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Main terminals</b>									
Flat type									
<b>Connection capacity (min. ... max.)</b>									
<b>Main conductors (poles)</b>									
	Cu cable - Stranded	1 x	10...95 mm <sup>2</sup>		6...150 mm <sup>2</sup>		16...300 mm <sup>2</sup>		
	Clamp type		LD... included (1)		1SDA066917R1		1SDA055016R1		
	Tightening torque		8 Nm		14 Nm		25 Nm		
	Cu cable - Stranded	2 x	10...95 mm <sup>2</sup>		50...120 mm <sup>2</sup>		70...185 mm <sup>2</sup>		
	Al cable - Stranded	1 x	-		95...185 mm <sup>2</sup>		185...240 mm <sup>2</sup>		
	Clamp type		-		1SDA054988R1		1SDA055020R1		
	Tightening torque		-		31 Nm		43 Nm		
	Cu cable - Flexible	1 x	10...70 mm <sup>2</sup>		6...120 mm <sup>2</sup>		16...240 mm <sup>2</sup>		
	Clamp type		LD... included (1)		1SDA066917R1		1SDA055016R1		
	Tightening torque		8 Nm		14 Nm		25 Nm		
	Cu cable - Flexible	2 x	10...70 mm <sup>2</sup>		50...95 mm <sup>2</sup>		70...185 mm <sup>2</sup>		
	Clamp type		LD... included (1)		1SFN074709R1000, LZ185-2C/120		1SCA022194R0890, OZXB4		
	Tightening torque		8 Nm		16 Nm		22 Nm		
	Lugs	L ≤	22 mm (.866 in)		24 mm (.945 in)		32 mm (1.260 in)		
		Ø >	6 mm (.236 in)		8 mm (.315 in)		10 mm (.394 in)		
	Socket type		LL... included		LL... included		LL... included		
	Tightening torque		9 Nm / 80 lb.in		18 Nm / 160 lb.in		28 Nm / 248 lb.in		
Connection capacity acc. to UL / CSA		1 x	AWG 6...3/0		6...300 MCM		4...400 MCM		
	Clamp type		LD... included (1)		ATK185 (2)		ATK300 (2)		
	Tightening torque		8 Nm / 71 lb.in		34 Nm / 301 lb.in		42 Nm / 372 lb.in		
Connection capacity acc. to UL / CSA		2 x	AWG 6...3/0		-		4...500 MCM		
	Clamp type		LD... included (1)		-		ATK300/2 (2)		
	Tightening torque		8 Nm / 71 lb.in		-		42 Nm / 372 lb.in		
<b>Auxiliary conductors</b>									
(coil terminals)									
	Solid / stranded	1 x	1...4 mm <sup>2</sup>						
		2 x	1...4 mm <sup>2</sup>						
	Flexible	1 x	0.75...2.5 mm <sup>2</sup>						
		2 x	0.75...2.5 mm <sup>2</sup>						
	Flexible with non insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>						
		2 x	0.75...2.5 mm <sup>2</sup>						
	Flexible with insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>						
		2 x	0.75...2.5 mm <sup>2</sup>						
	Lugs	L <	8 mm						
		I >	3.5 mm						
Connection capacity acc. to UL / CSA		1 or 2 x	AWG 18...14						
	Stripping length		9 mm						
	Tightening torque		1.00 Nm / 9 lb.in						
<b>Degree of protection</b>									
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529									
Main terminals			IP00						
Coil terminals			IP20						
<b>Screw terminals</b>									
Main terminals			M6		M8		M10		
	Screwdriver type		Screws and bolts						
Coil terminals (delivered in open position)			M3.5						
	Screwdriver type		Flat Ø 5.5 mm / Pozidriv 2						

(1) LD... not included for AF116B ... AF146B.

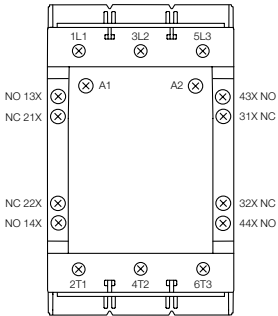
(2) Available in North America only.

# AF116B ... AF370B 3-pole contactors

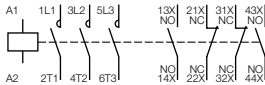
## Terminal marking and positioning

### AF116B ... AF370B contactors

Standard devices with factory mounted auxiliary contacts



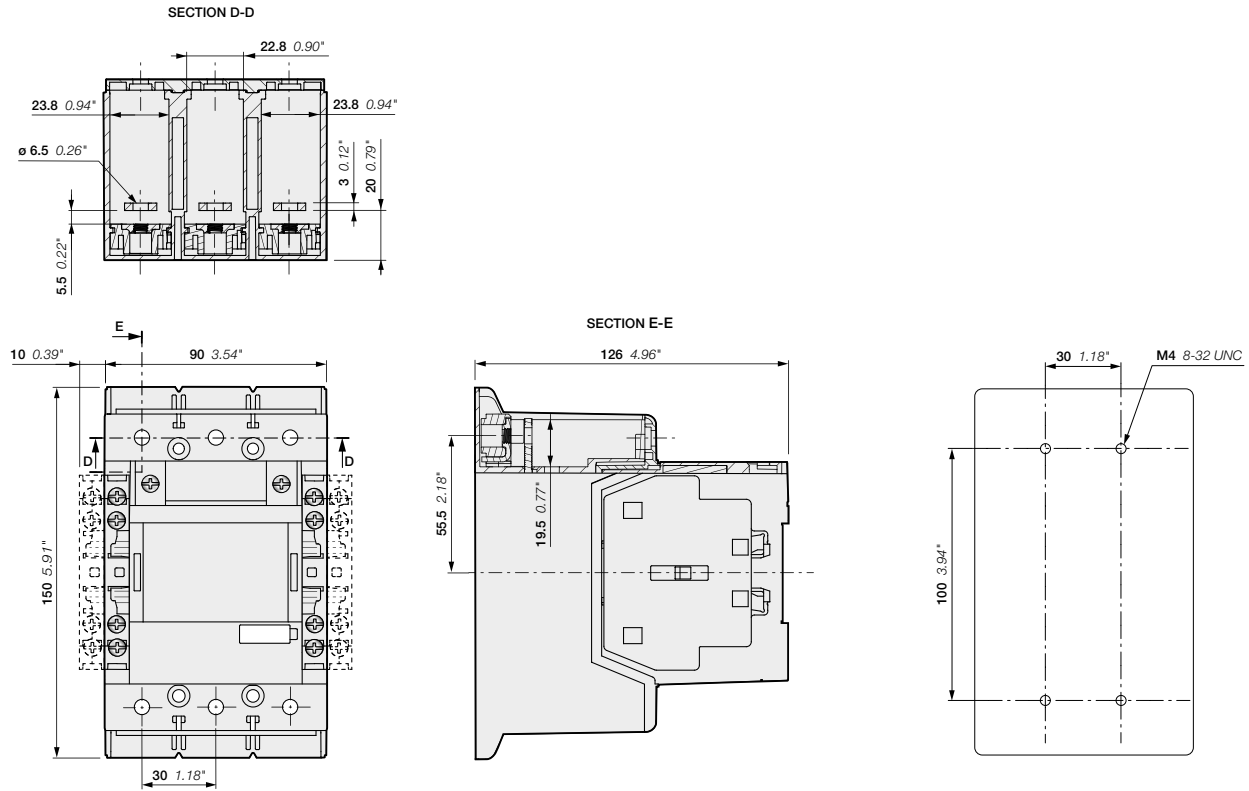
AF116B ... AF370B-30-22



AF116B ... AF370B-30-22

# AF116B, AF140B, AF146B 3-pole contactors

## Main dimensions mm, inches

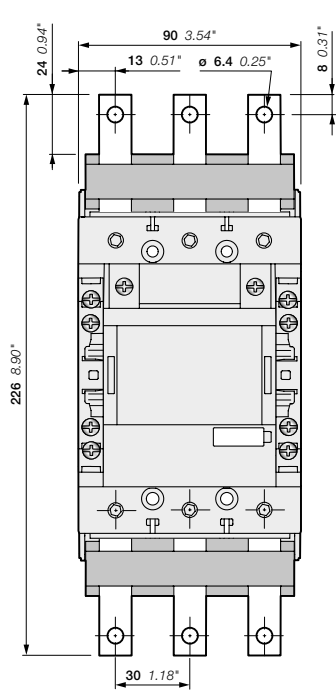


AF116B, AF140B, AF146B-30-22

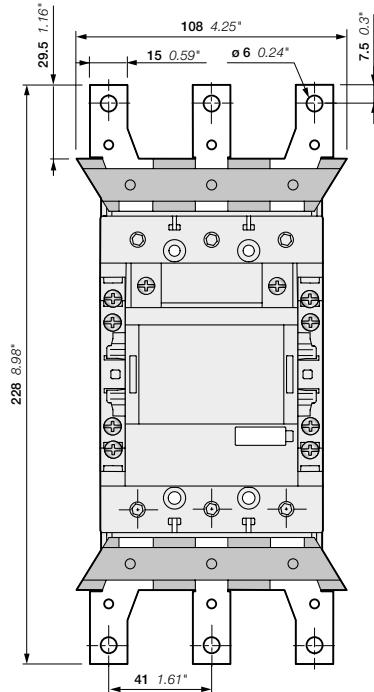
AF116B, AF140B, AF146B-30-22

# AF116B, AF140B, AF146B 3-pole contactors

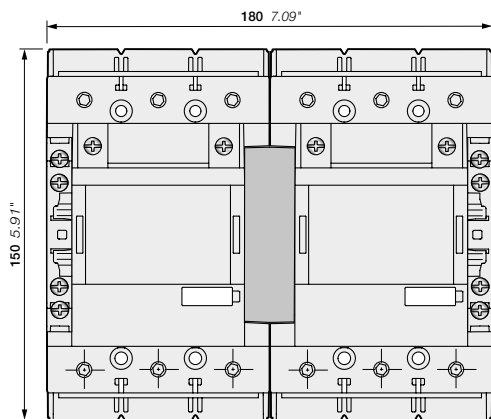
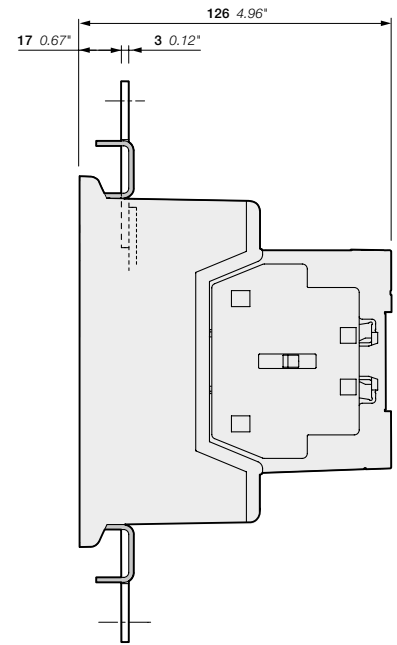
## Main dimensions mm, inches



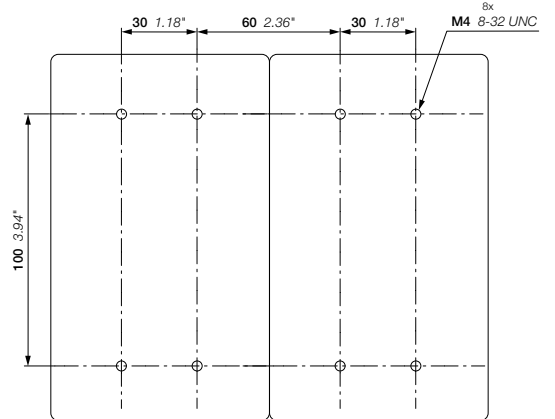
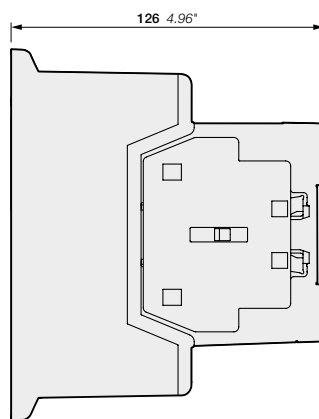
AF116B, AF140B, AF146B-30-22  
+ LX140 terminal extension



