



# Data Sheet

# Magnetically coupled pumps

**RS stock number 266-597, 266-979**

### General description

The Totton magnetically coupled pump is rated for continuous duty and is ideally suited for water or chemical transfer and re-circulation applications.

### Features

- Magnetically coupling offers leak free pumping
- Trouble free pumping of acids and alkalis up to 1.2 specific gravity
- No mechanical seal
- Reduced heat transfer from motor to fluid
- Wetted parts are Polypropylene pump chamber and impeller, Alumina Ceramic shaft, Fluoroelastomer static rubber O-ring seal.
- Not self priming, requires a flooded suction of approx. 300mm
- Hose port connection

### Technical specification

Fluid temperature range	-20°C to +85°C	
	<b>266-597</b>	<b>266-979</b>
Max. flow rate	35L/min	14L/min
Min flow rate	2 L/Min	2 L/min
Max. working pressure	1.4 bar	1.4 bar
Max. Head	2.3m (50Hz) 3.3m (60Hz)	2.4m (50Hz) 3.4m (60Hz)
Inlet/outlet ports	22mm plain	13mm plain
Weight	1.92kg	1.46kg

### Motor specification

Voltage	230V 50Hz - IP22	
	<b>266-597</b>	<b>266-979</b>
Input power	84W	51W
Output power	18W	10W
Maximum current	0.7A	0.5A

### Installation

The pump can be connected to pipework using suitable fittings such as jubilee clips. The pump mounting plates have several fixing options (Figure 1). Flexible hoses with internal diameters of 22mm (RS stock no. 266-597) or 13mm (RS stock no. 266-979) may be used (avoid overtightening as this may cause damage to the ports). The pump and pipework should be adequately supported and correctly fitted to avoid shock loading and strain on the pump and its ports. The pump should not be mounted vertically with the ports below the motor.



**Figure 1** Dimensions

Dimensions	RS stock numbers	
	266-597	266-979
A	191	150
B	22	13
C	46	27.5
D	59	60
E	15	18.6
F	76	54.5

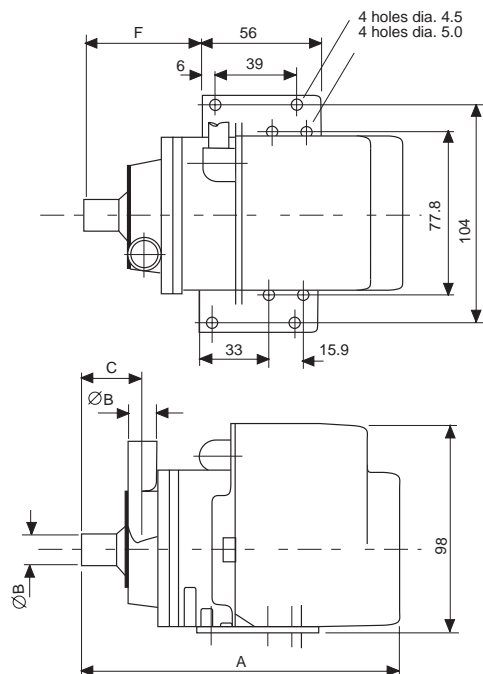
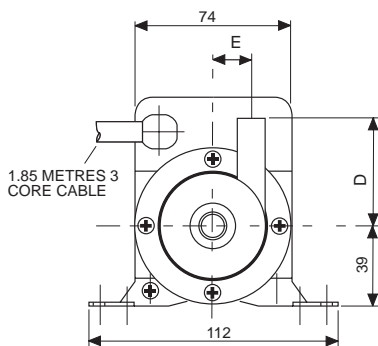
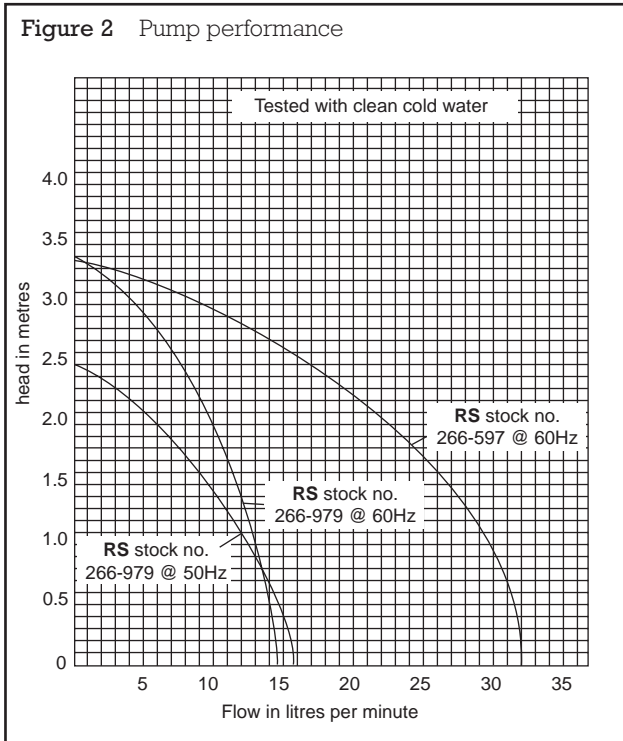


Figure 2 Pump performance



### Operation and maintenance

The pump should have flooded suction since it does not self prime. Filters or restrictions should not be situated before the pump inlet. When priming, operate the pump in short 10 second cycles to facilitate the cleaning of air. Ensure that there are no leaks or blockages in the associated pipework. The pump should not be operated against a closed valve for longer than 30 seconds. Where the pumped fluid causes coating or deposition, periodic cleaning of pump internals may be necessary. This can be achieved by flushing through with an appropriate cleaning agent. The pump casing should be adequately ventilated to avoid overheating the motor. The motor is protected by the magnetic coupling should the impeller stall.

**Do not run pump dry.**

### Chemical compatibility list

Aluminium chloride (10%)  
 Ammonium sulphate (50%)  
 Aniline  
 Antimony trichloride  
 Arsenic acid  
 Barium chloride  
 Boric acid  
 Calcium chloride  
 Castor oil  
 Chromic acid (10%)  
 Citric acid  
 Cod liver oil  
 Copper sulphate  
 Cresols  
 Diethylene Glycol  
 Ferric chloride (1.2SG)  
 Freon - 113  
 Glycerol  
 Hydrochloric acid (10%)  
 Hydrochloric acid (36%)  
 Hydrogen peroxide (35%)  
 Iso-propanol  
 Lactic acid (90%)  
 Linseed oil  
 Lubricating oil  
 Magnesium chloride  
 Mercuric chloride  
 Molasses  
 Nickel chloride  
 Olive oil  
 Paraffin oil  
 Potassium cyanide  
 Potassium permanganate (25%)  
 Potassium sulphate  
 Rape seed oil  
 Silicone fluids  
 Silver nitrate  
 Sodium carbonate (10%)  
 Sodium chloride (25%)  
 Sodium cyanide  
 Stannic chloride  
 Tetrachloroethane  
 Water (distilled)  
 Water (sea)  
 White spirit  
 Wine  
 Zinc chloride (aq sol)

# Contactors and Contactor Assemblies

## Contactors for Switching Motors



### 3RT10 contactors, 3-pole

#### Selection and ordering data AC operation

nsb0058



3RT10 2.-1A.00

nsb0706g



3RT10 2.-3A.00

NSB0604g



3RT10 2.-1A.04

NSB0640g



3RT10 2.-1AL24-3MA0

Ratings Utilization category		Auxiliary contacts Ident. Design no.	Rated control supply voltage $U_s$	DT	Screw connection		Cage Clamp connection for coil terminals		Weight approx.
AC-2 and AC-3 $T_U$ : up to 60 °C	AC-1 $T_U$ : 40 °C				Order No.	Price	DT	Order No.	Price
Operational current $I_e$ at 50 Hz and 400 V	Rating of three-phase motors at 50 Hz and 400 V	Operational current $I_e$ up to 690 V							
A	<b>kW</b>	A	NO NC AC		PG 101	1 unit		PG 101	1 unit

#### For screwing and snapping onto 35 mm standard mounting rail

##### • Size S0

9	<b>4</b>	40 <sup>1)</sup>	- - -	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 23-1AB00</b> <b>3RT10 23-1AF00</b> <b>3RT10 23-1AP00</b>	▶ ▶ ▶	<b>3RT10 23-3AB00</b> <b>3RT10 23-3AF00</b> <b>3RT10 23-3AP00</b>	0.32
12	<b>5.5</b>	40 <sup>1)</sup>	- - -	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 24-1AB00</b> <b>3RT10 24-1AF00</b> <b>3RT10 24-1AP00</b>	▶ ▶ ▶	<b>3RT10 24-3AB00</b> <b>3RT10 24-3AF00</b> <b>3RT10 24-3AP00</b>	0.32
17	<b>7.5</b>	40 <sup>1)</sup>	- - -	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 25-1AB00</b> <b>3RT10 25-1AF00</b> <b>3RT10 25-1AP00</b>	▶ ▶ ▶	<b>3RT10 25-3AB00</b> <b>3RT10 25-3AF00</b> <b>3RT10 25-3AP00</b>	0.32
25	<b>11</b>	40 <sup>1)</sup>	- - -	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 26-1AB00</b> <b>3RT10 26-1AF00</b> <b>3RT10 26-1AP00</b>	▶ ▶ ▶	<b>3RT10 26-3AB00</b> <b>3RT10 26-3AF00</b> <b>3RT10 26-3AP00</b>	0.32

##### • Size S0

with mounted auxiliary switch block (removable)  
Terminal designations according to EN 50 012

9	<b>4</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 23-1AB04</b> <b>3RT10 23-1AF04</b> <b>3RT10 23-1AP04</b>	- - -	0.38
12	<b>5.5</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 24-1AB04</b> <b>3RT10 24-1AF04</b> <b>3RT10 24-1AP04</b>	- - -	0.38
17	<b>7.5</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 25-1AB04</b> <b>3RT10 25-1AF04</b> <b>3RT10 25-1AP04</b>	- - -	0.38
25	<b>11</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	24 V, 50 Hz 110 V, 50 Hz 230 V, 50 Hz	▶ ▶ ▶	<b>3RT10 26-1AB04</b> <b>3RT10 26-1AF04</b> <b>3RT10 26-1AP04</b>	- - -	0.38

##### • Size S0

with permanently mounted auxiliary switch block<sup>2)</sup>  
Terminal designations according to EN 50 012

12	<b>5.5</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	230 V, 50/60 Hz	B	<b>3RT10 24-1AL24-3MA0</b>	-	0.38
17	<b>7.5</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	230 V, 50/60 Hz	B	<b>3RT10 25-1AL24-3MA0</b>	-	0.38
25	<b>11</b>	40 <sup>1)</sup>	<b>22 E</b> 2 2	230 V, 50/60 Hz	B	<b>3RT10 26-1AL24-3MA0</b>	-	0.38

For further voltages, see page 3/37.  
For accessories, see page 3/42.  
For spare parts, see page 3/62.  
For technical data, see page 3/92, 3/119.  
For description, see page 3/12.  
For int. circuit diagrams, see page 3/148.  
For dimension drawings, see page 3/216.

1) Minimum conductor cross-section 10 mm<sup>2</sup>.  
2) Further designs/voltages on request.

# Contactors and Contactor Assemblies

## Contactors for Switching Motors



### 3RT10 contactors, 3-pole

#### Selection and ordering data DC operation - DC solenoid system

nsb0058



3RT10 2.-1B.40

NSB0707g



3RT10 2.-3B.40

NSB0604g



3RT10 2.-1B.44

NSB0640g



3RT10 2.-1BB44-3MA0

Ratings Utilization category		Auxiliary contacts	Rated control supply voltage	Screw connection		Cage Clamp connection for coil terminals		Weight approx.
AC-2 and AC-3 $T_U$ : up to 60 °C	AC-1 $T_U$ : 40 °C	Ident. Design no.	$U_s$	Order No.	Price	Order No.	Price	
Operational current $I_e$ at 400 V	Rating of three-phase motors at 50 Hz and 400 V	Operational current $I_e$ up to 690 V		PG 101	1 unit	PG 101	1 unit	kg
A	<b>kW</b>	A	NO NC DC V					

#### For screwing and snapping onto 35 mm standard mounting rail

##### • Size S0

9	<b>4</b>	40 <sup>1)</sup>	-	-	-	24 220	▶ B	<b>3RT10 23-1BB40</b> <b>3RT10 23-1BM40</b>	▶ ▶	<b>3RT10 23-3BB40</b> <b>3RT10 23-3BM40</b>	0.56
12	<b>5.5</b>	40 <sup>1)</sup>	-	-	-	24 220	▶ ▶	<b>3RT10 24-1BB40</b> <b>3RT10 24-1BM40</b>	▶ ▶	<b>3RT10 24-3BB40</b> <b>3RT10 24-3BM40</b>	0.56
17	<b>7.5</b>	40 <sup>1)</sup>	-	-	-	24 220	▶ ▶	<b>3RT10 25-1BB40</b> <b>3RT10 25-1BM40</b>	▶ ▶	<b>3RT10 25-3BB40</b> <b>3RT10 25-3BM40</b>	0.56
25	<b>11</b>	40 <sup>1)</sup>	-	-	-	24 220	▶ ▶	<b>3RT10 26-1BB40</b> <b>3RT10 26-1BM40</b>	▶ ▶	<b>3RT10 26-3BB40</b> <b>3RT10 26-3BM40</b>	0.56

##### • Size S3 with mounted auxiliary switch block (removable)

Terminal designations according to EN 50 012											
9	<b>4</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24 220	▶ B	<b>3RT10 23-1BB44</b> <b>3RT10 23-1BM44</b>	- -	- -	0.62
12	<b>5.5</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24 220	▶ ▶	<b>3RT10 24-1BB44</b> <b>3RT10 24-1BM44</b>	- -	- -	0.62
17	<b>7.5</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24 220	▶ ▶	<b>3RT10 25-1BB44</b> <b>3RT10 25-1BM44</b>	- -	- -	0.62
25	<b>11</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24 220	▶ ▶	<b>3RT10 26-1BB44</b> <b>3RT10 26-1BM44</b>	- -	- -	0.62

##### • Size S0 with permanently mounted auxiliary switch block<sup>2)</sup>

Terminal designations according to EN 50 012											
12	<b>5.5</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24	B	<b>3RT10 24-1BB44-3MA0</b>	-	-	0.62
17	<b>7.5</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24	B	<b>3RT10 25-1BB44-3MA0</b>	-	-	0.62
25	<b>11</b>	40 <sup>1)</sup>	<b>22 E</b>	2	2	24	B	<b>3RT10 26-1BB44-3MA0</b>	-	-	0.62

For further voltages, see page 3/37.  
 For accessories, see page 3/42.  
 For technical data, see page 3/96, 3/119.  
 For description, see page 3/12.  
 For int. circuit diagrams, see page 3/148.  
 For dimension drawings, see page 3/216.

- 1) Minimum conductor cross-section 10 mm<sup>2</sup>.
- 2) Further designs/voltages on request.

# Contactors and Contactor Assemblies

## 3RT1 Contactors



### Accessories for contactors

#### Selection and ordering data

nsb0078



3RH19 21-1F...

nsb0731g



3RH19 21-2F...

NSB0603g



3RH19 21-1C...

nsb0644g



3RH19 21-2C...

nsb0080



3RH19 21-1LA..

nsb0081g



3RH19 21-1MA..

For contactors	Rated operational current $I_e$ /AC-15/AC-14 at <b>230 V</b>	Auxiliary contacts				Screw connection		Cage Clamp connection		Weight approx.	Pack.
		Ident. no.	Design	DT	Order No.	Price	DT	Order No.	Price		
Type	<b>A</b>				PG 101	1 unit	PG 101	1 unit	kg		

#### Auxiliary switch blocks for snapping onto the front acc. to EN 50 005

Sizes S0 to S12<sup>1)</sup>

4-pole auxiliary switch blocks												
3RT10 2, 3RT1. 3 to 3RT1. 7, 3RT11	6	40	4	-	-	-	▶	3RH19 21-1FA40	▶	3RH19 21-2FA40	0.065	1 unit
		31	3	1	-	-	▶	3RH19 21-1FA31	▶	3RH19 21-2FA31		
		22	2	2	-	-	▶	3RH19 21-1FA22	▶	3RH19 21-2FA22		
		04	-	4	-	-	▶	3RH19 21-1FA04	▶	3RH19 21-2FA04		
		22 U	-	-	2	2	▶	3RH19 21-1FC22	A	3RH19 21-2FC22		
Single-pole auxiliary switch blocks acc. to EN 50 005 and EN 50 012 (1 pack = 10 units)												
3RT1. 2 to 3RT1. 7, 3RT11	6	-	1	-	-	-	▶	3RH19 21-1CA10	▶	3RH19 21-2CA10	0.015	1 pack
		-	-	1	-	-	▶	3RH19 21-1CA01	▶	3RH19 21-2CA01		
		-	-	-	1	-	▶	3RH19 21-1CD10		-		
		-	-	-	-	1	▶	3RH19 21-1CD01		-		
2-pole auxiliary switch blocks with cable entry from one side												
• Cable entry from above												
3RT10 2, 3RT1. 3 to 3RT1. 7, 3RT11	6	-	1	1	-	-	▶	3RH19 21-1LA11	-	-	0.065	1 unit
		-	2	-	-	-	▶	3RH19 21-1LA20	-	-		
		-	-	2	-	-	▶	3RH19 21-1LA02	-	-		
• Cable entry from below												
	6	-	1	1	-	-	▶	3RH19 21-1MA11	-	-	0.065	1 unit
		-	2	-	-	-	▶	3RH19 21-1MA20	-	-		
		-	-	2	-	-	▶	3RH19 21-1MA02	-	-		

For int. circuit diagrams, see page 3/149.  
For position of terminals, see page 3/154.

1) Exception: 3RT16.


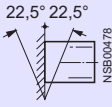

# Contactors and Contactor Assemblies

## Contactors for Switching Motors



### 3RT10 2. contactors

#### Technical data

Contactor	Size Type	S0 3RT10 2.	
<b>General data</b>			
<b>Permissible mounting position</b> The contactors are designed for operation on a vertical mounting surface.	AC and DC operation		
<b>Upright mounting position:</b>			
	AC operation	Standard design	
	DC operation	Special design required; also applies to 3RT10 2.-K.40 coupling relays Positions 13 to 16 of the Order No. must be changed to <b>-1AA0</b> . In the case of 3RT10 2.-3K.44-0LA0 contactors with extended coil voltage tolerance, positions 13 to 16 of the Order No. are changed to <b>-1LA0</b> . Additional charge	
<b>Mechanical endurance</b>	Basic units Basic unit with snap-on auxiliary switch block Solid-state compatible aux. switch block	Oper. cycles	10 million 10 million 5 million
<b>Electrical endurance</b>			See page 3/86
<b>Rated insulation voltage <math>U_i</math></b> (pollution degree 3)		V	690
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		kV	6
<b>Safe isolation</b> between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	400
<b>Positively driven operation</b>			
• There is positively driven operation if the NC and NO contacts cannot be closed at the same time	3RT10 2., 3RT13 2. (removable aux. switch block)		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)
• Positively driven operation for contactors with solid-state compatible auxiliary switch block according to Swiss regulations (SUVA) on request.	3RT10 2., 3RT13 2. (permanent aux. switch block)		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC), Swiss regulations (SUVA)
<b>Permissible ambient temperature</b>		in operation °C when stored °C	-25 ... +60 -55 ... +80
<b>Degree of protection</b> acc. to IEC 60 947-1 and DIN 40 050			IP 20, coil system IP 20
<b>Shock resistance</b>	Rectangular pulse	AC operation g/ms DC operation g/ms	8.2/5 and 4.9/10 10/5 and 7.5/10
	Sine pulse	AC operation g/ms DC operation g/ms	12.5/5 and 7.8/10 15/5 and 10/10
<b>Conductor cross-sections</b>			See page 3/95