AF116B, AF140B, AF146B-30-22  
+ LW140 terminal enlargement



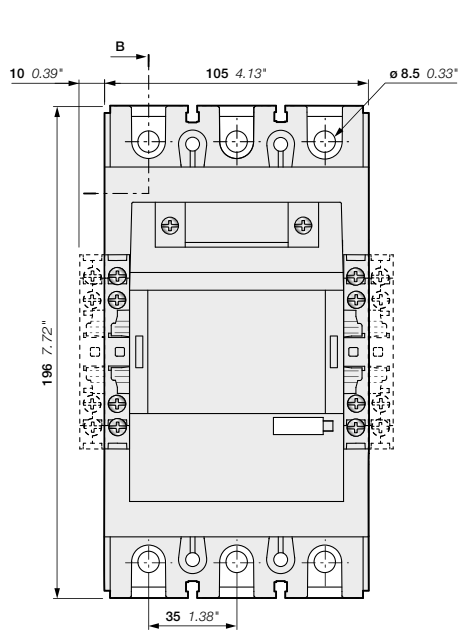
AF116B, AF140B, AF146B-30-22  
+ VM19 mechanical interlocking unit



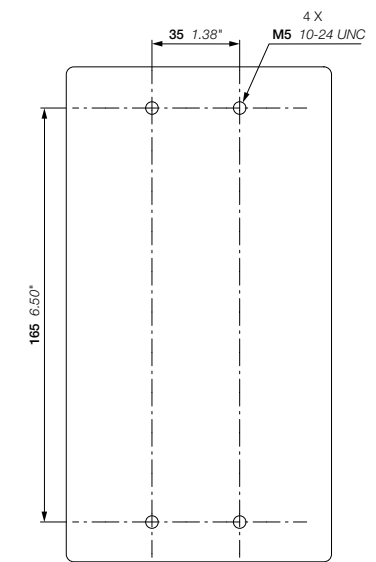
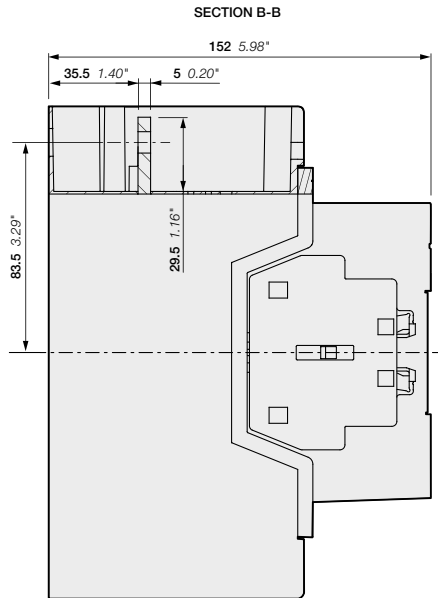
AF116B, AF140B, AF146B-30-22  
+ VM19 mechanical interlocking unit