Contactor	Size Type	S0 3RT10 23, 3RT10 24, RT10 25		S0 3RT10 26		
<b>Short-circuit protection of contactors without overload</b>		For short-circuit protection of contactors with overload relays, see Part 4. For short-circuit protection of weld-free contactors, see Part 5. (overload and short-circuit protection only with 3RV10 circuit-breaker). For short-circuit protection of fuseless load feeders, see Part 5.				
<b>Main circuit</b> Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE With fuse links – acc. to IEC 60 947-4-1/EN 60 947-4-1		Type of coord. "1-1) Type of coord. "2-1) Weld-free <sup>2)</sup>	A A A	63 25 10	100 35 16	
or miniature circuit-breaker with C-characteristic (short-circuit current 3 kA, type of coordination "1") <sup>1)</sup>			A	25	32	
<b>Auxiliary circuit</b> Fuse links, utilization category gL/gG DIAZED Type 5SB, NEOZED Type 5SE (weld-free protection at $I_k \geq 1$ kA) or miniature circuit-breaker with C-characteristic (short-circuit current $I_k < 400$ A)			A A	10 10	10 10	

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):  
Type of coordination "1":  
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":  
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.  
For 3RT11 weld-free contactors, see Part 5 (overload and short-circuit protection only with 3RV10 circuit-breaker).



### Technical data

Contactor	Size Type	S0 3RT10 2.			
<b>Control circuit</b>					
<b>Coil voltage tolerance</b>		AC/DC	0.8 ... 1.1 × U <sub>s</sub>		
<b>Power consumption of the coils</b> (with coil in cold state and 1.0 × U <sub>s</sub> )					
AC operation		Hz	Standard design		For USA and Canada
			50	50/60	50
	closing	VA	61	64 / 63	61
	p.f.		0.82	0.72/ 0.74	0.82
	closed	VA	7.8	8.4 / 6.8	7.8
	p.f.		0.24	0.24/ 0.28	0.24
DC operation		W	5.4		60
<b>Permissible residual current of the electronics</b> (with 0 signal)					
	AC operation	mA	$< 6 \text{ mA} \times \left( \frac{230 \text{ V}}{U_s} \right)$		
	DC operation	mA	$< 16 \text{ mA} \times \left( \frac{24 \text{ V}}{U_s} \right)$		
<b>Operating times at 0.8 ... 1.1 × U<sub>s</sub> 1)</b>					
Break-time = opening time + arcing time					
AC operation		closing time	ms	8 ... 44	
		opening time	ms	4 ... 20	
DC operation		closing time	ms	50 ... 170	
		opening time	ms	13.5 ... 15.5	
Arcing time			ms	10	
<b>Operating times at 1.0 × U<sub>s</sub> 1)</b>					
AC operation		closing time	ms	10 ... 17	
		opening time	ms	4 ... 20	
DC operation		closing time	ms	55 ... 85	
		opening time	ms	14 ... 15.5	

Contactor	Size Type	S0 3RT10 23, 3RT10 23	S0 3RT10 23, 3RT10 24	S0 3RT10 25	S0 3RT10 26
-----------	-----------	-----------------------------	-----------------------------	----------------	----------------

### Main circuit

#### Load ratings with AC

<b>AC-1 utilization category, switching resistive load</b>						
Rated operational currents I <sub>e</sub>	at 40 °C up to 690 V	A	40			
	at 60 °C up to 690 V	A	35			
Ratings of three-phase loads 2) p.f. = 0.95 (at 60 °C)	at 230 V	kW	13.3			
	400 V	kW	23			
	500 V	kW	29			
	690 V	kW	40			
Minimum conductor cross-section with I <sub>e load</sub>	at 40 °C	mm <sup>2</sup>	10			
	60 °C	mm <sup>2</sup>	10			
<b>AC-2 and AC-3 utilization categories</b>						
Rated operational currents I <sub>e</sub>	up to 400 V	A	9	12	17	25
	500 V	A	6.5	12	17	18
	690 V	A	5.2	9	13	13
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 110 V	kW	1.1	1.5	2.2	3
	230 V	kW	3	3	4	5.5
	400 V	kW	4	5.5	7.5	11
	500 V	kW	4.5	7.5	10	11
	660/690 V	kW	5.5	7.5	11	11
	<b>Thermal loading capacity</b>	10 s current 3)	A	80	110	150
<b>Power loss per conducting path</b>	at I <sub>e</sub> /AC-3	W	0.4	0.5	0.9	1.6

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (varistor +2 ms to 5 ms, diode assemblies: 2 to 6 times).

2) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

3) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Part 4.

# Contactors and Contactor Assemblies

## Contactors for Switching Motors



### 3RT10 2. contactors

#### Technical data

Contactors	Size Type		S0 3RT10 23	S0 3RT10 23	S0 3RT10 25	S0 3RT10 26
<b>Main circuit</b>						
<b>Load ratings with AC</b>						
<b>AC-4 utilization category</b> (at $I_a = 6 \times I_e$ )						
Rated operational current $I_e$	up to 400 V	A	8.5	12.5	15.5	15.5
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	4	5.5	7.5	7.5
• For a contact endurance of approx. 200 000 operating cycles:						
Rated operational currents $I_e$	up to 400 V	A	4.1	5.5	7.7	9
	690 V	A	3.3	5.5	7.7	9
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 110 V	kW	0.5	0.73	1	1.2
	230 V	kW	1.1	1.5	2	2.5
	400 V	kW	2	2.6	3.5	4.4
	500 V	kW	2	3.3	4.6	5.6
	690 V	kW	2.5	4.6	6	7.7
<b>AC-5a utilization category, switching gas discharge lamps</b> per main conducting path at 230 V <sup>1)</sup>						
	Rating per lamp uncorrected	Rated operational current per lamp (A)				
	L 18 W	0.37	units	95		
	L 36 W	0.43	units	81		
	L 58 W	0.67	units	52		
	lead-lag					
	L 18 W	0.11	units	318		
	L 36 W	0.21	units	166		
	L 58 W	0.32	units	109		
<b>Switching gas discharge lamps with correction, electronic ballast</b> per main conducting path at 230 V						
Rating per lamp	Capacitor (µF)	Rated operational current per lamp (A)				
Parallel correction						
L 18 W	4.5	0.11	units	37		61
L 36 W	4.5	0.21	units	37		61
L 58 W	7	0.32	units	23		39
With electronic ballast, single lamp						
L 18 W	6.8	0.10	units	105		105
L 36 W	6.8	0.18	units	58		97
L 58 W	10	0.27	units	38		64
With electronic ballast, twin lamp						
L 18 W	10	0.18	units	58		97
L 36 W	10	0.35	units	30		50
L 58 W	22	0.52	units	20		33
<b>AC-5b utilization category, switching incandescent lamps</b> per main conducting path at 230/220 V						
		kW	3			4
<b>AC-6a utilization category, switching three-phase transformers</b> with inrush						
Rated operational current $I_e$	up to 400 V	A	30	20		30 20
Ratings of three-phase transformers with an inrush of $n = 30$ or 20. The ratings must be re-calculated for other inrush factors $x$ :	at 230 V	kVA	3	4.5		5.4 8
	400 V	kVA	5.2	7.9		9.3 13.9
	500 V	kVA	6.6	9.9		11.7 15.5
	690 V	kVA	9.1	13.6		15.5 15.5
$P_x = P_{n,30} \cdot \frac{30}{x}$						
<b>AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors</b>						
Rated operational currents $I_e$	up to 400 V	A	5.8			10.8
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	2.5			4
	400 V	kvar	4			7.5
	500 V	kvar	4			7.5
	690 V	kvar	4			7.5

1)  $I_e/AC-1 = 35$  A (60 °C) and with the corresponding minimum conductor cross-section 10 mm<sup>2</sup>.



### Technical data

Contactor	Size Type	<b>S0</b> 3RT10 23, 3RT10 24, 3RT10 25	<b>S0</b> 3RT10 26
-----------	-----------	---	-----------------------

### Main circuit

#### Load ratings with DC

##### DC-1 utilization category, switching resistive load ( $L/R \leq 1 \text{ ms}$ )

##### Rated operational current $I_e$ (at 60 °C)

Number of conducting paths connected in series

	1	2	3
up to 24 V A	35	35	35
60 V A	20	35	35
110 V A	4.5	35	35
220 V A	1	5	35
440 V A	0.4	1	2.9
600 V A	0.25	0.8	1.4

##### DC-3 and DC-5 utilization categories, shunt and series motors ( $L/R \leq 15 \text{ ms}$ )

##### Rated operational current $I_e$ (at 60 °C)

Number of conducting paths connected in series

	1	2	3
up to 24 V A	20	35	35
60 V A	5	35	35
110 V A	2.5	15	35
220 V A	1	3	10
440 V A	0.09	0.27	0.6
600 V A	0.06	0.16	0.6

#### Operating frequency

##### Operating frequency $z$ in operating cycles per hour

Contactors without overload relays	No-load operating frequency	1/h	AC	DC	AC	DC
			5000	1500	5000	1500
Dependence of the operating frequency $z'$ on the operational current $I'$ and the operational voltage $U'$ :	for AC-1	1/h	AC/DC		AC/DC	
	for AC-2	1/h	1 000		1 000	
	for AC-3	1/h	1 000		750	
	for AC-4	1/h	300		750	
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'}\right)^{1.5}$		1/h	300		250	
Contactors with overload relays (mean value)		1/h	15		15	

### Conductor cross-sections

#### Screw connections (1 or 2 conductor connections possible)

##### Main conductor:

Solid	mm <sup>2</sup>	2 × (1 ... 2.5); 2 × (2.5 ... 6)
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (1 ... 2.5); 2 × (2.5 ... 6) acc. to IEC 60 947; max. 1 × 10
AWG conductor connections, – solid	AWG	2 × (16 ... 12)
– solid or stranded	AWG	2 × (14 ... 10)
– stranded	AWG	1 × 8
– Terminal screws		M4 (Pozi driv size 2)
– Tightening torque	Nm	2.0 ... 2.5 (18 ... 22 lb.in)

##### Auxiliary conductor:

Solid	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)
AWG conductor connections, solid or stranded	AWG	2 × (20 ... 16); 2 × (18 ... 14); 1 × 12
– Terminal screws		M3
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)

#### Cage Clamp connections (1 or 2 conductor connections possible)

##### Auxiliary conductor:

Solid	mm <sup>2</sup>	2 × (0.25 ... 2.5)
Finely stranded with end sleeve	mm <sup>2</sup>	2 × (0.25 ... 1.5)
Finely stranded without end sleeve	mm <sup>2</sup>	2 × (0.25 ... 2.5)
AWG conductor connections, solid or stranded	AWG	2 × (24 ... 14)

- For tool for opening the Cage Clamp connection, see accessories on page 3/52.
- An "insulation stop" must be used for conductor cross-sections  $\leq 1 \text{ mm}^2$ , see accessories on page 3/52.
- Max. outer diameter of conductor insulation: 3.6 mm.
- For information about Cage Clamp connections, see page 4.

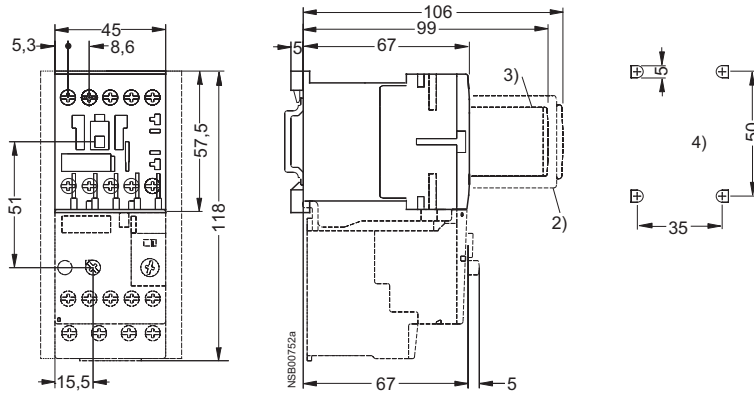
## 3RT10 contactors, 3-pole

### Dimension drawings

#### 3RT10 1 contactors

**Size S00**, screw connection  
with surge suppressor, auxiliary switch block and mounted overload relay

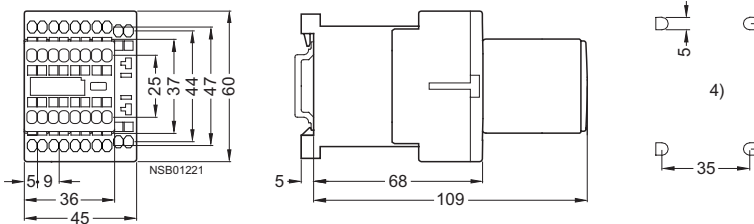
Lateral clearance from earthed parts = 6 mm



- 2) Auxiliary switch block (also 3RH19 11-..NF... solid-state compatible design)
- 3) Surge suppressor (also 3RT19 16-1GA00 additional load module)
- 4) Drilling pattern

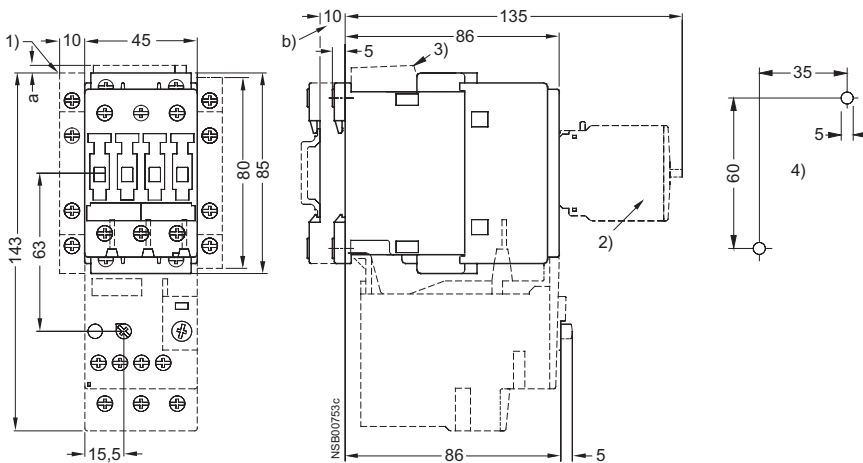
#### 3RT10 1 contactors

**Size S00**, Cage Clamp connection  
with auxiliary switch block



#### 3RT10 2 contactors, 3RT10 2 coupling relays

**Size S0**, screw connection  
with surge suppressor, auxiliary switch blocks and mounted overload relay



**For size S0:**

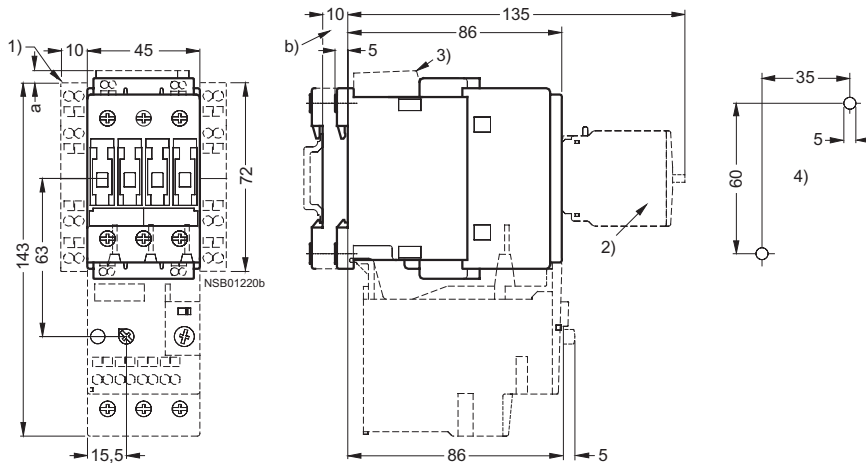
- a = 3 mm at < 240 V
- a = 7 mm at > 240 V
- b = DC 10 mm deeper than AC
- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front, 1, 2 and 4-pole (also 3RH19 21-..FE22 solid-state compatible design)
- 3) Surge suppressor
- 4) Drilling pattern



#### Dimension drawings

##### 3RT10 2 contactors, 3RT10 2 coupling relays

**Size S0**, Cage Clamp connection  
with surge suppressor, auxiliary switch blocks and mounted overload relay



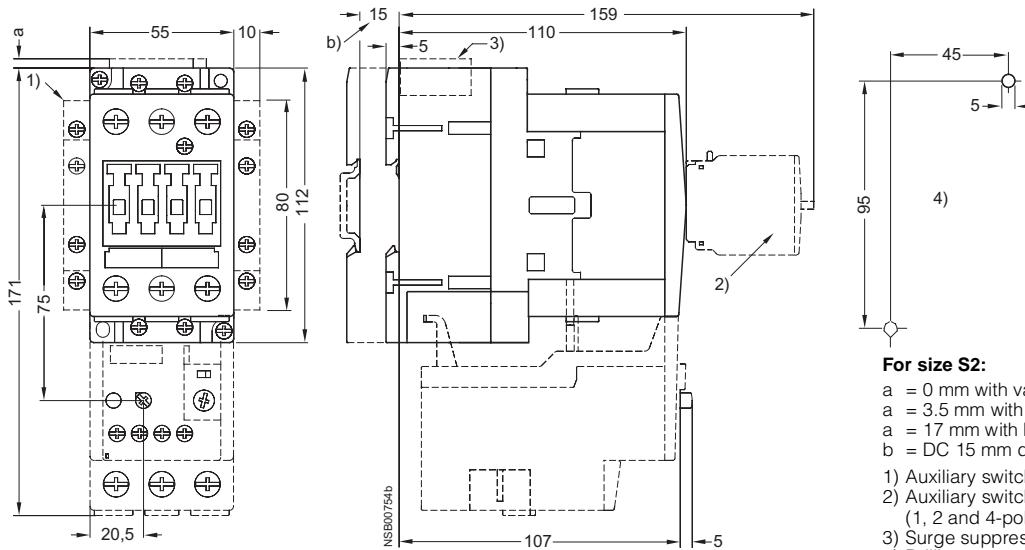
**For size S0:**

- a = 0 mm with varistor < 240 V, diode assembly
- a = 3.5 mm with varistor > 240 V
- a = 17 mm with RC element
- b = DC 15 mm deeper than AC

- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern

##### 3RT10 3 contactors

**Size S2**, screw connection  
with surge suppressor, auxiliary switch blocks and mounted overload relay



**For size S2:**

- a = 0 mm with varistor < 240 V, diode assembly
- a = 3.5 mm with varistor > 240 V
- a = 17 mm with RC element
- b = DC 15 mm deeper than AC

- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern

### Compact and Intelligent Temperature Controllers

#### 1/32 DIN with Communications Function

- Various temperature inputs: Thermocouple, platinum resistance thermometer, non-contact temperature sensor, and analog inputs.
- Auto-tuning and self-tuning available. Auto-tuning is possible even while self-tuning is being executed.
- Heating or heating/cooling control is available.
- Water-resistant construction (NEMA4X: equivalent to IP66).
- Conforms to UL, CSA, and IEC safety standards as well as CE marking.