# AF190B, AF205B 3-pole contactors

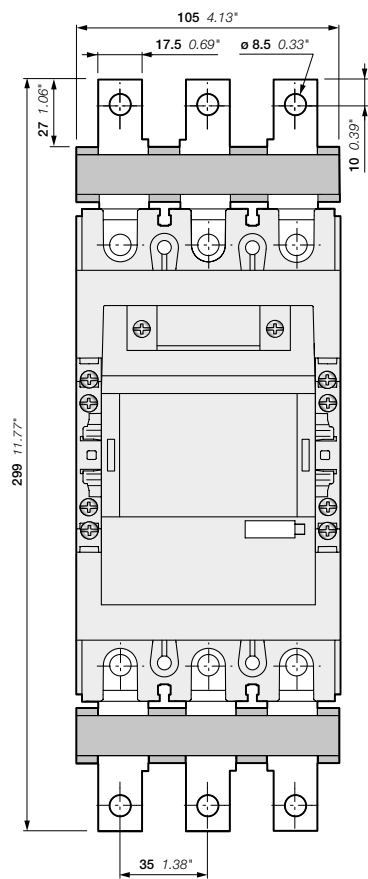
Main dimensions mm, inches



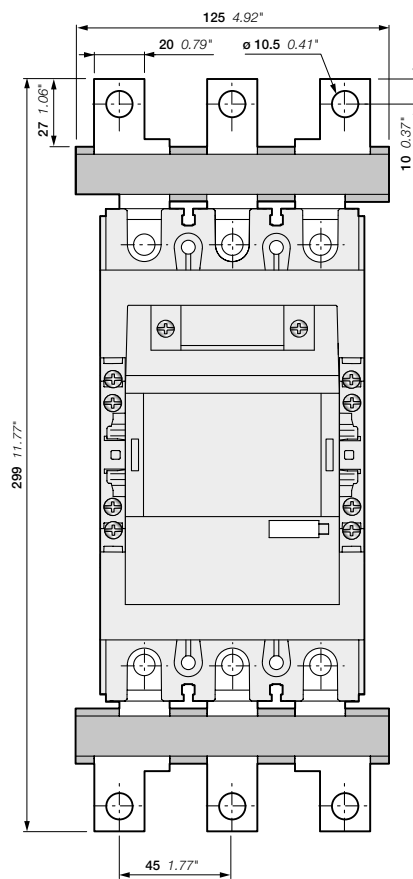
AF190B, AF205B-30-22



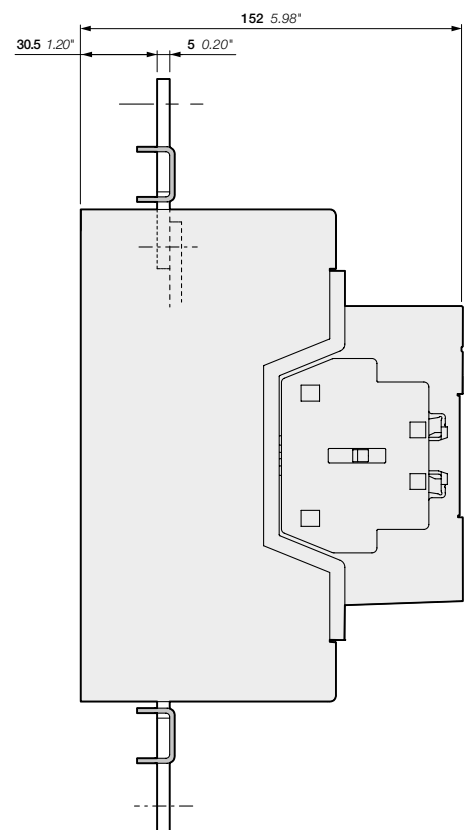
AF190B, AF205B-30-22



AF190B, AF205B-30-22  
+ LX205 terminal extension

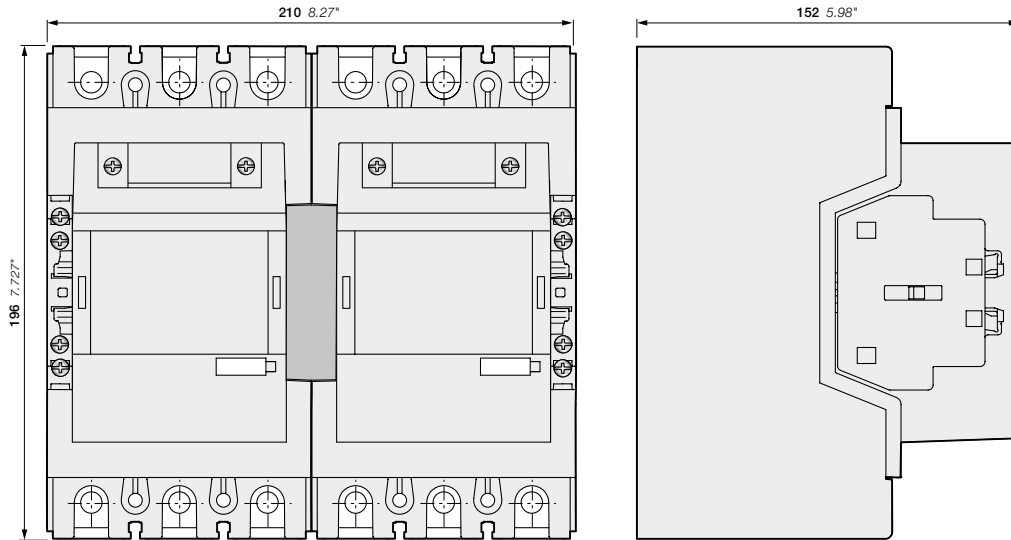


AF190B, AF205B-30-22  
+ LW205 terminal enlargement

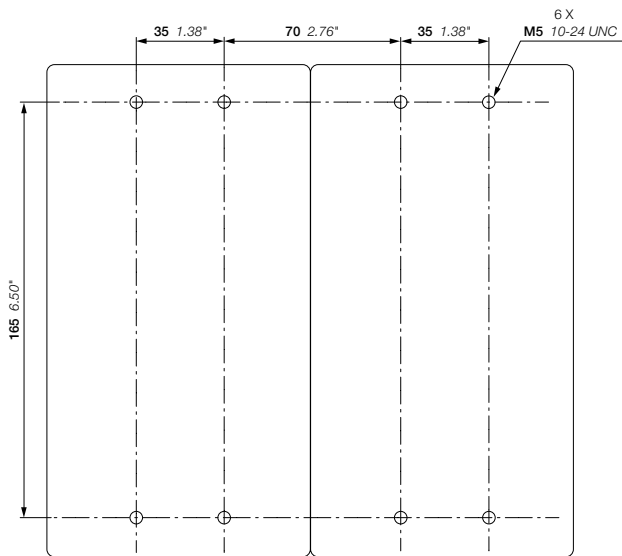


# AF190B, AF205B 3-pole contactors

## Main dimensions mm, inches



AF190B, AF205B-30-22  
+ VM19 mechanical interlocking unit

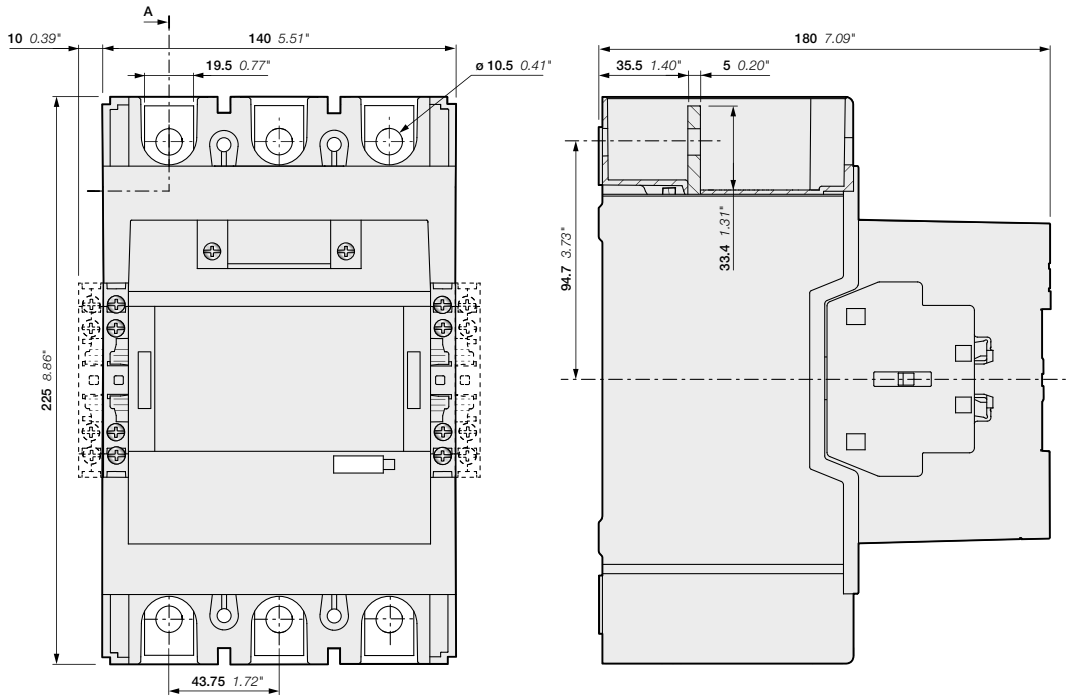


AF190B, AF205B-30-22  
+ VM19 mechanical interlocking unit

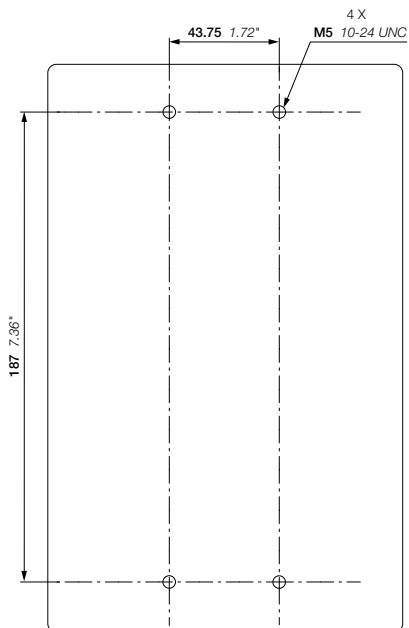


# AF265B, AF305B, AF370B 3-pole contactors

## Main dimensions mm, inches



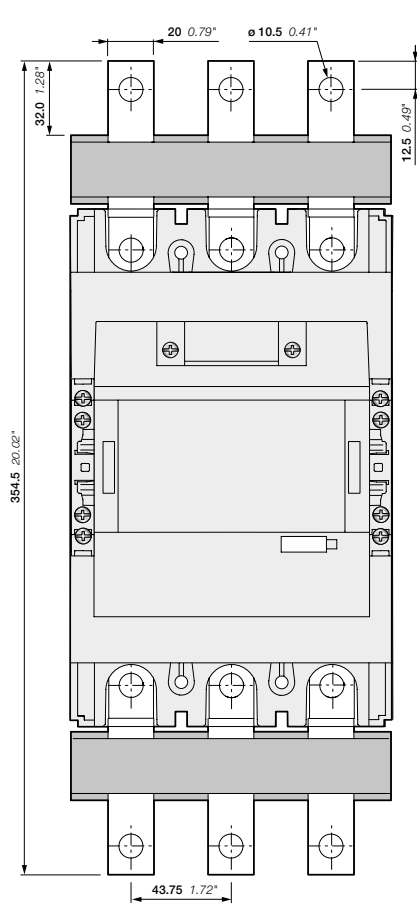
AF265B, AF305B, AF370B-30-22



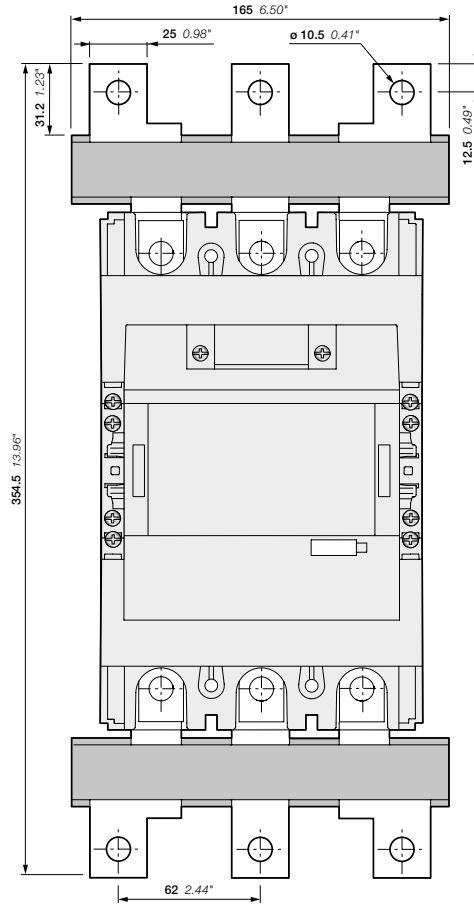
AF265B, AF305B, AF370B-30-22

# AF265B, AF305B, AF370B 3-pole contactors

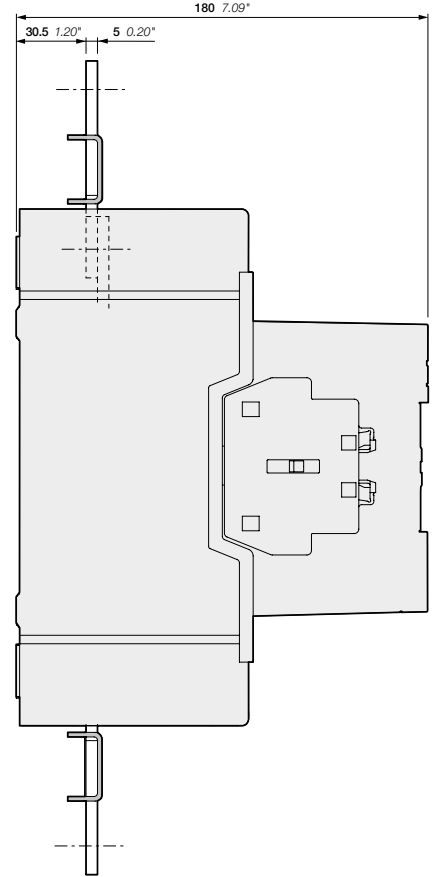
## Main dimensions mm, inches



AF265B, AF305B, AF370B-30-22  
+ LX370 terminal extension

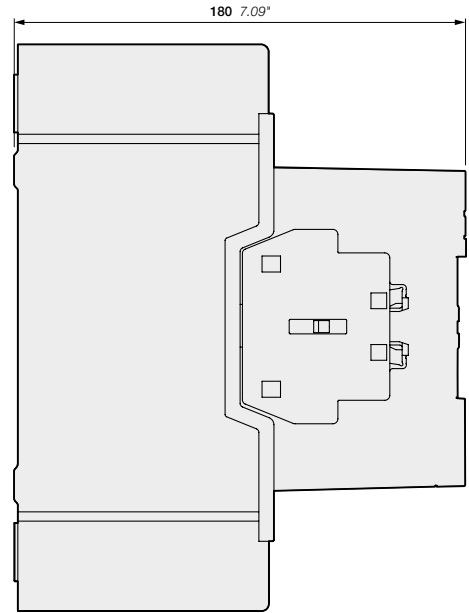
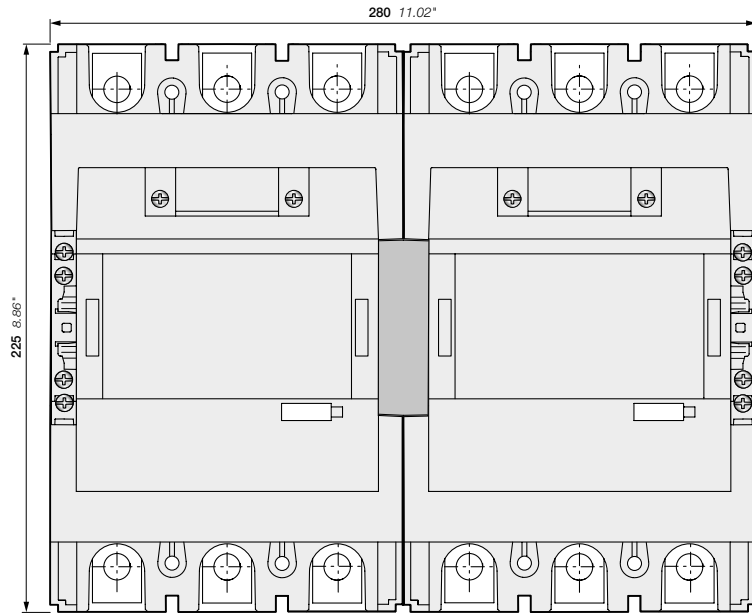


AF265B, AF305B, AF370B-30-22  
+ LW370 terminal enlargement

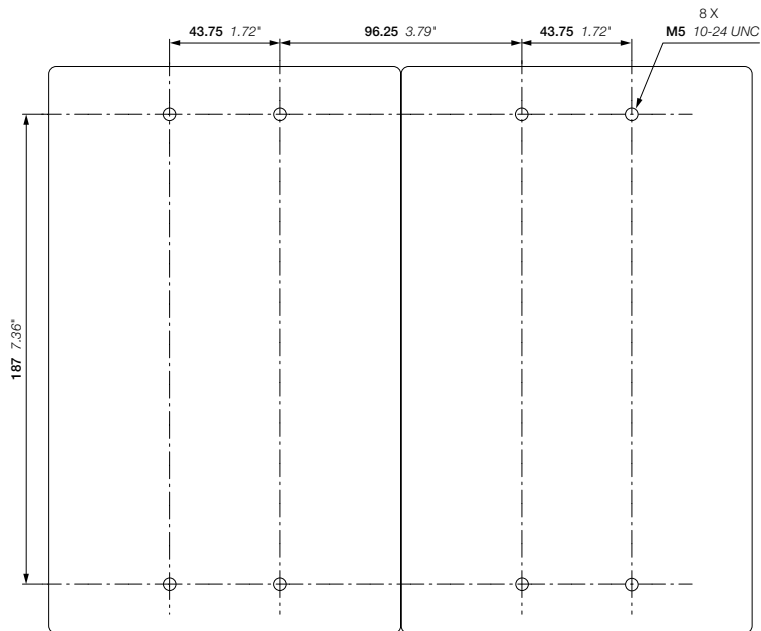


# AF265B, AF305B, AF370B 3-pole contactors

Main dimensions mm, inches



AF265B, AF305B, AF370B-30-22  
+ VM19 mechanical interlocking unit



AF265B, AF305B, AF370B-30-22  
+ VM19 mechanical interlocking unit

# AF116B ... AF140B 4-pole contactors

## 160 to 200 A AC-1

### DC operated - connection with standard ferrules



1SFC101217V0002

AF140B-40-22

#### Description

AF116B ... AF140B 4-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. They are mainly used for controlling non-inductive or slightly inductive loads and generally for controlling power circuits up to 690 V AC and up to 220 V DC. These contactors are of the block type design with 4 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting a wide DC control voltage range (0.85  $U_c$  min. ... 1.1  $U_c$  max. according to IEC 60947-4-1) including several  $U_c$  control voltages (0.7 ... 1.25  $U_c$  according to IEC 60077) used for battery supply
- low coil consumption
- built-in surge suppression
- side by side mounting without restriction from -40 °C up to +70 °C
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

#### Ordering details

IEC	UL / CSA	Supply control voltage	Rated control circuit voltage	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational current $\theta \leq 40$ °C AC-1	General use rating 600 V AC	$U_c$ (IEC 60077) (1)	$U_c$ min. ... $U_c$ max. (IEC 60947-4-1) (1)				Pkg (1 pce) kg
A	A	V DC	V DC				

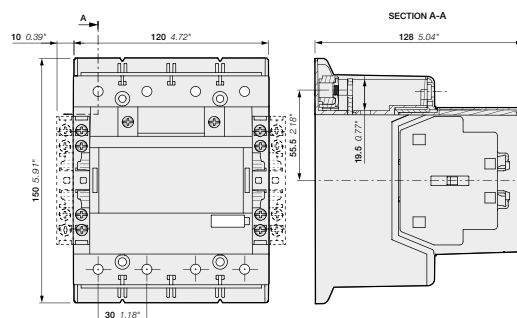
#### 4 N.O. main poles

##### With bar connections

160	160	24, 33, 48	20...60	2 2	AF116B-40-22-11	1SFL427263R1122	2.19
		72, 96, 110	48...130	2 2	AF116B-40-22-12	1SFL427263R1222	2.19
		220	100...250	2 2	AF116B-40-22-13	1SFL427263R1322	2.19
200	175	24, 33, 48	20...60	2 2	AF140B-40-22-11	1SFL447263R1122	2.19
		72, 96, 110	48...130	2 2	AF140B-40-22-12	1SFL447263R1222	2.19
		220	100...250	2 2	AF140B-40-22-13	1SFL447263R1322	2.19

(1) Other control voltages, see voltage code table.