48(W) x 24(H) x 100(D) mm

### Ordering Information

#### ■ E5GN Standard Models

Size	Power supply voltage	No. of alarm points	Output	Thermocouple model	Platinum resistance thermometer model
1/32 DIN 48(W) x 24(H) x 100(D) mm	100 to 240 VAC	---	Relay	E5GN-RTC	E5GN-RP
			Voltage output (for driving SSR)	E5GN-QTC	E5GN-QP
		1 (see note 1)	Relay	E5GN-R1TC	E5GN-R1P
			Voltage output (for driving SSR)	E5GN-Q1TC	E5GN-Q1P
	24 VAC/VDC	---	Relay	E5GN-RTC	E5GN-RP
			Voltage output (for driving SSR)	E5GN-QTC	E5GN-QP
		1 (see note 1)	Relay	E5GN-R1TC	E5GN-R1P
			Voltage output (for driving SSR)	E5GN-Q1TC	E5GN-Q1P

- Note:**
1. If the heating/cooling function is used, ALM1 will be used for control output and so alarm output will not be available.
  2. Control output 2 for heating/cooling control is relay output.
  3. Specify the power supply specifications when ordering.

#### ■ E5GN Communication Models

Size	Power supply voltage	Communication function	Output	Thermocouple model	Platinum resistance thermometer model
1/32 DIN 48(W) x 24(H) x 100(D) mm	100 to 240 VAC	RS-485	Relay	E5GN-R03TC-FLK	E5GN-R03P-FLK
			Voltage output (for driving SSR)	E5GN-Q03TC-FLK	E5GN-Q03P-FLK
	24 VAC/VDC		Relay	E5GN-R03TC-FLK	E5GN-R03P-FLK
			Voltage output (for driving SSR)	E5GN-Q03TC-FLK	E5GN-Q03P-FLK

- Note:** Specify the power supply specifications when ordering.

■ Input Ranges

Platinum Resistance Thermometer Input/Thermocouple Input

Platinum resistance thermometer input				
Input type	Platinum resistance thermometer			
Name	Pt100		JPt100	
Temperature range	850	500.0	500.0	100.0
	-200	-199.9	-199.9	0.0
Set value	0	1	2	3

Thermocouple input																			
Input type	Thermocouple											ES1A Non-contact Temperature Sensor				Analog input			
Name	K	J	T	E	L	U	N	R	S	B	K10 to 70°C	K60 to 120°C	K115 to 165°C	K160 to 260°C	0 to 50 mV				
Temperature range	1300	850	400.0	400.0	600	850	400	400.0	1700	1700	1800	70	120	165	260				
	-200	-100	-20.0	-20.0	0	-100	-200	-199.9	0	0	100	0	0	0	0				
Set value	0	1	2	3	4	17	5	6	7	18	8	9	10	11	12	13	14	15	16

Applicable standards by input type are as follows:

- K, J, T, E, N, R, S, B: JIS C1602-1995
- L: Fe-CuNi, DIN 43710-1985
- U: Cu-CuNi, DIN 43710-1985
- JPt100: JIS C1604-1989, JIS C1606-1989
- Pt100: JIS C1604-1997, IEC751

Shaded ranges indicate default settings.

# Specifications

## ■ Ratings

Supply voltage	100 to 240 VAC, 50/60 Hz	24 VAC, 50/60 Hz/24 VDC
Operating voltage range	85% to 110% of rated supply voltage	
Power consumption	7 VA	4 VA/2.5 W
Sensor input	Thermocouple: K, J, T, E, L, U, N, R, S, B Platinum resistance thermometer: Pt100, JPt100 Non-contact temperature sensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, 160 to 260°C Voltage input: 0 to 50 mV	
Control output	Relay output	SPST-NO, 250 VAC, 2 A (resistive load), electrical life: 100,000 operations
	Voltage output	12 VDC (PNP), max. load current: 21 mA, with short-circuit protection circuit
Alarm output	SPST-NO, 250 VAC, 1 A (resistive load), electrical life: 100,000 operations	
Control method	2-PID or ON/OFF control	
Setting method	Digital setting using front panel keys	
Indication method	7-segment digital display and single-lighting indicator Character height: PV: 7.0 mm; SV: 3.5 mm	
Other functions	According to controller model	
Ambient temperature	-10 to 55°C (with no condensation or icing)	
Ambient humidity	25% to 85%	
Storage temperature	-25 to 65°C (with no condensation or icing)	

## ■ Characteristics

Indication accuracy	Thermocouple: ( $\pm 0.5\%$ of indicated value or $\pm 1^\circ\text{C}$ , whichever greater) $\pm 1$ digit max. (see note) Platinum resistance thermometer: ( $\pm 0.5\%$ of indicated value or $\pm 1^\circ\text{C}$ , whichever greater) $\pm 1$ digit max. Analog input: $\pm 0.5\%$ FS $\pm 1$ digit max. CT input: $\pm 5\%$ FS $\pm 1$ digit max.	
Hysteresis	0.1 to 999.9 EU (in units of 0.1 EU)	
Proportional band (P)	0.1 to 999.9 EU (in units of 0.1 EU)	
Integral time (I)	0 to 3999 s (in units of 1 s)	
Derivative time (D)	0 to 3999 s (in units of 1 s)	
Control period	1 to 99 s (in units of 1 s)	
Manual reset value	0.0% to 100.0% (in units of 0.1%)	
Alarm setting range	-1999 to 9999 (decimal point position depends on input type)	
Sampling period	500 ms	
Insulation resistance	20 M $\Omega$ min. (at 500 VDC megger)	
Dielectric strength	2000 VAC, 50 or 60 Hz for 1 min (between different charging terminals)	
Vibration resistance	10 to 55 Hz, 10 m/s <sup>2</sup> for 2 hours each in X, Y and Z directions	
Shock resistance	300 m/s <sup>2</sup> , 3 times each in 3 axes, 6 directions (relay: 100 m/s <sup>2</sup> )	
Weight	Approx. 90 g	Mounting bracket: approx. 10 g
Protective structure	Front panel: NEMA4X for indoor use (equivalent to IP66), rear case: IP20, terminals: IP00	
Memory protection	EEPROM (non-volatile memory) (number of writes: 100,000)	
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (amplitude modulated, 80 MHz to 1 GHz) (level 3) 10 V/m (pulse modulated, 900 MHz) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4)	
Approved standards	UL3121-1, CSA22.2 No. 14, E.B.1402C Conforms to EN50081-2, EN50082-2, EN61010-1 (IEC61010-1) Conforms to VDE0106/part 100 (Finger Protection), when the terminal cover is mounted.	

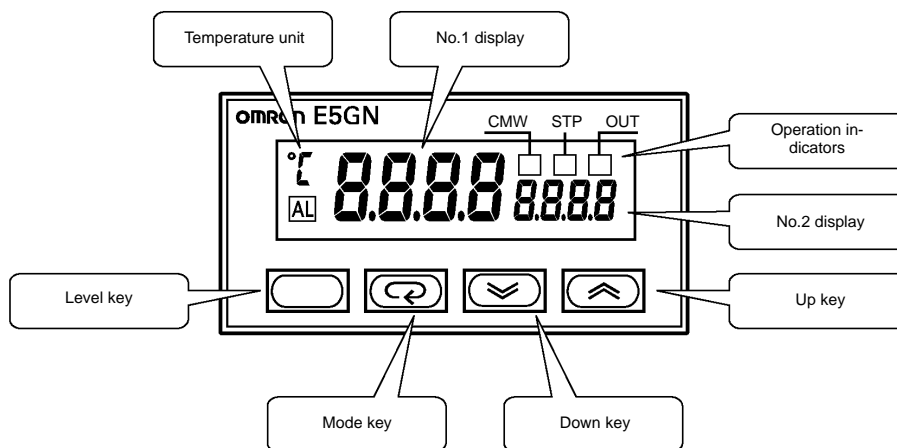
**Note:** The indication of K thermocouples in the -200 to 1300°C range, and T and N thermocouples at a temperature of -100°C or less, and U and L thermocouples at any temperature is  $\pm 2^\circ\text{C} \pm 1$  digit maximum. The indication of B thermocouples at a temperature of 400°C or less is unrestricted.  
 The indication of R and S thermocouples at a temperature of 200°C or less is  $\pm 3^\circ\text{C} \pm 1$  digit maximum.

## ■ Communications Specifications

Transmission path connection	Multiple points
Communications method	RS-485 (two-wire, half duplex)
Synchronization method	Start-stop synchronization
Baud rate	1,200/2,400/4,800/9,600/19,200 bps
Transmission code	ASCII
Data bit length (see note)	7 or 8 bits
Stop bit length (see note)	1 or 2 bits
Error detection	Vertical parity (none, even, odd) Frame check sequence (FCS): with SYSMAC WAY Block check character (BCC): with CompoWay/F
Flow control	Not available
Interface (see note)	RS-485
Retry function	Not available
Communications buffer	40 bytes

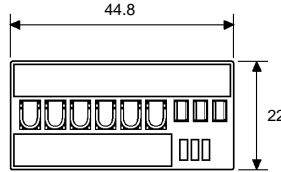
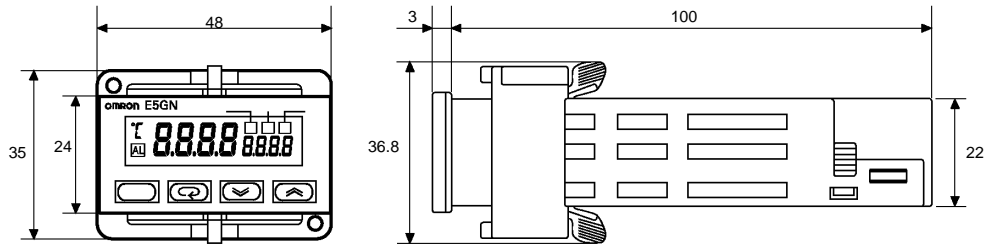
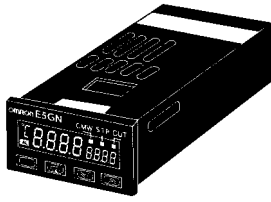
**Note:** The baud rate, data bit length, stop bit length, or vertical parity can be individually set using the communications setting level.

## Nomenclature



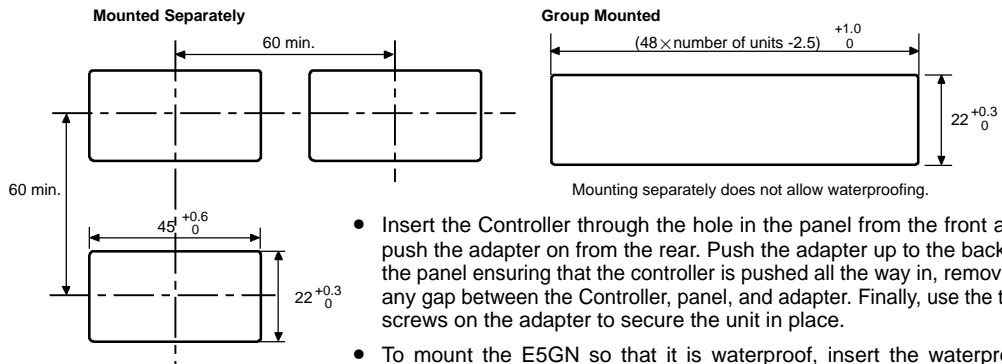
# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.



\* When carrying out maintenance on the E5GN, only the terminal plate can be drawn out with the terminal leads still attached.

### Panel Cutout



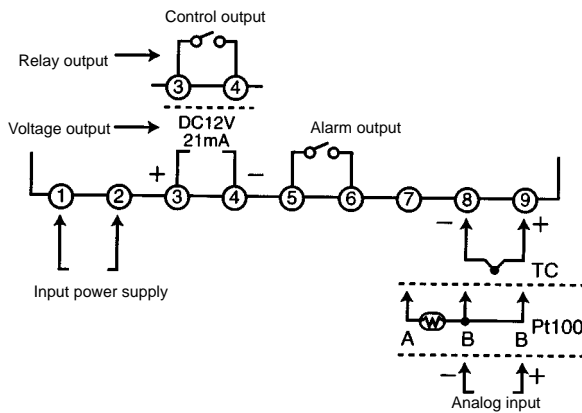
Mounting separately does not allow waterproofing.

- Insert the Controller through the hole in the panel from the front and push the adapter on from the rear. Push the adapter up to the back of the panel ensuring that the controller is pushed all the way in, removing any gap between the Controller, panel, and adapter. Finally, use the two screws on the adapter to secure the unit in place.
- To mount the E5GN so that it is waterproof, insert the waterproof packing onto the E5GN.
- When two or more E5GN Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature given in the specifications.

# Wiring Terminals

- The voltage output (control output) is not electrically insulated from the internal circuits. When using a grounding thermocouple, do not connect the control output terminals to the ground. If the control output terminals are connected to the ground, errors will occur in the measured temperature values as a result of leakage current.
- Standard insulation is applied to the power supply I/O sections. If reinforced insulation is required, connect the input and output terminals to a device without any exposed current-carrying parts or to a device with standard insulation suitable for the maximum operating voltage of the power supply I/O section.

## ■ E5GN



Two input power supplies are available:  
100 to 240 VAC or 24 VAC/VDC (no polarity).

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

# Bourdon Tube Pressure Gauges

Standard Series, Back Pressure Entry • Model 111.12

## Pressure Gauges

### Service intended

Suitable for all gaseous and liquid media that will not obstruct the pressure system or attack copper alloy parts.

### Design

EN 837-1

### Nominal size

40, 50, 63, 80 and 100 mm

### Accuracy class per EN 837-1 /6

2.5

### Scale ranges per EN 837-1 /5

0 ... 0,6 to 0 ... 400 bar  
or other equivalent units of pressure or vacuum.

### Working pressure

Steady:  $\frac{3}{4}$  of full scale value

Fluctuating:  $\frac{2}{3}$  of full scale value

Short time: full scale value

### Operating temperature

Ambient: -40 ... +60 °C

Medium: +60 °C maximum

### Temperature effect

When temperature of the pressure element deviates from reference temperature (+20 °C):  
max.  $\pm 0.4\%/10$  K of the span.

### Standard features

#### Pressure connection

Material: Cu-alloy

Threaded entry (back only) per EN 837-1 /7.3

40 mm: G  $\frac{1}{8}$  B, 14 mm flats

50, 63, 80 and 100 mm: G  $\frac{1}{4}$  B, 14 mm flats

#### Pressure element

Material: Cu-alloy

$\leq 40$  bar: C-type

$> 40$  bar: helical type

#### Movement

Cu-alloy

#### Dial

40, 50 and 63 mm: white plastic, with pointer stop pin

80 and 100 mm: white aluminium, with pointer stop pin

With black lettering

#### Pointer

Black plastic



#### Case

Black plastic

100 mm only: black finish steel

#### Window

Crystal-clear plastic, snap-fit

#### Optional extras

- Accuracy class 1.6
- Other pressure connection
- Black finish steel case
- Triangular bezel with clamp

Radial pressure entry see data sheet PM 01.01

Panel mounting, back pressure entry see data sheet PM 01.10

## Special versions

### For water-level-indicator and central heating

80 mm , accuracy class 2.5  
Scale ranges 0 ... 0.6 to 0 ... 40 bar, with 2nd scale of mWS (metres of water)

### Tyre inflation gauges with EEC approval mark

80 mm with black finish steel case  
Scale ranges 0 ... 4 and 0 ... 10 bar

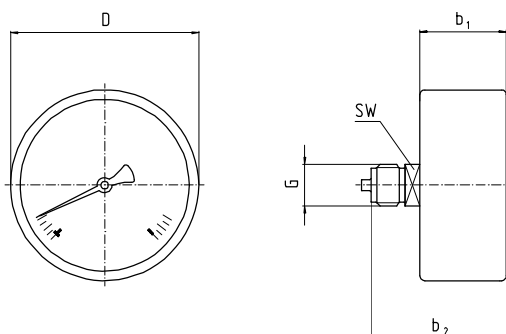
### For closed central heating

63 and 80 mm, accuracy class 2.5  
With red mark pointer and adjustable green sector  
Scale range 0 ... 4 bar, red mark at 2.5 or 3 bar

## Dimensions

### Standard version

Centre back pressure connection



1034 430

NS	Dimensions [mm]					Weight [kg]
	$b_1 \pm 0.5$	$b_2 \pm 1$	D	G	SW	
40	26	44	39	G 1/8 B	14	0.063
50	26.5	47.5	49	G 1/4 B	14	0.071
63	26.5	47	62	G 1/4 B	14	0.078
80	32	49	79	G 1/4 B	14	0.110
100	31	49	99	G 1/4 B	14	0.260

Standard pressure entry with parallel thread and seating to EN 837-1 / 7.3

## Ordering information

State:

Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.



**WIKAI Alexander Wiegand GmbH & Co. KG**  
Alexander-Wiegand-Straße · 63911 Klingenberg  
☎ (0 9372) 132-0 · ☎ (0 9372) 132-406/414  
<http://www.wika.de> · E-mail: info@wika.de

# Craig & Derricott Ltd - Controls for your Application

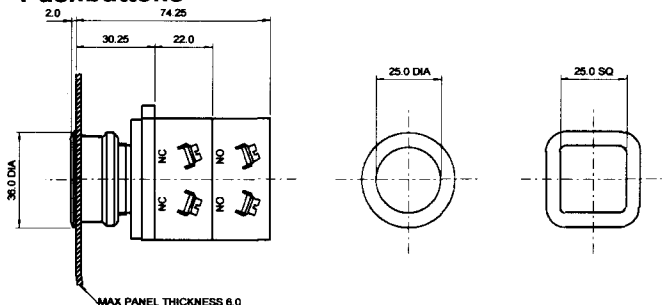
## New 30 Series Low profile Pushbuttons & Indicator Units

- Ith 10A. EN 60947-5 10A
- Six standard colours
- Die-cast aluminium construction
- Round & Square bezels
- 30.5 mm flush mounting IP65

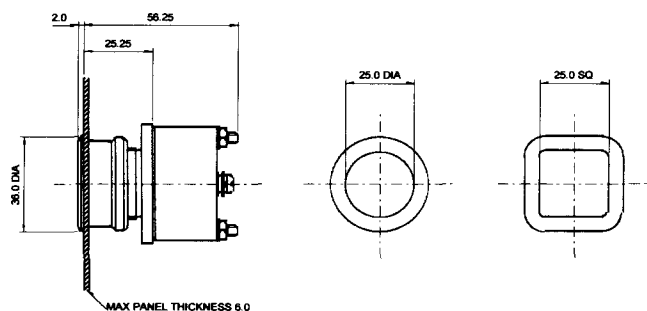
This range of robust low profile pushbutton operators has been specifically designed to meet the arduous operating standards, together with the ergonomic appearance, demanded in the modern environment. Units can be supplied with round or square bezels in a satin chrome finish. Buttons are supplied as standard in six colours.