#### Main dimensions mm, inches



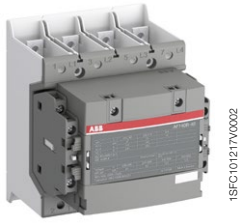
AF116B, AF140B-40-22

1SFC101284C0201

# AF116B ... AF140B 4-pole contactors

## 160 to 200 A AC-1

### AC operated - connection with standard ferrules



AF140B-40-22

1SFC101217V0002

#### Description

AF116B ... AF140B 4-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. They are mainly used for controlling non-inductive or slightly inductive loads and generally for controlling power circuits up to 690 V AC and up to 220 V DC. These contactors are of the block type design with 4 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting sinusoidal AC 50/60 Hz control supplies included inside the wide control voltage range  $U_c \text{ min.} \dots U_c \text{ max.}$  of the contactor. Max. permitted control voltage must not be exceeded during voltage fluctuation defined according to IEC 60077 or EN 50155 (see technical data)
- built-in surge suppression
- side by side mounting without restriction from  $-40\text{ }^\circ\text{C}$  up to  $+70\text{ }^\circ\text{C}$
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

#### Ordering details

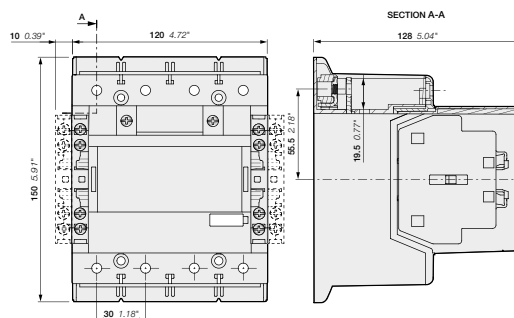
IEC	UL / CSA	Rated control circuit voltage	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational current $\theta \leq 40\text{ }^\circ\text{C}$ AC-1	General use rating  600 V AC	$U_c \text{ min.} \dots U_c \text{ max.}$ (IEC 60947-4-1)				Pkg (1 pce)  kg
A	A	V AC 50/60 Hz				

#### 4 N.O. main poles

##### With bar connections

160	160	24...60	2 2	AF116B-40-22-11	1SFL427263R1122	2.19
		48...130	2 2	AF116B-40-22-12	1SFL427263R1222	2.19
		100...250	2 2	AF116B-40-22-13	1SFL427263R1322	2.19
		250...500	2 2	AF116B-40-22-14	1SFL427263R1422	2.19
200	175	24...60	2 2	AF140B-40-22-11	1SFL447263R1122	2.19
		48...130	2 2	AF140B-40-22-12	1SFL447263R1222	2.19
		100...250	2 2	AF140B-40-22-13	1SFL447263R1322	2.19
		250...500	2 2	AF140B-40-22-14	1SFL447263R1422	2.19

#### Main dimensions mm, inches



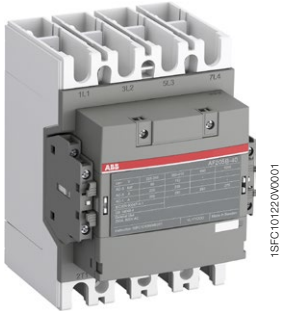
AF116B, AF140B-40-22

1SFC101285C0201

# AF190B ... AF370B 4-pole contactors

## 275 to 525 A AC-1

### DC operated - connection with standard ferrules



AF205B-40-22

1SFC10122V0001



AF370B-40-22

1SFC10122V0001

#### Description

AF190B ... AF370B 4-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. They are mainly used for controlling non-inductive or slightly inductive loads and generally for controlling power circuits up to 1000 V AC and up to 220 V DC. These contactors are of the block type design with 4 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting a wide DC control voltage range (0.85 Uc min. ... 1.1 Uc max. according to IEC 60947-4-1) including several Uc control voltages (0.7 ... 1.25 Uc according to IEC 60077) used for battery supply
- low coil consumption
- built-in surge suppression
- side by side mounting without restriction from -40 °C up to +70 °C
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

#### Ordering details

IEC	UL / CSA	Supply control voltage	Rated control circuit voltage	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational current $\theta \leq 40\text{ °C}$ AC-1	General use rating  600 V AC	Uc (IEC 60077) (1)	Uc min. ... Uc max. (IEC 60947-4-1) (1)				Pkg (1 pce)  kg
A	A	V DC	V DC				

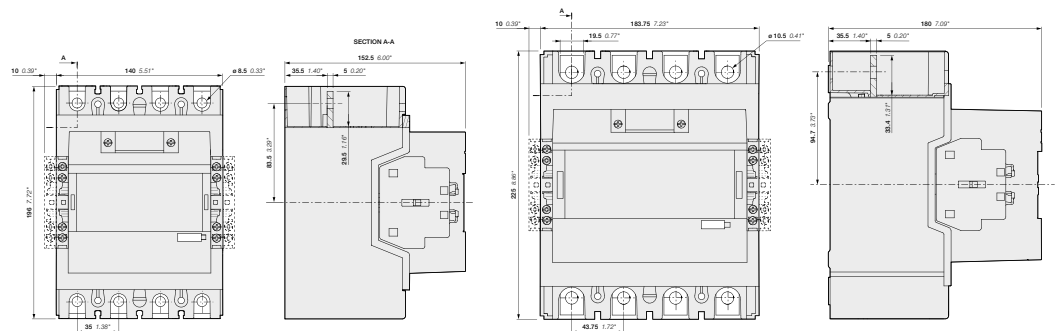
#### 4 N.O. main poles

##### With bar connections

Rated current (A)	Terminal spacing (mm)	Terminal width (mm)	Terminal height (mm)	Terminal pitch (mm)	Terminal depth (mm)	Terminal diameter (mm)	Terminal material	Terminal type	Terminal code	Weight (kg)
275	230	24, 33, 48	20...60	2	2	AF190B-40-22-11	1SFL487263R1122			3.94
		72, 96, 110	48...130	2	2	AF190B-40-22-12	1SFL487263R1222			3.94
		220	100...250	2	2	AF190B-40-22-13	1SFL487263R1322			3.94
350	250	24, 33, 48	20...60	2	2	AF205B-40-22-11	1SFL527263R1122			3.94
		72, 96, 110	48...130	2	2	AF205B-40-22-12	1SFL527263R1222			3.94
		220	100...250	2	2	AF205B-40-22-13	1SFL527263R1322			3.94
400	300	24, 33, 48	20...60	2	2	AF265B-40-22-11	1SFL547263R1122			6.4
		72, 96, 110	48...130	2	2	AF265B-40-22-12	1SFL547263R1222			6.4
		220	100...250	2	2	AF265B-40-22-13	1SFL547263R1322			6.4
500	350	24, 33, 48	20...60	2	2	AF305B-40-22-11	1SFL587263R1122			6.4
		72, 96, 110	48...130	2	2	AF305B-40-22-12	1SFL587263R1222			6.4
		220	100...250	2	2	AF305B-40-22-13	1SFL587263R1322			6.4
525	420	24, 33, 48	20...60	2	2	AF370B-40-22-11	1SFL607263R1122			6.4
		72, 96, 110	48...130	2	2	AF370B-40-22-12	1SFL607263R1222			6.4
		220	100...250	2	2	AF370B-40-22-13	1SFL607263R1322			6.4

(1) Other control voltages, see voltage code table.

#### Main dimensions mm, inches



AF190B, AF205B-40-22

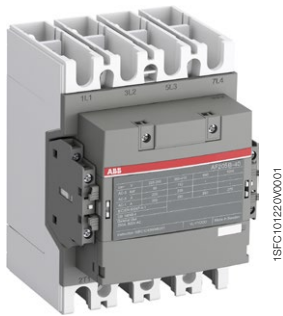
AF265B, AF305B, AF370B-40-22

1SFC101286C0201

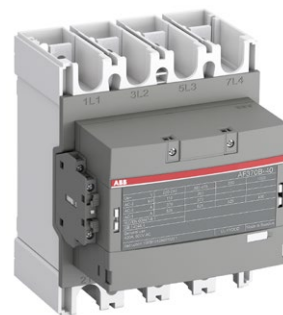
# AF190B ... AF370B 4-pole contactors

## 275 to 525 A AC-1

### AC operated - connection with standard ferrules



AF205B-40-22



AF370B-40-22

#### Description

AF190B ... AF370B 4-pole contactors comply with the latest railway rolling stock standards and allow installation in passengers or driver cabins for trains frequently operating tunnels or undergrounds. They are mainly used for controlling non-inductive or slightly inductive loads and generally for controlling power circuits up to 690 V AC and up to 220 V DC. These contactors are of the block type design with 4 main poles.

- designed in accordance to the applicable parts of IEC 60077 and EN 50155 standard
- shocks and vibration withstand conforming to IEC 61373 (category 1, class B)
- fire and smoke safety compliance to european standard EN 45545 (HL2 hazard level)
- electronic coil interface accepting sinusoidal AC 50/60 Hz control supplies included inside the wide control voltage range  $U_c \text{ min.} \dots U_c \text{ max.}$  of the contactor. Max. permitted control voltage must not be exceeded during voltage fluctuation defined according to IEC 60077 or EN 50155 (see technical data)
- built-in surge suppression
- side by side mounting without restriction from  $-40 \text{ }^\circ\text{C}$  up to  $+70 \text{ }^\circ\text{C}$
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

#### Ordering details

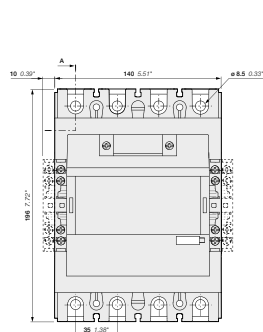
IEC	UL / CSA	Rated control circuit voltage	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational current $\theta \leq 40 \text{ }^\circ\text{C}$	General use rating	$U_c \text{ min.} \dots U_c \text{ max.}$ (IEC 60947-4-1)				Pkg (1 pce)
AC-1						kg
A	A	V AC 50/60 Hz				