Units are secured with a locking ring from the rear which is held in place with a tabbed washer. Up to six switching contacts can be supplied on each actuator, in any combination of normally open, normally closed or changeover (each changeover action requires two sets of contacts).

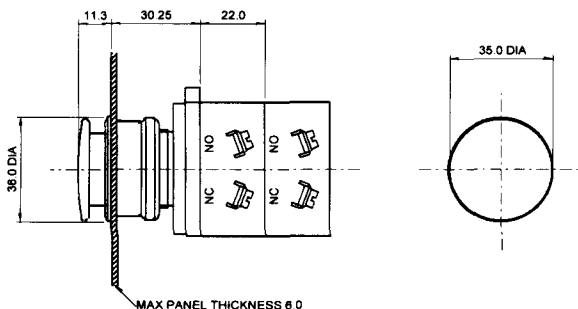
### Pushbuttons



### LED Indicators



### Mushroom Pushbuttons



## Technical Data

### Material

Die cast mazak bezel, barrel, actuator and locking collar

### Sealing

IP65

### Fitting

Rear panel access only

## Ordering References

To order suffix actuator reference with contact arrangement required. eg. 302Y1-3NO-3NC

### Pushbuttons

Button Colour	Round Pushbutton	Square Pushbutton
<b>Red</b>	301R1	302R1
<b>Green</b>	301G1	302G1
<b>Blue</b>	301Z1	302Z1
<b>Yellow</b>	301Y1	302Y1
<b>Black</b>	301B1	302B1
<b>White</b>	301W1	302W1

### Mushroom Pushbuttons

Button Colour	Round Pushbutton	Description
<b>Red</b>	301ERM1	Spring Return
<b>Red</b>	301ERT1	Twist To Reset

### Contact Blocks

Description	Reference
1 N/O. 1 N/C.	1000T1
2 N/O	1000T2
2 N/C	1000T3

### LED Indicators

Button Colour	Round LED Indicators	Square LED Indicators
<b>Red</b>	303R1	304R1
<b>Green</b>	303G1	304G1
<b>Blue</b>	303Z1	304Z1
<b>Yellow</b>	303Y1	304Y1
<b>White</b>	303W1	304W1

### Flush Enclosure with Stainless Steel Faceplate

Description	Dimensions	Reference
<b>Single Hole</b>	Back box 75x75x75 Plate 100x100	01/30/PB
<b>Two Hole</b>	Back box 150x75x75 Plate 175x100	02/30/PB

**Elevado  
caudal de aire...  
fresco**



**ventiladores**

**INDUSTRIALES  
AXIALES**

**SIEMENS**



# Ventiladores industriales axiales

La técnica de ventilación impone diversas exigencias a los ventiladores, por lo que se necesitan muchos tipos de ellos. Hay que diferenciar entre dos tipos constructivos básicos: Ventiladores radiales y ventiladores axiales.

En los ventiladores axiales el aire fluye a través del ventilador en dirección axial. Estos ventiladores transportan cantidades grandes de aire (caudales) con pequeños aumentos de presión.



# Ventiladores Axiales

Los ventiladores axiales son apropiados para la extracción de aire en general, gases y vapores, o para la inyección de aire en recintos tales como salas de cine, tiendas, almacenes, establos, gallineros, etc. También se emplean para disipar el calor producido por equipos que requieran constante refrigeración, como motores y transformadores de potencia.

### **Extracción de aire**

Cuando se extrae aire de un local cerrado, se crea un vacío. Este vacío provoca la entrada de aire fresco por las aberturas naturales del mismo (ventanas y puertas). En caso de que el local esté cerrado por completo y haya que renovar el aire frecuentemente, se hacen necesarias aberturas adicionales.

La velocidad de aire entrante no deberá sobrepasar 1 m/s. En caso de locales grandes, es preferible el uso de varios ventiladores, porque una ventilación completa solamente existe cuando todo el aire del local es uniformemente removido.

La extracción de aire se usa especialmente en lugares con concentraciones de gases, vapores y malos olores que no deban salir a locales vecinos.

### **Inyección de aire**

En un local cerrado, el ventilador que introduce aire desde el exterior genera una leve sobrepresión y obliga al aire del local a salir por las aberturas naturales del mismo. Si el volumen de aire a renovar es grande, habrá que practicar aberturas adicionales para la salida del aire.

La ventaja de esta modalidad de ventilación es poder limpiar el aire entrante por medio de filtros, o también acondicionarlo por medio de dispositivos adicionales.

### **Combinación de sistemas**

Una combinación de sistemas de extracción e inyección de aire es recomendable en los locales que requieran un elevado número de renovaciones de aire, o cuando se desee un flujo de éste en una dirección determinada.

### **Instalaciones de extracción de impurezas del aire**

Son adecuadas para locales o fábricas donde se generan vapores o polvo. Aparte de la ventilación del local, la extracción de impurezas debe ser hecha lo más cerca posible del lugar donde se generan, por medio de un ventilador que, combinado con un sistema de campana y recolector, transporte las impurezas y las deposite (si es el caso) en lugares seguros (colectores).

Dependiendo de las condiciones físicas y geométricas del local, es aconsejable instalar dos o más ventiladores uniformemente distribuidos, con lo cual se obtiene una ventilación más eficiente del recinto.

Ya que el motor está dispuesto en el trayecto de flujo de aire, se recomienda utilizarlo en temperaturas inferiores a 40° C., en la misma forma, para aplicaciones con humedad relativa alta del medio a transportar, se recomienda hacer protección IP54 al motor.



# Características técnicas

Los ventiladores axiales con elevado caudal de aire son especialmente aptos para ser instalados sobre paredes o ductos, en cualquier posición axial.

Para su montaje debe tenerse en cuenta la función deseada: extracción o inyección, ya que el aire debe circular en dirección de las aspas al motor, para lo cual el sentido de giro del motor debe ser hacia la derecha. Un cambio en el sentido de rotación reduce en un 35% el caudal nominal de aire.

Su ejecución mecánica se basa en una tobera cilíndrica en lámina de acero (laminado en frío) con dos recubrimientos de pintura, una anticorrosiva, en casos de humedad, y otra de acabado color gris.

El motor se fija por medio de cuatro soportes equidistantes, un extremo apoyado sobre una abrazadera alrededor de este y el otro al cilindro del ventilador. La rueda de aletas plásticas, en polipropileno de alta resistencia o, bajo pedido, en fundición de aluminio, se fija directamente al eje del motor, no siendo necesaria una brida especial.

Los valores de caudal de aire se basan en una sobrepresión estática equivalente a 0 N/m<sup>2</sup> y en un medio a transportar con peso específico de 1.23 Kp/m, correspondiente al aire a una temperatura de 15° C. y 76 mm. columna de mercurio.

## Con motor monofásico

Este tipo de ventilador se construye en diámetros desde 250 mm. hasta 500 mm., con motor sin interruptor centrífugo, es decir, con arranque por condensador para servicio permanente en redes de 110 V., 60 Hz. ó, bajo pedido, a 150 V., en ambos casos a 1800 rpm.

El motor viene con carcasa en lámina de acero totalmente cerrado, protección IP44, con el condensador sobre el platillo posterior; de esta manera el aire circula libremente sin resistencias ni turbulencias a través de la superficie del motor, aumentando su caudal nominal y reduciendo el nivel de ruido.

## Con motor trifásico

Este tipo de ventiladores se construye en diámetros desde 400 mm. hasta 710 mm., con motores totalmente cerrados, clase de protección IP44, a 1800 y 1200 rpm., para redes de 220/440 V., 60 Hz, ó voltajes de 260 V. y 380 V., bajo pedido.

Para la protección eléctrica del motor se aconseja utilizar un guardamotor SIRIUS 3RV como protección contra cortocircuito, sobrecarga y marcha en dos fases, producidas por bajos voltajes o fallas en la red de alimentación, adicionalmente permite la conexión y desconexión de la red.

### Datos Técnicos

Tipo	Diámetro mm.	Caudal m <sup>3</sup> /s	Potencia kW	Intensidad (A)	Nivel Ruido (dB) (A)	Peso Kg.	No. Depósito
<b>Con motor monofásico, 110 V., 4 polos, 1800 RPM</b>							
				<b>110V</b>			
2CC2 254-5YC3	250	0.38	0.050	0.8	62	5.0	01181
2CC2 314-5YC3	316	0.70	0.088	1.5	62	6.0	01182
2CC2 354-5YC3	350	1.01	0.110	1.9	68	7.0	01183
2CC2 404-5YC3	400	1.45	0.220	3.2	74	8.0	01184
2CC2 504-5YA3	500	2.93	0.700	8.3	78	23.5	01185
<b>Con motor trifásico, 220/440 V., 4 polos, 1800 RPM</b>							
				<b>220V</b>	<b>440V</b>		
2CC2 404-5YP6	400	1.45	0.20	1.14	0.57	74	01186
2CC2 504-5YB6	500	2.93	0.66	3.00	1.50	78	01187
2CC2 634-5YB6	630	5.33	1.60	6.40	3.20	87	01188
2CC1 714-5YB6	710	8.37	3.58	14.00	7.00	91	01189
<b>Con motor trifásico, 220/440 V., 6 polos, 1200 RPM</b>							
2CC2 506-5YB6	500	1.91	0.19	1.22	0.61	68	01190
2CC2 636-5YB6	630	3.55	0.51	3.10	1.55	76	01191
2CC2 716-5YB6	710	5.27	1.20	6.70	3.35	80	01192

\* Con aspa de aluminio.

# Amplia gama de selección

La selección de un ventilador se efectúa tomando en cuenta las condiciones de montaje y los datos característicos exigidos: caudal y sobrepresión.

## Determinación del caudal

El caudal requerido para ventilar adecuadamente un local puede ser calculado, generalmente, en dependencia del volumen del local que debe ventilarse y de la frecuencia de cambio de aire por hora, mediante la relación:

$$Q = \frac{V \times (R/h)}{3600}$$

Donde:

Q = Caudal de aire requerido (m<sup>3</sup>/seg)

V = Volumen del local a ventilar (m<sup>3</sup>)

R/h = Número de renovaciones por hora

En lugares donde se aglomeran personas, como cines, teatros, colegios, comedores, discotecas, etc., se recomienda calcular el caudal de aire a remover con base en el aire necesario por persona/hora, teniendo en cuenta el aire viciado (fumadores) y el calor producido por los cuerpos.

### Caudal de aire a remover

Aire exterior °C	Cantidad de aire requerido	
	No fumadores m3/h	Fumadores m3/h
0 a 26	20	30
> 26	15	23

Otro parámetro a considerar es la sobrepresión estática (la que vence las resistencias del sistema donde se encuentra el ventilador), ya que ella influye sobre el caudal de aire.

Para ventiladores instalados en locales (por ejemplo cuando se montan en paredes), 20 a 50 Pa. aproximadamente, son suficientes. Si se conectan tuberías o aparatos para tratamiento de aire, hay que añadir la resistencia que producen. Los casos más comunes son:

- 1) Sin persianas ni filtros  
Sobrepresión estática: 0 N/m<sup>2</sup>
- 2) Con persianas pero sin filtros  
Sobrepresión estática: 10 a 30 N/m<sup>2</sup>
- 3) Con persianas y filtros  
Sobrepresión estática: 50 a 100 N/m<sup>2</sup>.



Con motor monofásico

### Caudal de aire Q (m/s) impulsado bajo diferentes sobrepresiones estáticas\*

Ventilador tipo	Sobrepresión N/m2						
	0	30	50	100	150	200	300
2CC2 254	0.38	0.25	0.16				
2CC2 314	0.70	0.60	0.53				
2CC2 354	1.01	0.90	0.87	0.50			
2CC2 404	1.45	1.30	1.18	0.90			
2CC2 504	2.93	2.75	2.70	2.40	2.17	1.80	
2CC2 634	5.33	5.20	5.10	4.76	4.50	4.10	2.45
2CC1 714	8.37	8.20	8.10	7.80	7.80	7.00	6.00
2CC2 506	1.92	1.75	-	-	-		
2CC2 636	3.55	3.32	3.10	2.50	1.65		
2CC2 716	5.27	5.25	4.98	4.48	3.84	3.10	

\* Aire impulsado por los ventiladores Siemens.

Con motor trifásico



# Ejemplos

Dependiendo de las condiciones físicas del local, se pueden usar dos o más ventiladores uniformemente distribuidos, cuya suma de caudales sea equivalente al caudal total requerido.

## Ejemplo 1

Se pretende ventilar un taller de mecánica cuyo volumen es de 1800 m<sup>3</sup>. Para no contaminar el aire externo se instala un filtro. La red disponible es trifásica de 220V.

Renovaciones recomendadas 10 por hora.

Caudal necesario:

$$Q = \frac{1800 \text{ m}^3 \times 10}{3600} = 5.0 \text{ m}^3/\text{s}$$

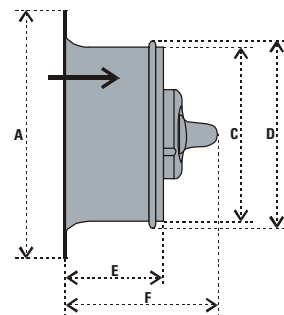
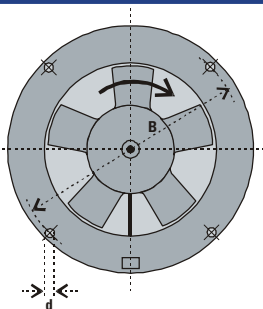
Debido al filtro, la sobrepresión estática será de 100 N/m<sup>2</sup>, por lo que se deberá seleccionar un ventilador tipo 2CC1 714, No. de Depósito 01189 cuyo caudal, a dicha presión, es de 7.8 m<sup>3</sup>/s. Para su protección se recomienda usar un guardamotor 3RV1021 4AA10, No. de Depósito 26873, regulado a la corriente nominal del motor a 220 V., 14.0 A.

Igualmente pueden ser utilizados dos ventiladores tipo 2CC2 504, cuyo caudal total es 2 x 2.4 m<sup>3</sup>/s. = 4.8 m<sup>3</sup>/s.

## Dimensiones generales

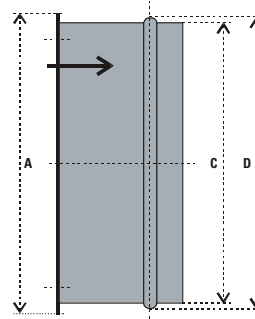
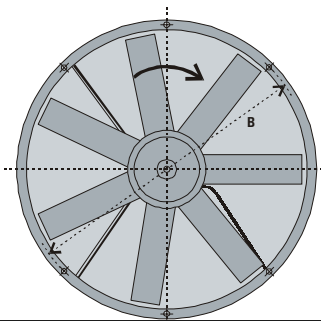
### Monofásicos

Tipo	A	B	C	D	E	F	d
2CC2 254-5YC3	360	340	252	262	145	215	10.5
2CC2 314-5YC3	430	410	318	328	145	238	10.5
2CC2 354-5YC3	465	445	356	366	145	236	10.5
2CC2 404-5YC3	515	490	402	412	145	234	10.5
2CC2 404-5YB6	515	490	402	412	145	205	10.5



### Trifásicos

Tipo	A	B	C	D	E	d
2CC2 504-5YA3	554	528	504	518	-	11.5
2CC2 504-5YB6	554	528	504	518	-	11.5
2CC2 634-5YB6	685	660	634	648	-	11.5
2CC1 714-5YB6*	765	740	714	728	-	11.5
2CC2 506-5YB6	554	528	504	518	260	11.5
2CC2 636-5YB6	685	660	634	648	300	11.5
2CC2 716-5YB6	765	740	714	728	320	11.5



\* Con aspa de aluminio

## Ejemplo 2

Se desea ventilar, en Bogotá, una taberna donde concurren 150 personas fumadoras, se utilizan persianas (sobre presión estática 30 N/m<sup>2</sup>). La red disponible es monofásica de 110 V.

Cantidad de aire requerido: 150 h x 30 m<sup>3</sup>/h = 4500 m<sup>3</sup>

Caudal necesario:

$$Q = \frac{4500 \text{ m}^3}{3600 \text{ s}} = 1.25 \text{ m}^3/\text{s}.$$

De acuerdo a la tabla de caudales, puede ser utilizado un ventilador tipo 2CC2 404 cuyo caudal, a dicha presión, es de 1.3 m<sup>3</sup>/s. El guardamotor recomendado en este caso (monofásico), es el 3RV1011 1AA10 No. de Depósito 26863, regulado a un tercio de la corriente nominal (3.2 A.), o sea 1.1 A., conectándose en paralelo sus tres vías de alimentación.

Igualmente pueden ser usados cinco ventiladores tipo 2CC2 254 cuyo caudal total es 5 x 0.25 m<sup>3</sup>/s. = 1.25 m<sup>3</sup>/s.

Guardamotor Sirius 3RV1021



### Guardamotores

Bimetálico (A)	Número de Depósito
0.7 - 1.0	26862
1.1 - 1.6	26863
1.4 - 2.0	26864
1.8 - 2.5	26865
2.2 - 3.2	26866
2.8 - 4.0	26867
3.5 - 5.0	26868
4.5 - 6.3	26869
5.5 - 8.0	26870
7.0 - 10.0	26871
9.0 - 12.0	26872
11.0 - 16.0	26873

### Renovaciones de aire recomendadas\*

	Renovaciones por hora
Iglesias	1 - 4
Habitaciones de viviendas	3 - 5
Oficinas y despachos	5 - 8
Salas de conferencias, aulas y escuelas	4 - 10
Restaurantes, casinos y comedores	5 - 10
Comercios en general	6 - 10
Cuartos de baño y guardarropas	8 - 10
Salas de acumuladores	8 - 15
Supermercados	8 - 15
Cafés y bares	10 - 12
Salas de espectáculos y baile	10 - 15
Clínicas, hospitales y laboratorios	6 - 10
Clínicas de cirugía y quirófanos	10 - 20
Sanitarios públicos	15 - 20
Salas de enfermos infecciosos	20 - 40
Sótanos y almacenaje	6 - 12
Sótanos de estacionamiento	10 - 15
Cuartos de basura	10 - 20
Cocinas, reposterías y pastelerías	10 - 20
Panaderías	20 - 30
Talleres, fábricas y almacenes	6 - 12
Manufacturas, textiles y del papel	10 - 20
Salas de copias y fotografía	12 - 20
Fábricas de productos insalubres	12 - 25
Tintorerías, lavanderías y salas de máquinas	15 - 20
Centrales eléctricas	15 - 30
Salas de calderas	20 - 30
Fundiciones	20 - 30
Quemadores de basura y residuos	20 - 40
Talleres de pintura	25 - 50
Hornos de cocción	30 - 60

\* Valor de orientación para algunos locales comunes en la práctica.

# Siemens, Calidad bien certificada



Distribuidor



**Siemens S.A.**  
**Productos Eléctricos Industriales**

**Colombia**  
**Fábrica y Sede principal**  
 Bogotá  
 Cra. 65 No. 11-50  
 ☎ 2942440 - 2942567  
 📠 2942254  
 📠 80150

[www.siemensandina.com/indus5/htm](http://www.siemensandina.com/indus5/htm)