#### 4 N.O. main poles

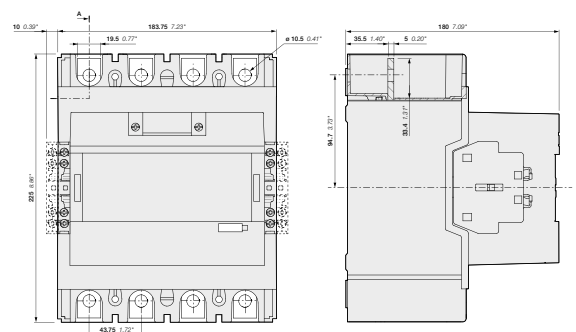
#### With bar connections

Rated current (A)	Rated voltage (V)	Rated current (A)	Rated voltage (V)	Rated current (A)	Rated voltage (V)	Rated current (A)	Rated voltage (V)	Rated current (A)	Rated voltage (V)	Rated current (A)	Rated voltage (V)	Weight (kg)
275	230	24...60	2	2	AF190B-40-22-11	1SFL487263R1122	3.94					
		48...130	2	2	AF190B-40-22-12	1SFL487263R1222	3.94					
		100...250	2	2	AF190B-40-22-13	1SFL487263R1322	3.94					
		250...500	2	2	AF190B-40-22-14	1SFL487263R1422	3.94					
350	250	24...60	2	2	AF205B-40-22-11	1SFL527263R1122	3.94					
		48...130	2	2	AF205B-40-22-12	1SFL527263R1222	3.94					
		100...250	2	2	AF205B-40-22-13	1SFL527263R1322	3.94					
		250...500	2	2	AF205B-40-22-14	1SFL527263R1422	3.94					
400	300	24...60	2	2	AF265B-40-22-11	1SFL547263R1122	6.4					
		48...130	2	2	AF265B-40-22-12	1SFL547263R1222	6.4					
		100...250	2	2	AF265B-40-22-13	1SFL547263R1322	6.4					
		250...500	2	2	AF265B-40-22-14	1SFL547263R1422	6.4					
500	350	24...60	2	2	AF305B-40-22-11	1SFL587263R1122	6.4					
		48...130	2	2	AF305B-40-22-12	1SFL587263R1222	6.4					
		100...250	2	2	AF305B-40-22-13	1SFL587263R1322	6.4					
		250...500	2	2	AF305B-40-22-14	1SFL587263R1422	6.4					
525	420	24...60	2	2	AF370B-40-22-11	1SFL607263R1122	6.4					
		48...130	2	2	AF370B-40-22-12	1SFL607263R1222	6.4					
		100...250	2	2	AF370B-40-22-13	1SFL607263R1322	6.4					
		250...500	2	2	AF370B-40-22-14	1SFL607263R1422	6.4					

#### Main dimensions mm, inches



AF190B, AF205B-40-22

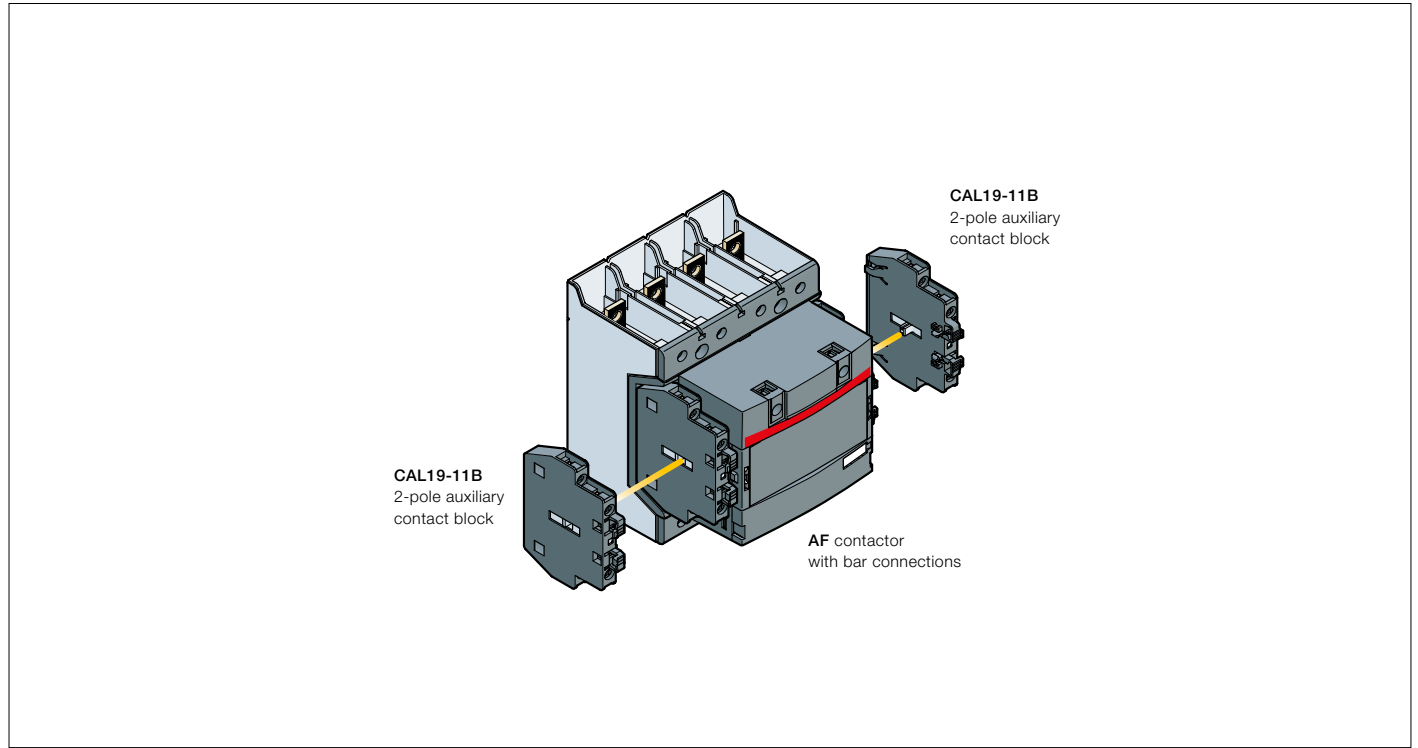


AF265B, AF305B, AF370B-40-22

# AF116B ... AF370B 4-pole contactors

## Main accessories

**Main accessories** (other accessories available)



### Main accessory fitting details

Contactor types	Main poles		Available auxiliary contacts		Side-mounted accessories	
					Auxiliary contact blocks	
					<b>CAL19-11</b>	<b>CAL19-11B</b>
AF116B ... AF370B	4	0	2	2	2 x CAL19-11 included	+ 2 x CAL19-11B



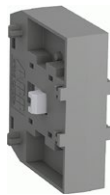
# AF116B ... AF370B 4-pole contactors

## Main accessories



CAL19-11



1SFC101071V0001



VM19

1SFC101039V0001

### Ordering details (1)

For contactors	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
	 				kg

### Side-mounted instantaneous auxiliary contact blocks

AF116B ... AF370B					
1st block	1	1	CAL19-11	1SFN010820R1011	2 0.04
2nd block	1	1	CAL19-11B	1SFN010820R3311	2 0.04

### Mechanical interlock unit

AF116B ... AF370B					
			VM19	1SFN030300R1000	1 0.054
AF116B ... AF146B and AF190B, AF205B			VM140/190	1SFN034403R1000	1 0.088
AF190B, AF205B and AF265B ... AF370B			VM205/265	1SFN035203R1000	1 0.09

Note: To mount VM mechanical interlock unit, remove CAL19-11.

### Terminal shrouds

AF116B ... AF140B, with compression lugs					
AF190B ... AF205B, with cable clamps			LT140-40L	1SFN124203R2000	2 0.09
AF190B ... AF205B, with compression lugs			LT205-40C	1SFN124801R2000	2 0.06
AF265B ... AF370B, with cable clamps			LT205-40L	1SFN124803R2000	2 0.29
AF265B ... AF370B, with compression lugs			LT370-40C	1SFN125401R2000	2 0.04
AF265B ... AF370B, with compression lugs			LT370-40L	1SFN125403R2000	2 0.37

For contactors	Dimensions		Type	Order code	Pkg qty	Weight (1 pce)
	hole Ø mm	bar mm				

### Terminal enlargements

AF190B ... AF205B	10.5	20 x 5	LW205-40	1SFN074807R2000	1 0.306
AF265B ... AF370B	10.5	25 x 5	LW370-40	1SFN075407R2000	1 0.54

(1) For more information, refer to "Accessories" section.

# AF116B ... AF370B 4-pole contactors

## Technical data

### Main pole - Utilization characteristics according to IEC

Contactor types	AF116B	AF140B	AF190B	AF205B	AF265B	AF305B	AF370B	
Standards	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1							
Fire and smoke	IEC 60077-1, IEC 60077-2, EN 50155 (applicable parts)							
Rated operational voltage $U_e$ max.	690 V		1000 V					
Rated frequency (without derating)	50 / 60 Hz							
Conventional free-air thermal current $I_{th}$	EN 45545 (HL2)							
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$	160 A	200 A	275 A	350 A	400 A	500 A	525 A	
With conductor cross-sectional area	70 mm <sup>2</sup>	95 mm <sup>2</sup>	150 mm <sup>2</sup>	240 mm <sup>2</sup> (2)	240 mm <sup>2</sup>	300 mm <sup>2</sup> (3)	2x 185 mm <sup>2</sup> (3)	
<b>AC-1 Utilization category</b>								
For air temperature close to contactor								
<b><math>I_e</math> / Rated operational current AC-1</b>								
$U_e$ max. $\leq 690$ V, 50/60 Hz	$\theta \leq 40^\circ\text{C}$	160 A	200 A	275 A	350 A	400 A	500 A	525 A
	$\theta \leq 60^\circ\text{C}$	145 A	175 A	250 A	300 A	350 A	400 A	425 A
	$\theta \leq 70^\circ\text{C}$	130 A	160 A	200 A	240 A	290 A	325 A	350 A
$U_e$ max. $\leq 1000$ V, 50/60 Hz	$\theta \leq 40^\circ\text{C}$	-	-	250 A	275 A	350 A	375 A	400 A
	$\theta \leq 60^\circ\text{C}$	-	-	225 A	250 A	300 A	325 A	350 A
	$\theta \leq 70^\circ\text{C}$	-	-	185 A	200 A	240 A	260 A	290 A
With conductor cross-sectional area		70 mm <sup>2</sup>	95 mm <sup>2</sup>	150 mm <sup>2</sup>	240 mm <sup>2</sup> (2)	240 mm <sup>2</sup>	300 mm <sup>2</sup> (3)	2x 185 mm <sup>2</sup> (3)
<b>Short-circuit protection device for contactors</b>								
Without thermal overload relay - Motor protection excluded								
$U_e \leq 500$ V AC - gG type fuse		200 A	250 A	355 A	400 A	630 A	630 A	630 A
<b>Rated short-time withstand current <math>I_{cw}</math></b>	<b>1 s</b>	1300 A	1460 A	1900 A	2050 A	2650 A	3050 A	3700 A
At 40 °C ambient temperature, in free air from a cold state	<b>10 s</b>	928 A	1168 A	1520 A	1640 A	2120 A	2440 A	2960 A
	<b>30 s</b>	536 A	674 A	878 A	947 A	1224 A	1409 A	1709 A
	<b>1 min</b>	379 A	477 A	621 A	670 A	865 A	996 A	1208 A
	<b>15 min</b>	160 A	200 A	275 A	350 A	400 A	500 A	525 A
<b>Maximum breaking capacity</b>								
$\cos \phi = 0.45$	<b>at 440 V</b>	2000 A	3000 A	3300 A	3500 A	3800 A	4600 A	5000 A
	<b>at 690 V</b>	-	-	-	-	-	-	-
<b>Power dissipation per pole</b>								
$I_e$ / AC-1		12 W	18 W	15 W	25 W	32 W	50 W	72 W
<b>Max. electrical switching frequency</b>	<b>AC-1</b>	300 cycles/h						

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For currents above 275 A use terminal enlargements or terminal extensions.

(3) For currents above 450 A use terminal enlargements or terminal extensions.

### Main pole - Utilization characteristics according to UL / CSA

Contactor types	AF116B	AF140B	AF190B	AF205B	AF265B	AF305B	AF370B
Standards	UL 60947-4-1						
Max. operational voltage	600 V						
<b>UL / CSA general use rating</b>							
600 V AC	160 A	175 A	230 A	250 A	300 A	350 A	420 A
With conductor cross-sectional area	AWG 2/0	AWG 3/0	MCM 250	MCM 250	MCM 400	MCM 500	2//MCM 300
<b>Max. electrical switching frequency</b>							
For general use	300 cycles/h						

# AF116B ... AF370B 4-pole contactors

## Technical data

### General technical data

Contactor types	AF116B	AF140B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Rated insulation voltage <math>U_i</math></b>							
acc. to IEC 60947-4-1	1000 V						
acc. to UL / CSA	600 V						
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	8 kV						
<b>Electromagnetic compatibility</b>	AF contactors comply with IEC 60947-1 / EN 60947-1 - Environment A						
<b>Ambient air temperature close to contactor</b>							
Operation	-40 to +70 °C						
Storage	-40 to +70 °C						
<b>Maximum operating altitude (without derating)</b>	3000 m						
<b>Mechanical durability</b>							
Number of operating cycles	5 million operating cycles						
Maximum switching frequency	300 cycles/h						
<b>Shock and vibration withstand</b>							
acc to IEC 61373	Category 1, class B						

### Magnet system characteristics

Contactor types	AF116B	AF140B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Coil operating limits</b>							
AC supply	At $\theta \leq 70$ °C $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$						
DC supply	At $\theta \leq 70$ °C $0.80 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$						
<b>Rated control circuit voltage <math>U_c</math></b>	24...500 V AC, 20...500 V DC						
<b>Coil consumption</b>							
<b>DC control voltage</b>							
20...60 V DC	Average pull-in value	210 W		205 W		400 W	
	Average holding value	2.5 W		2.5 W		3.5 W	
48...130 V DC	Average pull-in value	130 W		130 W		360 W	
	Average holding value	2.5 W		2.5 W		2.5 W	
100...250 V DC	Average pull-in value	135 W		190 W		410 W	
	Average holding value	3 W		2.5 W		4.5 W	
250...500 V DC	Average pull-in value	205 W		190 W		600 W	
	Average holding value	4 W		4 W		4.7 W	
<b>AC control voltage 50/60 Hz</b>							
24...60 V AC	Average pull-in value	225 VA		165 VA		475 VA	
	Average holding value	5.5 VA		6 VA		8.5 VA	
48...130 V AC	Average pull-in value	170 VA		175 VA		340 VA	
	Average holding value	4 VA		4 VA		17 VA	
100...250 V AC	Average pull-in value	130 VA		220 VA		385 VA	
	Average holding value	6 VA		7 VA		17.5 VA	
250...500 V AC	Average pull-in value	205 VA		185 VA		420 VA	
	Average holding value	16 VA		16 VA		21 VA	
Max. permitted control voltage during voltage fluctuation defined acc. to IEC 60077 / EN 50155	Rated control circuit voltage / Max. permitted control voltage 24 ... 60 V AC 50/60 Hz / 66 V AC 50/60 Hz 48 ... 130 V AC 50/60 Hz / 143 V AC 50/60 Hz 100 ... 250 V AC 50/60 Hz / 275 V AC 50/60 Hz 250 ... 500 V AC 50/60 Hz / 550 V AC 50/60 Hz						
<b>Drop-out voltage</b>	55 % of $U_c \text{ min}$						
<b>Operating time</b>							
<b>Coil supply between A1 - A2</b>							
Between coil energization and:	<b>N.O. contact closing</b>	20...55 ms		25...60 ms		30...60 ms	
Between coil de-energization and:	<b>N.O. contact opening</b>	40...70 ms		45...80 ms		45...80 ms	

### Mounting characteristics and conditions for use

Contactor types	AF116B	AF140B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Mounting positions</b>							
	Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 4-pole contactor AF116B ... AF370B						
<b>Mounting distances</b>	The contactors can be assembled side by side						
<b>Fixing</b>							
On rail acc. to IEC 60715, EN 60715	-						
By screws (not supplied)	4 x M5						

# AF116B ... AF370B 4-pole contactors

## Technical data

### Connecting characteristics

Contactor types	AC / DC operated	AF116B	AF140B	AF190B	AF205B	AF265B	AF305B	AF370B
<b>Main terminals</b>								
Flat type								
<b>Connection capacity (min. ... max.)</b>								
<b>Main conductors (poles)</b>								
	Cu cable - Stranded	1 x	10...95 mm <sup>2</sup>		6...150 mm <sup>2</sup>		16...300 mm <sup>2</sup>	
	Clamp type		LD... included (1)		1SDA066917R1		1SDA055016R1	
	Tightening torque		8 Nm		14 Nm		25 Nm	
	Cu cable - Stranded	2 x	10...95 mm <sup>2</sup>		50...120 mm <sup>2</sup>		70...185 mm <sup>2</sup>	
	Clamp type		LD... included (1)		1SFN074709R1000, LZ185-2C/120		1SCA022194R0890, OZXB4	
	Tightening torque		8 Nm		16 Nm		22 Nm	
	Al cable - Stranded	1 x	-		95...185 mm <sup>2</sup>		185...240 mm <sup>2</sup>	
	Clamp type		-		1SDA054988R1		1SDA055020R1	
	Tightening torque		-		31 Nm		43 Nm	
	Cu cable - Flexible	1 x	10...70 mm <sup>2</sup>		6...120 mm <sup>2</sup>		16...240 mm <sup>2</sup>	
	Clamp type		LD... included (1)		1SDA066917R1		1SDA055016R1	
	Tightening torque		8 Nm		14 Nm		25 Nm	
	Cu cable - Flexible	2 x	10...70 mm <sup>2</sup>		50...95 mm <sup>2</sup>		70...185 mm <sup>2</sup>	
	Clamp type		LD... included (1)		1SFN074709R1000, LZ185-2C/120		1SCA022194R0890, OZXB4	
	Tightening torque		8 Nm		16 Nm		22 Nm	
	Lugs	L ≤	22 mm (.866 in)		24 mm (.945 in)		32 mm (1.260 in)	
		Ø >	6 mm (.236 in)		8 mm (.315 in)		10 mm (.394 in)	
	Socket type		LL... included		LL... included		LL... included	
	Tightening torque		9 Nm / 80 lb.in		18 Nm / 160 lb.in		28 Nm / 248 lb.in	
Connection capacity acc. to UL / CSA		1 x	AWG 6...3/0		6...300 MCM		4...400 MCM	
	Clamp type		LD... included (1)		ATK185 (2)		ATK300 (2)	
	Tightening torque		8 Nm / 71 lb.in		34 Nm / 301 lb.in		42 Nm / 372 lb.in	
Connection capacity acc. to UL / CSA		2 x	AWG 6...3/0		-		4...500 MCM	
	Clamp type		LD... included (1)		-		ATK300/2 (2)	
	Tightening torque		8 Nm / 71 lb.in		-		42 Nm / 372 lb.in	
<b>Auxiliary conductors</b>								
(coil terminals)								
	Solid / stranded	1 x	1...4 mm <sup>2</sup>					
		2 x	1...4 mm <sup>2</sup>					
	Flexible	1 x	0.75...2.5 mm <sup>2</sup>					
		2 x	0.75...2.5 mm <sup>2</sup>					
	Flexible with non insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>					
		2 x	0.75...2.5 mm <sup>2</sup>					
	Flexible with insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>					
		2 x	0.75...2.5 mm <sup>2</sup>					
	Lugs	L <	8 mm					
		l >	3.5 mm					
Connection capacity acc. to UL / CSA		1 or 2 x	AWG 18...14					
	Stripping length		9 mm					
	Tightening torque		1.00 Nm / 9 lb.in					
<b>Degree of protection</b>								
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529								
	Main terminals		IP00					
	Coil terminals		IP20					
<b>Screw terminals</b>								
	Main terminals		M6		M8		M10	
		Screwdriver type	Screws and bolts					
	Coil terminals (delivered in open position)		M3.5					
		Screwdriver type	Flat Ø 5.5 mm / Pozidriv 2					

(1) LD... not included for AF116B, AF140B

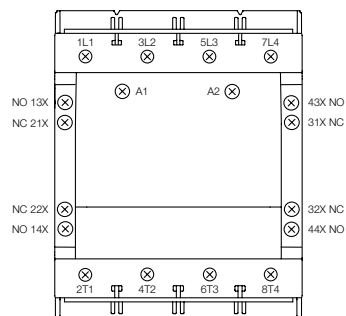
(2) Available in North America only.

# AF116B ... AF370B 4-pole contactors

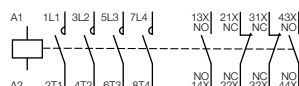
## Terminal marking and positioning

### AF116B ... AF370B contactors

Standard devices with factory mounted auxiliary contacts



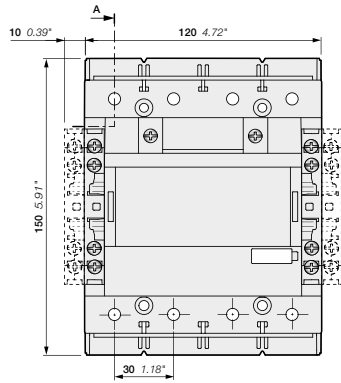
AF116B ... AF370B-40-22



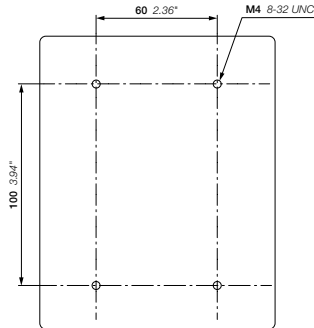
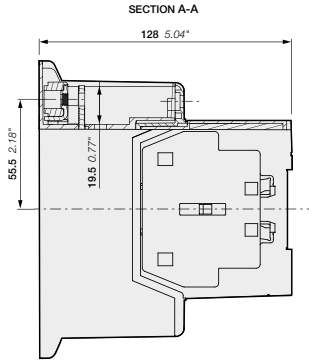
AF116B ... AF370B-40-22

# AF116B, AF140B 4-pole contactors

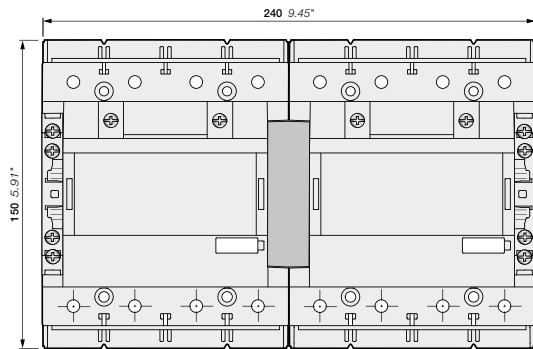
## Main dimensions mm, inches



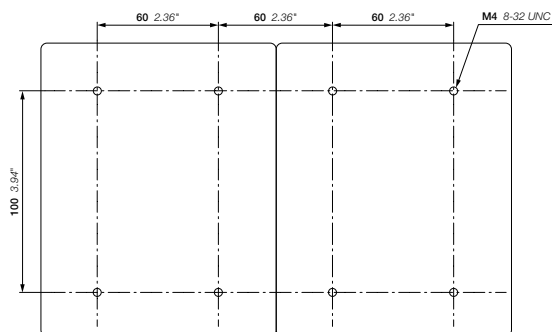
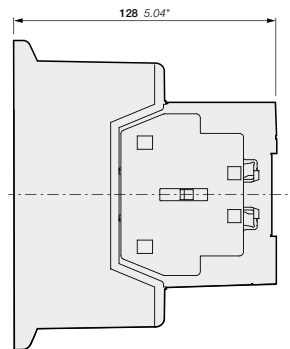
AF116B, AF140B-40-22



AF116B, AF140B-40-22



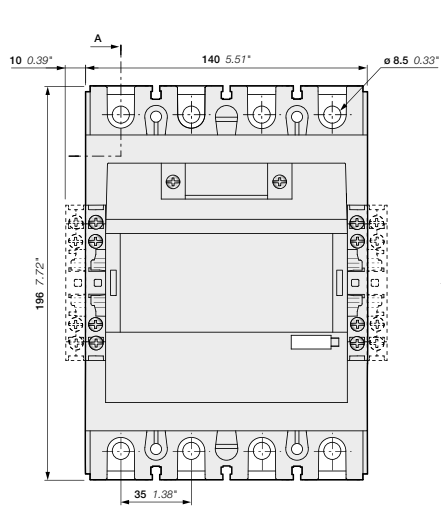
AF116B, AF140B-40-22  
+ VM19 mechanical interlocking unit



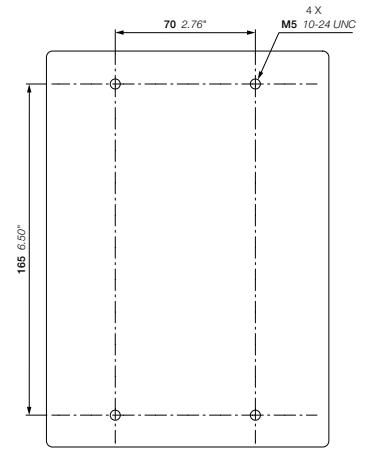
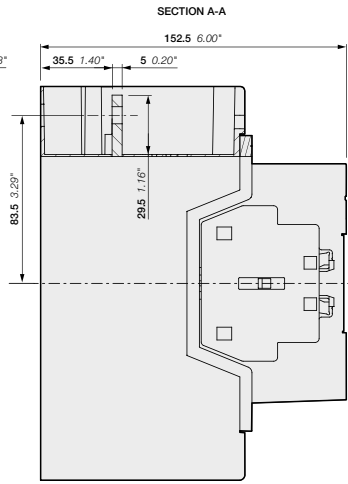
AF116B, AF140B-40-22  
+ VM19 mechanical interlocking unit

# AF190B, AF205B 4-pole contactors

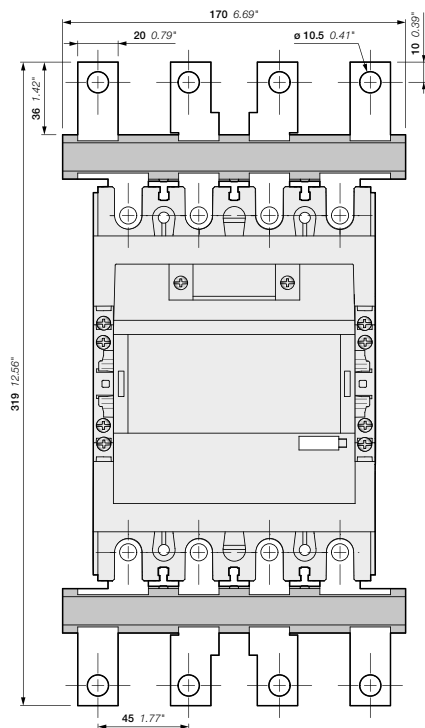
## Main dimensions mm, inches



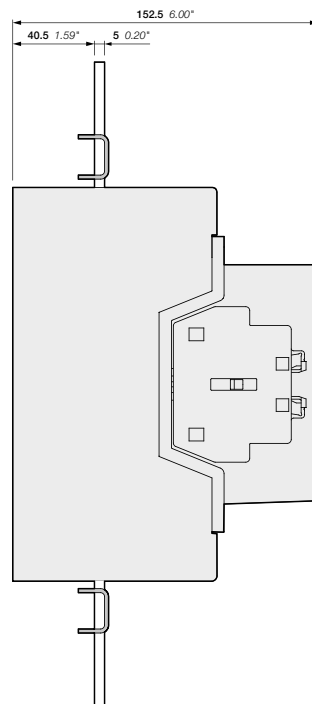
AF190B, AF205B-40-22



AF190B, AF205B-40-22

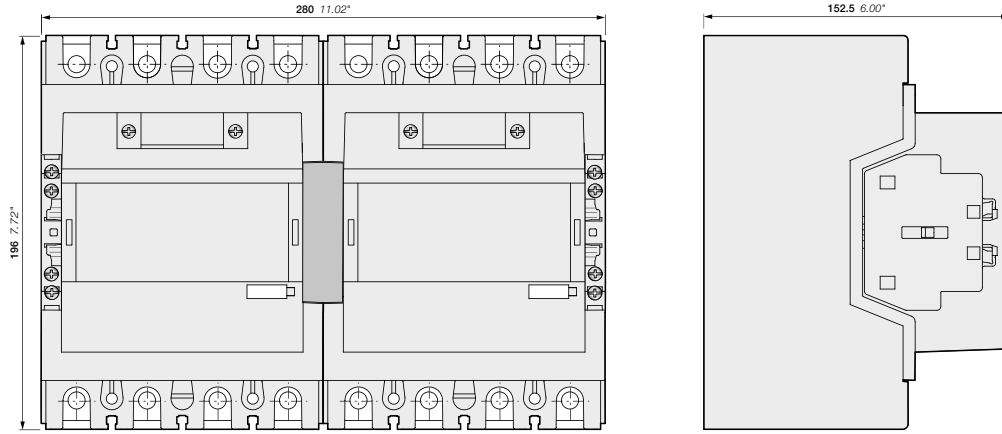


AF190B, AF205B-40-22  
+ LW205-40 terminal enlargement

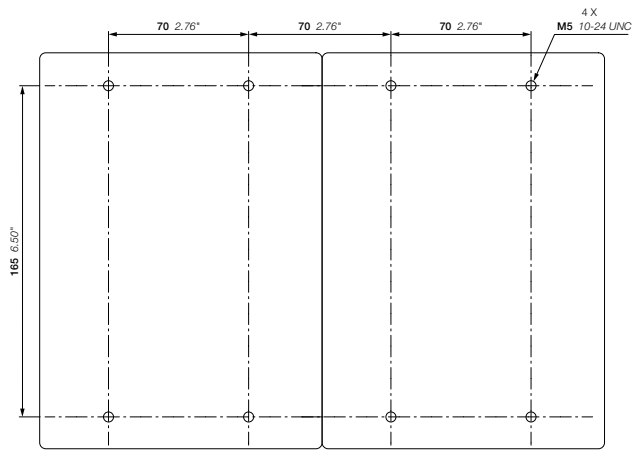


# AF190B, AF205B 4-pole contactors

## Main dimensions mm, inches



AF190B, AF205B-40-22  
+ VM19 mechanical interlocking unit

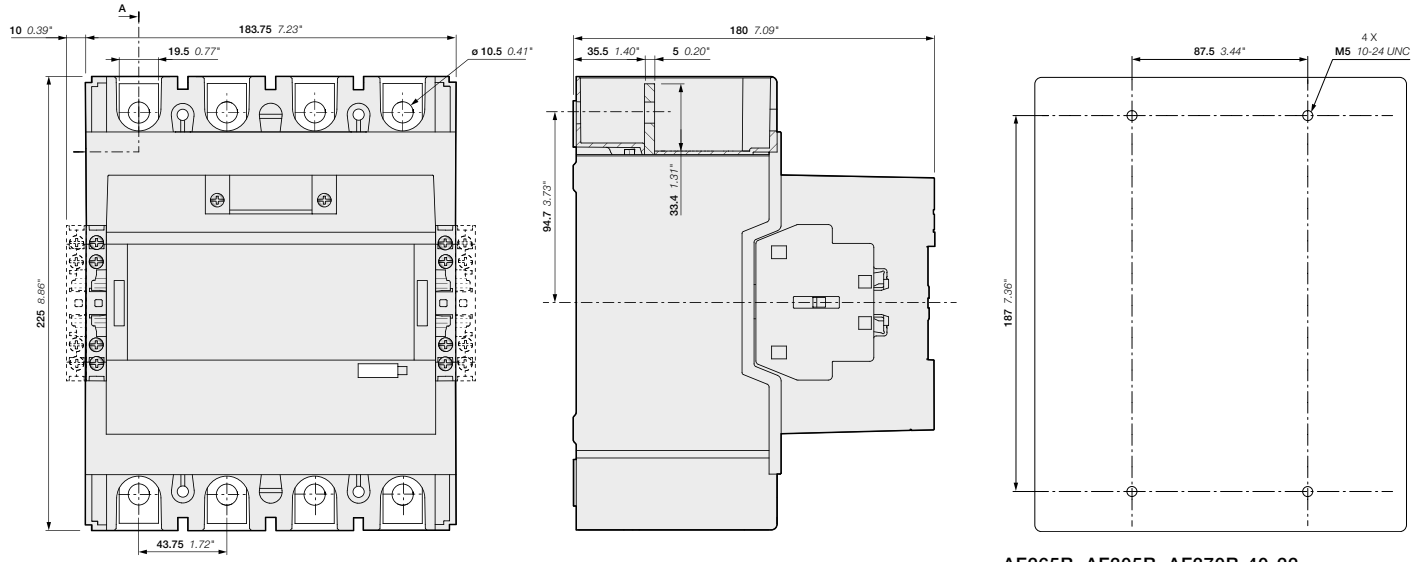


AF190B, AF205B-40-22  
+ VM19 mechanical interlocking unit



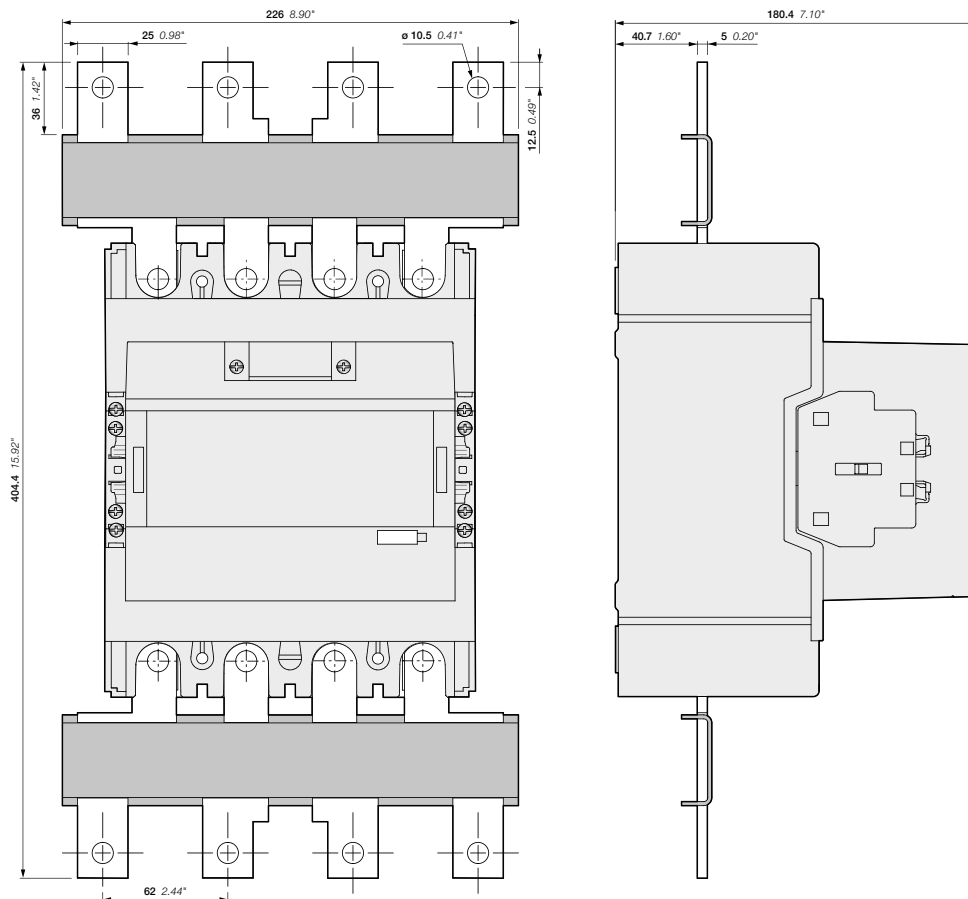
# AF265B, AF305B, AF370B 4-pole contactors

## Main dimensions mm, inches



AF265B, AF305B, AF370B-40-22

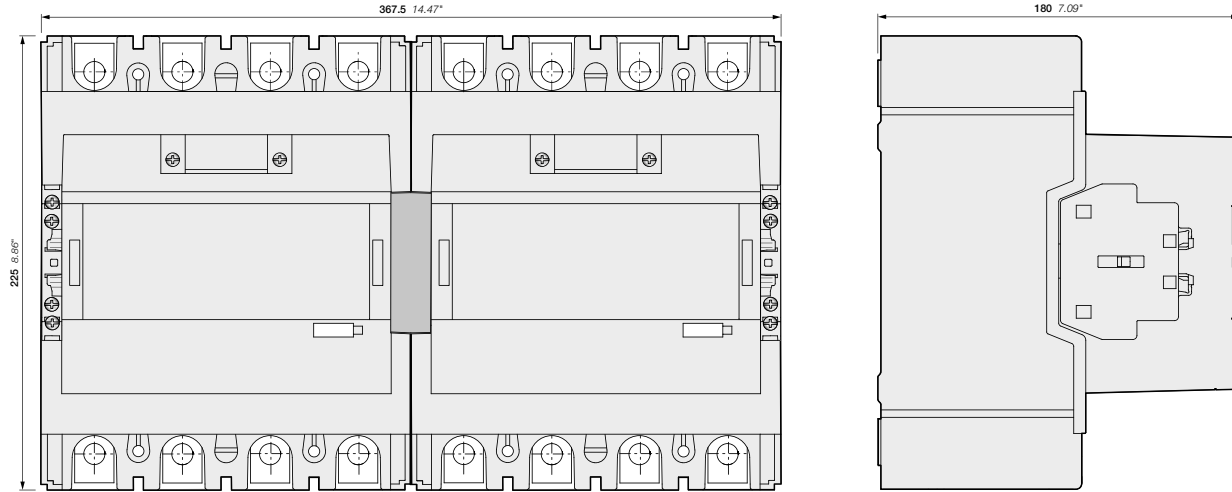
AF265B, AF305B, AF370B-40-22



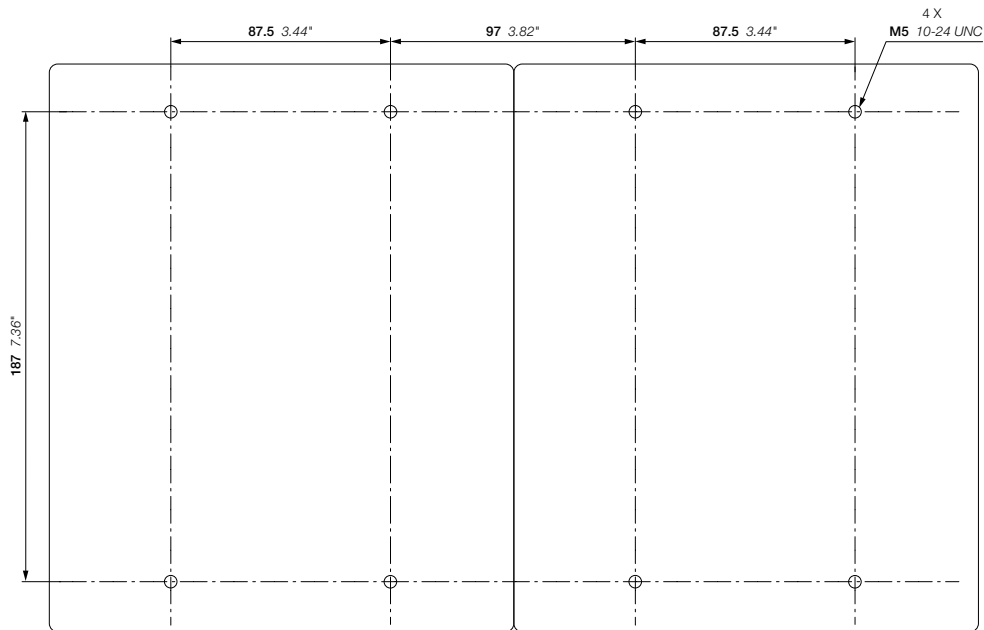
AF265B, AF305B, AF370B-40-22  
+ LW370-40 terminal enlargement

# AF265B, AF305B, AF370B 4-pole contactors

## Main dimensions mm, inches



AF265B, AF305B, AF370B-40-22  
+ VM19 mechanical interlocking unit



AF265B, AF305B, AF370B-40-22  
+ VM19 mechanical interlocking unit



# Auxiliary contact blocks for AF116B ... AF370B contactors



CAL19-11

## Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits for standard industrial environments.

Types of auxiliary contact blocks for side mounting:

- CAL 2-pole block, with instantaneous N.O. + N.C. contacts.

For clipping onto the right- and/or left-hand side of the contactors.

The CAL ...-11B is a second block for mounting in addition to a first CAL ...-11 block, right- and/or left-hand of the AF116B ... AF370B contactors.

The auxiliary contact blocks are equipped with screw type connecting terminals delivered open, protected against accidental direct contact and bear the corresponding function marking.

## Ordering details (1)

For contactors	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
					kg

## Side-mounted instantaneous auxiliary contact blocks

AF116B ... AF370B	1st block	1	1	CAL19-11	1SFN010820R1011	2	0.04
	2nd block	1	1	CAL19-11B	1SFN010820R3311	2	0.04

(1) For each contactor type, refer to "Accessory fitting details" table.

# CAL19 Auxiliary contact blocks for AF116B ... AF370B contactors

## Connection with standard ferrules








### Technical data

Types	CAL19	
<b>Contact utilization characteristics according to IEC</b>		
Standards	IEC 60947-5-1 and EN 60947-5-1	
Rated insulation voltage $U_i$ acc. to IEC 60947-5-1	690 V	
Rated impulse withstand voltage $U_{imp}$	6 kV	
Rated operational voltage $U_e$ max.	24...690 V AC	
Conventional thermal current $I_{th}$ - $\theta \leq 40$ °C	16 A	
Rated frequency (without derating)	50/60 Hz	
$I_e$ / Rated operational current AC-15		
acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A
	220-240 V 50/60 Hz	4 A
	380-440 V 50/60 Hz	3 A
	500-690 V 50/60 Hz	2 A
Making capacity acc. to IEC 60947-5-1	10 x $I_e$ AC-15	
Breaking capacity acc. to IEC 60947-5-1	10 x $I_e$ AC-15	
$I_e$ / Rated operational current DC-13		
acc. to IEC 60947-5-1	24 V DC	3 A / 72 W
	48 V DC	1.5 A / 72 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.3 A / 69 W
	250 V DC	0.3 A / 75 W
Short-circuit protection device gG type fuse	10 A	
Rated short-time withstand current $I_{sc}$	for 1.0 s	100 A
$\theta = 40$ °C	for 0.1 s	140 A
Minimum switching capacity	24 V / 50 mA	
with failure rate acc. to IEC 60947-5-4	$\leq 10^{-6}$	
Power dissipation per pole at 6 A	0.15 W	
Mechanical durability	Number of operating cycles	5 millions operating cycles
	Max. switching frequency	300 cycles/h
Max. electrical switching frequency	AC-15	300 cycles/h
	DC-13	300 cycles/h
Mirror contacts acc. to annex F of IEC 60947-4-1	N.C. auxiliary contacts are mirror contacts	

### Contact utilization characteristics according to UL / CSA

Standards	UL 508, CSA C22.2 N°14	
Max. operational voltage	600 V AC, 250 V DC	
Pilot duty	A600, Q300	
AC thermal rated current	10 A	
AC maximum volt-ampere making	7200 V A	
AC maximum volt-ampere breaking	720 V A	
DC thermal rated current	2.5 A	
DC maximum volt-ampere making-breaking	69 V A	

### Connecting characteristics

Connection capacity (min. ... max.)		
	Solid / stranded	1 x 1...4 mm <sup>2</sup>
	Flexible with non insulated ferrule	2 x 1...4 mm <sup>2</sup>
		1 x 0.75...2.5 mm <sup>2</sup>
	Flexible with insulated ferrule	2 x 0.75...2.5 mm <sup>2</sup>
		1 x 0.75...2.5 mm <sup>2</sup>
	Lugs	2 x 0.75...2.5 mm <sup>2</sup>
		L $\leq$ 8 mm
		I > 3.7 mm
Connection capacity acc. to UL/CSA	1 or 2 x	AWG18...14
Stripping length	9 mm	
Tightening torque	1 Nm	
Degree of protection	IP20	
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529		
Screw terminals	Delivered in open position, screws of unused terminals must be tightened	
All terminals	M3.5	
Screwdriver type	Flat $\varnothing$ 5.5 / Pozidriv 2	

# Auxiliary contact blocks for AF116B ... AF370B contactors

## Electrical durability

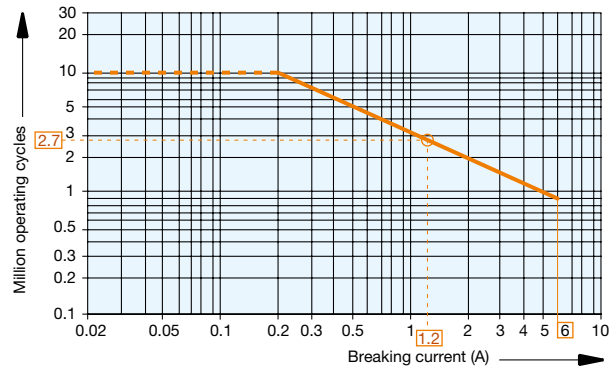
### Electrical durability for AC-15 utilization category

AC-15 utilization category according to IEC 60947-5-1 / EN 60947-5-1:

- making current:  $10 \times I_e$  with  $\cos \varphi = 0.7$  and  $U_e$
- breaking current:  $I_e$  with  $\cos \varphi = 0.4$  and  $U_e$ .

These curves represent the electrical durability of the add-on auxiliary contacts, in relation to the breaking current.

The curves have been drawn for resistive and inductive loads up to 690 V, 40...60 Hz.



- AF116B ... AF370B contactors auxiliary contacts
- 2-pole CAL19 add-on auxiliary contacts

#### Example:

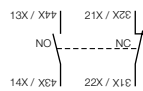
Breaking current = 1.2 A

On the opposite curve at intersection "O" 1.2 A the corresponding value for the electrical durability is approximately 2.7 millions operating cycles.

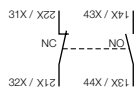
# Add-on auxiliary contacts

## Terminal marking and positioning

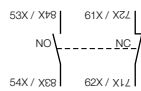
### 2-pole auxiliary contacts



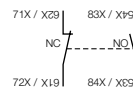
**CAL19-11**  
(Left-side mounted)



**CAL19-11**  
(Right-side mounted)



**CAL19-11B**  
(Left-side mounted)



**CAL19-11B**  
(Right-side mounted)